

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	42295.1.1 (B-5136)	1	16

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

STRUCTURE
SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 42295.1.1 (B-5136) F.A. PROJ. BRSTP-0029(43)
COUNTY CABARRUS
PROJECT DESCRIPTION BRIDGE NO. 66 & 69 OVER
NORFOLK SOUTHERN RAILROAD ON US 29/601

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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) 707-6950. NEITHER THE SUBSURFACE PLANS AND REPORTS, NOR THE FIELD BORING LOGS, ROCK CORES, OR SOIL TEST DATA ARE 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.

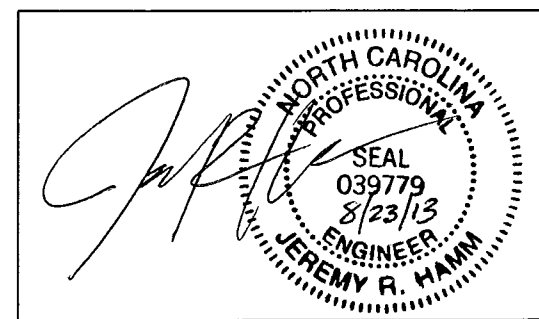
THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE SUBSURFACE PLANS ARE PRELIMINARY ONLY AND IN MANY CASES THE FINAL DESIGN DETAILS ARE DIFFERENT. FOR BIDDING AND CONSTRUCTION PURPOSES, REFER TO THE CONSTRUCTION PLANS AND DOCUMENTS FOR FINAL DESIGN INFORMATION ON THIS PROJECT. THE DEPARTMENT 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 THIS 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.

PROJECT: 42295.1.1 ID: B-5136

PERSONNEL

- NORVILLE, C. V.
- HAMM, J. R.
- EVANS, T. E.
- HUNSBERGER, W. S.
- TRIGON
- SDS

INVESTIGATED BY TEE, WSH
CHECKED BY CVN
SUBMITTED BY FALCON ENG.
DATE AUGUST 2013



DRAWN BY: EVANS, T. E.

NOTE - THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N.C. DEPARTMENT OF TRANSPORTATION AS BEING ACCURATE NOR IS IT CONSIDERED TO BE PART OF THE PLANS, SPECIFICATIONS, OR CONTRACT FOR THE PROJECT.

NOTE - 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.

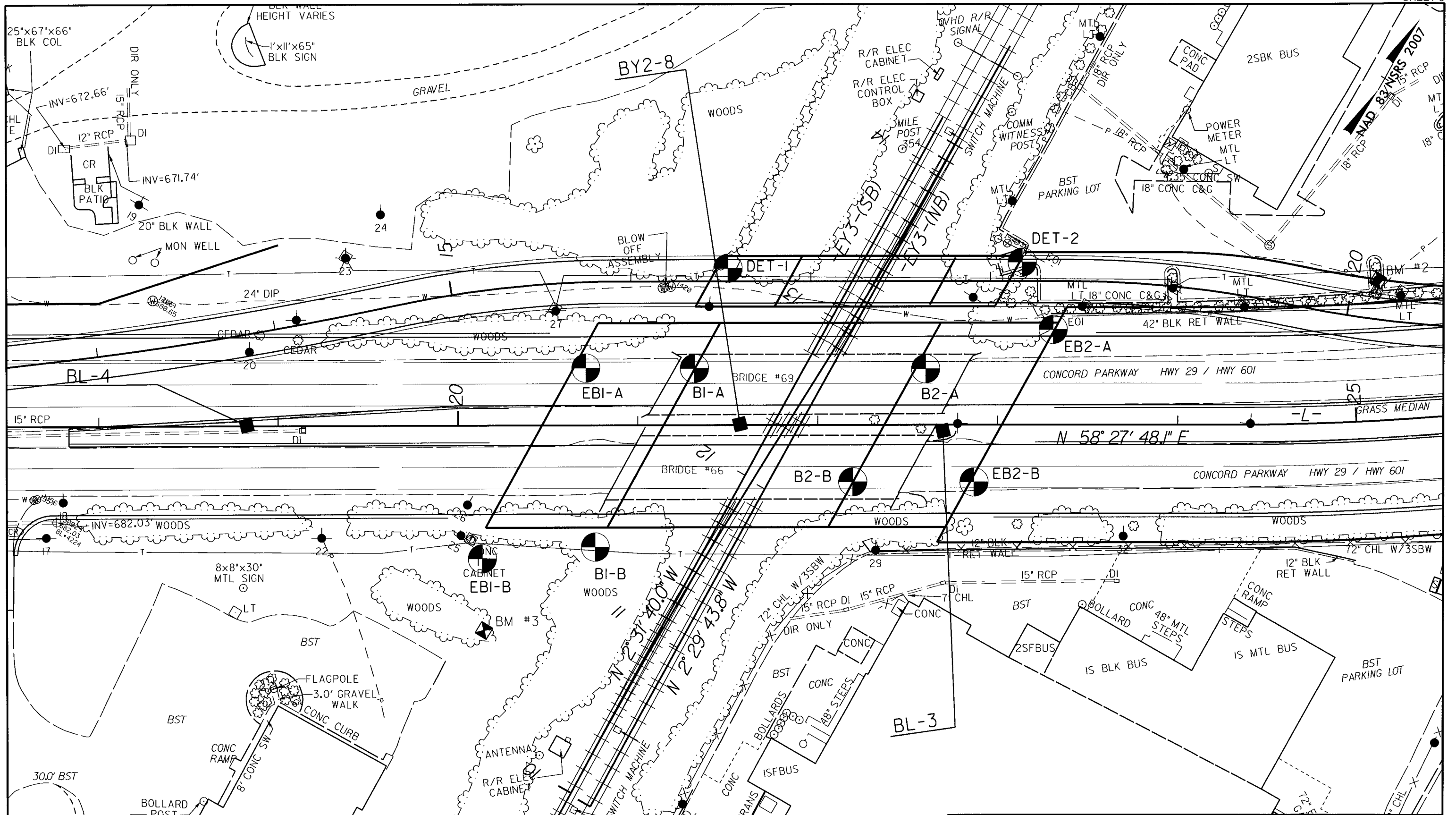
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
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PROJECT REFERENCE NO.
42295.1.1 (8-5136) SHEET NO.
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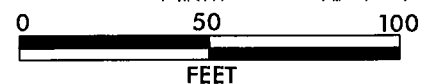
SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION		GRADATION		ROCK DESCRIPTION		TERMS AND DEFINITIONS																																																														
<p>SOIL IS CONSIDERED TO BE THE 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 STANDARD PENETRATION TEST (ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. EXAMPLE:</p> <p style="text-align: center;"><i>VERY STIFF, GRAY SILTY CLAY, MOST 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. UNIFORM - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. (ALSO POORLY GRADED) GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES.</p> <p style="text-align: center;">ANGULARITY OF GRAINS</p> <p>THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: <u>ANGULAR</u>, <u>SUBANGULAR</u>, <u>SUBROUNDED</u>, OR <u>ROUNDED</u>.</p>		<p>HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT IF TESTED, WOULD YIELD SPT REFUSAL. 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. ADUIFIER - 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, 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 (RQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK. SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS. SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE. STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS. STRATA CORE RECOVERY (SCRC) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE. STRATA ROCK QUALITY DESIGNATION (SRQD) - 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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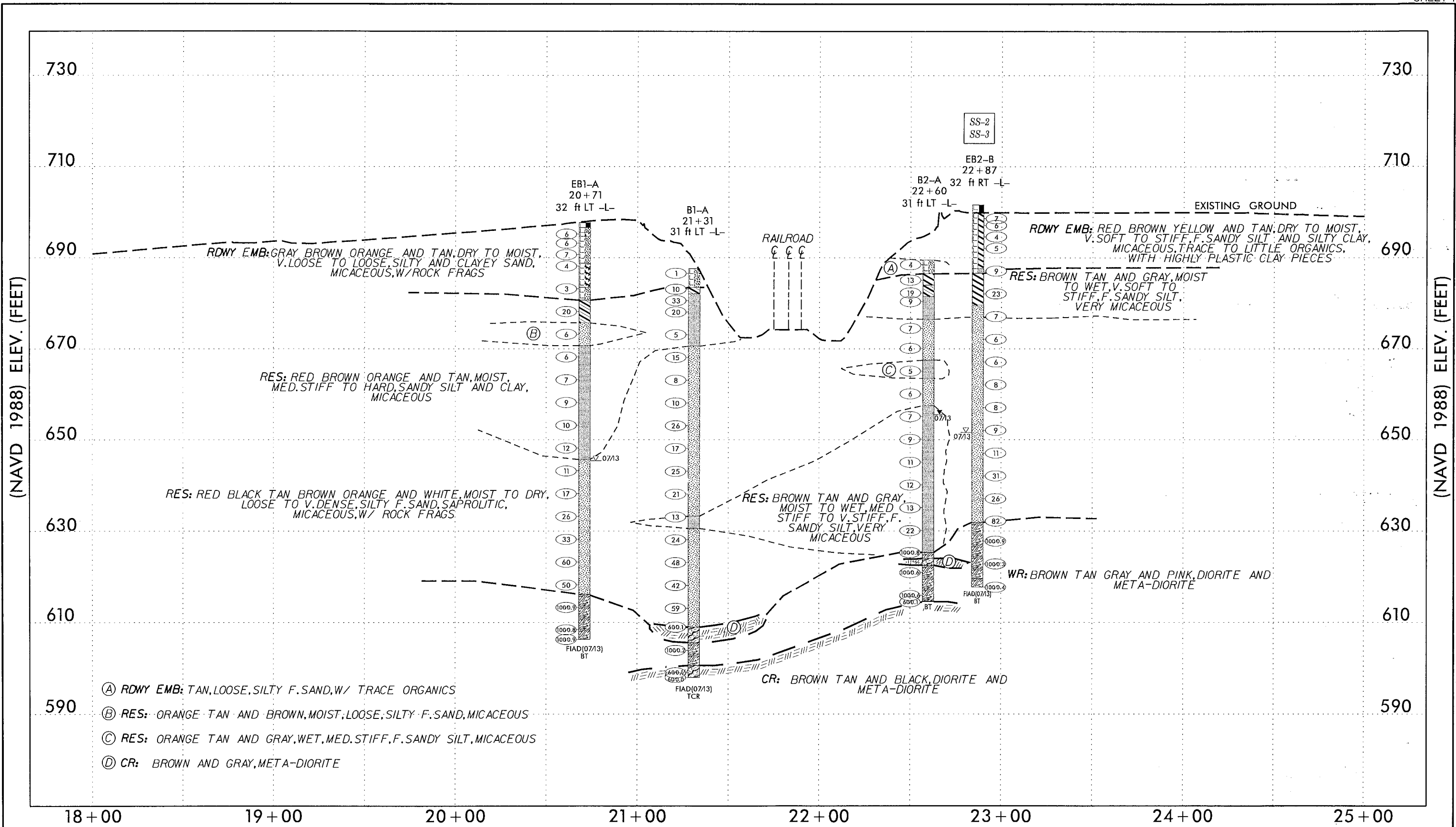


NOTES:
 PLANS ADOPTED FROM ELECTRONIC FILES RECEIVED FROM
 NCDOT GEU, DATED JUNE 2013.
 BRIDGE SKEW: 60 DEGREES



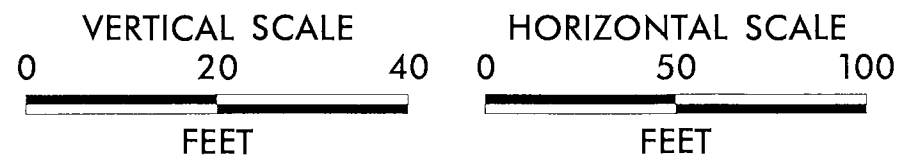
FALCON ENGINEERING
 FALCON ENGINEERING, INC.
 1210 TRINITY ROAD, SUITE 110
 RALEIGH, NC 27607
 PHONE: 919.871.0800
 FAX: 919.871.0803

SITE PLAN
 REPLACE BRIDGES NO. 66 AND 69 OVER NORFOLK
 SOUTHERN RR ON US 29/601
 CABARRUS COUNTY, NORTH CAROLINA
 WBS: 42295.1.1 TIP: B-5136
 FALCON PROJECT NO.: G13055.00



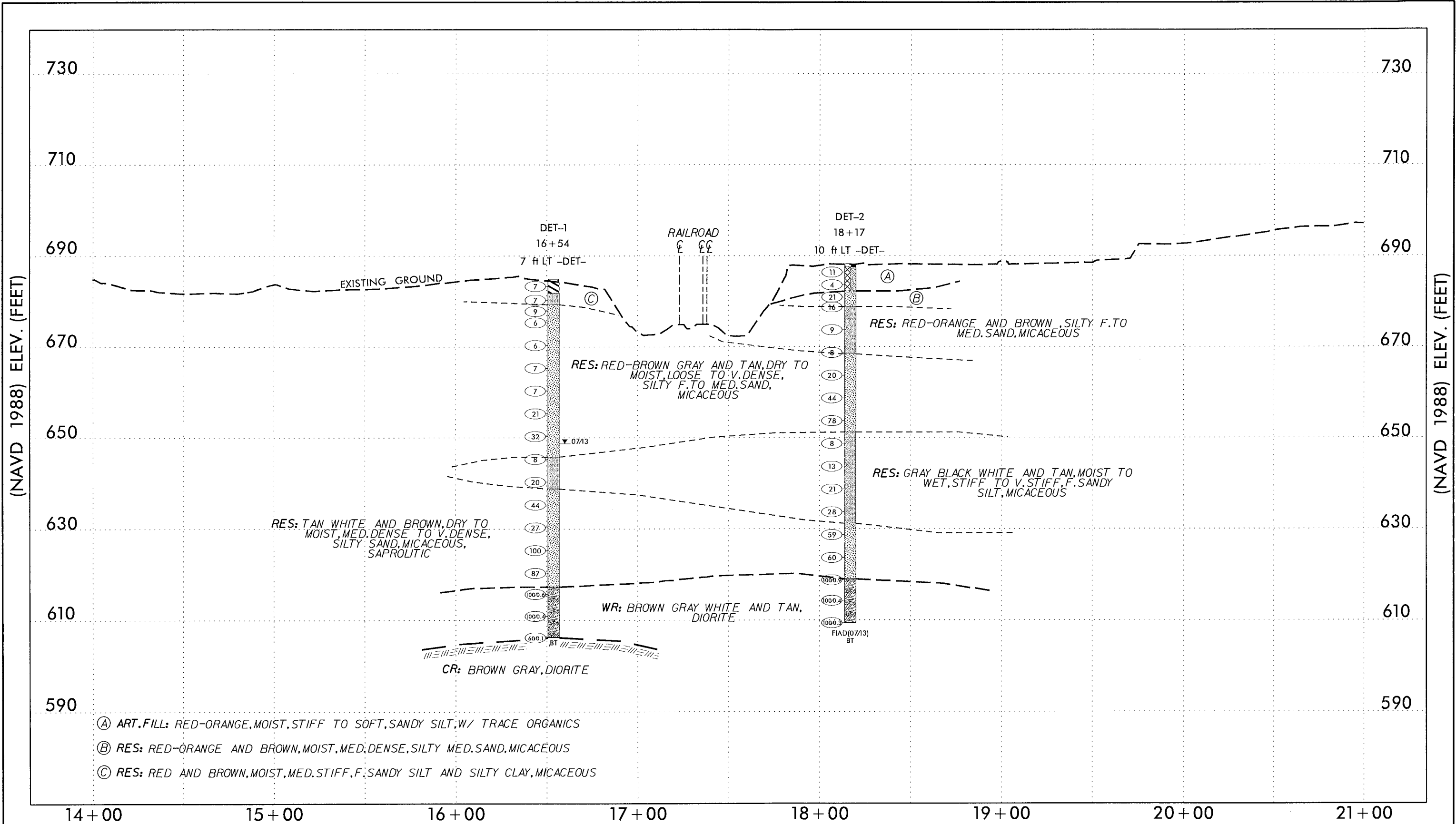
NOTES:

- GROUNDLINE PROFILE OF -L- TAKEN FROM ELECTRONIC FILES RECEIVED FROM NCDOT GEU, DATED JUNE 2013.
- INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE PROFILE.
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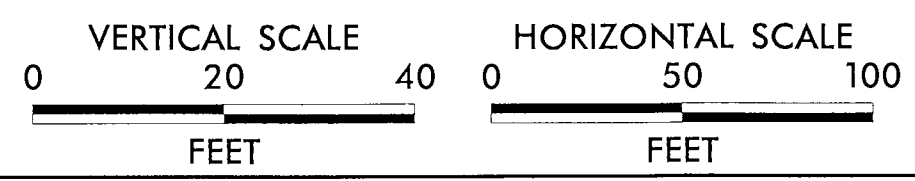
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SUBSURFACE PROFILE ALONG -L-
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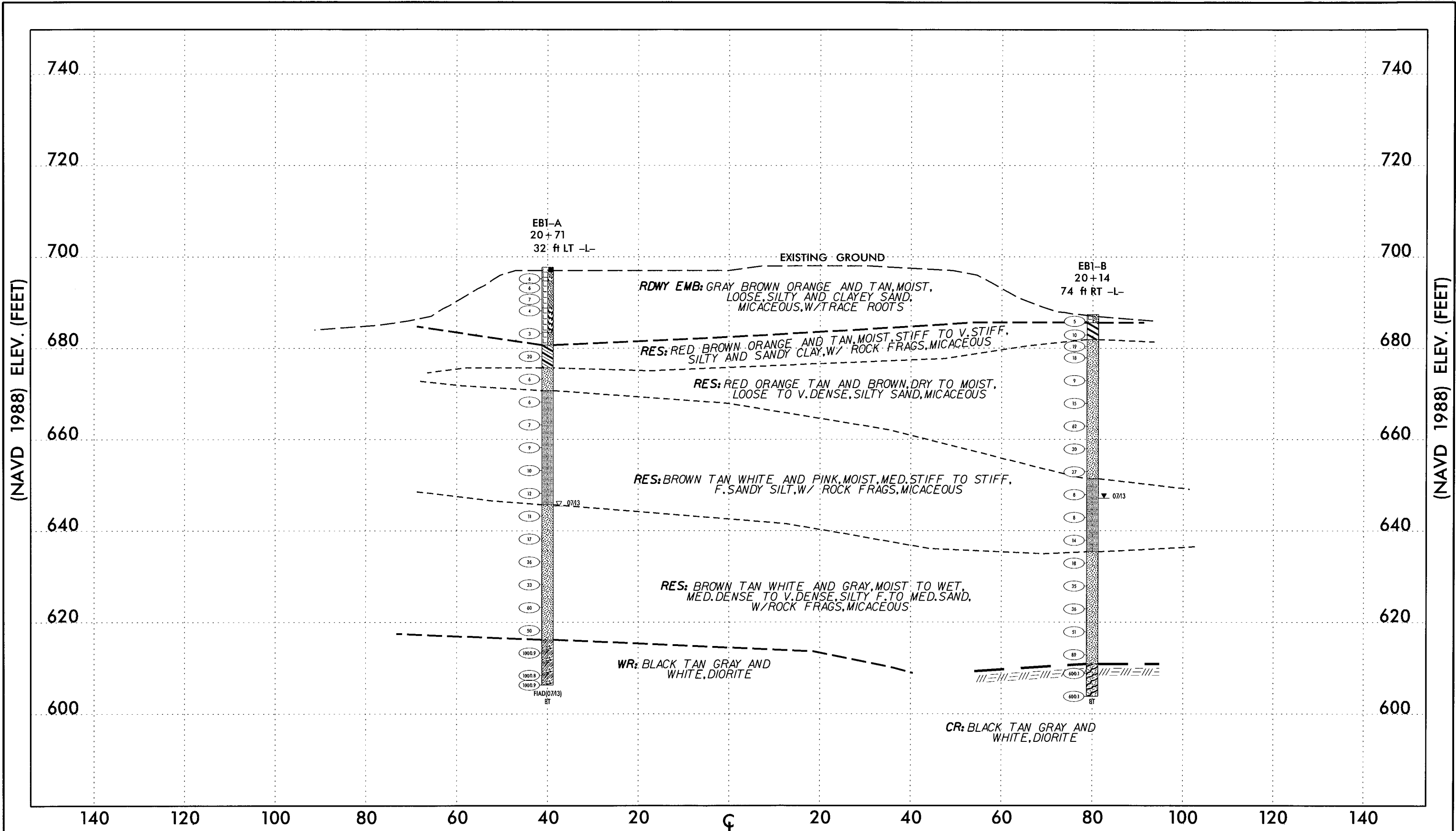
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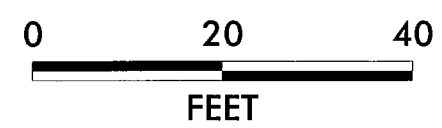
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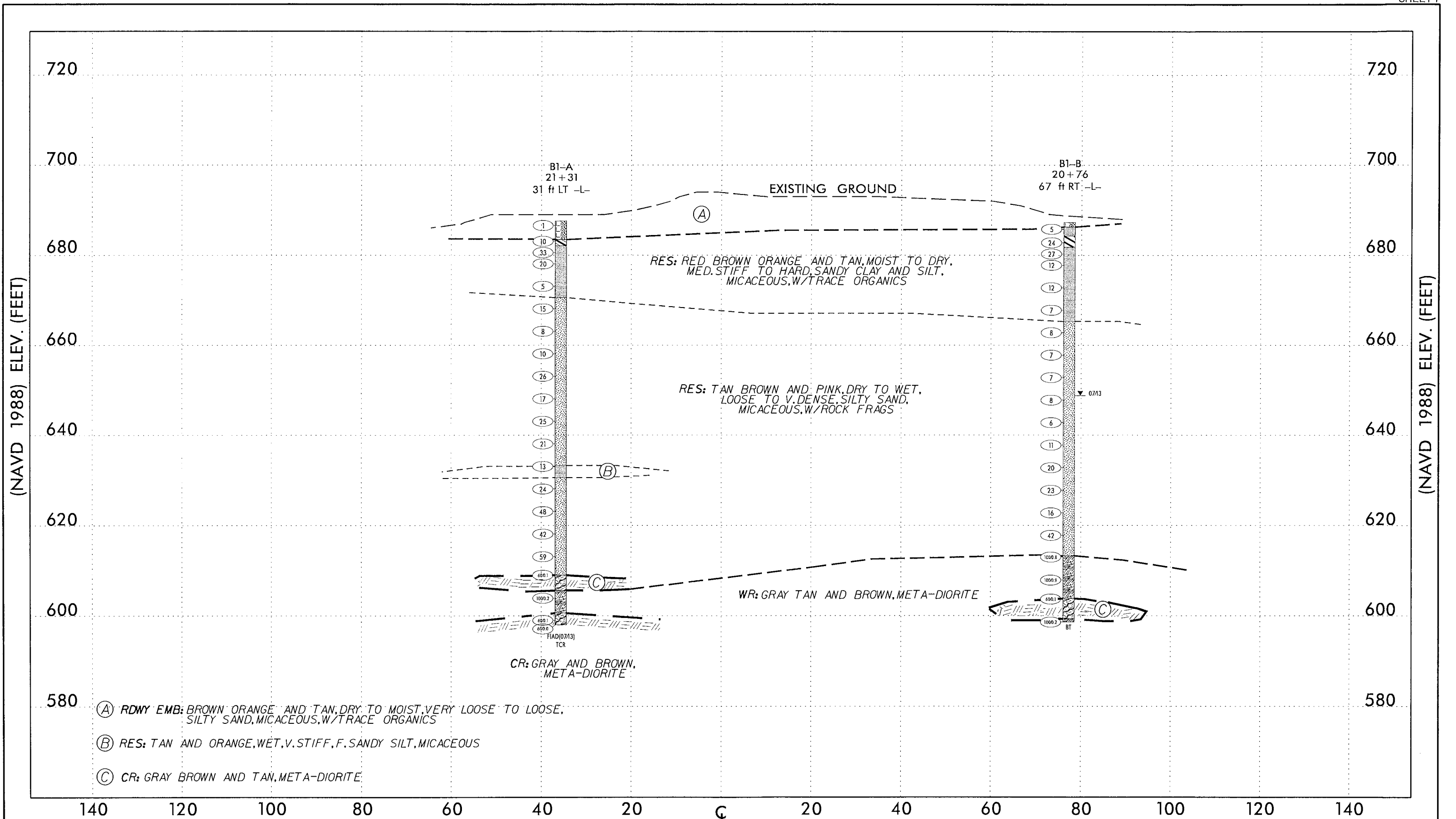
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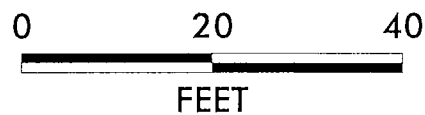
SUBSURFACE CROSS SECTION - END BENT 1

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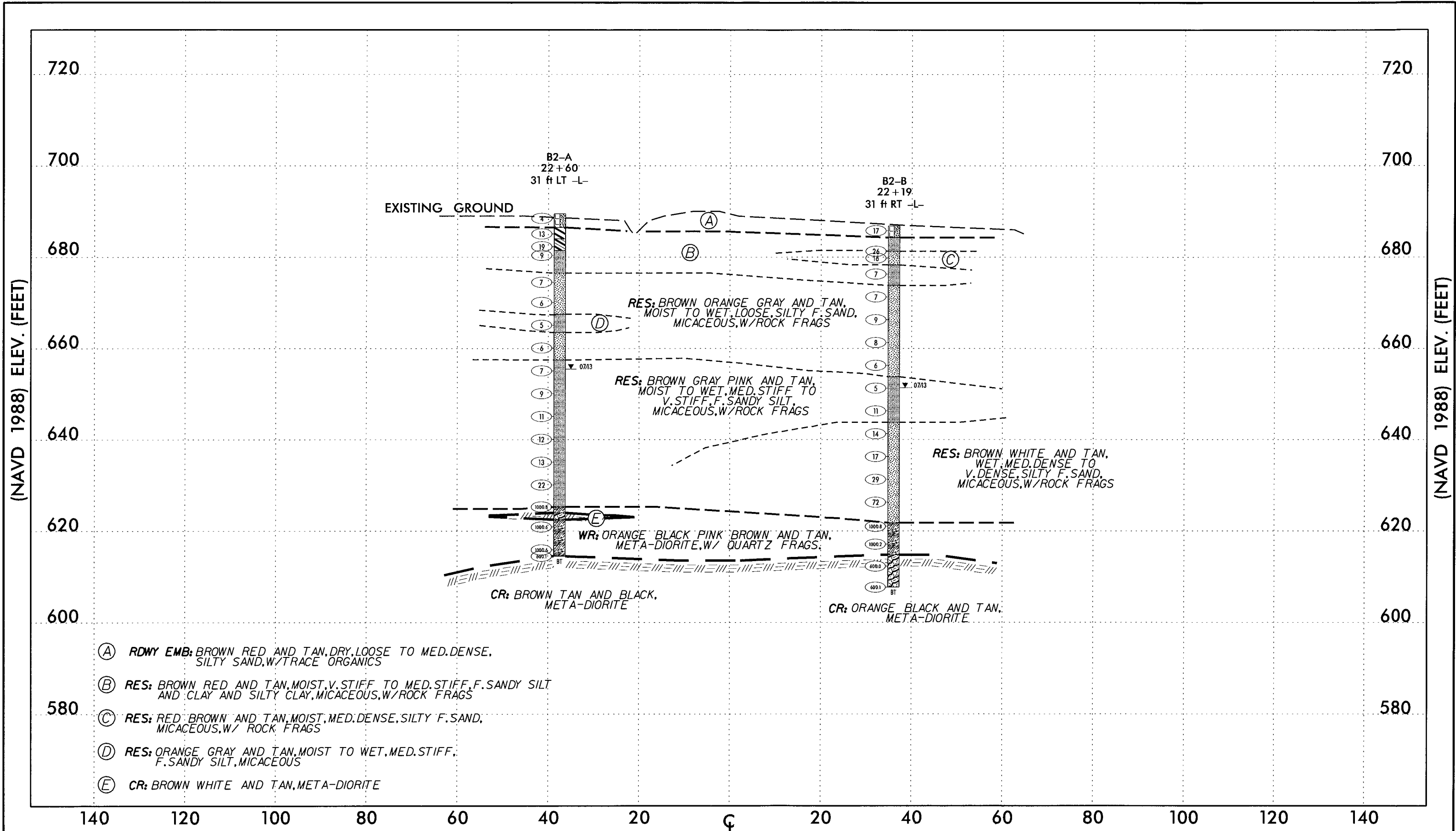
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SUBSURFACE CROSS SECTION - BENT 1

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- (A) **RDWY EMB:** BROWN RED AND TAN, DRY, LOOSE TO MED. DENSE, SILTY SAND, W/TRACE ORGANICS
- (B) **RES:** BROWN RED AND TAN, MOIST, V. STIFF TO MED. STIFF, F. SANDY SILT AND CLAY AND SILTY CLAY, MICACEOUS, W/ROCK FRAGS
- (C) **RES:** RED, BROWN AND TAN, MOIST, MED. DENSE, SILTY F. SAND, MICACEOUS, W/ROCK FRAGS
- (D) **RES:** ORANGE GRAY AND TAN, MOIST TO WET, MED. STIFF, F. SANDY SILT, MICACEOUS
- (E) **CR:** BROWN WHITE AND TAN, META-DIORITE

NOTES:

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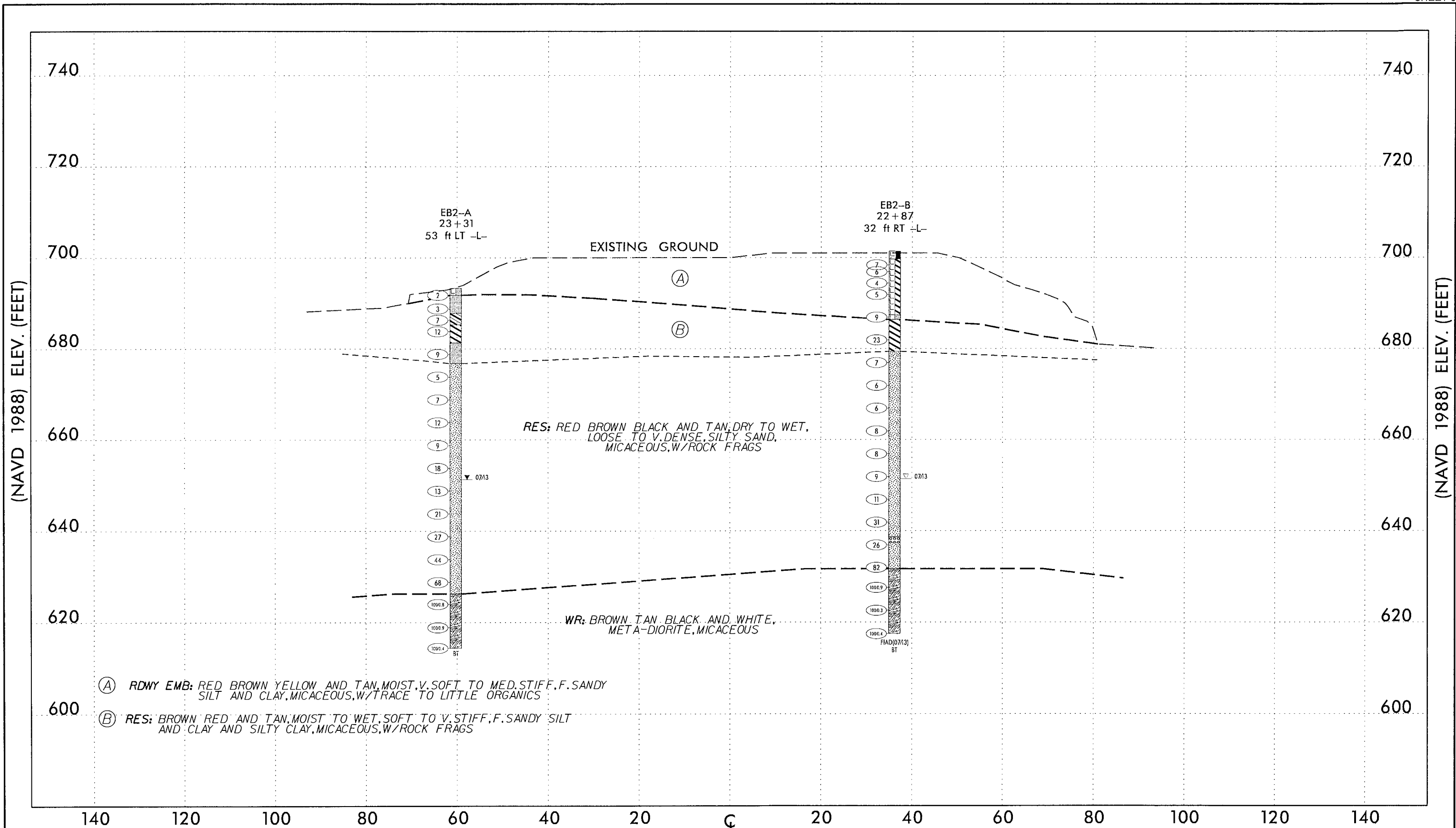
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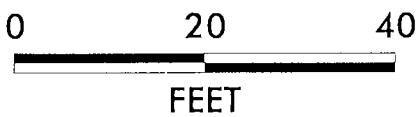
SUBSURFACE CROSS SECTION - BENT 2

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CABARRUS COUNTY, NORTH CAROLINA
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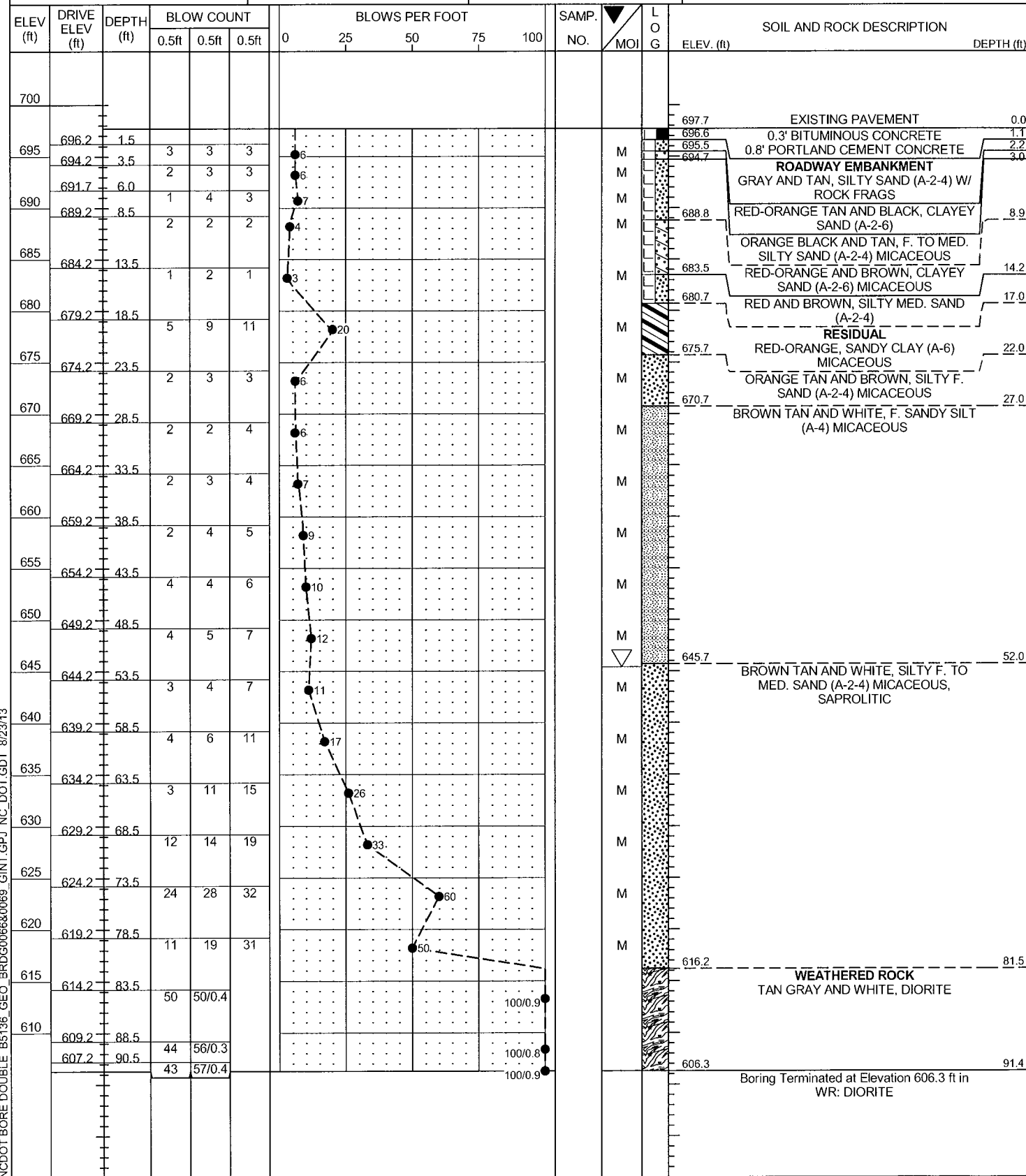
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SUBSURFACE CROSS SECTION - END BENT 2

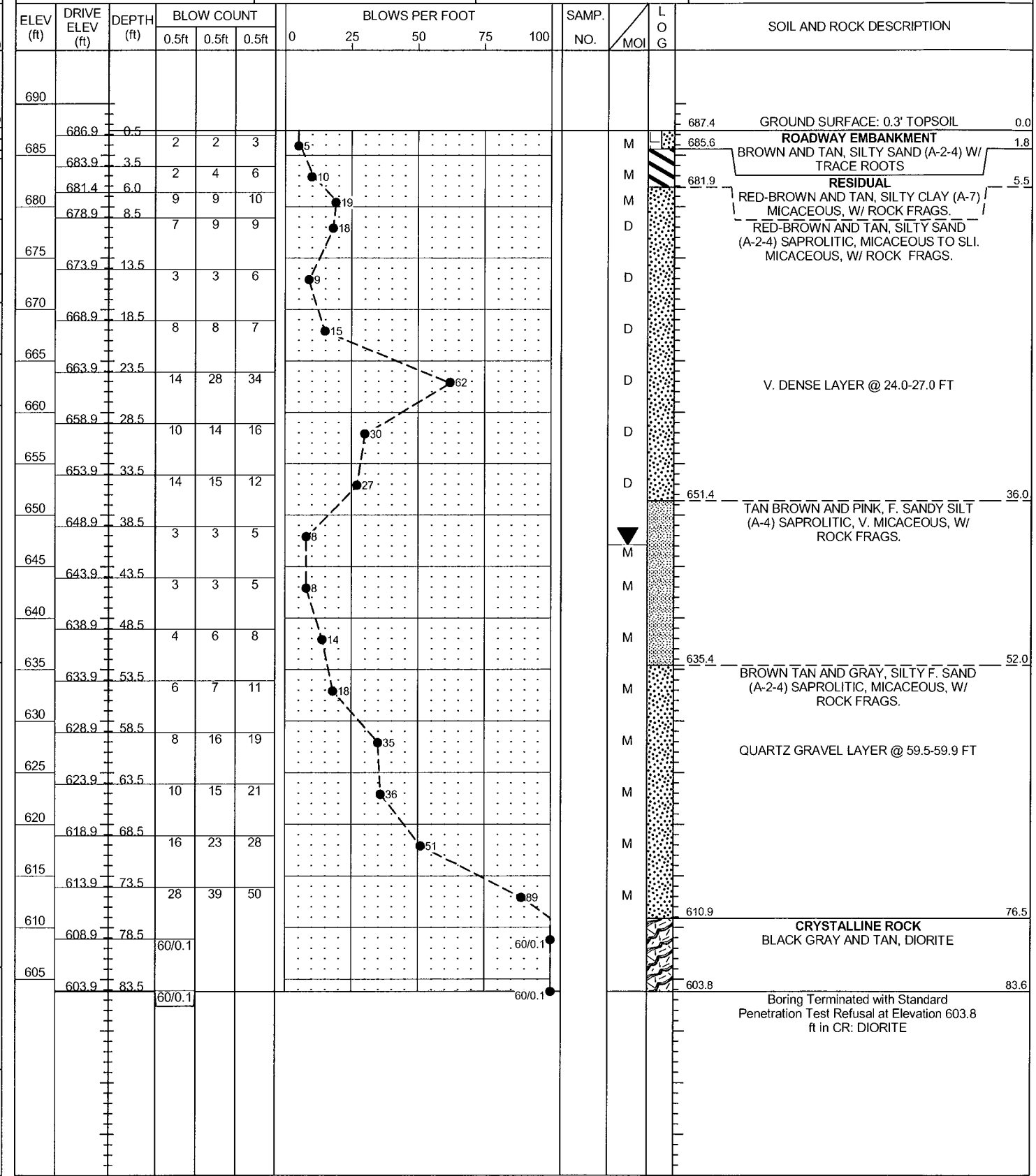
REPLACE BRIDGES NO. 66 AND 69 OVER NORFOLK SOUTHERN RR ON US 29/601
CABARRUS COUNTY, NORTH CAROLINA
WBS: 42295.1.1 TIP: B-5136
FALCON PROJECT NO.: G13055.00



WBS 42295.1.1	TIP B-5136	COUNTY CABARRUS	GEOLOGIST Hunsberger, W. S.
SITE DESCRIPTION REPLACE BRIDGE NO. 66 AND 69 OVER NORFOLK SOUTHERN RAILROAD ON US 29/601			GROUND WTR (ft) 0 HR. 52.3 24 HR. FIAD
BORING NO. EB1-A	STATION 20+71	OFFSET 32 ft LT	ALIGNMENT -L-
COLLAR ELEV. 697.7 ft	TOTAL DEPTH 91.4 ft	NORTHING 615,582	EASTING 1,521,308
DRILL RIG/HAMMER EFF./DATE TRI9435 CME-55 93% 12/08/2011		DRILL METHOD H.S. Augers	HAMMER TYPE Automatic
DRILLER Whichard, W.	START DATE 07/09/13	COMP. DATE 07/09/13	SURFACE WATER DEPTH N/A



WBS 42295.1.1	TIP B-5136	COUNTY CABARRUS	GEOLOGIST Evans, T. E.
SITE DESCRIPTION REPLACE BRIDGE NO. 66 AND 69 OVER NORFOLK SOUTHERN RAILROAD ON US 29/601			GROUND WTR (ft) 0 HR. 43.5 24 HR. 40.3
BORING NO. EB1-B	STATION 20+14	OFFSET 74 ft RT	ALIGNMENT -L-
COLLAR ELEV. 687.4 ft	TOTAL DEPTH 83.6 ft	NORTHING 615,462	EASTING 1,521,314
DRILL RIG/HAMMER EFF./DATE SOI8513 CME-550X 97% 08/08/2012		DRILL METHOD H.S. Augers	HAMMER TYPE Automatic
DRILLER White, J. D.	START DATE 07/03/13	COMP. DATE 07/03/13	SURFACE WATER DEPTH N/A



NCDOT BORE DOUBLE B5136_GEO_BRD0066&0069_GINT.GPJ_NC_DOT.GDT 8/23/13



NCDOT GEOTECHNICAL ENGINEERING UNIT

BORELOG REPORT

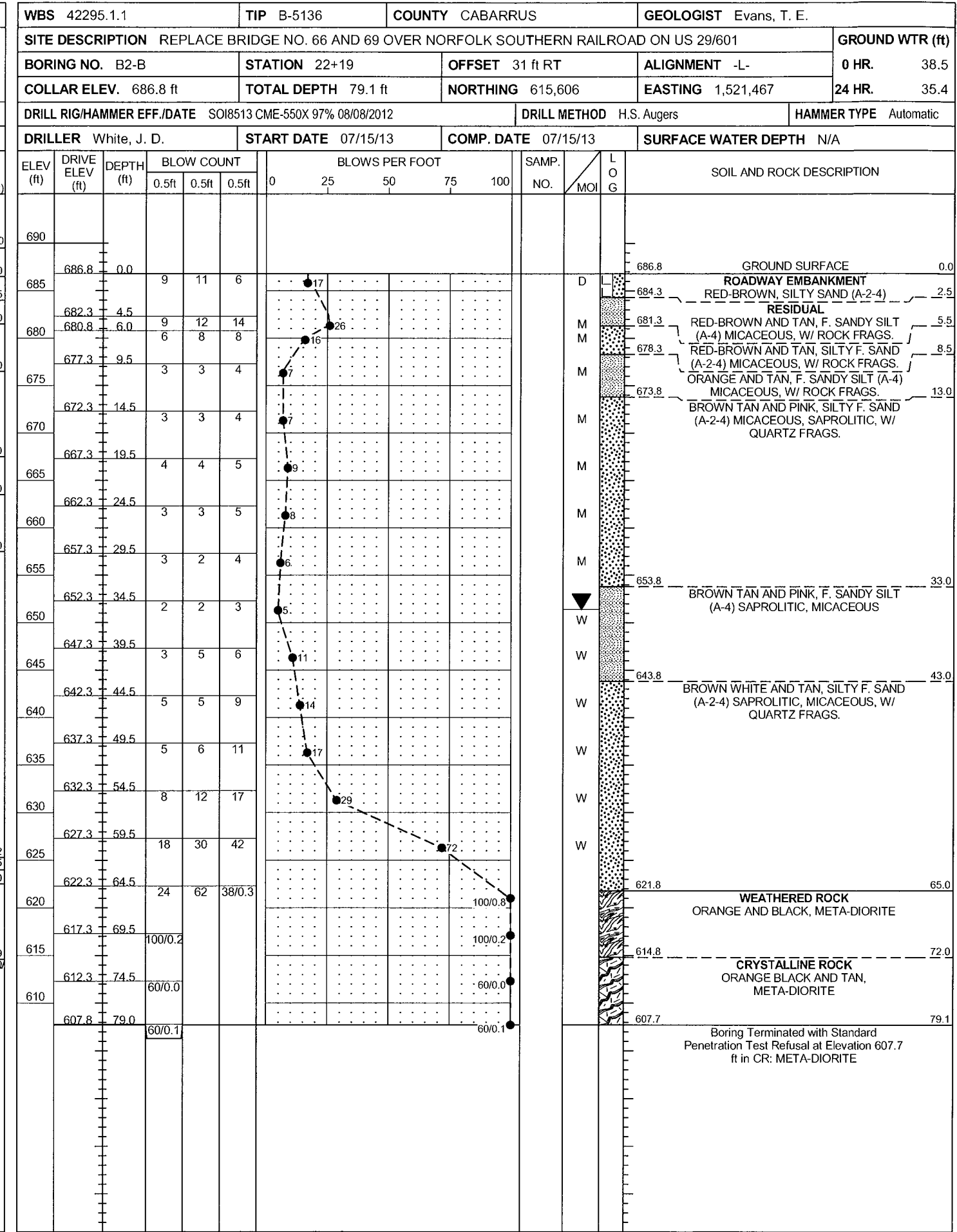
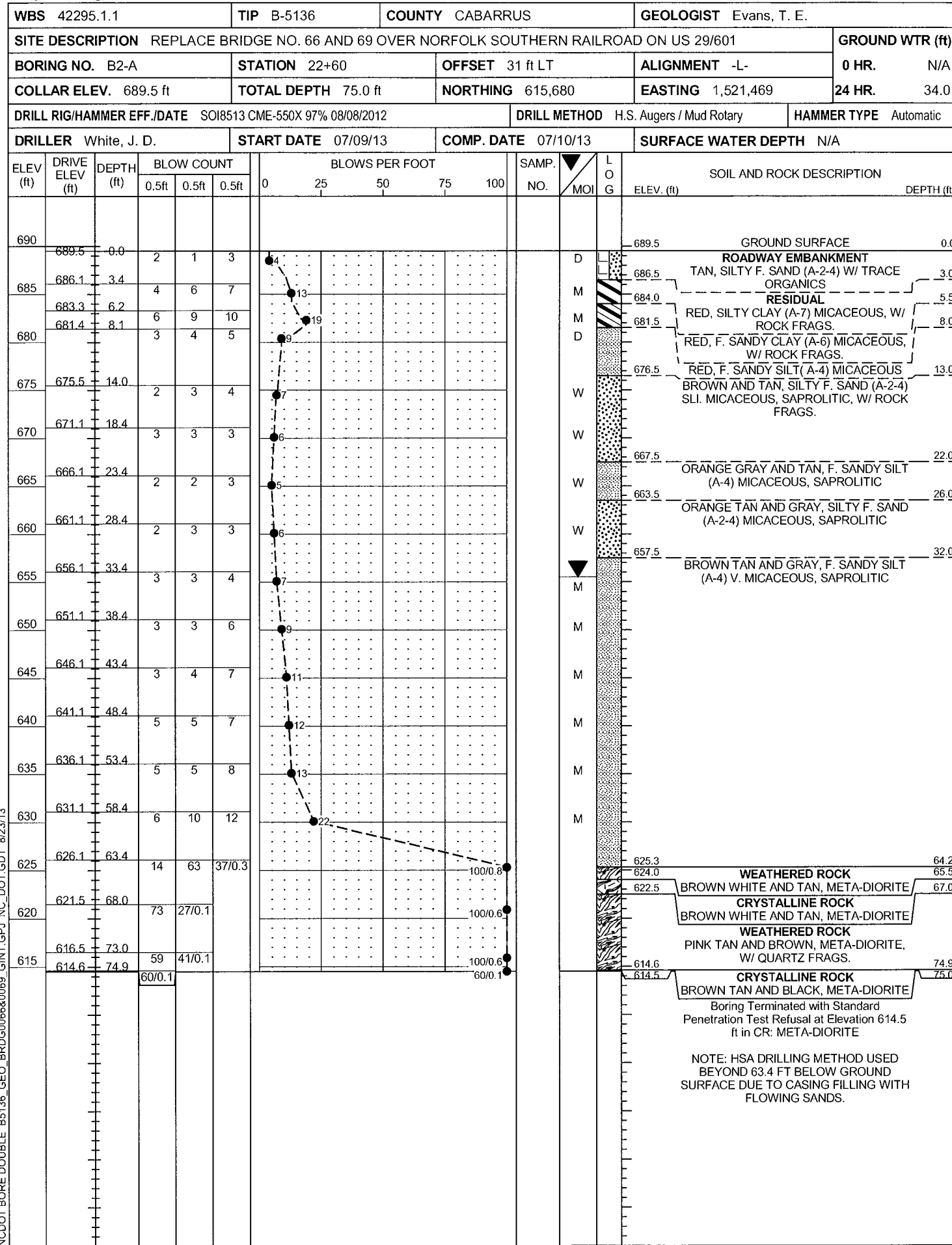
WBS 42295.1.1		TIP B-5136		COUNTY CABARRUS		GEOLOGIST Hunsberger, W. S.										
SITE DESCRIPTION REPLACE BRIDGE NO. 66 AND 69 OVER NORFOLK SOUTHERN RAILROAD ON US 29/601							GROUND WTR (ft)									
BORING NO. B1-A		STATION 21+31		OFFSET 31 ft LT		ALIGNMENT -L-										
COLLAR ELEV. 687.6 ft		TOTAL DEPTH 89.6 ft		NORTHING 615,613		EASTING 1,521,359										
DRILL RIG/HAMMER EFF./DATE TRI9435 CME-55 93% 12/08/2011				DRILL METHOD Mud Rotary		HAMMER TYPE Automatic										
DRILLER Whichard, W.		START DATE 07/10/13		COMP. DATE 07/16/13		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	LOG G	SOIL AND ROCK DESCRIPTION		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				ELEV. (ft)	DEPTH (ft)	
690																687.6 GROUND SURFACE 0.0
685	687.6	0.0	WOH	1	WOH									D		ROADWAY EMBANKMENT
	684.1	3.5	2	5	5									D		ORANGE BROWN AND TAN, SILTY SAND (A-2-4) MICACEOUS
	681.6	6.0												M		RESIDUAL
680	679.1	8.5	10	11	9									M		RED AND BLACK, SANDY CLAY (A-6) MICACEOUS
	674.1	13.5	2	2	3									M		RED-ORANGE WHITE AND TAN, SANDY SILT (A-4) MICACEOUS
675	669.1	18.5	4	6	9									D		TAN BROWN ORANGE AND WHITE, SILTY F. TO CSE. SAND (A-2-4) MICACEOUS W/ ROCK FRAGS. @ 34 FT
670	664.1	23.5	3	4	4									D		
665	659.1	28.5	3	4	6									D		
660	654.1	33.5	3	7	19									D		
655	649.1	38.5	4	4	13									D		
650	644.1	43.5	7	12	13									D		
645	639.1	48.5	6	9	12									M		
640	634.1	53.5	4	5	8									M		
635	629.1	58.5	10	10	14									M		
630	624.1	63.5	18	20	28									W		
625	619.1	68.5	16	19	23									M		
620	614.1	73.5	22	27	32									M		
615	609.1	78.5	60/0.1											M		
610	604.1	83.5	100/0.2											M		
605	599.1	88.5	60/0.1											M		
600	598.0	89.6	60/0.1											M		
			60/0.0													

WBS 42295.1.1		TIP B-5136		COUNTY CABARRUS		GEOLOGIST Evans, T. E.										
SITE DESCRIPTION REPLACE BRIDGE NO. 66 AND 69 OVER NORFOLK SOUTHERN RAILROAD ON US 29/601							GROUND WTR (ft)									
BORING NO. B1-B		STATION 20+76		OFFSET 67 ft RT		ALIGNMENT -L-										
COLLAR ELEV. 687.3 ft		TOTAL DEPTH 88.7 ft		NORTHING 615,500		EASTING 1,521,364										
DRILL RIG/HAMMER EFF./DATE SOI8513 CME-550X 97% 08/08/2012				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER White, J. D.		START DATE 07/03/12		COMP. DATE 07/03/12		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	LOG G	SOIL AND ROCK DESCRIPTION		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				ELEV. (ft)	DEPTH (ft)	
690																687.3 GROUND SURFACE: 0.4' TOPSOIL 0.0
685	686.8	0.5	2	2	3									M		ROADWAY EMBANKMENT
	683.8	3.5	6	9	15									M		BROWN, SILTY SAND (A-2-4) W/ TRACE ORGANICS, ROOTS
680	681.3	6.0	8	13	14									M		RESIDUAL
	678.8	8.5	6	5	7									M		RED-BROWN, F. SANDY SILT (A-4) W/ TRACE ORGANICS, MICACEOUS
675	673.8	13.5	4	5	7									D		RED-BROWN, SILTY CLAY (A-7) MICACEOUS
670	668.8	18.5	3	3	4									D		RED-BROWN BLACK AND TAN, F. SANDY SILT (A-4) MICACEOUS
665	663.8	23.5	3	3	5									M		TAN PINK BROWN GRAY AND BLACK, SILTY F. SAND (A-2-4) MICACEOUS, SAPROLITIC, W/ CSE. SAND LAYERS, MICACEOUS, W/ ROCK FRAGS.
660	658.8	28.5	3	3	4									M		
655	653.8	33.5	3	3	4									M		
650	648.8	38.5	3	4	4									M		
645	643.8	43.5	3	2	4									W		
640	638.8	48.5	3	4	7									W		
635	633.8	53.5	5	9	11									M		
630	628.8	58.5	6	13	10									M		
625	623.8	63.5	6	6	10									M		
620	618.8	68.5	9	18	24									M		
615	613.8	73.5	21	44	56/0.3									M		
610	608.8	78.5	69	31/0.4										M		
605	603.8	83.5	60/0.1											M		
600	598.8	88.5	100/0.2											M		

NCDOT BORE DOUBLE B5136_GEO_BRDG0066&0069_GINT.GPJ_NC_DOT_GDT_8/23/13

NOTE: GROUNDWATER NOT ENCOUNTERED DUE TO SHALLOW CAVING OF BOREHOLE. BOREHOLE CAVED AT 12.0 FT

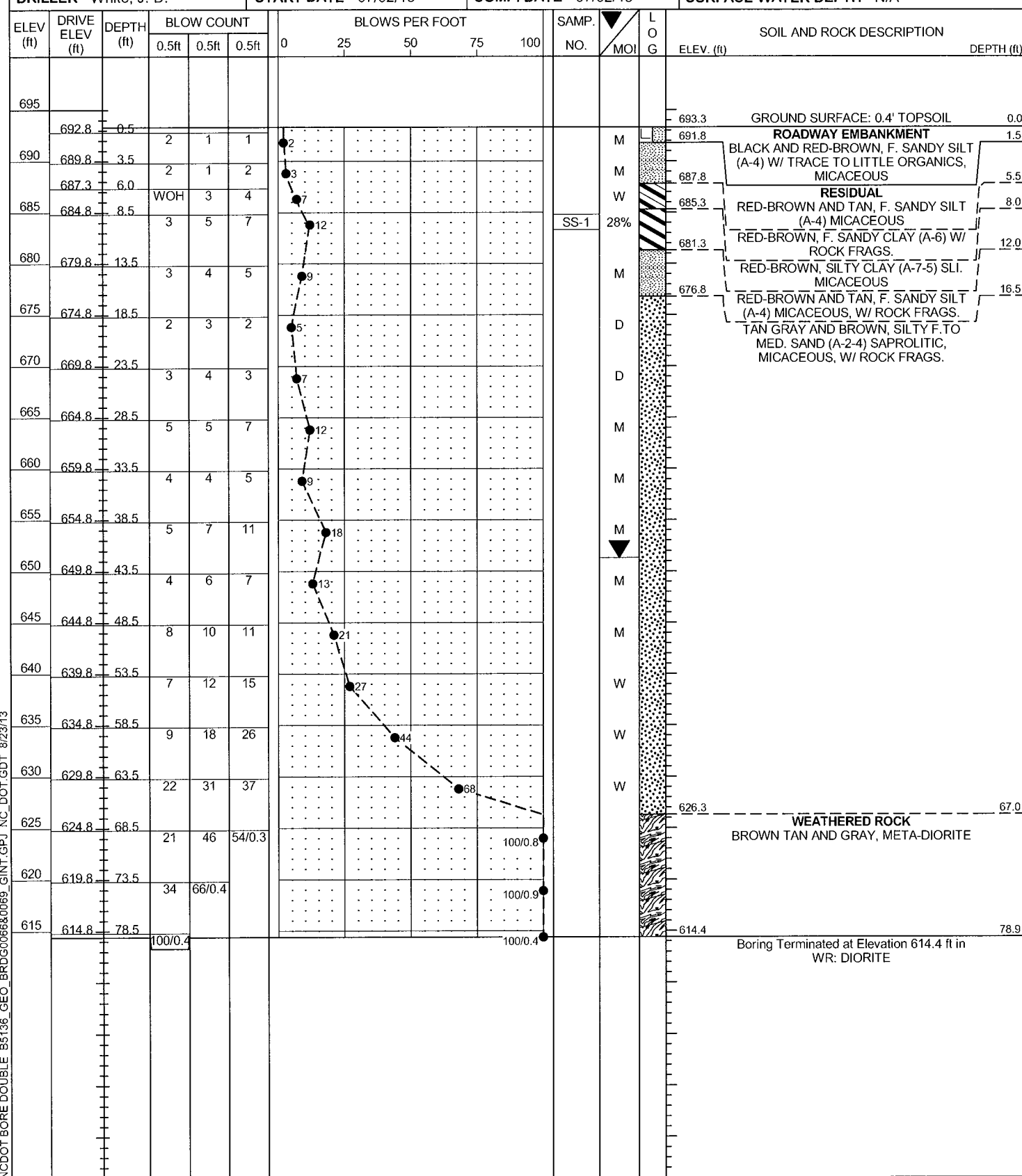
Boring Terminated at Elevation 598.6 ft in WR: META-DIORITE



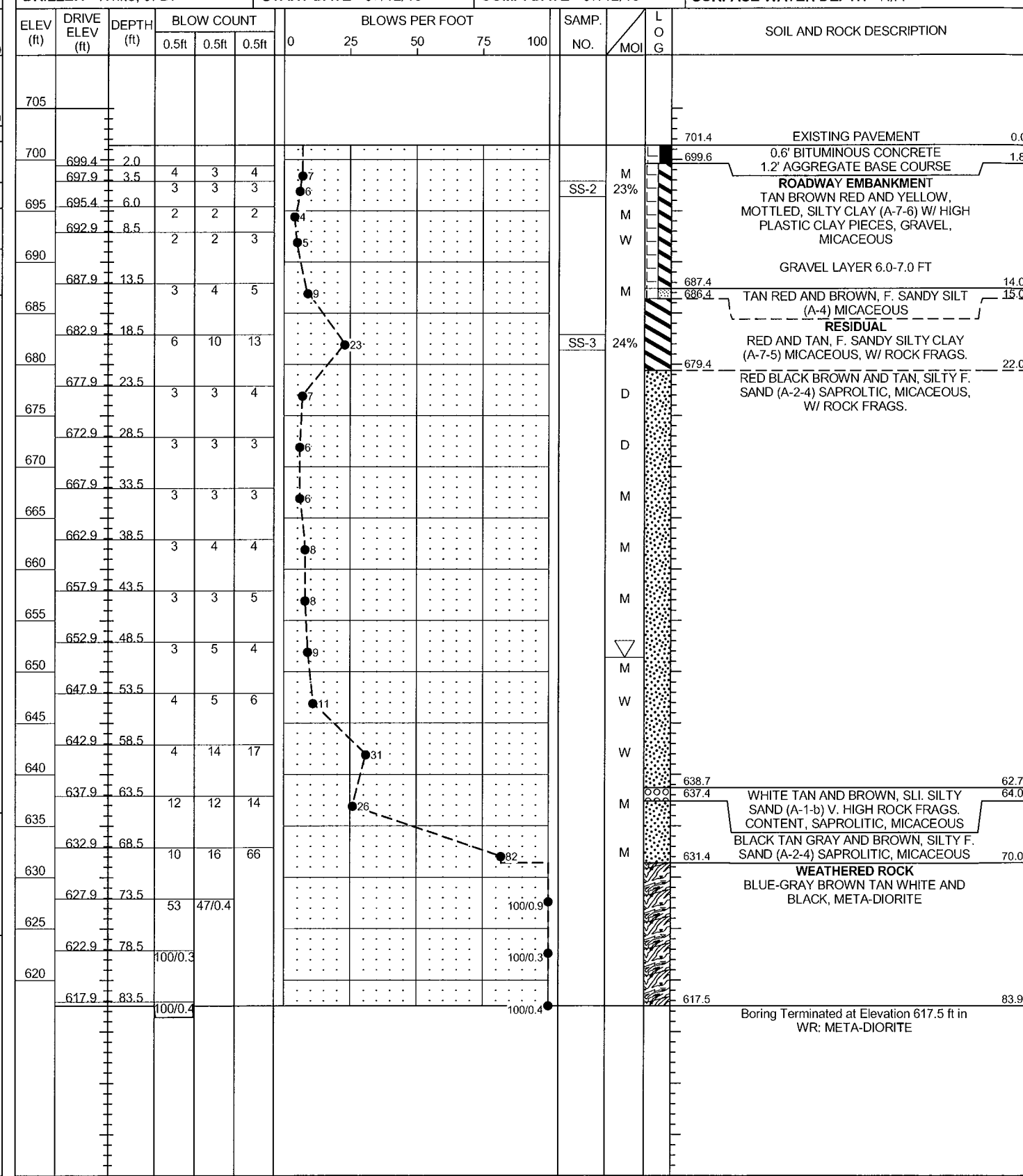
NCDOT BORE DOUBLE B5136_GEO_BRD0066&0069_GINT.GPJ_NC_DOT_GDT_8/23/13



WBS 42295.1.1	TIP B-5136	COUNTY CABARRUS	GEOLOGIST Evans, T. E.
SITE DESCRIPTION REPLACE BRIDGE NO. 66 AND 69 OVER NORFOLK SOUTHERN RAILROAD ON US 29/601			GROUND WTR (ft)
BORING NO. EB2-A	STATION 23+31	OFFSET 53 ft LT	ALIGNMENT -L-
COLLAR ELEV. 693.3 ft	TOTAL DEPTH 78.9 ft	NORTHING 615,736	EASTING 1,521,518
DRILL RIG/HAMMER EFF./DATE SOI8513 CME-550X 97% 08/08/2012			DRILL METHOD H.S. Augers
DRILLER White, J. D.			HAMMER TYPE Automatic
START DATE 07/02/13	COMP. DATE 07/02/13	SURFACE WATER DEPTH N/A	



WBS 42295.1.1	TIP B-5136	COUNTY CABARRUS	GEOLOGIST Evans, T. E.
SITE DESCRIPTION REPLACE BRIDGE NO. 66 AND 69 OVER NORFOLK SOUTHERN RAILROAD ON US 29/601			GROUND WTR (ft)
BORING NO. EB2-B	STATION 22+87	OFFSET 32 ft RT	ALIGNMENT -L-
COLLAR ELEV. 701.4 ft	TOTAL DEPTH 83.9 ft	NORTHING 615,641	EASTING 1,521,525
DRILL RIG/HAMMER EFF./DATE SOI8513 CME-550X 97% 08/08/2012			DRILL METHOD H.S. Augers
DRILLER White, J. D.			HAMMER TYPE Automatic
START DATE 07/12/13	COMP. DATE 07/12/13	SURFACE WATER DEPTH N/A	

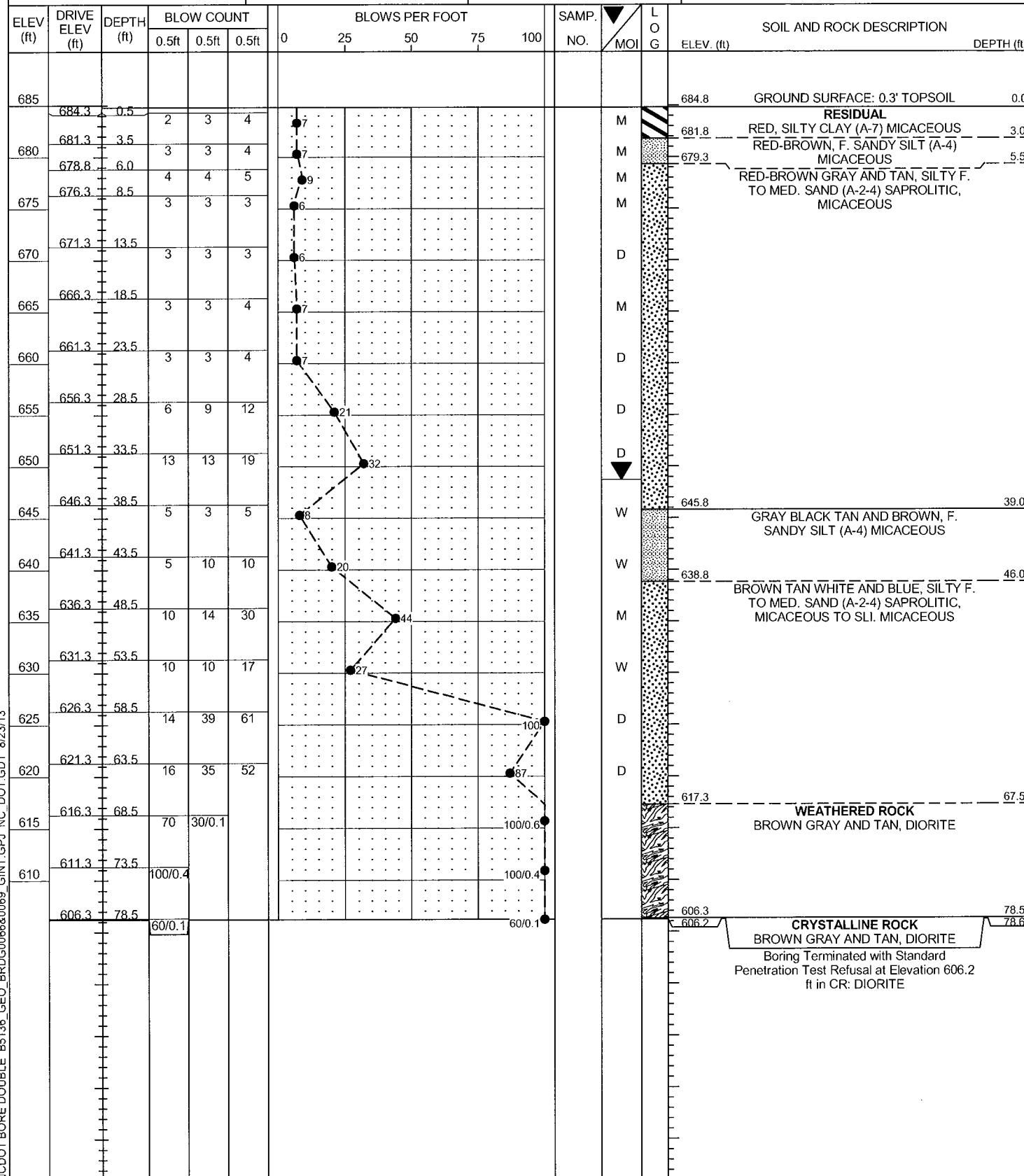


NCDOT BORE DOUBLE B5136 GEO_BRDG0066&0069_GINT.GPJ_NC_DOT_GDT_8/23/13

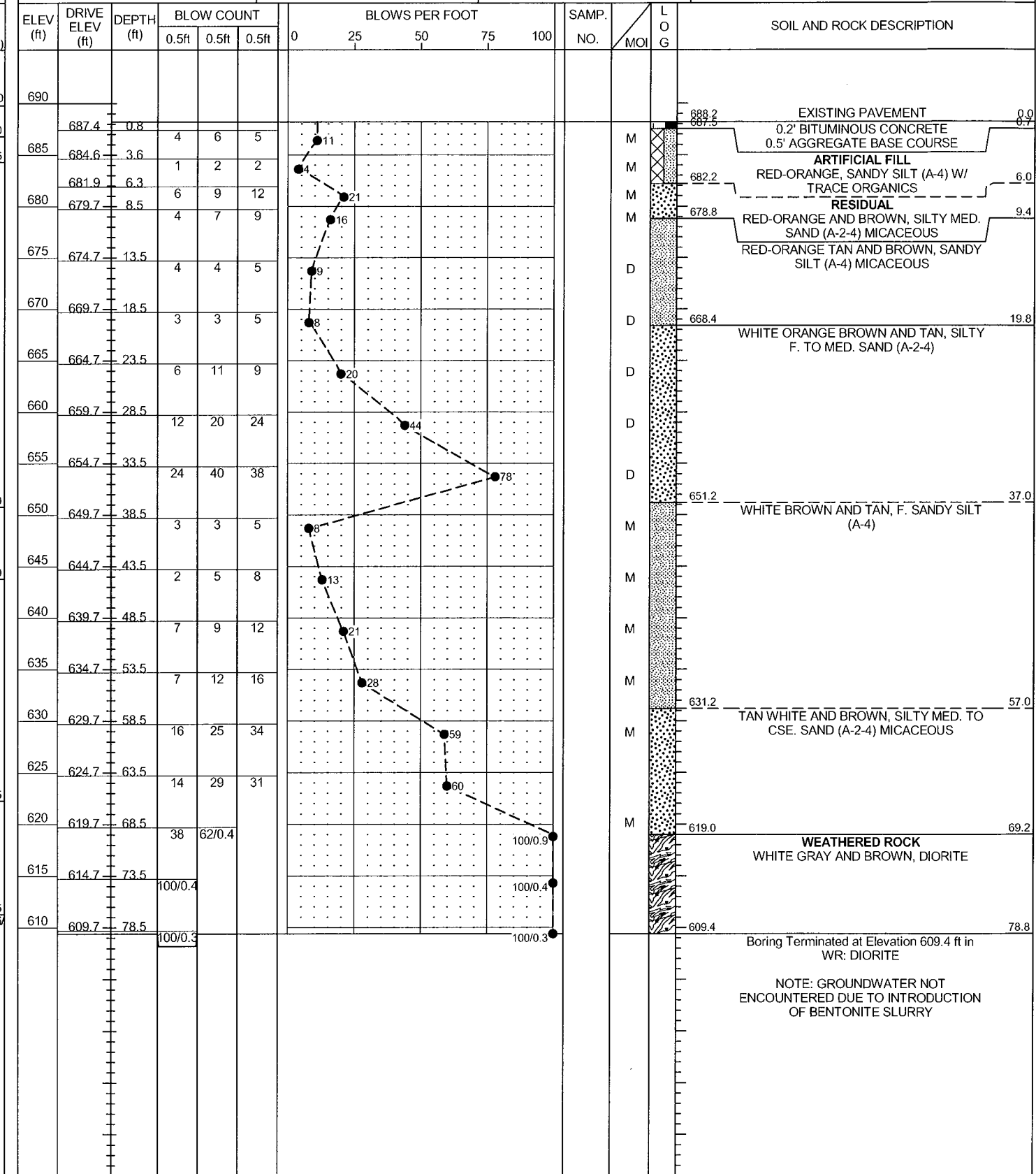


NCDOT GEOTECHNICAL ENGINEERING UNIT BORELOG REPORT

WBS 42295.1.1	TIP B-5136	COUNTY CABARRUS	GEOLOGIST Evans, T. E.
SITE DESCRIPTION REPLACE BRIDGE NO. 66 AND 69 OVER NORFOLK SOUTHERN RAILROAD ON US 29/601			GROUND WTR (ft)
BORING NO. DET-1	STATION 16+54	OFFSET 7 ft LT	ALIGNMENT -DET-
COLLAR ELEV. 684.8 ft	TOTAL DEPTH 78.6 ft	NORTHING 615,670	EASTING 1,521,346
DRILL RIG/HAMMER EFF./DATE SOI8513 CME-550X 97% 08/08/2012		DRILL METHOD H.S. Augers	HAMMER TYPE Automatic
DRILLER White, J. D.	START DATE 07/01/13	COMP. DATE 07/01/13	SURFACE WATER DEPTH N/A



WBS 42295.1.1	TIP B-5136	COUNTY CABARRUS	GEOLOGIST Hunsberger, W. S.
SITE DESCRIPTION REPLACE BRIDGE NO. 66 AND 69 OVER NORFOLK SOUTHERN RAILROAD ON US 29/601			GROUND WTR (ft)
BORING NO. DET-2	STATION 18+17	OFFSET 10 ft LT	ALIGNMENT -DET-
COLLAR ELEV. 688.2 ft	TOTAL DEPTH 78.8 ft	NORTHING 615,786	EASTING 1,521,484
DRILL RIG/HAMMER EFF./DATE TRI9435 CME-55 93% 12/08/2011		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic
DRILLER Whichard, W.	START DATE 07/03/13	COMP. DATE 07/03/13	SURFACE WATER DEPTH N/A



NOTE: GROUNDWATER NOT ENCOUNTERED DUE TO INTRODUCTION OF BENTONITE SLURRY

NCDOT BORE DOUBLE B5136_GEO_BRDC0066&0069_GINT.GPJ_NC_DOT_GDT_8/23/13

FALCON

1210 TRINITY ROAD, SUITE 110, RALEIGH, NORTH CAROLINA 27607

AASHTO SOIL CLASSIFICATION AND GRADATION SHEET

REPLACE BRIDGES NO. 66 & 69 OVER NORFOLK SOUTHERN RR ON US 29/601

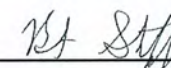
WBS NO.: 42295.1.1 , TIP NO.: B-5136

CABARRUS COUNTY, NORTH CAROLINA

FALCON ENGINEERING, INC. PROJECT NO: G13055.00

BORING		SAMPLE	TOTAL SAMPLE			Atterberg Limit Test Results			Natural Moisture Content
AASHTO Classification			PERCENT PASSING						
STATION	OFFSET (FEET)	DEPTH (FEET)	#10	#40	#200	LL	PL	PI	%
EB2-A		SS-1	100	86	79	81	33	48	27.9
A-7-5									
23+31	53' LT	8.5-10.0							
EB2-B		SS-2	99	80	56	54	26	28	22.6
A-7-6									
22+87	32' RT	3.5-5.0							
EB2-B		SS-3	97	75	60	69	52	17	23.7
A-7-5									
22+87	32' RT	18.5-20.0							

SIGNATURE



105-03-0803


Notes: LL = Liquid limit
 PL = Plastic limit
 PI = Plasticity index = LL - PL



LOOKING SOUTH TOWARDS EXISTING BRIDGE FROM NEAR BORING DET-1



LOOKING UPSTATION ALONG -L- FROM NEAR EXISTING END BENT 1

 <p>FALCON ENGINEERING, INC. 1210 TRINITY ROAD, SUITE 110 RALEIGH, NC 27607 PHONE: 919.871.0800 FAX: 919.871.0803</p>	<p>SITE PHOTOGRAPHS</p>
	<p>REPLACE BRIDGE NO. 66 & 69 OVER NORFOLK SOUTHERN RAILROAD ON US 29 /601 CABARRUS COUNTY, NORTH CAROLINA WBS NO.: 42295.1.1 , TIP NO.: B-5136 FALCON PROJECT NO.: G13055.00</p>