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STATE OF NORTH CAROLINA

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

STRUCTURE SUBSURFACE INVESTIGATION

COUNTY.	ALAMA	NCE					
PROJECT	DESCRIP	TION _	<i>REPLA</i>	CE I	BRIDGE	<i>NO. 112</i>	OVER
	' FORK						
SITE DES	SCRIPTION	STA.	<i>21</i> + 77	.00 –1	<u></u>		

STATE PROJECT REFERENCE NO. 19 B-5728

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 (1999) 707-6850. THE SUBSURFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA ARE NOT PART OF THE CONTRACT.

CENERAL 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 (MH-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 NIDICATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOIL MOISTURE TRUTH ACCORDING TO CLIMATIC CONDITIONS INCLUDING TEMPERATURES, PRECIPITATION AND WIND, AS WELL AS OTHER NON-CLIMATIC FACTORS.

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TRIGON EXPLORATION INVESTIGATED BY C. DRISCOLL DRAWN BY _C. DRISCOLL SUBMITTED BY KLEINFELDER, INC

C. DRISCOLL



DATE MARCH 2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT REFERENCE NO. SHEET NO. 2

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

CUI UECCDIBIIUM	CDADATION	BULN DESCRIPTION	TEDMO AND DESINITIONS
SOIL DESCRIPTION SOIL IS CONSIDERED UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN	GRADATION WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE.	ROCK DESCRIPTION HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT REFUSAL IF TESTED. AN INFERRED	TERMS AND DEFINITIONS
BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER AND YIELD LESS THAN 100 BLOWS PER FOOT	UNIFORMLY GRADED - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE.	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	ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. AQUIFER - A WATER BEARING FORMATION OR STRATA.
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:	GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLE SIZES OF TWO OR MORE SIZES.	■ BLOWS IN NON-COASTAL PLAIN MATERIAL, THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN	ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.
CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. FOR EXAMPLE,	ANGULARITY OF GRAINS	REPRESENTED BY A ZONE OF WEATHERED ROCK. ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:	ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING
VERY STIFF,GRAY,SILTY CLAY,MOIST WITH INTERBEDDED FINE SAND LAYERS,HIGHLY PLASTIC,A-7-6	THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.	WEATHERED NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES >	A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, SUCH AS SHALE, SLATE, ETC.
SOIL LEGEND AND AASHTO CLASSIFICATION	MINERALOGICAL COMPOSITION	ROCK (WR) 100 BLOWS PER FOOT IF TESTED.	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
GENERAL GRANULAR MATERIALS SILT-CLAY MATERIALS ORGANIC MATERIALS CLASS. (≤ 35% PASSING *200) (> 35% PASSING *200) ORGANIC MATERIALS	MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC.	CRYSTALLINE ROCK (CR) FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE,	SURFACE.
GROUP A-1 A-3 A-2 A-4 A-5 A-6 A-7 A-1, A-2 A-4, A-5	ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.	UNEISS, GABBRU, SCHISI, ETC.	CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.
CLASS. A-1-a A-1-b A-2-4 A-2-5 A-2-6 A-2-7 A-7-5 A-3 A-6, A-7	COMPRESSIBILITY SLIGHTLY COMPRESSIBLE LL < 31	NON-CRYSTALLINE ROCK (NCR) SEDIMENTARY ROCK THAT WOULD VEILD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.	COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.
SYMBOL 000000000000000000000000000000000000	MODERATELY COMPRESSIBLE LL = 31 - 50	COASTAL PLAIN COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD	CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED
7. PASSING GRANULAR SILT- MUCK,	HIGHLY COMPRESSIBLE LL > 50 PERCENTAGE OF MATERIAL	SEDIMENTARY ROCK SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED CP) SHELL BEDS, ETC.	BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.
#40 30 MX 50 MX 51 MN SOILS CLAY PEAT	GRANULAR SILT - CLAY	- WEATHERING	DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.
*200 15 MX 25 MX 10 MX 35 MX 35 MX 35 MX 35 MX 36 MN 36 MN	ORGANIC MATERIAL SOILS SOILS OTHER MATERIAL TRACE OF ORGANIC MATTER 2 - 3% 3 - 5% TRACE 1 - 10%	FRESH ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING, ROCK RINGS UNDER HAMMER IF CRYSTALLINE.	DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE
PASSING *40 SOILS WITH	LITTLE ORGANIC MATTER 3 - 5% 5 - 12% LITTLE 10 - 20%	VERY SLIGHT ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN,	HORIZONTAL.
LL — — 40 MX 41 MN LITTLE OR LICHLY	MODERATELY ORGANIC	(V SLI.) CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF	DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.
GROUP INDEX A A A AMX R MX 12 MX 16 MX NO MX AMOUNTS OF ORGANIC	GROUND WATER	OF A CRYSTALLINE NATURE. SLIGHT ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO	FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE
USUAL TYPES STONE FRAGS. FINE SILTY OR CLAYEY SILTY CLAYEY MATTER		(SLI.) 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR	SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.
OF MAJOR GRAVEL, AND SAND SAND GRAVEL AND SAND SOILS SOILS	▼ STATIC WATER LEVEL AFTER 24 HOURS	CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS. MODERATE SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN	FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES. FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM
CEN RATING FAIR TO	<u> </u>	(MOD.) GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY, ROCK HAS	PARENT MATERIAL.
AS SUBGRADE EXCELLENT TO GOOD FAIR TO POUR POUR ONSOTTABLE	SPRING OR SEEP	DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED WITH FRESH ROCK.	FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.
PI OF A-7-5 SUBGROUP IS ≤ LL - 30 :PI OF A-7-6 SUBGROUP IS > LL - 30		MODERATELY ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED, IN GRANITOID ROCKS, ALL FELDSPARS DULL	FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.
CONSISTENCY OR DENSENESS COMPARATIVES OF RANGE OF STANDARD RANGE OF UNCONFINED	MISCELLANEOUS SYMBOLS	SEVERE AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH (MOD. SEV.) AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK.	JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.
PRIMARY SOIL TYPE COMPACTORES OR PENETRATION RESISTENCE COMPRESSIVE STRENGTH	ROADWAY EMBANKMENT (RE) 25/025 DIP & DIP DIRECTION	<u>IF TESTED, WOULD YIELD SPT REFUSAL</u>	LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO
(N-YALUE) (TUNS/FT-)	WITH SOIL DESCRIPTION → OF ROCK STRUCTURES SPT	SEVERE ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND EVIDENT BUT (SEV.) REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED	ITS LATERAL EXTENT.
GENERALLY VERY LOOSE	SOIL SYMBOL SOIL SYMBOL SLOPE INDICATOR INSTALLATION	TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN.	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
MATERIAL DENSE 10 10 30 N/A	ARTIFICIAL FILL (AF) OTHER AUGER BORING CONE PENETROMETER THAN ROADWAY EMBANKMENT AUGER BORING TEST	IF TESTED, WOULD YIELD SPT N VALUES > 100 BPF VERY ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE	USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.
(NON-COHESIVE) VERY DENSE > 50		SEVERE BUT MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK	PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE
VERY SOFT < 2 < 0.25 GENERALLY SOFT 2 TO 4 0.25 TO 0.5	INFERRED SOIL BOUNDARY CORE BORING SOUNDING ROD	(V SEV.) REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE THAT ONLY MINOR VESTIGES OF ORIGINAL ROCK FABRIC REMAIN. <u>IF TESTED, WOULD YIELD SPT N VALUES < 100 BPF</u>	OF AN INTERVENING IMPERVIOUS STRATUM. RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.
SILT-CLAY MEDIUM STIFF 4 TO 8 0.5 TO 1.0	INFERRED ROCK LINE MONITORING WELL TEST BORING WITH CORE	COMPLETE ROCK REDUCED TO SOIL, ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND	ROCK QUALITY DESIGNATION (ROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF
MATERIAL STIFF 8 TO 15 1 TO 2 (COHESIVE) VERY STIFF 15 TO 30 2 TO 4	TTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTT	SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS ALSO AN EXAMPLE.	ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.
HARD > 30 > 4	INSTRUCTION -	ROCK HARDNESS	SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT
TEXTURE OR GRAIN SIZE	RECOMMENDATION SYMBOLS	VERY HARD CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES	ROCK.
U.S. STD. SIEVE SIZE 4 10 40 60 200 270 OPENING (MM) 4.76 2.00 0.42 0.25 0.075 0.053	UNCLASSIFIED EXCAVATION - UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE	SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.	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
COARSE FINE	SHALLOW UNCLASSIFIED EXCAVATION - USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL	HARD CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.	THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS.
BOULDER	ABBREVIATIONS	MODERATELY CAN BE SCRATCHED BY KNIFE OR PICK, GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE	SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.
GRAIN MM 305 75 2.0 0.25 0.05 0.005	AR - AUGER REFUSAL MED MEDIUM VST - VANE SHEAR TEST	HARD EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK. HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS.	STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR BPF) OF
SIZE IN. 12 3	BT - BORING TERMINATED MICA MICACEOUS WEA WEATHERED	MEDIUM CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT.	A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL
SOIL MOISTURE - CORRELATION OF TERMS	CL CLAY MOD MODERATELY 7 - UNIT WEIGHT CPT - CONE PENETRATION TEST NP - NON PLASTIC 7 - DRY UNIT WEIGHT	HARD CAN BE EXCAVATED IN SMALL CHIPS TO PEICES I INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK.	WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.
SOIL MOISTURE SCALE FIELD MOISTURE GUIDE FOR FIELD MOISTURE DESCRIPTION	CSE COARSE ORG ORGANIC	SOFT CAN BE GROVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS	STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY
(ATTERBERG LIMITS) DESCRIPTION	DMT - DILATOMETER TEST PMT - PRESSUREMETER TEST SAMPLE ABBREVIATIONS DPT - DYNAMIC PENETRATION TEST SAP SAPROLITIC S - BULK	FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE.	TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE. STRATA ROCK QUALITY DESIGNATION (SROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL
- SATURATED - USUALLY LIQUID; VERY WET, USUALLY (SAT.) FROM BELOW THE GROUND WATER TABLE	e - VOID RATIO SD SAND, SANDY SS - SPLIT SPOON F - FINE SL SILT, SILTY ST - SHELBY TUBE	VERY CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES 1 INCH	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.
LL LIQUID LIMIT	FOSS FOSSILIFEROUS SLI SLIGHTLY RS - ROCK	SOFT OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGERNAIL.	TOPSOIL (TS,) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.
PLASTIC SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE	FRAC FRACTURED, FRACTURES TCR - TRICONE REFUSAL RT - RECOMPACTED TRIAXIAL FRAGS FRAGMENTS W - MOISTURE CONTENT CBR - CALIFORNIA BEARING	FRACTURE SPACING BEDDING	
(PI) PL _ PLASTIC LIMITATTAIN OPTIMUM MOISTURE	HI HIGHLY V - VERY RATIO	<u>TERM</u> <u>SPACING</u> <u>TERM</u> <u>THICKNESS</u>	BENCH MARK:
- MOIST - (M) COLIDAT OR NEAR ORTIMIM MOISTURE	EQUIPMENT USED ON SUBJECT PROJECT	VERY WIDE MORE THAN 10 FEET VERY THICKLY BEDDED 4 FEET WIDE 3 TO 10 FEET THICKLY BEDDED 1.5 - 4 FEET	ELEVATION: FEET
OM OPTIMUM MOISTURE = MOIST = MM	DRILL UNITS: ADVANCING TOOLS: HAMMER TYPE: CLAY BITS ADVANCIAL ADVANCIAL	MODERATELY CLOSE 1 TO 3 FEET THINLY BEDDED 0.16 - 1.5 FEET	NOTES:
- DRY - (D) REQUIRES ADDITIONAL WATER TO	CME-45C CLAY BITS X AUTOMATIC MANUAL	CLOSE 0.16 TO 1 FOOT VERY THINLY BEDDED 0.03 - 0.16 FEET VERY CLOSE LESS THAN 0.16 FEET THICKLY LAMINATED 0.008 - 0.03 FEET	FIAD - FILLED IMMEDIATELY AFTER DRILLING
ATTAIN OPTIMUM MUISTURE	X CME-55 G* CONTINUOUS FLIGHT AUGER CORE SIZE:	THINLY LAMINATED < 0.008 FEET	
PLASTICITY	C C C C C C C C C C	INDURATION	THE BORINGS WERE SURVEYED BY SEPLENGINEERING & CONSTRUCTION, INC. USING A SUB CENTIMETER GPS.
PLASTICITY INDEX (PI) DRY STRENGTH NON PLASTIC 0-5 VERY LOW	HARD FACED FINGER BITS X -N Q2	FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC. RUBBING WITH FINGER FREES NUMEROUS GRAINS;	THE ELEVATION OF THE TOP OF BRIDGE RAIL ON THE DOWNSTREAM
SLIGHTLY PLASTIC 6-15 SLIGHT	VANE SHEAR TEST VANE SHEAR TES	FRIABLE GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.	THE ELEVATION OF THE TOP OF BRIDGE RAIL ON THE DOWNSTREAM SIDE OF THE BRIDGE ARE AS FOLLOWS: EB: 610.8 FT EB2: 610.8 FT
MODERATELY PLASTIC 16-25 MEDIUM HIGHLY PLASTIC 26 OR MORE HIGH	X CASING X W/ ADVANCER POST HOLE DIGGER	MODERATELY INDURATED GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE;	EDZ: 010.0 F1
COLOR	PORTABLE HOIST TRICONE STEEL TEETH HAND AUGER X TRICONE 2 15/6 TUNGCARB. SOUNDING ROD	BREAKS EASILY WHEN HIT WITH HAMMER. GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE:	
		INDURATED GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.	
DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY). MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.	X CORE BIT VANE SHEAR TEST	EXTREMELY INDURATED SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE;	
Soon no Eloni, bring Simerice, Elo. Aile OSED TO DESCRIBE ALL ENTANCE.	I	EXTREMELY INDURATED SAMPLE RREAKS ACROSS CRAINS	DATE: 8-15-14

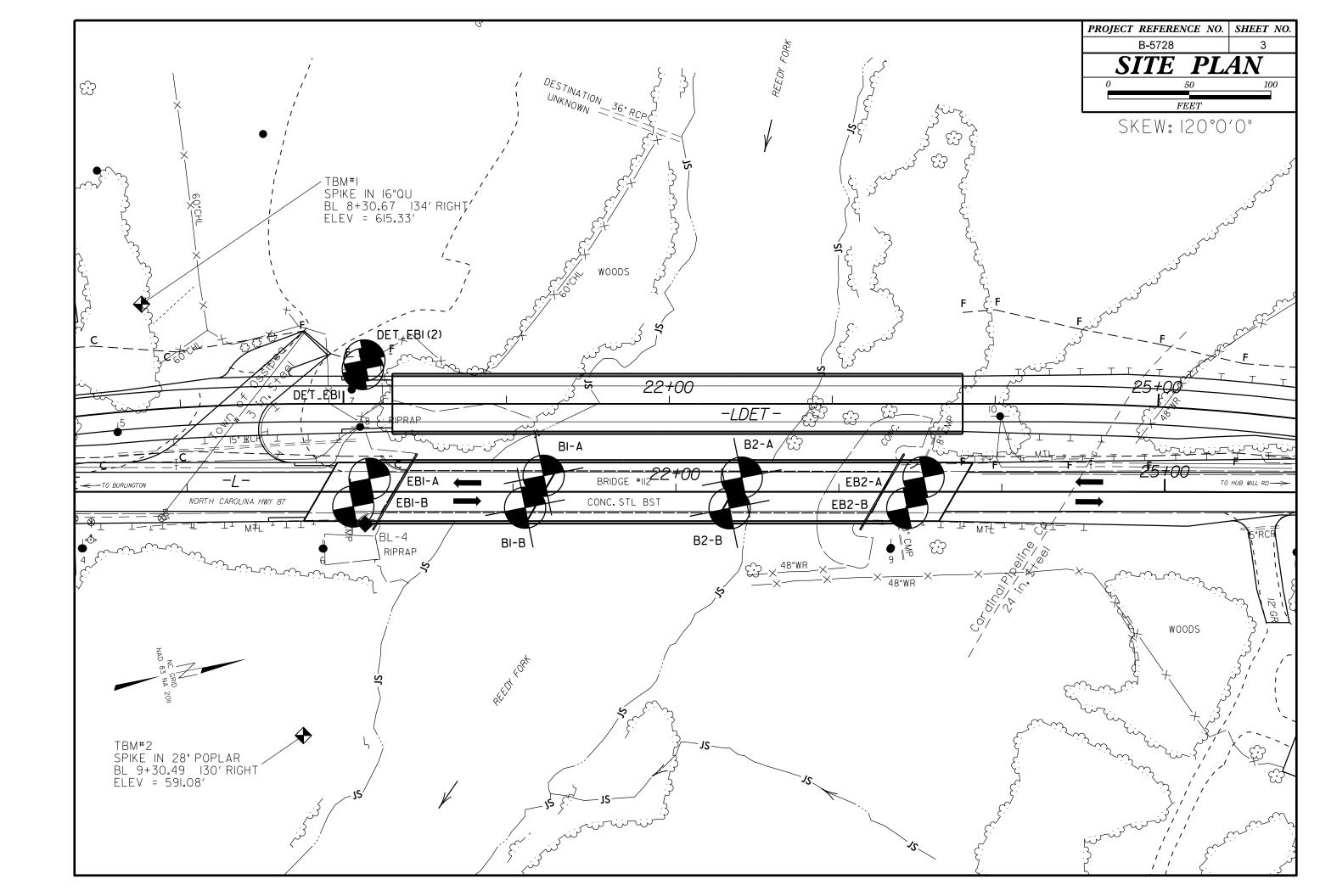
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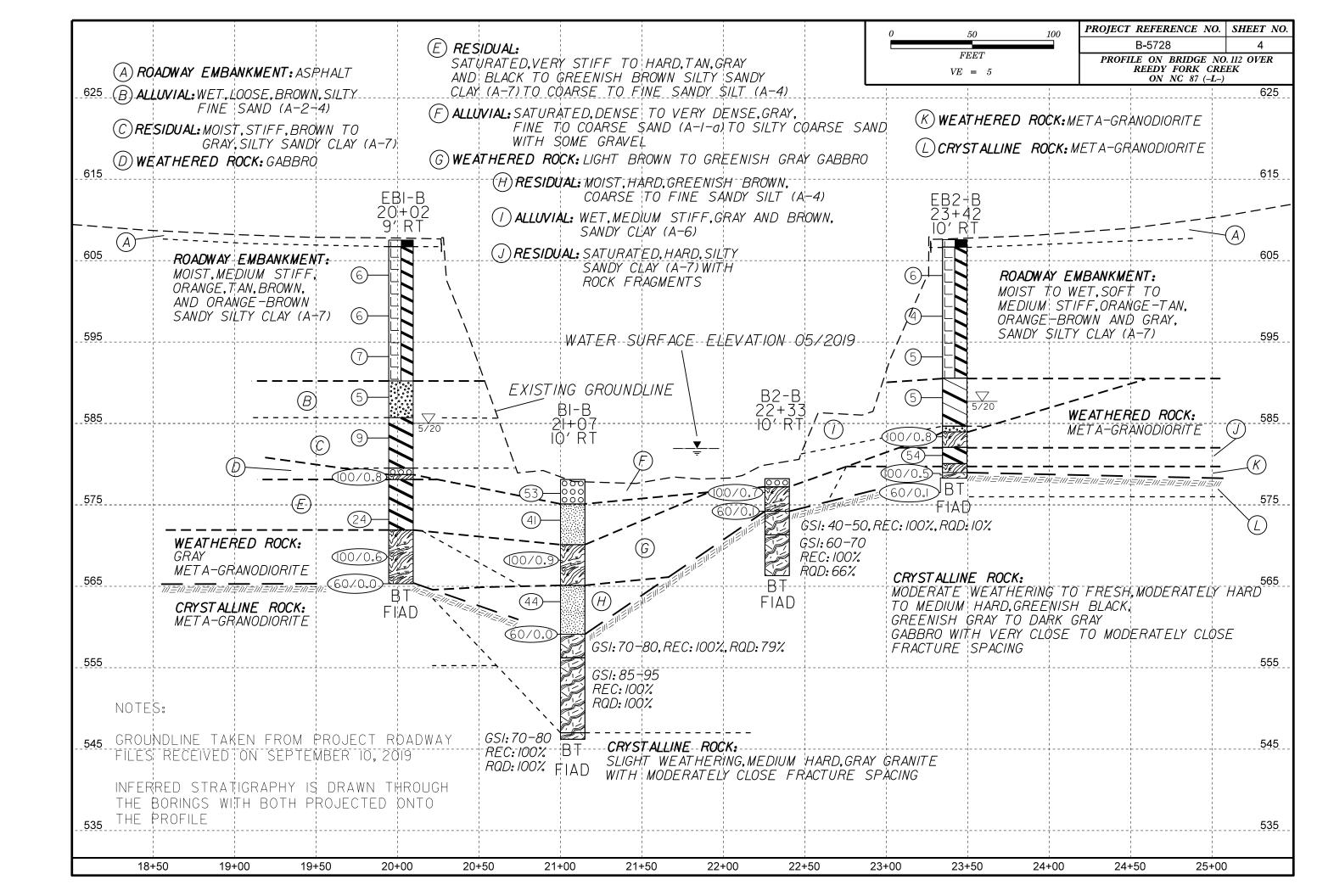
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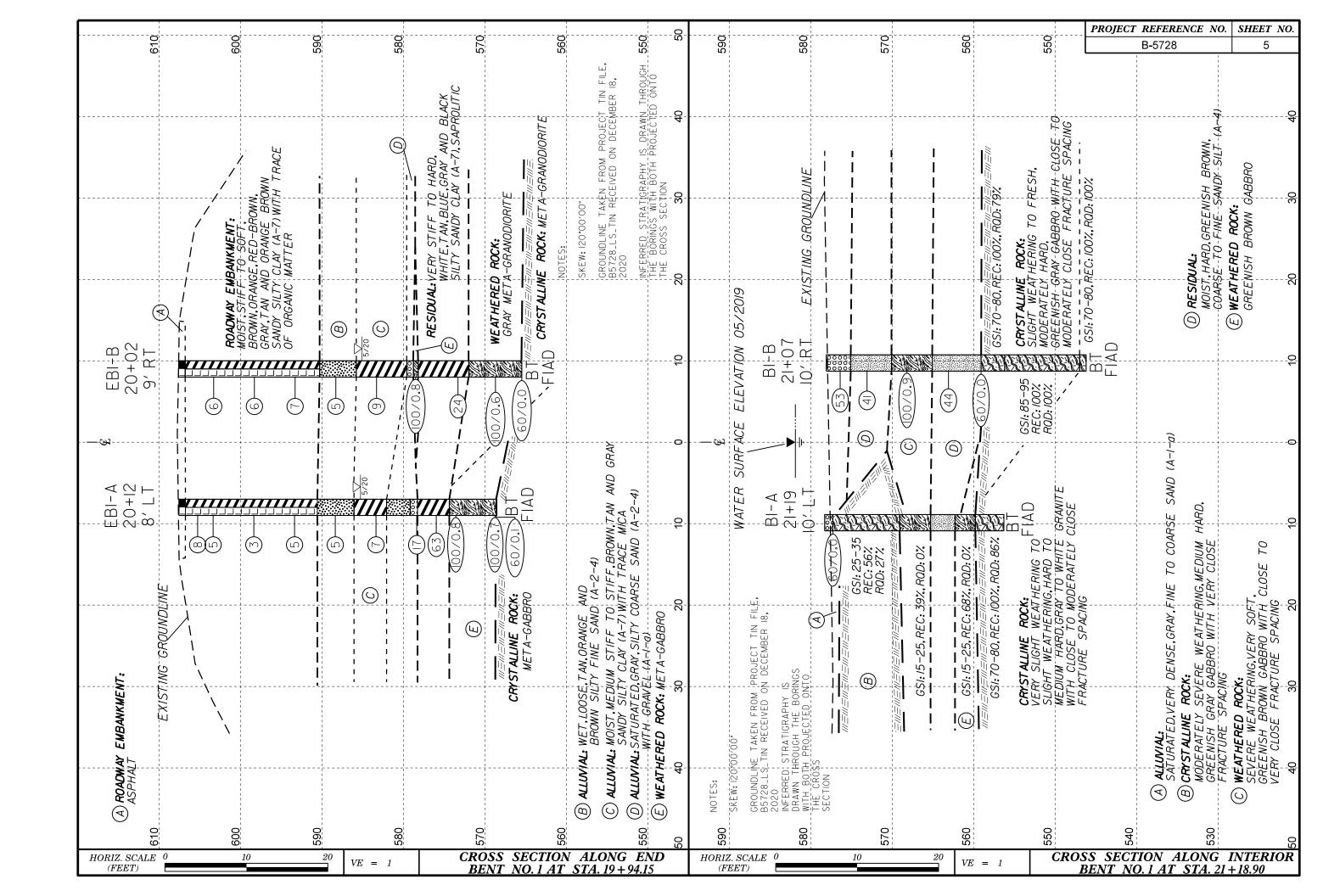
SUBSURFACE INVESTIGATION

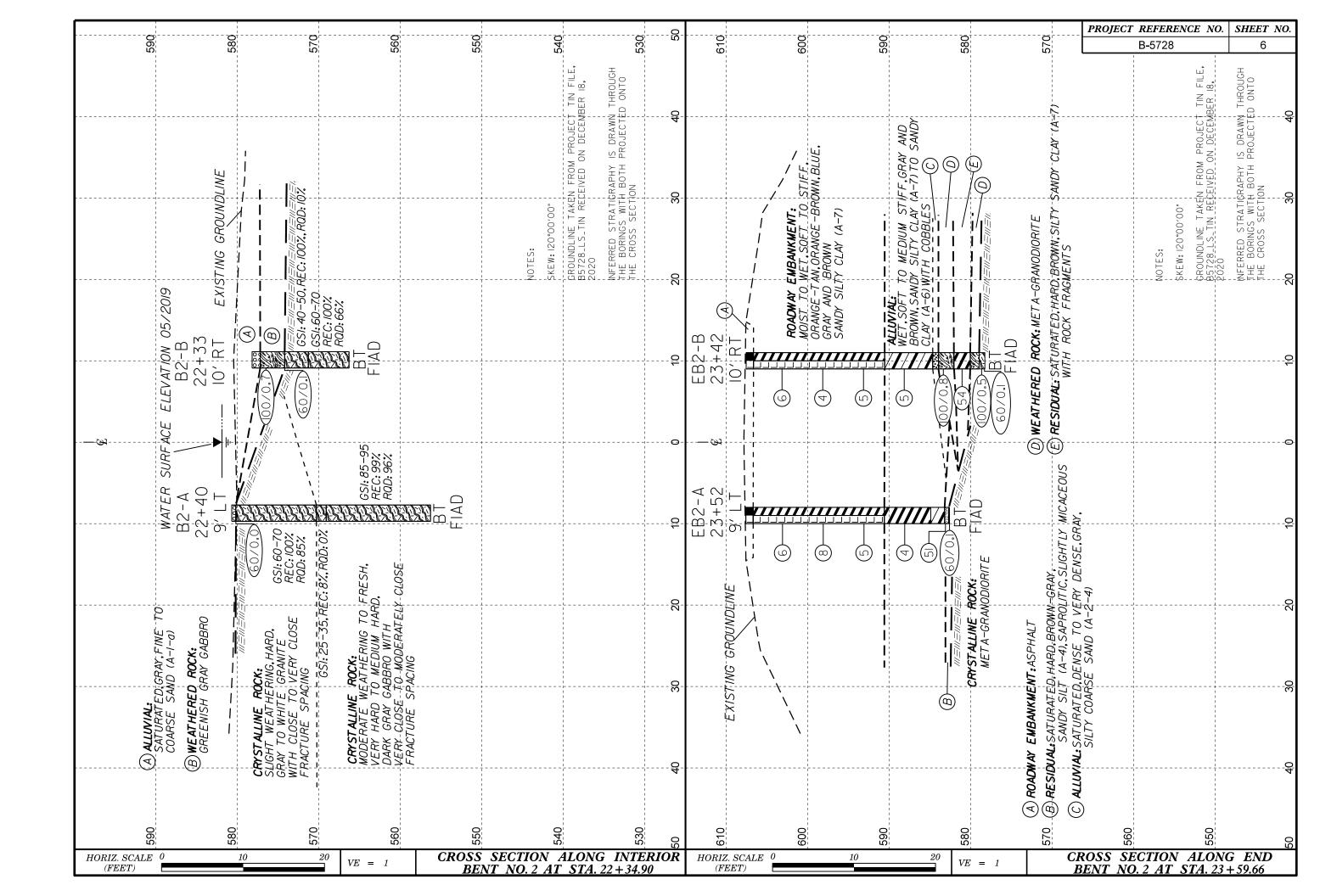
SUPPLEMENTAL LEGEND GEOLOGICAL STRENGTH INDEX (GSI) TARLES

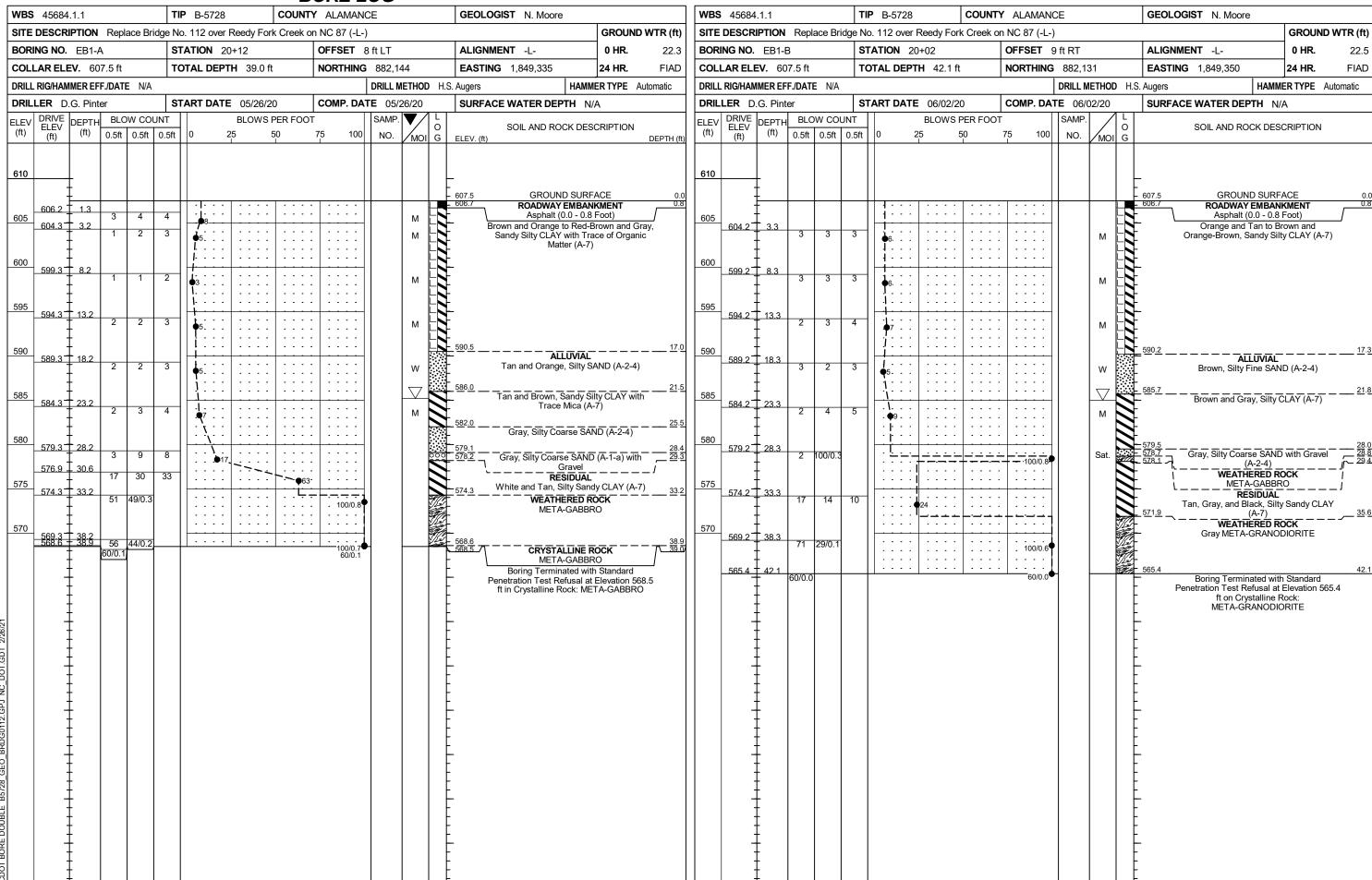
AASHTO LRFD Figure 10.4.6.4-1 — Determination of GSI for Joint	J D.	FR	OM AAS	EGEND, GEOLOGE EHTO LRFD BI	RID	AL STRENGTH INDEX (GSI) TABLES GE DESIGN SPECIFICATIONS AASHTO LRFD Figure 10.4.6.4-2 — Determination of GSI for Tectonically Defo	Darle	M (M		2000)
GEOLOGICAL STRENGTH INDEX (GSI) FOR JOINTED ROCKS (Hoek and Marinos, 2000)	tea N	(n	2000)	S S S S S S S S S S S S S S S S S S S)	GSI FOR HETEROGENEOUS ROCK MASSES SUCH AS FLYSCH (Marinos. P and Hoek E., 2000)	rmed neterogeneous nock	Masses (Marii	nos and noek,	
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.	SURFACE CONDITIONS	VERY GOOD Very rough, fresh unweathered surface: GOOD Rough, slightly weathered, iron stained surfaces.	FAIR Smooth, moderately weathered and altered surfaces	POOR Slickensided, highly weathered surfwith compact coatings or fillings or angular fragments VERY POOR Slickensided, highly weathered surf	soft clay coatings or fillings	From a description of the lithology, structure and surface conditions (particularly of the bedding planes), choose a box in the chart. Locate the position in the box that corresponds to the condition of the discontinuities and estimate the average value of GSI from the contours. Do not attempt to be too precise. Quoting a range from 33 to 37 is more realistic than giving GSI = 35. Note that the Hoek-Brown criterion does not apply to structurally controlled failures. Where unfavourably oriented continuous weak planar discontinuities are present, these will dominate the behaviour of the rock mass. The strength of some rock masses is reduced by the presence of groundwater and this can be allowed for by a slight shift to the right in the columns for fair, poor and very poor conditions. Water pressure does not change the value of GSI and it is dealt with by using effective stress analysis.	VERY GOOD - Very Rough, fresh unweathered surfaces GOOD - Rough, slightly weathered surfaces	FAIR - Smooth, moderately weathered and altered surfaces	POOR - Very smooth, occasionally slickensided surfaces with compact coatings or fillings with angular fragments	VERY POOR - Very smooth, slicken- sided or highly weathered surfaces with soft clau coathons or fillings
STRUCTURE		DECREASING S	URFACE QU	ALITY =>		COMPOSITION AND STRUCTURE				
INTACT OR MASSIVE - intact rock specimens or massive in situ rock with few widely spaced discontinuities BLOCKY - well interlocked un-	PIECES 	90 80		N/A N/A	Δ	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.	70 A			
disturbed rock mass consisting of cubical blocks formed by three intersecting discontinuity sets	OF ROCK	70 60				B. Sand- Stone with Stone and Siltstone Siltstone With sand- Siltstone With sand- With sand- Siltstone With sand- With sand-	50 B	C / [) E	
VERY BLOCKY - interlocked, partially disturbed mass with multi-faceted angular blocks formed by 4 or more joint sets	OCKING		50			thin inter- layers of siltstone in similar stone layers stale with sandstone siltstone amounts siltstone	40			
BLOCKY/DISTURBED/SEAMY - folded with angular blocks formed by many intersecting discontinuity sets. Persistence of bedding planes or schistosity	ASING INTERL		40	30		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.		30	F 20	
DISINTEGRATED - poorly inter- locked, heavily broken rock mass with mixture of angular and rounded rock pieces	DECREASING			20		G. Undisturbed silty or clayey shale with or without a few very thin sandstone layers H. Tectonically deformed silty or clayey shale forming a chaotic structure with pockets of clay. Thin layers of sandstone are transformed		\$		10
LAMINATED/SHEARED - Lack of blockiness due to close spacing of weak schistosity or shear planes	V	N/A N/A		10		→ Means deformation after tectonic disturbance				DATE: 8-19-











								BORE	LOG	•														C	O	RE L	.OG					
Ī	VBS	45684.1.			TIP B-572	B		NTY ALAN			GE	OLOGIST C. Drisco	oll .			WBS 4	5684.1	.1			TIP	B-5728	C	COUNT	ΓY /	LAMAN	CE	GEOLOG	GIST C. Drisco	oll		
:	SITE D	ESCRIPT	I ON Rep	lace Brido	ge No. 112 ov	er Reedy F	ork Cree	k on NC 87	(-L-)					GROUND	WTR (ft)	SITE DE	SCRIP	TION	Repla	ace Brid	lge No.	112 over I	Reedy Fork	Creek	on N	C 87 (-L	-)			GI	ROUND WTI	R (ft)
ı	BORIN	G NO. E	1-A		STATION	21+19		OFFSE	10 ft L	Γ	ALI	IGNMENT -L-		0 HR.	N/A	BORING	NO.	B1-A			STA	TION 21	⊦ 19		OF	FSET	10 ft LT	ALIGNM	ENT -L-	0	HR.	N/A
_ (COLLA	AR ELEV.	578.3 ft		TOTAL DEF	PTH 22.0	ft	NORTH	NG 882	,247	EAS	STING 1,849,353		24 HR.	N/A	COLLA	RELEV	'. 578	.3 ft		тот	AL DEPTI	l 22.0 ft		NC	RTHING	882,247	EASTING	1,849,353	24	HR.	N/A
l	RILL R	RIG/HAMME	R EFF./DATE	TRI00	055 CME-55 87				DRILL	METHOD	NW Casir	ng W/SPT & Core	HAMME	R TYPE /	utomatic	DRILL RIC	G/HAMM	ER EFF.	/DATE	TRI0	055 CN	1E-55 87%	04/27/2020				DRILL METHOD	NW Casing W/S	PT & Core	HAMMER T	YPE Autom	natic
		ER R. To			START DAT				DATE 0			RFACE WATER DEP	TH 3.0f	it		DRILLE	R R. 1	Foothm:	an		STA	RT DATE	01/15/21		CC	MP. DA	TE 01/15/21	SURFAC	E WATER DEP	TH 3.0ft		
E	LEV (ft)		PTH BLO	W COUN	T 0	BLOWS				P. L 0		SOIL AND ROO	CK DESC	RIPTION		CORE S		IQ _				AL RUN			1.							
	(11)	(ft)	ft) 0.5ft	0.5π 0.	.5π υ	25	50	75	00 NO	MOI G	ELEV	′. (ft)			DEPTH (ft		RUN LEV (ft)	EPTH F	RUN (ft)	DRILL RATE (Min/ft)	REC.	RQD S. (ft) %	AMP. REC.	RATA RQD (ft) %	L O G	ELEV. (· ·	DESCRIPTIO	N AND REMARK	(S	DE	DTI /#
	580															577.3											π)	Begin C	oring @ 1.0 ft		DEF	PTH (ft
									.	000	578.3	GROUNE	D SURFAC	CE	0.0	575	77.3 76.3	<u>2.8</u>	1.0 5.0	N=60/0.0 2:30/1.0	2 (1.0) - 100%	(0.3) (0.3) (30%	(4.6) 56%	(2.2) 27%		577.3	Moderately Sev	CRYS1 ere Weathering,	ALLINE ROCK Medium Hard, G y Close Fracture	reenish Gray	GABBRO	1.0
		577.3 1	60/0.0					"			577.3	Gray, Fine to Co	oarse SAN				Ŧ			3:15 4:00 2:30 2:45 3:45	(1.4)	(0.7)				Ē	V			Spacing		
	575	‡									-	Greenish G	LLINE RO Gray GABI				71.3		5.0							-		G	SI: 25-35			
		‡						· · · · · ·	1 1		1					570	+		5.0	4:00 3:30	54%	(1.2) 24%				569.1						9.2
	570	‡									569.1				9.2	5	66.3	12.0		5:00 5:00 5:00 4:00			(1.5) 39%	(0.0) 0%		-	Severe Weathe	ring, Very Soft,	HERED ROCK Greenish Brown (GABBRO wit	Close to	
		‡									300.1	WEATHE Greenish Br	RED ROO		J.2	565	1		5.0	4:00 4:00	(2.8)	(0.0)				565.3	٦	,	Fracture Spacin	ıg	_	13.0
	565	‡							1 1		565.3	Greenish bi		סאומס	13.0		‡			3:15 3:30	30%	0 76	27%	(0.0) 0%		- 562.3		R	SI: 15-25 ESIDUAL			16.0
	500	‡									∯-	Brown, Coarse to F	SIDUAL Fine Sand	y SILT (A-4	.)	560	61.3 +		5.0	3:30	(4.2)	(3.0)	(1.7)	(0.0)		559.8	Complete We	athering, Very S Close F	oft, Brown, Sandy racture Spacing	/ SILT (A-4) v	vith Very	
		Ŧ							-		562.3	WEATHE	ERED ROO	CK	16.0	300	‡		0.0	4:00 4:15 4:15	84%	(3.0) 60%	(3.5)	(3.0)		559.8 -	Severe Weather	WEAT	HERED ROCK	ABBRO with	Very Close	18.5
F	560	\pm									559.8	Greenish Bi	rown GAB LLINE RO		18.5	5	56.3 + 3	22.0		3:15 3:00			100%	86%		- - - 556.3		Frac	ture Spacing			22.0
		‡				.			-		556.3	Gray to Wi			22.0		+									_			SI: 15-25 ALLINE ROCK			
											330.3	Boring Terminated Crystalline F					Ŧ									E	Very Slight W	eathering, Hard, Moderately C	Gray to White Glose Fracture Spa	RANITE with	Close to	
		‡									<u> </u>	Crystalline P	NOCK. GIVE	AINII E			1									_			SI: 70-80	g		
		‡									-						‡									_	Boring Termina		556.3 ft in Crysta	alline Rock: (GRANITE	
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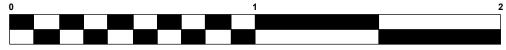
B1-ABOXES 1-3: 1.0 to 22.0 FEET



		BORE LOG			C	ORE LOG	
WBS 45684.1.1	TIP B-5728 COUN	NTY ALAMANCE	GEOLOGIST C. Driscoll	WBS 45684.1.1	TIP B-5728 COUNT	Y ALAMANCE	GEOLOGIST C. Driscoll
SITE DESCRIPTION Repla	ace Bridge No. 112 over Reedy Fork Cree	k on NC 87 (-L-)	GROUND WTR (ft)	SITE DESCRIPTION Replace Bridg	ge No. 112 over Reedy Fork Creek	on NC 87 (-L-)	GROUND WTR (fi
BORING NO. B1-B	STATION 21+07	OFFSET 10 ft RT	ALIGNMENT -L- 0 HR. N/A	BORING NO. B1-B	STATION 21+07	OFFSET 10 ft RT	ALIGNMENT -L- 0 HR. N//
COLLAR ELEV. 578.1 ft	TOTAL DEPTH 31.9 ft	NORTHING 882,232	EASTING 1,849,370 24 HR. N/A	COLLAR ELEV. 578.1 ft	TOTAL DEPTH 31.9 ft	NORTHING 882,232	EASTING 1,849,370 24 HR. N/A
DRILL RIG/HAMMER EFF./DATE	TRI0055 CME-55 87% 04/27/2020		W Casing W/SPT & Core HAMMER TYPE Automatic	l	055 CME-55 87% 04/27/2020	· '	NW Casing W/SPT & Core HAMMER TYPE Automatic
DRILLER R. Toothman	START DATE 01/06/21	COMP. DATE 01/12/21	SURFACE WATER DEPTH 3.7ft	DRILLER R. Toothman	START DATE 01/06/21	COMP. DATE 01/12/21	SURFACE WATER DEPTH 3.7ft
ELEV DRIVE DEPTH BLOW (ft) (ft) 0.5ft	N COUNT BLOWS PER FO 0.5ft 0.5ft 0 25 50	75 400 7 0	SOIL AND ROCK DESCRIPTION	CORE SIZE NQ	TOTAL RUN 12.9 ft	111	
(it) cont	0.01 0.01 0	75 100 NO. MOI G	ELEV. (ft) DEPTH (ft)	RUN DEPTH RUN RATE (ft) (ft) (ft) (ft) RUN (ft) (ft)	RUN STRATA REC. RQD (ft) (ft)	O G ELEV. (ft)	DESCRIPTION AND REMARKS
580				550 1		G ELEV. (π)	Begin Coring @ 19.0 ft
				559.1 19.0 2.9 N=60/0.0 5:00/0.9	7 (2.9) (2.3) (2.9) (2.3) 100% 79%	559.1 Slight Weathering	Begin Coring @ 19.0 ft CRYSTALLINE ROCK 19 Moderately Hard, Greenish Black GABBRO with Close
577.4 0.7 14	38 15	Sat. Sat.	ALLUVIAL Gray, Fine to Coarse SAND (A-1-a)	1 1 556.2 T 21.9 1 4.99	(5.0) (5.0) (9.2) (9.2)		Fracture Spacing
575 4.0			575.13.0	1 3300 3:300 3:300	(5.0) (5.0) (9.2) (9.2) (9.2) 100%	Frank Madambal	GSI: 70-80
19	26 15		Greenish Brown, Coarse to Fine Sandy SILT (A-4)	551.2 T 26.9 3:30 3:30 3:30		Fresh, Moderatei	y Hard, Greenish Gray GABBRO with Moderately Close Fracture Spacing
570			570.1	550	(5.0) (5.0) 100% 100%		GSI: 85-95
569.1 9.0 36 6	54/0.4		WEATHERED ROCK Light Brown GABBRO	550 5.0 6.30 3:00 3:45 3:45 546.2 31.9 3:30	RS-1	547.0 546.2 Slight Weathering	g. Medium Hard. Grav GRANITE with Moderately Close3
		100/0.9	-	546.2	(0.8) (0.8) (0.8) (100% 100%	Slight Weathering	g, Medium Hard, Gray GRANITE with Moderately Close3: Fracture Spacing
565 14.0 21	16 28		RESIDUAL				GSI: 70-80
	10 20	M	Greenish Brown Coarse to Fine Sandy SILT (A-4)			- Boring Termina	ted at Elevation 546.2 ft in Crystalline Rock: GRANITE
560 1 19.0			559.1 19.0			-	
60/0.0			CRYSTALLINE ROCK Greenish Black GABBRO]			
555			556.2 21.9 Greenish Gray GABBRO			-	
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				$ \underline{1} $		E	
550			559.1 19.0 CRYSTALLINE ROCK Greenish Black GABBRO 21.9 Greenish Gray GABBRO 31.1 547.0 31.1 546.2 Gray GRANITE 31.9				
		RS-1	547.0 31.1 546.2 Gray CDANITE 31.9				
			Boring Terminated at Elevation 546.2 ft in			-	
			Crystalline Rock: GRANITE				
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CDOT BORE DOUBLE B5728_GEO_BRDG0112.GPJ NC_DOT.GDT 1/28/21							
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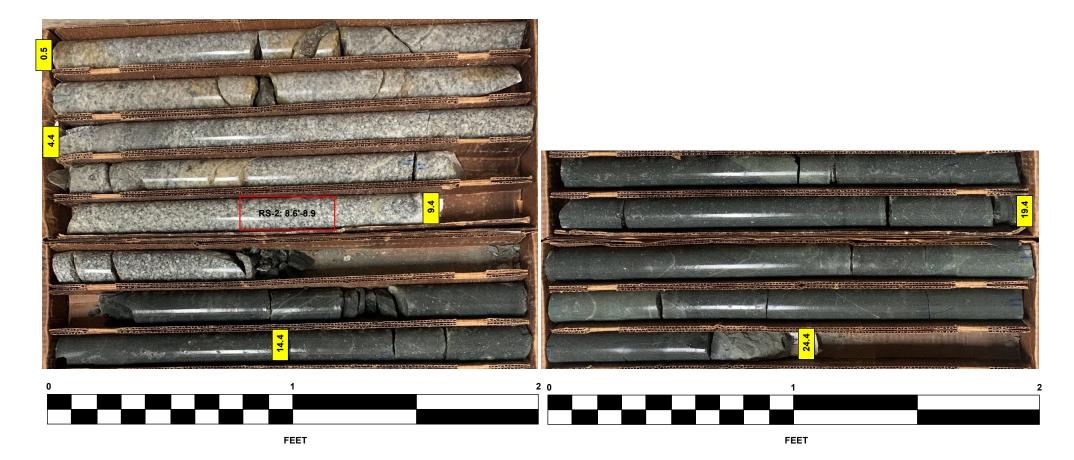
B1-BBOXES 1-2: 19.0 to 31.9 FEET





									BOR	RE L	OG																CO	RE L	OG					
WE	S 45	684.1.1			TIP	B-5728			NTY AL					GEOLOGIST C	. Drisco	oll		WB	S 4568	34.1.1			TIP E	3-5728				ALAMAN			GEOLOGIST C. [riscoll		
SIT	E DES	CRIPTIC	N Rep	olace Br	idge No	o. 112 ove	r Reedy	Fork Cree	k on NC	87 (-L-)			•		GR	OUND WTR (ft)	SITE	DESC	RIPTIO	N Re	eplace Brid	dge No. 1	12 over	Reedy F	ork Cre	ek on N	NC 87 (-L-)		•		GRO	JND WTR (ft)
во	RING I	NO . B2	-A		ST	ATION 2	22+40		OFF	FSET 9	ft LT			ALIGNMENT -		01	HR . N/A	BOF	RING NO). B2-	A		STATI	ON 22	2+40		О	FFSET 9	9 ft LT		ALIGNMENT -L-		0 HF	. N/A
co	LAR	ELEV.	580.7 ft		то	TAL DEP	TH 24.	4 ft	NOF	RTHING	882,3	66		EASTING 1,84	9,378	24 1	HR. N/A	COL	LAR E	LEV. 5	80.7 f	t	TOTAL	DEPT	H 24.4	ft	N	ORTHING	882,366		EASTING 1,849,3	78	24 HF	. N/A
DRI	L RIG/	HAMMER	EFF./DAT	E TR	10055 C	ME-55 87%	6 04/27/20	020			DRILL N	ETHOD	NW	V Casing W/SPT & Cor	e	HAMMER TY	YPE Automatic	DRIL	L RIG/H	MMER E	FF./DA	TE TRIC	0055 CME-	55 87%	04/27/20	20			DRILL METH	OD NW	V Casing W/SPT & Core	HAN	MER TYP	Automatic
DR	LLER	R. Too	thman		ST	ART DAT	E 01/14	4/21	CON	MP. DAT	ΓE 01/	14/21		SURFACE WAT	ER DEF	PTH N/A		DRII	LLER	R. Toot	hman		STAR	DATE	01/14	/21	С	OMP. DA	ΓΕ 01/14/2 ⁻	1	SURFACE WATER	DEPTH	N/A	
ELE	/ DRI	VE DEP	TH BLO	OW COL	JNT			/S PER FO			SAMP.	lacksquare	L	SOIL /	AND RO	CK DESCRIP	TION	COF	RE SIZE				TOTAL	RUN	23.9 ft									
(ft)	(fi	ή (π	0.5ft	0.5ft	0.5ft	0	25	50	75 	100	NO.	MOI	G	ELEV. (ft)			DEPTH (fi	ELEV (ft)	/ RUN ELEV (ft)	, DEPT (ft)	H RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RQD S (ft)	SAMP. NO.	STRAT REC. R (ft) (A L QD O ft) G	ELEV. (1	ft)	D	ESCRIPTION AND RE	MARKS		DEPTH (f
585														_				5600	2 590 7	0.5						(2.2)					Begin Coring @ 0.	5 ft		
		‡											F							0.5		3:00/0.9	0 (3.9) 100%	74%		100% 8	5.4) 5%	580.2	Slight We	eathering,	CRYSTALLINE RO Hard, Gray to White G Close Fracture Spa	CK RANITE wit cina	h Close to	0. Very
580	580).2 0.1	5 00/0 /				1			 60/0.0 ₽	,			588: <u>7</u>		ID SURFACE	8.	575		3 <u>† 4.4</u> †	5.0	3:45 3:45 3:00 3:45 4:30	(5.0)	4.5)							GSI: 60-70	9		
		1	60/0.0	ή						00/0.0				Gray, F	ine to Co	oarse SAND (Ŧ		3:45 4:30	100%	90%							2502			
		‡												G	ray to W	hite GRANITE	≣			9.4		5:15 4:30 5:00	(2.0)	(2.4)	RS-2			570.0						10
575		‡												Gray, F G G 570.3				570	-	†	5.0	1:30 3:30	(3.8) 76%	58%		(0.1) (0).0)	569.1	7 C W	_41	WEATHERED RO	CK	2 i4l- 1/	10.
		‡									RS-2								566.3	+ 3 + 14.4		3.00				(12.7) (199% 96	2.3)		Severe vvea	atnering,	Medium Hard, Dark Gra Fracture Spacin	IY, GABBRU J	J with ver	Close
570		‡									1.02			570.3 569.1	WEATH	ERED ROCK	10.4	565		+	5.0	2:30 3:15 4:00	(5.0) (100% !	4.9)		99% 96	فر فران	<u></u>			GSI: 25-35 CRYSTALLINE RO	01/		
		Ŧ							.							ray GABBRO				‡		3:30 4:45	10070	5070					Fresh, Very	y Hard, D	ark Gray, GABBRO wit	n Moderatel	y Close Fr	acture
565		Ī													Dark Gr	ray GABBRO		560		3 † 19.4 †	5.0	3:15 3:15	(5.0)	5.0)							Spacing			
		Ŧ						: : :												Ŧ		4:00 4:15	100% 1	00%							GSI: 85-95			
500		‡						-	-					556.3 Boring To					556.3	24.4		2:30 4:30						556.3	Davis s Ta			O t - III: I	Da alii CAE	24.
560		‡												-						+								_	Boring I e	rminated	at Elevation 556.3 ft in	Crystalline i	ROCK: GAE	RKO
		‡						I						556.3			24.4			‡								-						
		‡		1						•				Donnig rei		d at Elevation 5 Rock: GABBR				‡								_						
		‡											F	0.,	otalii lo l	rtook. Ortook	.0			‡								-						
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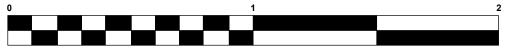
B2-ABOXES 1-3: 0.5 to 24.4 FEET



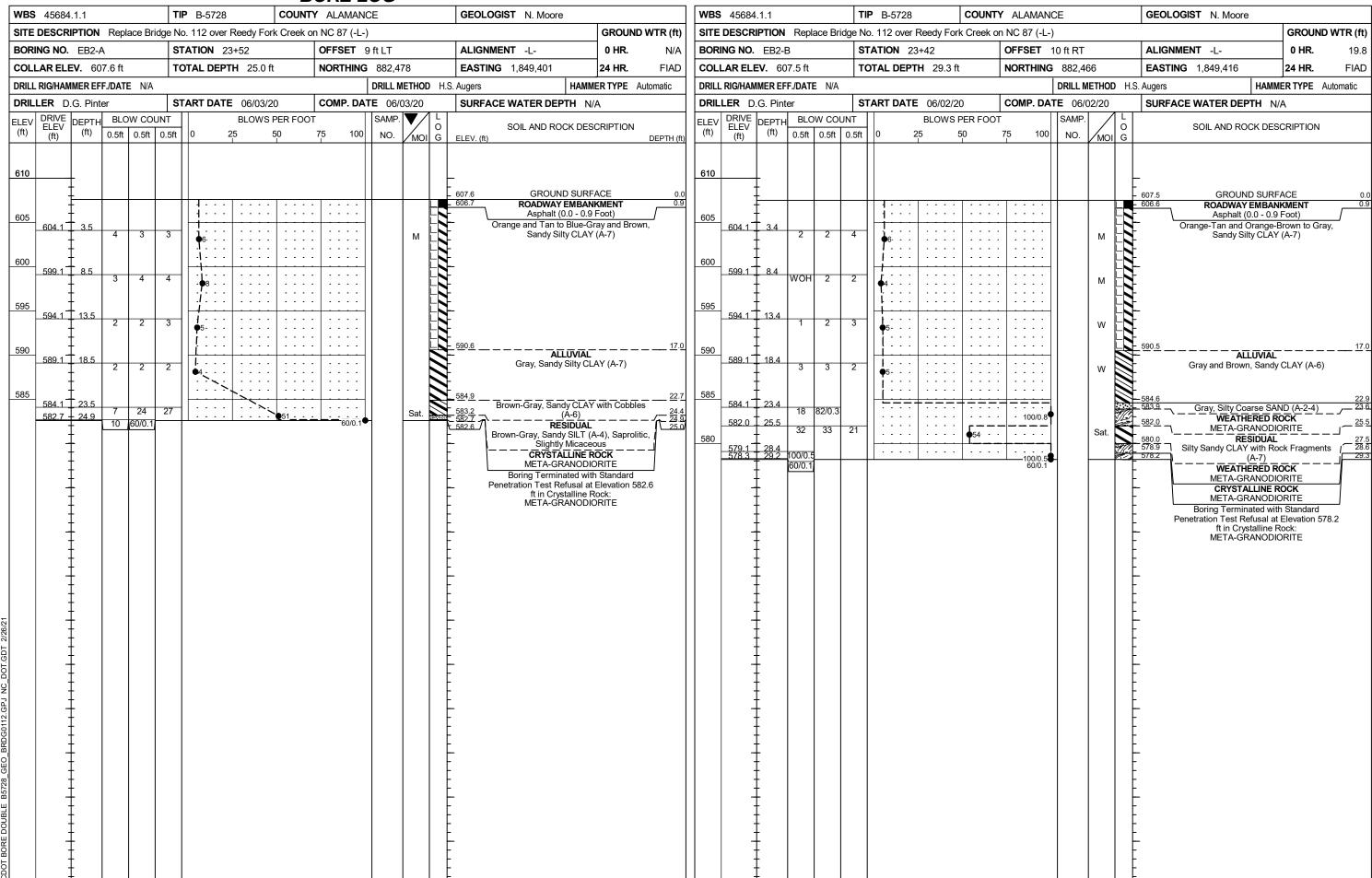
						BOR	<u>KE L</u>	<u>UG</u>												JORE	LOG			
WBS	45684.1	.1	1	FIP B-5728	cc	DUNTY AL	LAMANC	E		GEOLOGIST C. Dris	coll		WBS	45684.1.1			TIP B-572	28	COUN	TY ALAN	MANCE	GEOLOGIST C. Dris	scoll	
SITE D	ESCRIP [®]	TION Rep	olace Bridge	No. 112 over	Reedy Fork C	reek on NC	87 (-L-)	1			GROUND	WTR (ft)	SITE	DESCRIPTIO	N Rep	place Brid	ge No. 112 ov	er Reedy	Fork Creek	on NC 87	(-L-)			GROUND WTR (ft)
BORIN	G NO.	B2-B		STATION 2	2+33	OFF	SET 1	0 ft RT		ALIGNMENT -L-	0 HR.	N/A	BOR	NG NO . B2	В		STATION	22+33		OFFSE	T 10 ft RT	ALIGNMENT -L-		0 HR. N/A
COLLA	AR ELEV	. 578.2 ft		TOTAL DEPT	TH 11.9 ft	NOF	RTHING	882,355		EASTING 1,849,395	24 HR.	N/A	COLI	AR ELEV.	578.2 ft		TOTAL DE	PTH 11	.9 ft	NORTH	ING 882,355	EASTING 1,849,395	<u> </u>	24 HR . N/A
DRILL R	IG/HAMM	ER EFF./DAT	E TRI0055	CME-55 87%	04/27/2020			DRILL METHO	D NW	/ Casing W/SPT & Core	HAMMER TYPE A	Automatic	DRILL	RIG/HAMMER	EFF./DAT	TE TRIO	055 CME-55 87	7% 04/27/2	020		DRILL METHO	NW Casing W/SPT & Core	HAMME	R TYPE Automatic
		oothman		START DATE				E 01/13/21		SURFACE WATER DE	PTH 3.0ft		DRIL	LER R. Too	hman		START DA	TE 01/1	3/21	COMP.	DATE 01/13/21	SURFACE WATER D	EPTH 3.0	t
ELEV (ft)	DRIVE DI	EPTH BLO	OW COUNT		BLOWS PER			SAMP.	101	SOIL AND R	OCK DESCRIPTION		COR	E SIZE NQ		T ===::	TOTAL RU	N 7.9 ft		1				
(11)	(ft)	(11) 0.5π	0.5π 0.5π		25 50	75 	100	NO. MO	I G	ELEV. (ft)		DEPTH (ft)	ELEV (ft)	RUN ELEV DEP	H RUN (ft)	DRILL RATE (Min/ft)	RUN REC. RQD (ft) (ft) % %	SAMP. NO.	STRATA REC. RQE (ft) (ft) %			DESCRIPTION AND REMA	RKS	
														(ft) (π)	(11)	(Min/ft)	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	110.	% %	G EL	EV. (ft)			DEPTH (f
580	$-\pm$								1 -		ND OUDEAGE		574.2	574.2 4.0	2.9	5:00/0.9	(2.9) (0.3)		(2.9) (0.3) 57	4.2	Begin Coring @ 4.0 ft CRYSTALLINE ROCK	(4.
	577.2	1.0	25/0.2	 							ND SURFACE	1.0		571.3 6.9		4:00 5:15	(2.9) (0.3) 100% 10%		(2.9) (0.3 100% 10%	57	Moderate V	eathering, Medium Hard, Dark G Close Fracture Spacin	Gray GABBR	O with Very
575	-740		25/0.2				100/0.7			Gray Fine to WEAT	Coarse SAND (A-1-a) HERED ROCK		570	\pm	5.0	4:00 3:30 3:00	(5.0) (3.3) 100% 66%		(5.0) (3.3 100% 66%			GSI: 40-50		
	574.3	60/0.1	1				60/0.1			Greenis CRYS1	n Gray GABBRO CALLINE ROCK	4.0				3:00 4:30 4:15				56	Slight Weath	ering, Moderately Hard, Dark Gra Very Close Fracture Spa	y GABBRO	
570	‡				-	-				571.3 Dark (Gray GABBRO Gray GABBRO	6.9		566.3 † 11.9	,	4:15		_		56	5.3	GSI: 60-70	omg	
570	‡									. Dair (Siay GABBITO			1						1 - E	Boring Tern	ninated at Elevation 566.3 ft in Cry	stalline Roc	c: GABBRO
	‡						: : :			566.3		11.9		<u> </u>										
					<u> </u>		*			Boring Lerminat	ed at Elevation 566.3 ft e Rock: GABBRO			+						-				
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B2-BBOX 1: 4.0 to 11.9 FEET





FEET



BORING NO. DET EB1 STATION 20+12		BORE LOG						
BORING NO. DET_EB1 STATION 20+12	WBS 45684.1.1 TIP B-5728 COL	JNTY ALAMANCE	GEOLOGIST C. Driscoll		WBS 45684.1.1	TIP B-5728 COUN	ITY ALAMANCE	GEOLOGIST C. Driscoll
COLLAR ELEV. 604.6 ft TOTAL DEPTH 14.5 ft NORTHING 882.151 EASTING 1,849.267 24 HR FIAD DRILL RICHAMMER FEP,DAIR TROUSS CIAE-55 87% 042772020 DRILL METHOD HS. Augest HAMMER TYPE Autoristic DRILL STR. FOOThman START DATE 101/18/21 COMP. DATE 101/18/21 COMP. DATE 101/18/21 COMP. DATE 101/18/21 COMP. DATE 101/18/21 SURFACE WATER DEPTH N/A ELEVY ENTRY ENT	SITE DESCRIPTION Replace Bridge No. 112 over Reedy Fork Cree	ek on NC 87 (-L-)		GROUND WTR (ft)	SITE DESCRIPTION Replace Bri	idge No. 112 over Reedy Fork Creek	on NC 87 (-L-)	GROUND WTR (ft)
DRILL RIGHAMMER EFF.DATE TRIDOSS CME-55 87% 04272020 DRILL METHOD H.S. Augers HAMMER TYPE Automatic	BORING NO. DET_EB1 STATION 20+12	OFFSET 21 ft LT	ALIGNMENT -LDET-	0 HR . Dry	BORING NO. DET_EB1 (2)	STATION 20+13	OFFSET 27 ft LT	ALIGNMENT -LDET- 0 HR. Dry
DRILLER R. Toothman	COLLAR ELEV. 604.6 ft TOTAL DEPTH 14.5 ft	NORTHING 882,151	EASTING 1,849,267	24 HR. FIAD	COLLAR ELEV. 604.4 ft	TOTAL DEPTH 24.3 ft	NORTHING 882,153	EASTING 1,849,262 24 HR. FIAD
DRIVE DRIV	DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 87% 04/27/2020	DRILL METHOD H.S	S. Augers HAMMI	IER TYPE Automatic	DRILL RIG/HAMMER EFF./DATE TRIO	0055 CME-55 87% 04/27/2020	DRILL METHOD	H.S. Augers HAMMER TYPE Automatic
Control Cont		COMP. DATE 01/18/21	SURFACE WATER DEPTH N/A	/A			COMP. DATE 01/18/21	SURFACE WATER DEPTH N/A
	STATION 20+12 COLLAR ELEV. 604.6 ft TOTAL DEPTH 14.5 ft	OFFSET 21 ft LT NORTHING 882,151 DRILL METHOD H.S COMP. DATE 01/18/21 OOT 75 100 NO. MOI G M M M	S. Augers HAMMI SURFACE WATER DEPTH N// SOIL AND ROCK DESC ELEV. (ft) 604.6 GROUND SURF/ ARTIFICIAL FII Trace Gravel (A- Reddish Brown, Coarse to Fin CLAY (A-6) RESIDUAL Brown, Coarse to Fine Sar WEATHERED RC White GRANIT Boring Terminated at Elevat Crystalline Rock: GF Possible Boulder at 14.5 fee	O HR. Dry 24 HR. FIAD JER TYPE Automatic (A CRIPTION DEPTH (ft) ACCE 0.0 LL ne SAND with 2-0 Fine Sandy ndy SILT (A-4) OCCK TE 14.5 attion 590.1 ft on RANITE et. Offset boring	BORING NO. DET_EB1 (2) COLLAR ELEV. 604.4 ft DRILL RIG/HAMMER EFF./DATE TRI0 DRILLER R. Toothman ELEV (ft) DRIVE ELEV (ft) (ft) 0.5ft	STATION 20+13 TOTAL DEPTH 24.3 ft 0055 CME-55 87% 04/27/2020 START DATE 01/18/21 UNT 0.5ft 0 25 50	OFFSET 27 ft LT NORTHING 882,153 DRILL METHOD COMP. DATE 01/18/21 OT 75 100 NO. MOI	ALIGNMENT -LDET- EASTING 1,849,262 H.S. Augers HAMMER TYPE Automatic SURFACE WATER DEPTH N/A SOIL AND ROCK DESCRIPTION G GROUND SURFACE ARTIFICIAL FILL Brown, Silty Coarse to Fine SAND with Trace Gravel (A-2-4) Reddish Brown, Coarse to Fine Sandy CLAY (A-6) S98.4 RESIDUAL Brown, Coarse to Fine Sandy SILT (A-4) WEATHERED ROCK Brown GRANITE S80.1 Boring Terminated at Elevation 580.1 ft in

LABORATORY SUMMARY SHEET FOR ROCK CORE SAMPLES

SHEET 18

PROJECT NO.: 45684.1.1 (B-5728)

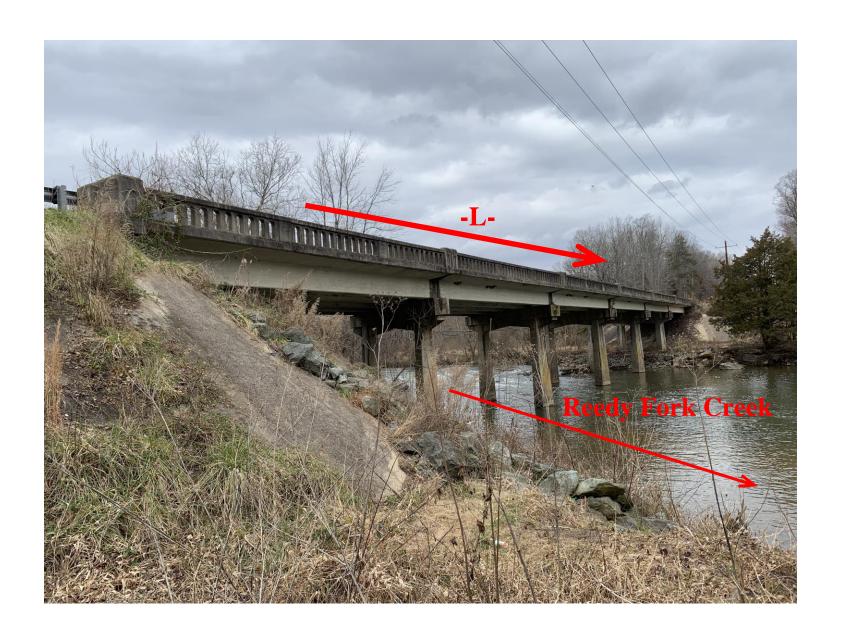
COUNTY: ALAMANCE

REPLACE BRIDGE NO. 112 OVER REEDY FORK CREEK ON NC 87

								Unit	Unconfined	Young's	Splitting Tensile	
				Geologic	Run			Weight	Compressive	Modulus	Strength	
Sample No.	Boring #	Depth (ft)	Rock Type	Map Unit	RQD	Length (in)	Diameter (in)	(PCF)	Strength (PSI)	(PSI)	(PSI)	Remarks
RS-1	B1-B	30.3' - 30.6'	Gabbro	CZg	100	3.92	1.98	185.9	16,270	N/A	N/A	GSI- 85-95
RS-2	B2-A	8.6' - 8.9'	Granite	PzZg	90	4.34	1.98	165.4	24,910	N/A	N/A	GSI- 60-70

SITE PHOTOGRAPHS

REPLACE BRIDGE NO. 112 OVER REEDY FORK CREEK ON NC 87 (-L-)



Looking Northeast at -L- from End Bent No. 1