

REFERENCE: U-2525C

PROJECT: 34821

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

STRUCTURE  
SUBSURFACE INVESTIGATION

COUNTY GUILFORD  
PROJECT DESCRIPTION GREENSBORO EASTERN LOOP  
FROM US 29 NORTH OF GREENSBORO TO SR  
2303 (LAWNSDALE DRIVE)  
SITE DESCRIPTION SITE #2 (STRUCTURE #2 AND #3)  
BRIDGE NO. 1241 AND 1242 ON I-85 BYPASS (-L-)  
OVER LEES CHAPEL ROAD (-Y1-)

CONTENTS

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2	LEGEND (SOIL & ROCK)
3	SITE PLAN
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STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-2525C	1	12

CAUTION NOTICE

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANNING AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N. C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT (919) 707-6850. THE SUBSURFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA ARE NOT PART OF THE CONTRACT.

GENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS OR BETWEEN SAMPLED STRATA WITHIN THE BOREHOLE. THE LABORATORY SAMPLE DATA AND THE IN SITU (IN-PLACE) TEST DATA CAN BE RELIED ON ONLY TO THE DEGREE OF RELIABILITY INHERENT IN THE STANDARD TEST METHOD. THE OBSERVED WATER LEVELS OR SOIL MOISTURE CONDITIONS INDICATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOIL MOISTURE CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS INCLUDING TEMPERATURES, PRECIPITATION AND WIND, AS WELL AS OTHER NON-CLIMATIC FACTORS.

THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE SUBSURFACE PLANS ARE PRELIMINARY ONLY AND IN MANY CASES THE FINAL DESIGN DETAILS ARE DIFFERENT. FOR BIDDING AND CONSTRUCTION PURPOSES, REFER TO THE CONSTRUCTION PLANS AND DOCUMENTS FOR FINAL DESIGN INFORMATION ON THIS PROJECT. THE DEPARTMENT DOES NOT WARRANT OR GUARANTEE THE SUFFICIENCY OR ACCURACY OF THE INVESTIGATION MADE, NOR THE INTERPRETATIONS MADE, OR OPINION OF THE DEPARTMENT AS TO THE TYPE OF MATERIALS AND CONDITIONS TO BE ENCOUNTERED. THE BIDDER OR CONTRACTOR IS CAUTIONED TO 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

D. KUBINSKI

R. TOOTHMAN

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B. JOHNSON

INVESTIGATED BY D. KUBINSKI

DRAWN BY B. JOHNSON

CHECKED BY X. BARRETT

SUBMITTED BY KLEINFELDER, INC.

DATE SEPTEMBER 2017

Prepared in the Office of:



DocuSigned by:

Xavier C. Barrett

10/9/2017

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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 (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

Table with columns for GENERAL CLASS., GRANULAR MATERIALS (A-1 to A-7), SILT-CLAY MATERIALS (A-4 to A-7), ORGANIC MATERIALS (A-1, A-2 to A-6, A-7), and SYMBOL. Includes rows for % PASSING, MATERIAL PASSING #40, #100, and GROUP INDEX.

CONSISTENCY OR DENSENESS

Table mapping PRIMARY SOIL TYPE (e.g., Generally Granular Material) to COMPACTNESS OR CONSISTENCY (e.g., Very Loose) and RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE).

TEXTURE OR GRAIN SIZE

Table showing U.S. STD. SIEVE SIZE (4, 10, 40, 60, 200, 270) and corresponding BOULDER, COBBLE, GRAVEL, SAND, SILT, and CLAY percentages.

SOIL MOISTURE - CORRELATION OF TERMS

Table correlating SOIL MOISTURE SCALE (Liquid Limit, Plastic Limit, Optimum Moisture Shrinkage Limit) with FIELD MOISTURE DESCRIPTION (Saturated, Wet, Moist, Dry).

PLASTICITY

Table mapping PLASTICITY INDEX (PI) to DRY STRENGTH (Very Low, Slight, Medium, High).

COLOR

DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-BROWN). 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

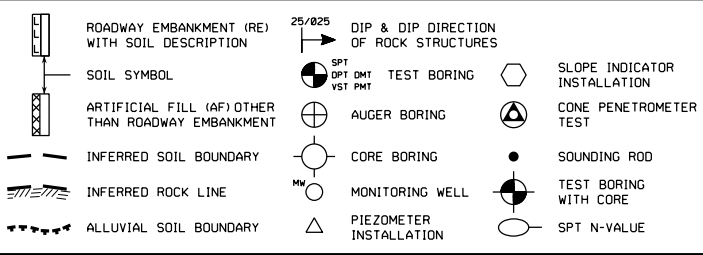
PERCENTAGE OF MATERIAL

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

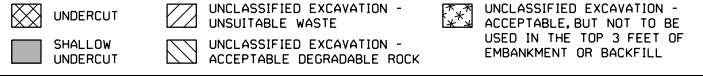
GROUND WATER

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



RECOMMENDATION SYMBOLS



ABBREVIATIONS

Table of ABBREVIATIONS including 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, FRAGMENTS, HI. - 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, SS - SPLIT SPOON, ST - SHELBY TUBE, RS - ROCK, RT - RECOMPACTED TRIAXIAL, CBR - CALIFORNIA BEARING RATIO).

EQUIPMENT USED ON SUBJECT PROJECT

Table listing 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 2-1/8" STEEL TEETH, TRICONE TUNG-CARB., CORE BIT), HAMMER TYPE (AUTOMATIC, MANUAL), CORE SIZE (-B, -H, -N), and 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:

Table defining WEATHERED ROCK (WR), CRYSTALLINE ROCK (CR), NON-CRYSTALLINE ROCK (NCR), and COASTAL PLAIN SEDIMENTARY ROCK (CP) with their respective descriptions and symbols.

WEATHERING

Descriptions of weathering conditions: FRESH (Rock fresh, crystals bright, few joints may show slight staining), VERY SLIGHT (S.L.), SLIGHT (SL), MODERATE (MOD.), MODERATELY SEVERE (MOD. SEV.), SEVERE (SEV.), VERY SEVERE (V. SEV.), COMPLETE. Includes descriptions of rock characteristics and SPT N-values.

ROCK HARDNESS

Descriptions of rock hardness: VERY HARD (cannot be scratched by knife or sharp pick), HARD (can be scratched by knife or pick only with difficulty), MODERATELY HARD (can be scratched by knife or pick, gouges or grooves to 0.25 inches deep), MEDIUM HARD (can be grooved or gouged 0.05 inches deep), SOFT (can be grooved or gouged readily by knife or pick), VERY SOFT (can be carved with knife).

FRACTURE SPACING

Table mapping FRACTURE SPACING (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 BEDDING (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).

INDURATION

FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC. Includes descriptions for FRIABLE, MODERATELY INDURATED, INDURATED, and EXTREMELY INDURATED.

TERMS AND DEFINITIONS

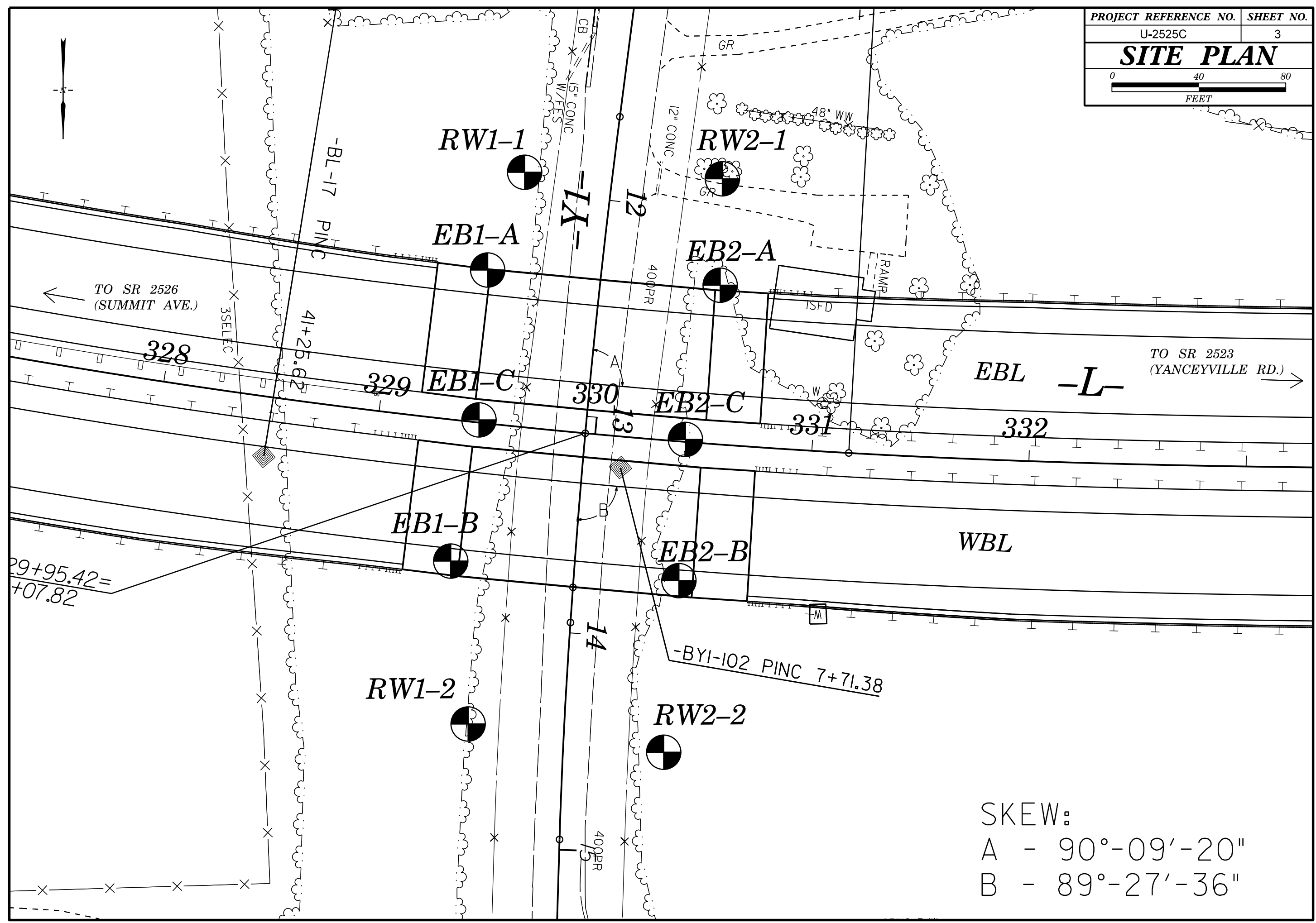
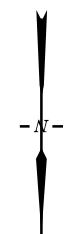
DEFINITIONS: ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. AQUIFER - A WATER BEARING FORMATION OR STRATA. ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND. ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION. ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED. 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 DISLOADED 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. 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. 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.

BENCH MARK: BYI-102; -YI- STA. 7+71.38, (874,678 FT. N, 1,777,494 FT. E)

ELEVATION: 874.57 FEET

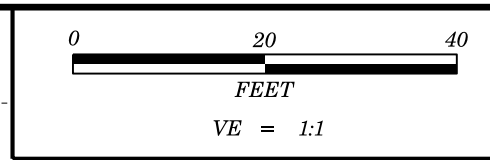
NOTES:

FIAD: FILLED IMMEDIATELY AFTER DRILLING

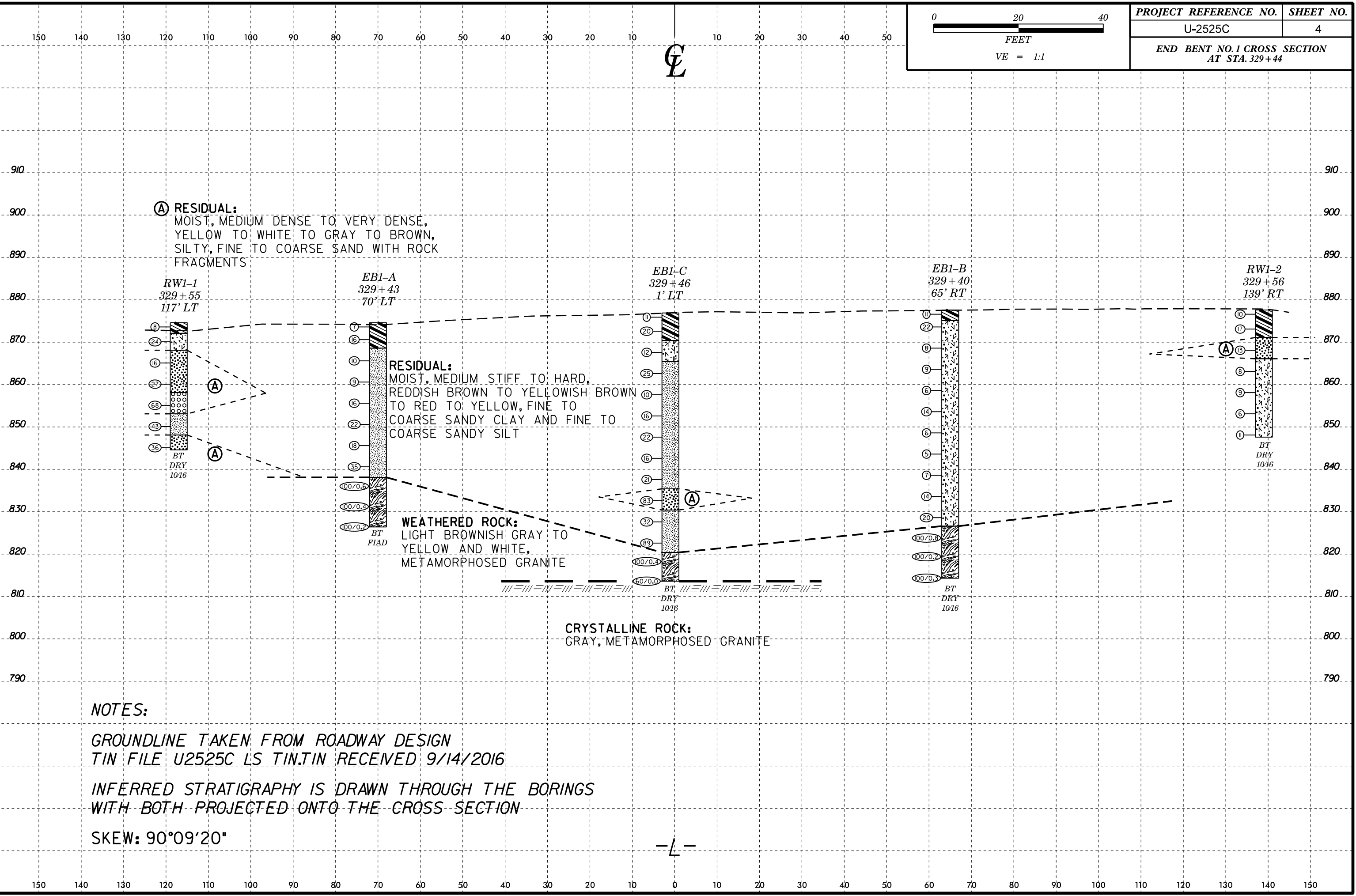


SKEW:  
 A - 90°-09'-20"  
 B - 89°-27'-36"

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 BAJohnson



PROJECT REFERENCE NO.	SHEET NO.
U-2525C	4
END BENT NO. 1 CROSS SECTION AT STA. 329+44	



**(A) RESIDUAL:**  
 MOIST, MEDIUM DENSE TO VERY DENSE,  
 YELLOW TO WHITE TO GRAY TO BROWN,  
 SILTY, FINE TO COARSE SAND WITH ROCK  
 FRAGMENTS

**RESIDUAL:**  
 MOIST, MEDIUM STIFF TO HARD,  
 REDDISH BROWN TO YELLOWISH BROWN  
 TO RED TO YELLOW, FINE TO  
 COARSE SANDY CLAY AND FINE TO  
 COARSE SANDY SILT

**WEATHERED ROCK:**  
 LIGHT BROWNISH GRAY TO  
 YELLOW AND WHITE,  
 METAMORPHOSED GRANITE

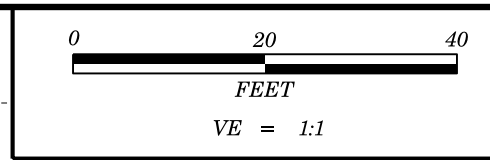
**CRYSTALLINE ROCK:**  
 GRAY, METAMORPHOSED GRANITE

**NOTES:**  
 GROUNDLINE TAKEN FROM ROADWAY DESIGN  
 TIN FILE U2525C LS TIN.TIN RECEIVED 9/14/2016  
 INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS  
 WITH BOTH PROJECTED ONTO THE CROSS SECTION  
 SKEW: 90°09'20"

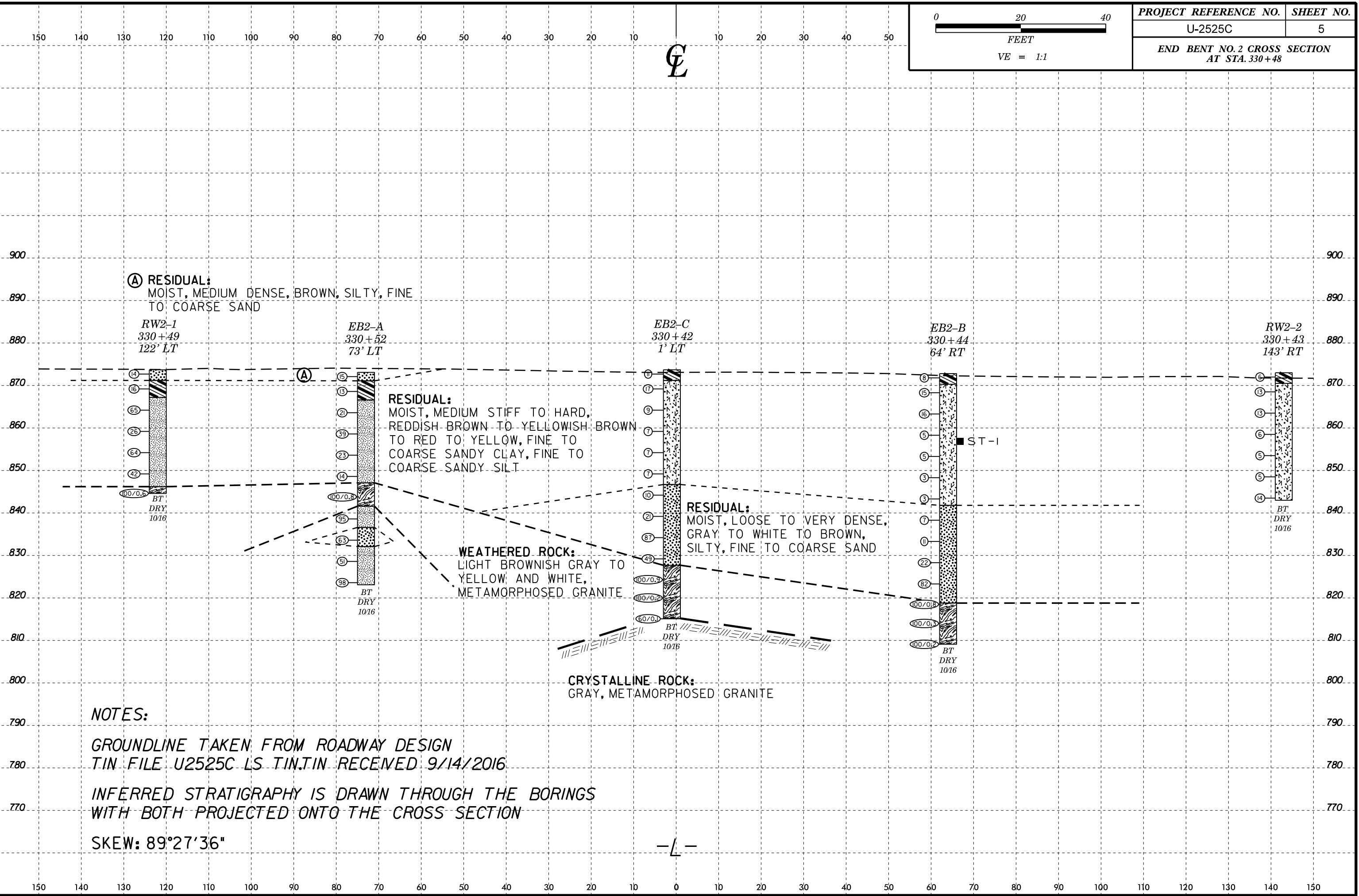
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6/23/16

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PROJECT REFERENCE NO.	SHEET NO.
U-2525C	5
END BENT NO. 2 CROSS SECTION AT STA. 330+48	



**NOTES:**  
 GROUNDLINE TAKEN FROM ROADWAY DESIGN  
 TIN FILE U2525C\_LS\_TIN.TIN RECEIVED 9/14/2016  
 INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS  
 WITH BOTH PROJECTED ONTO THE CROSS SECTION  
 SKEW: 89°27'36"

-L-

# GEOTECHNICAL BORING REPORT

## BORE LOG

WBS 34821.1.5		TIP U-2525C		COUNTY GUILFORD		GEOLOGIST Kubinski, D.										
SITE DESCRIPTION Site #2 (Structure #2 and #3) - Bridge No. 1241 and 1242 on I-85 Bypass (-L-) over Lees Chapel Road (-Y1-)							GROUND WTR (ft)									
BORING NO. EB1-A		STATION 329+43		OFFSET 70 ft LT		ALIGNMENT -L-										
COLLAR ELEV. 874.6 ft		TOTAL DEPTH 48.2 ft		NORTHING 874,587		EASTING 1,777,555										
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 77% 02/22/2016			DRILL METHOD Mud Rotary			HAMMER TYPE Automatic										
DRILLER Toothman, R.		START DATE 10/10/16		COMP. DATE 10/10/16		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						
875	874.6	0.0	2	2	5									874.6	GROUND SURFACE	0.0
	871.6	3.0	7	7	9										<b>RESIDUAL</b> Brown and Yellowish Brown to Red, Fine Sandy CLAY	
870	866.6	8.0	4	5	5									868.6	Yellowish Brown and Yellow to Gray to Olive Yellow, Fine to Coarse Sandy SILT	6.0
865	861.6	13.0	3	4	5											
860	856.6	18.0	5	7	9											
855	851.6	23.0	5	10	12											
850	846.6	28.0	5	8	10											
845	841.6	33.0	12	15	20											
840	836.6	38.0	84	16/0.1										838.1	<b>WEATHERED ROCK</b> Light Brownish Gray, METAMORPHOSED GRANITE	36.5
835	831.6	43.0	100/0.4													
830	826.6	48.0	100/0.2											826.4	Boring Terminated at Elevation 826.4 ft in WEATHERED ROCK: METAMORPHOSED GRANITE  Topsoil 0.0 to 0.4 foot	48.2

WBS 34821.1.5		TIP U-2525C		COUNTY GUILFORD		GEOLOGIST Kubinski, D.										
SITE DESCRIPTION Site #2 (Structure #2 and #3) - Bridge No. 1241 and 1242 on I-85 Bypass (-L-) over Lees Chapel Road (-Y1-)							GROUND WTR (ft)									
BORING NO. EB1-C		STATION 329+46		OFFSET 1 ft LT		ALIGNMENT -L-										
COLLAR ELEV. 876.9 ft		TOTAL DEPTH 63.3 ft		NORTHING 874,656		EASTING 1,777,559										
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 77% 02/22/2016			DRILL METHOD Mud Rotary			HAMMER TYPE Automatic										
DRILLER Toothman, R.		START DATE 10/06/16		COMP. DATE 10/06/16		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						
880	876.9	0.0	5	6	5									876.9	GROUND SURFACE	0.0
875	873.6	3.3	6	9	11										<b>RESIDUAL</b> Red, Fine Sandy CLAY with Trace Mica	
870	868.6	8.3	5	5	7									870.4	Red, Fine Sandy SILT with Trace Mica	6.5
865	863.6	13.3	8	11	14									865.4	Red to Olive and Yellow to Light Brownish Gray, Fine Sandy SILT with Trace Mica	11.5
860	858.6	18.3	5	4	6											
855	853.6	23.3	4	6	10											
850	848.6	28.3	7	10	12											
845	843.6	33.3	8	7	9											
840	838.6	38.3	6	9	12											
835	833.6	43.3	21	32	51									835.4	Olive, Silty, Fine to Coarse SAND	41.5
830	828.6	48.3	13	14	18									830.4	Olive and Yellow, Fine Sandy SILT with Trace Mica	46.5
825	823.6	53.3	17	31	58											
820	818.6	58.3	100/0.4											820.4	<b>WEATHERED ROCK</b> Light Brownish Gray, METAMORPHOSED GRANITE	56.5
815	813.6	63.3	60/0.0											813.6	Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 813.6 ft on CRYSTALLINE ROCK: METAMORPHOSED GRANITE  Topsoil 0.0 to 0.4 foot	63.3

NCDOT BORE DOUBLE U2525C\_GEO\_BRDG\_5\_6.GPJ\_NC\_DOT.GDT 9/29/17



# GEOTECHNICAL BORING REPORT

## BORE LOG

<b>WBS</b> 34821.1.5	<b>TIP</b> U-2525C	<b>COUNTY</b> GUILFORD	<b>GEOLOGIST</b> Kubinski, D.
<b>SITE DESCRIPTION</b> Site #2 (Structure #2 and #3) - Bridge No. 1241 and 1242 on I-85 Bypass (-L-) over Lees Chapel Road (-Y1-)			<b>GROUND WTR (ft)</b>
<b>BORING NO.</b> EB2-C	<b>STATION</b> 330+42	<b>OFFSET</b> 1 ft LT	<b>ALIGNMENT</b> -L-
<b>COLLAR ELEV.</b> 873.7 ft	<b>TOTAL DEPTH</b> 58.6 ft	<b>NORTHING</b> 874,665	<b>EASTING</b> 1,777,464
<b>DRILL RIG/HAMMER EFF./DATE</b> TRI0055 CME-55 77% 02/22/2016		<b>DRILL METHOD</b> Mud Rotary	<b>HAMMER TYPE</b> Automatic
<b>DRILLER</b> Toothman, R.	<b>START DATE</b> 10/04/16	<b>COMP. DATE</b> 10/04/16	<b>SURFACE WATER DEPTH</b> 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)		
875	873.7	0.0	3	5	6										873.7	GROUND SURFACE	0.0
870	870.2	3.5	6	8	9										871.2	<b>RESIDUAL</b> Reddish Brown, Fine Sandy CLAY Red and Light Brown and Brown to Red to White, Fine to Coarse Sandy SILT with Trace Mica	2.5
865	865.2	8.5	4	4	5												
860	860.2	13.5	3	3	4												
855	855.2	18.5	3	3	4												
850	850.2	23.5	3	3	4												
845	845.2	28.5	4	4	6										846.7	Light Brown to Gray, Silty, Fine to Coarse SAND	27.0
840	840.2	33.5	6	9	12												
835	835.2	38.5	18	32	55												
830	830.2	43.5	14	19	30												
825	825.2	48.5	28	72/0.4											827.7	<b>WEATHERED ROCK</b> Light Brownish Gray, METAMORPHOSED GRANITE	46.0
820	820.2	53.5	100/0.2														
	815.2	58.5	60/0.1												815.2	<b>CRYSTALLINE ROCK</b> METAMORPHOSED GRANITE Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 815.1 ft IN CRYSTALLINE ROCK: METAMORPHOSED GRANITE	58.5
															815.1		58.6
																Topsoil 0.0 to 0.3 foot	

<b>WBS</b> 34821.1.5	<b>TIP</b> U-2525C	<b>COUNTY</b> GUILFORD	<b>GEOLOGIST</b> Kubinski, D.
<b>SITE DESCRIPTION</b> Site #2 (Structure #2 and #3) - Bridge No. 1241 and 1242 on I-85 Bypass (-L-) over Lees Chapel Road (-Y1-)			<b>GROUND WTR (ft)</b>
<b>BORING NO.</b> EB2-B	<b>STATION</b> 330+44	<b>OFFSET</b> 64 ft RT	<b>ALIGNMENT</b> -L-
<b>COLLAR ELEV.</b> 872.8 ft	<b>TOTAL DEPTH</b> 63.7 ft	<b>NORTHING</b> 874,730	<b>EASTING</b> 1,777,467
<b>DRILL RIG/HAMMER EFF./DATE</b> TRI0055 CME-55 77% 02/22/2016		<b>DRILL METHOD</b> Mud Rotary	<b>HAMMER TYPE</b> Automatic
<b>DRILLER</b> Toothman, R.	<b>START DATE</b> 10/04/16	<b>COMP. DATE</b> 10/04/16	<b>SURFACE WATER DEPTH</b> 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)		
875	872.8	0.0	2	3	5										872.8	GROUND SURFACE	0.0
870	869.3	3.5	6	6	9										870.3	<b>RESIDUAL</b> Brown, Fine Sandy CLAY Reddish Brown to Dark Reddish Brown to Yellow to Yellow and White, Fine to Coarse Sandy SILT with Trace Mica	2.5
865	864.3	8.5	4	7	9												
860	859.3	13.5	2	2	3												
855	854.3	18.5	2	2	3												
850	849.3	23.5	2	1	2												
845	844.3	28.5	2	1	2												
840	839.3	33.5	3	3	4										841.8	Yellow and White, Silty, Fine to Coarse SAND	31.0
835	834.3	38.5	4	5	6												
830	829.3	43.5	7	10	12												
825	824.3	48.5	21	36	46												
820	819.3	53.5	38	61	39/0.3										818.8	<b>WEATHERED ROCK</b> Yellow and White, METAMORPHOSED GRANITE	54.0
815	814.3	58.5	100/0.3														
810	809.3	63.5	100/0.2												809.1	Boring Terminated at Elevation 809.1 ft in WEATHERED ROCK: METAMORPHOSED GRANITE	63.7
																Topsoil 0.0 to 0.7 foot	

NCDOT BORE DOUBLE U2525C\_GEO\_BRDG\_5\_6.GPJ\_NC\_DOT.GDT 9/29/17

Other Samples:  
ST-1 (15.1 - 16.8)



# GEOTECHNICAL BORING REPORT

## BORE LOG

WBS 34821.1.5		TIP U-2525C		COUNTY GUILFORD		GEOLOGIST Kubinski, D.	
SITE DESCRIPTION Site #2 (Structure #2 and #3) - Bridge No. 1241 and 1242 on I-85 Bypass (-L-) over Lees Chapel Road (-Y1-)							GROUND WTR (ft)
BORING NO. RW1-1		STATION 329+55		OFFSET 117 ft LT		ALIGNMENT -L-	
COLLAR ELEV. 874.6 ft		TOTAL DEPTH 30.0 ft		NORTHING 874,542		EASTING 1,777,538	
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 77% 02/22/2016			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic	
DRILLER Toothman, R.		START DATE 10/05/16		COMP. DATE 10/05/16		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				
875	874.6	0.0	3	4	4							M	GROUND SURFACE	0.0
													<b>RESIDUAL</b>	
													Yellowish Brown, Fine Sandy CLAY	
870	871.1	3.5	8	10	14							M	Yellow and Red, Fine Sandy SILT	2.5
865	866.1	8.5	4	6	10							M	Yellow to Yellow and Gray, Silty, Fine to Coarse SAND with Some Rock Fragments and Trace Mica	6.5
860	861.1	13.5	10	13	14							M	White, Gray and Brown, Silty, Fine to Coarse Sandy Rock Fragments	16.5
855	856.1	18.5	15	40	28							M	Olive and Gray, Fine to Coarse Sandy SILT with Little Rock Fragments and Trace Mica	21.5
850	851.1	23.5	8	17	26							M	Gray, Silty, Fine to Coarse SAND with Trace Mica	26.5
845	846.1	28.5	6	12	24							M	Boring Terminated at Elevation 844.6 ft in RESIDUAL: Silty SAND	30.0
													Topsoil 0.0 to 0.7 foot	

WBS 34821.1.5		TIP U-2525C		COUNTY GUILFORD		GEOLOGIST Kubinski, D.	
SITE DESCRIPTION Site #2 (Structure #2 and #3) - Bridge No. 1241 and 1242 on I-85 Bypass (-L-) over Lees Chapel Road (-Y1-)							GROUND WTR (ft)
BORING NO. RW1-2		STATION 329+56		OFFSET 139 ft RT		ALIGNMENT -L-	
COLLAR ELEV. 877.6 ft		TOTAL DEPTH 30.0 ft		NORTHING 874,796		EASTING 1,777,564	
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 77% 02/22/2016			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic	
DRILLER Toothman, R.		START DATE 10/05/16		COMP. DATE 10/05/16		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				
880													GROUND SURFACE	0.0
													<b>RESIDUAL</b>	
													Reddish Brown, Fine Sandy CLAY	
875	874.1	3.5	7	8	9							M	Red, Silty, Fine to Coarse SAND	6.5
870	869.1	8.5	5	6	7							M	Red and Yellow to Red, Brown and Yellow, Fine to Coarse Sandy SILT	11.5
865	864.1	13.5	3	3	5							M		
860	859.1	18.5	3	4	5							M		
855	854.1	23.5	2	3	3							M		
850	849.1	28.5	1	5	6							M	Boring Terminated at Elevation 847.6 ft in RESIDUAL: Sandy SILT	30.0
													Topsoil 0.0 to 0.4 foot	

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# GEOTECHNICAL BORING REPORT

## BORE LOG

WBS 34821.1.5		TIP U-2525C		COUNTY GUILFORD		GEOLOGIST Kubinski, D.									
SITE DESCRIPTION Site #2 (Structure #2 and #3) - Bridge No. 1241 and 1242 on I-85 Bypass (-L-) over Lees Chapel Road (-Y1-)							GROUND WTR (ft)								
BORING NO. RW2-1		STATION 330+49		OFFSET 122 ft LT		ALIGNMENT -L-									
COLLAR ELEV. 873.7 ft		TOTAL DEPTH 29.1 ft		NORTHING 874,545		EASTING 1,777,447									
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 77% 02/22/2016			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic									
DRILLER Toothman, R.		START DATE 10/05/16		COMP. DATE 10/05/16		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					
875	873.7	0.0	2	5	9							M		873.7 GROUND SURFACE 0.0	
870	870.2	3.5	8	8	8							M		871.2 RESIDUAL Brown, Silty, Fine SAND Yellowish Brown, Fine Sandy CLAY 2.5	
865	865.2	8.5	31	28	37							M		867.2 White and Yellow to Olive, Fine Sandy SILT with Trace Mica 6.5	
860	860.2	13.5	10	10	16							M			
855	855.2	18.5	11	20	44							M			
850	850.2	23.5	10	15	27							M			
845	845.2	28.5	88	12/0.1								M		846.2 WEATHERED ROCK Gray, METAMORPHOSED GRANITE 27.5 844.6 Boring Terminated at Elevation 844.6 ft in WEATHERED ROCK: METAMORPHOSED GRANITE 29.1 Topsoil 0.0 to 0.9 foot	

WBS 34821.1.5		TIP U-2525C		COUNTY GUILFORD		GEOLOGIST Kubinski, D.									
SITE DESCRIPTION Site #2 (Structure #2 and #3) - Bridge No. 1241 and 1242 on I-85 Bypass (-L-) over Lees Chapel Road (-Y1-)							GROUND WTR (ft)								
BORING NO. RW2-2		STATION 330+43		OFFSET 143 ft RT		ALIGNMENT -L-									
COLLAR ELEV. 873.0 ft		TOTAL DEPTH 30.0 ft		NORTHING 874,809		EASTING 1,777,474									
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 77% 02/22/2016			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic									
DRILLER Toothman, R.		START DATE 10/05/16		COMP. DATE 10/05/16		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					
875	873.0	0.0	1	2	4							M		873.0 GROUND SURFACE 0.0	
870	869.5	3.5	4	6	7							M		870.5 RESIDUAL Reddish Brown, Fine Sandy SILT Reddish Brown to Yellow and Red, Fine Sandy SILT with Trace Mica 2.5	
865	864.5	8.5	5	5	8							M			
860	859.5	13.5	3	2	4							M			
855	854.5	18.5	2	2	3							M			
850	849.5	23.5	2	2	3							M			
845	844.5	28.5	4	5	9							M		843.0 Boring Terminated at Elevation 843.0 ft in RESIDUAL: Sandy SILT Topsoil 0.0 to 0.4 foot	

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**SUMMARY OF LABORATORY TEST DATA**

**PROJECT NO. 34821.1.5 (U-2525C)**

**COUNTY: GUILFORD**

**SITE #2 (STRUCTURE #2 AND #3) – BRIDGE NO. 1241 AND 1242 ON I-85 BYPASS (-L-) OVER LEES CHAPEL ROAD (-Y1-)**

Sample No.	Boring Number	Station	Offset	Alignment	Sample Depth (ft.)	AASHTO Class	Atterberg Limits			Gradation Results							
							L.L.	P.L.	P.I.	Pass #10	Pass #40	Pass #200	Retained #270	Coarse Sand	Fine Sand	Silt (%)	Clay (%)
ST-1 *	EB2-B	330+44	64' RT	-L-	15.1-16.8	A-5 (3)	45	38	7	99.71	77.34	52.28	53.6	29.89	23.71	37.21	9.19

SS = Split-Barrel Sample (ASTM-D-1586) ST = Shelby Tube (Undisturbed) Sample

S = Grab Sample

NP -- Non Plastic

NA-- Non Applicable

\* CONSOLIDATION TEST RESULTS CAN BE FOUND UNDER SEPARATE COVER

Lab Technician: NCDOT Certification No.: 129-01-0411 – Geotechnics, Raleigh, NC



**SITE PHOTOGRAPHS**



Profile View Looking South along -Y1-



Cross-Section View Looking East from End Bent 2