

REFERENCE: B-4516

PROJECT: 38400

CONTENTS

<u>SHEET NO.</u>	<u>DESCRIPTION</u>
1	TITLE SHEET
2	LEGEND (SOIL & ROCK)
2A	SUPPLEMENTAL LEGEND (GSI)
3	SITE PLAN
4	PROFILE
5-6	CROSS SECTIONS
7-10	BORE LOGS & CORE REPORT
11	LAB TEST RESULTS
12	CORE PHOTOGRAPH
13	SITE PHOTOGRAPH

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

STRUCTURE
SUBSURFACE INVESTIGATION

COUNTY FRANKLIN
PROJECT DESCRIPTION BRIDGE NO. 52 ON SR 1433
(PERSON RD.) OVER SANDY CREEK

SITE DESCRIPTION 15+17 -L-

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4516	1	13

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 1919 TOTTENHAM ST., RALEIGH, N. C. 27617. 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 MAKE SUCH INDEPENDENT SUBSURFACE INVESTIGATIONS AS HE DEEMS NECESSARY TO SATISFY HIMSELF AS TO CONDITIONS TO BE 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

C.T. TANG, EI
CAROLINA DRILLING
J. ANDERSON
S. ANDERSON

INVESTIGATED BY C.T. TANG, EI
DRAWN BY C.T. TANG, EI
CHECKED BY D. BROWN, PE
SUBMITTED BY D. BROWN, PE
DATE AUGUST 2018



DocuSigned by:

C06817F5E770411...
SIGNATURE DATE 8/7/2018

**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																																																																																																																																																																																		
<p>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></p>										<p>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.</p>										<p>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:</p>										<p>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 (ROD) - 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.</p>																																																																																																																																																																																		
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<p>MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.</p>										<p>SLIGHTLY COMPRESSIBLE LL < 31 MODERATELY COMPRESSIBLE LL = 31 - 50 HIGHLY COMPRESSIBLE LL > 50</p>										<p>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.</p>										<p>COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.</p>																																																																																																																																																																																		
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<p>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.</p>										<p>INDURATION</p>										<p>INDURATION</p>										<p>INDURATION</p>																																																																																																																																																																																		

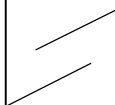
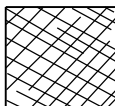


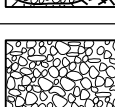
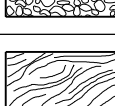
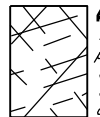


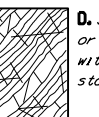
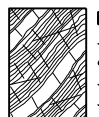



NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

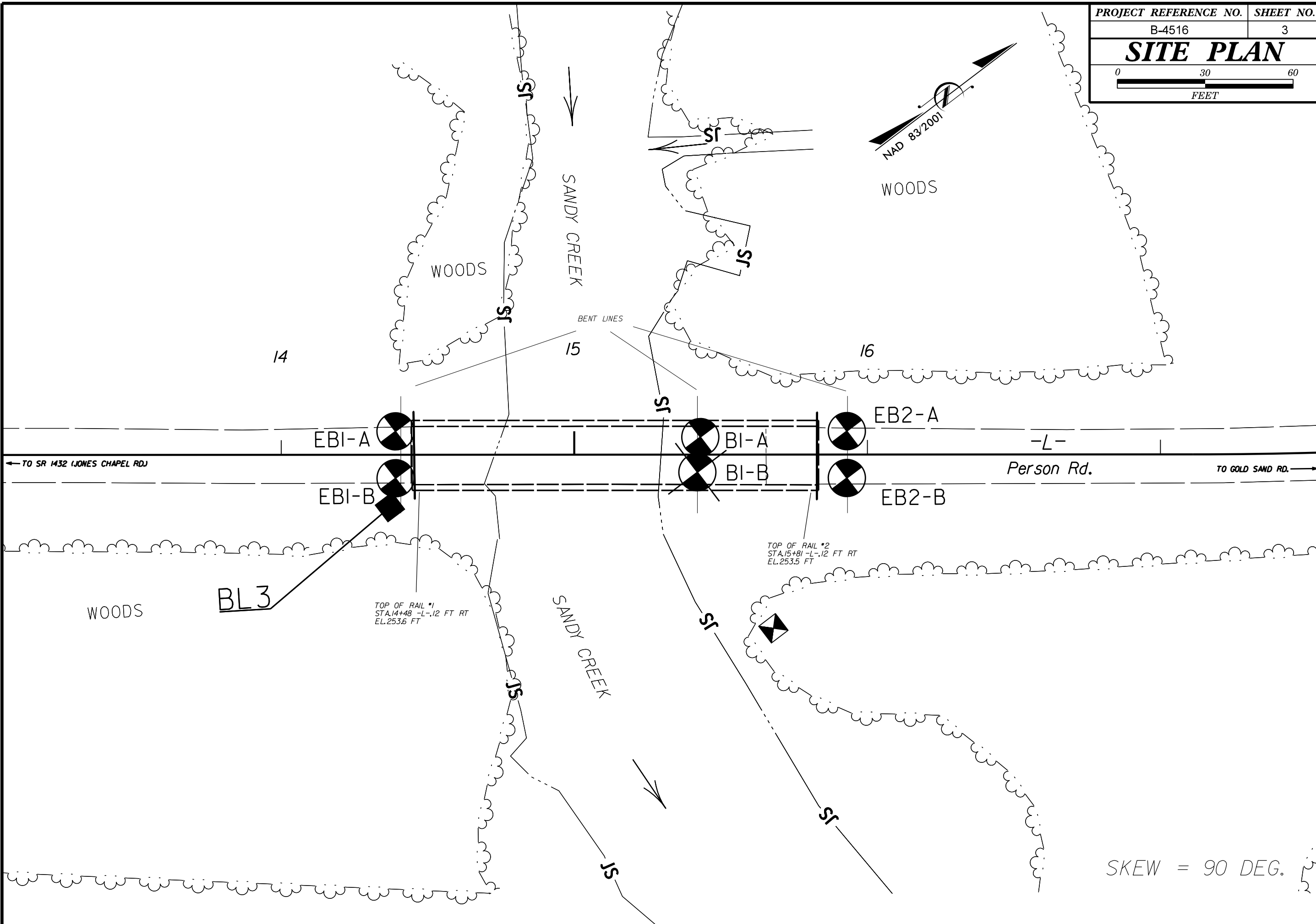
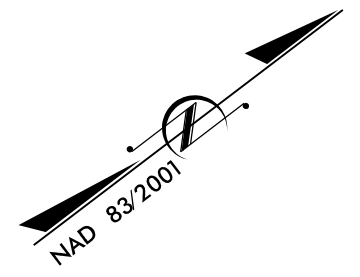
SUBSURFACE INVESTIGATION

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)

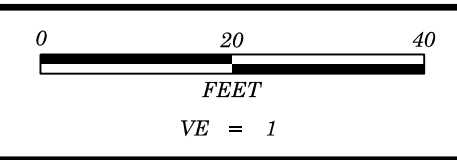
<p>GEOLOGICAL STRENGTH INDEX (GSI) FOR JOINTED ROCKS (Hoek and Marinos, 2000)</p> <p>From the lithology, structure and surface conditions of the discontinuities, estimate the average value of GSI. Do not try to be too precise. Quoting a range from 33 to 37 is more realistic than stating that GSI = 35. 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>STRUCTURE</p>	<p>SURFACE CONDITIONS</p> <p>VERY GOOD Very rough, fresh unweathered surfaces</p> <p>GOOD Rough, slightly weathered, iron stained surfaces</p> <p>FAIR Smooth, moderately weathered and altered surfaces</p> <p>POOR Slickensided, highly weathered surfaces with compact coatings or fillings or angular fragments</p> <p>VERY POOR Slickensided, highly weathered surfaces with soft clay coatings or fillings</p> <p>DECREASING SURFACE QUALITY →</p>					<p>GSI FOR HETEROGENEOUS ROCK MASSES SUCH AS FLYSCH (Marinos, P and Hoek E., 2000)</p> <p>From a description of the lithology, structure and surface conditions (particularly of the bedding planes), choose a box in the chart. Locate the position in the box that corresponds to the condition of the discontinuities and estimate the average value of GSI from the contours. Do not attempt to be too precise. Quoting a range from 33 to 37 is more realistic than giving GSI = 35. Note that the Hoek-Brown criterion does not apply to structurally controlled failures. Where unfavourably oriented continuous weak planar discontinuities are present, these will dominate the behaviour of the rock mass. The strength of some rock masses is reduced by the presence of groundwater and this can be allowed for by a slight shift to the right in the columns for fair, poor and very poor conditions. Water pressure does not change the value of GSI and it is dealt with by using effective stress analysis.</p> <p>COMPOSITION AND STRUCTURE</p>	<p>SURFACE CONDITIONS OF DISCONTINUITIES (Predominantly bedding planes)</p> <p>VERY GOOD - Very Rough, fresh unweathered surfaces</p> <p>GOOD - Rough, slightly weathered surfaces</p> <p>FAIR - Smooth, moderately weathered and altered surfaces</p> <p>POOR - Very smooth, occasionally slickensided surfaces with compact coatings or fillings with angular fragments</p> <p>VERY POOR - Very smooth, slickensided or highly weathered surfaces with soft clay coatings or fillings</p>				
<p>DECREASING INTERLOCKING OF ROCK PIECES</p> <p>↓</p> <p> INTACT OR MASSIVE - intact rock specimens or massive in situ rock with few widely spaced discontinuities</p> <p> BLOCKY - well interlocked undisturbed rock mass consisting of cubical blocks formed by three intersecting discontinuity sets</p> <p> VERY BLOCKY - interlocked, partially disturbed mass with multi-faceted angular blocks formed by 4 or more joint sets</p> <p> BLOCKY/DISTURBED/SEAMY - folded with angular blocks formed by many intersecting discontinuity sets. Persistence of bedding planes or schistosity</p> <p> DISINTEGRATED - poorly interlocked, heavily broken rock mass with mixture of angular and rounded rock pieces</p> <p> LAMINATED/SHEARED - Lack of blockiness due to close spacing of weak schistosity or shear planes</p>	<p>90</p> <p>80</p> <p>70</p> <p>60</p> <p>50</p> <p>40</p> <p>30</p> <p>20</p> <p>10</p>	<p>N/A</p> <p>N/A</p>	<p>N/A</p> <p>N/A</p>	<p>N/A</p> <p>N/A</p>	<p>N/A</p> <p>N/A</p>	<p> A. Thick bedded, very blocky sandstone 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. Sandstone with thin inter-layers of siltstone</p> <p> C. Sandstone and siltstone in similar amounts</p> <p> D. Siltstone or silty shale with sandstone layers</p> <p> E. Weak siltstone or clayey shale with sandstone layers</p> <p>C, D, E, and G - may be more or less folded than illustrated but this does not change the strength. Tectonic deformation, faulting and loss of continuity moves these categories to F and H.</p> <p> F. Tectonically deformed, intensively folded/faulted, sheared clayey shale or siltstone with broken and deformed sandstone layers forming an almost chaotic structure</p> <p> G. Undisturbed silty or clayey shale with or without a few very thin sandstone layers</p> <p> 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.</p> <p>→ Means deformation after tectonic disturbance</p>	<p>70</p> <p>60</p> <p>50</p> <p>40</p> <p>30</p> <p>20</p> <p>10</p>	<p>A</p> <p>B</p> <p>C</p> <p>D</p> <p>E</p>	<p>F</p> <p>G</p> <p>H</p>	<p>10</p>	<p>10</p>



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 EL.253.6 FT

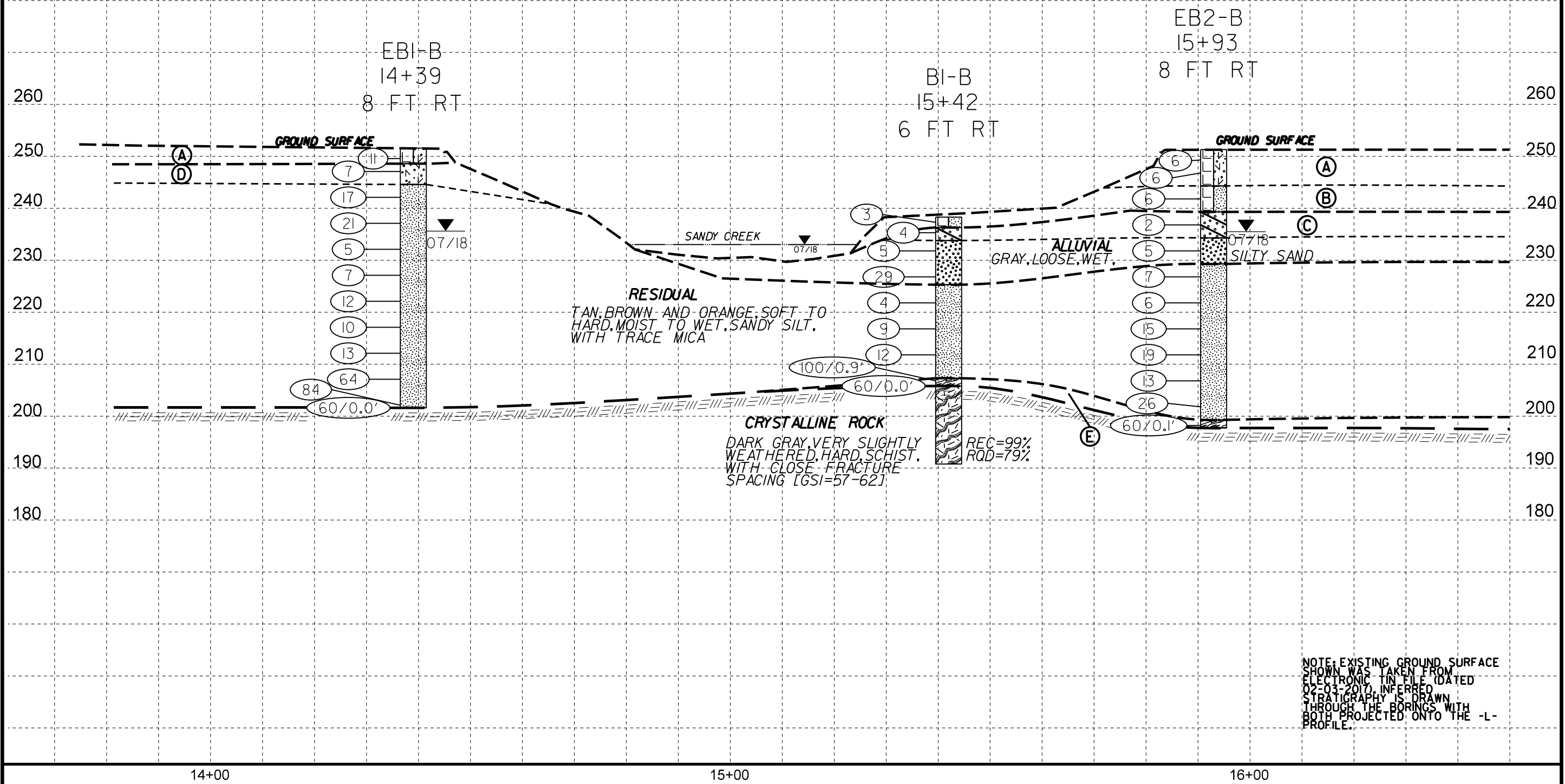
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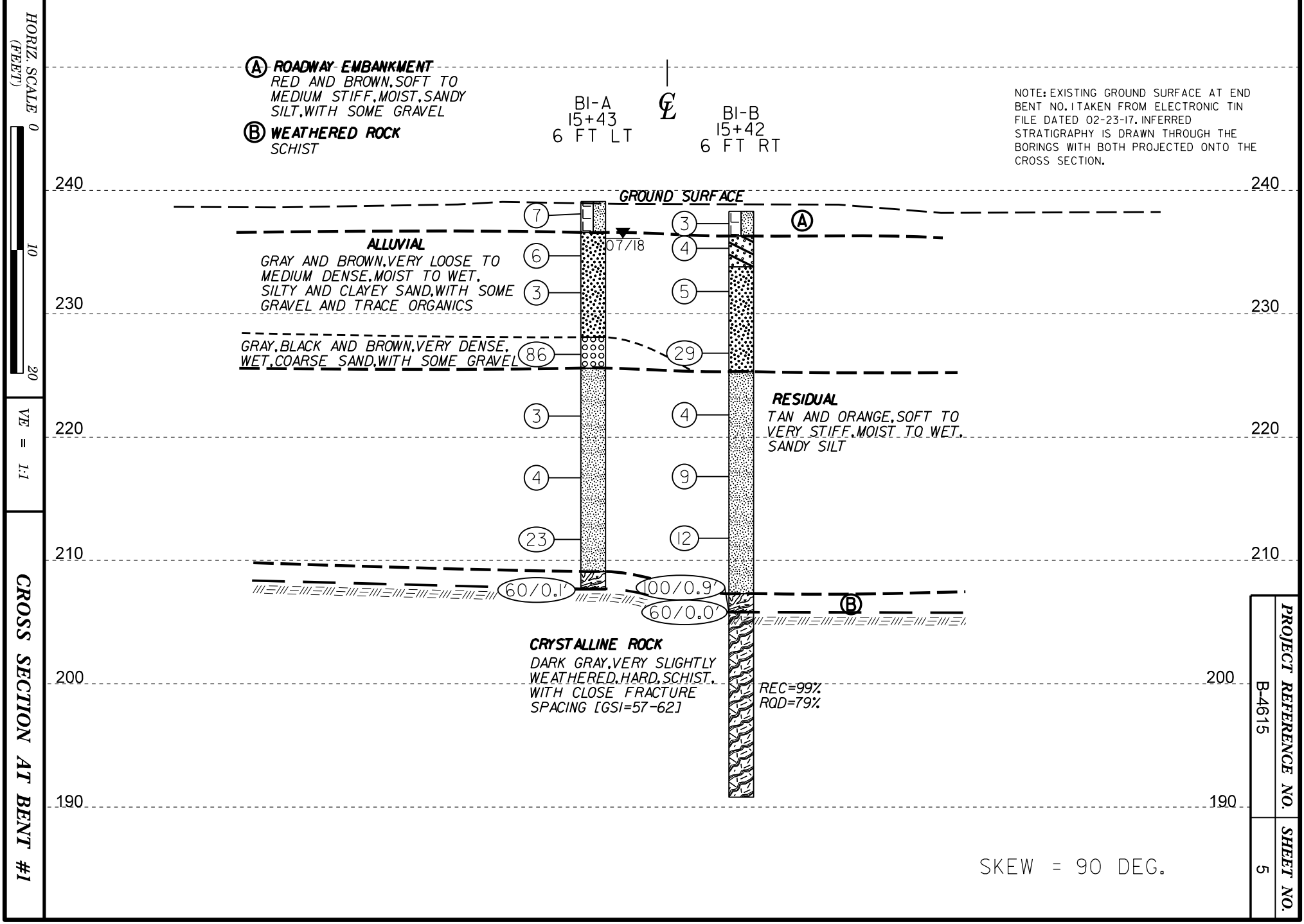
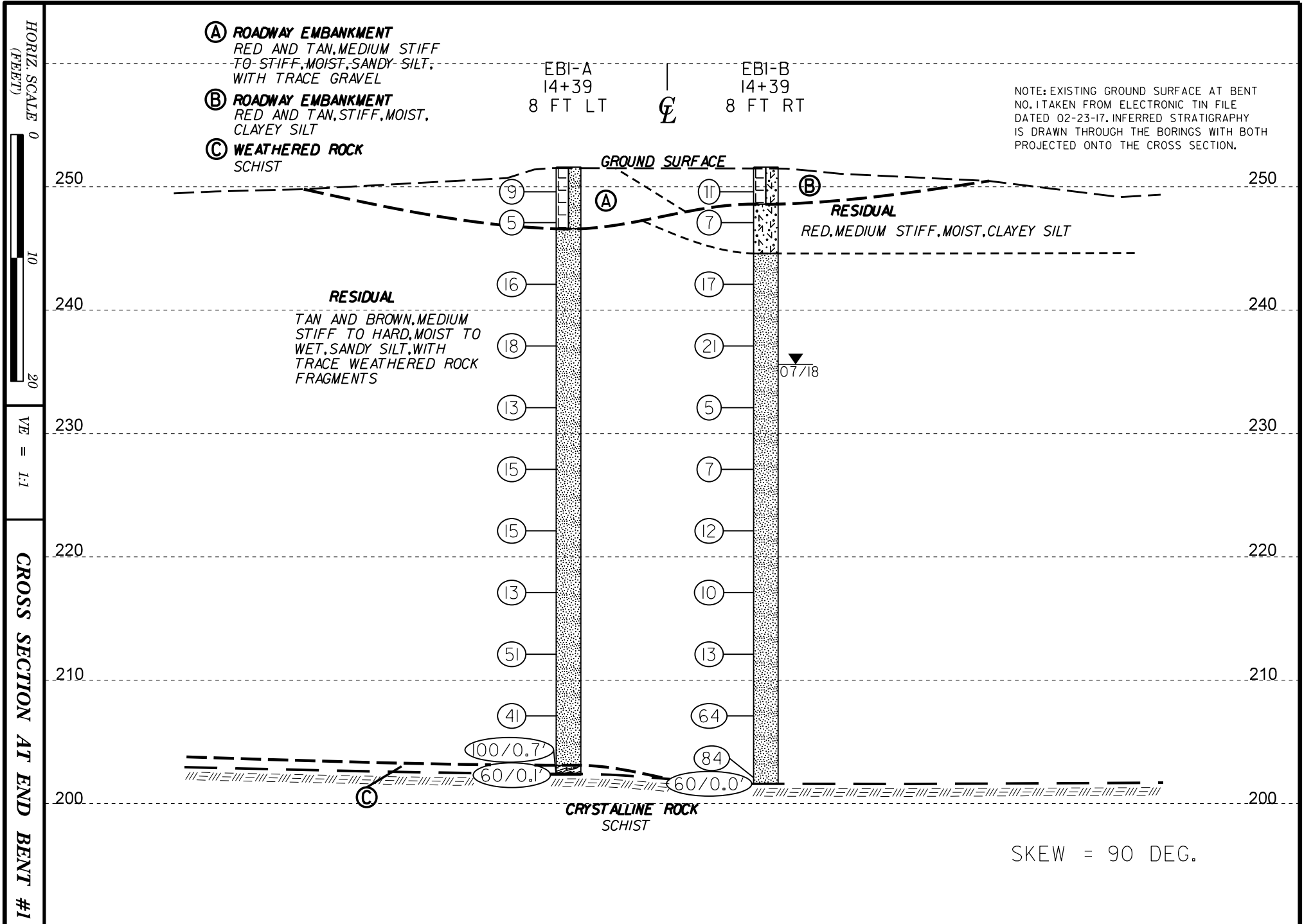
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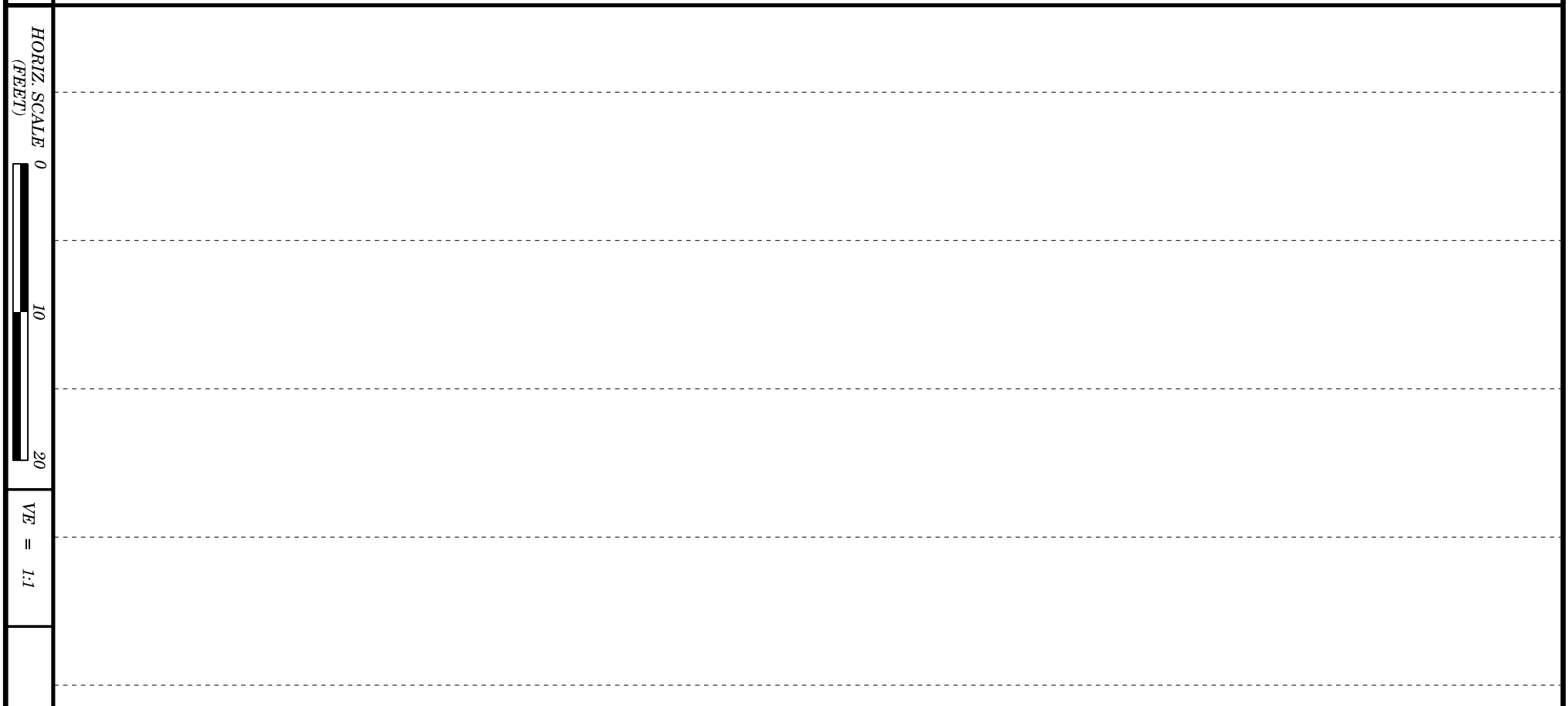
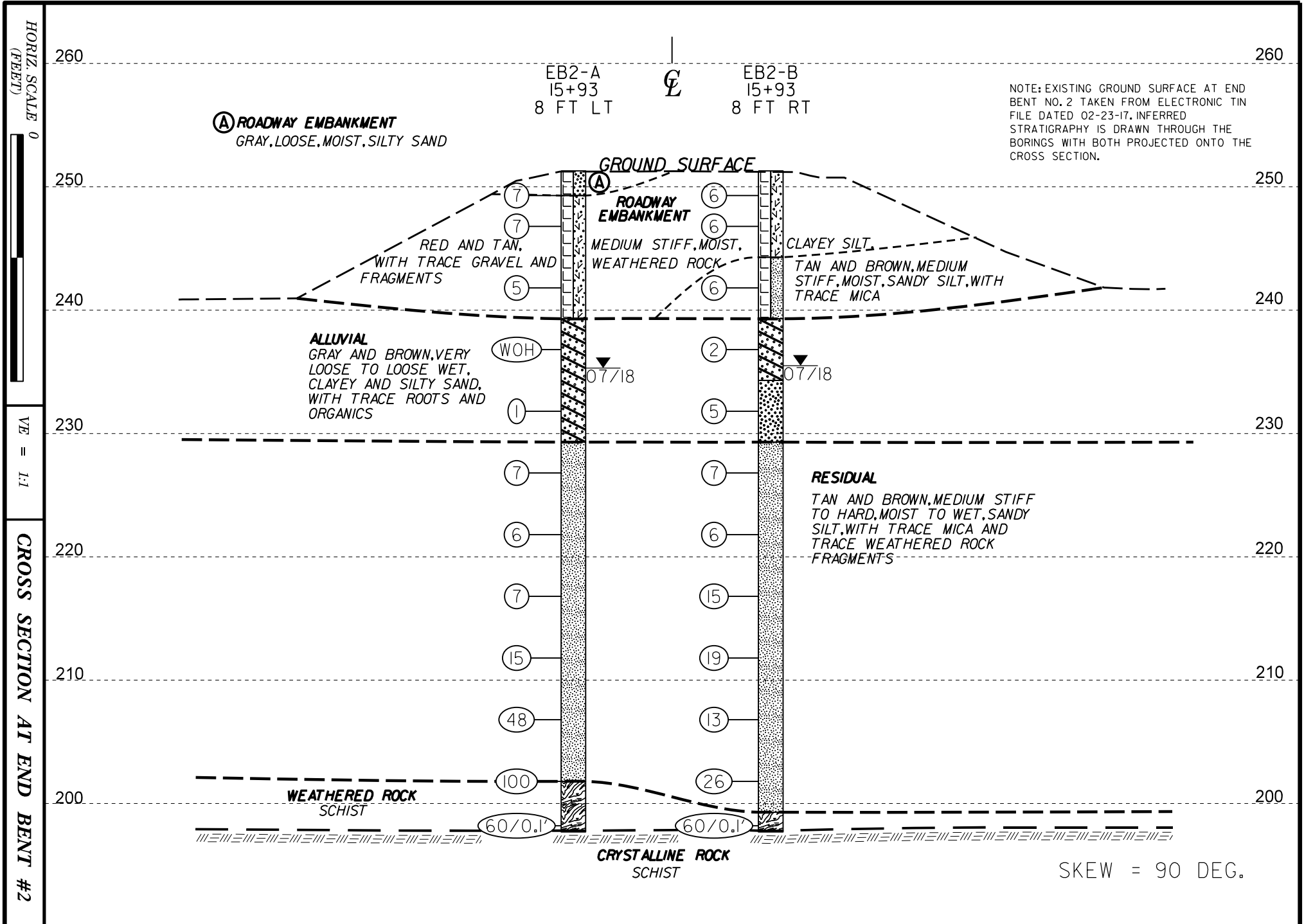


PROJECT REFERENCE NO.	SHEET NO.
B-4516	4
PROFILE ALONG -L- CENTERLINE	

- Ⓐ **ROADWAY EMBANKMENT** RED AND TAN, MEDIUM STIFF TO STIFF, MOIST, CLAYEY SILT, WITH TRACE GRAVEL
- Ⓑ **ROADWAY EMBANKMENT** TAN AND BROWN, MEDIUM STIFF, MOIST, SANDY SILT, WITH TRACE MICA
- Ⓒ **ALLUVIAL** GRAY AND BROWN, VERY LOOSE, WET, CLAYEY SAND, WITH TRACE ORGANICS
- Ⓓ **RESIDUAL** RED, MEDIUM STIFF, MOIST, CLAYEY SILT
- Ⓔ **WEATHERED ROCK** SCHIST







PROJECT REFERENCE NO. B-4615

SHEET NO. 6

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 38400.1.FD2	TIP B-4516	COUNTY FRANKLIN	GEOLOGIST C.T. Tang
SITE DESCRIPTION Bridge No. 52 on SR 1433 (Person Road) over Sandy Creek			GROUND WTR (ft)
BORING NO. B1-A	STATION 15+43	OFFSET 6 ft LT	ALIGNMENT -L-
COLLAR ELEV. 239.1 ft	TOTAL DEPTH 31.5 ft	NORTHING 888,610	EASTING 2,235,118
DRILL RIG/HAMMER EFF./DATE BRI8284 CME 300 91% 02/26/2018		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic
DRILLER J. Anderson	START DATE 07/19/18	COMP. DATE 07/19/18	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)			
240	239.1	0.0	1	4	3									239.1	0.0	GROUND SURFACE	
												M					ROADWAY EMBANKMENT
	235.7	3.4	2	4	2							W		236.6	2.5	Red and Brown, Sandy Silt, with Some Gravel	
235																	ALLUVIAL
	232.7	6.4	3	2	1							W					Gray and Brown, Silty Sand, with Trace Organics
230																	
	227.7	11.4	29	54	32							W		228.1	11.0	Gray, Black and Brown, Coarse Sand, with Gravel	
225														225.6	13.5		
																	RESIDUAL
	222.7	16.4	3	1	2							W					Tan, Sandy Silt, Saprolitic
220																	
	217.7	21.4	2	1	3							M					
215																	
	212.7	26.4	10	12	11							W					
210																	
	207.7	31.4	60/0.1											209.1	30.0		WEATHERED ROCK
														207.7	31.4		Schist
														207.6	31.5		CRYSTALLINE ROCK
																	Schist
																	Boring Terminated with Standard Penetration Test Refusal at Elevation 207.6 ft In Crystalline Rock (Schist)

NCDOT BORE DOUBLE B4516_GEO_BRDG0052_BH.GPJ NC_DOT.GDT 8/7/18

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 38400.1.FD2		TIP B-4516		COUNTY FRANKLIN		GEOLOGIST C.T. Tang										
SITE DESCRIPTION Bridge No. 52 on SR 1433 (Person Road) over Sandy Creek							GROUND WTR (ft)									
BORING NO. EB2-A		STATION 15+93		OFFSET 8 ft LT		ALIGNMENT -L-										
COLLAR ELEV. 251.3 ft		TOTAL DEPTH 53.6 ft		NORTHING 888,651		EASTING 2,235,147										
DRILL RIG/HAMMER EFF./DATE BRI8284 CME 300 91% 02/26/2018			DRILL METHOD Mud Rotary		HAMMER TYPE Automatic											
DRILLER J. Anderson		START DATE 07/18/18		COMP. DATE 07/18/18		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
255														251.3	GROUND SURFACE	0.0
250	250.3	1.0	6	3	4								M	249.3	ROADWAY EMBANKMENT Gray, Silty Sand	2.0
	247.8	3.5	3	3	4								M		Red, Clayey Silt, with Trace Weathered Rock Fragments	
245																
	242.8	8.5	2	2	3								M			
240																
	237.8	13.5	WOH	WOH	WOH									239.3	ALLUVIAL Brown and Gray, Clayey Sand, with Trace Roots	12.0
235																
	232.8	18.5	WOH	WOH	1								W	229.3	RESIDUAL Tan and Brown, Sandy Silt, Saprolitic	22.0
230																
	227.8	23.5	2	2	5								W			
225																
	222.8	28.5	2	3	3								W			
220																
	217.8	33.5	2	2	5								M			
215																
	212.8	38.5	4	6	9								M			
210																
	207.8	43.5	11	16	32								M			
205																
	202.8	48.5	18	25	75								M	201.8	WEATHERED ROCK Schist	49.5
200																
	198.3	53.0	60/0.1'											197.8	CRYSTALLINE ROCK Schist	53.5
														197.7		53.6
															Boring Terminated with Standard Penetration Test Refusal at Elevation 197.7 ft In Crystalline Rock (Schist)	

WBS 38400.1.FD2		TIP B-4516		COUNTY FRANKLIN		GEOLOGIST C.T. Tang										
SITE DESCRIPTION Bridge No. 52 on SR 1433 (Person Road) over Sandy Creek							GROUND WTR (ft)									
BORING NO. EB2-B		STATION 15+93		OFFSET 8 ft RT		ALIGNMENT -L-										
COLLAR ELEV. 251.3 ft		TOTAL DEPTH 53.6 ft		NORTHING 888,641		EASTING 2,235,160										
DRILL RIG/HAMMER EFF./DATE BRI8284 CME 300 91% 02/26/2018			DRILL METHOD Mud Rotary		HAMMER TYPE Automatic											
DRILLER J. Anderson		START DATE 07/18/18		COMP. DATE 07/18/18		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
255														251.3	GROUND SURFACE	0.0
250	250.3	1.0	4	3	3								M	249.3	ROADWAY EMBANKMENT Red and Tan, Clayey Silt, with Trace Gravel	2.0
	247.8	3.5	2	2	4								M			
245																
	242.8	8.5	1	2	4								M	244.3	Tan and Brown, Sandy Silt, with Trace Mica	7.0
240																
	237.8	13.5	1	1	1									239.3	ALLUVIAL Gray and Brown, Clayey Sand, with Trace Organics	12.0
235																
	232.8	18.5	2	2	3								W	234.3	Gray, Silty Sand	17.0
230																
	227.8	23.5	2	3	4								M	229.3	RESIDUAL Tan and Brown, Sandy Silt, Saprolitic, with Trace Mica	22.0
225																
	222.8	28.5	2	2	4								W			
220																
	217.8	33.5	3	6	9								M			
215																
	212.8	38.5	4	7	12								M			
210																
	207.8	43.5	4	5	8								M		with Trace Weathered Rock Fragments	
205																
	202.8	48.5	14	18	8								M		with Some Weathered Rock Fragments	
200																
	198.3	53.0	60/0.1'											199.3	WEATHERED ROCK Schist	52.0
														197.8	CRYSTALLINE ROCK Schist	53.5
														197.7		53.6
															Boring Terminated with Standard Penetration Test Refusal at Elevation 197.7 ft In Crystalline Rock (Schist)	

NCDOT BORE DOUBLE BA4516_GEO_BRDG0052_BH.GPJ NC_DOT.GDT 8/7/18

LAB TEST RESULTS



**UNCONFINED COMPRESSIVE STRENGTH
OF INTACT ROCK CORE SPECIMEN**
ASTM D7012

WBS No.: 38400.1.FD2

Test Date: 7/23/2018

TIP No.: B-4516

Tested By: J. Evans

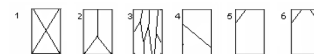
County: Franklin

Description: Bridge No. 52 on SR 1433 (Person Road) over Sandy Creek

Test No.	1			
Boring ID	B1-B			
Station	15+42			
Sample ID	RS-1			
Sample Depth, ft	39.3			
Core Length #1, in.	4.032			
Core Length #2, in.	4.041			
Core Length #3, in.	4.040			
Avg. Core Length, in.	4.038			
Core Dia. #1, in.	1.967			
Core Dia. #2, in.	1.967			
Avg. Core Dia., in.	1.967			
Length/Dia. Ratio	2.05			
X-Sectional Area, in ²	3.04			
Weight, lb	1.22			
Unit Weight, pcf	171.75			
Break Type	2			
Load at Failure, lb	16,390			
Correction Factor	1.00			
Comp. Strength, psi	5,391			
Comp. Strength, ksf	776			

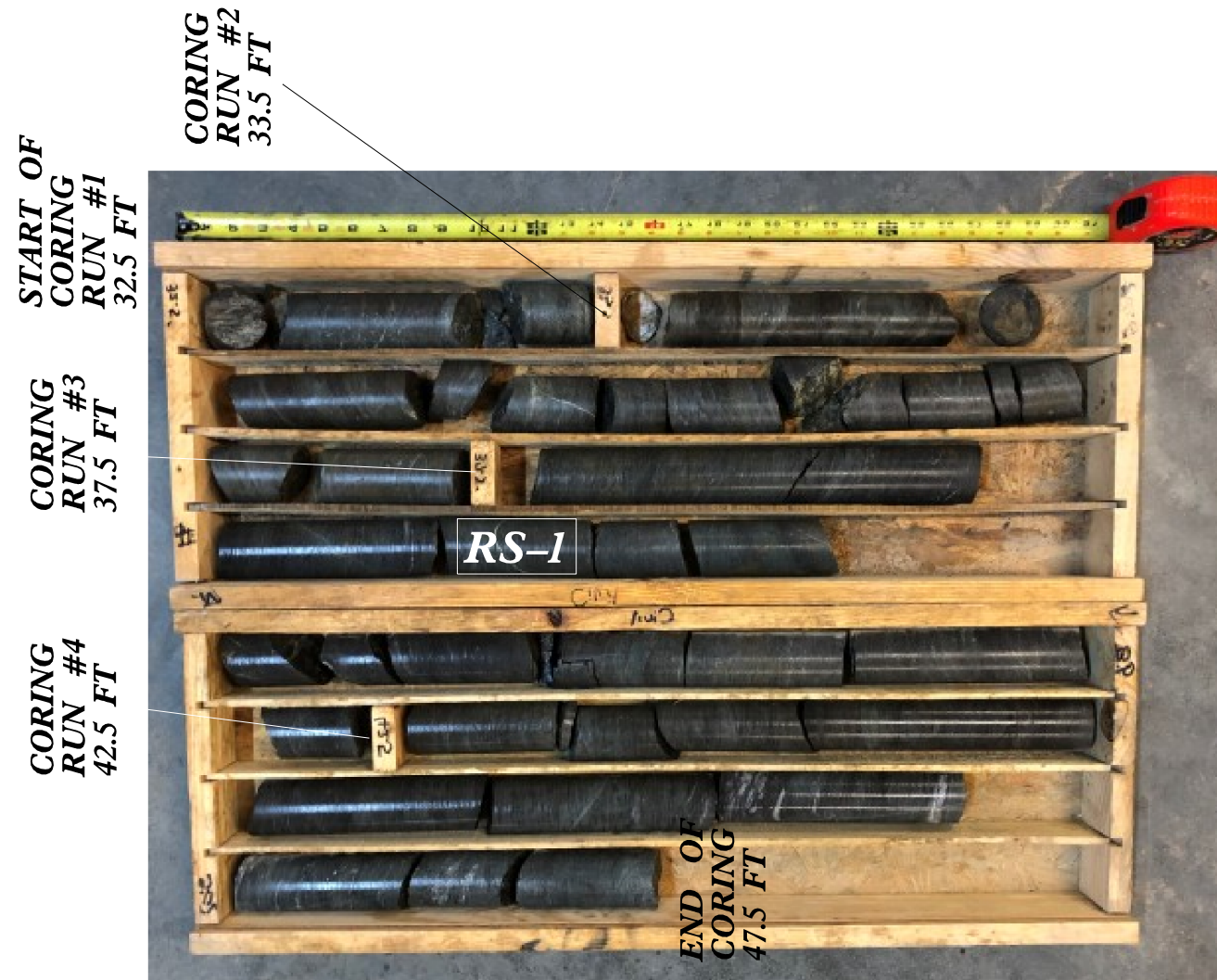
Rock Descriptions:

Test 1 : Dark Gray, Very Slight Weathered, Hard, Schist, with Close Fracture Spacing

Break Types:

CORE PHOTOGRAPHS

BORING BI-B
STA. 15+42 -L-, 6 FT RT
CORE DEPTH: 32.5 FT TO 47.5 FT



SITE PHOTOGRAPH

BRIDGE 52



PHOTOGRAPH NO.1.: VIEW LOOKING NORTH.