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STATE OF NORTH CAROLINA

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

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STRUCTURE SUBSURFACE INVESTIGATION

COUNTY _	YADKIN		
PROJECT	DESCRIPTION	ON BRIDGE NO. 35 ON	
NC 67 C	OVER YA	OKIN RIVER	

STATE PROJECT REFERENCE NO. B-5825 46

CAUTION NOTICE

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANNING AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N. C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT (1919) 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 BORNINGS OR BETWEEN SAMPLED STRATA WITHIN THE BORCHOLE. 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 DESCREED AND THE DESCREED AND THE DESCREED AND THE DESCREED AND THE STANDARD TEST METHOD. 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 INTERRETATIONS 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 HINSELF AS TO CONDITIONS TO BE ENCOUNTERED OF PROJECT. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OR FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FROM THE ACTUAL CONDITIONS ENCOUNTERED AT THE SITE DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.

- NOTES:

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

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

PERSONNEL J.K. STICKNEY C.L. SMITH B.E. FOSTER

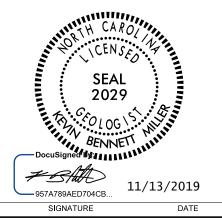
INVESTIGATED BY $\underline{\textit{J.K.}}$ $\underline{\textit{STICKNEY}}$ DRAWN BY _S. PAPKE/C. DRISCOLL

CHECKED BY J.E. BEVERLY

SUBMITTED BY K.B. MILER

DATE NOVEMBER 2019





DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT REPERENCE 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

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	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.	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.	ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.
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.	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	AQUIFER - A WATER BEARING FORMATION OR STRATA.
CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH	ANGULARITY OF GRAINS	REPRESENTED BY A ZONE OF WEATHERED ROCK. ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:	ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.
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	THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS:	WEATHERED WISCHARD NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES >	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.
SOIL LEGEND AND AASHTO CLASSIFICATION	ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.	ROCK (WR) 100 BLOWS PER FOOT IF TESTED.	ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT
GENERAL GRANULAR MATERIALS SILT-CLAY MATERIALS ORGANIC MATERIALS	MINERALOGICAL COMPOSITION	CRYSTALLINE FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT	WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE.
LLASS. (\$\(\sigma\) 50% PASSING "2001 (\$\(\sigma\) 30% PASSING "2001	MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.	ROCK (CR) WOOLD FIELD SPI REPUSAL IF TESTED, ROCK TIPE INCLODES GRANTE,	CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.
GROUP A-1 A-3 A-2 A-4 A-5 A-6 A-7 A-1, A-2 A-4, A-5 CLASS. A-1-6 A-1-6 A-1-6 A-2-4 A-2-5 A-2-6 A-2-7 B-2-6 A-2-7 A-3 A-6, A-7	COMPRESSIBILITY	NON-CRYSTALLINE SEDIMENTARY ROCK THAT WOULD YEILD SPT REFUSAL IF TESTED.	COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM
SYMBOL 000000000000000000000000000000000000	SLIGHTLY COMPRESSIBLE LL < 31	ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.	OF SLOPE.
2 PASSING	MODERATELY COMPRESSIBLE LL = 31 - 50 HIGHLY COMPRESSIBLE LL > 50	COASTAL PLAIN COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SEDIMENTARY ROCK SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED	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.
*10 50 MX GRANULAR SIL1- MUCK,	PERCENTAGE OF MATERIAL	(CP) SHELL BEDS, ETC. WEATHERING	DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT
*40	GRANULAR SILT - CLAY ORGANIC MATERIAL SOILS SOILS OTHER MATERIAL		ROCKS OR CUTS MASSIVE ROCK.
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% MODERATELY ORGANIC 5 - 10% 12 - 20% SOME 20 - 35%	VERY SLIGHT ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN,	HORIZONTAL. DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE
LL 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN LITTLE OR PI 6 MX NP 10 MX 10 MX 11 MN 11 MN 10 MX 10 MX 11 MN 11 MN LITTLE OR HIGHLY	HIGHLY ORGANIC > 10% > 20% HIGHLY 35% AND ABOVE	(V SLI.) CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE.	LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.
GROUP INDEX Ø Ø Ø 4 MX 8 MX 12 MX 16 MX NO MX AMOUNTS OF COLOR	GROUND WATER	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 FRACE. FINE SILTY OR CLAYEY SILTY CLAYEY MATTER	✓ WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING	(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 GRAYEL, AND SAND GRAYEL 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 PATING		(MOD.) GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS	PARENT MATERIAL.
AS SUBGRADE EXCELLENT TO GOOD FAIR TO POOR POOR UNSUITABLE	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	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 COMPACTNESS OR RANGE OF STANDARD RANGE OF UNCONFINED PRIMARY SOIL TYPE COMPACTNESS OR PENETRATION RESISTENCE COMPRESSIVE STRENGTH	ROADWAY EMBANKMENT (RE) 25/025 DIP & DIP DIRECTION	IF TESTED, WOULD YIELD SPT REFUSAL	LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO
CONSISTENCY CONSISTENCY (N-VALUE) (TONS/FT ²)	₩ITH SOIL DESCRIPTION → OF ROCK STRUCTURES	SEVERE ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND EVIDENT BUT	ITS LATERAL EXTENT.
GENERALLY VERY LOOSE < 4 CONTROL VERY LOOSE	SOIL SYMBOL SOIL SYMBOL SOIL SYMBOL SUPPLINT TEST BORING SLOPE INDICATOR INSTALLATION	(SEV.) REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED 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.
MATERIAI MEDIUM DENSE 10 TO 30 N/A	M	IF TESTED, WOULD YIELD SPT N VALUES > 100 BPF	MOTILED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS, MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.
(NON-COHESIVE) DENSE 30 TO 50 VERY DENSE > 50	ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT AUGER BORING CONE PENETROMETER TEST	VERY ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE 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	— INFERRED SOIL BOUNDARY — CORE BORING ■ SOUNDING ROD	(V SEV.) REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE THAT ONLY MINOR	OF AN INTERVENING IMPERVIOUS STRATUM.
GENERALLY SOFT 2 TO 4 0.25 TO 0.5	INFERRED ROCK LINE MONITORING WELL TEST BORING	VESTIGES OF ORIGINAL ROCK FABRIC REMAIN. IF TESTED, WOULD YIELD SPT N VALUES < 100 BPF	RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.
SILT-CLAY MEDIUM STIFF 4 TO 8 0.5 TO 1.0 MATERIAL STIFF 8 TO 15 1 TO 2	INFERRED ROCK LINE MONITORING WELL WITH CORE	COMPLETE ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS	ROCK QUALITY DESIGNATION (ROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE
(COHESIVE) VERY STIFF 15 TO 30 2 TO 4 HARD > 30 > 4	→ → → → → → ← ALLUVIAL SOIL BOUNDARY \(\triangle \) PIEZUMETER \(\triangle \) SPT N-VALUE	ALSO AN EXAMPLE.	RUN AND EXPRESSED AS A PERCENTAGE.
TEXTURE OR GRAIN SIZE	RECOMMENDATION SYMBOLS	ROCK HARDNESS	SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT
U.S. STD. SIEVE SIZE 4 10 40 60 200 270		VERY HARD CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.	ROCK. SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND
OPENING (MM) 4.76 2.00 0.42 0.25 0.075 0.053	UNDERCUT UNSUITABLE WASTE	HARD CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY, HARD HAMMER BLOWS REQUIRED	RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO
BOULDER COBBLE GRAVEL COARSE FINE SILT CLAY	SHALLOW UNCLASSIFIED EXCAVATION - USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL	TO DETACH HAND SPECIMEN.	THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS.
(BLDR.) (COB.) (GR.) (CSE. SD.) (F SD.) (SL.) (CL.)	ABBREVIATIONS	MODERATELY CAN BE SCRATCHED BY KNIFE OR PICK. GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE HARD EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK. HAND SPECIMENS CAN BE DETACHED	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	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 CL CLAY MOD MODERATELY 7 - UNIT WEIGHT	MEDIUM CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PEICES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE	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
SOIL MOISTURE - CORRELATION OF TERMS	CPT - CONE PENETRATION TEST NP - NON PLASTIC 7/d - DRY UNIT WEIGHT	POINT OF A GEOLOGIST'S PICK.	TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.
SOIL MOISTURE SCALE FIELD MOISTURE GUIDE FOR FIELD MOISTURE DESCRIPTION (ATTERBERG LIMITS) DESCRIPTION	CSE COARSE ORG ORGANIC DMT - DILATOMETER TEST PMT - PRESSUREMETER TEST SAMPLE ABBREVIATIONS	SOFT CAN BE GROVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN	STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.
	DPT - DYNAMIC PENETRATION TEST SAP SAPROLITIC S - BULK	PIECES CAN BE BROKEN BY FINGER PRESSURE.	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.
PLASTIC 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.
RANGE / SEMISOLIU; REGUIRES DRYING TO	FRAC FRACTURED, FRACTURES TCR - TRICONE REFUSAL FRAGS FRAGMENTS TCR - TRICONE REFUSAL TCR - RECOMPACTED TRIAXIAL CBR - CALIFORNIA BEARING	FRACTURE SPACING BEDDING	BENCH MARK; SEE NOTES
(PI) PL PLASTIC LIMIT ATTAIN OPTIMUM MOISTURE	HI HIGHLY V - VERY RATIO	TERM SPACING TERM THICKNESS	DERICH HARMS SEE NOTES
OM OPTIMUM MOISTURE - MOIST - (M) SOLID; AT OR NEAR OPTIMUM 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: N/A FEET
SL SHRINKAGE LIMIT	DRILL UNITS: ADVANCING TOOLS: HAMMER TYPE: X CME-45C	MODERATELY CLOSE	NOTES: FIAD - FILLED IMMEDIATELY AFTER DRILLING
- DRY - (D) REQUIRES ADDITIONAL WATER TO		VERY CLOSE LESS THAN 0.16 FEET THICKLY LAMINATED 0.008 - 0.03 FEET	B5825-2 GPS AT STA. 18+18.53 -L- (900.836 FT. N., 1.576.810 FT. E.)
ATTAIN OPTIMUM MOISTURE	CME-55 G* CONTINUOUS FLIGHT AUGER CORE SIZE:	THINLY LAMINATED < 0.008 FEET	ELEVATION: 769.45
PLASTICITY	X 8* HOLLOW AUGERS	INDURATION STATE OF THE PROPERTY OF THE PROPER	BL-4 AT STA. 29+61.97 -L- (900,488 FT. N., 1,577,899 FT. E.)
PLASTICITY INDEX (PI) ORY STRENGTH	X CME-550 HARD FACED FINGER BITS X -N O	FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC. RUBBING WITH FINGER FREES NUMEROUS GRAINS:	ELEVATION: 769.60 BY-26 AT STA. 12+13.49 -L- (900,709 FT. N., 1,578,216 FT. E.)
NON PLASTIC 0-5 VERY LOW SLIGHTLY PLASTIC 6-15 SLIGHT	VANE SHEAR TEST TUNG,-CARBIDE INSERTS HAND TOOLS:	FRIABLE GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.	ELEVATION: 756.60
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:	
	PORTABLE HOIST TRICONE STEEL TEETH HAND AUGER	BREAKS EASILY WHEN HIT WITH HAMMER.	
COLOR	TRICONE TUNGCARB. SOUNDING ROD	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).	CORE BIT VANE SHEAR TEST	SHAPP HAMMER BLOWS REGULDED TO RDEAK SAMPLE.	
MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.		EXTREMELY INDURATED SAMPLE BREAKS ACROSS GRAINS.	DATE: 8-15-14
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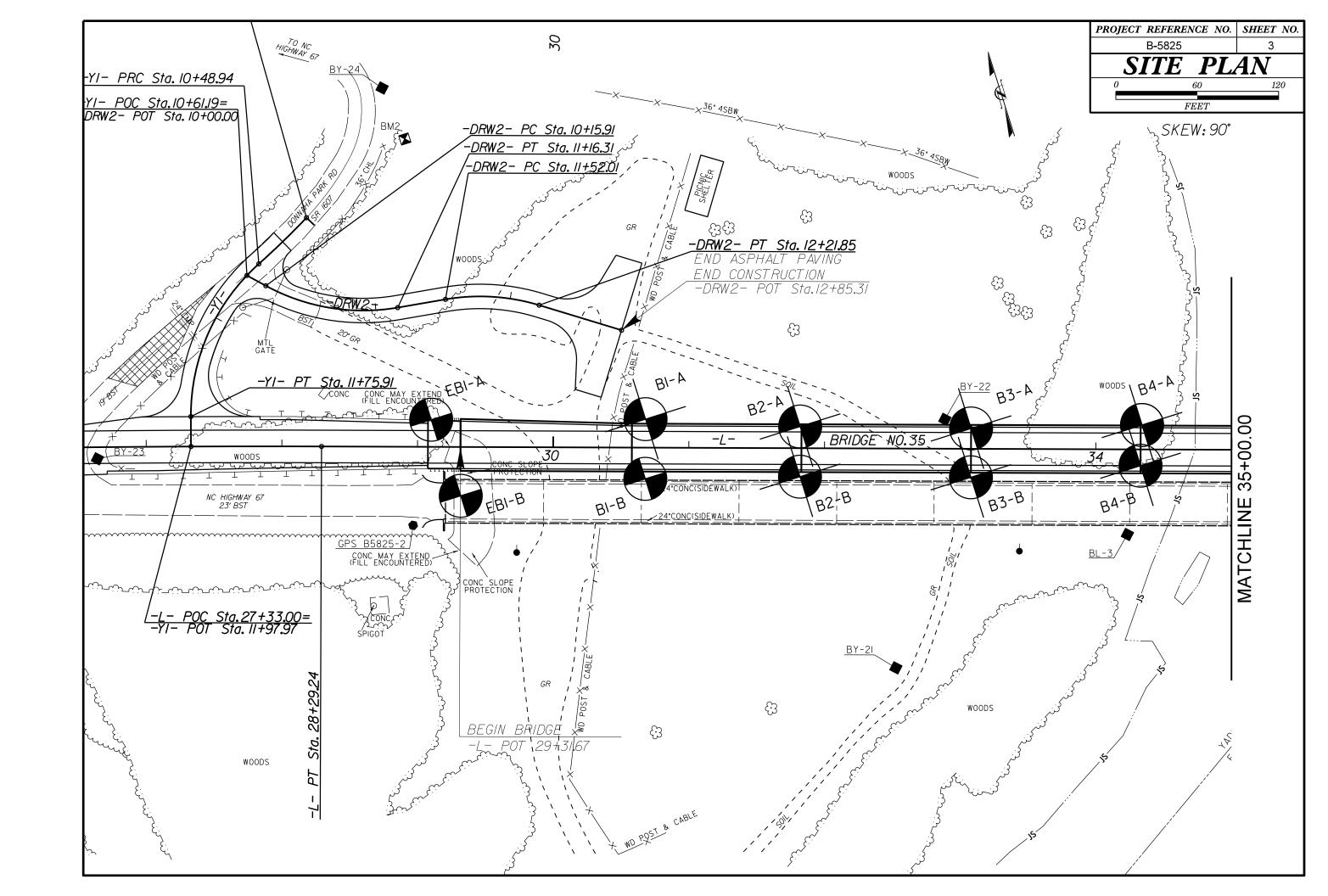
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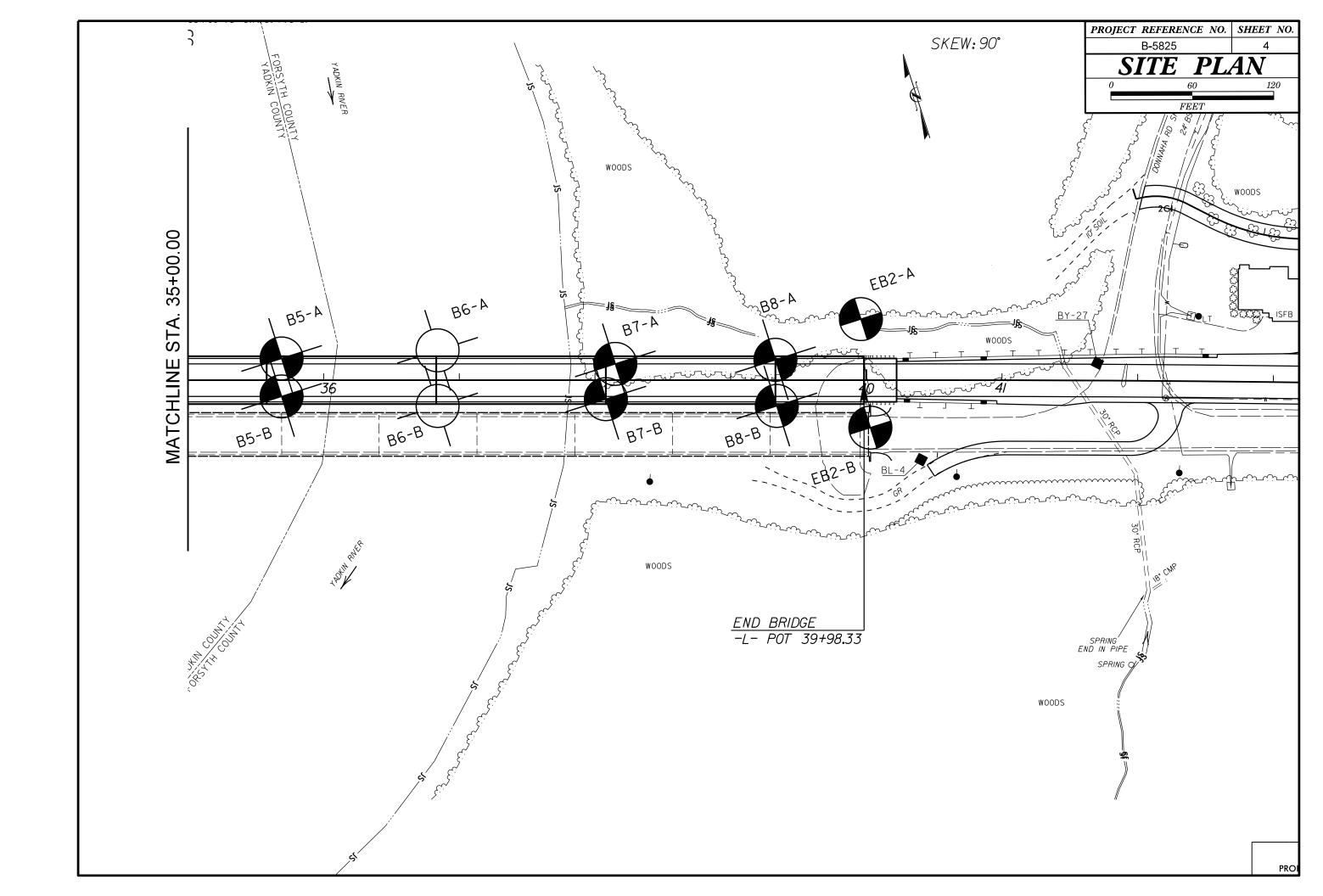
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION **DIVISION OF HIGHWAYS** GEOTECHNICAL ENGINEERING UNIT

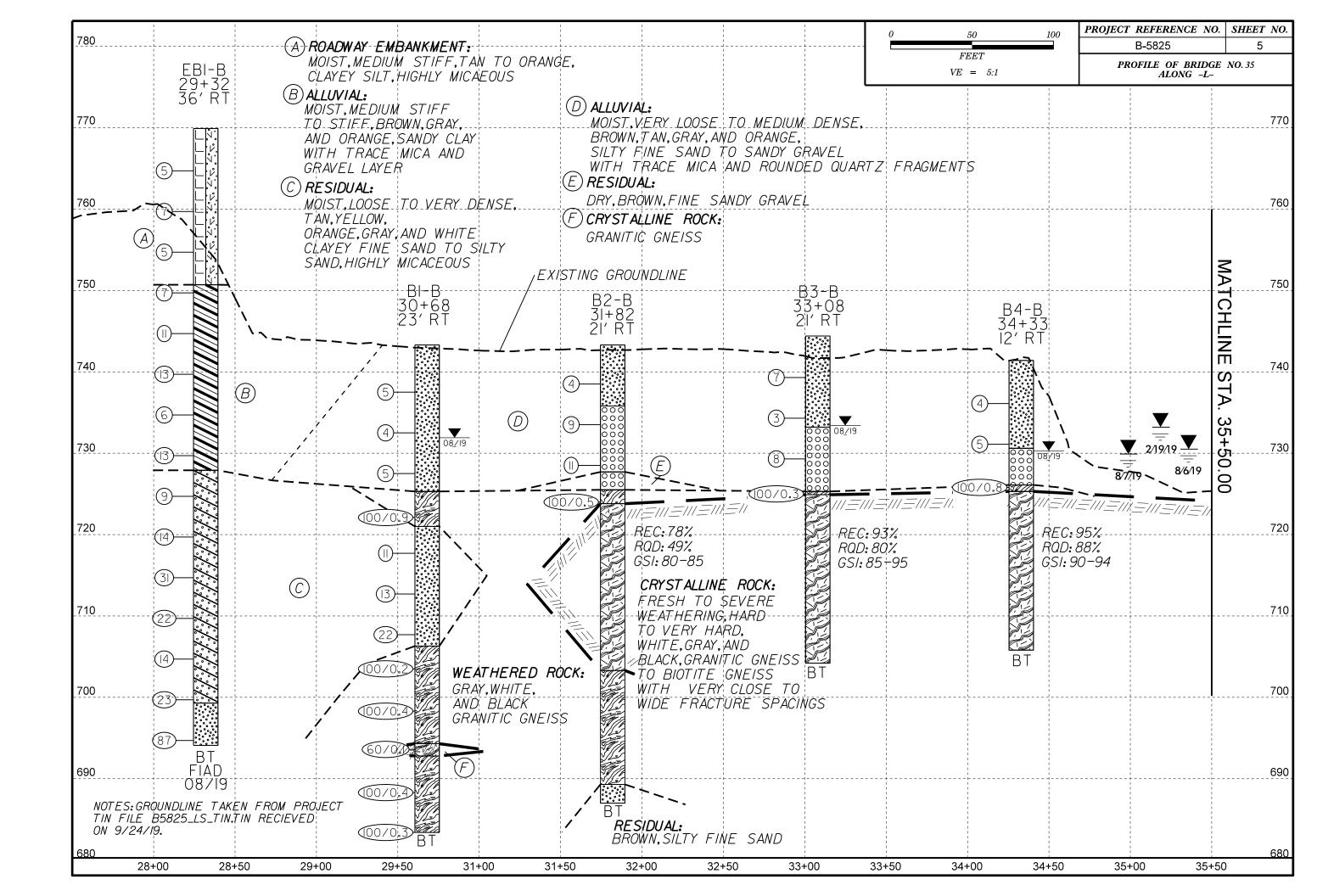
SUBSURFACE INVESTIGATION

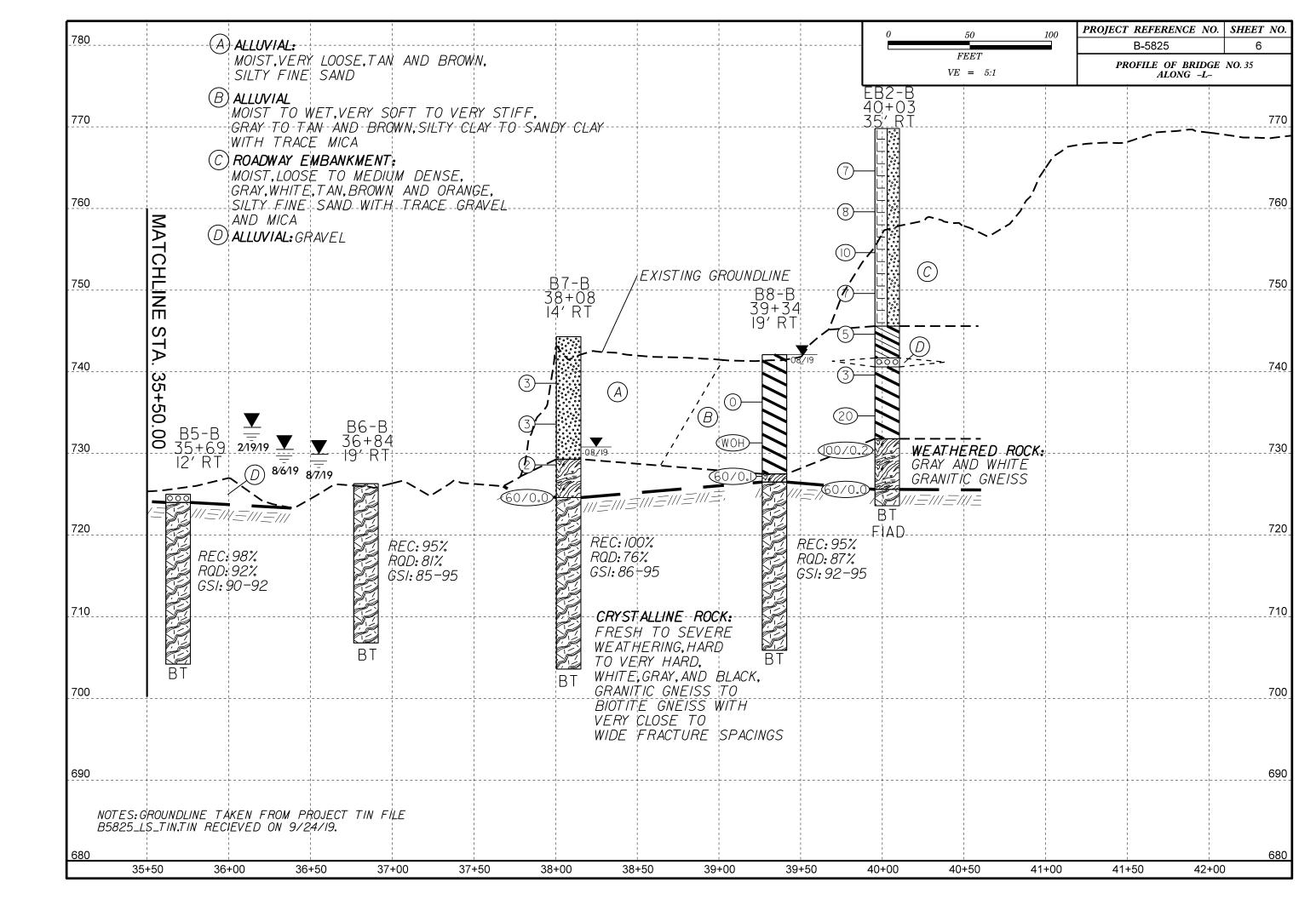
SUPPLEMENTAL LEGEND, GEOLOGICAL STRENGTH INDEX (GSI) TABLES

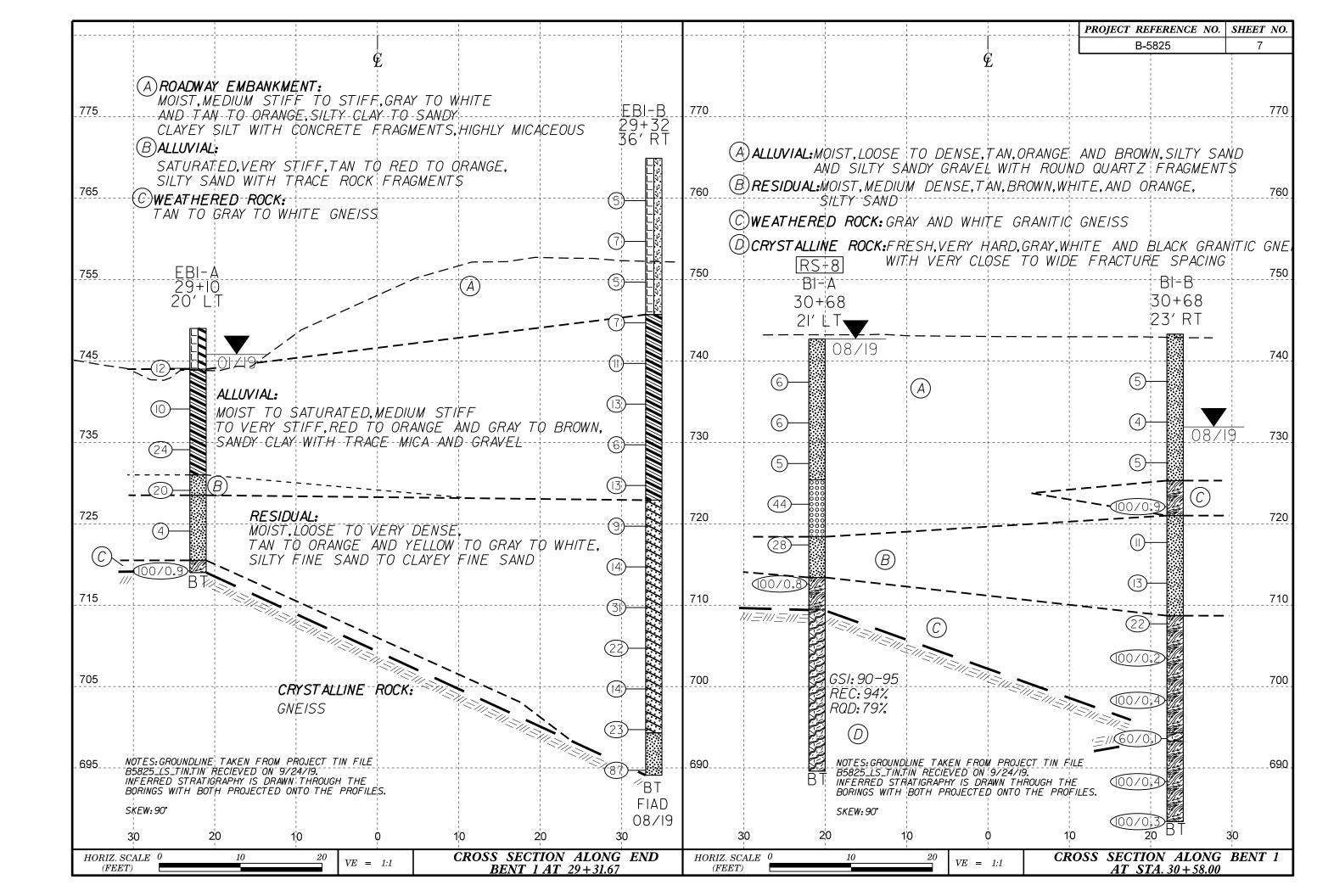
AASHTO LRFD Figure 10.4.6.4-1 — Determination of GSI for Join	ted Ro			SHTO LRF	D BRID	GE DESIGN SPECIFICATIONS AASHTO LRFD Figure 10.4.6.4-2 — Determination of GSI for Tectonically Deformed Heterogeneous Rock Masses (Marinos and Hoek, 2000)
GEOLOGICAL STRENGTH INDEX (GSI) FOR JOINTED ROCKS (Hoek and Marinos, 2000)		(0		ν Φ	s O	GSI FOR HETEROGENEOUS ROCK MASSES SUCH AS FLYSCH (Marinos. P and Hoek E., 2000)
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 surfaces GOOD Rough, slightly weathered, iron stained surfaces	FAIR Smooth, moderately weathered and altered surfaces	POOR Slickensided, highly weathered surfactive compact coatings or fillings or angular fragments	VERY POOR Slickensided, highly weathered surfac with soft clay coatings or fillings	Exercises of the filthology, structure and surface conditions (barticularly of the pedding planes), choose a pox in the chart. Tocate the bosition in the pox that corresponds to the condition of the discontinuities and estimate the average value of QSI from the contours. Do not attempt to be too brecises (Brown culteriou does not abply to structurally controlled failures). Where nulasonations was blanar discontinuities are present; these will dominate the pedanor of the surfaces with companion of the tock wass. The strength of some rock masses is reduced by the bresence of documents. VERY POOR - Very Silched Surfaces with the object of highly weathered for highly weathered for highly weathered surfaces with soft of highly weathered surfaces with s
STRUCTURE		DECREASING SI	URFACE QU	JALITY ===	≥	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	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. A. Thick bedded, very blocky sandstone TO A
disturbed rock mass consisting of cubical blocks formed by three intersecting discontinuity sets	OF ROCK	70 60				B. Sand- stone with stone and stitus inter- layers of C. Sand- or silty shale or silty shale with sand- stone layers B. Weak siltstone or clayey shale with
VERY BLOCKY - interlocked, partially disturbed mass with multi-faceted angular blocks formed by 4 or more joint sets	OCKING		50			layers of in similar amounts stone layers shall with sandstone layers 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. F. Tectonically deformed, intensively folded/faulted, sheared clayey shale or siltstone with broken and deformed sandstone layers forming an almost chaotic structure
DISINTEGRATED - poorly inter- locked, heavily broken rock mass with mixture of angular and rounded rock pieces	- ∭- -			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 and small rock average.
LAMINATED/SHEARED - Lack of blockiness due to close spacing of weak schistosity or shear planes	V	N/A N/A		$\left\langle \left\langle \left\langle \right\rangle \right\rangle \right\rangle$	10	into small rock pieces. → Means deformation after tectonic disturbance DATE: 8-19-

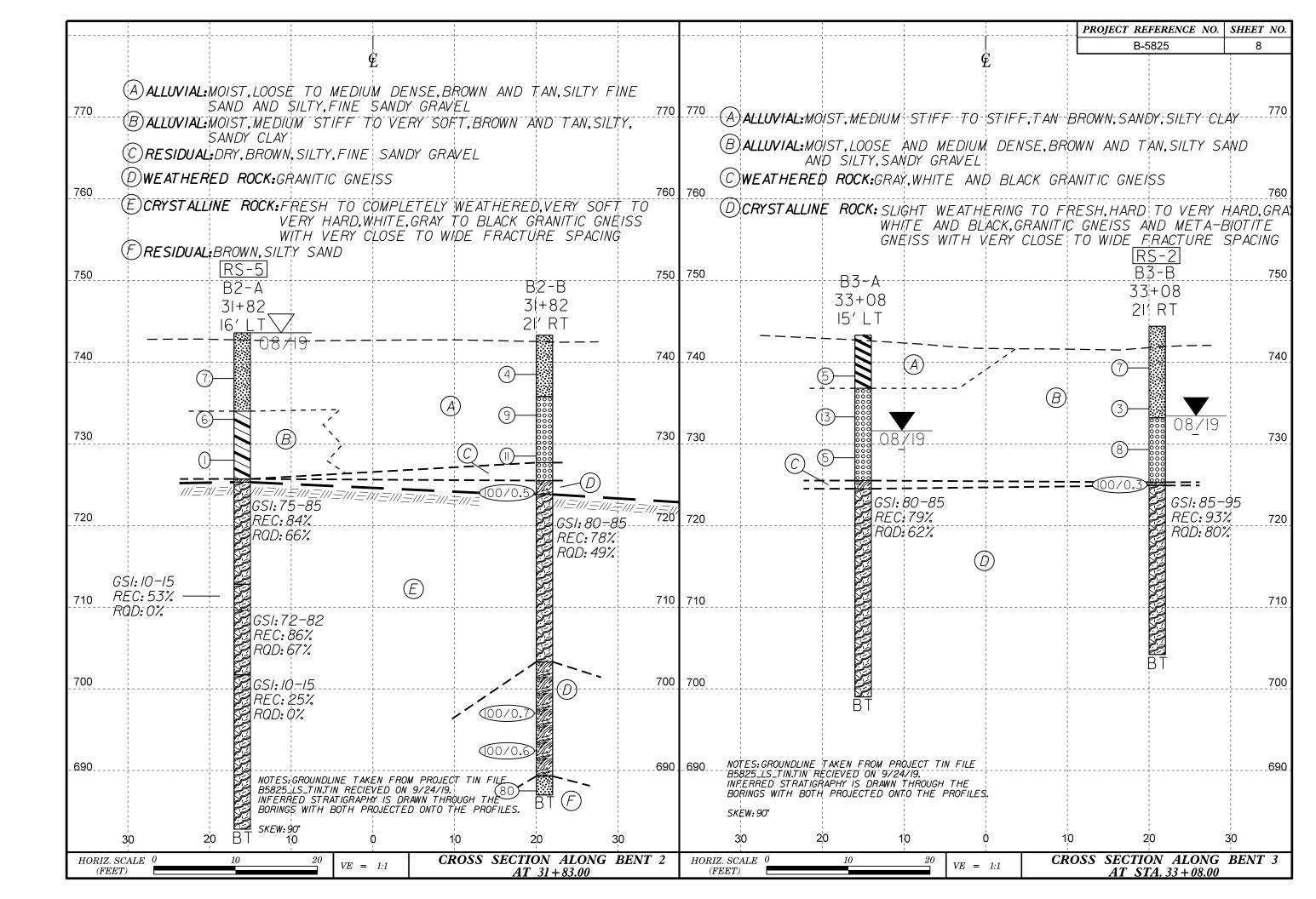


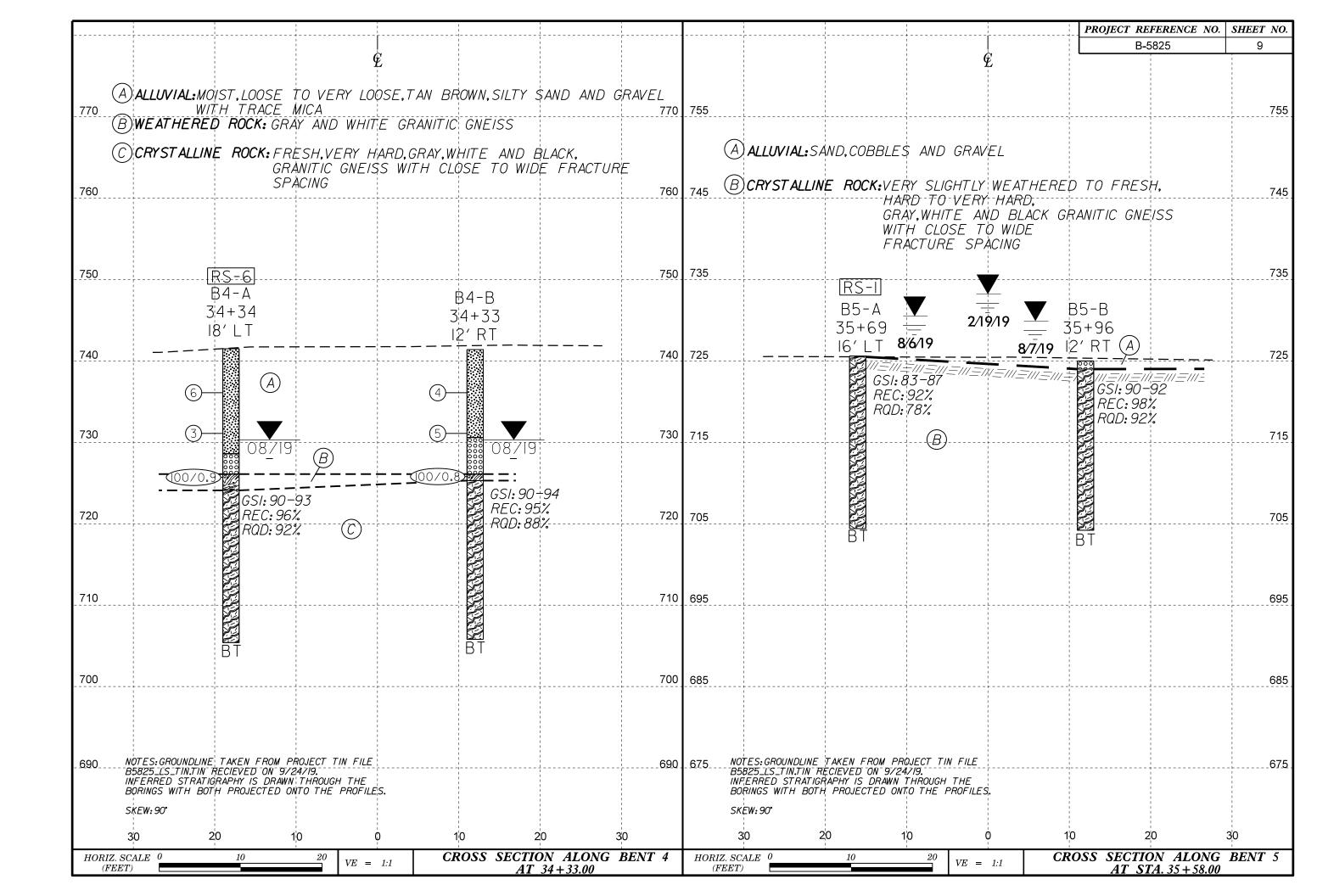


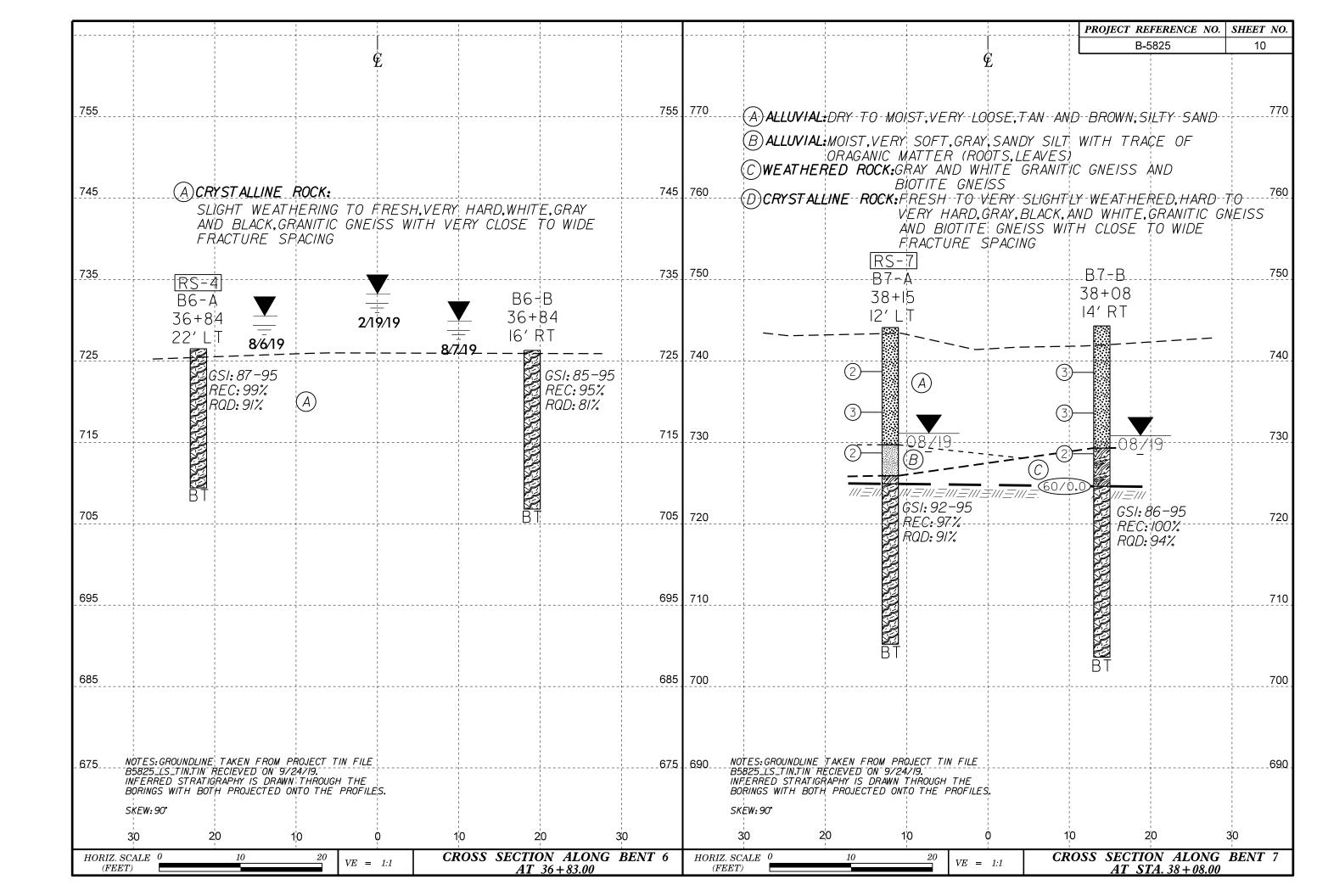


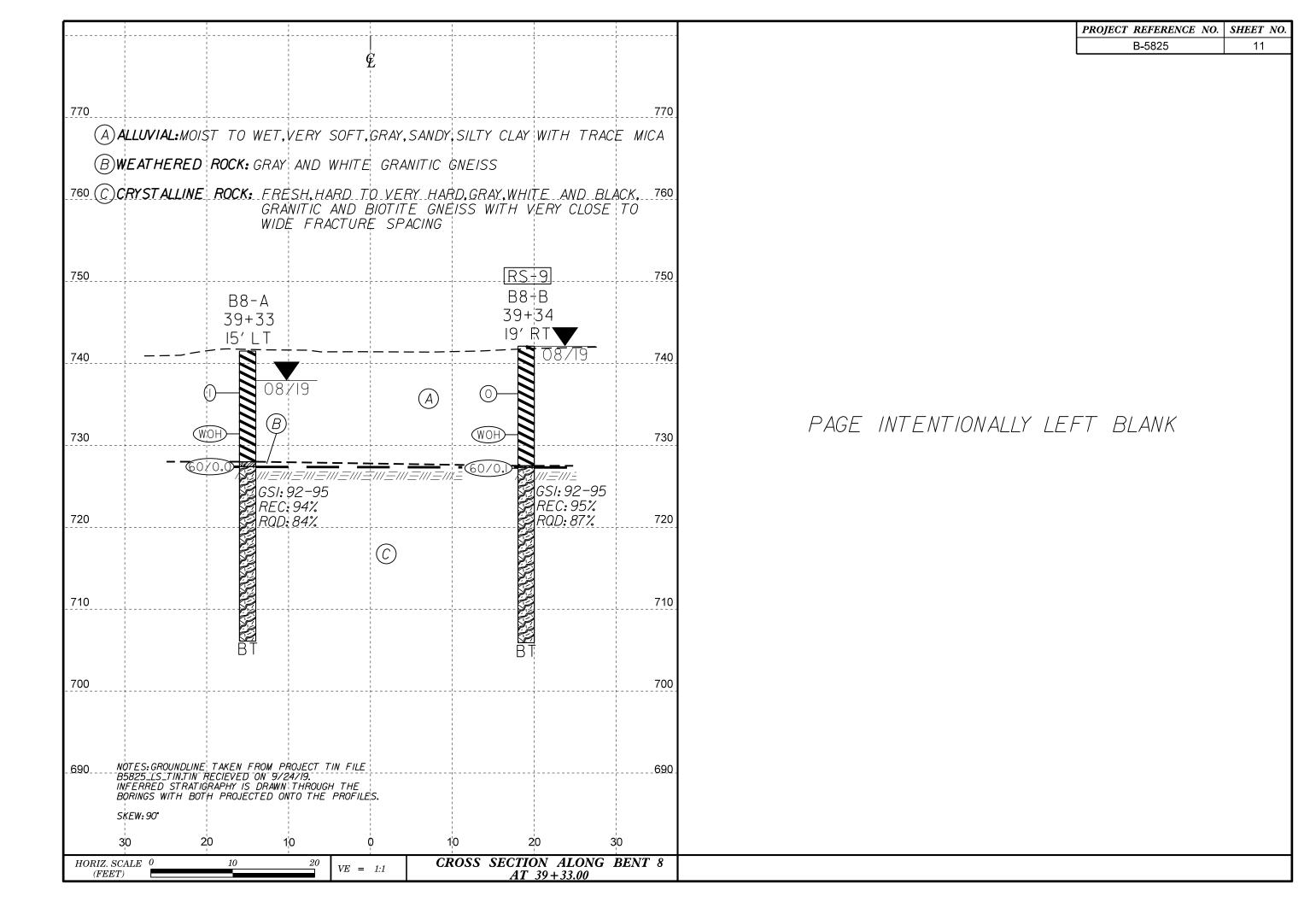


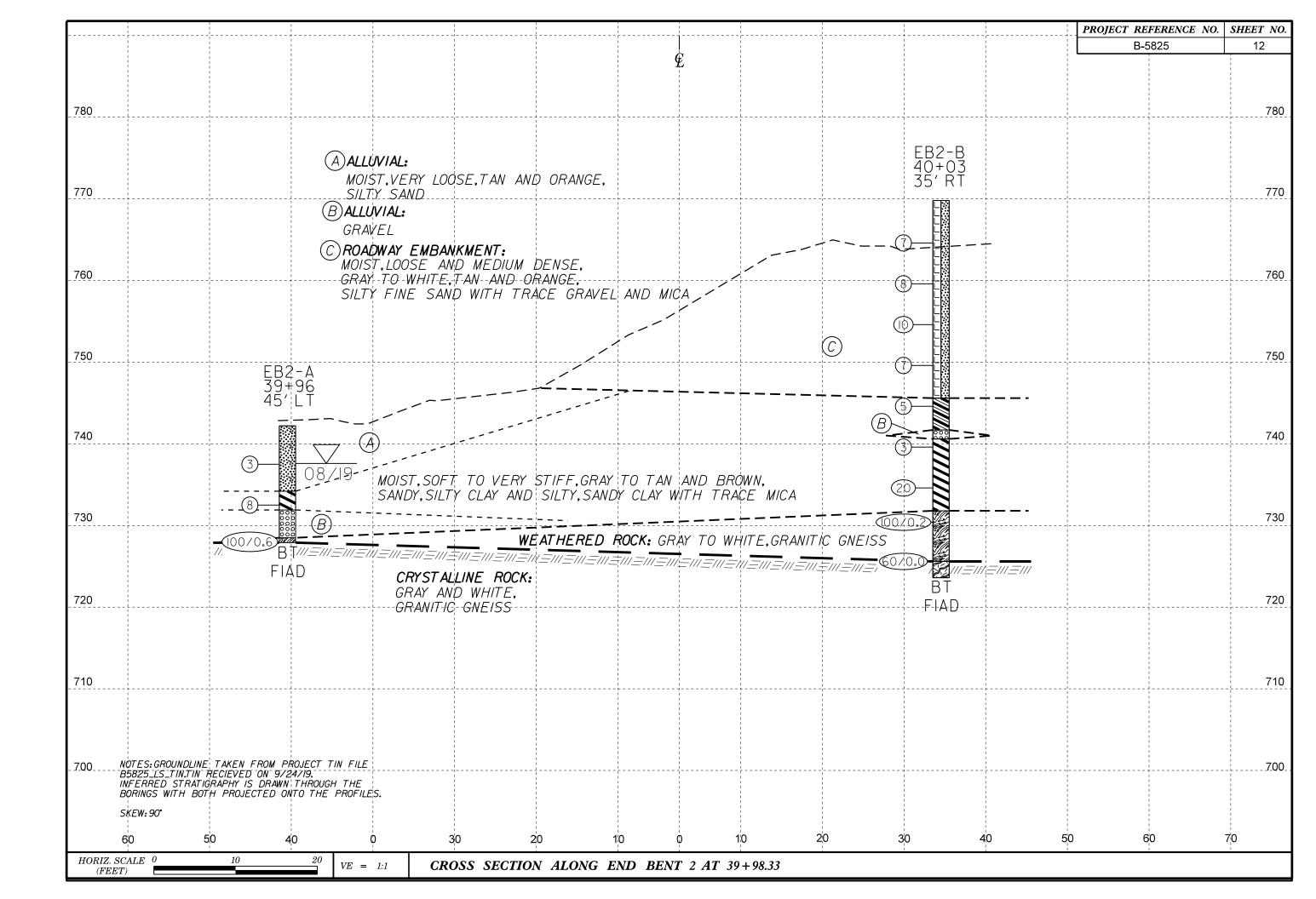


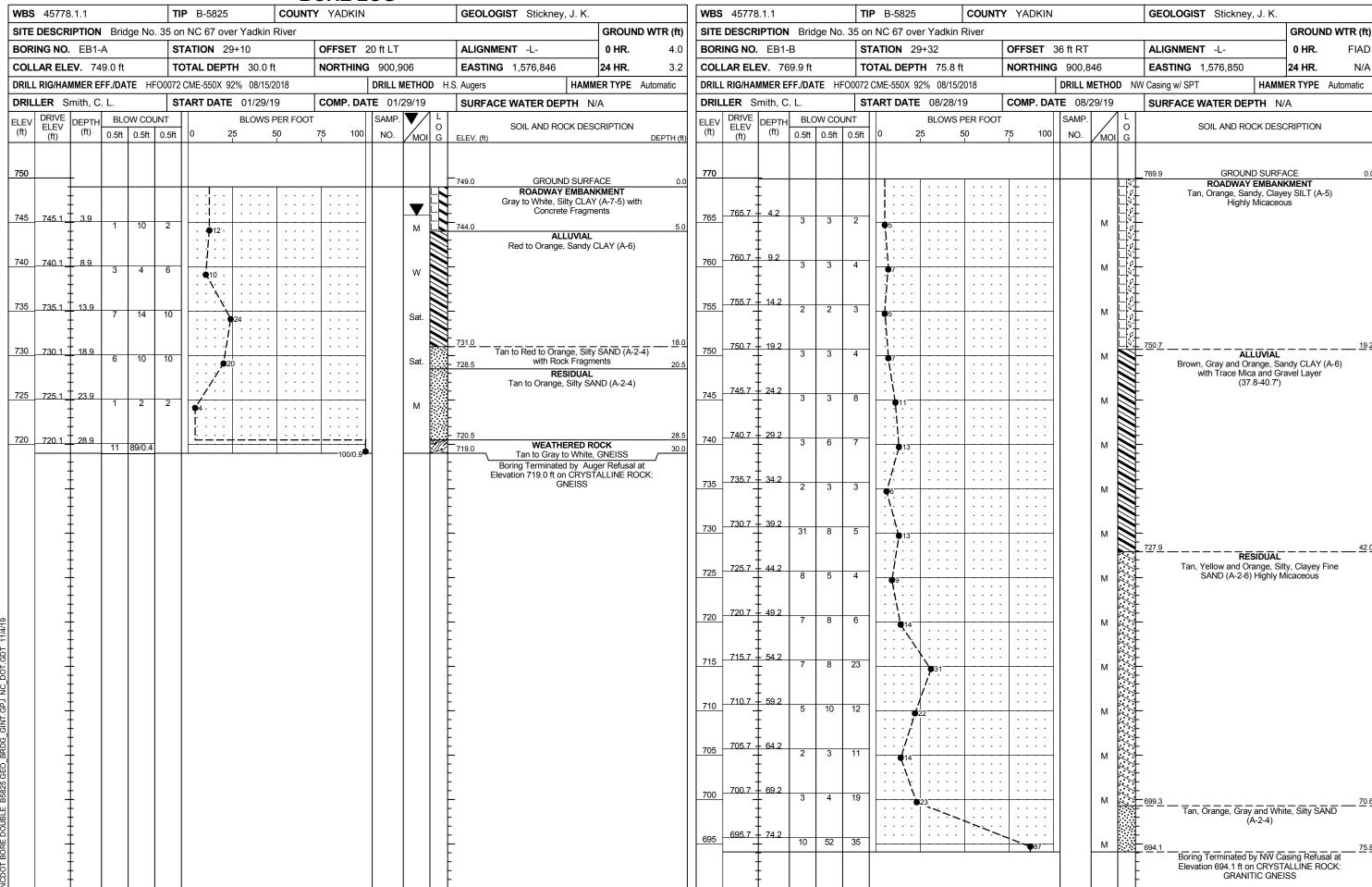












		BORE LOG					ORE LOG	
WBS 45778.1.1	TIP B-5825 COUN	TY YADKIN	GEOLOGIST Stickney, J. K.		WBS 45778.1.1	TIP B-5825 COUNT	Y YADKIN	GEOLOGIST Stickney, J. K.
SITE DESCRIPTION Bridge No.	35 on NC 67 over Yadkin River		GROU	UND WTR (ft)	SITE DESCRIPTION Bridge No. 35	on NC 67 over Yadkin River		GROUND WTR (ft
BORING NO. B1-A	STATION 30+68	OFFSET 21 ft LT	ALIGNMENT -L- 0 HR.	ર. 0.0	BORING NO. B1-A	STATION 30+68	OFFSET 21 ft LT	ALIGNMENT -L- 0 HR. 0.0
COLLAR ELEV. 742.7 ft	TOTAL DEPTH 53.1 ft	NORTHING 900,859	EASTING 1,576,997 24 HR .	₹. 0.0	COLLAR ELEV. 742.7 ft	TOTAL DEPTH 53.1 ft	NORTHING 900,859	EASTING 1,576,997 24 HR. 0.0
DRILL RIG/HAMMER EFF./DATE HF	O0072 CME-550X 92% 08/15/2018	DRILL METHOD NV	V Casing W/SPT & Core HAMMER TYPE	E Automatic	DRILL RIG/HAMMER EFF./DATE HFOO	072 CME-550X 92% 08/15/2018	DRILL METHOD N	W Casing W/SPT & Core HAMMER TYPE Automatic
DRILLER Smith, C. L.	START DATE 08/20/19	COMP. DATE 08/21/19	SURFACE WATER DEPTH N/A		DRILLER Smith, C. L.	START DATE 08/20/19	COMP. DATE 08/21/19	SURFACE WATER DEPTH N/A
ELEV DRIVE DEPTH BLOW COU			SOIL AND ROCK DESCRIPTIO	on	CORE SIZE NW2	TOTAL RUN 19.8 ft		
(ft) (ft) (ft) 0.5ft 0.5ft	0.5ft 0 25 50	75 100 NO. MOI G	ELEV. (ft)	DEPTH (ft)	ELEV RUN DEPTH RUN DRILL RATE	RUN STRATA REC. RQD NO. (ft) (L	DESCRIPTION AND REMARKS
					(ft) (ft) (ft) (Min/ft)	(ft) (ft) NO. (ft) (ft) (ft) %	G ELEV. (ft)	DEPTH (
745			-		709.4 709.4 + 33.3 2.3	(2.2) (1.5) (18.7) (15.6)	7094	Begin Coring @ 33.3 ft CRYSTALLINE ROCK 33
			742.7 GROUND SURFACE ALLUVIAL	0.0	707.1 35.6 5.0	(2.2) (1.5) 96% 65% (18.7) (15.6) 94% 79% (18.7)		Gray, White and Black GRANITIC GNEISS with Very Close to Wide Fracture Spacing
740			Tan and Brown Silty SAND (A-2-	2-4)	705	86% 60%		GSI = 90 to 95
738.4 + 4.3	1		-		702.1 + 40.6			331 - 90 10 93
3 3	3 6	- M			702.1 40.0 5.0	(4.7) (4.6) 94% 92%		
735		 	-		700	94% 92% RS-8 /		
733.4 + 9.3 3 3	$\frac{}{3}$				697.1 45.6	(5.0) (4.2)		
730					695	(5.0) (4.2) 100% 84%	889.6	
728.4 + 14.3	3		-		692.1 50.6			
	3 •5	[:		2.5	(2.5) (2.3) 100% 92%		
725			Tan, Brown and Orange, Silty, Sa	andv — — —	690 689.6 53.1	100% 92%	000.0	ated at Elevation 689.6 ft in CRYSTALLINE ROCK:
723.4 † 19.3 12 32		-	GRAVEL (A-1) with Round Quar Fragments	artz				GRANITIC GNEISS
720							-	
718.4 + 24.3		000	- 	24.3			-	
8 12	16 28	-	RESIDUAL Tan, Brown and White, Silty SAND ((A-2-4)				
715			-				-	
713.4 + 29.3	11 17 17	100/0.8	713.4 WEATHERED ROCK Gray and White GRANITIC GNEI	29.3				
710		-	Gray and White GRANITIC GNEI	EISS				
			CRYSTALLINE ROCK	33.3			-	
			Gray, White and Black GRANITIC G	GNEISS				
705			CRYSTALLINE ROCK Gray, White and Black GRANITIC G				-	
							-	
700			_				-	
		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1						
8 695			-				F	
							F	
690		I I I V #	-689.6	53.1			-	
			Boring Terminated at Elevation 689. CRYSTALLINE ROCK: GRANITIC G	9.6 ft in				
			SITIOTALLINE NOON, GIVANITIO G	U. VL. 100				
			-				F	
							F	
			_				F	
							F	
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			-				1 F	
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B1-A

BOX 1: 33.3 - 43.5 FEET

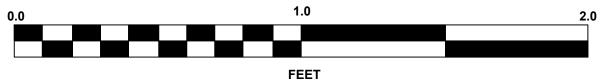


FEET

B1-A

BOX 2: 43.5 - 53.1 FEET





							<u> </u>	UKE L	<u> </u>				
WBS	45778.1.1				TI	P B-5825	COUNT	Y YADKIN				GEOLOGIST Stickney, J. K.	
SITE	DESCRIPT	ION	Brid	lge No	o. 35 or	NC 67 over Yadkir	River						GROUND WTR (ft)
BOR	NG NO . B	1-B			S	ATION 30+68		OFFSET 2	3 ft RT			ALIGNMENT -L-	0 HR. 0.0
COLI	AR ELEV.	743	.3 ft		TO	TAL DEPTH 59.9	ft	NORTHING	900,8	17		EASTING 1,576,984	24 HR. 11.4
DRILL	. RIG/HAMME	R EFF	F./DA	TE H	FO0072	CME-550X 92% 08/15	/2018	·	DRILL M	IETHC	D NW	/ Casing w/ SPT HAMMI	ER TYPE Automatic
DRIL	LER Smith	n, C. I	L.		S	ART DATE 08/19/	19	COMP. DAT	Γ E 08/1	19/19		SURFACE WATER DEPTH N/A	A
ELEV (ft)	DRIVE DEF	РТН		0.5ft	UNT	1	PER FOOT	75 100	SAMP.	MO	L O I G	SOIL AND ROCK DESC	
745												743.3 GROUND SURFA	NCE 0.0
	<u> </u>											ALLUVIAL Tan and Brown, Silty SAI	
740													ND (A-2-4)
	738.5 + 4	.8	1	2	3								
	Ŧ		'	_		\$ 5				М	-		
735	ļ <u>Ţ</u>												
	733.5 + 9	.8	2	2	2					MF			
700	‡					7 4 · · · · · · ·				- V			
730	700 5 1 4					 	+	+					
	728.5 + 14	1.8	1	3	2	1				М	F		
725	Ŧ											725.3	18.0
720	723.5 + 19	9.8					 	T				WEATHERED RO GRANITIC GNEI	
	1		28	31	69/0.4			100/0.9		М			
720	+					+	+	100/0.9				721.0	22.3
	718.7 - 24	1.6	4	5	6	.\					<u> </u>	Tan, Brown and Orange, Sil (A-2-4)	ty Fine SAND
	‡		4)	0	11				М		(A-2-4)	
715											Ł		
	713.7 + 29	9.6	5	5	8						-		
	Ŧ		Ü			13.				М	III.		
710	‡											-	
	708.7 + 34	l.6	5	6	16					М		707.2	36.1
	<u> </u>					· · · · · · · · · · · · · · · · · ·	 					WEATHERED RO	CK
705	703.7 + 39						 					Gray and White GRANITI	C GNEISS
	703.7 + 38	10	00/0.2					. 100/0.2		М			
700	‡												
700	+ 698.7 + 44	16					 	+				•	
	1	10	00/0.4					100/0.4		М			
695	Ŧ												
	693.7 + 49	0.6	00/0.4							М		694.3 CRYSTALLINE RO	49.0 OCK 50.5
	‡	ľ	60/0.1					60/0.1				GRANITIC ROC	K
690	#											WEATHERED RC Gray and White GRANITI	
	688.7 + 54	1.6	00/0.4					100/0.4		М			
	Ŧ	ľ	00,0.1					100/0.4					
685	‡							<u> </u>					
	683.7 - 59	9.6 10	00/0.3					100/0.3	-	M	74	683.4 Boring Terminated at Elevat	59.9 ion 683 4 ft in
	‡											WEATHERED ROCK: GRAN	
	\pm										<u> </u>		
	Ŧ										F		
	‡												
	‡											•	
	\pm										1 -		
	Ŧ										F		
	†										F	•	
	‡												
	+								1 1		1 -		



STE DESCRIPTION Ridge No. 35 on N.C. or over Yorks Peer 1 ORCHAR CREV. 7 (35.81) TOTAL DEPTH 50.51 NORTHING 500.520 OFFSET 16 IL I ALIGNMENT 1- 0 NR 0.0		E	BORE LOG					CORE LOG	
COMMAND COLAR STATION S1-92	WBS 45778.1.1	TIP B-5825 COUNT	TY YADKIN	GEOLOGIST Stickney, J. K.	WBS 45778.1	.1	TIP B-5825 COUN	TY YADKIN	· ·
COLLARELEY, 76.8 ft TOTAL DEPTH 60.8 ft MORTHWO 60.500 EASTING 1.577.104 MARR. MAR	SITE DESCRIPTION Bridge No. 3	5 on NC 67 over Yadkin River		GROUND WT	R (ft) SITE DESCRIP	FION Bridge No. 35	on NC 67 over Yadkin River		GROUND WTR (ft)
DRALL PRIVATE CHILD TOTAL PRIVATE CHILD TOTA	BORING NO. B2-A	STATION 31+82	OFFSET 16 ft LT	ALIGNMENT -L- 0 HR.	0.0 BORING NO.	B2-A	STATION 31+82	OFFSET 16 ft LT	ALIGNMENT -L- 0.0
DRILLER SIND. C.L. START DATE 091-19 SUPPLIES SIND. C.L. START D			NORTHING 900,820	EASTING 1,577,104 24 HR.	N/A COLLAR ELEV	. 743.6 ft	TOTAL DEPTH 60.8 ft	NORTHING 900,820	EASTING 1,577,104 24 HR. N/A
Part Supplement Supplemen		0072 CME-550X 92% 08/15/2018	DRILL METHOD NW	Casing W/SPT & Core HAMMER TYPE Autom			1		NW Casing W/SPT & Core HAMMER TYPE Automatic
State Column Co	-			SURFACE WATER DEPTH N/A				COMP. DATE 08/14/19	SURFACE WATER DEPTH N/A
Table Tabl	(ft) ELEA (ft)					WL	TOTAL RUN 42.5 ft	1	
Table Tabl	(ft) (vs) 0.5it 0.5it 0	J.5it 0 25 30	73 100 NO. MOI G	ELEV. (ft) DEF	TH (ft) ELEV RUN DI	EPTH RUN RATE	REC. RQD SAMP. REC. RQD		
To Table 4.6 5 4 5 7 7 7 8 7 8 8 8 8 9 9 9 9 9 9 9 9 9 9 9					(11)	(Min/ft)	% % %	G ELEV. (ft)	DEPTH (ft
70	745			743.6 GROUND SURFACE	0.0 725.3 725.3	18.3 2.5	(1.4) (0.0) (10.5) (8.2	725.3	CRYSTALLINE ROCK 18.3
70			- ****-	ALLUVIAL	722.8		56% 0% 84% 66%	Slight Weathe	NEISS with Close to Wide Fracture Spacing
70	740	11 ' 1		ran and brown sifty salve (A-2-4)		3.0	98% 80%		(Soft Soil/Biotite Seam from 19.5-19.8')
70	739.0 4.6 5 4	3 1	: : : : : M			25.8			GSI = 75 to 85
70		.			11 717.0 4	5.0	(4.2) (4.2)		
70	734.0 7 9.6			734.0	9.6 715		0476 0476		
725 725		\$6		Tan and Brown Silty Sandy CLAY (A-6)	712.8 🔭		(3.5) (1.6)	712.8 Complete to Sev	30.8
725 725					710	5.0	70% 32% 53% 0%	700 6	
725 725	729.0 <u>14.6</u> WOH WOH	<u> </u>			707.8	35.8	(6.8) (5.3) - 709.0	GSI = 10 -15
### ##################################	725 7 + 17 9			725.7	17.9			Moderate Weath GRANITIC G	nering to Fresh, Hard to Very Hard, Gray, White and Black NEISS with Very Close to Moderately Close Fractures
700	725 100/0.1				— ' * * +		7070 0470		GSI = 78 to 82
700				CRYSTALLINE ROCK	702.8 🗍		(2.3) (0.5)	701 7	41.9
700	720			White, Gray and blown GRANTIC GNEISS	700	0.0	46% 10% (4.7) (0.0)	Complete to M	loderate Severe Weathering, Very Soft to Medium Hard.
700						15.8	25% 0%	Brown and Gra	Spacing
700							(0.8) (0.0)		GSI = 10 to 15
700	$\frac{715}{1}$ $\frac{1}{1}$				695		1076 076		
700					30.8 692.8		(14) (00)		
700	710 +			709 6	34 0 690	3.0	28% 0%		
700				Gray, White and Black GRANITIC GNEISS		55.8			
700							(1.4) (0.0)		
700 Boring Terminated at Elevation 682.8 ft in CRYSTALLINE ROCK: GRANITIC GNEISS GRANITIC GNEISS	705						2070 070		
800 Brown and Gray GRANITIC GNEISS 690 GRANITIC GNEISS 682.a Boring Terminated at Browlin 682.8 ft. in GRYST ALLINE ROCK: GRANITIC GNEISS				701.7	41.9	60.8			60.4 sinated at Elevation 682.8 ft in CRYSTALLINE ROCK:
695. 695. Scring Terminated at Elevation 682.8 ft in CRYSTALLINE ROOK: GRANITIC GNEISS	700			Brown and Gray GRANITIC GNEISS	\Box \Box				GRANITIC GNEISS
895. 885. 886. 887. 888.					$\parallel \parallel \parallel \parallel \parallel \parallel$			1 E	
686 687 688 688 688 688 608 CRYSTALLINE ROCK: GRANITIC GNEISS 608									
685 685 Boring Terminated at Elevation 682.8 ft in CRYSTALLINE ROCK: GRANITIC GNEISS 60.8	+							-	
686 Boring Terminated at Elevation 682.9 ft in CRYSTALLINE ROCK: GRANITIC GNEISS CRYSTALLINE ROCK: GRANITIC GNEISS									
68.5 Boring Terminated at Elevation 682.8 ft in CRYSTALLINE ROCK: GRANITIC GNEISS	690 +								
685 Boring Terminated at Elevation 682.8 ft in CRYSTALLINE ROCK: GRANITIC GNEISS									
682.8 Boring Terminated at Elevation 682.8 ft in CRYSTALLINE ROCK: GRANITIC GNEISS									
Boring Terminated at Elevation 682.8 ft in CRYSTALLINE ROCK: GRANITIC GNEISS CRYSTALLINE ROCK: GRANITIC GNEISS CRYSTALLINE ROCK: GRANITIC GNEISS CRYSTALLINE ROCK: GRANITIC GNEISS	 			000.0				-	
THE CRYSTALLINE ROCK: GRANITIC GNEISS				Boring Terminated at Elevation 682.8 ft in	60.8				
				CRYSTALLINE ROCK: GRANITIC GNEISS					
			‡						
			‡		‡			-	
								-	
			‡						
			‡					-	
			‡					-	

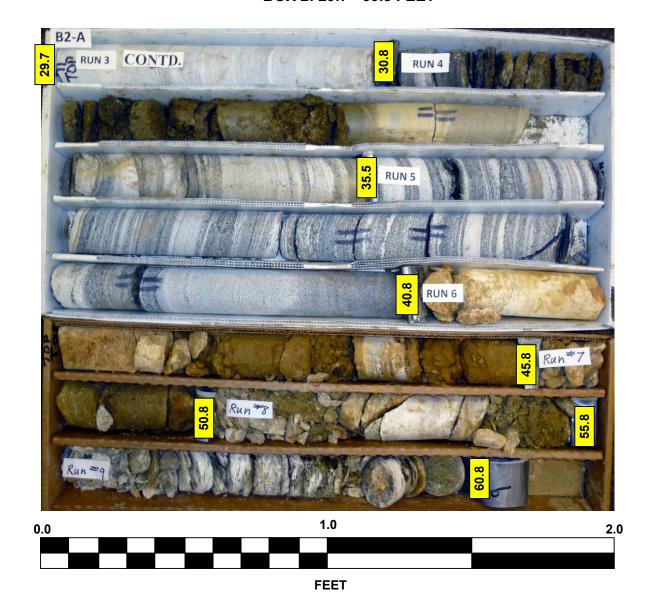
B2-A

BOX 1: 18.3 - 29.7 FEET



B2-A

BOX 2: 29.7 - 60.8 FEET



						В	BORE	LOG													C	ORE	E LOG					
WB	S 45778.1.1		Т	IP B-5825		COUNT	TY YADKII	N		GEOLOGIST Stickney, J. K.		v	VBS 4577	3.1.1			TIP	B-5825		COUNT	Y YAD	KIN	GEOL	LOGIST Stickne	y, J. K.			
SITI	E DESCRIPTIO	N Bridge N	lo. 35 c	n NC 67 ov	er Yadkin	River						GROUND WTR (f	t) S	ITE DESC	RIPTION	l Brid	ge No. 3	35 on N	IC 67 ove	r Yadkin F	liver						GROUND	WTR (ft)
BOI	RING NO. B2-	В	s	TATION 3	1+82		OFFSET	21 ft R1	Γ		ALIGNMENT -L-	0 HR . N//	A B	ORING NO	. B2-E	3		STAT	TION 31	+82		OFFS	ET 21 ft RT	ALIG	NMENT -L-		0 HR.	N/A
COI	LAR ELEV. 7	743.3 ft	т	OTAL DEP	TH 56.3	ft	NORTHIN	IG 900,	784		EASTING 1,577,093	24 HR. N//		OLLAR EL	EV . 74	13.3 ft		тот	AL DEPTI	H 56.3 ft		NORT	HING 900,784	EAST	TING 1,577,093		24 HR.	N/A
DRIL	L RIG/HAMMER	EFF./DATE									Casing W/SPT & Core HAMN	MER TYPE Automatic	$\dashv \vdash$	RILL RIG/HA			TE HFO						DRILL METH	OD NW Casing	W/SPT & Core	HAMM	ER TYPE A	utomatic
DRI	LLER Smith,			TART DATI			COMP. D				SURFACE WATER DEPTH N	I/A		RILLER S		C. L.		_		08/14/19	1	COMF	. DATE 08/14/19	SURF	ACE WATER DE	PTH N	'A	
ELE\ (ft)	ELEV /ft/	H BLOW C		1		PER FOO	T 75 10		· 🔻 /	0	SOIL AND ROCK DES			ORE SIZE	_		DRILL		AL RUN		ΤΡΔΤΔ	 						
	(ft)	0.511 0.51	0.511		1	j	70 10	o NO.	MOI	I G	ELEV. (ft)	DEPTH	-4 1-	LEV RUN (ft) FLEV	DEPTH (ft)	RUN (ft)	RATE (Min/ft)	REC.	UN RQD (ft) %	AMP. REC	RATA RQD (ft) %	Ö G E		DESCRIP	PTION AND REMAR	KS		
745														23.8 (ft)		.,	(IVIIII/IL)	<u> </u>	%	<u> </u>	<u>%</u>	I G E	LEV. (ft)	Pogin	Coring @ 19.5 ft			DEPTH (fi
745	+ +									-	743.3 GROUND SURF	FACE	0.0		19.5 20.0	0.5		(0.5)	(0.0)	(16.	0) (10.0)	7	23.8	CR'	YSTALLINE ROCK		rou to Plack	19.
				1	::::		I				ALLUVIAL Brown, Silty Fine SAN	ND (A-2-4)		720	Ŧ	5.0		(4.6) 92%	(2.9)	767	0 49%		GRANITIC	GNEISS, Very C	n, Very Hard to Hard Close to Moderately (Close Frac	ture Spacing	
740	739.5 3.8							\parallel			,,,,,	,			25.0										GSI = 80 to 85			
	‡	1 2	2	4					M						Ŧ	5.0		(4.6) 92%	(4.2) 84%									
735	7045			'\ : : :						000	735.8 Brown, Silty Fine Sandy C	3RAVEL (A-1) 7	7.5	715 713.3	20.0													
	734.5 + 8.8	5 5	4	. • 9					М	0000	Ziomi, only i mo ouncy i	5. u . v (7 13.3	30.0	5.0		(3.7) 74%	(2.7)									
	1 1			.						0000			7	710	‡			1470	3476									
730	729.5 13.8	7 6	5	1	1 : : : :			+	D					708.3	35.0	5.0		(2.6)	(0.4)									
	‡			· • • • • • • • • • • • • • • • • •						000	727.7 RESIDUAL		5.6	705	‡	"		(2.6) 52%	8%									
725	724.5 + 18.8			 · · · - -			- +			9000-	725.5 Brown, Silty Fine Sandy C	OCK	7.8		40.0								03.3					40.
	‡	100/0.5					100/0.	∮	D		723.8 Gray and White GRANI CRYSTALLINE F	IIC GNEISS /	9.5		Ŧ	5.0		(0.0) 0%	(0.0) 0%						EATHERED ROCK RANITIC GNEISS			
720	‡										White, Gray and Black GRA		7	700	Ī													
	1 Ŧ							1						698.3	45.0		N=100/0.7	7										
	1 - 1												6	§95	1													
715	$+$ \pm				1			-{							‡		N=100/0.6	6										
														690	‡													
710	↓ ‡							<u> </u>							‡							6	39.3		RESIDUAL			54.
	‡														‡	-	N=80					6	Boring Termin		n, Silty SAND (A-2-4 n 687.0 ft in CRYSTA	,	OCK: GRANITI	56.:
705	‡													-	‡								Bonning Termin	iated at Lievation	GNEISS	VELIIVE IXX	JOIN. OI VIIII	Ü
700	1 ‡				1	I	I	1			703.3	40	0.0		Ī							E						
											WEATHERED R GRANITIC GNE	ROCK EISS			Ŧ							l E						
700	$+$ \pm				+ : : : :			-							‡							-						
	697.7 + 45.6	100/0.7					I	,							‡							-						
_{තු} 695	↓ ‡						- Adjuste							-	‡							-						
11/6/19	693.5 + 49.8	15 89	11/0.1	: : : :				$ \cdot $							‡							-						
DOT.GDT	‡						- 100/0.0							-	‡													
TOO	688.5 + 54.8							 			689.3 RESIDUAL	. 54	1.0		Ī							E						
NC NC	<u> </u>	9 24	56				80	Щ		*****	687.0 Brown, Silty SAND Boring Terminated at Eleva		5.3		Ŧ							l E						
T.GPJ	1 ‡									F	CRYSTALLINE ROCK: GR				ŧ							<u> </u>						
GINT															‡							-						
BRDG	‡													-	‡							-						
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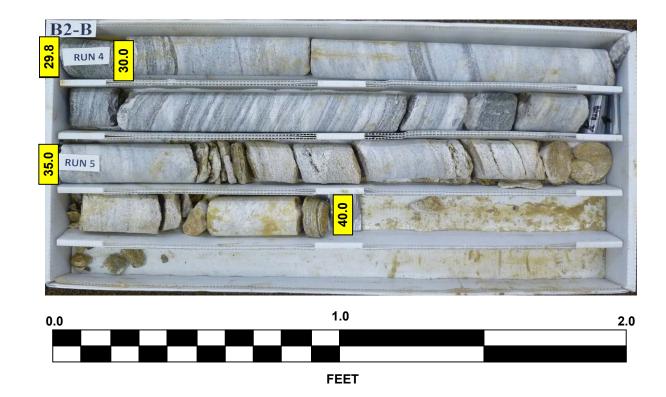
B2-B

BOX 1: 19.5 - 29.8 FEET

B2-B

BOX 2: 29.8 - 35.0 FEET

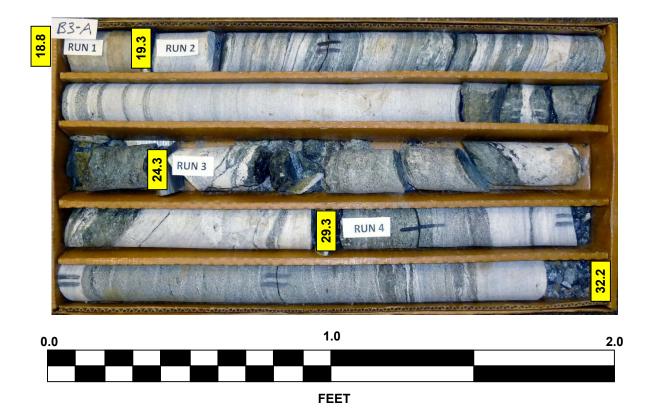




								BORE	LUG								,									,Uř	<u>RE L</u>	<u>UG</u>					
WBS 457	78.1.1			TIP	B-5825		COUN	TY YADKI	N			GEOLOG	GIST Stick	ney, J. K.			↓	3 45778.				TIP B				TY Y	'ADKIN			GEOLOG	IST Stickne		
SITE DESC	RIPTIO	N Brid	ge No. 3	_			River								GROUNI	D WTR (ft)	I 	DESCRI		Bridge					n River							GR	OUND WTR (f
BORING N) . B3-	A		STA	TION 3	3+08		OFFSET	15 ft LT				IENT -L-		0 HR.	N/A	l —	RING NO.				STATIC	ON 33	3+08		OF	FSET 1	5 ft LT		ALIGNME	NT -L-	0 H	R. N/.
COLLAR E						TH 44.3		NORTHIN					G 1,577,22		24 HR.	11.7	↓ 	LAR ELE						H 44.3		NO		900,781			1,577,224	24 H	
DRILL RIG/H			E HFO									V Casing W/S			MER TYPE	Automatic	-	L RIG/HAM												N Casing W/SF			PE Automatic
DRILLER		1			RT DAT	E 08/01/		COMP. D) / 	SURFAC	E WATER	DEPTH N	I/A		 	LLER Sm		L.				08/01	/19	co	MP. DA	TE 08/01/1	19	SURFACE	WATER DE	PTH N/A	
ELEV DRIVE	DEPTI	-	W COUN		0	BLOWS 25	PER FOO 50	T 7 <u>5</u> 10	SAMP	1.7	0		SOIL AND	ROCK DES	CRIPTION		l 	RE SIZE 1						25.5 ft	STDATA	١.,							
(ft)	(14)	0.511	0.511).oit		1	30	75 10	0 NO.	/ MO	I G	ELEV. (ft)				DEPTH (ft	ELE\ (ft)	LLLV	DEPTH (ft)	RUN R	RILL ATE (lin/ft)	RUN REC. F (ft) %	QD (ft)	SAMP. NO.	STRATA REC. RQD (ft) (ft) % %				1	DESCRIPTION	N AND REMAR	KS	
745																		(ft)		, , (IV	'lin/it)	%	%				ELEV. (f	t)		Danin Car	in = @ 10 0 f		DEPTH
745	†										-	- 743.3	GRO	OUND SURF	ACE	0.0	724.5	724.5 724.0 <u>1</u>	18.8 19.3	0.5		(0.3) (0	0.0)	((20.2) (15.9)	724.5	05.1.1.14		CPVST/	ing @ 18.8 f		18
	#				1				1					ALLUVIAL			1	I		5.0	\	(3.8) (2 76% 5	2.7)		79% 62%		_	GRANITIC (GNEISS V	to Fresh, Hard with Intermitter	nt Zones of Bio	Gray, White and Stite Gneiss and S	Black chist with
740	+ 4.0				<u> </u>				_			_	ran Brown,	Ouridy Only	OLY (717)		720	719.0	24.3		- 1						_		V	-	Vide Fracture S	pacing	
700.0	† 7.0	3	2	3	Q 5					М								\perp		5.0		(2.3) (0 46% 1	0.9) 8%				_				= 80 to 85		
735	‡				./		.					735.3				8.0	715	J	.								_	Predomin	nantly Biot	tite Schist Zon	e from 23.5 ft to	o 28.2 ft, GSI = 4	0 to 45
734.3	9.0	5	6	7	1	1			1	l M	000	_	Tan, Brown, S	Silty, Sandy	GRAVEL (A-	1)		714.0	29.3	5.0 1:4	11/0.5	(4.7) (4 94% 9	1.7)				-						
	‡				. , 13.				11	V	0000							I		I 1:4	14/1.0 L	94% 9	4%		20.2) (15.9 79% 62%		_						
730 729.3	+ 14.0				·/· · ·	1			41		0000	-					710	709.0	34.3	1:3	39/1.0 36/1.0						_						
. = 0.0	‡	4	3	2	∮ 5					М	000							1 ‡		5.0 1:4 1:4	17/1.0 10/1.0	(4.5) (3 90% 6	3.4) 8%				-						
725	‡				<u> </u>	· · · ·		<u>: </u>	_		000	725.5				17.8	705	<u> </u>		1:3	50/1.0 39/1.0						-						
720	‡								1			724.5		ATHERED R hite GRANI	OCK TIC GNEISS	18.8	1	704.0	39.3	5.0 1:5	12/1.0 50/1.0	(4.6) (4 92% 8	1.2)				-						
	‡							: : : : :						STALLINE F	ROCK			1 ±		1:3	37/1.0	92% 8	4%				-						
720	‡							+	-			-	,	a Black G. s			700	699.0	44.3		11/1.0 14/1.0						699.0						44
	‡																	1 ±									-	Boring Term	ninated at	Elevation 699	.0 ft in CRYSTA SNEISS	ALLINE ROCK: (GRANITIC
715	‡																	1 ‡	.								-						
7.10	‡								1			_						1 ‡									-						
	‡						.											1 ‡									-						
710	‡								-			_						1 ±	.								_						
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705	‡																	1 ‡	.								-						
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700	‡				· · · ·	1	· · · · ·		-{			699.0				44.3			.								-						
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	Ŧ										F	O	INTO INCLINE	rtoort. Ord	THE CITE	100		‡	.								_						
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B3-A

BOX 1: 18.8 - 32.2 FEET



B3-A

BOX 2: 32.2 - 44.3 FEET



		BORE LOG	T				CORE LOG		
WBS 45778.1.1		NTY YADKIN	GEOLOGIST Stickney, J. K.		WBS 45778.1.1		NTY YADKIN	GEOLOGIST Stickney, J.	T
	o. 35 on NC 67 over Yadkin River		1	GROUND WTR (ft)		e No. 35 on NC 67 over Yadkin River			GROUND WTF
BORING NO. B3-B	STATION 33+08	OFFSET 21 ft RT	ALIGNMENT -L-	0 HR. 0.0	BORING NO. B3-B	STATION 33+08	OFFSET 21 ft RT	ALIGNMENT -L-	0 HR.
COLLAR ELEV. 744.4 ft	TOTAL DEPTH 40.2 ft	NORTHING 900,746		24 HR. 11.0	COLLAR ELEV. 744.4 ft	TOTAL DEPTH 40.2 ft	NORTHING 900,746	EASTING 1,577,213	24 HR.
DRILL RIG/HAMMER EFF./DATE	HFO0072 CME-550X 92% 08/15/2018	DRILL METHOD	W Casing W/SPT & Core HAMME	R TYPE Automatic	DRILL RIG/HAMMER EFF./DATE	HFO0072 CME-550X 92% 08/15/2018	DRILL METHOD	NW Casing W/SPT & Core HA	AMMER TYPE Automa
DRILLER Smith, C. L.	START DATE 08/13/19	COMP. DATE 08/13/19	SURFACE WATER DEPTH N/A	4	DRILLER Smith, C. L.	START DATE 08/13/19	COMP. DATE 08/13/19	SURFACE WATER DEPTH	N/A
ELEV DRIVE DEPTH BLOW CO		OOT SAMP.	SOIL AND ROCK DESCR	RIPTION	CORE SIZE NWL	TOTAL RUN 20.7 ft			
(ft) (ft) (ft) 0.5ft 0.5ft	: 0.5ft 0 25 50		ELEV. (ft)	DEPTH (ft)	ELEV RUN DEPTH RUN (ft) (ft)	$ \begin{array}{c cccc} \textbf{DRILL} & & & & & & & & & & & \\ \textbf{RATE} & & & & & & & & & & & & \\ \textbf{RATE} & & & & & & & & & & & \\ \textbf{(Min/ft)} & & & & & & & & & & \\ \textbf{(Min/ft)} & & & & & & & & & \\ \end{array} \begin{array}{c ccccc} \textbf{RQD} & & & & & & & & & \\ \textbf{SAMP.} & & & & & & & \\ \textbf{REC.} & & & & & & \\ \textbf{REC.} & & & & & & \\ \textbf{NO.} & & & & & & \\ \textbf{(ft)} & & & & \\ \textbf{(ft)} & & & & & \\ \textbf{(ft)} & & & \\ \textbf{(ft)} & & & \\ \textbf{(ft)} & & & & \\ \textbf{(ft)} & & \\ \textbf{(ft)} & & & \\ \textbf{(ft)} & & \\ \textbf{(ft)} & & & \\ \textbf{(ft)} & & $	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	DESCRIPTION AND REMARKS	DEP
745	1 1 1		744.4 GROUND SURFAC	CE 0.0	724.9 19.5 0.7 724.2 20.5 0.7	(0.3) (0.0) (19.2) (16 43% 0% 93% 80	.5) 724.9 Fresh, Hard to Ve	Begin Coring @ 19.5 ft CRYSTALLINE ROCK ery Hard, Gray, White and Black GRAN	UTIC CNEISS AND
740 740.3 4.1			Tan and Brown, Silty SAN	ND (A-2-4)	720	(4.7) (4.7) 94% 94%		ΓE GNEISS with Very Close to Wide F	racture Spacing
740 740.3 4.1 3 3	4 • • • • • • • • • • • • • • • • • • •		<u>-</u> -		719.2 25.2 5.0	(4.7) (4.7) 94% 94%	Soft Seve	GSI = 85 to 95 rely Weathered Biotite Seam from 30.	2 ft to 31.2 ft
735 735.3 9.1					715	94% 94%	Solit, Seve	rely weathered blotte dealth from do.	211 10 01.211
4 2			733.2 Tan and Brown, Silty Sandy G	FRAVEL (A-1) 11.2	714.2 30.2 5.0	(4.8) (2.9) 96% 58%			
30 730.3 14.1 6 4	+ 4 - 1				710 709.2 35.2				
					5.0	(4.7) (4.2) 94% 84%	Soft, Seve		
725 725.3 19.1 100/0.3	'+	100/0.3	725.3 724.9 WEATHERED ROO	CK 19.1	705 704.2 40.2		704.2		
			Gray, White and Black GRAN	ITIC GNEISS				at Elevation 704.2 ft in CRYSTALLINI GNEISS	E ROCK: GRANITIC
20 +		RS-2	CRYSTALLINE RO Gray, White and Black GRAN	ITIC GNEISS				CIACIOO	
"			AND META-BIOTITE G	DINEISS	‡		-		
			1						
15			1		‡				
		RS-2	1						
							<u> </u>		
<u>•</u>			_				F		
			-				[
_									
5 7			704.2	40.2	‡		-		
			Boring Terminated at Elevation CRYSTALLINE ROCK: GRAN	on 704.2 ft in NITIC GNEISS					
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B3-B

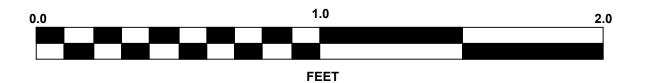
BOX 1: 19.5 - 30.2 FEET

B3-B

BOX 2: 30.2 - 40.2 FEET







Mail									E	ORE	LO	G														COF	RE L	OG						
GORINA D. D. A. STATION 34-34 OFFSET 16 ILT ALIGNMENT 4 OHR. NA.	WBS	45778.	1.1			TIP								GE	OLOGIST Stickney, J.	J. K.			WBS 45778	3.1.1			TIP B-582	25						GEOLOG	IST Stickney	, J. K.		
Column Section Secti	SITE	DESCRI	PTION	Bridge	e No. 3	5 on 1	NC 67 ov	C 67 over Yadkin River									GROUND WT	R (ft)	SITE DESCR	RIPTION	Bridg	ge No. 3	5 on NC 67	over Yac	kin River					-		(ROUND	NTR (ft)
DRILL RIGHMANDER EFF.OATE H-COUYZ CKE-950X (276 (615205)8 DRILL METHOD NNC Cesting wif SYT MAMMER TYPE Automatic	BOR	ING NO.	B4-A			STA	TION 3	4+34		T 181	ft LT		ALI	IGNMENT -L-		0 HR.	N/A	BORING NO	. B4-A	ı		STATION	34+34		OFI	FSET	8 ft LT		ALIGNME	ENT -L-	-	HR.	N/A	
DRILLER Smith, C, L START DATE 07/31/19 SURFACE WATER DEPTH NA	COL	LAR ELE	V. 741.	.5 ft		тот	AL DEP	TH 36.1	l ft	NORTH	IING 9	900,74	5	EAS	STING 1,577,345	7	24 HR.	11.2	COLLAR EL	EV . 74	1.5 ft		TOTAL DE	PTH 36	5.1 ft	NO	RTHING	900,74	5	EASTING	1,577,345	2	4 HR.	11.2
SEAT SUPPLY SUP	DRILI	RIG/HAM	IMER EFF	/DATE	HFO0	072 CI	ME-550X 9	92% 08/1	5/2018	•	DF	RILL ME	THOD	NW Casi	ing w/ SPT H	IAMME	R TYPE Autom	natic	DRILL RIG/HA	MMER E	FF./DAT	E HFO	0072 CME-550X	K 92% 08	/15/2018			DRILL ME	THOD NV	N Casing w/ SI	PT	HAMMEF	TYPE AL	tomatic
The color of the	DRIL	LER Sn	nith, C. I	L.		STA	RT DATI	E 07/31	/19	COMP.	DATE	07/3	1/19	SUI	RFACE WATER DEPTH	H N/A	A		DRILLER S	mith, C	. L.		START DA	TE 07/	31/19	co	MP. DA	Γ E 07/31	1/19	SURFACE	E WATER DEF	TH N/A		
The color of the		DRIVE L	DEPTH_										V L	-	SOIL AND ROCK	(DESCI	RIPTION			NW2														
741.5 GROUND SURFACE 0.5 ALLUMAL 720 To Presh, Very Hard, White, Black and Gray GRAMTIC CMEISS with Close to Presh, Very Hard, White, Black and Gray GRAMTIC CMEISS 17.4 (2.5) 1.5 (1.5) ((π)	(ft)	(π) (0.5ft (0.5ft 0.	5ft	0	25	50	75 	100	NO.	MOI	S ELEV	<u>'. (ft)</u>		DE	PTH (ft)			RUN (ft)	RATE	REC. RQD (ft) (ft) % %	SAMP. NO.	REC. R	A L QD O G		t)	[DESCRIPTIO	N AND REMARK	S		DEPTH (ft)
72.1 TV3 S T NMOT SURFACE 0.5 TV3	745													L					724.1											Begin Cor	ring @ 17.4 ft			
720 Tourish		<u> </u>												- - 741.5	GROUND S	SURFA(CE	0.0	700 4	Į	3.7	NM/0.7 2:00/1.0 2:05/1.0	(3.2) (2.7) 86% 73%		(17.9) (1 96% 92	7.2)	724.1 -	Fresh, Vo	ery Hard, Wi	CRYSTA hite. Black and	ALLINE ROCK nd Grav GRANITION	C GNEISS \	vith Close to	17.4
720 Tourish	740	+					+ · · ·								Tan Brown, Silty SAND	ID (A-2-4	4) with Trace		720 720.1	+	5.0	1:49/1.0 1:55/1.0	(4.8) (4.6) 96% 92%				-			GS	SI = 90-93			
720 Tourish		737.1	4.4								.				Mica	а			715 4	1 26 1		1:39/1.0 1:42/1.0					- -							
720 Tourish	735		.	2	3 3	3	6				1 1		М						715 713.4	20.1	5.0	1:44/1.0 1:40/1.0 1:35/1.0	(4.9) (4.9)				<u>-</u>							
720 Tourish		732.1					<u> </u>			.	-									‡	1 1	1:44/1.0		RS-6	1		- -							
720 Tourish	730	732.1	3.4	1	1 2	2	3			1									710 710.4	+ 31.1 +	5.0	1.41/1 0		-			-							
720 Tourish		1]								1			00	728.6		Π (Λ 1)		12.9		ŧ	1 1	1:41/1.0	1 1				-							
720 Tourish		727.1	14.4	5	9 91/	0.4		: : : : : : : : : : : : : : : : : : :		.	-				1			15.4	705.4	36.1		1:36/1.0 1:40/1.0					705.4	Doring To	uminated at	Floretion 705	Aft in CDVCTA	LINE DOC	C CDANITI	36.1
	725	1 1									11		\$\frac{\fin}}}}}}}}}}}}}}}}}}}}}}}}}}}}}}}}}}}}	724.1	WEATHERE Gray and White GR	RANITIC	C GNEISS	17.4		‡							- -	boning re	arminated at			LINE ROCI	N. GRANITI	J
										1					CRYSTALLII White, Black and Gray					‡							-							
	720		-																	‡							-							
										.	-									‡							- -							
	715																			‡							-							
		1 7								1		RS-6								‡							- -							
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	710	+	-			-		 												Ŧ							- - -							
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		+	-			$-\!$					·	_	7	705.4	Boring Terminated at	Elevation	on 705.4 ft in	36.1	-	‡							-							
														ļ.	CRYSTALLINE ROCK:	.: GRAN	NITIC GNEISS			‡							- -							
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B4-A

BOX 1: 17.4 - 27.5 FEET

B4-A

BOX 2: 27.5 - 36.1 FEET





		BORE LOG							CORE LOG		
WBS 45778.1.1	TIP B-5825 COUN	ITY YADKIN	GEOLOGIST Stickney, J. K.		WBS 45778.1.1		TIP B-5825		ITY YADKIN	GEOLOGIST Stickney, J.	
SITE DESCRIPTION Bridge No.	35 on NC 67 over Yadkin River			GROUND WTR (ft)	SITE DESCRIPTION Bri	idge No. 3	35 on NC 67 over Ya	adkin River			GROUND WTR (ft)
BORING NO. B4-B	STATION 34+33	OFFSET 12 ft RT	ALIGNMENT -L-	0 HR . N/A	BORING NO. B4-B		STATION 34+33	3	OFFSET 12 ft RT	ALIGNMENT -L-	0 HR . N/A
COLLAR ELEV. 741.4 ft	TOTAL DEPTH 35.6 ft	NORTHING 900,717	EASTING 1,577,335	24 HR. 11.1	COLLAR ELEV. 741.4 ft	t	TOTAL DEPTH	35.6 ft	NORTHING 900,717	EASTING 1,577,335	24 HR. 11.1
DRILL RIG/HAMMER EFF./DATE HF	O0072 CME-550X 92% 08/15/2018	DRILL METHOD N	W Casing w/ Core HAMI	MER TYPE Automatic	DRILL RIG/HAMMER EFF./DA	ATE HFO	0072 CME-550X 92%	08/15/2018	DRILL METHOD	NW Casing w/ Core HA	AMMER TYPE Automatic
DRILLER Smith, C. L.	START DATE 07/31/19	COMP. DATE 07/31/19	SURFACE WATER DEPTH	I/A	DRILLER Smith, C. L.		START DATE 07		COMP. DATE 07/31/19	SURFACE WATER DEPTH	N/A
ELEV DRIVE DEPTH BLOW COU			SOIL AND ROCK DES	SCRIPTION	CORE SIZE NW2	_	TOTAL RUN 19.				
(ft) ELEV (ft) 0.5ft 0.5ft	0.5ft 0 25 50	75 100 NO. MOI G	ELEV. (ft)	DEPTH (ft)	(ft) ELEV (ft) (ft)	DRILL RATE (Min/ft)	REC. RQD SAMF (ft) (ft) NO.	STRATA REC. RQI (ft) (ft) % %		DESCRIPTION AND REMARKS	
					(it) (ft) (it)	(Min/ft)	(1) (1) NO.	(11) (11)	G ELEV. (ft)		DEPTH (ft)
745			_		7 25 53 725.3 16.1 4.5	+	(4.0) (3.9)	(18.5) (17.5	5) 725.3	Begin Coring @ 16.1 ft CRYSTALLINE ROCK	16.1
			- - - 741.4	5ACE 0.0		1:56/1.0	(4.0) (3.9) 89% 87%	95% 90%		I, Gray, White, and Black GRANTIC GI Wide Fracture Spacing	NEISS with Close to
740	<u> </u>		ALLUVIAL		720.8 20.6	1:41/1.0 1:48/1.0				GSI = 90 to 94	
			Tan Brown, Silty SAND (A Mica	-2-4) with Trace	5.0	1:54/1.0 1:59/1.0 2:03/1.0	(4.7) (4.2) 94% 84%			301 301001	
737.1	2 I	: : : : : M			715.8 25.6	2:00/1.0 2:00/1.0 2:09/1.0					
735			<u>-</u> -		715 715.0 2 25.0	2:00/1.0	(4.9) (4.7)				
732.1 9.3			-			1:57/1.0 1:50/1.0	1 1 1				
730 1 2	3 5		- 730.6 GRAVEL (A-	10.8	710.8 30.6	2:06/1.0 2:10/1.0	(4.9) (4.7)		705.8		
			-	''	7 3.0	2:01/1.0 1:57/1.0 1:50/1.0	98% 94%				
727.1 14.3 4 7 !	93/0.3	1 1 1 1000	726.1	15.3 2000 16.1	705.8 35.6	2:07/1.0 2:11/1.0			705.8		35.6
725		100/0.8	726.1 725.3 WEATHERED R Gray and White GRANI CRYSTALLINE I Gray, White and Black GR	TIC GNEISS	+	2.1171.0			Boring Terminated	d at Elevation 705.8 ft in CRYSTALLIN GNEISS	E ROCK: GRANITIC
			CRYSTALLINE I Gray, White and Black GR						[CIVEIOC	
720			- -						I E		
			- -								
745 +			-								
715			<u>-</u> -						1 -		
			- -						<u> </u>		
710			<u>-</u>						<u> </u>		
			<u>-</u> -								
				35.6					<u> </u>		
			Boring Terminated at ElevCRYSTALLINE ROCK: GR						-		
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B4-B

BOX 1: 16.1 - 30.0 FEET

B4-B

BOX 2: 30.0 - 35.6 FEET



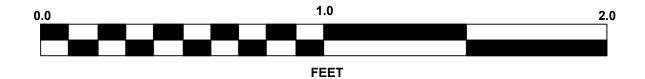


	E	BORE LOG					CORE LOG		
WBS 45778.1.1	TIP B-5825 COUNT	TY YADKIN	GEOLOGIST Stickney, J. I	ζ.	WBS 45778.1.1	TIP B-5825	COUNTY YADKIN	GEOLOGIST Stickney,	J. K.
SITE DESCRIPTION Bridge	No. 35 on NC 67 over Yadkin River			GROUND WTR (ft)	SITE DESCRIPTION Bridge I	No. 35 on NC 67 over Yadkin Riv	er		GROUND WTR (ft)
BORING NO. B5-A	STATION 35+69	OFFSET 16 ft LT	ALIGNMENT -L-	0 HR . N/A	BORING NO. B5-A	STATION 35+69	OFFSET 16 ft LT	ALIGNMENT -L-	0 HR . N/A
COLLAR ELEV. 725.6 ft	TOTAL DEPTH 21.2 ft	NORTHING 900,702	EASTING 1,577,473	24 HR. N/A	COLLAR ELEV. 725.6 ft	TOTAL DEPTH 21.2 ft	NORTHING 900,702	EASTING 1,577,473	24 HR . N/A
DRILL RIG/HAMMER EFF./DATE	HFO0072 CME-550X 92% 08/15/2018	DRILL METHOD N	W Casing w/ Core HA	AMMER TYPE Automatic	DRILL RIG/HAMMER EFF./DATE	HFO0072 CME-550X 92% 08/15/20	18 DRILL METHO	NW Casing w/ Core	HAMMER TYPE Automatic
DRILLER Smith, C. L.	START DATE 08/07/19	COMP. DATE 08/07/19	SURFACE WATER DEPTH	4.3ft	DRILLER Smith, C. L.	START DATE 08/07/19	COMP. DATE 08/07/19	SURFACE WATER DEP	TH 4.3ft
ELEV DRIVE DEPTH BLOW (ft) 0.5ft 0.5	COUNT BLOWS PER FOO		SOIL AND ROCK [DESCRIPTION	CORE SIZE NWL	TOTAL RUN 21.2 ft	TDATA		
(ft) (ft) (ft) 0.5ft 0.5	5ft 0.5ft 0 25 50	75 100 NO. MOI G	ELEV. (ft)	DEPTH (ft)	FLEV PERIOR ROLL R	RILL	TRATA L C. RQD O (ff) G ELEV. (ft)	DESCRIPTION AND REMARK	S
									DEPTH (ft)
730		-	WATER SURFAC	CE (08/07/19)	725.6 725 724.4 1.2 1.2 1.2 1.0 1.2 1.0 1.2 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0	M/1.2 (1.0) (0.0) (19.	6) (16.6) Very Slightly 78% Very Slightly 78% Apring Te	Ground Surface CRYSTALLINE ROCK	
			- -		5.0 3:	15/1.0 83% 0% 21/1.0 (4.7) (3.4) 07/1.0 94% 68%	78% Very Slightly	Weathered to Fresh, Very Hard, GF Close to Wide Fracture Space	RANITIC GNEISS with ng
725	+ +		- 725.6 GROUND SU CRYSTALLIN	IE ROCK	720 710 4 6 2 3:0	07/1.0 94% 68% 14/1.0 26/1.0		GSI = 83-87	
			- White, Gray and Black (GRANITIC GNEISS	719.4 + 6.2 3:2	26/1.0 11/1.0 (5.0) (4.6)			
720			- -		3:3	11/1.0 (5.0) (4.6) 19/1.0 100% 92% 27/1.0			
†			- -		715 714.4 11.2 3:	07/1.0 15/1.0 30/1.0 (4.8) (4.5)			
			-		$\begin{bmatrix} 1 & 1 & 1 & 1 & 3 \end{bmatrix}$	30/1.0 (4.8) (4.5) 11/1.0 96% 90% 24/1.0			
715			- -		710 709.4 16.2 3::	19/1.0 20/1.0			
			- -		+ 5.0 3:3 + 3:3	19/1.0 20/1.0 32/1.0 (4.1) (4.1) 30/1.0 82% 82% 18/1.0			
710			- 		705 704 4 31 2 31 3:	18/1.0 23/1.0 25/1.0			
			- -		704.4 + 21.2 3:2	25/1.0	704.4 Boring Te	rminated at Elevation 704.4 ft in CR	21.2 YSTALLINE ROCK:
705			- -					GRANITIC GNEISS	
†			- 704.4 Boring Terminated at E	21.2 Elevation 704.4 ft in	$\left\{ \left\{ \left\{ \right\} \right\} \right\} =\left\{ \left\{ \left\{ \left\{ \right\} \right\} \right\} =\left\{ \left\{ \left\{ \right\} \right\} \right\} =\left\{ \left\{ \left\{ \left\{ \right\} \right\} \right\} =\left\{ \left\{ \left\{ \left\{ \right\} \right\} \right\} =\left\{ \left\{ \left\{ \right\} \right\} \right\} =\left\{ \left\{ \left\{ \left\{ \right\} \right\} \right\} =\left\{ \left\{ \left\{ \left\{ \right\} \right\} \right\} =\left\{ \left\{ \left\{ \left\{ \left\{ \right\} \right\} \right\} \right\} =\left\{ \left\{ \left\{ \left\{ \left\{ \right\} \right\} \right\} \right\} =\left\{ \left\{ \left\{ \left\{ \left\{ \right\} \right\} \right\} =\left\{ \left\{ \left\{ \left\{ \left\{ \right\} \right\} \right\} \right\} =\left\{ \left\{ \left\{ \left\{ \left\{ \right\} \right\} \right\} \right\} =\left\{ \left\{ \left\{ \left\{ \left\{ \left\{ \right\} \right\} \right\} \right\} =\left\{ \left\{ \left\{ \left\{ \left\{ \left\{ \right\} \right\} \right\} \right\} =\left\{ \left\{ \left\{ \left\{ \left\{ \left\{ \right\} \right\} \right\} \right\} \right\} =\left\{ \left\{ \left\{ \left\{ \left\{ \left\{ \left\{ \right\} \right\} \right\} \right\} \right\} =\left\{ \left\{ \left\{ \left\{ \left\{ \left\{ \left\{ \right\} \right\} \right\} \right\} \right\} =\left\{ \left\{ \left\{ \left\{ \left\{ \left\{ \left\{ \left\{ \right\} \right\} \right\} \right\} \right\} \right\} =\left\{ \left\{ \right\} \right\} \right\} \right\} \right\} \right\} \right\} =\left\{ \left\{ \left\{ \left\{ \left\{ \left\{ \left\{ \left\{ \left\{ \left\{ \right\} \right\} \right\} \right\} \right\} \right\} \right\} \right\} \right\} =\left\{ \left\{ \left$				
‡			CRYSTALLINE ROCK:	GRANITIC GNEISS					
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B5-A

BOX 1: 0.0 - 9.7 FEET





B5-A

BOX 2: 9.7 - 21.2 FEET



FEET

BORE LOG CO	DRE LOG
WBS 45778.1.1 TIP B-5825 COUNTY YADKIN GEOLOGIST Stickney, J. K. WBS 45778.1.1 TIP B-5825 COUNTY	YADKIN GEOLOGIST Stickney, J. K.
SITE DESCRIPTION Bridge No. 35 on NC 67 over Yadkin River GROUND WTR (ft) SITE DESCRIPTION Bridge No. 35 on NC 67 over Yadkin River	GROUND WTR (ft)
BORING NO. B5-B STATION 35+69 OFFSET 12 ft RT ALIGNMENT -L- 0 HR. N/A BORING NO. B5-B STATION 35+69 C	OFFSET 12 ft RT ALIGNMENT -L- 0 HR. N/A
COLLAR ELEV. 725.0 ft TOTAL DEPTH 20.8 ft NORTHING 900,676 EASTING 1,577,464 24 HR. N/A COLLAR ELEV. 725.0 ft TOTAL DEPTH 20.8 ft N	NORTHING 900,676 EASTING 1,577,464 24 HR. N/A
DRILL RIG/HAMMER EFF./DATE HF00072 CME-550X 92% 08/15/2018 DRILL METHOD NW Casing w/ Core HAMMER TYPE Automatic DRILL RIG/HAMMER EFF./DATE HF00072 CME-550X 92% 08/15/2018	DRILL METHOD NW Casing w/ Core HAMMER TYPE Automatic
	COMP. DATE 08/06/19 SURFACE WATER DEPTH 4.9ft
BLOW COUNT BLOW COUNT BLOW SPER FOOT SAMP. TOTAL RUN 19.8 ft	
(II) (ft) (II) 0.5ft 0.5	L DESCRIPTION AND REMARKS
	G ELEV. (ft) DEPTH (ft)
730 WATER SURFACE (08/06/19) 724 724.0 1.0 4.8 (4.6) (3.6) (19.4) (18.2) 724 724.0 1.0 4.8 96% 75% 98% 92%	Begin Coring @ 1.0 ft CRYSTALLINE ROCK 1.0
	Fresh, Hard to Very Hard, Gray, White and Black GRANITIC GNEISS with Close to Wide Fracture Spacing
725 To a ground surface 0.0 719.2 5.8 719.2 5.8	GSI = 90 to 92
720	GSI = 90 (6 92
720	
715	
5.0 (5.0) (4.9)	
$oxed{\left \begin{array}{c ccccccccccccccccccccccccccccccccc$	704.2
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	Boring Terminated at Elevation 704.2 ft in CRYSTALLINE ROCK: GRANITIC GNEISS
	- GRANITIC GNEISS
705 +	-
Boring Terminated at Elevation 704.2 ft in CRYSTALLINE ROCK: GRANITIC GNEISS	<u> </u>
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B5-B

BOX 1: 1.0 - 10.5 FEET

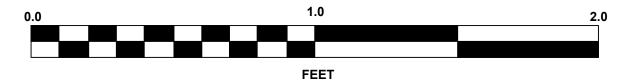


0.0 1.0 2.0 FEET

B5-B

BOX 2: 10.5 - 20.8 FEET





	В	ORE LOG					CORE LOG		
WBS 45778.1.1	TIP B-5825 COUNT	Y YADKIN	GEOLOGIST Stickney, J. K	•	WBS 45778.1.1	TIP B-5825 COUI	NTY YADKIN	GEOLOGIST Stickney, J.	K.
SITE DESCRIPTION Bridge	No. 35 on NC 67 over Yadkin River			GROUND WTR (ft)	SITE DESCRIPTION Bridge No.	35 on NC 67 over Yadkin River			GROUND WTR (ft)
BORING NO. B6-A	STATION 36+84	OFFSET 22 ft LT	ALIGNMENT -L-	0 HR . N/A	BORING NO. B6-A	STATION 36+84	OFFSET 22 ft LT	ALIGNMENT -L-	0 HR. N/A
COLLAR ELEV. 726.5 ft	TOTAL DEPTH 17.1 ft	NORTHING 900,673	EASTING 1,577,584	24 HR. N/A	COLLAR ELEV. 726.5 ft	TOTAL DEPTH 17.1 ft	NORTHING 900,673	EASTING 1,577,584	24 HR . N/A
DRILL RIG/HAMMER EFF./DATE	HFO0065 CME-45C 93% 08/15/2018	DRILL METHOD N	IW Casing w/ Core HAI	MMER TYPE Automatic	DRILL RIG/HAMMER EFF./DATE HF	FO0065 CME-45C 93% 08/15/2018	DRILL METHOD	NW Casing w/ Core	HAMMER TYPE Automatic
DRILLER Smith, C. L.	START DATE 08/07/19	COMP. DATE 08/08/19	SURFACE WATER DEPTH	3.4ft	DRILLER Smith, C. L.	START DATE 08/07/19	COMP. DATE 08/08/19	SURFACE WATER DEPTH	1 3.4ft
ELEV DRIVE DEPTH BLOW (ft) (ft) 0.5ft 0.5	COUNT BLOWS PER FOOT		SOIL AND ROCK D		CORE SIZE NWL	TOTAL RUN 17.1 ft	<u> </u>		
(II) (ft) (II) 0.5ft 0.5	5ft 0.5ft 0 25 50	75 100 NO. MOI G	ELEV. (ft)	DEPTH (ft)	ELEV RUN DEPTH RUN RATE (ft) (ft) (ft) (Min/ft)	E REC. ROD SAIVIF REC. RO	QD O	DESCRIPTION AND REMARKS	
			WATER OURFACE	E (00 (07 (40)	(It) (WIII)			One and Ourford	DEPTH (ft)
730		-	WATER SURFACI	E (08/07/19)	726.5 725 726.5 + 0.0 2.1	(2.0) (1.7) 95% 81% (17.0) (15 99% 91	Very Slight v GRAN	Ground Surface CRYSTALLINE ROCK	. One and Black
			- - 726.5 GROUND SU		724.4 + 2.1	(5.0) (4.2) 99% 91	% Very Slight V	Weathering to Fresh, Very Hard, Whit TIC GNEISS with Close to Wide Frac	e, Gray and Black ture Spacing
725			CRYSTALLINE White, Gray and Black G			100% 84%		GSI = 87 to 95	
‡			-		720 719.4 7.1 5.0	(5.0) (4.9)			
720						100% 98%			
			-		715 714.4 12.1	RS-4			
745		.	-		5.0	(5.0) (4.8) 100% 96%			
715		RS-4	-		710 709.4 17.1		700 4		47.4
			-		709.4 - 17.1		Boring Ten	minated at Elevation 709.4 ft in CRYS GRANITIC GNEISS	TALLINE ROCK:
710 ‡			709.4	17.1				GRANITIC GIVEISS	
			Boring Terminated at El- CRYSTALLINE ROCK: G	evation 709.4 ft in GRANITIC GNEISS			-		
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B6-A

BOX 1: 0.0 - 9.7 FEET



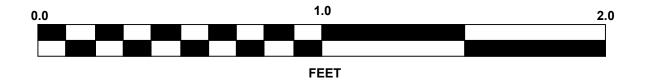
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FEET

B6-A

BOX 2: 9.7 - 17.1 FEET





							В	ORE L	LOG													C	CORE	LOG					
WBS	45778.	1.1		Т	P B-5825			YADKIN				GEOLOGIST Stick	ney, J. K.			WBS 457	78.1.1			TIP B-582	25	COUNT	TY YADI	(IN	GEOLO	OGIST Stickney	, J. K.		
SITE	DESCRI	PTION	Bridge I	No. 35 or	NC 67 ove	r Yadkin Riv	iver							GROUND V	VTR (ft)	SITE DESC	RIPTION	N Brid	dge No. 3	5 on NC 67 o	ver Yadk	in River					GF	OUND WT	R (ft)
BORII	NG NO.	В6-В		s	TATION 3	6+84		OFFSET	19 ft R1	Γ		ALIGNMENT -L-		0 HR.	N/A	BORING N) . B6-I	В		STATION	36+84		OFFSE	T 19 ft RT	ALIGN	MENT -L-	0	HR.	N/A
COLL	AR ELE	V. 726.3	3 ft	Т	OTAL DEP	H 19.5 ft	t	NORTHING	3 900,	634		EASTING 1,577,5	72	24 HR.	N/A	COLLAR E	LEV . 7	726.3 ft		TOTAL DE	PTH 19	9.5 ft	NORTH	IING 900,634	EASTIN	NG 1,577,572	24	HR.	N/A
DRILL	RIG/HAMI	/IER EFF./I	DATE	HFO0065	CME-45C 93	3% 08/15/201	18		DRILL	METHOD) NV	V Casing w/ Core	HAM	MERTYPE Au	tomatic	DRILL RIG/H	AMMER E	FF./DAT	E HFO	0065 CME-45C	93% 08/1	15/2018		DRILL METHOD	NW Casing w/	/ Core	HAMMER T	PE Auton	natic
		nith, C. L.			TART DATI	E 08/08/19	9	COMP. DA				SURFACE WATER	DEPTH 3	.5ft		DRILLER	Smith, 0	C. L.		START DA	TE 08/	08/19	COMP.	DATE 08/08/19	SURFA	ACE WATER DEP	PTH 3.5ft		
ELEV (ft)	DRIVE L	DEPTH	BLOW (COUNT		BLOWS F				°. ▼/	0	SOIL AND	ROCK DES	SCRIPTION		CORE SIZE				TOTAL RU			<u> </u>						
(ft)	(ft)	(ft) 0	.5ft 0.	o.5ft 0.5ft	0	25 5	50	75 100	NO.	MOI	G	ELEV. (ft)			DEPTH (ft)	ELEV RUN	DEPTI	H RUN (ft)	DRILL RATE (Min/ft)	RUN REC. RQD (ft) (ft) %	SAMP. NO.	STRATA REC. RQD (ft) (ft) % %			DESCRIPTI	ON AND REMARK	(S		
																(11)	(11)	(11)	(Min/ft)	W W	NO.	(ii) (iii)	G _{EL}	EV. (ft)				DE	PTH (ft
730											!	WATER	SURFACE	(08/08/19)		726.3 725 726.3	3 + 0.0 3 + 2.0	2.0		(1.6) (0.5)		(18.6) (15.7			CRYS	ound Surface STALLINE ROCK			
	\pm										l E	726.3 GR	OUND SURI	EACE	0.0	724.3	3 + 2.0	5.0	3:07	(1.6) (0.5) 80% 25% (4.8) (3.1)	1	(18.6) (15.7 95% 81%		Slight Weatheri GNE	ng to Fresh, Ver	ery Hard, White, Gra Close to Wide Frac	ay and Black (ture Spacing	GRANITIC	
725	Ī						· · · ·					CRY	STALLINE I	ROCK	0.0		‡		3:24 3:17	(4.8) (3.1) 96% 62%			70			GSI = 85 to 95			
	Ī											White, Gray ar	nd Black GR	ANITIC GNEISS	٠	720 719.3	3 + 7.0		3:40 3:46						· ·				
	1																Ŧ	5.0	4:10 3:50 3:41	(4.8) (4.8) 96% 96%									
720	+							 	-			-				715	. †		3:41 3:33										
	<u> </u>															714.3	3 † 12.0	5.0	3:33 3:52 3:47	(5.0) (4.9) 100% 98%	1								
715	1											_					Ŧ		7:10										
	<u></u>															710 709.3	3 17.0		13:00 8:10										
740	‡															706.8	∃ 3	2.5	9:45	(2.4) (2.4) 96% 96%			70	6.8					19.5
710	+								1			-					Ī				1		T E			ation 706.8 ft in CR ANITIC GNEISS	YSTALLINE F	OCK:	
	‡											706.8			19.5		‡								0.0				
	‡										L	Boring Termir CRYSTALLINE	nated at Elev EROCK: GR	ration 706.8 ft in ANITIC GNEIS	S		<u> </u>						1						
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GPJ	1										l Ł	_					Ŧ						1 F						
- N	1										<u> </u>						‡						1 F						
DG_C	<u> </u>										<u> </u>						Ŧ						1 F						
9 B	+										-	-					Ŧ						F						
2 GE	1										E						Ŧ						F						
B582	1										E	_					Ŧ						F						
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ORE	\pm											-					Ŧ						F						
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B6-B

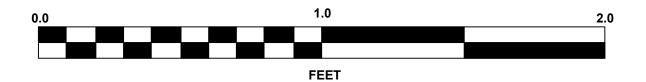
BOX 1: 0.0 - 9.7 FEET

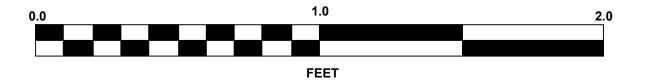
B6-B

BOX 2: 9.7 - 19.5 FEET





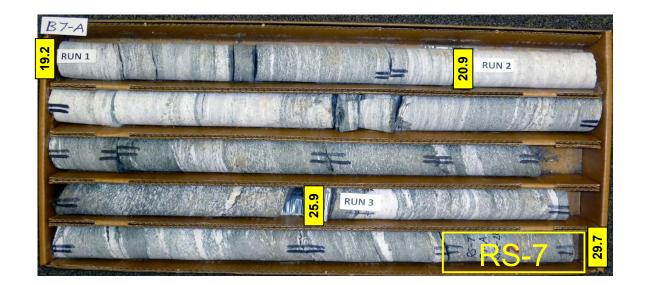




										E	3 <i>01</i>	RE I	LOC	3																C	ORE	L	OG					
WE	S 4	5778.1.	1			TIP	B-582	5		COUN	TY \	/ADKII	1				GEOLOGIST Stickne	y, J. K.			WBS	457	78.1.1			TIP I	B-5825	5	CC	DUNT	Y YADK	ΚIN		GEO	LOGIST Stickne	y, J. K.		
SIT	E DE	SCRIPT	ΓΙΟΝ	Bridge	No. 35	on N	IC 67 o	ver Ya	dkin F	River									GROUND	WTR (ft)	SITE	DESC	RIPTIC	N Br	idge No. 3	35 on NO	C 67 ov	ver Yadk	in Rive	er				-			GROUND WT	R (ft)
ВС	RING	NO. E	37-A			STA	TION :	38+15			OF	FSET	12 ft l	LT			ALIGNMENT -L-		0 HR.	8.0	BOR	ING N	0. B7-	-A		STAT	ION 3	38+15			OFFSE	T 12	2 ft LT	ALIG	SNMENT -L-		0 HR.	8.0
CC	LLAR	ELEV.	744.	1 ft		тот	AL DEP	TH 3	88.9 ft		NC	RTHIN	G 90	0,624			EASTING 1,577,706		24 HR.	13.0	COL	LAR E	LEV.	744.11	t	TOTA	L DEP	TH 38.	9 ft		NORTH	IING	900,624	EAS	TING 1,577,706		24 HR.	13.0
DR	LL RIG	/HAMM	ER EFF	./DATE	HFO00)72 CN	ЛЕ-550X	92% ()8/15/20	018			DRIL	L ME	THOD	NW (Casing w/ SPT	HAMME	R TYPE A	ıtomatic	DRIL	L RIG/H	AMMER	EFF./D	ATE HFO	00072 CME	E-550X	92% 08/	15/2018			1	ORILL METHOD	NW Casing	g w/ SPT	HAMM	ER TYPE Auton	natic
DR		R Smit					RT DAT	E 08	/21/19	9	CC	MP. D					SURFACE WATER DE	PTH N/A	Ą		DRIL	LER	Smith,	C. L.		STAR	RT DAT	E 08/2	1/19		COMP.	DATE	E 08/21/19	SURI	FACE WATER DE	PTH N	Ά	
ELE	V DR			BLOW						ER FOO				ИP.			SOIL AND RO	OCK DESC	RIPTION		COR	E SIZE						19.7 ft										
(ft)	(1	t)	(ft)).5ft 0.	5ft 0.5	oft C)	25	5	0	75 	100) NO	D. /	MOI	3 E	ELEV. (ft)			DEPTH (ft)	ELEV (ft)	RUN ELE\	, DEPT	H RUI (ft)	I KAIL	REC. (ft)	RQD	SAMP. NO.	STR/ REC. (ft) %	ATA RQD	L			DESCRI	PTION AND REMARI	KS		
																					(11)	(ft)	(ft)	(11)	(Min/ft)	(II) %	% ————————————————————————————————————	NO.	(II) %	(IL) %	G _{ELE}	EV. (ft)					DE	PTH (ft)
74	5	\rightarrow														<u> </u>		ND SURFA	CE	0.0	724.9	724.9	19.2	1.7		(1.5)	(0.7)		(19.1)	(17.9)	724	1.9	Fresh, Very Hard.	. Grav. Wh	n Coring @ 19.2 ft nite and Black GRANI	TIC GNEI	SS to BIOTITE	19.2
		Ŧ						: :			$\cdot \parallel \cdot$				•	::: <u>-</u>	Al Tan and Brow	LUVIAL n Silty SAN	ND (A-2-4)			723.2	<u>T 20.9</u>	5.0		(1.5) 88% (5.0)	41%		97%	91%	724		GN	EISS with	Close to Wide Fractur	re Spacing		
740) 70	9.7 1						: :											(,		720		Ŧ			(5.0) 100%	92%								GSI = 92 to 95			
	/3	9./ + '		1 '	1		2				- -		11		D	#F						718.2	25.9)														
		Ŧ						: :															Ŧ	5.0		(4.9) 98%	(4.9) 98%											
73	73	4.7 - 9	9.4	1 .	2			+					+		D						715	7	+					RS-7										
		Ŧ		•			3								::	<u> </u>						/13.2	30.9	5.0		(4.9) 98%	(4.9)											
730) 72	9.7 1	44				 	<u> </u>						\vdash	▼		729.7			14.4	710		<u></u>			98%	98%											
				1 '	1		2	: :]						М	E	Gray, Sandy Silty Organic Mat	CLAY (A-7)) with Trace of Leaves)	f		708.2	35.9	3.0		(2.0)	(2.0)											
	_	‡						1:	· ·				.]]			<u> </u>	725.9	•	,	<u>18.2</u> 19.2		705 1	38.9			(2.8) 93%	93%				705	5.2						39.0
72	<u> </u>	+				╁		<u> </u>			. .		┧╽				724.9 WEATH Gray and White	IERED RO	CK C GNEISS	19.2		700.2	1 30.8								- 703		Boring Terminated	at Elevatio	on 705.2 ft in CRYSTA GNEISS	ALLINE RO	OCK: GRANITIC	30.9
		‡									: :						Gray, White and E	lack GRAN	NITIC GNEISS SS	3			‡												GNEISS			
720)	‡						<u> : :</u>			<u>: </u> :		<u> </u>										‡															
		‡																					‡															
74	_	‡									: :		!										‡								-							
71		‡						 					RS	5-7									‡								-							
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710)	‡						ļ · ·				· · · ·	41										‡															
		‡																					‡															
		‡														\$ 7	705.2			38.9			‡								-							
		#						ı			1					<u> </u>	Boring Terminate CRYSTALLINE RO	d at Elevati	ion 705.2 ft in	3			‡								-							
		‡														ļ	OKTOTALLINE KO	JOIN. OI WIII	VITTO OTVETO	<i>-</i>			‡															
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B7-A

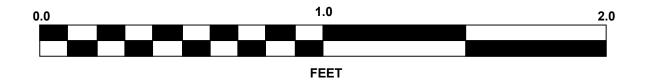
BOX 1: 19.2 - 29.7 FEET

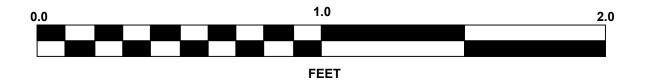


B7-A

BOX 2: 29.7 - 38.9 FEET







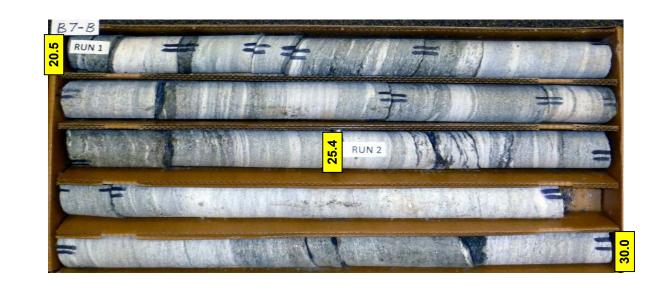
										E	BOR	EL	OG																C	ORE	LC	OG				
WE	S 45	5778.1	.1			TIP	B-582	5		COUN	TY YA	DKIN				GEO	OLOGIST Stickney	, J. K.		WBS	S 457	78.1.1			TIP E	B-5825	5	CC	DUNT	Y YADK	ΚIN		1	GEOLOGIST Stickne	ey, J. K.	
SIT	E DES	SCRIP.	TION	Bridge	No. 3	5 on l	NC 67 o	ver Ya	adkin F	River								GRO	UND WTR (ft)	SITE	DES	CRIPTIC	ON Br	idge No.	35 on NC	C 67 o	ver Yadl	kin Rive	er				•			GROUND WTR (ft)
ВС	RING	NO.	B7-B			STA	ATION :	38+08	3		OFFS	SET	14 ft R	Т		ALI	GNMENT -L-	0 HF	R. 11.0	BOF	RING N	Ю . В7	'-B		STATI	ION 3	38+08			OFFSE	T 14	ft RT		ALIGNMENT -L-		0 HR. 11.0
CC	LLAR	ELEV	. 744	.3 ft		тот	TAL DEP	PTH .	40.7 ft		NOR	THING	900	,601		EAS	STING 1,577,691	24 HF	R. 13.5	COL	LAR E	LEV.	744.31	t	тота	L DEP	TH 40	.7 ft		NORTH	IING	900,601	l l	EASTING 1,577,691		24 HR. 13.5
DR	LL RIG	HAMM)	ER EFI	F./DATE	HFO	0072 C	ME-550X	92%	08/15/2	018			DRILL	METH	OD N	IW Casin	ng w/ SPT	HAMMER TYP	PE Automatic	DRIL	L RIG/I	HAMMER	R EFF./D	ATE HF	O0072 CME	E-550X	92% 08	15/2018				RILL METHO	D NW C	Casing w/ SPT	HAMN	IER TYPE Automatic
DR		R Smi				 _	ART DAT	Γ E 08	8/21/1	9	СОМ	IP. DA	TE 08			SUF	RFACE WATER DE	PTH N/A		DRII	LLER	Smith,	C. L.		STAR	T DAT	E 08/2	1/19		COMP.	DATE	08/22/19		SURFACE WATER DE	EPTH N	/A
ELE	V DR EL	.⊏V	:: ⊢	BLOW			•			PER FOO		400	SAMF	17	0		SOIL AND RO	CK DESCRIPTION	ON	COF		E NX		_			20.21									
(ft)	(f	ft)	(ft)	0.5ft 0	.5ft 0.	.5ft	U	25		50	75 	100	NO.	/M	OI G	ELEV.	(ft)		DEPTH (ft)	ELEV (ft)		V DEP	TH RUI	I KAIL	REC. (ft)	RQD (ff)	SAMP. NO.	STRA REC. (ft) %	RQD (ff)	L 0			DE	SCRIPTION AND REMAR	RKS	
																					(ft)	(11)	(11)	(Min/ft	t) %	%	110.	%	%	G _{ELE}	EV. (ft)					DEPTH (f
74	5						1							_		744.3		D SURFACE	0.0	723.8	723.	8 20.	5 4.9		(4.9) 100%	(4.5)								Begin Coring @ 20.5 f CRYSTALLINE ROCK		
		‡					<u> </u>	. :										LUVIAL I Silty SAND (A-2	2-4)	720		‡			100%	92%						Very Slight We GRANITIC (eathering SNEISS a	to Fresh, Hard to Very Ha and BIOTITE GNEISS with	rd, Gray, Close to	Black and White Wide Fracture
740) 730	9.6	4 7				ļ ļ	· ·								_				720	718.	9 + 25.4	4											Spacing		
		1	* ./	1	1	2	4 3 · · ·	· ·						М		_						‡	5.3		(5.2) 98%	(4.7) 89%								GSI = 86 to 95		
	_	‡					<u> </u>	: :												715		‡														
73	734	4.6	9.7	2	1	2	<u> </u>	+-						_M		_					713.	6 30.1	7 5.0		(5.0)	(3.1)										
		‡					¶3	: :								<u> </u>				710		‡			(5.0) 100%	62%										
730	720	9.6 + 1	_{4.7}				<u> </u>	<u> </u>			-				_	<u> </u>				10		6 + 35.1	7													
		1		1	1	1	•2 · · ·	: :						w		<u> </u>						‡	5.0		(5.0) 100%	(4.7) 94%										
72		‡						: :								-				705	_	<u>,</u> ‡	_							703						
72	72	4.6 + 1	19.7	60/0.0			 :	===			-+-:	60/0.0	•			<u>724.6</u>	CRYSTA	LLINE ROCK		1	703.	6 + 40.1 +			+ +					703 -	3.6 E	Boring Termina	ated at Ele	evation 703.6 ft in CRYST	ALLINE R	OCK: GRANITIC
		‡						: :				: : :				-	Gray, Black and W	hite GRANITIC G TITE GNEISS	SNEISS			‡												AND BIOTITE GNEISS		
720)	#						<u> </u>	· · ·							_						‡								F						
		‡						: :			1	: : :				-						‡														
71		‡						: :				: : :				-						‡														
7 13	,	‡						. .								-						‡														
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710)	‡														-						Ŧ								l F						
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70:	5	‡						: :			1					-						Ŧ								F						
70.		_‡				Ш										- 703.6			40.7			Ŧ								F						
		‡														-	Boring Terminated CRYSTALLINE R	OCK: GRANITIC	3.6 ft in CAND			Ŧ								l F						
		‡														Ė	BIOTI	TE GNEISS				Ŧ								l F						
		Ŧ														-						Ŧ								l F						
		Ŧ														-						Ŧ								ΙE						
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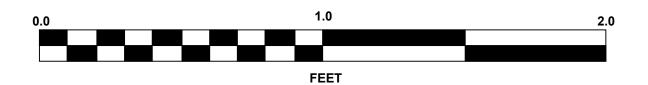
B7-B

BOX 1: 20.5 - 30.0 FEET

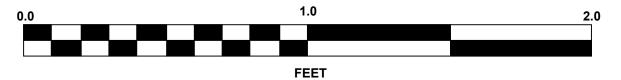
B7-B

BOX 2: 30.0 - 40.7 FEET









						В	ORE I	LOG														C	ORE L	OG				
WBS 4	45778.1.1		T	P B-5825		COUNT	Y YADKIN	٧		GE	OLOGIST Stickney	y, J. K.		WB	S 4577	78.1.1			TIP B-582	25	C	OUNT	Y YADKIN		GEOLO	OGIST Stickne	y, J. K.	
SITE DE	ESCRIPTION	Bridge N	lo. 35 o	n NC 67 ov	er Yadkin	River						GROUN	ID WTR (ft)	SITE	E DESC	RIPTIO	N Brid	ge No. 3	35 on NC 67	over Ya	dkin Riv	er						GROUND WTR (ft)
BORING	G NO. B8-A		S	TATION 3	9+33		OFFSET	15 ft LT		AL	IGNMENT -L-	0 HR.	0.0	BOF	RING N) . B8-A	A		STATION	39+33			OFFSET 1	5 ft LT	ALIGN	MENT -L-		0 HR. 0.0
COLLA	R ELEV . 74	1.5 ft	T	OTAL DEP	ΓH 35.4 f	ft	NORTHIN	IG 900,5	91	EA	STING 1,577,819	24 HR.	3.6	COL	LAR E	L EV . 7	41.5 ft		TOTAL DE	PTH 3	35.4 ft		NORTHING	900,591	EASTIN	NG 1,577,819	:	24 HR. 3.6
DRILL R	IG/HAMMER EF	F./DATE	HFO0072	CME-550X 9	02% 08/15/2	2018				NW Cas	ing W/SPT & Core	HAMMER TYPE	Automatic	DRIL	L RIG/H	AMMER E	FF./DA	TE HFO	0072 CME-550>	X 92% (08/15/2018	3		DRILL METHO	D NW Casing W	/SPT & Core	HAMME	R TYPE Automatic
	R Smith, C.			TART DATE			COMP. D			SU	IRFACE WATER DE	PTH N/A		DRI	LLER	Smith, 0	C. L.		START DA				COMP. DAT	TE 08/22/19	SURFA	CE WATER DE	PTH N/A	<u> </u>
ELEV E	RIVE DEPTH]		PER FOOT		SAMP.	/ (SOIL AND RO	OCK DESCRIPTION		COF	RE SIZE				TOTAL RU			NATA						
(11)	(ft) (II)	0.5ft 0.5f	0.5ft		25 	50	75 100	NO.	/MOI C	G ELEV	V. (ft)		DEPTH (fi	ELEV (ft)	LLEV	, DEPTH	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. RQD (ft) (ft)	SAMP NO.	STR REC. (ft) %	RQD (ff)	O C		DESCRIPTI	ION AND REMAR	KS	
															(ft)	(1.7)	(11)	(Min/ft)	% %	110.	%	%	G ELEV. (ft	i)				DEPTH (ft
745	 									F				726.4 725		15.1	5.3		(5.0) (4.3) 94% 81%						CRYS	Coring @ 15.1 ft		
	<u>†</u>									741.5	5 GROUN	ND SURFACE	0.0			Ŧ			94% 81%					Fresh, Hard to BIOTIT	o Very Hard, Gray ΓE GNEISS with V	y, White and Black Yery Close to Wide	GRANITIC Fracture S	GNEISS and pacing
740	-										AL	LUVIAL / CLAY (A-7) with Tra	are		721.1	20.4									G	SI = 92 to 95		
	737.4 + 4.1						I		V	}	Gray, Garidy, Girly	Mica	ace	720		+	5.0		(4.6) (3.9) 92% 78%]								
	37.4 + 4.1	WOH 1	0	•1 : : : :					w	}						Ŧ												
735	‡			 				┤ ┃ ┃		}				715	716.1	25.4	5.0		(4.4) (4.0) 88% 80%	1								
	732.4 + 9.1	WOH WOI	H WOH						w	}						Ŧ			88% 80%									
730	‡			0				.	·	}_					711.1	T 30.4												
	/ _{27.4} + 14.1						.			728.0 727.5	<u> </u>	IERED ROCK	13.5	710	-	\pm	5.0		(5.0) (4.8) 100% 96%									
725	1	60/0.0					• • • 60/0.0) T	Į.		Gray and White	GRANITIC GNEISS	3	1		<u> </u>												
725	‡					1		1	Ş		Gray, White and B	ALLINE ROCK lack GRANITIC GNE	EISS		706.1	35.4				1			706.1	Boring Termina		706.1 ft in CRYSTA		35.4 CK: GRANITIC
	‡										AND BIC	OTITE GNEISS				<u>†</u>									AND E	BIOTITE GNEISS		
720	‡							41 1	Į.							‡												
	‡					I	I									+							-					
715	‡						1									<u>†</u>							<u> </u>					
713	‡					1		11 1	Ş							1							lŁ					
	‡						I									<u>†</u>												
710	‡							4	Į.							‡												
	‡						.									+							-					
	+					• • •		Ц	Si	706.1		d at Elevation 706.1	35.4			‡												
	‡									F	CRYSTALLINE F	ROCK: GRANITIC AN TE GNEISS	ND			<u></u>							<u> </u>					
	‡									ļ.	ыоп	TE GNEISS				‡												
	‡									Ė.						‡												
	‡									ļ.						+							-					
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1/6/19	‡									F						<u> </u>							<u> </u>					
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B8-A

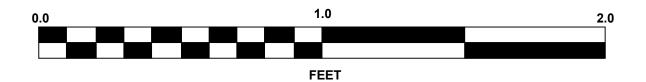
BOX 1: 15.1 - 25.4 FEET

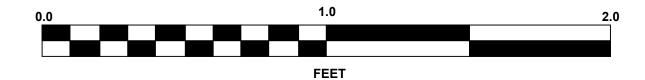
B8-A

BOX 2: 25.4 - 35.4 FEET









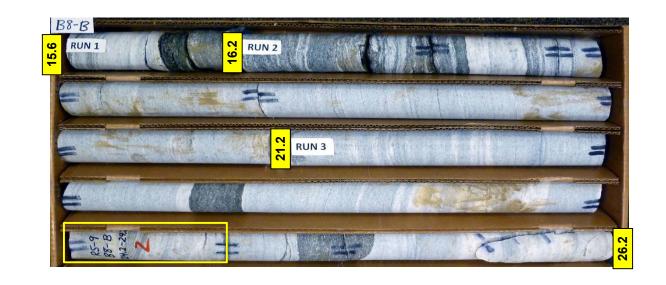
	E	BORE LOG				CORE LOG		
WBS 45778.1.1	TIP B-5825 COUNT	TY YADKIN GEO	OLOGIST Stickney, J. K.	WBS 45778.1.1	TIP B-5825 COUN	TY YADKIN	GEOLOGIST Stickney, J. K.	
SITE DESCRIPTION Bridge	e No. 35 on NC 67 over Yadkin River		GROUND WTR (ft)	SITE DESCRIPTION Bridge No. 38	5 on NC 67 over Yadkin River		GROUND	WTR (ft)
BORING NO. B8-B	STATION 39+34	OFFSET 19 ft RT ALIC	GNMENT -L- 0 HR. 0.0	BORING NO. B8-B	STATION 39+34	OFFSET 19 ft RT	ALIGNMENT -L- 0 HR.	0.0
COLLAR ELEV. 742.1 ft	TOTAL DEPTH 36.2 ft	NORTHING 900,558 EAS	STING 1,577,810 24 HR. 0.0	COLLAR ELEV. 742.1 ft	TOTAL DEPTH 36.2 ft	NORTHING 900,558	EASTING 1,577,810 24 HR .	0.0
DRILL RIG/HAMMER EFF./DATE	HFO0072 CME-550X 92% 08/15/2018	DRILL METHOD NW Casin	ng W/SPT & Core HAMMER TYPE Automatic	DRILL RIG/HAMMER EFF./DATE HFO	0072 CME-550X 92% 08/15/2018	DRILL METHOD	NW Casing W/SPT & Core HAMMER TYPE A	Automatic
DRILLER Smith, C. L.	START DATE 08/22/19	COMP. DATE 08/22/19 SUF	RFACE WATER DEPTH N/A	DRILLER Smith, C. L.	START DATE 08/22/19	COMP. DATE 08/22/19	SURFACE WATER DEPTH N/A	
ELEV DRIVE DEPTH BLOW	V COUNT BLOWS PER FOC	7 0	SOIL AND ROCK DESCRIPTION	CORE SIZE NQ	TOTAL RUN 20.6 ft			
(ft) (ft) (ft) 0.5ft (0.5ft 0.5ft 0 25 50	75 100 NO. MOI G ELEV.	(ft) DEPTH (ft)	ELEV RUN DEPTH RUN RATE	RUN SAMP. REC. RQD REC. RQD NO. (ft) (ft	L	DESCRIPTION AND REMARKS	
				(ft) (ft) (it) (Min/ft)	(II) (II) NO. (II) (II)	G _{ELEV. (ft)}		DEPTH (
745				726.5 725 726.5 15.6 0.6	- (0.6) (0.0)		Begin Coring @ 15.6 ft CRYSTALLINE ROCK	
		742.1	GROUND SURFACE 0.0	725 725.9 16.2 5.0	(0.6) (0.0) 100% 0%	Fresh, Hard to Vi	ery Hard, Gray, White and Black GRANITIC GNEISS a E GNEISS with Close to Wide Fracture Spacing	and
740			ALLUVIAL Gray, Sandy, Silty CLAY (A-7) with Trace	700 0 7 04 0	(4.1) (4.0) 82% 80%		GSI = 92 to 95 (continued)	
			Mica	720.9 21.2 5.0	(5.0) (5.0) 100% 100%		32 to 33 (continued)	
	0 0 0							
735		 		715.9 26.2	RS-9			
732.3 9.8	VOH WOH	.		715 5.0	(5.0) (4.3) 100% 86%			
730 ± WOHV	VOH WOH •0			710.9 1 31.2				
			14.6	710 5.0	(4.9) (4.6) 98% 92%			
727.3		727.5 727.3 727.3	WEATHERED ROCK Gray and White GRANITIC GNEISS		9676 9276			
725			CRYSTALLINE ROCK Gray, White and Black GRANITIC AND	705.9 1 36.2		705.9	inated at Elevation 705.9 ft in CRYSTALLINE ROCK:	36.
			BIOTITE GNEISS			- Boning reini	GRANITIC AND BIOTITE GNEISS	
720								
				‡		-		
715								
115						F		
						1 E		
710						E		
						 		
		705.9	36.2			E		
‡			Boring Terminated at Elevation 705.9 ft in CRYSTALLINE ROCK: GRANITIC AND			E		
			BIOTITE GNEISS			1 E		
				±				
<u>6</u> +								
1/10						<u> </u>		
[H								
9.10								
				†		-		
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12872								
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B8-B

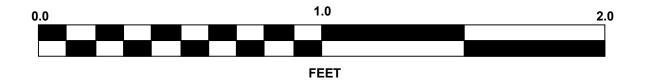
BOX 1: 15.6 - 26.2 FEET

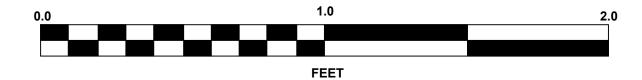
B8-B

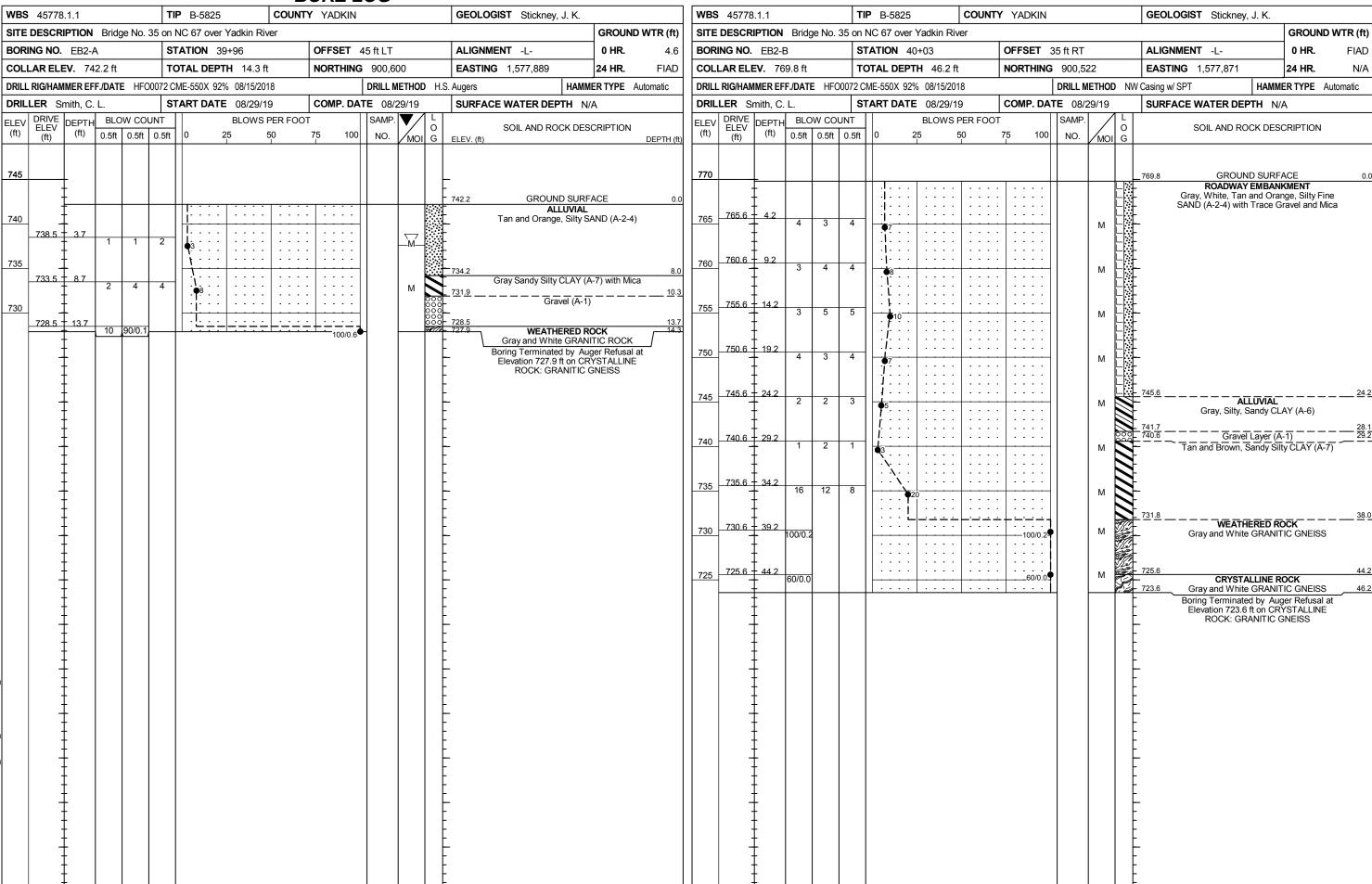
BOX 2: 26.2 - 36.2 FEET











LABORATORY SUMMARY SHEET FOR ROCK CORE SAMPLES

PROJECT NO.: 45778.1.1 (B-5825) SHEET 46 **COUNTY: FORSYTH/YADKIN**

REPLACE BRIDGE NO. 35 ON NC 67 OVER YADKIN RIVER STA. 34+65.50

								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 (ksi)	(MPSI)	(PSI)	Remarks
RS-1	B5-A	10.2 - 10.7	Granitic Gneiss	Vg	92	3.93	1.98	165.6	17.41	3.59	N/A	
RS-2	В3-В	29.7 - 30.2	Granitic Gneiss	Vg	94	3.93	1.98	162.8	18.77	4.91	N/A	
RS-4	B6-A	10.7 - 11.4	Granitic Gneiss	Vg	98	3.89	1.98	174.6	10.57	3.77	N/A	
RS-5	B2-A	29.3 - 29.7	Granitic Gneiss	Vg	84	3.75	1.98	155.6	14.24	4.64	N/A	
RS-6	B4-A	27.5 - 28.1	Granitic Gneiss	Vg	94	3.89	1.87	165.0	14.29	4.93	N/A	
RS-7	B7-A	28.2 - 28.6	Biotite Gneiss	Vg	98	3.35	1.87	161.5	6.29	1.188	N/A	
RS-8	B1-A	43.5 - 43.9	Granitic Gneiss	Vg	92	3.92	1.87	165.3	10.53	5.52	N/A	
RS-9	B8-B	24.2 - 24.8	Granitic Gneiss	Vg	100	3.90	1.87	167.8	12.39	2.68	N/A	