REFERENCE: I-2513AC

PROJECT: 34165

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	I-2513AC	1	24

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

STRUCTURE SUBSURFACE INVESTIGATION

COUNTY *BUNCOMBE*

PROJECT DESCRIPTION *I-26/I-40/I-240 INTERCHANGE TO SR 3548 (HAYWOOD ROAD)*

SITE DESCRIPTION *RETAINING WALL NO. 5 -WALL5- STA. 10+55.00 (-L- STA. 66+05.00) TO -WALL5- 26+51.90 (-L- 81+75.93)*

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) 707-6850. THE SUBSURFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA ARE NOT PART OF THE CONTRACT.

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

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DATE *AUGUST 2024*

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Signed by:

Amanda R. Suttle PG 6/30/2026

399DBE429744494... SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT REFERENCE NO.	SHEET NO.
I-2513AC	2

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION

SOIL IS CONSIDERED UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO THE STANDARD PENETRATION TEST (AASHTO T 206, ASTM D1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY INCLUDE THE FOLLOWING: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. FOR EXAMPLE,
VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6

SOIL LEGEND AND AASHTO CLASSIFICATION

GENERAL CLASS.	GRANULAR MATERIALS (≤ 35% PASSING #200)							SILT-CLAY MATERIALS (> 35% PASSING #200)				ORGANIC MATERIALS		
GROUP CLASS.	A-1		A-3	A-2				A-4	A-5	A-6	A-7	A-1, A-2 A-3	A-4, A-5 A-6, A-7	
	A-1-a	A-1-b		A-2-4	A-2-5	A-2-6	A-2-7				A-7-5, A-7-6			
SYMBOL														
% PASSING #10	50 MX													
#40	30 MX	50 MX	51 MN											
#200	15 MX	25 MX	10 MX	35 MX	35 MX	35 MX	35 MX	36 MN	36 MN	36 MN	36 MN	GRANULAR SOILS	SILT-CLAY SOILS	MUCK, PEAT
MATERIAL PASSING #40 LL PI	— 6 MX		— NP	40 MX 10 MX	41 MN 10 MX	40 MX 11 MN	41 MN 11 MN	40 MX 10 MX	41 MN 10 MX	40 MX 11 MN	41 MN 11 MN	SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER		HIGHLY ORGANIC SOILS
GROUP INDEX	0		0	0		4 MX		8 MX	12 MX	16 MX	NO MX			
USUAL TYPES OF MAJOR MATERIALS	STONE FRAGS. GRAVEL, AND SAND		FINE SAND	SILTY OR CLAYEY GRAVEL AND SAND				SILTY SOILS		CLAYEY SOILS				
GEN. RATING AS SUBGRADE	EXCELLENT TO GOOD							FAIR TO POOR				FAIR TO POOR	POOR	UNSUITABLE

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

CONSISTENCY OR DENSENESS

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

TEXTURE OR GRAIN SIZE

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

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

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

SOIL MOISTURE - CORRELATION OF TERMS

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

PLASTICITY

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

COLOR

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

GRADATION

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

ANGULARITY OF GRAINS

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

MINERALOGICAL COMPOSITION

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

COMPRESSIBILITY

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

PERCENTAGE OF MATERIAL

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

GROUND WATER

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

MISCELLANEOUS SYMBOLS

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

RECOMMENDATION SYMBOLS

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

ABBREVIATIONS

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

SAMPLE ABBREVIATIONS

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

EQUIPMENT USED ON SUBJECT PROJECT

DRILL UNITS:
- [ ] CME-45C
- [ ] CME-75
- [ ] CME-550
- [ ] VANE SHEAR TEST
- [ ] PORTABLE HOIST
- [X] CME 750X
- [ ] _____

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

HAMMER TYPE:
- [X] AUTOMATIC [ ] MANUAL

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

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

ROCK DESCRIPTION

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

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

WEATHERING

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

ROCK HARDNESS

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

FRACTURE SPACING

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

BEDDING

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

INDURATION

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

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

TERMS AND DEFINITIONS

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

AQUIFER - A WATER BEARING FORMATION OR STRATA.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

BENCH MARK: N/A

ELEVATION: FEET

NOTES:

ROADWAY DESIGN FILES, .TIN FILE, AND GPK FILE PROVIDED BY AECOM

NORTHING AND EASTINGS OBTAINED USING A TRIMBLE GEO7X. BORING ELEVATIONS FOR WALL BORINGS WERE OBTAINED USING THE PROVIDED .TIN FILE

FIAD = FILLED IMMEDIATELY AFTER DRILLING

◉ = DCP = DYNAMIC CONE PENETROMETER

DATE: 8-15-14

PROJECT REFERENCE NO.	SHEET NO.
I-2512AC	3

SITE PLAN

0 50 100

FEET

RETAINING WALL #5
-WALL5- POT STA.
10+40.00 TO 26+39.23

22+00
-RP32-
67+00
-L-
70+00
I-26 SB/I-240 WBL
L_6650R L_6700R L_6750R L_6850R L_6900R L_6950R L_7000R L_7100R
L_7150R
24+00
L_6800R
PROP.RETAINING WALL #5
-RP23-
L_7050R
I-26 NB/I-240 EBL
MTL
LT
SS
JS
W
T
M
E/P
TH-28

BEGIN RETAINING WALL #5
-WALL5- POT STA.10+40.00=
-L- STA.65+90.00 (65.00' RT)

MATCHLINE -WALL5- STA. 16+25.00 SEE SHEET 4

PROJECT REFERENCE NO.	SHEET NO.
I-2513AC	4

SITE PLAN

0 50 100

FEET

RETAINING WALL #5
-WALL5- POT STA.
10+40.00 TO 26+39.23

-RP32-

30+00

I-26 SB/I-240 WBL

MTL

BL5-65

75+00

-L-

L_7250R L_7300R L_7350R L_7400R WALL05_B-18 WALL05_B-20 WALL05_B-22

L_7200R PROP.RETAINING WALL #5 WALL05_B-17 WALL05_B-19 WALL05_B-21 WALL05_B-23

29+00

-RP23-

I-26 NB/I-240 EBL

MATCHLINE -WALL5- STA. 16+25.00 SEE SHEET 3

MATCHLINE -WALL5- STA. 22+25.00 SEE SHEET 5

W SS LT TV

PROJECT REFERENCE NO.	SHEET NO.
I-2513AC	5

SITE PLAN

0 50 100

FEET

RETAINING WALL #5
-WALL5- POT STA.
10+40.00 TO 26+39.23

MATCHLINE -WALL5- STA. 22+25.00 SEE SHEET 4

VIRGINIA AVENUE

85+00

-RP32-

I-26 SB/I-240 WBL

-L-

80+00

-Y3-

I-26 NB/I-240 EBL

WALL05_B-31

END RETAINING WALL #5
-WALL5- POT STA.26+51.90=
-L- STA.81+75.93 (70.53' RT)

PROP. RETAINING WALL #5

WALL05_B-24
WALL05_P-01
WALL05_B-25
WALL05_B-26
WALL05_P-02
WALL05_B-27
WALL05_B-28
WALL05_B-29
WALL05_B-30

39+00

-RP23-

144

AMBOY ROAD

140

GUY

139

INV.=1977.10

TH-11

142

INV.=1987.5

5/14/99

–WALL5– PROFILE ALONG EXISTING GROUND LINE FROM ROADWAY DESIGN FILES, PROVIDED BY AECOM JULY 2025 AND I2513 ls tnl.tin. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING, PROJECTED ON THE PROFILE.

–WALL5–

Prepared in the Office of:
ECS SOUTHEAST, LLC
1812 CENTER PARK DRIVE, SUITE D
CHARLOTTE, NC 28217
(704) 525-7782 (PHONE)
(704) 357-1023 (FAX)
NC REGISTERED ENGINEERING FIRM # C-1519

0 40 80
VE = 5:1

PROJECT REFERENCE NO.	SHEET NO.
I-2513AC	6

PROFILE BORINGS PROJECTED ON –WALL5– ALONG WALL NO. 5

BEGIN RET. WALL
–WALL5– 10+40.00
–L– STA. 65+90.00
ELEV = 2,037.54

GRADE ELEVATION

L_6650R 11+14 4' LT
L_6700R 11+68 3' LT
L_6750R 12+25 2' LT
L_6800R 12+56 1' LT
L_6850R 13+02 1' LT
L_6900R 13+50 2' LT
L_6950R 14+04 2' LT SS-755
L_7000R 14+53 2' LT
L_7050R 14+94 3' LT
L_7100R 15+52 4' LT SS-815
L_7150R 16+00 6' LT
L_7200R 16+55 6' LT
L_7250R 16+94 9' LT
L_7300R 17+43 8' LT
L_7350R 17+97 7' LT
L_7400R 18+40 9' LT SS-835
WALL05_B-17 18+84 9' LT
WALL05_B-18 19+61 9' LT
WALL05_B-19 19+95 9' LT
WALL05_B-20 20+44 10' LT
BOTTOM OF WALL
EX. GROUND
PAVEMENT
BT FIAD 07/23
REF FIAD 07/23

2060
2040
2020
2000
1980
1960
1940

Ⓐ-RESIDUAL- MEDIUM STIFF TO HARD, MOIST, WHITE-ORANGE-PINK-GRAY-BROWN-RED-BLACK-TAN, SLIGHTLY PLASTIC, FINE TO COARSE SANDY CLAY (A-6) AND FINE TO COARSE SANDY SILT (A-4), WITH TRACE TO SOME MICA

Ⓑ-RESIDUAL- LOOSE TO VERY DENSE, MOIST, BROWN-WHITE-PINK-GRAY-RED-BLACK-TAN-WHITE, SILTY FINE TO COARSE SAND (A-2-4), WITH TRACE TO LITTLE MICA AND TRACE ROCK FRAGMENTS

Ⓒ-WEATHERED ROCK- (GNEISS)

Ⓓ-CRYSTALLINE ROCK- (GNEISS)

10+00 11+00 12+00 13+00 14+00 15+00 16+00 17+00 18+00 19+00 20+00 21+00

5/14/99

–WALL5– PROFILE ALONG EXISTING GROUND LINE FROM ROADWAY DESIGN FILES, PROVIDED BY AECOM JULY 2025 AND I2513 ls tnl.tin. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING, PROJECTED ON THE PROFILE.

–WALL5–

Prepared in the Office of:
ECS SOUTHEAST, LLC
1812 CENTER PARK DRIVE, SUITE D
CHARLOTTE, NC 28217
(704) 525-6152 (PHONE)
(704) 357-0023 (FAX)
NC REGISTERED ENGINEERING FIRM # C-1519

0 40 80
VE = 5:1

PROJECT REFERENCE NO.	SHEET NO.
I–2513AC	7

PROFILE BORINGS PROJECTED ON –WALL5– ALONG WALL NO. 5

END RET. WALL
–WALL5– 26+39.23
–L– STA. 81+67.80
ELEV = 2,068.96

GRADE ELEVATION

EX. GROUND

BOTTOM OF WALL

2070
2050
2030
2010
1990
1970
1950

WALL05_B-21
21+01
10' LT

WALL05_B-22
21+47
8' LT

WALL05_B-23
22+08
6' LT

WALL05_B-24
22+61
4' LT

WALL05_B-25
23+04
1' LT

WALL05_B-26
23+81
8' RT

WALL05_B-27
24+14
12' RT

WALL05_B-28
24+57
18' RT

WALL05_B-29
25+12
17' RT

WALL05_B-30
25+58
7' RT

WALL05_B-31
26+31
8' RT

PAVEMENT

REF FIAD 07/23

BT FIAD 12/23

Ⓐ-**ROADWAY EMBANKMENT**- VERY SOFT TO VERY STIFF, MOIST, RED-BROWN-BLACK-TAN, MODERATELY PLASTIC, SILTY CLAY (A-7-5), FINE TO COARSE SANDY CLAY (A-6), CLAYEY SILT (A-5), AND FINE TO COARSE SANDY SILT (A-4), WITH TRACE MICA, ROOTS, AND GRAVEL

Ⓑ-**ROADWAY EMBANKMENT**- VERY LOOSE, MOIST, BROWN-TAN, SILTY FINE TO COARSE SAND (A-2-4)

Ⓒ-**RESIDUAL**- MEDIUM STIFF TO VERY STIFF, MOIST TO WET, FINE TO COARSE SANDY SILT (A-4), WITH TRACE MICA

Ⓓ-**RESIDUAL**- LOOSE TO VERY DENSE, MOIST TO WET, BROWN-ORANGE-TAN-BLACK-WHITE, SILTY FINE TO COARSE SAND (A-2-4), WITH TRACE MICA AND GRAVEL SIZED ROCK FRAGMENTS

Ⓔ-**WEATHERED ROCK**-(METAGRAYWACKE)

Ⓕ-**CRYSTALLINE ROCK**-(METAGRAYWACKE)

21+00 22+00 23+00 24+00 25+00 26+00 27+00

16-JUL-2025 13:22
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$$$$ISCFNAME$$$$

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34165.1.13	**TIP** I-2513AC	**COUNTY** BUNCOMBE	**GEOLOGIST** A. Blackmore	
SITE DESCRIPTION RETAINING WALL NO. 5, -L- STA. 66+05.00 TO -L- STA. 81+75.93				**GROUND WTR (ft)**
BORING NO. L_6650R	**STATION** 11+14	**OFFSET** 20 ft LT	**ALIGNMENT** -WALL5-	**0 HR.** Dry
COLLAR ELEV. 2,030.2 ft	**TOTAL DEPTH** 24.2 ft	**NORTHING** 679,885	**EASTING** 932,335	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE ECS0888 CME 750X 93% 12/02/2022		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER T. Hibdon	**START DATE** 07/11/23	**COMP. DATE** 07/11/23	**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
2035										
2030										2,030.2 GROUND SURFACE 0.0
	2,029.2	1.0	4	6	7	13, 16		M		2,029.2 **ROADWAY EMBANKMENT** Asphalt (0.1'), Concrete (0.9') 1.0
	2,026.7	3.5	6	5	11			M		**RESIDUAL** Stiff to Very Stiff, Brown-Tan, Fine to Coarse Sandy SILT (A-4), with trace mica
2025	2,024.2	6.0	8	8	11	19		M		2,024.7 5.5 Medium Dense, Brown-Black, Silty Fine to Coarse SAND (A-2-4), with trace mica
	2,021.7	8.5	10	33	67/0.4	100/0.9				2,021.2 9.0 **WEATHERED ROCK** Brown-Tan (GNEISS)
2020	2,016.7	13.5	35	18	14	32		M		2,017.2 13.0 **RESIDUAL** Hard, Brown, Fine to Coarse Sandy SILT (A-4), with trace mica
2015	2,011.7	18.5	23	16	21	37		M		
2010	2,006.7	23.5	70	30/0.2		100/0.7				2,006.7 23.5 2,006.0 **WEATHERED ROCK** Gray-Brown (GNEISS) 24.2 Boring Terminated at Elevation 2,006.0 ft In Weathered Rock (GNEISS)

WBS 34165.1.13	**TIP** I-2513AC	**COUNTY** BUNCOMBE	**GEOLOGIST** A. Blackmore	
SITE DESCRIPTION RETAINING WALL NO. 5, -L- STA. 66+05.00 TO -L- STA. 81+75.93				**GROUND WTR (ft)**
BORING NO. L_6700R	**STATION** 11+68	**OFFSET** 19 ft LT	**ALIGNMENT** -WALL5-	**0 HR.** Dry
COLLAR ELEV. 2,028.4 ft	**TOTAL DEPTH** 25.0 ft	**NORTHING** 679,909	**EASTING** 932,383	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE ECS0888 CME 750X 93% 12/02/2022		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER T. Hibdon	**START DATE** 07/11/23	**COMP. DATE** 07/11/23	**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
2030										2,028.4 GROUND SURFACE 0.0
	2,027.4	1.0	3	8	8	16		M		2,027.4 **ROADWAY EMBANKMENT** Asphalt (0.1'), Concrete (0.9') 1.0
2025	2,024.9	3.5	3	2	4	6		M		**RESIDUAL** Loose to Medium Dense, White-Pink-Tan-Brown, Silty Fine to Coarse SAND (A-2-4)
	2,022.4	6.0	5	9	12	21		M		2,020.4 8.0 Stiff to Very Stiff, Brown-Tan, Fine to Coarse Sandy SILT (A-4), with trace mica
2020	2,019.9	8.5	2	4	6	10		M		
2015	2,014.9	13.5	3	15	14	29		M		
2010	2,009.9	18.5	6	10	8	18		M		
2005	2,004.9	23.5	5	8	13	21		M		2,003.4 25.0 Boring Terminated at Elevation 2,003.4 ft In Residual Sandy SILT (A-4)

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34165.1.13	**TIP** I-2513AC	**COUNTY** BUNCOMBE	**GEOLOGIST** A. Blackmore	
SITE DESCRIPTION RETAINING WALL NO. 5, -L- STA. 66+05.00 TO -L- STA. 81+75.93				**GROUND WTR (ft)**
BORING NO. L_6750R	**STATION** 12+25	**OFFSET** 18 ft LT	**ALIGNMENT** -WALL5-	**0 HR.** Dry
COLLAR ELEV. 2,026.8 ft	**TOTAL DEPTH** 25.0 ft	**NORTHING** 679,934	**EASTING** 932,434	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE ECS0888 CME 750X 93% 12/02/2022		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER T. Hibdon	**START DATE** 07/11/23	**COMP. DATE** 07/11/23	**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
2030										
										2,026.8 GROUND SURFACE 0.0
2025	2,025.8	1.0	7	10	10	20		M		2,025.8 **ROADWAY EMBANKMENT** 1.0 Asphalt (0.1'), Concrete (0.9')
	2,023.3	3.5	8	7	13	20		M		**RESIDUAL** Medium Dense, Brown, Silty Fine to Coarse SAND (A-2-4), with trace mica
2020	2,020.8	6.0	6	7	7	14		M		2,021.3 5.5 Medium Stiff to Stiff, Tan-Brown, Fine to Coarse Sandy SILT (A-4), with trace mica
	2,018.3	8.5	2	3	4	7		M		
2015										2,013.8 13.0
	2,013.3	13.5	8	11	11	22		M		Medium Dense, Brown, Silty Fine to Coarse SAND (A-2-4), with trace mica
2010										
	2,008.3	18.5	7	7	9	16		M		
2005										2,003.8 23.0
	2,003.3	23.5	4	7	8	15		M		Very Stiff, Brown-White, Fine to Coarse Sandy SILT (A-4)
										2,001.8 25.0 Boring Terminated at Elevation 2,001.8 ft In Residual Sandy SILT (A-4)

WBS 34165.1.13	**TIP** I-2513AC	**COUNTY** BUNCOMBE	**GEOLOGIST** A. Blackmore	
SITE DESCRIPTION RETAINING WALL NO. 5, -L- STA. 66+05.00 TO -L- STA. 81+75.93				**GROUND WTR (ft)**
BORING NO. L_6800R	**STATION** 12+56	**OFFSET** 17 ft LT	**ALIGNMENT** -WALL5-	**0 HR.** Dry
COLLAR ELEV. 2,025.8 ft	**TOTAL DEPTH** 25.0 ft	**NORTHING** 679,948	**EASTING** 932,462	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE ECS0888 CME 750X 93% 12/02/2022		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER T. Hibdon	**START DATE** 07/11/23	**COMP. DATE** 07/12/23	**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
2030										
										2,025.8 GROUND SURFACE 0.0
2025	2,024.8	1.0	4	5	4	9		M		2,024.8 **ROADWAY EMBANKMENT** 1.0 Asphalt (0.1'), Concrete (0.9')
	2,022.3	3.5	8	13	15	28		M		2,022.8 3.0 **RESIDUAL** Stiff, Brown, Fine to Coarse Sandy SILT (A-4), with trace mica
2020	2,019.8	6.0	20	57	43/0.3	100/0.8		M		2,019.3 6.5 Medium Dense, Brown-Tan, Silty Fine to Coarse SAND (A-2-4), with trace mica and rock fragments
	2,017.3	8.5	31	21	19	40		M		2,017.8 8.0 **WEATHERED ROCK** Brown (GNEISS)
2015										**RESIDUAL**
	2,012.3	13.5	11	14	22	36		M		Dense to Very Dense, Brown-Tan, Silty Fine to Coarse SAND (A-2-4), with trace rock fragments
2010										
	2,007.3	18.5	31	31	32	63		M		
2005										2,002.8 23.0
	2,002.3	23.5	16	21	33	54		M		Hard, Brown-Tan, Fine to Coarse Sandy SILT (A-4), with trace mica
										2,000.8 25.0 Boring Terminated at Elevation 2,000.8 ft In Residual Sandy SILT (A-4)

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34165.1.13	**TIP** I-2513AC	**COUNTY** BUNCOMBE	**GEOLOGIST** A. Blackmore	
SITE DESCRIPTION RETAINING WALL NO. 5, -L- STA. 66+05.00 TO -L- STA. 81+75.93				**GROUND WTR (ft)**
BORING NO. L_6850R	**STATION** 13+02	**OFFSET** 17 ft LT	**ALIGNMENT** -WALL5-	**0 HR.** Dry
COLLAR ELEV. 2,024.6 ft	**TOTAL DEPTH** 24.2 ft	**NORTHING** 679,969	**EASTING** 932,503	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE ECS0888 CME 750X 93% 12/02/2022		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER T. Hibdon	**START DATE** 07/12/23	**COMP. DATE** 07/12/23	**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)
2025										2,024.6 GROUND SURFACE 0.0
	2,023.6	1.0	3	6	5	11		M		2,023.6 **ROADWAY EMBANKMENT** 1.0 Asphalt (0.1'), Concrete (0.9')
										RESIDUAL
2020	2,021.1	3.5	4	5	7	12		M		Medium Stiff to Hard, Brown-Tan, Fine to Coarse Sandy SILT (A-4)
	2,018.6	6.0	2	4	4	8		M		
	2,016.1	8.5								
2015			5	9	10	19		M		
	2,011.1	13.5	10	14	27	41		M		
2010										
	2,006.1	18.5	18	34	60	94		M		
2005										
	2,001.1	23.5	50	50/0.2		100/0.7				2,001.1 23.5 2,000.4 **WEATHERED ROCK** 24.2 Brown (GNEISS) Boring Terminated at Elevation 2,000.4 ft In Weathered Rock (GNEISS)

WBS 34165.1.13	**TIP** I-2513AC	**COUNTY** BUNCOMBE	**GEOLOGIST** A. West	
SITE DESCRIPTION RETAINING WALL NO. 5, -L- STA. 66+05.00 TO -L- STA. 81+75.93				**GROUND WTR (ft)**
BORING NO. L_6900R	**STATION** 13+50	**OFFSET** 18 ft LT	**ALIGNMENT** -WALL5-	**0 HR.** Dry
COLLAR ELEV. 2,023.0 ft	**TOTAL DEPTH** 22.0 ft	**NORTHING** 679,992	**EASTING** 932,545	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE ECS3518 CME 750X 96% 07/21/2022		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER W. King	**START DATE** 07/11/23	**COMP. DATE** 07/11/23	**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
2025										2,023.0 GROUND SURFACE 0.0
	2,022.0	1.0	2	6	9	15		M		2,022.0 **ROADWAY EMBANKMENT** 1.0 Concrete (1.0')
2020	2,019.5	3.5	3	4	6	10		M		**RESIDUAL** Stiff to Hard, Brown-White-Black, Fine to Coarse Sandy SILT (A-4), with some mica
	2,017.0	6.0	3	4	6	10		M		
2015	2,014.5	8.5	3	5	25	30		M		
2010	2,009.5	13.5	9	15	36	51		M		
2005	2,004.5	18.5	33	67/0.4		100/0.9				2,004.5 18.5 **WEATHERED ROCK** Brown-White-Black (GNEISS)
	2,001.0	22.0	60/0.0			60/0.0				2,001.0 22.0 Boring Terminated with Standard Penetration Test Refusal at Elevation 2,001.0 ft On Crystalline Rock (GNEISS)

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34165.1.13	**TIP** I-2513AC	**COUNTY** BUNCOMBE	**GEOLOGIST** A. West	
SITE DESCRIPTION RETAINING WALL NO. 5, -L- STA. 66+05.00 TO -L- STA. 81+75.93				**GROUND WTR (ft)**
BORING NO. L_6950R	**STATION** 14+04	**OFFSET** 18 ft LT	**ALIGNMENT** -WALL5-	**0 HR.** 30.0
COLLAR ELEV. 2,021.4 ft	**TOTAL DEPTH** 34.3 ft	**NORTHING** 680,016	**EASTING** 932,593	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE ECS3518 CME 750X 96% 07/21/2022		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER W. King	**START DATE** 07/11/23	**COMP. DATE** 07/11/23	**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)
2025										
										2,021.4 GROUND SURFACE 0.0
2020	2,020.4	1.0	2	8	8	16		M		2,020.4 **ROADWAY EMBANKMENT** 1.0 Concrete (1.0') **RESIDUAL** Very Stiff, Brown-Red, Fine to Coarse Sandy SILT (A-4(0)), with some mica
	2,017.9	3.5	4	7	10	17	SS-755	16%		
2015	2,015.4	6.0	6	10	10	20		M		
	2,012.9	8.5	6	11	12	23		M		
2010	2,007.9	13.5	5	10	12	22		M		
2005	2,002.9	18.5	5	9	10	19		M		
2000	1,997.9	23.5	12	17	13	30		M		1,999.4 22.0 Dense, Gray-Brown, Silty Fine to Coarse SAND (A-2-4)
1995	1,992.9	28.5	35	65/0.4		100/0.9		M		1,992.9 28.5 **WEATHERED ROCK** Brown-Gray (GNEISS)
1990	1,987.9	33.5	60	40/0.3		100/0.8		M		1,987.1 34.3 Boring Terminated at Elevation 1,987.1 ft In Weathered Rock (GNEISS)

WBS 34165.1.13	**TIP** I-2513AC	**COUNTY** BUNCOMBE	**GEOLOGIST** A. West
SITE DESCRIPTION RETAINING WALL NO. 5, -L- STA. 66+05.00 TO -L- STA. 81+75.93			**GROUND WTR (ft)**
BORING NO. L_7000R	**STATION** 14+53	**OFFSET** 18 ft LT	**ALIGNMENT** -WALL5-	**0 HR.** 28.0
COLLAR ELEV. 2,019.9 ft	**TOTAL DEPTH** 38.5 ft	**NORTHING** 680,039	**EASTING** 932,637	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE ECS3518 CME 750X 96% 07/21/2022		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER W. King	**START DATE** 07/11/23	**COMP. DATE** 07/11/23	**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
2020										2,019.9 GROUND SURFACE 0.0
	2,018.9	1.0	6	9	10	19		M		2,018.9 **ROADWAY EMBANKMENT** 1.0 Concrete (1.0') **RESIDUAL** Stiff to Very Stiff, White-Orange-Brown-Black, Fine to Coarse Sandy SILT (A-4), with trace mica
2015	2,016.4	3.5	4	6	7	13		M		
	2,013.9	6.0	12	9	5	14		M		
2010	2,011.4	8.5	12	13	13	26		M		
2005	2,006.4	13.5	10	14	14	28		M		2,007.9 12.0 Medium Dense, Brown-Black-Red, Silty Fine to Coarse SAND (A-2-4), with trace mica
2000	2,001.4	18.5	9	12	11	23		M		
1995	1,996.4	23.5	18	9	13	22		M		
1990	1,991.4	28.5	14	86/0.5		100/1.0		M		1,991.4 28.5 **WEATHERED ROCK** Brown-Black (GNEISS)
1985	1,986.4	33.5		100/0.1		100/0.1		M		
	1,981.4	38.5		60/0.0		60/0.0		M		1,981.4 38.5 Boring Terminated with Standard Penetration Test Refusal at Elevation 1,981.4 ft On Crystalline Rock (GNEISS)

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34165.1.13	**TIP** I-2513AC	**COUNTY** BUNCOMBE	**GEOLOGIST** A. West	
SITE DESCRIPTION RETAINING WALL NO. 5, -L- STA. 66+05.00 TO -L- STA. 81+75.93				**GROUND WTR (ft)**
BORING NO. L_7050R	**STATION** 14+94	**OFFSET** 18 ft LT	**ALIGNMENT** -WALL5-	**0 HR.** 26.5
COLLAR ELEV. 2,019.8 ft	**TOTAL DEPTH** 45.5 ft	**NORTHING** 680,058	**EASTING** 932,673	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE ECS3518 CME 750X 96% 07/21/2022		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER W. King	**START DATE** 07/12/23	**COMP. DATE** 07/12/23	**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)
2020										2,019.8 GROUND SURFACE 0.0
	2,018.8	1.0	8	9	10	19		M		2,018.8 **ROADWAY EMBANKMENT** Concrete (1.0') 1.0
	2,016.3	3.5								**RESIDUAL**
2015			10	7	8	15		M		Stiff to Hard, Brown, Fine to Coarse Sandy SILT (A-4)
	2,013.8	6.0								
			6	11	14	25		M		
	2,011.3	8.5								
2010			10	12	18	30		M		
	2,006.3	13.5								
2005			28	11	16	27		M		
	2,001.3	18.5								
2000			4	7	8	15		M		
	1,996.3	23.5								
1995			11	11	20	31		M		
	1,991.3	28.5								
1990			4	9	12	21		M		
	1,986.3	33.5								
1985			10	17	23	40		M		
	1,981.3	38.5								1,981.3 38.5
1980			35	65/0.5		100/1.0				**WEATHERED ROCK** Brown (GNEISS)
	1,976.3	43.5								1,977.8 42.0
1975			6	16	42	58		M		**RESIDUAL** Hard, Brown, Fine to Coarse Sandy SILT (A-4)
	1,974.3	45.5	60/0.0			60/0.0				1,974.3 45.5
										Boring Terminated with Standard Penetration Test Refusal at Elevation 1,974.3 ft On Crystalline Rock (GNEISS)

WBS 34165.1.13	**TIP** I-2513AC	**COUNTY** BUNCOMBE	**GEOLOGIST** A. West	
SITE DESCRIPTION RETAINING WALL NO. 5, -L- STA. 66+05.00 TO -L- STA. 81+75.93				**GROUND WTR (ft)**
BORING NO. L_7100R	**STATION** 15+52	**OFFSET** 19 ft LT	**ALIGNMENT** -WALL5-	**0 HR.** 22.5
COLLAR ELEV. 2,017.2 ft	**TOTAL DEPTH** 48.6 ft	**NORTHING** 680,085	**EASTING** 932,724	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE ECS3518 CME 750X 96% 07/21/2022		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER W. King	**START DATE** 07/12/23	**COMP. DATE** 07/12/23	**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
2020										2,017.2 GROUND SURFACE 0.0
	2,016.3	0.9	3	4	10	14				2,016.3 **ROADWAY EMBANKMENT** Concrete (0.9') 0.9
2015							SS-815	12%	M	2,014.2 **RESIDUAL** Medium Dense, Brown-White, Silty Fine to Coarse SAND (A-2-4(0)) 3.0
	2,013.7	3.5	11	10	10	20				Very Stiff to Hard, Brown-White, Fine to Coarse Sandy SILT (A-4)
	2,011.2	6.0	5	11	14	25		M		
2010										
	2,008.7	8.5	12	11	11	22		M		
2005										
	2,003.7	13.5	13	22	13	35		M		
2000										
	1,998.7	18.5	16	19	17	36		M		
1995										
	1,993.7	23.5	9	10	12	22		M		
1990										
	1,988.7	28.5	11	18	30	48		M		
1985										
	1,983.7	33.5	8	13	20	33		M		
1980										
	1,978.7	38.5	20	35	60	95		M		
1975										
	1,973.7	43.5	13	40	60/0.1	100/0.6				1,973.2 44.0
1970										**WEATHERED ROCK** Brown (GNEISS)
	1,968.7	48.5	60/0.1			60/0.1				1,968.7 48.5
										1,968.6 48.6 **CRYSTALLINE ROCK** (GNEISS)
										Boring Terminated with Standard Penetration Test Refusal at Elevation 1,968.6 ft In Crystalline Rock (GNEISS)

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34165.1.13	**TIP** I-2513AC	**COUNTY** BUNCOMBE	**GEOLOGIST** A. West	
SITE DESCRIPTION RETAINING WALL NO. 5, -L- STA. 66+05.00 TO -L- STA. 81+75.93				**GROUND WTR (ft)**
BORING NO. L_7150R	**STATION** 16+01	**OFFSET** 19 ft LT	**ALIGNMENT** -WALL5-	**0 HR.** 26.0
COLLAR ELEV. 2,015.7 ft	**TOTAL DEPTH** 28.6 ft	**NORTHING** 680,108	**EASTING** 932,767	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE ECS3518 CME 750X 96% 07/21/2022		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER W. King	**START DATE** 07/12/23	**COMP. DATE** 07/12/23	**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)
2020										
2015	2,014.8	0.9	9	10	13	23		M		2,015.7 GROUND SURFACE 0.0 2,014.8 **ROADWAY EMBANKMENT** 0.9 Concrete (0.9') **RESIDUAL** Very Stiff to Hard, Brown-Gray-White, Fine to Coarse Sandy SILT (A-4)
	2,012.2	3.5	7	8	9	17		M		
2010	2,009.7	6.0	13	11	13	24		M		
	2,007.2	8.5	5	9	10	19		M		
2005	2,002.2	13.5	12	17	20	37		M		
2000	1,997.2	18.5	8	9	7	16		M		
1995	1,992.2	23.5	6	12	14	26				
1990	1,987.2	28.5	60/0.1			60/0.1				1,987.2 28.5 1,987.1 28.6 **CRYSTALLINE ROCK** Gray (GNEISS) Boring Terminated with Standard Penetration Test Refusal at Elevation 1,987.1 ft In Crystalline Rock (GNEISS)

WBS 34165.1.13	**TIP** I-2513AC	**COUNTY** BUNCOMBE	**GEOLOGIST** A. West	
SITE DESCRIPTION RETAINING WALL NO. 5, -L- STA. 66+05.00 TO -L- STA. 81+75.93				**GROUND WTR (ft)**
BORING NO. L_7200R	**STATION** 16+56	**OFFSET** 19 ft LT	**ALIGNMENT** -WALL5-	**0 HR.** 19.0
COLLAR ELEV. 2,013.9 ft	**TOTAL DEPTH** 28.7 ft	**NORTHING** 680,133	**EASTING** 932,816	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE ECS3518 CME 750X 96% 07/21/2022		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER W. King	**START DATE** 07/12/23	**COMP. DATE** 07/13/23	**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
2015										2,013.9 GROUND SURFACE 0.0
	2,012.9	1.0	3	6	7	13		M		2,012.9 **ROADWAY EMBANKMENT** 1.0 Concrete (1.0') **RESIDUAL** Stiff to Hard, Brown-White, Fine to Coarse Sandy SILT (A-4)
2010	2,010.4	3.5	8	30	24	54		M		
	2,007.9	6.0	4	3	9	12		M		
2005	2,005.4	8.5	7	11	10	21		M		
2000	2,000.4	13.5	20	39	45	84		M		
1995	1,995.4	18.5	12	37	43	80				1,991.9 22.0 Dense, White-Brown, Silty Fine to Coarse SAND (A-2-4), with trace rock fragments
1990	1,990.4	23.5	8	8	22	30		M		
	1,985.4	28.5	100/0.2			100/0.2				1,985.4 28.5 1,985.2 28.7 **WEATHERED ROCK** (GNEISS) Boring Terminated with Standard Penetration Test Refusal at Elevation 1,985.2 ft On Crystalline Rock (GNEISS)
	1,985.2	28.7	60/0.0			60/0.0				

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34165.1.13	**TIP** I-2513AC	**COUNTY** BUNCOMBE	**GEOLOGIST** A. Blackmore	
SITE DESCRIPTION RETAINING WALL NO. 5, -L- STA. 66+05.00 TO -L- STA. 81+75.93				**GROUND WTR (ft)**
BORING NO. L_7250R	**STATION** 16+94	**OFFSET** 21 ft LT	**ALIGNMENT** -WALL5-	**0 HR.** 23.0
COLLAR ELEV. 2,013.1 ft	**TOTAL DEPTH** 28.9 ft	**NORTHING** 680,152	**EASTING** 932,849	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE ECS0888 CME 750X 93% 12/02/2022		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER T. Hibdon	**START DATE** 07/12/23	**COMP. DATE** 07/12/23	**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))
2015										
	2,013.1	0.0								2,013.1 GROUND SURFACE 0.0
	2,012.1	1.0								2,012.1 **ROADWAY EMBANKMENT** Asphalt (0.1'), Concrete (0.9') 1.0
2010			8	11	12	23		M		**RESIDUAL** Medium Dense, Brown-Tan, Silty Fine to Coarse SAND (A-2-4)
	2,009.6	3.5	7	11	9	20		M		2,007.6 5.5
	2,007.1	6.0								Stiff, Brown-Tan-White, Fine to Coarse Sandy SILT (A-4)
2005			16	6	7	13		M		
	2,004.6	8.5	3	4	6	10		M		
2000										
	1,999.6	13.5	7	12	28	40		M		2,000.1 13.0 Dense, Brown-Tan-Black, Silty Fine to Coarse SAND (A-2-4), with little mica
1995										
	1,994.6	18.5	32	68/0.2		100/0.7				1,994.6 18.5 **WEATHERED ROCK** Brown-Gray (GNEISS)
1990										
	1,989.6	23.5	100/0.4			100/0.4				
1985										
	1,984.6	28.5	100/0.4			100/0.4				1,984.2 28.9 Boring Terminated at Elevation 1,984.2 ft In Weathered Rock (GNEISS)

WBS 34165.1.13	**TIP** I-2513AC	**COUNTY** BUNCOMBE	**GEOLOGIST** A. Blackmore	
SITE DESCRIPTION RETAINING WALL NO. 5, -L- STA. 66+05.00 TO -L- STA. 81+75.93				**GROUND WTR (ft)**
BORING NO. L_7300R	**STATION** 17+43	**OFFSET** 20 ft LT	**ALIGNMENT** -WALL5-	**0 HR.** Dry
COLLAR ELEV. 2,011.2 ft	**TOTAL DEPTH** 30.0 ft	**NORTHING** 680,174	**EASTING** 932,893	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE ECS0888 CME 750X 93% 12/02/2022		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER T. Hibdon	**START DATE** 07/12/23	**COMP. DATE** 07/12/23	**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
2015										
	2,011.2	0.0								2,011.2 GROUND SURFACE 0.0
	2,010.2	1.0								2,010.2 **ROADWAY EMBANKMENT** Asphalt (0.1'), Concrete (0.9') 1.0
2010			6	7	11	18		M		**RESIDUAL** Medium Dense, Brown-Tan, Silty Fine to Coarse SAND (A-2-4)
	2,007.7	3.5	8	7	9	16		M		2,005.7 5.5
2005	2,005.2	6.0	4	6	7	13		M		Medium Stiff to Very Stiff, Brown, Fine to Coarse Sandy SILT (A-4), with trace to little mica
	2,002.7	8.5	2	4	8	12		M		
2000										
	1,997.7	13.5	7	10	10	20		M		
1995										
	1,992.7	18.5	11	11	12	23		M		
1990										
	1,987.7	23.5	2	2	3	5		M		
1985										
	1,982.7	28.5	16	84/0.3		100/0.8				1,982.2 29.0
	1,981.2	30.0	60/0.0			60/0.0				1,981.2 30.0 **WEATHERED ROCK** Brown-Tan (GNEISS)
										Boring Terminated with Standard Penetration Test Refusal at Elevation 1,981.2 ft On Crystalline Rock (GNEISS)

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34165.1.13	**TIP** I-2513AC	**COUNTY** BUNCOMBE	**GEOLOGIST** A. Blackmore	
SITE DESCRIPTION RETAINING WALL NO. 5, -L- STA. 66+05.00 TO -L- STA. 81+75.93				**GROUND WTR (ft)**
BORING NO. L_7350R	**STATION** 17+97	**OFFSET** 19 ft LT	**ALIGNMENT** -WALL5-	**0 HR.** Dry
COLLAR ELEV. 2,009.3 ft	**TOTAL DEPTH** 16.0 ft	**NORTHING** 680,198	**EASTING** 932,942	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE ECS0888 CME 750X 93% 12/02/2022		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER T. Hibdon	**START DATE** 07/12/23	**COMP. DATE** 07/12/23	**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
2010										ELEV. (ft) DEPTH (ft)
	2,009.3									GROUND SURFACE 0.0
	2,008.3	1.0	7	13	12	25		M		**ROADWAY EMBANKMENT** 1.0 Asphalt (0.1'), Concrete (0.9')
2005	2,005.8	3.5	7	5	6	11		M		**RESIDUAL** Medium Dense, Tan-Brown, Silty Fine to Coarse SAND (A-2-4)
	2,003.3	6.0	11	5	5	10		M		2,003.8 5.5 Stiff, Brown, Fine to Coarse Sandy SILT (A-4), with trace mica
2000	2,000.8	8.5	2	4	5	9		M		
1995	1,995.8	13.5	14	26	74/0.1	100/0.6				1,995.3 14.0 **WEATHERED ROCK**
	1,993.3	16.0	60/0.0			60/0.0				1,993.3 16.0 Brown-Tan (GNEISS) Boring Terminated with Standard Penetration Test Refusal at Elevation 1,993.3 ft On Crystalline Rock (GNEISS)

WBS 34165.1.13	**TIP** I-2513AC	**COUNTY** BUNCOMBE	**GEOLOGIST** A. Blackmore	
SITE DESCRIPTION RETAINING WALL NO. 5, -L- STA. 66+05.00 TO -L- STA. 81+75.93				**GROUND WTR (ft)**
BORING NO. L_7400R	**STATION** 18+40	**OFFSET** 21 ft LT	**ALIGNMENT** -WALL5-	**0 HR.** Dry
COLLAR ELEV. 2,008.5 ft	**TOTAL DEPTH** 19.1 ft	**NORTHING** 680,220	**EASTING** 932,979	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE ECS0888 CME 750X 93% 12/02/2022		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER T. Hibdon	**START DATE** 07/13/23	**COMP. DATE** 07/13/23	**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
2010										
	2,008.5									GROUND SURFACE 0.0
	2,007.5	1.0	4	7	5	12	SS-835	16%		**ROADWAY EMBANKMENT** 1.0 Asphalt (0.1'), Concrete (0.9')
2005	2,005.0	3.5	10	6	10	16		M		**RESIDUAL** Stiff to Very Stiff, Red-Brown, Slightly Plastic Fine to Coarse Sandy CLAY (A-6(4))
	2,002.5	6.0	9	6	15	21		M		
2000	2,000.0	8.5	7	12	21	33		M		2,000.5 8.0 Hard, Brown-Black, Fine to Coarse Sandy SILT (A-4), with trace mica
1995	1,995.0	13.5	26	29	19	48		M		1,995.5 13.0 Dense, Brown-Black-Tan, Silty Fine to Coarse SAND (A-2-4), with trace mica
1990	1,990.0	18.5	100/0.5			100/0.5				1,990.0 18.5
	1,989.5	19.0	60/0.0			60/0.0				1,989.5 19.0 **WEATHERED ROCK** 19.1 Brown (GNEISS) 1,989.4 **CRYSTALLINE ROCK** (GNEISS) Boring Terminated with Standard Penetration Test Refusal at Elevation 1,989.4 ft On Crystalline Rock (GNEISS)

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34165.1.13	**TIP** I-2513AC	**COUNTY** BUNCOMBE	**GEOLOGIST** A. Blackmore	
SITE DESCRIPTION RETAINING WALL NO. 5, -L- STA. 66+05.00 TO -L- STA. 81+75.93				**GROUND WTR (ft)**
BORING NO. WALL05_B-17	**STATION** 18+84	**OFFSET** 21 ft LT	**ALIGNMENT** -WALL5-	**0 HR.** 28.7
COLLAR ELEV. 2,007.2 ft	**TOTAL DEPTH** 42.5 ft	**NORTHING** 680,240	**EASTING** 933,018	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE ECS0888 CME 750X 93% 12/02/2022		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER T. Hibdon	**START DATE** 07/13/23	**COMP. DATE** 07/13/23	**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
2010										ELEV. (ft) DEPTH (ft)
										2,007.2 GROUND SURFACE 0.0
	2,006.2	1.0								2,006.2 **ROADWAY EMBANKMENT** 1.0
2005			5	4	5	9		M		Asphalt (0.1'), Concrete (0.9')
	2,003.7	3.5								2,004.2 **RESIDUAL** 3.0
			4	2	4	6		M		Stiff, Brown-Tan, Fine to Coarse Sandy SILT (A-4), with trace mica
	2,001.2	6.0								
2000			7	3	4	7		M		Loose to Dense, Brown-Tan, Silty Fine to Coarse SAND (A-2-4), with trace mica
	1,998.7	8.5								
			5	5	6	11		M		
1995										
	1,993.7	13.5								
			15	12	15	27		M		
1990										
	1,988.7	18.5								
			9	14	18	32		M		
1985										
	1,983.7	23.5								1,983.7 23.5
			78	22/0.1		100/0.6				**WEATHERED ROCK**
1980										Black-Brown (GNEISS)
	1,978.7	28.5								1,980.2 27.0
			12	35	48	83		M		**RESIDUAL**
1975										Very Dense, Brown-Tan, Silty Fine to Coarse SAND (A-2-4), with little mica
	1,973.7	33.5								
			6	42	40	82		M		
1970										
	1,968.7	38.5								1,968.7 38.5
			6	94/0.4		100/0.9				**WEATHERED ROCK**
1965										Gray-White (GNEISS)
	1,964.7	42.5								1,964.7 42.5
			60/0.0			60/0.0				Boring Terminated with Standard Penetration Test Refusal at Elevation 1,964.7 ft On Crystalline Rock (GNEISS)

WBS 34165.1.13	**TIP** I-2513AC	**COUNTY** BUNCOMBE	**GEOLOGIST** A. Blackmore	
SITE DESCRIPTION RETAINING WALL NO. 5, -L- STA. 66+05.00 TO -L- STA. 81+75.93				**GROUND WTR (ft)**
BORING NO. WALL05_B-18	**STATION** 19+61	**OFFSET** 21 ft LT	**ALIGNMENT** -WALL5-	**0 HR.** 22.0
COLLAR ELEV. 2,005.1 ft	**TOTAL DEPTH** 36.0 ft	**NORTHING** 680,275	**EASTING** 933,087	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE ECS0888 CME 750X 93% 12/02/2022		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER T. Hibdon	**START DATE** 07/13/23	**COMP. DATE** 07/13/23	**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
2010										
										2,005.1 GROUND SURFACE 0.0
	2,004.1	1.0								2,004.1 **ROADWAY EMBANKMENT** 1.0
2005			4	6	8	14		M		Asphalt (0.1'), Concrete (0.9')
	2,001.6	3.5								**RESIDUAL**
			5	6	9	15		M		Medium Dense, Brown-White, Silty Fine to Coarse SAND (A-2-4), with trace mica
2000	1,999.1	6.0	7	6	7	13		M		
	1,996.6	8.5								
			5	11	16	27		M		
1995										
	1,991.6	13.5								
			7	11	13	24		M		
1990										
	1,986.6	18.5								
			7	13	16	29		M		
1985										
	1,981.6	23.5								1,987.1 18.0
			7	4	7	11		M		Stiff to Very Stiff, White-Brown, Fine to Coarse Sandy SILT (A-4), with little mica
1980										
	1,976.6	28.5								
			4	8	8	16		M		
1975										
	1,971.6	33.5								
			3	3	7	10		M		
1970										
	1,969.1	36.0								1,969.1 36.0
			60/0.0			60/0.0				Boring Terminated with Standard Penetration Test Refusal at Elevation 1,969.1 ft On Crystalline Rock (GNEISS)

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34165.1.13	**TIP** I-2513AC	**COUNTY** BUNCOMBE	**GEOLOGIST** A. West	
SITE DESCRIPTION RETAINING WALL NO. 5, -L- STA. 66+05.00 TO -L- STA. 81+75.93				**GROUND WTR (ft)**
BORING NO. WALL05_B-19	**STATION** 19+95	**OFFSET** 21 ft LT	**ALIGNMENT** -WALL5-	**0 HR.** 21.5
COLLAR ELEV. 2,004.5 ft	**TOTAL DEPTH** 24.1 ft	**NORTHING** 680,291	**EASTING** 933,117	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE ECS3518 CME 750X 96% 07/21/2022		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER W. King	**START DATE** 07/13/23	**COMP. DATE** 07/13/23	**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
2005										ELEV. (ft) DEPTH (ft)
	2,004.5	0.0								GROUND SURFACE
	2,003.5	1.0	4	5	9	14		M		**ROADWAY EMBANKMENT** Asphalt (0.1'), Concrete (0.9')
	2,001.0	3.5	6	4	6	10		M		**RESIDUAL** Medium Stiff to Very Stiff, Red-Brown, Fine to Coarse Sandy SILT (A-4)
2000	1,998.5	6.0	5	9	11	20		M		
	1,996.0	8.5	5	6	9	15		M		
1995	1,991.0	13.5	5	3	3	6		M		
1990	1,986.0	18.5	3	2	4	6		M		
1985	1,981.0	23.5								
	1,980.4	24.1	75	25/0.1		100/0.6				**WEATHERED ROCK** Brown (GNEISS)
			60/0.0			60/0.0				Boring Terminated with Standard Penetration Test Refusal at Elevation 1,980.4 ft On Crystalline Rock (GNEISS)

WBS 34165.1.13	**TIP** I-2513AC	**COUNTY** BUNCOMBE	**GEOLOGIST** A. West	
SITE DESCRIPTION RETAINING WALL NO. 5, -L- STA. 66+05.00 TO -L- STA. 81+75.93				**GROUND WTR (ft)**
BORING NO. WALL05_B-20	**STATION** 20+44	**OFFSET** 22 ft LT	**ALIGNMENT** -WALL5-	**0 HR.** 21.0
COLLAR ELEV. 2,004.1 ft	**TOTAL DEPTH** 28.6 ft	**NORTHING** 680,314	**EASTING** 933,160	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE ECS3518 CME 750X 96% 07/21/2022		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER W. King	**START DATE** 07/13/23	**COMP. DATE** 07/13/23	**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
2005										
	2,004.1	0.0								GROUND SURFACE
	2,003.3	0.8	5	5	6	11		M		**ROADWAY EMBANKMENT** Concrete (0.8')
	2,000.6	3.5	16	19	20	39		M		**RESIDUAL** Stiff to Hard, Brown, Fine to Coarse Sandy SILT (A-4)
2000	1,998.1	6.0	12	15	26	41		M		
	1,995.6	8.5	21	16	14	30		M		
1995	1,990.6	13.5	11	11	13	24		M		
1990	1,985.6	18.5	6	5	11	16		M		
1985	1,980.6	23.5	36	24	34	58		M		
1980	1,975.6	28.5	60/0.1			60/0.1				
	1,975.5	28.6								**CRYSTALLINE ROCK** Brown (GNEISS)
										Boring Terminated with Standard Penetration Test Refusal at Elevation 1,975.5 ft In Crystalline Rock (GNEISS)

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34165.1.13	**TIP** I-2513AC	**COUNTY** BUNCOMBE	**GEOLOGIST** A. Blackmore	
SITE DESCRIPTION RETAINING WALL NO. 5, -L- STA. 66+05.00 TO -L- STA. 81+75.93				**GROUND WTR (ft)**
BORING NO. WALL05_B-21	**STATION** 21+01	**OFFSET** 22 ft LT	**ALIGNMENT** -WALL5-	**0 HR.** Dry
COLLAR ELEV. 2,004.0 ft	**TOTAL DEPTH** 8.1 ft	**NORTHING** 680,341	**EASTING** 933,210	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE ECS0888 CME 750X 93% 12/02/2022		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER T. Hibdon	**START DATE** 07/13/23	**COMP. DATE** 07/13/23	**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
2005										ELEV. (ft) DEPTH (ft)
										2,004.0 GROUND SURFACE 0.0
	2,003.0	1.0	3	6	6	12		M		2,003.0 **ROADWAY EMBANKMENT** Asphalt (0.1'), Concrete (0.9') 1.0
2000	2,000.5	3.5	9	11	19	30		M		**RESIDUAL** Medium Dense, Brown-Red, Clayey Fine to Coarse SAND (A-2-6), with trace rock fragments 1,997.5 6.5
	1,998.0	6.0	12	17	83/0.2	100/0.7				**WEATHERED ROCK** Brown-Tan (GNEISS) 1,996.0 8.0
	1,996.0	8.0	60/0.1			60/0.1				1,995.9 8.1
										CRYSTALLINE ROCK (GNEISS)
										Boring Terminated with Standard Penetration Test Refusal at Elevation 1,995.9 ft In Crystalline Rock (GNEISS)

WBS 34165.1.13	**TIP** I-2513AC	**COUNTY** BUNCOMBE	**GEOLOGIST** A. Blackmore	
SITE DESCRIPTION RETAINING WALL NO. 5, -L- STA. 66+05.00 TO -L- STA. 81+75.93				**GROUND WTR (ft)**
BORING NO. WALL05_B-22	**STATION** 21+47	**OFFSET** 20 ft LT	**ALIGNMENT** -WALL5-	**0 HR.** Dry
COLLAR ELEV. 2,003.8 ft	**TOTAL DEPTH** 26.0 ft	**NORTHING** 680,361	**EASTING** 933,251	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE ECS0888 CME 750X 93% 12/02/2022		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER T. Hibdon	**START DATE** 07/13/23	**COMP. DATE** 07/13/23	**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
2005										
										2,003.8 GROUND SURFACE 0.0
	2,002.9	0.9	3	5	5	10		M		2,002.9 **ROADWAY EMBANKMENT** Asphalt (0.1'), Concrete (0.8') 0.9
2000	2,000.3	3.5	3	2	3	5		M		2,000.8 Stiff, Brown-Tan, Fine to Coarse Sandy SILT (A-4) 3.0
	1,997.8	6.0	5	3	3	6		M		Medium Stiff, Brown, Fine to Coarse Sandy CLAY (A-6)
1995	1,995.3	8.5	4	9	14	23		M		1,994.3 9.5
1990	1,990.3	13.5	6	22	20	42		M		**RESIDUAL** Medium Dense to Dense, Brown-Black, Silty Fine to Coarse SAND (A-2-4), with trace mica
1985	1,985.3	18.5	16	13	24	37		M		
1980	1,980.3	23.5	46	54/0.2		100/0.7				1,980.3 23.5
	1,977.8	26.0	60/0.0			60/0.0				**WEATHERED ROCK** Brown-Tan (GNEISS) 1,977.8 26.0
										Boring Terminated with Standard Penetration Test Refusal at Elevation 1,977.8 ft On Crystalline Rock (GNEISS)

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34165.1.13	**TIP** I-2513AC	**COUNTY** BUNCOMBE	**GEOLOGIST** A. Blackmore	
SITE DESCRIPTION RETAINING WALL NO. 5, -L- STA. 66+05.00 TO -L- STA. 81+75.93				**GROUND WTR (ft)**
BORING NO. WALL05_B-23	**STATION** 22+09	**OFFSET** 18 ft LT	**ALIGNMENT** -WALL5-	**0 HR.** 24.0
COLLAR ELEV. 2,004.3 ft	**TOTAL DEPTH** 26.0 ft	**NORTHING** 680,390	**EASTING** 933,305	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE ECS0888 CME 750X 93% 12/02/2022		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER T. Hibdon	**START DATE** 07/13/23	**COMP. DATE** 07/13/23	**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
2005										ELEV. (ft) DEPTH (ft)
	2,003.3	1.0								2,004.3 GROUND SURFACE 0.0
			3	6	5	11		M		2,003.3 **ROADWAY EMBANKMENT** 1.0 Asphalt (0.1'), Concrete (0.9')
2000	2,000.8	3.5	6	4	2	6		M		2,001.3 Medium Dense, Tan-Brown, Silty Fine to Coarse SAND (A-2-4) 3.0
	1,998.3	6.0	3	7	20	27		M		Medium Stiff to Very Stiff, Brown, Fine to Coarse Sandy SILT (A-4), with trace mica and rock fragments
1995	1,995.8	8.5	3	3	3	6		M		1,995.3 9.0 Medium Stiff to Stiff, Red-Brown, Fine to Coarse Sandy CLAY (A-6), with trace mica and roots
1990	1,990.8	13.5	3	5	6	11		M		
1985	1,985.8	18.5	3	7	4	11		M		
1980	1,980.8	23.5	80	20/0.2		100/0.7				1,980.8 23.5 **WEATHERED ROCK**
	1,978.3	26.0	60/0.0			60/0.0				Brown-Tan (GNEISS) 1,978.3 26.0 Boring Terminated with Standard Penetration Test Refusal at Elevation 1,978.3 ft On Crystalline Rock (GNEISS)

WBS 34165.1.13	**TIP** I-2513AC	**COUNTY** BUNCOMBE	**GEOLOGIST** A. Blackmore	
SITE DESCRIPTION RETAINING WALL NO. 5, -L- STA. 66+05.00 TO -L- STA. 81+75.93				**GROUND WTR (ft)**
BORING NO. WALL05_B-24	**STATION** 22+62	**OFFSET** 16 ft LT	**ALIGNMENT** -WALL5-	**0 HR.** Dry
COLLAR ELEV. 2,005.3 ft	**TOTAL DEPTH** 16.1 ft	**NORTHING** 680,415	**EASTING** 933,351	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE ECS0888 CME 750X 93% 12/02/2022		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER T. Hibdon	**START DATE** 07/13/23	**COMP. DATE** 07/14/23	**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
2010										
2005	2,004.4	0.9	5	5	4	9		M		2,005.3 GROUND SURFACE 0.0 2,004.4 **ROADWAY EMBANKMENT** 0.9 Asphalt (0.1'), Concrete (0.8')
	2,001.8	3.5	5	4	7	11		M		Stiff, Brown, Fine to Coarse Sandy SILT (A-4), with trace mica
2000	1,999.3	6.0	4	4	5	9		M		
1995	1,996.8	8.5	3	4	5	9		M		
	1,991.8	13.5	2	3	4	7		M		1,992.3 13.0 **RESIDUAL** Medium Stiff, Brown-Black, Fine to Coarse Sandy CLAY (A-6)
1990	1,989.3	16.0	60/0.1			60/0.1				1,989.3 16.0 1,989.2 16.1 **CRYSTALLINE ROCK** (GNEISS) Boring Terminated with Standard Penetration Test Refusal at Elevation 1,989.2 ft In Crystalline Rock (GNEISS)

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34165.1.13	**TIP** I-2513AC	**COUNTY** BUNCOMBE	**GEOLOGIST** A. West
SITE DESCRIPTION RETAINING WALL NO. 5, -L- STA. 66+05.00 TO -L- STA. 81+75.93			**GROUND WTR (ft)**
BORING NO. WALL05_B-25	**STATION** 23+05	**OFFSET** 13 ft LT	**ALIGNMENT** -WALL5- — **0 HR.** 20.5
COLLAR ELEV. 2,006.1 ft	**TOTAL DEPTH** 38.6 ft	**NORTHING** 680,435	**EASTING** 933,389 — **24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE ECS3518 CME 750X 96% 07/21/2022		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER W. King	**START DATE** 07/13/23	**COMP. DATE** 07/13/23	**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))
2010										
										2,006.1 GROUND SURFACE 0.0
2005	2,004.9	1.2	4	4	3	7 10		M		2,004.9 **ROADWAY EMBANKMENT** 1.2 Concrete (1.2')
	2,002.6	3.5	5	4	6			M		2,003.1 Medium Stiff, Brown-Red, Clayey SILT (A-5) 3.0
2000	2,000.1	6.0	8	3	3	6 6		M		**RESIDUAL** Medium Stiff to Stiff, Brown-Red, Fine to Coarse Sandy SILT (A-4)
	1,997.6	8.5	2	2	4			M		1,997.1 9.0
1995	1,992.6	13.5	2	4	4	8		M		Very Soft to Medium Stiff, Brown, Silty CLAY (A-7-5), with trace mica
1990	1,987.6	18.5	WOH	WOH	WOH	0		▽		
1985	1,982.6	23.5	5	3	2	5		W		
1980	1,977.6	28.5	1	3	5	8		W		
1975	1,972.6	33.5	18	45	53	98		M		1,974.1 32.0 Very Dense, Brown, Silty Fine to Coarse SAND (A-2-4), with trace rock fragments
1970	1,967.6	38.5	60/0.1			60/0.1				1,967.6 38.5 1,967.5 38.6 **CRYSTALLINE ROCK** Black-Brown (GNEISS) Boring Terminated with Standard Penetration Test Refusal at Elevation 1,967.5 ft In Crystalline Rock (GNEISS)

WBS 34165.1.13	**TIP** I-2513AC	**COUNTY** BUNCOMBE	**GEOLOGIST** A. West
SITE DESCRIPTION RETAINING WALL NO. 5, -L- STA. 66+05.00 TO -L- STA. 81+75.93			**GROUND WTR (ft)**
BORING NO. WALL05_B-26	**STATION** 23+83	**OFFSET** 4 ft LT	**ALIGNMENT** -WALL5- — **0 HR.** 19.0
COLLAR ELEV. 2,008.4 ft	**TOTAL DEPTH** 43.6 ft	**NORTHING** 680,472	**EASTING** 933,458 — **24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE ECS3518 CME 750X 96% 07/21/2022		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER W. King	**START DATE** 07/13/23	**COMP. DATE** 07/13/23	**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
2010										
										2,008.4 GROUND SURFACE 0.0
	2,007.4	1.0								2,007.4 **ROADWAY EMBANKMENT** 1.0 Concrete (1.0')
2005	2,004.9	3.5	3	4	4	8		M		Medium Stiff, Brown, Clayey SILT (A-5)
	2,002.4	6.0	2	2	3	5		M		
2000	1,999.9	8.5	4	3	3	6		M		2,001.4 7.0 **RESIDUAL** Soft, Brown, Clayey SILT (A-5), with trace mica
	1,994.9	13.5	1	1	1	2		M		1,996.4 12.0
1995										Very Soft to Soft, Brown-Red, Silty CLAY (A-7-5)
1990	1,989.9	18.5	1	1	1	2		▽		
1985	1,984.9	23.5	1	1	1	2		W		
			WOH	WOH	1	1				
1980	1,979.9	28.5	7	12	18	30		W		1,981.4 27.0 Loose to Dense, Brown-Red, Silty Fine to Coarse SAND (A-2-4)
1975	1,974.9	33.5	3	3	4	7		W		
1970	1,969.9	38.5	11	11	11	22		W		
1965	1,964.9	43.5	60/0.1			60/0.1				1,964.9 43.5 1,964.8 43.6 **CRYSTALLINE ROCK** Black-Gray (GNEISS) Boring Terminated with Standard Penetration Test Refusal at Elevation 1,964.8 ft In Crystalline Rock (GNEISS)

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34165.1.13	**TIP** I-2513AC	**COUNTY** BUNCOMBE	**GEOLOGIST** A. West	
SITE DESCRIPTION RETAINING WALL NO. 5, -L- STA. 66+05.00 TO -L- STA. 81+75.93				**GROUND WTR (ft)**
BORING NO. WALL05_B-27	**STATION** 24+16	**OFFSET** CL	**ALIGNMENT** -WALL5-	**0 HR.** 15.0
COLLAR ELEV. 2,009.8 ft	**TOTAL DEPTH** 38.6 ft	**NORTHING** 680,488	**EASTING** 933,487	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE ECS3518 CME 750X 96% 07/21/2022		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER W. King	**START DATE** 07/13/23	**COMP. DATE** 07/13/23	**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)
2010												
										GROUND SURFACE	2,009.8	0.0
	2,008.9	0.9	4	6	8	14		M		**ROADWAY EMBANKMENT** Concrete (0.9')	2,008.9	0.9
	2,006.3	3.5								Medium Stiff to Stiff, Brown-Red, Fine to Coarse Sandy SILT (A-4)		
2005			2	2	3	5		M				
	2,003.8	6.0	2	3	4	7		M				
	2,001.3	8.5										
2000			2	2	6	8		M				
	1,996.3	13.5								**RESIDUAL** Medium Stiff, Brown-Red, Silty CLAY (A-7-5)	1,997.8	12.0
1995			3	3	5	8		▽				
	1,991.3	18.5								Medium Stiff to Stiff, Brown, Fine to Coarse Sandy SILT (A-4), with trace rock fragments	1,992.8	17.0
1990			2	3	4	7		W				
	1,986.3	23.5										
1985			5	6	6	12		W				
	1,981.3	28.5										
1980			17	26	70	96		M				
	1,976.3	33.5										
1975			39	42	58/0.3	100/0.8						
	1,971.3	38.5	60/0.1			60/0.1				**WEATHERED ROCK** Brown (GNEISS)	1,975.8	34.0
										CRYSTALLINE ROCK (GNEISS)	1,971.3	38.5
											1,971.2	38.6
										Boring Terminated with Standard Penetration Test Refusal at Elevation 1,971.2 ft In Crystalline Rock (GNEISS)		

WBS 34165.1.13	**TIP** I-2513AC	**COUNTY** BUNCOMBE	**GEOLOGIST** A. West	
SITE DESCRIPTION RETAINING WALL NO. 5, -L- STA. 66+05.00 TO -L- STA. 81+75.93				**GROUND WTR (ft)**
BORING NO. WALL05_B-28	**STATION** 24+59	**OFFSET** 6 ft RT	**ALIGNMENT** -WALL5-	**0 HR.** 26.3
COLLAR ELEV. 2,011.6 ft	**TOTAL DEPTH** 28.5 ft	**NORTHING** 680,510	**EASTING** 933,525	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE ECS3518 CME 750X 96% 07/21/2022		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER W. King	**START DATE** 07/14/23	**COMP. DATE** 07/14/23	**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)
2015												
										GROUND SURFACE	2,011.6	0.0
2010	2,010.5	1.1	4	6	9	15		M		**ROADWAY EMBANKMENT** Concrete (1.1')	2,010.5	1.1
	2,008.1	3.5								Stiff, Brown-Tan, Fine to Coarse Sandy SILT (A-4)	2,008.6	3.0
			6	6	8	14		M		**RESIDUAL** Stiff to Very Stiff, Brown-Tan, Fine to Coarse Sandy SILT (A-4), with trace mica		
2005	2,005.6	6.0	9	9	13	22		M				
	2,003.1	8.5								Medium Dense, Brown-Tan, Silty Fine to Coarse SAND (A-2-4)	2,003.6	8.0
			8	9	15	24		M				
2000	1,998.1	13.5								Medium Stiff to Stiff, Brown-Tan, Fine to Coarse Sandy SILT (A-4)	1,999.6	12.0
			4	3	5	8		M				
1995	1,993.1	18.5										
			4	5	5	10		M				
1990	1,988.1	23.5										
			5	11	89/0.3	100/0.8		▽		**WEATHERED ROCK** Brown (GNEISS)	1,987.6	24.0
1985	1,983.1	28.5	60/0.0			60/0.0						
										Boring Terminated with Standard Penetration Test Refusal at Elevation 1,983.1 ft On Crystalline Rock (GNEISS)	1,983.1	28.5

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34165.1.13	**TIP** I-2513AC	**COUNTY** BUNCOMBE	**GEOLOGIST** A. Blackmore
SITE DESCRIPTION RETAINING WALL NO. 5, -L- STA. 66+05.00 TO -L- STA. 81+75.93			**GROUND WTR (ft)**
BORING NO. WALL05_B-29	**STATION** 25+15	**OFFSET** 5 ft RT	**ALIGNMENT** -WALL5-	**0 HR.** Dry
COLLAR ELEV. 2,015.3 ft	**TOTAL DEPTH** 13.6 ft	**NORTHING** 680,547	**EASTING** 933,567	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE G. Sowers Dynamic Cone Penetrometer		**DRILL METHOD** Hand Auger/DCP	**HAMMER TYPE** N/A	
DRILLER N/A	**START DATE** 12/15/23	**COMP. DATE** 12/15/23	**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)
2020										
2015	2,015.3	0.0								2,015.3 GROUND SURFACE 0.0
			0	0	2	2				**ROADWAY EMBANKMENT**
	2,014.3	1.0				2				Soft, Brown-Tan, FIne to Coarse Sandy SILT (A-4)
			0	0	2	2				
	2,013.3	2.0								
			0	0	2	2				
	2,012.3	3.0								
			0	0	3	3				
	2,011.3	4.0						M		
			0	0	3	3				
2010	2,010.3	5.0								
			0	0	2	2				
	2,009.3	6.0								
			0	0	3	3				
	2,008.3	7.0								
			0	0	3	3				
	2,007.3	8.0								2,007.3 8.0
			0	0	2	2				**RESIDUAL**
	2,006.3	9.0								Very Loose to Loose, Tan-Orange-Brown, Silty Fine to Coarse SAND (A-2-4), with trace mica
			0	0	3	3				
2005	2,005.3	10.0								
			0	0	3	3		M		
	2,004.3	11.0								
			0	0	5	5				
	2,003.3	12.0								
			0	0	8	8				
	2,002.3	13.0								
			0	0	10	10				2,001.7 13.6
										Boring Terminated at Elevation 2,001.7 ft In Residual Silty SAND (A-2-4)
										Surficial Organic Soil from 0.0 to 0.2 feet.

WBS 34165.1.13	**TIP** I-2513AC	**COUNTY** BUNCOMBE	**GEOLOGIST** A. Blackmore
SITE DESCRIPTION RETAINING WALL NO. 5, -L- STA. 66+05.00 TO -L- STA. 81+75.93			**GROUND WTR (ft)**
BORING NO. WALL05_B-30	**STATION** 25+61	**OFFSET** 5 ft LT	**ALIGNMENT** -WALL5-	**0 HR.** Dry
COLLAR ELEV. 2,022.9 ft	**TOTAL DEPTH** 12.5 ft	**NORTHING** 680,584	**EASTING** 933,595	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE G. Sowers Dynamic Cone Penetrometer		**DRILL METHOD** Hand Auger/DCP	**HAMMER TYPE** N/A	
DRILLER N/A	**START DATE** 12/15/23	**COMP. DATE** 12/15/23	**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
2025										
	2,022.9	0.0								2,022.9 GROUND SURFACE 0.0
			0	0	2	2				**ROADWAY EMBANKMENT**
	2,021.9	1.0	0	0	1	1				Very Soft to Soft, Brown-Tan, Fine to Coarse Sandy SILT (A-4), with trace mica
	2,020.9	2.0	0	0	2	2				
	2,019.9	3.0	0	0	2	2				
	2,018.9	4.0	0	0	3	3				
	2,017.9	5.0	0	0	2	2				
	2,016.9	6.0	0	0	3	3		M		
	2,015.9	7.0	0	0	1	1				2,016.4 6.5
2015	2,014.9	8.0	0	0	2	2				Very Loose, Brown-Tan, Silty Fine to Coarse SAND (A-2-4)
	2,013.9	9.0	0	0	2	2				
	2,012.9	10.0	0	0	1	1				
	2,011.9	11.0	0	0	3	3		M		2,011.4 11.5
	2,010.9	12.0	0	0	8	8				**RESIDUAL**
										2,010.4 Stiff, Tan-Brown, Fine to Coarse Sandy SILT (A-4) 12.5
										Boring Terminated at Elevation 2,010.4 ft In Residual Sandy SILT (A-4)
										Surficial Organic Soil from 0.0 to 0.2 feet.

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34165.1.13	**TIP** I-2513AC	**COUNTY** BUNCOMBE	**GEOLOGIST** A. Blackmore	
SITE DESCRIPTION RETAINING WALL NO. 5, -L- STA. 66+05.00 TO -L- STA. 81+75.93				**GROUND WTR (ft)**
BORING NO. WALL05_B-31	**STATION** 26+34	**OFFSET** 5 ft RT	**ALIGNMENT** -WALL5-	**0 HR.** Dry
COLLAR ELEV. 2,032.2 ft	**TOTAL DEPTH** 7.5 ft	**NORTHING** 680,634	**EASTING** 933,649	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE G. Sowers Dynamic Cone Penetrometer		**DRILL METHOD** Hand Auger/DCP	**HAMMER TYPE** N/A	
DRILLER N/A	**START DATE** 12/15/23	**COMP. DATE** 12/15/23	**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
2035										ELEV. (ft) DEPTH (ft)
	2,032.2	0.0								2,032.2 GROUND SURFACE 0.0
	2,031.2	1.0	0	0	1	1				**ROADWAY EMBANKMENT** Very Soft to Stiff, Brown-Tan, Fine to Coarse Sandy SILT (A-4)
2030	2,030.2	2.0	0	0	2	2				
	2,029.2	3.0	0	0	3	3				
	2,028.2	4.0	0	0	3	3		M		
	2,027.2	5.0	0	0	2	2				
	2,026.2	6.0	0	0	3	3				
2025	2,025.2	7.0	0	0	2	2				
			0	0	8	8				2,024.7 7.5
										Boring Terminated at Elevation 2,024.7 ft In Roadway Embankment Sandy SILT (A-4)
										Surficial Organic Soil from 0.0 to 0.2 feet.

PROJECT REFERENCE NO.	SHEET NO.
I-2513AC	24

SOIL TEST RESULTS

BORING NO.	SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
								C. SAND	F. SAND	SILT	CLAY	10	40	200		
L_6950R	SS–755	18' LT	14+04 –WALL5–	3.5 – 5.0	A–4(0)	40	10	35.3	25.8	17.0	22.0	78.2	57.4	35.4	15.8	–
L_7100R	SS–815	19' LT	15+52 –WALL5–	0.9 – 2.4	A–2–4(0)	33	4	31.9	38.3	15.9	13.9	91.6	74.0	33.3	11.8	–
L_7400R	SS–835	21' LT	18+40 –WALL5–	1.0 – 2.5	A–6(4)	32	13	23.6	25.8	36.7	13.9	95.6	81.7	52.8	15.5	–

LAB TECHNICIAN: DANIEL REEVE NCDOT CERTIFICATION NO. 135–03–0816

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