

REFERENCE: I-5715

PROJECT: 50128

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	I-5715	1	5

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

STRUCTURE
SUBSURFACE INVESTIGATION

COUNTY MECKLENBURG
PROJECT DESCRIPTION I-77 AND NC 73 INTERCHANGE
UPGRADE EXISTING INTERCHANGE TO
SPLIT DIAMOND CONFIGURATION
SITE DESCRIPTION CULVERT EXTENSION ON -Y2-
(NC 73) FOR UNNAMED TRIBUTARY TO CALDWELL
STATION CREEK AT STA. 19+43 -Y2-

CONTENTS

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2, 2A	LEGEND (SOIL & ROCK)
3	SITE PLAN
4	BORE LOG
5	SITE PHOTOGRAPH

PERSONNEL

GUYTON, B.

KAHLON, J.

INVESTIGATED BY GUYTON, B.

DRAWN BY WELLS, T.

CHECKED BY CORLEY, D.

SUBMITTED BY WELLS, T.

DATE AUGUST 2026

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.

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 PERFORM INDEPENDENT SUBSURFACE INVESTIGATIONS AND MAKE INTERPRETATIONS AS NECESSARY TO CONFIRM CONDITIONS ENCOUNTERED ON THE 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.

NOTES:

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

Prepared in the Office of:



7327-G W. FRIENDLY AVE. 27410
GREENSBORO, NORTH CAROLINA
NC REGISTERED ENGINEERING FIRM: F-0969
NC REGISTERED GEOLOGIC FIRM: C-367



Signed by:

Thomas Wells

08/10/2026

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SIGNATURE

DATE

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

I-5715

2

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

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS (PAGE 1 OF 2)

SOIL DESCRIPTION										GRADATION																																																																								
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										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.																																																																								
SOIL LEGEND AND AASHTO CLASSIFICATION										ANGULARITY OF GRAINS																																																																								
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I-5715

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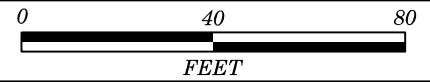
**NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
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SUBSURFACE INVESTIGATION

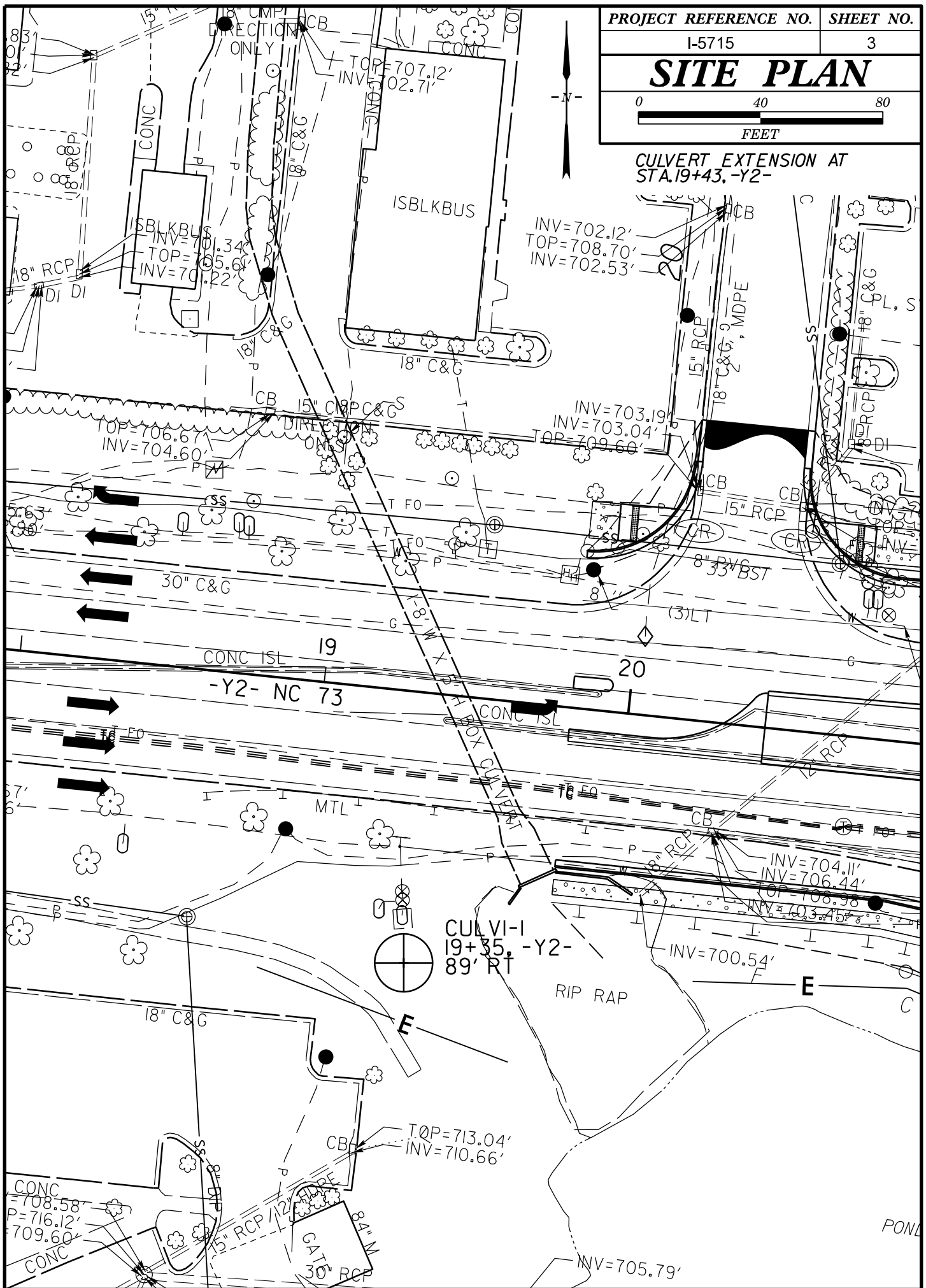
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS (PAGE 2 OF 2)

ROCK DESCRIPTION		TERMS AND DEFINITIONS
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:		ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.
WEATHERED ROCK (WR)		AQUIFER - A WATER BEARING FORMATION OR STRATA.
CRYSTALLINE ROCK (CR)		ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.
NON-CRYSTALLINE ROCK (NCR)		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.
COASTAL PLAIN SEDIMENTARY ROCK (CP)		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.
WEATHERING		CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.
FRESH	ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE.	COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.
VERY SLIGHT (V SL.)	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.	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.
SLIGHT (SL.)	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.	DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.
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.	DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.
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. <u>IF TESTED, WOULD YIELD SPT REFUSAL</u>	DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.
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. <u>IF TESTED, WOULD YIELD SPT N VALUES > 100 BPF</u>	FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.
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. <u>IF TESTED, WOULD YIELD SPT N VALUES < 100 BPF</u>	FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.
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.	Float - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL.
ROCK HARDNESS		FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.
VERY HARD	CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.	FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.
HARD	CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.	JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.
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.	LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.
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.	LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.
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.	MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.
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.	PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.
FRACTURE SPACING		RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.
TERM	SPACING	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.
VERY WIDE	MORE THAN 10 FEET	SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.
WIDE	3 TO 10 FEET	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.
MODERATELY CLOSE	1 TO 3 FEET	SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.
CLOSE	0.16 TO 1 FOOT	STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS IN 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.
VERY CLOSE	LESS THAN 0.16 FEET	STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.
BEDDING		STRATA ROCK QUALITY DESIGNATION (SROD) - 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.
TERM	THICKNESS	TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.
VERY THICKLY BEDDED	4 FEET	BENCH MARK: TOP OF BORING ELEVATION ESTIMATED USING PROJECT PROVIDED TIN FILE: I5715_MERGE_TIN_2018-II-01.TIN DATED 05/05/2023
THICKLY BEDDED	1.5 - 4 FEET	ELEVATION: N/A 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		NOTES:
FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.		FIAD - FILLED IMMEDIATELY AFTER DRILLING
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.	

SITE PLAN



CULVERT EXTENSION AT
STA. 19+43. -Y2-



GEOTECHNICAL BORING REPORT

BORE LOG

SHEET 4

WBS 50128.1.FS1				TIP I-5715		COUNTY MECKLENBURG				GEOLOGIST B. Guyton					
SITE DESCRIPTION CULVERT EXTENSION ON -Y2- (NC 73) FOR UNNAMED TRIBUTARY TO CALDWELL STATION CREEK										GROUND WTR (ft)					
BORING NO. CULV1-1				STATION 19+35				OFFSET 89 ft RT				ALIGNMENT -Y2-		0 HR. Dry	
COLLAR ELEV. 708.9 ft				TOTAL DEPTH 1.0 ft				NORTHING 621,238				EASTING 1,442,198		24 HR. FIAD	
DRILL RIG/HAMMER EFF./DATE N/A								DRILL METHOD Hand Auger				HAMMER TYPE Manual			
DRILLER N/A				START DATE 07/09/26				COMP. DATE 07/09/26				SURFACE WATER DEPTH N/A			
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					ELEV. (ft)
710															
															708.9 GROUND SURFACE 0.0 707.9 ARTIFICIAL FILL 1.0 Dense, Red-Brown, Fine Sandy SILT, Little Rip Rap, Trace of Organic Matter (A-4) Boring Terminated by Auger Refusal at Elevation 707.9 ft in ARTIFICIAL FILL: Sandy SILT, Little Rip Rap HAND AUGER OFFSET AT SEVERAL LOCATIONS BUT WERE UNABLE TO EXTEND THE HAND AUGER THROUGH THE RIP RAP

SITE PHOTOGRAPHS

PROJECT REFERENCE NO.

I-5715

SHEET NO.

5

CULVERT EXTENSION ON -Y2- (NC 73) FOR UNNAMED TRIBUTARY TO CALDWELL STATION CREEK AT STA.
19+43 -Y2-



VIEW FROM EAST OF CULVERT OUTLET LOOKING NORTHWEST

REFERENCE: I-5715

PROJECT: 50128

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	I-5715	1	5

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

STRUCTURE
SUBSURFACE INVESTIGATION

COUNTY MECKLENBURG
PROJECT DESCRIPTION I-77 AND NC 73 INTERCHANGE
UPGRADE EXISTING INTERCHANGE TO
SPLIT DIAMOND CONFIGURATION
SITE DESCRIPTION CULVERT EXTENSION OF 590360
ON -L3SB- (I-77 SBL) AND -Y2RPB- FOR CALDWELL
STATION CREEK AT STA. 20+03 -Y2RPB-

CONTENTS

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2, 2A	LEGEND (SOIL & ROCK)
3	SITE PLAN
4	BORE LOG
5	SITE PHOTOGRAPH

PERSONNEL

GUYTON, B.
KAHLON, J.

INVESTIGATED BY GUYTON, B.
DRAWN BY WELLS, T.
CHECKED BY CORLEY, D.
SUBMITTED BY WELLS, T.
DATE AUGUST 2026

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.

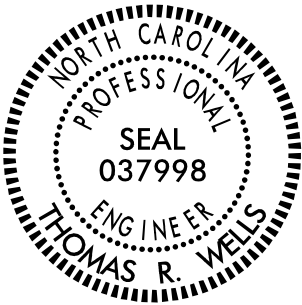
THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE SUBSURFACE PLANS ARE PRELIMINARY ONLY AND IN MANY CASES THE FINAL DESIGN DETAILS ARE DIFFERENT. FOR BIDDING AND CONSTRUCTION PURPOSES, REFER TO THE CONSTRUCTION PLANS AND DOCUMENTS FOR FINAL DESIGN INFORMATION ON THIS PROJECT. THE DEPARTMENT 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 PERFORM INDEPENDENT SUBSURFACE INVESTIGATIONS AND MAKE INTERPRETATIONS AS NECESSARY TO CONFIRM CONDITIONS ENCOUNTERED ON THE 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.

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

Prepared in the Office of:



7327-G W. FRIENDLY AVE. 27410
GREENSBORO, NORTH CAROLINA
NC REGISTERED ENGINEERING FIRM: F-0969
NC REGISTERED GEOLOGIC FIRM: C-367



Signed by: Thomas Wells 08/10/2026
F38C777458854EA...
SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

I-5715

2

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

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS (PAGE 1 OF 2)

SOIL DESCRIPTION										GRADATION																																																																								
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										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.																																																																								
SOIL LEGEND AND AASHTO CLASSIFICATION										ANGULARITY OF GRAINS																																																																								
THE ANGULARITY OF 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																																																																								
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<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>NON PLASTIC</th> <th>SLIGHTLY PLASTIC</th> <th>MODERATELY PLASTIC</th> <th>HIGHLY PLASTIC</th> <th>PLASTICITY INDEX (PI)</th> <th>DRY STRENGTH</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> <td></td> <td>0-5</td> <td>VERY LOW</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td>6-15</td> <td>SLIGHT</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td>16-25</td> <td>MEDIUM</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td>26 OR MORE</td> <td>HIGH</td> </tr> </tbody> </table>										NON PLASTIC	SLIGHTLY PLASTIC	MODERATELY PLASTIC	HIGHLY PLASTIC	PLASTICITY INDEX (PI)	DRY STRENGTH					0-5	VERY LOW					6-15	SLIGHT					16-25	MEDIUM					26 OR MORE	HIGH	DRILL UNITS: ☐ CME-45C ☐ CME-55 ☐ CME-550 ☐ VANE SHEAR TEST ☐ PORTABLE HOIST ADVANCING TOOLS: ☐ CLAY BITS ☐ 6" CONTINUOUS FLIGHT AUGER ☐ 8" HOLLOW AUGERS ☐ HARD FACED FINGER BITS ☐ TUNG-CARBIDE INSERTS ☐ CASING ☐ W/ ADVANCER ☐ TRICONE * STEEL TEETH ☐ TRICONE * TUNG.-CARB. ☐ CORE BIT HAMMER TYPE: ☐ AUTOMATIC ☐ MANUAL CORE SIZE: ☐ -B ☐ -H ☐ -N HAND TOOLS: ☐ POST HOLE DIGGER ☒ HAND AUGER ☐ SOUNDING ROD ☐ VANE SHEAR TEST																																										
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I-5715

2A

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

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS (PAGE 2 OF 2)

ROCK DESCRIPTION		TERMS AND DEFINITIONS
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:		ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.
WEATHERED ROCK (WR)		AQUIFER - A WATER BEARING FORMATION OR STRATA.
		ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.
CRYSTALLINE ROCK (CR)		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.
NON-CRYSTALLINE ROCK (NCR)		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.
COASTAL PLAIN SEDIMENTARY ROCK (CP)		CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.
WEATHERING		COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.
FRESH	ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE.	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.
VERY SLIGHT (V SL.)	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.	DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.
SLIGHT (SL.)	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.	DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.
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.	DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.
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. <u>IF TESTED, WOULD YIELD SPT REFUSAL</u>	FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.
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. <u>IF TESTED, WOULD YIELD SPT N VALUES > 100 BPF</u>	FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.
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. <u>IF TESTED, WOULD YIELD SPT N VALUES < 100 BPF</u>	FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL.
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.	FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.
ROCK HARDNESS		FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.
VERY HARD	CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.	JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.
HARD	CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.	LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.
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.	LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.
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.	MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.
SOFT	CAN BE GROOVED 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.	PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.
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.	RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.
FRACTURE SPACING		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.
TERM	SPACING	SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.
VERY WIDE	MORE THAN 10 FEET	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.
WIDE	3 TO 10 FEET	SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.
MODERATELY CLOSE	1 TO 3 FEET	STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS IN 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.
CLOSE	0.16 TO 1 FOOT	STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.
VERY CLOSE	LESS THAN 0.16 FEET	STRATA ROCK QUALITY DESIGNATION (SROD) - 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.
BEDDING		TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.
TERM	THICKNESS	BENCH MARK: TOP OF BORING ELEVATION ESTIMATED USING PROJECT PROVIDED TIN FILE: I5715_MERGE_TIN_2018-II-01.TIN DATED 05/05/2023
VERY THICKLY BEDDED	4 FEET	ELEVATION: N/A 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		NOTES:
FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.		FIAD - FILLED IMMEDIATELY AFTER DRILLING
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.	

SITE PHOTOGRAPHS

PROJECT REFERENCE NO.

SHEET NO.

I-5715

5

CULVERT EXTENSION OF 590360 ON -L3SB- (I-77 SBL) AND -Y2RPB- FOR CALDWELL STATION CREEK AT
STA. 20+03 -Y2RPB-



VIEW FROM SOUTH OF CULVERT OUTLET LOOKING NORTH

REFERENCE: I-5715

PROJECT: 50128

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	I-5715	1	5

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

STRUCTURE
SUBSURFACE INVESTIGATION

COUNTY MECKLENBURG
PROJECT DESCRIPTION I-77 AND NC 73 INTERCHANGE
UPGRADE EXISTING INTERCHANGE TO
SPLIT DIAMOND CONFIGURATION
SITE DESCRIPTION CULVERT EXTENSION OF 590453
ON -L3NB- (I-77 NBL) AND -Y2RPA- FOR CALDWELL
STATION CREEK AT STA. 20+53 -Y2RPA-

CONTENTS

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2, 2A	LEGEND (SOIL & ROCK)
3	SITE PLAN
4	BORE LOG
5	SITE PHOTOGRAPH

PERSONNEL

GUYTON, B.

KAHLON, J.

INVESTIGATED BY GUYTON, B.

DRAWN BY WELLS, T.

CHECKED BY CORLEY, D.

SUBMITTED BY WELLS, T.

DATE AUGUST 2026

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.

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 PERFORM INDEPENDENT SUBSURFACE INVESTIGATIONS AND MAKE INTERPRETATIONS AS NECESSARY TO CONFIRM CONDITIONS ENCOUNTERED ON THE 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.

NOTES:

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- 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.

Prepared in the Office of:



7327-G W. FRIENDLY AVE. 27410
GREENSBORO, NORTH CAROLINA
NC REGISTERED ENGINEERING FIRM: F-0969
NC REGISTERED GEOLOGIC FIRM: C-367



Signed by:

Thomas Wells

08/10/2026

F38C777458854EA...

SIGNATURE

DATE

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

I-5715

2

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

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS (PAGE 1 OF 2)

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 ($\leq 35\%$ 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			
SYMBOL														
% PASSING	50 MX 30 MX 15 MX	50 MX 25 MX 10 MX	50 MN 35 MX 10 MX	35 MX 10 MX 5 MN	35 MX 10 MX 5 MN	35 MX 10 MX 5 MN	35 MX 10 MX 5 MN	35 MN 10 MX 5 MN	35 MN 10 MX 5 MN	35 MN 10 MX 5 MN	35 MN 10 MX 5 MN	35 MN 10 MX 5 MN	GRANULAR SOILS	SILT-CLAY SOILS
MATERIAL PASSING #40 LL PI	— 6 MX	— NP	40 MX 10 MX 10 MX	41 MN 10 MX 11 MN	40 MX 11 MN 11 MN	40 MX 10 MX 11 MN	40 MX 10 MX 11 MN	40 MX 10 MX 11 MN	40 MX 10 MX 11 MN	40 MX 10 MX 11 MN	40 MX 10 MX 11 MN	40 MX 10 MX 11 MN	SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER	
GROUP INDEX	0	0	0	4 MX	8 MX	12 MX	16 MX	NO MX						HIGHLY ORGANIC SOILS
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

PI OF A-7-5 SUBGROUP IS $\leq$ LL - 30 ; PI OF A-7-6 SUBGROUP IS $>$ LL - 30

CONSISTENCY OR DENSENESS

PRIMARY SOIL TYPE	COMPACTNESS OR CONSISTENCY	RANGE OF STANDARD PENETRATION RESISTANCE (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 OPENING (MM)	4	10	40	60	200	270
	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
LL — LIQUID LIMIT	- SATURATED - (SAT.)	USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE
PLASTIC RANGE (PI)	- WET - (W)	SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE
OM — OPTIMUM MOISTURE SHRINKAGE LIMIT	- MOIST - (M)	SOLID; AT OR NEAR OPTIMUM MOISTURE
SL — SHRINKAGE LIMIT	- DRY - (D)	REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE

PLASTICITY

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

COLOR

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

GRADATION

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

ANGULARITY OF GRAINS

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

MINERALOGICAL COMPOSITION

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

COMPRESSIBILITY

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

PERCENTAGE OF MATERIAL

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

GROUND WATER

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

MISCELLANEOUS SYMBOLS

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

RECOMMENDATION SYMBOLS

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

ABBREVIATIONS

AR - AUGER REFUSAL	MED. - MEDIUM	VST - VANE SHEAR TEST
BT - BORING TERMINATED	MICA - MICACEOUS	WEA. - WEATHERED
CL - CLAY	MOD. - MODERATELY	UNIT WEIGHT
CPT - CONE PENETRATION TEST	NP - NON PLASTIC	UNIT WEIGHT
CSE. - COARSE	ORG. - ORGANIC	DRY UNIT WEIGHT
DMT - DILATOMETER TEST	PMT - PRESSUREMETER TEST	
DPT - DYNAMIC PENETRATION TEST	SAP. - SAPROLITIC	SAMPLE ABBREVIATIONS
e - VOID RATIO	SD. - SAND, SANDY	S - BULK
F - FINE	SL. - SILT, SILTY	SS - SPLIT SPOON
FOSS. - FOSSILIFEROUS	SLL. - SLIGHTLY	ST - SHELBY TUBE
FRAC. - FRACTURED, FRACTURES	TCR - TRICONE REFUSAL	RS - ROCK
FRAGS. - FRAGMENTS	w - MOISTURE CONTENT	RT - RECOMPACTED TRIAXIAL
HI. - HIGHLY	V - VERY	CBR - CALIFORNIA BEARING RATIO

EQUIPMENT USED ON SUBJECT PROJECT

DRILL UNITS:	ADVANCING TOOLS:	HAMMER TYPE:
☐ CME-45C	☐ CLAY BITS	☐ AUTOMATIC ☐ MANUAL
☐ CME-55	☐ 6" CONTINUOUS FLIGHT AUGER	
☐ CME-550	☐ 8" HOLLOW AUGERS	CORE SIZE:
☐ VANE SHEAR TEST	☐ HARD FACED FINGER BITS	☐ -B ☐ -H
☐ PORTABLE HOIST	☐ TUNG-CARBIDE INSERTS	☐ -N
☐	☐ CASING ☐ W/ ADVANCER	HAND TOOLS:
☐	☐ TRICONE * STEEL TEETH	☒ POST HOLE DIGGER
☐	☐ TRICONE * TUNG.-CARB.	☐ HAND AUGER
☐	☐ CORE BIT	☐ SOUNDING ROD
		☐ VANE SHEAR TEST

I-5715

2A

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

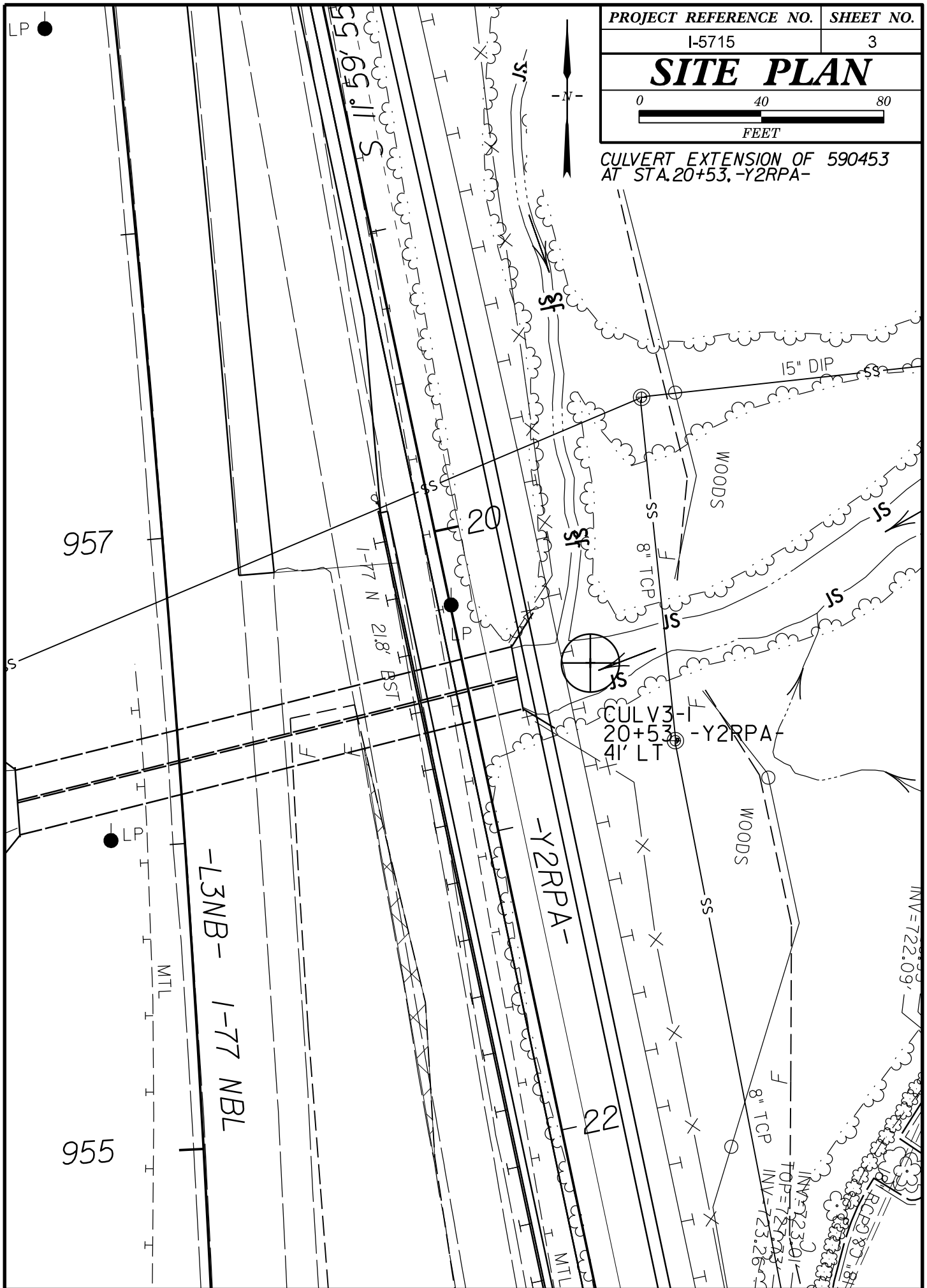
SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS (PAGE 2 OF 2)

ROCK DESCRIPTION		TERMS AND DEFINITIONS
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:		ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.
WEATHERED ROCK (WR)		AQUIFER - A WATER BEARING FORMATION OR STRATA.
CRYSTALLINE ROCK (CR)		ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.
NON-CRYSTALLINE ROCK (NCR)		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.
COASTAL PLAIN SEDIMENTARY ROCK (CP)		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.
WEATHERING		CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.
FRESH	ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE.	COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.
VERY SLIGHT (V SL.)	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.	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.
SLIGHT (SL.)	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.	DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.
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.	DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.
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. <u>IF TESTED, WOULD YIELD SPT REFUSAL</u>	DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.
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. <u>IF TESTED, WOULD YIELD SPT N VALUES > 100 BPF</u>	FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.
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. <u>IF TESTED, WOULD YIELD SPT N VALUES < 100 BPF</u>	FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.
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.	FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL.
ROCK HARDNESS		FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.
VERY HARD	CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.	FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.
HARD	CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.	JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.
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.	LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.
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.	LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.
SOFT	CAN BE GROOVED 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.	MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.
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.	PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.
FRACTURE SPACING		RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.
TERM	SPACING	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.
VERY WIDE	MORE THAN 10 FEET	SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.
WIDE	3 TO 10 FEET	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.
MODERATELY CLOSE	1 TO 3 FEET	SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.
CLOSE	0.16 TO 1 FOOT	STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS IN 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.
VERY CLOSE	LESS THAN 0.16 FEET	STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.
BEDDING		STRATA ROCK QUALITY DESIGNATION (SROD) - 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.
TERM	THICKNESS	TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.
VERY THICKLY BEDDED	4 FEET	BENCH MARK: TOP OF BORING ELEVATION ESTIMATED USING PROJECT PROVIDED TIN FILE: I5715_MERGE_TIN_2018-II-01.TIN DATED 05/05/2023
THICKLY BEDDED	1.5 - 4 FEET	ELEVATION: N/A 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		NOTES:
FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.		FIAD - FILLED IMMEDIATELY AFTER DRILLING
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.	

PROJECT REFERENCE NO.	SHEET NO.
I-5715	3
SITE PLAN	

CULVERT EXTENSION OF 590453
AT STA.20+53, -Y2RPA-



SITE PHOTOGRAPHS

PROJECT REFERENCE NO.

SHEET NO.

I-5715

5

CULVERT EXTENSION OF 590453 ON -L3NB- (I-77 NBL) AND -Y2RPA- FOR CALDWELL STATION CREEK AT
STA. 20+53 -Y2RPA-



VIEW FROM SOUTH OF CULVERT OUTLET LOOKING NORTH

REFERENCE: I-5715

PROJECT: 50128

CONTENTS

<u>SHEET NO.</u>	<u>DESCRIPTION</u>
1	TITLE SHEET
2	LEGEND (SOIL & ROCK)
3	SITE PLAN
4 - 5	PROFILES
6 - 10	BORE LOGS
11	SOIL TEST RESULTS

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

STRUCTURE
SUBSURFACE INVESTIGATION

COUNTY MECKLENBURG
PROJECT DESCRIPTION I-77 AND NC 73 INTERCHANGE,
UPGRADE EXISTING INTERCHANGE TO
SPLIT DIAMOND CONFIGURATION

SITE DESCRIPTION NOISE WALL 1 ALONG -Y2RPB-
FROM STATION 10+00.93 TO 20+81.43 -NW1-

INVENTORY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	I-5715	1	11

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.

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 PERFORM INDEPENDENT SUBSURFACE INVESTIGATIONS AND MAKE INTERPRETATIONS AS NECESSARY TO CONFIRM CONDITIONS ENCOUNTERED ON THE 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.

- NOTES:
1. THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N. C. DEPARTMENT OF TRANSPORTATION AS ACCURATE NOR IS IT CONSIDERED PART OF THE PLANS, SPECIFICATIONS OR CONTRACT FOR THE PROJECT.
 2. 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.

PERSONNEL
GRAINGER, P.
TOOTHMAN, R.

INVESTIGATED BY GRAINGER, P.

DRAWN BY FIELDS, W. D.

CHECKED BY CORLEY, D. J.

SUBMITTED BY WELLS, T. R.

DATE MARCH 2025

Prepared in the Office of:



7327-G W. FRIENDLY AVE.
GREENSBORO, NORTH CAROLINA 27410
NC REGISTERED ENGINEERING FIRM: E-0869
NC REGISTERED GEOLOGIC FIRM: C-367



Signed by: Thomas Wells 04/13/2026
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SIGNATURE DATE
**DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED**

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

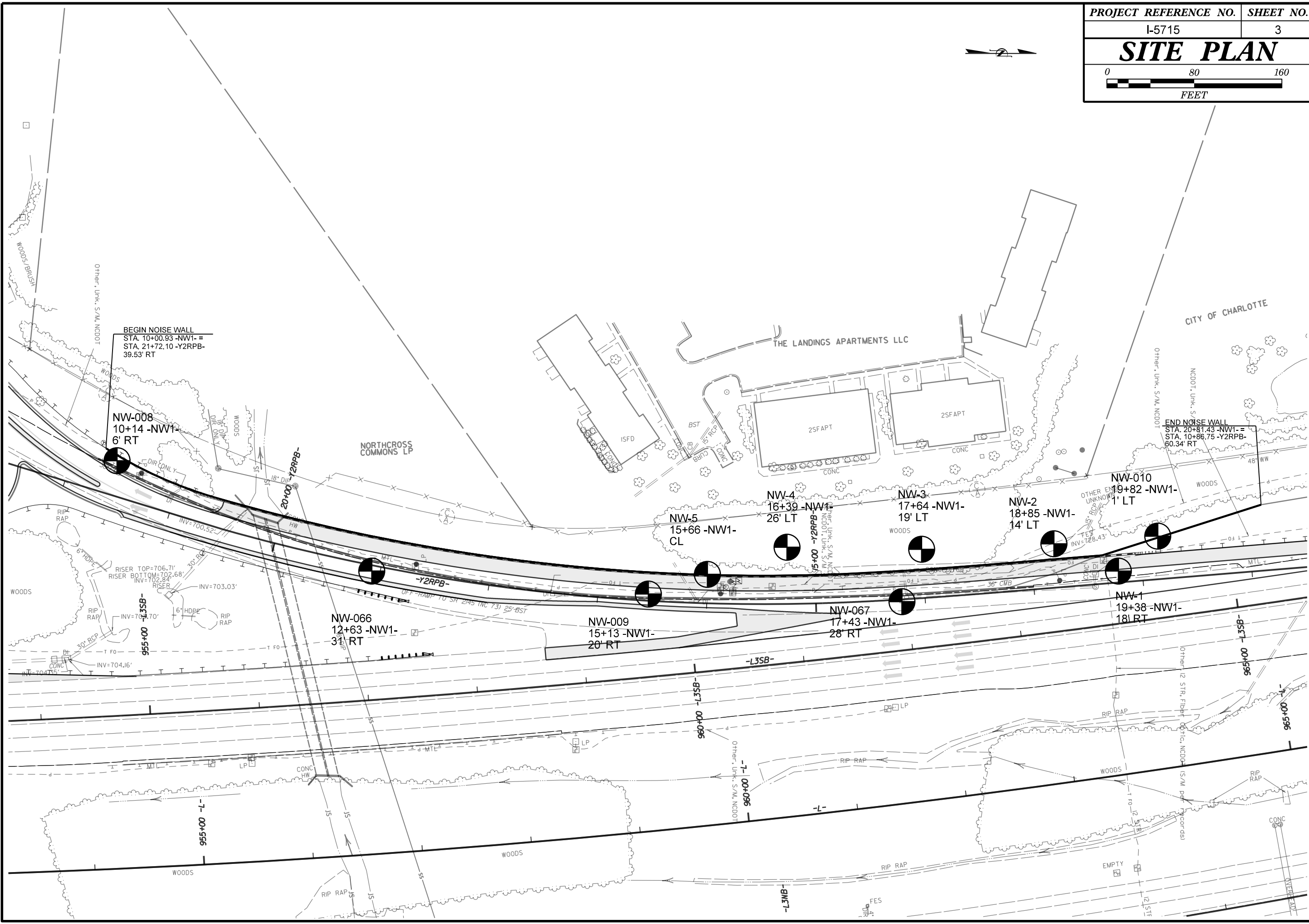
DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

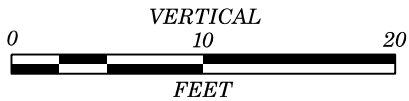
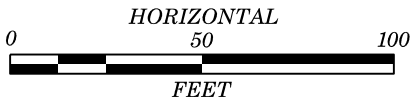
SUBSURFACE INVESTIGATION

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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, <i>VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6</i>												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.												HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT REFUSAL IF TESTED. 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TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
SOIL LEGEND AND AASHTO CLASSIFICATION												ANGULARITY OF GRAINS												WEATHERED ROCK (WR)												NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
GENERAL CLASS.		GRANULAR MATERIALS (≤ 35% PASSING #200)						SILT-CLAY MATERIALS (> 35% PASSING #200)						ORGANIC MATERIALS						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.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
GROUP CLASS.	A-1-a	A-1-b	A-3	A-2-4	A-2-5	A-2-6	A-2-7	A-4	A-5	A-6	A-7	A-1-A-2	A-4-A-5	A-6-A-7	A-3	A-6-A-7	NON-CRYSTALLINE ROCK (NCR)	FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
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% PASSING	#10	50 MX	30 MX	50 MX	51 MN	10 MX	35 MX	35 MX	35 MX	35 MX	36 MN	36 MN	36 MN	36 MN	36 MN	36 MN	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.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
MATERIAL PASSING #40	LL	—	—	40 MX	41 MN	40 MX	41 MN	40 MX	41 MN	40 MX	41 MN	40 MX	41 MN	40 MX	41 MN	41 MN	WEATHERING																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
PI	6 MX	NP	10 MX	10 MX	11 MN	11 MN	10 MX	10 MX	11 MN	11 MN	10 MX	10 MX	11 MN	11 MN	11 MN	11 MN	FRESH																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
GROUP INDEX	0	0	0	4 MX	8 MX	12 MX	16 MX	NO MX	SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER								MODERATELY SEVERE (MOD. SEV.)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
USUAL TYPES OF MAJOR MATERIALS	STONE FRAGS, GRAVEL, AND SAND	FINE SAND	SILTY OR CLAYEY GRAVEL AND SAND				SILTY SOILS				CLAYEY SOILS				HIGHLY ORGANIC SOILS								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. <i>IF TESTED, WOULD YIELD SPT REFUSAL</i>																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
GEN. RATING AS SUBGRADE	EXCELLENT TO GOOD						FAIR TO POOR						FAIR TO POOR		POOR		UNSATISFACTORY		SEVERE (SEV.)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
PI OF A-7-5 SUBGROUP IS ≤ LL - 30; PI OF A-7-6 SUBGROUP IS > LL - 30												MISCELLANEOUS SYMBOLS												ROCK HARDNESS												VERY HARD																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
PRIMARY SOIL TYPE		COMPACTNESS OR CONSISTENCY		RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE)				RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT ²)						ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION		25/025 DIP & DIP DIRECTION OF ROCK STRUCTURES		SLOPE INDICATOR INSTALLATION		CONE PENETROMETER TEST																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
GENERALLY GRANULAR MATERIAL (NON-COHESIVE)		VERY LOOSE LOOSE MEDIUM DENSE DENSE VERY DENSE		< 4 4 TO 10 10 TO 30 30 TO 50				N/A						SOIL SYMBOL		TEST BORING		CONCRETE		SEVERE (SEV.)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
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						ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT		AUGER BORING		TEST BORING WITH CORE		COMPLETE																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
TEXTURE OR GRAIN SIZE												RECOMMENDATION SYMBOLS												FRACTURE SPACING												BEDDING																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
U.S. STD. SIEVE SIZE OPENING (MM)		4 4.76		10 2.00		40 0.42		60 0.25		200 0.075		270 0.053		UNDERCUT		UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE		UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK		VERY HARD																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
BOULDER (BLDR.)		COBBLE (COB.)		GRAVEL (GR.)		COARSE SAND (CSE, SD.)		FINE SAND (F SD.)		SILT (SL.)		CLAY (CL.)		SHALLOW UNDERCUT		UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK		HARD																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
GRAIN SIZE		305 12		75 3		2.0		0.25		0.05		0.005		AR - AUGER REFUSAL		MED. - MEDIUM		VST - VANE SHEAR TEST		MODERATELY HARD																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
SOIL MOISTURE - CORRELATION OF TERMS												ABBREVIATIONS												SOFT												VERY SOFT																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
SOIL MOISTURE SCALE (ATTERBERG LIMITS)				FIELD MOISTURE DESCRIPTION				GUIDE FOR FIELD MOISTURE DESCRIPTION				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				HL. - HIGHLY				MED. - MEDIUM				MICA. - MICACEOUS				MOD. - MODERATELY				NP - NON PLASTIC				ORG. - ORGANIC				PMT - PRESSUREMETER TEST				SAP. - SAPROLITIC				SD. - SAND, SANDY				SL. - SILT, SILTY				SL. - SLIGHTLY				TCR. - TRICONE REFUSAL				w - MOISTURE CONTENT				V - VERY				WEA. - WEATHERED				UNIT WEIGHT				DRY UNIT WEIGHT				SAMPLE ABBREVIATIONS				S - BULK				SS - SPLIT SPOON				ST - SHELBY TUBE				RS - ROCK				RT - RECOMPACTED TRIAXIAL				CBR - CALIFORNIA BEARING RATIO				SOFT				VERY SOFT																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
PLASTICITY												EQUIPMENT USED ON SUBJECT PROJECT												FRIABLE												MODERATELY INDURATED												INDURATED												EXTREMELY INDURATED																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
LL		LIQUID LIMIT		- SATURATED - (SAT.)				USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE				DRILL UNITS:		ADVANCING TOOLS:				HAMMER TYPE:				CORE SIZE:				HAND TOOLS:				FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
PL		PLASTIC LIMIT		- WET - (W)				SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE				CME-45C		CLAY BITS				AUTOMATIC				-B				POST HOLE DIGGER				RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
OM		OPTIMUM MOISTURE		- MOIST - (M)				SOLID; AT OR NEAR OPTIMUM MOISTURE				CME-55		6" CONTINUOUS FLIGHT AUGER				-N				H				HAND AUGER				GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
SL		SHRINKAGE LIMIT		- DRY - (D)				REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE				CME-550		HARD FACED FINGER BITS												SOUNDING ROD				GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
PLASTICITY INDEX (PI)												DRY STRENGTH												CME-55 (TRI0055)		CASING				W/ ADVANCER								VANE SHEAR TEST				TRICONE				STEEL TEETH				TRICONE				TUNG.-CARB.				CORE BIT				3/4" HOLLOW STEM AUGERS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											



NOTE: INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ON THE EXISTING GROUND PROFILE ALONG THE CENTERLINE OF -NW1- TAKEN FROM THE PROVIDED NOISE WALL PROFILE DATED 2/25/2026.



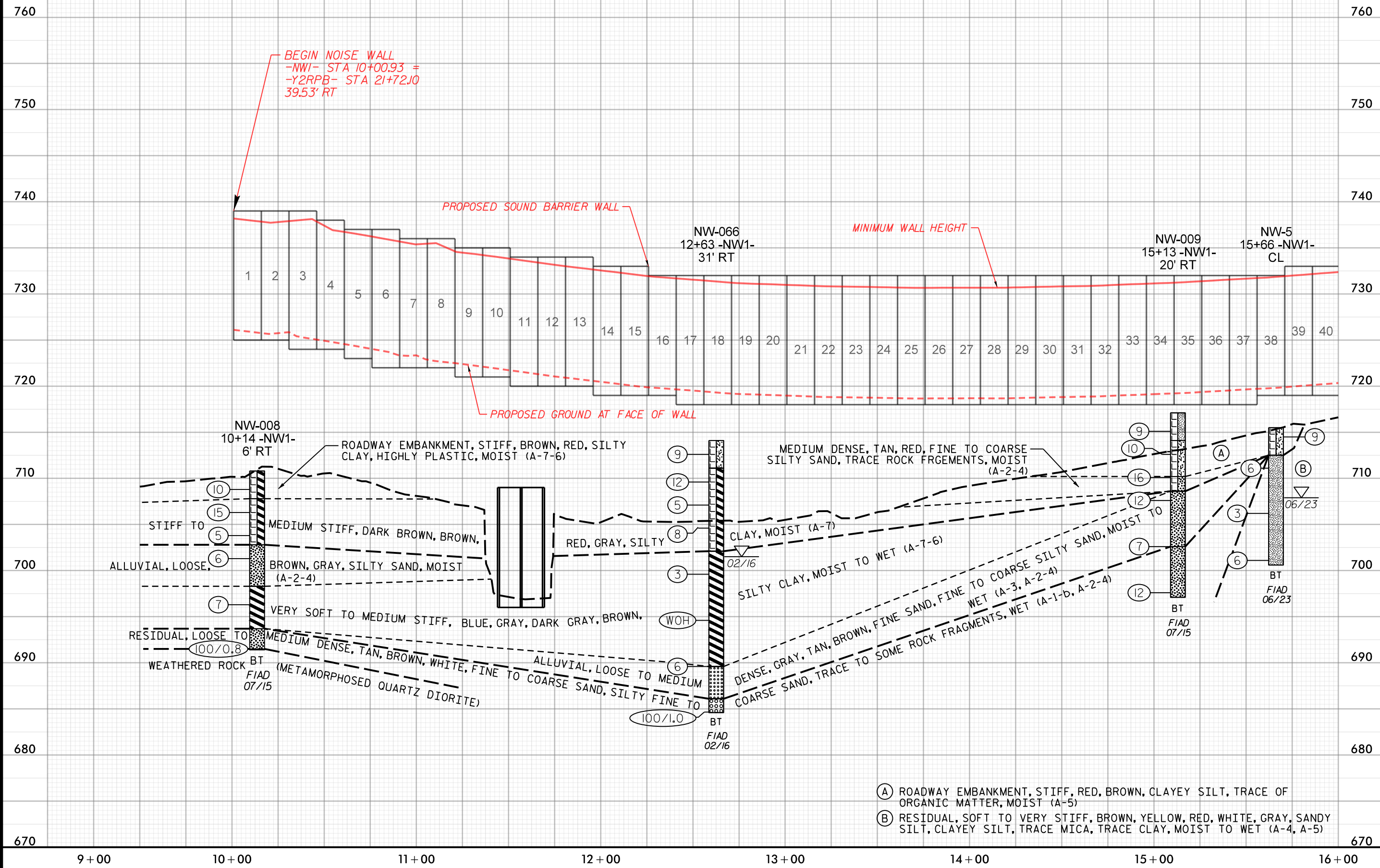
VE = 5

PROJECT REFERENCE NO. SHEET NO.

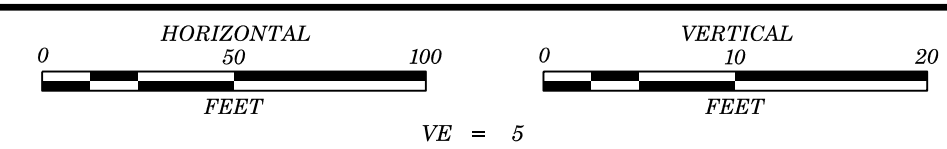
I-5715

4

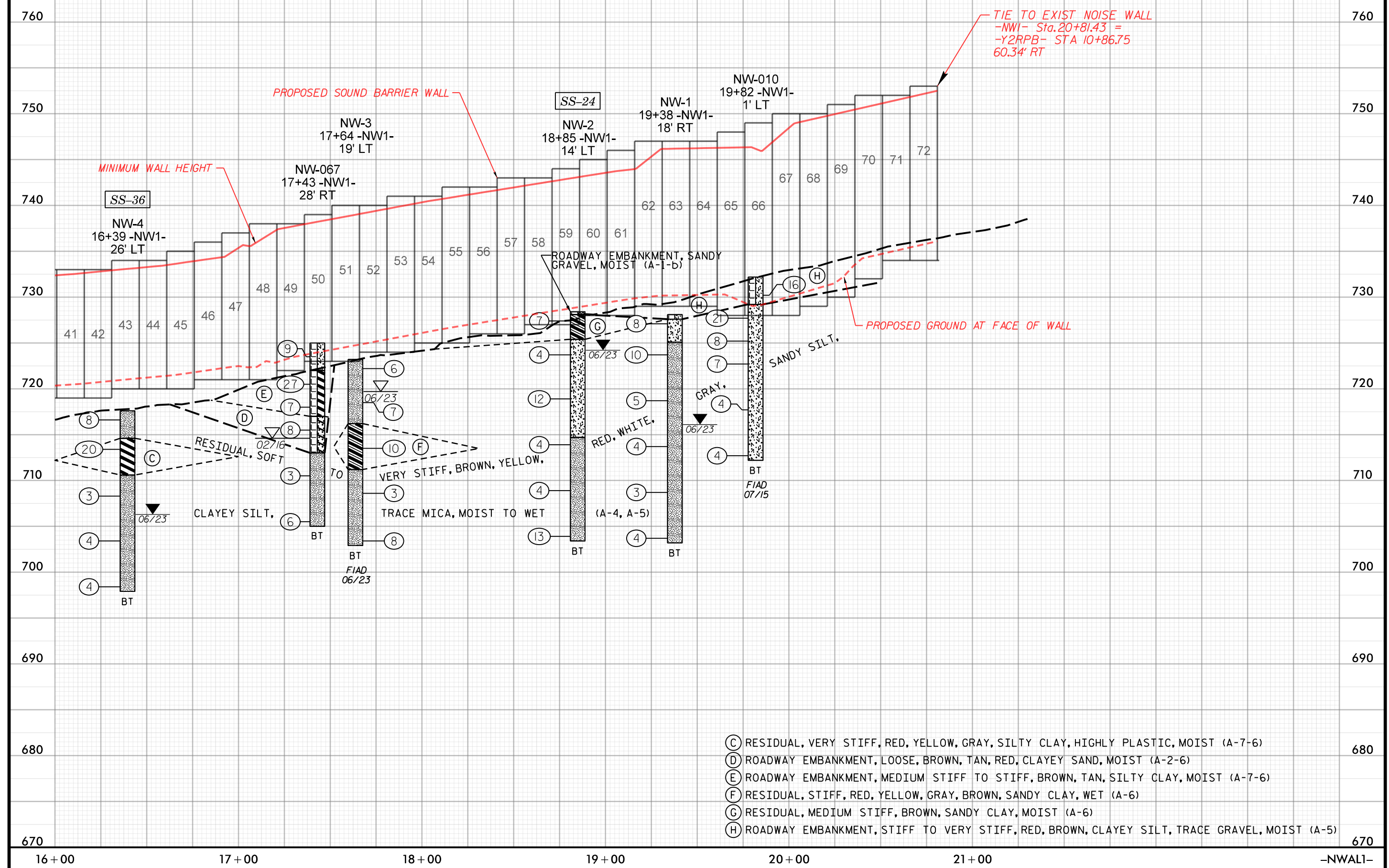
NOISE WALL 1 FROM STA. 10+00.93 TO STA. 20+81.43 -NW1-



NOTE: INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ON THE EXISTING GROUND PROFILE ALONG THE CENTERLINE OF -NW1- TAKEN FROM THE PROVIDED NOISE WALL PROFILE DATED 2/25/2026.



PROJECT REFERENCE NO.	SHEET NO.
I-5715	5
NOISE WALL 1 FROM STA. 10+00.93 TO STA. 20+81.43 -NW1-	



GEOTECHNICAL BORING REPORT
BORE LOG

WBS 50128.1.FS1			TIP I-5715			COUNTY MECKLENBURG			GEOLOGIST Contract Geologist				
SITE DESCRIPTION NOISE WALL 1 ALONG -Y2RPB- FROM STA. 10+00.93 TO 20+81.43 -NW1-											GROUND WTR (ft)		
BORING NO. NW-008			STATION 10+14			OFFSET 6 ft RT			ALIGNMENT -NW1-			0 HR. Dry	
COLLAR ELEV. 710.8 ft			TOTAL DEPTH 19.4 ft			NORTHING 622,100			EASTING 1,443,008			24 HR. FIAD	
DRILL RIG/HAMMER EFF./DATE SDS7893 CME-550X 82% 03/13/2015						DRILL METHOD H.S. Augers				HAMMER TYPE Automatic			
DRILLER Contract Driller			START DATE 07/29/15			COMP. DATE 07/29/15			SURFACE WATER DEPTH N/A				
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
			0.5ft	0.5ft	0.5ft	0	25	50	75	100			
715													
710	709.8	1.0	2	4	6								710.8 GROUND SURFACE 0.0
705	707.3	3.5	6	7	8								ROADWAY EMBANKMENT
	704.8	6.0	2	3	2								STIFF, BROWN, RED, SILTY CLAY, HIGHLY PLASTIC, MOIST (A-7-6)
700	702.3	8.5	2	3	3								STIFF TO MEDIUM STIFF, BROWN, GRAY, SILTY CLAY, MOIST (A-7-6)
695	697.3	13.5	WOH	2	5								ALLUVIAL
	692.3	18.5											LOOSE, BROWN, GRAY, SILTY SAND, MOIST (A-2-4)
													698.3 MEDIUM STIFF, GRAY, BROWN, SILTY CLAY, MOIST (A-7-6) 12.5
													692.8 18.0
													691.5 19.3
													691.4 19.4
													RESIDUAL
													VERY DENSE, BROWN, TAN, SILTY SAND, TRACE ROCK FRAGMENTS, MOIST (A-2-4)
													WEATHERED ROCK
													METAMORPHOSED QUARTZ DIORITE
													Boring Terminated at Elevation 691.4 ft IN WEATHERED ROCK (METAMORPHOSED QUARTZ DIORITE)

WBS 50128.1.FS1			TIP I-5715			COUNTY MECKLENBURG			GEOLOGIST Contract Geologist					
SITE DESCRIPTION NOISE WALL 1 ALONG -Y2RPB- FROM STA. 10+00.93 TO 20+81.43 -NW1-										GROUND WTR (ft)				
BORING NO. NW-066			STATION 12+63			OFFSET 31 ft RT			ALIGNMENT -NW1-		0 HR. 12.6			
COLLAR ELEV. 714.1 ft			TOTAL DEPTH 29.5 ft			NORTHING 622,333			EASTING 1,443,109		24 HR. FIAD			
DRILL RIG/HAMMER EFF./DATE SDS7893 CME-550X 82% 03/13/2015						DRILL METHOD H.S. Augers				HAMMER TYPE Automatic				
DRILLER Contract Driller			START DATE 02/11/16			COMP. DATE 02/11/16			SURFACE WATER DEPTH N/A					
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				
715														
710	713.6	0.5	5	4	5									714.1 GROUND SURFACE 0.0
	710.6	3.5	3	6	6									ROADWAY EMBANKMENT 3.0
705	708.1	6.0	2	3	2									STIFF, TAN, BROWN, CLAYEY SILT, MOIST (A-5)
	705.6	8.5	3	3	5									STIFF TO MEDIUM STIFF, DARK BROWN, BROWN, RED, GRAY, SILTY CLAY, MOIST (A-7)
700	700.6	13.5	WOH	1	2									12.0
														ALLUVIAL
695	695.6	18.5	WOH	WOH	WOH									VERY SOFT TO SOFT, BLUE, DARK GRAY, BROWN, SILTY CLAY, WET (A-7)
690	690.6	23.5	WOH	2	4									
685	685.6	28.5	33	77	0.5									689.6 24.5
														LOOSE, GRAY, TAN, FINE SAND, WET (A-3)
														686.1 28.0
														684.6 29.5
														RESIDUAL
														VERY DENSE, TAN, BROWN, WHITE, FINE TO COARSE SAND, SOME ROCK FRAGMENTS, WET (A-1-b)
														Boring Terminated at Elevation 684.6 ft IN RESIDUAL, FINE TO COARSE SAND

NCDOT BORE DOUBLE I5715_GEO_NWAL_BORELOGS.GPJ NC_DOT.GDT 3/6/26

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 50128.1.FS1			TIP I-5715			COUNTY MECKLENBURG			GEOLOGIST Contract Geologist				
SITE DESCRIPTION NOISE WALL 1 ALONG -Y2RPB- FROM STA. 10+00.93 TO 20+81.43 -NW1-										GROUND WTR (ft)			
BORING NO. NW-009			STATION 15+13			OFFSET 20 ft RT			ALIGNMENT -NW1-		0 HR. Dry		
COLLAR ELEV. 717.1 ft			TOTAL DEPTH 20.0 ft			NORTHING 622,586			EASTING 1,443,130		24 HR. FIAD		
DRILL RIG/HAMMER EFF./DATE SDS7893 CME-550X 82% 03/13/2015						DRILL METHOD H.S. Augers			HAMMER TYPE Automatic				
DRILLER Contract Driller			START DATE 07/29/15			COMP. DATE 07/29/15			SURFACE WATER DEPTH N/A				
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
			0.5ft	0.5ft	0.5ft	0	25	50	75	100			ELEV. (ft) DEPTH (ft)
720													
715	716.1	1.0	3	4	5								717.1 GROUND SURFACE 0.0
	713.6	3.5	3	5	5						M		ROADWAY EMBANKMENT STIFF, RED, BROWN, SANDY SILT, MOIST (A-4) 3.0
	711.1	6.0	9	7	9						M		STIFF, BROWN, GRAY, CLAYEY SILT, MOIST (A-5) 6.9
710	708.6	8.5	4	5	7						M		710.2 MEDIUM DENSE, TAN, RED, FINE TO COARSE SILTY SAND, TRACE ROCK FRGEMENTS, MOIST (A-2-4) 8.5
	703.6	13.5	2	3	4						M		708.6
705													ALLUVIAL LOOSE TO MEDIUM DENSE, BROWN, TAN, FINE TO COARSE SILTY SAND, MOIST (A-2-4) 14.5
	700												702.6
	698.6	18.5	3	5	7						M		RESIDUAL LOOSE TO MEDIUM DENSE, BROWN, TAN, FINE TO COARSE SILTY SAND, MOIST (A-2-4) 20.0
													Boring Terminated at Elevation 697.1 ft IN RESIDUAL, SILTY SAND

WBS 50128.1.FS1			TIP I-5715			COUNTY MECKLENBURG			GEOLOGIST GRAINGER, P.				
SITE DESCRIPTION NOISE WALL 1 ALONG -Y2RPB- FROM STA. 10+00.93 TO 20+81.43 -NW1-											GROUND WTR (ft)		
BORING NO. NW-5			STATION 15+66			OFFSET 0 ft LT			ALIGNMENT -NW1-		0 HR.	7.6	
COLLAR ELEV. 715.5 ft			TOTAL DEPTH 14.9 ft			NORTHING 622,640			EASTING 1,443,112		24 HR.	FIAD	
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 83% 05/09/2022						DRILL METHOD H.S. Augers				HAMMER TYPE Automatic			
DRILLER TOOTHMAN, R.			START DATE 06/08/23			COMP. DATE 06/08/23			SURFACE WATER DEPTH N/A				
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
			0.5ft	0.5ft	0.5ft	0	25	50	75	100			
720													
715	715.5	0.0											715.5 GROUND SURFACE 0.0
710	712.1	3.4	3	5	4						M	LN	ROADWAY EMBANKMENT
			3	3	3						M	LN	STIFF, BROWN, CLAYEY SILT, TRACE OF ORGANIC MATTER, MOIST (A-5) 3.0
705	707.2	8.3									▽		RESIDUAL
	702.1	13.4	2	1	2						M		MEDIUM STIFF TO SOFT, BROWN, YELLOW, WHITE, SANDY SILT, TRACE MICA, MOIST (A-4)
			2	2	4						M		697.1 20.0
													Boring Terminated at Elevation 700.6 ft IN RESIDUAL, SANDY SILT

NCDOT BORE DOUBLE I5715_GEO_NWAL_BORELOGS.GPJ NC_DOT.GDT 3/6/26

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 50128.1.FS1			TIP I-5715			COUNTY MECKLENBURG			GEOLOGIST GRAINGER, P.							
SITE DESCRIPTION NOISE WALL 1 ALONG -Y2RPB- FROM STA. 10+00.93 TO 20+81.43 -NW1-									GROUND WTR (ft)							
BORING NO. NW-4			STATION 16+39			OFFSET 26 ft LT			ALIGNMENT -NW1-			0 HR. Dry				
COLLAR ELEV. 717.6 ft			TOTAL DEPTH 19.7 ft			NORTHING 622,713			EASTING 1,443,087			24 HR. 11.3				
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 83% 05/09/2022						DRILL METHOD H.S. Augers			HAMMER TYPE Automatic							
DRILLER TOOTHMAN, R.			START DATE 06/07/23			COMP. DATE 06/07/23			SURFACE WATER DEPTH N/A							
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
720																
715	717.6	0.0												717.6	GROUND SURFACE	0.0
	714.4	3.2	2	3	5							M		714.6	RESIDUAL MEDIUM STIFF, BROWN, SANDY SILT, MOIST (A-4)	3.0
710	714.4	3.2	6	10	10						SS-36	13%			710.6	VERY STIFF, RED, YELLOW, GRAY, SILTY CLAY, HIGHLY PLASTIC, MOIST (A-7-6)
	709.3	8.3	1	2	1							M			710.6	SOFT TO MEDIUM STIFF, RED, YELLOW, BROWN, WHITE, GRAY, SANDY SILT, TRACE MICA, MOIST TO WET (A-4)
705	704.4	13.2	1	2	2							M				
700	699.4	18.2	1	1	3							W			697.9	Boring Terminated at Elevation 697.9 ft IN RESIDUAL, SANDY SILT

WBS 50128.1.FS1			TIP I-5715			COUNTY MECKLENBURG			GEOLOGIST Contract Geologist					
SITE DESCRIPTION NOISE WALL 1 ALONG -Y2RPB- FROM STA. 10+00.93 TO 20+81.43 -NW1-											GROUND WTR (ft)			
BORING NO. NW-067			STATION 17+43			OFFSET 28 ft RT			ALIGNMENT -NW1-		0 HR. 10.4			
COLLAR ELEV. 725.0 ft			TOTAL DEPTH 20.0 ft			NORTHING 622,818			EASTING 1,443,137		24 HR. FIAD			
DRILL RIG/HAMMER EFF./DATE SDS7893 CME-550X 82% 03/13/2015						DRILL METHOD H.S. Augers			HAMMER TYPE Automatic					
DRILLER Contract Driller			START DATE 02/11/16			COMP. DATE 02/11/16			SURFACE WATER DEPTH N/A					
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				
725														725.0 GROUND SURFACE 0.0
720	724.5	0.5	3	4	5								M	722.0 ROADWAY EMBANKMENT STIFF, BROWN, TAN, CLAYEY SILT, MOIST (A-5) 3.0
	721.5	3.5	5	13	14								M	719.0 VERY STIFF TO MEDIUM STIFF, BROWN, TAN, SILTY CLAY, MOIST (A-7-6) 8.0
	719.0	6.0	2	3	4								M	717.0 LOOSE, BROWN, TAN, RED, CLAYEY SAND, MOIST (A-2-6) 12.0
715	716.5	8.5	2	4	4									713.0 RESIDUAL SOFT TO MEDIUM STIFF, BROWN, TAN, WHITE, SANDY SILT, WET (A-4) 20.0
	711.5	13.5	WOH	1	2								W	705.0 Boring Terminated at Elevation 705.0 ft IN RESIDUAL, SANDY SILT
710														
705	706.5	18.5	2	2	4								W	

NCDOT BORE DOUBLE I5715_GEO_NWAL_BORELOGS.GPJ NC_DOT.GDT 3/6/26

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 50128.1.FS1				TIP I-5715				COUNTY MECKLENBURG				GEOLOGIST GRAINGER, P.					
SITE DESCRIPTION NOISE WALL 1 ALONG -Y2RPB- FROM STA. 10+00.93 TO 20+81.43 -NW1-												GROUND WTR (ft)					
BORING NO. NW-1				STATION 19+38				OFFSET 18 ft RT				ALIGNMENT -NW1-				0 HR. 13.4	
COLLAR ELEV. 728.1 ft				TOTAL DEPTH 24.9 ft				NORTHING 623,016				EASTING 1,443,109				24 HR. 12.0	
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 83% 05/09/2022								DRILL METHOD H.S. Augers				HAMMER TYPE Automatic					
DRILLER TOOTHMAN, R.				START DATE 06/07/23				COMP. DATE 06/07/23				SURFACE WATER DEPTH N/A					
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION			
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						ELEV. (ft)	DEPTH (ft)
730																	
725	728.1	0.0	2	4	4									728.1	0.0		
	724.7	3.4	3	4	6									725.1	3.0		
720	719.7	8.4	2	2	3												
	714.7	13.4	1	2	2												
710	709.7	18.4	1	1	2												
	704.7	23.4	1	2	2												
705																	

WBS 50128.1.FS1			TIP I-5715			COUNTY MECKLENBURG			GEOLOGIST Contract Geologist					
SITE DESCRIPTION NOISE WALL 1 ALONG -Y2RPB- FROM STA. 10+00.93 TO 20+81.43 -NW1-										GROUND WTR (ft)				
BORING NO. NW-010			STATION 19+82			OFFSET 1 ft LT			ALIGNMENT -NW1-		0 HR. Dry			
COLLAR ELEV. 732.2 ft			TOTAL DEPTH 20.0 ft			NORTHING 623,052			EASTING 1,443,077		24 HR. FIAD			
DRILL RIG/HAMMER EFF./DATE SDS7893 CME-550X 82% 03/13/2015						DRILL METHOD H.S. Augers			HAMMER TYPE Automatic					
DRILLER Contract Driller			START DATE 07/29/15			COMP. DATE 07/29/15			SURFACE WATER DEPTH N/A					
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				
735														
730	731.2	1.0	7	8	8								732.2 GROUND SURFACE 0.0	
	728.7	3.5	7	10	11								729.2 VERY STIFF, BROWN, RED, SANDY SILT, MOIST (A-5) 3.0	
725	726.2	6.0	3	3	5								VERY STIFF TO SOFT, RED, BROWN, SANDY SILT, MOIST (A-5)	
	723.7	8.5	2	3	4									
720														
	718.7	13.5	2	2	2									
715														
	713.7	18.5	2	1	3								712.2 Boring Terminated at Elevation 712.2 ft IN RESIDUAL, CLAYEY SILT 20.0	

NCDOT BORE DOUBLE I5715_GEO_NWAL_BORELOGS.GPJ NC_DOT.GDT 3/6/26

LABORATORY TESTING SUMMARY

PROJECT NUMBER: 50128.1.FS1

TIP: I-5715

COUNTY: MECKLENBURG

DESCRIPTION: I-77 AND THE NC 73 INTERCHANGE. NOISE WALL 1 ALONG -Y2RPB- FROM STA. 10+00.93 TO 20+80+62 -NW1-

[illegible]

Mitra Grabski
Certified Lab Technician Signature

114-01-1203
NCDOT Certification Number

REFERENCE: I-5715

PROJECT: 50128

CONTENTS

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	LEGEND (SOIL & ROCK)
3	SITE PLAN
4 - 5	PROFILES
6 - 11	BORE LOGS
12	SOIL TEST RESULTS

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

ROADWAY
SUBSURFACE INVESTIGATION

COUNTY MECKLENBURG
PROJECT DESCRIPTION I-77 AND NC 73 INTERCHANGE,
UPGRADE EXISTING INTERCHANGE TO
SPLIT DIAMOND CONFIGURATION

SITE DESCRIPTION MSE RETAINING WALLS NO.1 AND
NO.2 AT BRIDGE NO.1415, END BENT NO.1
AND END BENT NO.2

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	I-5715	1	12

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.

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 PERFORM INDEPENDENT SUBSURFACE INVESTIGATIONS AND MAKE INTERPRETATIONS AS NECESSARY TO CONFIRM CONDITIONS ENCOUNTERED ON THE 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.

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

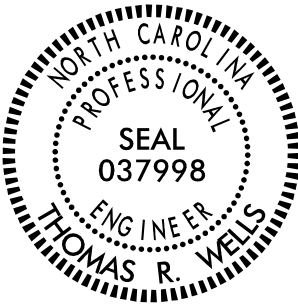
PERSONNEL
GRAINGER, P.
TURNAGE, J.
GRAHL, D.
TOOTHMAN, R.

INVESTIGATED BY POSADAS, A.
DRAWN BY FIELDS, W. D.
CHECKED BY RIGGS, A.F., JR.
SUBMITTED BY WELLS, T. R.
DATE MAY 2025

Prepared in the Office of:



7327-G W. FRIENDLY AVE.
GREENSBORO, NORTH CAROLINA 27410
NC REGISTERED ENGINEERING FIRM: E-0869
NC REGISTERED GEOLOGIC FIRM: C-367



Signed by: Thomas R. Wells 05/20/2025
F38C777458854EA SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

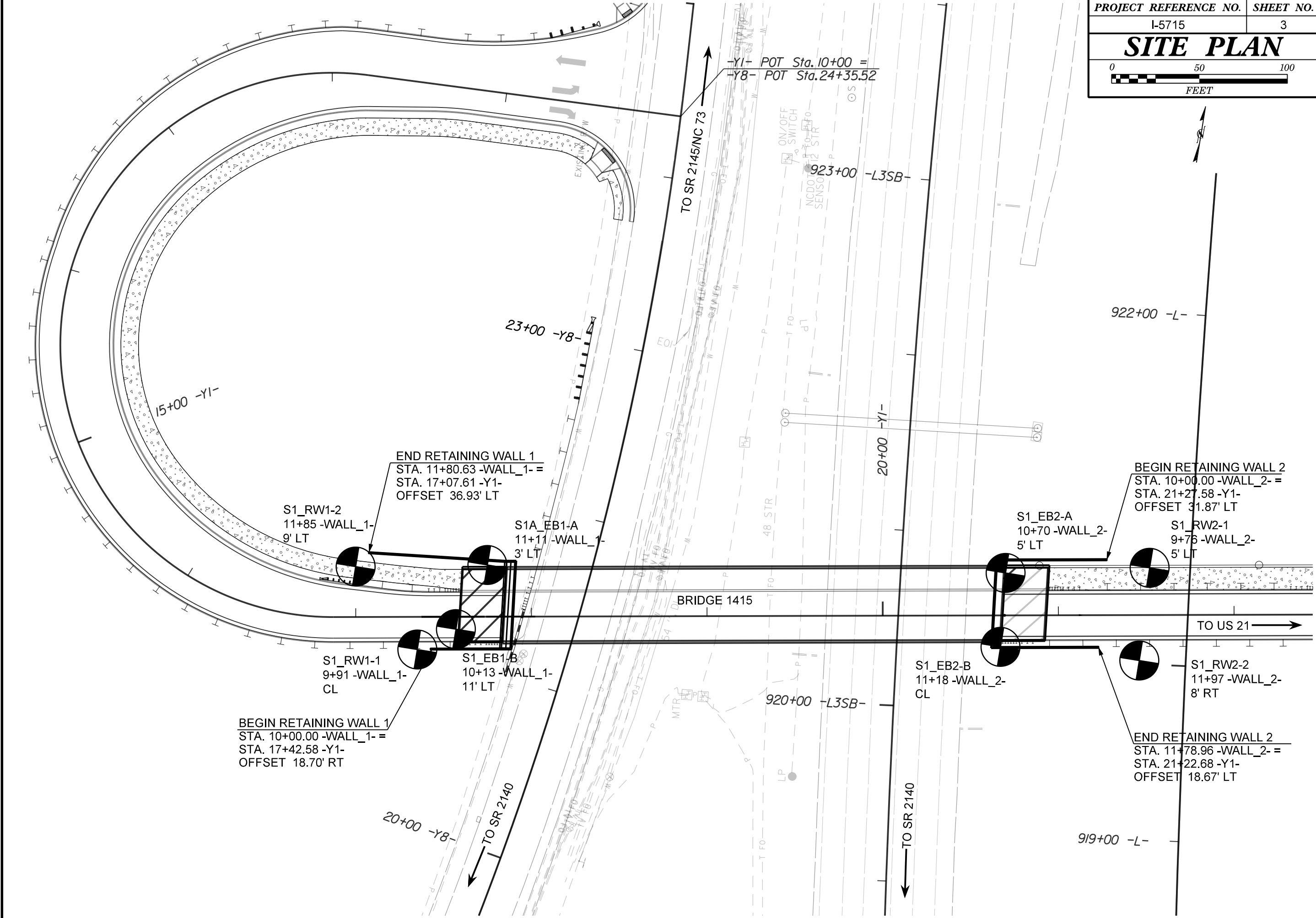
DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

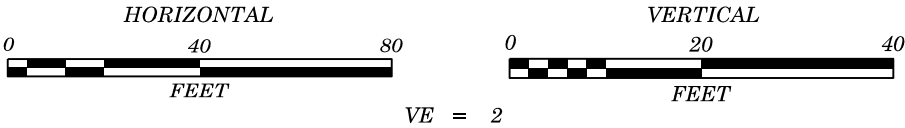
SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

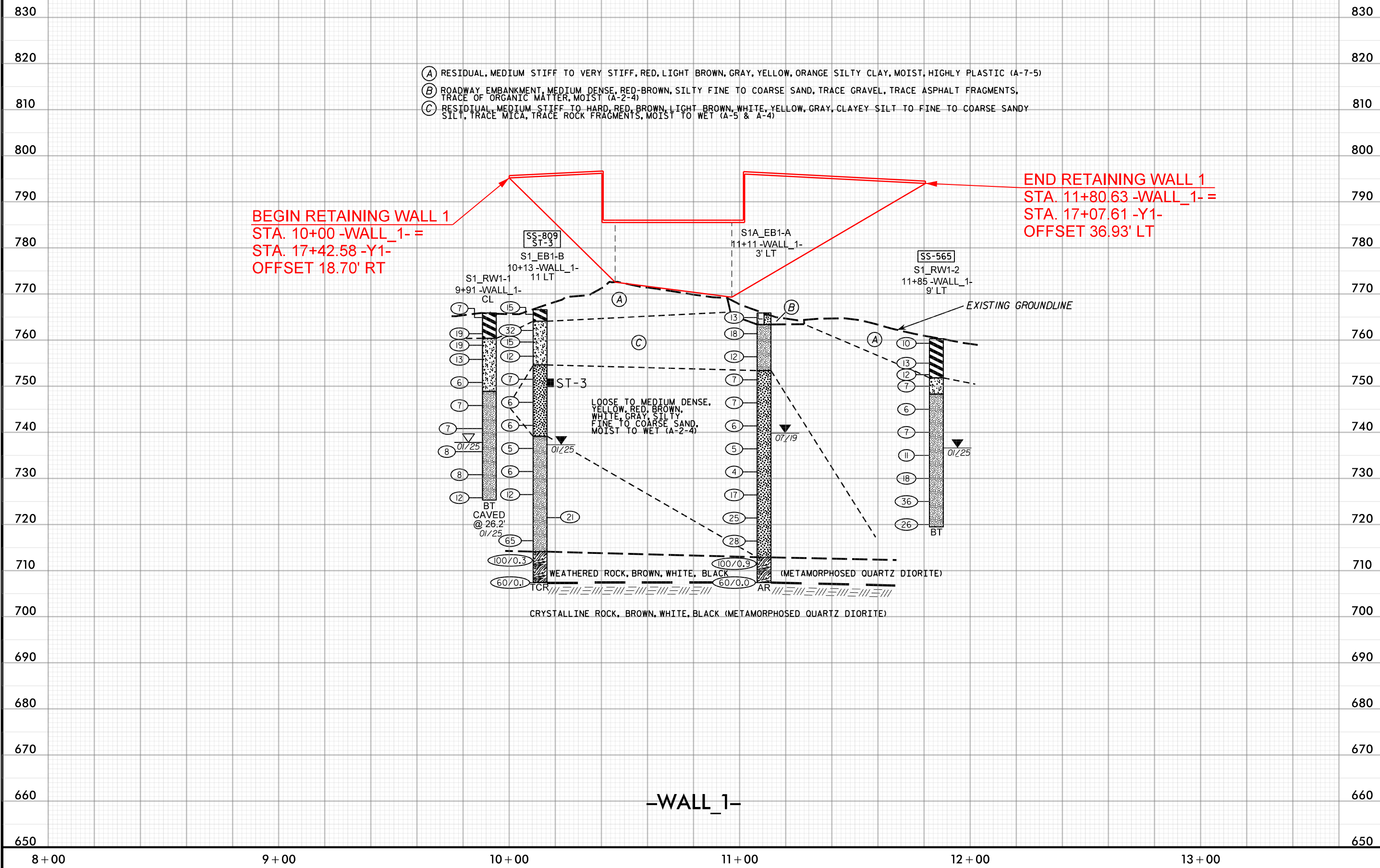
SOIL DESCRIPTION										GRADATION										ROCK DESCRIPTION										TERMS AND DEFINITIONS																																																																																																																																	
SOIL IS CONSIDERED UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS 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, <i>VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6</i>										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.										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) CRYSTALLINE ROCK (CR) NON-CRYSTALLINE ROCK (NCR) COASTAL PLAIN SEDIMENTARY ROCK (CP)										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 DISLOOGED 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 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 (SROD) - 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.																																																																																																																																	
SOIL LEGEND AND AASHTO CLASSIFICATION										ANGULARITY OF GRAINS										MINERALOGICAL COMPOSITION										COMPRESSIONIBILITY										PERCENTAGE OF MATERIAL										GROUND WATER										MISCELLANEOUS SYMBOLS										RECOMMENDATION SYMBOLS										ABBREVIATIONS										EQUIPMENT USED ON SUBJECT PROJECT																																																																					
GENERAL CLASS.										SILT-CLAY MATERIALS (> 35% PASSING #200)										ORGANIC MATERIALS										THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.										MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.										SLIGHTLY COMPRESSIBLE MODERATELY COMPRESSIBLE HIGHLY COMPRESSIBLE										ORGANIC MATERIAL TRACE OF ORGANIC MATTER LITTLE ORGANIC MATTER MODERATELY ORGANIC HIGHLY ORGANIC										WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING STATIC WATER LEVEL AFTER 24 HOURS PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA SPRING OR SEEP										ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION SOIL SYMBOL ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT INFERRED SOIL BOUNDARY INFERRED ROCK LINE ALLUVIAL SOIL BOUNDARY										UNDERCUT SHALLOW UNDERCUT UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK										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 HL - 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 W - UNIT WEIGHT W _d - DRY UNIT WEIGHT SAMPLE ABBREVIATIONS S - BULK SS - SPLIT SPOON ST - SHELBY TUBE RS - ROCK RT - RECOMPACTED TRIAXIAL CBR - CALIFORNIA BEARING RATIO										DRILL UNITS: ☐ CME-45C ☐ CME-55 ☐ CME-550 ☐ VANE SHEAR TEST ☐ PORTABLE HOIST ☒ CME-55 (TR10055) ☒ MOBILE B-57 (TR4013)										ADVANCING TOOLS: ☐ CLAY BITS ☐ 6" CONTINUOUS FLIGHT AUGER ☐ 8" HOLLOW AUGERS ☐ HARD FACED FINGER BITS ☐ TUNG-CARBIDE INSERTS ☐ CASING ☐ W/ ADVANCER ☐ TRICONE ☐ STEEL TEETH ☒ TRICONE 2-15/16" TUNG-CARB. ☐ CORE BIT ☒ 3-1/4" HOLLOW STEM AUGERS										HAMMER TYPE: ☒ AUTOMATIC ☐ MANUAL CORE SIZE: ☐ -B ☐ -H ☐ -N HAND TOOLS: ☐ POST HOLE DIGGER ☐ HAND AUGER ☐ SOUNDING ROD ☐ VANE SHEAR TEST									
TEXTURE OR GRAIN SIZE										CONSISTENCY OR DENSENESS										ROCK HARDNESS										FRACTURE SPACING										BEDDING										INDURATION																																																																																																													
U.S. STD. SIEVE SIZE OPENING (MM)										RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE)										RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT ²)										VERY HARD HARD MODERATELY HARD MEDIUM HARD SOFT VERY SOFT										TERM VERY WIDE WIDE MODERATELY CLOSE CLOSE VERY CLOSE										SPACING MORE THAN 10 FEET 3 TO 10 FEET 1 TO 3 FEET 0.16 TO 1 FOOT LESS THAN 0.16 FEET										TERM VERY THICKLY BEDDED THICKLY BEDDED THINLY BEDDED VERY THINLY BEDDED THICKLY LAMINATED THINLY LAMINATED										THICKNESS 4 FEET 1.5 - 4 FEET 0.16 - 1.5 FEET 0.03 - 0.16 FEET 0.008 - 0.03 FEET < 0.008 FEET										FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC. FRIABLE MODERATELY INDURATED INDURATED EXTREMELY INDURATED										RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE. GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER. GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER. SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.																																																																					
SOIL MOISTURE - CORRELATION OF TERMS										PLASTICITY										BENCH MARK: SEE BELOW										ELEVATION: SEE BELOW FEET										NOTES: FIAD - FILLED IMMEDIATELY AFTER DRILLING BENCH MARKS: TOP OF CATCH BASIN, STA. 20+16 -Y8-, 19.0' LT N: 618532 FT, E: 1443007 FT, ELEV. 775.72 FT TOP OF DROP INLET, STA. 92+02 -L3NB-, 58.0' LT N: 618820 FT, E: 1443484 FT, ELEV. 765.98 FT																																																																																																																							
SOIL MOISTURE SCALE (ATTERBERG LIMITS)										FIELD MOISTURE DESCRIPTION										GUIDE FOR FIELD MOISTURE DESCRIPTION																																																																																																																																											
LL - LIQUID LIMIT										- SATURATED - (SAT.)										USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE																																																																																																																																											
PL - PLASTIC LIMIT										- WET - (W)										SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE																																																																																																																																											
OM - OPTIMUM MOISTURE										- MOIST - (M)										SOLID; AT OR NEAR OPTIMUM MOISTURE																																																																																																																																											
SL - SHRINKAGE LIMIT										- DRY - (D)										REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE																																																																																																																																											
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.																																																																																																																																																															



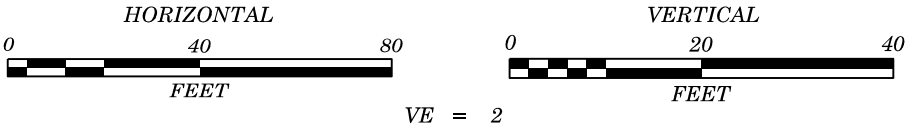
NOTE: INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ON TO THE EXISTING GROUND PROFILE ALONG THE CENTERLINE OF -WALL_1- TAKEN FROM THE PROVIDED PROJECT TIN FILE (i5715_ls_tin.tin) DATE 12/18/2024.



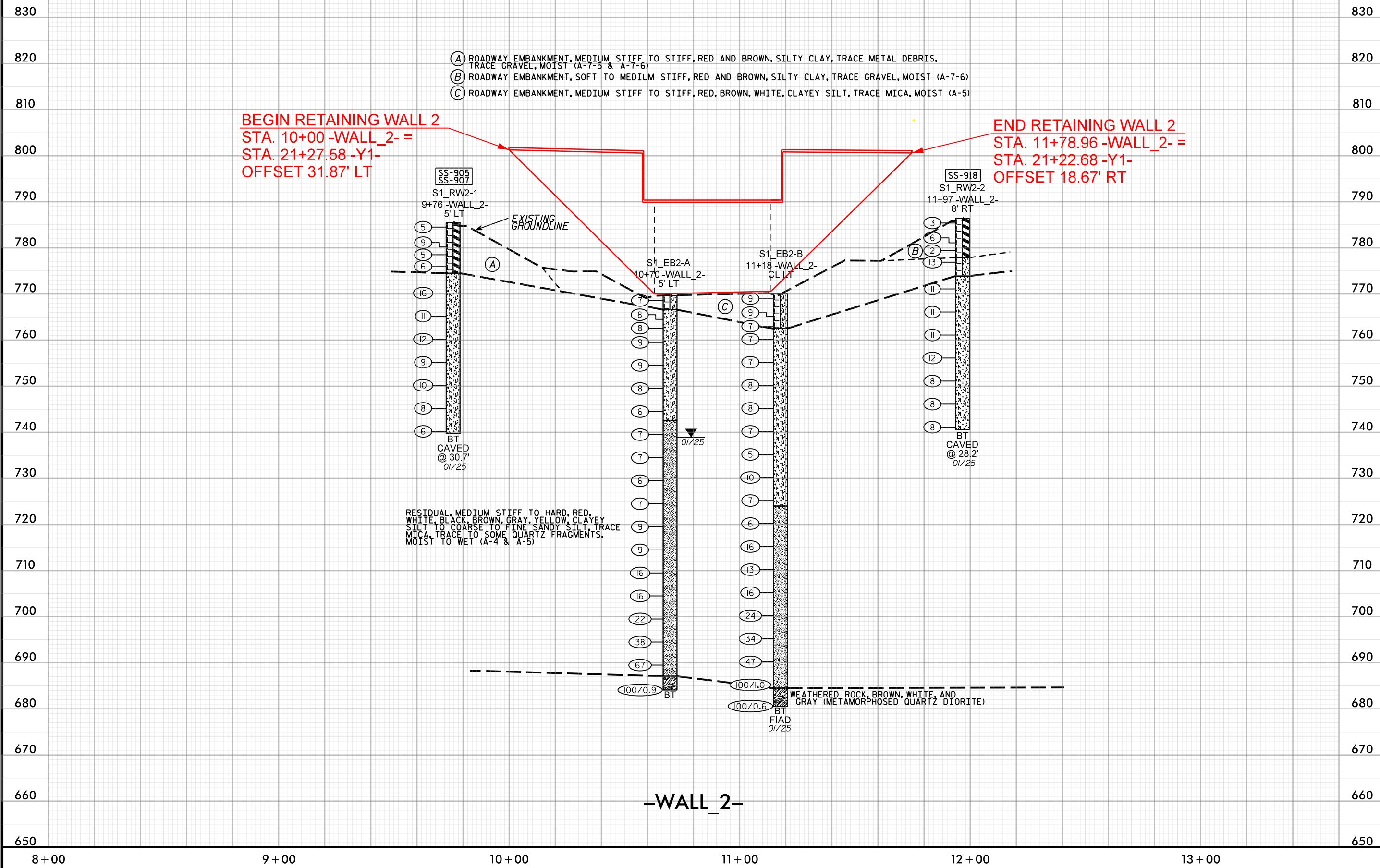
PROJECT REFERENCE NO.	SHEET NO.
I-5715	4
CENTERLINE PROFILE ALONG (-WALL_1-) AT END BENT NO.1	

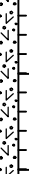
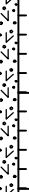
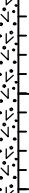


NOTE: INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ON TO THE EXISTING GROUND PROFILE ALONG THE CENTERLINE OF -WALL_2- TAKEN FROM THE PROVIDED PROJECT TIN FILE (i5715_ls_tin.tin) DATE 12/18/2024.



PROJECT REFERENCE NO.	SHEET NO.
I-5715	5
CENTERLINE PROFILE ALONG (-WALL_2-) AT END BENT NO. 2	



WBS 50128.1.FS1			TIP I-5715			COUNTY MECKLENBURG			GEOLOGIST GRAINGER, P.							
SITE DESCRIPTION MSE Retaining Wall No. 2 at Bridge No. 1415, End Bent No. 2											GROUND WTR (ft)					
BORING NO. S1_RW2-1			STATION 9+76			OFFSET 5 ft LT			ALIGNMENT -WALL_2-			0 HR. Dry				
COLLAR ELEV. 785.5 ft			TOTAL DEPTH 45.8 ft			NORTHING 618,735			EASTING 1,443,361			24 HR. Caved				
DRILL RIG/HAMMER EFF./DATE TER4013 Mobile B-57 88% 11/12/2024						DRILL METHOD H.S. Augers			HAMMER TYPE Automatic							
DRILLER TURNAGE, J. R.			START DATE 01/16/25			COMP. DATE 01/17/25			SURFACE WATER DEPTH N/A							
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				ELEV. (ft)	DEPTH (ft)	
790																
785	785.5	0.0	2	3	2										785.5	0.0
780	781.2	4.3	3	5	4						SS-905	14%		ROADWAY EMBANKMENT MEDIUM STIFF TO STIFF, RED AND BROWN, SILTY CLAY, TRACE METAL DEBRIS, TRACE GRAVEL, MOIST (A-7-5 & A-7-6)		
	779.5	6.0	1	3	2							M				
775	777.0	8.5	2	3	3						SS-907	17%		RESIDUAL VERY STIFF TO MEDIUM STIFF, RED, CLAYEY SILT, TRACE MICA, MOIST (A-5)		
	771.2	14.3	4	7	9							M				
770																
765	766.2	19.3	2	5	6											
	761.2	24.3	3	5	7							M				
760	756.2	29.3	3	4	5											
	751.2	34.3	2	4	6							M				
755	746.2	39.3	2	4	4											
	741.2	44.3	2	2	4							M				
740																
															739.7	45.8
Boring Terminated at Elevation 739.7 ft IN RESIDUAL CLAYEY SILT																

NCDOT BORE DOUBLE I5715_GEO_STRUC.GPJ NC_DOT.GDT 5/16/25

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 50128.1.FS1						TIP I-5715						COUNTY MECKLENBURG						GEOLOGIST GRAINGER, P.							
SITE DESCRIPTION MSE Retaining Wall No. 2 at Bridge No. 1415, End Bent No. 2																		GROUND WTR (ft)							
BORING NO. S1_EB2-A						STATION 10+70						OFFSET 5 ft LT						ALIGNMENT -WALL_2-						0 HR. N/A	
COLLAR ELEV. 769.6 ft						TOTAL DEPTH 85.5 ft						NORTHING 618,719						EASTING 1,443,281						24 HR. 30.7	
DRILL RIG/HAMMER EFF./DATE TER4013 Mobile B-57 88% 11/12/2024												DRILL METHOD Mud Rotary						HAMMER TYPE Automatic							
DRILLER TURNAGE, J. R.						START DATE 01/21/25						COMP. DATE 01/24/25						SURFACE WATER DEPTH N/A							
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION											
			0.5ft 0.5ft 0.5ft			0 25 50 75 100								ELEV. (ft) DEPTH (ft)											
770	769.6	0.0	2	3	4									769.6 GROUND SURFACE 0.0											
765	765.5	4.1	2	3	5									ROADWAY EMBANKMENT											
	763.6	6.0	2	4	4									MEDIUM STIFF, RED AND BROWN, CLAYEY SILT, TRACE MICA, MOIST (A-5) 3.0											
760	760.5	9.1	3	4	5									RESIDUAL											
														STIFF TO MEDIUM STIFF, RED, WHITE, BLACK, AND YELLOW, CLAYEY SILT, TRACE MICA (A-5)											
755	755.5	14.1	2	4	5																				
750	750.5	19.1	3	3	5																				
745	745.5	24.1	2	3	3																				
740	740.5	29.1	2	3	4																				
735	735.5	34.1	2	3	4																				
730	730.5	39.1	1	3	3																				
725	725.5	44.1	2	2	5																				
720	720.5	49.1	2	4	5																				
715	715.5	54.1	3	3	6																				
710	710.5	59.1	5	7	9																				
705	705.5	64.1	4	6	10																				
700	700.5	69.1	5	8	14																				
695	695.5	74.1	13	17	21																				
690	690.5	79.1																							

WBS 50128.1.FS1			TIP I-5715			COUNTY MECKLENBURG			GEOLOGIST GRAINGER, P.			
SITE DESCRIPTION MSE Retaining Wall No. 2 at Bridge No. 1415, End Bent No. 2									GROUND WTR (ft)			
BORING NO. S1_EB2-A			STATION 10+70			OFFSET 5 ft LT			ALIGNMENT -WALL_2-			0 HR. N/A
COLLAR ELEV. 769.6 ft			TOTAL DEPTH 85.5 ft			NORTHING 618,719			EASTING 1,443,281			24 HR. 30.7
DRILL RIG/HAMMER EFF./DATE TER4013 Mobile B-57 88% 11/12/2024						DRILL METHOD Mud Rotary			HAMMER TYPE Automatic			
DRILLER TURNAGE, J. R.			START DATE 01/21/25			COMP. DATE 01/24/25			SURFACE WATER DEPTH N/A			
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT				SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
			0.5ft	0.5ft	0.5ft	0	25	50	75	100	MOI	
690						Match Line						
			17	29	38							687.1 82.5
685	685.5	84.1	21	49	51/0.4							684.1 85.5

NCDOT BORE DOUBLE I5715 GEO STRUC.GPJ NC_DOT.GDT 5/16/25

NC DOT BORE DOUBLE I5715 GEO STRUC.GPJ NC_DOT.GDT 5/16/25

[illegible]

WBS 50128.1.FS1			TIP I-5715			COUNTY MECKLENBURG			GEOLOGIST GRAINGER, P.						
SITE DESCRIPTION MSE Retaining Wall No. 2 at Bridge No. 1415, End Bent No. 2											GROUND WTR (ft)				
BORING NO. S1_RW2-2			STATION 11+97			OFFSET 8 ft RT			ALIGNMENT -WALL_2-		0 HR. Dry				
COLLAR ELEV. 786.4 ft			TOTAL DEPTH 45.8 ft			NORTHING 618,682			EASTING 1,443,364		24 HR. Caved				
DRILL RIG/HAMMER EFF./DATE TER4013 Mobile B-57 88% 11/12/2024						DRILL METHOD H.S. Augers			HAMMER TYPE Automatic						
DRILLER TURNAGE, J. R.			START DATE 01/17/25			COMP. DATE 01/17/25			SURFACE WATER DEPTH N/A						
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				ELEV. (ft)	DEPTH (ft)
790															
785	786.4	0.0	2	1	2									786.4	0.0
780	782.1	4.3												GROUND SURFACE	
	780.4	6.0	2	3	3									ROADWAY EMBANKMENT	
775	777.9	8.5	WOH	WOH	2						SS-918	20%		777.9	8.5
			1	5	8									SOFT TO MEDIUM STIFF, RED AND BROWN, SILTY CLAY, TRACE GRAVEL, MOIST (A-7-6)	
770	772.1	14.3												773.9	12.5
			3	5	6									STIFF, RED AND WHITE, CLAYEY, SILT, TRACE MICA, MOIST (A-5)	
765	767.1	19.3												RESIDUAL	
			3	5	6									STIFF TO MEDIUM STIFF, RED, YELLOW, AND WHITE, CLAYEY SILT, MOIST (A-5)	
760	762.1	24.3													
			3	5	6										
755	757.1	29.3													
			3	5	7										
750	752.1	34.3													
			2	4	4										
745	747.1	39.3													
			3	3	5										
	742.1	44.3												740.6	45.8
			2	3	5									Boring Terminated at Elevation 740.6 ft IN RESIDUAL CLAYEY SILT	

NCDOT BORE DOUBLE I5715_GEO_STRUC.GPJ NC_DOT.GDT 5/16/25

LABORATORY TESTING SUMMARY

PROJECT NUMBER: 50128.1.FS1

TIP: I-5715

COUNTY: Mecklenburg

DESCRIPTION: MSE Retaining Walls No.1 and No. 2 At Bridge No. 1415, End Bent No. 1 and End Bent No. 2

[illegible]

NP - NON-PLASTIC

Mitra Grabski
Certified Lab Technician Signature

114-01-1203
Certification Number

REFERENCE: I-5715

PROJECT: 50128

CONTENTS

<u>SHEET NO.</u>	<u>DESCRIPTION</u>
1	TITLE SHEET
2	LEGEND (SOIL & ROCK)
3	SITE PLAN
4 - 5	PROFILES
6 - 11	BORE LOGS
12	SOIL TEST RESULTS
13 - 17	CONSOLIDATON TEST RESULTS

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

STRUCTURE
SUBSURFACE INVESTIGATION

COUNTY MECKLENBURG
PROJECT DESCRIPTION I-77 AND NC 73 INTERCHANGE,
UPGRADE EXISTING INTERCHANGE TO
SPLIT DIAMOND CONFIGURATION

SITE DESCRIPTION MSE RETAINING WALLS NO. 3
AND NO. 4 AT BRIDGE NO. 1416, END BENT
NO. 1 AND END BENT NO. 2

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	I-5715	1	17

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.

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 PERFORM INDEPENDENT SUBSURFACE INVESTIGATIONS AND MAKE INTERPRETATIONS AS NECESSARY TO CONFIRM CONDITIONS ENCOUNTERED ON THE 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.

- NOTES:
1. THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N. C. DEPARTMENT OF TRANSPORTATION AS ACCURATE NOR IS IT CONSIDERED PART OF THE PLANS, SPECIFICATIONS OR CONTRACT FOR THE PROJECT.
 2. 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.

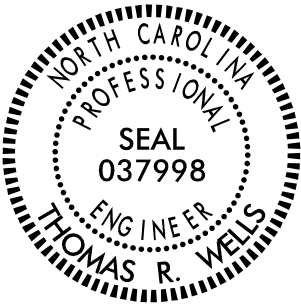
PERSONNEL
DRISCOLL, C.
KIKER, Z.
GRAINGER, P.
TURNAGE, J.

INVESTIGATED BY GRAINGER, P.
DRAWN BY FIELDS, W. D.
CHECKED BY RIGGS, A.F., JR.
SUBMITTED BY WELLS, T. R.
DATE MAY 2025

Prepared in the Office of:



7327-G W. FRIENDLY AVE.
GREENSBORO, NORTH CAROLINA 27410
NC REGISTERED ENGINEERING FIRM: F-0809
NC REGISTERED GEOLOGIC FIRM: C-387



Signed by: Thomas R. Wells 05/28/2025
F38C777458854EA SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

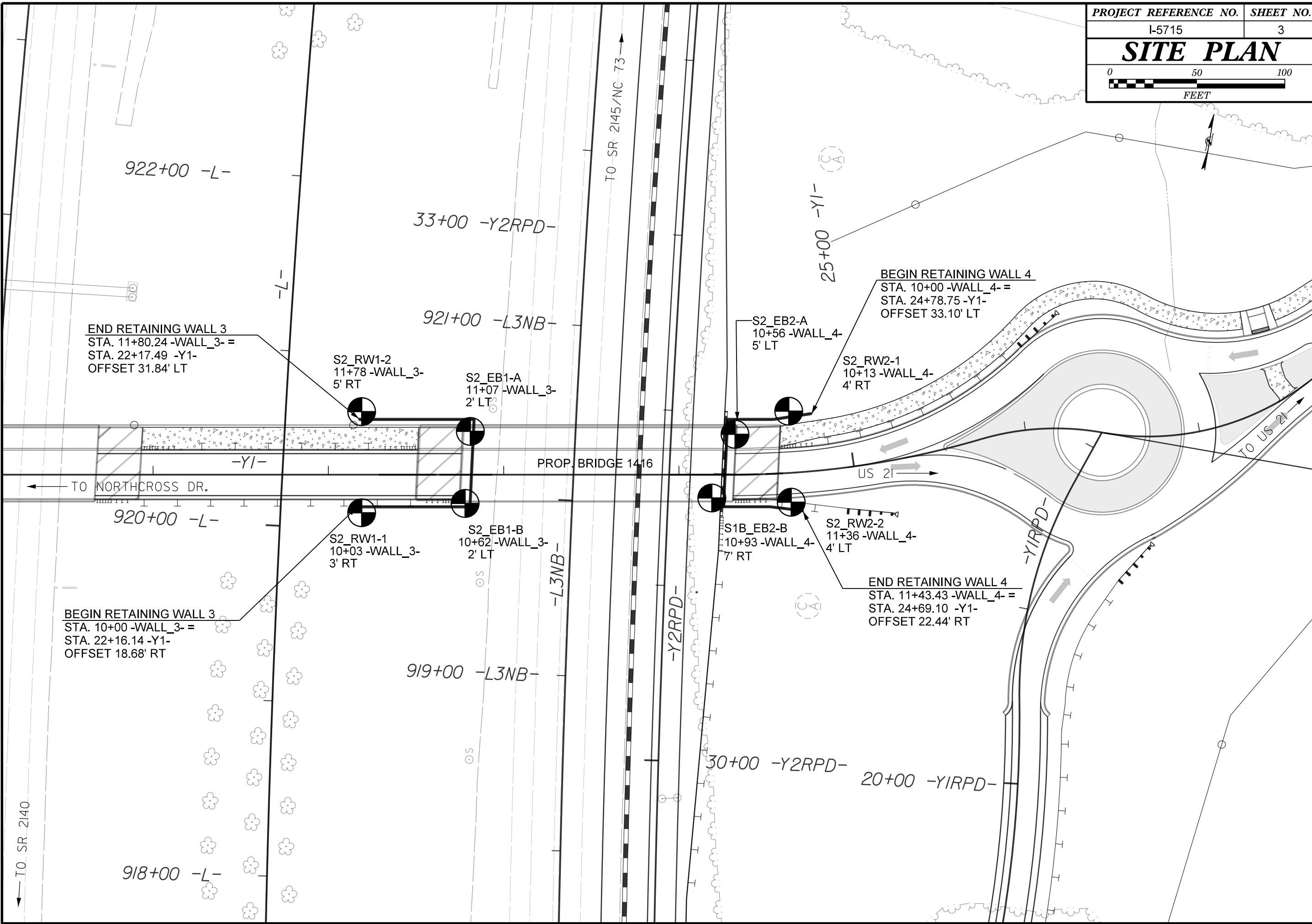
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

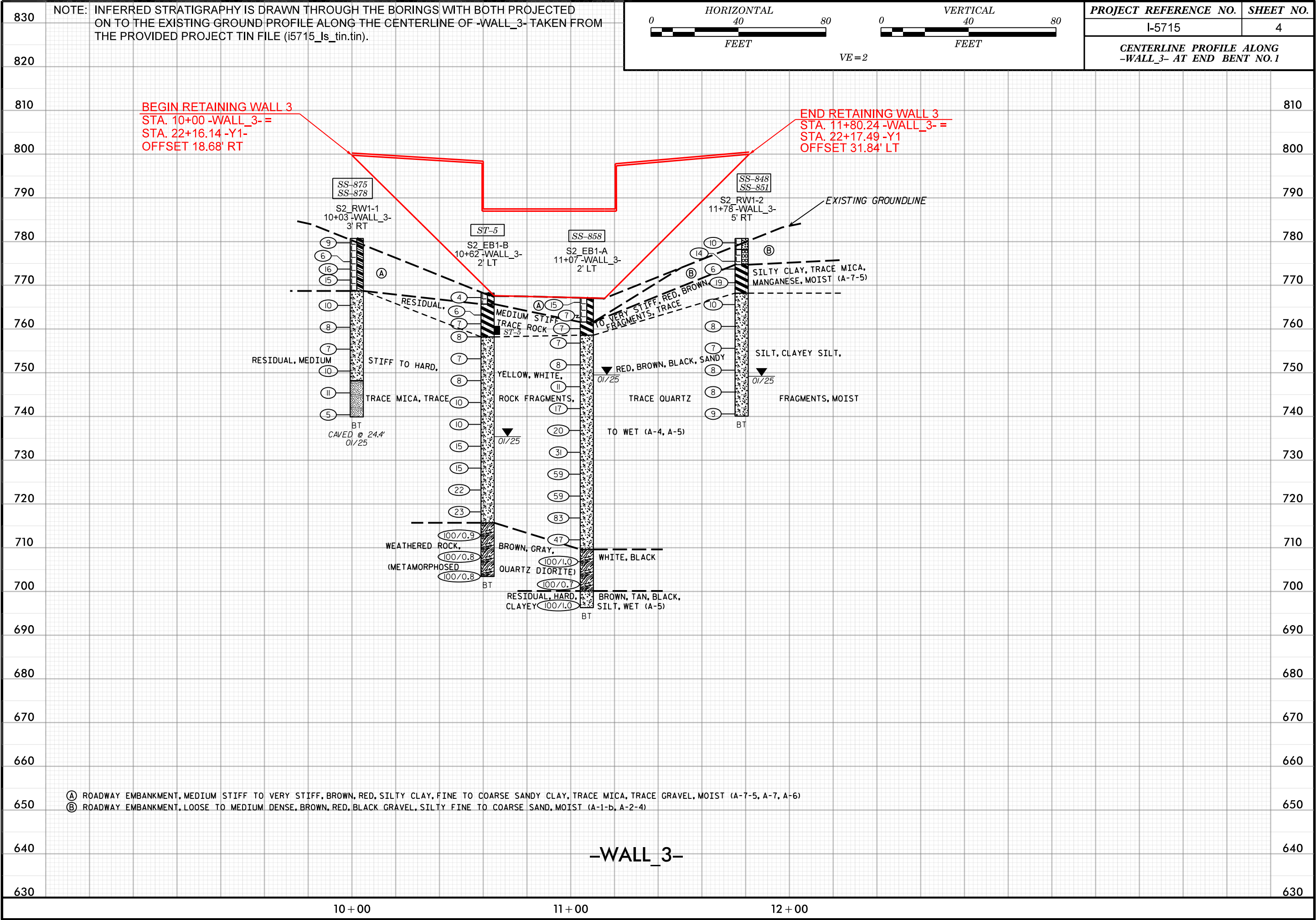
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

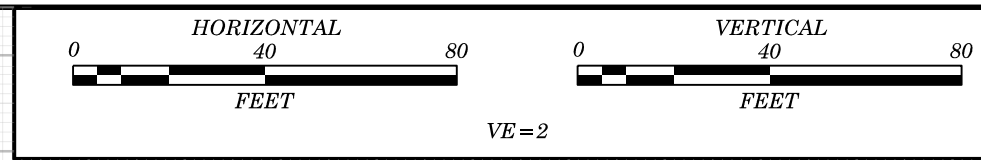
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

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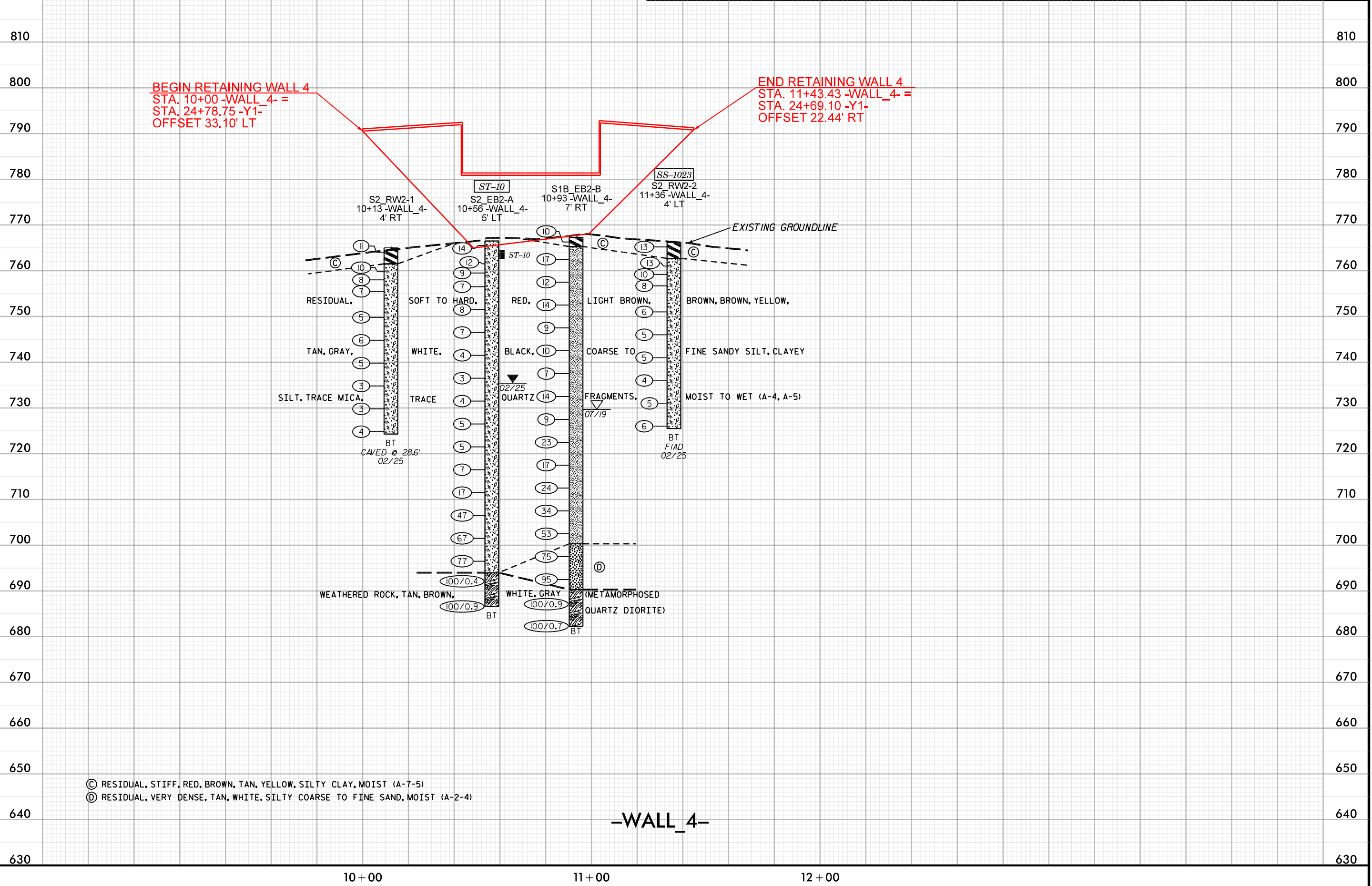




830	NOTE: INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ON TO THE EXISTING GROUND PROFILE ALONG THE CENTERLINE OF -WALL_4- TAKEN FROM THE PROVIDED PROJECT TIN FILE (i5715_Is_tin.tin).
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PROJECT REFERENCE NO.	SHEET NO.
I-5715	5
CENTERLINE PROFILE ALONG -WALL_4- AT END BENT NO. 2	



GEOTECHNICAL BORING REPORT
BORE LOG

WBS 50128.1.FS1		TIP I-5715		COUNTY MECKLENBURG		GEOLOGIST GRAINGER, P.										
SITE DESCRIPTION MSE Retaining Wall No. 3 at Bridge No. 1416, End Bent No. 1							GROUND WTR (ft)									
BORING NO. S2_RW1-1		STATION 10+03		OFFSET 3 ft RT		ALIGNMENT -WALL_3-		0 HR. Dry								
COLLAR ELEV. 780.7 ft		TOTAL DEPTH 40.8 ft		NORTHING 618,698		EASTING 1,443,435		24 HR. Caved								
DRILL RIG/HAMMER EFF./DATE TER4013 Mobile B-57 88% 11/12/2024				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER TURNAGE, J. R.		START DATE 01/16/25		COMP. DATE 01/16/25		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				ELEV. (ft)	DEPTH (ft)	
785																
780	780.7	0.0												780.7 GROUND SURFACE 0.0		
775	776.4	4.3	2	2	7									ROADWAY EMBANKMENT MEDIUM STIFF TO VERY STIFF, BROWN AND RED, FINE TO COARSE SANDY CLAY, TRACE MICA, TRACE GRAVEL, MOIST (A-6)		
	774.7	6.0	5	3	3						SS-875	12%				
	774.7	6.0	2	6	10							M				
770	772.2	8.5	4	6	9									M		
	766.4	14.3	2	4	6										768.7	12.0
765														RESIDUAL MEDIUM STIFF TO STIFF, RED, WHITE, BLACK, CLAYEY SILT, TRACE MICA, TRACE QUARTZ FRAGMENTS, MOIST (A-5)		
760	761.4	19.3	2	3	5						SS-878	22%				
	756.4	24.3	2	3	4									M		
755	751.4	29.3	2	4	6									M		
	746.4	34.3	3	5	6									M		
750	741.4	39.3	2	2	3									M		
															748.2	32.5
745																
740															739.9	40.8
														Boring Terminated at Elevation 739.9 ft IN RESIDUAL SANDY SILT		

WBS 50128.1.FS1		TIP I-5715		COUNTY MECKLENBURG		GEOLOGIST GRAINGER, P.									
SITE DESCRIPTION MSE Retaining Wall No. 3 at Bridge No. 1416, End Bent No. 1							GROUND WTR (ft)								
BORING NO. S2_EB1-B		STATION 10+62		OFFSET 2 ft LT		ALIGNMENT -WALL_3-		0 HR. N/A							
COLLAR ELEV. 768.2 ft		TOTAL DEPTH 64.8 ft		NORTHING 618,713		EASTING 1,443,493		24 HR. 32.8							
DRILL RIG/HAMMER EFF./DATE TER4013 Mobile B-57 88% 11/12/2024				DRILL METHOD Mud Rotary		HAMMER TYPE Automatic									
DRILLER TURNAGE, J. R.		START DATE 01/16/25		COMP. DATE 01/16/25		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
770															
765	768.2	0.0	2	2	2								768.2 GROUND SURFACE 0.0		
760	764.2	4.0	1	3	3									765.7 ROADWAY EMBANKMENT 2.5	
	762.2	6.0	2	3	4									RESIDUAL	
755	759.2	9.0	2	3	5									MEDIUM STIFF, RED AND BROWN, SILTY CLAY, TRACE MICA, MOIST (A-7-5)	
750	754.2	14.0	2	3	4									34% M	
745	749.2	19.0	2	3	5									M	
740	744.2	24.0	2	4	6									M	
735	739.2	29.0	2	4	6									M	
730	734.2	34.0	4	6	9									W	
725	729.2	39.0	4	6	9									W	
720	724.2	44.0	4	10	12									W	
715	719.2	49.0	5	8	15									W	
710	714.2	54.0	16	45	55/0.4									715.7 WEATHERED ROCK 52.5	
														BROWN, GRAY, BLACK (METAMORPHOSED QUARTZ DIORITE)	
705	709.2	59.0	29	63	37/0.3										
	704.2	64.0	44	56/0.3										703.4 Boring Terminated at Elevation 703.4 ft IN WEATHERED ROCK (METAMORPHOSED QUARTZ DIORITE) 64.8	
														Other Samples: ST-5 (7.5 - 9.5)	

NCDOT BORE DOUBLE I5715_GEO_STRUC.GPJ NC_DOT.GDT 5/16/25

NCDOT BORE DOUBLE I5715_GEO_STRUC.GPJ NC_DOT.GDT 5/20/25

WBS 50128.1.FS1			TIP I-5715			COUNTY MECKLENBURG			GEOLOGIST GRAINGER, P.					
SITE DESCRIPTION MSE Retaining Wall No. 3 at Bridge No. 1416, End Bent No. 1										GROUND WTR (ft)				
BORING NO. S2_RW1-2			STATION 11+78			OFFSET 5 ft RT			ALIGNMENT -WALL_3-		0 HR. N/A			
COLLAR ELEV. 780.7 ft			TOTAL DEPTH 40.6 ft			NORTHING 618,755			EASTING 1,443,426		24 HR. 31.5			
DRILL RIG/HAMMER EFF./DATE TER4013 Mobile B-57 88% 11/12/2024						DRILL METHOD Mud Rotary			HAMMER TYPE Automatic					
DRILLER TURNAGE, J. R.			START DATE 01/14/25			COMP. DATE 01/15/25			SURFACE WATER DEPTH N/A					
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				
785														
780	780.7	0.0												
775	776.5	4.2	2	2	8						SS-848	14%		780.7 GROUND SURFACE 0.0
	774.7	6.0												778.2 LOOSE, BROWN AND RED, SILTY FINE TO COARSE SAND, TRACE GRAVEL, MOIST (A-2-4) 2.5
770	771.6	9.1	6	10	4							M		774.7 MEDIUM DENSE, BLACK GRAVEL, MOIST (A-1-b) 6.0
	766.6	14.1	3	3	3						SS-581	27%		RESIDUAL MEDIUM STIFF TO VERY STIFF, BROWN, SILTY CLAY, TRACE ROCK FRAGMENTS, MOIST (A-7-5)
765	761.6	19.1	3	7	12							M		768.2 STIFF, RED, YELLOW, BROWN, CLAYEY SILT, TRACE MICA, MOIST (A-5) 12.5
760	756.6	24.1	3	4	6							M		
	751.6	29.1	2	4	4							M		
755	746.6	34.1	2	2	5							M		
	741.6	39.1	3	3	5							M		
745			3	3	5									
			2	3	6							M		
														Boring Terminated at Elevation 740.1 ft IN RESIDUAL CLAYEY SILT

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 50128.1.FS1				TIP I-5715				COUNTY MECKLENBURG				GEOLOGIST GRAINGER, P.				
SITE DESCRIPTION MSE Retaining Wall No. 4 at Bridge No. 1416, End Bent No. 2												GROUND WTR (ft)				
BORING NO. S2_RW2-1				STATION 10+13				OFFSET 4 ft RT				ALIGNMENT -WALL_4-				0 HR. N/A
COLLAR ELEV. 765.0 ft				TOTAL DEPTH 40.7 ft				NORTHING 618,795				EASTING 1,443,666				24 HR. Caved
DRILL RIG/HAMMER EFF./DATE TER4013 Mobile B-57 88% 11/12/2024								DRILL METHOD H.S. Augers				HAMMER TYPE Automatic				
DRILLER TURNAGE, J. R.				START DATE 02/03/25				COMP. DATE 02/03/25				SURFACE WATER DEPTH N/A				
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				ELEV. (ft)	DEPTH (ft)	
765														765.0	GROUND SURFACE 0.0	
760	765.0	0.0	1	4	7							M		RESIDUAL STIFF, RED, BROWN, YELLOW, SILTY CLAY, MOIST (A-7)		
	760.8	4.2	3	4	6							M		761.5	STIFF TO SOFT, RED, BROWN, YELLOW, CLAYEY SILT, TRACE MICA, MOIST TO WET (A-5) 3.5	
755	759.0	6.0	3	3	5							M				
	756.5	8.5	2	3	4							M				
750																
	750.8	14.2	2	2	3							M				
745																
	745.8	19.2	1	2	4							M				
740																
	740.8	24.2	1	2	3							M				
735																
	735.8	29.2	1	1	2							M				
730																
	730.8	34.2	1	1	2							W				
725																
	725.8	39.2	1	1	3							W				
														724.3	40.7	
Boring Terminated at Elevation 724.3 ft IN RESIDUAL CLAYEY SILT																

NCDOT BORE DOUBLE I5715 GEO STRUC.GPJ NC DOT.GDT 5/16/25

[illegible]

NCDOT BORE DOUBLE I5715 GEO STRUC.GPJ NC_DOT.GDT 5/16/25

WBS 50128.1.FS1			TIP I-5715			COUNTY MECKLENBURG			GEOLOGIST DRISCOLL, C.				
SITE DESCRIPTION MSE Retaining Wall No. 4 at Bridge No. 1416, End Bent No. 2									GROUND WTR (ft)				
BORING NO. S1B_EB2-B			STATION 10+93			OFFSET 7 ft RT			ALIGNMENT -WALL_4-		0 HR. 37.6		
COLLAR ELEV. 767.3 ft			TOTAL DEPTH 85.0 ft			NORTHING 618,739			EASTING 1,443,631		24 HR. Dry		
DRILL RIG/HAMMER EFF./DATE HPC0279 Diedrich D50 82% 02/06/2019						DRILL METHOD H.S. Augers			HAMMER TYPE Automatic				
DRILLER KIKER, Z.			START DATE 07/08/19			COMP. DATE 07/08/19			SURFACE WATER DEPTH N/A				
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
			0.5ft	0.5ft	0.5ft	0	25	50	75	100		MOI	
690						Match Line							
685	688.5	78.8	15	31	69/0.4	...	...	...	...	100/0.9			 WEATHERED ROCK TAN, WHITE (METAMORPHOSED QUARTZ DIORITE) (continued)
	683.5	83.8	36	60	40/0.2	...	...	...	...	100/0.7			
													682.3 85.0 Boring Terminated at Elevation 682.3 ft IN WEATHERED ROCK (METAMORPHOSED QUARTZ DIORITE)

WBS 50128.1.FS1			TIP I-5715			COUNTY MECKLENBURG			GEOLOGIST GRAINGER, P.						
SITE DESCRIPTION MSE Retaining Wall No. 4 at Bridge No. 1416, End Bent No. 2											GROUND WTR (ft)				
BORING NO. S2_RW2-2			STATION 11+36			OFFSET 4 ft LT			ALIGNMENT -WALL_4-			0 HR. Dry			
COLLAR ELEV. 766.2 ft			TOTAL DEPTH 40.7 ft			NORTHING 618,744			EASTING 1,443,676			24 HR. FIAD			
DRILL RIG/HAMMER EFF./DATE TER4013 Mobile B-57 88% 11/12/2024						DRILL METHOD H.S. Augers			HAMMER TYPE Automatic						
DRILLER TURNAGE, J. R.			START DATE 02/03/25			COMP. DATE 02/04/25			SURFACE WATER DEPTH N/A						
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				ELEV. (ft)	DEPTH (ft)
770															
765	766.2	0.0	2	4	9	13					SS-1023	31%		766.2	GROUND SURFACE 0.0
760	762.0	4.2	3	6	7	13								762.7	3.5
	760.2	6.0	3	4	6	10						M		RESIDUAL STIFF, RED, BROWN, YELLOW, SILTY CLAY, MOIST (A-7-5)	
755	757.7	8.5	2	4	4	8						M		STIFF TO MEDIUM STIFF, RED, BROWN, YELLOW, BROWN, LIGHT BROWN, BLACK, GRAY, WHITE, CLAYEY SILT, MOIST (A-5)	
	752.0	14.2	2	3	3	6						M			
750	747.0	19.2	2	2	3	5						M			
740	742.0	24.2	2	2	3	5						M			
	737.0	29.2	1	1	3	4						M			
735	732.0	34.2	1	2	3	5						M			
730	727.0	39.2	1	2	4	6						M		725.5	40.7
														Boring Terminated at Elevation 725.5 ft IN RESIDUAL CLAYEY SILT	

NCDOT BORE DOUBLE I5715_GEO_STRUC.CPJ NC_DOT.GDT 5/16/25

LABORATORY TESTING SUMMARY

PROJECT NUMBER: 50128.1.FS1

TIP: I-5715

COUNTY: MECKLENBURG

DESCRIPTION: MSE RETAINING WALLS NO. 3 AND NO. 4 AT BRIDGE NO. 1416, END BENT NO. 1 AND END BENT NO. 2

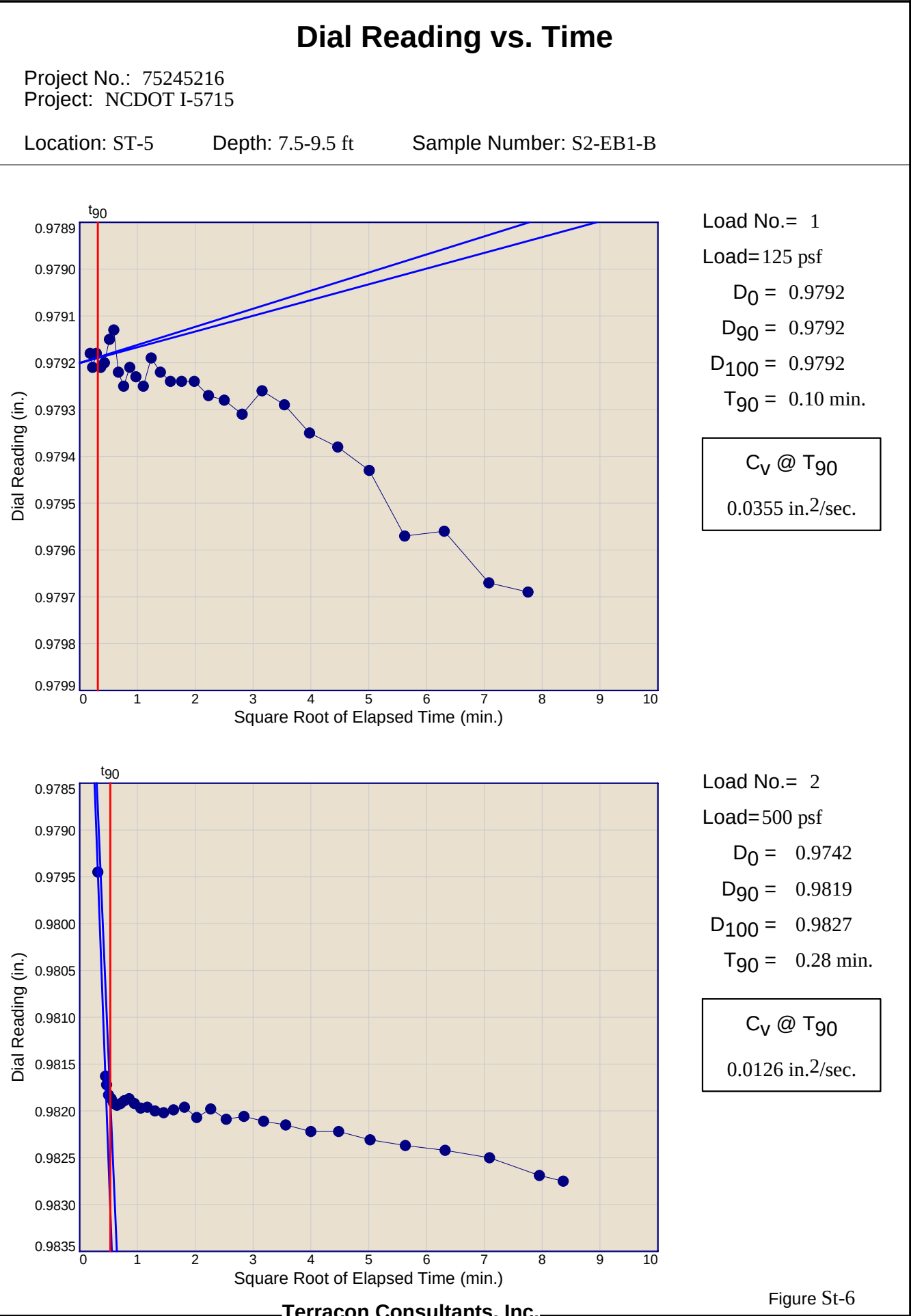
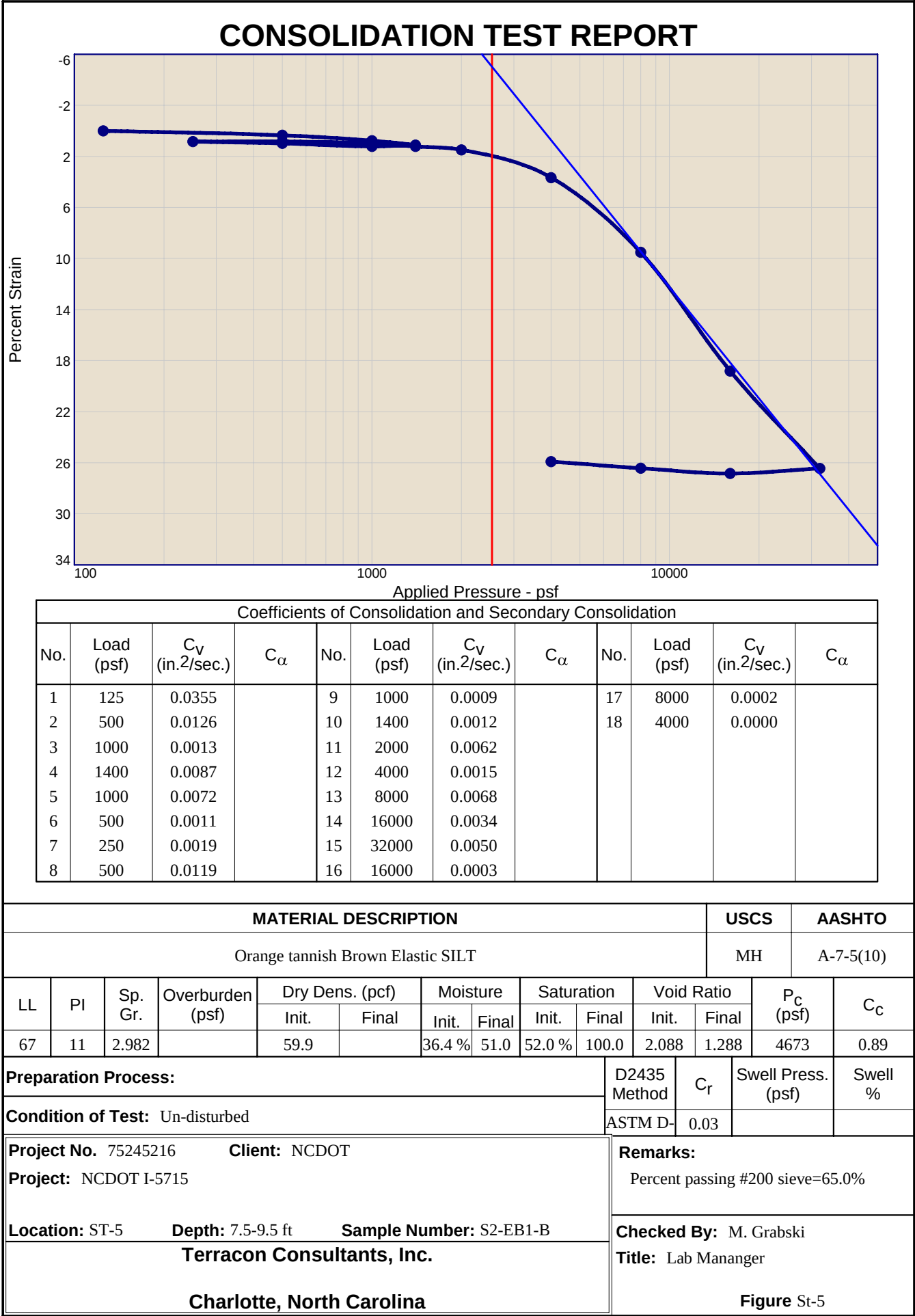
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Mitra Grabski

Certified Lab Technician Signature

114-01-1203

Certification Number



Dial Reading vs. Time

Project No.: 75245216
Project: NCDOT I-5715

Location: ST-5 Depth: 7.5-9.5 ft Sample Number: S2-EB1-B

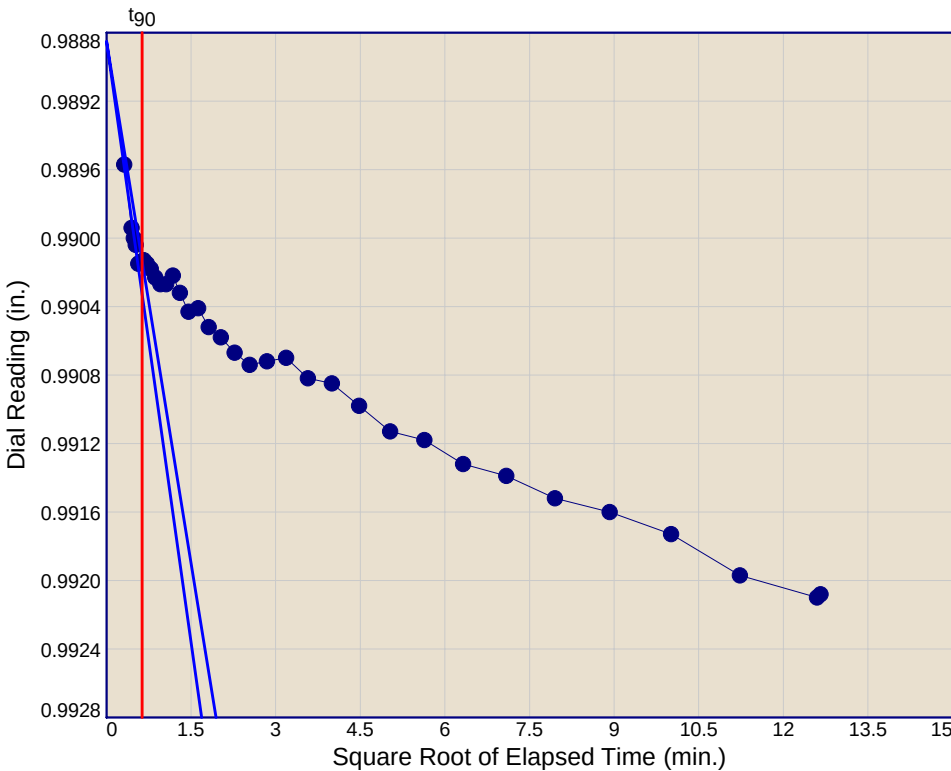
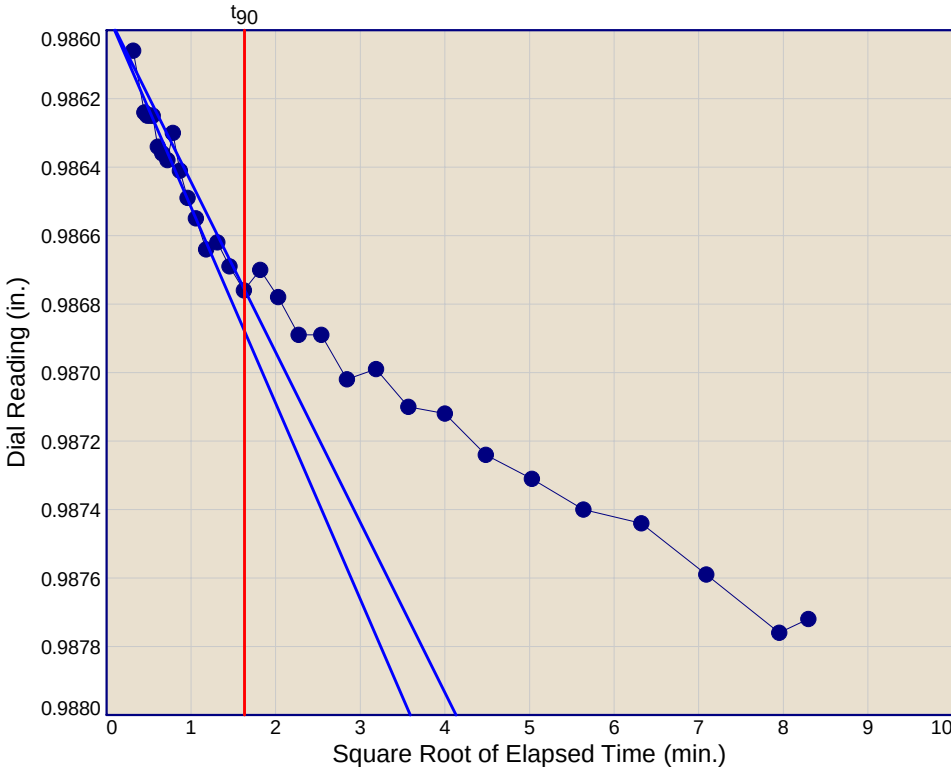


Figure St-7

Dial Reading vs. Time

Project No.: 75245216
Project: NCDOT I-5715

Location: ST-5 Depth: 7.5-9.5 ft Sample Number: S2-EB1-B

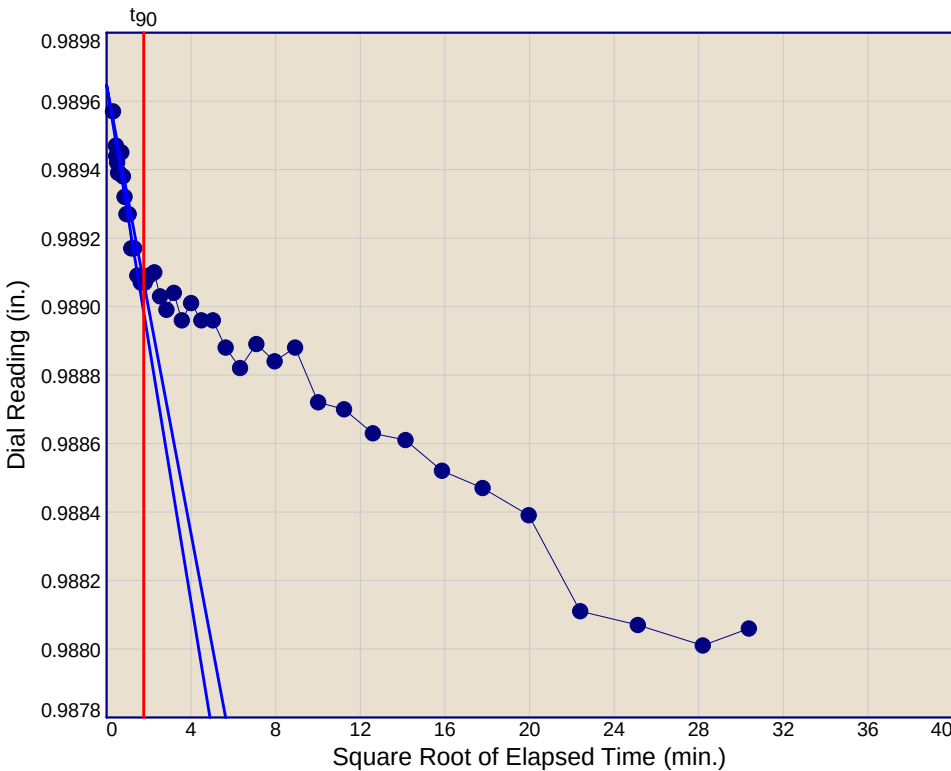
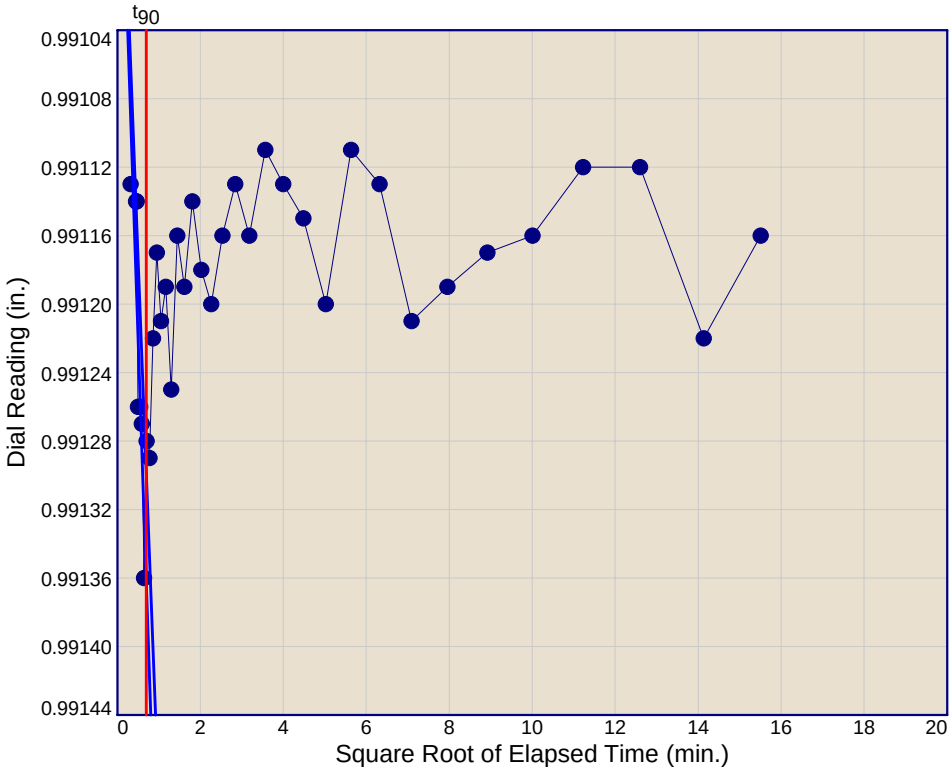


Figure St-8

Dial Reading vs. Time

Project No.: 75245216
Project: NCDOT I-5715

Location: ST-5 Depth: 7.5-9.5 ft Sample Number: S2-EB1-B

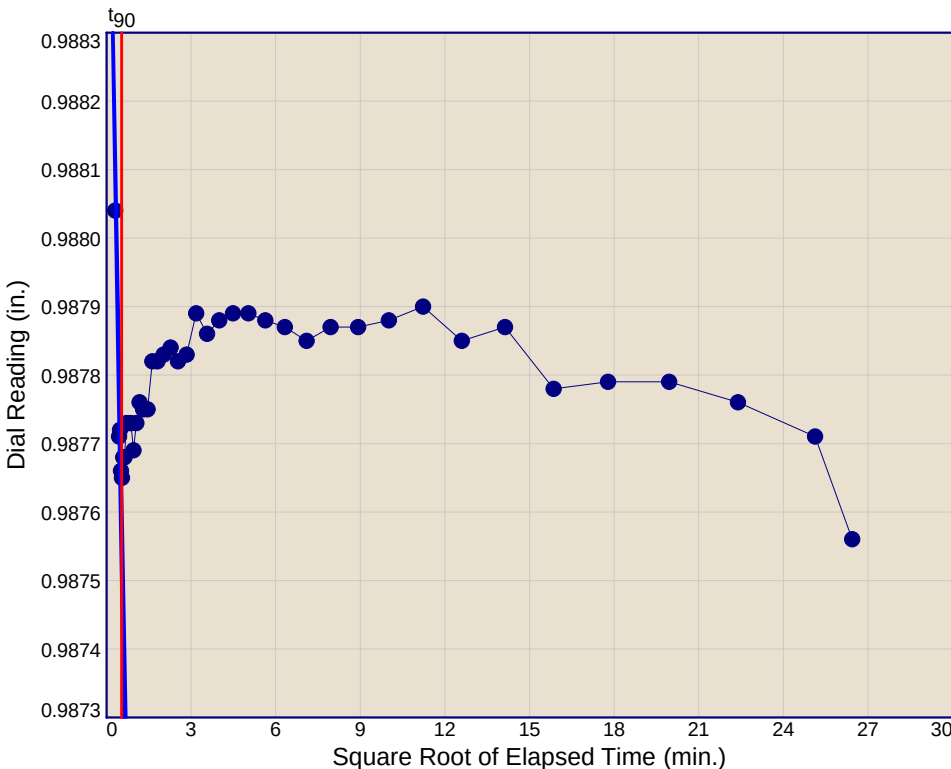
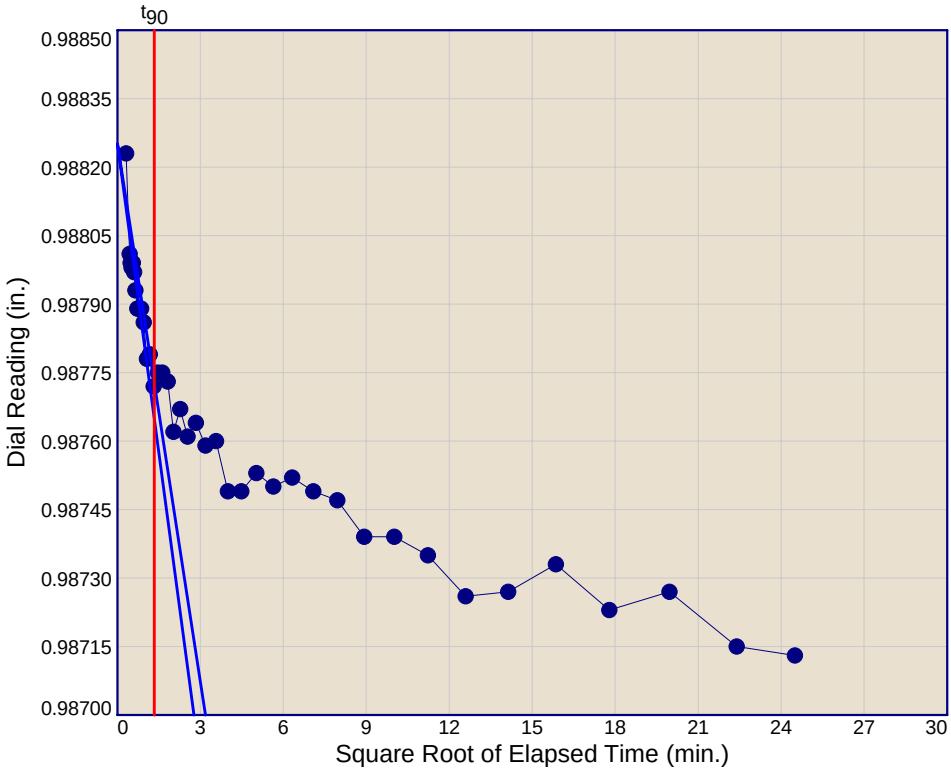


Figure St-9

Dial Reading vs. Time

Project No.: 75245216
Project: NCDOT I-5715

Location: ST-5 Depth: 7.5-9.5 ft Sample Number: S2-EB1-B

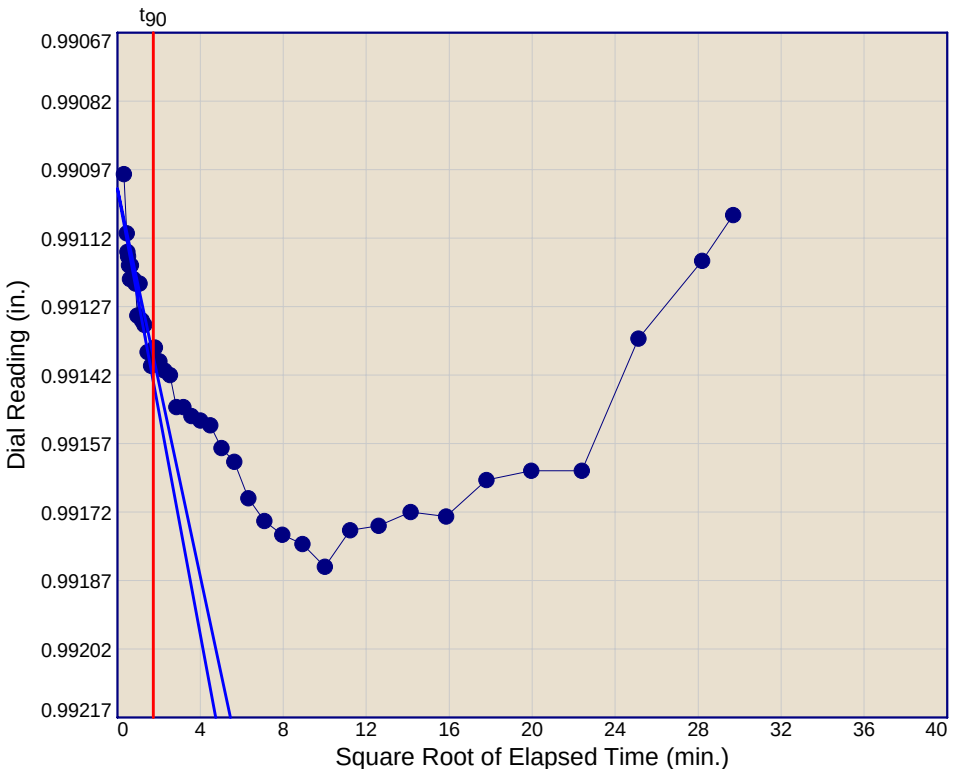
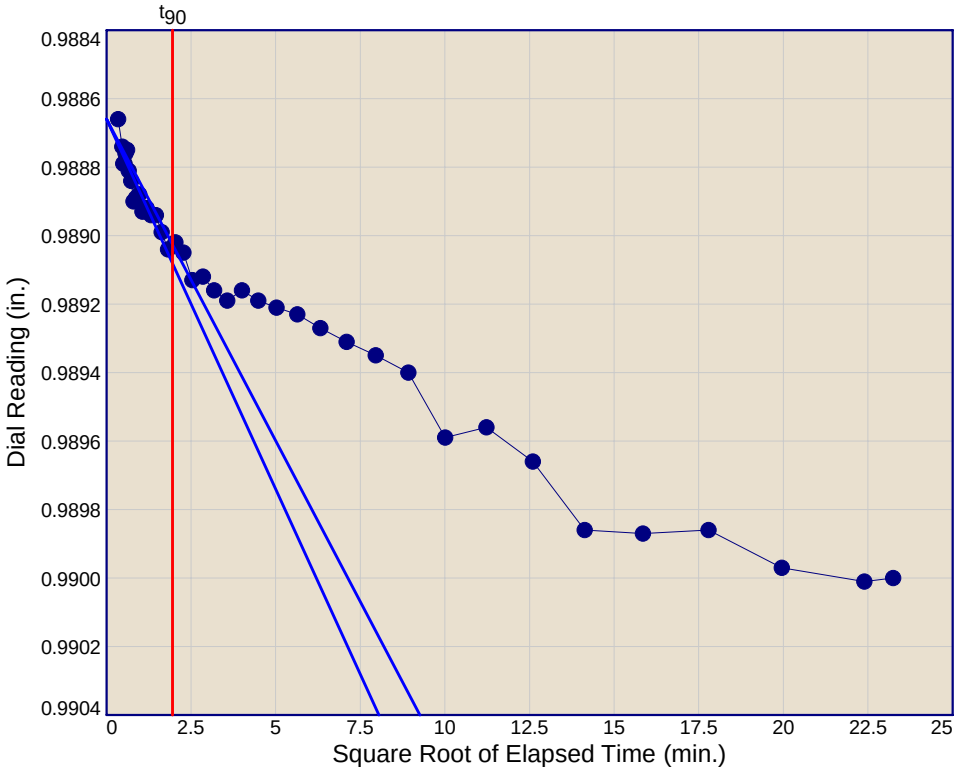


Figure St-10

Dial Reading vs. Time

Project No.: 75245216
Project: NCDOT I-5715

Location: ST-5 Depth: 7.5-9.5 ft Sample Number: S2-EB1-B

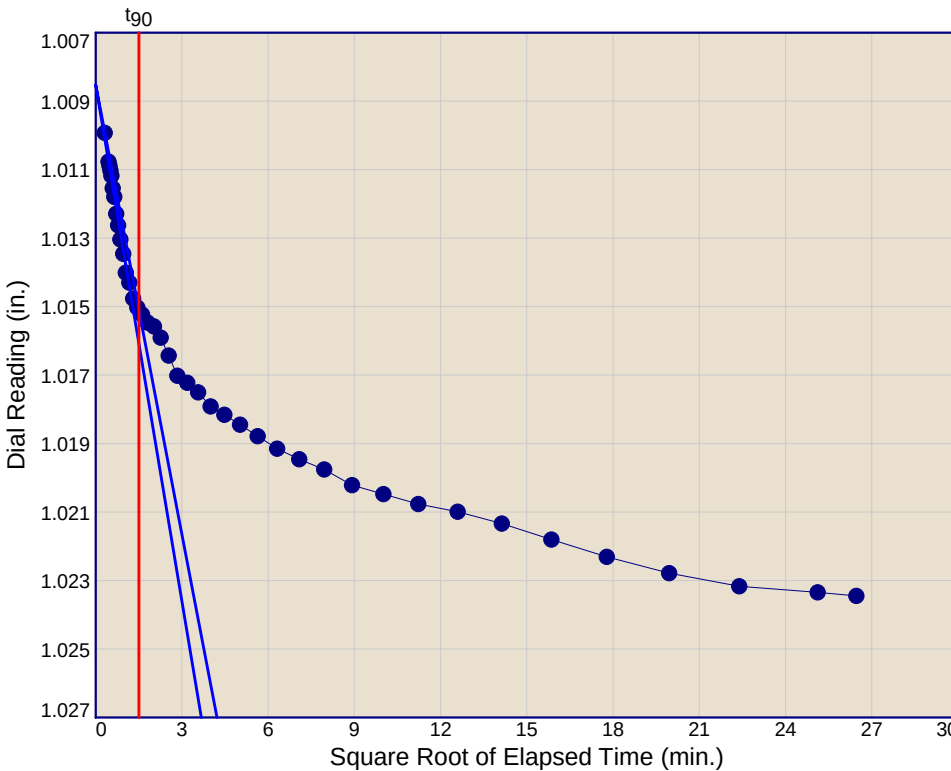
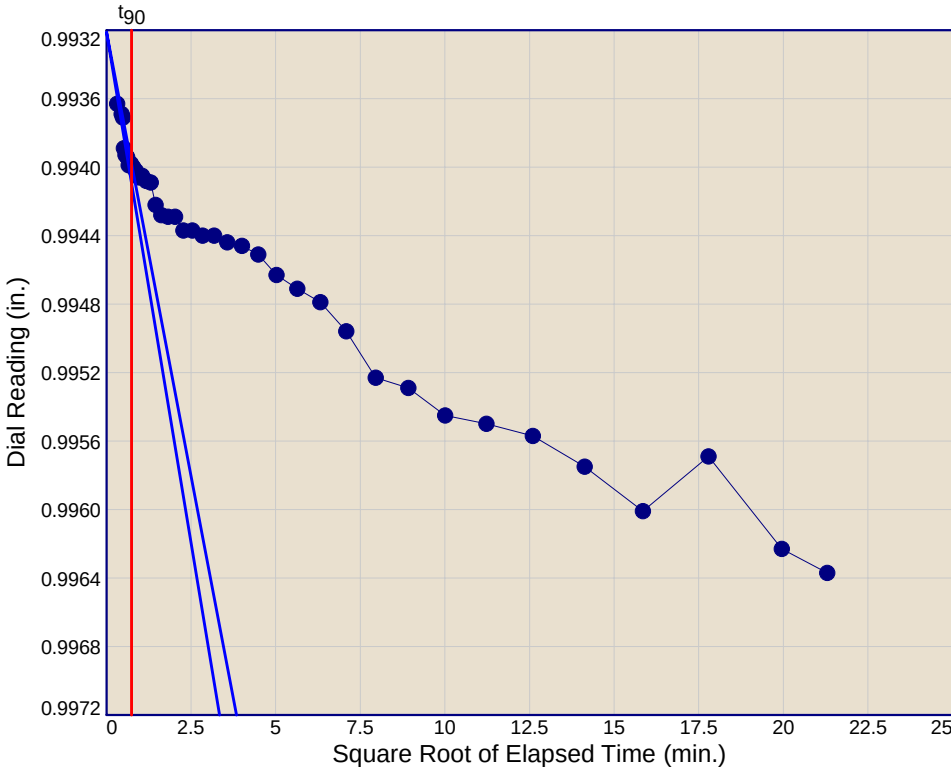


Figure St-11

Dial Reading vs. Time

Project No.: 75245216
Project: NCDOT I-5715

Location: ST-5 Depth: 7.5-9.5 ft Sample Number: S2-EB1-B

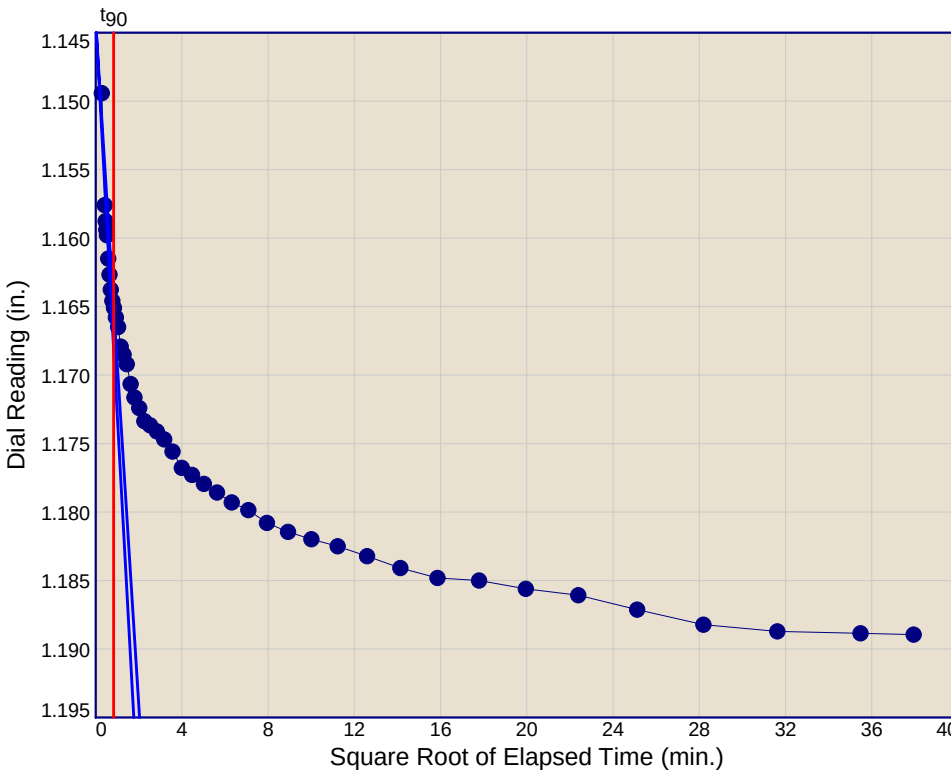
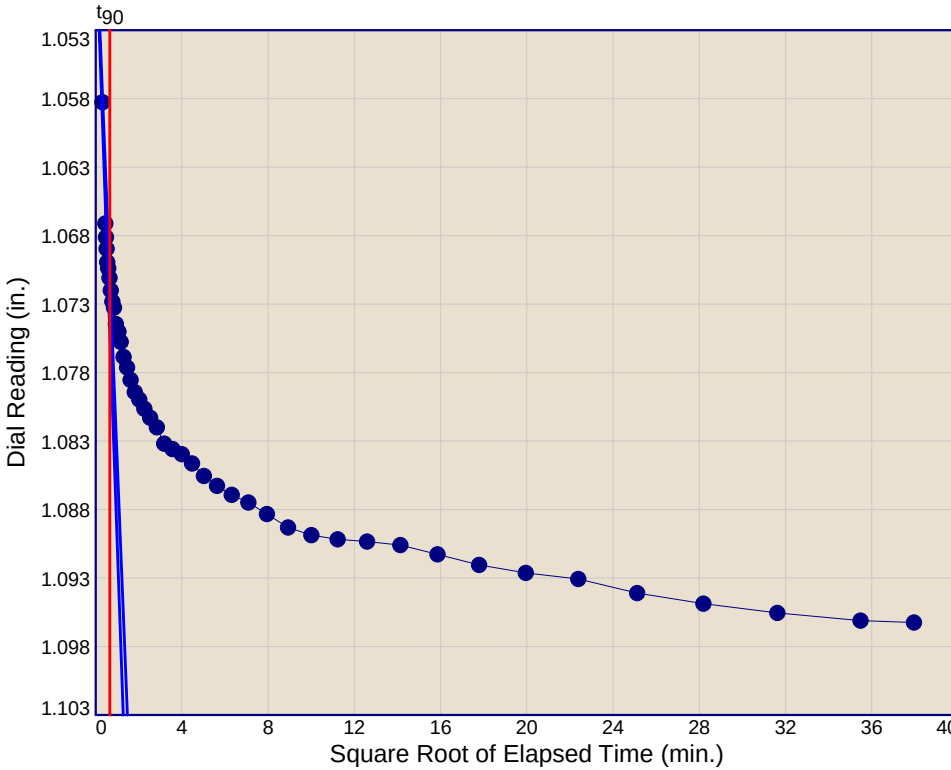


Figure St-12

Dial Reading vs. Time

Project No.: 75245216
Project: NCDOT I-5715

Location: ST-5 Depth: 7.5-9.5 ft Sample Number: S2-EB1-B

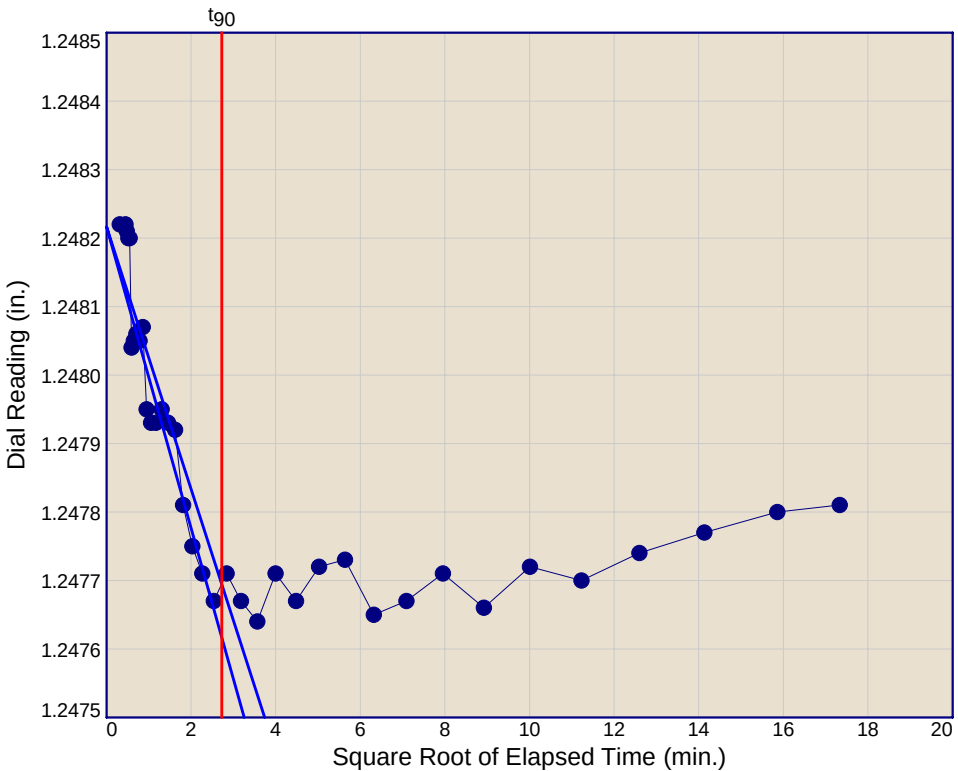
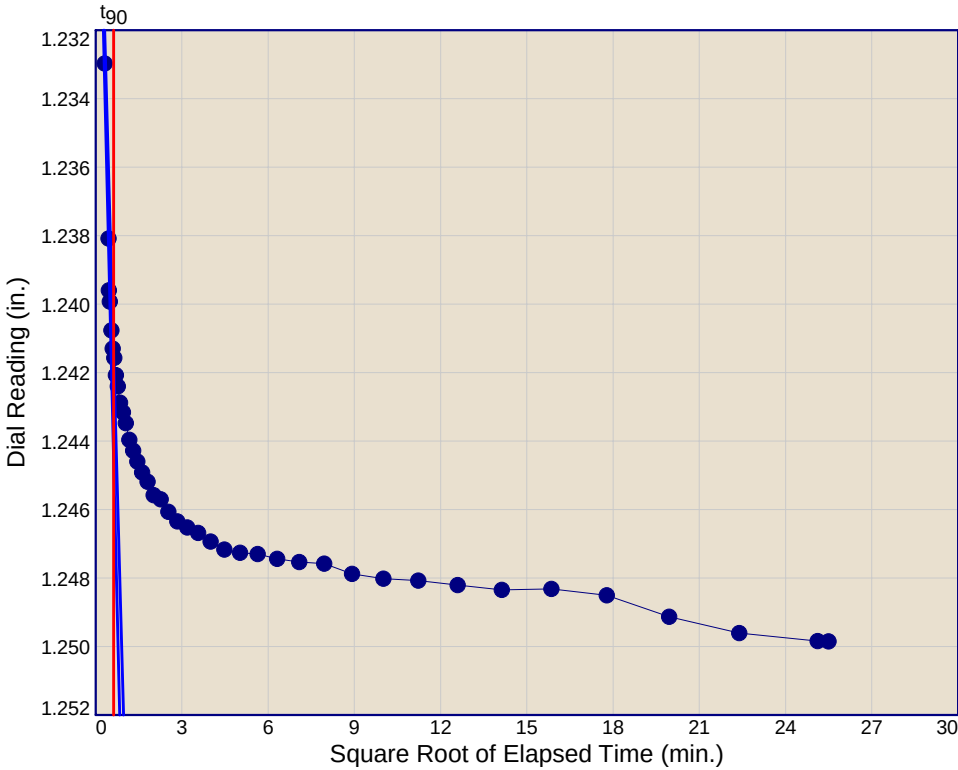


Figure St-13

Dial Reading vs. Time

Project No.: 75245216
Project: NCDOT I-5715

Location: ST-5 Depth: 7.5-9.5 ft Sample Number: S2-EB1-B

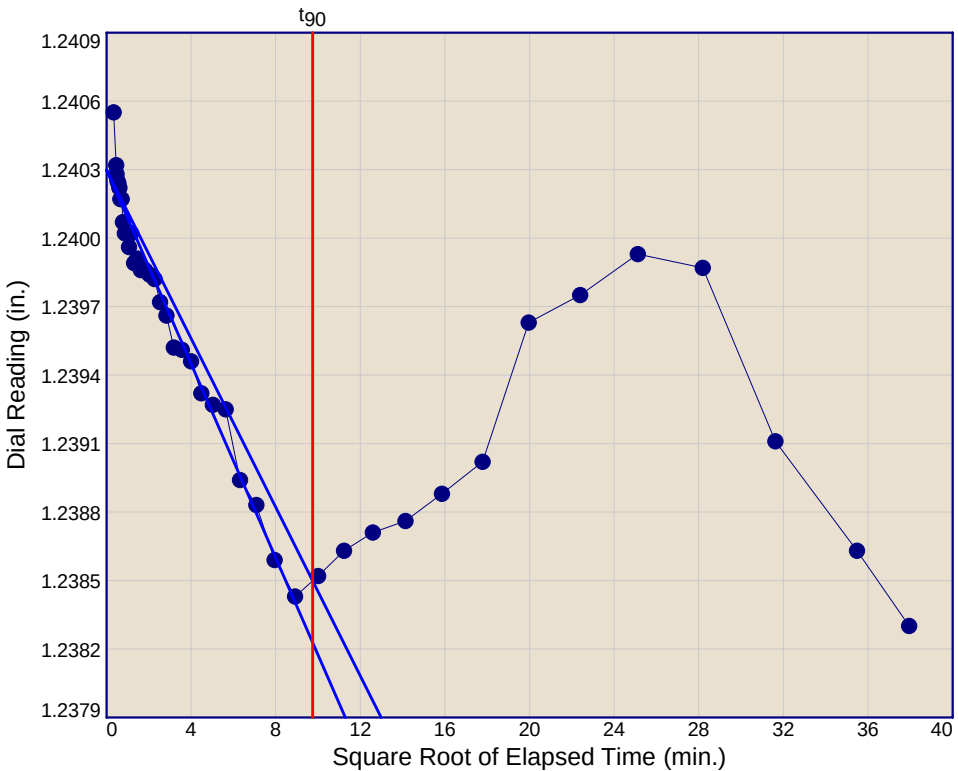
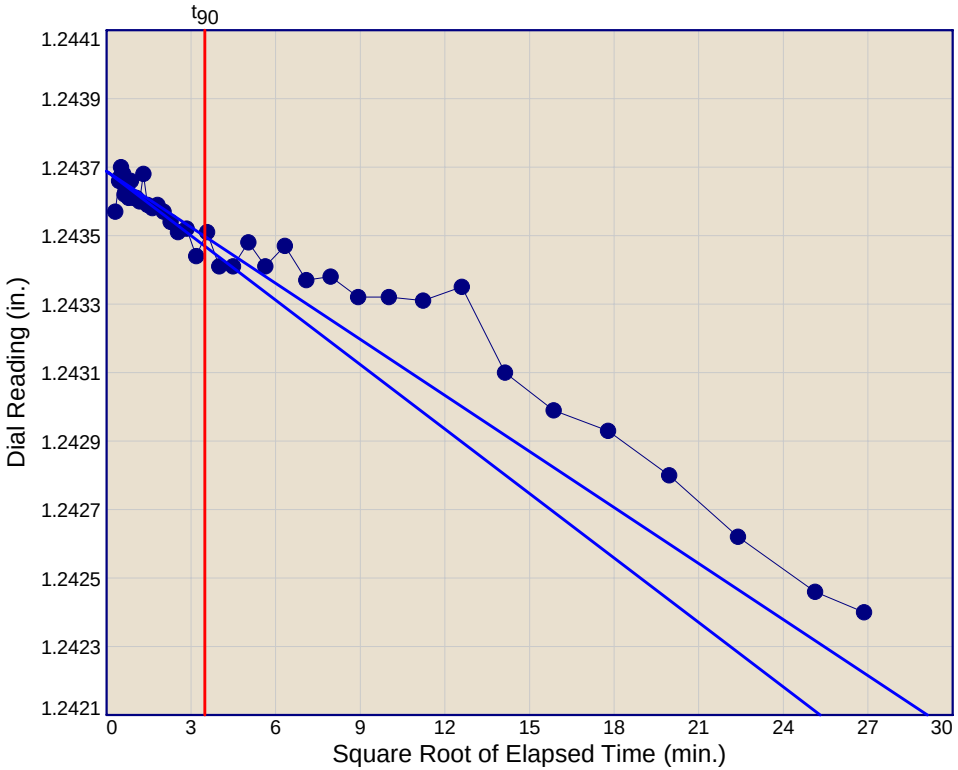


Figure St-14

REFERENCE: I-5715

PROJECT: 50128

CONTENTS

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	LEGEND (SOIL & ROCK)
3	SITE PLAN
4 - 5	PROFILES
6 - 9	BORE LOGS
10	SOIL TEST RESULTS

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

ROADWAY
SUBSURFACE INVESTIGATION

COUNTY MECKLENBURG
PROJECT DESCRIPTION I-77 AND NC 73 INTERCHANGE,
UPGRADE EXISTING INTERCHANGE TO
SPLIT DIAMOND CONFIGURATION

SITE DESCRIPTION MSE RETAINING WALLS NO. 5 AND
NO. 6 AT BRIDGE NO. 1417, END BENT NO. 1
AND END BENT NO. 2

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	I-5715	1	10

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

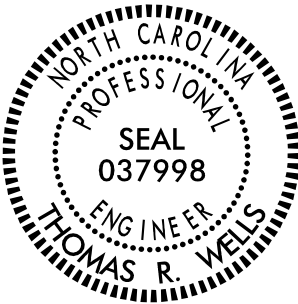
PERSONNEL
GRAINGER, P.
TURNAGE, J.
MARPLES, Z.
BEATY, A.

INVESTIGATED BY GRAINGER, P.
DRAWN BY WELLS, T. R.
CHECKED BY RIGGS, A.F., JR.
SUBMITTED BY WELLS, T. R.
DATE JULY 2025

Prepared in the Office of:



7327-G W. FRIENDLY AVE.
GREENSBORO, NORTH CAROLINA 27410
NC REGISTERED ENGINEERING FIRM: E-0869
NC REGISTERED GEOLOGIC FIRM: C-367



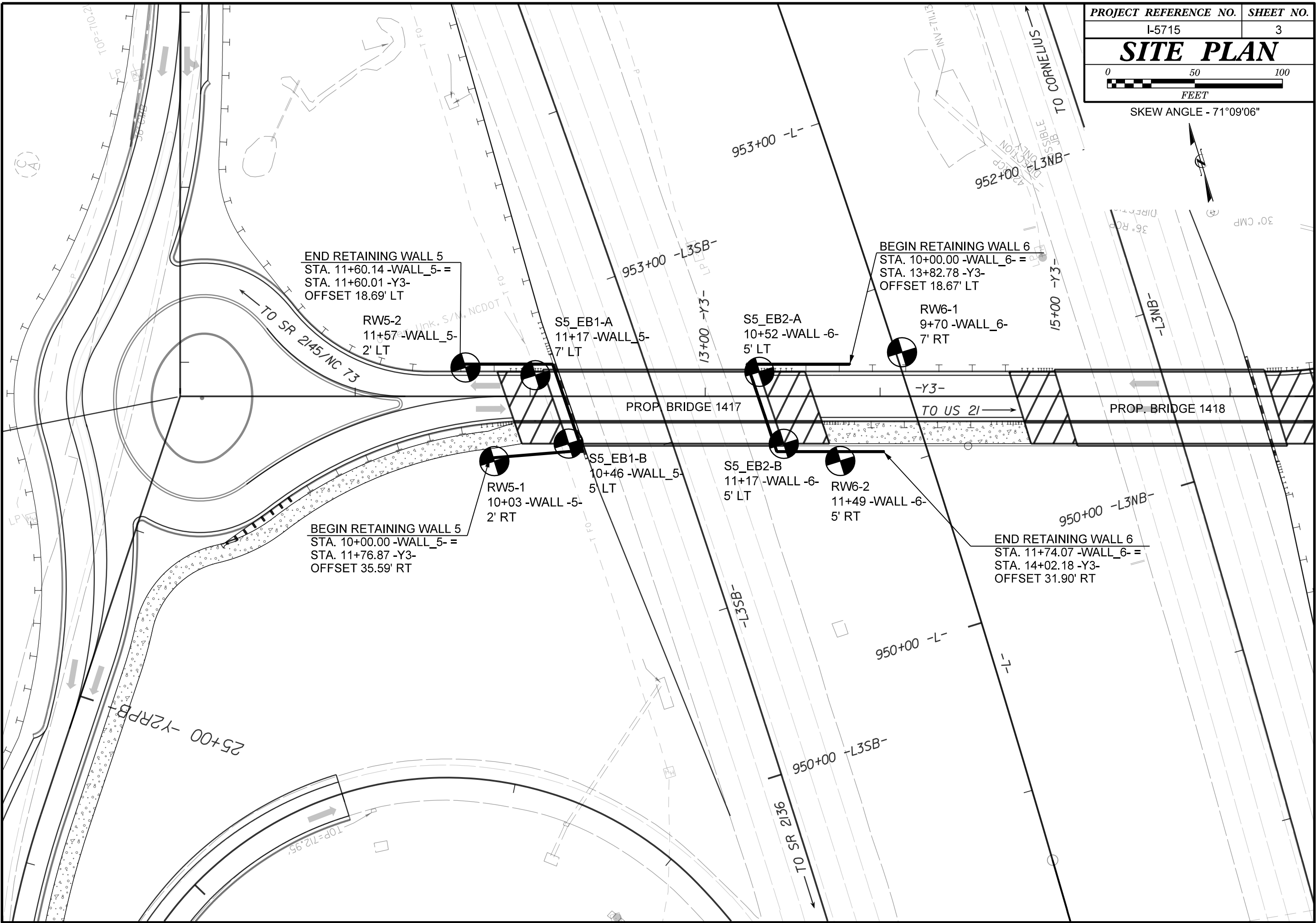
Signed by: Thomas R. Wells 07/09/2025
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SIGNATURE DATE

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UNLESS ALL SIGNATURES COMPLETED

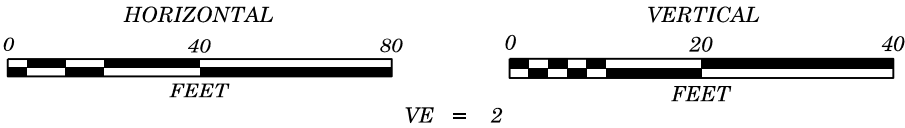
***NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT
SUBSURFACE INVESTIGATION
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS***

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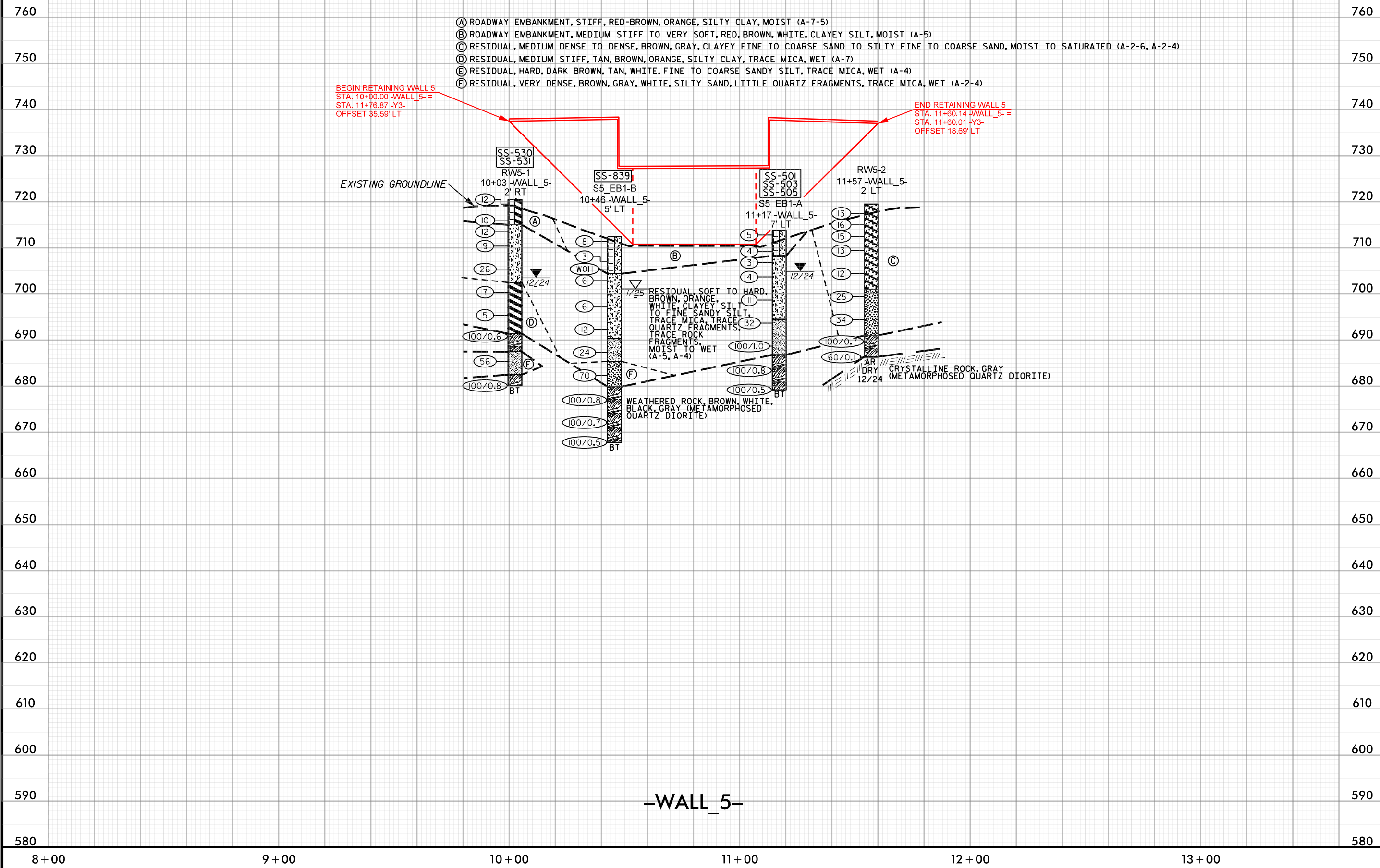
SKEW ANGLE - 71°09'06"



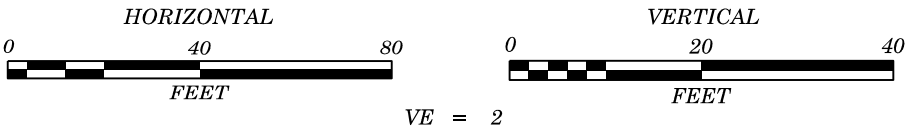
NOTE: INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ON TO THE EXISTING GROUND PROFILE ALONG THE CENTERLINE OF -WALL_5- TAKEN FROM THE PROVIDED PROJECT TIN FILE (i5715_ls_tin.tin) DATE 12/18/2024.



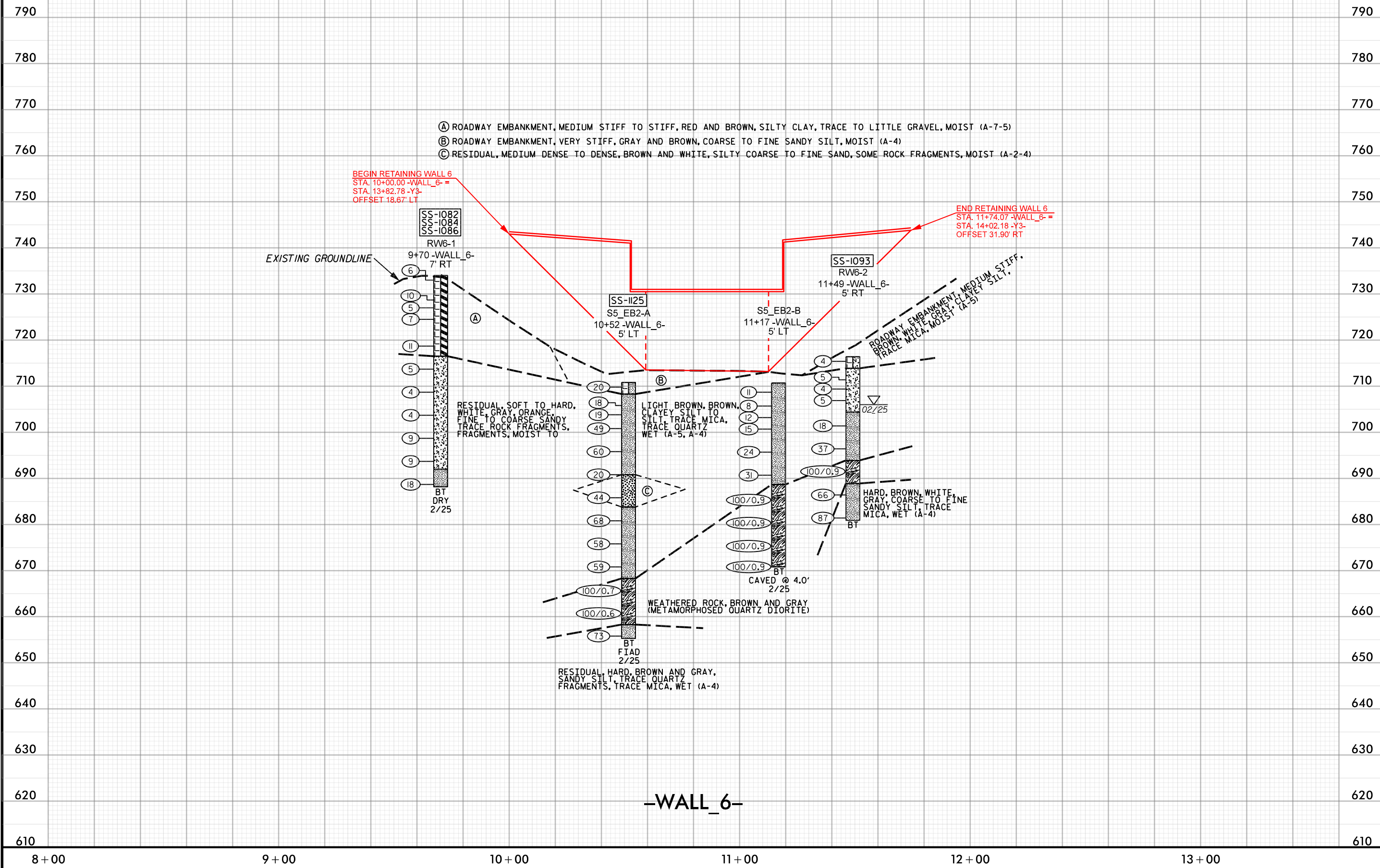
PROJECT REFERENCE NO.	SHEET NO.
I-5715	4
CENTERLINE PROFILE ALONG (-WALL_5-) AT END BENT NO.1	



NOTE: INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ON TO THE EXISTING GROUND PROFILE ALONG THE CENTERLINE OF -WALL_6- TAKEN FROM THE PROVIDED PROJECT TIN FILE (i5715_ls_tin.tin) DATE 12/18/2024.



PROJECT REFERENCE NO.	SHEET NO.
I-5715	5
CENTERLINE PROFILE ALONG (-WALL_6-) AT END BENT NO. 2	



GEOTECHNICAL BORING REPORT
BORE LOG

WBS 50128.1.FS1			TIP I-5715			COUNTY MECKLENBURG			GEOLOGIST GRAINGER, P.						
SITE DESCRIPTION MSE Retaining Wall No. 5 at Bridge No. 1417, End Bent No. 1									GROUND WTR (ft)						
BORING NO. RW5-1			STATION 10+03			OFFSET 2 ft RT			ALIGNMENT -WALL_5-			0 HR. Dry			
COLLAR ELEV. 720.5 ft			TOTAL DEPTH 40.4 ft			NORTHING 621,850			EASTING 1,443,152			24 HR. 17.0			
DRILL RIG/HAMMER EFF./DATE TER4013 Mobile B-57 88% 11/12/2024						DRILL METHOD H.S. Augers			HAMMER TYPE Automatic						
DRILLER TURNAGE, J. R.			START DATE 12/19/24			COMP. DATE 12/20/24			SURFACE WATER DEPTH N/A						
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				ELEV. (ft)	DEPTH (ft)
725															
720	720.5	0.0												720.5	0.0
	717.0	3.5	3	6	6	12					SS-530	37%			
	714.5	6.0	2	5	5	10					SS-531	37%		715.0	5.5
715															
	711.4	9.1	5	7	5	12							M		
													M		
710			4	4	5	9									
	706.4	14.1											M		
705			9	13	13										
	701.4	19.1												702.5	18.0
700			6	4	3	7							W		
	696.4	24.1											W		
695			2	2	3	5									
	691.4	29.1												691.4	29.1
690			97	3/0.1						100/0.6					
	686.4	34.1												687.5	33.0
685			11	24	32								W		
	681.4	39.1												682.5	38.0
			26	48	52/0.3										
										100/0.8				680.1	40.4
</															

WBS 50128.1.FS1			TIP I-5715			COUNTY MECKLENBURG			GEOLOGIST GRAINGER, P.					
SITE DESCRIPTION MSE Retaining Wall No. 5 at Bridge No. 1417, End Bent No. 1									GROUND WTR (ft)					
BORING NO. S5_EB1-B			STATION 10+46			OFFSET 5 ft LT			ALIGNMENT -WALL_5-			0 HR. 11.3		
COLLAR ELEV. 712.4 ft			TOTAL DEPTH 44.6 ft			NORTHING 621,847			EASTING 1,443,195			24 HRCAVED @7.2		
DRILL RIG/HAMMER EFF./DATE TER4013 Mobile B-57 88% 11/12/2024						DRILL METHOD H.S. Augers			HAMMER TYPE Automatic					
DRILLER TURNAGE, J. R.			START DATE 01/14/25			COMP. DATE 01/14/25			SURFACE WATER DEPTH N/A					
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				
715														
	712.4	0.0	2	3	5	8								712.4 GROUND SURFACE 0.0
710												M		ROADWAY EMBANKMENT
	708.1	4.3												MEDIUM STIFF TO VERY SOFT, RED, CLAYEY SILT, MOIST (A-5)
	706.4	6.0	WOH	1	2	3						M		
705			WOH	WOH	WOH	0					SS-839	39%		704.4 8.0
	703.9	8.5	1	2	4	6						M		RESIDUAL
700												▽		MEDIUM STIFF TO STIFF, BROWN, WHITE, CLAYEY SILT, TRACE MICA, MOIST TO WET (A-5)
	698.3	14.1	2	2	4	6						M		
695														
	693.3	19.1	3	4	8	12						W		
690														690.4 22.0
	688.3	24.1	4	10	14	24						W		VERY STIFF, BROWN AND WHITE, SANDY SILT, TRACE MICA, TRACE QUARTZ FRAGMENTS, WET (A-4)
685												W		
	683.3	29.1	17	32	38	70						W		685.4 27.0
680														VERY DENSE, BROWN, GRAY, WHITE, SILTY SAND, LITTLE QUARTZ FRAGMENTS, TRACE MICA, WET (A-2-4)
	678.3	34.1	28	47	53/0.3									679.9 32.5
675														WEATHERED ROCK
	673.3	39.1	29	58	42/0.2									BROWN, WHITE, BLACK (METAMORPHOSED QUARTZ DIORITE)
670														
	668.3	44.1	100/0.5											667.8 44.6
														Boring Terminated at Elevation 667.8 ft IN WEATHERED ROCK (METAMORPHOSED QUARTZ DIORITE)

NCDOT BORE DOUBLE I5715_GEO_STRUC.GPJ NC_DOT.GDT 7/3/25

NC DOT BORE DOUBLE I5715_GEO_STRUC.GPJ NC_DOT.GDT 7/3/25

WBS			50128.1.FS1			TIP			I-5715			COUNTY			MECKLENBURG			GEOLOGIST			GRAINGER, P.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
SITE DESCRIPTION															MSE Retaining Wall No. 6 at Bridge No. 1417, End Bent No. 2					GROUND WTR (ft)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
BORING NO.			RW6-2			STATION			11+49			OFFSET			5 ft RT			ALIGNMENT			-WALL_6-			0 HR.	10.4																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
COLLAR ELEV.			716.4 ft			TOTAL DEPTH			35.5 ft			NORTHING			621,792			EASTING			1,443,341			24 HR.	FIAD																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
DRILL RIG/HAMMER EFF./DATE										TER4013 Mobile B-57 88% 11/12/2024										DRILL METHOD					H.S. Augers					HAMMER TYPE					Automatic																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
DRILLER					TURNAGE, J. R.					START DATE					02/06/25					COMP. DATE					02/06/25					SURFACE WATER DEPTH										N/A																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT										SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
0.5ft	0.5ft	0.5ft	0	25	50	75	100																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														

LABORATORY TESTING SUMMARY

PROJECT NUMBER: 50128.1.FS1

TIP: I-5715

COUNTY: Mecklenburg

DESCRIPTION: MSE RETAINING WALLS NO. 5 AND NO. 6 AT BRIDGE NO. 1417, END BENT NO. 1 AND END BENT NO. 2

Boring No.	Sample No.	Station	Alignment	Offset (feet)	Northing (feet)	Easting (feet)	Depth Interval (feet)	AASHTO Class.	L.L.	P.I.	% by Weight				% Retained #4 Sieve	% Passing (sieves)			% Moisture	% Organic
											Coarse Sand	Fine Sand	Silt	Clay		#10	#40	#200		
RW5-1	SS-530	10+03	-WALL 5-	2' RT	621,850	1,443,152	0.0-1.5	A-7-5(19)	66	25	18.7	13.5	28.7	39.1	1	97	83	69	37.3	-
RW5-1	SS-531	10+03	-WALL 5-	2' RT	621,850	1,443,152	3.5-5.0	A-7-5(7)	63	20	30.3	20.2	26.6	22.9	0	89	69	48	37.3	-
S5 EB1-B	SS-839	10+46	-WALL 5-	5' LT	621,847	1,443,195	6.0-7.5	A-5(3)	48	8	28.0	26.2	33.3	12.5	1	98	80	51	39.3	-
S5 EB1-A	SS-501	11+17	-WALL 5-	7' LT	621,890	1,443,189	0.0-1.5	A-5(0)	45	2	30.3	31.8	26.3	11.6	0	100	80	47	30.8	-
S5 EB1-A	SS-503	11+17	-WALL 5-	7' LT	621,890	1,443,189	6.0-7.5	A-5(0)	45	6	38.4	33.8	20.1	7.7	0	100	71	37	35.0	-
S5 EB1-A	SS-505	11+17	-WALL 5-	7' LT	621,890	1,443,189	14.1-15.6	A-5(0)	41	3	33.8	33.7	18.7	13.8	0	100	77	42	24.2	-
RW6-1	SS-1082	9+70	-WALL 6-	7' RT	621,841	1,443,393	0.0-1.5	A-7-5(1)	41	13	32.6	20.7	25.3	21.4	24	70	54	35	18.8	-
RW6-1	SS-1084	9+70	-WALL 6-	7' RT	621,841	1,443,393	6.0-7.5	A-7-5(6)	49	16	27.3	19.5	27.4	25.8	9	47	70	49	26.2	-
RW6-1	SS-1086	9+70	-WALL 6-	7' RT	621,841	1,443,393	14.3-15.8	A-7-5(3)	55	20	28.7	19.8	26.8	24.7	20	66	53	36	30.9	-
S5 EB2-A	SS-1125	10+52	-WALL 6-	5' LT	621,854	1,443,311	0.0-1.5	A-4(0)	36	3	17.9	38.4	36.8	6.9	0	99	91	51	25.2	-
RW6-2	SS-1093	11+49	-WALL 6-	5' RT	621,792	1,443,341	0.0-1.5	A-5(0)	47	5	32.1	32.5	30.6	4.8	0	97	75	42	25.6	-

Mitra Grabski

Certified Lab Technician Signature

114-01-1203

Certification Number

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

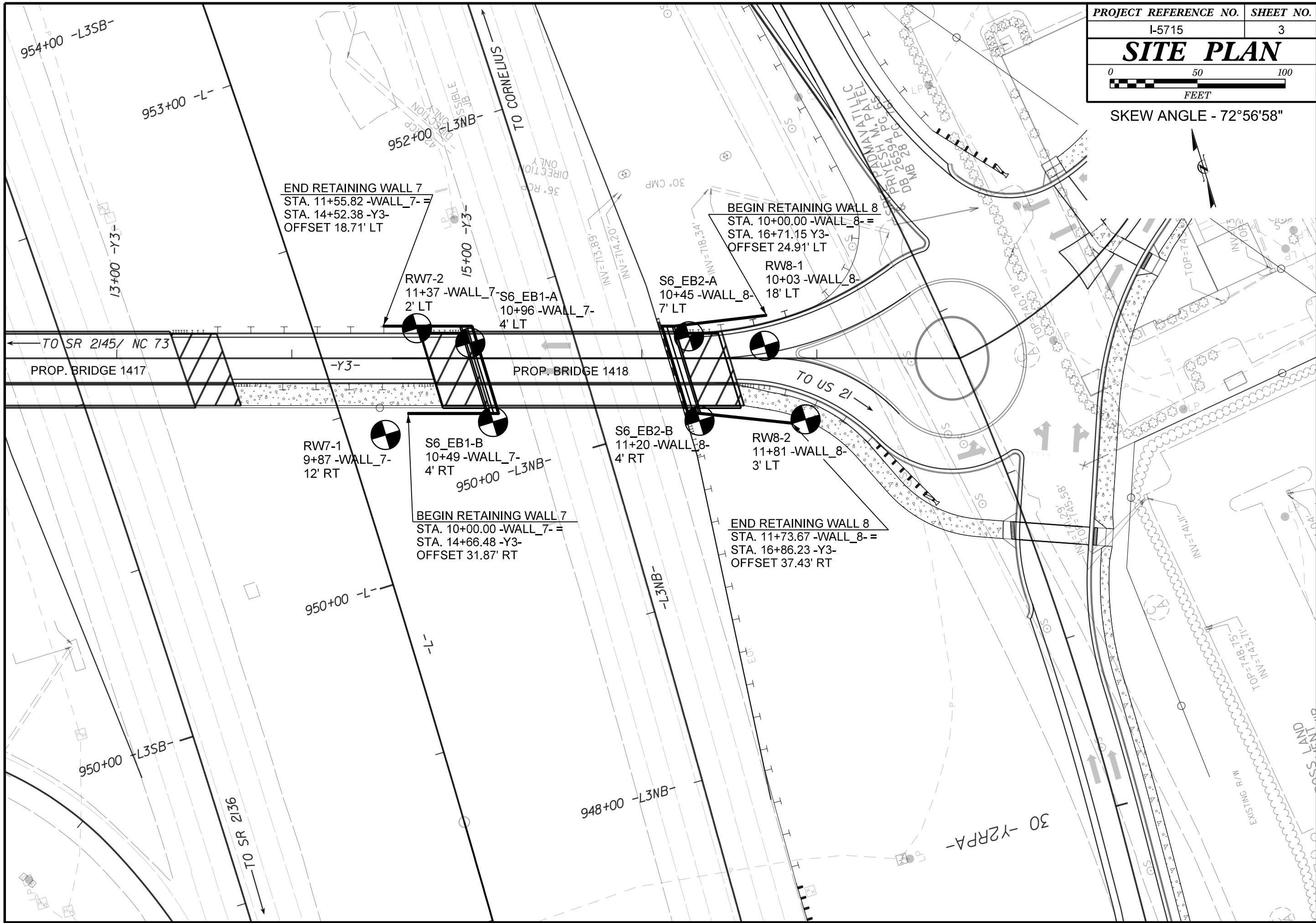
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

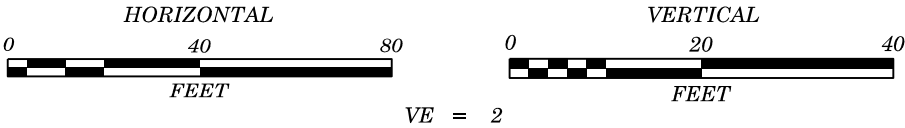
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION												GRADATION												ROCK DESCRIPTION												TERMS AND DEFINITIONS											
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, <i>VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6</i>												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.												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:												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 DISLOGGED 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 (SROD) - 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.											
SOIL LEGEND AND AASHTO CLASSIFICATION												ANGULARITY OF GRAINS												WEATHERED ROCK (WR)												CRISTALLINE ROCK (CR)											
GENERAL CLASS.		GRANULAR MATERIALS (≤ 35% PASSING #200)						SILT-CLAY MATERIALS (> 35% PASSING #200)						ORGANIC MATERIALS				FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.																													
GROUP CLASS.	A-1-a	A-1-b	A-3	A-2-4	A-2-5	A-2-6	A-2-7	A-4	A-5	A-6	A-7	A-1, A-2	A-3	A-4, A-5	A-6, A-7	NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED.																															
SYMBOL																NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.																															
% PASSING	#10	50 MX	30 MX	50 MX	51 MN	10 MX	35 MX	35 MX	35 MX	35 MX	36 MN	36 MN	36 MN	36 MN	36 MN	FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.																															
MATERIAL PASSING #40	—	—	—	40 MX	41 MN	40 MX	41 MN	40 MX	41 MN	40 MX	41 MN	40 MX	41 MN	40 MX	41 MN	COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.																															
LL	—	—	—	40 MX	41 MN	40 MX	41 MN	40 MX	41 MN	40 MX	41 MN	40 MX	41 MN	40 MX	41 MN	WEATHERING																															
PI	6 MX	NP	—	10 MX	10 MX	11 MN	11 MN	10 MX	10 MX	11 MN	11 MN	10 MX	10 MX	11 MN	11 MN	FRESH																															
GROUP INDEX	0	0	0	0	4 MX	8 MX	12 MX	16 MX	NO MX	SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER						MODERATELY SEVERE (MOD. SEV.)																															
USUAL TYPES OF MAJOR MATERIALS	STONE FRAGS, GRAVEL, AND SAND	FINE SAND	SILTY OR CLAYEY GRAVEL AND SAND				SILTY SOILS				CLAYEY SOILS				COMPLETE																																
GEN. RATING AS SUBGRADE	EXCELLENT TO GOOD						FAIR TO POOR						FAIR TO POOR		POOR		UNSATURABLE																														
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 RESISTANCE (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				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 OPENING (MM)		4 4.76		10 2.00		40 0.42		60 0.25		200 0.075		270 0.053																																			
BOULDER (BLDR.)		COBBLE (COB.)		GRAVEL (GR.)		COARSE SAND (CSE, SD.)		FINE SAND (F SD.)		SILT (SL.)		CLAY (CL.)																																			
GRAIN SIZE	MM IN.	305 12	75 3	2.0		0.25		0.05		0.005																																					
SOIL MOISTURE - CORRELATION OF TERMS																																															
SOIL MOISTURE SCALE (ATTERBERG LIMITS)		FIELD MOISTURE DESCRIPTION		GUIDE FOR FIELD MOISTURE DESCRIPTION																																											
PLASTIC RANGE (PI)	LL	LIQUID LIMIT		- SATURATED - (SAT.)																																											
		PLASTIC LIMIT		- WET - (W)																																											
	OM	OPTIMUM MOISTURE SHRINKAGE LIMIT		- MOIST - (M)																																											
				- DRY - (D)																																											
USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE																																															
SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE																																															
SOLID; AT OR NEAR OPTIMUM MOISTURE																																															
REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE																																															
PLASTICITY																																															
PLASTICITY INDEX (PI)																																															
DRY STRENGTH																																															
NON PLASTIC SLIGHTLY PLASTIC MODERATELY PLASTIC HIGHLY PLASTIC																																															
0-5 6-15 16-25 26 OR MORE																																															
VERY LOW SLIGHT MEDIUM 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.																																															
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		DIP & DIP DIRECTION OF ROCK STRUCTURES		TEST BORING		SLOPE INDICATOR INSTALLATION																															

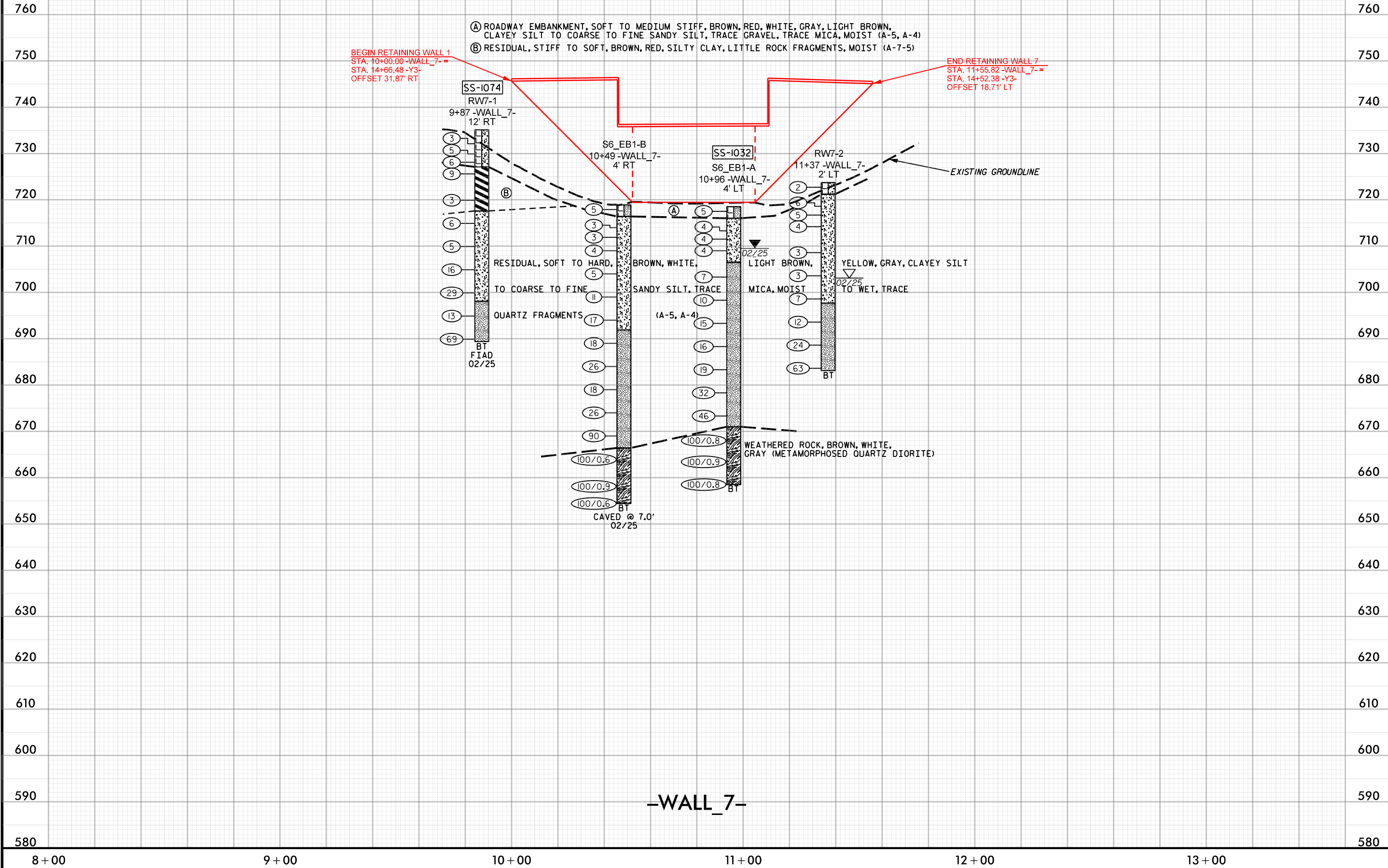
SKEW ANGLE - 72°56'58"



NOTE: INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ON TO THE EXISTING GROUND PROFILE ALONG THE CENTERLINE OF -WALL_7- TAKEN FROM THE PROVIDED PROJECT TIN FILE (i5715_ls_tin.tin) DATE 12/18/2024.

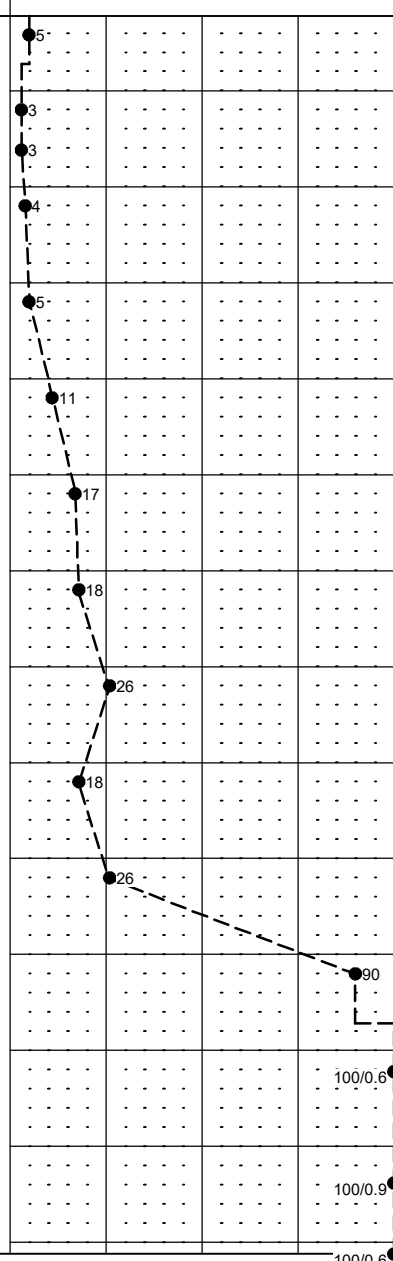


PROJECT REFERENCE NO.	SHEET NO.
I-5715	4
CENTERLINE PROFILE ALONG (-WALL_7-) AT END BENT NO.1	



PROJECT REFERENCE NO.	SHEET NO.
I-5715	5
CENTERLINE PROFILE ALONG (-WALL_8-) AT END BENT NO. 2	

NC DOT BORE DOUBLE I5715_GEO_STRUC.GPJ NC_DOT.GDT 7/3/25

WBS		50128.1.FS1		TIP		I-5715		COUNTY		MECKLENBURG		GEOLOGIST		GRAINGER, P.																																			
SITE DESCRIPTION												MSE Retaining Wall No. 7 at Bridge No. 1418, End Bent No. 1		GROUND WTR (ft)																																			
BORING NO.				S6_EB1-B				STATION				10+49		OFFSET		4 ft RT		ALIGNMENT		-WALL_7-		0 HR.		N/A																									
COLLAR ELEV.				718.9 ft				TOTAL DEPTH				64.5 ft		NORTHING				621,752		EASTING				1,443,473		24 HRC		AVED @7.0																					
DRILL RIG/HAMMER EFF./DATE										TER4013 Mobile B-57 88% 11/12/2024										DRILL METHOD					Mud Rotary					HAMMER TYPE					Automatic														
DRILLER					TURNAGE, J. R.					START DATE					02/05/25					COMP. DATE					02/05/25					SURFACE WATER DEPTH										N/A									
ELEV	DRIVE	DEPTH	BLOW COUNT			BLOWS PER FOOT					SAMP.	NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION																																		
(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	25	50	75	100																																							
720																																																	
	718.9	0.0	2 2 3									M																																					
715	715.0	3.9	1 1 2										M																																				
	712.9	6.0	1 2 1										M																																				
710	710.0	8.9	1 2 2										M																																				
													M																																				
705	705.0	13.9	1 2 3										M																																				
													M																																				
700	700.0	18.9	2 4 7										M																																				
													M																																				
695	695.0	23.9	4 8 9										M																																				
													M																																				
690	690.0	28.9	4 7 11										W	691.9 VERY STIFF TO HARD, BROWN, WHITE, GRAY, SANDY SILT, TRACE MICA, WET (A-4) 27.0																																			
													W																																				
685	685.0	33.9	5 11 15										W																																				
													W																																				
680	680.0	38.9	6 8 10										W																																				
													W																																				
675	675.0	43.9	7 11 15										W																																				
													W																																				
670	670.0	48.9	13 38 52										W																																				
													W																																				
665	665.0	53.9	20 76 24/0.1											666.4 WEATHERED ROCK 52.5 BROWN, GRAY, WHITE (METAMORPHOSED QUARTZ DIORITE)																																			
660	659.0	59.9	32 68/0.4																																														
655	655.0	63.9	60 40/0.1													654.4 Boring Terminated at Elevation 654.4 ft IN WEATHERED ROCK (METAMORPHOSED QUARTZ DIORITE) 64.5																																	

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 50128.1.FS1			TIP I-5715			COUNTY MECKLENBURG			GEOLOGIST MARPLES, Z.							
SITE DESCRIPTION MSE Retaining Wall No. 8 at Bridge No. 1418, End Bent No. 2										GROUND WTR (ft)						
BORING NO. S6_EB2-B			STATION 11+20			OFFSET 4 ft RT			ALIGNMENT -WALL_8-		0 HR. N/A					
COLLAR ELEV. 720.7 ft			TOTAL DEPTH 24.1 ft			NORTHING 621,718			EASTING 1,443,586		24 HRCAVED @4.6					
DRILL RIG/HAMMER EFF./DATE TER4013 Mobile B-57 88% 11/12/2024						DRILL METHOD Mud Rotary				HAMMER TYPE Automatic						
DRILLER TURNAGE, J. R.			START DATE 12/17/24			COMP. DATE 12/17/24			SURFACE WATER DEPTH N/A							
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						ELEV. (ft)
725																
720	720.7	0.0												720.7	GROUND SURFACE	0.0
715	717.2	3.5	3	4	5									717.7	ROADWAY EMBANKMENT	
	714.7	6.0	3	7	6									714.7	STIFF, BLACK, WHITE, BROWN, CLAYEY SILT, TRACE OF ORGANIC MATTER, TRACE MICA, MOIST (A-5)	3.0
710	711.6	9.1	6	14	20									714.7	RESIDUAL	6.0
	706.6	14.1	10	17	25										STIFF, BROWN, GRAY, WHITE, CLAYEY SILT, TRACE MICA, MOIST (A-5)	
705			17	26	31										DENSE TO VERY DENSE, BROWN, GRAY, SILTY FINE TO COARSE SAND, MOIST (A-2-4)	
700	701.6	19.1												701.6	CRYSTALLINE ROCK	19.1
	696.6	24.1													GRAY (METAMORPHOSED QUARTZ DIORITE)	
														696.6	Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 696.6 ft IN CRYSTALLINE ROCK (METAMORPHOSED QUARTZ DIORITE)	24.1

WBS 50128.1.FS1				TIP I-5715		COUNTY MECKLENBURG				GEOLOGIST GRAINGER, P.					
SITE DESCRIPTION MSE Retaining Wall No. 8 at Bridge No. 1418, End Bent No. 2										GROUND WTR (ft)					
BORING NO. RW8-2				STATION 11+81				OFFSET 3 ft LT				ALIGNMENT -WALL_8-		0 HR. 39.2	
COLLAR ELEV. 737.7 ft				TOTAL DEPTH 40.6 ft				NORTHING 621,701				EASTING 1,443,644		24 HRCaved @21.6	
DRILL RIG/HAMMER EFF./DATE TER4013 Mobile B-57 88% 11/12/2024								DRILL METHOD H.S. Augers				HAMMER TYPE Automatic			
DRILLER TURNAGE, J. R.				START DATE 12/16/24				COMP. DATE 12/16/24				SURFACE WATER DEPTH N/A			
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
740															
735	737.7	0.0	3	4	6									737.7 GROUND SURFACE 0.0	
	733.5	4.2	4	7	9									RESIDUAL STIFF TO MEDIUM STIFF, RED-BROWN, LIGHT BROWN, DARK BROWN, SILTY CLAY, MOIST (A-7)	
730	731.0	6.7	3	6	6										
	728.5	9.2	3	4	6										
725	723.5	14.2	2	3	5									721.7 MEDIUM STIFF, DARK BROWN, LIGHT BROWN, WHITE, CLAYEY SILT, TRACE MICA, MOIST (A-5) 16.0	
	718.5	19.2	2	3	4										
715	713.5	24.2	2	3	4									711.7 HARD, DARK BROWN, LIGHT BROWN, WHITE, SANDY SILT, TRACE MICA, MOIST TO WET (A-4) 26.0	
	708.5	29.2	10	24	27										
705	703.5	34.2	10	25	32									700.7 WEATHERED ROCK 37.0 BROWN, WHITE, BLACK (METAMORPHOSED QUARTZ DIORITE) Boring Terminated at Elevation 697.1 ft IN WEATHERED ROCK (METAMORPHOSED QUARTZ DIORITE) 697.1 40.6	
	698.5	39.2	23	50	50/0.4										
700															

NCDOT BORE DOUBLE I5715_GEO_STRUC.GPJ NC_DOT.GDT 7/3/25

