STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-2579B	1	14

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

STRUCTURE SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 34839.1.1 (U-2579B) F.A. PROJ. _____

COUNTY FORSYTH

PROJECT DESCRIPTION WINSTON SALEM NORTHERN BELTWAY (EASTERN SECTION) (FUTURE I-74) FROM US 158 TO I-40 BUS/US 421

SITE DESCRIPTION NOISE WALL NWCD2

ID: U-2579B

PROJECT: 34839.1.1

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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) 250-4088. NEITHER THE SUBSURFACE PLANS AND REPORTS, NOR THE FIELD BORING LOGS, ROCK CORES, OR SOIL TEST DATA ARE PART OF THE CONTRACT.

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PERSONNEL

C.C. MURRAY

J.E. ESTEP

M.R. MOORE

INVESTIGATED BY C.B. LITTLE

CHECKED BY C.B. LITTLE

SUBMITTED BY C.B. LITTLE

DATE MARCH 2014

NORTH CAROLINA LICENSED SEAL 1104 GEOLOGIST CLINTON B. LITTLE 3-6-14

DRAWN BY: J.K. McCLURE

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PROJECT REFERENCE NO.	SHEET NO.
34839.1.1 (U-2579B)	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 TO BE THE 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 STANDARD PENETRATION TEST (AASHTO T206, ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. 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											GRANULAR SOILS	SILT-CLAY SOILS	MUCK, PEAT
#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			
LIQUID LIMIT	6 MX		NP	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
PLASTIC INDEX				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 A 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/FT²)
GENERALLY GRANULAR MATERIAL (NON-COHESIVE)	VERY LOOSE	<4	N/A
	LOOSE	4 TO 10	
	MEDIUM DENSE	10 TO 30	
	DENSE	30 TO 50	
	VERY DENSE	>50	
GENERALLY SILT-CLAY MATERIAL (COHESIVE)	VERY SOFT	<2	<0.25
	SOFT	2 TO 4	0.25 TO 0.50
	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
NONPLASTIC	0-5	VERY LOW
LOW PLASTICITY	6-15	SLIGHT
MED. PLASTICITY	16-25	MEDIUM
HIGH PLASTICITY	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.
UNIFORM - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. (ALSO POORLY GRADED)
GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLES 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 WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.

COMPRESSIBILITY

SLIGHTLY COMPRESSIBLE	LIQUID LIMIT LESS THAN 31
MODERATELY COMPRESSIBLE	LIQUID LIMIT EQUAL TO 31-50
HIGHLY COMPRESSIBLE	LIQUID LIMIT GREATER THAN 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 — OIP & OIP 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 W/ CORE
- SPT N-VALUE
- REF — SPT REFUSAL

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:
- [ ] MOBILE B-___
- [ ] BK-51
- [ ] CME-45C
- [X] CME-550
- [ ] PORTABLE HOIST
- [ ] _____
- [ ] _____

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

HAMMER TYPE:
- [X] AUTOMATIC [ ] MANUAL

CORE SIZE:
- [ ] -B_____
- [ ] -N_____
- [ ] -H_____

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

ROCK DESCRIPTION

HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT IF TESTED, WOULD YIELD SPT REFUSAL. 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, YIELDS SPT N VALUES > 100 BPF*
VERY SEVERE (V SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT THE MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE SUCH THAT ONLY MINOR VESTIGES OF THE ORIGINAL ROCK FABRIC REMAIN. *IF TESTED, YIELDS 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 FEET
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 THE 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, 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: FT.

NOTES:

SOIL STRATIGRAPHY IS THROUGH THE BORINGS FOR PROFILE.

BORING ELEVATIONS WERE OBTAINED FROM THE U2579B_LS_TIN_070212.TIN FILE.

REVISED 09/23/09

PROJECT REFERENCE NO.	SHEET
34839.1.1 (U-2579B)	3

SITE PLAN

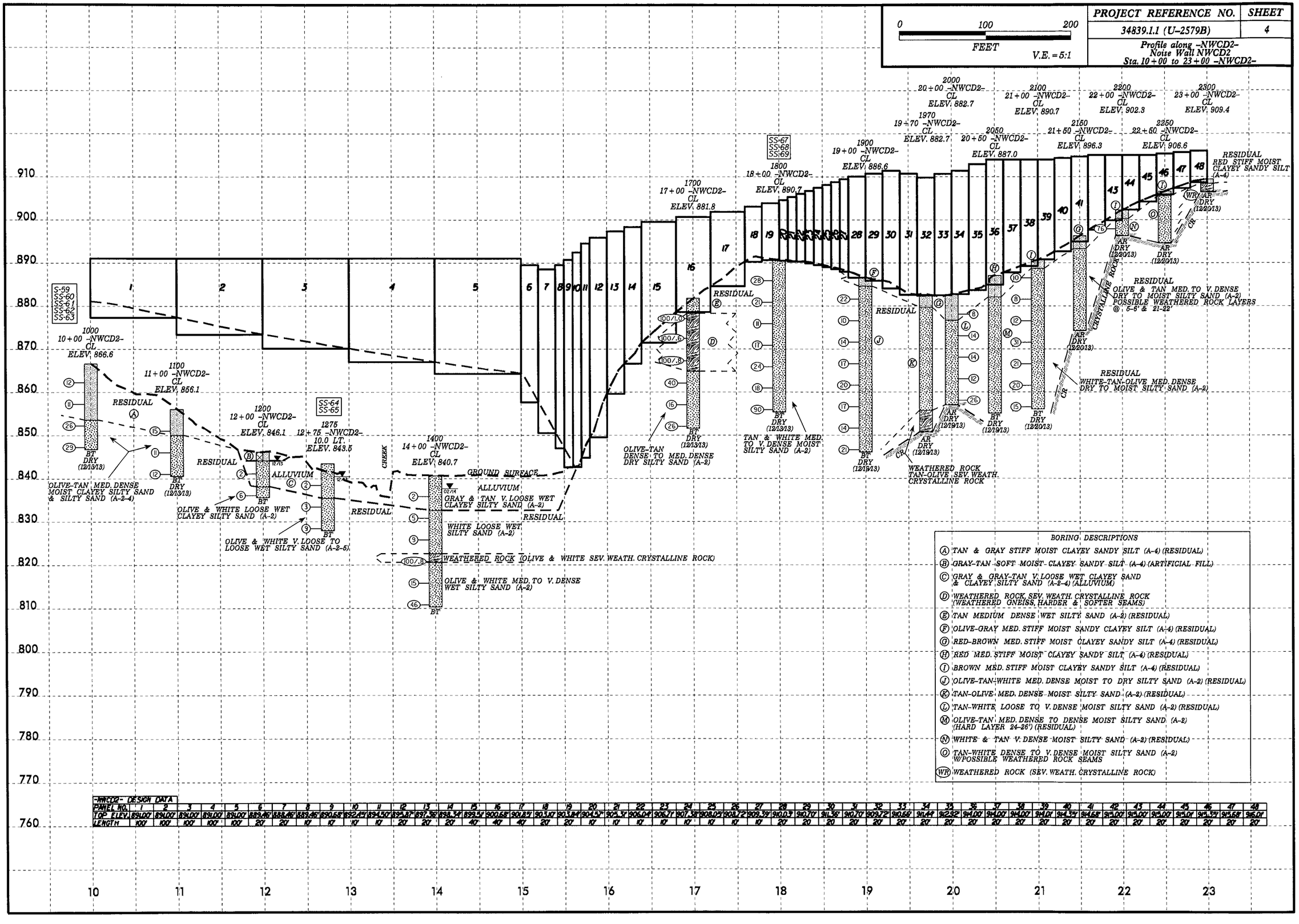
0 100 200
FEET

NOISE WALL -NWCD2-

PROJECT REFERENCE NO.	SHEET
34839.1.1 (U-2579B)	4

Profile along –NWCD2–
Noise Wall NWCD2
Sta. 10+00 to 23+00 –NWCD2–

0 100 200
FEET
V.E. = 5:1



BORING DESCRIPTIONS

- (A) TAN & GRAY STIFF MOIST CLAYEY SANDY SILT (A-4) (RESIDUAL)
- (B) GRAY-TAN SOFT MOIST CLAYEY SANDY SILT (A-4) (ARTIFICIAL FILL)
- (C) GRAY & GRAY-TAN V. LOOSE WET CLAYEY SAND & CLAYEY SILTY SAND (A-2-4) (ALLUVIUM)
- (D) WEATHERED ROCK SEV. WEATH. CRYSTALLINE ROCK (WEATHERED GNEISS, HARDER & SOFTER SEAMS)
- (E) TAN MEDIUM DENSE WET SILTY SAND (A-2) (RESIDUAL)
- (F) OLIVE-GRAY MED. STIFF MOIST SANDY CLAYEY SILT (A-4) (RESIDUAL)
- (G) RED-BROWN MED. STIFF MOIST CLAYEY SANDY SILT (A-4) (RESIDUAL)
- (H) RED MED. STIFF MOIST CLAYEY SANDY SILT (A-4) (RESIDUAL)
- (I) BROWN MED. STIFF MOIST CLAYEY SANDY SILT (A-4) (RESIDUAL)
- (J) OLIVE-TAN-WHITE MED. DENSE MOIST TO DRY SILTY SAND (A-2) (RESIDUAL)
- (K) TAN-OLIVE MED. DENSE MOIST SILTY SAND (A-2) (RESIDUAL)
- (L) TAN-WHITE LOOSE TO V. DENSE MOIST SILTY SAND (A-2) (RESIDUAL)
- (M) OLIVE-TAN MED. DENSE TO DENSE MOIST SILTY SAND (A-2) (HARD LAYER 24–26') (RESIDUAL)
- (N) WHITE & TAN V. DENSE MOIST SILTY SAND (A-2) (RESIDUAL)
- (O) TAN-WHITE DENSE TO V. DENSE MOIST SILTY SAND (A-2) W/POSSIBLE WEATHERED ROCK SEAMS
- (WR) WEATHERED ROCK (SEV. WEATH. CRYSTALLINE ROCK)

–NWCD2– DESIGN DATA

PANEL NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
TOP ELEV.	891.00'	891.00'	891.00'	891.00'	891.00'	889.46'	888.46'	883.46'	880.68'	882.47'	894.50'	892.81'	897.36'	898.34'	899.51'	900.68'	901.87'	903.10'	903.84'	904.57'	905.34'	906.04'	906.71'	907.38'	908.07'	908.72'	909.39'	910.03'	910.70'	911.36'	910.70'	909.72'	910.66'	911.44'	912.92'	914.00'	914.00'	914.00'	914.01'	914.34'	914.68'	915.00'	915.00'	915.00'	915.01'	915.34'	915.68'	916.01'
LENGTH	100'	100'	100'	100'	100'	20'	20'	10'	10'	10'	10'	20'	20'	20'	40'	40'	40'	20'	20'	10'	10'	10'	10'	10'	10'	10'	10'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'

NCDOT GEOTECHNICAL ENGINEERING UNIT
BOREHOLE REPORT

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION WINSTON-SALEM NORTHERN BELTWAY (EASTERN SECTION) NOISE WALL NWCD2				**GROUND WTR (ft)**
BORING NO. 1000	**STATION** 10+00	**OFFSET** CL	**ALIGNMENT** -NWCD2-	**0 HR.** Dry
COLLAR ELEV. 866.6 ft	**TOTAL DEPTH** 19.8 ft	**NORTHING** 859,805	**EASTING** 1,665,881	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/2011		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 12/12/13	**COMP. DATE** 12/12/13	**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)
870										
										866.6 GROUND SURFACE 0.0
865							S-59			**RESIDUAL** TAN & GRAY STIFF MOIST CLAYEY SANDY SILT (A-4)
	863.3	3.3	6	5	7	12	SS-60	M		
860	858.3	8.3	5	4	7	11	SS-61	M		
855										853.6 13.0
	853.3	13.3	6	7	19	26	SS-62	M		OLIVE-TAN MED. DENSE MOIST CLAYEY SILTY SAND & SILTY SAND (A-2-4)
850	848.3	18.3	15	13	16	29	SS-63	M		846.8 19.8
										Boring Terminated at Elevation 846.8 ft IN MEDIUM DENSE MOIST SILTY SAND (A-2-4)

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION WINSTON-SALEM NORTHERN BELTWAY (EASTERN SECTION) NOISE WALL NWCD2				**GROUND WTR (ft)**
BORING NO. 1100	**STATION** 11+00	**OFFSET** CL	**ALIGNMENT** -NWCD2-	**0 HR.** Dry
COLLAR ELEV. 856.1 ft	**TOTAL DEPTH** 15.5 ft	**NORTHING** 859,712	**EASTING** 1,665,844	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/2011		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 12/12/13	**COMP. DATE** 12/12/13	**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
860										
										856.1 GROUND SURFACE 0.0
855										**RESIDUAL** TAN & GRAY STIFF MOIST CLAYEY SANDY SILT (A-4)
	852.1	4.0	5	6	9	15		M		
850										850.1 6.0
	847.1	9.0	4	5	6	11		M		OLIVE-TAN MEDIUM DENSE MOIST SILTY SAND (A-2)
845										
	842.1	14.0	6	5	7	12		M		840.6 15.5
										Boring Terminated at Elevation 840.6 ft IN MEDIUM DENSE MOIST SILTY SAND (A-2)

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WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION WINSTON-SALEM NORTHERN BELTWAY (EASTERN SECTION) NOISE WALL NWCD2				**GROUND WTR (ft)**
BORING NO. 1200	**STATION** 12+00	**OFFSET** CL	**ALIGNMENT** -NWCD2-	**0 HR.** 3.0
COLLAR ELEV. 846.1 ft	**TOTAL DEPTH** 10.5 ft	**NORTHING** 859,619	**EASTING** 1,665,807	**24 HR.** 2.0
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/2011		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 12/12/13	**COMP. DATE** 12/12/13	**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)
850											
										846.1 GROUND SURFACE	0.0
845										ARTIFICIAL FILL	
										844.1 GRAY-TAN SOFT MOIST CLAYEY SANDY SILT (A-4)	2.0
	842.1	4.0	2	1	1	2		W		ALLUVIAL	
840										GRAY V. LOOSE WET CLAYEY SAND (A-2)	
										838.1	8.0
	837.1	9.0	1	2	4	6		W		RESIDUAL	
										835.6 OLIVE & WHITE LOOSE WET CLAYEY SILTY SAND (A-2)	10.5
										Boring Terminated at Elevation 835.6 ft IN LOOSE WET SILTY SAND (A-2)	

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION WINSTON-SALEM NORTHERN BELTWAY (EASTERN SECTION) NOISE WALL NWCD2				**GROUND WTR (ft)**
BORING NO. 1275	**STATION** 12+75	**OFFSET** 10 ft LT	**ALIGNMENT** -NWCD2-	**0 HR.** 4.0
COLLAR ELEV. 843.5 ft	**TOTAL DEPTH** 15.5 ft	**NORTHING** 859,545	**EASTING** 1,665,790	**24 HR.** 3.0
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/2011		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 12/12/13	**COMP. DATE** 12/12/13	**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
845										
										843.5 GROUND SURFACE 0.0
840	839.5	4.0	1	1	1	2	SS-64	W		ALLUVIAL GRAY-TAN V. LOOSE WET CLAYEY SILTY SAND (A-2-4)
835	834.5	9.0	1	2	1	3	SS-65	W		835.5 8.0 RESIDUAL OLIVE & WHITE V. LOOSE TO LOOSE WET SILTY SAND (A-2-5)
830	829.5	14.0	5	4	5	9		W		828.0 15.5 Boring Terminated at Elevation 828.0 ft IN LOOSE WET SILTY SAND (A-2-5)

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WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION WINSTON-SALEM NORTHERN BELTWAY (EASTERN SECTION) NOISE WALL NWCD2				**GROUND WTR (ft)**
BORING NO. 1400	**STATION** 14+00	**OFFSET** CL	**ALIGNMENT** -NWCD2-	**0 HR.** 4.0
COLLAR ELEV. 840.7 ft	**TOTAL DEPTH** 30.3 ft	**NORTHING** 859,432	**EASTING** 1,665,735	**24 HR.** 3.0
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/2011		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 02/06/14	**COMP. DATE** 02/06/14	**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)
845												
840										GROUND SURFACE	840.7	0.0
										ALLUVIAL GRAY & TAN V. LOOSE WET CLAYEY SILTY SAND (A-2)		
	836.9	3.8	1	1	1	2		Sat.				
835												
	831.9	8.8	1	3	2	5		W			832.7	8.0
830										**RESIDUAL** WHITE LOOSE WET SILTY SAND (A-2)		
	826.9	13.8	3	4	5	9		W				
825												
	821.9	18.8	44	56/.3		100/.8					822.7	18.0
820										**WEATHERED ROCK** OLIVE & WHITE SEV. WEATH. CRYSTALLINE ROCK	820.7	20.0
	816.9	23.8	4	9	6	15		W		**RESIDUAL** OLIVE & WHITE MED. TO V. DENSE WET SILTY SAND (A-2)		
815												
	811.9	28.8	13	24	22	46		W			810.4	30.3
										Boring Terminated at Elevation 810.4 ft IN DENSE WET SILTY SAND (A-2)		

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION WINSTON-SALEM NORTHERN BELTWAY (EASTERN SECTION) NOISE WALL NWCD2				**GROUND WTR (ft)**
BORING NO. 1700	**STATION** 17+00	**OFFSET** CL	**ALIGNMENT** -NWCD2-	**0 HR.** Dry
COLLAR ELEV. 881.8 ft	**TOTAL DEPTH** 30.2 ft	**NORTHING** 859,165	**EASTING** 1,665,745	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/2011		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 12/12/13	**COMP. DATE** 12/12/13	**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)
885												
880										GROUND SURFACE	881.8	0.0
										RESIDUAL TAN MEDIUM DENSE WET SILTY SAND (A-2)		
	878.1	3.7	22	78/.5		100/1.0		D			878.3	3.5
875										**WEATHERED ROCK** SEV. WEATH. CRYSTALLINE ROCK (WEATHERED GNEISS, HARDER & SOFTER SEAMS)		
	873.1	8.7	55	60/.1		100/.6						
870												
	868.1	13.7	47	53/.3		100/.8					864.8	17.0
865										OLIVE-TAN DENSE TO MED. DENSE DRY SILTY SAND (A-2)		
	863.1	18.7	9	5	35	40		D				
860												
	858.1	23.7	5	7	9	16		D				
855												
	853.1	28.7	7	11	15	26		D			851.6	30.2
										Boring Terminated at Elevation 851.6 ft IN MED. DENSE DRY SILTY SAND (A-2)		

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WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION WINSTON-SALEM NORTHERN BELTWAY (EASTERN SECTION) NOISE WALL NWCD2				**GROUND WTR (ft)**
BORING NO. 1800	**STATION** 18+00	**OFFSET** CL	**ALIGNMENT** -NWCD2-	**0 HR.** Dry
COLLAR ELEV. 890.7 ft	**TOTAL DEPTH** 35.3 ft	**NORTHING** 859,073	**EASTING** 1,665,706	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/2011		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 12/13/13	**COMP. DATE** 12/13/13	**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)
895										
890										890.7 GROUND SURFACE 0.0
										RESIDUAL
										TAN & WHITE MED. TO V. DENSE MOIST
										SILTY SAND (A-2)
885	886.9	3.8	14	11	17	28	SS-67	M		
880	881.9	8.8	6	8	13	21		M		
875	876.9	13.8	7	5	6	11	SS-68	M		
870	871.9	18.8	5	7	10	17		M		
865	866.9	23.8	20	12	12	24	SS-69	M		
860	861.9	28.8	4	7	11	18		M		
	856.9	33.8	12	29	61	90		M		855.4 35.3
										Boring Terminated at Elevation 855.4 ft IN V. DENSE MOIST SILTY SAND (A-2)

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION WINSTON-SALEM NORTHERN BELTWAY (EASTERN SECTION) NOISE WALL NWCD2				**GROUND WTR (ft)**
BORING NO. 1900	**STATION** 19+00	**OFFSET** CL	**ALIGNMENT** -NWCD2-	**0 HR.** Dry
COLLAR ELEV. 886.6 ft	**TOTAL DEPTH** 40.5 ft	**NORTHING** 858,983	**EASTING** 1,665,661	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/2011		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 12/18/13	**COMP. DATE** 12/18/13	**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
890										886.6 GROUND SURFACE 0.0
										RESIDUAL
885										884.6 OLIVE-GRAY MED. STIFF MOIST SANDY CLAYEY SILT (A-4) 2.0
	882.6	4.0	7	10	12	22		M		OLIVE-TAN-WHITE MED. DENSE MOIST
880	877.6	9.0	4	4	6	10		D		TO DRY SILTY SAND (A-2)
875	872.6	14.0	4	6	8	14		D		
870	867.6	19.0	7	8	9	17		D		
865	862.6	24.0	4	6	14	20		D		
860	857.6	29.0	8	8	9	17		D		
855	852.6	34.0	6	6	8	14		M		
850	847.6	39.0	6	9	12	21		M		846.1 40.5
										Boring Terminated at Elevation 846.1 ft IN MEDIUM DENSE MOIST SILTY SAND (A-2)

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WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.
SITE DESCRIPTION WINSTON-SALEM NORTHERN BELTWAY (EASTERN SECTION) NOISE WALL NWCD2			**GROUND WTR (ft)**
BORING NO. 1970	**STATION** 19+70	**OFFSET** CL	**ALIGNMENT** -NWCD2- — **0 HR.** Dry
COLLAR ELEV. 882.7 ft	**TOTAL DEPTH** 32.0 ft	**NORTHING** 858,920	**EASTING** 1,665,630 — **24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/2011		**DRILL METHOD** Solid Augers	**HAMMER TYPE** Automatic
DRILLER Estep, J. E.	**START DATE** 12/18/13	**COMP. DATE** 12/18/13	**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)
										882.7 GROUND SURFACE	0.0
										RESIDUAL RED-BROWN MED. STIFF MOIST CLAYEY SANDY SILT (A-4)	
										879.7 TAN-OLIVE MED. DENSE MOIST SILTY SAND (A-2)	3.0
										855.7 **WEATHERED ROCK** TAN-OLIVE SEV. WEATH. CRYSTALLINE ROCK	27.0
										850.7 Boring Terminated BY AUGER REFUSAL at Elevation 850.7 ft ON CRYSTALLINE ROCK	32.0

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.
SITE DESCRIPTION WINSTON-SALEM NORTHERN BELTWAY (EASTERN SECTION) NOISE WALL NWCD2			**GROUND WTR (ft)**
BORING NO. 2000	**STATION** 20+00	**OFFSET** CL	**ALIGNMENT** -NWCD2- — **0 HR.** Dry
COLLAR ELEV. 882.7 ft	**TOTAL DEPTH** 25.7 ft	**NORTHING** 858,893	**EASTING** 1,665,617 — **24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/2011		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER Estep, J. E.	**START DATE** 12/18/13	**COMP. DATE** 12/18/13	**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)
										882.7 GROUND SURFACE	0.0
										RESIDUAL RED-BROWN MED. STIFF MOIST CLAYEY SANDY SILT (A-4)	
								M		876.7 TAN-WHITE LOOSE TO V. DENSE MOIST SILTY SAND (A-2)	6.0
	879.1	3.6	4	4	4	8		M			
	874.1	8.6	4	6	8	14		M			
	869.1	13.6	4	6	8	14		M			
	864.1	18.6	4	5	7	12		M			
	859.1	23.6	3	6	20	26		M		857.0 Boring Terminated BY AUGER REFUSAL at Elevation 857.0 ft ON CRYSTALLINE ROCK	25.7

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WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.
SITE DESCRIPTION WINSTON-SALEM NORTHERN BELTWAY (EASTERN SECTION) NOISE WALL NWCD2			**GROUND WTR (ft)**
BORING NO. 2050	**STATION** 20+50	**OFFSET** CL	**ALIGNMENT** -NWCD2- — **0 HR.** Dry
COLLAR ELEV. 887.0 ft	**TOTAL DEPTH** 32.0 ft	**NORTHING** 858,849	**EASTING** 1,665,595 — **24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/2011		**DRILL METHOD** Solid Augers	**HAMMER TYPE** Automatic
DRILLER Estep, J. E.	**START DATE** 12/18/13	**COMP. DATE** 12/18/13	**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)
										887.0 GROUND SURFACE	0.0
										RESIDUAL RED MED. STIFF MOIST CLAYEY SANDY SILT (A-4)	
										882.0	5.0
										OLIVE-TAN MED. DENSE TO DENSE MOIST SILTY SAND (A-2) (HARD LAYER 24-26')	
										855.0 Boring Terminated at Elevation 855.0 ft IN DENSE MOIST SILTY SAND (A-2)	32.0

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.
SITE DESCRIPTION WINSTON-SALEM NORTHERN BELTWAY (EASTERN SECTION) NOISE WALL NWCD2			**GROUND WTR (ft)**
BORING NO. 2100	**STATION** 21+00	**OFFSET** CL	**ALIGNMENT** -NWCD2- — **0 HR.** Dry
COLLAR ELEV. 890.7 ft	**TOTAL DEPTH** 34.7 ft	**NORTHING** 858,804	**EASTING** 1,665,573 — **24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/2011		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER Estep, J. E.	**START DATE** 12/19/13	**COMP. DATE** 12/19/13	**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
										890.7 GROUND SURFACE 0.0
										RESIDUAL
										888.7 BROWN MED. STIFF MOIST CLAYEY SANDY SILT (A-4) 2.0
										WHITE-TAN-OLIVE MED. DENSE DRY TO MOIST SILTY SAND (A-2)
887.5		3.2	6	4	6	10		M		
882.5		8.2	2	4	4	8		M		
877.5		13.2	4	5	7	12		M		
872.5		18.2	6	19	12	31		D		
867.5		23.2	10	9	12	21		D		
862.5		28.2	6	12	8	20		M		
857.5		33.2	4	5	10	15		M		
										856.0 Boring Terminated at Elevation 856.0 ft IN MEDIUM DENSE MOIST SILTY SAND (A-2) 34.7

NCDOT GEOTECHNICAL ENGINEERING UNIT
BOREHOLE REPORT

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION WINSTON-SALEM NORTHERN BELTWAY (EASTERN SECTION) NOISE WALL NWCD2				**GROUND WTR (ft)**
BORING NO. 2150	**STATION** 21+50	**OFFSET** CL	**ALIGNMENT** -NWCD2-	**0 HR.** Dry
COLLAR ELEV. 896.3 ft	**TOTAL DEPTH** 22.0 ft	**NORTHING** 858,759	**EASTING** 1,665,551	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/2011		**DRILL METHOD** Solid Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 12/19/13	**COMP. DATE** 12/19/13	**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)
900										896.3 GROUND SURFACE 0.0
										RESIDUAL
895										RED-BROWN MED. STIFF MOIST CLAYEY SANDY SILT (A-4)
										893.3 3.0
890										OLIVE & TAN MED. TO V. DENSE DRY TO MOIST SILTY SAND (A-2) POSSIBLE WEATHERED ROCK LAYERS @ 5-6' & 21-22'
885										
880										
875										874.3 22.0
										Boring Terminated BY AUGER REFUSAL at Elevation 874.3 ft ON CRYSTALLINE ROCK

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION WINSTON-SALEM NORTHERN BELTWAY (EASTERN SECTION) NOISE WALL NWCD2				**GROUND WTR (ft)**
BORING NO. 2200	**STATION** 22+00	**OFFSET** CL	**ALIGNMENT** -NWCD2-	**0 HR.** Dry
COLLAR ELEV. 902.3 ft	**TOTAL DEPTH** 6.0 ft	**NORTHING** 858,714	**EASTING** 1,665,528	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/2011		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 12/19/13	**COMP. DATE** 12/19/13	**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
905										902.3 GROUND SURFACE 0.0
										RESIDUAL
900										900.3 BROWN MED. STIFF MOIST CLAYEY SANDY SILT (A-4) 2.0
	898.9	3.4	11	11	65	76		M		WHITE & TAN V. DENSE MOIST SILTY SAND (A-2)
										896.3 6.0
										Boring Terminated BY AUGER REFUSAL at Elevation 896.3 ft ON CRYSTALLINE ROCK

NCDOT GEOTECHNICAL ENGINEERING UNIT
BOREHOLE REPORT

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION WINSTON-SALEM NORTHERN BELTWAY (EASTERN SECTION) NOISE WALL NWCD2				**GROUND WTR (ft)**
BORING NO. 2250	**STATION** 22+50	**OFFSET** CL	**ALIGNMENT** -NWCD2-	**0 HR.** Dry
COLLAR ELEV. 906.6 ft	**TOTAL DEPTH** 12.0 ft	**NORTHING** 858,669	**EASTING** 1,665,506	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/2011		**DRILL METHOD** Solid Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 12/19/13	**COMP. DATE** 12/19/13	**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)
910										906.6 GROUND SURFACE	0.0
										905.6 **RESIDUAL** BROWN MED. STIFF MOIST CLAYEY SANDY SILT (A-4)	1.0
905										TAN-WHITE DENSE TO V. DENSE MOIST SILTY SAND (A-2) W/ POSSIBLE WEATHERED ROCK SEAMS	
900											
895										894.6	12.0
										Boring Terminated BY AUGER REFUSAL at Elevation 894.6 ft ON CRYSTALLINE ROCK	

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION WINSTON-SALEM NORTHERN BELTWAY (EASTERN SECTION) NOISE WALL NWCD2				**GROUND WTR (ft)**
BORING NO. 2300	**STATION** 23+00	**OFFSET** CL	**ALIGNMENT** -NWCD2-	**0 HR.** Dry
COLLAR ELEV. 909.4 ft	**TOTAL DEPTH** 3.0 ft	**NORTHING** 858,625	**EASTING** 1,665,484	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/2011		**DRILL METHOD** Solid Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 12/19/13	**COMP. DATE** 12/19/13	**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	
910										909.4 GROUND SURFACE	0.0
										908.4 **RESIDUAL** RED STIFF MOIST CLAYEY SANDY SILT (A-4)	1.0
										906.4 **WEATHERED ROCK** SEV. WEATH. CRYSTALLINE ROCK	3.0
										Boring Terminated BY AUGER REFUSAL at Elevation 906.4 ft ON CRYSTALLINE ROCK	

TEST RESULTS

PROJECT: 34839.1.1 (U-2579B)
COUNTY: FORSYTH
SITE DESCRIPTION: WINSTON-SALEM NORTHERN BELTWAY (EASTERN SECTION) NOISE WALL NWCD2

SHEET 13

SOIL SAMPLE RESULTS

SAMPLE NO.	*OFFSET*	*STATION*	*DEPTH INTERVAL*	*AASHTO CLASS*	*N*	*L.L.*	*P.I.*	*% BY WEIGHT*				*% PASSING SIEVES*			*% MOISTURE*	*% ORGANIC*	*UNIT WT. (d)*	*VOID RATIO*
								C. SAND	*F. SAND*	*SILT*	*CLAY*	*10*	*40*	*200*				
		1000																
S-59	CL	10+00 -NWCD2-	0.0-2.0	A-4(0)		24	4	38.5	25.0	18.3	18.2	98	75	39	-	-		
SS-60	CL	10+00 -NWCD2-	3.3-4.8	A-4(0)	12	28	4	37.7	30.1	20.1	12.1	100	77	36	-	-		
SS-61	CL	10+00 -NWCD2-	8.3-9.8	A-4(1)	11	35	10	36.9	27.9	17.1	18.2	100	77	40	-	-		
SS-62	CL	10+00 -NWCD2-	13.3-14.8	A-2-4(0)	26	30	NP	56.5	20.0	13.4	10.1	92	54	24	-	-		
SS-63	CL	10+00 -NWCD2-	18.3-19.8	A-2-4(0)	29	28	NP	45.4	35.3	15.2	4.0	100	75	24	-	-		
		1275																
SS-64	10' LT	12+75 -NWCD2-	4.0-5.5	A-2-4(0)	2	29	4	39.2	28.7	18.1	14.1	99	74	35	-	-		
SS-65	10' LT	12+75 -NWCD2-	9.0-10.5	A-2-5(0)	3	50	NP	50.3	31.1	14.6	4.0	100	69	22	-	-		
		1800																
SS-67	CL	18+00 -NWCD2-	3.8-5.3	A-2-4(0)	28	34	NP	47.0	33.9	13.0	6.1	100	74	23	-	-		
SS-68	CL	18+00 -NWCD2-	13.8-15.3	A-2-4(0)	11	39	NP	41.6	31.3	17.1	10.1	100	75	31	-	-		
SS-69	CL	18+00 -NWCD2-	23.8-29.3	A-2-4(0)	24	33	NP	53.1	31.7	13.2	2.0	91	59	17	-	-		

ROCK SAMPLE RESULTS

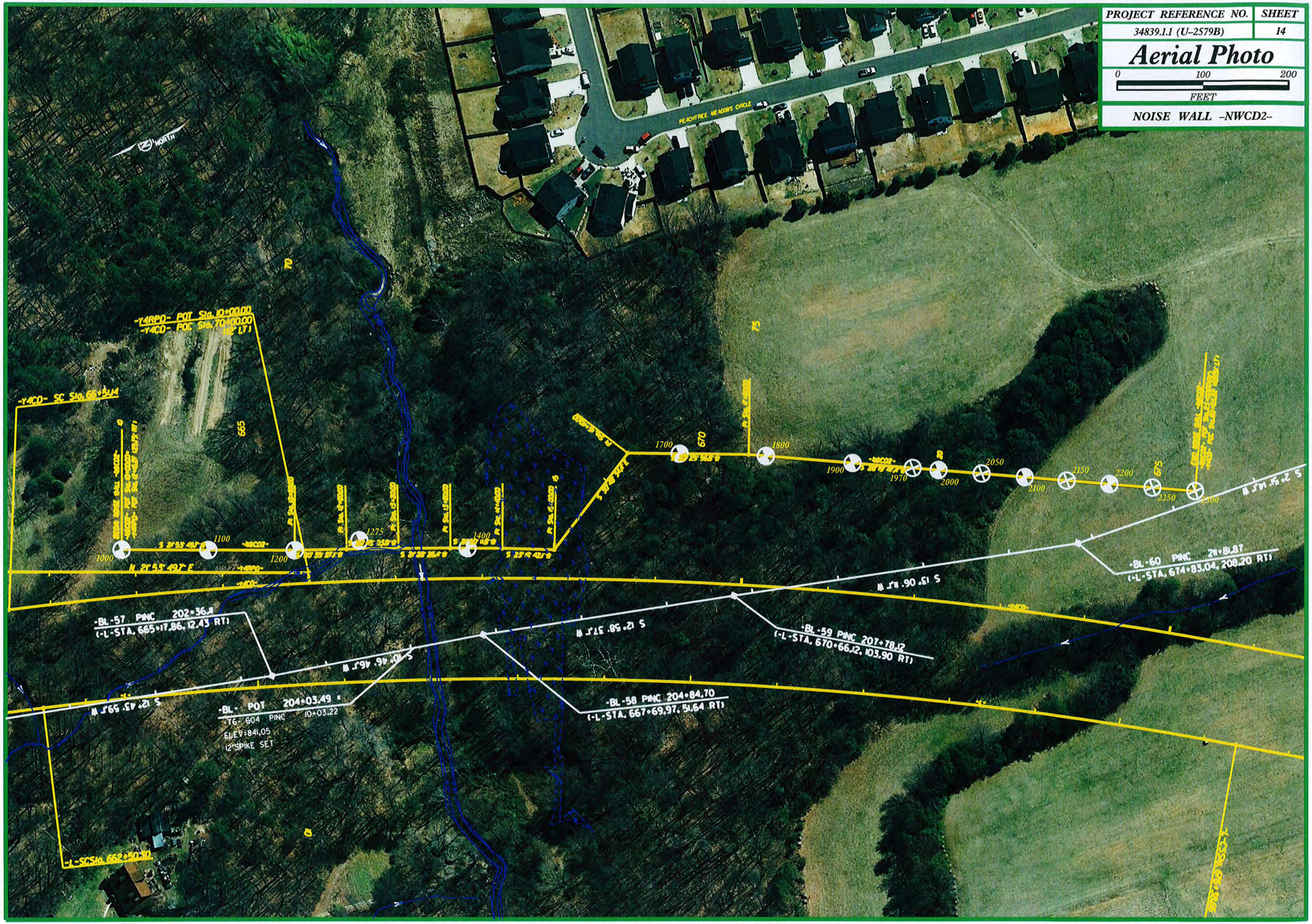
SAMPLE NO.	*OFFSET*	*STATION*	*DEPTH INTERVAL*	*RQD*	*UNIT WT (pcf)*	Q(ksf)	E(MPsi)

PROJECT REFERENCE NO.	SHEET
34839.1.1 (U-2579B)	14

Aerial Photo

0 100 200
FEET

NOISE WALL -NWCD2-



STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	34839.1.1 (U-2579B)	1	12

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

STRUCTURE SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. *34839.1.1 (U-2579B)* F.A. PROJ. *NHF-0918(93)*

COUNTY *FORSYTH*

PROJECT DESCRIPTION *WINSTON-SALEM NORTHERN BELTWAY (EASTERN SECTION) FROM US 158 TO I-40 BUS./US 421*

SITE DESCRIPTION *NOISE WALL -NWL2- 10+00 TO -NWL2- 33+60*

ID: U-2579B

PROJECT: 34839.1.1

CONTENTS

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PERSONNEL

C. C. MURRAY

M. R. MOORE

J. E. ESTEP

INVESTIGATED BY *C. B. LITTLE*

CHECKED BY *C. B. LITTLE*

SUBMITTED BY *C. B. LITTLE*

DATE *APRIL 2014*

NORTH CAROLINA LICENSED SEAL 1104 GEOLOGIST CLINTON B. LITTLE

4-22-14

DRAWN BY: *C. E. BURRIS*

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PROJECT REFERENCE NO.	SHEET NO.
34839.1.1 (U-2579B)	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 TO BE THE 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 STANDARD PENETRATION TEST (AASHTO T206, ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. 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
LIQUID LIMIT	6 MX		NP	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
PLASTIC INDEX				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 A 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	N/A
	LOOSE	4 TO 10	
	MEDIUM DENSE	10 TO 30	
	DENSE	30 TO 50	
	VERY DENSE	>50	
GENERALLY SILT-CLAY MATERIAL (COHESIVE)	VERY SOFT	<2	<0.25
	SOFT	2 TO 4	0.25 TO 0.50
	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
NONPLASTIC	0-5	VERY LOW
LOW PLASTICITY	6-15	SLIGHT
MED. PLASTICITY	16-25	MEDIUM
HIGH PLASTICITY	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.
UNIFORM - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. (ALSO POORLY GRADED)
GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLES 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 WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.

COMPRESSIBILITY

SLIGHTLY COMPRESSIBLE	LIQUID LIMIT LESS THAN 31
MODERATELY COMPRESSIBLE	LIQUID LIMIT EQUAL TO 31-50
HIGHLY COMPRESSIBLE	LIQUID LIMIT GREATER THAN 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 W/ CORE
- SPT N-VALUE
- REF — SPT REFUSAL

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:
- [ ] MOBILE B-___
- [ ] BK-51
- [ ] CME-45C
- [X] CME-550
- [ ] PORTABLE HOIST
- [ ] _____
- [ ] _____

ADVANCING TOOLS:
- [ ] CLAY BITS
- [ ] 6" CONTINUOUS FLIGHT AUGER
- [X] 8" HOLLOW AUGERS
- [ ] HARD FACED FINGER BITS
- [X] TUNG.-CARBIDE INSERTS
- [X] CASING [X] W/ ADVANCER
- [X] TRICONE 2 15/16 " STEEL TEETH
- [ ] TRICONE _____ " TUNG.-CARB.
- [ ] CORE BIT
- [X] 2 3/8 DRAG BIT

HAMMER TYPE:
- [X] AUTOMATIC [ ] MANUAL

CORE SIZE:
- [ ] -B_____
- [ ] -N_____
- [ ] -H_____

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

ROCK DESCRIPTION

HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT IF TESTED, WOULD YIELD SPT REFUSAL. 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 FELOSPARS ARE KAOLINIZED TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. *IF TESTED, YIELDS SPT N VALUES > 100 BPF*
VERY SEVERE (V SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT THE MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE SUCH THAT ONLY MINOR VESTIGES OF THE ORIGINAL ROCK FABRIC REMAIN. *IF TESTED, YIELDS 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 FEET
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 THE 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, 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: BL-39 STA. 585+16.87 -L- 191.58 RT
N 867741.4220 E 1666381.6040
ELEVATION: 945.66 FT.

NOTES:
STRATIGRAPHY SHOWN THROUGH BORINGS

ELEVATIONS FOR NOISE WALL BORINGS WERE OBTAINED FROM U-2579B .TIN FILE

ELEVATION FOR BRIDGE BORING 'EB2-B (SBL)' OBTAINED FROM BENCHMARK 'BL-39'.

REVISED 09/23/09

PROJECT REFERENCE NO.	SHEET NO.
U-2579B	3
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PISGAH METHODIST CHURCH

STANLEY STIGALL

STANLEY RUSSELL STIGALL

NOISE WALL ON BRIDGE
(STRUCTURE PAY ITEM SEE STRUCTURE PLANS)

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DB 2687 PG 409

GARY V. WILSON and wife MARY M. WILSON

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DB 3023 PG 0254

DALE V. WILSON
ANN H. WILSON

-L- WINSTON SALEM OUTER LOOP

SR 2654 PISGAH RD

NOISE BARRIER -NWL2-

-NWL2- DESIGN DATA																																	
PANEL NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
TOP ELEV	992.00'	992.00'	992.00'	992.00'	992.00'	991.02'	990.44'	989.77'	989.10'	988.44'	987.77'	987.10'	986.44'	985.77'	985.10'	984.44'	983.77'	983.10'	982.44'	981.77'	981.10'	980.44'	979.77'	979.10'	978.44'	977.77'	977.10'	976.44'	975.77'	975.10'	974.43'	973.77'	973.10'	972.43'	971.77'	971.00'
LENGTH	100'	100'	60'	60'	60'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'

-NWL1-

-NWL2-

MINIMUM WALL HEIGHT

NOISE WALL ON BRIDGE

PROPOSED GROUND AT FACE OF NOISE WALL

EXISTING GROUND

SS-124
SS-125
SS-126
SS-127
SS-128
SS-129

EB2-B (SBL)
10+00 -NWL2-
1.0 LT.
=
585+81 -L-
88.0 RT.
ELEV. = 949.1

S-95
SS-96
SS-97
SS-98
SS-99

19+50 -NWL2-
℄
ELEV. = 937.6'

RESIDUAL
RED & PURPLE MOIST STIFF CLAYEY SANDY SILT (A-6) W/MICA

ORANGE WET STIFF CLAYEY SANDY SILT (A-6)

TAN-BROWN WET STIFF CLAYEY SANDY SILT (A-6) W/MICA

TAN ORANGE WET STIFF CLAYEY SANDY SILT (A-6)

GREENISH-BROWN WET LOOSE MICA CLAYEY SILTY SAND. (A-2-6)

TAN-ORANGE WET LOOSE TO MED. DENSE MICA SILTY SAND (A-2-4)

WEATHERED ROCK
SEVERELY WEATHERED CRYSTALLINE ROCK

DBR CRYSTALLINE ROCK

NOTE:
DBR = DRAG BIT REFUSAL

NM (02/13)

RESIDUAL
RED-BROWN STIFF TO VERY STIFF MOIST LOW TO MED PLASTIC SILTY SANDY CLAY (A-7-6)
PI = 16

RESIDUAL
PI = 24

PI = 14

OLIVE-GRAY VERY DENSE DRY SILTY SAND (A-1-b)

GRAY AND WHITE MED DENSE DRY SILTY SAND (A-2-6)

BT DRY 02/14

MATCHLINE -NWL2- STA. 20+00.00

1000 990 980 970 960 950 940 930 920 910 900 890

34 10 11 12 13 14 15 16 17 18 19 20

8/17/99

NOISE BARRIER -NWL2-

PROJECT REFERENCE NO.	SHEET NO.
U-2579B	4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DALE V. WILSON
ANN H. WILSON
DB 2103 PG 3539
DB 1963 PG 1045

(-L-STA. 605+99.88, 0.39 LT)
-BL-42 PINC 141+67.03

-L- WINSTON SALEM OUTER LOOP

MATCHLINE -NWL2- STA.20+00.00

S 5°26'33.0" E | S 4°25'44.4" E | S 3°24'55.7" E | S 2°24'07.1" E | S 1°23'18.4" E | S 0°22'29.8" E | S 0°37'41.4" W | S 1°25'13.8" W | S 1°47'36.8" W | S 1°50'32.0" W

2115 | 2200 | 2300 | 2425 | 2500 | 2600 | 2675 | 2800 | 2900 | 3000 | 3100 | 3200

-NWL2-

PI Sta. 20+00.00 | PI Sta. 21+00.00 | PI Sta. 22+00.00 | PI Sta. 23+00.00 | PI Sta. 24+00.00 | PI Sta. 25+00.00 | PI Sta. 26+00.00 | PI Sta. 27+00.00 | PI Sta. 28+00.00 | PI Sta. 29+00.00

-L- CS Sta. 602+51.20 | -L- ST Sta. 604+97.20

CHORD

END NOISE WALL -NWL2-
-NWL2- POT Sta. 33+60.00
-L- POT Sta. 609+68.44 (86.75' RT)

DALE V. WILSON
ANN H. WILSON

HELEN ELLIOTT
DB 193 PG 290

HELEN ELLIOTT

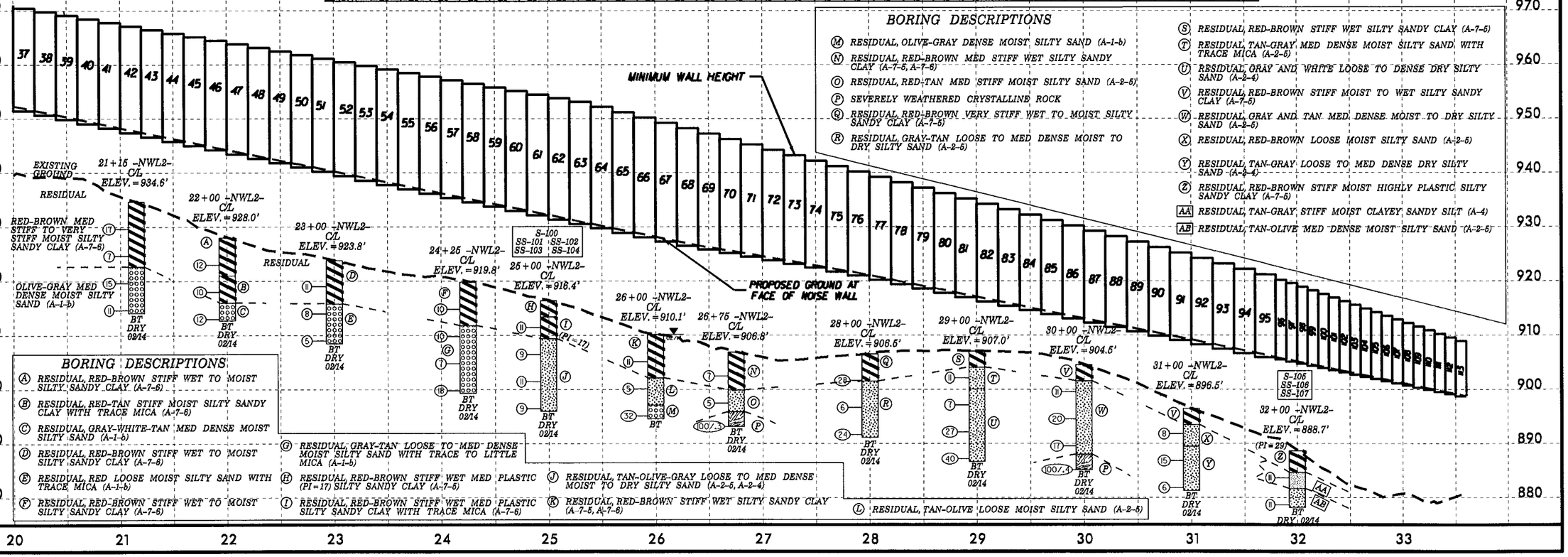
ISFD

-NWL2-

-NWL2- DESIGN DATA

PANEL NO.	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83
TOP ELEV.	970.4'	969.7'	969.0'	968.4'	967.7'	967.0'	966.4'	965.7'	965.0'	964.4'	963.7'	963.0'	962.4'	961.7'	961.0'	960.4'	959.7'	959.0'	958.4'	957.7'	957.0'	956.4'	955.7'	955.0'	954.4'	953.7'	953.0'	952.4'	951.7'	951.0'	950.4'	949.7'	949.0'	948.4'	947.7'	947.0'	946.4'	945.7'	945.0'	944.4'	943.7'	943.0'	942.4'	941.7'	941.0'	940.4'	939.7'	939.0'	938.4'	937.7'	937.0'	936.4'	935.7'	935.0'	934.4'	933.7'
LENGTH	-	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'

PANEL NO.	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113
TOP ELEV.	932.7'	932.0'	931.4'	930.7'	930.0'	929.4'	928.7'	928.0'	927.4'	926.7'	926.0'	925.4'	924.7'	924.0'	923.4'	922.7'	922.0'	921.4'	920.7'	920.0'	919.5'	918.8'	918.2'	917.5'	916.8'	916.2'	915.5'	914.8'	914.2'	913.5'	912.8'	912.2'	911.5'	910.8'	910.2'	909.5'	908.8'
LENGTH	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	10'	10'	10'	10'	10'	10'	10'	10'	10'	10'	10'	10'	10'	10'	10'	10'	10'	10'



NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.
SITE DESCRIPTION Winston-Salem Northern Beltway Noise Wall NWL2			**GROUND WTR (ft)**
BORING NO. 1950	**STATION** 19+50	**OFFSET** CL	**ALIGNMENT** -NWL2-	**0 HR.** Dry
COLLAR ELEV. 937.6 ft	**TOTAL DEPTH** 20.3 ft	**NORTHING** 866,584	**EASTING** 1,666,372	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/2011		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER Estep, J. E.	**START DATE** 02/18/14	**COMP. DATE** 02/18/14	**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)
940											
										937.6	0.0
										GROUND SURFACE	
935										**RESIDUAL** RED-BROWN STIFF TO VERY STIFF MOIST LOW TO MED PLASTIC (PI=24, PI=16, PI=14) SILTY SANDY CLAY (A-7-6)	
	933.8	3.8	5	6	8	14	S-95	M			
930							SS-96	M			
	928.8	8.8	5	6	9	15	SS-97	M			
925										926.6	11.0
	923.8	13.8	10	37	28	65	SS-98	D		**RESIDUAL** OLIVE-GRAY VERY DENSE DRY SILTY SAND (A-1-b)	
920										920.6	17.0
	918.8	18.8	10	8	7	15	SS-99	D		**RESIDUAL** GRAY AND WHITE MED DENSE DRY SILTY SAND (A-2-5)	
										917.3	20.3
										Boring Terminated at Elevation 917.3 ft in silty sand	

NCDOT BORE SINGLE U2579B_GEO_BH_SWAL_NWL2.GPJ NC_DOT.GDT 4/7/14

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.
SITE DESCRIPTION Winston-Salem Northern Beltway Noise Wall NWL2			**GROUND WTR (ft)**
BORING NO. 2115	**STATION** 21+15	**OFFSET** CL	**ALIGNMENT** -NWL2-	**0 HR.** Dry
COLLAR ELEV. 934.6 ft	**TOTAL DEPTH** 20.5 ft	**NORTHING** 866,419	**EASTING** 1,666,389	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/2011		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER Estep, J. E.	**START DATE** 02/18/14	**COMP. DATE** 02/18/14	**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)
935											
										934.6	0.0
										GROUND SURFACE	
930	930.6	4.0	5	8	9	17		M		**RESIDUAL** RED-BROWN MED STIFF TO VERY STIFF MOIST SILTY SANDY CLAY (A-7-6)	
925	925.6	9.0	3	3	4	7		M			
										922.6	12.0
920	920.6	14.0	4	7	8	15		M		**RESIDUAL** OLIVE-GRAY MED DENSE MOIST SILTY SAND (A-1-b)	
915	915.6	19.0	4	4	7	11		M		914.1	20.5
										Boring Terminated at Elevation 914.1 ft in silty sand	

NCDOT BORE SINGLE U2579B_GEO_BH_SWAL_NWL2.GPJ NC_DOT.GDT 4/7/14

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION Winston-Salem Northern Beltway Noise Wall NWL2				**GROUND WTR (ft)**
BORING NO. 2200	**STATION** 22+00	**OFFSET** CL	**ALIGNMENT** -NWL2-	**0 HR.** Dry
COLLAR ELEV. 928.0 ft	**TOTAL DEPTH** 15.3 ft	**NORTHING** 866,335	**EASTING** 1,666,395	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/2011		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 02/18/14	**COMP. DATE** 02/18/14	**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)
930											
										928.0 GROUND SURFACE	0.0
										RESIDUAL RED-BROWN STIFF WET TO MOIST SILTY SANDY CLAY (A-7-6)	
925	924.0	4.0	4	5	7	12		M			
										921.0	7.0
920	919.0	9.0	5	5	5	10		M		**RESIDUAL** RED-TAN STIFF MOIST SILTY SANDY CLAY WITH TRACE MICA (A-7-6)	
										916.0	12.0
915	914.0	14.0	5	3	9	12		M		**RESIDUAL** GRAY-WHITE-TAN MED DENSE MOIST SILTY SAND (A-1-b)	
										912.7	15.3
										Boring Terminated at Elevation 912.7 ft in silty sand	

NCDOT BORE SINGLE U2579B_GEO_BH_SWAL_NWL2.GPJ NC_DOT.GDT 4/7/14

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION Winston-Salem Northern Beltway Noise Wall NWL2				**GROUND WTR (ft)**
BORING NO. 2300	**STATION** 23+00	**OFFSET** CL	**ALIGNMENT** -NWL2-	**0 HR.** Dry
COLLAR ELEV. 923.8 ft	**TOTAL DEPTH** 15.3 ft	**NORTHING** 866,235	**EASTING** 1,666,401	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/2011		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 02/18/14	**COMP. DATE** 02/18/14	**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)
925											
										923.8 GROUND SURFACE	0.0
										RESIDUAL RED-BROWN STIFF WET TO MOIST SILTY SANDY CLAY (A-7-6)	
920	920.0	3.8	3	5	6	11		W			
										915.8	8.0
915	915.0	8.8	3	3	5	8		M		**RESIDUAL** RED LOOSE MOIST SILTY SAND WITH TRACE MICA (A-1-b)	
910	910.0	13.8	2	2	3	5		M		908.5	15.3
										Boring Terminated at Elevation 908.5 ft in silty sand	

NCDOT BORE SINGLE U2579B_GEO_BH_SWAL_NWL2.GPJ NC_DOT.GDT 4/7/14

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION Winston-Salem Northern Beltway Noise Wall NWL2				**GROUND WTR (ft)**
BORING NO. 2425	**STATION** 24+25	**OFFSET** CL	**ALIGNMENT** -NWL2-	**0 HR.** Dry
COLLAR ELEV. 919.8 ft	**TOTAL DEPTH** 20.5 ft	**NORTHING** 866,110	**EASTING** 1,666,406	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/2011		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 02/18/14	**COMP. DATE** 02/18/14	**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)
920										919.8 GROUND SURFACE	0.0
	915.8	4.0	3	4	6	10		M		RESIDUAL RED-BROWN STIFF WET TO MOIST SILTY SANDY CLAY (A-7-6)	
915										911.8	8.0
	910.8	9.0	2	3	7	10		M		RESIDUAL GRAY-TAN LOOSE TO MED DENSE MOIST SILTY SAND WITH TRACE TO LITTLE MICA (A-1-b)	
910											
	905.8	14.0	3	3	4	7		M			
905											
	900.8	19.0	3	6	12	18		M		899.3	20.5
900										Boring Terminated at Elevation 899.3 ft in silty sand	

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION Winston-Salem Northern Beltway Noise Wall NWL2				**GROUND WTR (ft)**
BORING NO. 2500	**STATION** 25+00	**OFFSET** CL	**ALIGNMENT** -NWL2-	**0 HR.** Dry
COLLAR ELEV. 916.4 ft	**TOTAL DEPTH** 20.4 ft	**NORTHING** 866,035	**EASTING** 1,666,408	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/2011		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 02/18/14	**COMP. DATE** 02/18/14	**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)
920										916.4 GROUND SURFACE	0.0
	912.5	3.9	3	5	6	11	S-100	W		RESIDUAL RED-BROWN STIFF WET MED PLASTIC (PI=17) SILTY SANDY CLAY (A-7-5)	
915										913.4	3.0
	907.5	8.9	3	4	5	9	SS-101	W		RESIDUAL RED-BROWN STIFF WET MED PLASTIC (PI=17) SILTY SANDY CLAY WITH TRACE MICA (A-7-6)	
910										909.4	7.0
	902.5	13.9	3	5	6	11	SS-102	M		RESIDUAL TAN-OLIVE-GRAY LOOSE TO MED DENSE MOIST TO DRY SILTY SAND (A-2-5, A-2-4)	
905											
	897.5	18.9	5	4	5	9	SS-103	M			
900											
							SS-104	D		896.0	20.4
										Boring Terminated at Elevation 896.0 ft in silty sand	

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION Winston-Salem Northern Beltway Noise Wall NWL2				**GROUND WTR (ft)**
BORING NO. 2600	**STATION** 26+00	**OFFSET** CL	**ALIGNMENT** -NWL2-	**0 HR.** Dry
COLLAR ELEV. 910.1 ft	**TOTAL DEPTH** 15.5 ft	**NORTHING** 865,935	**EASTING** 1,666,408	**24 HR.** 0.0
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/2011		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 02/18/14	**COMP. DATE** 02/18/14	**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)
915											
910										910.1 GROUND SURFACE	0.0
										RESIDUAL RED-BROWN STIFF WET SILTY SANDY CLAY (A-7-5, A-7-6)	
905	906.1	4.0	3	5	6	11		W			
										902.1	8.0
900	901.1	9.0	3	2	3	5		M		**RESIDUAL** TAN-OLIVE LOOSE MOIST SILTY SAND (A-2-5)	
										897.1	13.0
895	896.1	14.0	35	22	10	32		M		**RESIDUAL** OLIVE-GRAY DENSE MOIST SILTY SAND (A-1-b)	
										894.6	15.5
										Boring Terminated at Elevation 894.6 ft in silty sand	

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION Winston-Salem Northern Beltway Noise Wall NWL2				**GROUND WTR (ft)**
BORING NO. 2675	**STATION** 26+75	**OFFSET** CL	**ALIGNMENT** -NWL2-	**0 HR.** Dry
COLLAR ELEV. 906.8 ft	**TOTAL DEPTH** 13.7 ft	**NORTHING** 865,860	**EASTING** 1,666,408	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/2011		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 02/19/14	**COMP. DATE** 02/19/14	**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)
910										906.8 GROUND SURFACE	0.0
905	903.4	3.4	2	4	3	7		W		**RESIDUAL** RED-BROWN MED STIFF WET SILTY SANDY CLAY (A-7-5, A-7-6)	
										899.8	7.0
900	898.4	8.4	2	2	3	5		M		**RESIDUAL** RED-TAN MED STIFF MOIST SILTY SAND (A-2-5)	
										895.8	11.0
895	893.4	13.4	100/.3			100/.3				**WEATHERED ROCK** SEVERELY WEATHERED CRYSTALLINE ROCK	
										893.1	13.7
										Boring Terminated at Elevation 893.1 ft in severely weathered crystalline rock	

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION Winston-Salem Northern Beltway Noise Wall NWL2				**GROUND WTR (ft)**
BORING NO. 2800	**STATION** 28+00	**OFFSET** CL	**ALIGNMENT** -NWL2-	**0 HR.** Dry
COLLAR ELEV. 906.5 ft	**TOTAL DEPTH** 15.4 ft	**NORTHING** 865,735	**EASTING** 1,666,405	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/2011		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 02/19/14	**COMP. DATE** 02/19/14	**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)
910										906.5 GROUND SURFACE	0.0
905	902.6	3.9	10	17	11	28		M		**RESIDUAL** RED-BROWN VERY STIFF WET TO MOIST SILTY SANDY CLAY (A-7-5)	
900	897.6	8.9	3	3	3	6		M		901.5 **RESIDUAL** GRAY-TAN LOOSE TO MED DENSE MOIST TO DRY SILTY SAND (A-2-5)	5.0
895	892.6	13.9	11	12	12	24		D		891.1 Boring Terminated at Elevation 891.1 ft in silty sand	15.4

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION Winston-Salem Northern Beltway Noise Wall NWL2				**GROUND WTR (ft)**
BORING NO. 2900	**STATION** 29+00	**OFFSET** CL	**ALIGNMENT** -NWL2-	**0 HR.** Dry
COLLAR ELEV. 907.0 ft	**TOTAL DEPTH** 20.4 ft	**NORTHING** 865,635	**EASTING** 1,666,402	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/2011		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 02/19/14	**COMP. DATE** 02/19/14	**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)
910										907.0 GROUND SURFACE	0.0
905	903.1	3.9	3	6	5	11		M		**RESIDUAL** RED-BROWN STIFF WET SILTY SANDY CLAY (A-7-5)	3.0
900	898.1	8.9	2	2	5	7		D		904.0 **RESIDUAL** TAN-GRAY MED DENSE MOIST SILTY SAND WITH TRACE MICA (A-2-5)	7.0
895	893.1	13.9	7	14	13	27		D		900.0 **RESIDUAL** GRAY AND WHITE LOOSE TO DENSE DRY SILTY SAND (A-2-4)	
890	888.1	18.9	31	22	18	40		D		886.6 Boring Terminated at Elevation 886.6 ft in silty sand	20.4

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.
SITE DESCRIPTION Winston-Salem Northern Beltway Noise Wall NWL2			**GROUND WTR (ft)**
BORING NO. 3000	**STATION** 30+00	**OFFSET** CL	**ALIGNMENT** -NWL2-	**0 HR.** Dry
COLLAR ELEV. 904.5 ft	**TOTAL DEPTH** 19.4 ft	**NORTHING** 865,535	**EASTING** 1,666,399	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/2011		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER Estep, J. E.	**START DATE** 02/19/14	**COMP. DATE** 02/19/14	**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)
905											
	904.5									904.5 GROUND SURFACE	0.0
										RESIDUAL RED-BROWN STIFF MOIST SILTY SANDY CLAY (A-7-5)	
900	900.5	4.0	3	6	5	11		M		901.5	3.0
										RESIDUAL GRAY AND TAN MED DENSE MOIST TO DRY SILTY SAND (A-2-5)	
895	895.5	9.0	3	11	9	20		D			
890	890.5	14.0	9	8	9	17		D			
										888.0	16.5
	885.5	19.0	100/.4			100/.4				**WEATHERED ROCK** SEVERELY WEATHERED CRYSTALLINE ROCK	
										885.1	19.4
										Boring Terminated at Elevation 885.1 ft in severely weathered crystalline rock	

NCDOT BORE SINGLE U2579B_GEO_BH_SWAL_NWL2.GPJ NC_DOT.GDT 4/7/14

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.
SITE DESCRIPTION Winston-Salem Northern Beltway Noise Wall NWL2			**GROUND WTR (ft)**
BORING NO. 3100	**STATION** 31+00	**OFFSET** CL	**ALIGNMENT** -NWL2-	**0 HR.** Dry
COLLAR ELEV. 896.5 ft	**TOTAL DEPTH** 15.2 ft	**NORTHING** 865,435	**EASTING** 1,666,395	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/2011		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER Estep, J. E.	**START DATE** 02/19/14	**COMP. DATE** 02/19/14	**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)
900											
										896.5 GROUND SURFACE	0.0
895										**RESIDUAL** RED-BROWN STIFF WET SILTY SANDY CLAY (A-7-5)	
	892.8	3.7	3	4	4	8		M		893.5	3.0
890										**RESIDUAL** RED-BROWN LOOSE MOIST SILTY SAND (A-2-5)	
	887.8	8.7	7	7	8	15		D		889.5	7.0
885										**RESIDUAL** TAN-GRAY LOOSE TO MED DENSE DRY SILTY SAND (A-2-4)	
	882.8	13.7	3	2	4	6		D			
										881.3	15.2
										Boring Terminated at Elevation 881.3 ft in silty sand	

NCDOT BORE SINGLE U2579B_GEO_BH_SWAL_NWL2.GPJ NC_DOT.GDT 4/7/14

NCDOT GEOTECHNICAL ENGINEERING UNIT
BOREHOLE REPORT

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION Winston-Salem Northern Beltway Noise Wall NWL2				**GROUND WTR (ft)**
BORING NO. 3200	**STATION** 32+00	**OFFSET** CL	**ALIGNMENT** -NWL2-	**0 HR.** Dry
COLLAR ELEV. 888.7 ft	**TOTAL DEPTH** 10.5 ft	**NORTHING** 865,335	**EASTING** 1,666,392	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/2011		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 02/19/14	**COMP. DATE** 02/19/14	**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)
890										888.7 GROUND SURFACE	0.0
										RESIDUAL RED-BROWN STIFF MOIST HIGHLY PLASTIC (PI=29) SILTY SANDY CLAY (A-7-5)	
885	884.7	4.0	4	5	6	11	S-105	M		884.7	4.0
							SS-106	M		**RESIDUAL** TAN-GRAY STIFF MOIST CLAYEY SANDY SILT (A-4)	
880	879.7	9.0	3	4	7	11				881.7	7.0
							SS-107	M		**RESIDUAL** TAN-OLIVE MED DENSE MOIST SILTY SAND (A-2-5)	
										878.2	10.5
										Boring Terminated at Elevation 878.2 ft in silty sand	

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Callaway, R. Q.	
SITE DESCRIPTION BRIDGE OVER WEST MOUNTAIN ROAD ON WINSTON SALEM NORTHERN BELTWAY, (FUTURE I-74)				**GROUND WTR (ft)**
BORING NO. EB2-B (SBL)	**STATION** 585+81	**OFFSET** 83 ft RT	**ALIGNMENT** -L-	**0 HR.** NM
COLLAR ELEV. 949.1 ft	**TOTAL DEPTH** 59.2 ft	**NORTHING** 867,516	**EASTING** 1,666,191	**24 HR.** NM
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 82% 01/09/2013		**DRILL METHOD** NW Casing w/ SPT	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 02/28/13	**COMP. DATE** 02/28/13	**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	
950										949.1 GROUND SURFACE	0.0
										RESIDUAL 0 - 10' RESIDUAL, RED & PURPLE, MOIST, STIFF, CLAYEY SANDY SILT. MICA 10% BLACK OXIDE 10%, HIGHLY WEATHERED GNEISS (A-5)	
945											
940	941.1	8.0	3	5	6	11	SS-124	M		939.1	10.0
935	936.1	13.0	3	4	6	10		W		**RESIDUAL** 10' - 25' ORANGE, WET, STIFF, CLAYEY SANDY SILT. NO MICA. WEATHERED FINE GRAINED INTRUSIVE (A-5)	
930	931.1	18.0	4	5	7	12	SS-125	W			
925	926.1	23.0	4	4	8	12		W		924.1	25.0
920	921.1	28.0	3	4	5	9	SS-126	W		**RESIDUAL** 25' - 30' TAN, BROWN, WET, STIFF, CLAYEY SANDY SILT. 20% - 50% MICA. PROBABLY HIGHLY WEATHERED GNEISS (A-5)	
915	916.1	33.0	4	5	7	12	SS-127	W		919.1	30.0
910	911.1	38.0	2	4	5	9	SS-128	W		**RESIDUAL** 30' - 35' TAN ORANGE, WET, STIFF, CLAYEY SANDY SILT, NO MICA, WEATHERED INTRUSIVE (A-5)	
905	906.1	43.0	4	4	7	11		W		914.1	35.0
900	901.1	48.0	4	4	5	9	SS-129	W		**RESIDUAL** 35' - 40' GREENISH BROWN WET, LOOSE, CLAYEY SILTY SAND. 20% - 50% MICA, PROBABLY WEATHERED GNEISS (A-2-5)	
895	896.1	53.0	21	79/.3		100/.8				909.1	40.0
890	891.1	58.0	65	60/.1		60/.1				**RESIDUAL** 40' - 53' TAN ORANGE, WET, LOOSE TO MED. DENSE, SILTY SAND. 10% TO 20% MICA. FINE GRAINED GRANITIC INTRUSIVE (A-2-4)	
										896.1	53.0
										WEATHERED ROCK 53' - 58.5' SEVERELY WEATHERED CRYSTALLINE ROCK	
										890.6	58.5
										889.9 **CRYSTALLINE ROCK** 58.5' -59.2 CRYSTALLINE ROCK. (SPT REFUSAL AT TOP, DRAG BIT REFUSAL AT BASE)	59.2
										Boring Terminated with Drag Bit Refusal at Elevation 889.9 ft in crystalline rock	
										NOTE: BORING BEING USED ON NOISE WALL -NWL2- AT STA. 10+00 -NWL2- 1.0 LT.	

TEST RESULTS

PROJECT: 34839.1.1 (U-2579B)
COUNTY: FORSYTH
SITE DESCRIPTION: NOISE WALL -NWL2- 10+00 TO -NWL2- 33+60

SOIL SAMPLE RESULTS

SAMPLE NO.	*OFFSET*	*STATION*	*DEPTH INTERVAL*	*AASHTO CLASS*	*N*	*L.L.*	*P.I.*	*% BY WEIGHT*				*% PASSING SIEVES*			*% MOISTURE*	*% ORGANIC*	*UNIT WT. (d)*	*VOID RATIO*
								C. SAND	*F. SAND*	*SILT*	*CLAY*	*10*	*40*	*200*				
S-95	C/L	19+50 -NWL2-	0.00-3.00	A-7-6(17)	N/A	50	24	14.7	15.3	7.5	62.5	98	89	71				
SS-96	C/L	19+50 -NWL2-	3.80-5.30	A-7-6(6)	14	44	16	22.0	30.0	11.7	36.3	98	85	52				
SS-97	C/L	19+50 -NWL2-	8.80-10.30	A-7-6(5)	15	43	14	20.8	32.9	12.1	34.3	99	87	52				
SS-98	C/L	19+50 -NWL2-	13.80-15.30	A-1-b(0)	65	35	NP	41.5	41.5	10.9	6.0	56	42	13				
SS-99	C/L	19+50 -NWL2-	18.80-20.30	A-2-5(0)	15	43	NP	37.7	45.4	10.9	6.0	94	76	20				
S-100	C/L	25+00 -NWL2-	0.00-3.00	A-7-5(9)	N/A	49	17	16.9	29.8	14.9	38.3	100	91	59				
SS-101	C/L	25+00 -NWL2-	3.90-5.40	A-7-6(7)	11	43	17	22.0	26.0	13.7	38.3	99	86	55				
SS-102	C/L	25+00 -NWL2-	8.90-10.40	A-2-5(0)	9	50	NP	33.9	42.9	17.1	6.0	100	80	31				
SS-103	C/L	25+00 -NWL2-	13.90-15.40	A-2-5(0)	11	45	NP	24.0	55.6	16.3	4.0	100	90	27				
SS-104	C/L	25+00 -NWL2-	18.90-20.40	A-2-4(0)	9	37	NP	22.6	52.6	18.8	6.0	98	89	33				
S-105	C/L	32+00 -NWL2-	0.00-4.00	A-7-5(18)	N/A	63	29	19.4	20.2	15.8	44.5	100	88	63				
SS-106	C/L	32+00 -NWL2-	4.00-5.50	A-4(1)	11	37	7	31.0	30.0	20.9	18.2	100	83	43				
SS-107	C/L	32+00 -NWL2-	9.00-10.50	A-2-5(0)	11	46	NP	26.7	50.0	19.2	4.0	100	87	30				
THE FOLLOWING SAMPLES ARE FROM PROJECT 34839.1.1 BRDG_584+36-L-EB2-B (SBL)																		
SS-124	83 RT.	585+81 -L-	8.00-9.50	A-5(3)	11	55	10	28.8	30.2	20.9	20.1	97	78	46				
SS-125	83 RT.	585+81 -L-	18.00-19.50	A-5(2)	12	45	5	21.5	35.8	26.6	16.1	96	83	51				
SS-126	83 RT.	585+81 -L-	28.00-29.50	A-5(1)	9	54	9	28.4	37.6	19.9	14.1	98	81	41				
SS-127	83 RT.	585+81 -L-	33.00-34.50	A-5(0)	12	43	NP	29.6	39.4	20.9	10.1	99	81	37				
SS-128	83 RT.	585+81 -L-	38.00-39.50	A-2-5(0)	9	44	NP	35.4	35.6	18.9	10.1	96	76	33				
SS-129	83 RT.	585+81 -L-	48.00-49.50	A-2-4(0)	9	39	NP	32.8	41.4	17.7	8.0	93	73	32				

STATE	STATE PROJECT REFERENCE NO.	SHEET NO	TOTAL SHEETS
N.C.	34839.1.1 (U-2579B)	1	14

ID: U-2579B

PROJECT: 34839.1.1

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

STRUCTURE SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 34839.1.1 (U-2579B) F.A. PROJ. NHF-0918(93)

COUNTY FORSYTH

PROJECT DESCRIPTION WINSTON-SALEM NORTHERN BELTWAY (EASTERN SECTION) FROM US 158 TO I-40 BUS./US-421

SITE DESCRIPTION NOISE WALL NWL3 FROM -NWL3- 10+00 TO -NWL3- 30+93.86

CONTENTS

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PERSONNEL

C. C. MURRAY

J. E. ESTEP

M. R. MOORE

INVESTIGATED BY C. B. LITTLE

CHECKED BY C. B. LITTLE

SUBMITTED BY C. B. LITTLE

DATE APRIL 2014

NORTH CAROLINA LICENSED SEAL 1104 GEOLOGIST CLINTON B. LITTLE 4-21-14

DRAWN BY: C. E. BURRIS

NOTE - THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N. C. DEPARTMENT OF TRANSPORTATION AS BEING ACCURATE NOR IT IS CONSIDERED TO BE PART OF THE PLANS, SPECIFICATIONS, OR CONTRACT FOR THE PROJECT.

NOTE - BY HAVING REQUESTED THIS INFORMATION THE CONTRACTOR SPECIFICALLY WAIVES ANY CLAIMS FOR INCREASED COMPENSATION OR EXTENSION OF TIME BASED ON DIFFERENCES BETWEEN THE CONDITIONS INDICATED HEREIN AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

PROJECT REFERENCE NO.	SHEET NO.
34839.1.1 (U-2579B)	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 TO BE THE 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 STANDARD PENETRATION TEST (AASHTO T206, ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. 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-4, A-5	
	A-1-a	A-1-b		A-2-4	A-2-5	A-2-6	A-2-7				A-7-5, A-7-6	A-3	A-6, A-7	
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
LIQUID LIMIT	6 MX		NP	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
PLASTIC INDEX				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 A 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	N/A
	LOOSE	4 TO 10	
	MEDIUM DENSE	10 TO 30	
	DENSE	30 TO 50	
	VERY DENSE	>50	
GENERALLY SILT-CLAY MATERIAL (COHESIVE)	VERY SOFT	<2	<0.25
	SOFT	2 TO 4	0.25 TO 0.50
	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
NONPLASTIC	0-5	VERY LOW
LOW PLASTICITY	6-15	SLIGHT
MED. PLASTICITY	16-25	MEDIUM
HIGH PLASTICITY	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.
UNIFORM - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. (ALSO POORLY GRADED)
GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLES 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, FELOSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.

COMPRESSIBILITY

SLIGHTLY COMPRESSIBLE	LIQUID LIMIT LESS THAN 31
MODERATELY COMPRESSIBLE	LIQUID LIMIT EQUAL TO 31-50
HIGHLY COMPRESSIBLE	LIQUID LIMIT GREATER THAN 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 W/ CORE
- SPT N-VALUE
- REF — SPT REFUSAL

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:
- [ ] MOBILE B-___
- [ ] BK-51
- [ ] CME-45C
- [X] CME-550
- [ ] PORTABLE HOIST
- [ ] _____
- [ ] _____

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

HAMMER TYPE:
- [X] AUTOMATIC
- [ ] MANUAL

CORE SIZE:
- [ ] -B_____
- [ ] -N_____
- [ ] -H_____

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

ROCK DESCRIPTION

HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT IF TESTED, WOULD YIELD SPT REFUSAL. 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 FELOSPAR 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 FELOSPARS 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 FELOSPARS 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 FELOSPARS ARE KAOLINIZED TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. *IF TESTED, YIELDS SPT N VALUES > 100 BPF*
VERY SEVERE (V SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT THE MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE SUCH THAT ONLY MINOR VESTIGES OF THE ORIGINAL ROCK FABRIC REMAIN. *IF TESTED, YIELDS 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 FEET
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 THE 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, 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 (REC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.

STRATA ROCK QUALITY DESIGNATION (RQD) - 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: FT.

NOTES:
STRATIGRAPHY SHOWN THROUGH BORINGS

ELEVATIONS OBTAINED FROM U-2579B_LS_TIN FILE

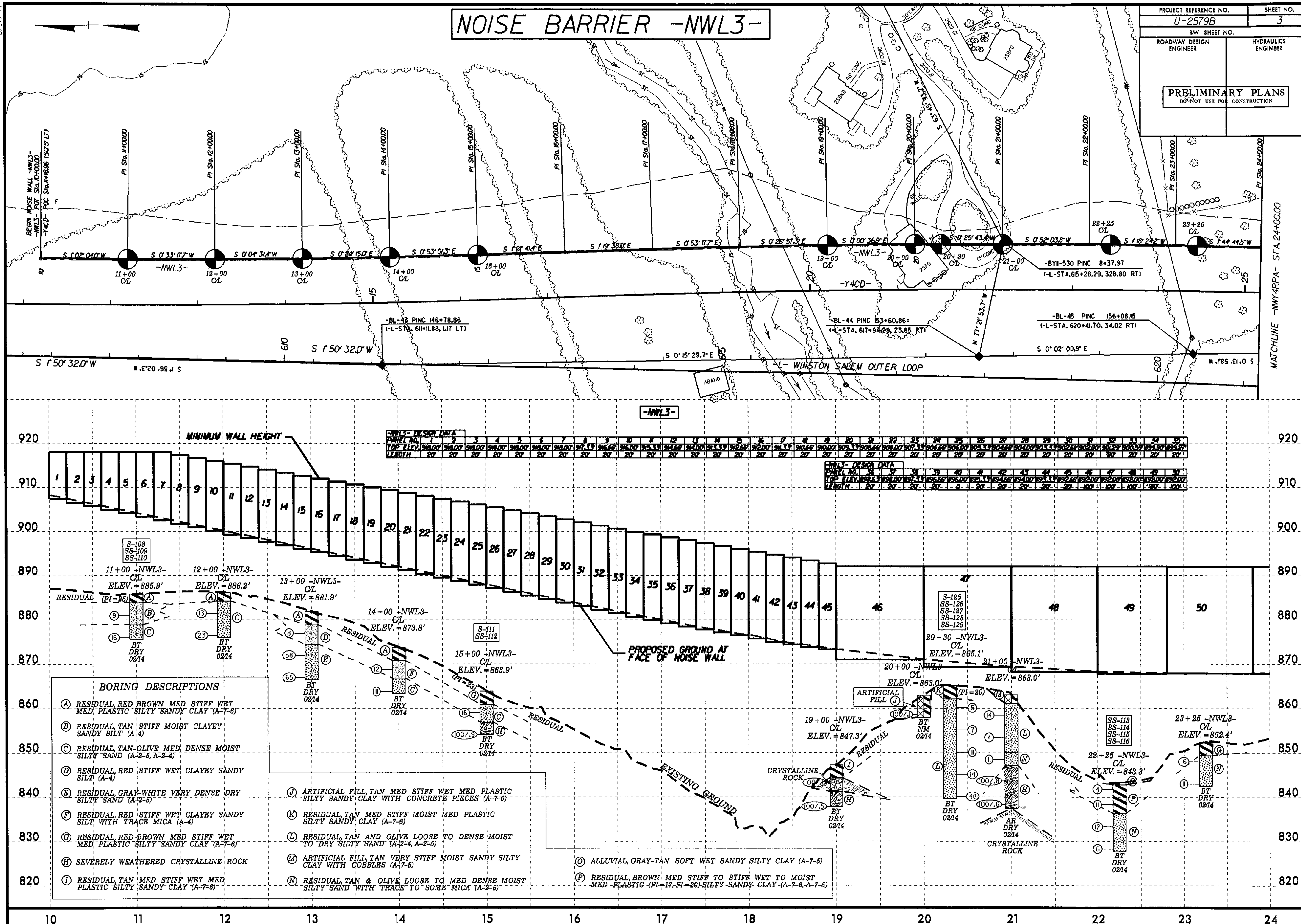
REVISED 09/23/09

8/17/99

NOISE BARRIER -NWL3-

PROJECT REFERENCE NO.	SHEET NO.
U-2579B	3
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



-NWL3- DESIGN DATA																		
PANEL NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
TOP ELEV.	918.00'	918.00'	918.00'	918.00'	918.00'	918.00'	918.00'	917.33'	916.66'	916.00'	915.33'	914.66'	914.00'	913.33'	912.66'	912.00'	911.33'	910.66'
LENGTH	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'

-NWL3- DESIGN DATA																	
PANEL NO.	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
TOP ELEV.	910.00'	909.33'	908.66'	908.00'	907.33'	906.66'	906.00'	905.33'	904.66'	904.00'	903.33'	902.66'	902.00'	901.29'	900.59'	899.90'	899.27'
LENGTH	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'

-NWL3- DESIGN DATA															
PANEL NO.	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
TOP ELEV.	898.63'	898.00'	897.33'	896.66'	896.00'	895.33'	894.66'	894.00'	893.33'	892.66'	892.00'	892.00'	892.00'	892.00'	892.00'
LENGTH	20'	20'	20'	20'	0	20'	20'	20'	20'	20'	100'	100'	100'	80'	100'

BORING DESCRIPTIONS

(A) RESIDUAL, RED-BROWN MED STIFF WET MED. PLASTIC SILTY SANDY CLAY (A-7-6)

(B) RESIDUAL, TAN STIFF MOIST CLAYEY SANDY SILT (A-4)

(C) RESIDUAL, TAN-OLIVE MED DENSE MOIST SILTY SAND (A-2-5, A-2-4)

(D) RESIDUAL, RED STIFF WET CLAYEY SANDY SILT (A-4)

(E) RESIDUAL, GRAY-WHITE VERY DENSE DRY SILTY SAND (A-2-6)

(F) RESIDUAL, RED STIFF WET CLAYEY SANDY SILT WITH TRACE MICA (A-4)

(G) RESIDUAL, RED-BROWN MED STIFF WET MED. PLASTIC SILTY SANDY CLAY (A-7-6)

(H) SEVERELY WEATHERED CRYSTALLINE ROCK

(I) RESIDUAL, TAN MED STIFF WET MED PLASTIC SILTY SANDY CLAY (A-7-6)

(J) ARTIFICIAL FILL, TAN MED STIFF WET MED PLASTIC SILTY SANDY CLAY WITH CONCRETE PIECES (A-7-6)

(K) RESIDUAL, TAN MED STIFF MOIST MED PLASTIC SILTY SANDY CLAY (A-7-6)

(L) RESIDUAL, TAN AND OLIVE LOOSE TO DENSE MOIST TO DRY SILTY SAND (A-2-4, A-2-5)

(M) ARTIFICIAL FILL, TAN VERY STIFF MOIST SANDY SILTY CLAY WITH COBBLES (A-7-5)

(N) RESIDUAL, TAN & OLIVE LOOSE TO MED DENSE MOIST SILTY SAND WITH TRACE TO SOME MICA (A-2-5)

(O) ALLUVIAL, GRAY-TAN SOFT WET SANDY SILTY CLAY (A-7-5)

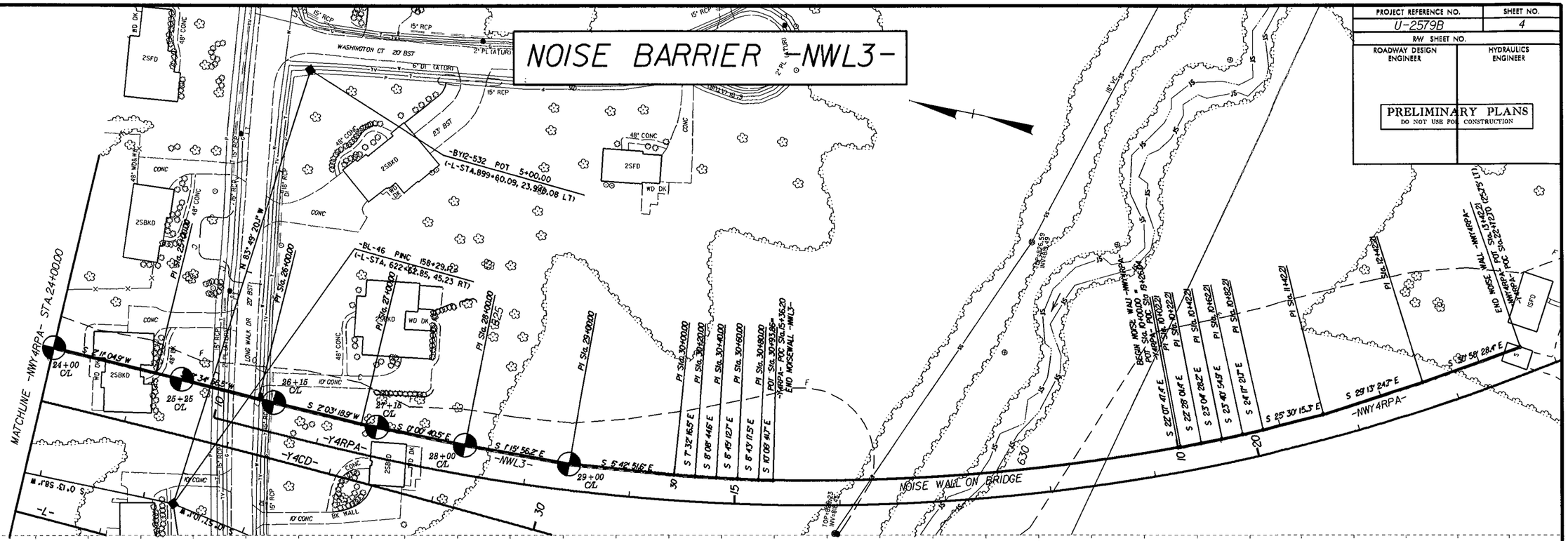
(P) RESIDUAL, BROWN MED STIFF TO STIFF WET TO MOIST MED PLASTIC (PI=17, PI=20) SILTY SANDY CLAY (A-7-6, A-7-5)

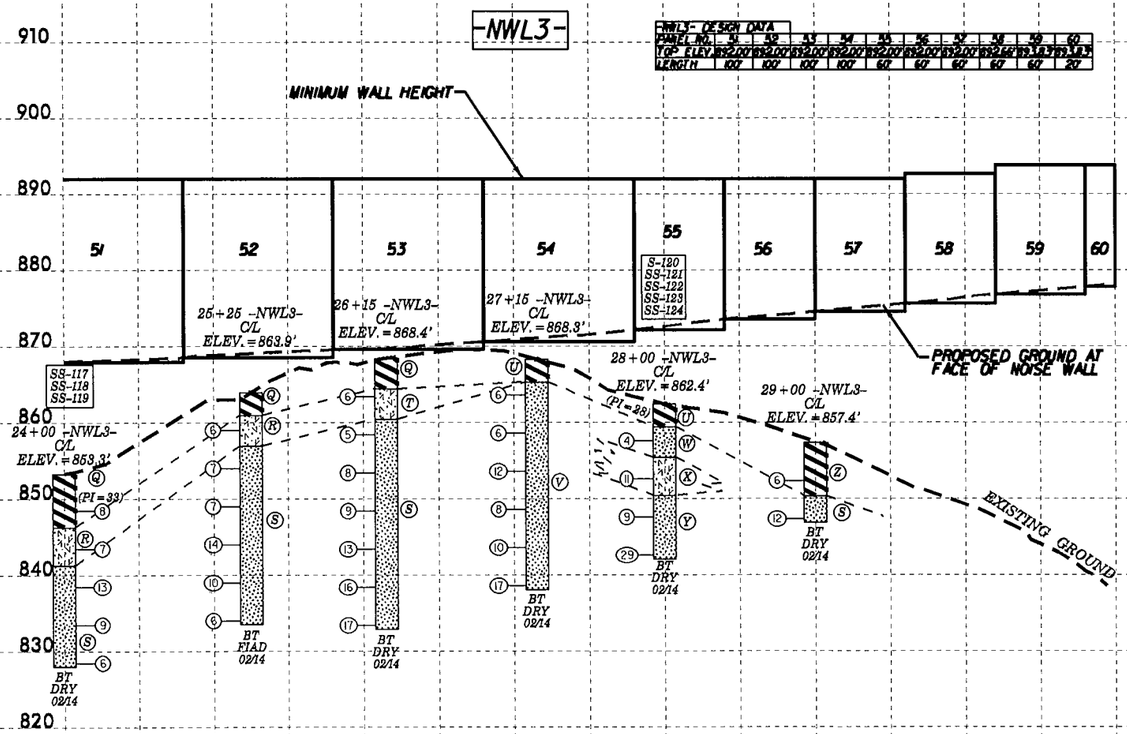
8/17/99

PROJECT REFERENCE NO.	SHEET NO.
U-2579B	4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NOISE BARRIER -NWL3-





BORING DESCRIPTIONS

- (Q) RESIDUAL, RED-BROWN MED STIFF TO STIFF WET TO MOIST HIGHLY PLASTIC SILTY SANDY CLAY (A-7-5)
- (R) RESIDUAL, TAN-WHITE MED STIFF MOIST CLAYEY SANDY SILT WITH TRACE MICA (A-5)
- (S) RESIDUAL, OLIVE-TAN LOOSE TO MED DENSE MOIST TO WET SILTY SAND WITH TRACE TO SOME MICA (A-2-5)
- (T) RESIDUAL, RED MED STIFF MOIST CLAYEY SANDY SILT (A-5)
- (U) RESIDUAL, RED-BROWN MED STIFF MOIST HIGHLY PLASTIC SILTY SANDY CLAY (A-7-5)
- (V) RESIDUAL, TAN-OLIVE-PINK LOOSE TO MED DENSE MOIST SILTY SAND WITH TRACE TO LITTLE MICA (A-2-5)
- (W) RESIDUAL, RED-TAN LOOSE MOIST CLAYEY SILTY SAND (A-2-5)
- (X) RESIDUAL, RED-TAN STIFF MOIST SANDY SILT WITH TRACE MICA (A-5)
- (Y) RESIDUAL, GRAY-WHITE LOOSE TO MED DENSE MOIST SILTY SAND WITH TRACE MICA (A-2-5)
- (Z) RESIDUAL, RED-BROWN MED STIFF WET TO MOIST SANDY SILTY CLAY (A-7-5)

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION Noise wall NWL3 Winston-Salem Northern Beltway from US 158 to I-40 Bus. / US-421				**GROUND WTR (ft)**
BORING NO. 1100	**STATION** 11+00	**OFFSET** CL	**ALIGNMENT** -NWL3-	**0 HR.** Dry
COLLAR ELEV. 885.9 ft	**TOTAL DEPTH** 10.4 ft	**NORTHING** 865,319	**EASTING** 1,666,591	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/2011		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 02/20/14	**COMP. DATE** 02/20/14	**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
890										
885	885.9	0.0								GROUND SURFACE
							S-108	W		RESIDUAL RED-BROWN MED STIFF WET MED PLASTIC (PI=25) SILTY SANDY CLAY (A-7-6)
	883.9	2.0								
	882.0	3.9	3	4	5	9				
880							SS-109	M		RESIDUAL TAN STIFF MOIST CLAYEY SANDY SILT (A-4)
	878.9	7.0								
	877.0	8.9	5	7	9	16				RESIDUAL TAN-OLIVE MED DENSE MOIST SILTY SAND (A-2-5)
	875.5	10.4					SS-110	M		Boring Terminated at Elevation 875.5 ft in silty sand

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION Noise wall NWL3 Winston-Salem Northern Beltway from US 158 to I-40 Bus. / US-421				**GROUND WTR (ft)**
BORING NO. 1200	**STATION** 12+00	**OFFSET** CL	**ALIGNMENT** -NWL3-	**0 HR.** Dry
COLLAR ELEV. 886.2 ft	**TOTAL DEPTH** 10.2 ft	**NORTHING** 865,219	**EASTING** 1,666,590	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/2011		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 02/20/14	**COMP. DATE** 02/20/14	**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
890										
885	886.2	0.0						W		GROUND SURFACE
										RESIDUAL RED-BROWN MED STIFF WET MED PLASTIC SILTY SANDY CLAY (A-7-6)
	884.2	2.0								
	882.5	3.7	4	6	7	13		M		RESIDUAL TAN-OLIVE MED DENSE MOIST SILTY SAND (A-2-5)
880										
	877.5	8.7	3	3	20	23		M		
	876.0	10.2								Boring Terminated at Elevation 876.0 ft in silty sand

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION Noise wall NWL3 Winston-Salem Northern Beltway from US 158 to I-40 Bus. / US-421				**GROUND WTR (ft)**
BORING NO. 1300	**STATION** 13+00	**OFFSET** CL	**ALIGNMENT** -NWL3-	**0 HR.** Dry
COLLAR ELEV. 881.9 ft	**TOTAL DEPTH** 15.4 ft	**NORTHING** 865,119	**EASTING** 1,666,590	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/2011		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 02/20/14	**COMP. DATE** 02/20/14	**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)
885											
								W		881.9 GROUND SURFACE	0.0
880										**RESIDUAL** RED-BROWN MED STIFF WET MED PLASTIC SILTY SANDY CLAY (A-7-6)	
	878.0	3.9	3	4	4	8				878.9	3.0
								W		**RESIDUAL** RED STIFF WET CLAYEY SANDY SILT (A-4)	
875										874.5	7.4
	873.0	8.9	11	25	33	58		D		**RESIDUAL** GRAY-WHITE VERY DENSE DRY SILTY SAND (A-2-5)	
870											
	868.0	13.9	8	15	50	65		D		866.5	15.4
										Boring Terminated at Elevation 866.5 ft in silty sand	

NCDOT BORE SINGLE U2579B_GEO_BH_SWAL_NWL3.GPJ NC_DOT.GDT 4/16/14

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION Noise wall NWL3 Winston-Salem Northern Beltway from US 158 to I-40 Bus. / US-421				**GROUND WTR (ft)**
BORING NO. 1400	**STATION** 14+00	**OFFSET** CL	**ALIGNMENT** -NWL3-	**0 HR.** Dry
COLLAR ELEV. 873.8 ft	**TOTAL DEPTH** 10.5 ft	**NORTHING** 865,019	**EASTING** 1,666,591	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/2011		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 02/20/14	**COMP. DATE** 02/20/14	**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)
875											
								W		873.8 GROUND SURFACE	0.0
870										**RESIDUAL** RED-BROWN MED STIFF WET MED PLASTIC SILTY SANDY CLAY (A-7-6)	
	869.8	4.0	3	5	7	12				870.8	3.0
								W		**RESIDUAL** RED STIFF WET CLAYEY SANDY SILT WITH TRACE MICA (A-4)	
865										866.8	7.0
	864.8	9.0	4	5	6	11		M		**RESIDUAL** TAN MED DENSE MOIST SILTY SAND (A-2-5)	
										863.3	10.5
										Boring Terminated at Elevation 863.3 ft in silty sand	

NCDOT BORE SINGLE U2579B_GEO_BH_SWAL_NWL3.GPJ NC_DOT.GDT 4/16/14

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION Noise wall NWL3 Winston-Salem Northern Beltway from US 158 to I-40 Bus. / US-421				**GROUND WTR (ft)**
BORING NO. 1500	**STATION** 15+00	**OFFSET** CL	**ALIGNMENT** -NWL3-	**0 HR.** Dry
COLLAR ELEV. 863.9 ft	**TOTAL DEPTH** 9.8 ft	**NORTHING** 864,919	**EASTING** 1,666,592	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/2011		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 02/20/14	**COMP. DATE** 02/20/14	**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)
865										863.9 GROUND SURFACE	0.0
							S-111	W		**RESIDUAL** RED-BROWN MED STIFF WET MED PLASTIC (PI=23) SILTY SANDY CLAY (A-7-6) 860.9	3.0
860	860.0	3.9	11	4	12	16	SS-112	M		**RESIDUAL** TAN-OLIVE MED DENSE MOIST SILTY SAND (A-2-4) 856.9	7.0
855	855.0	8.9	49	51/.4		100/.9				**WEATHERED ROCK** SEVERELY WEATHERED CRYSTALLINE ROCK 854.1	9.8
										Boring Terminated at Elevation 854.1 ft in weathered rock	

NCDOT BORE SINGLE U2579B_GEO_BH_SWAL_NWL3.GPJ NC_DOT.GDT 4/16/14

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION Noise wall NWL3 Winston-Salem Northern Beltway from US 158 to I-40 Bus. / US-421				**GROUND WTR (ft)**
BORING NO. 1900	**STATION** 19+00	**OFFSET** CL	**ALIGNMENT** -NWL3-	**0 HR.** Dry
COLLAR ELEV. 847.3 ft	**TOTAL DEPTH** 9.4 ft	**NORTHING** 864,519	**EASTING** 1,666,599	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/2011		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 02/24/14	**COMP. DATE** 02/24/14	**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)
850								W		847.3 GROUND SURFACE	0.0
										RESIDUAL TAN MED STIFF WET MED PLASTIC SILTY SANDY CLAY (A-7-6) 844.3	3.0
845	843.4	3.9	100/.1			100/.1				**CRYSTALLINE ROCK** 841.3	6.0
840	838.4	8.9	100/.5			100/.5				**WEATHERED ROCK** SEVERELY WEATHERED CRYSTALLINE ROCK 837.9	9.4
										Boring Terminated at Elevation 837.9 ft in weathered rock	

NCDOT BORE SINGLE U2579B_GEO_BH_SWAL_NWL3.GPJ NC_DOT.GDT 4/16/14

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION Noise wall NWL3 Winston-Salem Northern Beltway from US 158 to I-40 Bus. / US-421				**GROUND WTR (ft)**
BORING NO. 2000	**STATION** 20+00	**OFFSET** CL	**ALIGNMENT** -NWL3-	**0 HR.** NM
COLLAR ELEV. 863.0 ft	**TOTAL DEPTH** 5.0 ft	**NORTHING** 864,419	**EASTING** 1,666,599	**24 HR.** NM
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/2011		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 02/24/14	**COMP. DATE** 02/24/14	**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)
865										
										863.0 GROUND SURFACE 0.0
										ARTIFICIAL FILL TAN MED STIFF WET MED PLASTIC SILTY SANDY CLAY WITH CONCRETE PIECES (A-7-6)
860										858.0 5.0
	858.8	4.2	100/.1			100/.1				Boring Terminated at Elevation 858.0 ft in sandy silty clay with concrete Boring stopped due to buried chunks of concrete

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION Noise wall NWL3 Winston-Salem Northern Beltway from US 158 to I-40 Bus. / US-421				**GROUND WTR (ft)**
BORING NO. 2030	**STATION** 20+30	**OFFSET** CL	**ALIGNMENT** -NWL3-	**0 HR.** Dry
COLLAR ELEV. 865.1 ft	**TOTAL DEPTH** 25.5 ft	**NORTHING** 864,389	**EASTING** 1,666,599	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/2011		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 02/24/14	**COMP. DATE** 02/24/14	**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)
870										
865										865.1 GROUND SURFACE 0.0
										RESIDUAL TAN MED STIFF MOIST MED PLASTIC (PI=20) SILTY SANDY CLAY (A-7-6)
										862.1 3.0
	861.1	4.0	3	2	3	5	S-125	M		**RESIDUAL** TAN AND OLIVE LOOSE TO DENSE MOIST TO DRY SILTY SAND (A-2-4, A-2-5)
860							SS-126	M		
	856.1	9.0	3	3	4	7				
855							SS-127	M		
	851.1	14.0	6	5	6	11		M		
850										
	846.1	19.0	4	5	9	14				
845							SS-128	M		
	841.1	24.0	12	15	33	48				
840							SS-129	D		839.6 25.5
										Boring Terminated at Elevation 839.6 ft in silty sand

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION Noise wall NWL3 Winston-Salem Northern Beltway from US 158 to I-40 Bus. / US-421				**GROUND WTR (ft)**
BORING NO. 2100	**STATION** 21+00	**OFFSET** CL	**ALIGNMENT** -NWL3-	**0 HR.** Dry
COLLAR ELEV. 863.0 ft	**TOTAL DEPTH** 25.6 ft	**NORTHING** 864,319	**EASTING** 1,666,599	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/2011		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 02/24/14	**COMP. DATE** 02/24/14	**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)
865										863.0 GROUND SURFACE	0.0
										861.0 **ARTIFICIAL FILL** TAN VERY STIFF MOIST SANDY SILTY CLAY WITH COBBLES (A-7-5)	2.0
860	859.4	3.6	7	8	6	14		M		**RESIDUAL** TAN MED DENSE MOIST SILTY SAND (A-2-4)	
855	854.4	8.6	4	2	2	4		M			
850	849.4	13.6	4	5	6	11		M		850.0	13.0
										847.0 **RESIDUAL** TAN MED DENSE MOIST SILTY SAND WITH LITTLE MICA (A-2-5)	16.0
845	844.4	18.6	61	39/.3		100/.8				**WEATHERED ROCK** SEVERELY WEATHERED CRYSTALLINE ROCK	
840	839.4	23.6	10	70	30/.1	100/.6				837.4	25.6
										Boring Terminated by Auger Refusal at Elevation 837.4 ft on crystalline rock	

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION Noise wall NWL3 Winston-Salem Northern Beltway from US 158 to I-40 Bus. / US-421				**GROUND WTR (ft)**
BORING NO. 2225	**STATION** 22+25	**OFFSET** CL	**ALIGNMENT** -NWL3-	**0 HR.** Dry
COLLAR ELEV. 843.3 ft	**TOTAL DEPTH** 15.5 ft	**NORTHING** 864,194	**EASTING** 1,666,597	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/2011		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 02/20/14	**COMP. DATE** 02/20/14	**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)
845								W		843.3 GROUND SURFACE	0.0
	842.8	0.5	2	2	2	4	SS-113	W		842.8 **ALLUVIAL** GRAY-TAN SOFT WET SANDY SILTY CLAY (A-7-5)	0.5
840	839.3	4.0	4	5	6	11	SS-114	M		**RESIDUAL** BROWN MED STIFF TO STIFF WET TO MOIST MED PLASTIC (PI=17, PI=20) SILTY SANDY CLAY (A-7-6, A-7-5)	
835	834.3	9.0	4	5	7	12	SS-115	M		836.3	7.0
830	829.3	14.0	3	2	4	6	SS-116	M		**RESIDUAL** OLIVE-TAN LOOSE TO MED DENSE MOIST SILTY SAND WITH SOME MICA (A-2-5)	
										827.8	15.5
										Boring Terminated at Elevation 827.8 ft in silty sand	

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION Noise wall NWL3 Winston-Salem Northern Beltway from US 158 to I-40 Bus. / US-421				**GROUND WTR (ft)**
BORING NO. 2325	**STATION** 23+25	**OFFSET** CL	**ALIGNMENT** -NWL3-	**0 HR.** Dry
COLLAR ELEV. 852.4 ft	**TOTAL DEPTH** 9.9 ft	**NORTHING** 864,094	**EASTING** 1,666,594	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/2011		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 02/20/14	**COMP. DATE** 02/20/14	**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)
855											
								W		852.4 GROUND SURFACE	0.0
850										**RESIDUAL** RED MED STIFF WET MED PLASTIC SILTY SANDY CLAY (A-7-6)	
	849.0	3.4	10	8	8	16				849.4	3.0
845								M		**RESIDUAL** TAN MED DENSE MOIST SILTY SAND WITH TRACE TO LITTLE MICA (A-2-5)	
	844.0	8.4	4	4	7	11		M		842.5	9.9
										Boring Terminated at Elevation 842.5 ft in silty sand	

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION Noise wall NWL3 Winston-Salem Northern Beltway from US 158 to I-40 Bus. / US-421				**GROUND WTR (ft)**
BORING NO. 2400	**STATION** 24+00	**OFFSET** CL	**ALIGNMENT** -NWL3-	**0 HR.** Dry
COLLAR ELEV. 853.3 ft	**TOTAL DEPTH** 25.3 ft	**NORTHING** 864,019	**EASTING** 1,666,592	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/2011		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 02/20/14	**COMP. DATE** 02/20/14	**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)
855											
										853.3 GROUND SURFACE	0.0
850										**RESIDUAL** RED-BROWN MED STIFF TO STIFF WET TO MOIST HIGHLY PLASTIC (PI=33) SILTY SANDY CLAY (A-7-5)	
	849.5	3.8	2	3	5	8	SS-117	M		846.3	7.0
845	844.5	8.8	5	3	4	7	SS-118	M		**RESIDUAL** TAN MED STIFF MOIST CLAYEY SANDY SILT WITH TRACE MICA (A-5)	
840	839.5	13.8	5	6	7	13	SS-119	M		841.3	12.0
835	834.5	18.8	4	3	6	9		M		**RESIDUAL** OLIVE-TAN LOOSE TO MED DENSE MOIST SILTY SAND WITH TRACE MICA (A-2-5)	
830	829.5	23.8	3	2	4	6		M		828.0	25.3
										Boring Terminated at Elevation 828.0 ft in silty sand	

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION Noise wall NWL3 Winston-Salem Northern Beltway from US 158 to I-40 Bus. / US-421				**GROUND WTR (ft)**
BORING NO. 2525	**STATION** 25+25	**OFFSET** CL	**ALIGNMENT** -NWL3-	**0 HR.** Dry
COLLAR ELEV. 863.9 ft	**TOTAL DEPTH** 30.4 ft	**NORTHING** 863,894	**EASTING** 1,666,587	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/2011		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 02/20/14	**COMP. DATE** 02/20/14	**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)
865										863.9 GROUND SURFACE	0.0
860	860.0	3.9	3	3	3	6		M		**RESIDUAL** RED MED STIFF MOIST HIGHLY PLASTIC SILTY SANDY CLAY (A-7-5) 860.9	3.0
855	855.0	8.9	3	4	3	7		M		**RESIDUAL** TAN-WHITE MED STIFF MOIST CLAYEY SANDY SILT WITH TRACE MICA (A-5) 856.9	7.0
850	850.0	13.9	2	3	4	7		W		**RESIDUAL** OLIVE-TAN LOOSE TO MED DENSE WET SILTY SAND WITH TRACE TO SOME MICA (A-2-5)	
845	845.0	18.9	4	5	9	14		W			
840	840.0	23.9	4	4	6	10		W			
835	835.0	28.9	3	2	4	6		W		833.5 Boring Terminated at Elevation 833.5 ft in silty sand	30.4

NCDOT BORE SINGLE U2579B_GEO_BH_SWAL_NWL3.GPJ NC_DOT.GDT 4/16/14

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION Noise wall NWL3 Winston-Salem Northern Beltway from US 158 to I-40 Bus. / US-421				**GROUND WTR (ft)**
BORING NO. 2615	**STATION** 26+15	**OFFSET** CL	**ALIGNMENT** -NWL3-	**0 HR.** Dry
COLLAR ELEV. 868.4 ft	**TOTAL DEPTH** 35.5 ft	**NORTHING** 863,804	**EASTING** 1,666,583	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/2011		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 02/20/14	**COMP. DATE** 02/20/14	**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)
870										868.4 GROUND SURFACE	0.0
865	864.4	4.0	3	2	4	6		M		**RESIDUAL** RED MED STIFF MOIST HIGHLY PLASTIC SILTY SANDY CLAY (A-7-5) 864.4	4.0
860	859.4	9.0	2	2	3	5		M		**RESIDUAL** RED MED STIFF MOIST CLAYEY SANDY SILT (A-5) 860.4	8.0
855	854.4	14.0	4	3	5	8		M		**RESIDUAL** OLIVE-TAN LOOSE TO MED DENSE MOIST SILTY SAND WITH TRACE MICA (A-2-5)	
850	849.4	19.0	4	4	5	9		M			
845	844.4	24.0	5	5	8	13		M			
840	839.4	29.0	8	7	9	16		M			
835	834.4	34.0	6	7	10	17		M		832.9 Boring Terminated at Elevation 832.9 ft in silty sand	35.5

NCDOT BORE SINGLE U2579B_GEO_BH_SWAL_NWL3.GPJ NC_DOT.GDT 4/16/14

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION Noise wall NWL3 Winston-Salem Northern Beltway from US 158 to I-40 Bus. / US-421				**GROUND WTR (ft)**
BORING NO. 2715	**STATION** 27+15	**OFFSET** CL	**ALIGNMENT** -NWL3-	**0 HR.** Dry
COLLAR ELEV. 868.3 ft	**TOTAL DEPTH** 30.2 ft	**NORTHING** 863,704	**EASTING** 1,666,580	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/2011		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 02/21/14	**COMP. DATE** 02/21/14	**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)
870										
										868.3 GROUND SURFACE 0.0
										RESIDUAL RED-BROWN MED STIFF MOIST HIGHLY PLASTIC SILTY SANDY CLAY (A-7-5)
865	864.6	3.7								865.3 3.0
			2	3	3	6		M		**RESIDUAL** TAN-OLIVE-PINK LOOSE TO MED DENSE MOIST SILTY SAND WITH TRACE TO LITTLE MICA (A-2-5)
860	859.6	8.7	2	3	3	6		M		
855	854.6	13.7	5	5	7	12		M		
850	849.6	18.7	4	4	4	8		M		
845	844.6	23.7	5	5	5	10		M		
840	839.6	28.7	5	9	8	17		M		838.1 30.2
										Boring Terminated at Elevation 838.1 ft in silty sand

NCDOT BORE SINGLE U2579B_GEO_BH_SWAL_NWL3.GPJ NC_DOT.GDT 4/16/14

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION Noise wall NWL3 Winston-Salem Northern Beltway from US 158 to I-40 Bus. / US-421				**GROUND WTR (ft)**
BORING NO. 2800	**STATION** 28+00	**OFFSET** CL	**ALIGNMENT** -NWL3-	**0 HR.** Dry
COLLAR ELEV. 862.4 ft	**TOTAL DEPTH** 20.3 ft	**NORTHING** 863,619	**EASTING** 1,666,580	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/2011		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 02/24/14	**COMP. DATE** 02/24/14	**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)
865										
										862.4 GROUND SURFACE 0.0
860							S-120	W		**RESIDUAL** RED-BROWN MED STIFF MOIST HIGHLY PLASTIC (PI=28) SILTY SANDY CLAY (A-7-5)
	858.6	3.8	2	2	2	4	SS-121	M		859.4 3.0
855										**RESIDUAL** RED-TAN LOOSE MOIST CLAYEY SILTY SAND (A-2-5)
	853.6	8.8	2	3	8	11	SS-122	M		855.4 7.0
850										**RESIDUAL** RED-TAN STIFF MOIST SANDY SILT WITH TRACE MICA (A-5)
	848.6	13.8	4	4	5	9	SS-123	M		850.4 12.0
845										**RESIDUAL** GRAY-WHITE LOOSE TO MED DENSE MOIST SILTY SAND WITH TRACE MICA (A-2-5)
	843.6	18.8	7	11	18	29	SS-124	M		842.1 20.3
										Boring Terminated at Elevation 842.1 ft in silty sand

NCDOT BORE SINGLE U2579B_GEO_BH_SWAL_NWL3.GPJ NC_DOT.GDT 4/16/14

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION Noise wall NWL3 Winston-Salem Northern Beltway from US 158 to I-40 Bus. / US-421				**GROUND WTR (ft)**
BORING NO. 2900	**STATION** 29+00	**OFFSET** CL	**ALIGNMENT** -NWL3-	**0 HR.** Dry
COLLAR ELEV. 857.4 ft	**TOTAL DEPTH** 10.5 ft	**NORTHING** 863,519	**EASTING** 1,666,582	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/2011		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 02/24/14	**COMP. DATE** 02/24/14	**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	DEPTH (ft)
860											
										857.4 GROUND SURFACE	0.0
855										**RESIDUAL** RED-BROWN MED STIFF WET TO MOIST SANDY SILTY CLAY (A-7-5)	
	853.4	4.0	3	3	3	6		M		850.4	7.0
850										**RESIDUAL** TAN-OLIVE MED DENSE MOIST SILTY SAND WITH TRACE MICA (A-2-5)	
	848.4	9.0	4	4	8	12		M		846.9	10.5
										Boring Terminated at Elevation 846.9 ft in silty sand	

NCDOT BORE DOUBLE U2579B_GEO_BH_SWAL_NWL3.GPJ NC_DOT.GDT 4/16/14

TEST RESULTS

PROJECT: 34839.1.1 (U-2579B)
COUNTY: FORSYTH
SITE DESCRIPTION: NOISE WALL NWL3 FROM -NWL3- 10+00 TO -NWL3- 30+93.86

SOIL SAMPLE RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS	N	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC	UNIT WT. (d)	VOID RATIO
		1100																
S-108	C/L	11+00 -NWL3-	0.00-2.00	A-7-6(15)	N/A	54	25	19.2	19.2	19.0	42.5	100	89	64				
SS-109	C/L	11+00 -NWL3-	3.90-5.40	A-4(0)	9	38	NP	18.6	44.9	18.2	18.2	100	93	41				
SS-110	C/L	11+00 -NWL3-	8.90-10.40	A-2-5(0)	16	47	NP	32.2	49.8	14.0	4.0	99	85	25				
		1500																
S-111	C/L	15+00 -NWL3-	0.00-3.00	A-7-6(7)	N/A	42	23	33.4	19.6	14.6	32.4	98	76	48				
SS-112	C/L	15+00 -NWL3-	3.90-5.40	A-2-4(0)	16	38	NP	50.2	27.9	15.8	6.1	97	64	25				
		2030																
S-125	C/L	20+30 -NWL3-	0.00-3.00	A-7-6(8)	N/A	45	20	27.9	21.4	18.3	32.4	100	82	54				
SS-126	C/L	20+30 -NWL3-	4.00-5.50	A-2-4(0)	5	36	NP	50.4	23.9	17.7	8.1	94	60	29				
SS-127	C/L	20+30 -NWL3-	9.00-10.50	A-2-4(0)	7	37	NP	45.1	37.4	13.4	4.0	99	71	23				
SS-128	C/L	20+30 -NWL3-	19.00-20.50	A-2-5(0)	14	44	NP	37.0	39.8	15.1	8.1	93	71	28				
SS-129	C/L	20+30 -NWL3-	24.00-25.50	A-2-4(0)	48	33	NP	49.3	33.6	13.0	4.0	100	65	22				
		2225																
SS-113	C/L	22+25 -NWL3-	0.50-2.00	A-7-6(6)	4	41	17	32.0	17.4	22.3	28.3	99	77	52				
SS-114	C/L	22+25 -NWL3-	4.00-5.50	A-7-5(10)	11	50	20	27.9	15.2	20.4	36.4	99	80	58				
SS-115	C/L	22+25 -NWL3-	9.00-10.50	A-2-5(0)	12	48	NP	40.3	40.9	14.8	4.0	100	80	23				
SS-116	C/L	22+25 -NWL3-	14.00-15.50	A-2-5(0)	6	45	NP	38.5	45.7	11.7	4.0	98	81	20				
		2400																
SS-117	C/L	24+00 -NWL3-	3.80-5.30	A-7-5(17)	8	65	33	27.5	13.8	12.1	46.6	95	75	57				
SS-118	C/L	24+00 -NWL3-	8.80-10.30	A-5(0)	7	46	5	41.3	24.5	22.1	12.1	94	66	36				
SS-119	C/L	24+00 -NWL3-	13.80-15.30	A-2-5(0)	13	44	NP	53.2	25.3	13.4	8.1	97	60	24				
		2800																
S-120	C/L	28+00 -NWL3-	0.00-3.00	A-7-5(19)	N/A	62	28	18.0	19.0	16.5	46.5	100	89	66				
SS-121	C/L	28+00 -NWL3-	3.80-5.30	A-2-5(0)	4	51	NP	36.2	34.6	19.1	10.1	99	77	33				
SS-122	C/L	28+00 -NWL3-	8.80-10.30	A-5(0)	11	54	NP	33.8	34.8	23.4	8.1	100	80	38				
SS-123	C/L	28+00 -NWL3-	13.80-15.30	A-2-5(0)	9	44	NP	31.1	41.9	20.9	6.1	97	81	34				
SS-124	C/L	28+00 -NWL3-	18.80-20.30	A-2-5(0)	29	44	NP	42.7	30.9	18.3	8.1	76	55	24				

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	34839.1.1 (U-2579B)	1	21

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

STRUCTURE SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. *34839.1.1 (U-2579B)* F.A. PROJ. *NHF-0918(93)*

COUNTY *FORSYTH*

PROJECT DESCRIPTION *WINSTON-SALEM NORTHERN BELTWAY FROM US 421/I-40 BUS. TO I-40*

SITE DESCRIPTION *WINSTON-SALEM NORTHERN BELTWAY FROM US 158 TO I-40 BUS./US 421 NOISE WALL -NWY41- 10+00 TO -NWY41- 33+20*

ID: U-2579B

PROJECT: 34839.1.1

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CAUTION NOTICE

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SUBMITTED BY *C. B. LITTLE*

DATE *MARCH 2014*

NORTH CAROLINA LICENSED SEAL 1104 GEOLOGIST CLINTON B. LITTLE

4-1-14

DRAWN BY: *C. E. BURRIS*

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PROJECT REFERENCE NO.	SHEET NO.
34839.1.1 (U-2579B)	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 TO BE THE 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 STANDARD PENETRATION TEST (AASHTO T206, ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. 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		50 MX 25 MX	51 MN 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
LIQUID LIMIT PLASTIC INDEX	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 A 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	N/A
	LOOSE	4 TO 10	
	MEDIUM DENSE	10 TO 30	
	DENSE	30 TO 50	
	VERY DENSE	>50	
GENERALLY SILT-CLAY MATERIAL (COHESIVE)	VERY SOFT	<2	<0.25
	SOFT	2 TO 4	0.25 TO 0.50
	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
NONPLASTIC	0-5	VERY LOW
LOW PLASTICITY	6-15	SLIGHT
MED. PLASTICITY	16-25	MEDIUM
HIGH PLASTICITY	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.
UNIFORM - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. (ALSO POORLY GRADED)
GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLES 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 WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.

COMPRESSIBILITY

SLIGHTLY COMPRESSIBLE	LIQUID LIMIT LESS THAN 31
MODERATELY COMPRESSIBLE	LIQUID LIMIT EQUAL TO 31-50
HIGHLY COMPRESSIBLE	LIQUID LIMIT GREATER THAN 50

PERCENTAGE OF MATERIAL

ORGANIC MATERIAL	GRANULAR SOILS	SILT - CLAY SOILS
TRACE OF ORGANIC MATTER	2 - 3%	3 - 5%
LITTLE ORGANIC MATTER	3 - 5%	5 - 12%
MODERATELY ORGANIC	5 - 10%	12 - 20%
HIGHLY ORGANIC	>10%	>20%

OTHER MATERIAL	
TRACE	1 - 10%
LITTLE	10 - 20%
SOME	20 - 35%
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 W/ CORE
- SPT N-VALUE
- REF — SPT REFUSAL

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:
- [ ] MOBILE B-___
- [ ] BK-51
- [ ] CME-45C
- [X] CME-550
- [ ] PORTABLE HOIST
- [ ] _____
- [ ] _____

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

HAMMER TYPE:
- [X] AUTOMATIC [ ] MANUAL

CORE SIZE:
- [ ] -B_____
- [ ] -N_____
- [ ] -H_____

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

ROCK DESCRIPTION

HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT IF TESTED, WOULD YIELD SPT REFUSAL. 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, YIELDS SPT N VALUES > 100 BPF*
VERY SEVERE (V SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT THE MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE SUCH THAT ONLY MINOR VESTIGES OF THE ORIGINAL ROCK FABRIC REMAIN. *IF TESTED, YIELDS 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 PIECES 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 FEET
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 THE 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, 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: FT.

NOTES:

STRATIGRAPHY SHOWN THROUGH BORINGS

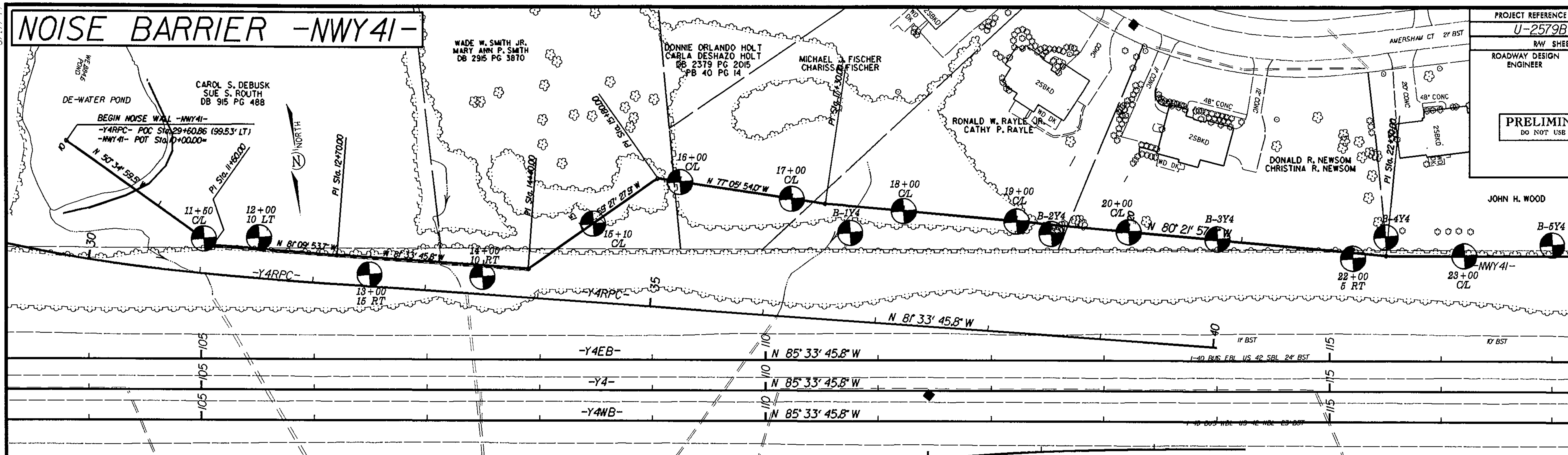
COLLAR ELEVATIONS OBTAINED FROM U2579B_LS_TIN FILE

REVISED 09/23/09

NOISE BARRIER -NWY41-

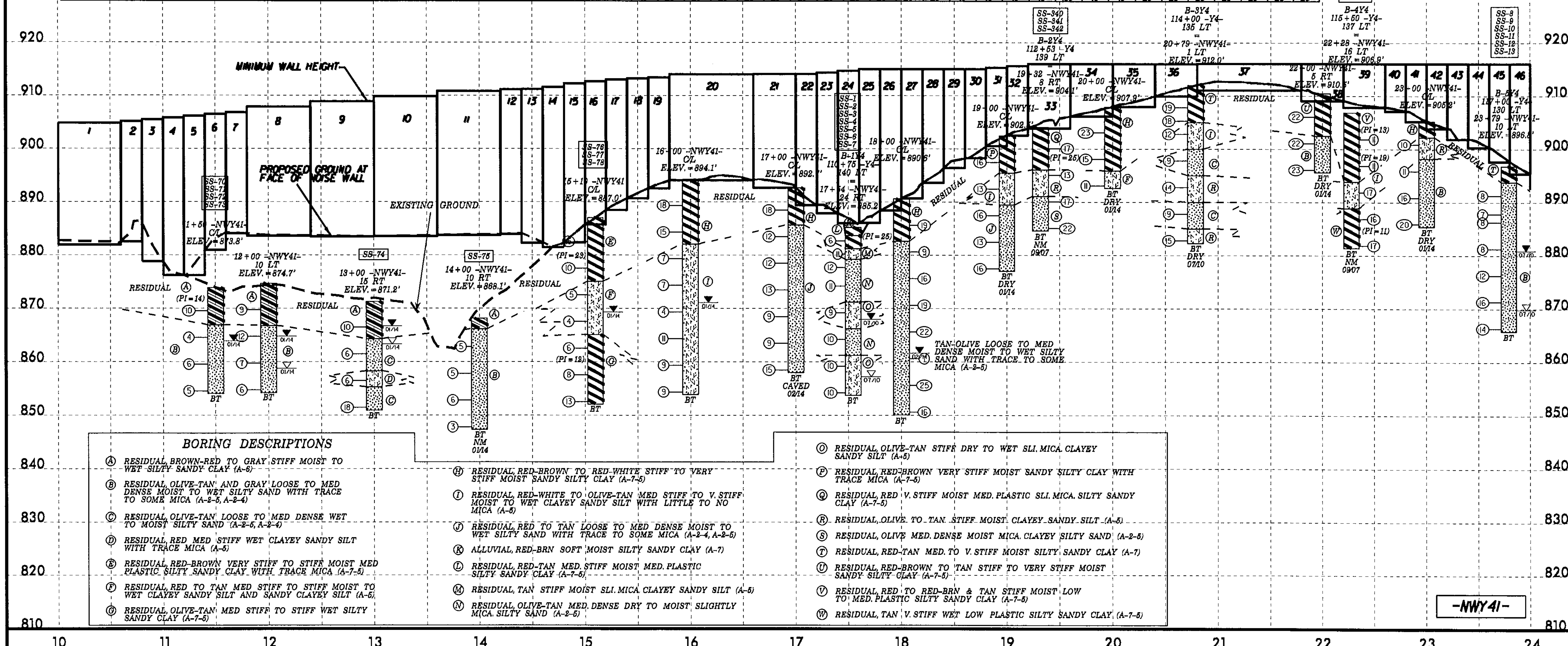
PROJECT REFERENCE NO.	SHEET NO.
U-2579B	3
RAW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



-NWY41- DESIGN DATA																							
PANEL NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
TOP ELEV.	904.89'	905.15'	905.48'	905.82'	906.15'	906.48'	906.82'	907.82'	908.82'	909.82'	910.82'	911.17'	911.17'	911.53'	912.28'	912.66'	913.02'	913.39'	913.39'	914.00'	914.00'	914.00'	914.28'
LENGTH	60'	20'	20'	20'	20'	20'	20'	60'	60'	60'	60'	20'	20'	20'	20'	20'	20'	20'	20'	80'	40'	20'	20'

PANEL NO.	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46
TOP ELEV.	914.67'	915.00'	915.00'	915.00'	915.00'	915.00'	915.00'	915.32'	915.66'	916.00'	916.00'	916.00'	916.00'	916.00'	916.00'	916.00'	916.00'	916.00'	916.00'	916.00'	916.00'	916.00'	916.00'
LENGTH	20'	20'	20'	20'	20'	20'	20'	20'	20'	40'	40'	40'	40'	100'	40'	40'	20'	20'	20'	20'	20'	20'	20'



BORING DESCRIPTIONS

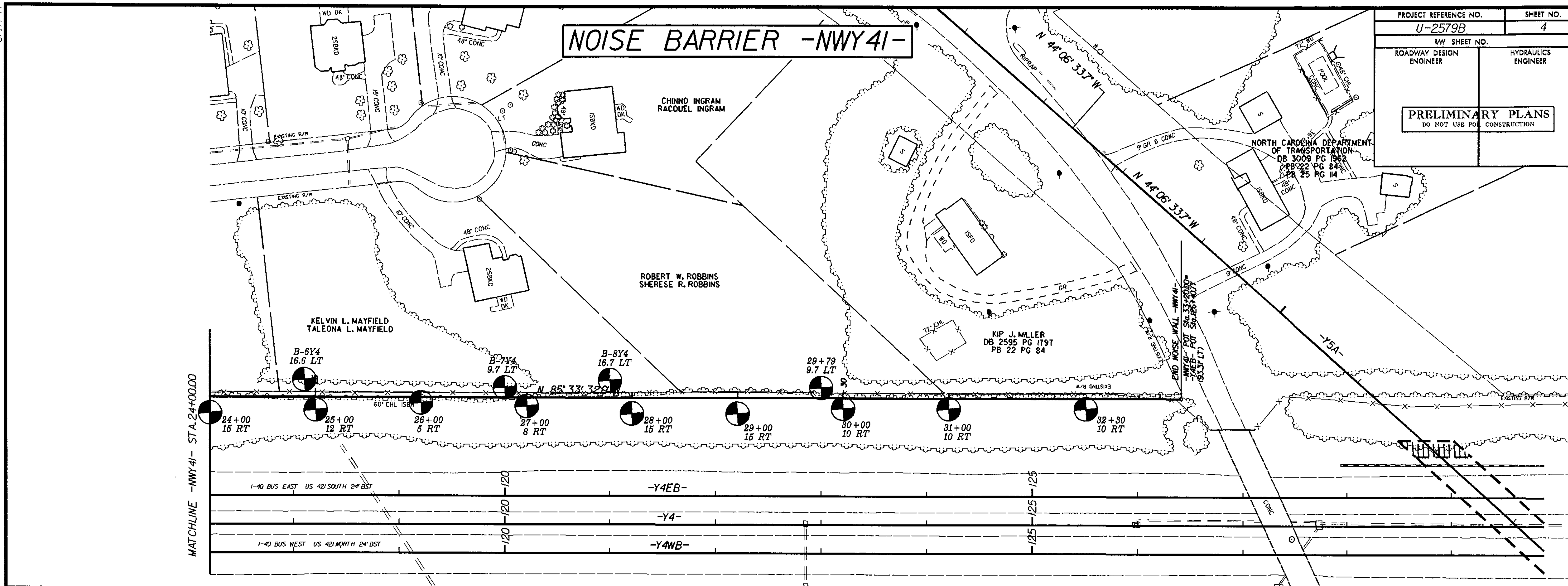
- Ⓐ RESIDUAL, BROWN-RED TO GRAY STIFF MOIST TO WET SILTY SANDY CLAY (A-6)
- Ⓑ RESIDUAL, OLIVE-TAN AND GRAY LOOSE TO MED DENSE MOIST TO WET SILTY SAND WITH TRACE TO SOME MICA (A-2-5, A-2-4)
- Ⓒ RESIDUAL, OLIVE-TAN LOOSE TO MED DENSE WET TO MOIST SILTY SAND (A-2-5, A-2-4)
- Ⓓ RESIDUAL, RED MED STIFF WET CLAYEY SANDY SILT WITH TRACE MICA (A-5)
- Ⓔ RESIDUAL, RED-BROWN VERY STIFF TO STIFF MOIST MED PLASTIC SILTY SANDY CLAY WITH TRACE MICA (A-7-5)
- Ⓕ RESIDUAL, RED TO TAN MED STIFF TO STIFF MOIST TO WET CLAYEY SANDY SILT AND SANDY CLAYEY SILT (A-5)
- Ⓖ RESIDUAL, OLIVE-TAN MED STIFF TO STIFF WET SILTY SANDY CLAY (A-7-5)
- Ⓗ RESIDUAL, RED-BROWN TO RED-WHITE STIFF TO VERY STIFF MOIST SANDY SILTY CLAY (A-7-5)
- Ⓘ RESIDUAL, RED-WHITE TO OLIVE-TAN MED STIFF TO V. STIFF MOIST TO WET CLAYEY SANDY SILT WITH LITTLE TO NO MICA (A-5)
- Ⓙ RESIDUAL, RED TO TAN LOOSE TO MED DENSE MOIST TO WET SILTY SAND WITH TRACE TO SOME MICA (A-2-4, A-2-5)
- Ⓚ ALLUVIAL, RED-BRN SOFT MOIST SILTY SANDY CLAY (A-7)
- Ⓛ RESIDUAL, RED-TAN MED. STIFF MOIST MED. PLASTIC SILTY SANDY CLAY (A-7-5)
- Ⓜ RESIDUAL, TAN STIFF MOIST SLI. MICA CLAYEY SANDY SILT (A-5)
- Ⓝ RESIDUAL, OLIVE-TAN MED. DENSE DRY TO MOIST SLIGHTLY MICA. SILTY SAND (A-2-5)
- Ⓞ RESIDUAL, OLIVE-TAN STIFF DRY TO WET SLI. MICA. CLAYEY SANDY SILT (A-5)
- Ⓟ RESIDUAL, RED-BROWN VERY STIFF MOIST SANDY SILTY CLAY WITH TRACE MICA (A-7-5)
- Ⓠ RESIDUAL, RED V. STIFF MOIST MED. PLASTIC SLI. MICA. SILTY SANDY CLAY (A-7-5)
- Ⓡ RESIDUAL, OLIVE TO TAN STIFF MOIST CLAYEY SANDY SILT (A-5)
- Ⓢ RESIDUAL, OLIVE MED. DENSE MOIST MICA. CLAYEY SILTY SAND (A-2-5)
- Ⓣ RESIDUAL, RED-TAN MED. TO V. STIFF MOIST SILTY SANDY CLAY (A-7)
- Ⓤ RESIDUAL, RED-BROWN TO TAN STIFF TO VERY STIFF MOIST SANDY SILTY CLAY (A-7-5)
- Ⓥ RESIDUAL, RED TO RED-BRN & TAN STIFF MOIST LOW TO MED. PLASTIC SILTY SANDY CLAY (A-7-5)
- Ⓦ RESIDUAL, TAN V. STIFF WET LOW PLASTIC SILTY SANDY CLAY (A-7-5)

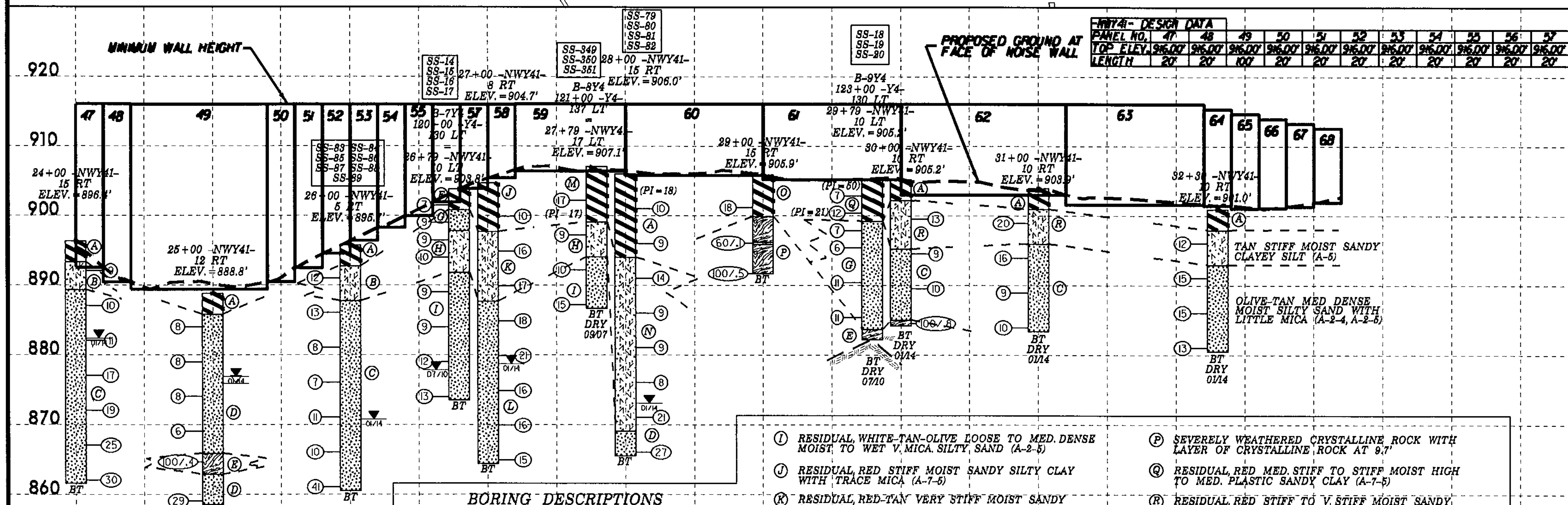
-NWY41-

PROJECT REFERENCE NO.	SHEET NO.
U-2579B	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

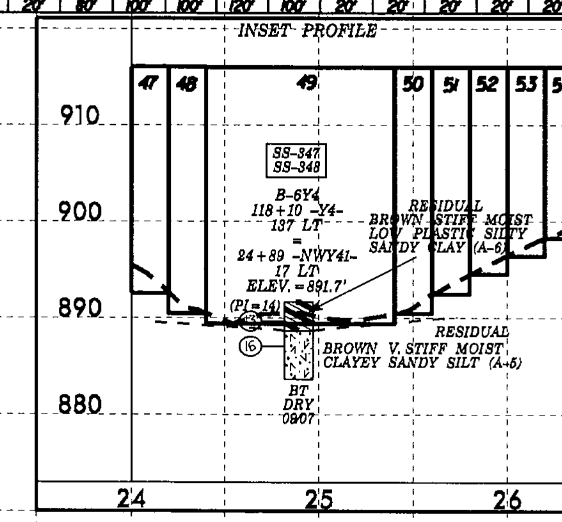
NOISE BARRIER -NWY41-





-NWY41- DESIGN DATA																						
PANEL NO.	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68
TOP ELEV.	916.00'	916.00'	916.00'	916.00'	916.00'	916.00'	916.00'	916.00'	916.00'	916.00'	916.00'	916.00'	916.00'	916.00'	916.00'	916.00'	916.00'	915.31'	914.64'	913.97'	913.31'	912.64'
LENGTH	20'	20'	100'	20'	20'	20'	20'	20'	20'	20'	20'	20'	80'	100'	100'	120'	100'	20'	20'	20'	20'	20'

INSET PROFILE



BORING DESCRIPTIONS

(A) RESIDUAL, RED-BROWN STIFF MOIST SANDY SILTY CLAY AND SILTY SANDY CLAY (A-7-5)

(B) RESIDUAL, TAN-OLIVE STIFF MOIST CLAYEY SANDY SILT WITH TRACE TO LITTLE MICA (A-5)

(C) RESIDUAL, OLIVE-TAN LOOSE TO DENSE MOIST TO WET SILTY SAND WITH TRACE TO SOME MICA (A-2-4, A-2-5)

(D) RESIDUAL, BROWN-TAN TO OLIVE-TAN AND WHITE LOOSE TO MED DENSE MOIST TO WET SILTY SAND (A-2-4, A-2-5)

(E) SEVERELY WEATHERED CRYSTALLINE ROCK

(F) RESIDUAL, RED MED. STIFF MOIST SANDY CLAY (A-7)

(G) RESIDUAL, TAN AND OLIVE LOOSE TO MED DENSE MOIST SLI. MICA. SILTY CLAYEY SAND (A-2-5)

(H) RESIDUAL, WHITE-TAN TO RED SLI. MICA. STIFF MOIST CLAYEY SANDY SILT (A-5)

(I) RESIDUAL, WHITE-TAN-OLIVE LOOSE TO MED. DENSE MOIST TO WET V. MICA. SILTY SAND (A-2-5)

(J) RESIDUAL, RED STIFF MOIST SANDY SILTY CLAY WITH TRACE MICA (A-7-5)

(K) RESIDUAL, RED-TAN VERY STIFF MOIST SANDY SILT WITH TRACE MICA (A-5)

(L) RESIDUAL, OLIVE & WHITE MED DENSE MOIST TO WET SILTY SAND WITH TRACE MICA (A-2-4, A-2-5)

(M) RESIDUAL, RED MED. STIFF TO V. STIFF MOIST MED. PLASTIC SLI. MICA. SANDY SILTY CLAY (A-7-5)

(N) RESIDUAL, RED-TAN TO TAN STIFF TO VERY STIFF MOIST TO WET CLAYEY SANDY SILT WITH TRACE MICA (A-5)

(O) RESIDUAL, RED-BROWN VERY STIFF MOIST SANDY SILTY CLAY (A-7-5)

(P) SEVERELY WEATHERED CRYSTALLINE ROCK WITH LAYER OF CRYSTALLINE ROCK AT 9.7'

(Q) RESIDUAL, RED MED. STIFF TO STIFF MOIST HIGH TO MED. PLASTIC SANDY CLAY (A-7-5)

(R) RESIDUAL, RED STIFF TO V. STIFF MOIST SANDY CLAYEY SILT (A-5)

-NWY41-

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION Noise Wall -NWY41- 10+00 - 33+20 Winston-Salem Northern Beltway				**GROUND WTR (ft)**
BORING NO. 1150	**STATION** 11+50	**OFFSET** CL	**ALIGNMENT** -NWY41-	**0 HR.** 10.0
COLLAR ELEV. 873.8 ft	**TOTAL DEPTH** 19.8 ft	**NORTHING** 861,850	**EASTING** 1,664,795	**24 HR.** 10.0
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/11		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 01/08/14	**COMP. DATE** 01/08/14	**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)
875											
										873.8	0.0
										GROUND SURFACE	
870	870.5	3.3	5	4	6	10	SS-70	M		**RESIDUAL** BROWN-RED TO GRAY STIFF MOIST (PI=14) SILTY SANDY CLAY (A-6)	
										866.8	7.0
865	865.5	8.3	2	2	2	4	SS-71	W		**RESIDUAL** OLIVE-TAN LOOSE MOIST SILTY SAND WITH SOME MICA (A-2-5, A-2-4)	
860	860.5	13.3	2	2	4	6	SS-72	M			
855	855.5	18.3	2	2	3	5	SS-73	W		854.0	19.8
										Boring Terminated at Elevation 854.0 ft in sand	

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION Noise Wall -NWY41- 10+00 - 33+20 Winston-Salem Northern Beltway				**GROUND WTR (ft)**
BORING NO. 1200LT	**STATION** 12+00	**OFFSET** 10 ft LT	**ALIGNMENT** -NWY41-	**0 HR.** 16.0
COLLAR ELEV. 874.7 ft	**TOTAL DEPTH** 20.5 ft	**NORTHING** 861,853	**EASTING** 1,664,747	**24 HR.** 10.0
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/11		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 01/08/14	**COMP. DATE** 01/08/14	**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)
875											
										874.7	0.0
										GROUND SURFACE	
870	870.7	4.0	3	4	5	9		W		**RESIDUAL** BROWN-RED STIFF MOIST TO WET SILTY SANDY CLAY (A-6)	
										866.7	8.0
865	865.7	9.0	4	5	7	12		W		**RESIDUAL** OLIVE-TAN AND GRAY MED DENSE TO LOOSE WET SILTY SAND WITH SOME MICA (A-2-5, A-2-4)	
860	860.7	14.0	2	3	4	7		W			
855	855.7	19.0	3	2	4	6		W		854.2	20.5
										Boring Terminated at Elevation 854.2 ft in sand	

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION Noise Wall -NWY41- 10+00 - 33+20 Winston-Salem Northern Beltway				**GROUND WTR (ft)**
BORING NO. 1300RT	**STATION** 13+00	**OFFSET** 15 ft RT	**ALIGNMENT** -NWY41-	**0 HR.** 8.0
COLLAR ELEV. 871.2 ft	**TOTAL DEPTH** 20.3 ft	**NORTHING** 861,893	**EASTING** 1,664,651	**24 HR.** 4.6
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/11		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 01/08/14	**COMP. DATE** 01/08/14	**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)
875											
										871.2 GROUND SURFACE	0.0
870										**RESIDUAL** RED-BROWN TO GRAY STIFF MOIST TO WET SILTY SANDY CLAY (A-6)	
	867.4	3.8	4	4	6	10		W			
865										864.2	7.0
	862.4	8.8	3	3	3	6		W		**RESIDUAL** OLIVE-TAN LOOSE WET SILTY SAND (A-2-5)	
860										858.2	13.0
	857.4	13.8	1	2	4	6	SS-74	W		**RESIDUAL** RED MED STIFF WET CLAYEY SANDY SILT WITH TRACE MICA (A-5)	
855										855.2	16.0
	852.4	18.8	8	8	10	18		W		**RESIDUAL** OLIVE-TAN MED DENSE WET SILTY SAND (A-2-4)	
										850.9	20.3
										Boring Terminated at Elevation 850.9 ft in sand	

NCDOT BORE SINGLE U2579B_GEO_BH_SWAL_NWY41.GPJ NC_DOT.GDT 3/24/14

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION Noise Wall -NWY41- 10+00 - 33+20 Winston-Salem Northern Beltway				**GROUND WTR (ft)**
BORING NO. 1400RT	**STATION** 14+00	**OFFSET** 10 ft RT	**ALIGNMENT** -NWY41-	**0 HR.** NM
COLLAR ELEV. 868.1 ft	**TOTAL DEPTH** 20.8 ft	**NORTHING** 861,903	**EASTING** 1,664,552	**24 HR.** NM
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/11		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 01/08/14	**COMP. DATE** 01/08/14	**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)
870											
										868.1 GROUND SURFACE	0.0
865										**RESIDUAL** RED-BROWN MED STIFF MOIST SILTY SANDY CLAY (A-6)	
	863.8	4.3	3	3	2	5		M		866.1	2.0
860										**RESIDUAL** OLIVE-TAN LOOSE MOIST TO WET SILTY SAND WITH SOME MICA (A-2-5)	
	858.8	9.3	2	2	3	5	SS-75	M			
855											
	853.8	14.3	2	2	4	6		W			
850											
	848.8	19.3	1	1	2	3		W		847.3	20.8
										Boring Terminated at Elevation 847.3 ft in sand	

NCDOT BORE SINGLE U2579B_GEO_BH_SWAL_NWY41.GPJ NC_DOT.GDT 3/24/14

NCDOT GEOTECHNICAL ENGINEERING UNIT
BOREHOLE REPORT

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.
SITE DESCRIPTION Noise Wall -NWY41- 10+00 - 33+20 Winston-Salem Northern Beltway			**GROUND WTR (ft)**
BORING NO. 1510	**STATION** 15+10	**OFFSET** CL	**ALIGNMENT** -NWY41-	**0 HR.** NM
COLLAR ELEV. 887.0 ft	**TOTAL DEPTH** 35.0 ft	**NORTHING** 861,863	**EASTING** 1,664,450	**24 HR.** 17.8
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/11		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 01/08/14	**COMP. DATE** 01/09/14	**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)
890										887.0 GROUND SURFACE	0.0
	883.5	3.5	4	6	9	15		M		**RESIDUAL** RED-BROWN VERY STIFF TO STIFF MOIST MED PLASTIC (PI=23) SILTY SANDY CLAY WITH TRACE MICA (A-7-5)	
885											
	878.5	8.5	4	4	6	10	SS-76	M			
880											
	873.5	13.5	2	2	3	5	SS-77	W		875.0 **RESIDUAL** RED MED STIFF WET CLAYEY SANDY SILT (A-5)	12.0
875											
	868.5	18.5	2	2	2	4		W			
870											
	863.5	23.5	2	2	4	6	SS-78	W		865.0 **RESIDUAL** OLIVE-TAN MED STIFF TO STIFF WET (PI=12) SILTY SANDY CLAY (A-7-5)	22.0
865											
	858.5	28.5	2	2	6	8		W			
860											
	853.5	33.5	3	5	8	13		W		852.0 Boring Terminated at Elevation 852.0 ft in clay	35.0
855											

NCDOT GEOTECHNICAL ENGINEERING UNIT
BOREHOLE REPORT

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.
SITE DESCRIPTION Noise Wall -NWY41- 10+00 - 33+20 Winston-Salem Northern Beltway			**GROUND WTR (ft)**
BORING NO. 1600	**STATION** 16+00	**OFFSET** CL	**ALIGNMENT** -NWY41-	**0 HR.** NM
COLLAR ELEV. 894.1 ft	**TOTAL DEPTH** 40.2 ft	**NORTHING** 861,832	**EASTING** 1,664,371	**24 HR.** 23.0
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/11		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 01/09/14	**COMP. DATE** 01/09/14	**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)
895										894.1 GROUND SURFACE	0.0
	890.4	3.7	6	8	10	18		M		**RESIDUAL** RED-BROWN TO RED-WHITE VERY STIFF MOIST SANDY SILTY CLAY (A-7-5)	
890											
	885.4	8.7	3	6	9	15		M			
885											
	880.4	13.7	3	3	4	7		M		882.1 **RESIDUAL** RED-WHITE TO OLIVE-TAN MED STIFF TO STIFF MOIST TO WET CLAYEY SANDY SILT WITH LITTLE TO NO MICA (A-5)	12.0
880											
	875.4	18.7	3	3	4	7		M			
875											
	870.4	23.7	2	2	2	4		M			
870											
	865.4	28.7	2	4	7	11		W			
865											
	860.4	33.7	5	4	5	9		W			
860											
	855.4	38.7	3	4	5	9		W		853.9 Boring Terminated at Elevation 853.9 ft in silt	40.2
855											

NCDOT GEOTECHNICAL ENGINEERING UNIT
BOREHOLE REPORT

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.
SITE DESCRIPTION Noise Wall -NWY41- 10+00 - 33+20 Winston-Salem Northern Beltway			**GROUND WTR (ft)**
BORING NO. 1700	**STATION** 17+00	**OFFSET** CL	**ALIGNMENT** -NWY41-	**0 HR.** Dry
COLLAR ELEV. 892.7 ft	**TOTAL DEPTH** 34.7 ft	**NORTHING** 861,854	**EASTING** 1,664,273	**24 HR.** Caved
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/11		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER Estep, J. E.	**START DATE** 02/04/14	**COMP. DATE** 02/04/14	**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)
895											
										892.7 GROUND SURFACE	0.0
890	889.5	3.2								**RESIDUAL** RED-BROWN VERY STIFF MOIST SANDY SILTY CLAY (A-7-5)	
			5	8	10	18		M			
885	884.5	8.2								885.7	7.0
			4	6	6	12		M		**RESIDUAL** TAN LOOSE TO MED DENSE MOIST TO WET SILTY SAND WITH TRACE TO SOME MICA (A-2-4, A-2-5)	
880	879.5	13.2									
			3	4	8	12		M			
875	874.5	18.2									
			4	6	7	13		M			
870	869.5	23.2									
			3	3	6	9		W			
865	864.5	28.2									
			3	3	6	9		W			
860	859.5	33.2									
			3	6	9	15		W		858.0	34.7
										Boring Terminated at Elevation 858.0 ft in sand	

NCDOT BORE SINGLE U2579B_GEO_BH_SWAL_NWY41.GPJ NC_DOT.GDT 3/24/14

NCDOT GEOTECHNICAL ENGINEERING UNIT
BOREHOLE REPORT

WBS 34839.1.1	**TIP** U-2579 B	**COUNTY** Forsyth	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION NOISE WALL NWY4 FROM STA. 10+00.00 -NWY4- TO STA. 22+10.00 -NWY4-				**GROUND WTR (ft)**
BORING NO. B-1y4	**STATION** 110+75	**OFFSET** 140 ft LT	**ALIGNMENT** -Y4-	**0 HR.** 28.0
COLLAR ELEV. 885.2 ft	**TOTAL DEPTH** 31.5 ft	**NORTHING** 861,888	**EASTING** 1,664,224	**24 HR.** 17.3
DRILL RIG/HAMMER EFF./DATE CME-550		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 07/21/10	**COMP. DATE** 07/21/10	**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)
890											
885										885.2 GROUND SURFACE	0.0
	883.7	1.5	1	3	3	6	SS-1	M		**ALLUVIAL** RED-BRN SOFT MOIST SILTY SANDY CLAY (A-7)	1.5
880	881.2	4.0	3	5	6	11	SS-2	M		883.7 **RESIDUAL** RED-TAN MED. STIFF MOIST MED. (PI=25) PLASTIC SILTY SANDY CLAY (A-7-5)	4.0
	878.7	6.5	4	6	6	12	SS-3	D		879.2 **RESIDUAL** TAN STIFF MOIST SLI. MICA. CLAYEY SANDY SILT (A-5)	6.0
875	875.2	10.0	3	5	6	11	SS-4	D		**RESIDUAL** OLIVE-TAN MED. DENSE DRY SLI. MICA. SILTY SAND (A-2-5)	
870	870.2	15.0	3	4	5	9	SS-5	D		871.2	14.0
865	865.2	20.0	3	4	6	10	SS-6	M		**RESIDUAL** OLIVE-TAN STIFF DRY TO MOIST SLI. MICA. CLAYEY SANDY SILT (A-5)	
860	860.2	25.0	3	4	6	10	SS-7	W		866.2	19.0
855	855.2	30.0	3	4	6	10		W		**RESIDUAL** OLIVE-TAN MED. DENSE MOIST SLI. MICA. SILTY SAND (A-2-5)	
										861.2	24.0
										RESIDUAL OLIVE-TAN STIFF WET SLI. MICA. CLAYEY SAND SILT (A-5)	
										853.7	31.5
										Boring Terminated at Elevation 853.7 ft IN OLIVE-TAN STIFF WET SLI. MICA. CLAYEY SANDY SILT (A-5)	

NCDOT BORE SINGLE U2579B_GEO_BH_NWY4.GPJ NC_DOT.GDT 3/24/14

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.
SITE DESCRIPTION Noise Wall -NWY41- 10+00 - 33+20 Winston-Salem Northern Beltway			**GROUND WTR (ft)**
BORING NO. 1800	**STATION** 18+00	**OFFSET** CL	**ALIGNMENT** -NWY41-	**0 HR.** 31.0
COLLAR ELEV. 890.6 ft	**TOTAL DEPTH** 40.5 ft	**NORTHING** 861,873	**EASTING** 1,664,175	**24 HR.** 29.0
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/11		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 02/04/14	**COMP. DATE** 02/04/14	**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)
895											
890										890.6 GROUND SURFACE	0.0
	886.6	4.0	4	8	11	19		M		**RESIDUAL** RED-BROWN VERY STIFF MOIST SANDY SILTY CLAY (A-7-5)	
885	881.6	9.0	3	4	5	9		M		882.6 **RESIDUAL** TAN-OLIVE LOOSE TO MED DENSE MOIST TO WET SILTY SAND WITH TRACE TO SOME MICA (A-2-5)	8.0
880	876.6	14.0	5	6	10	16		M			
875	871.6	19.0	6	9	10	19		M			
870	866.6	24.0	3	7	15	22		W			
865	861.6	29.0	2	3	4	7		W_2			
860	856.6	34.0	3	9	16	25		W			
855	851.6	39.0	3	7	9	16		W		850.1	40.5
										Boring Terminated at Elevation 850.1 ft in sand	

NCDOT BORE SINGLE U2579B_GEO_BH_SWAL_NWY41.GPJ NC_DOT.GDT 3/24/14

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.
SITE DESCRIPTION Noise Wall -NWY41- 10+00 - 33+20 Winston-Salem Northern Beltway			**GROUND WTR (ft)**
BORING NO. 1900	**STATION** 19+00	**OFFSET** CL	**ALIGNMENT** -NWY41-	**0 HR.** Dry
COLLAR ELEV. 902.5 ft	**TOTAL DEPTH** 25.5 ft	**NORTHING** 861,889	**EASTING** 1,664,076	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/11		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 01/31/14	**COMP. DATE** 01/31/14	**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)
905											
900										902.5 GROUND SURFACE	0.0
	898.5	4.0	5	7	9	16		M		**RESIDUAL** RED-BROWN VERY STIFF MOIST SANDY SILTY CLAY WITH TRACE MICA (A-7-5)	
895	893.5	9.0	4	6	7	13		M		895.5 **RESIDUAL** RED-TAN STIFF MOIST SANDY CLAYEY SILT WITH TRACE MICA (A-5)	7.0
890	888.5	14.0	5	6	10	16		M		889.5 **RESIDUAL** RED-TAN MED DENSE MOIST SILTY SAND WITH LITTLE MICA (A-2-4, A-2-5)	13.0
885	883.5	19.0	4	5	8	13		M			
880	878.5	24.0	5	6	10	16		M		877.0	25.5
										Boring Terminated at Elevation 877.0 ft in sand	

NCDOT BORE SINGLE U2579B_GEO_BH_SWAL_NWY41.GPJ NC_DOT.GDT 3/24/14

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34839.1.1	**TIP** U-2579 B	**COUNTY** Forsyth	**GEOLOGIST** Murray, C. C.
SITE DESCRIPTION NOISE WALL NWY4 FROM STA. 10+00.00 -NWY4- TO STA. 22+10.00 -NWY4-			**GROUND WTR (ft)**
BORING NO. B-2y4	**STATION** 112+53	**OFFSET** 139 ft LT	**ALIGNMENT** -Y4- — **0 HR.** NM
COLLAR ELEV. 904.1 ft	**TOTAL DEPTH** 19.5 ft	**NORTHING** 861,902	**EASTING** 1,664,046 — **24 HR.** NM
DRILL RIG/HAMMER EFF./DATE CME-550		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER Estep, J. E.	**START DATE** 09/18/07	**COMP. DATE** 09/18/07	**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)
905											
										904.1 GROUND SURFACE	0.0
	901.1	3.0	4	7	10	17	SS-340	M		**RESIDUAL** RED V. STIFF MOIST MED. (PI=25) PLASTIC SLI. MICA. SILTY SANDY CLAY (A-7-5)	
900											
	896.1	8.0	3	6	7	13	SS-341	M		896.1 **RESIDUAL** OLIVE STIFF MOIST CLAYEY SANDY SILT (A-5)	8.0
895											
	891.1	13.0	6	7	10	17	SS-342	M		891.1 **RESIDUAL** OLIVE MED. DENSE MOIST MICA. CLAYEY SILTY SAND (A-2-5)	13.0
890											
	886.1	18.0	7	10	12	22		M		884.6 Boring Terminated at Elevation 884.6 ft IN MED. DENSE CLAYEY SILTY SAND (A-2-5) B-2'S ORIGINAL RDWY. BORING NAME & LOCATION ARE: Y4RPC_3850L STA. 38+50 -Y4RPC- 90' LT	19.5
885											

NCDOT BORE SINGLE U2579B_GEO_BH_NWY4.GPJ NC_DOT.GDT 3/24/14

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.
SITE DESCRIPTION Noise Wall -NWY41- 10+00 - 33+20 Winston-Salem Northern Beltway			**GROUND WTR (ft)**
BORING NO. 2000	**STATION** 20+00	**OFFSET** CL	**ALIGNMENT** -NWY41- — **0 HR.** Dry
COLLAR ELEV. 907.9 ft	**TOTAL DEPTH** 15.3 ft	**NORTHING** 861,906	**EASTING** 1,663,978 — **24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/11		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER Estep, J. E.	**START DATE** 01/31/14	**COMP. DATE** 01/31/14	**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)
910											
										907.9 GROUND SURFACE	0.0
	904.1	3.8	5	10	13	23		M		**RESIDUAL** RED-BROWN VERY STIFF MOIST SANDY SILTY CLAY (A-7-5)	
905											
	899.1	8.8	4	6	9	15		M		895.9 **RESIDUAL** RED-TAN STIFF MOIST SANDY CLAYEY SILT (A-5)	12.0
900											
	894.1	13.8	4	5	6	11		M		892.6 Boring Terminated at Elevation 892.6 ft in silt	15.3
895											

NCDOT BORE SINGLE U2579B_GEO_BH_SWAL_NWY41.GPJ NC_DOT.GDT 3/24/14

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34839.1.1	**TIP** U-2579 B	**COUNTY** Forsyth	**GEOLOGIST** Murray, C. C.
SITE DESCRIPTION NOISE WALL NWY4 FROM STA. 10+00.00 -NWY4- TO STA. 22+10.00 -NWY4-			**GROUND WTR (ft)**
BORING NO. B-3y4	**STATION** 114+00	**OFFSET** 135 ft LT	**ALIGNMENT** -Y4- — **0 HR.** Dry
COLLAR ELEV. 912.0 ft	**TOTAL DEPTH** 29.7 ft	**NORTHING** 861,918	**EASTING** 1,663,900 — **24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE CME-550		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER Estep, J. E.	**START DATE** 07/21/10	**COMP. DATE** 07/21/10	**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)
915											
										912.0 GROUND SURFACE	0.0
910										**RESIDUAL** RED-TAN V. STIFF MOIST SILTY SANDY CLAY (A-7)	
	908.8	3.2	5	8	11	19		M			
	906.3	5.7	5	8	10	18		M		905.0	7.0
905	903.8	8.2	4	6	6	12		M		**RESIDUAL** TAN V. STIFF TO STIFF MOIST CLAYEY SANDY SILT (A-5)	
900										900.0	12.0
	898.8	13.2	2	4	5	9		M		**RESIDUAL** OLIVE LOOSE MOIST SILTY SAND (A-2)	
895										895.0	17.0
	893.8	18.2	5	6	8	14		M		**RESIDUAL** OLIVE STIFF MOIST CLAYEY SANDY SILT (A-5)	
890										890.0	22.0
	888.8	23.2	3	3	6	9		M		**RESIDUAL** OLIVE LOOSE MOIST SILTY SAND (A-2)	
885										885.0	27.0
	883.8	28.2	5	7	8	15		M		**RESIDUAL** OLIVE STIFF MOIST CLAYEY SANDY SILT (A-5)	
										882.3	29.7
										Boring Terminated at Elevation 882.3 ft IN OLIVE STIFF MOIST CLAYEY SANDY SILT (A-5)	

NCDOT BORE SINGLE U2579B_GEO_BH_NWY4.GPJ NC_DOT.GDT 3/24/14

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.
SITE DESCRIPTION Noise Wall -NWY41- 10+00 - 33+20 Winston-Salem Northern Beltway			**GROUND WTR (ft)**
BORING NO. 2200RT	**STATION** 22+00	**OFFSET** 5 ft RT	**ALIGNMENT** -NWY41- — **0 HR.** Dry
COLLAR ELEV. 910.5 ft	**TOTAL DEPTH** 14.9 ft	**NORTHING** 861,944	**EASTING** 1,663,781 — **24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/11		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER Estep, J. E.	**START DATE** 01/31/14	**COMP. DATE** 01/31/14	**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)
915											
910										910.5 GROUND SURFACE	0.0
	907.1	3.4	5	9	13	22		M		**RESIDUAL** RED-BROWN TO TAN STIFF TO VERY STIFF MOIST SANDY SILTY CLAY (A-7-5)	
905										902.5	8.0
	902.1	8.4	8	8	14	22		M		**RESIDUAL** OLIVE-TAN MED DENSE MOIST SILTY SAND WITH TRACE MICA (A-2-4, A-2-5)	
900										895.6	14.9
	897.1	13.4	8	9	14	23		M		Boring Terminated at Elevation 895.6 ft in sand	

NCDOT BORE SINGLE U2579B_GEO_BH_SWAL_NWY41.GPJ NC_DOT.GDT 3/24/14

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34839.1.1	**TIP** U-2579 B	**COUNTY** Forsyth	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION NOISE WALL NWY4 FROM STA. 10+00.00 -NWY4- TO STA. 22+10.00 -NWY4-				**GROUND WTR (ft)**
BORING NO. B-4y4	**STATION** 115+50	**OFFSET** 137 ft LT	**ALIGNMENT** -Y4-	**0 HR.** Dry
COLLAR ELEV. 906.9 ft	**TOTAL DEPTH** 25.5 ft	**NORTHING** 861,928	**EASTING** 1,663,751	**24 HR.** NM
DRILL RIG/HAMMER EFF./DATE CME-550		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 09/18/07	**COMP. DATE** 09/18/07	**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)
										906.9 GROUND SURFACE	0.0
	902.9	4.0	3	5	6	11	SS-343	M		**RESIDUAL** RED TO RED-BRN & TAN STIFF MOIST LOW (PI=13) TO MED. (PI=19) PLASTIC SILTY SANDY CLAY (A-7-5)	
	897.9	9.0	4	4	7	11	SS-344	M			
	892.9	14.0	5	7	10	17	SS-345	M		893.9 **RESIDUAL** TAN V. STIFF MOIST CLAYEY SANDY SILT (A-5)	13.0
	887.9	19.0	7	8	8	16	SS-346	M		888.9 **RESIDUAL** TAN V. STIFF WET LOW (PI=11) PLASTIC SILTY SANDY CLAY (A-7-5)	18.0
	882.9	24.0	7	7	10	17		W		881.4 Boring Terminated at Elevation 881.4 ft IN V. STIFF SILTY SANDY CLAY (A-7-5) B-4'S ORIGINAL RDWY. BORING NAME & LOCATION ARE: Y4EB_11550L STA. 115+50 -Y4EB- 110' LT	25.5

NCDOT BORE SINGLE U2579B_GEO_BH_NWY4.GPJ NC_DOT.GDT 3/24/14

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION Noise Wall -NWY41- 10+00 - 33+20 Winston-Salem Northern Beltway				**GROUND WTR (ft)**
BORING NO. 2300	**STATION** 23+00	**OFFSET** CL	**ALIGNMENT** -NWY41-	**0 HR.** Dry
COLLAR ELEV. 905.2 ft	**TOTAL DEPTH** 19.8 ft	**NORTHING** 861,950	**EASTING** 1,663,681	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/11		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 01/30/14	**COMP. DATE** 01/30/14	**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)
										905.2 GROUND SURFACE	0.0
	901.9	3.3	4	4	6	10		M		902.2 **RESIDUAL** RED-BROWN STIFF MOIST SANDY SILTY CLAY (A-7-5)	3.0
	896.9	8.3	3	5	6	11		M		898.2 **RESIDUAL** TAN STIFF MOIST SANDY SILT (A-5)	7.0
	891.9	13.3	7	7	9	16		M		**RESIDUAL** OLIVE-TAN MED DENSE MOIST SILTY SAND WITH TRACE MICA (A-2-4, A-2-5)	
	886.9	18.3	10	8	12	20		M		885.4 Boring Terminated at Elevation 885.4 ft in sand	19.8

NCDOT BORE SINGLE U2579B_GEO_BH_SWAL_NWY41.GPJ NC_DOT.GDT 3/24/14

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34839.1.1	**TIP** U-2579 B	**COUNTY** Forsyth	**GEOLOGIST** Murray, C. C.
SITE DESCRIPTION NOISE WALL NWY4 FROM STA. 10+00.00 -NWY4- TO STA. 22+10.00 -NWY4-			**GROUND WTR (ft)**
BORING NO. B-5y4	**STATION** 117+00	**OFFSET** 130 ft LT	**ALIGNMENT** -Y4-	**0 HR.** 27.0
COLLAR ELEV. 896.8 ft	**TOTAL DEPTH** 31.0 ft	**NORTHING** 861,947	**EASTING** 1,663,602	**24 HR.** 15.9
DRILL RIG/HAMMER EFF./DATE CME-550		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 07/21/10	**COMP. DATE** 07/21/10	**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)
900										
	896.8	0.0								GROUND SURFACE 0.0
895										**RESIDUAL** RED MED. STIFF MOIST SILTY SANDY CLAY (A-7) 893.8 3.0
	892.3	4.5	3	3	5	8				**RESIDUAL** TAN TO OLIVE-TAN LOOSE TO MED. DENSE MOIST TO WET MICA. SILTY SAND (A-2-5)
890							SS-8	M		
	888.8	8.0	2	3	4	7		M		
	887.3	9.5	3	3	5	8	SS-9	M		
885										
	882.3	14.5	2	4	4	8	SS-10	W		
880										
	877.3	19.5	3	6	6	12	SS-11	W		
875										
	872.3	24.5	4	7	9	16	SS-12	W		
870										
	867.3	29.5	4	6	8	14	SS-13	W		
										865.8 31.0
										Boring Terminated at Elevation 865.8 ft IN OLIVE-TAN MED. DENSE WET MICA. SILTY SAND (A-2-5)

NCDOT BORE SINGLE U2579B_GEO_BH_NWY4.GPJ NC_DOT.GDT 3/24/14

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.
SITE DESCRIPTION Noise Wall -NWY41- 10+00 - 33+20 Winston-Salem Northern Beltway			**GROUND WTR (ft)**
BORING NO. 2400RT	**STATION** 24+00	**OFFSET** 15 ft RT	**ALIGNMENT** -NWY41-	**0 HR.** NM
COLLAR ELEV. 896.4 ft	**TOTAL DEPTH** 34.8 ft	**NORTHING** 861,973	**EASTING** 1,663,583	**24 HR.** 14.0
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/11		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 01/30/14	**COMP. DATE** 01/30/14	**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)
900										
	896.4	0.0								GROUND SURFACE 0.0
895										**RESIDUAL** RED-BROWN STIFF MOIST SANDY SILTY CLAY (A-7-5) 893.4 3.0
	893.1	3.3	4	4	5	9		M		**RESIDUAL** TAN-OLIVE STIFF MOIST CLAYEY SANDY SILT WITH LITTLE MICA (A-5) 889.4 7.0
890										
	888.1	8.3	3	4	6	10		M		**RESIDUAL** OLIVE-TAN MED DENSE TO DENSE MOIST TO WET SILTY SAND WITH SOME MICA (A-2-4, A-2-5)
885										
	883.1	13.3	4	4	7	11		M		
880										
	878.1	18.3	4	7	10	17		W		
875										
	873.1	23.3	3	7	12	19		W		
870										
	868.1	28.3	7	11	14	25		W		
865										
	863.1	33.3	8	13	17	30		W		
										861.6 34.8
										Boring Terminated at Elevation 861.6 ft in sand

NCDOT BORE SINGLE U2579B_GEO_BH_SWAL_NWY41.GPJ NC_DOT.GDT 3/24/14

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34839.1.1	**TIP** U-2579 B	**COUNTY** Forsyth	**GEOLOGIST** Murray, C. C.
SITE DESCRIPTION NOISE WALL NWY4 FROM STA. 10+00.00 -NWY4- TO STA. 22+10.00 -NWY4-			**GROUND WTR (ft)**
BORING NO. B-6y4	**STATION** 118+10	**OFFSET** 137 ft LT	**ALIGNMENT** -Y4- — **0 HR.** Dry
COLLAR ELEV. 891.7 ft	**TOTAL DEPTH** 8.0 ft	**NORTHING** 861,948	**EASTING** 1,663,491 — **24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE CME-550		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER Estep, J. E.	**START DATE** 09/18/07	**COMP. DATE** 09/18/07	**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
895										ELEV. (ft) / DEPTH (ft)
										891.7 GROUND SURFACE 0.0
890	890.7	1.0	6	6	7	13	SS-347	M		**RESIDUAL** BRN STIFF MOIST LOW (PI=14) PLASTIC SILTY SANDY CLAY (A-6) — 888.7 / 3.0
	888.1	3.6	5	7	9	16	SS-348	M		**RESIDUAL** BRN V. STIFF MOIST CLAYEY SANDY SILT (A-5) — 883.7 / 8.0
885										Boring Terminated at Elevation 883.7 ft IN V. STIFF CLAYEY SANDY SILT (A-5)
										B-6'S ORIGINAL RDWY. BORING NAME & LOCATION ARE: Y4EBL_11750L STA. 118+10 -Y4EB- 110' LT

NCDOT BORE SINGLE U2579B_GEO_BH_NWY4.GPJ NC_DOT.GDT 3/24/14

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.
SITE DESCRIPTION Noise Wall -NWY41- 10+00 - 33+20 Winston-Salem Northern Beltway			**GROUND WTR (ft)**
BORING NO. 2500RT	**STATION** 25+00	**OFFSET** 12 ft RT	**ALIGNMENT** -NWY41- — **0 HR.** 13.0
COLLAR ELEV. 888.8 ft	**TOTAL DEPTH** 30.3 ft	**NORTHING** 861,977	**EASTING** 1,663,483 — **24 HR.** 12.0
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/11		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER Estep, J. E.	**START DATE** 01/23/14	**COMP. DATE** 01/23/14	**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
890										ELEV. (ft) / DEPTH (ft)
										888.8 GROUND SURFACE 0.0
885	885.0	3.8	3	4	4	8		M		**RESIDUAL** RED-BROWN STIFF MOIST SANDY SILTY CLAY (A-7-5) — 885.8 / 3.0
880	880.0	8.8	3	3	5	8		M		**RESIDUAL** BROWN-TAN TO OLIVE-TAN LOOSE MOIST TO WET SILTY SAND (A-2-4, A-2-5)
875	875.0	13.8	1	3	5	8		M		
870	870.0	18.8	2	2	4	6		W		
865	865.0	23.8	100/.4			100/.4				865.8 / 23.0
										WEATHERED ROCK SEVERELY WEATHERED CRYSTALLINE ROCK — 862.8 / 26.0
860	860.0	28.8	9	10	19	29				**RESIDUAL** OLIVE-TAN-WHITE MED DENSE WET SILTY SAND (A-2-5) — 858.5 / 30.3
										Boring Terminated at Elevation 858.5 ft in sand

NCDOT BORE SINGLE U2579B_GEO_BH_SWAL_NWY41.GPJ NC_DOT.GDT 3/24/14

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.
SITE DESCRIPTION Noise Wall -NWY41- 10+00 - 33+20 Winston-Salem Northern Beltway			**GROUND WTR (ft)**
BORING NO. 2600RT	**STATION** 26+00	**OFFSET** 5 ft RT	**ALIGNMENT** -NWY41- **0 HR.** NM
COLLAR ELEV. 895.7 ft	**TOTAL DEPTH** 35.2 ft	**NORTHING** 861,978	**EASTING** 1,663,383 **24 HR.** 25.0
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/11		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER Estep, J. E.	**START DATE** 01/27/14	**COMP. DATE** 01/27/14	**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)
										895.7 GROUND SURFACE	0.0
	892.0	3.7	4	5	7	12	SS-83	M		**RESIDUAL** RED-BROWN STIFF MOIST SANDY SILTY CLAY (A-7-5) 892.7	3.0
	887.0	8.7	4	4	9	13	SS-84	M		**RESIDUAL** TAN-OLIVE STIFF MOIST CLAYEY SANDY SILT WITH TRACE MICA (A-5) 887.7	8.0
	882.0	13.7	3	3	5	8	SS-85	M		**RESIDUAL** OLIVE-TAN LOOSE TO DENSE MOIST TO WET SILTY SAND WITH SOME MICA (A-2-4, A-2-5)	
	877.0	18.7	3	3	4	7	SS-86	M			
	872.0	23.7	3	5	6	11	SS-87	M			
	867.0	28.7	3	3	7	10	SS-88	W			
	862.0	33.7	5	12	29	41	SS-89	W		860.5	35.2
										Boring Terminated at Elevation 860.5 ft in sand	

NCDOT BORE SINGLE U2579B_GEO_BH_SWAL_NWY41.GPJ NC_DOT.GDT 3/24/14

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34839.1.1	**TIP** U-2579 B	**COUNTY** Forsyth	**GEOLOGIST** Murray, C. C.
SITE DESCRIPTION NOISE WALL NWY4 FROM STA. 10+00.00 -NWY4- TO STA. 22+10.00 -NWY4-			**GROUND WTR (ft)**
BORING NO. B-7y4	**STATION** 120+00	**OFFSET** 130 ft LT	**ALIGNMENT** -Y4- **0 HR.** Dry
COLLAR ELEV. 903.8 ft	**TOTAL DEPTH** 30.3 ft	**NORTHING** 861,970	**EASTING** 1,663,302 **24 HR.** 26.0
DRILL RIG/HAMMER EFF./DATE CME-550		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER Estep, J. E.	**START DATE** 07/22/10	**COMP. DATE** 07/22/10	**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)
	902.5	1.3								903.8 GROUND SURFACE	0.0
	900.0	3.8	3	3	4	7		M		**RESIDUAL** RED MED. STIFF MOIST SANDY CLAY (A-7) 900.8	3.0
	897.5	6.3	3	2	7	9	SS-14	M		**RESIDUAL** TAN LOOSE MOIST SLI. MICA. SILTY CLAYEY SAND (A-2-5) 897.8	6.0
	895.0	8.8	3	4	5	9	SS-15	M		**RESIDUAL** WHITE-TAN SLI. MICA. STIFF MOIST CLAYEY SANDY SILT (A-5)	
			3	4	6	10		M		891.8	12.0
	890.0	13.8	1	3	6	9	SS-16	M		**RESIDUAL** WHITE-TAN LOOSE TO MED. DENSE MOIST TO WET V. MICA. SILTY SAND (A-2-5)	
	885.0	18.8	3	4	5	9		M			
	880.0	23.8	4	5	7	12	SS-17	M			
	875.0	28.8	4	5	8	13		W		873.5	30.3
										Boring Terminated at Elevation 873.5 ft IN TAN MED. DENSE WET V. MICA. SILTY SAND (A-2-5)	

NCDOT BORE SINGLE U2579B_GEO_BH_NWY4.GPJ NC_DOT.GDT 3/24/14

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.
SITE DESCRIPTION Noise Wall -NWY41- 10+00 - 33+20 Winston-Salem Northern Beltway			**GROUND WTR (ft)**
BORING NO. 2700RT	**STATION** 27+00	**OFFSET** 8 ft RT	**ALIGNMENT** -NWY41- **0 HR.** NM
COLLAR ELEV. 904.7 ft	**TOTAL DEPTH** 40.3 ft	**NORTHING** 861,989	**EASTING** 1,663,283 **24 HR.** 26.0
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/11		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER Estep, J. E.	**START DATE** 01/23/14	**COMP. DATE** 01/23/14	**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)
905											
										904.7 GROUND SURFACE	0.0
	900.9	3.8	4	4	6	10		M		**RESIDUAL** RED STIFF MOIST SANDY SILTY CLAY WITH TRACE MICA (A-7-5)	
900										897.7	7.0
	895.9	8.8	4	7	9	16		M		**RESIDUAL** RED-TAN VERY STIFF MOIST SANDY SILT WITH TRACE MICA (A-5)	
895											
	890.9	13.8	6	7	10	17		M		887.7	17.0
890										**RESIDUAL** OLIVE & WHITE MED DENSE MOIST TO WET SILTY SAND WITH TRACE MICA (A-2-4, A-2-5)	
	885.9	18.8	6	8	10	18		M			
885											
	880.9	23.8	7	8	13	21		W			
880											
	875.9	28.8	4	6	10	16		W			
875											
	870.9	33.8	3	6	10	16		W			
870											
	865.9	38.8	5	6	9	15		W		864.4	40.3
865										Boring Terminated at Elevation 864.4 ft in sand	

NCDOT BORE SINGLE U2579B_GEO_BH_SWAL_NWY41.GPJ NC_DOT.GDT 3/24/14

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34839.1.1	**TIP** U-2579 B	**COUNTY** Forsyth	**GEOLOGIST** Murray, C. C.
SITE DESCRIPTION NOISE WALL NWY4 FROM STA. 10+00.00 -NWY4- TO STA. 22+10.00 -NWY4-			**GROUND WTR (ft)**
BORING NO. B-8y4	**STATION** 121+00	**OFFSET** 137 ft LT	**ALIGNMENT** -Y4- **0 HR.** Dry
COLLAR ELEV. 907.1 ft	**TOTAL DEPTH** 20.4 ft	**NORTHING** 861,970	**EASTING** 1,663,202 **24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE CME-550		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER Estep, J. E.	**START DATE** 09/18/07	**COMP. DATE** 09/18/07	**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)
910											
										907.1 GROUND SURFACE	0.0
905	903.2	3.9	4	8	9	17	SS-349	M		**RESIDUAL** RED MED. STIFF TO V. STIFF MOIST MED. (PI=17) PLASTIC SLI. MICA. SANDY SILTY CLAY (A-7-5)	
900	898.2	8.9	4	4	5	9	SS-350	M		899.1	8.0
										RESIDUAL RED STIFF MOIST SLI. MICA. CLAYEY SANDY SILT (A-5)	
895	893.2	13.9	5	4	6	10	SS-351	M		894.1	13.0
										RESIDUAL OLIVE & TAN MED. DENSE MOIST V. MICA. SILTY SAND (A-2-5)	
890	888.2	18.9	6	7	8	15		M		886.7	20.4
										Boring Terminated at Elevation 886.7 ft IN MED. DENSE SILTY SAND (A-2-5)	
										B-8'S ORIGINAL RDWY. BORING NAME & LOCATION ARE: Y4EBL_12100L STA. 121+00 -Y4EB- 110' LT	

NCDOT BORE SINGLE U2579B_GEO_BH_NWY4.GPJ NC_DOT.GDT 3/24/14

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION Noise Wall -NWY41- 10+00 - 33+20 Winston-Salem Northern Beltway				**GROUND WTR (ft)**
BORING NO. 2800RT	**STATION** 28+00	**OFFSET** 15 ft RT	**ALIGNMENT** -NWY41-	**0 HR.** 34.0
COLLAR ELEV. 906.0 ft	**TOTAL DEPTH** 40.5 ft	**NORTHING** 862,004	**EASTING** 1,663,184	**24 HR.** 33.0
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/11		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 01/23/14	**COMP. DATE** 01/23/14	**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
910										ELEV. (ft) DEPTH (ft)
										906.0 GROUND SURFACE 0.0
905										**RESIDUAL** RED STIFF MOIST (PI=18) SILTY SANDY CLAY (A-7-5)
	902.0	4.0	3	4	6	10	SS-79			
900										
	897.0	9.0	3	3	6	9		M		
895										894.0 12.0
	892.0	14.0	5	6	8	14	SS-80	M		**RESIDUAL** RED-TAN TO TAN STIFF TO VERY STIFF MOIST TO WET CLAYEY SANDY SILT WITH TRACE MICA (A-5)
890										
	887.0	19.0	3	4	5	9		M		
885										
	882.0	24.0	3	3	6	9		M		
880										
	877.0	29.0	3	3	5	8	SS-81	W		
875										
	872.0	34.0	10	8	13	21		W		
870										869.0 37.0
	867.0	39.0	9	10	17	27	SS-82	W		**RESIDUAL** OLIVE-TAN MED DENSE WET SILTY SAND (A-2-4)
										865.5 40.5
										Boring Terminated at Elevation 865.5 ft in sand

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION Noise Wall -NWY41- 10+00 - 33+20 Winston-Salem Northern Beltway				**GROUND WTR (ft)**
BORING NO. 2900	**STATION** 29+00	**OFFSET** 15 ft RT	**ALIGNMENT** -NWY41-	**0 HR.** Dry
COLLAR ELEV. 905.9 ft	**TOTAL DEPTH** 14.2 ft	**NORTHING** 862,011	**EASTING** 1,663,084	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/11		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 01/28/14	**COMP. DATE** 01/28/14	**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
910										ELEV. (ft) DEPTH (ft)
										905.9 GROUND SURFACE 0.0
905										**RESIDUAL** RED-BROWN VERY STIFF MOIST SANDY SILTY CLAY (A-7-5)
	902.2	3.7	11	8	10	18		M		
900										899.9 6.0
	897.2	8.7	12	56	60/.1	60/.1				**WEATHERED ROCK** SEVERELY WEATHERED CRYSTALLINE ROCK
895										896.2 9.7
										895.9 **CRYSTALLINE ROCK** 10.0
	892.2	13.7	100/.5			100/.5				**WEATHERED ROCK** SEVERELY WEATHERED CRYSTALLINE ROCK
										891.7 14.2
										Boring Terminated at Elevation 891.7 ft in severely weathered crystalline rock

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34839.1.1	**TIP** U-2579 B	**COUNTY** Forsyth	**GEOLOGIST** Murray, C. C.
SITE DESCRIPTION NOISE WALL NWY4 FROM STA. 10+00.00 -NWY4- TO STA. 22+10.00 -NWY4-			**GROUND WTR (ft)**
BORING NO. B-9y4	**STATION** 123+00	**OFFSET** 130 ft LT	**ALIGNMENT** -Y4- — **0 HR.** Dry
COLLAR ELEV. 905.2 ft	**TOTAL DEPTH** 23.0 ft	**NORTHING** 861,993	**EASTING** 1,663,003 — **24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE CME-550		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER Estep, J. E.	**START DATE** 07/22/10	**COMP. DATE** 07/22/10	**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)
910											
905										905.2 GROUND SURFACE	0.0
	903.9	1.3	3	3	4	7 12	SS-18	M		**RESIDUAL** RED MED. STIFF TO STIFF MOIST HIGH TO MED. (PI=50, 21) PLASTIC SANDY CLAY (A-7-5)	
	901.4	3.8	3	5	7						
900	898.9	6.3	3	3	4	7	SS-19	M		899.2	6.0
	896.4	8.8						M		**RESIDUAL** TAN-OLIVE LOOSE TO MED. DENSE MOIST MICA. SILTY CLAYEY SAND (A-2-5)	
895			2	3	3	6	SS-20	M			
	891.4	13.8	3	5	6	11		M			
890											
	886.4	18.8	4	5	6	11		M		883.7	21.5
885										882.2 **WEATHERED ROCK** SEVERELY WEATHERED CRYSTALLINE ROCK	23.0
										Boring Terminated at Elevation 882.2 ft ON CRYSTALLINE ROCK	

NCDOT BORE SINGLE U2579B_GEO_BH_NWY4.GPJ NC_DOT.GDT 3/24/14

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.
SITE DESCRIPTION Noise Wall -NWY41- 10+00 - 33+20 Winston-Salem Northern Beltway			**GROUND WTR (ft)**
BORING NO. 3000RT	**STATION** 30+00	**OFFSET** 10 ft RT	**ALIGNMENT** -NWY41- — **0 HR.** Dry
COLLAR ELEV. 905.2 ft	**TOTAL DEPTH** 21.0 ft	**NORTHING** 862,014	**EASTING** 1,662,984 — **24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/11		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER Estep, J. E.	**START DATE** 01/28/14	**COMP. DATE** 01/28/14	**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)
910											
905										905.2 GROUND SURFACE	0.0
										RESIDUAL RED STIFF MOIST SANDY SILTY CLAY (A-7-5)	
										902.2	3.0
900	900.5	4.7	3	6	7	13		M		**RESIDUAL** RED STIFF MOIST SANDY CLAYEY SILT (A-5)	
										895.2	10.0
895	895.5	9.7	3	3	6	9		M		**RESIDUAL** OLIVE MED DENSE MOIST SILTY SAND WITH TRACE TO SOME MICA (A-2-4, A-2-5)	
890	890.5	14.7	4	4	6	10		M			
885	885.5	19.7	13	62	38/.3	100/.8				885.0	20.2
										884.2 **WEATHERED ROCK** SEVERELY WEATHERED CRYSTALLINE ROCK	21.0
										Boring Terminated at Elevation 884.2 ft in severely weathered crystalline rock	

NCDOT BORE SINGLE U2579B_GEO_BH_SWAL_NWY41.GPJ NC_DOT.GDT 3/24/14

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.
SITE DESCRIPTION Noise Wall -NWY41- 10+00 - 33+20 Winston-Salem Northern Beltway			**GROUND WTR (ft)**
BORING NO. 3100RT	**STATION** 31+00	**OFFSET** 10 ft RT	**ALIGNMENT** -NWY41- **0 HR.** Dry
COLLAR ELEV. 903.9 ft	**TOTAL DEPTH** 20.5 ft	**NORTHING** 862,022	**EASTING** 1,662,884 **24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/11		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER Estep, J. E.	**START DATE** 01/28/14	**COMP. DATE** 01/28/14	**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)
905											
										903.9 GROUND SURFACE	0.0
										RESIDUAL RED-BROWN STIFF MOIST SANDY SILTY CLAY (A-7-5)	
900	899.9	4.0	4	9	11	20		M		900.9	3.0
										RESIDUAL RED VERY STIFF MOIST SANDY CLAYEY SILT (A-5)	
895	894.9	9.0	4	8	8	16		M		895.9	8.0
										RESIDUAL OLIVE-TAN LOOSE TO MED DENSE MOIST SILTY SAND WITH LITTLE TO SOME MICA (A-2-4, A-2-5)	
890	889.9	14.0	4	4	5	9		M			
885	884.9	19.0	3	4	6	10		M		883.4	20.5
										Boring Terminated at Elevation 883.4 ft in sand	

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.
SITE DESCRIPTION Noise Wall -NWY41- 10+00 - 33+20 Winston-Salem Northern Beltway			**GROUND WTR (ft)**
BORING NO. 3230RT	**STATION** 32+30	**OFFSET** 10 ft RT	**ALIGNMENT** -NWY41- **0 HR.** Dry
COLLAR ELEV. 901.0 ft	**TOTAL DEPTH** 20.4 ft	**NORTHING** 862,032	**EASTING** 1,662,755 **24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/11		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER Estep, J. E.	**START DATE** 01/28/14	**COMP. DATE** 01/28/14	**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)
905											
										901.0 GROUND SURFACE	0.0
										RESIDUAL RED STIFF MOIST SANDY SILTY CLAY (A-7-5)	
900										898.0	3.0
	897.1	3.9	4	6	6	12		M		**RESIDUAL** TAN STIFF MOIST SANDY CLAYEY SILT (A-5)	
895	892.1	8.9	3	7	8	15		M		893.0	8.0
										RESIDUAL OLIVE-TAN MED DENSE MOIST SILTY SAND WITH LITTLE MICA (A-2-4, A-2-5)	
890	887.1	13.9	5	6	9	15		M			
885	882.1	18.9	5	6	7	13		M		880.6	20.4
										Boring Terminated at Elevation 880.6 ft in sand	

TEST RESULTS

PROJECT: 34839.1.1 (U-2579B)
COUNTY: FORSYTH
SITE DESCRIPTION: NOISE WALL NWY41 FROM STA. 10+00.00 -NWY41- TO STA. 33+20.00 -NWY41-

SOIL SAMPLE RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL (ft)	AASHTO CLASS	N	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200
		B-1Y4												
SS-1	140 LT	110+75 -Y4-	1.5-3.0	A-7-5(15)	6	56	25	18.5	21.3	14.1	46.2	100	90	64
SS-2	140 LT	110+75 -Y4-	4.0-5.5	A-5(0)	11	53	6	31.9	37.1	14.9	16.1	99	80	37
SS-3	140 LT	110+75 -Y4-	6.5-8.0	A-2-5(0)	12	51	NP	29.5	49.2	13.3	8.0	98	83	30
SS-4	140 LT	110+75 -Y4-	10.0-11.5	A-2-5(0)	11	52	NP	31.5	49.4	13.1	6.0	100	83	29
SS-5	140 LT	110+75 -Y4-	15.0-16.5	A-5(0)	9	47	8	29.5	40.2	20.3	10.0	100	83	38
SS-6	140 LT	110+75 -Y4-	20.0-21.5	A-2-5(0)	10	45	NP	34.1	43.8	14.1	8.0	99	79	30
SS-7	140 LT	110+75 -Y4-	25.0-26.5	A-5(0)	10	47	5	22.9	49.4	17.7	10.0	98	89	36
		B-2Y4 (Y4RPC_3850L STA. 38+50 -Y4RPC- 90' LT)												
SS-340	139 LT	112+53 -Y4-	3.0-4.5	A-7-5(15)	17	67	25	23.5	17.8	18.1	40.6	98	83	60
SS-341	139 LT	112+53 -Y4-	8.0-9.5	A-5(3)	13	56	9	24.5	35.5	21.7	18.3	99	86	45
SS-342	139 LT	112+53 -Y4-	13.0-14.5	A-2-5(0)	17	45	9	33.1	40.6	16.2	10.1	100	83	28
		B-4Y4 (Y4EB_11550L STA. 115+50 -Y4EB- 110' LT)												
SS-343	137 LT	115+50 -Y4-	4.0-5.5	A-7-5(4)	11	57	13	23.5	35.3	24.9	16.2	100	85	47
SS-344	137 LT	115+50 -Y4-	9.0-10.5	A-7-5(8)	11	63	19	20.1	35.3	28.4	16.2	99	89	50
SS-345	137 LT	115+50 -Y4-	14.0-15.5	A-5(1)	17	48	9	28.8	36.5	24.5	10.1	95	77	40
SS-346	137 LT	115+50 -Y4-	19.0-20.5	A-7-5(0)	16	50	11	31.4	38.9	21.5	8.1	97	77	36
		B-5Y4												
SS-8	130 LT	117+00 -Y4-	4.5-6.0	A-2-5(0)	8	50	5	24.1	54.8	13.1	8.0	100	88	30
SS-9	130 LT	117+00 -Y4-	9.5-11.0	A-2-5(0)	8	48	NP	22.5	56.2	17.3	4.0	100	90	32
SS-10	130 LT	117+00 -Y4-	14.5-16.0	A-2-5(0)	8	46	NP	38.6	46.2	11.2	4.0	100	78	22
SS-11	130 LT	117+00 -Y4-	19.5-21.0	A-2-5(0)	12	42	4	24.5	50.8	16.7	8.0	100	90	22
SS-12	130 LT	117+00 -Y4-	24.5-26.0	A-2-5(0)	16	41	NP	22.1	54.6	17.3	6.0	100	92	32
SS-13	130 LT	117+00 -Y4-	29.5-31.0	A-2-5(0)	14	42	NP	22.5	57.8	13.7	6.0	100	92	28
		B-6Y4 (Y4EBL_11750L STA. 118+10 -Y4EB- 110' LT)												
SS-347	137 LT	118+10 -Y4-	1.0-2.5	A-6(3)	13	40	14	33.3	24.3	14.0	28.4	96	74	44
SS-348	137 LT	118+10 -Y4-	3.6-5.1	A-5(1)	16	52	9	37.5	27.6	12.6	22.3	100	77	39
		B-7Y4												
SS-14	130 LT	120+00 -Y4-	3.8-5.3	A-2-5(0)	9	55	7	40.8	36.7	10.4	12.0	99	74	28
SS-15	130 LT	120+00 -Y4-	6.3-7.8	A-5(0)	9	46	NP	20.9	48.4	16.7	14.1	99	88	39
SS-16	130 LT	120+00 -Y4-	13.8-15.3	A-2-5(0)	9	49	NP	24.3	53.8	13.9	8.0	99	85	31
SS-17	130 LT	120+00 -Y4-	23.8-25.3	A-2-5(0)	12	53	NP	29.5	49.0	13.5	8.0	98	82	27
		B-8Y4 (Y4EBL_12100L STA. 121+00 -Y4EB- 110' LT)												
SS-349	137 LT	121+00 -Y4-	3.9-5.4	A-7-5(7)	17	57	17	30.8	19.3	23.5	26.4	96	74	51
SS-350	137 LT	121+00 -Y4-	8.9-10.4	A-5(0)	9	53	8	25.4	45.2	17.2	12.2	98	83	36
SS-351	137 LT	121+00 -Y4-	13.9-15.4	A-2-5(0)	10	49	8	25.4	50.3	16.2	8.1	100	84	32
		B-9Y4												
SS-18	130 LT	123+00 -Y4-	1.3-2.8	A-7-5(42)	7	86	50	12.4	13.9	9.4	64.3	100	93	76
SS-19	130 LT	123+00 -Y4-	3.8-5.3	A-7-5(15)	12	68	21	13.1	28.1	10.6	48.2	100	94	63
SS-20	130 LT	123+00 -Y4-	8.8-10.3	A-2-5(0)	6	53	NP	34.1	42.2	11.6	12.0	99	83	29
		1150												
SS-70	C/L	11+50 -NWY41-	3.3-4.8	A-6(3)	10	34	14	31.3	22.1	12.5	34.1	92	73	45
SS-71	C/L	11+50 -NWY41-	8.3-9.8	A-2-5(0)	4	46	NP	34.1	42.9	14.9	8.0	98	83	27
SS-72	C/L	11+50 -NWY41-	13.3-14.8	A-2-5(0)	6	43	NP	31.1	47.7	13.1	8.0	100	85	28
SS-73	C/L	11+50 -NWY41-	18.3-19.8	A-2-4(0)	5	38	NP	33.5	43.7	16.8	6.0	99	81	28
		1510												
SS-76	C/L	15+10 -NWY41-	8.5-10.0	A-7-5(24)	10	70	23	6.2	17.7	24.0	52.2	100	97	80
SS-77	C/L	15+10 -NWY41-	13.5-15.0	A-5(7)	5	64	10	14.6	35.7	29.6	20.1	100	94	57
SS-78	C/L	15+10 -NWY41-	23.5-25.0	A-7-5(10)	6	71	12	11.6	37.1	31.2	20.1	100	96	60

TEST RESULTS

SAMPLE NO.	*OFFSET*	*STATION*	*DEPTH INTERVAL (ft)*	*AASHTO CLASS*	*N*	*L.L.*	*P.I.*	*% BY WEIGHT*				*% PASSING SIEVES*		
								C. SAND	*F. SAND*	*SILT*	*CLAY*	*10*	*40*	*200*
		1300 RT												
SS-74	15 RT	13+00 -NWY41-	13.8-15.3	A-5(0)	6	42	NP	13.0	52.2	24.8	10.0	100	97	44
		1400 RT												
SS-75	10 RT	14+00 -NWY41-	9.3-10.8	A-2-5(0)	5	44	NP	41.1	42.1	12.7	4.0	97	75	21
		2600 RT												
SS-83	5 RT	26+00 -NWY41-	3.7-5.2	A-5(0)	12	47	NP	30.9	36.3	14.7	18.1	100	82	37
SS-84	5 RT	26+00 -NWY41-	8.7-10.2	A-2-4(0)	13	40	NP	38.7	45.9	11.3	4.0	98	78	21
SS-85	5 RT	26+00 -NWY41-	13.7-15.2	A-2-5(0)	8	44	NP	37.1	49.5	11.3	2.0	100	85	18
SS-86	5 RT	26+00 -NWY41-	18.7-20.2	A-2-5(0)	7	51	NP	33.9	49.3	14.7	2.0	100	85	23
SS-87	5 RT	26+00 -NWY41-	23.7-25.2	A-2-4(0)	11	38	NP	34.3	44.7	17.0	4.0	98	80	24
SS-88	5 RT	26+00 -NWY41-	28.7-30.2	A-2-4(0)	10	37	NP	35.5	50.2	8.3	6.0	99	82	20
SS-89	5 RT	26+00 -NWY41-	33.7-35.2	A-2-4(0)	41	37	NP	43.9	44.7	7.3	4.0	100	76	16
		2800 RT												
SS-79	15 RT	28+00 -NWY41-	4.0-5.5	A-7-5(13)	10	70	18	18.1	24.3	23.6	34.1	100	89	62
SS-80	15 RT	28+00 -NWY41-	14.0-15.5	A-5(1)	14	53	6	20.1	43.1	28.8	8.0	100	91	45
SS-81	15 RT	28+00 -NWY41-	29.0-30.5	A-5(2)	8	51	5	13.4	43.5	29.0	14.0	98	93	49
SS-82	15 RT	28+00 -NWY41-	39.0-40.5	A-2-4(0)	27	35	NP	29.9	46.1	18.0	6.0	98	81	30

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	34839.1.1 (U-2579B)	1	13

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

STRUCTURE SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. *34839.1.1 (U-2579B)* F.A. PROJ. *NHF-0918(93)*

COUNTY *FORSYTH*

PROJECT DESCRIPTION *WINSTON-SALEM NORTHERN BELTWAY (EASTERN SECTION) (FUTURE I-74) FROM US 158 TO I-40 BUS. /US-421*

SITE DESCRIPTION *WINSTON-SALEM NORTHERN BELTWAY EASTERN SECTION FROM US 158 TO I-40 BUS./US 421 -NWY42- 10+00 TO NWY42 26+50*

CONTENTS

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PERSONNEL

C. C. MURRAY

M. R. MOORE

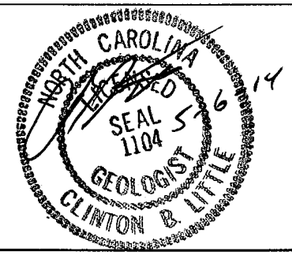
J. E. ESTEP

INVESTIGATED BY *C. B. LITTLE*

CHECKED BY *C. B. LITTLE*

SUBMITTED BY *C. B. LITTLE*

DATE *APRIL 2014*



DRAWN BY: *C. E. BURRIS*

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PROJECT: 34839.1.1

ID: U-2579B

PROJECT REFERENCE NO.	SHEET NO.
34839.1.1 (U-2579B)	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 TO BE THE 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 STANDARD PENETRATION TEST (AASHTO T206, ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. 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-7-5, A-7-6)	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							
SYMBOL														
% PASSING #10	50 MX											GRANULAR SOILS	SILT-CLAY SOILS	MUCK, PEAT
#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			
LIQUID LIMIT	6 MX		NP	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
PLASTIC INDEX				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 A 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/FT²)
GENERALLY GRANULAR MATERIAL (NON-COHESIVE)	VERY LOOSE	<4	N/A
	LOOSE	4 TO 10	
	MEDIUM DENSE	10 TO 30	
	DENSE	30 TO 50	
	VERY DENSE	>50	
GENERALLY SILT-CLAY MATERIAL (COHESIVE)	VERY SOFT	<2	<0.25
	SOFT	2 TO 4	0.25 TO 0.50
	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
NONPLASTIC	0-5	VERY LOW
LOW PLASTICITY	6-15	SLIGHT
MED. PLASTICITY	16-25	MEDIUM
HIGH PLASTICITY	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.
UNIFORM - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. (ALSO POORLY GRADED)
GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLES 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 WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.

COMPRESSIBILITY

SLIGHTLY COMPRESSIBLE	LIQUID LIMIT LESS THAN 31
MODERATELY COMPRESSIBLE	LIQUID LIMIT EQUAL TO 31-50
HIGHLY COMPRESSIBLE	LIQUID LIMIT GREATER THAN 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, DHT, VST, PMT — TEST BORING
- AUGER BORING
- CORE BORING
- MW — MONITORING WELL
- PIEZOMETER INSTALLATION
- SLOPE INDICATOR INSTALLATION
- CONE PENETROMETER TEST
- SOUNDING ROD
- TEST BORING W/ CORE
- SPT N-VALUE
- REF — SPT REFUSAL

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:
- [ ] MOBILE B-___
- [ ] BK-51
- [ ] CME-45C
- [X] CME-550
- [ ] PORTABLE HOIST
- [ ] _____
- [ ] _____

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

HAMMER TYPE:
- [X] AUTOMATIC [ ] MANUAL

CORE SIZE:
- [ ] -B_____
- [ ] -N_____
- [ ] -H_____

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

ROCK DESCRIPTION

HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT IF TESTED, WOULD YIELD SPT REFUSAL. 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, YIELDS SPT N VALUES > 100 BPF*
VERY SEVERE (V SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT THE MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE SUCH THAT ONLY MINOR VESTIGES OF THE ORIGINAL ROCK FABRIC REMAIN. *IF TESTED, YIELDS 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 FEET
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 THE 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, 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: FT.

NOTES:
STRATIGRAPHY SHOWN THROUGH BORINGS

ELEVATIONS OBTAINED FROM U2579B_LS_TIN_070212.TIN FILE

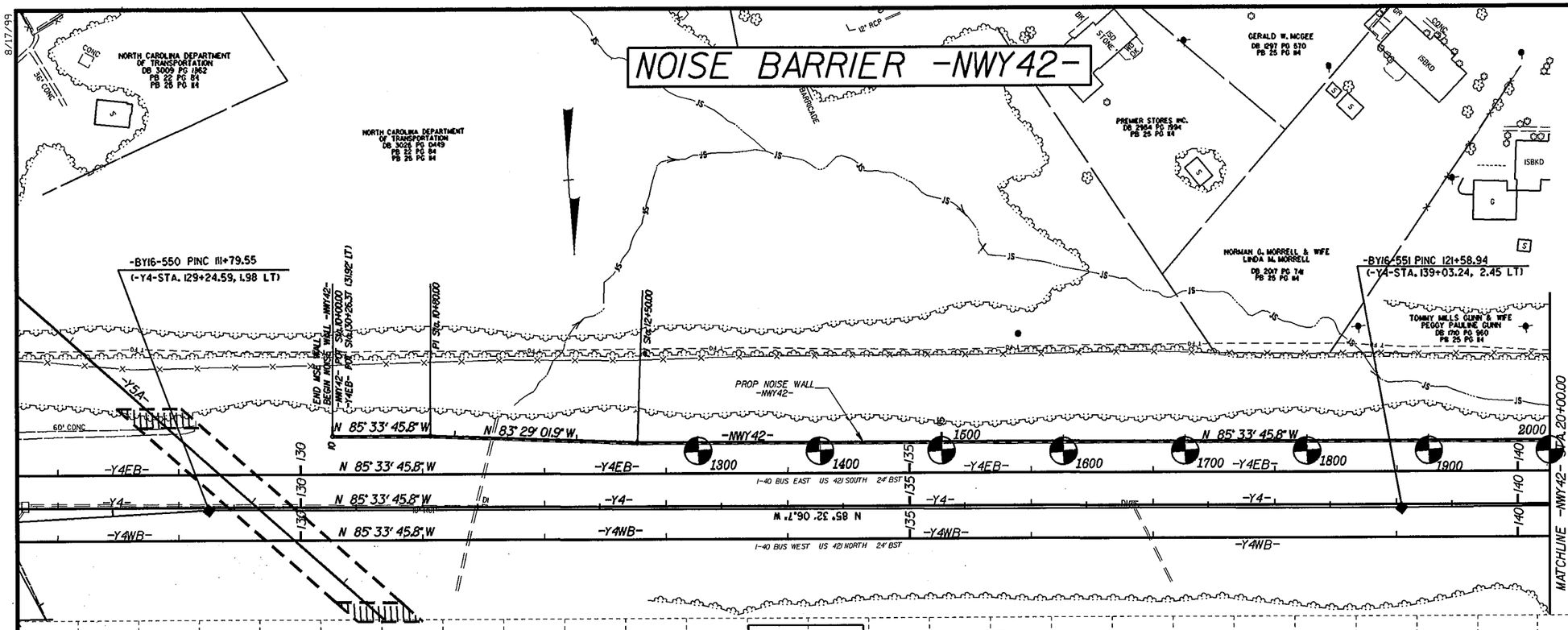
REVISED 09/23/09

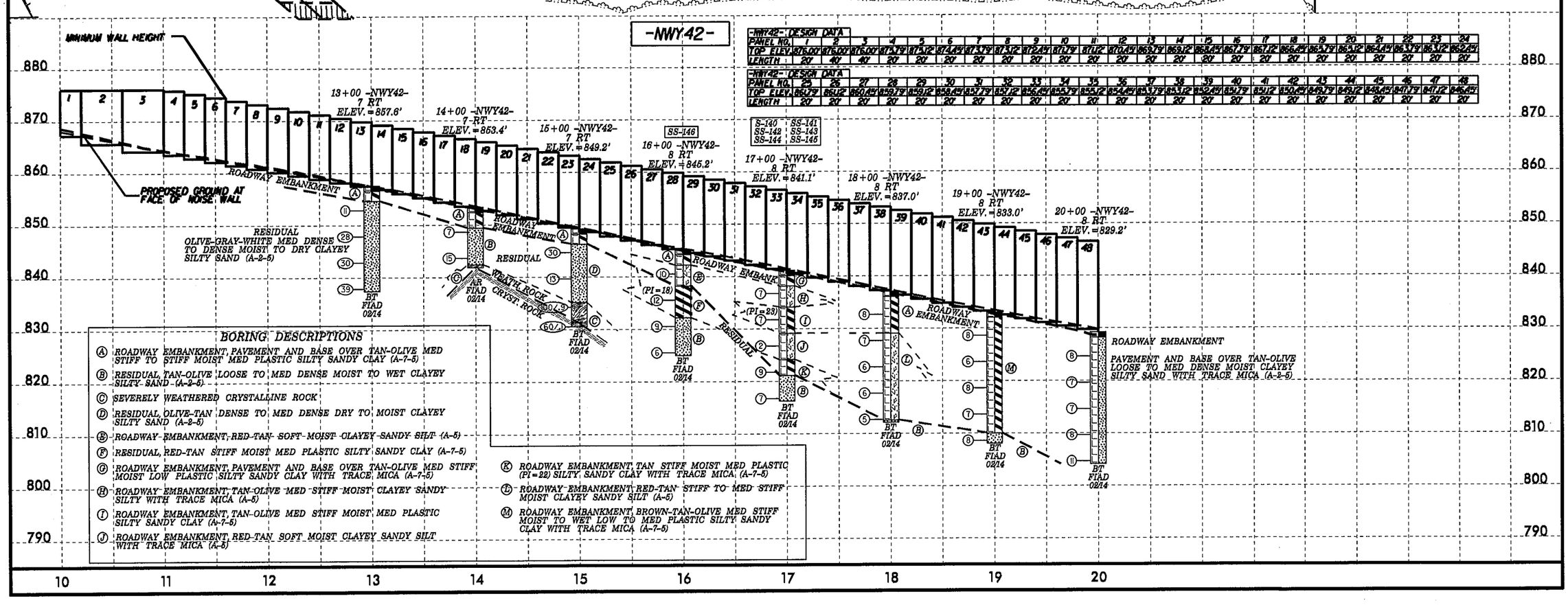
8/17/99

PROJECT REFERENCE NO.	SHEET NO.
U-2579B	3
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NOISE BARRIER -NWY42-





-NWY42- DESIGN DATA

PANEL NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
TOP ELEV.	876.00'	876.00'	876.00'	874.79'	874.12'	873.45'	872.79'	872.12'	871.45'	870.79'	870.12'	869.45'	868.79'	868.12'	867.45'	866.79'	866.12'	865.45'	864.79'	864.12'	863.45'	862.79'	862.12'	861.45'
LENGTH	20'	40'	40'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'

-NWY42- DESIGN DATA

PANEL NO.	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
TOP ELEV.	860.79'	860.12'	859.45'	858.79'	858.12'	857.45'	856.79'	856.12'	855.45'	854.79'	854.12'	853.45'	852.79'	852.12'	851.45'	850.79'	850.12'	849.45'	848.79'	848.12'	847.45'	846.79'	846.12'	845.45'
LENGTH	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'

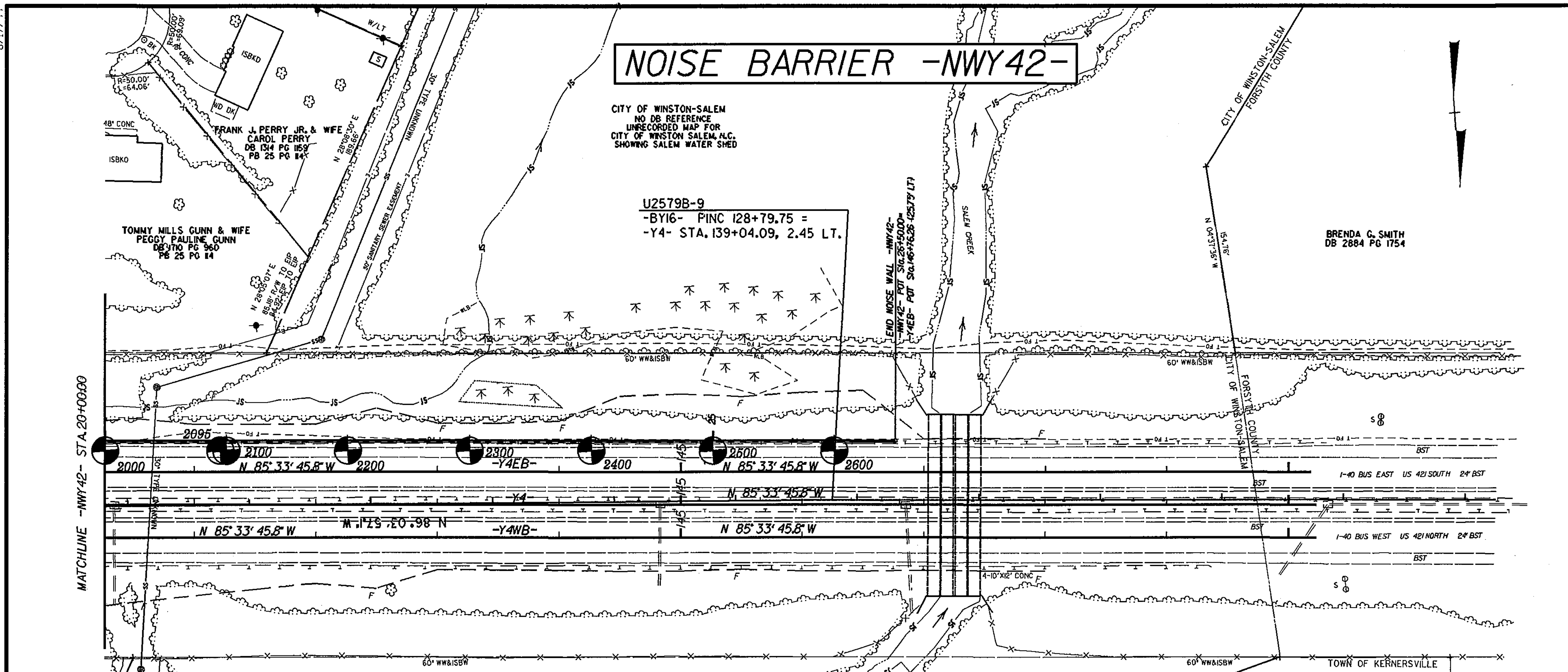
BORING DESCRIPTIONS

- (A) ROADWAY EMBANKMENT, PAVEMENT AND BASE OVER TAN-OLIVE MED STIFF TO STIFF MOIST MED PLASTIC SILTY SANDY CLAY (A-7-5)
- (B) RESIDUAL, TAN-OLIVE LOOSE TO MED DENSE MOIST TO WET CLAYEY SILTY SAND (A-2-5)
- (C) SEVERELY WEATHERED CRYSTALLINE ROCK
- (D) RESIDUAL, OLIVE-TAN DENSE TO MED DENSE DRY TO MOIST CLAYEY SILTY SAND (A-2-5)
- (E) ROADWAY EMBANKMENT, RED-TAN SOFT MOIST CLAYEY SANDY SILT (A-5)
- (F) RESIDUAL, RED-TAN STIFF MOIST MED PLASTIC SILTY SANDY CLAY (A-7-5)
- (G) ROADWAY EMBANKMENT, PAVEMENT AND BASE OVER TAN-OLIVE MED STIFF MOIST LOW PLASTIC SILTY SANDY CLAY WITH TRACE MICA (A-7-5)
- (H) ROADWAY EMBANKMENT, TAN-OLIVE MED STIFF MOIST CLAYEY SANDY SILTY WITH TRACE MICA (A-5)
- (I) ROADWAY EMBANKMENT, TAN-OLIVE MED STIFF MOIST MED PLASTIC SILTY SANDY CLAY (A-7-5)
- (J) ROADWAY EMBANKMENT, RED-TAN SOFT MOIST CLAYEY SANDY SILT WITH TRACE MICA (A-5)
- (K) ROADWAY EMBANKMENT, TAN STIFF MOIST MED PLASTIC (PI = 22) SILTY, SANDY CLAY WITH TRACE MICA. (A-7-5)
- (L) ROADWAY EMBANKMENT, RED-TAN STIFF TO MED STIFF MOIST CLAYEY SANDY SILT (A-5)
- (M) ROADWAY EMBANKMENT, BROWN-TAN-OLIVE MED STIFF MOIST TO WET LOW TO MED PLASTIC SILTY SANDY CLAY WITH TRACE MICA (A-7-5)

PROJECT REFERENCE NO.	SHEET NO.
U-2579B	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

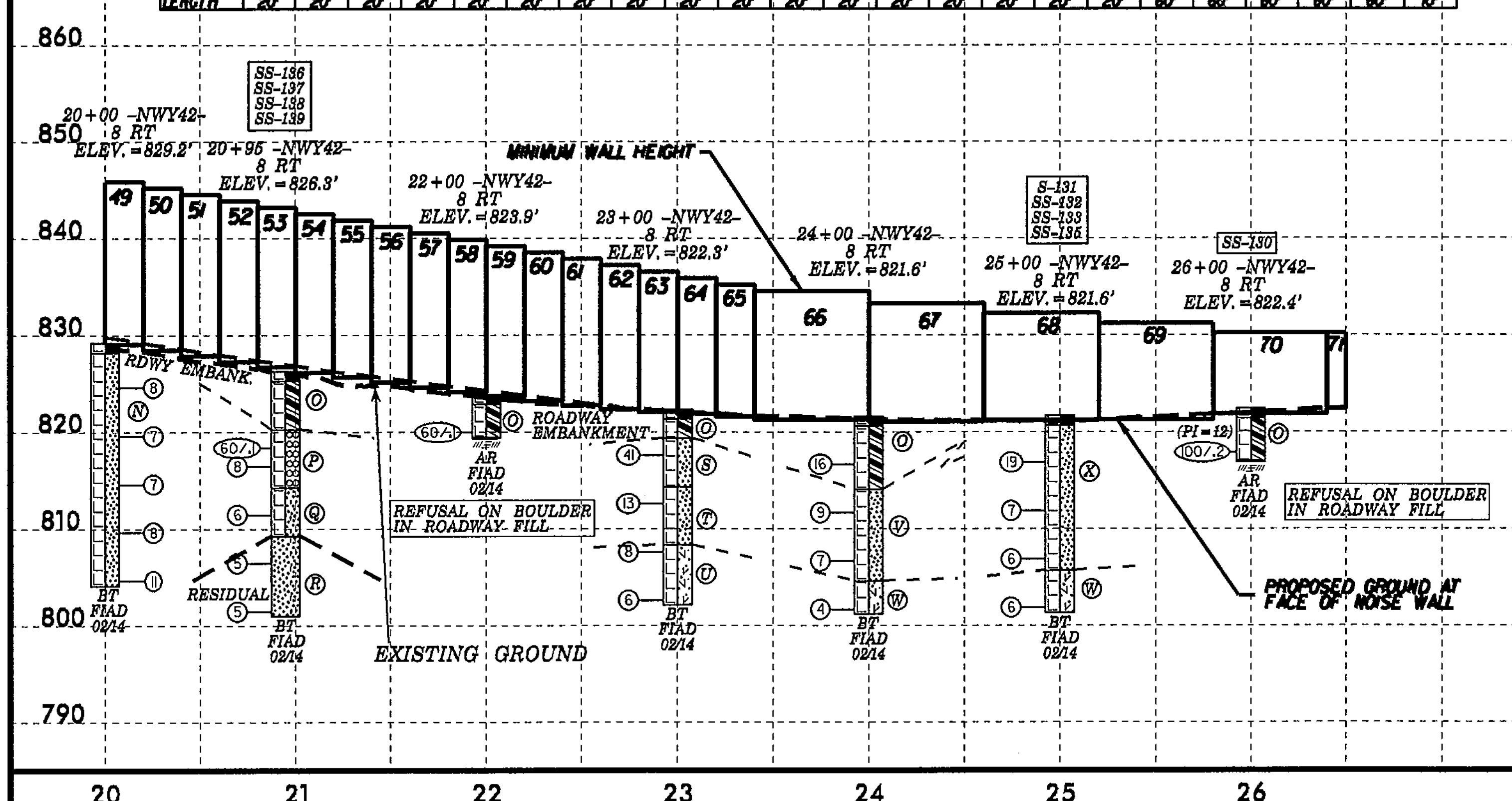
NOISE BARRIER -NWY42-



-NWY42-

-NWY42- DESIGN DATA

PANEL NO.	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71
TOP ELEV.	845.79'	845.12'	844.45'	843.79'	843.12'	842.45'	841.79'	841.12'	840.45'	839.79'	839.12'	838.45'	837.79'	837.12'	836.45'	835.79'	835.12'	834.45'	833.23'	832.23'	831.23'	830.23'	830.23'
LENGTH	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	60'	60'	60'	60'	60'	10'



BORING DESCRIPTIONS

(N) ROADWAY EMBANKMENT, PAVEMENT AND BASE OVER TAN-OLIVE LOOSE TO MED. DENSE MOIST CLAYEY SILTY SAND WITH TRACE MICA (A-2-5)

(O) ROADWAY EMBANKMENT, PAVEMENT AND BASE OVER RED BROWN STIFF TO VERY STIFF MOIST LOW PLASTIC SILTY SANDY CLAY WITH BOULDERS AND COBBLES (A-6)

(P) ROADWAY EMBANKMENT, TAN LOOSE MOIST CLAYEY SILTY SAND WITH COBBLES (A-1-b)

(Q) ROADWAY EMBANKMENT, TAN LOOSE MOIST SILTY CLAYEY SAND WITH TRACE MICA (A-2-5)

(R) RESIDUAL, TAN-OLIVE LOOSE WET CLAYEY SILTY SAND AND SILTY CLAYEY SAND (A-2-5)

(S) ROADWAY EMBANKMENT, GRAY-WHITE DENSE MOIST SILTY SAND WITH COBBLES (A-2-4)

(T) ROADWAY EMBANKMENT, TAN-GRAY MED DENSE MOIST CLAYEY SILTY SAND (A-2-4)

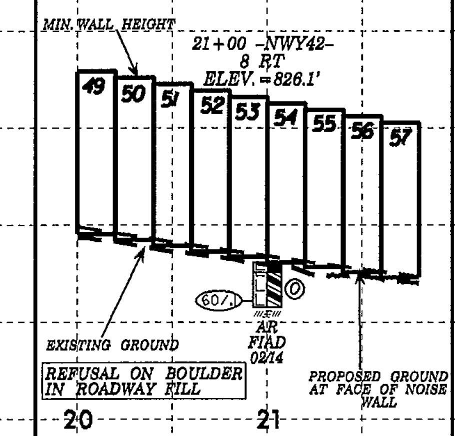
(U) ROADWAY EMBANKMENT, TAN STIFF TO MED STIFF MOIST CLAYEY SANDY SILT (A-5)

(V) ROADWAY EMBANKMENT, OLIVE-TAN LOOSE MOIST CLAYEY SILTY SAND WITH LITTLE MICA (A-2-4)

(W) ROADWAY EMBANKMENT, TAN MED STIFF MOIST CLAYEY SANDY SILT WITH LITTLE MICA (A-5)

(X) ROADWAY EMBANKMENT, PAVEMENT AND BASE OVER RED BROWN TO TAN MED DENSE TO LOOSE MOIST SILTY CLAYEY SAND AND CLAYEY SILTY SAND WITH TRACE TO LITTLE MICA (A-2-4)

INSET PROFILE



NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.
SITE DESCRIPTION Winston-Salem Northern Beltway Noise Wall NWY42			**GROUND WTR (ft)**
BORING NO. 1300	**STATION** 13+00	**OFFSET** 7 ft RT	**ALIGNMENT** -NWY42-	**0 HR.** Dry
COLLAR ELEV. 857.6 ft	**TOTAL DEPTH** 20.2 ft	**NORTHING** 862,156	**EASTING** 1,661,987	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/2011		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 02/27/14	**COMP. DATE** 02/27/14	**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)
860										857.6 GROUND SURFACE	0.0
										856.6 **ROADWAY EMBANKMENT** PAVEMENT AND BASE	1.0
855	853.9	3.7	6	4	7	11		M		854.6 **ROADWAY EMBANKMENT** TAN-OLIVE STIFF MOIST MED PLASTIC SILTY SANDY CLAY (A-7-5)	3.0
850	848.9	8.7	12	19	9	28		M		**RESIDUAL** OLIVE-GRAY-WHITE MED DENSE TO DENSE MOIST TO DRY CLAYEY SILTY SAND (A-2-5)	
845	843.9	13.7	5	11	19	30		M			
840	838.9	18.7	13	19	20	39		D		837.4	20.2
										Boring Terminated at Elevation 837.4 ft in clayey silty sand	

NCDOT BORE SINGLE U2579B_GEO_BH_SWAL_NWY42.GPJ NC_DOT.GDT 4/29/14

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.
SITE DESCRIPTION Winston-Salem Northern Beltway Noise Wall NWY42			**GROUND WTR (ft)**
BORING NO. 1400	**STATION** 14+00	**OFFSET** 7 ft RT	**ALIGNMENT** -NWY42-	**0 HR.** Dry
COLLAR ELEV. 853.4 ft	**TOTAL DEPTH** 11.5 ft	**NORTHING** 862,164	**EASTING** 1,661,887	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/2011		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 02/27/14	**COMP. DATE** 02/27/14	**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)
855										853.4 GROUND SURFACE	0.0
										852.4 **ROADWAY EMBANKMENT** PAVEMENT AND BASE	1.0
850	849.7	3.7	6	3	4	7		M		**ROADWAY EMBANKMENT** TAN-OLIVE MED STIFF MOIST MED PLASTIC SILTY SANDY CLAY (A-7-5)	4.0
845	844.7	8.7	6	7	8	15		M		**RESIDUAL** TAN-OLIVE LOOSE TO MED DENSE MOIST CLAYEY SILTY SAND (A-2-5)	
										842.4	11.0
										841.9 **WEATHERED ROCK** SEVERELY WEATHERED CRYSTALLINE ROCK	11.5
										Boring Terminated by Auger Refusal at Elevation 841.9 ft on crystalline rock	

NCDOT BORE SINGLE U2579B_GEO_BH_SWAL_NWY42.GPJ NC_DOT.GDT 4/29/14

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.
SITE DESCRIPTION Winston-Salem Northern Beltway Noise Wall NWY42			**GROUND WTR (ft)**
BORING NO. 1500	**STATION** 15+00	**OFFSET** 7 ft RT	**ALIGNMENT** -NWY42-	**0 HR.** Dry
COLLAR ELEV. 849.2 ft	**TOTAL DEPTH** 18.7 ft	**NORTHING** 862,172	**EASTING** 1,661,787	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/2011		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 02/27/14	**COMP. DATE** 02/27/14	**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)
850										849.2 GROUND SURFACE	0.0
										848.2 **ROADWAY EMBANKMENT** PAVEMENT AND BASE	1.0
845	845.6	3.6	13	17	13	30		D		846.2 **ROADWAY EMBANKMENT** TAN-OLIVE STIFF MOIST MED PLASTIC SILTY SANDY CLAY (A-7-5)	3.0
										RESIDUAL OLIVE-TAN DENSE TO MED DENSE DRY TO MOIST CLAYEY SILTY SAND (A-2-5)	
840	840.6	8.6	6	6	7	13		M			
835	835.6	13.6	19	43	57/.4	100/.9				835.1 **WEATHERED ROCK** SEVERELY WEATHERED CRYSTALLINE ROCK	14.1
	830.6	18.6	60/.1			60/.1				831.2 830.5 **CRYSTALLINE ROCK** Boring Terminated at Elevation 830.5 ft in crystalline rock	18.0 18.7

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WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.
SITE DESCRIPTION Winston-Salem Northern Beltway Noise Wall NWY42			**GROUND WTR (ft)**
BORING NO. 1600	**STATION** 16+00	**OFFSET** 8 ft RT	**ALIGNMENT** -NWY42-	**0 HR.** Dry
COLLAR ELEV. 845.2 ft	**TOTAL DEPTH** 20.2 ft	**NORTHING** 862,181	**EASTING** 1,661,688	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/2011		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 02/27/14	**COMP. DATE** 02/27/14	**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)
850										845.2 GROUND SURFACE	0.0
										844.2 **ROADWAY EMBANKMENT** PAVEMENT AND BASE	1.0
845										842.2 **ROADWAY EMBANKMENT** TAN-OLIVE MED STIFF MOIST MED PLASTIC SILTY SANDY CLAY (A-7-5)	3.0
	841.5	3.7	4	4	6	10		M		838.2 **ROADWAY EMBANKMENT** RED-TAN SOFT MOIST CLAYEY SANDY SILT (A-5)	7.0
840	836.5	8.7	3	5	7	12	SS-146	M		**RESIDUAL** RED-TAN STIFF MOIST MED PLASTIC (PI=18) SILTY SANDY CLAY (A-7-5)	
835	831.5	13.7	3	4	5	9		W		832.2 **RESIDUAL** TAN LOOSE WET CLAYEY SILTY SAND (A-2-5)	13.0
830	826.5	18.7	2	3	3	6		W		825.0 Boring Terminated at Elevation 825.0 ft in clayey silty sand	20.2
825											

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BORELOG REPORT

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION Winston-Salem Northern Beltway Noise Wall NWY42				**GROUND WTR (ft)**
BORING NO. 1700	**STATION** 17+00	**OFFSET** 8 ft RT	**ALIGNMENT** -NWY42-	**0 HR.** Dry
COLLAR ELEV. 841.1 ft	**TOTAL DEPTH** 24.9 ft	**NORTHING** 862,188	**EASTING** 1,661,588	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/2011		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 02/27/14	**COMP. DATE** 02/27/14	**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)
845										841.1 GROUND SURFACE	0.0
840										840.1 **ROADWAY EMBANKMENT** PAVEMENT AND BASE	1.0
	837.7	3.4	3	3	4	7	S-140	M		838.1 **ROADWAY EMBANKMENT** TAN-OLIVE MED STIFF MOIST LOW PLASTIC (PI=13) SILTY SANDY CLAY WITH TRACE MICA (A-7-5)	3.0
835							SS-141	M			
	832.7	8.4	2	2	5	7	SS-142	M		834.1 **ROADWAY EMBANKMENT** TAN-OLIVE MED STIFF MOIST CLAYEY SANDY SILTY WITH TRACE MICA (A-5)	7.0
830										829.1 **ROADWAY EMBANKMENT** TAN-OLIVE MED STIFF MOIST MED PLASTIC (PI=23) SILTY SANDY CLAY (A-7-5)	12.0
	827.7	13.4	2	1	1	2	SS-143	M		**ROADWAY EMBANKMENT** RED-TAN SOFT MOIST CLAYEY SANDY	
825										824.1 SILT WITH TRACE MICA (A-5)	17.0
	822.7	18.4	3	3	6	9	SS-144	M		**ROADWAY EMBANKMENT** 821.1 TAN STIFF MOIST MED PLASTIC (PI=22) SILTY SANDY CLAY WITH TRACE MICA (A-7-5)	20.0
820										**RESIDUAL**	
	817.7	23.4	2	3	4	7	SS-145	M		816.2 OLIVE-TAN LOOSE MOIST CLAYEY SILTY SAND (A-2-5)	24.9
										Boring Terminated at Elevation 816.2 ft in clayey silty sand	

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WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION Winston-Salem Northern Beltway Noise Wall NWY42				**GROUND WTR (ft)**
BORING NO. 1800	**STATION** 18+00	**OFFSET** 8 ft RT	**ALIGNMENT** -NWY42-	**0 HR.** Dry
COLLAR ELEV. 837.0 ft	**TOTAL DEPTH** 24.9 ft	**NORTHING** 862,196	**EASTING** 1,661,488	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/2011		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 02/27/14	**COMP. DATE** 02/27/14	**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)
840										837.0 GROUND SURFACE	0.0
835										836.0 **ROADWAY EMBANKMENT** PAVEMENT AND BASE	1.0
	833.6	3.4	6	3	5	8		M		**ROADWAY EMBANKMENT** OLIVE-TAN STIFF MOIST SILTY SANDY CLAY (A-7-5)	
830											
	828.6	8.4	3	4	3	7		M			
825										829.0 **ROADWAY EMBANKMENT** RED-TAN STIFF TO MED STIFF MOIST CLAYEY SANDY SILT (A-5)	8.0
	823.6	13.4	3	3	3	6		M			
820											
	818.6	18.4	3	3	3	6		M			
815											
	813.6	23.4	3	2	3	5		M		812.5	24.5
										812.1 **RESIDUAL** OLIVE-TAN LOOSE MOIST CLAYEY SILTY SAND (A-2-5)	24.9
										Boring Terminated at Elevation 812.1 ft in clayey silty sand	

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WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION Winston-Salem Northern Beltway Noise Wall NWY42				**GROUND WTR (ft)**
BORING NO. 1900	**STATION** 19+00	**OFFSET** 8 ft RT	**ALIGNMENT** -NWY42-	**0 HR.** Dry
COLLAR ELEV. 833.0 ft	**TOTAL DEPTH** 24.9 ft	**NORTHING** 862,204	**EASTING** 1,661,389	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/2011		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 02/27/14	**COMP. DATE** 02/27/14	**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)
835											
										833.0 GROUND SURFACE	0.0
										832.0 **ROADWAY EMBANKMENT** PAVEMENT AND BASE	1.0
830	829.6	3.4	2	4	4	8		M		**ROADWAY EMBANKMENT** BROWN-TAN-OLIVE MED STIFF MOIST TO WET LOW TO MED PLASTIC SILTY SANDY CLAY WITH TRACE MICA (A-7-5)	
825	824.6	8.4	2	2	4	6		M			
820	819.6	13.4	2	3	5	8		M			
815	814.6	18.4	2	2	5	7		W			
810	809.6	23.4	2	3	5	8		W		810.0 **RESIDUAL** 808.1 TAN LOOSE WET CLAYEY SILTY SAND (A-2-5)	23.0 24.9
										Boring Terminated at Elevation 808.1 ft in clayey silty sand	

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WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION Winston-Salem Northern Beltway Noise Wall NWY42				**GROUND WTR (ft)**
BORING NO. 2000	**STATION** 20+00	**OFFSET** 8 ft RT	**ALIGNMENT** -NWY42-	**0 HR.** Dry
COLLAR ELEV. 829.2 ft	**TOTAL DEPTH** 25.1 ft	**NORTHING** 862,211	**EASTING** 1,661,289	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/2011		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 02/27/14	**COMP. DATE** 02/27/14	**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)
830											
										829.2 GROUND SURFACE	0.0
										828.2 **ROADWAY EMBANKMENT** PAVEMENT AND BASE	1.0
825	825.6	3.6	5	4	4	8		M		**ROADWAY EMBANKMENT** TAN-OLIVE LOOSE TO MED DENSE MOIST CLAYEY SILTY SAND WITH TRACE MICA (A-2-5)	
820	820.6	8.6	4	4	3	7		M			
815	815.6	13.6	3	3	4	7		M			
810	810.6	18.6	3	3	5	8		M			
805	805.6	23.6	4	5	6	11		M		804.1	25.1
										Boring Terminated at Elevation 804.1 ft in coarse sand	

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NCDOT GEOTECHNICAL ENGINEERING UNIT
BOREHOLE REPORT

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION Winston-Salem Northern Beltway Noise Wall NWY42				**GROUND WTR (ft)**
BORING NO. 2095	**STATION** 20+95	**OFFSET** 8 ft RT	**ALIGNMENT** -NWY42-	**0 HR.** 20.0
COLLAR ELEV. 826.3 ft	**TOTAL DEPTH** 25.3 ft	**NORTHING** 862,219	**EASTING** 1,661,194	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/2011		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 02/26/14	**COMP. DATE** 02/26/14	**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)
										826.3	
										GROUND SURFACE	0.0
										825.3	
										ROADWAY EMBANKMENT PAVEMENT AND BASE	1.0
										ROADWAY EMBANKMENT RED BROWN STIFF MOIST LOW PLASTIC SILTY SANDY CLAY WITH BOULDERS AND COBBLES (A-6)	
										820.3	6.0
										ROADWAY EMBANKMENT TAN LOOSE MOIST CLAYEY SILTY SAND WITH COBBLES (A-1-b)	
	818.5	7.8	60/.1			60/.1					
	817.5	8.8	4	4	4	8	SS-136	M			
										814.3	12.0
										ROADWAY EMBANKMENT TAN LOOSE MOIST SILTY CLAYEY SAND WITH TRACE MICA (A-2-5)	
	812.5	13.8	2	2	4	6	SS-137	M			
										809.3	17.0
										RESIDUAL TAN-OLIVE LOOSE WET SILTY CLAYEY SAND AND CLAYEY SILTY SAND (A-2-5)	
	807.5	18.8	2	2	3	5	SS-138	W			
	802.5	23.8	2	2	3	5	SS-139	W			
										801.0	25.3
										Boring Terminated at Elevation 801.0 ft in coarse sand	

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BOREHOLE REPORT

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION Winston-Salem Northern Beltway Noise Wall NWY42				**GROUND WTR (ft)**
BORING NO. 2100	**STATION** 21+00	**OFFSET** 8 ft RT	**ALIGNMENT** -NWY42-	**0 HR.** Dry
COLLAR ELEV. 826.1 ft	**TOTAL DEPTH** 4.6 ft	**NORTHING** 862,219	**EASTING** 1,661,189	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/2011		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 02/26/14	**COMP. DATE** 02/26/14	**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)
										826.1	
										GROUND SURFACE	0.0
										825.1	
										ROADWAY EMBANKMENT PAVEMENT AND BASE	1.0
										ROADWAY EMBANKMENT RED BROWN STIFF MOIST LOW PLASTIC SILTY SANDY CLAY WITH BOULDERS AND COBBLES (A-6)	
	822.3	3.8	60/.1			60/.1				821.5	4.6
										Boring Terminated by Auger Refusal at Elevation 821.5 ft on boulder	

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WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION Winston-Salem Northern Beltway Noise Wall NWY42				**GROUND WTR (ft)**
BORING NO. 2200	**STATION** 22+00	**OFFSET** 8 ft RT	**ALIGNMENT** -NWY42-	**0 HR.** Dry
COLLAR ELEV. 823.9 ft	**TOTAL DEPTH** 4.5 ft	**NORTHING** 862,227	**EASTING** 1,661,089	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/2011		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 02/26/14	**COMP. DATE** 02/26/14	**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)
825										823.9 GROUND SURFACE	0.0
										822.9 ROADWAY EMBANKMENT PAVEMENT AND BASE	1.0
820	820.1	3.8	60/.1			60/.1				ROADWAY EMBANKMENT RED BROWN STIFF MOIST LOW PLASTIC SILTY SANDY CLAY WITH BOULDERS AND COBBLES (A-6) 819.4	4.5
										Boring Terminated by Auger Refusal at Elevation 819.4 ft on boulder	

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WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION Winston-Salem Northern Beltway Noise Wall NWY42				**GROUND WTR (ft)**
BORING NO. 2300	**STATION** 23+00	**OFFSET** 8 ft RT	**ALIGNMENT** -NWY42-	**0 HR.** Dry
COLLAR ELEV. 822.3 ft	**TOTAL DEPTH** 20.2 ft	**NORTHING** 862,235	**EASTING** 1,660,990	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/2011		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 02/26/14	**COMP. DATE** 02/26/14	**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)
825										822.3 GROUND SURFACE	0.0
										821.3 ROADWAY EMBANKMENT PAVEMENT AND BASE	1.0
820	818.6	3.7	6	10	31	41		M		819.3 ROADWAY EMBANKMENT RED BROWN STIFF MOIST LOW PLASTIC SILTY SANDY CLAY WITH BOULDERS AND COBBLES (A-6)	3.0
815	813.6	8.7	4	9	4	13		M		814.3 ROADWAY EMBANKMENT GRAY-WHITE DENSE MOIST SILTY SAND WITH COBBLES (A-2-4)	8.0
810	808.6	13.7	3	2	6	8		M		ROADWAY EMBANKMENT TAN-GRAY MED DENSE MOIST CLAYEY SILTY SAND (A-2-4) 808.3	14.0
805	803.6	18.7	2	1	5	6		M		ROADWAY EMBANKMENT TAN STIFF TO MED STIFF MOIST CLAYEY SANDY SILT (A-5)	
										802.1	20.2
										Boring Terminated at Elevation 802.1 ft in clayey sandy silt	

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WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION Winston-Salem Northern Beltway Noise Wall NWY42				**GROUND WTR (ft)**
BORING NO. 2400	**STATION** 24+00	**OFFSET** 8 ft RT	**ALIGNMENT** -NWY42-	**0 HR.** Dry
COLLAR ELEV. 821.6 ft	**TOTAL DEPTH** 20.4 ft	**NORTHING** 862,242	**EASTING** 1,660,890	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/2011		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 02/26/14	**COMP. DATE** 02/26/14	**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)
825										821.6 GROUND SURFACE	0.0
820										820.6 **ROADWAY EMBANKMENT** PAVEMENT AND BASE	1.0
	817.7	3.9	6	7	9	16		M		**ROADWAY EMBANKMENT** RED BROWN VERY STIFF MOIST LOW PLASTIC SILTY SANDY CLAY WITH BOULDERS AND COBBLES (A-6)	
815										814.1	7.5
	812.7	8.9	7	5	4	9		M		**ROADWAY EMBANKMENT** OLIVE-TAN LOOSE MOIST CLAYEY SILTY SAND WITH LITTLE MICA (A-2-4)	
810										804.6	17.0
	807.7	13.9	3	3	4	7		M		**ROADWAY EMBANKMENT** TAN MED STIFF MOIST CLAYEY SANDY SILT WITH LITTLE MICA (A-5)	
805										801.2	20.4
	802.7	18.9	3	1	3	4		M		Boring Terminated at Elevation 801.2 ft in clayey sandy silt	

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WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION Winston-Salem Northern Beltway Noise Wall NWY42				**GROUND WTR (ft)**
BORING NO. 2500	**STATION** 25+00	**OFFSET** 8 ft RT	**ALIGNMENT** -NWY42-	**0 HR.** Dry
COLLAR ELEV. 821.6 ft	**TOTAL DEPTH** 20.3 ft	**NORTHING** 862,250	**EASTING** 1,660,790	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/2011		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 02/26/14	**COMP. DATE** 02/26/14	**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)
825										821.6 GROUND SURFACE	0.0
820										820.6 **ROADWAY EMBANKMENT** PAVEMENT AND BASE	1.0
	817.8	3.8	4	8	11	19	S-131	M		**ROADWAY EMBANKMENT** RED BROWN TO TAN MED DENSE TO LOOSE MOIST SILTY CLAYEY SAND AND CLAYEY SILTY SAND WITH TRACE TO LITTLE MICA (A-2-4)	
815							SS-132	M			
	812.8	8.8	3	3	4	7	SS-133	M			
810											
	807.8	13.8	4	3	3	6				805.6	16.0
805										**ROADWAY EMBANKMENT** TAN MED STIFF MOIST CLAYEY SANDY SILT WITH LITTLE MICA (A-5)	
	802.8	18.8	2	2	4	6	SS-135	M		801.3	20.3
										Boring Terminated at Elevation 801.3 ft in clayey sandy silt	

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION Winston-Salem Northern Beltway Noise Wall NWY42				**GROUND WTR (ft)**
BORING NO. 2600	**STATION** 26+00	**OFFSET** 8 ft RT	**ALIGNMENT** -NWY42-	**0 HR.** Dry
COLLAR ELEV. 822.4 ft	**TOTAL DEPTH** 5.5 ft	**NORTHING** 862,258	**EASTING** 1,660,691	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/2011		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 02/26/14	**COMP. DATE** 02/26/14	**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)
825										
										822.4 GROUND SURFACE 0.0
										821.4 **ROADWAY EMBANKMENT** 1.0 PAVEMENT AND BASE
820										**ROADWAY EMBANKMENT** RED BROWN STIFF MOIST LOW PLASTIC
	818.6	3.8								(PI=12) SILTY SANDY CLAY WITH
			8	100/.2		100/.2	SS-130	M		816.9 BOULDERS AND COBBLES (A-6) 5.5
										Boring Terminated by Auger Refusal at Elevation 816.9 ft on boulder

TEST RESULTS

PROJECT: 34839.1.1 (U-2579B)
COUNTY: FORSYTH
SITE DESCRIPTION: WINSTON-SALEM NORTHERN BELTWAY (EASTERN SECTION) FROM US 158 TO I-40 BUS. / US 421 -NWY42- 10+00 TO -NWY42- 26+50

SOIL SAMPLE RESULTS

SAMPLE NO.	*OFFSET*	*STATION*	*DEPTH INTERVAL*	*AASHTO CLASS*	*N*	*L.L.*	*P.I.*	*% BY WEIGHT C. SAND*	*F. SAND*	*SILT*	*CLAY*	*% PASSING SIEVES 10*	*40*	*200*	*% MOISTURE*	*% ORGANIC*	*UNIT WT. (d)*	*VOID RATIO*
		1600																
SS-146	8.0 RT	16+00 -NWY42-	8.70-10.20	A-7-5(10)	12	48	18	25.7	18.4	21.5	34.4	100	83	60				
		1700																
S-140	8.0 RT	17+00 -NWY42-	1.00-3.00	A-7-5(3)	N/A	51	13	28.1	30.5	15.1	26.3	94	78	44				
SS-141	8.0 RT	17+00 -NWY42-	3.40-4.90	A-5(2)	7	49	10	28.1	33.4	14.3	24.3	98	81	43				
SS-142	8.0 RT	17+00 -NWY42-	8.40-9.90	A-7-5(11)	7	56	23	24.3	23.7	11.6	40.4	100	85	55				
SS-143	8.0 RT	17+00 -NWY42-	13.40-14.90	A-5(0)	2	49	5	28.5	38.6	16.7	16.2	97	82	36				
SS-144	8.0 RT	17+00 -NWY42-	18.40-19.90	A-7-5(13)	9	60	22	20.0	23.5	18.1	38.4	100	89	61				
SS-145	8.0 RT	17+00 -NWY42-	23.40-24.90	A-2-5(0)	7	41	2	37.4	33.6	16.9	12.1	99	80	34				
		2095																
SS-136	8.0 RT	20+95 -NWY42-	8.80-10.30	A-1-b(0)	8	31	NP	41.9	33.8	14.3	10.1	68	50	21				
SS-137	8.0 RT	20+95 -NWY42-	13.80-15.30	A-2-5(0)	6	45	NP	32.8	16.8	34.3	16.2	98	79	34				
SS-138	8.0 RT	20+95 -NWY42-	18.80-20.30	A-2-5(0)	5	42	NP	30.3	40.6	12.8	16.2	100	87	34				
SS-139	8.0 RT	20+95 -NWY42-	23.80-25.30	A-2-5(0)	5	51	NP	69.4	12.7	9.8	8.1	97	68	21				
		2500																
S-131	8.0 RT	25+00 -NWY42-	1.00-3.00	A-2-4(0)	N/A	32	NP	44.3	29.9	11.6	14.2	97	71	30				
SS-132	8.0 RT	25+00 -NWY42-	3.80-5.30	A-2-4(0)	19	35	NP	38.4	39.6	13.9	8.1	98	76	27				
SS-133	8.0 RT	25+00 -NWY42-	8.80-10.30	A-2-4(0)	7	38	NP	39.8	35.0	15.1	10.1	99	76	30				
SS-135	8.0 RT	25+00 -NWY42-	18.80-20.30	A-5(0)	6	45	NP	31.5	32.2	16.1	20.2	99	80	40				

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	34839.1.1 (U-2579B)	1	9

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

STRUCTURE SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. *34839.1.1 (U-2579B)* F.A. PROJ. *NHF-0918 (93)*

COUNTY *FORSYTH*

PROJECT DESCRIPTION *WINSTON-SALEM NORTHERN BELTWAY (EASTERN SECTION) FROM I-40 BUS /US-421 TO US 158*

SITE DESCRIPTION *NOISE WALL NWY4RPA ON -Y4RPA-*

ID: U-2579B

PROJECT: 34839.1.1

CONTENTS

CAUTION NOTICE

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PERSONNEL

C. C. MURRAY

M. R. MOORE

J. E. ESTEP

INVESTIGATED BY *C. B. LITTLE*

CHECKED BY *C. B. LITTLE*

SUBMITTED BY *C. B. LITTLE*

DATE *MARCH 2014*

NORTH CAROLINA LICENSED SEAL 1104 GEOLOGIST CLINTON B. LITTLE 3-31-14

DRAWN BY: *C. E. BURRIS*

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PROJECT REFERENCE NO.	SHEET NO.
34839.1.1 (U-2579B)	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 TO BE THE 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 STANDARD PENETRATION TEST (AASHTO T206, ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. 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											GRANULAR SOILS	SILT-CLAY SOILS	MUCK, PEAT
#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			
LIQUID LIMIT	6 MX		NP	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
PLASTIC INDEX				10 MX	10 MX	11 MN	11 MN	10 MX	10 MX	11 MN	11 MN			
GROUP INDEX	0		0	8		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 A 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	N/A
	LOOSE	4 TO 10	
	MEDIUM DENSE	10 TO 30	
	DENSE	30 TO 50	
	VERY DENSE	>50	
GENERALLY SILT-CLAY MATERIAL (COHESIVE)	VERY SOFT	<2	<0.25
	SOFT	2 TO 4	0.25 TO 0.50
	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
NONPLASTIC	0-5	VERY LOW
LOW PLASTICITY	6-15	SLIGHT
MED. PLASTICITY	16-25	MEDIUM
HIGH PLASTICITY	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.
UNIFORM - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. (ALSO POORLY GRADED)
GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLES 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 WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.

COMPRESSIBILITY

SLIGHTLY COMPRESSIBLE	LIQUID LIMIT LESS THAN 31
MODERATELY COMPRESSIBLE	LIQUID LIMIT EQUAL TO 31-50
HIGHLY COMPRESSIBLE	LIQUID LIMIT GREATER THAN 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 W/ CORE
- SPT N-VALUE
- REF — SPT REFUSAL

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:
- [ ] MOBILE B-___
- [ ] BK-51
- [ ] CME-45C
- [X] CME-550
- [ ] PORTABLE HOIST
- [ ] _____
- [ ] _____

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

HAMMER TYPE:
- [X] AUTOMATIC
- [ ] MANUAL

CORE SIZE:
- [ ] -B_____
- [ ] -N_____
- [ ] -H_____

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

ROCK DESCRIPTION

HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT IF TESTED, WOULD YIELD SPT REFUSAL. 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, YIELDS SPT N VALUES > 100 BPF*
VERY SEVERE (V SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT THE MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE SUCH THAT ONLY MINOR VESTIGES OF THE ORIGINAL ROCK FABRIC REMAIN. *IF TESTED, YIELDS 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 FEET
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 THE 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, 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: FT.

NOTES:
STRATIGRAPHY SHOWN THROUGH BORINGS

BORING ELEVATIONS OBTAINED FROM DTM FILE

REVISED 09/23/09

PROJECT REFERENCE NO.	SHEET
34839.1.1 (U-2579B)	3

SITE PLAN

0 50 100
FEET

N NORTH

PENNSTON CORP.
DB 1519 PG 957

20' SANITARY SEWER EASEMENT

DONNA K. IDOL
PENNY PETTITT
DB 3126 PG 4192
DB 3125 PG 293

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DB 2794 PG 158

BEGIN NOISE WALL -NWY4RPA-
POT Sta. 10+00.00 = -Y4RPA- POC Sta 19+26.04

PI Sta. 10+02.21
PI Sta. 10+22.21
PI Sta. 10+42.21
PI Sta. 10+62.21
PI Sta. 10+82.21
PI Sta. 11+42.21
PI Sta. 12+42.21

END NOISE WALL -NWY4RPA-
-NWY4RPA- POT Sta. 13+42.21
-Y4RPA- POC Sta. 22+72.70 (25.75' LT)

ALLUVIAL

RESIDUAL

RESIDUAL

B1 B2 B3 B4 B5

-NWY4RPA-

-Y4RPA-

8:1 TAPER

-Y4CD-

-Y4LPA-

12" RCP

36" CONC

ISFD

W/LT

GR

SCRUB

30' ACCESS EASEMENT DB 1647 PG 402

HTR ABAND

JOHN R. CROTTS
GLADYS L. CROTTS
DB 2398 PG 1660

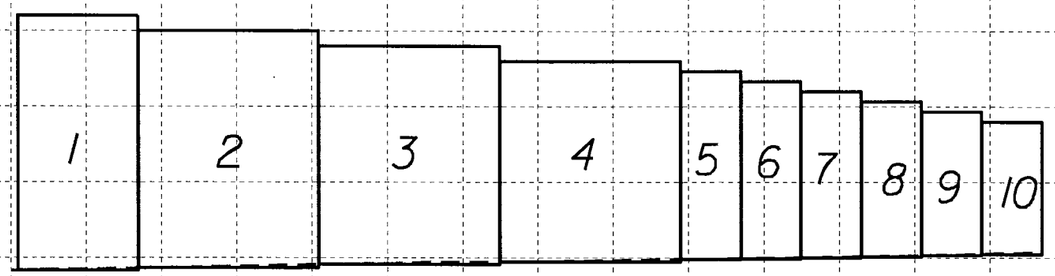
SANDRA F. SHREVE
DB 1137 PG 1712

BERDINA SMITH
DB 1692 PG 3186

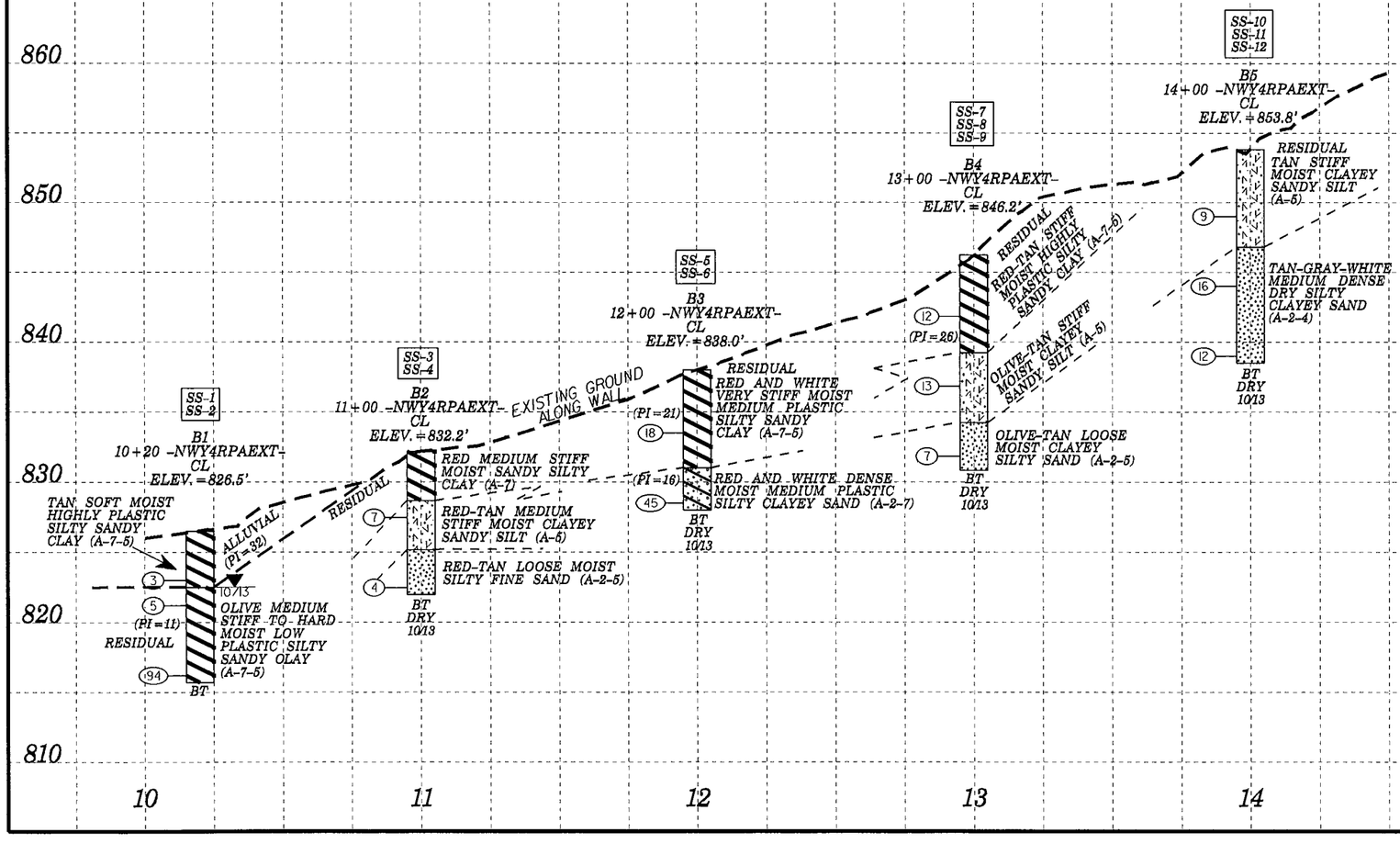
DOROTHY T. BAKER
DB 2030 PG 1276

0	50	100
FEET		

PROJECT REFERENCE NO.	SHEET
34839.1.1 (U-2579B)	4
NOISE WALL ON -Y4RPA- PROFILE ALONG -NWY4RPA- VE = 5:1	



-NWY4RPA- DESIGN DATA										
PANEL NO.	1	2	3	4	5	6	7	8	9	10
TOP ELEV.	896.00'	895.00'	894.00'	893.00'	892.35'	891.68'	891.01'	890.35'	889.68'	889.01'
LENGTH	40'	60'	60'	60'	20'	20'	20'	20'	20'	20'



NCDOT GEOTECHNICAL ENGINEERING UNIT
BOREHOLE REPORT

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION NOISE WALL NWY4RPA				**GROUND WTR (ft)**
BORING NO. B1	**STATION** 10+20	**OFFSET** CL	**ALIGNMENT** -NWY4RPA-	**0 HR.** NM
COLLAR ELEV. 826.5 ft	**TOTAL DEPTH** 10.8 ft	**NORTHING** 862,939	**EASTING** 1,666,721	**24 HR.** 4.0
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/11		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 10/29/13	**COMP. DATE** 10/29/13	**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
830										
										826.5 GROUND SURFACE 0.0
825										**ALLUVIAL**
	824.0	2.5	2	1	2	3	SS-1	M		TAN SOFT MOIST HIGHLY PLASTIC (PI=32) SILTY SANDY CLAY (A-7-5)
	822.2	4.3								822.5 4.0
			2	2	3	5	SS-2	M		**RESIDUAL**
820										OLIVE MEDIUM STIFF TO HARD MOIST LOW PLASTIC (PI=11) SILTY SANDY CLAY (A-7-5)
	817.2	9.3						M		815.7 10.8
			15	45	49	94				Boring Terminated at Elevation 815.7 ft in hard silty sandy clay

NCDOT BORE SINGLE U2579B_GEO_BH_NWY4RPA.GPJ NC_DOT.GDT 3/7/14

NCDOT GEOTECHNICAL ENGINEERING UNIT
BOREHOLE REPORT

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION NOISE WALL NWY4RPA				**GROUND WTR (ft)**
BORING NO. B2	**STATION** 11+00	**OFFSET** CL	**ALIGNMENT** -NWY4RPA-	**0 HR.** Dry
COLLAR ELEV. 832.2 ft	**TOTAL DEPTH** 10.2 ft	**NORTHING** 862,866	**EASTING** 1,666,754	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/11		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 10/29/13	**COMP. DATE** 10/29/13	**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
835										
										832.2 GROUND SURFACE 0.0
830										**RESIDUAL**
	828.5	3.7	3	3	4	7	SS-3	M		RED MEDIUM STIFF MOIST SANDY SILTY CLAY
										828.7 3.5
825										RED-TAN MEDIUM STIFF MOIST CLAYEY SANDY SILT (A-5)
	823.5	8.7								825.2 7.0
			2	2	2	4	SS-4	M		RED-TAN LOOSE MOIST SILTY FINE SAND (A-2-5)
										822.0 10.2
										Boring Terminated at Elevation 822.0 ft in loose silty sand

NCDOT BORE SINGLE U2579B_GEO_BH_NWY4RPA.GPJ NC_DOT.GDT 3/7/14

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION NOISE WALL NWY4RPA				**GROUND WTR (ft)**
BORING NO. B3	**STATION** 12+00	**OFFSET** CL	**ALIGNMENT** -NWY4RPA-	**0 HR.** Dry
COLLAR ELEV. 838.0 ft	**TOTAL DEPTH** 10.0 ft	**NORTHING** 862,778	**EASTING** 1,666,800	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/11		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 10/29/13	**COMP. DATE** 10/29/13	**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
840										ELEV. (ft) 838.0 GROUND SURFACE DEPTH (ft) 0.0
835	834.5	3.5	6	8	10	18	SS-5	M		**RESIDUAL** RED AND WHITE VERY STIFF MOIST MEDIUM PLASTIC (PI=21) SILTY SANDY CLAY (A-7-5)
830	829.5	8.5	6	24	21	45	SS-6	M		831.0 7.0 RED AND WHITE DENSE MOIST MEDIUM PLASTIC (PI=16) SILTY CLAYEY SAND (A-2-7) 828.0 10.0 Boring Terminated at Elevation 828.0 ft in dense silty clayey sand

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION NOISE WALL NWY4RPA				**GROUND WTR (ft)**
BORING NO. B4	**STATION** 13+00	**OFFSET** CL	**ALIGNMENT** -NWY4RPA-	**0 HR.** Dry
COLLAR ELEV. 846.2 ft	**TOTAL DEPTH** 15.4 ft	**NORTHING** 862,691	**EASTING** 1,666,851	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/11		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 10/29/13	**COMP. DATE** 10/29/13	**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
850										ELEV. (ft) 846.2 GROUND SURFACE DEPTH (ft) 0.0
845	842.8	3.4	4	5	7	12	SS-7	M		**RESIDUAL** RED-TAN STIFF MOIST HIGHLY PLASTIC (PI=26) SILTY SANDY CLAY (A-7-5)
840	837.8	8.4	4	5	8	13	SS-8	M		839.2 7.0 OLIVE-TAN STIFF MOIST CLAYEY SANDY SILT (A-5)
835	832.8	13.4	2	3	4	7	SS-9	M		834.2 12.0 OLIVE-TAN LOOSE MOIST CLAYEY SILTY SAND (A-2-5) 830.8 15.4 Boring Terminated at Elevation 830.8 ft in loose clayey silty sand

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION NOISE WALL NWY4RPA				**GROUND WTR (ft)**
BORING NO. B5	**STATION** 14+00	**OFFSET** CL	**ALIGNMENT** -NWY4RPA-	**0 HR.** Dry
COLLAR ELEV. 853.8 ft	**TOTAL DEPTH** 15.3 ft	**NORTHING** 862,607	**EASTING** 1,666,905	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/11		**DRILL METHOD** H.S. Augers		**HAMMER TYPE** Automatic
DRILLER Estep, J. E.	**START DATE** 10/29/13	**COMP. DATE** 10/29/13	**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)
855										853.8 GROUND SURFACE	0.0
850	850.0	3.8	2	4	5	9	SS-10	M		**RESIDUAL** TAN STIFF MOIST CLAYEY SANDY SILT (A-5)	
845	845.0	8.8	2	2	14	16	SS-11	D		846.8 TAN-GRAY-WHITE MEDIUM DENSE DRY SILTY CLAYEY SAND (A-2-4)	7.0
840	840.0	13.8	8	6	6	12	SS-12	D		838.5 Boring Terminated at Elevation 838.5 ft in medium dense silty clayey sand	15.3

TEST RESULTS

PROJECT: 34839.1.1 (U-2579B)
COUNTY: FORSYTH
SITE DESCRIPTION: NOISE WALL NWY4RPA

SOIL SAMPLE RESULTS

SAMPLE NO.	*OFFSET*	*STATION*	*DEPTH INTERVAL*	*AASHTO CLASS*	*N*	*L.L.*	*P.I.*	*% BY WEIGHT*				*% PASSING SIEVES*			*%*	*%*	*UNIT*	*VOID*
								C. SAND	*F. SAND*	*SILT*	*CLAY*	*10*	*40*	*200*	*MOISTURE*	*ORGANIC*	*WT. (d)*	*RATIO*
		B1																
SS-1	C/L	10+20 -NWY4RPA-	2.5-4.0	A-7-5(19)	3	79	32	21.0	22.0	18.6	38.4	100	90	59				
SS-2	C/L	10+20 -NWY4RPA-	4.3-5.8	A-7-5(4)	5	56	11	17.8	37.8	24.2	20.2	100	96	49				
		B2																
SS-3	C/L	11+00 -NWY4RPA-	3.7-5.2	A-5(1)	7	43	8	10.1	52.5	19.2	18.2	100	99	43				
SS-4	C/L	11+00 -NWY4RPA-	8.7-10.2	A-2-5(0)	4	51	NP	19.4	58.0	16.6	6.1	100	96	31				
		B3																
SS-5	C/L	12+00 -NWY4RPA-	3.5-5.0	A-7-5(8)	18	55	21	28.1	25.3	20.4	26.3	96	79	49				
SS-6	C/L	12+00 -NWY4RPA-	8.5-10.0	A-2-7(1)	45	41	16	41.0	24.6	12.1	22.2	92	68	35				
		B4																
SS-7	C/L	13+00 -NWY4RPA-	3.4-5.9	A-7-5(15)	12	62	26	19.0	21.4	15.2	44.4	95	85	61				
SS-8	C/L	13+00 -NWY4RPA-	8.4-9.9	A-5(0)	13	44	NP	28.2	35.2	18.5	18.1	98	86	41				
SS-9	C/L	13+00 -NWY4RPA-	13.4-14.9	A-2-5(0)	7	52	NP	35.2	34.1	18.6	12.1	97	80	33				
		B5																
SS-10	C/L	14+00 -NWY4RPA-	3.8-5.3	A-5(2)	9	60	8	26.7	31.9	11.1	30.3	95	81	44				
SS-11	C/L	14+00 -NWY4RPA-	8.8-10.3	A-2-4(0)	16	37	NP	46.9	30.3	8.7	14.1	100	73	26				
SS-12	C/L	14+00 -NWY4RPA-	13.8-15.3	A-2-4(0)	12	31	NP	48.7	29.7	9.5	12.1	99	69	24				


PROJECT REFERENCE NO.
SHEET
34839.1.1 (U-2579B)
9
Aerial Photo
0
50
100
FEET
NORTH
20
35
BEGIN NOISE WALL -NWY4RPA-
POT Sta. 10+00.00 =
-Y4RPA- POC Sta. 19+26.04
PI Sta. 10+02.21
PI Sta. 10+22.21
PI Sta. 10+42.21
PI Sta. 10+62.21
PI Sta. 10+82.21
PI Sta. 11+42.21
PI Sta. 12+42.21
END NOISE WALL -NWY4RPA-
-NWY4RPA- POT Sta. 13+42.21
-Y4RPA- POC Sta. 22+72.70 (25.75' LT)
10
ALLUVIAL
RESIDUAL
RESIDUAL
B1
B2
B3
B4
B5
-NWY4RPA-
-Y4RPA-
-Y4CD-
-Y4LPA-

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	34839.1.1 (U-2579B)	1	16

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

STRUCTURE SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 34839.1.1 (U-2579B) F.A. PROJ. NHF-0918(93)

COUNTY FORSYTH

PROJECT DESCRIPTION WINSTON-SALEM NORTHERN BELTWAY (EASTERN SECTION) FROM US 421/I-40 BUS TO US 311

SITE DESCRIPTION SOUND WALL NWY4RPBD1 10+00 TO 21+90 NWY4RPBD1 = Y4RPBD 70+07.09 (79.59 RT.)

CONTENTS

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) 250-4088. NEITHER THE SUBSURFACE PLANS AND REPORTS, NOR THE FIELD BORING LOGS, ROCK CORES, OR SOIL TEST DATA ARE 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.

THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE SUBSURFACE PLANS ARE PRELIMINARY ONLY AND IN MANY CASES THE FINAL DESIGN DETAILS ARE DIFFERENT. FOR BIDDING AND CONSTRUCTION PURPOSES, REFER TO THE CONSTRUCTION PLANS AND DOCUMENTS FOR FINAL DESIGN INFORMATION ON THIS PROJECT. THE DEPARTMENT DOES NOT WARRANT OR GUARANTEE THE SUFFICIENCY OR ACCURACY OF THE INVESTIGATION MADE, NOR THE INTERPRETATIONS MADE, OR OPINION OF THE DEPARTMENT AS TO THE TYPE OF MATERIALS AND CONDITIONS TO BE ENCOUNTERED. THE BIDDER OR CONTRACTOR IS CAUTIONED TO MAKE SUCH INDEPENDENT SUBSURFACE INVESTIGATIONS AS HE DEEMS NECESSARY TO SATISFY HIMSELF AS TO CONDITIONS TO BE ENCOUNTERED ON THIS PROJECT. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OR FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FROM THE ACTUAL CONDITIONS ENCOUNTERED AT THE SITE DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.

PERSONNEL

C. C. MURRAY

J. E. ESTEP

M. R. MOORE

INVESTIGATED BY C. B. LITTLE

CHECKED BY C. B. LITTLE

SUBMITTED BY C. B. LITTLE

DATE FEBRUARY 2014

NORTH CAROLINA LICENSED SEAL 1104 GEOLOGIST CLINTON B. LITTLE 4-2-14

PROJECT: 34839.1.1

ID: U-2579B

DRAWN BY: C. E. BURRIS

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PROJECT REFERENCE NO.	SHEET NO.
34839.1.1 (U-2579B)	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 TO BE THE 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 STANDARD PENETRATION TEST (AASHTO T206, ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. 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-5 A-7-6			
SYMBOL														
% PASSING #10 #40 #200	50 MX 30 MX 15 MX	50 MX 25 MX	51 MN 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
LIQUID LIMIT PLASTIC INDEX	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 A 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	N/A
	LOOSE	4 TO 10	
	MEDIUM DENSE	10 TO 30	
	DENSE	30 TO 50	
	VERY DENSE	>50	
GENERALLY SILT-CLAY MATERIAL (COHESIVE)	VERY SOFT	<2	<0.25
	SOFT	2 TO 4	0.25 TO 0.50
	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
NONPLASTIC	0-5	VERY LOW
LOW PLASTICITY	6-15	SLIGHT
MED. PLASTICITY	16-25	MEDIUM
HIGH PLASTICITY	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.
UNIFORM - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. (ALSO POORLY GRADED)
GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLES 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 WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.

COMPRESSIBILITY

SLIGHTLY COMPRESSIBLE	LIQUID LIMIT LESS THAN 31
MODERATELY COMPRESSIBLE	LIQUID LIMIT EQUAL TO 31-50
HIGHLY COMPRESSIBLE	LIQUID LIMIT GREATER THAN 50

PERCENTAGE OF MATERIAL

ORGANIC MATERIAL	GRANULAR SOILS	SILT - CLAY SOILS
TRACE OF ORGANIC MATTER	2 - 3%	3 - 5%
LITTLE ORGANIC MATTER	3 - 5%	5 - 12%
MODERATELY ORGANIC	5 - 10%	12 - 20%
HIGHLY ORGANIC	>10%	>20%

OTHER MATERIAL	
TRACE	1 - 10%
LITTLE	10 - 20%
SOME	20 - 35%
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 W/ CORE
- SPT N-VALUE
- REF — SPT REFUSAL

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:
- [ ] MOBILE B-___
- [ ] BK-51
- [ ] CME-45C
- [X] CME-550
- [ ] PORTABLE HOIST
- [ ] _____
- [ ] _____

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

HAMMER TYPE:
- [X] AUTOMATIC [ ] MANUAL

CORE SIZE:
- [ ] -B_____
- [ ] -N_____
- [ ] -H_____

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

ROCK DESCRIPTION

HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT IF TESTED, WOULD YIELD SPT REFUSAL. 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, YIELDS SPT N VALUES > 100 BPF*
VERY SEVERE (V SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT THE MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE SUCH THAT ONLY MINOR VESTIGES OF THE ORIGINAL ROCK FABRIC REMAIN. *IF TESTED, YIELDS 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 FEET
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 THE 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, 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: FT.

NOTES:
STRATIGRAPHY SHOWN THROUGH BORINGS

BORING COLLAR ELEVATIONS DERIVED FROM DTM FILE

REVISED 09/23/09

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SITE PLAN

0 80 160

FEET

NORTH

PI Sta 17+62.12
Δ = 230° 46' 20.2" (LT)
D = 21° 52' 07.0"
L = 1,055.27'
T = 552.12'
R = 262.00'

PI Sta 64+51.91
θs = 5° 10' 10.4"
Ls = 240.00'
LT = 160.07'
ST = 80.06'

PI Sta 26+83.62
θs = 5° 43' 46.5"
Ls = 240.00'
LT = 160.08'
ST = 80.08'

CS Sta. 63+71.85

POT Sta. 33+19.67 12.00' RT.

POT Sta. 66+11.85 -Y4RPD-

-NWY4RPBD1-

-Y4RPBD-

-Y4RPD-

-NWY4RPBD2-

BEGIN NOISE WALL -NWY4RPBD2-

POT Sta.10+00.00 -Y4RPBD-

POT Sta.69+87.48 (65.85' RT)

-NWY4RPBD1- PI Sta. 21+90.00 (79.58' RT)

END NOISE WALL -NWY4RPBD1- POT Sta. 21+10.00

BEGIN NOISE WALL -NWY4RPBD1- POT Sta. 18+70.00

PI Sta. 18+70.00

PI Sta. 13+40.00

PI Sta. 12+38.03

PI Sta. 11+80.00

BEGIN NOISE WALL -NWY4RPBD1- POT Sta. 26+03.54

END -Y4RPD- STA 29+56.27 -PAVEMENT

BEGIN -Y4RPD- -PAVEMENT

-Y4RPD- ST Sta. 28+43.54

B-1(old)
B-2(old)
B-3(old)
B-4(old)
B-5(old)
B-6(old)
B1
B2
B3
B4
B5
B6
B7
B8
B9
B10
B11

FAST CREST DR 20' BST

MONT CREST DR 20' BST

HEDGEMORE DR 20' BST

APPROX JB PER PROPERTY OWNER

ISBKD
ISFD
2SBKD
2SFD
POOL
TIMBERS
STONE PATIO
WD DK
WD RAIL
CONC
BST
W/LT
LT
JB
DI

48" 4SBW
48" CHL
48" CONC
18" RCP
15" RCP
12" RCP
72" WD
60" WD
60" CMP
36" CONC
16' CONC
14' CONC
12' CONC
10' CONC
9' CONC
8' BST
10' BST
8' WD
6' WD
4' P.S.
10' P.S.
18' P.S.
60' EXISTING R/W
60' R
10' DRAIN/UTILITY EASEMENT
BEGIN W.W. FENCE
END W.W. FENCE
W.W. FENCE
SR 2681 HASTINGS HILL RD 22' PVMT
35BW
35SBW
55SBW
MTL GATE
12' RCP
-Y5-

PROJECT REFERENCE NO.	SHEET NO.
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ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-NWY4RPBD1- DESIGN DATA

PANEL NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
TOP ELEV.	954.01'	955.01'	956.00'	957.00'	957.00'	957.00'	957.00'	956.49'	955.64'	954.52'	953.76'	953.00'	952.00'	950.99'	949.99'	949.32'	948.65'	947.98'	946.98'
LENGTH	20'	60'	60'	120'	80'	20'	40'	20'	40'	40'	40'	20'	20'	20'	20'	20'	20'	20'	20'

EXISTING GROUND
PROPOSED GRADE ALONG WALL

SS-404
SS-405
B-1(OLD)
27+00 -Y4RPD-C/L
=
10+96 -NWY4RPBD1-
20 LT
ELEV. = 918.2'

RESIDUAL
RED-BRN V. STIFF MOIST MED. PLASTIC SILTY SANDY CLAY (A-6)
17 (PI = 16)
RED-BRN STIFF MOIST MED. PLASTIC SILTY SANDY CLAY (A-7-6)
17 (PI = 25)
BT NM 10/07

EXISTING GROUND

B10
63+00 -Y4RPBD-
105 RT
=
14+15
-NWY4RPBD1-
1 RT
ELEV. = 931.6'

B11
62+20 -Y4RPBD-
120 RT
=
14+41
-NWY4RPBD1-
1 LT
ELEV. = 932.0'

B9
63+40 -Y4RPBD-
145 RT
=
14+74
-NWY4RPBD1-
3 RT
ELEV. = 933.9'

S-56
SS-57
SS-58
B8
64+00 -Y4RPBD-
140 RT
=
15+40
-NWY4RPBD1-
1 LT
ELEV. = 938.1'

B7
64+40 -Y4RPBD-
135 RT
=
15+84
-NWY4RPBD1-
1 LT
ELEV. = 939.2

B6
65+00 -Y4RPBD-
133 RT
=
16+47
-NWY4RPBD1-
4 LT
ELEV. = 937.6'

B5
66+60 -Y4RPBD-
145 RT
=
16+99
-NWY4RPBD1-
9 RT
ELEV. = 937.3'

RESIDUAL
TAN-OLIVE, GRAY-WHITE DENSE TO V. DENSE MOIST SILTY SAND (A-2-4)
(A) 20
RESIDUAL
TAN-OLIVE MEDIUM DENSE MOIST SILTY SAND (A-2-4)
100/.5
WEATHERED ROCK SEVERELY WEATHERED CRYSTALLINE ROCK
(B) 13
SEVERELY WEATHERED CRYSTALLINE ROCK
AR NM 11/13
WEATH. RK
CRYSTALLINE ROCK
AR NM 11/13
(PI = 25)
(C) 77
WEATH. RK
60/.1
(E)
CRYSTALLINE ROCK
AR NM 11/13
RESIDUAL
(H)
RESIDUAL
(F)
WEATHERED ROCK
26
(E)
AR NM 11/13
(I)
AR DRY 11/13
CRYSTALLINE ROCK
AR DRY 11/13

SS-21
SS-22
B-2(OLD)
65+00 -Y4RPBD-
140 RT
=
16+47 -NWY4RPBD1-
3 RT
ELEV. = 937.6'
RESIDUAL
RED TO TAN-OLIVE STIFF MOIST MICA. HIGH TO LOW PLASTIC SILTY SANDY CLAY (A-7-6)
(PI = 33)
9
(PI = 13)
10
SEV. WEATH. CRYST. RK
100/.4
WEATHERED ROCK
AR DRY 07/10
CRYSTALLINE ROCK

BORING DESCRIPTIONS

- (A) RESIDUAL, BROWN-RED MEDIUM STIFF MOIST SANDY CLAY (A-7-6)
- (B) RESIDUAL, TAN-OLIVE MEDIUM DENSE DRY TO MOIST SILTY SAND (A-2-4)
- (C) RESIDUAL, RED MEDIUM STIFF MOIST SANDY CLAY (A-7-6)
- (D) RESIDUAL, BROWN-RED MED. STIFF MOIST MED. PLASTIC SANDY CLAY (A-7-6)
- (E) WEATHERED ROCK, SEVERELY WEATHERED CRYSTALLINE ROCK
- (F) RESIDUAL, RED MEDIUM STIFF MOIST SILTY SANDY CLAY (A-7-6)
- (G) RESIDUAL, TAN-OLIVE VERY DENSE MOIST SILTY SAND (A-2-4)
- (H) RESIDUAL, TAN VERY STIFF DRY CLAYEY SANDY SILT (A-5)
- (I) RESIDUAL, TAN-OLIVE MED DENSE TO VERY DENSE DRY CLAYEY SILTY SAND (A-2-5)
- (J) ARTIFICIAL FILL, TAN-RED MEDIUM STIFF DRY SANDY SILTY CLAY WITH GRAVEL (A-7-5)
- (K) RESIDUAL, RED MEDIUM STIFF DRY SANDY SILTY CLAY (A-7-5)

NWY4RPBD1

970 960 950 940 930 920 910 900 890 880

10+00 11+00 12+00 13+00 14+00 15+00 16+00 17+00

5/14/99

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NWY4RPBD1

PROJECT REFERENCE NO.	SHEET NO.
34839.1.1 (U-2579B)	5
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

B2
66+30 -Y4RPBD-
140 RT
=
17+80
-NWY4RPBD-
4 RT
ELEV. = 933.6'

B1
67+20 -Y4RPBD-
145 RT
=
18+71
-NWY4RPBD1-
3 LT
ELEV. = 926.0'

B-4(OLD)
67+40 -Y4RPBD-
140 RT
=
18+91
-NWY4RPBD1-
7 LT
ELEV. = 923.3'

B4
67+90 -Y4RPBD-
145 RT
19+41
-NWY4RPBD1-
1 LT
ELEV. = 922.4'

B-5(OLD)
68+30 -Y4RPBD-
140 RT
=
19+81
-NWY4RPBD1-
6 LT
ELEV. = 921.0'

B3
68+85 -Y4RPBD-
145 RT
=
20+36
-NWY4RPBD1-
C/L
ELEV. = 914.7'

SS-51
SS-23
SS-24
SS-50
SS-45
SS-46
SS-47
SS-48
SS-49

EXISTING GROUND
PROPOSED GRADE ALONG WALL

RESIDUAL

AR DRY 11/13

CRYSTALLINE ROCK

AR DRY 07/10

WEATHERED ROCK
SEVERELY WEATHERED CRYSTALLINE ROCK

BT DRY 11/13

RED-TAN-OLIVE STIFF MOIST TO DRY CLAYEY SANDY SILT WITH TRACE MICA (A-5)

AR NM 07/10

RESIDUAL
RED-TAN STIFF MOIST LOW PLASTIC SILTY SANDY CLAY (A-7-5)

EXISTING GROUND

OLIVE-TAN-RED STIFF MOIST CLAYEY SANDY SILT WITH TRACE MICA (A-5)

RED-TAN VERY STIFF MOIST LOW PLASTIC SILTY SANDY CLAY (A-7-5)

BT DRY 11/13

B-3(OLD)
66+20 -Y4RPBD-
150 RT
=
17+70
-NWY4RPBD1-
4 RT
ELEV. = 935.0'

RESIDUAL
TAN DENSE MOIST SILTY SAND (A-2)

WEATH. ROCK

AR DRY 07/10

SEV. WEATHERED CRYSTALLINE ROCK

CRYSTALLINE ROCK

B-6(OLD)
68+25 -Y4RPBD-
160 RT
19+75
-NWY4RPBD1-
14 RT
ELEV. = 921.0'

SS-25
SS-26
SS-27

RED-TAN MED. STIFF MOIST HIGH PLASTIC SILTY SANDY CLAY (A-7-6) (W/ RES. CONST. DEBRIS)

TAN STIFF TO MED. STIFF MOIST LOW PLASTIC SILTY SANDY CLAY (A-6)

RESIDUAL

OLIVE LOOSE DRY SILTY SAND (A-2-4)

SEV. WEATH. CRYST. RK

AR DRY 07/10 CR

WEATH. ROCK

BORING DESCRIPTIONS

- (K) RESIDUAL, RED MEDIUM STIFF DRY SANDY SILTY CLAY (A-7-5)
- (I) RESIDUAL, TAN-OLIVE MED DENSE TO VERY DENSE DRY CLAYEY SILTY SAND (A-2-5)
- (L) RESIDUAL, RED VERY STIFF MOIST TO DRY SILTY SANDY CLAY (A-7-5)
- (M) RESIDUAL, OLIVE-TAN LOOSE MOIST TO DRY CLAYEY SAND WITH TRACE MICA (A-2-5)
- (N) RESIDUAL, RED-TAN STIFF MOIST MED. PLASTIC SILTY SANDY CLAY (A-6)
- (P) RESIDUAL, OLIVE MED. DENSE DRY SILTY SAND (A-2-4)
- (Q) ARTIFICIAL FILL, BROWN-RED MEDIUM STIFF MOIST SANDY SILTY CLAY (A-7-5)
- (R) RESIDUAL, RED-BROWN STIFF MOIST MEDIUM PLASTIC SILTY SANDY CLAY (A-7-6)
- (S) ARTIFICIAL FILL, RED-BRN SOFT MOIST SILTY SANDY CLAY (A-7) (W/ RESIDENTIAL CONSTRUCTION DEBRIS)
- (T) ARTIFICIAL FILL, RED MEDIUM STIFF MOIST SANDY SILTY CLAY (A-7-5)

	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43
	945.98'	944.99'	944.32'	943.65'	942.97'	941.83'	940.69'	939.77'	939.19'	938.62'	938.04'	937.07'	936.07'	935.07'	934.38'	933.71'	933.04'	932.06'	931.05'	930.05'	929.05'	928.05'	927.04'	926.04'
	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'

17+00 18+00 19+00 20+00 21+00

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NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION NOISE WALL NWY4RPBD1				**GROUND WTR (ft)**
BORING NO. B1	**STATION** 67+20	**OFFSET** 145 ft RT	**ALIGNMENT** -Y4RPBD-	**0 HR.** Dry
COLLAR ELEV. 925.0 ft	**TOTAL DEPTH** 18.9 ft	**NORTHING** 861,062	**EASTING** 1,667,462	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/11		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 11/06/13	**COMP. DATE** 11/06/13	**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)
925										925.0 GROUND SURFACE	0.0
	921.5	3.5	4	2	3	5	SS-51	D		**RESIDUAL** OLIVE-TAN LOOSE MOIST TO DRY CLAYEY SAND WITH TRACE MICA (A-2-5)	
920										917.0	8.0
	916.5	8.5	22	78/.4		100/.9				**WEATHERED ROCK** SEVERELY WEATHERED CRYSTALLINE ROCK	
915										911.0	14.0
	911.5	13.5	57	60/.1		60/.1				910.0 **CRYSTALLINE ROCK**	15.0
910										**WEATHERED ROCK** SEVERELY WEATHERED CRYSTALLINE ROCK	
	906.5	18.5	100/.4			100/.4				906.1	18.9
										Boring Terminated at Elevation 906.1 ft in severely weathered crystalline rock	

NCDOT BORE SINGLE U2579B_GEO_BH_SWAL_NWY4RPBD1.GPJ NC_DOT.GDT 1/31/14

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION NOISE WALL NWY4RPBD1				**GROUND WTR (ft)**
BORING NO. B2	**STATION** 66+30	**OFFSET** 140 ft RT	**ALIGNMENT** -Y4RPBD-	**0 HR.** Dry
COLLAR ELEV. 933.6 ft	**TOTAL DEPTH** 10.0 ft	**NORTHING** 861,037	**EASTING** 1,667,376	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/11		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 11/06/13	**COMP. DATE** 11/06/13	**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)
935										933.6 GROUND SURFACE	0.0
	930.2	3.4	14	10	12	22		D		**RESIDUAL** RED VERY STIFF MOIST TO DRY SILTY SANDY CLAY (A-7-5)	
930										925.6	8.0
	925.2	8.4	100/.4			100/.4		D		923.6 **WEATHERED ROCK** SEVERELY WEATHERED CRYSTALLINE ROCK	10.0
925										Boring Terminated by Auger Refusal at Elevation 923.6 ft on crystalline rock	

NCDOT BORE SINGLE U2579B_GEO_BH_SWAL_NWY4RPBD1.GPJ NC_DOT.GDT 1/31/14

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION NOISE WALL NWY4RPBD1				**GROUND WTR (ft)**
BORING NO. B3	**STATION** 68+85	**OFFSET** 145 ft RT	**ALIGNMENT** -Y4RPBD-	**0 HR.** Dry
COLLAR ELEV. 914.7 ft	**TOTAL DEPTH** 28.8 ft	**NORTHING** 861,117	**EASTING** 1,667,618	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/11		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 11/06/13	**COMP. DATE** 11/06/13	**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)
915										914.7 GROUND SURFACE	0.0
	912.4	2.3	3	4	9	13	SS-45	M		**ARTIFICIAL FILL** RED MEDIUM STIFF MOIST SANDY SILTY CLAY (A-7-5) 912.7	2.0
910	907.4	7.3	3	5	9	14	SS-46	M		**RESIDUAL** RED-TAN STIFF MOIST LOW PLASTIC (PI=12) SILTY SANDY CLAY (A-7-5) 908.7	6.0
905	902.4	12.3	4	5	8	13	SS-47	M		**RESIDUAL** OLIVE-TAN-RED STIFF MOIST CLAYEY SANDY SILT WITH TRACE MICA (A-5)	
900	897.4	17.3	4	5	8	13	SS-48	M		890.7	24.0
895	887.4	27.3	4	6	9	15	SS-49	M		**RESIDUAL** RED-TAN VERY STIFF MOIST LOW PLASTIC (PI=13) SILTY SANDY CLAY (A-7-5) 885.9	28.8
890										Boring Terminated at Elevation 885.9 ft in silty sandy clay	

NCDOT BORE SINGLE U2579B_GEO_BH_SWAL_NWY4RPBD1.GPJ NC_DOT.GDT 1/31/14

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION NOISE WALL NWY4RPBD1				**GROUND WTR (ft)**
BORING NO. B4	**STATION** 67+90	**OFFSET** 145 ft RT	**ALIGNMENT** -Y4RPBD-	**0 HR.** Dry
COLLAR ELEV. 922.4 ft	**TOTAL DEPTH** 20.3 ft	**NORTHING** 861,086	**EASTING** 1,667,528	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/11		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 11/06/13	**COMP. DATE** 11/06/13	**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)
925										922.4 GROUND SURFACE	0.0
920	918.6	3.8	4	4	6	10	SS-50	M		**ARTIFICIAL FILL** BROWN-RED MEDIUM STIFF MOIST SANDY SILTY CLAY (A-7-5) 920.4	2.0
915	913.6	8.8	4	4	6	10		M		**RESIDUAL** RED-BROWN STIFF MOIST MEDIUM PLASTIC (PI=24) SILTY SANDY CLAY (A-7-6) 915.4	7.0
910	908.6	13.8	3	4	9	13		D		**RESIDUAL** RED-TAN-OLIVE STIFF MOIST TO DRY CLAYEY SANDY SILT WITH TRACE MICA (A-5)	
905	903.6	18.8	11	5	8	13		D		902.1	20.3
										Boring Terminated at Elevation 902.1 ft in clayey sandy silt	

NCDOT BORE SINGLE U2579B_GEO_BH_SWAL_NWY4RPBD1.GPJ NC_DOT.GDT 1/31/14

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION NOISE WALL NWY4RPBD1				**GROUND WTR (ft)**
BORING NO. B5	**STATION** 65+50	**OFFSET** 145 ft RT	**ALIGNMENT** -Y4RPBD-	**0 HR.** Dry
COLLAR ELEV. 937.3 ft	**TOTAL DEPTH** 11.0 ft	**NORTHING** 861,005	**EASTING** 1,667,301	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/11		**DRILL METHOD** Solid Augers	**HAMMER TYPE** N/A	
DRILLER Estep, J. E.	**START DATE** 11/13/13	**COMP. DATE** 11/13/13	**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)
940											
										937.3 GROUND SURFACE	0.0
935										**ARTIFICIAL FILL** TAN-RED MEDIUM STIFF DRY SANDY SILTY CLAY WITH GRAVEL (A-7-5) 935.3	2.0
										RESIDUAL RED MEDIUM STIFF DRY SANDY SILTY CLAY (A-7-5) 933.3	4.0
930										**RESIDUAL** TAN-OLIVE MED DENSE TO VERY DENSE DRY CLAYEY SILTY SAND (A-2-5) 926.3	11.0
										Boring Terminated by Auger Refusal at Elevation 926.3 ft on crystalline rock	

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION NOISE WALL NWY4RPBD1				**GROUND WTR (ft)**
BORING NO. B6	**STATION** 65+00	**OFFSET** 133 ft RT	**ALIGNMENT** -Y4RPBD-	**0 HR.** Dry
COLLAR ELEV. 937.6 ft	**TOTAL DEPTH** 7.3 ft	**NORTHING** 861,000	**EASTING** 1,667,248	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/11		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 11/07/13	**COMP. DATE** 11/07/13	**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)
940											
										937.6 GROUND SURFACE	0.0
935	933.8	3.8	19	13	13	26	D			**RESIDUAL** TAN VERY STIFF DRY CLAYEY SANDY SILT (A-5) 935.6	2.0
										RESIDUAL TAN-OLIVE MEDIUM DENSE DRY CLAYEY SILTY SAND (A-2-5) 931.8	5.8
										WEATHERED ROCK SEVERELY WEATHERED CRYSTALLINE ROCK 930.3	7.3
										Boring Terminated by Auger Refusal at Elevation 930.3 ft on crystalline rock	

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION NOISE WALL NWY4RPBD1				**GROUND WTR (ft)**
BORING NO. B7	**STATION** 64+40	**OFFSET** 138 ft RT	**ALIGNMENT** -Y4RPBD-	**0 HR.** NM
COLLAR ELEV. 939.2 ft	**TOTAL DEPTH** 7.0 ft	**NORTHING** 860,976	**EASTING** 1,667,189	**24 HR.** NM
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/11		**DRILL METHOD** Solid Augers	**HAMMER TYPE** N/A	
DRILLER Estep, J. E.	**START DATE** 11/21/13	**COMP. DATE** 11/21/13	**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)
940										939.2 GROUND SURFACE	0.0
										RESIDUAL RED MEDIUM STIFF MOIST SILTY SANDY CLAY (A-7-6)	
935										935.2	4.0
										RESIDUAL 933.2 TAN-OLIVE VERY DENSE MOIST SILTY SAND (A-2-4)	6.0
										932.2 **WEATHERED ROCK** SEVERELY WEATHERED CRYSTALLINE ROCK	7.0
										Boring Terminated by Auger Refusal at Elevation 932.2 ft on crystalline rock	

NCDOT BORE SINGLE U2579B_GEO_BH_SWAL_NWY4RPBD1.GPJ NC_DOT.GDT 1/31/14

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION NOISE WALL NWY4RPBD1				**GROUND WTR (ft)**
BORING NO. B8	**STATION** 64+00	**OFFSET** 140 ft RT	**ALIGNMENT** -Y4RPBD-	**0 HR.** NM
COLLAR ELEV. 938.1 ft	**TOTAL DEPTH** 18.1 ft	**NORTHING** 860,962	**EASTING** 1,667,148	**24 HR.** NM
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/11		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 11/21/13	**COMP. DATE** 11/21/13	**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)
940										938.1 GROUND SURFACE	0.0
										RESIDUAL BROWN-RED MEDIUM STIFF MOIST MEDIUM PLASTIC (PI=25) SANDY CLAY (A-7-6)	
935	934.7	3.4	11	28	49	77	S-56	M		935.6	2.5
							SS-57	M		**RESIDUAL** GRAY-WHITE DENSE TO VERY DENSE MOIST SILTY SAND (A-2-4)	
930	929.7	8.4	6	11	35	46	SS-58	M			
925	924.7	13.4	53	60/.1		60/.1				925.4	12.7
										924.2 **WEATHERED ROCK** SEVERELY WEATHERED CRYSTALLINE ROCK	13.9
920										**CRYSTALLINE ROCK** 920.0	18.1
										Boring Terminated by Auger Refusal at Elevation 920.0 ft in crystalline rock	

NCDOT BORE SINGLE U2579B_GEO_BH_SWAL_NWY4RPBD1.GPJ NC_DOT.GDT 1/31/14

NCDOT GEOTECHNICAL ENGINEERING UNIT
BOREHOLE REPORT

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION NOISE WALL NWY4RPBD1				**GROUND WTR (ft)**
BORING NO. B9	**STATION** 63+40	**OFFSET** 145 ft RT	**ALIGNMENT** -Y4RPBD-	**0 HR.** NM
COLLAR ELEV. 933.9 ft	**TOTAL DEPTH** 32.0 ft	**NORTHING** 860,941	**EASTING** 1,667,085	**24 HR.** NM
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/11		**DRILL METHOD** Solid Augers	**HAMMER TYPE** N/A	
DRILLER Estep, J. E.	**START DATE** 11/21/13	**COMP. DATE** 11/21/13	**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)
935										933.9 GROUND SURFACE	0.0
										RESIDUAL RED MEDIUM STIFF MOIST SANDY CLAY (A-7-6)	
930										930.9	3.0
										RESIDUAL TAN-OLIVE DENSE TO VERY DENSE MOIST SILTY SAND (A-2-4)	
925											
920											
915											
910											
905										903.9	30.0
										WEATHERED ROCK SEVERELY WEATHERED CRYSTALLINE ROCK	
										901.9	32.0
										Boring Terminated by Auger Refusal at Elevation 901.9 ft on crystalline rock	

NCDOT GEOTECHNICAL ENGINEERING UNIT
BOREHOLE REPORT

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION NOISE WALL NWY4RPBD1				**GROUND WTR (ft)**
BORING NO. B10	**STATION** 63+00	**OFFSET** 105 ft RT	**ALIGNMENT** -Y4RPBD-	**0 HR.** NM
COLLAR ELEV. 931.6 ft	**TOTAL DEPTH** 17.6 ft	**NORTHING** 860,971	**EASTING** 1,667,034	**24 HR.** NM
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/11		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 11/21/13	**COMP. DATE** 11/21/13	**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)
935										931.6 GROUND SURFACE	0.0
								M		**RESIDUAL** BROWN-RED MEDIUM STIFF MOIST SANDY CLAY (A-7-6)	
930										928.6	3.0
	927.6	4.0	7	9	11	20		M		**RESIDUAL** TAN-OLIVE MEDIUM DENSE MOIST SILTY SAND (A-2-4)	
925										924.6	7.0
	922.6	9.0	100/.5			100/.5		D		**WEATHERED ROCK** SEVERELY WEATHERED CRYSTALLINE ROCK	
920										918.6	13.0
	917.6	14.0	4	6	7	13		D		**RESIDUAL** TAN-OLIVE MEDIUM DENSE DRY SILTY SAND (A-2-4)	
915										915.6	16.0
										914.0 **WEATHERED ROCK** SEVERELY WEATHERED CRYSTALLINE ROCK	17.6
										Boring Terminated by Auger Refusal at Elevation 914.0 ft on crystalline rock	

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION NOISE WALL NWY4RPBD1				**GROUND WTR (ft)**
BORING NO. B11	**STATION** 63+20	**OFFSET** 120 ft RT	**ALIGNMENT** -Y4RPBD-	**0 HR.** NM
COLLAR ELEV. 932.0 ft	**TOTAL DEPTH** 16.0 ft	**NORTHING** 860,961	**EASTING** 1,667,058	**24 HR.** NM
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/11		**DRILL METHOD** Solid Augers		**HAMMER TYPE** N/A
DRILLER Estep, J. E.	**START DATE** 11/21/13	**COMP. DATE** 11/21/13	**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)
935										GROUND SURFACE	932.0	0.0
930										**RESIDUAL** BROWN-RED MEDIUM STIFF MOIST SANDY CLAY (A-7-6)	929.0	3.0
925										**RESIDUAL** TAN-OLIVE MEDIUM DENSE MOIST SILTY SAND (A-2-4)		
920										**WEATHERED ROCK** SEVERELY WEATHERED CRYSTALLINE ROCK	920.0	12.0
										Boring Terminated by Auger Refusal at Elevation 916.0 ft on crystalline rock	916.0	16.0

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** Forsyth	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION NOISE WALL NWY4RPBD1				**GROUND WTR (ft)**
BORING NO. B-1(old)	**STATION** 27+00	**OFFSET** CL	**ALIGNMENT** -Y4RPD-	**0 HR.** Dry
COLLAR ELEV. 918.2 ft	**TOTAL DEPTH** 9.0 ft	**NORTHING** 860,943	**EASTING** 1,666,732	**24 HR.** NM
DRILL RIG/HAMMER EFF./DATE CME-550		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 10/04/07	**COMP. DATE** 10/04/07	**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
920										ELEV. (ft) 918.2 GROUND SURFACE DEPTH (ft) 0.0
915	915.7	2.5	5	7	10	17	SS-404	M		**RESIDUAL** RED-BRN V. STIFF MOIST MED. (PI=16) PLASTIC SILTY SANDY CLAY (A-6)
910	910.7	7.5	4	5	6	11	SS-405	M		911.2 7.0 **RESIDUAL** RED-BRN STIFF MOIST MED. (PI=25) PLASTIC SILTY SANDY CLAY (A-7-6) 909.2 9.0 Boring Terminated at Elevation 909.2 ft IN STIFF SILTY SANDY CLAY (A-7-6)

B-1'S ORIGINAL RDWY. BORING NAME & LOCATION ARE: Y4RPD_2700 STA. 27+00 -Y4RPD- CL

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** Forsyth	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION NOISE WALL NWY4RPBD1				**GROUND WTR (ft)**
BORING NO. B-2(old)	**STATION** 65+00	**OFFSET** 140 ft RT	**ALIGNMENT** -Y4RPBD-	**0 HR.** Dry
COLLAR ELEV. 937.5 ft	**TOTAL DEPTH** 8.2 ft	**NORTHING** 860,993	**EASTING** 1,667,251	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE CME-550		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 07/27/10	**COMP. DATE** 07/27/10	**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
940										ELEV. (ft) 937.5 GROUND SURFACE DEPTH (ft) 0.0
935	936.0	1.5	5	5	4	9	SS-21	M		**RESIDUAL** RED TO TAN-OLIVE STIFF MOIST MICA. HIGH TO LOW (PI=33, 13) PLASTIC SILTY SANDY CLAY (A-7-6)
	933.5	4.0	5	5	5	10	SS-22	M		
930	931.0	6.5	35	65/.5		100/1				931.0 6.5 **WEATHERED ROCK** SEVERELY WEATHERED CRYSTALLINE ROCK 929.3 8.2 Boring Terminated by Auger Refusal at Elevation 929.3 ft ON CRYSTALLINE ROCK

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** Forsyth	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION NOISE WALL NWY4RPBD1				**GROUND WTR (ft)**
BORING NO. B-3(old)	**STATION** 66+20	**OFFSET** 150 ft RT	**ALIGNMENT** -Y4RPBD-	**0 HR.** Dry
COLLAR ELEV. 935.0 ft	**TOTAL DEPTH** 4.3 ft	**NORTHING** 861,024	**EASTING** 1,667,370	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE CME-550		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 07/27/10	**COMP. DATE** 07/27/10	**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)
935										935.0 GROUND SURFACE	0.0
	933.5	1.5	39	61/.5		100/1		M		933.0 RESIDUAL TAN DENSE MOIST SILTY SAND (A-2)	2.0
	931.0	4.0	60/.1			60/.1				931.0 WEATHERED ROCK SEVERELY WEATHERED CRYSTALLINE ROCK	4.0
										930.7 CRYSTALLINE ROCK CRYSTALLINE ROCK	4.3
										Boring Terminated by Auger Refusal at Elevation 930.7 ft ON CRYSTALLINE ROCK	

NCDOT BORE SINGLE_U2579B_GEO_BH_NWALY4RPBD1.GPJ NC_DOT.GDT 2/3/14

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** Forsyth	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION NOISE WALL NWY4RPBD1				**GROUND WTR (ft)**
BORING NO. B-4(old)	**STATION** 67+40	**OFFSET** 140 ft RT	**ALIGNMENT** -Y4RPBD-	**0 HR.** Dry
COLLAR ELEV. 923.3 ft	**TOTAL DEPTH** 13.0 ft	**NORTHING** 861,074	**EASTING** 1,667,480	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE CME-550		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 07/27/10	**COMP. DATE** 07/27/10	**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)
925										923.3 GROUND SURFACE	0.0
	920.8	2.5	4	5	5	10	SS-23	M		919.8 RESIDUAL RED-TAN STIFF MOIST MED. (PI=18) PLASTIC SILTY SANDY CLAY (A-6)	3.5
920	918.7	4.6	6	8	6	14	SS-24	D		915.2 RESIDUAL OLIVE MED. DENSE DRY SILTY SAND (A-2-4)	8.1
	916.2	7.1	7	20	60/.1	60/.1		D		910.3 CRYSTALLINE ROCK CRYSTALLINE ROCK	13.0
915	913.7	9.6	60/.1			60/.1		D		Boring Terminated by Auger Refusal at Elevation 910.3 ft ON CRYSTALLINE ROCK	

NCDOT BORE SINGLE_U2579B_GEO_BH_NWALY4RPBD1.GPJ NC_DOT.GDT 2/3/14

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** Forsyth	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION NOISE WALL NWY4RPBD1				**GROUND WTR (ft)**
BORING NO. B-5(old)	**STATION** 68+30	**OFFSET** 140 ft RT	**ALIGNMENT** -Y4RPBD-	**0 HR.** NM
COLLAR ELEV. 921.0 ft	**TOTAL DEPTH** 3.0 ft	**NORTHING** 861,104	**EASTING** 1,667,564	**24 HR.** NM
DRILL RIG/HAMMER EFF./DATE CME-550		**DRILL METHOD** H.S. Augers		**HAMMER TYPE** Automatic
DRILLER Estep, J. E.	**START DATE** 07/27/10	**COMP. DATE** 07/27/10	**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)
925											
										921.0 GROUND SURFACE	0.0
920										**ARTIFICIAL FILL** RED-BRN SOFT MOIST SILTY SANDY CLAY (A-7) (W/ RESIDENTIAL CONSTRUCTION DEBRIS) NO SPT	
										918.0	3.0
										Boring Terminated by Auger Refusal at Elevation 918.0 ft ON ARTIFICIAL FILL	

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** Forsyth	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION NOISE WALL NWY4RPBD1				**GROUND WTR (ft)**
BORING NO. B-6(old)	**STATION** 68+25	**OFFSET** 160 ft RT	**ALIGNMENT** -Y4RPBD-	**0 HR.** Dry
COLLAR ELEV. 921.0 ft	**TOTAL DEPTH** 13.8 ft	**NORTHING** 861,083	**EASTING** 1,667,566	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE CME-550		**DRILL METHOD** H.S. Augers		**HAMMER TYPE** Automatic
DRILLER Estep, J. E.	**START DATE** 07/27/10	**COMP. DATE** 07/27/10	**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)
925											
										921.0 GROUND SURFACE	0.0
920	919.4	1.6	3	3	4	7	SS-25	M		**RESIDUAL** RED-TAN MED. STIFF MOIST HIGH (PI=26) PLASTIC SILTY SANDY CLAY (A-7-6) (W/ RESIDENTIAL CONSTRUCTION DEBRIS)	
	916.9	4.1								917.0	4.0
915			3	3	7	10	SS-26	M		**RESIDUAL** TAN STIFF TO MED. STIFF MOIST LOW (PI=11) PLASTIC SILTY SANDY CLAY (A-6)	
	914.4	6.6	4	3	3	6		M		912.0	9.0
	911.9	9.1								**RESIDUAL** OLIVE LOOSE DRY SILTY SAND (A-2-4)	
910			3	4	4	8	SS-27	D		908.6	12.4
										907.2 **WEATHERED ROCK** SEVERELY WEATHERED CRYSTALLINE ROCK	13.8
										Boring Terminated by Auger Refusal at Elevation 907.2 ft ON CRYSTALLINE ROCK	

TEST RESULTS

PROJECT 34839.1.1 (U-2579B)
COUNTY: FORSYTH
SITE DESCRIPTION NOISE WALL NWY4RPBD1

SOIL SAMPLE RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS	N	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC	UNIT WT. (d)	VOID RATIO
		B1																
SS-51	145 RT.	67+20 -Y4RPBD-	3.5-5.0	A-2-5(0)	5	41	NP	46.8	31.7	9.5	12.1	99	73	25				
		B3																
SS-45	145 RT.	68+85 -Y4RPBD-	2.3-3.8	A-7-5(4)	13	46	12	31.7	22.0	20.2	26.2	98	77	50				
SS-46	145 RT.	68+85 -Y4RPBD-	7.3-8.8	A-5(4)	14	47	10	25.2	29.0	21.6	24.2	100	84	53				
SS-47	145 RT.	68+85 -Y4RPBD-	12.3-13.8	A-5(0)	13	42	6	35.9	31.5	16.5	16.1	97	73	38				
SS-48	145 RT.	68+85 -Y4RPBD-	17.3-18.8	A-5(2)	13	45	9	30.2	32.3	21.4	16.1	100	80	43				
SS-49	145 RT.	68+85 -Y4RPBD-	27.3-28.8	A-7-5(3)	15	45	13	32.1	26.6	21.2	20.2	100	79	46				
		B4																
SS-50	145 RT.	67+90 -Y4RPBD-	3.8-5.3	A-7-6(13)	10	46	24	23.2	16.9	11.5	48.4	100	85	63				
		B8																
S-56	140 RT.	64+00 -Y4RPBD-	0.0-2.5	A-7-6(12)	N/A	49	25	24.5	18.5	8.9	48.1	100	84	59				
SS-57	140 RT.	64+00 -Y4RPBD-	3.4-4.9	A-2-4(0)	77	27	NP	45.5	35.1	13.3	6.0	100	75	25				
SS-58	140 RT.	64+00 -Y4RPBD-	8.4-9.9	A-2-4(0)	46	27	NP	49.1	32.3	10.5	8.0	95	67	22				
		B1(OLD)																
SS-404	C/L	27+00 -Y4RPD-	2.5-4.0	A-6(2)	17	33	16	36.4	26.3	11.1	26.3	100	79	40				
SS-405	C/L	27+00 -Y4RPD-	7.5-9.0	A-7-6(12)	11	52	25	24.4	20.2	14.9	40.4	100	85	58				
		B2(OLD)																
SS-21	140 RT.	65+00 -Y4RPBD-	1.5-3.0	A-7-6(28)	9	62	33	10.8	14.9	10.0	64.3	100	94	78				
SS-22	140 RT.	65+00 -Y4RPBD-	4.0-5.5	A-7-6(2)	10	41	13	35.5	28.1	16.3	20.1	100	80	41				
		B4(OLD)																
SS-23	140 RT.	67+40 -Y4RPBD-	2.5-4.0	A-6(7)	10	39	18	28.1	19.7	16.1	36.1	100	82	56				
SS-24	140 RT.	67+40 -Y4RPBD-	4.6-6.1	A-2-4(0)	14	35	NP	49.0	30.6	11.3	9.0	99	70	25				
		B6(OLD)																
SS-25	160 RT.	68+25 -Y4RPBD-	1.6-3.1	A-7-6(14)	7	48	26	23.3	17.7	10.8	48.2	100	85	62				
SS-26	160 RT.	68+25 -Y4RPBD-	4.1-5.6	A-6-(3)	10	33	11	17.9	34.9	17.1	30.1	98	91	52				
SS-27	160 RT.	68+25 -Y4RPBD-	9.1-10.6	A-2-4(0)	8	40	NP	36.9	39.2	14.9	9.0	100	79	31				

PROJECT REFERENCE NO.	SHEET
34839.1.1 (U–2579B)	16

Aerial Photo

0 80 160
FEET

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	34839.1.1 (U-2579B)	1	16

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

STRUCTURE SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 34839.1.1 (U-2579B) F.A. PROJ. NHF-0918(93)

COUNTY FORSYTH

PROJECT DESCRIPTION WINSTON-SALEM NORTHERN BELTWAY (EASTERN SECTION) (FUTURE I-74) FROM US 158 TO I-40 BUS/US 421

SITE DESCRIPTION NOISE WALL -NWY4RPBD2-

ID: U-2579B

PROJECT: 34839.1.1

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CAUTION NOTICE

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PERSONNEL

C.C. MURRAY

J.E. ESTEP

M.R. MOORE

INVESTIGATED BY C.B. LITTLE

CHECKED BY C.B. LITTLE

SUBMITTED BY C. B. LITTLE

DATE MARCH 2014

NORTH CAROLINA LICENSED SEAL 1104 GEOLOGIST CLINTON B. LITTLE

5-28-14

DRAWN BY: J.K. McCLURE

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PROJECT REFERENCE NO.	SHEET NO.
34839.1.1 (U-2579B)	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 TO BE THE 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 STANDARD PENETRATION TEST (AASHTO T206, ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. 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	50 MX 25 MX	51 MN 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
LIQUID LIMIT PLASTIC INDEX	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 A 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/FT²)
GENERALLY GRANULAR MATERIAL (NON-COHESIVE)	VERY LOOSE	<4	N/A
	LOOSE	4 TO 10	
	MEDIUM DENSE	10 TO 30	
	DENSE	30 TO 50	
	VERY DENSE	>50	
GENERALLY SILT-CLAY MATERIAL (COHESIVE)	VERY SOFT	<2	<0.25
	SOFT	2 TO 4	0.25 TO 0.50
	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
NONPLASTIC	0-5	VERY LOW
LOW PLASTICITY	6-15	SLIGHT
MED. PLASTICITY	16-25	MEDIUM
HIGH PLASTICITY	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.
UNIFORM - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. (ALSO POORLY GRADED)
GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLES 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 WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.

COMPRESSIBILITY

SLIGHTLY COMPRESSIBLE	LIQUID LIMIT LESS THAN 31
MODERATELY COMPRESSIBLE	LIQUID LIMIT EQUAL TO 31-50
HIGHLY COMPRESSIBLE	LIQUID LIMIT GREATER THAN 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 W/ CORE
- SPT N-VALUE
- REF — SPT REFUSAL

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:
- [ ] MOBILE B-___
- [ ] BK-51
- [ ] CME-45C
- [X] CME-550
- [ ] PORTABLE HOIST
- [ ] _____
- [ ] _____

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

HAMMER TYPE:
- [X] AUTOMATIC [ ] MANUAL

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

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

ROCK DESCRIPTION

HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT IF TESTED, WOULD YIELD SPT REFUSAL. 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, YIELDS SPT N VALUES > 100 BPF*
VERY SEVERE (V SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT THE MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE SUCH THAT ONLY MINOR VESTIGES OF THE ORIGINAL ROCK FABRIC REMAIN. *IF TESTED, YIELDS 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 PIECES 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 FEET
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 THE 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, 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: FT.

NOTES:

TIN FILE USED TO DETERMINE BORING ELEVATIONS:
u2579b_ls_tin_070212.tin

SOIL STRATIGRAPHY IS THROUGH THE BORINGS FOR THE PROFILE.

REVISED 09/23/09

PROJECT REFERENCE NO.	SHEET
34839.1.1 (U-2579B)	3

SITE PLAN

0 100 200

FEET

-BY16-547 PINC 54+15.64
(-Y4-STA. 71+67.77, 3.2735 LT)

-Y4RPA- CS Sta. 39+41.74

-Y4RPA- ST Sta. 41+41.74
-Y4WB- POT Sta. 68+87.73
2400' RT.

Pls Sta 40+08.43
Θs = 2° 59' 59.2"
Ls = 200.00'
LT = 133.35'
ST = 66.68'

-Y4RPBD- CS Sta. 84+04.51

Pl Sta 80+21.76
Δ = 19° 00' 00.0" (RT)
D = 2° 27' 32.6"
L = 772.66'
T = 389.91'
R = 2,330.00'

Pls Sta 76+65.20
Θs = 2° 27' 32.6"
Ls = 200.00'
LT = 133.35'
ST = 66.68'

-BY18-564 POT 20+83.33
(-RPBD/Y4-STA. 75+59.96, 52.3968 LT)

NOISE WALL
-NWY4RPBD2-

NORTH

PROJECT REFERENCE NO.	SHEET
34839.1.1 (U-2579B)	4
Profile along -NWY4RPBD2-	

0 100 200 FEET V.E. = 5:1

-NWY4RPBD2- DESIGN DATA

PANEL NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
TOP ELEV.	927.8'	927.13'	926.46'	925.78'	925.10'	924.42'	923.75'	923.07'	922.10'	921.10'	920.10'	919.40'	918.73'	918.07'	917.10'	916.10'	915.10'	914.40'	913.73'	913.07'	912.10'	911.10'	910.10'	909.40'	908.73'
LENGTH	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'

-NWY4RPBD2- DESIGN DATA

PANEL NO.	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
TOP ELEV.	908.07'	907.10'	906.10'	905.10'	904.40'	903.73'	903.07'	902.40'	901.73'	901.07'	900.40'	899.73'	899.07'	898.40'	897.73'	897.07'	896.40'	895.73'	895.07'	894.40'	893.73'	893.07'	892.40'	891.73'	891.06'
LENGTH	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'

-NWY4RPBD2- DESIGN DATA

PANEL NO.	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70
TOP ELEV.	890.40'	889.73'	889.06'	888.40'	887.73'	887.06'	886.40'	885.73'	885.06'	884.40'	883.73'	883.06'	882.09'	881.09'	880.09'	878.77'	877.42'	876.06'	875.06'	874.06'
LENGTH	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'

7150
11+87 -NWY4RPBD2- 2.0 RT.
=
71+50 -Y4RPBD- 40.0 RT. ELEV. 892.1

7270
13+07 -NWY4RPBD2- 2.0 RT.
=
72+70 -Y4RPBD- 40.0 RT. ELEV. 889.3

7360
13+97 -NWY4RPBD2- 7.0 RT.
=
73+60 -Y4RPBD- 40.0 RT. ELEV. 884.5

7555
16+91 -NWY4RPBD2- CL
=
75+55 -Y4RPBD- 98.0 RT. ELEV. 878.0

B-2
16+56 -NWY4RPBD2- 2.0 RT.
=
75+20 -Y4RPBD- 40.0 RT. ELEV. 879.7

7665
17+00 -NWY4RPBD2- CL
=
76+65 -Y4RPBD- 37.0 RT. ELEV. 881.1

S-21
SS-22

7750
17+83 -NWY4RPBD2- 1.0 LT.
=
77+50 -Y4RPBD- 33.0 RT. ELEV. 880.2

7860
18+92 -NWY4RPBD2- CL
=
78+60 -Y4RPBD- 30.0 RT. ELEV. 872.2

7970
20+01 -NWY4RPBD2- 1.0 LT.
=
79+70 -Y4RPBD- 25.0 RT. ELEV. 863.9

8070
21+00 -NWY4RPBD2- 1.0 RT.
=
80+70 -Y4RPBD- 27.0 RT. ELEV. 851.5

B-5
21+29 -NWRPBD2- 4.0 RT.
=
81+00 -Y4RPBD- 30.0 RT. ELEV. 847.5

8175
22+03 -NWY4RPBD2- 1.0 LT.
=
81+75 -Y4RPBD- 25.0 RT. ELEV. 848.8

8275
23+02 -NWY4RPBD2- CL
=
82+75 -Y4RPBD- 26.0 RT. ELEV. 852.6

8348
24+00 -NWRPBD2- 1.0 RT.
=
83+48 -Y4RPBD- 75.0 RT. ELEV. 860.8

PROPOSED GROUND SURFACE ALONG -NWY4RPBD2-

EXISTING GROUND SURFACE ALONG -NWY4RPBD2-

RESIDUAL
RED MED. STIFF MOIST SANDY SHALY CLAY (A-7)

RED-TAN & TAN MED. STIFF TO STIFF MOIST SANDY CLAYEY SILT (A-5)

TAN & OLIVE TO OLIVE-TAN DENSE TO MED. DENSE MOIST TO WET SILTY SAND (A-2)

RED STIFF DRY SANDY CLAY (A-7)

RED-TAN STIFF DRY CLAYEY SANDY SILT (A-5)

TAN MEDIUM STIFF MOIST CLAYEY SANDY SILT (A-4) TO OLIVE-TAN MEDIUM STIFF MOIST TO WET CLAYEY SANDY SILT (A-5)

OLIVE-TAN LOOSE WET SILTY SAND (A-2-5)

RESIDUAL

RED-BRN TO OLIVE-TAN & TAN LOOSE TO MED. DENSE MOIST TO WET SILTY SAND (A-2-4 & A-2-5)

ARTIFICIAL FILL

RESIDUAL

OLIVE-TAN & TAN TO WHITE & GRAY-WHITE LOOSE TO MED. DENSE MOIST TO WET SILTY SAND & SAND TO CLAYEY SILTY SAND (A-2-4 & A-2-5)

ARTIFICIAL FILL

RESIDUAL

OLIVE-TAN LOOSE & MED. DENSE DRY TO WET SILTY SAND (A-2)

TAN-OLIVE TO OLIVE-TAN & GRAY-WHITE LOOSE TO DENSE MOIST TO WET CLAYEY SILTY SAND & SILTY SAND (A-2)

RESIDUAL

OLIVE-TAN-WHITE LOOSE MOIST TO WET SILTY SAND (A-2-5 & A-2-4)

ALLUVIUM

RESIDUAL

TAN & RED TO RED-TAN MED. STIFF TO V. STIFF MOIST TO WET SANDY SILTY CLAY & SILTY SANDY CLAY (A-7)

OLIVE-TAN & TAN-OLIVE TO TAN LOOSE TO MED. DENSE DRY TO WET SILTY SAND (A-2)

BORING DESCRIPTIONS

- (A) RED & TAN V. STIFF TO STIFF DRY TO WET HIGH TO MED. PLASTIC SANDY CLAY (A-7-6) & SILTY SANDY CLAY (A-7-5) (RESIDUAL)
- (B) RED-BROWN STIFF MOIST HIGH PLASTIC SANDY CLAY (A-7-6) (RESIDUAL)
- (C) TAN MED. STIFF TO STIFF DRY TO WET CLAYEY SANDY SILT (A-5) (RESIDUAL)
- (D) TAN STIFF MOIST LOW PLASTIC CLAYEY SANDY SILT (A-5) (RESIDUAL)
- (E) RED-TAN V. STIFF MOIST MED. PLASTIC SILTY SANDY CLAY (A-7-6) W/PETROLEUM ODOR BELOW 6' (ARTIFICIAL FILL)
- (F) RED-TAN V. STIFF MOIST HIGH TO MED. PLASTIC SILTY SANDY CLAY & SANDY CLAY (A-7-5) (RESIDUAL)
- (G) GRAY-WHITE STIFF MOIST CLAYEY SANDY SILT (A-4) (RESIDUAL)
- (H) RED MED. STIFF MOIST SILTY CLAY (A-7) W/GRAVEL (ARTIFICIAL FILL)
- (I) RED-TAN V. STIFF MOIST SANDY SILTY CLAY (A-7) (RESIDUAL)
- (J) RED MED. STIFF MOIST SILTY CLAY (A-7) (RESIDUAL)
- (K) RED TO TAN-WHITE STIFF DRY LOW PLASTIC SILTY SANDY CLAY (A-7-5) (RESIDUAL)
- (L) GRAY V. SOFT MOIST LOW PLASTIC SILTY SANDY CLAY (A-7-5) (ALLUVIUM)
- (M) GRAY V. LOOSE WET CLAYEY SILTY SAND (A-2-4) (ALLUVIUM)
- (N) OLIVE & WHITE LOOSE WET CLAYEY SILTY SAND (A-2-4) (RESIDUAL)
- (O) OLIVE-TAN LOOSE TO MED. DENSE MOIST CLAYEY SILTY SAND & SILTY SAND (A-2-6)

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WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.
SITE DESCRIPTION NOISE WALL NWY4RPBD2			**GROUND WTR (ft)**
BORING NO. 7150	**STATION** 71+50	**OFFSET** 40 ft RT	**ALIGNMENT** -Y4RPBD-
COLLAR ELEV. 892.1 ft	**TOTAL DEPTH** 30.2 ft	**NORTHING** 861,305	**EASTING** 1,667,833
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/11		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER Estep, J. E.	**START DATE** 03/03/14	**COMP. DATE** 03/03/14	**SURFACE WATER DEPTH** N/A

0 HR. Dry
24 HR. Dry

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)
895										892.1 GROUND SURFACE 0.0
										RESIDUAL RED MED. STIFF MOIST SANDY SILTY CLAY (A-7)
890	888.4	3.7	3	2	3	5		M		889.1 3.0
	883.4	8.7	2	4	5	9		M		**RESIDUAL** RED-TAN & TAN MED. STIFF TO STIFF MOIST SANDY CLAYEY SILT (A-5)
885	878.4	13.7	3	8	14	22		M		879.1 13.0
880	873.4	18.7	9	8	6	14		M		**RESIDUAL** TAN & OLIVE TO OLIVE-TAN DENSE TO MED. DENSE MOIST TO WET SILTY SAND (A-2)
875	868.4	23.7	6	5	6	11		W		
870	863.4	28.7	3	4	6	10		W		861.9 30.2
865										Boring Terminated at Elevation 861.9 ft IN MED. DENSE WET SILTY SAND (A-2)

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.
SITE DESCRIPTION NOISE WALL NWY4RPBD2			**GROUND WTR (ft)**
BORING NO. 7270	**STATION** 72+70	**OFFSET** 40 ft RT	**ALIGNMENT** -Y4RPBD-
COLLAR ELEV. 889.3 ft	**TOTAL DEPTH** 35.0 ft	**NORTHING** 861,345	**EASTING** 1,667,946
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/11		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER Estep, J. E.	**START DATE** 11/01/13	**COMP. DATE** 11/01/13	**SURFACE WATER DEPTH** N/A

0 HR. N/A
24 HR. 26.0

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)
890										889.3 GROUND SURFACE 0.0
										RESIDUAL RED STIFF DRY SANDY CLAY (A-7)
	885.8	3.5	5	7	8	15	SS-38	D		886.3 3.0
885										RED-TAN STIFF DRY CLAYEY SANDY SILT (A-5)
	880.8	8.5	3	4	6	10	SS-39	D		881.3 8.0
880										OLIVE-TAN LOOSE TO MED. DENSE MOIST CLAYEY SILTY SAND (A-2-5)
	875.8	13.5	3	4	6	10	SS-40	M		
875										871.3 18.0
	870.8	18.5	2	3	5	8	SS-41	M		TAN MEDIUM STIFF MOIST CLAYEY SANDY SILT (A-4)
870										866.3 23.0
	865.8	23.5	2	2	4	6	SS-42	M		OLIVE-TAN MEDIUM STIFF MOIST TO WET CLAYEY SANDY SILT (A-5)
865										
	860.8	28.5	3	3	4	7	SS-43	W		
860										856.3 33.0
	855.8	33.5	2	3	6	9	SS-44	W		OLIVE-TAN LOOSE WET SILTY SAND (A-2-5)
855										854.3 35.0
										Boring Terminated at Elevation 854.3 ft IN RESIDUAL LOOSE WET SILTY SAND (A-2-5)

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WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION NOISE WALL NWY4RPBD2				**GROUND WTR (ft)**
BORING NO. 7360	**STATION** 73+60	**OFFSET** 45 ft RT	**ALIGNMENT** -Y4RPBD-	**0 HR.** N/A
COLLAR ELEV. 884.5 ft	**TOTAL DEPTH** 34.7 ft	**NORTHING** 861,370	**EASTING** 1,668,032	**24 HR.** 22.5
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/11		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 10/31/13	**COMP. DATE** 10/31/13	**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)
885										GROUND SURFACE	884.5	0.0
	881.3	3.2	8	9	12	21	SS-31	D		**RESIDUAL** RED V. STIFF DRY HIGH (PI=34) PLASTIC SILTY SANDY CLAY (A-7-5)	878.5	6.0
880	876.3	8.2	12	3	4	7	SS-32	D		TAN MEDIUM STIFF DRY CLAYEY SANDY SILT (A-5)	873.5	11.0
875	871.3	13.2	2	3	7	10	SS-33	D		OLIVE-TAN MED. DENSE DRY SILTY SAND (A-2-5)	868.5	16.0
870	866.3	18.2	2	1	7	8	SS-34	M		TAN STIFF MOIST CLAYEY SANDY SILT (A-5)	863.5	21.0
865	861.3	23.2	3	5	4	9	SS-35	M		RED-BROWN TO OLIVE-TAN MED. DENSE MOIST SILTY SAND (A-2-4)	853.5	31.0
860	856.3	28.2	5	4	9	13	SS-36	M		OLIVE-TAN MED. DENSE MOIST SILTY SAND (A-2-5)	849.8	34.7
855	851.3	33.2	5	5	7	12	SS-37	M		Boring Terminated at Elevation 849.8 ft IN RESIDUAL MEDIUM DENSE MOIST SILTY SAND (A-2-5)		
850												

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION NOISE WALL NWY4RPBD2				**GROUND WTR (ft)**
BORING NO. 7555	**STATION** 75+55	**OFFSET** 38 ft RT	**ALIGNMENT** -Y4RPBD-	**0 HR.** 21.5
COLLAR ELEV. 878.0 ft	**TOTAL DEPTH** 34.9 ft	**NORTHING** 861,441	**EASTING** 1,668,214	**24 HR.** 21.0
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/11		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 10/31/13	**COMP. DATE** 10/31/13	**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)
880										GROUND SURFACE	878.0	0.0
	874.6	3.4	3	4	5	9	SS-24	M		**RESIDUAL** RED-BROWN STIFF MOIST HIGH (PI=41) PLASTIC SANDY CLAY (A-7-6)	872.0	6.0
875	869.6	8.4	3	4	4	8	SS-25	M		TAN STIFF MOIST LOW (PI=10) PLASTIC CLAYEY SANDY SILT (A-5)	867.0	11.0
870	864.6	13.4	1	3	4	7	SS-26	M		OLIVE-TAN TO TAN & WHITE LOOSE TO MED. DENSE MOIST TO WET SILTY SAND (A-2-5 & A-2-4)	843.1	34.9
865	859.6	18.4	3	3	3	6	SS-27	W				
860	854.6	23.4	2	2	5	7	SS-28	W				
855	849.6	28.4	3	6	6	12	SS-29	W				
850	844.6	33.4	2	5	7	12	SS-30	W		Boring Terminated at Elevation 843.1 ft IN RESIDUAL MEDIUM DENSE WET SILTY SAND (A-2-4)		
845												

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WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION NOISE WALL NWY4RPBD2				**GROUND WTR (ft)**
BORING NO. 7665	**STATION** 76+65	**OFFSET** 37 ft RT	**ALIGNMENT** -Y4RPBD-	**0 HR.** FIAD
COLLAR ELEV. 881.1 ft	**TOTAL DEPTH** 9.0 ft	**NORTHING** 861,474	**EASTING** 1,668,317	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/11		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 10/31/13	**COMP. DATE** 10/31/13	**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)
885										881.1 GROUND SURFACE 0.0
880	877.6	3.5	2	5	15	20	S-21	M		**ARTIFICIAL FILL** RED-TAN V. STIFF MOIST MED. (PI=23) PLASTIC SILTY SANDY CLAY (A-7-6) (PETROLEUM ODOR BELOW 6')
875							SS-22	M		872.1 9.0
										Boring Terminated at Elevation 872.1 ft IN ARTIFICIAL FILL V. STIFF MOIST SILTY SANDY CLAY (A-7-6)
										NOTE: SS-2 HAD INSUFFICIENT MATERIAL TO TEST.
										BORING WAS ABANDONED, BACKFILLED AND CAPPED WITH A BENTONITE PLUG DUE TO PETROLEUM ODOR.

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION NOISE WALL NWY4RPBD2				**GROUND WTR (ft)**
BORING NO. 7750	**STATION** 77+50	**OFFSET** 33 ft RT	**ALIGNMENT** -Y4RPBD-	**0 HR.** 27.0
COLLAR ELEV. 880.2 ft	**TOTAL DEPTH** 35.0 ft	**NORTHING** 861,500	**EASTING** 1,668,396	**24 HR.** 24.0
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/11		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 10/29/13	**COMP. DATE** 10/29/13	**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
885										880.2 GROUND SURFACE 0.0
880	876.7	3.5	5	7	9	16	S-13	M		**RESIDUAL** RED-TAN V. STIFF MOIST HIGH (PI=35) TO MED. (PI=20) PLASTIC SILTY SANDY CLAY & SANDY CLAY (A-7-5)
875	871.7	8.5	4	3	5	8	SS-14	M		874.2 6.0
870	866.7	13.5	5	4	8	12	SS-15	M		OLIVE-TAN & GRAY-WHITE LOOSE TO MED. DENSE MOIST SILTY SAND (A-2-5) & CLAYEY SILTY SAND (A-2-4)
865	861.7	18.5	3	3	5	8	SS-16	M		
860	856.7	23.5	3	5	9	14	SS-17	M		858.2 22.0
855	851.7	28.5	2	2	4	6	SS-18	M		GRAY-WHITE STIFF MOIST CLAYEY SANDY SILT (A-4)
850	846.7	33.5	2	3	4	7	SS-19	W		853.2 27.0
							SS-20	W		GRAY-WHITE LOOSE WET SAND (A-2-5) & SILTY SAND (A-2-4)
										845.2 35.0
										Boring Terminated at Elevation 845.2 ft IN RESIDUAL LOOSE WET SILTY SAND (A-2-4)

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WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION NOISE WALL NWY4RPBD2				**GROUND WTR (ft)**
BORING NO. 7860	**STATION** 78+60	**OFFSET** 30 ft RT	**ALIGNMENT** -Y4RPBD-	**0 HR.** N/A
COLLAR ELEV. 872.2 ft	**TOTAL DEPTH** 35.5 ft	**NORTHING** 861,527	**EASTING** 1,668,502	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/11		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 11/13/13	**COMP. DATE** 11/13/13	**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)
875										
										872.2 GROUND SURFACE 0.0
870										**ARTIFICIAL FILL** RED MED. STIFF MOIST SILTY CLAY (A-7) W/ GRAVEL 869.2 3.0
	868.2	4.0	8	7	9	16		M		**RESIDUAL** RED-TAN V. STIFF MOIST SANDY SILTY CLAY (A-7)
865										865.2 7.0
	863.2	9.0	4	5	5	10		D		OLIVE-TAN LOOSE & MEDIUM DENSE DRY TO WET SILTY SAND (A-2)
860										
	858.2	14.0	7	7	10	17		D		
855										
	853.2	19.0	2	2	5	7		D		
850										
	848.2	24.0	2	3	4	7		M		
845										
	843.2	29.0	2	3	4	7		W		
840										
	838.2	34.0	3	5	9	14		W		836.7 35.5
										Boring Terminated at Elevation 836.7 ft IN RESIDUAL MEDIUM DENSE WET SILTY SAND (A-2)

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION NOISE WALL NWY4RPBD2				**GROUND WTR (ft)**
BORING NO. 7970	**STATION** 79+70	**OFFSET** 25 ft RT	**ALIGNMENT** -Y4RPBD-	**0 HR.** N/A
COLLAR ELEV. 863.9 ft	**TOTAL DEPTH** 35.4 ft	**NORTHING** 861,551	**EASTING** 1,668,608	**24 HR.** 27.0
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/11		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 11/13/13	**COMP. DATE** 11/13/13	**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
865										863.9 GROUND SURFACE 0.0
										RESIDUAL RED MED. STIFF MOIST SILTY CLAY (A-7) 860.9 3.0
860	860.0	3.9	4	5	6	11		M		TAN-OLIVE TO OLIVE-TAN & GRAY-WHITE LOOSE TO DENSE MOIST TO WET CLAYEY SILTY SAND & SILTY SAND (A-2)
855	855.0	8.9	3	5	7	12		M		
850	850.0	13.9	2	3	5	8		M		
845	845.0	18.9	3	4	5	9		M		
840	840.0	23.9	12	19	31	50		M		
835	835.0	28.9	6	9	27	36		W		
830	830.0	33.9	4	9	13	22		W		828.5 35.4
										Boring Terminated at Elevation 828.5 ft IN RESIDUAL MEDIUM DENSE WET SILTY SAND (A-2)

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WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION NOISE WALL NWY4RPBD2				**GROUND WTR (ft)**
BORING NO. 8070	**STATION** 80+70	**OFFSET** 27 ft RT	**ALIGNMENT** -Y4RPBD-	**0 HR.** N/A
COLLAR ELEV. 851.5 ft	**TOTAL DEPTH** 20.0 ft	**NORTHING** 861,562	**EASTING** 1,668,706	**24 HR.** 19.0
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/11		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 11/19/13	**COMP. DATE** 11/19/13	**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)
855										851.5 GROUND SURFACE	0.0
850	848.0	3.5	5	5	7	12	SS-52	D		**RESIDUAL** RED TO TAN-WHITE STIFF DRY LOW (PI=15) PLASTIC SILTY SANDY CLAY (A-7-5)	
845	843.0	8.5	2	2	3	5	SS-53	M		844.5 OLIVE-TAN-WHITE LOOSE MOIST TO WET SILTY SAND (A-2-5 & A-2-4)	7.0
840	838.0	13.5	2	3	5	8	SS-54	W			
835	833.0	18.5	4	3	6	9	SS-55	W		831.5 Boring Terminated at Elevation 831.5 ft IN RESIDUAL LOOSE WET SILTY SAND (A-2-4)	20.0

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION NOISE WALL NWY4RPBD2				**GROUND WTR (ft)**
BORING NO. 8175	**STATION** 81+75	**OFFSET** 25 ft RT	**ALIGNMENT** -Y4RPBD-	**0 HR.** N/A
COLLAR ELEV. 848.8 ft	**TOTAL DEPTH** 19.9 ft	**NORTHING** 861,573	**EASTING** 1,668,809	**24 HR.** 9.0
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/11		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 11/14/13	**COMP. DATE** 11/14/13	**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
850										848.8 GROUND SURFACE 0.0
845	845.4	3.4	2	2	3	5		M		**RESIDUAL** TAN MEDIUM STIFF MOIST TO WET SANDY SILTY CLAY (A-7)
840	840.4	8.4	2	2	3	5				836.8 OLIVE-TAN LOOSE WET SILTY SAND (A-2) 12.0
835	835.4	13.4	2	2	3	5		W		
830	830.4	18.4	1	2	3	5		W		828.9 Boring Terminated at Elevation 828.9 ft IN RESIDUAL LOOSE WET SILTY SAND (A-2) 19.9

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WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION NOISE WALL NWY4RPBD2				**GROUND WTR (ft)**
BORING NO. 8275	**STATION** 82+75	**OFFSET** 26 ft RT	**ALIGNMENT** -Y4RPBD-	**0 HR.** N/A
COLLAR ELEV. 852.6 ft	**TOTAL DEPTH** 20.5 ft	**NORTHING** 861,576	**EASTING** 1,668,908	**24 HR.** 12.0
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/11		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 11/14/13	**COMP. DATE** 11/14/13	**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)
855										GROUND SURFACE	852.6	0.0
850	848.6	4.0	8	10	10	20		M		**RESIDUAL** RED STIFF MOIST SILTY SANDY CLAY (A-7)	849.6	3.0
845	843.6	9.0	3	6	8	14		M		TAN-OLIVE MED. DENSE TO LOOSE MOIST TO WET SILTY SAND (A-2)		
840	838.6	14.0	2	3	3	6		M				
835	833.6	19.0	2	2	5	7		M			832.1	20.5
										Boring Terminated at Elevation 832.1 ft IN RESIDUAL LOOSE WET SILTY SAND (A-2)		

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION NOISE WALL NWY4RPBD2				**GROUND WTR (ft)**
BORING NO. 8348	**STATION** 83+48	**OFFSET** 75 ft RT	**ALIGNMENT** -Y4RPBD-	**0 HR.** Dry
COLLAR ELEV. 860.8 ft	**TOTAL DEPTH** 30.0 ft	**NORTHING** 861,527	**EASTING** 1,668,980	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 80% 11/28/11		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 11/14/13	**COMP. DATE** 11/14/13	**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)
865										GROUND SURFACE	860.8	0.0
860	857.3	3.5	9	8	13	21		M		**RESIDUAL** RED-TAN & TAN V. STIFF MOIST SANDY SILTY CLAY (A-7)	854.8	6.0
855	852.3	8.5	3	2	5	7		M		TAN TO OLIVE-TAN LOOSE TO MEDIUM DENSE DRY TO MOIST SILTY SAND (A-2)		
850	847.3	13.5	7	8	11	19		D				
845	842.3	18.5	9	13	8	21		D				
840	837.3	23.5	6	12	14	26		M				
835	832.3	28.5	12	13	12	25		M			830.8	30.0
										Boring Terminated at Elevation 830.8 ft IN RESIDUAL MEDIUM DENSE MOIST SILTY SAND (A-2)		

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WBS 34839.1.1	**TIP** U-2579B	**COUNTY** Forsyth	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION NOISE WALL NWY4RPBD2				**GROUND WTR (ft)**
BORING NO. B-1	**STATION** 72+80	**OFFSET** 40 ft RT	**ALIGNMENT** -Y4RPBD-	**0 HR.** Dry
COLLAR ELEV. 888.8 ft	**TOTAL DEPTH** 29.8 ft	**NORTHING** 861,348	**EASTING** 1,667,955	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE CME-550		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 07/27/10	**COMP. DATE** 07/27/10	**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
890										ELEV. (ft) DEPTH (ft)
										888.8 GROUND SURFACE 0.0
	887.8	1.0	3	3	4	7				**RESIDUAL**
885	885.5	3.3					SS-28	M		RED-TAN MED. STIFF TO STIFF TO MED. STIFF MOIST HIGH TO LOW (PI=34, 11) PLASTIC SILTY SANDY CLAY (A-7-5)
			4	7	8	15	SS-29	M		
	883.0	5.8	3	3	3	6		M		
880	880.5	8.3								880.8 8.0
			2	4	5	9	SS-30	M		**RESIDUAL**
										OLIVE-TAN MED. STIFF MOIST SLI. MICA. CLAYEY SAND SILT (A-5)
875	875.5	13.3	3	3	3	6	SS-31	M		
										871.8 17.0
	870.5	18.3	2	3	4	7	SS-32	W		**RESIDUAL**
870										OLIVE-WHITE LOOSE WET TO SAT. MICA. SILTY SAND (A-2-5)
865	865.5	23.3	2	3	4	7		W		
860	860.5	28.3	3	4	5	9		Sat.		859.0 29.8
										Boring Terminated at Elevation 859.0 ft IN OLIVE-WHITE LOOSE SAT. MICA. SILTY SAND (A-2)

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** Forsyth	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION NOISE WALL NWY4RPBD2				**GROUND WTR (ft)**
BORING NO. B-2	**STATION** 75+20	**OFFSET** 40 ft RT	**ALIGNMENT** -Y4RPBD-	**0 HR.** Dry
COLLAR ELEV. 879.7 ft	**TOTAL DEPTH** 29.6 ft	**NORTHING** 861,428	**EASTING** 1,668,181	**24 HR.** 9.5
DRILL RIG/HAMMER EFF./DATE CME-550		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 07/27/10	**COMP. DATE** 07/27/10	**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
880										
										879.7 GROUND SURFACE 0.0
	876.6	3.1	2	4	5	9				**RESIDUAL**
875	874.1	5.6					SS-33	M		RED TO TAN STIFF MOIST TO WET HIGH TO MED. (PI=29, 29, 22) PLASTIC SANDY CLAY (A-7-6) TO SILTY SANDY CLAY (A-7-5)
			3	4	4	8		M		
	871.6	8.1	3	5	6	11	SS-34	▼		
870	869.1	10.6					SS-35	W		
			3	4	6	10				
	866.6	13.1	2	3	4	7	SS-36	W		867.7 12.0
865										**RESIDUAL**
										TAN MED. STIFF WET CLAYEY SANDY SILT (A-5)
	861.6	18.1	1	3	4	7		W		
860										
	856.6	23.1	2	2	3	5	SS-37	W		857.7 22.0
855										**RESIDUAL**
										TAN LOOSE WET SILTY SAND (A-2-5)
	851.6	28.1	3	3	3	6		W		850.1 29.6
										Boring Terminated at Elevation 850.1 ft IN TAN LOOSE WET SILTY SAND (A-2)

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WBS 34839.1.1	**TIP** U-2579B	**COUNTY** Forsyth	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION NOISE WALL NWY4RPBD2				**GROUND WTR (ft)**
BORING NO. B-3	**STATION** 78+40	**OFFSET** 40 ft RT	**ALIGNMENT** -Y4RPBD-	**0 HR.** NM
COLLAR ELEV. 871.9 ft	**TOTAL DEPTH** 25.2 ft	**NORTHING** 861,513	**EASTING** 1,668,484	**24 HR.** 22.5
DRILL RIG/HAMMER EFF./DATE CME-550		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 07/27/10	**COMP. DATE** 07/27/10	**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)
										871.9 GROUND SURFACE	0.0
	870.4	1.5	3	4	5	9		M		**RESIDUAL** RED-TAN TO TAN STIFF MOIST SANDY CLAY (A-7) 868.9	3.0
	868.2	3.7	3	3	5	8	SS-38	M		**RESIDUAL** TAN STIFF MOIST SLI. MICA. CLAYEY SANDY SILT (A-5) 865.9	6.0
	865.7	6.2	3	3	5	8	SS-39	M		**RESIDUAL** TAN LOOSE MOIST CLAYEY SILTY SAND (A-2-4)	
	863.2	8.7	3	4	5	9		M		859.9	12.0
	858.2	13.7	2	2	4	6	SS-40	M		**RESIDUAL** OLIVE-TAN MED. STIFF MOIST MICA. CLAYEY SANDY SILT (A-5) 854.9	17.0
	853.2	18.7	3	5	5	10	SS-41	M		**RESIDUAL** WHITE-TAN STIFF MOIST CLAYEY SANDY SILT (A-4) 849.9	22.0
	848.2	23.7	3	3	7	10	SS-42	M		**RESIDUAL** OLIVE STIFF MOIST MICA. CLAYEY SANDY SILT (A-5) 846.7	25.2
										Boring Terminated at Elevation 846.7 ft IN OLIVE STIFF MOIST MICA. CLAYEY SANDY SILT (A-5)	

WBS 34839.1.1	**TIP** U-2579B	**COUNTY** Forsyth	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION NOISE WALL NWY4RPBD2				**GROUND WTR (ft)**
BORING NO. B-4	**STATION** 79+50	**OFFSET** 30 ft RT	**ALIGNMENT** -Y4RPBD-	**0 HR.** 25.0
COLLAR ELEV. 865.8 ft	**TOTAL DEPTH** 30.0 ft	**NORTHING** 861,543	**EASTING** 1,668,589	**24 HR.** 20.0
DRILL RIG/HAMMER EFF./DATE CME-550		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 07/28/10	**COMP. DATE** 07/28/10	**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	
										865.8 GROUND SURFACE	0.0
	864.3	1.5	3	4	3	7		M		**RESIDUAL** RED-BRN MED. STIFF MOIST SILTY SANDY CLAY (A-7) 862.8	3.0
	862.3	3.5	2	5	7	12	SS-43	M		**RESIDUAL** TAN STIFF MOIST CLAYEY SANDY SILT (A-5) 858.8	7.0
	857.3	8.5	2	2	5	7	SS-44	M		**RESIDUAL** OLIVE-TAN LOOSE TO V. DENSE MOIST TO WET V. MICA. TO MICA. CLAYEY SILTY SAND TO SILTY SAND (A-2-5)	
	852.3	13.5	2	2	4	6	SS-45	M			
	847.3	18.5	10	20	14	34					
	842.3	23.5	15	23	19	42	SS-46	W			
	837.3	28.5	19	27	31	58		W		835.8	30.0
										Boring Terminated at Elevation 835.8 ft IN OLIVE-TAN V. DENSE WET MICA. SILTY SAND (A-2-5)	

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WBS 34839.1.1	**TIP** U-2579B	**COUNTY** Forsyth	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION NOISE WALL NWY4RPBD2				**GROUND WTR (ft)**
BORING NO. B-5	**STATION** 81+00	**OFFSET** 30 ft RT	**ALIGNMENT** -Y4RPBD-	**0 HR.** 1.0
COLLAR ELEV. 847.5 ft	**TOTAL DEPTH** 10.2 ft	**NORTHING** 861,562	**EASTING** 1,668,736	**24 HR.** NM
DRILL RIG/HAMMER EFF./DATE CME-550		**DRILL METHOD** H.S. Augers		**HAMMER TYPE** Automatic
DRILLER Estep, J. E.	**START DATE** 11/01/07	**COMP. DATE** 11/01/07	**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)
850											
	847.5	0.0	1	1	0	2	SS-444	M		847.5 GROUND SURFACE	0.0
845										**ALLUVIAL** GRAY V. SOFT MOIST LOW (PI=15) PLASTIC SILTY SANDY CLAY (A-7-5) 844.5	3.0
	843.8	3.7	0	1	1	2	SS-445	W		**ALLUVIAL** GRAY V. LOOSE WET CLAYEY SILTY SAND (A-2-4)	
840										838.0	9.5
	838.8	8.7	0	3	3	6		W		837.3 **RESIDUAL** OLIVE & WHITE LOOSE WET CLAYEY SILTY SAND (A-2-4)	10.2
										Boring Terminated at Elevation 837.3 ft IN LOOSE CLAYEY SILTY SAND (A-2-4)	
										B-5'S ORIGINAL RDWY. BORING NAME & LOCATION ARE: Y4RPBD_8100R STA. 81+00.00 -Y4RPBD- 30.0' RT	

TEST RESULTS

PROJECT: 34839.1.1 (U-2579B)
COUNTY: FORSYTH
SITE DESCRIPTION: NOISE WALL -NWY4RPBD2-

SOIL SAMPLE RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS	N	L.L.	P.I.	% BY WEIGHT C. SAND	% BY WEIGHT F. SAND	% BY WEIGHT SILT	% BY WEIGHT CLAY	% PASSING SIEVES 10	% PASSING SIEVES 40	% PASSING SIEVES 200	% MOISTURE	% ORGANIC	UNIT WT. (d)	VOID RATIO
		7750																
S-13	33 RT	77+50 -Y4RPBD-	0.0-3.50	A-7-5(23)		69	35	19.2	16.0	10.3	54.5	98	86	66	-	-		
SS-14	33 RT	77+50 -Y4RPBD-	3.5-5.0	A-7-5(14)	16	76	20	18.6	23.6	9.3	48.5	100	89	61	-	-		
SS-15	33 RT	77+50 -Y4RPBD-	8.5-10.0	A-2-5(0)	8	59	NP	32.9	45.3	13.7	8.1	100	83	26	-	-		
SS-16	33 RT	77+50 -Y4RPBD-	13.5-15.0	A-2-5(0)	12	46	NP	33.9	43.0	14.9	8.1	100	81	27	-	-		
SS-17	33 RT	77+50 -Y4RPBD-	18.5-20.0	A-2-4(0)	8	36	NP	29.3	44.6	13.9	12.1	100	84	34	-	-		
SS-18	33 RT	77+50 -Y4RPBD-	23.5-25.0	A-4(0)	14	40	NP	27.9	39.4	18.6	14.1	97	82	37	-	-		
SS-19	33 RT	77+50 -Y4RPBD-	28.5-30.0	A-2-5(0)	6	48	NP	41.8	43.0	9.1	6.1	94	74	18	-	-		
SS-20	33 RT	77+50 -Y4RPBD-	33.5-35.0	A-2-4(0)	7	40	NP	31.9	42.6	17.4	8.1	95	79	29	-	-		
		7665																
S-21	37 RT	76+65 -Y4RPBD-	0.0-3.5	A-7-6(7)		51	23	29.3	23.4	12.9	34.3	92	74	47	-	-		
SS-22	37 RT	76+65 -Y4RPBD-	3.5-5.0	***	20	-	-	40.2	30.5	13.1	16.2	60	43	21	-	-		
		7555																
SS-24	38 RT	75+55 -Y4RPBD-	3.4-4.9	A-7-6(23)	9	67	41	25.1	15.4	7.1	52.5	100	83	61	-	-		
SS-25	38 RT	75+55 -Y4RPBD-	8.4-9.9	A-5(2)	8	53	10	30.5	27.3	16.0	26.3	96	77	44	-	-		
SS-26	38 RT	75+55 -Y4RPBD-	13.4-14.9	A-2-5(0)	7	49	NP	38.8	38.8	16.4	6.1	100	79	28	-	-		
SS-27	38 RT	75+55 -Y4RPBD-	18.4-19.9	A-2-4(0)	6	36	NP	40.4	41.2	12.3	6.1	98	76	24	-	-		
SS-28	38 RT	75+55 -Y4RPBD-	23.4-24.9	A-2-5(0)	7	53	NP	28.5	45.3	18.2	8.1	96	82	31	-	-		
SS-29	38 RT	75+55 -Y4RPBD-	28.4-29.9	A-2-4(0)	12	26	NP	56.4	26.1	9.5	8.1	97	59	20	-	-		
SS-30	38 RT	75+55 -Y4RPBD-	33.4-34.9	A-2-4(0)	12	39	NP	47.5	29.5	14.9	8.1	93	63	26	-	-		
		7360																
SS-31	45 RT	73+60 -Y4RPBD-	3.2-4.7	A-7-5(26)	21	72	34	13.3	19.0	13.1	54.5	100	93	71	-	-		
SS-32	45 RT	73+60 -Y4RPBD-	8.2-9.7	A-5(0)	7	60	NP	21.2	41.8	20.8	16.2	100	92	44	-	-		
SS-33	45 RT	73+60 -Y4RPBD-	13.2-14.7	A-2-5(0)	10	48	NP	40.0	36.4	15.6	8.1	98	81	29	-	-		
SS-34	45 RT	73+60 -Y4RPBD-	18.2-19.7	A-5(7)	8	68	9	14.3	39.2	32.3	14.1	100	94	57	-	-		
SS-35	45 RT	73+60 -Y4RPBD-	23.2-24.7	A-2-4(0)	9	35	NP	41.4	31.3	19.2	8.1	94	69	32	-	-		
SS-36	45 RT	73+60 -Y4RPBD-	28.2-29.7	A-2-4(0)	13	32	NP	50.1	28.1	15.8	6.1	81	52	22	-	-		
SS-37	45 RT	73+60 -Y4RPBD-	33.2-33.7	A-2-5(0)	12	43	NP	51.3	31.9	10.7	6.1	93	62	19	-	-		
		7270																
SS-38	40 RT	72+70 -Y4RPBD-	3.5-5.0	A-5(5)	15	58	9	25.0	28.0	16.7	30.2	100	86	52	-	-		
SS-39	40 RT	72+70 -Y4RPBD-	8.5-10.0	A-2-5(0)	10	54	6	39.1	32.3	16.5	12.1	97	73	33	-	-		
SS-40	40 RT	72+70 -Y4RPBD-	13.5-15.0	A-2-5(0)	10	54	6	39.5	37.9	12.5	10.1	99	77	27	-	-		
SS-41	40 RT	72+70 -Y4RPBD-	18.5-20.0	A-4(0)	8	39	5	33.7	33.9	20.4	12.1	97	75	40	-	-		
SS-42	40 RT	72+70 -Y4RPBD-	23.5-25.0	A-5(0)	6	42	NP	35.9	35.1	19.0	10.1	99	77	37	-	-		
SS-43	40 RT	72+70 -Y4RPBD-	28.5-30.0	A-5(0)	7	47	4	32.5	36.1	21.4	10.1	99	80	39	-	-		
SS-44	40 RT	72+70 -Y4RPBD-	33.5-35.0	A-2-5(0)	9	43	NP	40.9	40.7	10.3	8.1	99	76	24	-	-		
		8070																
SS-52	27 RT	80+70 -Y4RPBD-	3.5-5.0	A-7-5(8)	12	60	15	27.6	19.4	20.9	32.0	100	81	56	-	-		
SS-53	27 RT	80+70 -Y4RPBD-	8.5-10.0	A-2-5(0)	5	47	NP	38.6	40.4	12.9	8.0	100	82	25	-	-		
SS-54	27 RT	80+70 -Y4RPBD-	13.5-15.0	A-2-5(0)	8	43	NP	43.6	38.0	12.3	6.0	98	72	23	-	-		
SS-55	27 RT	80+70 -Y4RPBD-	18.5-20.0	A-2-4(0)	9	35	NP	49.6	30.6	13.7	6.0	97	63	23	-	-		
*** Insufficient Material to Test Sample								0.0	0.0	0.0	0.0		0	0	-	-		
		B-1																
SS-28	40' RT	72+80-Y4RPBD-	1.0-2.5	A-7-5(23)	7	64	34	21.5	13.1	13.3	52.2	99	85	67				
SS-29	40' RT	72+80-Y4RPBD-	3.3-4.8	A-7-5(3)	15	42	11	28.5	26.5	20.9	24.1	96	77	49				
SS-30	40' RT	72+80-Y4RPBD-	8.3-9.8	A-5(1)	9	53	6	26.7	38.6	20.7	14.1	100	85	41				
SS-31	40' RT	72+80-Y4RPBD-	13.3-14.8	A-5(3)	6	46	8	26.9	31.5	25.3	16.3	100	84	49				
SS-32	40' RT	72+80-Y4RPBD-	18.3-19.8	A-2-5(0)	7	50	6	47.8	29.7	14.3	8.1	97	65	27				

ROCK SAMPLE RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	RQD	UNIT WT (pcf)	Q(ksf)	E(MPsi)

TEST RESULTS

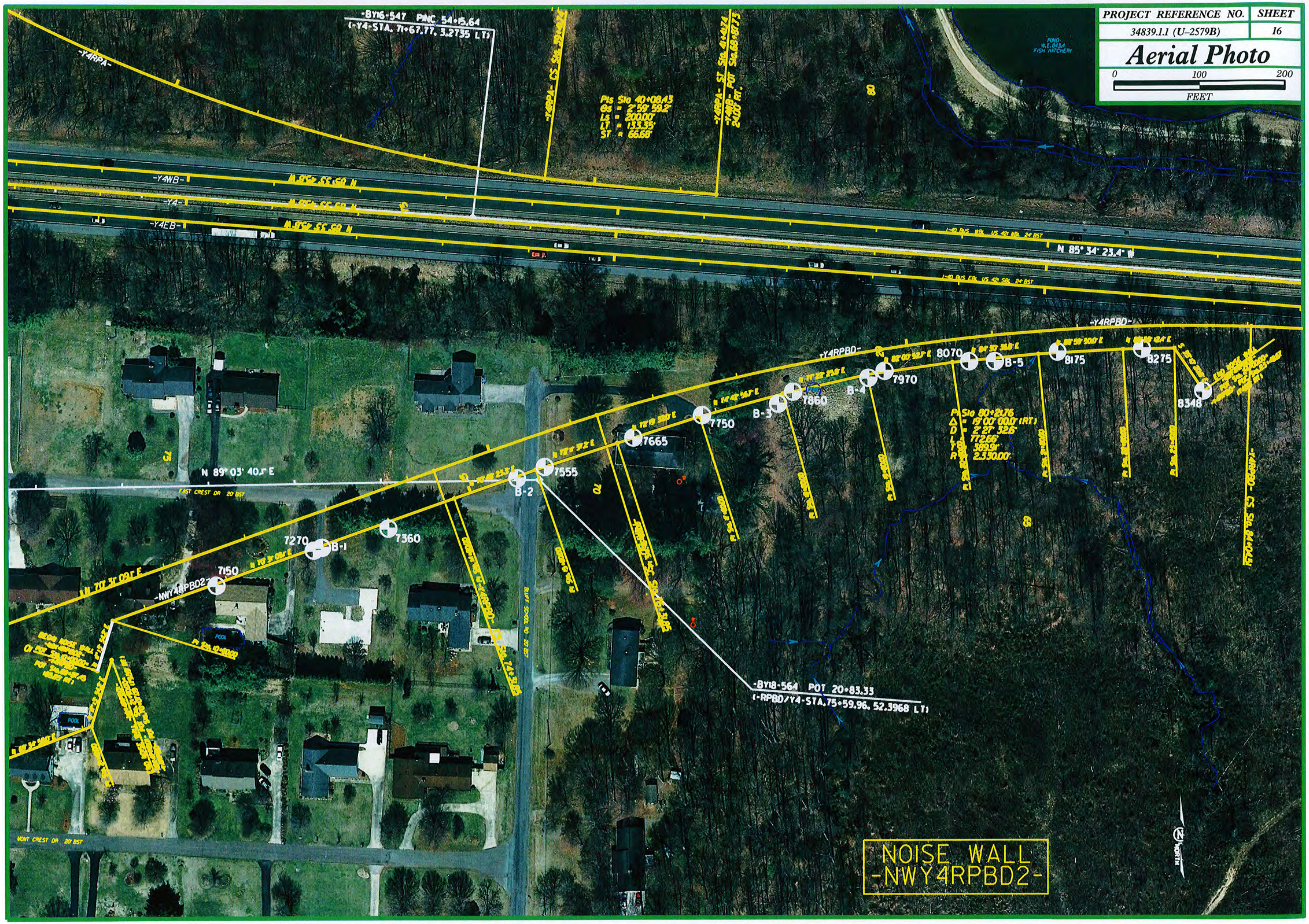
PROJECT: 34839.1.1 (U-2579B)
COUNTY: FORSYTH
SITE DESCRIPTION: NOISE WALL -NWY4RPBD2-

SOIL SAMPLE RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS	N	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC	UNIT WT. (d)	VOID RATIO
		B-2																
SS-33	40' RT	75+20-Y4RPBD-	3.1-4.6	A-7-6(11)	9	49	29	31.3	19.1	4.8	44.8	100	80	52				
SS-34	40' RT	75+20-Y4RPBD-	8.1-9.6	A-7-6(11)	11	52	29	31.7	21	6.6	40.7	100	80	50				
SS-35	40' RT	75+20-Y4RPBD-	10.6-12.1	A-7-5(9)	10	55	22	31.7	18.1	13.5	36.6	98	77	52				
SS-36	40' RT	75+20-Y4RPBD-	13.1-14.6	A-5(0)	7	47	7	34	36	19.8	10.2	100	80	38				
SS-37	40' RT	75+20-Y4RPBD-	23.1-24.6	A-2-5(0)	5	55	NP	37.6	34	20.2	8.1	97	78	32				
		B-3																
SS-38	40' RT	78+40-Y4RPBD-	3.7-5.2	A-5(0)	8	47	5	30.1	34.2	17.4	18.3	99	80	42				
SS-39	40' RT	78+40-Y4RPBD-	6.2-7.7	A-2-4(0)	8	38	10	60	13.6	16.2	10.2	83	39	25				
SS-40	40' RT	78+40-Y4RPBD-	13.7-15.2	A-5(0)	6	47	6	24.2	43.1	20.4	12.2	99	86	40				
SS-41	40' RT	78+40-Y4RPBD-	18.7-20.2	A-4(0)	10	36	5	42.5	26.9	18.4	12.2	94	65	36				
SS-42	40' RT	78+40-Y4RPBD-	23.7-25.2	A-5(0)	10	42	4	25	36	22.7	16.3	100	91	44				
		B-4																
SS-43	30' RT	79+50-Y4RPBD-	3.5-5.0	A-5(3)	12	60	5	21.8	31.1	16.6	30.5	100	89	52				
SS-44	30' RT	79+50-Y4RPBD-	8.5-10.0	A-2-5(0)	7	66	NP	38	34.6	15.2	12.2	99	80	32				
SS-45	30' RT	79+50-Y4RPBD-	13.5-15.0	A-2-5(0)	6	52	NP	33.2	40.9	17.8	8.1	99	79	35				
SS-46	30' RT	79+50-Y4RPBD-	23.5-25.0	A-2-5(0)	42	54	NP	40.1	43.5	10.3	6.1	99	77	22				
B-5 (Y4RPBD 8100R STA. 81+00.00 -Y4RPBD- 30' RT)																		
SS-444	30' RT	81+00-Y4RPBD-	0.0-1.5	A-7-5(5)	1	45	15	32.5	20.4	22.9	24.2	97	74	49				
SS-445	30' RT	81+00-Y4RPBD-	3.7-5.2	A-2-4(0)	2	30	8	51.7	19.4	14.8	14.1	97	62	30				

ROCK SAMPLE RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	RQD	UNIT WT (pcf)	Q(ksf)	E(MPsi)


PROJECT REFERENCE NO.
SHEET
34839.1.1 (U-2579B)
16
Aerial Photo
0
100
200
FEET
-BY16-547 PINC 54+15.64
(-Y4-STA. 71+67.77, 3.2735 LT)
-Y4RPA-
-Y4WB-
-Y4-
-Y4EB-
N 85° 34' 23.4" W
-Y4RPBD-
N 89° 03' 40.5" E
-NWY4RPBD2-
7150
7270
B-1
7360
B-2
7555
7665
7750
B-3
7860
B-4
7970
8070
B-5
8175
8275
8348
-BY18-564 POT 20+83.33
(-RPBD/Y4-STA.75+59.96, 52.3968 LT)
NOISE WALL
-NWY4RPBD2-