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DESCRIPTION

TITLE SHEET LEGEND (SOIL & ROCK)

SITE PLAN

PROFILE BORE LOG(S)

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STATE OF NORTH CAROLINA

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

STRUCTURE SUBSURFACE INVESTIGATION

COUNTY FORSYTH

SITE DESCRIPTION STRUCTURE BP-034-2103 ON SR 1600 (DONNAHA RD) BETWEEN NC 67 (REYNOLDA RD) AND SR 1602 (MARTIN FERRY RD)

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STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5825	1	4

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 SOLI TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N.C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT 1991 707-680. THE SUBSURFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA ARE NOT PART OF THE CONTRACT.

GENERAL SOL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSUFFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSUFFACE CONDITIONS BETWEEN BORINGS OR BETWEEN SAMPLED STRATA WITHIN THE BOREHOLE. THE LABORATORY SAMPLE DATA AND THE IN SITU (IN-PLACE)TEST DATA CAN BE RELIED ON ONLY TO THE DECREE OF RELIABILITY INHERENT IN THE STANDARD TEST METHOD. THE OBSERVED WATER LEVELS OR SOLI MOISTURE CONDITIONS INDICATED IN THE SUBSUFFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOLI 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 PRELIMMARY 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 TO BE ENCOUNTERED. THE BIDDER OR CONTRACTOR IS CAUTIONED TO MARE SUCH INDEPENDENT SUBSURFACE INVESTIGATIONS AS HE DEEMS NECESSARY TO SATISFY IMINSELF AS TO CONDITIONS TO BE ENCOUNTERED. RS HE DEEMS NECESSARY TO SATISFY IMINSELF AS TO CONDITIONS TO BE ENCOUNTERED AT THE SUFFICIENCY OF THE CONTRACTOR SUCH FOR ADDITIONAL COMPENSATION OR FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FROM THE ACTUAL COMPENSATION OR FOR AN THE SITE DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.

- NOTES: I. 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.

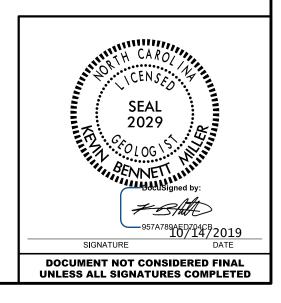
PERSONNEL

J.K. STICKNEY

C.L. SMITH

B. FOSTER

INVESTIGATED BY ______. STICKNEY DRAWN BY _J.E. BEVERLY SUBMITTED BY _____. MILLER DATE APRIL 2019



NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS GEOTECHNICAL ENGINEERING UNIT SUBSURFACE INVESTIGATION

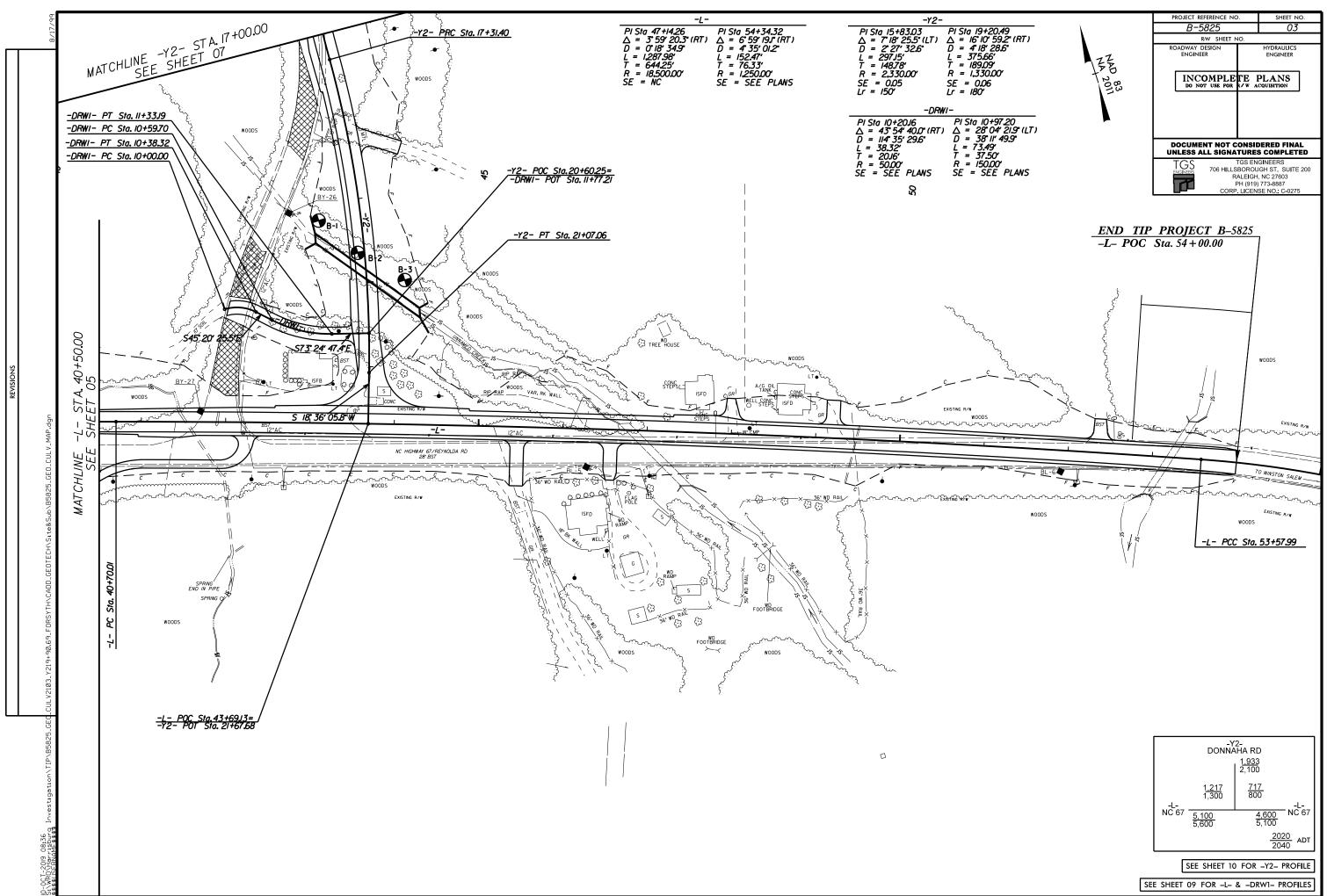
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

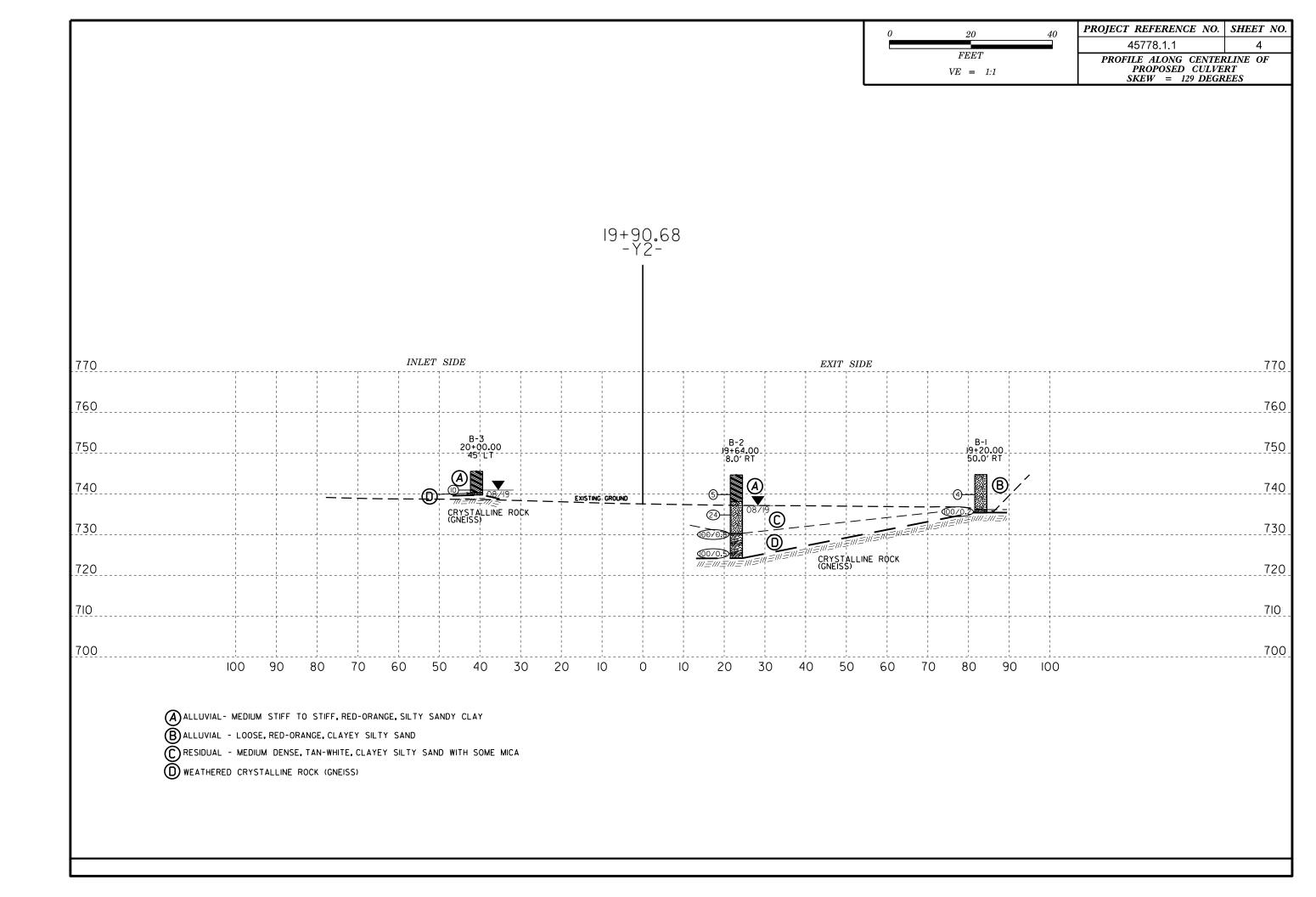
SOIL DESCRIPTION	GRADATION		TERMS AND DEFINITIONS
SOIL DESCRIFTION SOIL IS CONSIDERED UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN	WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE.	ROCK DESCRIPTION HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT REFUSAL IF TESTED. AN INFERRED	ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.
BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO THE STANDARD PENETRATION TEST (AASHTO T 206, ASTM D1586). SOIL CLASSIFICATION	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	AQUIFER - A WATER BEARING FORMATION OR STRATA.
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
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	WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND 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.	RUCK (CH) GNEISS, GABBRO, SCHIST, ETC.	CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.
CLASS. A-1-8 A-1-6 A-2-4 A-2-5 A-2-6 A-2-7 A-7-5 A-3 A-6 A-7	COMPRESSIBILITY	NON-CRYSTALLINE FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN ROCK (NCR) SEDIMENTARY ROCK THAT WOULD YELLD SPT REFUSAL IF TESTED.	COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM
SYMBOL SCOORDONOOD	SLIGHTLY COMPRESSIBLE LL < 31 MODERATELY COMPRESSIBLE LL = 31 - 50	COASTAL PLAIN COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD	OF SLOPE.
	HIGHLY COMPRESSIBLE LL > 50	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 SILLI GRANULAR SILLI	PERCENTAGE OF MATERIAL		DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT
•40 30 MX 50 MX 51 MN •200 15 MX 25 MX 10 MX 35 MX 35 MX 35 MX 35 MX 36 MN 36 MN 36 MN 36 MN 36 MN	GRANULAR SILT - CLAY ORGANIC MATERIAL SOILS OTHER MATERIAL	FRESH ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER	ROCKS OR CUTS MASSIVE ROCK.
	TRACE OF ORGANIC MATTER 2 - 3% 3 - 5% TRACE 1 - 10%	HAMMER IF CRYSTALLINE.	DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.
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,	DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE
LL – – 48 MX 41 MN 40 MX 41 MN 40 MX 41 MN 40 MX 41 MN 50 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 10 MX	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 ND MX AMOUNTS OF	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 STORE FRAGS. 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.
UF MAJUR GRAVEL, AND SAND SAND SOTIS SOTIS	STATIC WATER LEVEL AFTER <u>24</u> HOURS	CRYSTALS ARE DULL AND DISCOLORED, CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS.	FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.
MATERIALS SAND SHID CHILL HIG SHID SOLS SOLS SOLS	∇ PW PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA	MODERATE SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN (MOD.) GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS	FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL.
CEN.RATING EXCELLENT TO GOOD FAIR TO POOR POOR UNSUITABLE		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	- O-M- Spring or Seep	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
CONSISTENCY OR DENSENESS	MISCELLANEOUS SYMBOLS	SEVERE AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH	FIELD.
PRIMARY SOIL TYPE COMPACTNESS OR PENETRATION RESISTENCE COMPRESSIVE STRENGTH	ROADWAY EMBANKMENT (RE) 25/025 DIP & DIP DIRECTION	(MOD. SEV.) AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES 'CLUNK' SOUND WHEN STRUCK. IF TESTED, WOULD YIELD SPT REFUSAL	JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.
PRIMARY SOIL TYPE CONFIGURESS ON PENETRATION RESISTENCE COMPRESSIVE STRENGTH CONSISTENCY (N-VALUE) (TONS/FT ²)	ROADWAY EMBANKMENT (RE) 29/023 DIP & DIP DIRECTION WITH SOIL DESCRIPTION FOR STRUCTURES	SEVERE ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND EVIDENT BUT	LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.
GENERALLY VERY LOOSE < 4	SOIL SYMBOL	(SEV.) REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED	LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.
OLINE (NEE) LOOSE 4 TO 10 GRANULAR MEDIUM DENSE 10 TO 30 N/A		TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. IF TESTED, WOULD YIELD SPT N VALUES > 100 BPF	MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS
MATERIAL DENSE 30 TO 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	USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.
VERT DENSE > 50		SEVERE BUT MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK (V SEV.) REMAINING, SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE THAT ONLY MINOR	PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.
VERY SOFT < 2 < 0.25 GENERALLY SOFT 2 TO 4 0.25 TO 0.5	INFERRED SOIL BOUNDARY	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	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		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
HARD > 30 > 4		ROCK HARDNESS	RUN AND EXPRESSED AS A PERCENTAGE. 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	UNCLASSIFIED EXCAVATION - UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE UNCLASSIFIED EXCAVATION -	SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.	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		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 THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS.
BOULDER COBBLE GRAVEL COARSE FINE SILT CLAY	SHALLOW UNDERCUT UNCLASSIFIED EXCAVATION - USED IN THE TOP 3 FEET OF ACCEPTABLE DEGRADABLE ROCK EMBANKMENT OR BACKFILL	TO DETACH HAND SPECIMEN. 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
(BLDR.) (COB.) (GR.) SHIND SHIND (SL.) (CL.) (CSE. SD.) (F SD.)	ABBREVIATIONS	HARD EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK, HAND SPECIMENS CAN BE DETACHED	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 A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL
SIZE IN. 12 3	BT - BORING TERMINATED MICA MICACEOUS WEA WEATHERED CL CLAY MOD MODERATELY γ - UNIT WEIGHT	MEDIUM CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. HARD CAN BE EXCAVATED IN SMALL CHIPS TO PEICES I INCH MAXIMUM SIZE BY HARD BLOWS OF THE	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 $\dot{\gamma}_{ m d}$ - DRY UNIT WEIGHT	POINT OF A GEOLOGIST'S PICK.	TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.
SOIL MOISTURE SCALE FIELD MOISTURE (ATTERBERG LIMITS) DESCRIPTION GUIDE FOR FIELD MOISTURE 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 LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY
- 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.
	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	FRAC FRACTURED, FRACTURES TCR - TRICONE REFUSAL RT - RECOMPACTED TRIAXIAL FRAGS FRAGMENTS W - MOISTURE CONTENT CBR - CALIFORNIA BEARING	FRACTURE SPACING BEDDING	
	HI HIGHLY V - VERY RATIO	TERM SPACING TERM THICKNESS	BENCH MARK: BY-26 - N 900709.0862 E 1578216.2099, STA. 12+13.49
	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: 756.6 FEET
	DRILL UNITS: ADVANCING TOOLS: HAMMER TYPE:	MODERATELY CLOSE 1 TO 3 FEET THINLY BEDDED 0.16 - 1.5 FEET	NOTES:
	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
- DRY - (D) ATTAIN OPTIMUM MOISTURE	CME-55 6' CONTINUOUS FLIGHT AUGER CORE SIZE:	THINLY LAMINATED < 0.008 FEET	
PLASTICITY	■ CHE-33 X 8' HOLLOW AUGERS	INDURATION	
PLASTICITY INDEX (PI) DRY STRENGTH	CME-550 ARD FACED FINGER BITS	FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.	
NON PLASTIC 0-5 VERY LOW	TUNGCARBIDE INSERTS	FRIABLE RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.	
SLIGHTLY PLASTIC 6-15 SLIGHT MODERATELY PLASTIC 16-25 MEDIUM	VANE SHEAR TEST		
HIGHLY PLASTIC 26 OR MORE HIGH		MODERATELY INDURATED GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.	
COLOR		GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE:	
DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN. RED. YELLOW-BROWN, BLUE-GRAY).	X CME-550X CORE BIT VANE SHEAR TEST	INDURATED DIFFICULT TO BREAK WITH HAMMER.	
MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.		EXTREMELY INDURATED SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.	DATE: 8-15-14
		SHOULE DIGENS HURUSS UNHINS,	DH1E: 0-10-14

PROJECT REFERENCE NO.



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STATE OF NORTH CAROLINA

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

STRUCTURE SUBSURFACE INVESTIGATION

COUNTY _YADKIN

PROJECT DESCRIPTION BRIDGE NO. 35 ON NC 67 OVER YADKIN RIVER

STATE PROJECT REFERENCE NO. STATE SHEETS NO. **B-5825** N.C 46 1

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

THE BIDDER OF CONTRACTOR IS CALIFORED 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 THINSELF AS TO CONDITIONS TO BE ENCOUNTERED ON THE PROJECT. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OR FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FOM THE AUDITIONAL COMPENSATION OF FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FOM THE SUBSURFACE INFORMATION.

- NOTES: I. 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

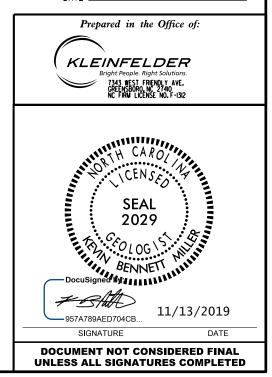
B.E. FOSTER

INVESTIGATED BY J.K. STICKNEY DRAWN BY _S. PAPKE/C. DRISCOLL

CHECKED BY _____. BEVERLY

SUBMITTED BY _____K.B. MILER

DATE NOVEMBER 2019

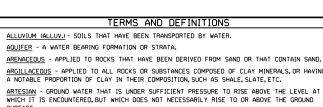


NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS GEOTECHNICAL ENGINEERING UNIT SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION	GRADATION	ROCK DESCRIPTION
SOIL IS CONSIDERED UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLICAT POWER AUGER AND VIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO THE STANDARD PENETRATION TEST IAASHTO T 206, ASTM D15863, SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM, BASIC DESCRIPTIONS GENERALLY INCLUBE THE FOLLOWING: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AD UTHER PERTINENT FACTORS SUCH	WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. UNIFORMLY GRADED - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. GAP-GRADED - INDICATES AN MIXTURE OF UNIFORM PARTICLE SIZES OF TWO OR MORE SIZES. ANGULARITY OF GRAINS	HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT REFUSAL IF TESTED. AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EDUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS IN NON-COASTAL PLAIN MATERIAL. THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK.
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:	ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:
SOIL LEGEND AND AASHTO CLASSIFICATION		ROCK (WR) 100 BLOWS PER FOOT IF TESTED.
$ \begin{array}{ c c c c c } \hline & & & & & & \\ \hline & & & & & \\ \hline & & & &$	MINERALOGICAL COMPOSITION MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC.	CRYSTALLINE ROCK (CR) THE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED, ROCK TYPE INCLUDES GRANITE OUTCOS CREEPED CONTENT FOR
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-a A-1-b A-2-4 A-2-5 A-2-6 A-2-7 A-3 A-6, A-7	ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.	NON-CRYSTALLINE FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YELLD SPT REFUSAL IF TESTED.
	SLIGHTLY COMPRESSIBLE LL < 31 MODERATELY COMPRESSIBLE LL = 31 - 50	ROCK (NCR)
2 PASSING SILT-	HIGHLY COMPRESSIBLE LL > 50	SEDIMENTARY ROCK SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.
*10 50 MX *40 33 MX 50 MX 51 MN SOILS SOILS SOILS SOILS		WEATHERING
*200 15 MX 25 MX 10 MX 35 MX 35 MX 35 MX 35 MX 35 MX 36 MN 36 MN 36 MN 36 MN 36 MN	GRANULAR SILT - CLAY 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.
PASSING *40 LL – – 40 MX 41 MN 40 MX 41 MN 40 MX 41 MN 40 MX 41 MN 40 MX 41 MN PI 5 MY 10 MY 10 MY 11 MN 11 MN 10 MY 10 MY 11 MN 11 TTLE OR LITTLE OR	LITLE ORGANIC MATTER 3 - 5% 5 - 12% LITTLE 10 - 20% MODERATELY ORGANIC 5 - 10% 12 - 20% SOME 20 - 35% HIGHLY ORGANIC > 10% > 20% HIGHLY 35% AND ABOVE	VERY SLIGHT ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN, (V SLI.) CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE.
GROUP INDEX 0 0 0 4 MX 8 MX 12 MX 16 MX NO MX AMOUNTS OF SOLUTION	GROUND WATER	SLIGHT ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO
USUAL TYPES STONE FRAGS. 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 CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS.
MATERIALS SAND SAND GRAVEL AND SAND SUILS SUILS	STATIC WATER LEVEL AFTER <u>24</u> HOURS ✓PW PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA	MODERATE SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN (MOD.) GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS
GEN. RATING AS SUBGRADE EXCELLENT TO GOOD FAIR TO POOR POOR UNSUITAGE	LE CARLES PRINT OR SEEP	DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED WITH FRESH ROCK.
PI OF A-7-5 SUBCROUP IS \leq LL - 30 ; PI OF A-7-6 SUBCROUP IS > LL - 30 CONSISTENCY OR DENSENESS		MODERATELY ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL
COMPACTNESS 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.
PRIMART SULL ITPE CONSISTENCY PENEITRATION RESISTENCE COMPRESSIVE STREND F (N-VALUE) (TONS/FT2)	ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION COLL SYMPOLE COLL SYMPOL	IF TESTED, WOULD YIELD SPT REFUSAL SEVER 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
GENERALLY LOOSE 4 TO 10 GRANULAR MEDIUM DENSE 10 TO 30 N/A		TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. IF TESTED, WOULD YIELD SPT N VALUES > 100 BPF
MATERIAL (NON-COHESIVE) DENSE VERY DENSE 30 TO 50 10 FO VERY SOFT < 2	ARTIFICIAL FILL (AF) DIHER THAN ROADWAY EMBANKMENT INFERRED SOIL BOUNDARY	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 REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE THAT ONLY MINOR
GENERALLY SOFT 2 TO 4 0.25 TO 0.5 SILT-CLAY MEDIUM STIFF 4 TO 8 0.5 TO 1.0		VESTIGES OF ORIGINAL ROCK FABRIC REMAIN. <i>IF TESTED, WOULD YIELD SPT N VALUES < 100 BPF</i> COMPLETE ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND
MATERIAL STIFF 8 T0 15 1 T0 2 (COHESIVE) VERY STIFF 15 T0 30 2 T0 4 HARD > 30 > 4	The line line line line line line line lin	SCATTERED CONCENTRATIONS, QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS, SAPROLITE IS ALSO AN EXAMPLE.
	RECOMMENDATION SYMBOLS	ROCK HARDNESS
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.
OPENING (MM) 4.76 2.00 0.42 0.25 0.075 0.053 DOW SED COARSE FINE SU Z SU Z	SHALLOW VICLASSIFIED EXCAVATION - USED IN THE TOP 3 FEEL OF	HARD CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.
BOULDER COBBLE GRAVEL SAND SAND SILT CLAY (BLDR.) (COB.) (GR.) (CSE. SO.) (F SD.) (SL.) (CL.)		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
GRAIN MM 305 75 2.0 0.25 0.05 0.005 SIZE IN. 12 3	AR - AUGER REFUSAL MED MEDIUM VST - VANE SHEAR TEST BT - BORING TERMINATED MICA MICACEOUS WEA WEATHERED	BY MODERATE BLOWS.
SIZE IN. 12 3 SOIL MOISTURE - CORRELATION OF TERMS	CL CLAY MODE AND PARTICLE γ - NUME WEIGHT CPT - CONE PENETRATION TEST NP - NON PLASTIC γ_1 - DRY UNIT WEIGHT	MEDIUM CAN BE GROUVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. HARD CAN BE EXCAVATED IN SMALL CHIPS TO PEICES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK.
SOIL MOISTURE SCALE FIELD MOISTURE (ATTERBERG LIMITS) DESCRIPTION GUIDE FOR FIELD MOISTURE DESCRIPTIO		SOFT CAN BE GROVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS
- SATURATED - USUALLY LIQUID; VERY WET, USUALLY	DPT - DYNAMIC PENETRATION TEST SAP SAPROLITIC S - BULK e - VOID RATIO SD SAND, SANDY SS - SPLIT SPOON	FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE.
(SAT.) FROM BELOW THE GROUND WATER TABLE	F - FINE SL SILT, SILTY ST - SHELBY TUBE	VERY CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK, PIECES I INCH SOFT OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY
PLASTIC SEMISOLID; REQUIRES DRYING TO	FRAC FRACTURED, FRACTURES TCR - TRICONE REFUSAL RT - RECOMPACTED TRIAXIAL	FINGERNAIL.
	FRAGS FRAGMENTS w - MOISTURE CONTENT CBR - CALIFORNIA BEARING HI HIGHLY V - VERY RATIO	FRACTURE SPACING BEDDING
	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
OM _ OPTIMUM MOISTURE - HUIST - (H) SULUEHT ON NEHN OFTIMUM MOISTURE	DRILL UNITS: ADVANCING TOOLS: HAMMER TYPE: X CME-45C □ CLAY BITS X AUTOMATIC ■ MANUAL	MODERATELY CLOSE 1 TO 3 FEET THINLY BEDDED 0.16 - 1.5 FEET CLOSE 0.16 TO 1 FOOT VERY THINLY BEDDED 0.06 - 1.5 FEET
- DRY - (D) REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE		VERY CLOSE LESS THAN 0.16 FEET THICKLY LAMINATED 0.008 - 0.03 FEET
PLASTICITY	CME-55 CME-5	THINLY LAMINATED < 0.008 FEET
PLASTICITY INDEX (PI) DRY STRENGTH	X CME-550 HARD FACED FINGER BITS X N 0	FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ET
NON PLASTIC 0-5 VERY LOW SLIGHTLY PLASTIC 6-15 SLIGHT		FRIABLE RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.
MODERATELY PLASTIC 16-25 MEDIUM HIGHLY PLASTIC 26 OR MORE HIGH		MODERATELY INDURATED GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE: BREAKS FASILY WHEN HIT WITH HAMMER.
COLOR		CRAINS ARE DISCICULT TO SERARATE WITH STEEL PROPE.
DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY).	CORE BIT VANE SHEAR TEST	DIFFICULT TO BREAK WITH HAMMER.
MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.	Image: Market and Mar	EXTREMELY INDURATED SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.



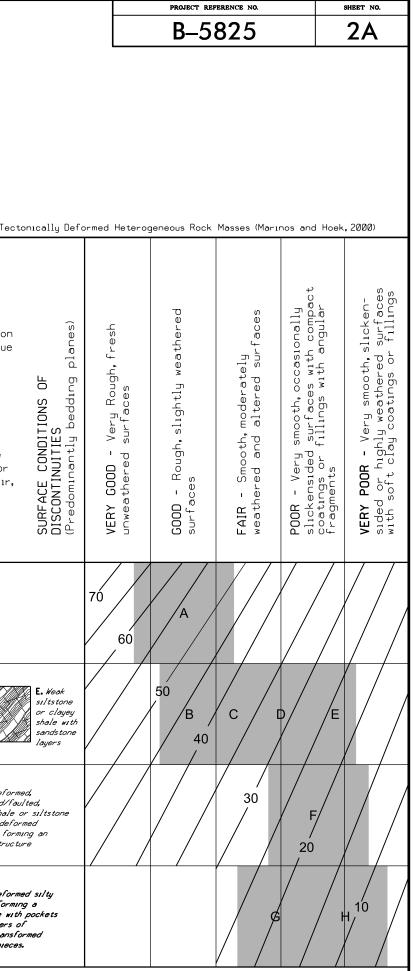


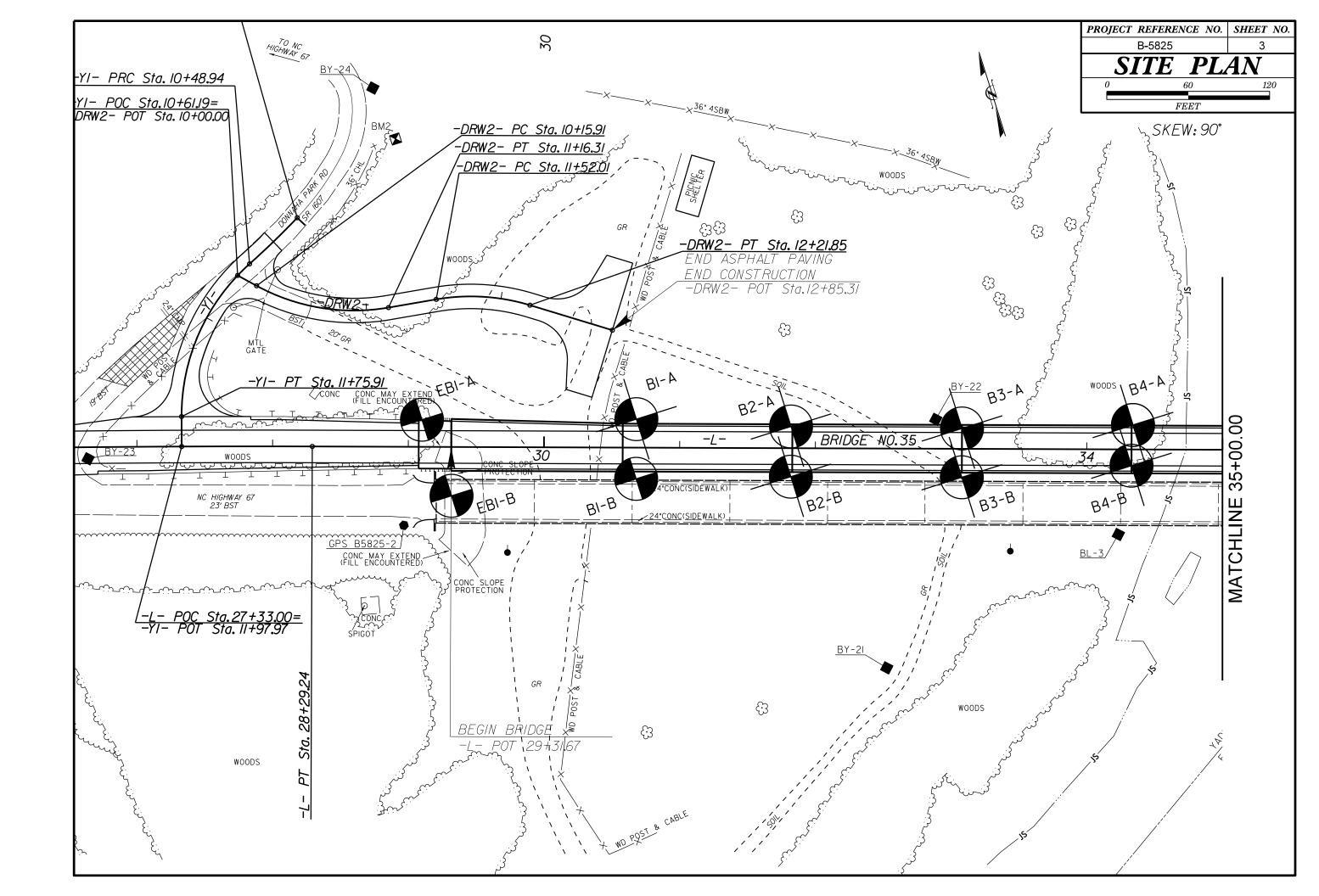
	ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.
N VALUES >	ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, SUCH AS SHALE, SLATE, ETC.
CK THAT CLUDES GRANITE,	A <u>RTESIAN</u> - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS EUCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE.
	CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.
L PLAIN F TESTED.	$\underline{\text{COLLUVIUM}}$ - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.
MAY NOT YIELD TONE, CEMENTED	$\frac{\text{CORE} \text{ Recovery (Rec.)}}{\text{By TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED}$
RINGS UNDER	<u>DIKE</u> - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.
	$\underline{\text{DIP}}$ - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.
DATINGS IF OPEN. MMMER BLOWS IF	DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.
CK UP TO FELDSPAR	FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.
BLOWS.	FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.
. IN 7. ROCK HAS	\underline{FLOAT} - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL.
AS COMPARED	FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM. FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE
ELDSPARS DULL DSS OF STRENGTH	FIELD.
HEN STRUCK.	JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED. LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO
/IDENT BUT RE KAOLINIZED	ITS LATERAL EXTENT. L <u>ENS</u> - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.
	MOTILED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.
E DISCERNIBLE STRONG ROCK ONLY MINOR	PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.
ALUES < 100 BPF	RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.
N SMALL AND 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 RUN AND EXPRESSED AS A PERCENTAGE.
REQUIRES	SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.
OWS REQUIRED	<u>SILL</u> - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS.
EP CAN BE TACHED	<u>SLICKENSIDE</u> - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.
R PICK POINT. BLOWS OF THE	STANDARD PENETRATION TEST (PENETRATION RESISTANCE)(SPT) - NUMBER OF BLOWS (N OR BPF)OF A 140 LB.HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF I FOOT INTO SOIL WITH A 2 INCH QUTSIDE DIAMETER SPLIT SPOON SAMPLER, SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.
FRAGMENTS	<u>STRATA CORE RECOVERY (SREC.)</u> - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.
PIECES 1 INCH ED READILY BY	STRATA ROCK QUALITY DESIGNATION (SRQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.
	TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.
	BENCH MARK: SEE NOTES
THICKNESS	
4 FEET 5 - 4 FEET	ELEVATION: N/A FEET
6 - 1.5 FEET	NOTES: FIAD - FILLED IMMEDIATELY AFTER DRILLING
3 - 0.16 FEET 8 - 0.03 FEET	B5825-2 GPS AT STA. I8+I8.53 -L- (900,836 FT. N., I,576,810 FT. E.)
0.008 FEET	ELEVATION: 769.45
AT, PRESSURE, ETC.	BL-4 AT STA.29+61.97 -L- (900,488 FT.N.,1,577,899 FT.E.) ELEVATION: 769.60
	BY-26 AT STA.12+13.49 -L- (900,709 FT.N.,1,578,216 FT.E.) ELEVATION: 756.60
EEL PROBE:	
*	
PROBE:	

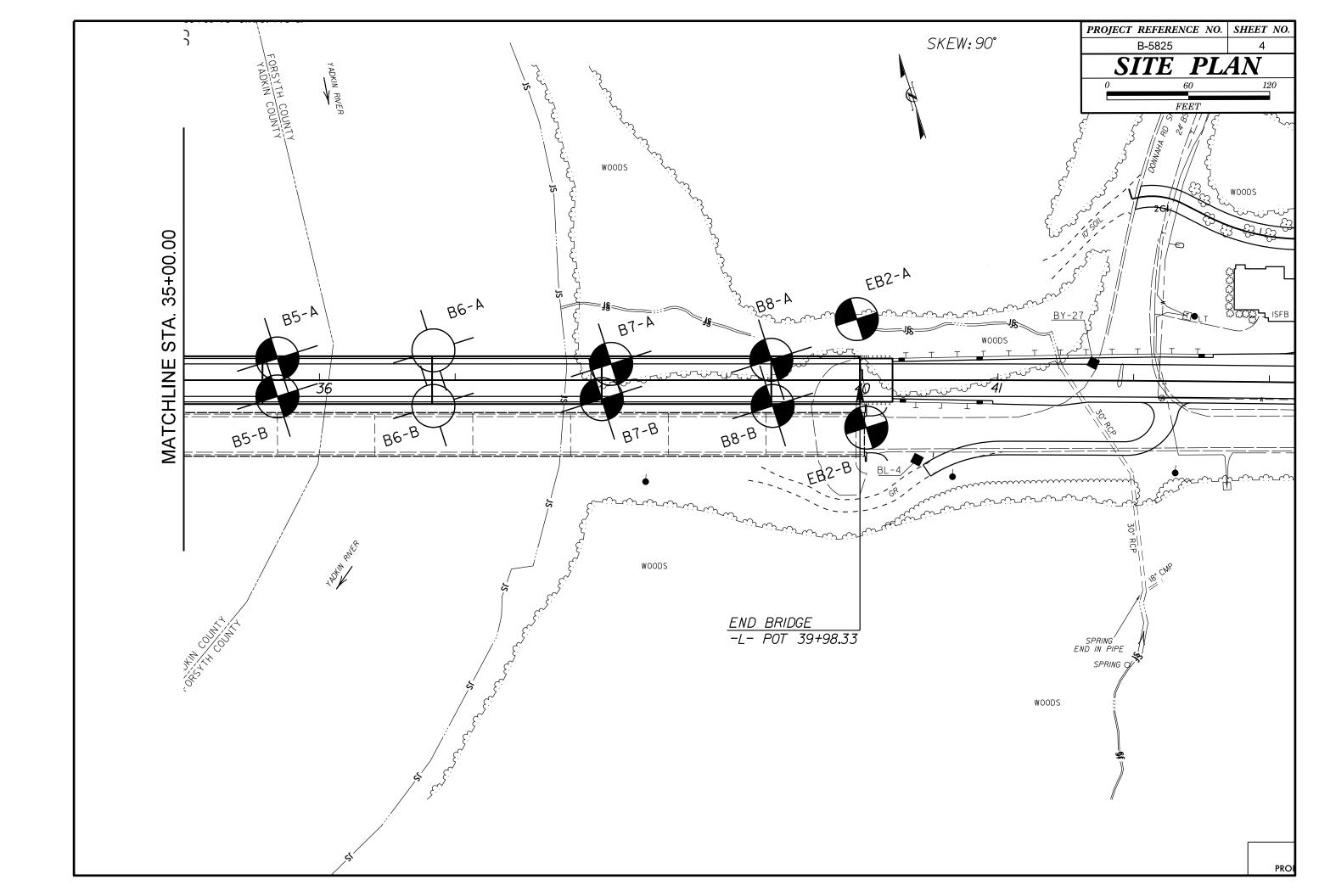
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS GEOTECHNICAL ENGINEERING UNIT SUBSURFACE INVESTIGATION

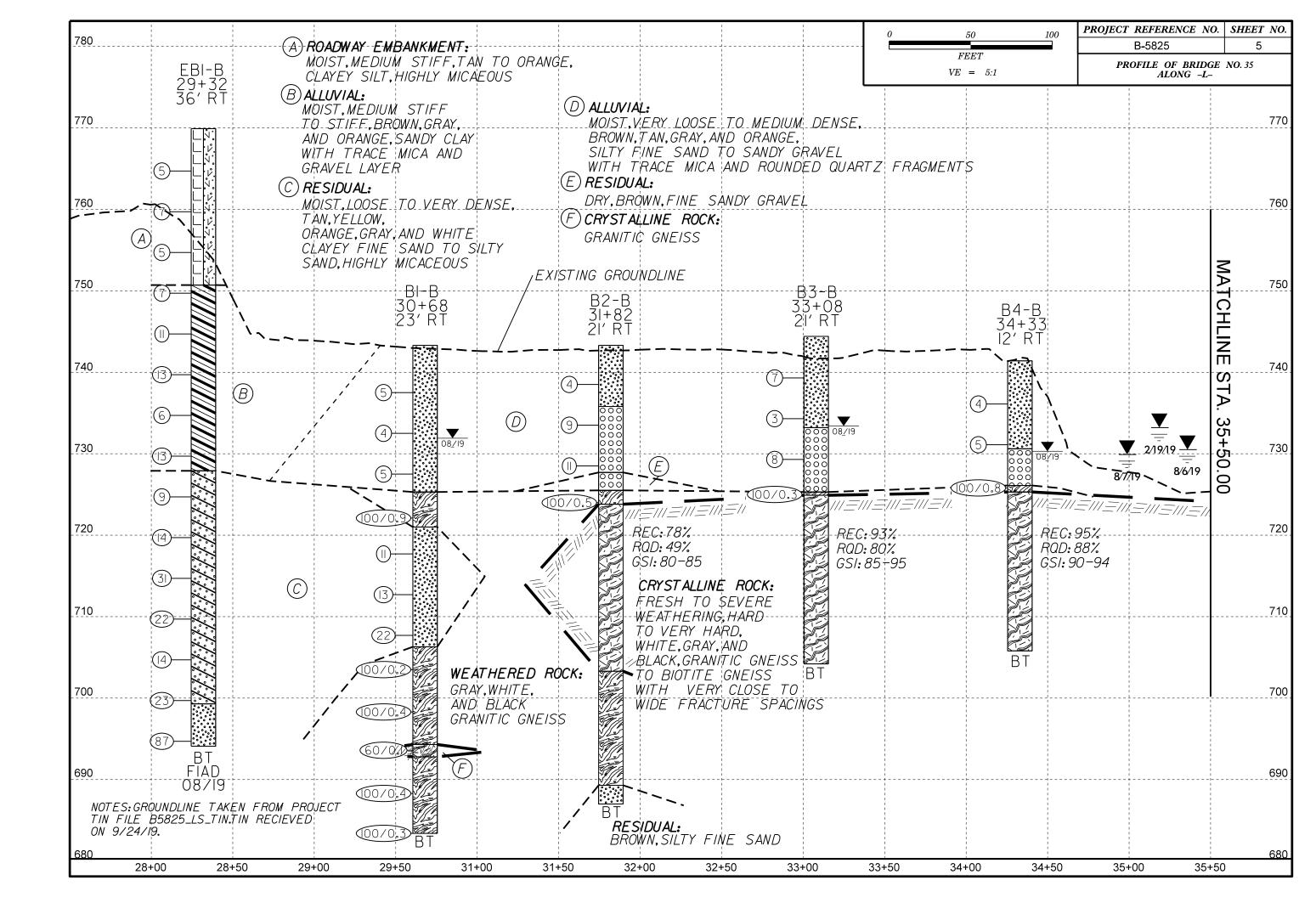
SUPPLEMENTAL LEGEND, GEOLOGICAL STRENGTH INDEX (GSI) TABLES FROM AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS

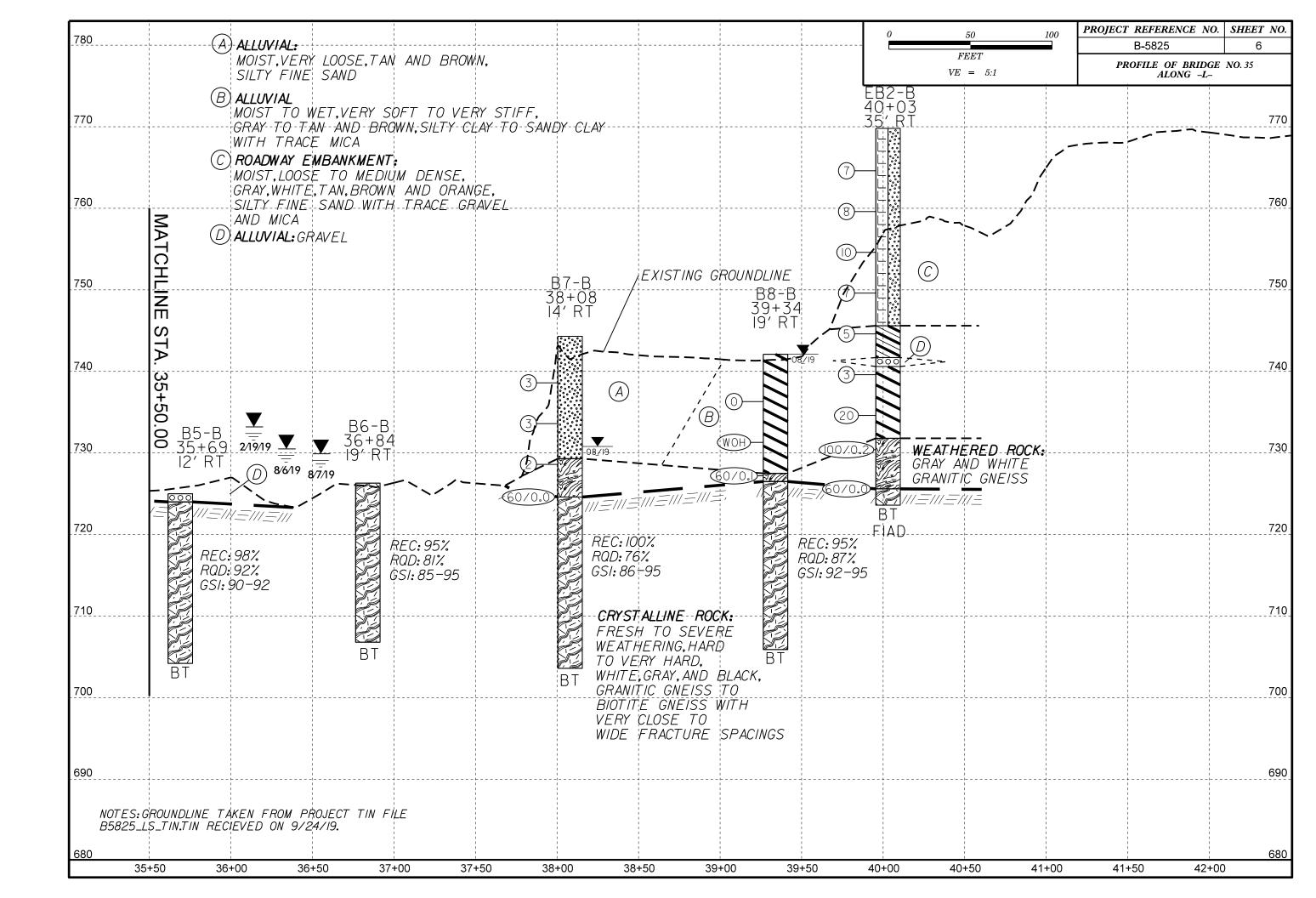
AASHTO LRFD Figure 10.4.6.4–1 — Determination of GSI for Jointed	Rock Mass (Marı	nos and Hoek,2	2000)			AASHTO LRFD Figure 10.4.6.4–2 $-$ Determination of GSI for T
GEOLOGICAL STRENGTH INDEX (GSI)FOR JOINTED ROCKS (Hoek and Marinos,2000)	S C	e G		aces	ດ ບ ບ	GSIFOR HETEROGENEOUS ROCK MASSES SUCH AS FLYSCH (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.	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 surf∂ with compact coatings or fillings or angular fragments	VERY POOR Slickensided, highly weathered surf∂ with 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 fail poor and very poor conditions. Water pressure does not change the value of GSI and it is dealt with by using effective stress analysis.
STRUCTURE	DEC	REASING SU	JRFACE QUA	ALITY 💳	-	COMPOSITION AND STRUCTURE
INTACT OR MASSIVE - intact rock specimens or massive in situ rock with few widely spaced discontinuities	90			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.
BLOCKY - well interlocked un- disturbed rock mass consisting of cubical blocks formed by three intersecting discontinuity sets		70 60				B. Sand- stone with thin inter-
VERY BLOCKY - interlocked, partially disturbed mass with multi-faceted angular blocks formed by 4 or more joint sets BLOCKY/DISTURBED/SEAMY - folded with angular blocks		5	0			layers of siltstone amounts stone layers
formed by many intersecting			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 .
discontinuity sets. Persistence of bedding planes or schistosity 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
LAMINATED/SHEARED - Lack of blockiness due to close spacing of weak schistosity or shear planes	N/A	N/A			10	► Means deformation after tectonic disturbance

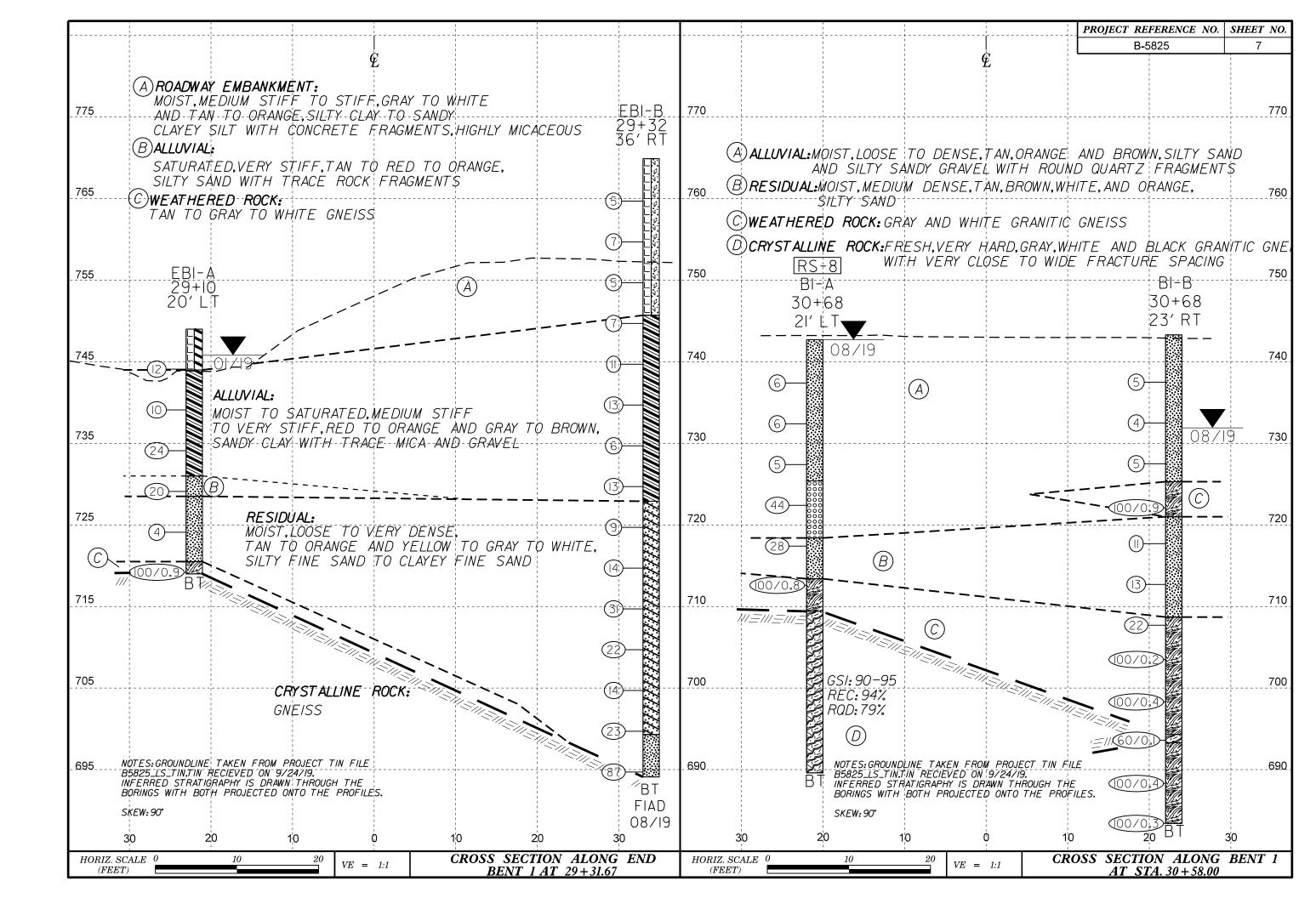




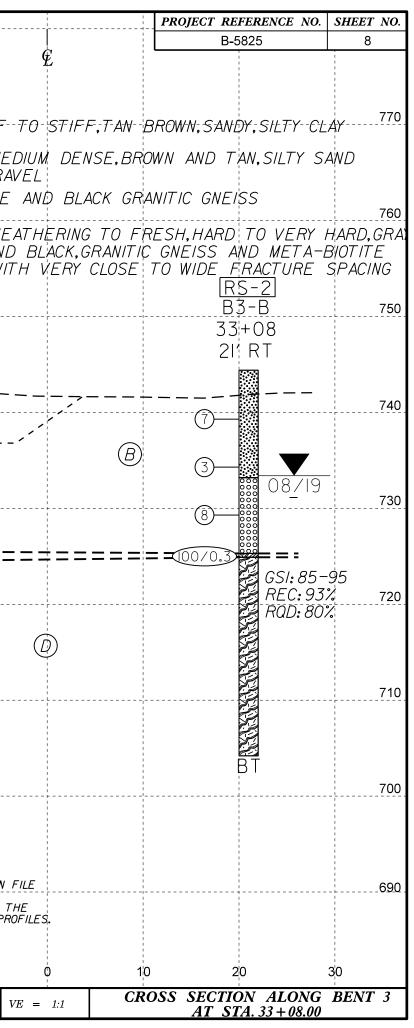




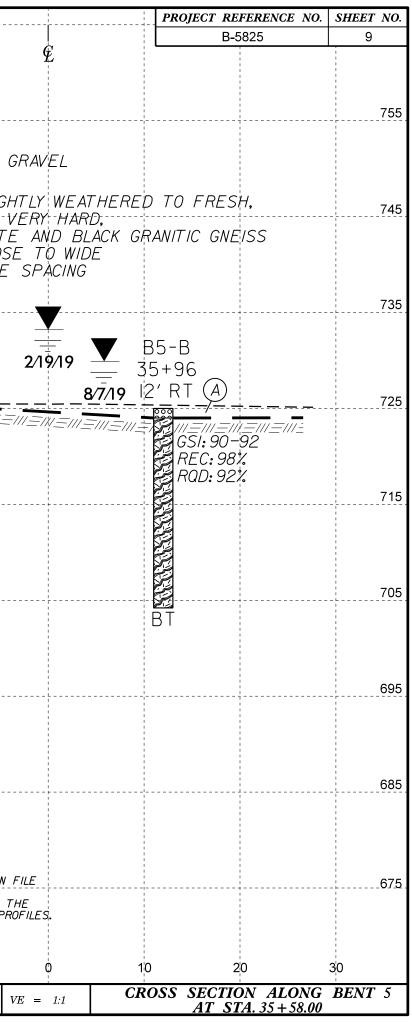




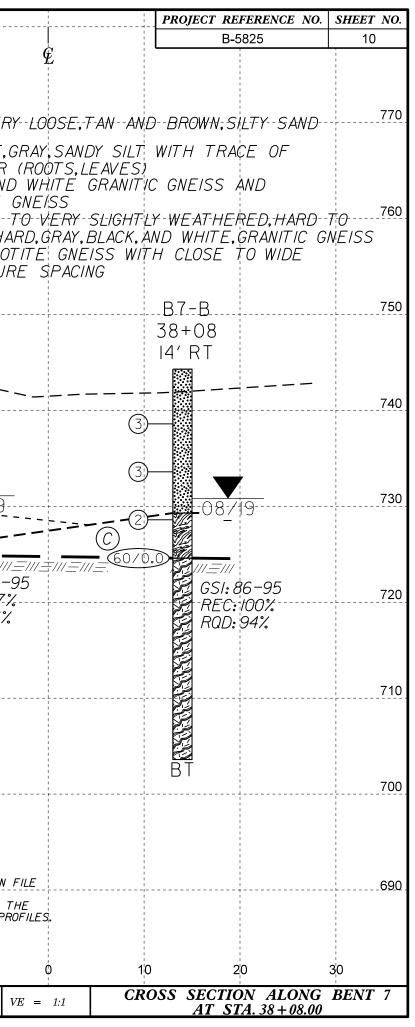
			Ē									
770		AND \$ILTY,F	TINE SANDY	GRAVEL			-	770 77	0			
	(B) ALLUVIAL: MOIST, N SANDY		FF TO VER	Y SOFT,B	ROWN AND	D TAN, SI	LTY,		A	ALLUVIAL:MO		
	CRESIDUAL:DRY, BI		FINE SAND	GRAVEL					B	ALLUVIAL:MO AN	ST,LOOS D SILTY,	SE AND MEL SANDY GRAV
760	DWEATHERED RO		1				-	760 76	0 (C)	WEATHERED	ROCK:	GRAY, WHITE
	(E)CRYSTALLINE RO	VERY H	TO COMPLE ARD,WHITE,G ERY CLOSE	GRAY TO E	BLACK GRA	ANITIC GN	VÉISS		D	CRYST ALLINE		SLIGHT WEA WHITE AND GNEISS WIT
	(F) RESIDUAL: BROWN	, SILTY SAN										
750	<u>LRS-</u> B2-7				B2	-B		750 75	0			1
	31+8 16 <u>′ L</u>	2			3 + 2 ′	82					33+0 15′ L 1	
740		08/19			— — — —	3 — — — — 3 4		740 74	0			
	(7)				4					- (
			~	(\underline{A})	9	00000				(3	
730			`	Q		0 0 0 0 0 0		730 73	0	\bigcirc		0.8/19
					100/0.5	D				-		=====
720		REC: 84%	/	//_/// <u>_</u>		#G21:80-	// <u>+</u> /// <u>-</u> ///	720 72	0			GSI: 80-85 REC: 79% ROD: 62%
		RQD:66%				REC: 78 RQD: 49						TUU: 6∠⁄.
	GSI: 10-15 REC: 53%		Ē	$\mathbf{)}$			-	710 71	0			
	R0D:0%	GSI:72-82						, 10 / 1	v			
		REC: 86% RQD: 67%										
700		GSI:10-15				(D)		700 70	0			
		REC: 25% RQD: 0%			100/0.0						BT	
_ 690				(100/0.6		4	690 69	0 <i>NO</i> 1	ES: GROUNDLINE	TAKEN FROM	N PROJECT TIN F
- 220		B5825_LS_TIN.TII	NE TAKEN FROM N RECIEVED ON S TIGRAPHY IS DRA	0/24/19. NN THROUGH	(80) – 🔛	T (F)			B58 ואר ואר	825_LS_TIN.TIN [®] RE ERRED STRATIGR RINGS WITH BOTH	CIEVED ON APHY IS DR	9/24/19. AWN THROUGH TH
		BORINGS WITH E	BOTH PROJECTED	ONTO THE PI	ROFILES.				SKL	EW:90°		
	30 20 BT	10	0	10	20		30		3	-		10
	SCALE 0 10 ET) 10	20	VE = 1:1	CROSS	SECTION AT 31	[ALONG [+83.00	BENT	2 H	ORIZ. SCA (FEET)		10	20 VI

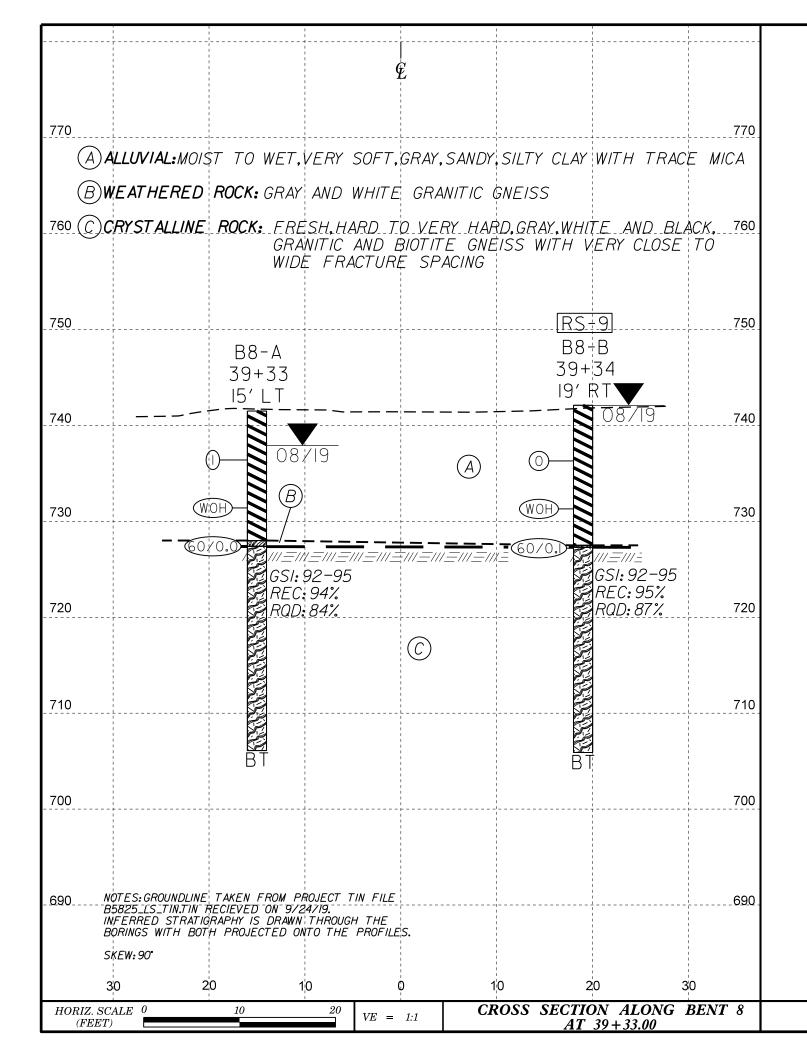


GROUNDLINE TAKEN FROM LS_TIN.TIN RECIEVED ON 9. ED STRATIGRAPHY IS DRAW S WITH BOTH PROJECTED 10 20) ON 9/24/19.	10 20		NOTES: GROUNDLINE TAKEN FROM PROJECT TIN B5825_LS_TIN.TIN RECIEVED ON 9/24/19. INFERRED STRATIGRAPHY IS DRAWN THROUGH T BORINGS WITH BOTH PROJECTED ONTO THE PR SKEW: 90° 30 20 10
GROUNDLINE TAKEN FROM LS_TIN.TIN RECIEVED ON 9, ED STRATIGRAPHY IS DRAW	O'ON' 9724719. S DRAWN' THROUGH THE			B5825_LS_TIN.TIN RECIEVED ON 9/24/19. INFERRED STRATIGRAPHY IS DRAWN THROUGH 1
BT				
BT			700 685	
		BT		
			710 695	DI
00/0.9 GSI: 90 REC: 90 RAD: 92	/ 51: 90-93	070.8 GSI: 90-94 REC: 95% RQD: 88%	720 705	BT
3- V	▼	5 1 1 1 1 1 1 1 1 1 1	730_715_	Rad: 78%
 6 A	A		- 740 725	I6' L⊤ 8/6/19 GSI: 83-87 REC: 92%
B4-A 34+34 18'LT		B4-B 34+33 I2' RT		[<u>RS−I</u>] B5−A 35+69
<u> </u>			750 735	GRAY,WHITI WITH CLOS FRACTURE
	GRANITIC GNEISS WITH SPACING	CLOSE TO WIDE FRACT	TURE 760 745	BCRYSTALLINE ROCK:VERY SLIGI
GF			770 755	(A) ALLUVIAL: SAND,COBBLES AND
WITH TRACE ATHERED ROCK:GR STALLINE ROCK:FF GF	RACE MICA K: GRAY AND WHITE GRAM			
-		STALLINE ROCK: FRESH,VERY HARD,GRA GRANITIC GNEISS WITH	THERED ROCK: GRAY AND WHITE GRANITIC GNEISS STALLINE ROCK: FRESH,VERY HARD,GRAY,WHITE AND BLACK, GRANITIC GNEISS WITH CLOSE TO WIDE FRACT	THERED ROCK: GRAY AND WHITE GRANITIC GNEISS STALLINE ROCK: FRESH, VERY HARD, GRAY, WHITE AND BLACK, GRANITIC GNEISS WITH CLOSE TO WIDE FRACTURE



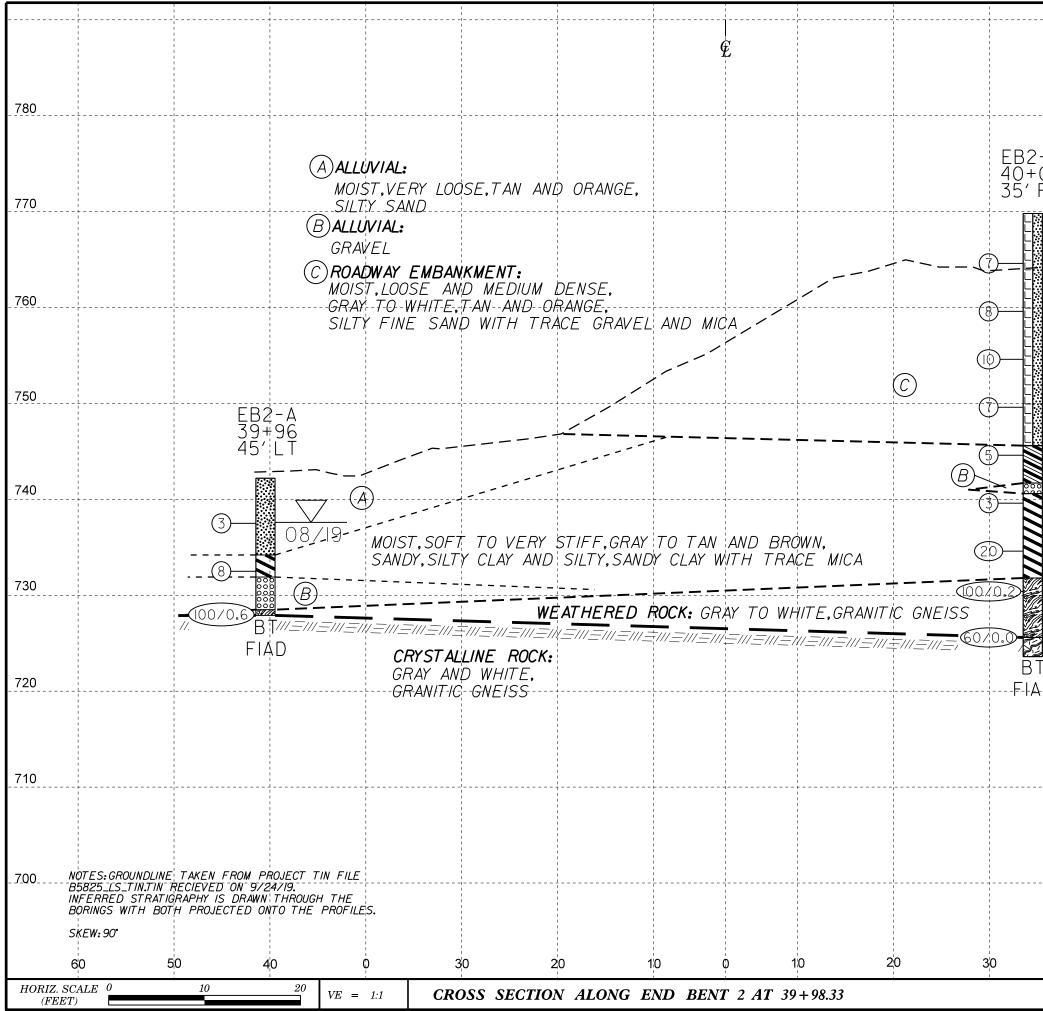
5825_LS_TIN.TIN	TAKEN FROM PI RECIEVED ON 972 RAPHY IS DRAWN	34719.				695 685 675		NOTES: GROUNDLINE TAKEN FROM PROJECT B5825_LS_TIN.TIN RECIEVED ON 9/24/19. INFERRED STRATIGRAPHY IS DRAWN THROUG	
								BT	
	 					695	710		
	1 1 1 1 1 1 1	1 1 1 1 1 1 1 1							
BT				BT		705	720	——————————————————————————————————————	92-9 97%
	REC:99%	A			REC:95%	715	730	(A) (3)	<u> </u>
B6-4 36+8 22'L	4 ⊤ <u>8/6/19</u>	2/1	9/19 8/7	36+8 16' R 4 9	34 2T —————	725	740	38+15 12' LT 	
AN F F	D BLACK,GR ACTURE SF	ANITIC GNEI	SS WITH VE	RY CLOSE 7	O WIDE	735	750	AND L FRAC RS-7 B7-A	BIOT
		1	RESHVERY	HARD WHIT	ΓGRAY	745	760	B ALLUVIAL:MOIST,VERY SOF ORAGANIC MATTL C WEATHERED ROCK:GRAY BIOTIT D CRYSTALLINE ROCK:FRES	-T,G ER AND E G HT
		9	£			755	770		¢ <i>F</i> ₽γ
	SL AN FF B6-4 36+8 22' L 22' L	SLÌGHT WEATH AND BLACK,GR FRACTURE SF	AND BLACK, GRANITIC GNEI FRACTURE SPACING RS - 4 B6 - A 36 + 8 4 22' LT 8/6/19 GSI: 87 - 95 REC: 99%	SLIGHT WEATHERING TO FRESH, VERY AND BLACK, GRANITIC GNEISS WITH VE FRACTURE SPACING $\begin{array}{c} \hline RS-4 \\ B6-A \\ 36+84 \\ 2/19/19 \\ 22' LT \\ 8/6/19 \\ GSI: 87-95 \\ REC: 99% \\ \end{array}$	SLIGHT WEATHERING TO FRESH, VERY HARD, WHITE AND BLACK, GRANITIC GNEISS WITH VERY CLOSE T FRACTURE SPACING B6-A 36+84 22' LT 8/6/19 GSI: 87-95 REC: 99% ROD: 91% A	SLIGHT WEATHERING TO FRESH, VERY HARD, WHITE, GRAY AND BLACK, GRANITIC GNEISS WITH VERY CLOSE TO WIDE FRACTURE SPACING B6-A 36+84 22' LT 8'6/19 GSI: 87-95 REC: 99% ROD: 91% A BT	(A) CRYSTALLINE ROCK: 745 SLIGHT WEATHERING TO FRESH, VERY HARD, WHITE, GRAY AND BLACK, GRAWITIC GNEISS WITH VERY CLOSE TO WIDE FRACTURE SPACING 735 B6-A Image: Solid Stress of the stres	SLIGHT WEATHERING TO FRESH, VERY HARD, WHITE, GRAY AND BLACK, GRANITIC GNEISS WITH VERY CLOSE TO WIDE FRACTURE SPACING 735 RS-4 735 B6-A 86-84 22' LT 86/19 GSI: 87-95 87/19 REC: 99% 651: 85-95 ROD: 91% A	(A) (ALLUVIAL:BAT + U MOIST, VERY SOUTH ALLUVAL:MOIST, VERY SOUTH ALLOVAL:MOIST, VERY SOUTH AL





PROJECT REFERENCE NO.	SHEET NO.
B-5825	11

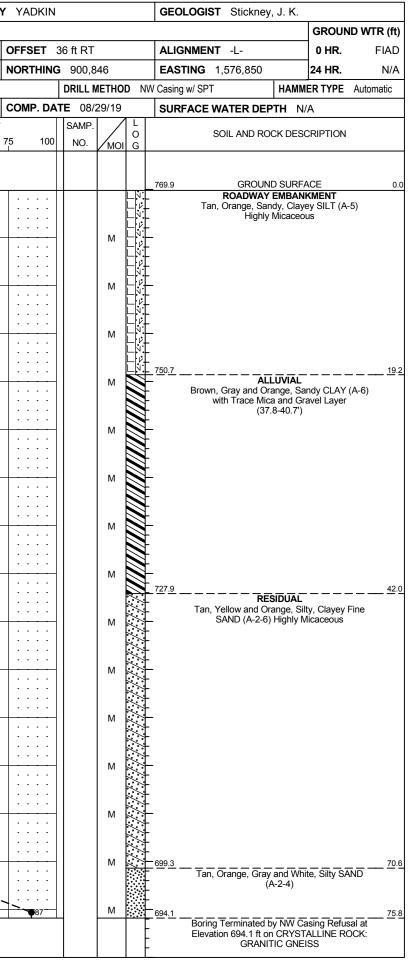
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	45778					P B-5825			ry yadkii	١			GEO	LOGIST Stickney, J. K.	1		45778					P B-582		COUNTY
				lge No		n NC 67 ov		n River	1						GROUND WTR (ft)					ge No.	_		ver Yadkin	
BOR	ING NO	. EB1-	A			TATION 2			OFFSET				_	NMENT -L-	0 HR. 4.0		NG NO.				_	TATION 2		(
	LAR EL					OTAL DEP			NORTHIN	G 900,9	906		EAS	FING 1,576,846	24 HR. 3.2	COL	AR ELE	V . 76	69.9 ft		Т	OTAL DEP	TH 75.8 f	ft I
DRILI	L RIG/HA	MMER E	FF./DA	TE HF	00072	CME-550X	92% 08/15	/2018		DRILL	METHO	DD ⊦	I.S. Auger	s HAMN	IER TYPE Automatic	DRILL	. RIG/HAN	IMER E	FF./DAT	E HF	00072	CME-550X	92% 08/15/2	2018
DRIL	LER S	mith, C	. L.		S	TART DAT	E 01/29/	19	COMP. D	ATE 01/	/29/19)	SUR	FACE WATER DEPTH N	I/A	DRIL	LER Sr	mith, C	. L.		ST	TART DAT	E 08/28/1	19
ELEV	DRIVE ELEV	DEPTH		w cou				PER FOO		SAMP	· 🔻			SOIL AND ROCK DES	CRIPTION	ELEV	DRIVE ELEV	DEPTH		w cou				PER FOOT
(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	25	50	75 10) NO.	Имо) G	ELEV. (DEPTH (ft)	(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	25	50 7
750		Ļ											749.0	GROUND SURF	ACE 0.0	770		_						
		<u> </u>				<u> </u>							- 749.0	ROADWAY EMBAN	IKMENT		-	-				 		· · · · · · · · · · · · · · · · · · ·
		ŧ				 							_	Gray to White, Silty CLAN Concrete Fragm	Y (A-7-5) with ents		765.7	- 4.2						
745	745.1	3.9	1	10	2	• 1 2	_ <u> </u>				м		744.0		5.0	765		-	3	3	2	\$ 5		
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740	740.1	T 8.9											-	, , , , , , , , , , , , , , , , , , ,	- (-)	760	760.7	9.2	3	3	4			
		F	3	4	6	• •10 •]	w		-					-		3	-			
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735	735.1	13.9	7	14	10	· · · <u>`</u>		· · · ·			Sat.		- 			755	755.7 -	- 14.2 -	2	2	3	↓ · · · ·	· · · ·	
		ŧ			10				· · · · · ·		Sat.		-				-	-				$\left \begin{array}{c} 1 \\ 1 \\ 1 \end{array}\right $		
		<u>+</u>					/ ::::		· · · · · ·				<u>731.0</u>		18.0	750	750.7	- - 19.2				1:::		
730	730.1	18.9	6	10	10		20				Sat.		- 728.5	Tan to Red to Orange, Silty with Rock Fragm	/ SAND (A-2-4) nents 20.5		_	-	3	3	4		<u> </u>	
		t				· · · /· ·			· · · · ·					RESIDUAL Tan to Orange, Silty SA				-				:\:::		
725	725.1	23.9			-								_	Tarrito Orange, Silty SP	(ND (A-2-4)	745	745.7	- 24.2	3	3	8			
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		Ŧ															740 7	- 29.2						
720	720.1	28.9	11	89/0.4		<u> '::::</u>	<u> +</u>	<u></u>		4			- 720.5 719.0	WEATHERED R		740		- 29.2	3	6	7	13		
		ŧ							100/0.9	•		Ju-	-	Tan to Gray to White, Boring Terminated by Au	, GNEISS			-				· ·/· · · / · ·		
		‡											-	Elevation 719.0 ft on CRYST GNEISS	TALLINE ROCK:	735	735.7	- - 34.2		-		· /· · ·		· · · · ·
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SHEET 13



GEOTECHNICAL BORING REPORT

С

14/20			1 -	-		<u> </u>					1.																			
WBS 45778				IP B-582				YADKIN			G	EOLOGIST Stickn	ey, J. K.	1			6 45778.1.1			TIP			COUNTY	YADKI	N		GEO	LOGIST Stickney		
SITE DESCR		Bridge I												GROUND			DESCRIPTION		lge No. 35	-										
BORING NO.				STATION				OFFSET				IGNMENT -L-		0 HR.	0.0		ING NO. B1-			_		30+68		OFFSET				NMENT -L-	0	HR.
COLLAR ELE	V. 742.	7 ft	ר	OTAL DE	PTH 5	53.1 ft		NORTHIN	G 900,8	59	E	ASTING 1,576,997		24 HR.	0.0	COL	LAR ELEV. 7	'42.7 ft		TOTA	AL DEF	PTH 53.1 ft		NORTHIN	NG 90	00,859	EAST	TING 1,576,997	24	HR.
DRILL RIG/HAM	IMER EFF./	DATE					8		DRILL N	ETHOD	NW Ca	sing W/SPT & Core	HAM	MER TYPE A	utomatic	DRILI	RIG/HAMMER E	FF./DAT	E HFOO						DRI	LL METHOD	NW Casing	W/SPT & Core	HAMMER T	PE Automa
DRILLER SI				START DA	TE 08	/20/19		COMP. D			S	JRFACE WATER D	EPTH N	I/A		DRIL	LER Smith, (C. L.		STAR	RT DAT	TE 08/20/19		COMP. D	DATE	08/21/19	SURF	FACE WATER DE	PTH N/A	
		BLOW	COUNT				R FOOT		SAMP.	▼∕	L	SOIL AND F	ROCK DES	SCRIPTION		COR	E SIZE NW2					N 19.8 ft								
(ft) (ft)	(ft) C	.5ft 0.5	5ft 0.5ft	0	25	50		75 100	NO.	моі		V. (ft)			DEPTH (ft)	ELEV	RUN ELEV DEPT	H RUN	DRILL RATE	REC.	JN RQD	SAMP. REC NO. (ft)	RATA C. RQD (ft) %	LO			DESCRIF	PTION AND REMAR	KS	
																(ft)	(ft) (ft)	(ft)	(Min/ft)	REC. (ft) %	(ft) %	NO. (ft) %	(ft) %	G ELE	V. (ft)		BEGOR			DEP
745											L					709.4					(1.5)							n Coring @ 33.3 ft		
-										\bigtriangledown	742	7 GRO	UND SURF	FACE	0.0		709.4 + 33.3 707.1 + 35.6			(2.2) 96%	(1.5) 65%	(18.) 94%	7) (15.6) % 79%	709.4	4 Fr	resh, Very Har	CR d, Gray, Wh	RYSTALLINE ROCK nite and Black GRAN Wide Fracture Space	IITIC GNEISS	with Very
						•••	· · · ·					Tan and Bro	ALLUVIAL			705	T	5.0		(4.3) 86%	(3.0) 60%								cing	
740											-		in only of	(,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			1 Ŧ				0070							GSI = 90 to 95		
738.4	4.3	3 3	3 3		: :			 		м							702.1 40.6	5.0		(4 7)	(4.6)									
735																700				(4.7) 94%	92%			R.						
733.4	9.3			1 1		•••					F						697.1 45.6					RS-8								
-		3 3	3 3	•6						м						005	T	5.0		(5.0) 100%	(4.2)			R						
730	F			+							F					695	1 1			100%	84%									
728.4	14.3	3 2	2 3		· · · · · ·	•••	· · · · ·			м							692.1 50.6				(0.5)									
725				•°``	· · · · · · ·		· · · · ·				- 725	4			17.3	690	689.6 - 53.1	2.5		(2.5) 100%	(2.3) 92%			E 689 (6					
723.4	- 103				· .							Tan, Brown a GRAVEL (A	nd Orange	e, Silty, Sandy											0	Boring Termi		evation 689.6 ft in CF	RYSTALLINE F	ROCK:
-		12 3	2 12	1 : : :	· · · ·	44	· · · · ·						Fragments				Ŧ							F			9	RANITIC GIVEISS		
720						<i>/</i> ·					000 - 000-													<u> </u>						
718.4	24.3	8 1	2 16		: .						<u>718</u>	4	RESIDUAL		<u>24</u> .3		 							F						
-		0 1.	2 10		• 1							Tan, Brown and	White, Silf	- ty SAND (A-2-	4)		‡							Ę						
715	-							+			 						‡							- -						
713.4	29.3	48 52/	0.3		: ':	+		100/0.8	•		\$617A-	WEA	THERED R		29.3		‡							Ę						
710												Gray and Wh	nite GRANI	ITIC GNEISS										-						
-									1		709	4CRYS		ROCK	33.3		<u>+</u>							E						
-					: :		· · · · ·		!			Gray, White and	Black GR	ANITIC GNEIS	SS		1 ±							Ł						
705									<u> </u>															-						
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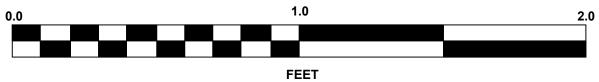
SHEET 14

B1-A

B1-A 33.3 RUN 1 35.6 RUN 2 RUN 3 <u>40.6</u> 47 1.0 2.0 0.0

FEET





BOX 1: 33.3 - 43.5 FEET

SHEET 15

B1-A

BOX 2: 43.5 - 53.1 FEET

											L		RE	L								
WBS	45778	3.1.1			Т	ΠP	B-582	25		(COUN	ΤY	YADK	ίN				GEOLOGI	IST Stickney	y, J. K.		
SITE	DESCR	IPTION	Bric	dge N	o. 35 c	on N	NC 67 d	over	Yadki	in Ri	ver										GROUN	id wtr (f
BORI	NG NO.	B1-E	3		s	ЯΤΑ	TION	30+	68			0	FFSET	r 2	3 ft RT			ALIGNME	NT -L-		0 HR.	0.
COLL	AR ELE	EV . 74	43.3 ft		Т	от	AL DE	РТН	59.9	9 ft		N	ORTH	ING	900,8	17		EASTING	1,576,984		24 HR.	11.
DRILL	RIG/HAI	MMER E	FF./DA	TE ⊦	IFO007	2 CI	ME-550X	(92%	6 08/1	5/201	18				DRILL N	IETHO	D N	W Casing w/ SP	т	HAMN	IER TYPE	Automatic
DRILL	.ER S	mith, C). L.		S	SТА	RT DA	TE	08/19	9/19		С	OMP.	DAT	E 08/*	19/19		SURFACE	WATER DE	PTH N	/A	
ELEV	DRIVE ELEV	DEPTH	BLC	ow co	DUNT				BLOW	S PE	R FOC	DT			SAMP.	▼/		•	SOIL AND RO		CRIPTION	
(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft		0	25		50		75	1	00	NO.	/мо		ELEV. (ft)	00127112110			DEPTH
745		Ļ																_				
	-	-				++	1 · ·	•		• 1		•						743.3		ID SURF	ACE	
740	-	ł					į::	:	· · · · · ·	:	· · · · · ·	•	· · ·	:				-	Tan and Brown		and (A-2-4))
740	738.5	4.8															-	-				
	-	+	1	2	3		∮ 5	:	· · · · · ·	:	· · · · · ·	:	· · · · · ·	:		М		-				
735	-	ŧ.					<u>i · ·</u>	•		•		•		•				-				
-	733.5	9.8	2	2	2	$\left \right $	1 1	:	· · ·	:	· · · · · ·	-	· · · · · ·	:		M		-				
720	-	ł					¶ ⁴ · · ·	·	· · · · · ·	:	· · · · · ·	:	· · · · · ·	:				-				
730	728.5	- 14.8				┨┠	<u>;</u>			.								-				
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725	-	ŧ						÷+	 	<u>.</u>	<u> </u>	÷	<u></u>	-			4/7	725.3			<u>оск</u>	1
-	723.5	19.8	28	31	69/0.4	4	· · · ·	:	· · ·	:	· · ·	:	· · · · · ·	:		М		-		TIC GNE		
700	-	ł					· · · ·	·	 	·	· · ·	·	· 100/0	0.9		IVI						2
720	718.7 -	- 24.6					- <u>\</u>	.		.								Ta	an, Brown and C	SIDUAL Drange, S		ND
	-	t i	4	5	6		÷ •11	:	· · ·	:	· · ·	:	· · ·	:		М		-	(A-2-4)		
715	-	L					<u> </u>	•		•		•		•				-				
-	713.7 -	29.6	5	5	8	$\left \right $			· · ·	:	· · ·		· · ·	:		М		-				
	-	l l					· · · •	°.	· · ·	:	· · ·	:	· · ·	:				-				
710	- 708.7	- 34.6					<u> </u>							-				-				
Γ	-	-	5	6	16		· · ·	222	· · ·		· · ·		 	÷		М	am	707.2				3
705	-	L						•		•		•		•				-	Gray and White			3
-	703.7 -	39.6	100/0.2	2			· · ·	:		:	· · ·	:	 . 100/0	0.2♥		М						
	-	l l					· · · · · ·	:	· · ·	:	· · ·	:	· · ·	:				-				
700	698.7 -	44.6												-				-				
Γ	-	-	100/0.4	4			· · ·	:	· · ·	:	· · ·	:	· 100/0	0.4 •		М		-				
695	-	Ł						•		•		•		•				- 				4
-	693.7 -	49.6	60/0.1	-			· · · · · ·	:	· · ·	:	· · ·	:	60/0	D.1		М		692.8		ALLINE F		5
	-	l l					· · · · · ·	:	· · ·	:	· · ·	:	· · ·	:					WEATH	IERED R	ОСК	
690	- 688.7	- 54.6											· · · ·	-				-	Gray and White	e GRANI	FIC GNEISS	6
ſ			100/0.4	4			· · ·	:	· · ·	:	· · ·	:	· 100/0	0.4 †		М		-				
685	-	ŧ						•		•		·						-				
þ	683.7 -	59.6	100/0.:	3		\parallel							100/0	. 0.3		M	Ø	- 683.4 - Bo	ring Torminator	t at Elou	ation 602 1	5 ft in
	-	Ł		1														- WE	oring Terminated		NITIC GNE	ISS
	-	F																-				
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SHEET 16

GEOTECHNICA

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		BURE LUG	1			
WBS 45778.1.1	TIP B-5825 COU	JNTY YADKIN	GEOLOGIST Stickney, J. K.	WBS 45778.1.1	TIP B-5825 COUN	TY YADKIN GEOLOGIST Stickney, J. K.
SITE DESCRIPTION Bridge	lo. 35 on NC 67 over Yadkin River		GROUND WTR (ft)	SITE DESCRIPTION Bridge N	o. 35 on NC 67 over Yadkin River	GROUND WTR (f
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 HR. 0.
COLLAR ELEV. 743.6 ft	TOTAL DEPTH 60.8 ft	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/
DRILL RIG/HAMMER EFF./DATE	HFO0072 CME-550X 92% 08/15/2018		W Casing W/SPT & Core HAMMER TYPE Automatic	DRILL RIG/HAMMER EFF./DATE	HFO0072 CME-550X 92% 08/15/2018	DRILL METHOD NW Casing W/SPT & Core HAMMER TYPE Automatic
DRILLER Smith, C. L.	START DATE 08/13/19	COMP. DATE 08/14/19	SURFACE WATER DEPTH N/A	DRILLER Smith, C. L.	START DATE 08/13/19	COMP. DATE 08/14/19 SURFACE WATER DEPTH N/A
ELEV DRIVE DEPTH BLOW	OUNT BLOWS PER F		SOIL AND ROCK DESCRIPTION	CORE SIZE NWL	TOTAL RUN 42.5 ft	
(ft) (ft) (ft) 0.5ft 0.	ft 0.5ft 0 25 50	75 100 NO. MOI G		ELEV RUN DEPTH RUN DR		DESCRIPTION AND REMARKS
				(ft) (ft) (ft) (ft) (Mi	n/ft) % % NO. (ft) (ft	G ELEV. (ft) DESCRIPTION AND REMARKS
745			_	7 2 5-3		Begin Coring @ 18.3 ft
			743.6 GROUND SURFACE 0.0	725.3 18.3 2.5 722.8 20.8	(1.4) (0.0) 56% 0% (10.5) (8.2 84% 669	2) 725.3 CRYSTALLINE ROCK 1 % Slight Weathering to Fresh, Hard, White, Gray and Black GRANITIC GNEISS with Close to Wide Fracture Spacing
			Tan and Brown Silty SAND (A-2-4)	- 5.0	(4.9) (4.0) 98% 80%	GNEIŠS with Close to Wide Fracture Spacing (Soft Soil/Biotite Seam from 19.5-19.8')
740 <u> </u>	+ + + + + + + + + + + + + + + + + +		_	720	96% 80%	GSI = 75 to 85
	3			717.8 25.8 5.0	(4.2) (4.2)	
735				715	84% 84%	
734.0 9.6	3		734.0 734.0 9.6	712.8 30.8		712.8
				712.8 _ 30.8	(3.5) (1.6) 70% 32% (1.7) (0.0 53% 0%	Complete to Severe Weathering, Very Soft to Soft, Gray-Brown GRANITIC
730				710	70% 32% 53% 0%	 Slight Weathering to Fresh, Hard, White, Gray and Black GRANITIC GNEISS with Close to Wide Fracture Spacing (Soft Soil/Biotite Seam from 19.5-19.8') GSI = 75 to 85 712.8 Complete to Severe Weathering, Very Soft to Soft, Gray-Brown GRANITIC GNEISS GSI = 10 -15 Moderate Weathering to Fresh, Hard to Very Hard, Gray, White and Black GRANITIC GNEISS with Very Close to Moderately Close Fractures
				707.8 35.8		3) GSI = 10 -15 % Moderate Weathering to Fresh, Hard to Very Hard, Gray, White and Black
725 725.7 17.9			- 725.7 - 725.7 - 725.3	705 5.0	(3.8) (3.2) 76% 64%	
		· · · · · · ·	GRANITIC GNEISS	\Box \downarrow \downarrow \downarrow		GSI = 78 to 82
			725.7 WEATHERED ROCK 17.9 725.3 GRANITIC GNEISS 18.3 GRANITIC GNEISS CRYSTALLINE ROCK White, Gray and Brown GRANITIC GNEISS 30.8 712.8 30.8 709.6 34.0 Gray, White and Black GRANITIC GNEISS 34.0	702.8 40.8	(2.3) (0.5) 46% 10% (4.7) (0.0	701.7 4
720			-	700	46% 10% (4.7) (0.0 25% 0%	0) Complete to Moderate Severe Weathering, Very Soft to Medium Hard, 6 Brown and Gray GRANITIC GNEISS with Very Close to Close Fracture
				697.8 45.8		Spacing
715					(0.8) (0.0) 16% 0%	GSI = 10 to 15
		· · · · · · ·	- . 712.8	695		
			Gray-Brown GRANITIC GNEISS	692.8 50.8 5.0	(1.4) (0.0) 28% 0%	
710			- 709.6 34.0	690	28% 0%	
			Gray, White and Black GRANITIC GNEISS	687.8 55.8		
705				5.0	(1.4) (0.0) 28% 0%	
		·· · · · · · ·	-	685		0) Complete to Moderate Severe Weathering, Very Soft to Medium Hard, 6 Brown and Gray GRANITIC GNEISS with Very Close to Close Fracture Spacing GSI = 10 to 15
			- - 701.7 41.9	682.8 60.8		682.8 662.8 660 660 660 660 660 660 660 660 660 66
700			Brown and Gray GRANITIC GNEISS			- GRANITIC GNEISS
		· · · · · · · ·	-			
690			-			ΙŁ
			-			
			60.8 60.8 60.8 60.8 60.8 60.8 60.8 60.8			
			CRYSTALLINE ROCK: GRANITIC GNEISS			
						I F
						I F
			-			
			-			

NICAL BORING REPORT	
CORE LOG	

B2-A

BOX 1: 18.3 - 29.7 FEET

B2-A RUN 2 RUN 3 2> 1.0 0.0 2.0

FEET



FEET

SHEET 18

B2-A

BOX 2: 29.7 - 60.8 FEET

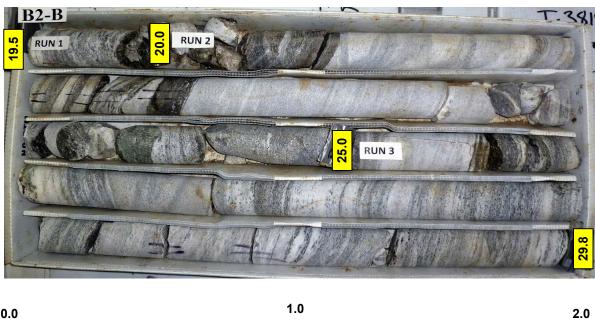
2.0

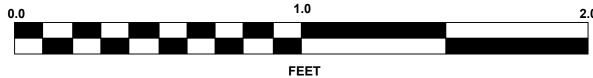
GEOTECHNICAL BORING REPORT

		ORE LOG	1		ı ——						CORE LOG		
WBS 45778.1.1	TIP B-5825 COUNT	r y yadkin	GEOLOGIST Stickney, J. K.		WBS	3 45778.1.1		TIF	P B-582	25 COU	ITY YADKIN	GEOLOGIST Stickney, J. H	1
SITE DESCRIPTION Bridge No. 3	35 on NC 67 over Yadkin River			GROUND WTR (ft)	SITE	DESCRIPTION	Bridge I	No. 35 on	n NC 67 d	over Yadkin River			GROUND WTR (ft
BORING NO. B2-B	STATION 31+82	OFFSET 21 ft RT	ALIGNMENT -L-	0 HR. N/A	BOR	ING NO. B2-B		ST	TATION	31+82	OFFSET 21 ft RT	ALIGNMENT -L-	0 HR. N/A
COLLAR ELEV. 743.3 ft	TOTAL DEPTH 56.3 ft	NORTHING 900,784	EASTING 1,577,093	24 HR. N/A	COL	LAR ELEV. 743	3.3 ft	то	TAL DE	PTH 56.3 ft	NORTHING 900,784	EASTING 1,577,093	24 HR. N/A
DRILL RIG/HAMMER EFF./DATE HFC	00072 CME-550X 92% 08/15/2018	DRILL METHOD NV	/ Casing W/SPT & Core HAMI	MER TYPE Automatic	DRILI	L RIG/HAMMER EF	F./DATE	HFO0072 (CME-550X	(92% 08/15/2018	DRILL METHOD	NW Casing W/SPT & Core HA	MMER TYPE Automatic
DRILLER Smith, C. L.	START DATE 08/14/19	COMP. DATE 08/14/19	SURFACE WATER DEPTH	N/A	DRIL	LER Smith, C.	L.	ST		TE 08/14/19	COMP. DATE 08/14/19	SURFACE WATER DEPTH	N/A
ELEV DRIVE DEPTH BLOW COUN	NT BLOWS PER FOO	T SAMP.	SOIL AND ROCK DES		COR	E SIZE NWL		то	TAL RU	N 25.5 ft			
(ft) (ft) (ft) 0.5ft 0.5ft (0.5ft 0 25 50	75 100 NO. MOI G		DEPTH (ft)	ELEV	RUN ELEV		RILL REC	RUN C. RQD	SAMP. STRATA NO. (ft) (ft) %			
					(ft)	(ft) (ft)		ATE (ft)	t) (ft) % %	NO. (ft) (ft	G ELEV. (ft)	DESCRIPTION AND REMARKS	DEPTH (1
745					723.8							Begin Coring @ 19.5 ft	
			743.3 GROUND SURF			723.8 19.5 723.3 20.0	0.5	(0.5	5) (0.0) 0% 0%	(16.0) (10 78% 49	0) 723.8 % Slight Weathe	CRYSTALLINE ROCK ring to Fresh, Very Hard to Hard, White	19. . Grav to Black
			ALLUVIAL Brown, Silty Fine SAN		720		0.0	(4.6	6) (2.9) % 58%		GRĂNITIC GNE	EISS, Very Close to Moderately Close F	racture Spacing
740 739.5 3.8						718.3 25.0						GSI = 80 to 85	
	$\begin{array}{c c c c c c c c c c c c c c c c c c c $	· · · · ·					5.0	(4.6	6) (4.2) % 84%				
735 724 5 0 0			735.8Brown, Silty Fine Sandy (715	┤╂							
735 734.5 8.8	$4 \qquad \qquad$. Drown, Silly Fine Sandy (GIVAVEL (A-1)		713.3 + 30.0	5.0	(3.7	7) (2.7) % 54%				
		· · · · · · · · · · · · · · · · · · ·			710	‡		74%	% 54%				
730 729.5 13.8		· · · · · 000				708.3 - 35.0					GRĂNITIC GNE		
7 6	5		727.7	15.6			5.0	(2.6	6) (0.4) % 8%				
		· · · · · · · · · · · · · · · · · · ·	725.5 Brown, Silty Fine Sandy (L GRAVEL (A-1) 17.8	705	‡							
725 724.5 18.8			WEATHERED R	ROCK		703.3 + 40.0	5.0	(0.0	0) (0,0)		703.3	WEATHERED ROCK	40.
				ROCK	700		0.0	0%	0) (0.0) % 0%			GRANITIC GNEISS	
720		· · 100/0.5● · · · </td <td>White, Gray and Black GR</td> <td>ANITIC GNEISS</td> <td>700</td> <td>698.3 + 45.0</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	White, Gray and Black GR	ANITIC GNEISS	700	698.3 + 45.0							
							N=1	00/0.7					
					695								
	· · · · · · · · · · · · · · · · · · ·							00/0.6					
						I I I	//=/	00/0.6					
710					690						689.3		54.
							N	=80			687.0	RESIDUAL Brown, Silty SAND (A-2-4)	56
											Boring Terminated	at Elevation 687.0 ft in CRYSTALLINE GNEISS	ROCK: GRANITIC
705												GNEISS	
			703.3	40.0									
			WEATHERED R GRANITIC GNE	EISS									
						‡							
<u>697.7 + 45.6</u> + 100/0.7													
т <u>695</u>		• 100/0.7 • Adjusted				+							
693.5 4 9.8 15 89 1	1/0.1												
		· · 100/0.6											
			689.3	54.0		<u>+</u>							
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	<u>56</u>		687.0 Brown, Silty SAND	L D (A-2-4) 56.3									
			Boring Terminated at Elev CRYSTALLINE ROCK: GR	vation 687.0 ft in	11	‡					-		
			. URISTALLINE KUUK: GR			‡							
						‡							
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		F				+							
						Ŧ					I E		

SHEET 19

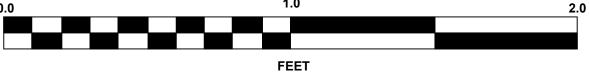
B2-B





BOX 2: 29.8 - 35.0 FEET





BOX 1: 19.5 - 29.8 FEET

SHEET 20

B2-B

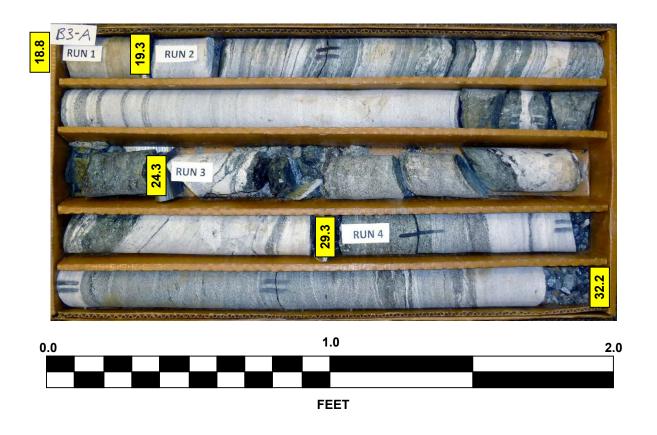
		BORE LOG						
WBS 45778.1.1		TY YADKIN	GEOLOGIST Stickney, J. K.	WBS 45778.1.1		TY YADKIN	GEOLOGIST Stickney, J. K.	
SITE DESCRIPTION Bridge No.			GROUND WTR (ft)	SITE DESCRIPTION Bridge No.	i			GROUND WTR (ft)
BORING NO. B3-A	STATION 33+08	OFFSET 15 ft LT	ALIGNMENT -L- 0 HR. N/A	BORING NO. B3-A	STATION 33+08	OFFSET 15 ft LT		0 HR. N/A
COLLAR ELEV. 743.3 ft	TOTAL DEPTH 44.3 ft	NORTHING 900,781	EASTING 1,577,224 24 HR. 11.7	COLLAR ELEV. 743.3 ft	TOTAL DEPTH 44.3 ft	NORTHING 900,781	EASTING 1,577,224	24 HR. 11.7
DRILL RIG/HAMMER EFF./DATE HF			W Casing W/SPT & Core HAMMER TYPE Automatic	DRILL RIG/HAMMER EFF./DATE HFC				MER TYPE Automatic
DRILLER Smith, C. L.	START DATE 08/01/19	COMP. DATE 08/01/19	SURFACE WATER DEPTH N/A	DRILLER Smith, C. L.	START DATE 08/01/19	COMP. DATE 08/01/19	SURFACE WATER DEPTH	N/A
ELEV DRIVE ELEV (ft) (ft) (ft) (ft) 0.5ft 0.5ft		75 100 100 0	SOIL AND ROCK DESCRIPTION	CORE SIZE NW2	TOTAL RUN 25.5 ft			
(it) (ft) (it) 0.5ft 0.5ft		75 100 NO. MOI G	ELEV. (ft) DEPTH (ft)	ELEV BUILT ON RATE			DESCRIPTION AND REMARKS	
						G ELEV. (ft)		DEPTH (
745				724.5 724.5 18.8 0.5 724.0 19.3	(0.3) (0.0) (20.2) (15.9 60% 0% 79% 62%) 724.5 6 Slight Weatherin	Begin Coring @ 18.8 ft CRYSTALLINE ROCK	18
			ALLUVIAL		60% 0% 79% 62%		g to Fresh, Hard to Very Hard, Gray, W with Intermittent Zones of Biotite Gneis	hite and Black s and Schist with
740 700 0 4 4 0			Tan Brown, Sandy Silty CLAY (A-7)	720 719.0 24.3	(3.8) 76% 54%		Very Close to Wide Fracture Spacing	
739.3 4.0 3 2	$3 1 \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot $			5.0	(2.3) (0.9) 46% 18%		GSI = 80 to 85	
	$ \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot $	· · · · ·	- 735.3 8.0	715	40 /0 10 /0	Predominantly Bi	otite Schist Zone from 23.5 ft to 28.2 ft,	GSI = 40 to 45
735 734.3 9.0 5 6	7		Tan, Brown, Silty, Sandy GRAVEL (A-1)	714.0 729.3	5 (47) (47)	GRANITIC GNEISS Predominantly Bi		
	'				5 (4.7) (4.7) 0 94% 94% 0			
730 729.3 14.0				710 1:39/1.		R#		
	2 5			5.0 1:47/1.0	0 (4.5) (3.4) 0 90% 68%			
		· · · · · 000	- 725.5 17.8					
725			-724.5 WEATHERED ROCK 18.8	704.0 39.3 1:42/1.0	0 0 (4.6) (4.2) 0 92% 84%	64		
		الجشر المالية	CRYSTALLINE ROCK		0 92% 84%			
720		· · · · ·	Gray, White and Black GRANITIC GNEISS	700 <u>+</u> 1:41/1.0 699.0 44.3 1:44/1.0	0 0	699.0		4.
							at Elevation 699.0 ft in CRYSTALLINE F GNEISS	
							UNLIGO	
715		· · · · · · ·	-					
710								
705			-					
700			·					
			CRYSTALLINE ROCK: GRANITIC GNEISS					
			-					
			-					
			-					

GEOTECHNICAL BORING REPORT

SHEET 21



BOX 1: 18.8 - 32.2 FEET







SHEET 22

B3-A

BOX 2: 32.2 - 44.3 FEET



FEET

											D	JRE L	.00																	<u> </u>	<i>:</i> 01
WBS	4577	8.1.1				TIP	B-5	825		C	OUNTY	YADKIN				GEOL	OGIST Stickney	, J. K.				4 577					B-582			COUN	TY Y
	DESC			idge N						in Riv									GROUND WT	R (ft)					ge No. 3				lkin Ri	ver	
BOR	ING NC). B3-l	В			STA	TION	33	+08			OFFSET	21 ft RT			ALIGN	IMENT -L-		0 HR.	0.0	BOR	ING NC). B3-E	3		STA	TION	33+08			OF
COL	LAR EL	. EV. 7	44.4 f	t		TOT	AL D	EPT	H 40.2	2 ft		NORTHING	9 00,7	746		EAST	NG 1,577,213		24 HR.	11.0	COL	LAR EL	. EV. 74	44.4 ft		тот	AL DE	PTH 40	0.2 ft		NO
DRILI	RIG/HA	MMER	EFF./D/	ATE	HFO0)72 CN	ME-55	0X 92	% 08/1	5/2018	3		DRILL I	METHO	DD N	IW Casing \	V/SPT & Core	HAMM	ER TYPE Autom	atic	DRIL	L RIG/HA	MMER E	EFF./DA	TE HFO	0072 CN	/IE-550)	K 92% 08	3/15/201	18	
DRIL	LER S	Smith, (C. L.			STA	RT D	ATE	08/13	8/19		COMP. DA	TE 08/	13/19)	SURF	ACE WATER DEF	PTH N/	A		DRIL	LER S	Smith, C	C. L.		STA	rt da	TE 08/	13/19		со
LEV	DRIVE ELEV		· —	OW C	_				BLOW	S PER	R FOOT		SAMP.	▼⁄	L		SOIL AND RO	CK DESC	RIPTION		COR	E SIZE	NWL			тот	AL RU	N 20.7			
(ft)	(ft)	(ft)	0.5ft	t 0.5f	t 0.5	5ft C	0	25	5	50		75 100	NO.	Имо) G	ELEV. (ft)				PTH (ft)	ELEV	RUN ELEV	DEPTH	RUN	DRILL RATE	REC.	UN RQD	SAMP.	ST REC.	RATA RQD	LO
																					(ft)	(ft)	(ft)	(ft)	(Min/ft)	(ft) %	(ft) %	NO.	(ft) %	RQD (ft) %	Ğ
745		+														- 744.4	GROUN	D SURFA	NCE	0.0	724.9		10.5	0.7			(0.0)		(10.0) (10 5	
		ţ					· · · ·			: :						-	AL Tan and Brown	LUVIAL Silty SAI	ND (A-2-4)			724.2	<u>† 19.5</u> † 20.2	0.7 5.0		(0.3) 43%	0%		93%	(16.5 80%	
40	740.3	+						· ·	· · · · · ·	: :	•••	· · · · ·				L		, only or a			720		‡			(4.7) 94%	(4.7) 94%				
740		+ 4.1 +	3	3	4	- -	.•7			: :											720	719.2	25.2	5.0				-			
		ŧ					1.	· ·	· · ·	· ·						L							ŧ	5.0		(4.7) 94%	(4.7) 94%				
35	735.3	9.1					<u>; </u>			• •						L					715	714 2	+ 30.2								
		ŧ	4	2	1	_ ¶	●3 . \ .	::[: :					_	7 <u>3</u> 3.2				11.2		114.2	- 50.2	5.0		(4.8)	(2.9)	RS-2]		R
		£					1.	•••		. .					000	L	Tan and Brown, Sil	ty Sandy	GRAVEL (A-1)				ŧ			96%	58%				
30	730.3	<u>† 14.1</u>	6	4	4									м	000	F					710	709.2	35.2								
		Ŧ					Ĩ.								000								Ŧ	5.0		(4.7) 94%	(4.2) 84%				R
25	725.3	T 19.1		_			· .		· · · ·		· · · ·				000	725.3 724.9				<u>19.1</u>	705		Ŧ								
		Ŧ	100/0	.3								100/0.3				- <u>724.9</u> -	WEATH Gray, White and B	ERED RO lack GRA		19.5		704.2	+ 40.2 					-			
		Ŧ					•••		· · · · · ·	. .		· · · · ·				F	CRYSTA Gray, White and B	LLINE RO	CK				Ŧ								
20		Ŧ														F F	AND META-	BIOTITE	GNEISS				Ŧ								
		ŧ					· · · ·		· · · ·	. .	· · · · · ·				P	F							Ŧ								
' 15		‡					· · · ·		· · · · · ·		· · · ·					-							‡								
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05		<u>+</u>			_			• •							<u>شر</u>	704.2	Denin a Terrain etc.	-4 []	ian 704 0 ft in	40.2		-	ŧ								
		ŧ														E	Boring Terminated CRYSTALLINE RO	CK: GRA	NITIC GNEISS				‡								
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GEOTECHNICAL BORING REPORT

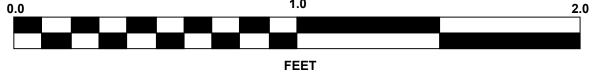
CORE LOG

GEOLOGIST Stickney, J. K. YADKIN GROUND WTR (ft) OFFSET 21 ft RT ALIGNMENT -L-0 HR. 0.0 **ORTHING** 900,746 **EASTING** 1,577,213 24 HR. 11.0 DRILL METHOD NW Casing W/SPT & Core HAMMER TYPE Automatic COMP. DATE 08/13/19 SURFACE WATER DEPTH N/A DESCRIPTION AND REMARKS DEPTH (ft) ELEV. (ft) Begin Coring @ 19.5 ft CRYSTALLINE ROCK Fresh, Hard to Very Hard, Gray, White and Black GRANTIC GNEISS AND META-BIOTITE GNEISS with Very Close to Wide Fracture Spacing 724.9 GSI = 85 to 95 Soft, Severely Weathered Biotite Seam from 30.2 ft to 31.2 ft 704.2 40.2 Boring Terminated at Elevation 704.2 ft in CRYSTALLINE ROCK: GRANITIC GNEISS

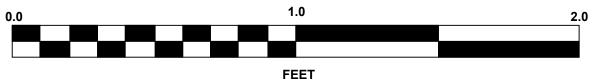
B3-B

BOX 1: 19.5 - 30.2 FEET

B3-B RUN 2 RUN 1 <mark>9.5</mark> 25.2 RUN 3 201 NB Se 1.0



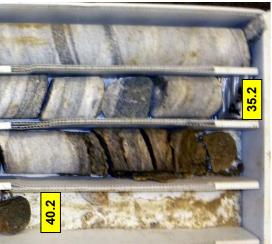
B2-B RIIN RUN 4 <u>ິ</u>ດ



SHEET 24

B3-B

BOX 2: 30.2 - 40.2 FEET



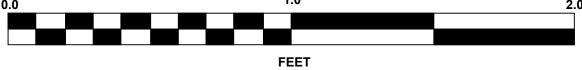
		SORE LOG						CORE LOG		
WBS 45778.1.1		TY YADKIN	GEOLOGIST Stickney, J. K.		WBS 45778.1.1		TIP B-5825	COUNTY YADKIN	GEOLOGIST Stickney, J	1
SITE DESCRIPTION Bridge No. 3	1	1	1	GROUND WTR (ft)		Bridge No. 3	35 on NC 67 over Yadkin			GROUND WTR (ft)
BORING NO. B4-A	STATION 34+34	OFFSET 18 ft LT	ALIGNMENT -L-	0 HR. N/A	BORING NO. B4-A		STATION 34+34	OFFSET 18 ft LT	ALIGNMENT -L-	0 HR. N/A
COLLAR ELEV. 741.5 ft	TOTAL DEPTH 36.1 ft	NORTHING 900,745	EASTING 1,577,345	24 HR. 11.2	COLLAR ELEV. 741.5		TOTAL DEPTH 36.1		EASTING 1,577,345	24 HR. 11.2
DRILL RIG/HAMMER EFF./DATE HFO		DRILL METHOD N		MER TYPE Automatic			00072 CME-550X 92% 08/15			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 07/31/	19 COMP. DATE 07/31/19	SURFACE WATER DEPTH	N/A
ELEV DRIVE DEPTH BLOW COUN (ft) (ft) 0.5ft 0.5ft 0			SOIL AND ROCK DES		CORE SIZE NW2	UNI DRILL	TOTAL RUN 18.7 ft	STRATA I		
(ft) (ft) 0.5ft 0.5ft 0		75 100 NO. MOI G	ELEV. (ft)	DEPTH (ft)	ELEV RUN (ft) ELEV DEPTH R (ft) (ft) (ft) (ft)	UN RATE	RUN SAMP. REC. RQD (ft) (ft) % %	STRATA L IEC. RQD O (ft) (ft) G ELEV. (ft) G ELEV. (ft)	DESCRIPTION AND REMARKS	
						(Min/ft)			Desia Caring @ 17.4.#	DEPTH (f
745			-		724.1 724.1 17.4 3	8.7 NM/0.7	(3.2) (2.7) (1	7.9) (17.2) 724.1	Begin Coring @ 17.4 ft CRYSTALLINE ROCK	17.
			- 741.5 GROUND SURF	ACE 0.0	720 720.4 - 21.1	2:00/1.0 2:05/1.0 NM/1.0	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	16% 92% Figure Fresh, Very Hard	I, White, Black and Gray GRANITIC C Wide Fracture Spacing	INEISS with Close to
740		· · · · · ·	- ALLUVIAL Tan Brown, Silty SAND (A-	2-4) with Trace	720 720.4 = 21.1	5.0 1:49/1.0 1:55/1.0	0 (4.8) (4.6) 0 96% 92%		GSI = 90-93	
737.1 4.4			Mica	,		1:39/1.0				
	$\begin{array}{c c c c c c c c c c c c c c c c c c c $	М	• •		715 715.4 - 26.1	1:42/1.0 1:44/1.0 5.0 1:40/1.0) (4.9) (4.9)			
			-			1:39/1.0) (4.9) (4.9)) 98% 98% RS-6			
732.1 9.4	$\begin{array}{c c c c c c c c c c c c c c c c c c c $	· · · · · ·			710 710.4 - 31.1	1:44/1.0				
730 -			- - 728.6			5.0 1:38/1.0 1:44/1.0	0 (5.0) (5.0) 0 100% 100%	7.9) (17.2) 724.1 92% Fresh, Very Hard - - - - - - - - - - - - -		
727.1 14.4			- 728.6 - GRAVEL (A-	12.9		1:41/1.0 1:36/1.0 1:40/1.0				
		100/0.9¶ М обо	726.1 WEATHERED R	15.4 ROCK	705.4 + 36.1	1:40/1.0		705.4 Boring Terminated	d at Elevation 705.4 ft in CRYSTALLI	36. NE ROCK: GRANITIC
				TIC GNEISS 17.4					GNEISS	
			White, Black and Gray GR	ANITIC GNEISS						
			-							
			-							
715		· · · · ·	_							
		RS-6	-							
			-							
			- -							
		· · · · · · · · · · · · · · · · · · ·	- 705.4 - Boring Terminated at Elev	36.1 ation 705.4 ft in						
			CRYSTALLINE ROCK: GR	ANITIC GNEISS						
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GEOTECHNICAL BORING REPORT



BOX 1: 17.4 - 27.5 FEET

B4-A RUN 1 RUN 2 RUN 3 1.0 0.0 2.0





FEET

SHEET 26

B4-A

BOX 2: 27.5 - 36.1 FEET

2.0

GEOTECHNICAL BORING REPORT

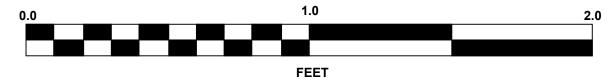
	<i>E</i>	BORE LOG				CORE LOG	
WBS 45778.1.1	TIP B-5825 COUN	TY YADKIN	GEOLOGIST Stickney, J. K.	WBS 45778.1.1	TIP B-5825 COUN	I TY YADKIN	GEOLOGIST Stickney, J. K.
SITE DESCRIPTION Bridge No.	. 35 on NC 67 over Yadkin River		GROUND WTR (ft)	SITE DESCRIPTION Bridge No. 3	35 on NC 67 over Yadkin River		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	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	TOTAL DEPTH 35.6 ft	NORTHING 900,717	EASTING 1,577,335 24 HR. 11.1
DRILL RIG/HAMMER EFF./DATE HF	FO0072 CME-550X 92% 08/15/2018	DRILL METHOD N	V Casing w/ Core HAMMER TYPE Automatic	DRILL RIG/HAMMER EFF./DATE HFC	D0072 CME-550X 92% 08/15/2018	DRILL METHOD	NW Casing w/ Core HAMMER TYPE Automatic
DRILLER Smith, C. L.	START DATE 07/31/19	COMP. DATE 07/31/19	SURFACE WATER DEPTH N/A	DRILLER Smith, C. L.	START DATE 07/31/19	COMP. DATE 07/31/19	SURFACE WATER DEPTH N/A
ELEV DRIVE DEPTH BLOW COU		75 400	SOIL AND ROCK DESCRIPTION	CORE SIZE NW2	TOTAL RUN 19.5 ft		
(ft) (ft) (ft) 0.5ft 0.5ft	0.5ft 0 25 50	75 100 NO. MOI G	ELEV. (ft) DEPTH (ft)	ELEV RUN (ft) (ft) DEPTH RUN RATE (ft) (ft) (ft) (Min/ft)	REC. RQD SAIVIE. REC. RQE		DESCRIPTION AND REMARKS
						G ELEV. (ft)	DEPTH (fi
745			-	7 255 3 725.3 16.1 4.5	(4.0) (3.9) 0 89% 87% (18.5) (17.5) 95% 90%	5) 725.3 6 Fresh, Very Hard	Begin Coring @ 16.1 ft CRYSTALLINE ROCK 16.
			741.4 GROUND SURFACE 0.0	1:56/1.0	0 89% 87% 95% 90%	6 Fresh, Very Har	d, Gray, White, and Black GRANTIC GNEISS with Close to Wide Fracture Spacing
740			ALLUVIAL Tan Brown, Silty SAND (A-2-4) with Trace	720.8 1 20.6 1:48/1.0			GSI = 90 to 94
			Mica	⊥ 2:03/1.0	0 (4.7) (4.2) 0 94% 84% 0		
737.1 4.3 2 2 735	2 I	· · · · · M		715.8 25.6 2:00/1.0		705.8	
			-	715 5.0 2:00/1.0	0 (4.9) (4.7) 0 98% 94%		
732.1 9.3 1 2							
730 7			730.6 10.8 - GRAVEL (A-1)	710.8 30.6 2:10/1.0 710 5.0 2:01/1.0	0 (4.9) (4.7) 0 98% 94%		
		· · · · ·		⊥ 1:50/1.0			
	93/0.3		726.1 15.3 725.3 WEATHERED ROCK 16.1	705.8 35.6 2:07/1.0 2:11/1.0			
			Gray and White GRANITIC GNEISS			Boring Terminate	ad at Elevation 705.8 ft in CRYSTALLINE ROCK: GRANITIC GNEISS
		· · · · · · · · · · · · · · · · · · ·	Gray, White and Black GRANTIC GNEISS				
			-				
715		· · · · · ·	_				
710							
		· · · · · · · · · · · · · · · · · · ·	-				
			705.0				
			705.8 35.6 Boring Terminated at Elevation 705.8 ft in				
			CRYSTALLINE ROCK: GRANITIC GNEISS				
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SHEET 27

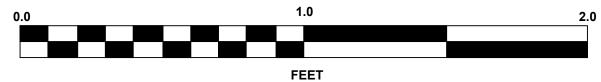
B4-B

BOX 1: 16.1 - 30.0 FEET

B4-B 16.1 RUN 1 RUN 2 RUN 3







BOX 2: 30.0 - 35.6 FEET

SHEET 28

B4-B

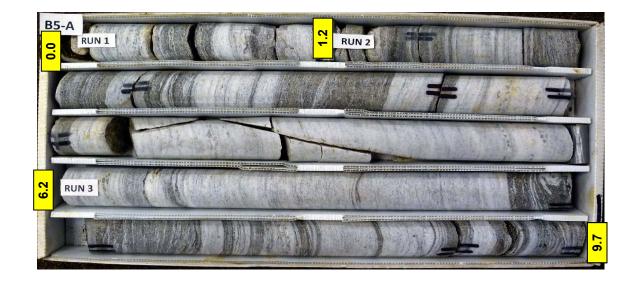
		BURELUG						JURE LUG		
WBS 45778.1.1		NTY YADKIN	GEOLOGIST Stickney, J. K.		WBS 45778.1.1	TIP B		TY YADKIN	GEOLOGIST Stickney, J. K.	-
	No. 35 on NC 67 over Yadkin River			GROUND WTR (ft)		Bridge No. 35 on NC				GROUND WTR (ft)
BORING NO. B5-A	STATION 35+69	OFFSET 16 ft LT	ALIGNMENT -L-	0 HR. N/A	BORING NO. B5-A		ON 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			COLLAR ELEV. 72		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	NW Casing w/ Core HAMM	ER TYPE Automatic	DRILL RIG/HAMMER EFF	F./DATE HFO0072 CME	-550X 92% 08/15/2018	DRILL METHOD	NW Casing w/ Core HAN	IMER TYPE Automatic
DRILLER Smith, C. L.	START DATE 08/07/19	COMP. DATE 08/07/19	SURFACE WATER DEPTH 4.3	3ft	DRILLER Smith, C.	L. START	DATE 08/07/19	COMP. DATE 08/07/19	SURFACE WATER DEPTH	4.3ft
ELEV DRIVE DEPTH BLOW (SOIL AND ROCK DES	CRIPTION	CORE SIZE NWL	TOTAL	. RUN 21.2 ft			
(ft) (ft) (ft) 0.5ft 0.5	5ft 0.5ft 0 25 50	75 100 NO. MOI 0			ELEV RUN (ft) ELEV DEPTH	RUN BRILL RUN (ft) (Min/ft) %	N SAMP. STRATA RQD SAMP. REC. RQD (ft) NO. (ft) (ft) %		DESCRIPTION AND REMARKS	
					(ft) ELEV (ft)	(ft) (Min/ft) %	(ft) NO. (ft) (ft) %	G ELEV. (ft)	DESCRIPTION AND REMARKS	DEPTH (ft)
730			WATER SURFACE (0	08/07/19)	725,6				Ground Surface	
			- F		725.6 725 725.6 - 0.0 724.4 - 1.2	1.2 NM/1.2 (1.0) (5.0 3:15/1.0 83%	(0.0) (19.6) (16.6 0% / 92% 78%	6) Very Slightly V	CRYSTALLINE ROCK	IC GNEISS with
			C 725.6 GROUND SURF			3:21/1.0 3:07/1.0 94%	(3.4)		Veathered to Fresh, Very Hard, GRANIT Close to Wide Fracture Spacing	
725			- 725.6 GROUND SURF/ CRYSTALLINE R	OCK	720 719.4 6.2	3:14/1.0	58%		GSI = 83-87	
		· · · · · ·	White, Gray and Black GRA	NITIC GNEISS	7 19.4 - 0.2	3:26/1.0 5.0 3:11/1.0 (5.0) ((4.6)			
					‡	5.0 3:11/1.0 (5.0) (3:19/1.0 100% 9 3:27/1.0	92%	67		
		· · · · · ·			715 714.4 11.2	I I 3·07/10 I I				
						5.0 3:30/1.0 (4.8) (3:11/1.0 96% 9 3:224/1.0 96% 9	(4.5) 90%			
715						3:24/1.0 3:19/1.0				
					710 709.4 16.2		(4 1)			
					‡	5.0 3:32/1.0 (4.1) (3:30/1.0 82% 8 3:18/1.0	82%			
710 +			Ŧ		705 704.4 21.2	3:18/1.0 3:23/1.0 3:25/1.0		Very Slightly V		21.2
		🛛 🛛				3.25/1.0		Boring Tern	ninated at Elevation 704.4 ft in CRYSTA	LLINE ROCK:
					<u>+</u>				GRANITIC GNEISS	
			704.4 Boring Terminated at Eleva	21.2 tion 704 4 ft in						
			CRYSTALLINE ROCK: GRA	NITIC GNEISS						
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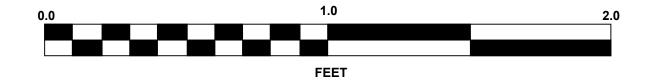
GEOTECHNICAL BORING REPORT

SHEET	29



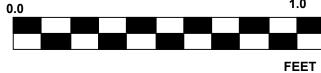
BOX 1: 0.0 - 9.7 FEET











SHEET 30

B5-A

BOX 2: 9.7 - 21.2 FEET

	C

WBS 45778.1.1 TIP B-5825 COUNTY YADKIN GEOLOGIST Stickney, J. K.							70 4 4		_		05													
						YADKIN			GEO	LOGIST Stickne	-		WBS 4577				IP B-58			JNIY	YADKIN	GEOLOGIST Stickney,	I	
SITE DESCRIPTION Bridge No. 35 on NC 67 over Yadkin River									GROUND WTR (ft)			SITE DESCRIPTION Bridge No. 3											JND WTR (ft)	
BORING NO. B5-B STATION 35+69								ALIGNMENT -L- 0 HR. N/A			BORING NO. B5-B				STATION 35+69				FSET 12 ft RT	ALIGNMENT -L-	0 HR			
	COLLAR ELEV. 725.0 ft TOTAL DEPTH 20.8 ft								EASTING 1,577,464 24 HR. N/A			COLLAR ELEV. 725.0 ft				TOTAL DEPTH 20.8 ft				DRTHING 900,676	EASTING 1,577,464	24 HR		
	RIG/HAMMER EFF./DA							IETHOD			HAMMER TYPE	Automatic	DRILL RIG/HA									NW Casing w/ Core	HAMMER TYPE	E Automatic
DRILLER Smith, C. L. START DATE 08/06/19									SURFACE WATER DEPTH 4.9ft			DRILLER Smith, C. L.				START DATE 08/06/19			C(OMP. DATE 08/06/19	SURFACE WATER DEP	TH 4.9ft		
ELEV	DRIVE DEPTH BI ELEV (ft) 0.5	LOW COUNT			PER FOOT					SOIL AND F	ROCK DESCRIPTIO	N	CORE SIZE			Т	OTAL RI	JN 19.8			1			
(11)	(ft) (10) 0.5	ift 0.5ft 0.5ft		25	50	75 100	NO.	MOI G	ELEV. (ft)		DEPTH (ft)	ELEV RUN			DRILL	RUN EC. RQD (ft) (ft) % %	SAMP.	STRAT REC. F (ft) %			DESCRIPTION AND REMARK	(S	
													(ft) (ft)	(ft)	(ft) (Min/ft)	(ii) (ii) % %	NO.	(II) %	(ft) % G	ELEV. (ft)			DEPTH (ft)
730								– –		WATER S	URFACE (08/06/19)		724		10		1.6) (2.6)			0 2)	704.0	Begin Coring @ 1.0 ft CRYSTALLINE ROCK		1.0
	‡								Ę.				121.0	, †	4.0	9	4.6) (3.6) 6% 75%		98% 9	2%	Fresh, Hard to V	/ery Hard, Gray, White and Black (Close to Wide Fracture Spac	GRANITIC GNEI	SS with
705	‡								- 725.0	GROU	JND SURFACE	0.0	720 719 2	2 + 5.8									ing	
725									725.0 724.0		ALLUVIAL	1.0	113.2		5.0	(4	4.8) (4.8) 6% 96%	7				GSI = 90 to 92		
	±										bbles, and Gravel			t		9	90%							
720	<u>+</u>								£		Black GRANITIC GI	NEISS	715 714.2	2 10.8				_		,				
	£													Ŧ	5.0) (5 10	5.0) (4.9) 00% 98%							
	ŦI								F				710	Ŧ										
715	 + 								724.0				709.2	2 + 15.8 +	5.0	(5	5.0) (4.9)	-	(19.4) (1 98% 9		F			
	‡													‡		10	5.0) (4.9) 00% 98%			j.				
710	‡								1				705 704.2	20.8							704.2			20.8
710	†						11							+				1			Boring Tern	ninated at Elevation 704.2 ft in CR GRANITIC GNEISS	YSTALLINE ROO	
	±													±							-	GRANITIC GIVEISS		
705	±								L					+							- -			
	± 1		<u> </u>				4	-186	704.2 L	Boring Terminat	ted at Elevation 704.	20.8 2 ft in		ł										
	Ŧ								F	CRYSTALLINE F	ROCK: GRANITIC GI	NEISS		Ŧ							F			
									F					Ŧ							-			
	‡								F					‡							-			
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NCD	<u>+ </u>								F					+							F			

GEOTECHNICAL BORING REPORT



BOX 1: 1.0 - 10.5 FEET







SHEET 32

B5-B

BOX 2: 10.5 - 20.8 FEET

		SORE LOG	F				CORE LOG		
WBS 45778.1.1	TIP B-5825 COUN	TY YADKIN	GEOLOGIST Stickney, J. K.		WBS 45778.1.1	TIP B-5825 COU	NTY YADKIN	GEOLOGIST Stickney, J. K	
SITE DESCRIPTION Bridge	e No. 35 on NC 67 over Yadkin River			GROUND WTR (ft)	SITE DESCRIPTION Bridge No. 3	5 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	HF00065 CME-45C 93% 08/15/2018	DRILL METHOD	NW Casing w/ Core HAMM	IER TYPE Automatic	DRILL RIG/HAMMER EFF./DATE HFO	0065 CME-45C 93% 08/15/2018	DRILL METHOD	NW Casing w/ Core HAI	MMER 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	3.4ft
ELEV DRIVE DEPTH BLOW	/ COUNT BLOWS PER FOO	DT SAMP.	SOIL AND ROCK DES	CRIPTION	CORE SIZE NWL	TOTAL RUN 17.1 ft			
(ft) ELEV (ft) 0.5ft (0.5ft 0.5ft 0 25 50	75 100 NO. MOI G	ELEV. (ft)	DEPTH (ft)	ELEV RUN (ft) ELEV DEPTH RUN RATE (ft) (ft) (ft) (ft) (Min/ft)	RUN STRAT/ REC. RQD SAMP. REC. RC (ft) (ft) NO. (ft) (ft) (ft)		DESCRIPTION AND REMARKS	
					(ft) (ft) (ft) (ft) (Min/ft)	(ft) (ft) NO. (ft) (f	t) G ELEV. (ft)		DEPTH (ft)
730				08/07/19)	726.5 726.5 0.0 2.1			Ground Surface CRYSTALLINE ROCK	
					725 724.4 2.1 5.0	(2.0) (1.7) 95% 81% (5.0) (1.7) 99% 91	% Very Slight W	eathering to Fresh, Very Hard, White, C GNEISS with Close to Wide Fractur	Gray and Black
725		· · · · · ·	- 726.5 GROUND SURF	ROCK		(5.0) (4.2) 100% 84%	GRANIT	GSI = 87 to 95	e Spacing
		· · · · · ·	White, Gray and Black GRA	ANITIC GNEISS	720 719.4 7.1			GSI = 87 to 95	
					5.0	(5.0) (4.9) 100% 98%			
720									
					715 714.4 12.1 5.0	(5.0) (4.8)			
715		· · · · · · · · · · · · · · · · · · ·	Ĩ			100% 96%	5.6) Very Slight W GRANIT 709.4 Boring Term		
			ł.		710 709.4 - 17.1		709.4		17.1
		· · · · ·					Boring Term	nated at Elevation 709.4 ft in CRYSTA GRANITIC GNEISS	
710			709.4	17.1					
			Boring Terminated at Eleva CRYSTALLINE ROCK: GR/	ANITIC GNEISS					
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GEOTECHNICAL BORING REPORT



BOX 1: 0.0 - 9.7 FEET







SHEET 34

B6-A

BOX 2: 9.7 - 17.1 FEET

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WB	S 45778.	1 1		TIP	B-5825		-		ADKIN	.00		GE		T Stickr	nev lk	<			WBS	45778	11			TIP B	2-5825		co				GEO	DLOGIST Sti	knev I K		
	E DESCRIF		Bridge No.			Vadkin F									ncy, 0. i						IPTION	Bridge							TADRI	\			oknoy, o. rk.	GROUND W	
	RING NO.		211490 140.		FION 36				ESET	19 ft RT		Δι	IGNMEN	T _! -			HR.	N/A			B6-B	-		STATI					FESET	19 ft RT		GNMENT -L-		0 HR.	N/A
	LAR ELE		3 ft				ft	_		900,634				1,577,57	<i>'</i> 2	24		N/A			EV. 726			TOTAL			5 ft			IG 900,634		STING 1,577,		24 HR.	N/A
	L RIG/HAMN																				IMER EFF		HEUU							DRILL METHO				MERTYPE Auto	
	LLER Sn									TE 08/08			-	NATER D				nomatic			mith, C.			STAR						ATE 08/08/19					tomatic
ELE\			BLOW CO				PER FO			SAMP.		-								SIZE		L.		TOTAL											
(ft)	' ELEV (ft)		.5ft 0.5ft		2		50	75	100			D G ELEV		Soil and	ROCK [DESCRIP		DEPTH (ft)			· · · ·		DRILI					TA L							
										Í			. (,						(ft)	ELEV (ft)	DEPTH (ft)	(ft) (RATE (Min/ft)	RUN REC. I (ft) %	(ft) %	NO.	STRA REC. I (ft) %	RQD (ft) %	ELE	/. (ft)	DESCR	RIPTION AND RE	MARKS	Г	DEPTH (ft)
730										.				WATER	SURFAC	CE (08/08	/19)		726.3	. ,			. ,	,.	,0			,,,		. (17)		Ground Surfac	9		<u> </u>
	1 1										•	- . -							725	726.3 -	- 0.0 - 2.0	2.0		(1.6) ((0.5)		(18.6) (* 95% 8	15.7)		Slight Weathe	С	RYSTALLINE R	OCK		`
	1											726.3	5			JRFACE		0.0				5.0	3:07	(4.8) (96% ((3.1)			5		GN	NEISS with Ve	ery Close to Wid	e Fracture Sp	Black GRANITIC acing	5
725	- -					· · · ·					L.		White	CRYS e, Gray and		IE ROCK GRANITIO		s	700	-			3:24 3:17 3:40	96%	62%			j.				GSI = 85 to 9	5		
	‡				· · · · ·			.	· · · · · ·		5			, , -					720	719.3	7.0		3:46	(4.8) ((4.8)			j.							
720	‡				· · · · ·						5									-		5.0	3:50 3:41	(4.8) (96% 9	96%			Ś							
120	1 ‡								• • •		5								715	- 714.3	+ 120		3:33 3:52 3:47					j.							
	‡				· · · · ·	· · · · ·	.	.	· · · · · ·		5									-		5.0	3:47	(5.0) (100% 9	(4.9)										
715	‡										5									-	<u> </u>		7:10 11:00 13:00		JO 70			E.	1						
	‡				· · · ·	· · · ·			· · ·		5	Ĩ							710	709.3	17.0		8·10		(2.4)			Ē.	1						
710	‡				 	· · · · ·			· · · · · ·		j.									706.8	19.5	2.5	11:00 9:45	(2.4) (96% §	(2.4) 96%				706.8						19.5
710	1 ‡							.											ļĪ	-									E			Elevation 706.8 fl GRANITIC GNE		LINE ROCK:	
	1				· · · ·			· · ·	· · ·		j.	706.8						19.5		-	ŁI								E						
	_											Ł	Borii CRYS	ng Termina STALLINE	ated at E ROCK: (Elevation 7 GRANITI	706.8 ft ir C GNEIS	s		-									E						
	1 1											Ł									F								F						
	<u>†</u>											E								-	F								F						
	+											F								-	F								F						
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OT.0	-											F								-									F						
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B5825 GEO_BRDG	1											F								-	Ł								E						
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E DO	‡											F								-	‡								F						
BORI	‡											F								-	t								È.						
DOT	‡											F								-	t								F						
NC	<u> †</u>											t								-	t								F						

GEOTECHNICAL BORING REPORT



BOX 1: 0.0 - 9.7 FEET







BOX 2: 9.7 - 19.5 FEET

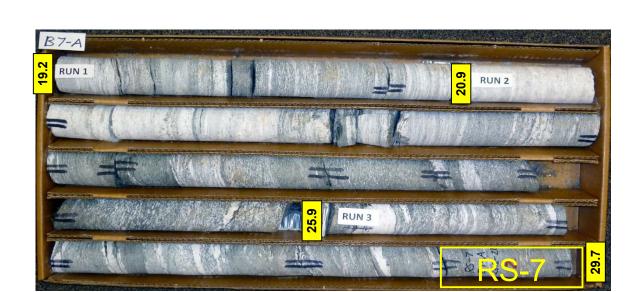
SHEET 36

B6-B

GEOTECHNICAL BORING REPORT

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		BORE LOG			1	CORE LOG	1
WBS 45778.1.1	TIP B-5825 COU	NTY YADKIN	GEOLOGIST Stickney, J. K.	WBS 45778.1.1	TIP B-5825 COU	NTY YADKIN	GEOLOGIST Stickney, J. K.
SITE DESCRIPTION Bridge No.	35 on NC 67 over Yadkin River		GROUND WTR (ft)	SITE DESCRIPTION Bridge No. 3	35 on NC 67 over Yadkin River		GROUND WTR (ft
BORING NO. B7-A	STATION 38+15	OFFSET 12 ft LT	ALIGNMENT -L- 0 HR. 8.0	BORING NO. B7-A	STATION 38+15	OFFSET 12 ft LT	ALIGNMENT -L- 0 HR. 8.0
COLLAR ELEV. 744.1 ft	TOTAL DEPTH 38.9 ft	NORTHING 900,624	EASTING 1,577,706 24 HR. 13.0	COLLAR ELEV. 744.1 ft	TOTAL DEPTH 38.9 ft	NORTHING 900,624	EASTING 1,577,706 24 HR. 13.0
DRILL RIG/HAMMER EFF./DATE HFC	00072 CME-550X 92% 08/15/2018		W Casing w/ SPT HAMMER TYPE Automatic	DRILL RIG/HAMMER EFF./DATE HFO	0072 CME-550X 92% 08/15/2018	DRILL METHOD	W Casing w/ SPT HAMMER TYPE Automatic
DRILLER Smith, C. L.	START DATE 08/21/19	COMP. DATE 08/21/19	SURFACE WATER DEPTH N/A	DRILLER Smith, C. L.	START DATE 08/21/19	COMP. DATE 08/21/19	SURFACE WATER DEPTH N/A
ELEV DRIVE DEPTH BLOW COUL	NT BLOWS PER FC	DOT SAMP.	SOIL AND ROCK DESCRIPTION	CORE SIZE NQ	TOTAL RUN 19.7 ft		
(ft) (ft) (ft) 0.5ft 0.5ft	0.5ft 0 25 50	75 100 NO. MOI G		ELEV RUN DEPTH RUN DRILL (ft) ELEV (ft) (ft) RATE	RUN SAMP. STRATA REC. RQD SAMP. REC. RQ (ft) (ft) NO. (ft) (ft) (ft)		
				(ft) ELEV (ft) (ft) RATE (Min/ft)	RUN SAMP. STRATA REC. RQD NO. (ft) (ft) (ft) (ft) (ft) NO. (ft) (ft) (ft) (ft)) G <u>ELEV. (ft</u>)	DESCRIPTION AND REMARKS
745				724.9			Begin Coring @ 19.2 ft
			744.1 GROUND SURFACE 0.0 ALLUVIAL	723.2 + 20.9	(1.5) (0.7) 88% 41% 97% 91	.9) 724.9 Fresh, Very Hard, % GN	Gray, White and Black GRANITIC GNEISS to BIOTITE 1 EISS with Close to Wide Fracture Spacing
			Tan and Brown Silty SAND (A-2-4)	5.0	(5.0) (4.6) 100% 92%		GSI = 92 to 95
740 739.7 4.4 1 1							
	$\begin{array}{c c c c c c c c c c c c c c c c c c c $	· · · · · · D	-	718.2 25.9	(4.9) (4.9) 98% 98%		
735 734.7 9.4			_	715	(1.5) (0.7) 88% 41% (5.0) (4.6) 100% 92% (4.9) (4.9) 98% 98% RS-7 (4.9) (4.9) 98% 98% 98% 98% 98% 98%		
/34./ - 9.4	$2 \qquad 43 \qquad 3 \qquad $		F	713.2 30.9		F	
			-	5.0	(4.9) (4.9) 98% 98%		
730 729.7 14.4							
	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	· · · · · · · · M	Gray, Sandy Silty CLAY (A-7) with Trace of Organic Matter (Roots/Leaves)	708.2 35.9	(2.8) (2.8)		
725		···	725.9 18.2 19.219.219.2		(2.8) 93% 93%	705.2	3
						Boring Terminated	at Elevation 705.2 ft in CRYSTALLINE ROCK: GRANITIC GNEISS
		RS-7	- Gray, White and Black GRANITIC GNEISS to BIOTITE GNEISS				
720			-			-	
715							
		RS-7	-				
			-				
710							
			705.0				
			Boring Terminated at Elevation 705.2 ft in				
			CRYSTALLINE ROCK: GRANITIC GNEISS				
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BOX 1: 19.2 - 29.7 FEET

SHEET 38

B7-A

BOX 2: 29.7 - 38.9 FEET

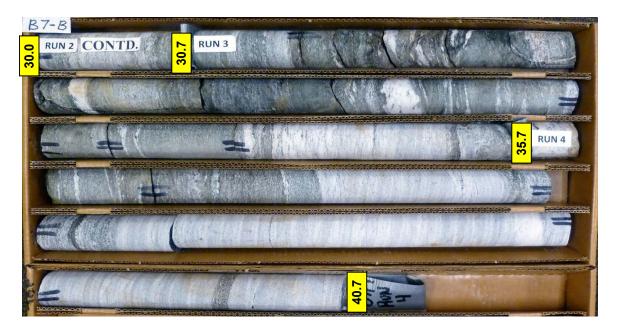
GEOTECHNICAL BORING REPORT

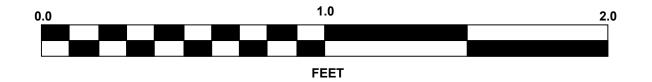
		ORE LOG	1				CORE LOG		
WBS 45778.1.1		Y YADKIN	GEOLOGIST Stickney, J. K.		WBS 45778.1.1		UNTY YADKIN	GEOLOGIST Stickney, J. K	
SITE DESCRIPTION Bridge No.		1	1	GROUND WTR (ft)		dge No. 35 on NC 67 over Yadkin Rive		1	GROUND WTR (ft
BORING NO. B7-B	STATION 38+08	OFFSET 14 ft RT	ALIGNMENT -L-	0 HR. 11.0	BORING NO. B7-B	STATION 38+08	OFFSET 14 ft RT	ALIGNMENT -L-	0 HR. 11.0
COLLAR ELEV. 744.3 ft	TOTAL DEPTH 40.7 ft	NORTHING 900,601	EASTING 1,577,691	24 HR. 13.5	COLLAR ELEV. 744.3 ft		NORTHING 900,601	EASTING 1,577,691	24 HR. 13.5
DRILL RIG/HAMMER EFF./DATE HF		DRILL METHOD N		MER TYPE Automatic		ATE HF00072 CME-550X 92% 08/15/2018	DRILL METHOD		MMER TYPE Automatic
DRILLER Smith, C. L.	START DATE 08/21/19	COMP. DATE 08/22/19	SURFACE WATER DEPTH	N/A	DRILLER Smith, C. L.	START DATE 08/21/19	COMP. DATE 08/22/19	SURFACE WATER DEPTH	N/A
ELEV DRIVE ELEV (ft) (ft) (ft) 0.5ft 0.5ft			SOIL AND ROCK DE		CORE SIZE NX	TOTAL RUN 20.2 ft	TA		
(ft) (ft) 0.5ft 0.5ft		75 100 NO. MOI G	ELEV. (ft)	DEPTH (ft)	ELEV RUN (ft) ELEV (ft) (ft) (ft)	I DRILL RUN SAMP. STRA RATE REC. RQD SAMP. REC. (Min/ft) % % %	ITA L RQD O (ft) G ELEV. (ft)	DESCRIPTION AND REMARKS	
						(Min/ft) % % NO. (ft) %	% G ELEV. (ft)		DEPTH (
745		· · · · · · · · · · · · · · · · · · ·	-744.3 GROUND SUR		723.8 723.8 20.5 4.9	(4.9) (4.5) 100% 92%		Begin Coring @ 20.5 ft CRYSTALLINE ROCK	
			ALLUVIAL Tan and Brown Silty S			100% 92%	Very Slight Weath GRANITIC GNE	ering to Fresh, Hard to Very Hard, Gra	y, Black and White to Wide Fracture
740 739.6 4.7			-		720 718.9 25.4			Spacing	
	2	· · · · · M	-		5.3	(5.2) (4.7) 98% 89%		GSI = 86 to 95	
			-		715				
735 734.6 9.7	2		-		713.6 - 30.7	(5.0) (3.1)			
	$\left \begin{array}{c} \left \begin{array}{c} \P^3 \\ \bullet \end{array} \right \cdot \cdot \cdot \cdot \left \begin{array}{c} \bullet \\ \bullet \end{array} \right \cdot \cdot \cdot \cdot \left \begin{array}{c} \bullet \\ \bullet \end{array} \right \cdot \cdot \cdot \cdot \cdot \left \begin{array}{c} \bullet \\ \bullet \end{array} \right \cdot \cdot \cdot \cdot \cdot \left \begin{array}{c} \bullet \\ \bullet \end{array} \right \cdot \cdot \cdot \cdot \cdot \left \begin{array}{c} \bullet \\ \bullet \end{array} \right \cdot \cdot \cdot \cdot \cdot \left \begin{array}{c} \bullet \\ \bullet \end{array} \right \cdot \cdot \cdot \cdot \cdot \left \begin{array}{c} \bullet \\ \bullet \end{array} \right \cdot \cdot \cdot \cdot \cdot \left \begin{array}{c} \bullet \\ \bullet \end{array} \right \cdot \cdot \cdot \cdot \cdot \left \begin{array}{c} \bullet \\ \bullet \end{array} \right \cdot \cdot \cdot \cdot \cdot \left \begin{array}{c} \bullet \\ \bullet \end{array} \right \cdot \cdot \cdot \cdot \cdot \left \begin{array}{c} \bullet \\ \bullet \end{array} \right \cdot \cdot \cdot \cdot \cdot \left \begin{array}{c} \bullet \\ \bullet \end{array} \right \cdot \cdot \cdot \cdot \cdot \left \begin{array}{c} \bullet \\ \bullet \end{array} \right \cdot \cdot \cdot \cdot \cdot \left \begin{array}{c} \bullet \\ \bullet \end{array} \right \cdot \cdot \cdot \cdot \cdot \left \begin{array}{c} \bullet \\ \bullet \end{array} \right \cdot \cdot \cdot \cdot \cdot \left \begin{array}{c} \bullet \\ \bullet \end{array} \right \cdot \cdot \cdot \cdot \cdot \left \begin{array}{c} \bullet \\ \bullet \end{array} \right \cdot \cdot \cdot \cdot \cdot \left \begin{array}{c} \bullet \\ \bullet \end{array} \right \cdot \cdot \cdot \cdot \cdot \left \begin{array}{c} \bullet \\ \bullet \end{array} \right \cdot \cdot \cdot \cdot \cdot \left \begin{array}{c} \bullet \\ \bullet \end{array} \right \cdot \cdot \cdot \cdot \cdot \left \begin{array}{c} \bullet \\ \bullet \end{array} \right \cdot \cdot \cdot \cdot \cdot \left \begin{array}{c} \bullet \\ \bullet \end{array} \right \cdot \cdot \cdot \cdot \cdot \left \begin{array}{c} \bullet \\ \bullet \end{array} \right \cdot \cdot \cdot \cdot \cdot \left \begin{array}{c} \bullet \\ \bullet \end{array} \right \cdot \cdot \cdot \cdot \cdot \left \begin{array}{c} \bullet \\ \bullet \end{array} \right \cdot \cdot \cdot \cdot \cdot \left \begin{array}{c} \bullet \\ \bullet \end{array} \right \cdot \cdot \cdot \cdot \cdot \left \begin{array}{c} \bullet \\ \bullet \end{array} \right \cdot \cdot \cdot \cdot \cdot \left \begin{array}{c} \bullet \\ \bullet \end{array} \right \cdot \cdot \cdot \cdot \cdot \left \begin{array}{c} \bullet \\ \bullet \end{array} \right \cdot \cdot \cdot \cdot \cdot \left \begin{array}{c} \bullet \\ \bullet \end{array} \right \cdot \cdot \cdot \cdot \cdot \left \begin{array}{c} \bullet \\ \bullet \end{array} \right \cdot \cdot \cdot \cdot \cdot \left \begin{array}{c} \bullet \\ \bullet \end{array} \right \cdot \cdot \cdot \cdot \cdot \left \begin{array}{c} \bullet \\ \bullet \end{array} \right \cdot \cdot \cdot \cdot \cdot \left \begin{array}{c} \bullet \\ \bullet \end{array} \right \cdot \cdot \cdot \cdot \cdot \left \end{array} \right \cdot \cdot \cdot \cdot \cdot \left \begin{array}{c} \bullet \\ \bullet \end{array} \right \cdot \cdot \cdot \cdot \cdot \left \end{array} \right \cdot \cdot \cdot \cdot \cdot \left \left \begin{array}{c} \bullet \\ \bullet \end{array} \right \cdot \cdot \cdot \cdot \cdot \left \end{array} \right \cdot \cdot \cdot \cdot \cdot \left \left \begin{array}{c} \bullet \\ \bullet \end{array} \right \cdot \cdot \cdot \cdot \cdot \left \cdot \right \cdot \cdot \cdot \cdot \left \cdot \cdot \cdot \cdot \right \cdot \cdot \cdot \cdot \left \cdot \cdot \cdot \cdot \cdot \right \cdot \cdot \cdot \cdot \cdot \left \cdot \cdot \cdot \cdot \cdot \right \cdot \cdot \cdot \cdot \cdot \left \cdot \cdot \cdot \cdot \cdot \right \cdot \cdot \cdot \cdot \cdot \left \cdot \cdot \cdot \cdot \cdot \right \cdot \cdot \cdot \cdot \cdot \left \cdot \cdot \cdot \cdot \cdot \right \cdot \cdot \cdot \cdot \cdot \left \cdot \cdot \cdot \cdot \cdot \right \cdot \cdot \cdot \cdot \cdot \cdot \left \cdot \cdot \cdot \cdot \cdot \cdot \right \cdot \cdot \cdot \cdot \cdot \cdot \left \cdot \cdot \cdot \cdot \cdot \cdot \right \cdot \cdot \cdot \cdot \cdot \cdot \left \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \right \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot$		-			(5.0) (3.1) 100% 62%			
730 729.6 14.7			-		710 708.6 35.7		Togs 6		
	1 • 2 · · · · · · · · · · · ·	· · · · · w	-		5.0	(5.0) (4.7) 100% 94%			
			- -						
725 724.6 19.7				ROCK <u>19.7</u>	703.6 - 40.7			at Elevation 703.6 ft in CRYSTALLINE	40 ROCK: GRANITIC
			- Gray, Black and White GR - AND BIOTITE G	ANITIC GNEISS				AND BIOTITE GNEISS	
720			-						
			- -						
715			-						
			-						
			-						
710			- _						
			-						
705			-						
				40.7					
			- Boring Terminated at Elev CRYSTALLINE ROCK: 0	GRANITIC AND					
			- BIOTITE GNE	:155					
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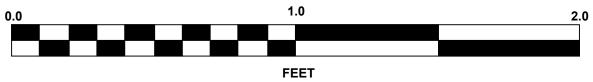


BOX 1: 20.5 - 30.0 FEET

B7-B RUN 1 RUN 2







BOX 2: 30.0 - 40.7 FEET

SHEET 40

B7-B

GEOTECHNICAL BORING REPORT

С

		BORE LOG			1	CORE LOG	
WBS 45778.1.1		NTY YADKIN	GEOLOGIST Stickney, J. K.	WBS 45778.1.1		ITY YADKIN	GEOLOGIST Stickney, J. K.
SITE DESCRIPTION Bridge No.		-	GROUND WTR (No. 35 on NC 67 over Yadkin River		GROUND WTR
BORING NO. B8-A	STATION 39+33	OFFSET 15 ft LT		.0 BORING NO. B8-A	STATION 39+33	OFFSET 15 ft LT	ALIGNMENT -L- 0 HR.
COLLAR ELEV. 741.5 ft	TOTAL DEPTH 35.4 ft	NORTHING 900,591		.6 COLLAR ELEV. 741.5 ft	TOTAL DEPTH 35.4 ft	NORTHING 900,591	EASTING 1,577,819 24 HR.
DRILL RIG/HAMMER EFF./DATE HF		I	IW Casing W/SPT & Core HAMMER TYPE Automation		HFO0072 CME-550X 92% 08/15/2018		NW Casing W/SPT & Core HAMMER TYPE Automa
DRILLER Smith, C. L.	START DATE 08/22/19	COMP. DATE 08/22/19	SURFACE 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 COU (ft) (ft) 0.5ft 0.5ft			SOIL AND ROCK DESCRIPTION	CORE SIZE NQ	TOTAL RUN 20.3 ft		
(ft) (ft) (ft) 0.5ft 0.5ft	0.5ft 0 25 50	75 100 NO. MOI G	ELEV. (ft) DEPTH	CELV ELEV CELITICON RA	RILL RUN STRATA ATE REC. RQD SAMP. REC. RQC. (ft) (ft) (ft) (ft) (ft) (ft)		DESCRIPTION AND REMARKS
					in/ft) (11) (11) (11) (11) (11) (11) (11) (1	G ELEV. (ft)	DEP1
745			-	726.4 725 726.4 - 15.1 5.3	(5.0) (4.3)		Begin Coring @ 15.1 ft CRYSTALLINE ROCK
			- 741.5 GROUND SURFACE		(5.0) (4.3) 94% 81%	Fresh, Hard to Ve	ery Hard, Gray, White and Black GRANITIC GNEISS and GNEISS with Very Close to Wide Fracture Spacing
740		· · · · · ·	ALLUVIAL	721.1 20.4			GSI = 92 to 95
T T I I			Gray, Sandy, Silty CLAY (A-7) with Trace Mica	720 5.0	(4.6) (3.9) 92% 78%		
737.4 + 4.1 WOH 1			-		92 /8 / 0 /8		
				716.1 25.4 715 5.0	(4.4) (4.0)		
732.4 9.1 WOH WOH		· · · · · ·	-		(4.4) (4.0) 88% 80%		
730 T WOH WOH		· · · · · ·	-	711.1 + 30.4		Fresh, Hard to Ve BIOTITE C	
			728.0	3.5 710 5.0	(5.0) (4.8) 100% 96%		
727.4 + 14.1 60/0.0		· · · · · · · · · · · ·	C727.5 WEATHERED ROCK Gray and White GRANITIC GNEISS				
725			CRYSTALLINE ROCK Gray, White and Black GRANITIC GNEISS	706.1 35.4		706.1 Boring Terminated	at Elevation 706.1 ft in CRYSTALLINE ROCK: GRANITIC
			AND BIOTITE GNEISS				AND BIOTITE GNEISS
720 -			- -				
			-				
715 7			-				
			-			F	
710			-				
			-				
			706.1	5.4			
			CRYSTALLINE ROCK: GRANITIC AND				
			BIOTITE GNEISS			E	
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SHEET 41



BOX 1: 15.1 - 25.4 FEET

B8-A RUN 1 20.4 RUN 2





BOX 2: 25.4 - 35.4 FEET

SHEET 42

B8-A

		BORE LOG]			CORE LOG	
WBS 45778.1.1		FY YADKIN	GEOLOGIST Stickney, J. K.	WBS 45778.1.1		TY YADKIN	GEOLOGIST Stickney, J. K.
SITE DESCRIPTION Bridge No. 3			GROUND WTR (ft)	SITE DESCRIPTION Bridge No. 3		1	GROUND WTR (ft)
BORING NO. B8-B	STATION 39+34	OFFSET 19 ft RT	ALIGNMENT -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	EASTING 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 HFO			V Casing W/SPT & Core HAMMER TYPE Automatic	DRILL RIG/HAMMER EFF./DATE HFC			W Casing W/SPT & Core HAMMER TYPE Automatic
DRILLER Smith, C. L.	START DATE 08/22/19	COMP. DATE 08/22/19 OT SAMP. ▼ L	SURFACE WATER DEPTH N/A	DRILLER Smith, C. L.	START DATE 08/22/19	COMP. DATE 08/22/19	SURFACE WATER DEPTH N/A
ELEV (ft) DRIVE ELEV (ft) DEPTH (ft) BLOW COUNT	0 25 50		SOIL AND ROCK DESCRIPTION		TOTAL RUN 20.6 ft RUN STRATA		
			ELEV. (ft) DEPTH (ft)	ELEV RUN ELEV (ft) (ft) (ft) (ft) DEPTH RUN (ft) RATE (Min/ft)	RUN STRATA REC. RQD SAMP. REC. RQE (ft) (ft) NO. (ft) (ft) (ft)) % % % % %	G ELEV. (ft)	DESCRIPTION AND REMARKS
745				726.5			Begin Coring @ 15.6 ft
			-	725 725.9 <u>726.5</u> 15.6 0.6 5.0	(0.6) (0.0) (100% 0%	Eresh Hard to Ven	CRYSTALLINE ROCK
	<u> </u>		742.1 GROUND SURFACE 0.0 ALLUVIAL		(4.1) (4.0)	BIOTITE	y Hard, Gray, White and Black GRANITIC GNEISS and GNEISS with Close to Wide Fracture Spacing
740			Gray, Sandy, Silty CLAY (A-7) with Trace Mica	720 720.9 21.2 50	82% 80%		GSI = 92 to 95 (continued)
737.3 4.8 1 0		· · · · ·		720 5.0	(5.0) (5.0) 100% 100%		
735	0			715.9 26.2	RS-9		
732.3 9.8				715 5.0	(5.0) (4.3) 100% 86%		
730 <u></u>							
			-	710.9 31.2 5.0	(4.9) (4.6) 98% 92%	Fresh, Hard to Ven BIOTITE	
727.3 14.8 60/0.1			727.5 727.3 Crow and White CRANITIC CNEISS		98% 92%		
			Gray and White GRANITIC GNEISS	705.9 36.2	+ $+$ $+$ $+$ $+$ $+$ $+$		ated at Elevation 705.0 ft in CRYSTALLINE POCK:
			Gray, White and Black GRANITIC AND BIOTITE GNEISS				ated at Elevation 705.9 ft in CRYSTALLINE ROCK: GRANITIC AND BIOTITE GNEISS
720		· · · · · ·				[
		· · · · · · · · · · · · · · · · · · ·					
715		· · · · · · · · · · · · · · · · · · ·					
		· · · · ·					
		· · · · · ·	-				
			705.0			I E	
			705.9 36.2 Boring Terminated at Elevation 705.9 ft in CRYSTALLINE ROCK: GRANITIC AND				
			BIOTITE GNEISS				
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GEOTECHNICAL BORING REPORT

SHEET 43



BOX 1: 15.6 - 26.2 FEET

B8-B RUN 1 RUN 2 0 00 2 N





BOX 2: 26.2 - 36.2 FEET

SHEET 44

B8-B

									1			00																	
	45778					P B-582				TY YAD	KIN				0	GEOLOGIST Stickney, J. K.				3 45778						B-5825		COUN	TY Y
				je No.		NC 67 ov			ver								_	ROUND WTR (ft)					ge No.				Yadkin R	iver	
	NG NO.				_	TATION				_		15 ft LT				ALIGNMENT -L-	0	HR. 4.6		RING NO						FION 4			OFF
COLL	AR ELE	V . 74	2.2 ft		то	OTAL DE	EPTH	14.3 f	t	NORT	HING	900,6	600		E	EASTING 1,577,889	24	HR. FIAD	COL	LAR EL	EV . 7	69.8 ft		٦	тот	AL DEP	TH 46.2	ft	NO
DRILL	RIG/HAM	MER EF	F./DATI	E HFC		ME-550X						DRILL I						TYPE Automatic					E HF				% 08/15/2		
DRIL	LER Sr					TART DA					P. DA	TE 08/			s	SURFACE WATER DEPTH N/	J/A		DRIL	LER S		-			STAF	RT DAT	E 08/29/		CO
ELEV (ft)	DRIVE ELEV		BLC	W CO					PER FOC			SAMP	1.7	0		SOIL AND ROCK DES	SCRIF	PTION	ELEV	ELEV	DEPTH	·	ow co					PER FOO	
(11)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	25		50	75	100	NO.	Имо	I G	EL	_EV. (ft)		DEPTH (ft)	(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5f	t 0		25	50	75
1																													
745		-													-				770		╞──								
	-	-													- 74	GROUND SURF		0.0			Ŧ								
740	-	-													-	ALLUVIAL Tan and Orange, Silty S) (A-2-4)	765	765.6	4.2					$ \cdot $ \cdot \cdot \cdot $ \cdot $ \cdot \cdot			
	738.5 -	- 3.7				1									F			· · ·			Ŧ	4	3	4		•7			
	-	-	1	1	2	• 3	:						<u> </u>	-	1						ŧ								
735	-	-				$\left \left \frac{1}{1} \right \right $	•			· · ·					- 73	34.2		8.0	760	760.6	+ 9.2 +	3	4	4	$\dashv \vdash$	· · · ·	· · ·	· · · ·	· ·
	733.5 -	- 8.7	2	4	4		:	· · · · ·	· · · · · ·	· · · · · · ·			м			Gray Sandy Silty CLAY (A	(A-7) v	with Mica			‡					בוויי ן ב			· · ·
730	-	-				.¶° .	:				: :			000	<u> </u>	<u>1.9</u> Gravel (A-1)	-	<u> </u>	755	755.6	+ 14.2					· ト · · ·			: :
730	- 728.5 -	- 137				 . <u> </u>			 					000	0 0 0 7 7 7 7 7 7 7 7	28.5		13.7	755		+	3	5	5	٦ŀ	. • 1 <u>0</u>			
		-	10	90/0.1		<u> </u>	-		· 	<u>- + -</u> 10	0/0.6	Ч		¥4771	7 <u>-</u> 72	Cray and White GRAN		14.3			t					: <u>i:</u> : :			: :
	-	-													Ł	Boring Terminated by Au Elevation 727.9 ft on CR	uger F	Refusal at	750	750.6	+ 19.2	4	3	4	$\dashv \vdash$. I 			· ·
	-	-													Ł	ROCK: GRANITIC	GNE	ISS			ŧ					•7 !			· ·
	-	-													Ł					745.6	+ 24.2					1			: :
	-	-													F				745		+	2	2	3	٦ŀ	6 5			
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	_	-													Ł					725.6	+ + 34.2					· `\. · · · \ ·			: :
	-	-													F				735	- 135.0	1 34.2	16	12	8	٦ŀ	<u> </u>	20		
	_	-													Ł						Ŧ								
	-	_													F				730	730.6	39.2	100/0.	2						· [·
	-	-													E						Ŧ	100/0.	1						•
	-	-													F					705.0	Ŧ								
	_	-													F				725	- 125.0	+ 44.2 	60/0.0	D				<u> </u>		
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SHEET 45

NTY	YADKIN				GEOLOGIS	ST Stickney,	J. K.		
								GROUN	D WTR (ft)
	OFFSET 3	5 ft RT			ALIGNMEN	NT -L-		0 HR.	FIAD
	NORTHING	900,52	22		EASTING	1,577,871		24 HR.	N/A
		DRILL M				1			Automatic
				INVV	Casing w/ SPT				Automatic
	COMP. DAT		29/19	L	SURFACE	WATER DEP	TH N/A	4	
ют		SAMP.		Ō		SOIL AND ROC	K DESC	RIPTION	I
	75 100	NO.	/MOI	G					
					769.8	GROUNE			0.0
					Gra	ROADWAY E ay, White, Tan a			ine
• •					SAN	ID (A-2-4) with	Frace Gr	avel and	Mica
			М						
· ·									
: :									
• •			М						
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	+ · · · · · ·		М						
					745.6				24.2
			М			ALL Gray, Silty, Sa	UVIAL andv CLA	AY (A-6)	
••••					741.7		,		28.1
• •					<u>741.7</u> 740.6	Gravel L	ayer (A-	1)	$\frac{28.1}{29.2}$
			М		Та	n and Brown, Sa	andy Silt	y CLAY (A	4-7)
: :									
• •									
•••			М	N					
· ·	· - · · · ·				731.8				<u>38.0</u>
	100/0.2		М		G	Gray and White			S
• •									
	60/0.0		М		725.6	CRYSTAL	LINE RO	DCK	44.2
• •				-		Gray and White (
				E	E	levation 723.6 fl	t on CRY	′STALLIN	IE
				-		ROCK: GRA	NITIC G	NEISS	
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PROJECT NO.: 45778.1.1 (B-5825) 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	B3-B	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	

SHEET 46