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REFERENCE: B-5326

PROJECT: 46040

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

**STRUCTURE**  
**SUBSURFACE INVESTIGATION**

COUNTY WAKE  
 PROJECT DESCRIPTION BRIDGE NO. 247 ON -L-  
(SR 2555) OVER WHITE OAK CREEK AT STA. 17 + 70

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STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5326	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 1919 TOT-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 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:  
 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

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**A. N. KINTNER**  
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**D. G. PINTER**  
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**R. E. CLARKE**  
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INVESTIGATED BY J. L. LOVE  
 DRAWN BY A. N. KINTNER  
 CHECKED BY N. T. ROBERSON  
 SUBMITTED BY N. T. ROBERSON  
 DATE MAY 2018





























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*Jaime L. Love* 12/10/2018  
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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		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 (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:		<b>ALLUVIUM (ALLUV.)</b> - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. <b>AQUIFER</b> - A WATER BEARING FORMATION OR STRATA. <b>ARENACEOUS</b> - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND. <b>ARGILLACEOUS</b> - 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. <b>ARTESIAN</b> - 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. <b>CALCAREOUS (CALC.)</b> - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE. <b>COLLUVIUM</b> - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE. <b>CORE RECOVERY (REC.)</b> - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. <b>DIKE</b> - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK. <b>DIP</b> - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL. <b>DIP DIRECTION (DIP AZIMUTH)</b> - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH. <b>FAULT</b> - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE. <b>FISSILE</b> - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES. <b>FLOAT</b> - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLOGGED FROM PARENT MATERIAL. <b>FLOOD PLAIN (FP)</b> - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM. <b>FORMATION (FM)</b> - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD. <b>JOINT</b> - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED. <b>LEDGE</b> - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT. <b>LENS</b> - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS. <b>MOTTLED (MOT.)</b> - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE. <b>PERCHED WATER</b> - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM. <b>RESIDUAL (RES.) SOIL</b> - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. <b>ROCK QUALITY DESIGNATION (RQD)</b> - 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. <b>SAPROLITE (SAP.)</b> - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK. <b>SILL</b> - 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. <b>SLICKENSIDE</b> - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE. <b>STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT)</b> - 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. <b>STRATA CORE RECOVERY (SREC.)</b> - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE. <b>STRATA ROCK QUALITY DESIGNATION (SROD)</b> - 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. <b>TOPSOIL (TS.)</b> - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.																																																																																																	
<b>SOIL LEGEND AND AASHTO CLASSIFICATION</b> <table border="1" style="width: 100%; font-size: 8px;"> <thead> <tr> <th>GENERAL CLASS.</th> <th colspan="3">GRANULAR MATERIALS (<math>\leq 35\%</math> PASSING #200)</th> <th colspan="3">SILT-CLAY MATERIALS (<math>&gt; 35\%</math> PASSING #200)</th> <th colspan="3">ORGANIC MATERIALS</th> </tr> <tr> <th>GROUP CLASS.</th> <th>A-1</th> <th>A-3</th> <th>A-2</th> <th>A-4</th> <th>A-5</th> <th>A-6</th> <th>A-7</th> <th>A-1, A-2</th> <th>A-4, A-5</th> </tr> <tr> <th>SYMBOL</th> <th>A-1-a</th> <th>A-1-b</th> <th>A-2-4</th> <th>A-2-5</th> <th>A-2-6</th> <th>A-2-7</th> <th>A-7-5</th> <th>A-7-6</th> <th>A-3</th> </tr> </thead> <tbody> <tr> <td>% PASSING #10</td> <td>50 MX</td> <td>30 MX</td> <td>10 MX</td> <td>51 MN</td> <td>35 MX</td> <td>35 MX</td> <td>35 MX</td> <td>35 MX</td> <td>36 MN</td> <td>36 MN</td> <td>36 MN</td> <td>36 MN</td> <td></td> </tr> <tr> <td>% PASSING #40</td> <td>15 MX</td> <td>25 MX</td> <td>10 MX</td> <td>10 MN</td> <td>10 MN</td> <td>11 MN</td> <td>11 MN</td> <td>11 MN</td> <td>10 MX</td> <td>10 MX</td> <td>11 MN</td> <td>11 MN</td> <td></td> </tr> <tr> <td>% PASSING #200</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>		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-4, A-5	SYMBOL	A-1-a	A-1-b	A-2-4	A-2-5	A-2-6	A-2-7	A-7-5	A-7-6	A-3	% PASSING #10	50 MX	30 MX	10 MX	51 MN	35 MX	35 MX	35 MX	35 MX	36 MN	36 MN	36 MN	36 MN		% PASSING #40	15 MX	25 MX	10 MX	10 MN	10 MN	11 MN	11 MN	11 MN	10 MX	10 MX	11 MN	11 MN		% PASSING #200														<b>ANGULARITY OF GRAINS</b> THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.		<b>MINERALOGICAL COMPOSITION</b> MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.		<b>WEATHERED ROCK (WR)</b>  NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES $> 100$ BLOWS PER FOOT IF TESTED.		<b>CRYSTALLINE ROCK (CR)</b>  FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.																							
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<b>GROUND WATER</b>  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		<b>MISCELLANEOUS SYMBOLS</b>  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 TEST BORING  AUGER BORING  CORE BORING  MONITORING WELL  PIEZOMETER INSTALLATION  SOUNDING ROD  TEST BORING WITH CORE  SPT N-VALUE		<b>RECOMMENDATION SYMBOLS</b>  UNDERCUT  SHALLOW UNDERCUT  UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE  UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK  UNCLASSIFIED EXCAVATION - UNACCEPTABLE DEGRADABLE ROCK		<b>ABBREVIATIONS</b> AR - AUGER REFUSAL BT - BORING TERMINATED CL - CLAY CPT - CONE PENETRATION TEST CSE - COARSE DMT - DILATOMETER TEST DPT - DYNAMIC PENETRATION TEST e - VOID RATIO F - FINE FOSS. - FOSSILIFEROUS FRAC. - FRACTURED, FRACTURES FRAGS. - FRAGMENTS HI. - HIGHLY MED. - MEDIUM MICA - MICACEOUS MOD. - MODERATELY NP - NON PLASTIC ORG. - ORGANIC PMT - PRESSUREMETER TEST SAP. - SAPROLITIC SD. - SAND, SANDY SL. - SILTY, SILTY SLI. - SLIGHTLY TCR - TRICONE REFUSAL w - MOISTURE CONTENT V - VERY VST - VANE SHEAR TEST WEA. - WEATHERED w - UNIT WEIGHT w <sub>d</sub> - DRY UNIT WEIGHT <b>SAMPLE ABBREVIATIONS</b> S - BULK SS - SPLIT SPOON ST - SHELBY TUBE RS - ROCK RT - RECOMPACTED TRIAXIAL CBR - CALIFORNIA BEARING RATIO																																																																																																	
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<b>COLOR</b> 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.		<b>BENCH MARK: BL-102, REBAR AND CAP AT -L- S+0.17+7, 18' RT</b>		<b>ELEVATION: 249.53 FEET</b>																																																																																																			

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
GEOTECHNICAL ENGINEERING UNIT

**SUBSURFACE INVESTIGATION**

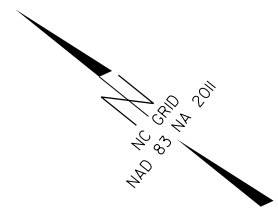
SUPPLEMENTAL LEGEND, GEOLOGICAL STRENGTH INDEX (GSI) TABLES  
FROM AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS

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

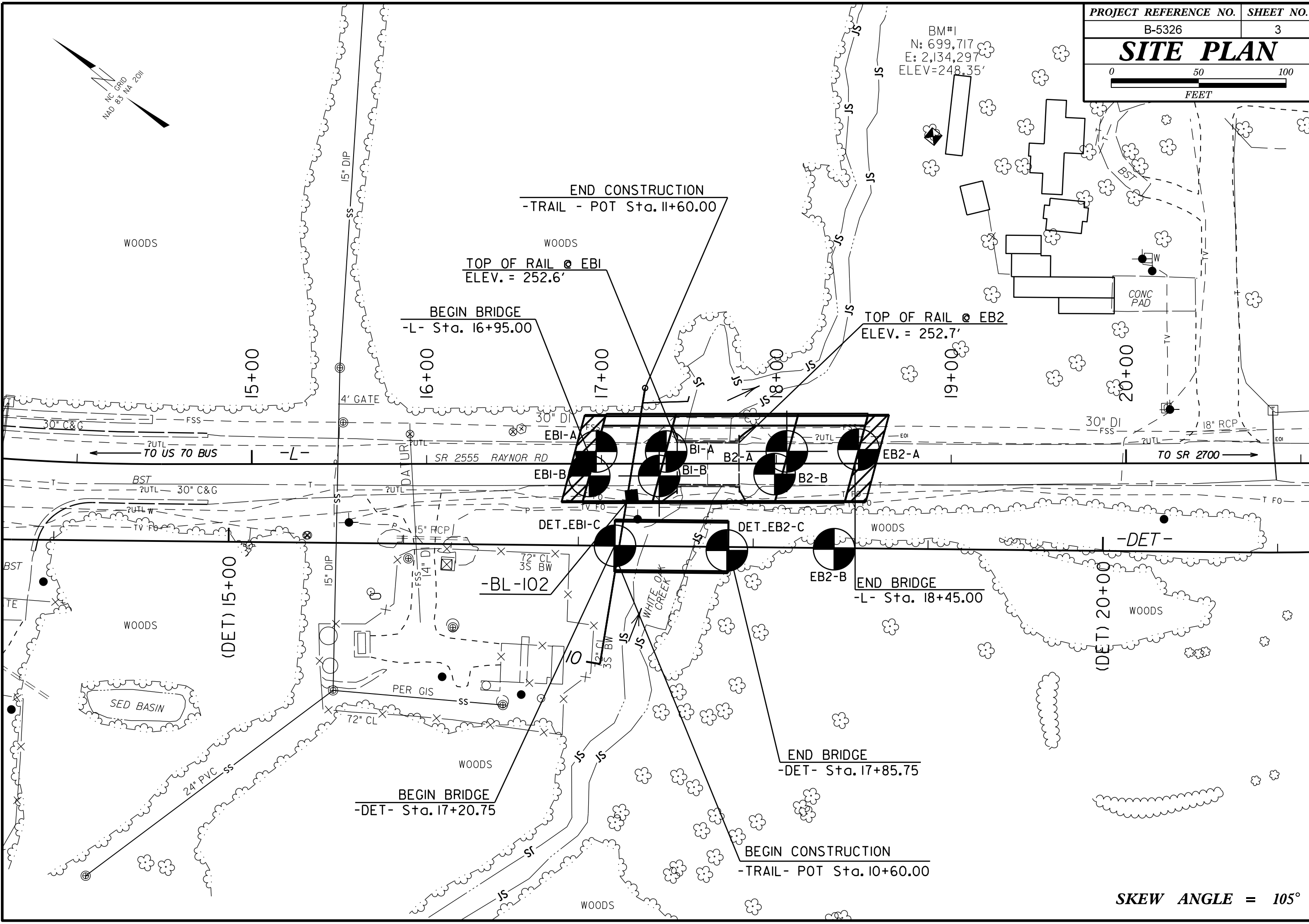
AASHTO LRFD Figure 10.4.6.4-2 — Determination of GSI for Tectonically Deformed Heterogeneous Rock Masses (Marinos and Hoek, 2000)

GEOLOGICAL STRENGTH INDEX (GSI) FOR JOINTED ROCKS (Hoek and Marinos, 2000)		SURFACE CONDITIONS					GSI FOR HETEROGENEOUS ROCK MASSES SUCH AS FLYSCH (Marinos, P and Hoek E., 2000)		SURFACE CONDITIONS OF DISCONTINUITIES (Predominantly bedding planes)				
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.		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	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.		VERY GOOD - Very Rough, fresh unweathered surfaces	GOOD - Rough, slightly weathered surfaces	FAIR - Smooth, moderately weathered and altered surfaces	POOR - Very smooth, occasionally slickensided surfaces with compact coatings or fillings with angular fragments	VERY POOR - Very smooth, slickensided or highly weathered surfaces with soft clay coatings or fillings
STRUCTURE		DECREASING SURFACE QUALITY →					COMPOSITION AND STRUCTURE						
INTACT OR MASSIVE - intact rock specimens or massive in situ rock with few widely spaced discontinuities		90			N/A	N/A	<b>A.</b> 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.	70					
BLOCKY - well interlocked undisturbed rock mass consisting of cubical blocks formed by three intersecting discontinuity sets		80					<b>B.</b> Sandstone with thin inter-layers of siltstone	60					
VERY BLOCKY - interlocked, partially disturbed mass with multi-faceted angular blocks formed by 4 or more joint sets			70				<b>C.</b> Sandstone and siltstone in similar amounts		50				
BLOCKY/DISTURBED/SEAMY - folded with angular blocks formed by many intersecting discontinuity sets. Persistence of bedding planes or schistosity			60				<b>D.</b> Siltstone or silty shale with sandstone layers			40			
DISINTEGRATED - poorly interlocked, heavily broken rock mass with mixture of angular and rounded rock pieces				50			<b>E.</b> Weak siltstone or clayey shale with sandstone layers				30		
LAMINATED/SHEARED - Lack of blockiness due to close spacing of weak schistosity or shear planes					40		<b>F.</b> Tectonically deformed, intensively folded/faulted, sheared clayey shale or siltstone with broken and deformed sandstone layers forming an almost chaotic structure					20	
					30		<b>G.</b> Undisturbed silty or clayey shale with or without a few very thin sandstone layers						10
					20		<b>H.</b> Tectonically deformed silty or clayey shale forming a chaotic structure with pockets of clay. Thin layers of sandstone are transformed into small rock pieces.						
					10								
		N/A	N/A										

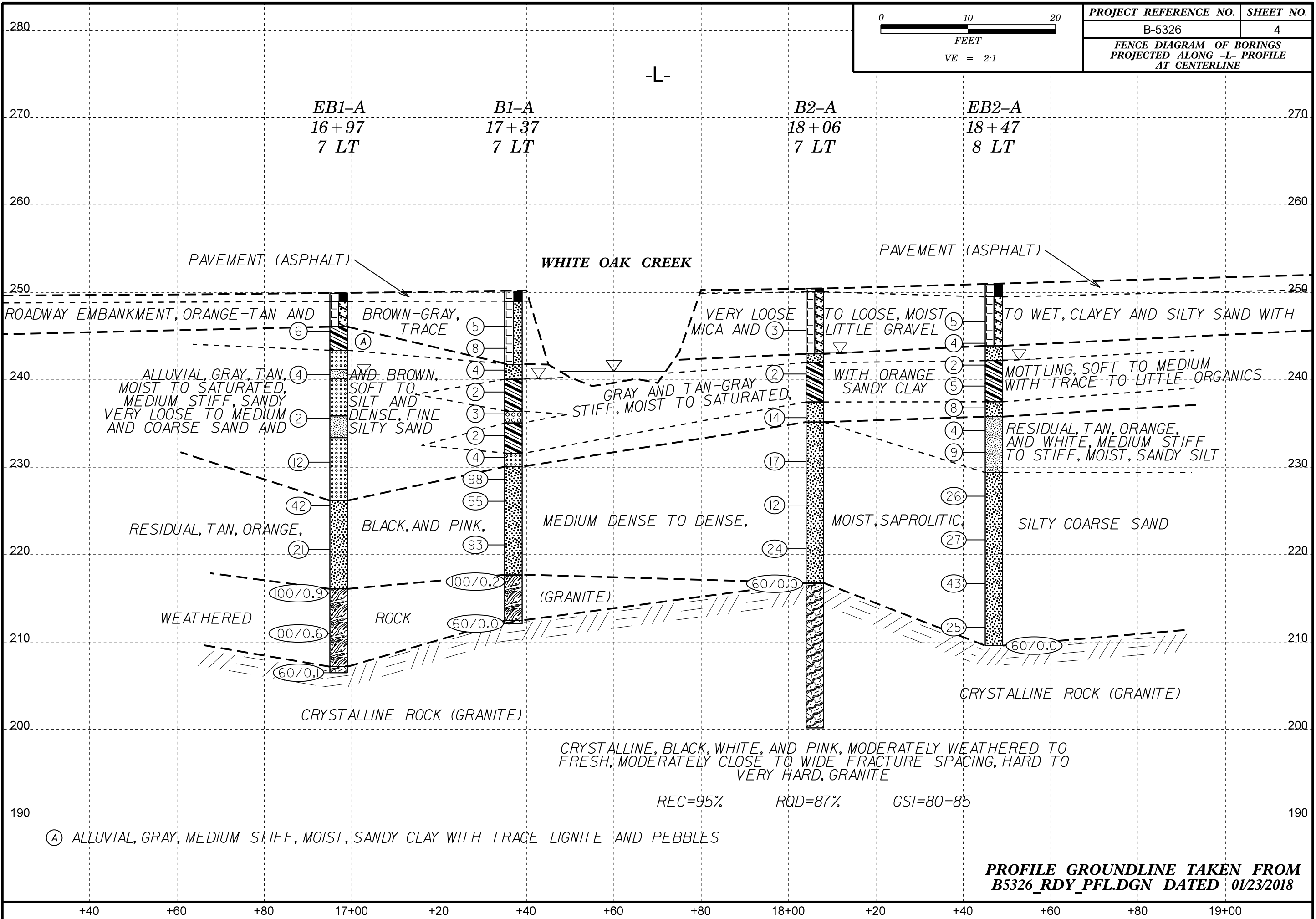
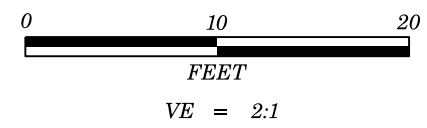
→ Means deformation after tectonic disturbance



BM#1  
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 E: 2,134,297  
 ELEV=248.35'

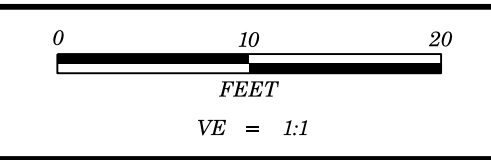


**SKREW ANGLE = 105°**

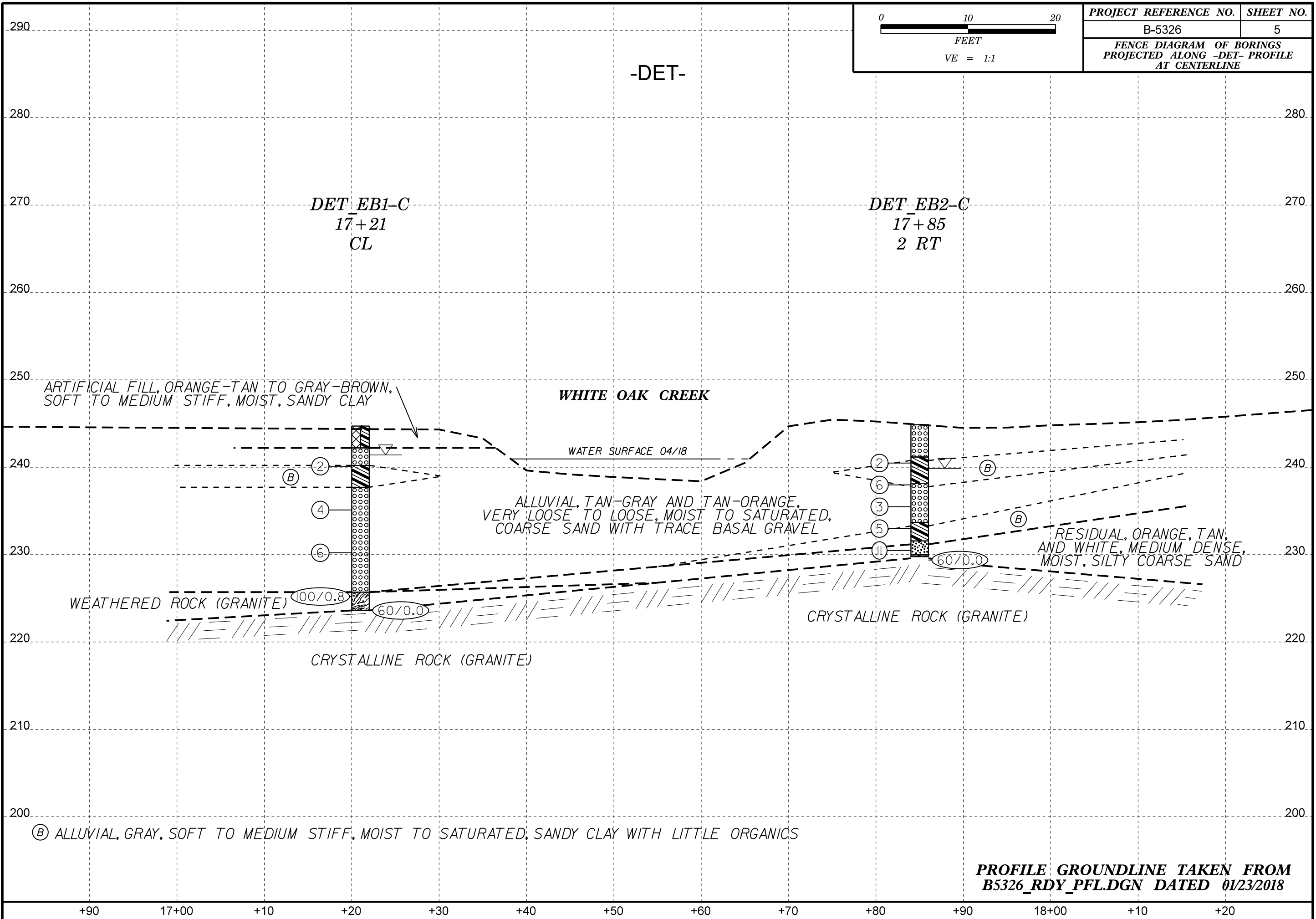


Ⓐ ALLUVIAL, GRAY, MEDIUM STIFF, MOIST, SANDY CLAY WITH TRACE LIGNITE AND PEBBLES

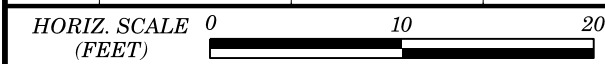
**PROFILE GROUNDLINE TAKEN FROM  
B5326\_RDY\_PFL.DGN DATED 01/23/2018**



PROJECT REFERENCE NO.	SHEET NO.
B-5326	5
FENCE DIAGRAM OF BORINGS PROJECTED ALONG -DET- PROFILE AT CENTERLINE	

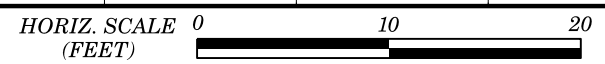


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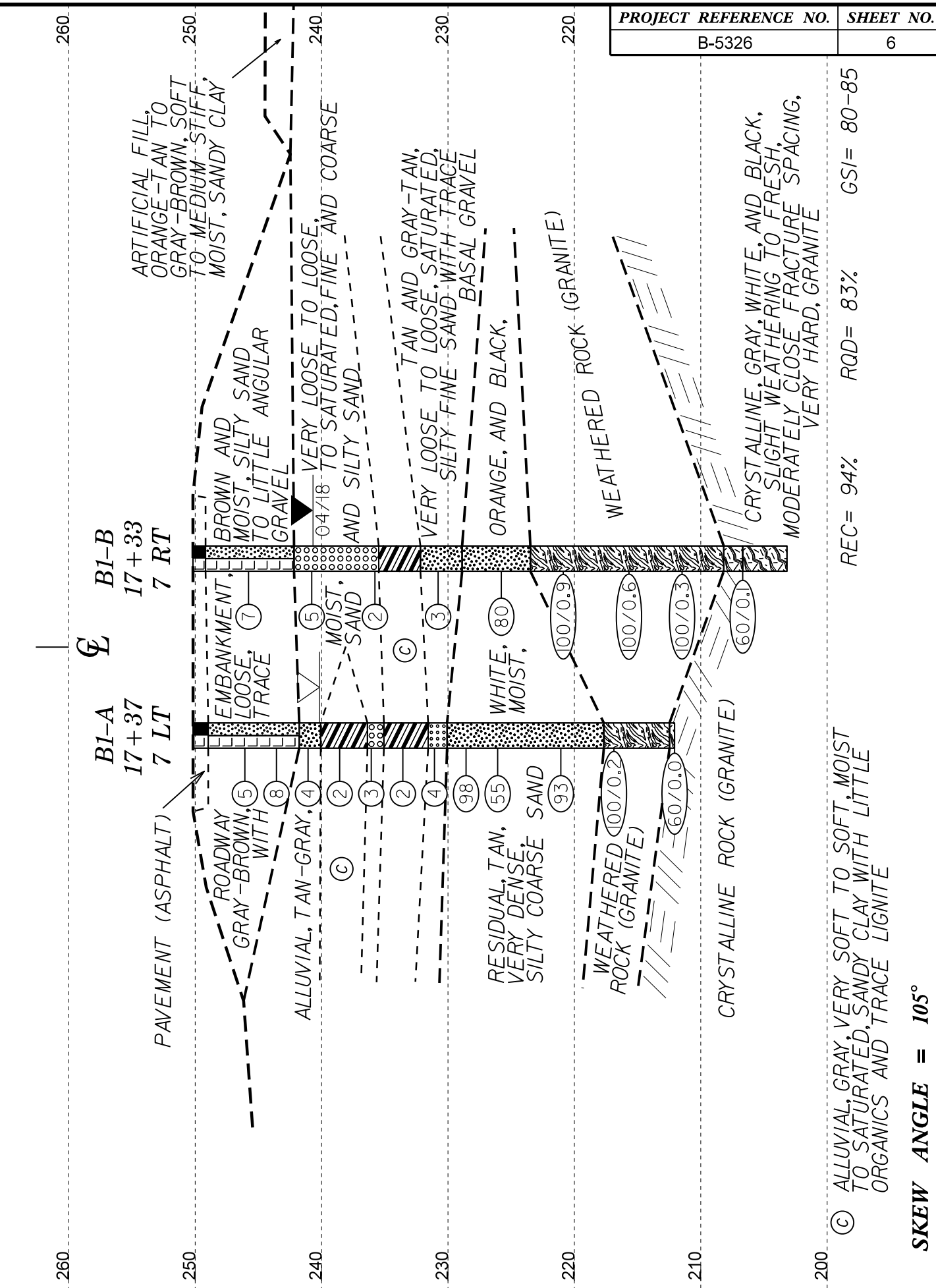
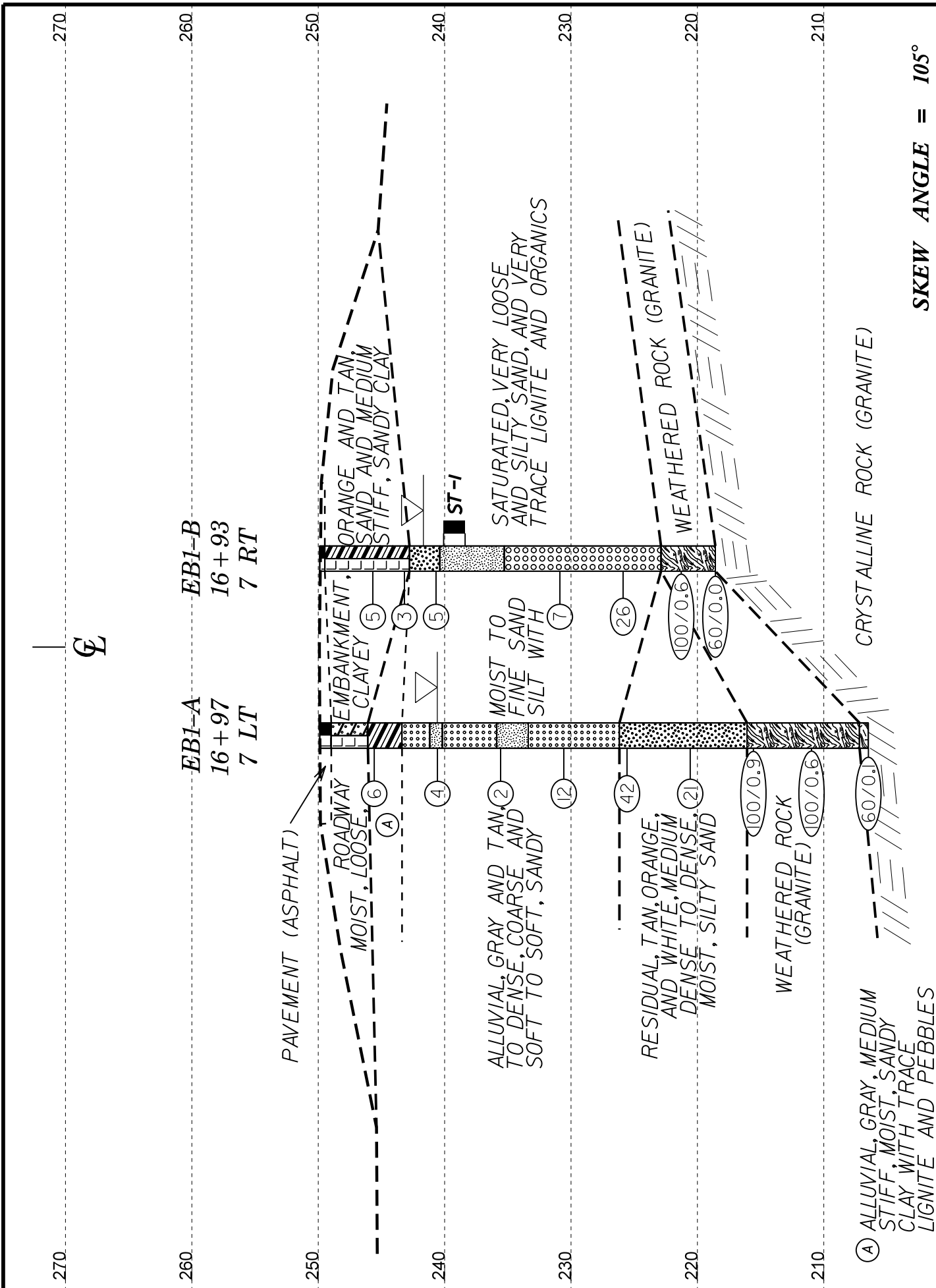
VE = 1:1

**CROSS SECTION THROUGH EBI**



VE = 1:1

**CROSS SECTION THROUGH BI**



(C) ALLUVIAL GRAY, VERY SOFT TO SOFT, MOIST TO SATURATED, SANDY CLAY WITH LITTLE ORGANICS AND TRACE LIGNITE

**SKEW ANGLE = 105°**

REC= 94% RQD= 83%

GSI= 80-85

CRYSTALLINE, GRAY, WHITE, AND BLACK, SLIGHT WEATHERING TO FRESH, MODERATELY CLOSE FRACTURE SPACING, VERY HARD, GRANITE

WEATHERED ROCK (GRANITE)

ORANGE, AND BLACK, BASAL GRAVEL

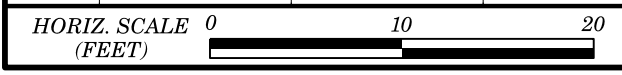
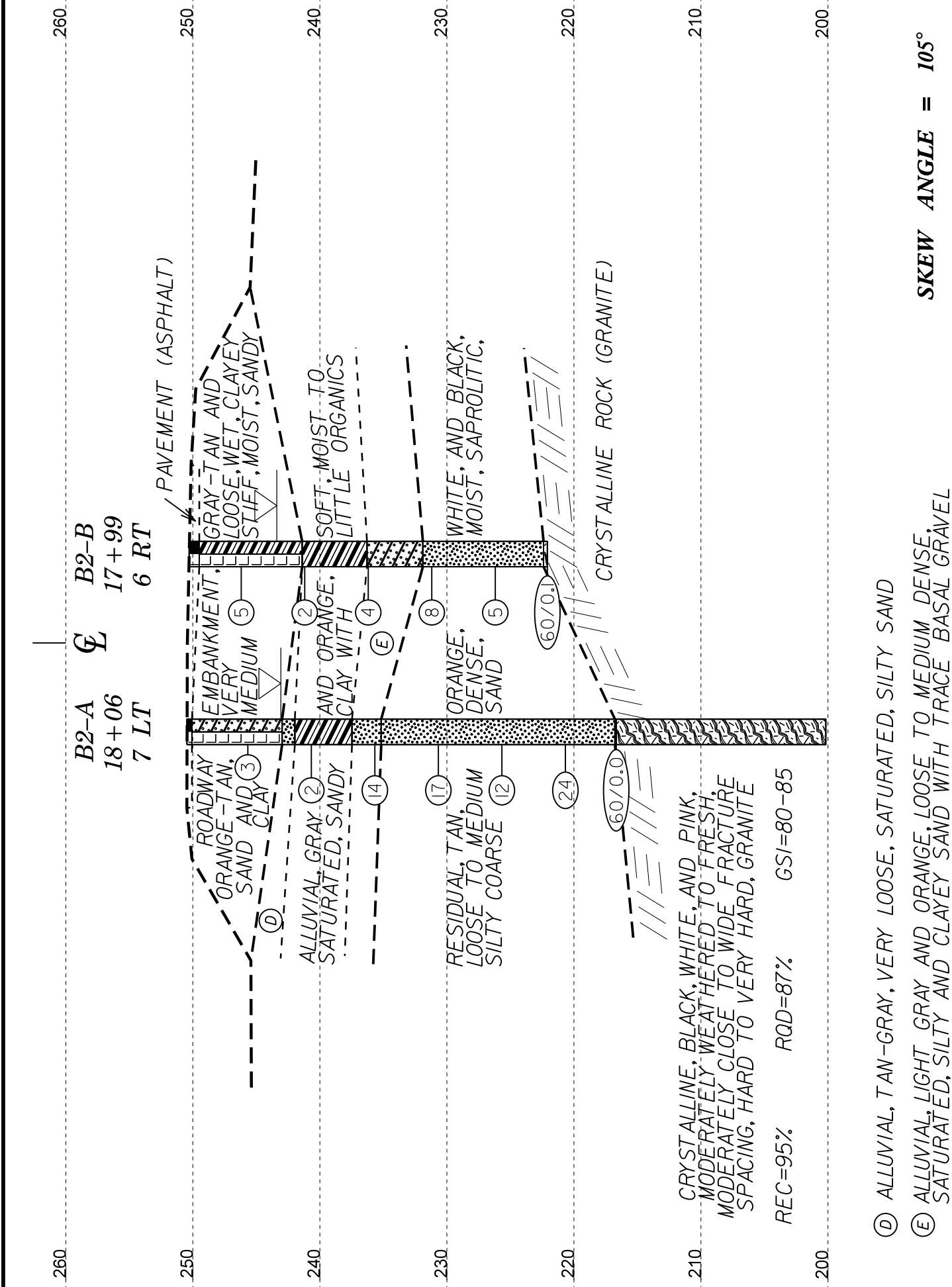
TAN AND GRAY-TAN, VERY LOOSE TO LOOSE, SATURATED, SILTY FINE SAND WITH TRACE

VERY LOOSE TO LOOSE, 04/18 TO SATURATED, FINE AND COARSE AND SILTY SAND

BROWN AND MOIST, SILTY SAND TO LITTLE ANGULAR GRAVEL

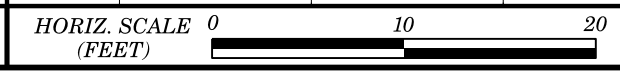
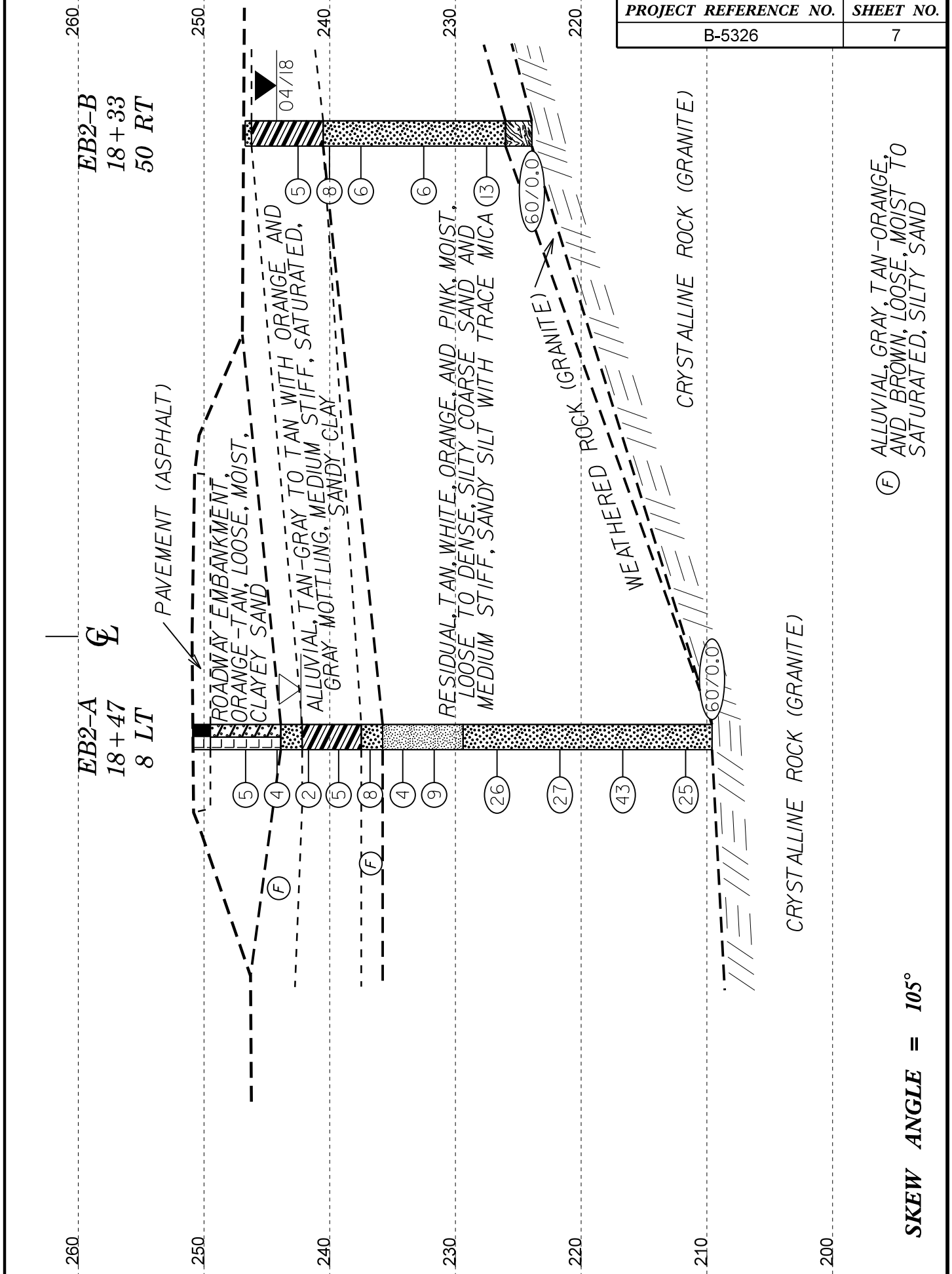
ARTIFICIAL FILL, ORANGE-TAN TO GRAY-BROWN, SOFT TO MEDIUM-STIFF, MOIST, SANDY CLAY





VE = 1:1

**CROSS SECTION THROUGH B2**



VE = 1:1

**CROSS SECTION THROUGH EB2**

# GEOTECHNICAL BORING REPORT

## BORE LOG

WBS 46040.1.1		TIP B-5326		COUNTY WAKE		GEOLOGIST Kintner, A. N.									
SITE DESCRIPTION BRIDGE NO. 247 ON -L- (SR 2555) OVER WHITE OAK CREEK							GROUND WTR (ft)								
BORING NO. EB1-A		STATION 16+97		OFFSET 7 ft LT		ALIGNMENT -L-									
COLLAR ELEV. 249.9 ft		TOTAL DEPTH 43.4 ft		NORTHING 699,754		EASTING 2,134,035									
DRILL RIG/HAMMER EFF./DATE RFO0074 CME-55 86% 11/17/2017			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic									
DRILLER Pinter, D. G.		START DATE 03/22/18		COMP. DATE 03/22/18		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
250														249.9 GROUND SURFACE 0.0	
														249.0 ROADWAY EMBANKMENT (ASPHALT) 0.9	
245	246.6	3.3	2	3	3									246.1 ORANGE-TAN, CLAYEY SAND 3.8	
														243.4 ALLUVIAL GRAY, SANDY CLAY WITH TRACE LIGNITE AND PEBBLES 6.5	
240	241.6	8.3	3	2	2									241.2 TAN, FINE SAND 8.7	
														240.2 DARK GRAY, SANDY SILT WITH TRACE LIGNITE 9.7	
														TAN, FINE SAND	
235	236.6	13.3	1	1	1									235.9 DARK GRAY, SANDY SILT WITH TRACE LIGNITE 14.0	
														233.4 DARK GRAY, SANDY SILT WITH TRACE LIGNITE 16.5	
230	231.6	18.3	5	6	6									TAN, FINE AND COARSE SAND WITH TRACE WELL-ROUNDED PEBBLES	
														226.2 RESIDUAL TAN, ORANGE, AND WHITE, SILTY SAND 23.7	
225	226.6	23.3	15	18	24										
220	221.6	28.3	11	9	12										
215	216.6	33.3	4	28	72/0.4										
210	211.6	38.3	4	96/0.1											
	206.6	43.3	60/0.1												

WBS 46040.1.1		TIP B-5326		COUNTY WAKE		GEOLOGIST Kintner, A. N.									
SITE DESCRIPTION BRIDGE NO. 247 ON -L- (SR 2555) OVER WHITE OAK CREEK							GROUND WTR (ft)								
BORING NO. EB1-B		STATION 16+93		OFFSET 7 ft RT		ALIGNMENT -L-									
COLLAR ELEV. 249.9 ft		TOTAL DEPTH 31.3 ft		NORTHING 699,748		EASTING 2,134,022									
DRILL RIG/HAMMER EFF./DATE RFO0074 CME-55 86% 11/17/2017			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic									
DRILLER Clarke, R. E.		START DATE 04/02/18		COMP. DATE 04/02/18		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
250														249.9 GROUND SURFACE 0.0	
														249.5 ROADWAY EMBANKMENT (ASPHALT) 0.4	
245	246.7	3.2	2	2	3									246.1 ORANGE AND TAN, SANDY CLAY 3.8	
														243.4 ALLUVIAL GRAY, SANDY CLAY WITH TRACE LIGNITE AND PEBBLES 6.5	
240	244.2	5.7	1	1	2									241.2 TAN, FINE SAND 8.7	
														240.2 DARK GRAY, SANDY SILT WITH TRACE LIGNITE 9.7	
														TAN, FINE SAND	
235	241.7	8.2	2	3	2									235.9 DARK GRAY, SANDY SILT WITH TRACE LIGNITE 14.0	
														233.4 DARK GRAY, SANDY SILT WITH TRACE LIGNITE 16.5	
230														TAN, FINE AND COARSE SAND WITH TRACE WELL-ROUNDED PEBBLES	
														226.2 RESIDUAL TAN, ORANGE, AND WHITE, SILTY SAND 23.7	
225	231.9	18.0	2	3	4										
220	226.9	23.0	17	11	15										
	221.9	28.0	86	14/0.1											
	218.6	31.3	60/0.0												

NCDOT BORE DOUBLE\_B5326\_GEO\_BH.GPJ NC\_DOT.GDT 5/22/18

WBS 46040.1.1		TIP B-5326		COUNTY WAKE		GEOLOGIST Kintner, A. N.										
SITE DESCRIPTION BRIDGE NO. 247 ON -L- (SR 2555) OVER WHITE OAK CREEK							GROUND WTR (ft)									
BORING NO. B1-A		STATION 17+37		OFFSET 7 ft LT		ALIGNMENT -L-										
COLLAR ELEV. 250.2 ft		TOTAL DEPTH 38.1 ft		NORTHING 699,723		EASTING 2,134,060										
DRILL RIG/HAMMER EFF./DATE RFO0074 CME-55 86% 11/17/2017				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER Pinter, D. G.		START DATE 03/26/18		COMP. DATE 03/26/18		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						
255																
250														250.2	GROUND SURFACE	0.0
														249.0	ROADWAY EMBANKMENT (ASPHALT)	1.2
	247.1	3.1	2	3	2	5						M			BROWN TO BROWN-GRAY, SILTY SAND WITH LITTLE GRAVEL	
245	244.6	5.6	3	4	4	8						M				
	242.1	8.1	3	2	2	4						Sat. V		241.8		8.4
240	239.6	10.6	2	1	1	2						SS-5		240.1	ALLUVIAL TAN-GRAY, SILTY SAND	10.1
	237.1	13.1	1	1	2	3						Sat.		236.4	GRAY, SANDY CLAY WITH LITTLE ORGANICS	13.8
235	234.6	15.6	1	1	1	2						Sat.		235.1	TAN-GRAY, COARSE SAND	15.1
	232.1	18.1	WOH	WOH	4	4						SS-6		231.6	LIGHT GRAY, SANDY CLAY WITH TRACE ORGANICS	18.6
230	229.6	20.6	25	40	58	98						Sat.		230.1	TAN, FINE SAND WITH TRACE BASAL GRAVEL	20.1
	227.1	23.1	27	23	32	55						M			RESIDUAL TAN, WHITE, AND BLACK, SILTY COARSE SAND	
225	222.1	28.1	43	45	48	93						M				
220	217.1	33.1	100/0.2			100/0.2						M		217.7	WEATHERED ROCK (GRANITE)	32.5
215	212.1	38.1	60/0.0			60/0.0								212.5	CRYSTALLINE ROCK (GRANITE)	37.7
														212.1	CRYSTALLINE ROCK (GRANITE)	38.1
															Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 212.1 ft IN CRYSTALLINE ROCK (GRANITE)	
															Other Samples: O-5 = 7.5% (10.6 - 12.1)	

# GEOTECHNICAL BORING REPORT BORE LOG

# GEOTECHNICAL BORING REPORT CORE LOG

WBS 46040.1.1		TIP B-5326		COUNTY WAKE		GEOLOGIST Kintner, A. N.									
SITE DESCRIPTION BRIDGE NO. 247 ON -L- (SR 2555) OVER WHITE OAK CREEK							GROUND WTR (ft)								
BORING NO. B1-B		STATION 17+33		OFFSET 7 ft RT		ALIGNMENT -L-									
COLLAR ELEV. 250.2 ft		TOTAL DEPTH 47.0 ft		NORTHING 699,717		EASTING 2,134,047									
DRILL RIG/HAMMER EFF./DATE RFO0074 CME-55 86% 11/17/2017			DRILL METHOD NW Casing W/SPT & Core		HAMMER TYPE Automatic										
DRILLER Clarke, R. E.		START DATE 03/29/18		COMP. DATE 04/12/18		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
255															
250														250.2 GROUND SURFACE 0.0	
														249.2 ROADWAY EMBANKMENT (ASPHALT) 1.0	
245	246.8	3.4	3	4	3									242.2 GRAY-BROWN, SILTY SAND WITH TRACE ANGULAR GRAVEL 8.0	
240	241.8	8.4	3	3	2									235.5 ALLUVIAL TAN-GRAY, COARSE SAND 14.7	
235	236.8	13.4	1	1	1									232.2 GRAY, SANDY CLAY 18.0	
230	231.8	18.4	1	1	2									228.9 GRAY-TAN, SILTY FINE SAND 21.3	
225	226.8	23.4	41	38	42									223.5 RESIDUAL ORANGE, TAN, AND WHITE, SILTY COARSE SAND 26.7	
220	221.8	28.4	50	50/0.4										223.5 WEATHERED ROCK (GRANITE) 26.7	
215	216.8	33.4	29	64	36/0.1									208.2 CRYSTALLINE ROCK (GRANITE) 42.0	
210	211.8	38.4	100/0.3											206.7 CRYSTALLINE ROCK (GRANITE) 43.5	
205	206.8	43.4	60/0.1											203.2 GRAY, WHITE, AND BLACK, SLIGHT WEATHERING TO FRESH, MODERATELY CLOSE FRACTURE SPACING, VERY HARD, GRANITE 47.0	
														REC= 94% RQD= 83% GSI= 80-85 Boring Terminated at Elevation 203.2 ft IN CRYSTALLINE ROCK (GRANITE) CORING STOPPED DUE TO WATER PUMP MALFUNCTION	

WBS 46040.1.1		TIP B-5326		COUNTY WAKE		GEOLOGIST Kintner, A. N.						
SITE DESCRIPTION BRIDGE NO. 247 ON -L- (SR 2555) OVER WHITE OAK CREEK							GROUND WTR (ft)					
BORING NO. B1-B		STATION 17+33		OFFSET 7 ft RT		ALIGNMENT -L-						
COLLAR ELEV. 250.2 ft		TOTAL DEPTH 47.0 ft		NORTHING 699,717		EASTING 2,134,047						
DRILL RIG/HAMMER EFF./DATE RFO0074 CME-55 86% 11/17/2017			DRILL METHOD NW Casing W/SPT & Core		HAMMER TYPE Automatic							
DRILLER Clarke, R. E.		START DATE 03/29/18		COMP. DATE 04/12/18		SURFACE WATER DEPTH N/A						
CORE SIZE NWXL				TOTAL RUN 3.5 ft								
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		SAMP. NO.	STRATA		LOG	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC. (ft) %	RQD (ft) %		REC. (ft) %	RQD (ft) %			
206.68	206.7	43.5	1.5	1:00/0.5	(1.3)	(1.0)		(3.3)	(2.9)		Begin Coring @ 43.5 ft	
205	205.2	45.0	2.0	1:02/1.0	87%	67%		94%	83%		GRAY, WHITE, AND BLACK, SLIGHT WEATHERING TO FRESH, MODERATELY CLOSE FRACTURE SPACING, VERY HARD, GRANITE	43.5
	203.2	47.0		3:27/1.0	100%	95%	RS-2				GSI= 80-85 Boring Terminated at Elevation 203.2 ft IN CRYSTALLINE ROCK (GRANITE) CORING STOPPED DUE TO WATER PUMP MALFUNCTION	47.0

# GEOTECHNICAL BORING REPORT BORE LOG

# GEOTECHNICAL BORING REPORT CORE LOG

WBS 46040.1.1		TIP B-5326		COUNTY WAKE		GEOLOGIST Kintner, A. N.									
SITE DESCRIPTION BRIDGE NO. 247 ON -L- (SR 2555) OVER WHITE OAK CREEK							GROUND WTR (ft)								
BORING NO. B2-A		STATION 18+06		OFFSET 7 ft LT		ALIGNMENT -L-									
COLLAR ELEV. 250.5 ft		TOTAL DEPTH 50.3 ft		NORTHING 699,669		EASTING 2,134,104									
DRILL RIG/HAMMER EFF./DATE RFO0074 CME-55 86% 11/17/2017			DRILL METHOD NW Casing W/SPT & Core		HAMMER TYPE Automatic										
DRILLER Pinter, D. G.		START DATE 03/27/18		COMP. DATE 03/27/18		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
255															
250															
245	246.7	3.8	2	2	1										
240	241.7	8.8	2	1	1										
235	236.7	13.8	6	9	5										
230	231.7	18.8	8	8	9										
225	226.7	23.8	6	5	7										
220	221.7	28.8	10	11	13										
215	216.7	33.8	60/0.0												
210															
205															
Boring Terminated at Elevation 200.2 ft IN CRYSTALLINE ROCK (GRANITE)															

WBS 46040.1.1		TIP B-5326		COUNTY WAKE		GEOLOGIST Kintner, A. N.						
SITE DESCRIPTION BRIDGE NO. 247 ON -L- (SR 2555) OVER WHITE OAK CREEK							GROUND WTR (ft)					
BORING NO. B2-A		STATION 18+06		OFFSET 7 ft LT		ALIGNMENT -L-						
COLLAR ELEV. 250.5 ft		TOTAL DEPTH 50.3 ft		NORTHING 699,669		EASTING 2,134,104						
DRILL RIG/HAMMER EFF./DATE RFO0074 CME-55 86% 11/17/2017			DRILL METHOD NW Casing W/SPT & Core		HAMMER TYPE Automatic							
DRILLER Pinter, D. G.		START DATE 03/27/18		COMP. DATE 03/27/18		SURFACE WATER DEPTH N/A						
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		SAMP. NO.	STRATA		LOG	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC. (%)	RQD (%)		REC. (%)	RQD (%)			
216.67												
215	216.7	33.8	1.5	N=60/0.0 0:50/0.5 1:19/1.0 4:08/1.0 2:08/1.0 2:26/1.0 2:08/1.0 2:33/1.0	(1.5) 100%	(1.2) 80%		(15.6) 95%	(14.3) 87%		Begin Coring @ 33.8 ft	33.8
210	210.2	40.3	5.0	(4.7) 94%	(4.5) 90%	RS-1					BLACK, WHITE, AND PINK, MODERATELY WEATHERED TO FRESH, MODERATELY CLOSE TO WIDE FRACTURE SPACING, HARD TO VERY HARD, GRANITE	
205	205.2	45.3	5.0	(5.0) 100%	(4.4) 88%						GSI=80-85	
	200.2	50.3	5.0	5:44/1.0 3:20/1.0 5:24/1.0 7:27/1.0 12:24/1.0	(4.4) 88%	(4.2) 84%						
Boring Terminated at Elevation 200.2 ft IN CRYSTALLINE ROCK (GRANITE)												

NCDOT BORE DOUBLE B5326\_GEO\_BH.GPJ NC\_DOT.GDT 5/31/18

NCDOT BORE DOUBLE B5326\_GEO\_BH.GPJ NC\_DOT.GDT 5/31/18

WBS 46040.1.1		TIP B-5326		COUNTY WAKE		GEOLOGIST Kintner, A. N.								
SITE DESCRIPTION BRIDGE NO. 247 ON -L- (SR 2555) OVER WHITE OAK CREEK							GROUND WTR (ft)							
BORING NO. B2-B		STATION 17+99		OFFSET 6 ft RT		ALIGNMENT -L-	0 HR. 6.9							
COLLAR ELEV. 250.3 ft		TOTAL DEPTH 28.2 ft		NORTHING 699,666		EASTING 2,134,089	24 HR. FIAD							
DRILL RIG/HAMMER EFF./DATE RFO0074 CME-55 86% 11/17/2017				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic								
DRILLER Clarke, R. E.		START DATE 04/02/18		COMP. DATE 04/02/18		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				
255														
250														
	247.2	3.1	3	2	3	5						M	250.3 GROUND SURFACE 0.0 249.5 ROADWAY EMBANKMENT (ASPHALT) 0.8 ORANGE-TAN, SANDY CLAY	
245														
	242.2	8.1	1	1	1	2						Sat.	241.4 ALLUVIAL 8.9 GRAY TO ORANGE, SANDY CLAY WITH LITTLE ORGANICS	
240														
	237.2	13.1	2	1	3	4						M	236.3 LIGHT GRAY, CLAYEY SAND 14.0	
235														
	232.2	18.1	3	4	4	8						Sat.	231.9 RESIDUAL 18.4 WHITE, GRAY, AND BLACK, SAPROLITIC, SILTY COARSE SAND	
230														
	227.2	23.1	1	2	3	5						M		
225														
	222.2	28.1	60/0.1			60/0.1							222.4 CRYSTALLINE ROCK (GRANITE) 27.9 222.1 Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 222.1 ft IN CRYSTALLINE ROCK (GRANITE) 28.2	

# GEOTECHNICAL BORING REPORT

## BORE LOG

WBS 46040.1.1		TIP B-5326		COUNTY WAKE		GEOLOGIST Kintner, A. N.										
SITE DESCRIPTION BRIDGE NO. 247 ON -L- (SR 2555) OVER WHITE OAK CREEK							GROUND WTR (ft)									
BORING NO. EB2-A		STATION 18+47		OFFSET 8 ft LT		ALIGNMENT -L-										
COLLAR ELEV. 250.9 ft		TOTAL DEPTH 41.3 ft		NORTHING 699,638		EASTING 2,134,130										
DRILL RIG/HAMMER EFF./DATE RFO0074 CME-55 86% 11/17/2017			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic										
DRILLER Pinter, D. G.		START DATE 03/26/18		COMP. DATE 03/26/18		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
255																
250																
	247.7	3.2														
	245.2	5.7	2	3	2											
245	242.7	8.2	3	2	2											
	240.3	10.6	1	1	1											
240	237.8	13.1	2	2	3											
	235.2	15.7	3	3	5											
235	232.7	18.2	WOR	2	2											
	227.7	23.2	3	4	5											
230	222.7	28.2														
	217.7	33.2														
225	212.7	38.2														
220	209.6	41.3														
215																
210																
			60/0.0													

WBS 46040.1.1		TIP B-5326		COUNTY WAKE		GEOLOGIST Kintner, A. N.										
SITE DESCRIPTION BRIDGE NO. 247 ON -L- (SR 2555) OVER WHITE OAK CREEK							GROUND WTR (ft)									
BORING NO. EB2-B		STATION 18+33		OFFSET 49 ft RT		ALIGNMENT -L-										
COLLAR ELEV. 246.7 ft		TOTAL DEPTH 22.8 ft		NORTHING 699,613		EASTING 2,134,077										
DRILL RIG/HAMMER EFF./DATE RFO0074 CME-55 86% 11/17/2017			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic										
DRILLER Clarke, R. E.		START DATE 04/03/18		COMP. DATE 04/03/18		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
250																
245																
	243.5	3.2														
	241.0	5.7	2	2	3											
240	238.5	8.2	3	4	4											
	233.5	13.2	3	3	3											
235	228.5	18.2														
	223.9	22.8	2	3	3											
230			4	6	7											
225																
			60/0.0													

NCDOT BORE DOUBLE B5326\_GEO\_BH.GPJ NC\_DOT.GDT 5/22/18

# GEOTECHNICAL BORING REPORT

## BORE LOG

WBS 46040.1.1		TIP B-5326		COUNTY WAKE		GEOLOGIST Kintner, A. N.										
SITE DESCRIPTION BRIDGE NO. 247 ON -L- (SR 2555) OVER WHITE OAK CREEK							GROUND WTR (ft)									
BORING NO. DET_EB1-C		STATION 17+21		OFFSET CL		ALIGNMENT -DET-										
COLLAR ELEV. 244.7 ft		TOTAL DEPTH 21.1 ft		NORTHING 699,712		EASTING 2,134,000										
DRILL RIG/HAMMER EFF./DATE RFO0074 CME-55 86% 11/17/2017			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic										
DRILLER Clarke, R. E.		START DATE 04/03/18		COMP. DATE 04/03/18		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						
245														244.7	GROUND SURFACE	0.0
														242.2	ARTIFICIAL FILL ORANGE-TAN TO GRAY-BROWN, SANDY CLAY	2.5
240	241.1	3.6	1	1	1								Sat.	240.2	ALLUVIAL TAN-GRAY, COARSE SAND	4.5
														237.7	GRAY, SANDY CLAY WITH LITTLE ORGANICS	7.0
235	236.1	8.6	2	2	2								M		TAN-GRAY, COARSE SAND WITH TRACE BASAL GRAVEL (17.0-19.0)	
230	231.2	13.5	1	3	3								M			
225	226.2	18.5	7	93/0.3									Sat.	225.7	WEATHERED ROCK (GRANITE)	19.0
														223.6	Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 223.6 ft ON CRYSTALLINE ROCK (GRANITE)	21.1

WBS 46040.1.1		TIP B-5326		COUNTY WAKE		GEOLOGIST Kintner, A. N.										
SITE DESCRIPTION BRIDGE NO. 247 ON -L- (SR 2555) OVER WHITE OAK CREEK							GROUND WTR (ft)									
BORING NO. DET_EB2-C		STATION 17+85		OFFSET 2 ft RT		ALIGNMENT -DET-										
COLLAR ELEV. 244.5 ft		TOTAL DEPTH 15.1 ft		NORTHING 699,660		EASTING 2,134,038										
DRILL RIG/HAMMER EFF./DATE RFO0074 CME-55 86% 11/17/2017			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic										
DRILLER Clarke, R. E.		START DATE 04/03/18		COMP. DATE 04/03/18		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						
245														244.5	GROUND SURFACE	0.0
														240.8	ALLUVIAL TAN-ORANGE, COARSE SAND	3.7
240	241.5	3.0	2	1	1								Sat.	240.2	GRAY, SANDY CLAY WITH LITTLE ORGANICS	6.7
														237.8	TAN-GRAY, COARSE SAND	6.7
235	239.0	5.5	3	3	3								Sat.	233.3	GRAY, SANDY CLAY	11.2
														231.2	RESIDUAL ORANGE, TAN, AND WHITE, SILTY COARSE SAND	14.9
230	229.4	15.1	4	5	6								M	229.4	CRYSTALLINE ROCK (GRANITE)	15.1
															Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 229.4 ft IN CRYSTALLINE ROCK (GRANITE)	



**EB1-A**

<b>SOIL TEST RESULTS</b>															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-1	7'LT	16+97	8.7-9.7	A-4(0)	26	4	13.1	40.6	26.2	20.1	100	95	53	-	-
SS-2	7'LT	16+97	14.0-14.8	A-4(0)	-	-	12.9	59.4	13.7	14.1	100	96	37	-	-

**EB1-B**

<b>SOIL TEST RESULTS</b>															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
ST-1	7'RT	16+93	9.8-11.5	A-4(4)	31	9	11.9	30.5	27.3	30.3	100	93	64	-	-

**B1-A**

<b>SOIL TEST RESULTS</b>															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-5	7'LT	17+37	10.6-12.1	A-4(6)	35	10	11.1	27.0	29.8	32.2	100	94	69	-	7.5
SS-6	7'LT	17+37	15.6-17.1	A-6(8)	36	15	14.7	23.5	21.5	40.2	100	93	66	-	-

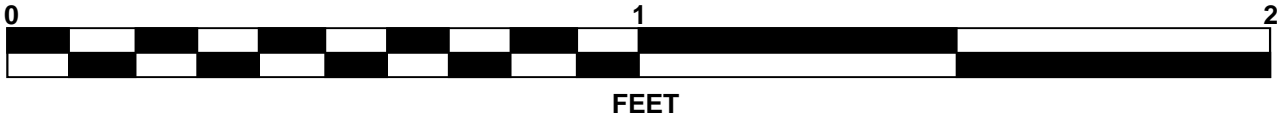
**EB2-A**

<b>SOIL TEST RESULTS</b>															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
M-1	8'LT	18+47	8.7-9.7	-	-	-	-	-	-	-	-	-	-	18.4	-
SS-4	8'LT	18+47	10.6-12.1	A-6(2)	32	13	32.4	31.2	10.3	26.2	100	79	41	-	-

# CORE PHOTOGRAPHS

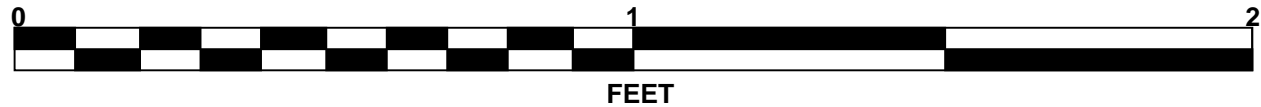
## B1-B

BOX 1: 43.5 - 47.0 FEET



## B2-A

BOXES 1 & 2: 33.8 - 50.3 FEET



# SITE PHOTOGRAPH

Bridge No. 247 on -L- (SR 2555) over White Oak Creek



Looking Southeast towards End Bent 2