

REFERENCE: B-5793

PROJECT: 45747

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

**STRUCTURE  
SUBSURFACE INVESTIGATION**

COUNTY CABARRUS  
PROJECT DESCRIPTION BRIDGE NO. 201 ON SR 2443  
(DRYE RD.) OVER LITTLE BUFFALO CREEK

CONTENTS

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2A	SUPPLEMENTAL LEGEND (GSI)
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STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5793	1	10

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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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  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

J.K. STICKNEY

C.L. SMITH

M.R. MOORE

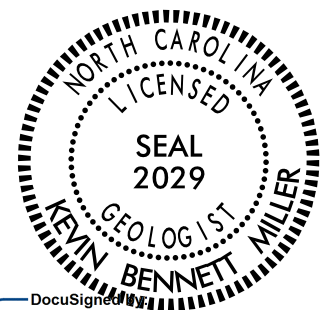
INVESTIGATED BY J.K. STICKNEY

DRAWN BY T.T. WALKER, F&R Inc.

CHECKED BY K.B. MILLER

SUBMITTED BY K.B. MILLER

DATE APRIL 2017



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4/24/2017

SIGNATURE

DATE

**DOCUMENT NOT CONSIDERED FINAL  
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NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT
SUBSURFACE INVESTIGATION
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION

SOIL IS CONSIDERED UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO THE STANDARD PENETRATION TEST (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

Table with columns for GENERAL CLASS, GRANULAR MATERIALS, SILT-CLAY MATERIALS, ORGANIC MATERIALS, and various soil symbols and descriptions.

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

CONSISTENCY OR DENSENESS

Table mapping PRIMARY SOIL TYPE to COMPACTNESS OR CONSISTENCY, RANGE OF STANDARD PENETRATION RESISTANCE, and RANGE OF UNCONFINED COMPRESSIVE STRENGTH.

TEXTURE OR GRAIN SIZE

Table showing U.S. STD. SIEVE SIZE OPENING (MM) for BOULDER, COBBLE, GRAVEL, COARSE SAND, FINE SAND, SILT, and CLAY.

SOIL MOISTURE - CORRELATION OF TERMS

Table correlating SOIL MOISTURE SCALE (ATTERBERG LIMITS) with FIELD MOISTURE DESCRIPTION and GUIDE FOR FIELD MOISTURE DESCRIPTION.

PLASTICITY

Table showing PLASTICITY INDEX (PI) and DRY STRENGTH for NON PLASTIC, SLIGHTLY PLASTIC, MODERATELY PLASTIC, and HIGHLY PLASTIC soils.

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

Table showing percentages for ORGANIC MATERIAL, GRANULAR SOILS, SILT-CLAY SOILS, and OTHER MATERIAL.

GROUND WATER

Water level symbols: 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

Diagrammatic symbols for ROADWAY EMBANKMENT, SOIL SYMBOL, ARTIFICIAL FILL, INFERRED SOIL BOUNDARY, INFERRED ROCK LINE, ALLUVIAL SOIL BOUNDARY, DIP & DIP DIRECTION, TEST BORING, AUGER BORING, CORE BORING, MONITORING WELL, PIEZOMETER INSTALLATION, SLOPE INDICATOR, CONE PENETROMETER TEST, SOUNDING ROD, TEST BORING WITH CORE, SPT N-VALUE.

RECOMMENDATION SYMBOLS

Symbols for 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

Table of abbreviations for AR, BT, CL, CPT, CSE, DMT, DPT, e, F, FOSS, FRAC, FRAGS, HL, MED., MICA, MOD., NP, ORG., PMT, SAP., SAND, SANDY, SILT, SILTY, SLL, TCR, W, V, VST, WEA., UNIT WEIGHT, DRY UNIT WEIGHT, SAMPLE ABBREVIATIONS, SS, SPLIT SPOON, ST, RS, RT, CBR.

EQUIPMENT USED ON SUBJECT PROJECT

Checklist for DRILL UNITS, ADVANCING TOOLS, HAMMER TYPE, CORE SIZE, HAND TOOLS, and other project equipment.

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 60 BLOWS PER FOOT PER 60 BLOWS IN NON-COASTAL PLAIN MATERIAL.

WEATHERED ROCK (WR) NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED.

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

NON-CRYSTALLINE ROCK (NCR) FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.

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

WEATHERING

FRESH ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE.

VERY SLIGHT (V SLI.) ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN. CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE.

SLIGHT (SLI.) ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS.

MODERATE (MOD.) SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED WITH FRESH ROCK.

MODERATELY SEVERE (MOD. SEV.) ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES 'CLUNK' SOUND WHEN STRUCK. IF TESTED, WOULD YIELD SPT N VALUES > 100 BPF.

SEVERE (SEV.) ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. IF TESTED, WOULD YIELD SPT N VALUES > 100 BPF.

VERY SEVERE (V SEV.) ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE THAT ONLY MINOR VESTIGES OF ORIGINAL ROCK FABRIC REMAIN. IF TESTED, WOULD YIELD SPT N VALUES < 100 BPF.

COMPLETE ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS ALSO AN EXAMPLE.

ROCK HARDNESS

VERY HARD CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.

HARD CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.

MODERATELY HARD CAN BE SCRATCHED BY KNIFE OR PICK. GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK. HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS.

MEDIUM HARD CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PEICES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK.

SOFT CAN BE 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.

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 FINGER NAIL.

FRACTURE SPACING

Table mapping TERM (VERY WIDE, WIDE, MODERATELY CLOSE, CLOSE, VERY CLOSE) to SPACING (MORE THAN 10 FEET, 3 TO 10 FEET, 1 TO 3 FEET, 0.16 TO 1 FOOT, LESS THAN 0.16 FEET).

BEDDING

Table mapping TERM (VERY THICKLY BEDDED, THICKLY BEDDED, THINLY BEDDED, VERY THINLY BEDDED, THICKLY LAMINATED, THINLY LAMINATED) to 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).

BENCH MARK: BM #2; RR SPIKE IN BASE OF 36 INCH SYCAMORE N: 621325, E: 1585616, -BL- STATION 15+60.00, 98' LEFT ELEVATION: 555.34 FEET

NOTES

FIAD= FILLED IMMEDIATELY AFTER DRILLING
NM= NOT MEASURED

INDURATION

FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC. FRIABLE RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE. MODERATELY INDURATED GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER. INDURATED GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER. EXTREMELY INDURATED SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.

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

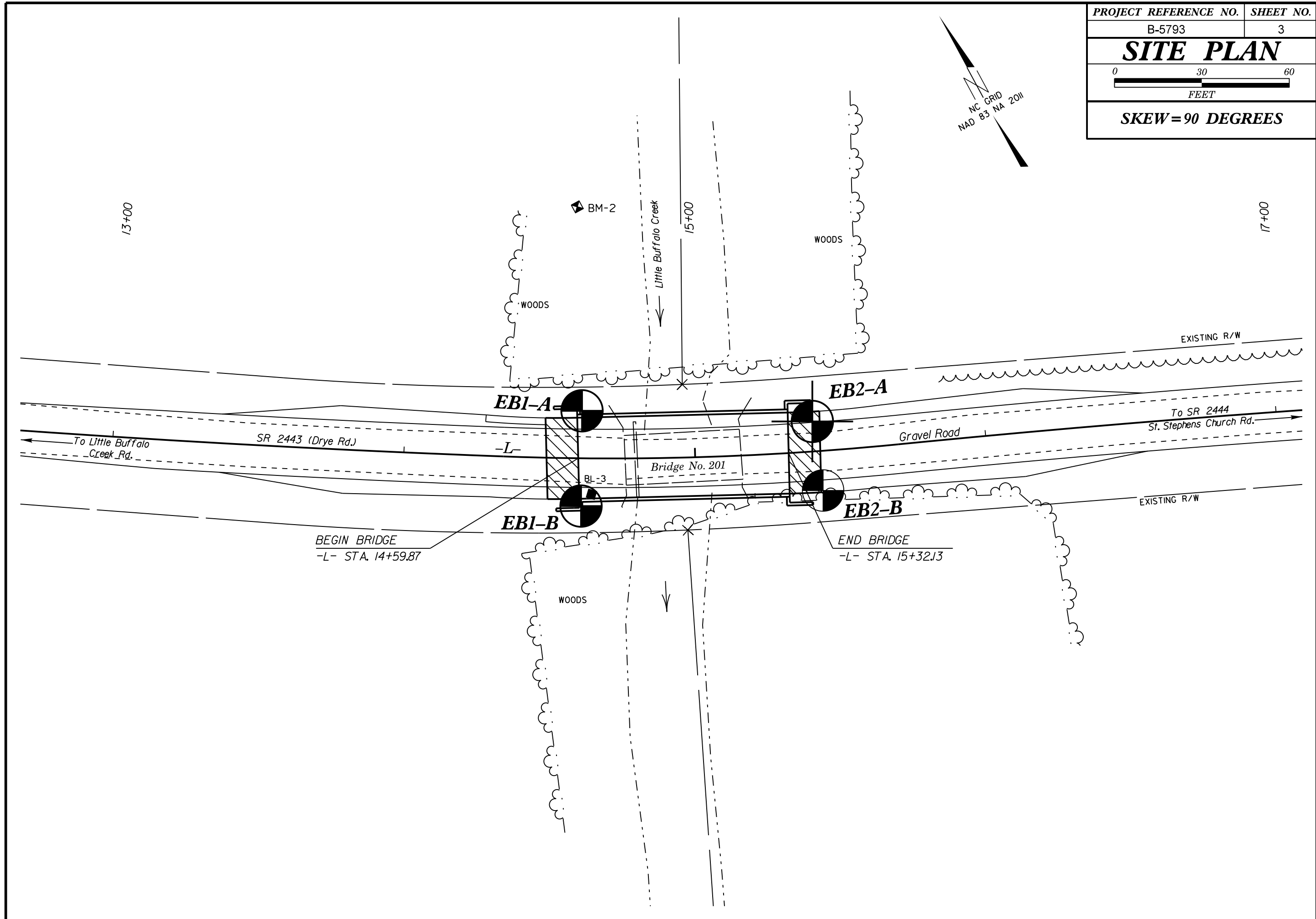
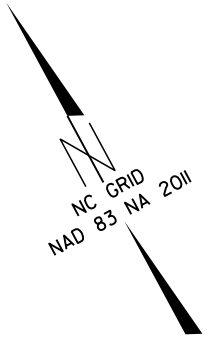
**SUPPLEMENTAL LEGEND, GEOLOGICAL STRENGTH INDEX (GSI) TABLES  
FROM AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS**

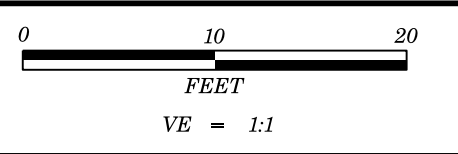
AASHTO LRFD Figure 10.4.6.4-1 — Determination of GSI for Jointed Rock Mass (Marinos and Hoek, 2000)

AASHTO LRFD Figure 10.4.6.4-2 — Determination of GSI for Tectonically Deformed Heterogeneous Rock Masses (Marinos and Hoek, 2000)

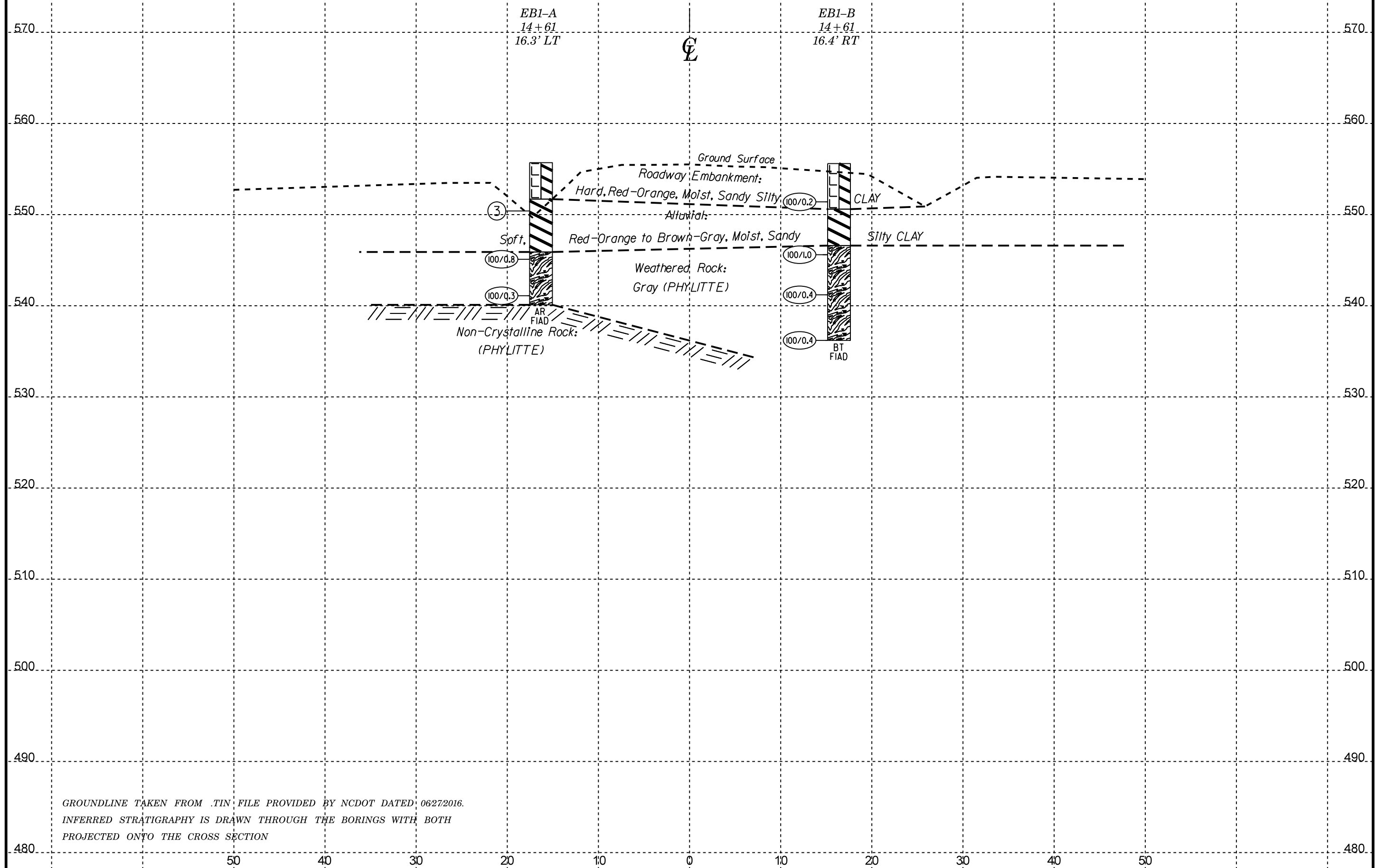
<p><b>GEOLOGICAL STRENGTH INDEX (GSI) FOR JOINTED ROCKS (Hoek and Marinos, 2000)</b></p> <p>From the lithology, structure and surface conditions of the discontinuities, estimate the average value of GSI. Do not try to be too precise. Quoting a range from 33 to 37 is more realistic than stating that GSI = 35. Note that the table does not apply to structurally controlled failures. Where weak planar structural planes are present in an unfavorable orientation with respect to the excavation face, these will dominate the rock mass behaviour. The shear strength of surfaces in rocks that are prone to deterioration as a result of changes in moisture content will be reduced if water is present. When working with rocks in the fair to very poor categories, a shift to the right may be made for wet conditions. Water pressure is dealt with by effective stress analysis.</p> <p><b>STRUCTURE</b></p>	SURFACE CONDITIONS	VERY GOOD Very rough, fresh unweathered surfaces	GOOD Rough, slightly weathered, iron stained surfaces	FAIR Smooth, moderately weathered and altered surfaces	POOR Slickensided, highly weathered surfaces with compact coatings or fillings or angular fragments	VERY POOR Slickensided, highly weathered surfaces with soft clay coatings or fillings
<p><b>INTACT OR MASSIVE</b> - intact rock specimens or massive in situ rock with few widely spaced discontinuities</p> <p><b>BLOCKY</b> - well interlocked undisturbed rock mass consisting of cubical blocks formed by three intersecting discontinuity sets</p> <p><b>VERY BLOCKY</b> - interlocked, partially disturbed mass with multi-faceted angular blocks formed by 4 or more joint sets</p> <p><b>BLOCKY/DISTURBED/SEAMY</b> - folded with angular blocks formed by many intersecting discontinuity sets. Persistence of bedding planes or schistosity</p> <p><b>DISINTEGRATED</b> - poorly interlocked, heavily broken rock mass with mixture of angular and rounded rock pieces</p> <p><b>LAMINATED/SHEARED</b> - Lack of blockiness due to close spacing of weak schistosity or shear planes</p>	SURFACE CONDITIONS					
<p>DECREASING SURFACE QUALITY →</p>						
<p><b>COMPOSITION AND STRUCTURE</b></p> <p><b>A. Thick bedded, very blocky sandstone</b> The effect of pelitic coatings on the bedding planes is minimized by the confinement of the rock mass. In shallow tunnels or slopes these bedding planes may cause structurally controlled instability.</p> <p><b>B. Sandstone with thin inter-layers of siltstone</b></p> <p><b>C. Sandstone and siltstone in similar amounts</b></p> <p><b>D. Siltstone or silty shale with sandstone layers</b></p> <p><b>E. Weak siltstone or clayey shale with sandstone layers</b></p> <p><b>F. Tectonically deformed, intensively folded/faulted, sheared clayey shale or siltstone with broken and deformed sandstone layers forming an almost chaotic structure</b></p> <p><b>G. Undisturbed silty or clayey shale with or without a few very thin sandstone layers</b></p> <p><b>H. Tectonically deformed silty or clayey shale forming a chaotic structure with pockets of clay. Thin layers of sandstone are transformed into small rock pieces.</b></p> <p>→ Means deformation after tectonic disturbance</p>	SURFACE CONDITIONS OF DISCONTINUITIES (Predominantly bedding planes)					
<p>DECREASING INTERLOCKING OF ROCK PIECES</p>						
<p>→</p>						

PROJECT REFERENCE NO.	SHEET NO.
B-5793	3
<b>SITE PLAN</b>	
 0                      30                      60 FEET	
<b>SKEW = 90 DEGREES</b>	

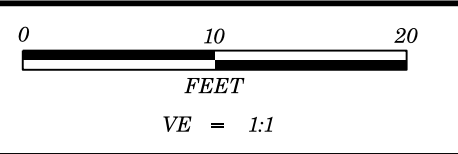




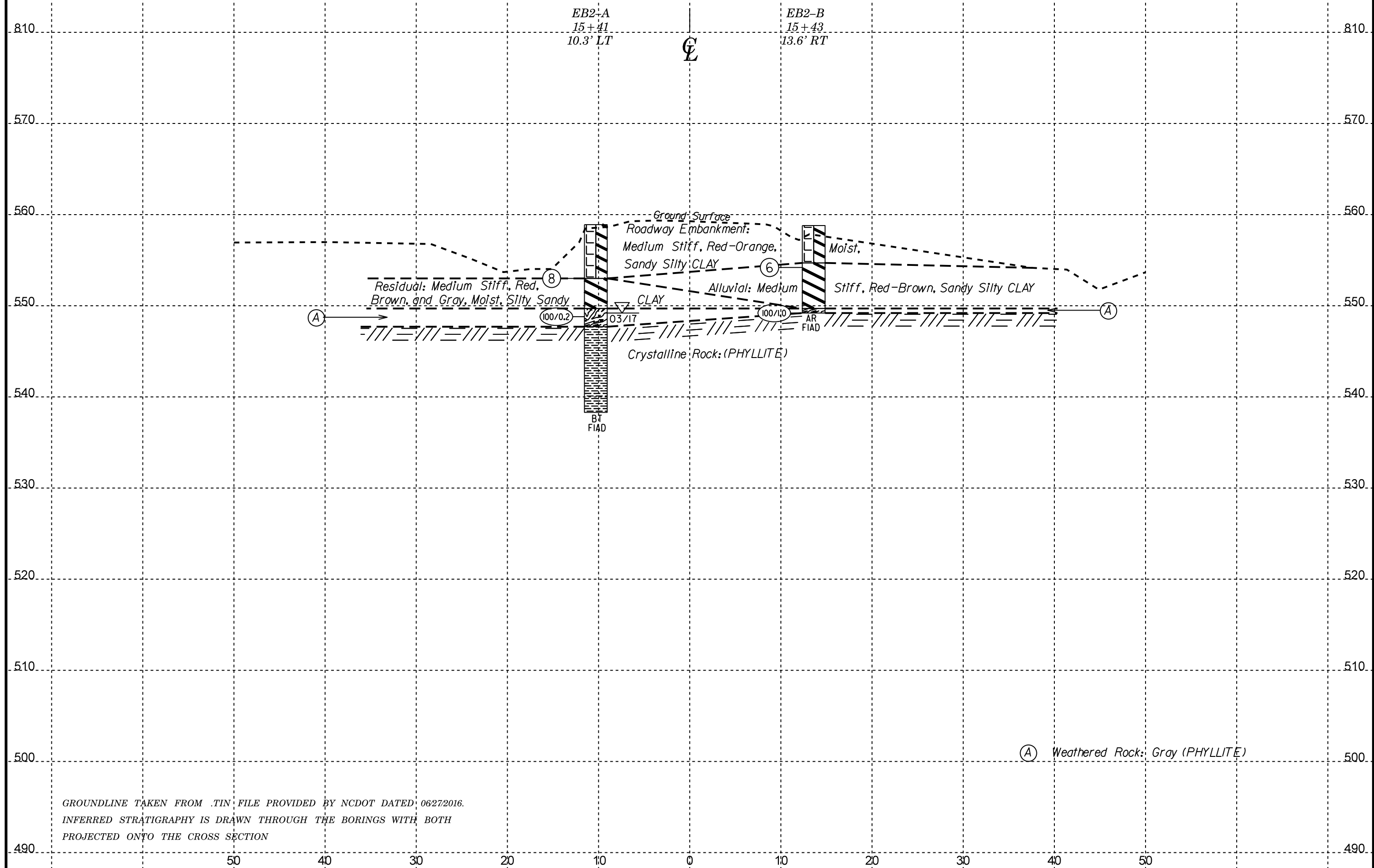
<b>PROJECT REFERENCE NO.</b>	<b>SHEET NO.</b>
B-5793	4
<b>CROSS SECTION THROUGH END BENT 1</b>	
AT STA. 14+59.87	
SKEW=90 DEGREES	



GROUNDLINE TAKEN FROM .TIN FILE PROVIDED BY NCDOT DATED 06/27/2016.  
 INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH  
 PROJECTED ONTO THE CROSS SECTION



<b>PROJECT REFERENCE NO.</b>	<b>SHEET NO.</b>
B-5793	5
<b>CROSS SECTION THROUGH END BENT 2</b>	
AT STA. 15+32.13	
SKEW=90 DEGREES	



GROUNDLINE TAKEN FROM .TIN FILE PROVIDED BY NCDOT DATED 06/27/2016.  
 INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH  
 PROJECTED ONTO THE CROSS SECTION

# GEOTECHNICAL BORING REPORT

## BORE LOG

WBS 45747.1.1		TIP B-5793		COUNTY CABARRUS		GEOLOGIST Stickney, J. K.									
SITE DESCRIPTION Bridge No. 201 SR 2443 (Drye Rd.) over Little Buffalo Creek							GROUND WTR (ft)								
BORING NO. EB1-A		STATION 14+61		OFFSET 16 ft LT		ALIGNMENT -L-									
COLLAR ELEV. 555.7 ft		TOTAL DEPTH 15.6 ft		NORTHING 621,263		EASTING 1,585,584									
DRILL RIG/HAMMER EFF./DATE HFC0072 CME-550X 85% 05/20/2016			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic									
DRILLER Smith, C. L.		START DATE 03/21/17		COMP. DATE 03/21/17		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
560															
555														555.7	0.0
														551.7	4.0
550	551.4	4.3	0	1	2										
545	546.4	9.3	4	31	69/0.3									545.9	9.8
	541.4	14.3	100/0.3											540.1	15.6

WBS 45747.1.1		TIP B-5793		COUNTY CABARRUS		GEOLOGIST Stickney, J. K.									
SITE DESCRIPTION Bridge No. 201 SR 2443 (Drye Rd.) over Little Buffalo Creek							GROUND WTR (ft)								
BORING NO. EB1-B		STATION 14+61		OFFSET 16 ft RT		ALIGNMENT -L-									
COLLAR ELEV. 555.6 ft		TOTAL DEPTH 19.4 ft		NORTHING 621,234		EASTING 1,585,569									
DRILL RIG/HAMMER EFF./DATE HFC0072 CME-550X 85% 05/20/2016			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic									
DRILLER Smith, C. L.		START DATE 03/21/17		COMP. DATE 03/21/17		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
560															
555														555.6	0.0
														550.6	5.0
550	551.6	4.0	100/0.2												
545	546.6	9.0	17	83/0.5										546.6	9.0
540	541.6	14.0	100/0.4												
	536.6	19.0	100/0.4											536.2	19.4

NCDOT BORE DOUBLE B5793\_GEO\_BH\_BRDG201.GPJ NC\_DOT.GDT 4/14/17

# GEOTECHNICAL BORING REPORT

## BORE LOG

WBS 45747.1.1		TIP B-5793		COUNTY CABARRUS		GEOLOGIST Stickney, J. K.										
SITE DESCRIPTION Bridge No. 201 SR 2443 (Drye Rd.) over Little Buffalo Creek							GROUND WTR (ft)									
BORING NO. EB2-A		STATION 15+41		OFFSET 10 ft LT		ALIGNMENT -L-										
COLLAR ELEV. 558.9 ft		TOTAL DEPTH 20.6 ft		NORTHING 621,222		EASTING 1,585,652										
DRILL RIG/HAMMER EFF./DATE HFC0072 CME-550X 85% 05/20/2016			DRILL METHOD SPT Core Boring			HAMMER TYPE Automatic										
DRILLER Smith, C. L.		START DATE 03/22/17		COMP. DATE 03/22/17		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)		
560														558.9	0.0	GROUND SURFACE
																ROADWAY EMBANKMENT Red-Orange, Sandy Silty CLAY
555	554.0	4.9	3	2	6							M		553.0	5.9	RESIDUAL Red, Brown, and Gray, Silty Sandy CLAY
550	549.0	9.9	100/0.2											549.7	9.2	WEATHERED ROCK Gray (PHYLLITE)
														547.7	11.2	NON-CRYSTALLINE ROCK (PHYLLITE)
545														546.7	12.2	NON-CRYSTALLINE ROCK (PHYLLITE)
540														538.3	20.6	Boring Terminated at Elevation 538.3 ft in Non-Crystalline Rock (PHYLLITE)
																NOTE: 0HR GROUND WATER MEASUREMENT LIKELY INFLUENCED BY CORING OPERATION

NCDOT BORE DOUBLE B5793\_GEO\_BH\_BRDG201.GPJ NC\_DOT.GDT 4/14/17

WBS 45747.1.1		TIP B-5793		COUNTY CABARRUS		GEOLOGIST Stickney, J. K.	
SITE DESCRIPTION Bridge No. 201 SR 2443 (Drye Rd.) over Little Buffalo Creek							GROUND WTR (ft)
BORING NO. EB2-A		STATION 15+41		OFFSET 10 ft LT		ALIGNMENT -L-	
COLLAR ELEV. 558.9 ft		TOTAL DEPTH 20.6 ft		NORTHING 621,222		EASTING 1,585,652	
DRILL RIG/HAMMER EFF./DATE HFC0072 CME-550X 85% 05/20/2016			DRILL METHOD SPT Core Boring			HAMMER TYPE Automatic	
DRILLER Smith, C. L.		START DATE 03/22/17		COMP. DATE 03/22/17		SURFACE WATER DEPTH N/A	
CORE SIZE NX		TOTAL RUN 9.4 ft					
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN ROD (ft) %	SAMP. NO.
547.7	547.7	11.2	4.4		(4.4) 100%	(0.9) 20%	
545	543.3	15.6			(4.7) 94%	(0.4) 8%	
540	538.3	20.6					
STRATA		LOG		DESCRIPTION AND REMARKS		DEPTH (ft)	
REC. (ft) %	ROD (ft) %	ELEV. (ft)					
(1.0) 100%	(0.0) 0%	547.7		Begin Coring @ 11.2 ft		11.2	
(8.1) 96%	(1.3) 15%	546.7		NON-CRYSTALLINE ROCK Brown-Gray, Moderate to Slight Weathering, Moderately Hard to Hard, Closely Fractured, PHYLLITE		12.2	
		538.3		Gray, Very Slight to Slight Weathering, Hard, Closely Fractured, PHYLLITE		20.6	
Boring Terminated at Elevation 538.3 ft in Non-Crystalline Rock (PHYLLITE)							
NOTE: 0HR GROUND WATER MEASUREMENT LIKELY INFLUENCED BY CORING OPERATION							

NCDOT BORE DOUBLE B5793\_GEO\_BH\_BRDG201.GPJ NC\_DOT.GDT 4/14/17



**CORE PHOTOGRAPH: Bridge No. 201 on SR 2443 (Drye Rd.) over Little Buffalo, EB2-A 14+61, 16' LT**

