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REFERENCE: I-5823

PROJECT: 50466

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

STRUCTURE
SUBSURFACE INVESTIGATION

COUNTY DAVIE
 SITE DESCRIPTION BRIDGE NO. 29 AND BRIDGE NO. 32
ON I-40 OVER HUNTING CREEK

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	I-5823	1	30

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 (ON-PLACE) TEST DATA CAN BE RELIED ON ONLY TO THE DEGREE OF RELIABILITY INHERENT IN THE STANDARD TEST METHOD. THE OBSERVED WATER LEVELS OR SOIL MOISTURE CONDITIONS INDICATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOIL MOISTURE CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS INCLUDING TEMPERATURES, PRECIPITATION AND WIND, AS WELL AS OTHER NON-CLIMATIC FACTORS.

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 2. BY HAVING REQUESTED THIS INFORMATION, THE CONTRACTOR SPECIFICALLY WAIVES ANY CLAIMS FOR INCREASED COMPENSATION OR EXTENSION OF TIME BASED ON DIFFERENCES BETWEEN THE CONDITIONS INDICATED HEREIN AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

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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 (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	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: WEATHERED ROCK (WR) CRYSTALLINE ROCK (CR) NON-CRYSTALLINE ROCK (NCR) COASTAL PLAIN SEDIMENTARY ROCK (CP)	ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. AQUIFER - A WATER BEARING FORMATION OR STRATA. ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND. ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, SUCH AS SHALE, SLATE, ETC. ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE. CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE. COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE. CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK. DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL. DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH. FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE. FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES. FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED 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 INTRODUCED 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 IN OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS. STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE. STRATA ROCK QUALITY DESIGNATION (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.
SOIL LEGEND AND AASHTO CLASSIFICATION	ANGULARITY OF GRAINS THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.	WEATHERED ROCK (WR) CRYSTALLINE ROCK (CR) NON-CRYSTALLINE ROCK (NCR) COASTAL PLAIN SEDIMENTARY ROCK (CP)	
MINERALOGICAL COMPOSITION MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.	MINERALOGICAL COMPOSITION MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.	WEATHERED ROCK (WR) CRYSTALLINE ROCK (CR) NON-CRYSTALLINE ROCK (NCR) COASTAL PLAIN SEDIMENTARY ROCK (CP)	
COMPRESSION SLIGHTLY COMPRESSIBLE MODERATELY COMPRESSIBLE HIGHLY COMPRESSIBLE	COMPRESSION SLIGHTLY COMPRESSIBLE MODERATELY COMPRESSIBLE HIGHLY COMPRESSIBLE	WEATHERED ROCK (WR) CRYSTALLINE ROCK (CR) NON-CRYSTALLINE ROCK (NCR) COASTAL PLAIN SEDIMENTARY ROCK (CP)	
PERCENTAGE OF MATERIAL	PERCENTAGE OF MATERIAL	WEATHERED ROCK (WR) CRYSTALLINE ROCK (CR) NON-CRYSTALLINE ROCK (NCR) COASTAL PLAIN SEDIMENTARY ROCK (CP)	
GROUND WATER	GROUND WATER	WEATHERED ROCK (WR) CRYSTALLINE ROCK (CR) NON-CRYSTALLINE ROCK (NCR) COASTAL PLAIN SEDIMENTARY ROCK (CP)	
MISCELLANEOUS SYMBOLS	MISCELLANEOUS SYMBOLS	WEATHERED ROCK (WR) CRYSTALLINE ROCK (CR) NON-CRYSTALLINE ROCK (NCR) COASTAL PLAIN SEDIMENTARY ROCK (CP)	
RECOMMENDATION SYMBOLS	RECOMMENDATION SYMBOLS	WEATHERED ROCK (WR) CRYSTALLINE ROCK (CR) NON-CRYSTALLINE ROCK (NCR) COASTAL PLAIN SEDIMENTARY ROCK (CP)	
ABBREVIATIONS	ABBREVIATIONS	WEATHERED ROCK (WR) CRYSTALLINE ROCK (CR) NON-CRYSTALLINE ROCK (NCR) COASTAL PLAIN SEDIMENTARY ROCK (CP)	
SOIL MOISTURE - CORRELATION OF TERMS	SOIL MOISTURE - CORRELATION OF TERMS	WEATHERED ROCK (WR) CRYSTALLINE ROCK (CR) NON-CRYSTALLINE ROCK (NCR) COASTAL PLAIN SEDIMENTARY ROCK (CP)	
PLASTICITY	PLASTICITY	WEATHERED ROCK (WR) CRYSTALLINE ROCK (CR) NON-CRYSTALLINE ROCK (NCR) COASTAL PLAIN SEDIMENTARY ROCK (CP)	
COLOR	COLOR	WEATHERED ROCK (WR) CRYSTALLINE ROCK (CR) NON-CRYSTALLINE ROCK (NCR) COASTAL PLAIN SEDIMENTARY ROCK (CP)	
EQUIPMENT USED ON SUBJECT PROJECT	EQUIPMENT USED ON SUBJECT PROJECT	WEATHERED ROCK (WR) CRYSTALLINE ROCK (CR) NON-CRYSTALLINE ROCK (NCR) COASTAL PLAIN SEDIMENTARY ROCK (CP)	
FRACATURE SPACING	FRACATURE SPACING	WEATHERED ROCK (WR) CRYSTALLINE ROCK (CR) NON-CRYSTALLINE ROCK (NCR) COASTAL PLAIN SEDIMENTARY ROCK (CP)	
BEDDING	BEDDING	WEATHERED ROCK (WR) CRYSTALLINE ROCK (CR) NON-CRYSTALLINE ROCK (NCR) COASTAL PLAIN SEDIMENTARY ROCK (CP)	
INDURATION	INDURATION	WEATHERED ROCK (WR) CRYSTALLINE ROCK (CR) NON-CRYSTALLINE ROCK (NCR) COASTAL PLAIN SEDIMENTARY ROCK (CP)	
NOTES:	NOTES:	WEATHERED ROCK (WR) CRYSTALLINE ROCK (CR) NON-CRYSTALLINE ROCK (NCR) COASTAL PLAIN SEDIMENTARY ROCK (CP)	

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

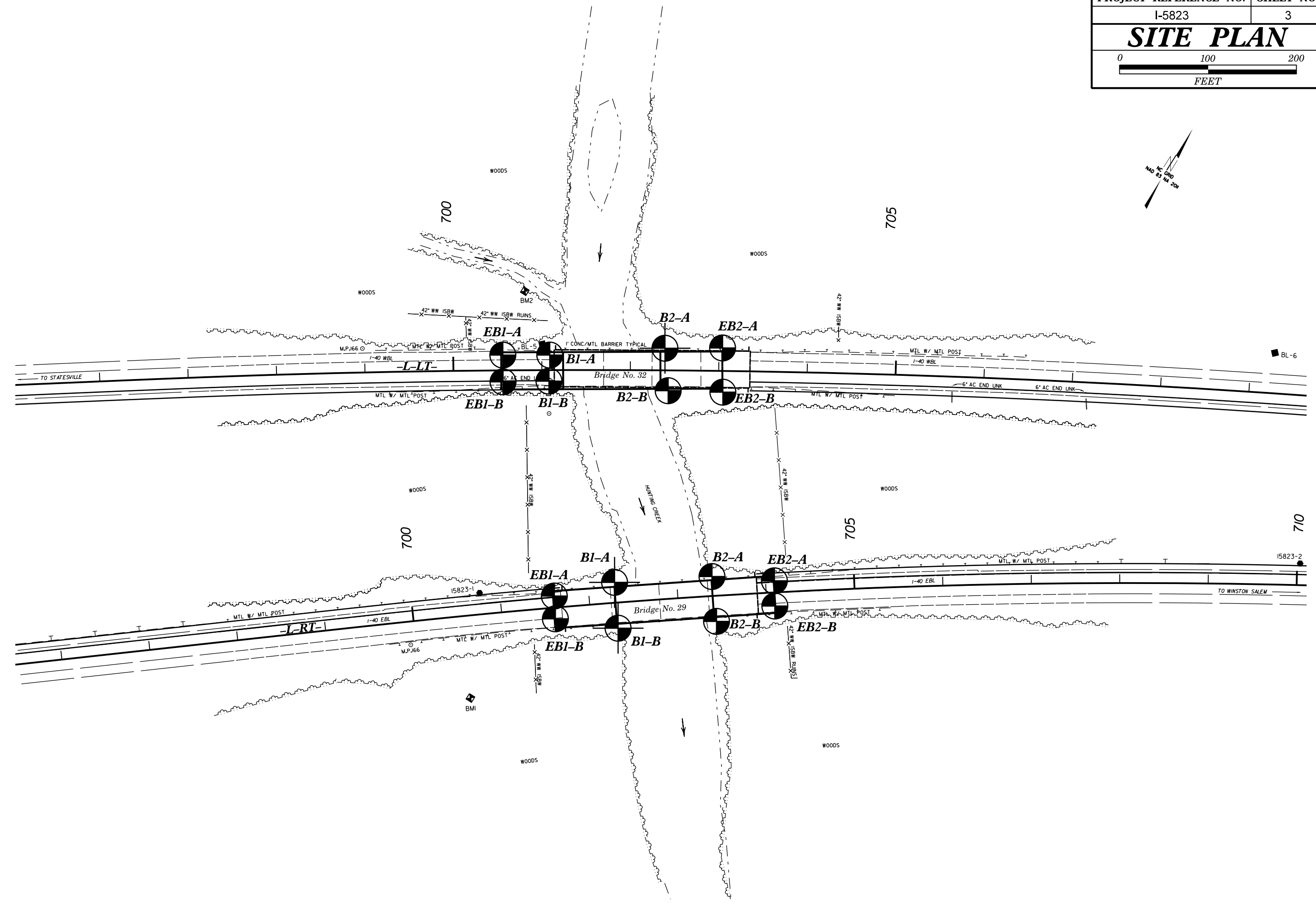
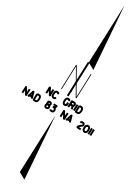
SUBSURFACE INVESTIGATION

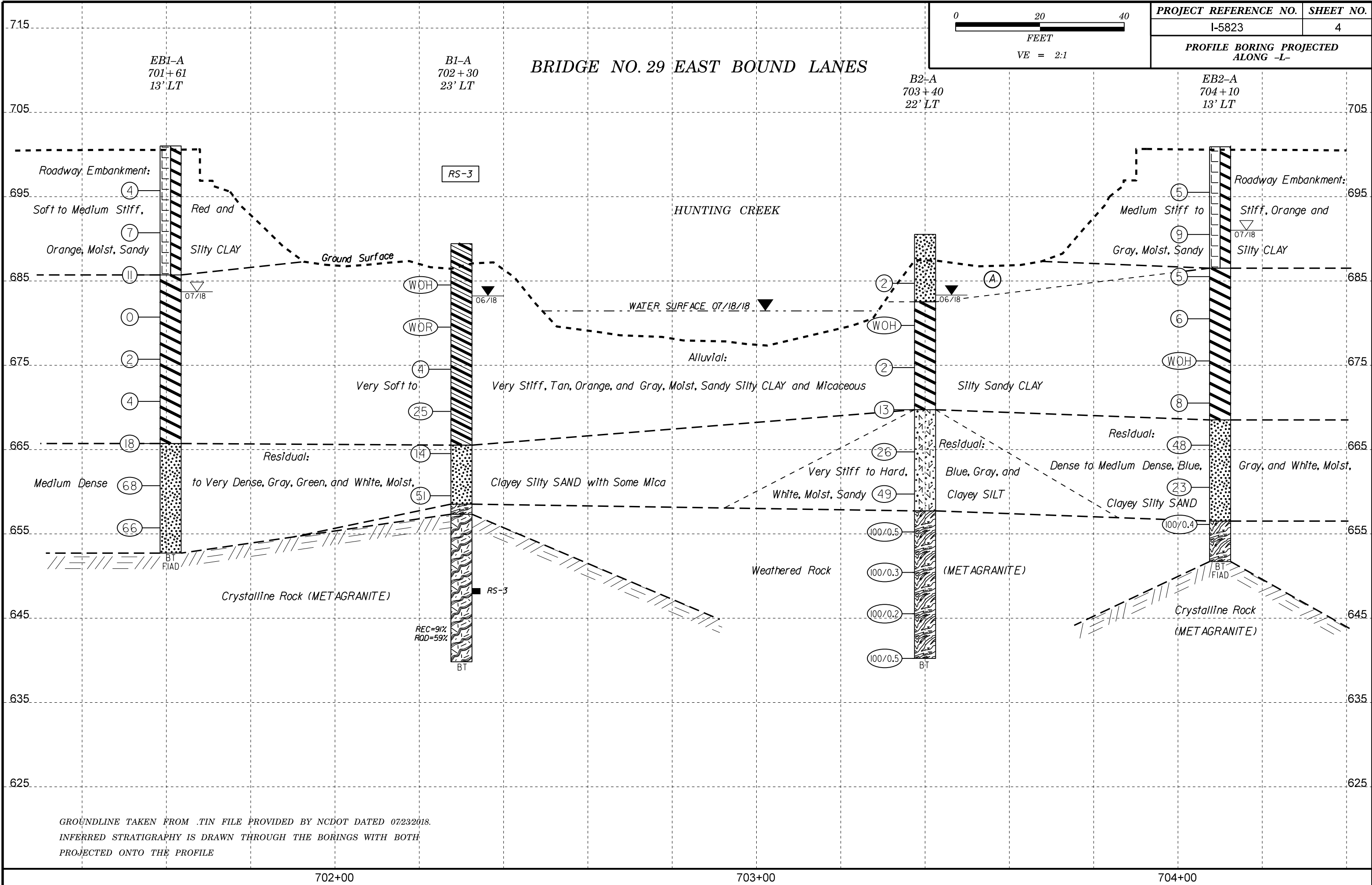
**SUPPLEMENTAL LEGEND, GEOLOGICAL STRENGTH INDEX (GSI) TABLES
FROM AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS**

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)

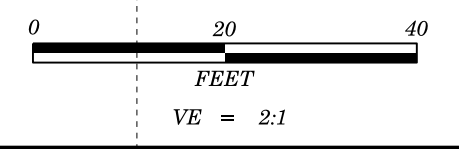
	SURFACE CONDITIONS						SURFACE CONDITIONS OF DISCONTINUITIES (Predominantly bedding planes)					
GEOLOGICAL STRENGTH INDEX (GSI) FOR JOINTED ROCKS (Hoek and Marinos, 2000)	VERY GOOD	GOOD	FAIR	POOR	VERY POOR	GSI FOR HETEROGENEOUS ROCK MASSES SUCH AS FLYSCH (Marinos, P and Hoek E., 2000)	VERY GOOD	GOOD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



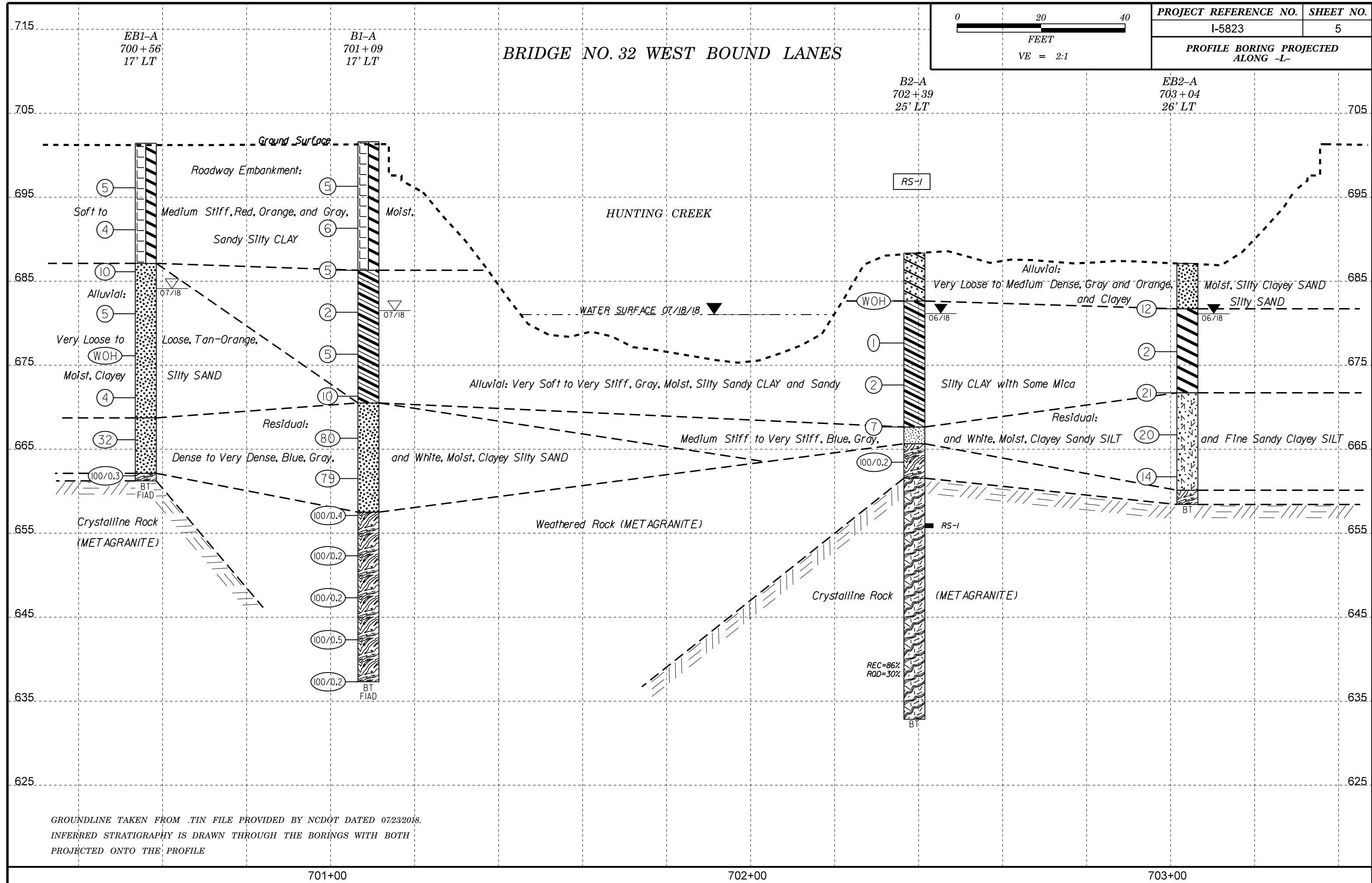


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 INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH
 PROJECTED ONTO THE PROFILE

BRIDGE NO. 32 WEST BOUND LANES



PROJECT REFERENCE NO.	SHEET NO.
I-5823	5
PROFILE BORING PROJECTED ALONG -L-	

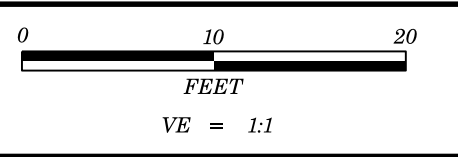


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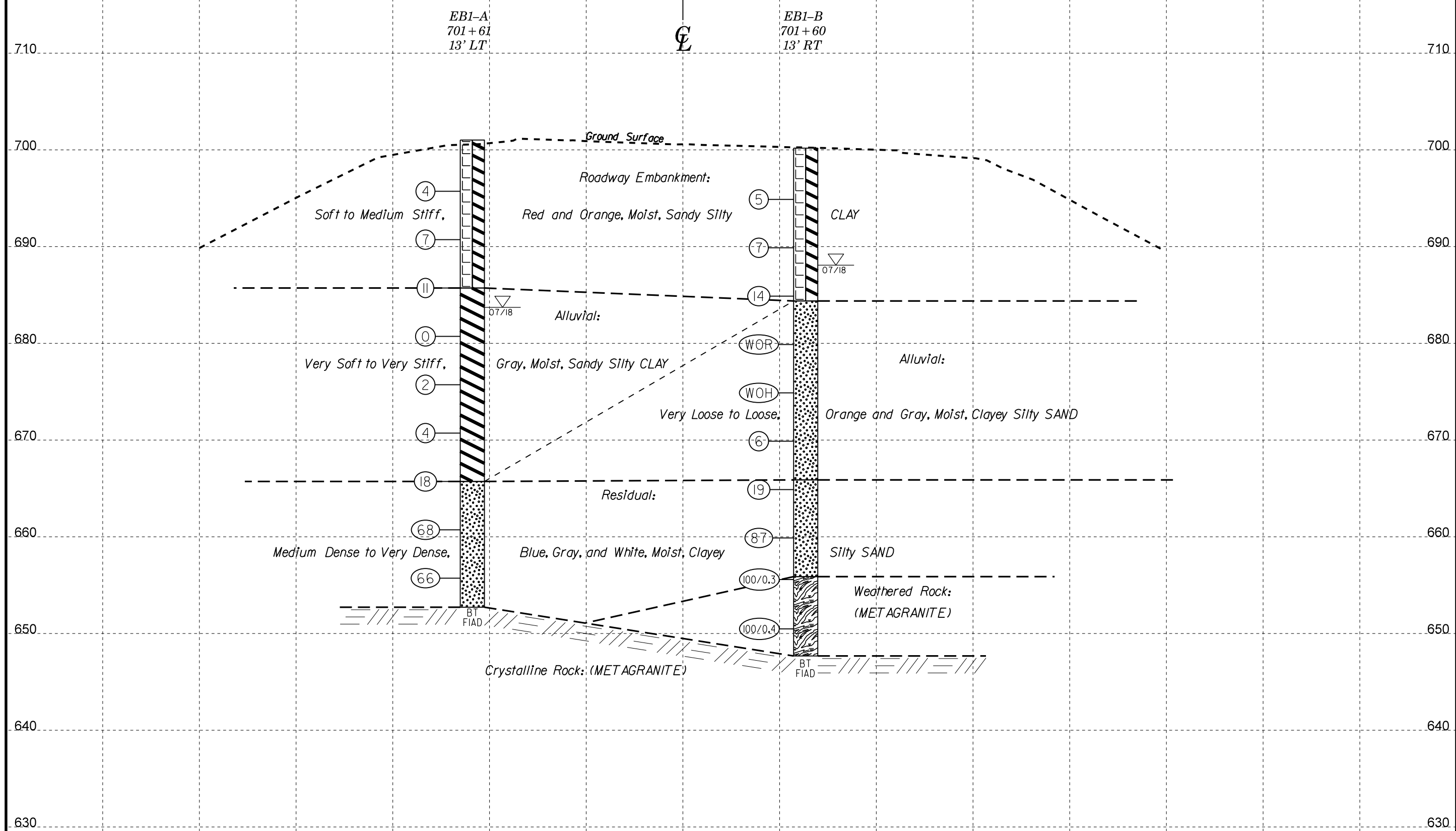
701+00

702+00

703+00



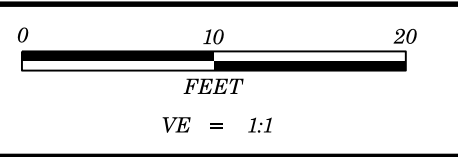
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I-5823	6
CROSS SECTION THROUGH END BENT 1	
AT -L-RT- STATION 701+59.41	
SKEW=90°	



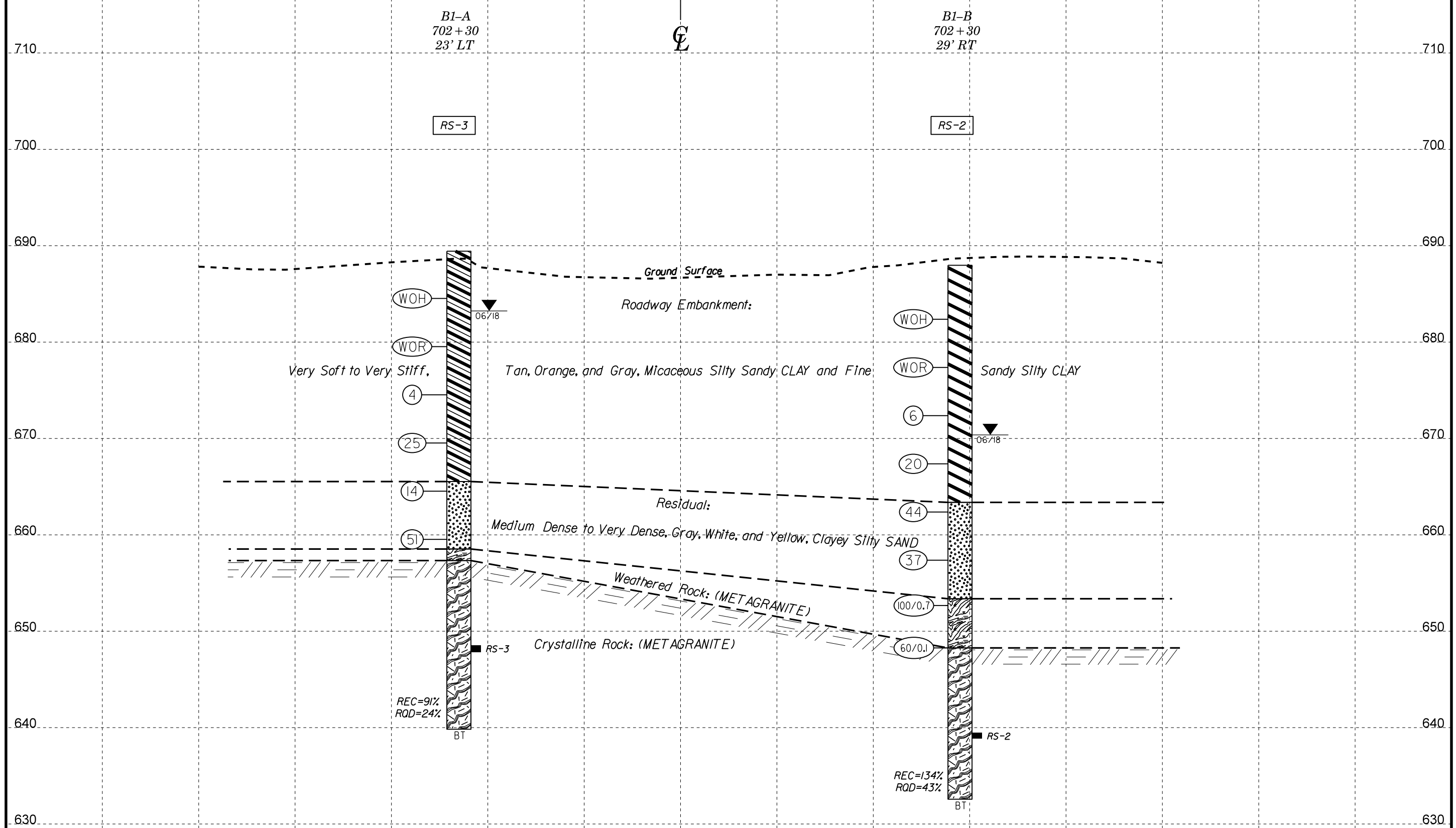
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INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH
PROJECTED ONTO THE CROSS SECTION

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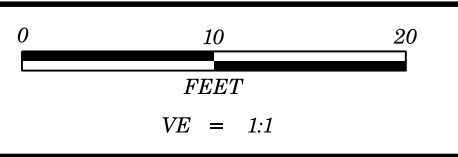
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I-5823	7
CROSS SECTION THROUGH BENT 1 AT -L-RT- STATION 702+29.41 SKEW=90°	



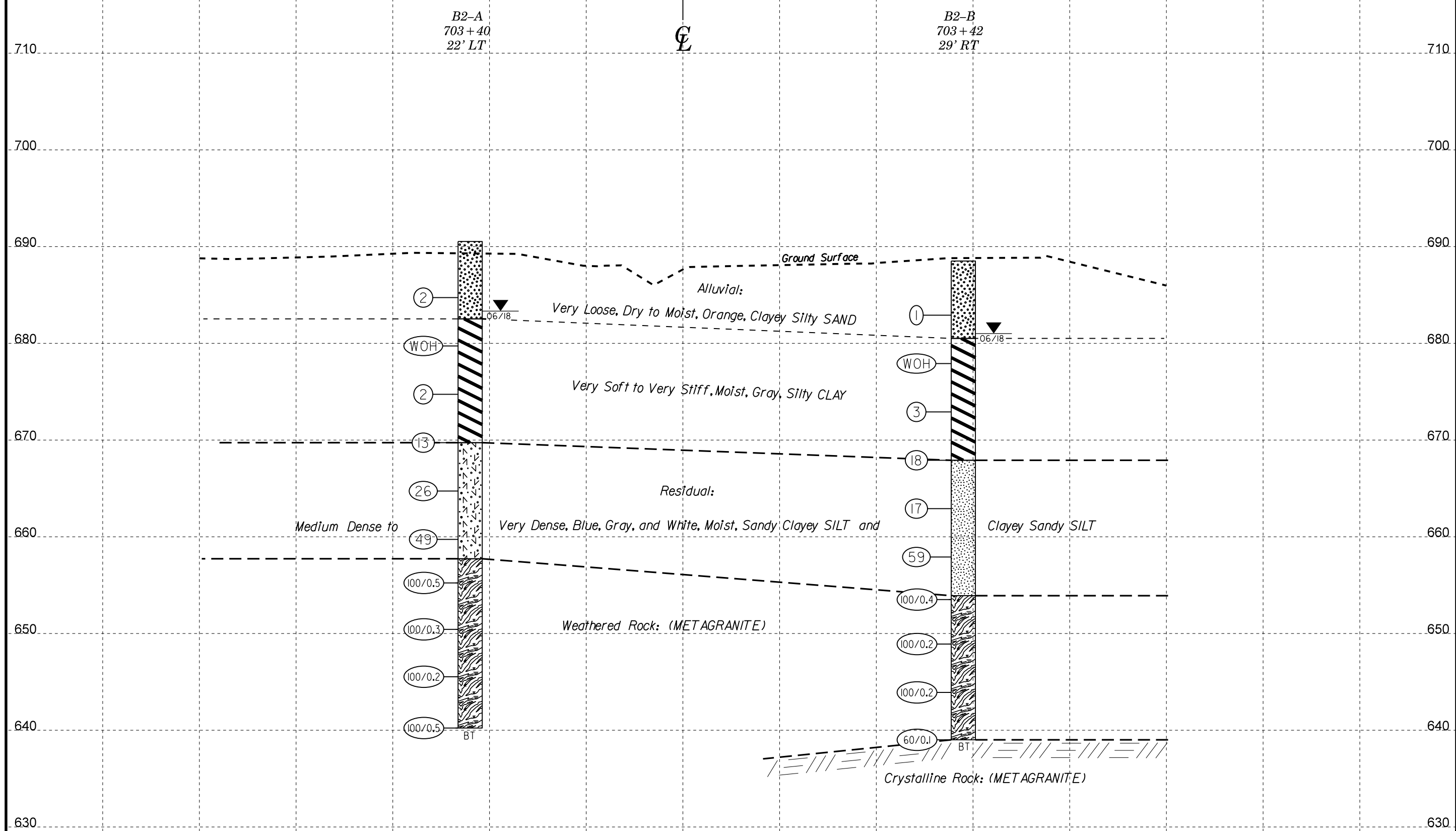
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PROJECTED ONTO THE CROSS SECTION

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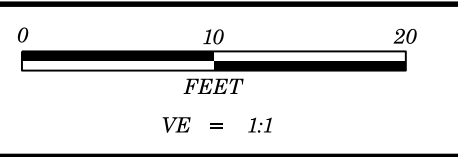
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I-5823	8
CROSS SECTION THROUGH BENT 2 AT -L-RT- STATION 703+39.41 SKEW=90°	



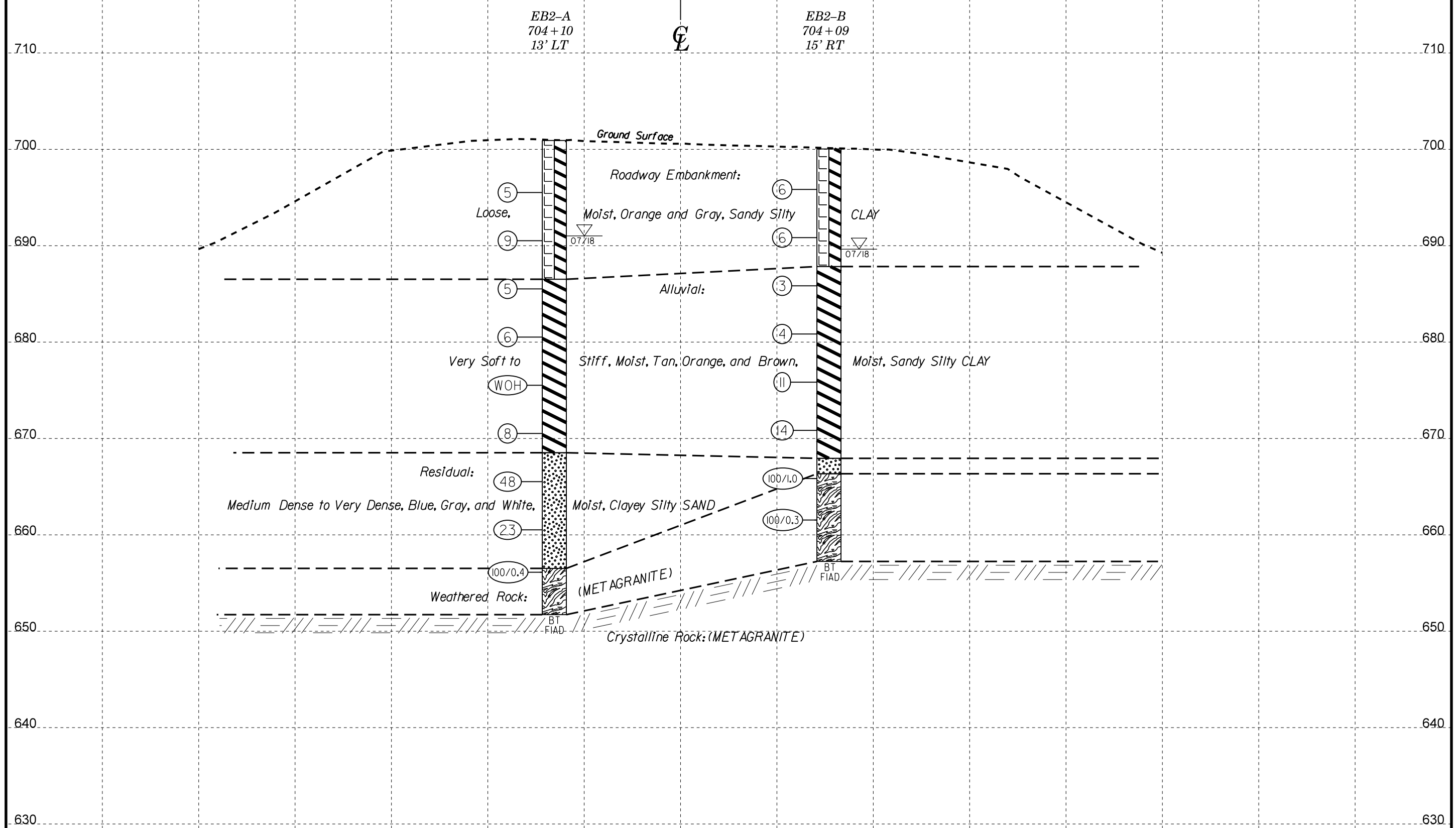
BRIDGE NO. 29 EAST BOUND LANES

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 INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH
 PROJECTED ONTO THE CROSS SECTION

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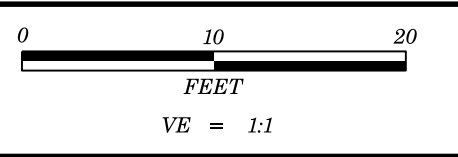
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I-5823	9
CROSS SECTION THROUGH END BENT 2	
AT -L-LT- STATION 704+09.42	
SKEW=90°	



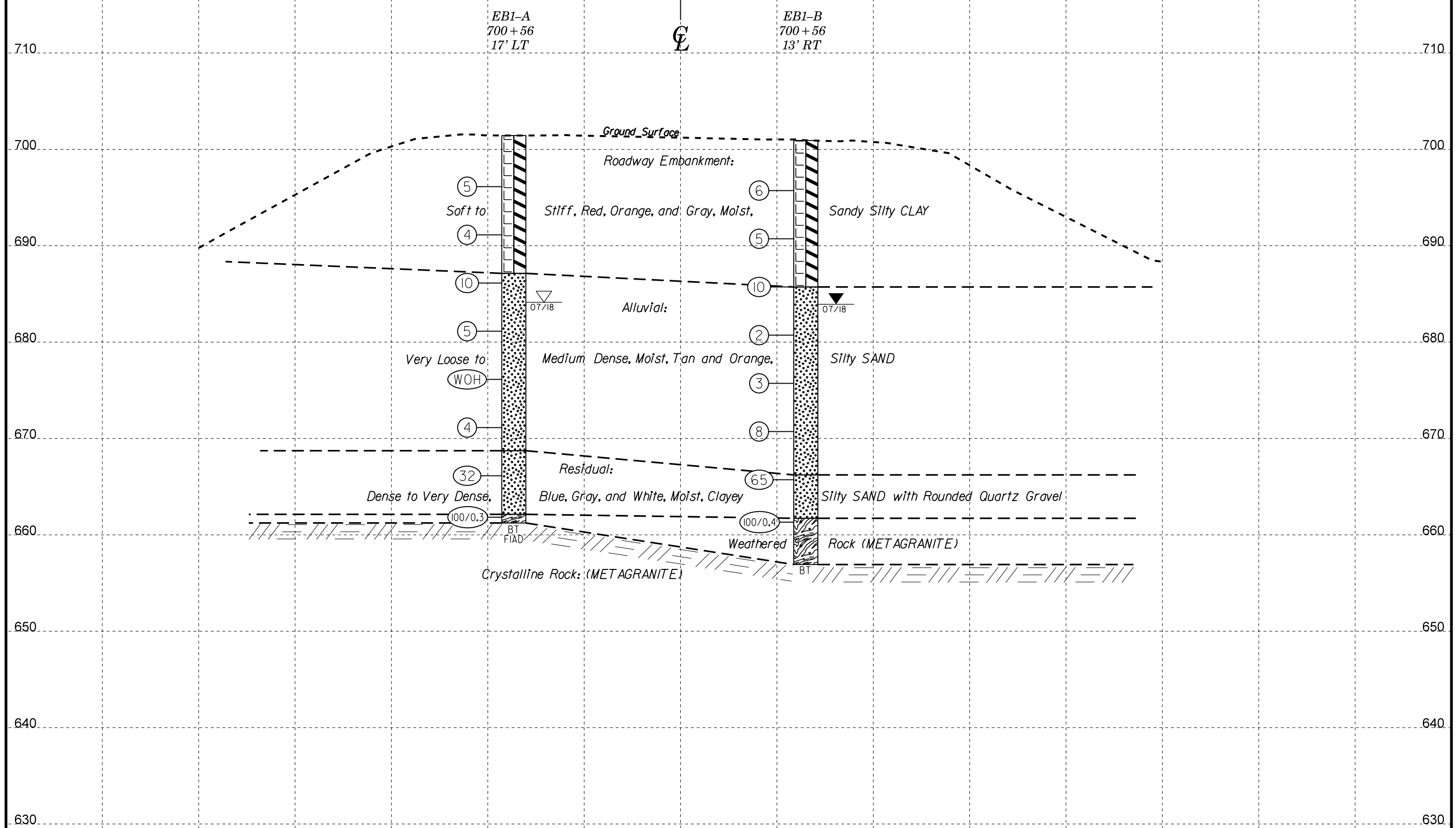
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INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH
PROJECTED ONTO THE CROSS SECTION

50 40 30 20 10 0 10 20 30 40 50



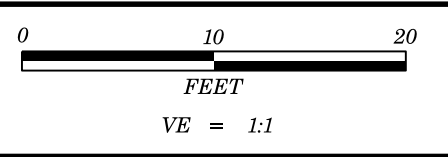
PROJECT REFERENCE NO.	SHEET NO.
I-5823	10
CROSS SECTION THROUGH END BENT 1	
AT -L-LT- STATION 700+54	
SKEW=90°	



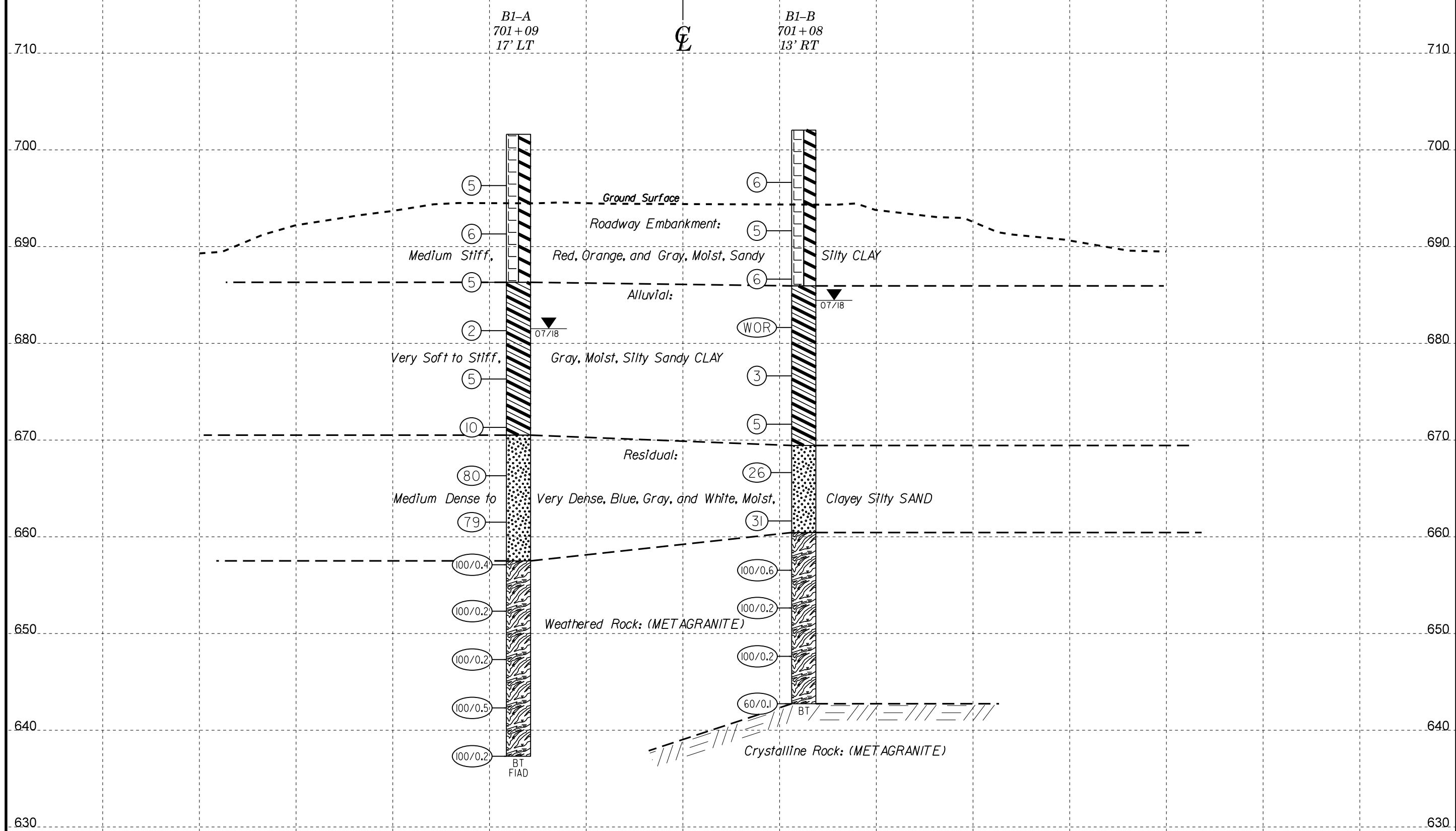
BRIDGE NO. 32 WEST BOUND LANES

GROUNDLINE TAKEN FROM .TIN FILE RECEIVED BY NCDOT DATED 07/23/2018.
 INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH
 PROJECTED ONTO THE CROSS SECTION

50 40 30 20 10 0 10 20 30 40 50



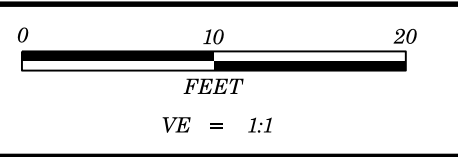
PROJECT REFERENCE NO.	SHEET NO.
I-5823	11
CROSS SECTION THROUGH BENT 1 AT -L-LT- STATION 701+24 SKEW=90°	



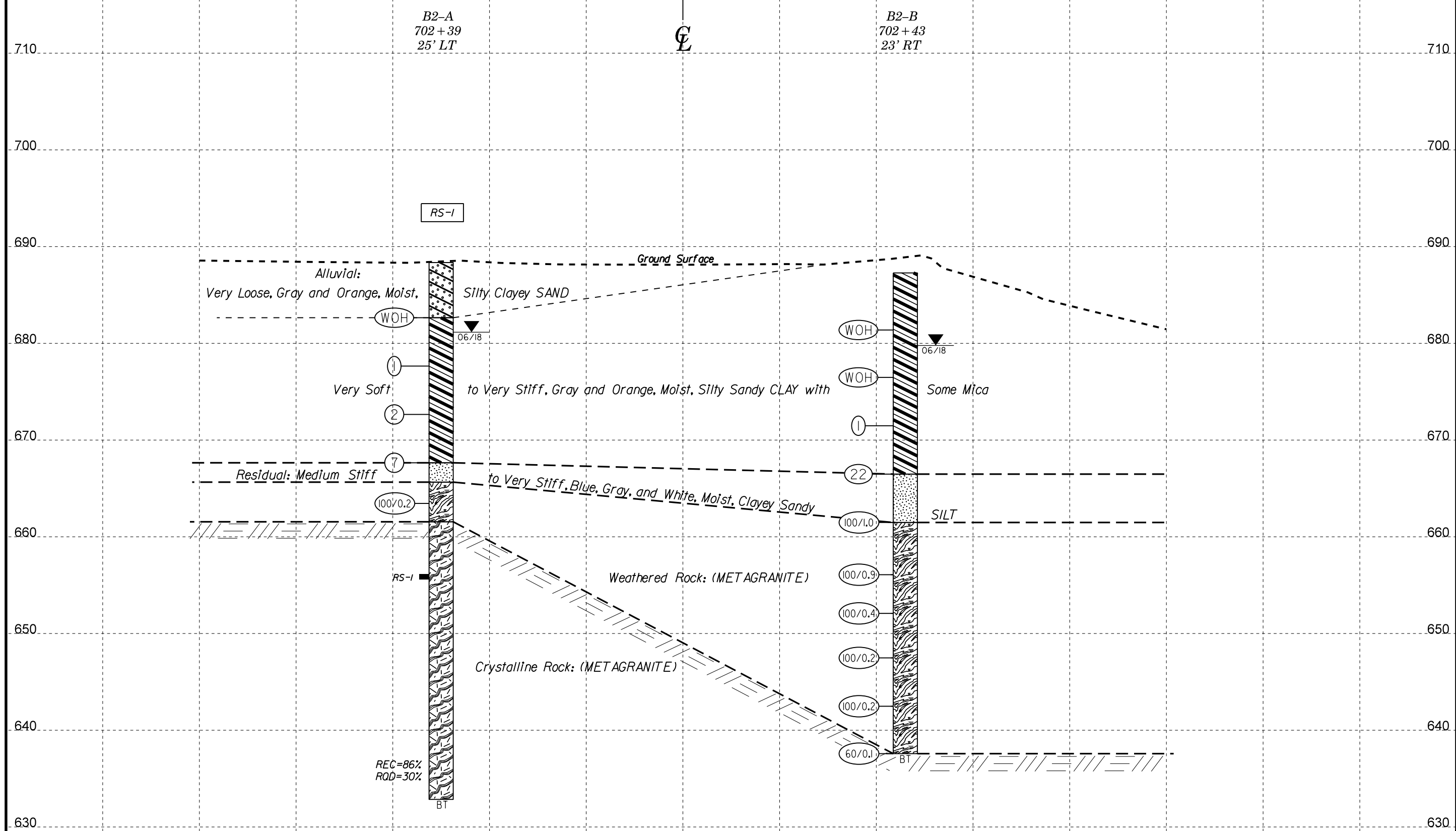
BRIDGE NO. 32 WEST BOUND LANES

GROUNDLINE TAKEN FROM .TIN FILE RECEIVED BY NCDOT DATED 07/23/2018.
INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH
PROJECTED ONTO THE CROSS SECTION

50 40 30 20 10 0 10 20 30 40 50



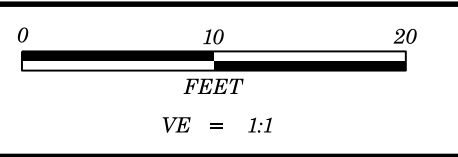
PROJECT REFERENCE NO.	SHEET NO.
I-5823	12
CROSS SECTION THROUGH BENT 2 AT -L-LT- STATION 702+34 SKEW=90°	



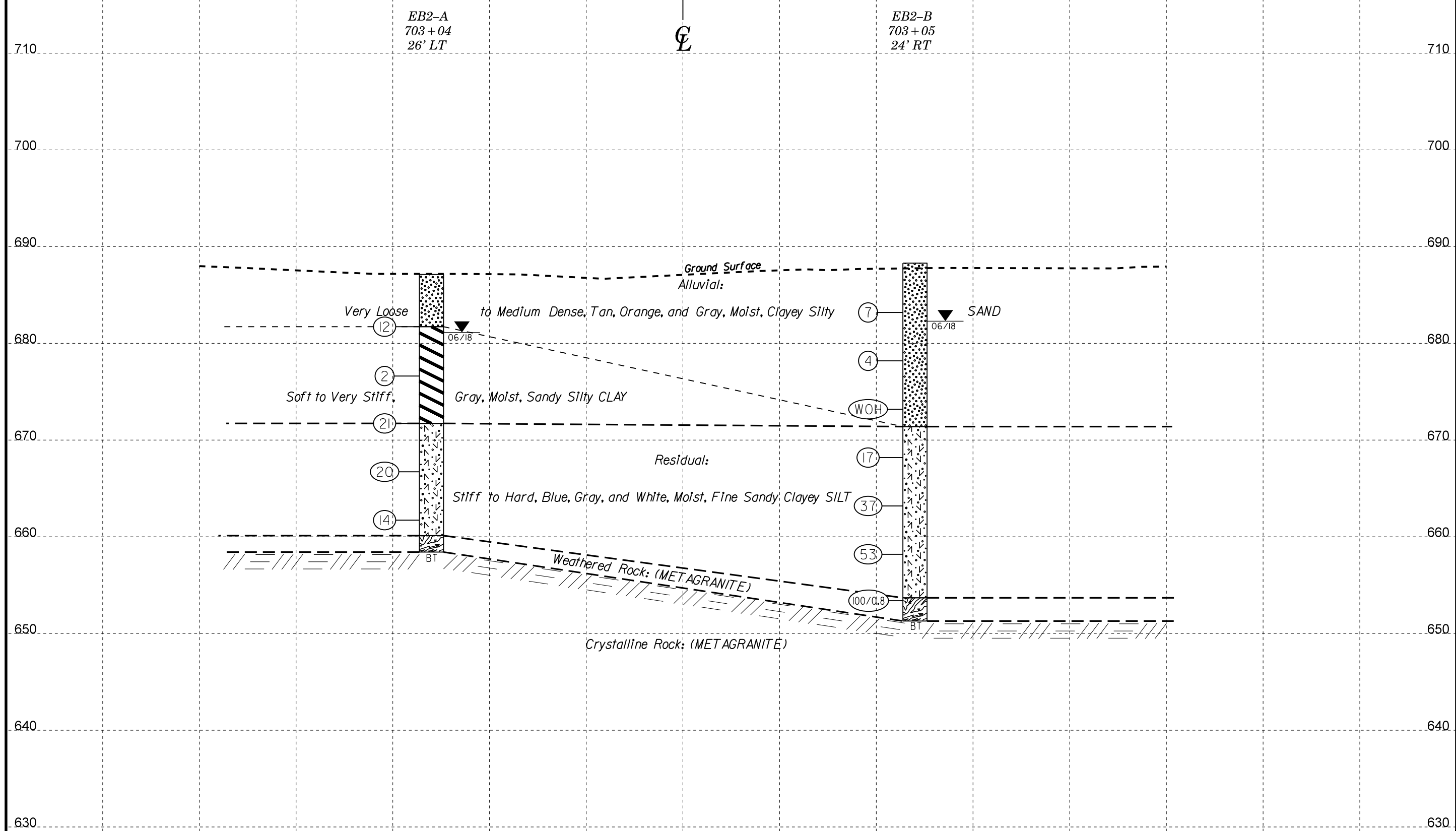
BRIDGE NO. 32 WEST BOUND LANES

GROUNDLINE TAKEN FROM .TIN FILE RECEIVED BY NCDOT DATED 07/23/2018.
INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH
PROJECTED ONTO THE CROSS SECTION

50 40 30 20 10 0 10 20 30 40 50



PROJECT REFERENCE NO.	SHEET NO.
I-5823	13
CROSS SECTION THROUGH END BENT 2	
AT -L-LT- STATION 703+04	
SKEW=90°	



BRIDGE NO. 32 WEST BOUND LANES

GROUNDLINE TAKEN FROM .TIN FILE RECEIVED BY NCDOT DATED 07/23/2018.
INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH
PROJECTED ONTO THE CROSS SECTION

50 40 30 20 10 0 10 20 30 40 50

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 50466.1.1		TIP I-5823		COUNTY DAVIE		GEOLOGIST Stickney, J. K.									
SITE DESCRIPTION Bridge No. 29 over Hunting Creek on I-40 East Bound Lanes							GROUND WTR (ft)								
BORING NO. EB1-A		STATION 701+61		OFFSET 13 ft LT		ALIGNMENT -L-									
COLLAR ELEV. 701.0 ft		TOTAL DEPTH 48.3 ft		NORTHING 785,221		EASTING 1,511,797									
DRILL RIG/HAMMER EFF./DATE HFC0072 CME-550X 90% 05/23/2017			DRILL METHOD NW Casing w/ SPT			HAMMER TYPE Automatic									
DRILLER Smith, C. L.		START DATE 07/12/18		COMP. DATE 07/12/18		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					
705															
700														701.0	GROUND SURFACE
															ROADWAY EMBANKMENT
															Red and Orange, Sandy Silty CLAY
695	696.7	4.3	1	2	2										
690	691.7	9.3	2	3	4										
685	686.7	14.3	5	4	7									685.7	ALLUVIAL
															Gray, Sandy Silty CLAY
680	681.7	19.3	3	0	0										
675	676.7	24.3	1	1	1										
670	671.7	29.3	1	2	2										
665	666.7	34.3	3	7	11									665.7	RESIDUAL
															Blue, Gray, and White, Clayey Silty SAND
660	661.7	39.3	10	14	54										
655	656.7	44.3	38	32	34										
														652.7	Boring Terminated with Casing Advancer Refusal at Elevation 652.7 ft on Crystalline Rock (METAGRANITE)

WBS 50466.1.1		TIP I-5823		COUNTY DAVIE		GEOLOGIST Stickney, J. K.									
SITE DESCRIPTION Bridge No. 29 over Hunting Creek on I-40 East Bound Lanes							GROUND WTR (ft)								
BORING NO. EB1-B		STATION 701+60		OFFSET 13 ft RT		ALIGNMENT -L-									
COLLAR ELEV. 700.2 ft		TOTAL DEPTH 52.5 ft		NORTHING 785,200		EASTING 1,511,812									
DRILL RIG/HAMMER EFF./DATE HFC0072 CME-550X 90% 05/23/2017			DRILL METHOD NW Casing w/ SPT			HAMMER TYPE Automatic									
DRILLER Smith, C. L.		START DATE 07/09/18		COMP. DATE 07/09/18		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					
705															
700														700.2	GROUND SURFACE
															ROADWAY EMBANKMENT
															Red and Orange, Sandy Silty CLAY
695	695.9	4.3	1	1	4										
690	690.9	9.3	2	3	4										
685	685.9	14.3	3	6	8									684.4	ALLUVIAL
															Orange and Gray, Clayey Silty SAND
680	680.9	19.3	WOR	WOR	WOR										
675	675.9	24.3	WOH	WOH	WOH										
670	670.9	29.3	3	3	3										
665	665.9	34.3	9	8	11									665.9	RESIDUAL
															Blue, Gray, and White, Clayey Silty SAND
660	660.9	39.3	10	28	59										
655	655.9	44.3	100/0.3											655.9	WEATHERED ROCK
															(METAGRANITE)
650	650.9	49.3	100/0.4												
														647.7	Boring Terminated with Casing Advancer Refusal at Elevation 647.7 ft on Crystalline Rock (METAGRANITE)

NCDOT BORE DOUBLE I5823_GEO_BH_BRDG0029.GPJ NC_DOT_GDT 8/17/18

GEOTECHNICAL BORING REPORT BORE LOG

GEOTECHNICAL BORING REPORT CORE LOG

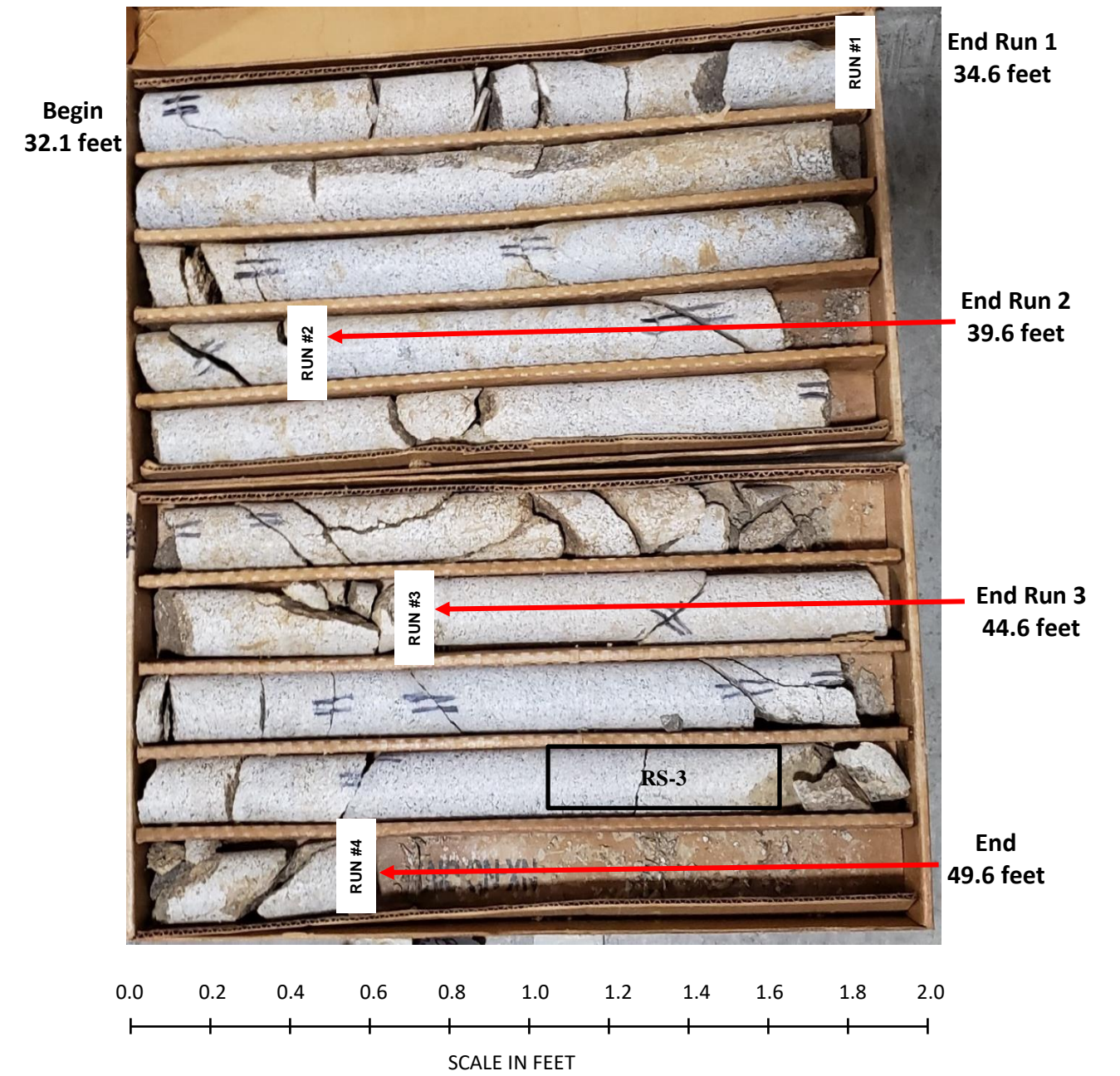
WBS 50466.1.1			TIP I-5823			COUNTY DAVIE			GEOLOGIST Stickney, J. K.					
SITE DESCRIPTION Bridge No. 29 over Hunting Creek on I-40 East Bound Lanes									GROUND WTR (ft)					
BORING NO. B1-A			STATION 702+30			OFFSET 23 ft LT			ALIGNMENT -L-					
COLLAR ELEV. 689.4 ft			TOTAL DEPTH 49.6 ft			NORTHING 785,270			EASTING 1,511,847					
DRILL RIG/HAMMER EFF./DATE HFC0072 CME-550X 90% 05/23/2017						DRILL METHOD NW Casing WSPT & Core			HAMMER TYPE Automatic					
DRILLER Smith, C. L.			START DATE 06/22/18			COMP. DATE 06/22/18			SURFACE WATER DEPTH N/A					
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft 0.5ft 0.5ft			BLOWS PER FOOT 0 25 50 75 100				SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION		DEPTH (ft)
690												GROUND SURFACE 689.4	0.0	
685	685.5	3.9	WOH	WOH	WOH						ALLUVIAL Tan, Orange, and Gray, Micaceous Silty Sandy CLAY			
680	680.5	8.9	WOR	WOR	WOR						RESIDUAL Gray, Green, and White, Clayey Silty SAND with Some Mica			
675	675.5	13.9		1	1	3					WEATHERED ROCK (METAGRANITE)			
670	670.5	18.9		7	12	13					CRYSTALLINE ROCK (METAGRANITE)			
665	665.5	23.9		3	6	8								
660	660.5	28.9		22	27	24								
655														
650														
645														
640														

WBS 50466.1.1			TIP I-5823			COUNTY DAVIE			GEOLOGIST Stickney, J. K.				
SITE DESCRIPTION Bridge No. 29 over Hunting Creek on I-40 East Bound Lanes									GROUND WTR (ft)				
BORING NO. B1-A			STATION 702+30			OFFSET 23 ft LT			ALIGNMENT -L-				
COLLAR ELEV. 689.4 ft			TOTAL DEPTH 49.6 ft			NORTHING 785,270			EASTING 1,511,847				
DRILL RIG/HAMMER EFF./DATE HFC0072 CME-550X 90% 05/23/2017						DRILL METHOD NW Casing WSPT & Core			HAMMER TYPE Automatic				
DRILLER Smith, C. L.			START DATE 06/22/18			COMP. DATE 06/22/18			SURFACE WATER DEPTH N/A				
CORE SIZE NX						TOTAL RUN 17.5 ft							
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	REC. (ft) %	ROD (ft) %	SAMP. NO.	STRATA REC. (ft) % ROD (ft) %		LOG	DESCRIPTION AND REMARKS		DEPTH (ft)
657.33											Begin Coring @ 32.1 ft		
655	654.8	34.6	5.0	1:36/1.0 1:39/1.0 1:36/1.0	(1.9) 76%	(0.6) 24%		(16.0) 91%	(10.3) 59%		CRYSTALLINE ROCK Light Gray, Slightly Weathered, Hard, METAGRANITE with Moderately Close Fracture Spacing GSI=40-55	32.1	
650	649.8	39.6	5.0	1:43/1.0 1:48/1.0 1:36/1.0 1:44/1.0 1:40/1.0	(4.2) 84%	(2.6) 52%							
645	644.8	44.6	5.0	1:50/1.0 1:41/1.0 1:43/1.0 1:44/1.0 1:47/1.0	(4.9) 98%	(3.0) 60%	RS-3						
640	639.8	49.6		2:10/1.0 2:19/1.0 2:15/1.0 2:30/1.0 2:11/1.0	(5.0) 100%	(4.1) 82%					Boring Terminated at Elevation 639.8 ft in Crystalline Rock (METAGRANITE)	49.6	

NCDOT BORE DOUBLE I5823_GEO_BH_BRDG0029.GPJ NC_DOT.GDT 8/17/18

NCDOT BORE DOUBLE I5823_GEO_BH_BRDG0029.GPJ NC_DOT.GDT 8/17/18

CORE PHOTOGRAPHS: Bridge No. 29 over Hunting Creek on I-40 East Bound Lanes, B1-A 702+30, 23' LT



GEOTECHNICAL BORING REPORT BORE LOG

GEOTECHNICAL BORING REPORT CORE LOG

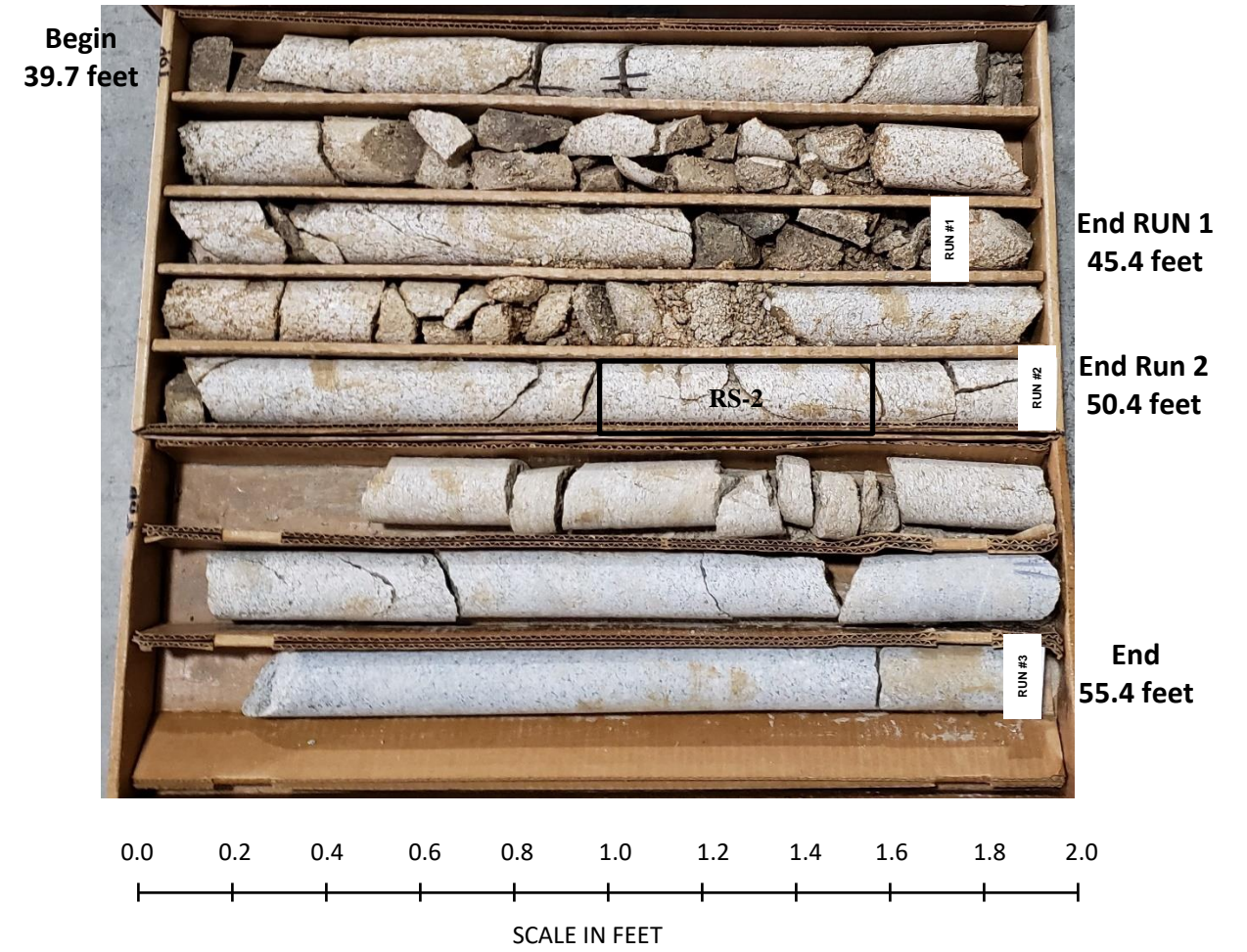
WBS 50466.1.1		TIP I-5823		COUNTY DAVIE		GEOLOGIST Stickney, J. K.										
SITE DESCRIPTION Bridge No. 29 over Hunting Creek on I-40 East Bound Lanes							GROUND WTR (ft)									
BORING NO. B1-B		STATION 702+30		OFFSET 29 ft RT		ALIGNMENT -L-										
COLLAR ELEV. 688.0 ft		TOTAL DEPTH 55.4 ft		NORTHING 785,228		EASTING 1,511,878										
DRILL RIG/HAMMER EFF/DATE HFC0072 CME-550X 90% 05/23/2017				DRILL METHOD NW Casing WSPT & Core		HAMMER TYPE Automatic										
DRILLER Smith, C. L.		START DATE 06/21/18		COMP. DATE 06/21/18		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION			
			0.5ft	0.5ft	0.5ft	0	25	50	75	100			ELEV. (ft)	DEPTH (ft)		
690														688.0	GROUND SURFACE	0.0
685															ALLUVIAL Tan, Orange, and Gray, Micaceous Fine Sandy Silty CLAY	
680	683.4	4.6	WOH	WOH	WOH											
675	678.4	9.6	WOR	WOR	WOR											
670	673.4	14.6														
665	668.4	19.6														
660	663.4	24.6												663.4	RESIDUAL Gray, White, and Yellow, Clayey Silty SAND	24.6
655	658.4	29.6														
650	653.4	34.6												653.4	WEATHERED ROCK (METAGRANITE)	34.6
645	648.4	39.6												648.3	CRYSTALLINE ROCK (METAGRANITE)	39.7
640														637.6	(METAGRANITE)	50.4
635														632.6	Boring Terminated at Elevation 632.6 ft in Crystalline Rock (METAGRANITE)	55.4

NCDOT BORE DOUBLE I5823_GEO_BH_BRDG0029.GPJ NC_DOT.GDT 8/17/18

WBS 50466.1.1		TIP I-5823		COUNTY DAVIE		GEOLOGIST Stickney, J. K.						
SITE DESCRIPTION Bridge No. 29 over Hunting Creek on I-40 East Bound Lanes							GROUND WTR (ft)					
BORING NO. B1-B		STATION 702+30		OFFSET 29 ft RT		ALIGNMENT -L-						
COLLAR ELEV. 688.0 ft		TOTAL DEPTH 55.4 ft		NORTHING 785,228		EASTING 1,511,878						
DRILL RIG/HAMMER EFF/DATE HFC0072 CME-550X 90% 05/23/2017				DRILL METHOD NW Casing WSPT & Core		HAMMER TYPE Automatic						
DRILLER Smith, C. L.		START DATE 06/21/18		COMP. DATE 06/21/18		SURFACE WATER DEPTH N/A						
CORE SIZE NX		TOTAL RUN 15.7 ft										
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		SAMP. NO.	STRATA		LOG	DESCRIPTION AND REMARKS	
					REC. (ft) %	ROD (ft) %		REC. (ft) %	ROD (ft) %		ELEV. (ft)	DEPTH (ft)
648.27	648.3	39.7	5.7	0:56/1.0 0:59/1.0	(5.2) 91%	(0.6) 11%		(14.3) 134%	(4.6) 43%			Begin Coring @ 39.7 ft CRYSTALLINE ROCK
645				0:47/1.0 0:57/1.7								Light Gray to Light Brown, Moderately Weathered, Hard, METAGRANITE with Close Fracture Spacing GSI=20-25
640	642.6	45.4	5.0	1:00/1.0 1:04/1.0 1:02/1.0 1:00/1.0 1:05/1.0	(4.1) 82%	(0.9) 18%	RS-2					
635	637.6	50.4	5.0	1:10/1.0 0:58/1.0 0:50/1.0 1:30/1.0 1:22/1.0	(5.0) 100%	(3.1) 62%						Light Gray, Moderate to Very Slightly Weathered, Hard, METAGRANITE with Close to Moderately Close Fracture Spacing GSI=40-55
	632.6	55.4										Boring Terminated at Elevation 632.6 ft in Crystalline Rock (METAGRANITE)

NCDOT BORE DOUBLE I5823_GEO_BH_BRDG0029.GPJ NC_DOT.GDT 8/17/18

CORE PHOTOGRAPHS: Bridge No. 29 over Hunting Creek on I-40 East Bound Lanes, B1-B 702+30, 29' RT



GEOTECHNICAL BORING REPORT

BORE LOG

WBS 50466.1.1		TIP I-5823		COUNTY DAVIE		GEOLOGIST Stickney, J. K.										
SITE DESCRIPTION Bridge No. 29 over Hunting Creek on I-40 East Bound Lanes							GROUND WTR (ft)									
BORING NO. B2-A		STATION 703+40		OFFSET 22 ft LT		ALIGNMENT -L-										
COLLAR ELEV. 690.5 ft		TOTAL DEPTH 50.3 ft		NORTHING 785,334		EASTING 1,511,937										
DRILL RIG/HAMMER EFF./DATE HFC0072 CME-550X 90% 05/23/2017			DRILL METHOD NW Casing w/ SPT			HAMMER TYPE Automatic										
DRILLER Smith, C. L.		START DATE 06/25/18		COMP. DATE 06/25/18		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						
695																
690																
685	685.7	4.8	1	1	1											
680	680.7	9.8	WOH	WOH	WOH											
675	675.7	14.8	WOH	WOH	2											
670	670.7	19.8	5	7	6											
665	665.7	24.8	7	12	14											
660	660.7	29.8	14	21	28											
655	655.7	34.8	100/0.5													
650	650.7	39.8	100/0.3													
645	645.7	44.8	100/0.2													
	640.7	49.8	100/0.5													

WBS 50466.1.1		TIP I-5823		COUNTY DAVIE		GEOLOGIST Stickney, J. K.										
SITE DESCRIPTION Bridge No. 29 over Hunting Creek on I-40 East Bound Lanes							GROUND WTR (ft)									
BORING NO. B2-B		STATION 703+42		OFFSET 29 ft RT		ALIGNMENT -L-										
COLLAR ELEV. 688.5 ft		TOTAL DEPTH 49.5 ft		NORTHING 785,294		EASTING 1,511,968										
DRILL RIG/HAMMER EFF./DATE HFC0072 CME-550X 90% 05/23/2017			DRILL METHOD NW Casing w/ SPT			HAMMER TYPE Automatic										
DRILLER Smith, C. L.		START DATE 06/26/18		COMP. DATE 06/26/18		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						
690																
685	683.9	4.6	WOH	WOH	1											
680	678.9	9.6	WOH	WOH	WOH											
675	673.9	14.6	WOH	WOH	3											
670	668.9	19.6	6	8	10											
665	663.9	24.6	6	7	10											
660	658.9	29.6	15	23	36											
655	653.9	34.6	100/0.4													
650	649.1	39.4	100/0.2													
645	644.1	44.4	100/0.2													
640	639.1	49.4	60/0.1													

NCDOT BORE DOUBLE I5823_GEO_BH_BRDG0029.GPJ NC_DOT.GDT 8/8/18

GEOTECHNICAL BORING REPORT

BORE LOG

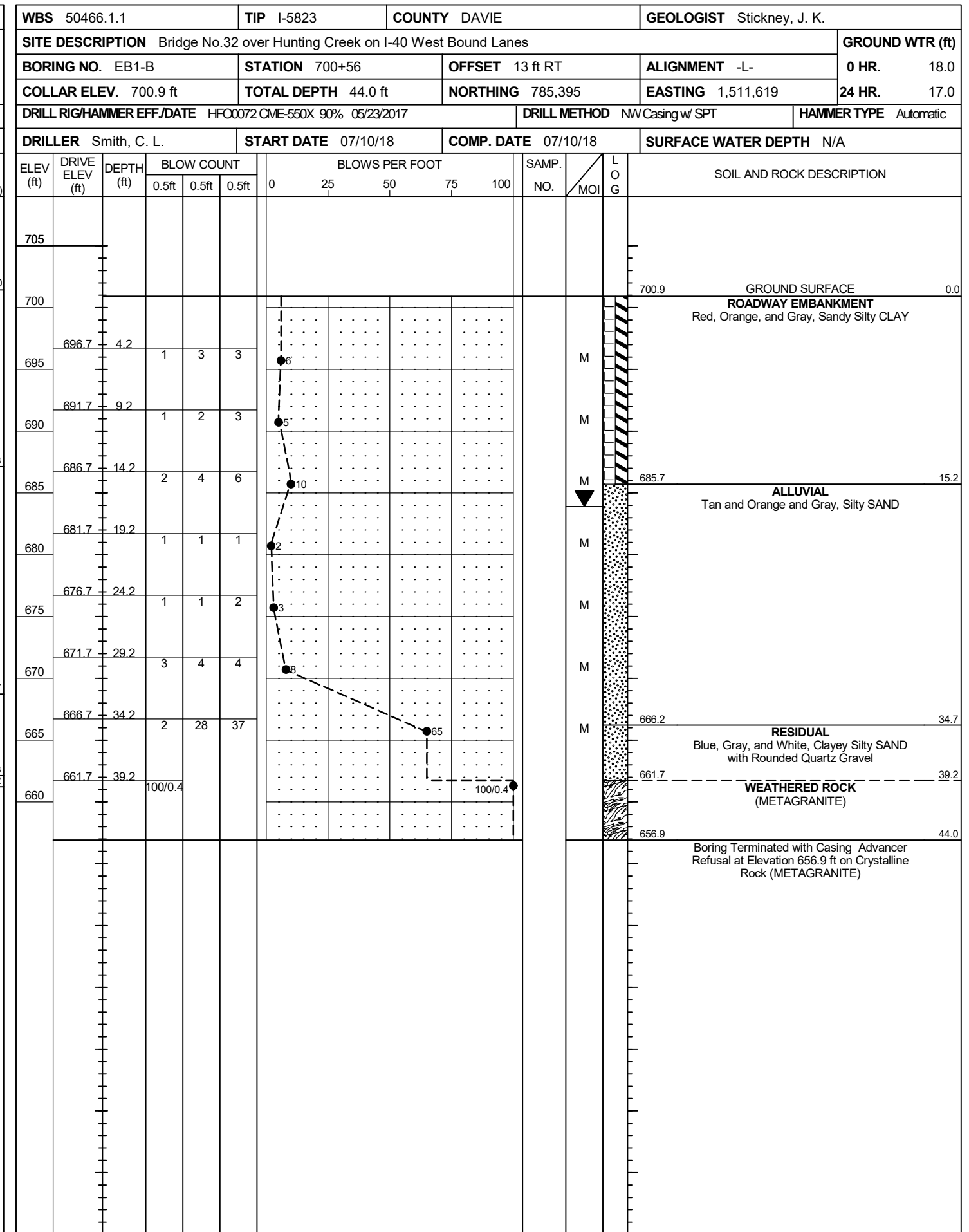
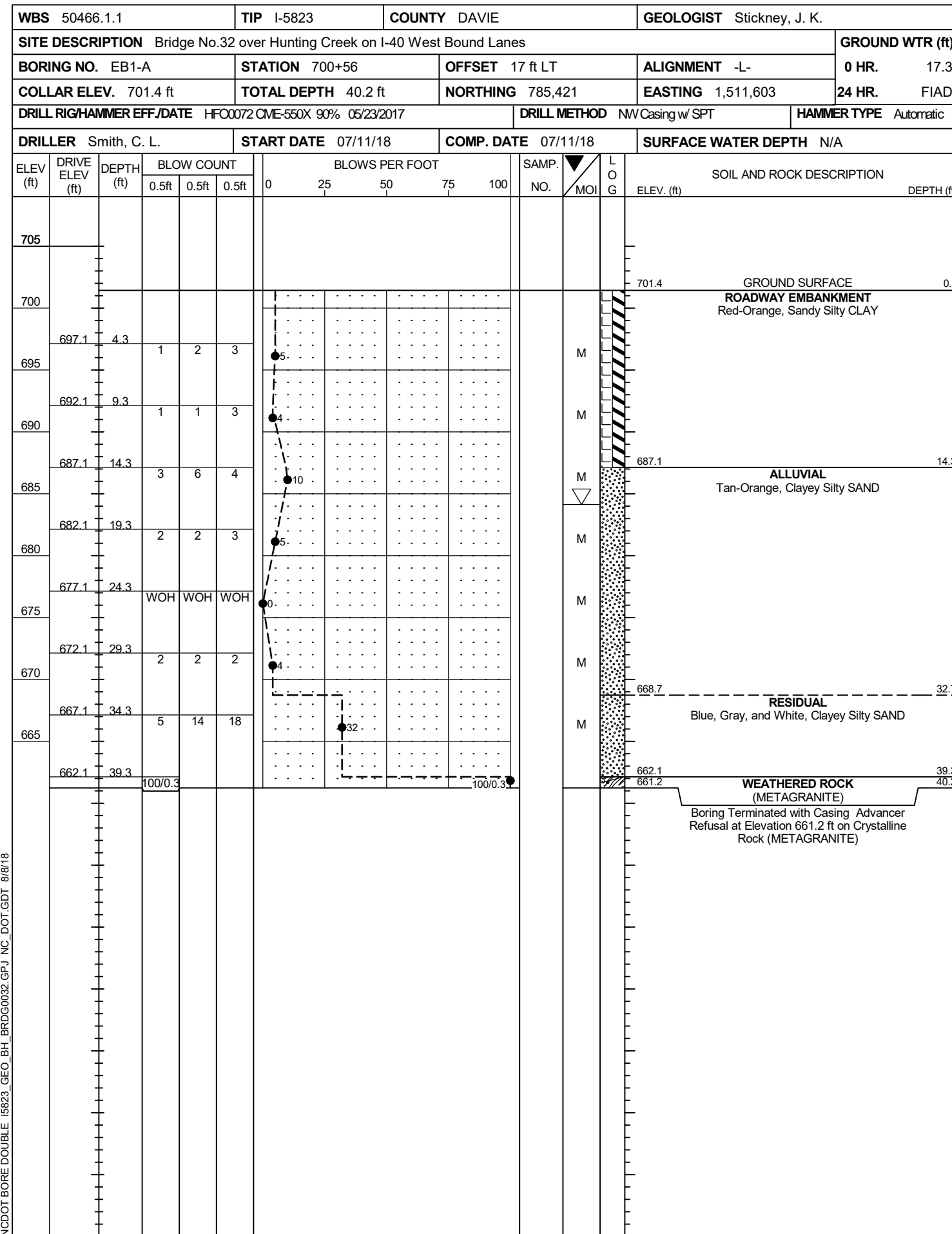
WBS 50466.1.1		TIP I-5823		COUNTY DAVIE		GEOLOGIST Stickney, J. K.									
SITE DESCRIPTION Bridge No. 29 over Hunting Creek on I-40 East Bound Lanes							GROUND WTR (ft)								
BORING NO. EB2-A		STATION 704+10		OFFSET 13 ft LT		ALIGNMENT -L-									
COLLAR ELEV. 700.9 ft		TOTAL DEPTH 49.2 ft		NORTHING 785,368		EASTING 1,511,999									
DRILL RIG/HAMMER EFF./DATE HFC0072 CME-550X 90% 05/23/2017			DRILL METHOD NW Casing w/ SPT			HAMMER TYPE Automatic									
DRILLER Smith, C. L.		START DATE 07/12/18		COMP. DATE 07/12/18		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				ELEV. (ft)	DEPTH (ft)
705															
700														700.9	GROUND SURFACE
															ROADWAY EMBANKMENT Orange and Gray, Sandy Silty CLAY
695	696.5	4.4	1	2	3										
690	691.5	9.4	2	3	6										
685	686.5	14.4	2	2	3									686.5	ALLUVIAL Tan, Orange, and Brown, Sandy Silty CLAY
680	681.5	19.4	1	2	4										
675	676.5	24.4	WOH	WOH	WOH										
670	671.5	29.4	2	3	5										
665	666.5	34.4	10	22	26									668.5	RESIDUAL Blue, Gray, and White, Clayey Silty SAND
660	661.5	39.4	10	10	13										
655	656.5	44.4	100/0.4											656.5	WEATHERED ROCK (METAGRANITE)
														651.7	Boring Terminated with Casing Advancer Refusal at Elevation 651.7 ft on Crystalline Rock (METAGRANITE)

WBS 50466.1.1		TIP I-5823		COUNTY DAVIE		GEOLOGIST Stickney, J. K.									
SITE DESCRIPTION Bridge No. 29 over Hunting Creek on I-40 East Bound Lanes							GROUND WTR (ft)								
BORING NO. EB2-B		STATION 704+09		OFFSET 15 ft RT		ALIGNMENT -L-									
COLLAR ELEV. 700.0 ft		TOTAL DEPTH 42.8 ft		NORTHING 785,344		EASTING 1,512,014									
DRILL RIG/HAMMER EFF./DATE HFC0072 CME-550X 90% 05/23/2017			DRILL METHOD NW Casing w/ SPT			HAMMER TYPE Automatic									
DRILLER Smith, C. L.		START DATE 07/09/18		COMP. DATE 07/09/18		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				ELEV. (ft)	DEPTH (ft)
705															
700														700.0	GROUND SURFACE
															ROADWAY EMBANKMENT Gray, Sandy Silty CLAY
695	696.8	3.2	1	2	4										
690	691.8	8.2	1	3	3										
685	686.8	13.2	1	1	2									687.8	ALLUVIAL Tan, Brown, Orange, Sandy Silty CLAY
680	681.8	18.2	1	2	2										
675	676.8	23.2	1	4	7										
670	671.8	28.2	5	5	9										
665	666.8	33.2	27	47	53/0.5									667.9	RESIDUAL Blue, Gray, White, Clayey Silty SAND
														666.3	WEATHERED ROCK (METAGRANITE)
660	661.8	38.2	100/0.3											657.2	Boring Terminated with Casing Advancer Refusal at Elevation 657.2 ft on Crystalline Rock (METAGRANITE)

NCDOT BORE DOUBLE I5823_GEO_BH_BRDG0029.GPJ NC_DOT.GDT 8/8/18

GEOTECHNICAL BORING REPORT

BORE LOG



NCDOT BORE DOUBLE I5823_GEO_BH_BRD0032.GPJ NC_DOT.GDT 8/8/18

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 50466.1.1		TIP I-5823		COUNTY DAVIE		GEOLOGIST Stickney, J. K.	
SITE DESCRIPTION Bridge No.32 over Hunting Creek on I-40 West Bound Lanes							GROUND WTR (ft)
BORING NO. B1-A		STATION 701+09		OFFSET 17 ft LT		ALIGNMENT -L-	
COLLAR ELEV. 701.6 ft		TOTAL DEPTH 64.3 ft		NORTHING 785,449		EASTING 1,511,648	
DRILL RIG/HAMMER EFF./DATE HFC0072 CME-550X 90% 05/23/2017			DRILL METHOD NW Casing w/ SPT			HAMMER TYPE Automatic	
DRILLER Smith, C. L.		START DATE 07/11/18		COMP. DATE 07/11/18		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					
705															
700															
	697.3	4.3		1	2	3									
695															
	692.3	9.3		1	3	3									
690															
	687.3	14.3		1	2	3									
685															
	682.3	19.3		1	1	1									
680															
	677.3	24.3		1	2	3									
675															
	672.3	29.3		2	3	7									
670															
	667.3	34.3		23	37	43									
665															
	662.5	39.1		23	24	55									
660															
	657.5	44.1		100/0.4											
655															
	652.5	49.1		100/0.2											
650															
	647.5	54.1		100/0.2											
645															
	642.5	59.1		100/0.5											
640															
	637.5	64.1		100/0.2											

WBS 50466.1.1		TIP I-5823		COUNTY DAVIE		GEOLOGIST Stickney, J. K.	
SITE DESCRIPTION Bridge No.32 over Hunting Creek on I-40 West Bound Lanes							GROUND WTR (ft)
BORING NO. B1-B		STATION 701+08		OFFSET 13 ft RT		ALIGNMENT -L-	
COLLAR ELEV. 702.0 ft		TOTAL DEPTH 59.3 ft		NORTHING 785,423		EASTING 1,511,663	
DRILL RIG/HAMMER EFF./DATE HFC0072 CME-550X 90% 05/23/2017			DRILL METHOD NW Casing w/ SPT			HAMMER TYPE Automatic	
DRILLER Smith, C. L.		START DATE 07/10/18		COMP. DATE 07/10/18		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					
705															
700															
	697.6	4.4		1	4	2									
695															
	692.6	9.4		1	2	3									
690															
	687.6	14.4		1	2	4									
685															
	682.6	19.4		WOR	WOR	WOR									
680															
	677.6	24.4		1	1	2									
675															
	672.6	29.4		1	2	3									
670															
	667.6	34.4		8	10	16									
665															
	662.6	39.4		10	11	20									
660															
	657.6	44.4		20	59	41/0.1									
655															
	652.8	49.2		100/0.2											
650															
	647.8	54.2		100/0.2											
645															
	642.8	59.2		60/0.1											

NCDOT BORE DOUBLE I5823 GEO_BH_BRDG0032.GPJ NC_DOT.GDT 8/8/18

GEOTECHNICAL BORING REPORT BORE LOG

GEOTECHNICAL BORING REPORT CORE LOG

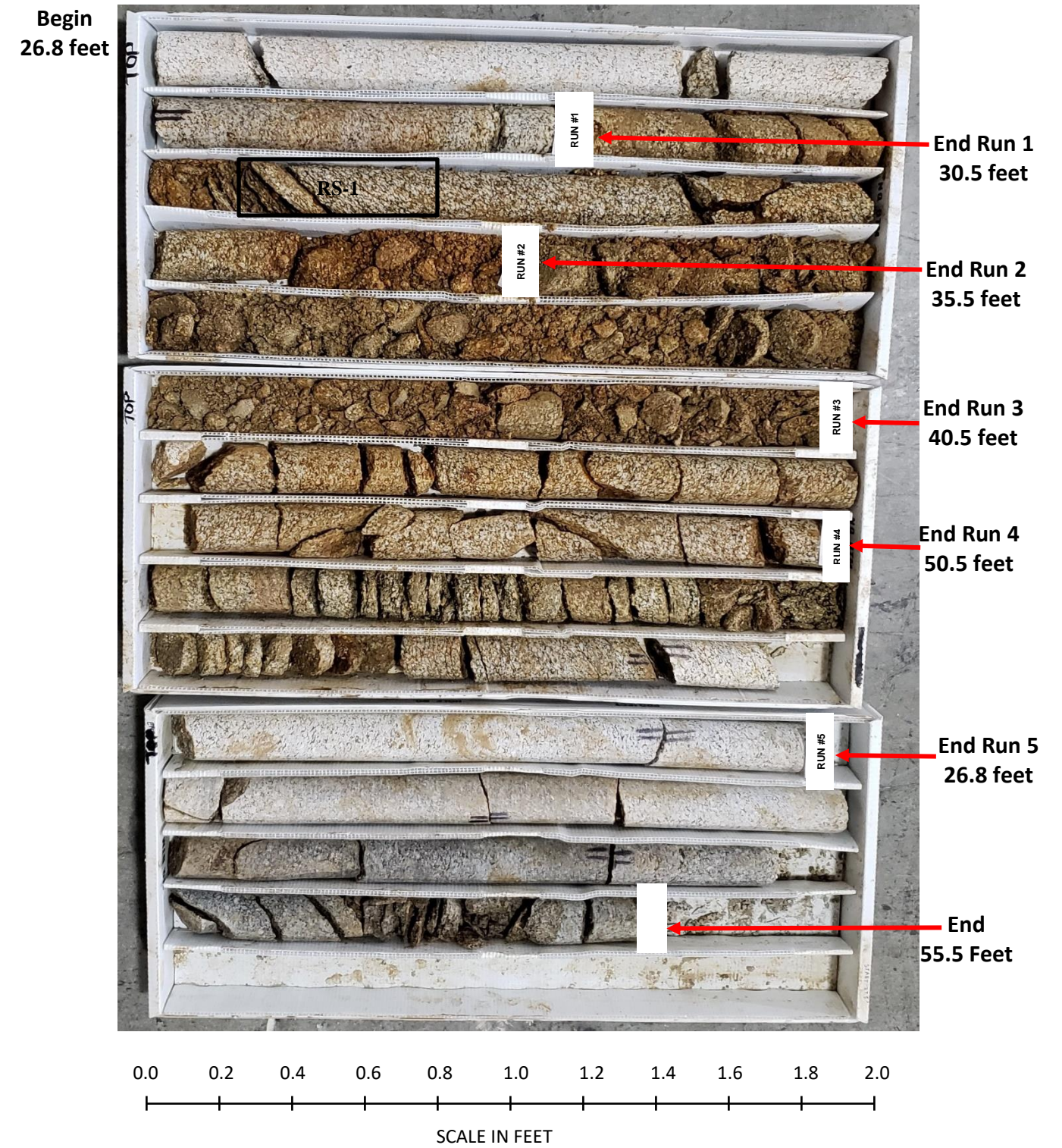
WBS 50466.1.1		TIP I-5823		COUNTY DAVIE		GEOLOGIST Stickney, J. K.										
SITE DESCRIPTION Bridge No.32 over Hunting Creek on I-40 West Bound Lanes							GROUND WTR (ft)									
BORING NO. B2-A		STATION 702+39		OFFSET 25 ft LT		ALIGNMENT -L-										
COLLAR ELEV. 688.4 ft		TOTAL DEPTH 55.5 ft		NORTHING 785,525		EASTING 1,511,754										
DRILL RIG/HAMMER EFF./DATE HFO0072 CME-550X 90% 05/23/2017				DRILL METHOD NW Casing W/SPT & Core		HAMMER TYPE Automatic										
DRILLER Smith, C. L.		START DATE 06/26/18		COMP. DATE 06/26/18		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			ELEV. (ft)	DEPTH (ft)		
690														688.4	GROUND SURFACE	0.0
685	683.7	4.7	WOH	WOH	WOH								M	682.7	ALLUVIAL Gray and Orange, Silty Clayey SAND	5.7
680	678.7	9.7	WOH	WOH	1								M		Gray, Silty Sandy CLAY with Some Mica	
675	673.7	14.7	WOH	1	1								M			
670	668.7	19.7	1	3	4								M	667.7	RESIDUAL	20.7
665	663.7	24.7	100/0.2										M	665.7	Blue, Gray, and White, Clayey Sandy SILT	22.7
660														661.6	WEATHERED ROCK (METAGRANITE)	26.8
655													RS-1		CRYSTALLINE ROCK (METAGRANITE)	
650																
645																
640																
635																
														632.9	Boring Terminated at Elevation 632.9 ft in Crystalline Rock (METAGRANITE)	55.5

NCDOT BORE DOUBLE I5823_GEO_BH_BRDG0032.GPJ NC_DOT.GDT 8/17/18

WBS 50466.1.1		TIP I-5823		COUNTY DAVIE		GEOLOGIST Stickney, J. K.				
SITE DESCRIPTION Bridge No.32 over Hunting Creek on I-40 West Bound Lanes							GROUND WTR (ft)			
BORING NO. B2-A		STATION 702+39		OFFSET 25 ft LT		ALIGNMENT -L-				
COLLAR ELEV. 688.4 ft		TOTAL DEPTH 55.5 ft		NORTHING 785,525		EASTING 1,511,754				
DRILL RIG/HAMMER EFF./DATE HFO0072 CME-550X 90% 05/23/2017				DRILL METHOD NW Casing W/SPT & Core		HAMMER TYPE Automatic				
DRILLER Smith, C. L.		START DATE 06/26/18		COMP. DATE 06/26/18		SURFACE WATER DEPTH N/A				
CORE SIZE NX		TOTAL RUN 28.7 ft								
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		STRATA		LOG	DESCRIPTION AND REMARKS
					REC. (%)	ROD (%)	REC. (%)	ROD (%)		
661.55										Begin Coring @ 26.8 ft
660	661.6	26.8	3.7	1:20/1.0 1:10/1.0 1:09/1.0	(3.0) 81%	(2.3) 62%	(24.7) 86%	(8.5) 30%		CRYSTALLINE ROCK Light Gray, Slightly Weathered, Hard, METAGRANITE, Close to Moderately Close Fracture Spacing
655	657.9	30.5	5.0	0:45/1.0 0:53/1.0 0:51/1.0 1:01/1.0 0:55/1.0	(3.6) 72%	(0.9) 18%			RS-1	
650	652.9	35.5	5.0	0:40/1.0 0:36/1.0 0:34/1.0 0:42/1.0 0:38/1.0	(4.4) 88%	(0.0) 0%				
645	647.9	40.5	5.0	0:38/1.0 0:44/1.0 0:39/1.0 0:57/1.0 0:59/1.0	(3.7) 74%	(0.0) 0%				
640	642.9	45.5	5.0	0:51/1.0 0:47/1.0 0:53/1.0 0:55/1.0 0:50/1.0	(5.0) 100%	(2.5) 50%				
635	637.9	50.5	5.0	0:53/1.0 0:51/1.0 0:46/1.0 0:55/1.0 0:57/1.0	(5.5) 110%	(2.8) 56%				
	632.9	55.5								Boring Terminated at Elevation 632.9 ft in Crystalline Rock (METAGRANITE)

NCDOT BORE DOUBLE I5823_GEO_BH_BRDG0032.GPJ NC_DOT.GDT 8/17/18

CORE PHOTOGRAPHS: Bridge No. 32 over Hunting Creek on I-40 West Bound Lanes, B2-A 702+39, 25' LT



GEOTECHNICAL BORING REPORT BORE LOG

WBS 50466.1.1		TIP I-5823		COUNTY DAVIE		GEOLOGIST Stickney, J. K.	
SITE DESCRIPTION Bridge No.32 over Hunting Creek on I-40 West Bound Lanes							GROUND WTR (ft)
BORING NO. B2-B		STATION 702+43		OFFSET 23 ft RT		ALIGNMENT -L-	
COLLAR ELEV. 687.3 ft		TOTAL DEPTH 49.7 ft		NORTHING 785,486		EASTING 1,511,783	
DRILL RIG/HAMMER EFF./DATE HFC0072 CME-550X 90% 05/23/2017		DRILL METHOD NW Casing w/ SPT		HAMMER TYPE Automatic			
DRILLER Smith, C. L.		START DATE 06/27/18		COMP. DATE 06/27/18		SURFACE WATER DEPTH N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	LOG	SOIL AND ROCK DESCRIPTION			
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				ELEV. (ft)	DEPTH (ft)		
690																	
															687.3	GROUND SURFACE	0.0
685																ALLUVIAL Gray, Orange, Silty Sandy CLAY with Some Mica	
680	682.4	4.9	WOH	WOH	WOH												
675	677.5	9.8	WOH	WOH	WOH												
670	672.5	14.8	WOH	WOH	1												
665	667.5	19.8	5	6	16										666.5	RESIDUAL Blue, Gray, and White, Clayey Sandy SILT	20.8
660	662.5	24.8	20	45	55/0.5										661.5	WEATHERED ROCK (METAGRANITE)	25.8
655	657.5	29.8	8	29	71/0.4												
650	652.5	34.8															
645	647.7	39.6															
640	642.7	44.6															
	637.7	49.6													637.6	Boring Terminated with Standard Penetration Test Refusal at Elevation 637.6 ft on Crystalline Rock (METAGRANITE)	49.7
																35.2' Switched to AW Rods and Tricone	

NCDOT BORE DOUBLE I5823_GEO_BH_BRDG0032.GPJ NC_DOT_GDT 8/8/18

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 50466.1.1		TIP I-5823		COUNTY DAVIE		GEOLOGIST Stickney, J. K.										
SITE DESCRIPTION Bridge No.32 over Hunting Creek on I-40 West Bound Lanes							GROUND WTR (ft)									
BORING NO. EB2-A		STATION 703+04		OFFSET 26 ft LT		ALIGNMENT -L-										
COLLAR ELEV. 687.1 ft		TOTAL DEPTH 28.7 ft		NORTHING 785,560		EASTING 1,511,809										
DRILL RIG/HAMMER EFF./DATE HFC0072 CME-550X 90% 05/23/2017			DRILL METHOD NW Casing w/ SPT			HAMMER TYPE Automatic										
DRILLER Smith, C. L.		START DATE 06/28/18		COMP. DATE 06/28/18		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						
690														687.1	GROUND SURFACE	0.0
685	682.7	4.4	4	6	6								M	ALLUVIAL Gray and Orange, Clayey Silty SAND		
680	677.6	9.5	WOH	WOH	2								M	Gray, Sandy Silty CLAY	5.4	
675	672.7	14.4	7	9	12								M			
670	667.7	19.4	5	9	11								M	RESIDUAL Blue, Gray, and White, Fine Sandy Clayey SILT	15.4	
665	662.7	24.4	3	5	9								M			
660													M	WEATHERED ROCK (METAGRANITE)	27.0	
														658.4	Boring Terminated with Casing Advancer Refusal at Elevation 658.4 ft on Crystalline Rock (METAGRANITE)	28.7

WBS 50466.1.1		TIP I-5823		COUNTY DAVIE		GEOLOGIST Stickney, J. K.										
SITE DESCRIPTION Bridge No.32 over Hunting Creek on I-40 West Bound Lanes							GROUND WTR (ft)									
BORING NO. EB2-B		STATION 703+05		OFFSET 24 ft RT		ALIGNMENT -L-										
COLLAR ELEV. 688.3 ft		TOTAL DEPTH 37.0 ft		NORTHING 785,518		EASTING 1,511,836										
DRILL RIG/HAMMER EFF./DATE HFC0072 CME-550X 90% 05/23/2017			DRILL METHOD NW Casing w/ SPT			HAMMER TYPE Automatic										
DRILLER Smith, C. L.		START DATE 06/28/18		COMP. DATE 06/28/18		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						
690														688.3	GROUND SURFACE	0.0
685	684.2	4.1	2	3	4								M	ALLUVIAL Tan, Orange, and Gray, Clayey Silty SAND		
680	679.2	9.1	2	2	2								M			
675	674.2	14.1	WOH	WOH	WOH								M			
670	669.2	19.1	6	7	10								M	RESIDUAL Blue, Gray, and White, Fine Sandy Clayey SILT	16.9	
665	664.2	24.1	10	18	19								M			
660	659.2	29.1	18	19	34								M			
655	654.2	34.1	33	67/0.3									M	WEATHERED ROCK (METAGRANITE)	34.6	
														651.3	Boring Terminated with Casing Advancer Refusal at Elevation 651.3 ft on Crystalline Rock (METAGRANITE)	37.0

NCDOT BORE DOUBLE I5823_GEO_BH_BRDG0032.GPJ NC_DOT.GDT 8/8/18

LABORATORY SUMMARY SHEET FOR ROCK CORE SAMPLES

PROJECT NO.: 50466.1.1

TIP: I-5823

COUNTY: DAVIE

Bridge No. 29 and No. 32 on I-40 over Hunting Creek

Sample #	Boring #	Depth (ft)	Rock Type	Geologic Map Unit	Run RQD (%)	Length (in)	Diameter (in)	Unit Weight (PCF)	Unconfined Compressive Strength (PSI)	Remarks
RS-1	B2-A	32.2-32.75	MetaGranite	CZg	30	0.55	1.86	156.1	468	Bridge No.32
RS-2	B1-B	48.5-49.1	MetaGranite	CZg	43	0.6	1.86	164.2	1,469	Bridge No. 29
RS-3	B1-A	40.9-41.6	MetaGranite	CZg	59	0.7	1.86	167.7	6,300	Bridge No. 29

BRIDGE NO. 29 SITE PHOTOGRAPH



Photograph No. 1: Looking at End Bent 1 toward End Bent 2

BRIDGE NO. 32 SITE PHOTOGRAPH



Photograph No. 1: Looking at End Bent 1 toward End Bent 2



Photograph No. 2: Looking Downstream