

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BR-0096	1	

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GENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A GEOCHEMICAL 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 UNCORRECTED DATA ARE BASED ONLY ON THE BEST AVAILABLE REPEATABILITY AND ACCURACY 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:

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.

C. Ranieri, GIT

W. Shenbergen

G. Mahon

INVESTIGATED BY F&R, Inc

DRAWN BY T.T. Walker

CHECKED BY P. Alton, P.E.

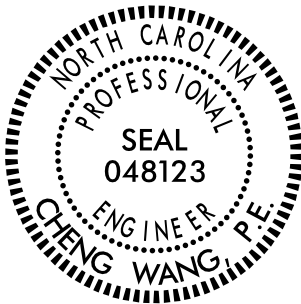
SUBMITTED BY C. Wang, P.E.DATE June 2023

Prepared in the Office of:

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DocuSigned by:

Cheng Wang

06/14/2023

1711224BFB39493

DATE _____

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UNLESS ALL SIGNATURES COMPLETED**

SHEET NO.

DESCRIPTION

1	TITLE SHEET
2	LEGEND (SOIL & ROCK)
3	SITE PLAN
4-5	PROFILE(S)
6-9	BORE LOG(S)
10	SOIL TEST RESULT(S)

COUNTY ROCKINGHAM

PROJECT DESCRIPTION REPLACE BRIDGE NO. 780176
ON SR 1700 OVER NC 14/NC 87

SITE DESCRIPTION MSE WALL NO.1 ON -W1-
FROM 10+00 TO 11+12 AND MSE WALL NO.2
ON -W2- FROM 10+00 TO 11+13

REFERENCE: BR-0096

PROJECT: 67096

PROJECT REFERENCE NO.
BR-0096

SHEET NO.
2

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION

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

SOIL LEGEND AND AASHTO CLASSIFICATION

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

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

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

GROUND WATER

▽

WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING

▽PW

STATIC WATER LEVEL AFTER 24 HOURS

▽PW

PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA

○

SPRING OR SEEP

MISCELLANEOUS SYMBOLS

ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION

SOIL SYMBOL

ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT

INFERRED SOIL BOUNDARY

INFERRED ROCK LINE

ALLUVIAL SOIL BOUNDARY

DIP & DIP DIRECTION OF ROCK STRUCTURES

SPT DPT DMT VST PMT TEST BORING

AUGER BORING

CORE BORING

MONITORING WELL

PIEZOMETER INSTALLATION

SLOPE INDICATOR INSTALLATION

CONE PENETROMETER TEST

SOUNDING ROD

TEST BORING WITH CORE

SPT N-VALUE

RECOMMENDATION SYMBOLS

UNDERCUT

SHALLOW UNDERCUT

UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE

UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK

UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL

ABBREVIATIONS

AR - AUGER REFUSAL
BT - BORING TERMINATED
CL - CLAY
CPT - CONE PENETRATION TEST
CSE - COARSE
DMT - DILATOMETER TEST
DPT - DYNAMIC PENETRATION TEST
e - VOID RATIO
F - FINE
FOSS. - FOSSILIFEROUS
FRAC. - FRACTURED, FRACTURES
FRAGS. - FRAGMENTS
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
% - UNIT WEIGHT
% - DRY UNIT WEIGHT

SAMPLE ABBREVIATIONS

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

EQUIPMENT USED ON SUBJECT PROJECT

DRILL UNITS:
☐ CME-45C
☐ CME-55
☒ 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
☐

ROCK DESCRIPTION

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

WEATHERED ROCK (WR)

CRYSTALLINE ROCK (CR)

NON-CRYSTALLINE ROCK (NCR)

COASTAL PLAIN SEDIMENTARY ROCK (CP)

NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED.

FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.

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.

COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.

WEATHERING

FRESH
VERY SLIGHT (V SLI.)

SLIGHT (SLI.)

MODERATE (MOD.)

MODERATELY SEVERE (MOD. SEV.)

SEVERE (SEV.)

VERY SEVERE (V SEV.)

COMPLETE

ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE.
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.
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.
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.
ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK. IF TESTED, WOULD YIELD SPT REFUSAL
ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. IF TESTED, WOULD YIELD SPT N VALUES > 100 BPF
ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE THAT ONLY MINOR VESTIGES OF ORIGINAL ROCK FABRIC REMAIN. IF TESTED, WOULD YIELD SPT N VALUES < 100 BPF
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.

TERMS AND DEFINITIONS

ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.
AQUIFER - A WATER BEARING FORMATION OR STRATA.
ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.
ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, SUCH AS SHALE, SLATE, ETC.
ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE.
CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.
COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.
CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.
DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.
DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.
DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.
FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.
FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.
FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL.
FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.
FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.
JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.
LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.
LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.
MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.
PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.
RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.
ROCK QUALITY DESIGNATION (RQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.
SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.
SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS.
SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.
STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.
STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.
STRATA ROCK QUALITY DESIGNATION (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.

FRACTURE SPACING

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

BEDDING

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

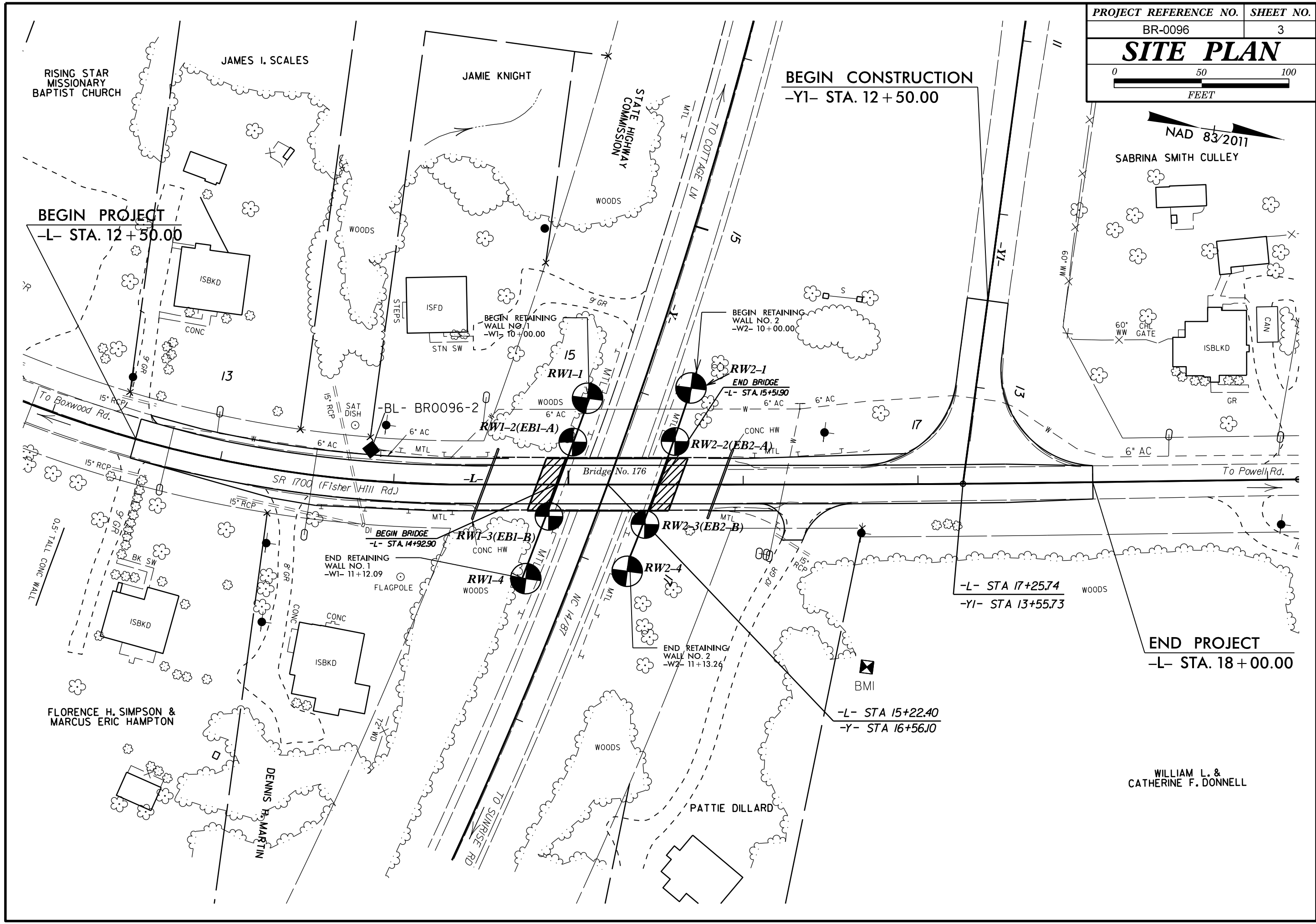
INDURATION

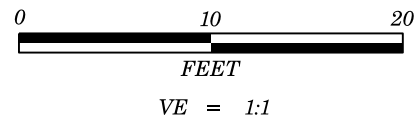
FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.

FRIABLE
MODERATELY INDURATED
INDURATED
EXTREMELY INDURATED

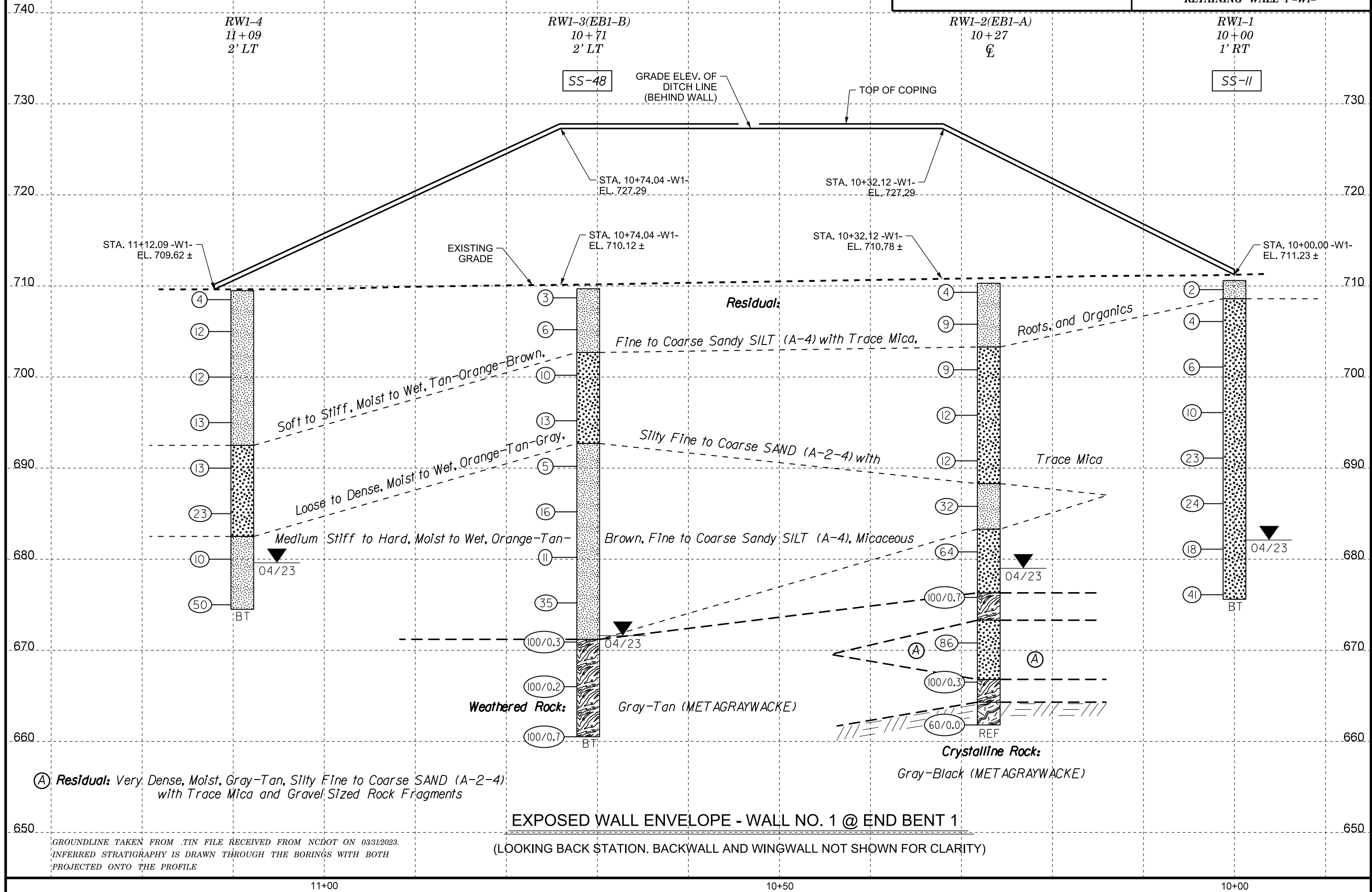
RUBBING WITH FINGER FREES NUMEROUS GRAINS;
GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.
GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE;
BREAKS EASILY WHEN HIT WITH HAMMER.
GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE;
DIFFICULT TO BREAK WITH HAMMER.
SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE;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

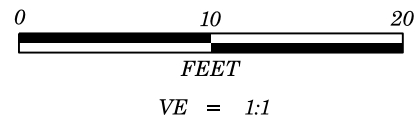
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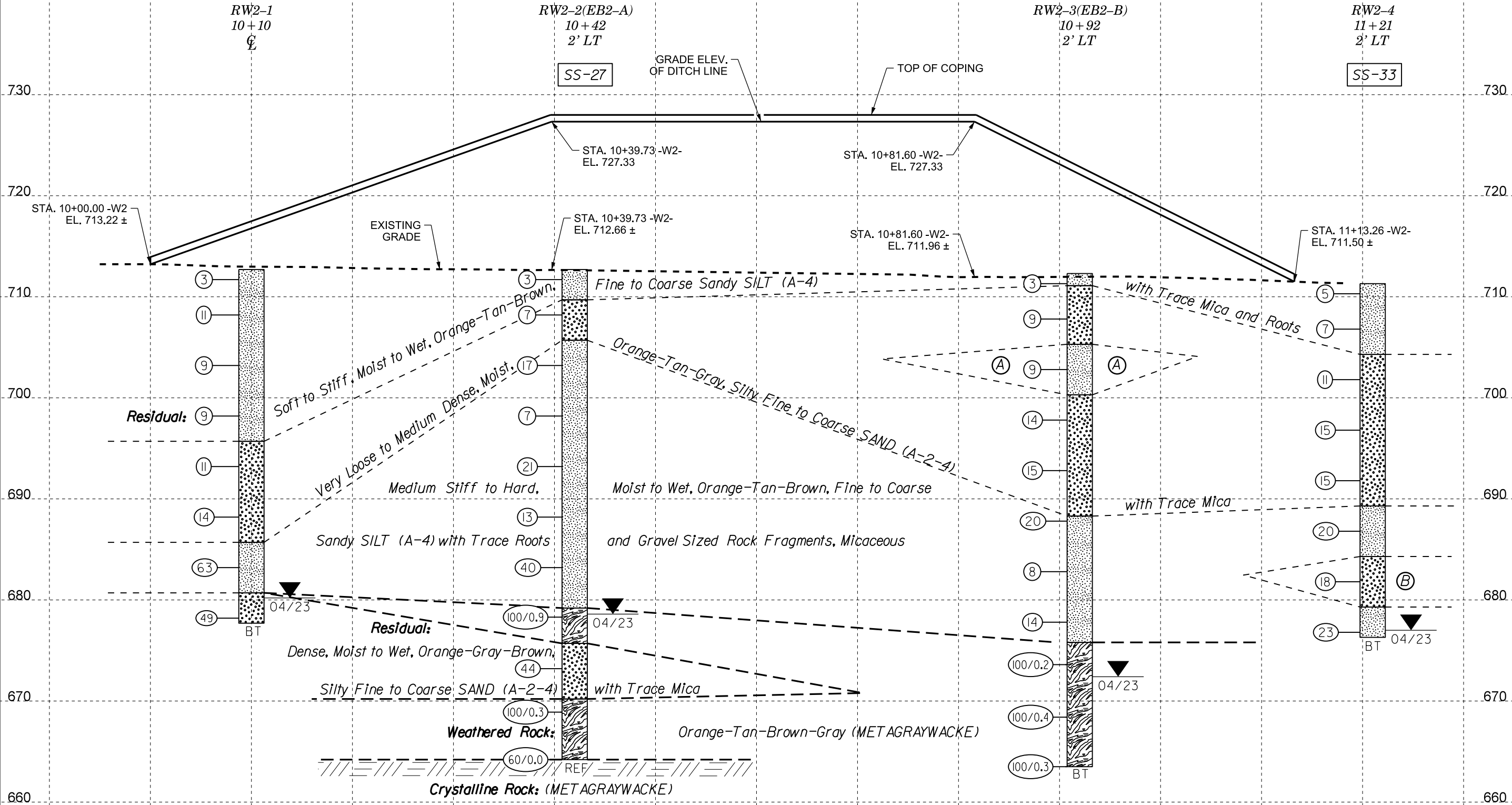
PROJECT REFERENCE NO.	SHEET NO.
BR-0096	4
PROFILE BORINGS PROJECTED ALONG RETAINING WALL 1 -W1-	





PROJECT REFERENCE NO.	SHEET NO.
BR-0096	5
PROFILE BORINGS PROJECTED ALONG RETAINING WALL 2 -W2-	

- Ⓐ **Residual:** Stiff, Moist, Orange-Gray, Fine to Coarse Sandy SILT (A-4) with Trace Gravel Sized Rock Fragments, Micaceous
- Ⓑ **Residual:** Medium Dense, Wet, Orange-Tan, Silty Fine to Coarse SAND (A-2-4) with Trace Mica



GROUNDLINE TAKEN FROM .TIN FILE RECEIVED FROM NCDOT ON 03/31/2023.
INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH
PROJECTED ONTO THE PROFILE

EXPOSED WALL ENVELOPE - WALL NO. 2 @ END BENT 2
(LOOKING AHEAD STATION. BACKWALL AND WINGWALL NOT SHOWN FOR CLARITY)

10+00

10+50

11+00

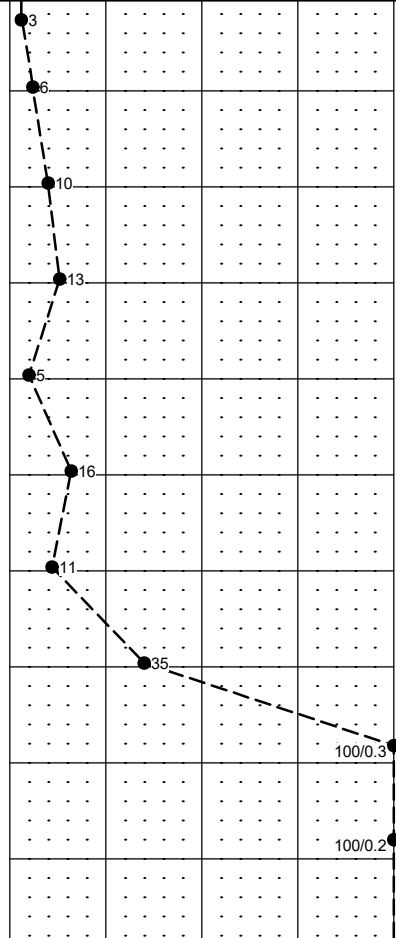
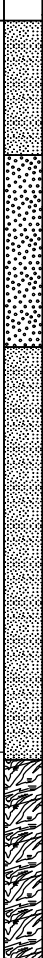
GEOTECHNICAL BORING REPORT
BORE LOG

WBS 67096.1.1			TIP BR-0096			COUNTY ROCKINGHAM			GEOLOGIST C. Ranieri						
SITE DESCRIPTION Bridge 780176 on SR 1700 over NC 14/ NC 87- MSE Wall No. 1									GROUND WTR (ft)						
BORING NO. RW1-1			STATION 10+00			OFFSET 1 ft RT			ALIGNMENT -W1-			0 HR. 30.5			
COLLAR ELEV. 710.6 ft			TOTAL DEPTH 35.0 ft			NORTHING 1,013,446			EASTING 1,771,261			24 HR. 28.5			
DRILL RIG/HAMMER EFF./DATE F&R3763 CME-550X 87% 05/20/2022						DRILL METHOD H.S. Augers			HAMMER TYPE Automatic						
DRILLER W. Shenberger			START DATE 04/10/23			COMP. DATE 04/10/23			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)
715															
710	710.6	0.0												710.6	GROUND SURFACE 0.0
705	707.1	3.5	WOH	1	1									708.6	RESIDUAL
	702.1	8.5	2	2	2						SS-11	25%		Orange-Light Brown, Fine to Coarse Sandy SILT (A-4), with Trace Mica and Organics	
700	697.1	13.5	2	2	4										Orange-Tan-Gray, Silty Fine to Coarse SAND (A-2-4), with Trace Mica and Gravel Sized Rock Fragments
	692.1	18.5	4	4	6										
695	687.1	23.5	10	10	13										
685	682.1	28.5	10	12	12										
	677.1	33.5	7	9	9										
680			6	13	28										

WBS 67096.1.1			TIP BR-0096			COUNTY ROCKINGHAM			GEOLOGIST C. Ranieri						
SITE DESCRIPTION Bridge 780176 on SR 1700 over NC 14/ NC 87- MSE Wall No. 1									GROUND WTR (ft)						
BORING NO. RW1-2 (EB1-A)			STATION 10+27			OFFSET CL			ALIGNMENT -W1-			0 HR. 35.0			
COLLAR ELEV. 710.3 ft			TOTAL DEPTH 48.5 ft			NORTHING 1,013,441			EASTING 1,771,287			24 HR. 31.3			
DRILL RIG/HAMMER EFF./DATE F&R3763 CME-550X 87% 05/20/2022						DRILL METHOD H.S. Augers			HAMMER TYPE Automatic						
DRILLER W. Shenberger			START DATE 04/11/23			COMP. DATE 04/11/23			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					
715															
710	710.3	0.0												710.3	GROUND SURFACE 0.0
			1	1	3										
	706.8	3.5													
705			4	4	5										
	701.8	8.5												703.3	Orange-Tan, Silty Fine to Coarse SAND (A-2-4), with Trace Mica 7.0
700			5	4	5										
	696.8	13.5													
695			5	6	6										
	691.8	18.5													
690			4	6	6										
	686.8	23.5												688.3	Brown, Fine to Coarse Sandy SILT (A-4), with Trace Mica 22.0
685			7	13	19										
	681.8	28.5												683.3	Tan-Brown-Gray, Silty Fine to Coarse SAND (A-2-4), with Trace Mica and Gravel Sized Rock Fragments 27.0
680			16	20	44										
	676.8	33.5												676.3	WEATHERED ROCK 34.0
675			30	70	30/0.2									673.3	Gray-Tan (METAGRAYWACKE) 37.0
	671.8	38.5													Gray-Tan, Silty Fine to Coarse SAND (A-2-4), with Trace Mica and Gravel Sized Rock Fragments
670			11	21	65										
	666.8	43.5												666.8	WEATHERED ROCK 43.5
665			100/0.3											664.3	Gray (METAGRAYWACKE) 46.0
	661.8	48.5												661.8	CRYSTALLINE ROCK 48.5
			60/0.0												Boring Terminated with Standard Penetration Test Refusal at Elevation 661.8 ft in CRYSTALLINE ROCK (METAGRAYWACKE)
															Notes: 1. Surficial Organic Soil: 0.0-0.3' 2. Harder drilling indicated by driller at 46.0'

NCDOT BORE DOUBLE 66B-0055 BORING LOGS - WALL.GPJ NC_DOT.GDT 6/14/23

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 67096.1.1			TIP BR-0096			COUNTY ROCKINGHAM			GEOLOGIST C. Ranieri						
SITE DESCRIPTION Bridge 780176 on SR 1700 over NC 14/ NC 87- MSE Wall No. 1										GROUND WTR (ft)					
BORING NO. RW1-3 (EB1-B)			STATION 10+71			OFFSET 2 ft LT			ALIGNMENT -W1-		0 HR. 40.0				
COLLAR ELEV. 709.7 ft			TOTAL DEPTH 49.2 ft			NORTHING 1,013,432			EASTING 1,771,331		24 HR. 38.1				
DRILL RIG/HAMMER EFF./DATE F&R3763 CME-550X 87% 05/20/2022						DRILL METHOD H.S. Augers			HAMMER TYPE Automatic						
DRILLER W. Shenberger			START DATE 04/12/23			COMP. DATE 04/12/23			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)
710														709.7	0.0
	709.7	0.0	1	1	2									RESIDUAL Orange-Brown, Fine to Coarse Sandy SILT (A-4), with Trace Mica and Roots	
705	706.2	3.5	2	3	3						SS-48	21%			
700	701.2	8.5	4	4	6							M		Orange-Gray, Silty Fine to Coarse SAND (A-2-4), with Trace Mica	
695	696.2	13.5	5	6	7							M		692.7	17.0
690	691.2	18.5	2	2	3							M		Orange-Tan, Micaceous, Fine to Coarse Sandy SILT (A-4)	
685	686.2	23.5	5	7	9							M			
680	681.2	28.5	2	4	7							W			
675	676.2	33.5	12	18	17							W			
670	671.2	38.5	100/0.3			100/0.3								671.2	38.5
665	666.2	43.5	100/0.2			100/0.2								WEATHERED ROCK Tan-Gray (METAGRAYWACKE)	
	661.2	48.5	40	60/0.2		100/0.7								660.5	49.2
														Boring Terminated with Standard Penetration Test Refusal at Elevation 660.5 ft in WEATHERED ROCK (METAGRAYWACKE)	

WBS 67096.1.1			TIP BR-0096			COUNTY ROCKINGHAM			GEOLOGIST C. Ranieri					
SITE DESCRIPTION Bridge 780176 on SR 1700 over NC 14/ NC 87- MSE Wall No. 1									GROUND WTR (ft)					
BORING NO. RW1-4			STATION 11+09			OFFSET 2 ft LT			ALIGNMENT -W1-			0 HR. 34.1		
COLLAR ELEV. 709.5 ft			TOTAL DEPTH 35.0 ft			NORTHING 1,013,424			EASTING 1,771,368			24 HR. 29.9		
DRILL RIG/HAMMER EFF./DATE F&R3763 CME-550X 87% 05/20/2022						DRILL METHOD H.S. Augers			HAMMER TYPE Automatic					
DRILLER W. Shenberger			START DATE 04/11/23			COMP. DATE 04/11/23			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				
710														
	709.5	0.0	WOH	1	3									709.5 GROUND SURFACE 0.0
705	706.0	3.5	4	6	6							W		
												W		
700	701.0	8.5	4	5	7							W		
695	696.0	13.5	5	6	7							W		
												W		692.5 17.0
690	691.0	18.5	5	6	7							W		
												W		
685	686.0	23.5	9	12	11							W		682.5 27.0
680	681.0	28.5	2	3	7							▼		
675	676.0	33.5	5	17	33							W		674.5 35.0
														Boring Terminated at Elevation 674.5 ft in SILT (RESIDUAL) Note: Surficial Organic Soil: 0.0-0.3'

NCDOT BORE DOUBLE 66B-0055 BORING LOGS - WALL.GPJ NC_DOT.GDT 6/14/23

NCDOT BORE DOUBLE 66B-0055 BORING LOGS - WALL.GPJ NC_DOT.GDT 6/14/23

Notes:
1. Surficial Organic Soil: 0.0-0.2'
2. Harder drilling indicated by driller at 42.5'

NCDOT BORE DOUBLE 66B-0055 BORING LOGS - WALL.GPJ NC_DOT.GDT 6/14/23

WBS 67096.1.1			TIP BR-0096			COUNTY ROCKINGHAM			GEOLOGIST C. Ranieri					
SITE DESCRIPTION Bridge 780176 on SR 1700 over NC 14/ NC 87- MSE Wall No. 2									GROUND WTR (ft) 0 HR. Dry 24 HR. 34.3					
BORING NO. RW2-4			STATION 11+21			OFFSET 2 ft LT						ALIGNMENT -W2-		
COLLAR ELEV. 711.3 ft			TOTAL DEPTH 35.0 ft			NORTHING 1,013,481						EASTING 1,771,356		
DRILL RIG/HAMMER EFF./DATE F&R3763 CME-550X 87% 05/20/2022						DRILL METHOD H.S. Augers			HAMMER TYPE Automatic					
DRILLER W. Shenberger			START DATE 04/11/23			COMP. DATE 04/11/23			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				
715														
710	711.3	0.0	WOH	2	3	5					SS-33	17%	711.3	GROUND SURFACE 0.0
705	707.8	3.5	3	3	4	7					M		704.3	RESIDUAL Orange-Light Brown, Fine to Coarse Sandy SILT (A-4), with Trace Mica and Roots 7.0
	702.8	8.5	3	5	6	11							704.3	Gray-Light Brown, Silty Fine to Coarse SAND (A-2-4), with Trace Mica 7.0
700	697.8	13.5	4	5	10	15					M			
	692.8	18.5	5	6	9	15								
690	687.8	23.5	6	9	11	20					M		689.3	Tan, Fine to Coarse Sandy SILT (A-4), with Trace Mica 22.0
	682.8	28.5	8	9	9	18							684.3	Orange-Tan, Silty Fine to Coarse SAND (A-2-4), with Trace Mica 27.0
680	677.8	33.5	10	10	13	23					W		679.3	Orange-Brown, Fine Sandy SILT (A-4), Micaceous 32.0
													676.3	Boring Terminated at Elevation 676.3 ft in SILT (RESIDUAL) 35.0



PROJECT REFERENCE NO.	SHEET NO.
67096.1.1	10

County: Rockingham
Project Description: Replace Bridge No. 780176 on SR 1700 over NC 14/NC 87
Site Description: MSE Wall No. 1 on -W1- from 10+00 to 11+12 and MSE Wall No. 2 on -W2- from 10+00 to 11+13

SOIL TEST RESULTS																	
SAMPLE NO.	ALIGNMENT	STATION	LOCATION	OFFSET *	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
									C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-11	-W1-	10+00	RW1-1	1' RT	3.5-5.0	A-2-4	NP	NP	33.8	41.0	20.7	4.5	100.0	82.4	28.5	24.6	NT
SS-48	-W1-	10+71	RW1-3 (EB1-B)	2' LT	3.5-5.0	A-4	NP	NP	27.9	37.6	27.7	6.8	93.9	77.6	36.1	21.1	NT
SS-27	-W2-	10+42	RW2-2 (EB2-A)	2' LT	3.5-5.0	A-2-4	NP	NP	35.9	45.8	14.4	3.9	100.0	76.8	22.9	13.4	NT
SS-33	-W2-	11+21	RW2-4	2' LT	0.0-1.5	A-4	NP	NP	29.5	32.8	27.2	10.5	91.9	76.5	37.6	16.9	NT

NP = Not Plastic
NT = Not Tested
ND = Not Determined

D. Council
Lab Manager, Certification No. 101-02-0603

C.Wang, P.E.
Soils Engineer