REFERENCE: B-5527

PROJECT: 55027

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5527	1	

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

STRUCTURE SUBSURFACE INVESTIGATION

COUNTY SURRY

PROJECT DESCRIPTION BRIDGE NO. 122 OVER TOMS CREEK ON US 52 NB

CONTENTS

CAUTION NOTICE

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DATE MARCH, 2023

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03/27/2023
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PROJECT REFERENCE NO.	SHEET NO.
B-5527	2

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION

SOIL IS CONSIDERED UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO THE STANDARD PENETRATION TEST (AASHTO T 206, ASTM D1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY INCLUDE THE FOLLOWING: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. FOR EXAMPLE,
VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6

SOIL LEGEND AND AASHTO CLASSIFICATION

GENERAL CLASS.	GRANULAR MATERIALS (≤ 35% PASSING #200)							SILT-CLAY MATERIALS (> 35% PASSING #200)				ORGANIC MATERIALS		
GROUP CLASS.	A-1		A-3	A-2				A-4	A-5	A-6	A-7	A-1, A-2 A-3	A-4, A-5 A-6, A-7	
	A-1-a	A-1-b		A-2-4	A-2-5	A-2-6	A-2-7				A-7-5, A-7-6			
SYMBOL														
% PASSING #10 #40 #200	50 MX 30 MX 15 MX		50 MX 25 MX	51 MN 10 MX	35 MX	35 MX	35 MX	35 MX	36 MN	36 MN	36 MN	36 MN	GRANULAR SOILS	SILT-CLAY SOILS	MUCK, PEAT
MATERIAL PASSING #40 LL PI	— 6 MX		— NP		40 MX 10 MX	41 MN 10 MX	40 MX 11 MN	41 MN 11 MN	40 MX 10 MX	41 MN 10 MX	40 MX 11 MN	41 MN 11 MN	SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER		HIGHLY ORGANIC SOILS
GROUP INDEX	0		0		0		4 MX		8 MX	12 MX	16 MX	NO MX			
USUAL TYPES OF MAJOR MATERIALS	STONE FRAGS. GRAVEL, AND SAND		FINE SAND		SILTY OR CLAYEY GRAVEL AND SAND				SILTY SOILS		CLAYEY SOILS				
GEN. RATING AS SUBGRADE	EXCELLENT TO GOOD								FAIR TO POOR				FAIR TO POOR	POOR	UNSUITABLE

PI OF A-7-5 SUBGROUP IS ≤ LL - 30 ; PI OF A-7-6 SUBGROUP IS > LL - 30

CONSISTENCY OR DENSENESS

PRIMARY SOIL TYPE	COMPACTNESS OR CONSISTENCY	RANGE OF STANDARD PENETRATION RESISTENCE (N-VALUE)	RANGE OF UNCONFINED COMPRESSIVE STRENGTH ($TONS/FT^2$)
GENERALLY GRANULAR MATERIAL (NON-COHESIVE)	VERY LOOSE	< 4	
	LOOSE	4 TO 10	
	MEDIUM DENSE	10 TO 30	N/A
	DENSE	30 TO 50	
	VERY DENSE	> 50	
GENERALLY SILT-CLAY MATERIAL (COHESIVE)	VERY SOFT	< 2	< 0.25
	SOFT	2 TO 4	0.25 TO 0.5
	MEDIUM STIFF	4 TO 8	0.5 TO 1.0
	STIFF	8 TO 15	1 TO 2
	VERY STIFF	15 TO 30	2 TO 4
	HARD	> 30	> 4

TEXTURE OR GRAIN SIZE

U.S. STD. SIEVE SIZE		4	10	40	60	200	270
OPENING (MM)		4.76	2.00	0.42	0.25	0.075	0.053

BOULDER (BLDR.)	COBBLE (COB.)	GRAVEL (GR.)	COARSE SAND (CSE. SD.)	FINE SAND (F SD.)	SILT (SL.)	CLAY (CL.)

GRAIN SIZE	MM	305	75	2.0	0.25	0.05	0.005
	IN.	12	3				

SOIL MOISTURE - CORRELATION OF TERMS

SOIL MOISTURE SCALE (ATTERBERG LIMITS)	FIELD MOISTURE DESCRIPTION	GUIDE FOR FIELD MOISTURE DESCRIPTION
	- SATURATED - (SAT.)	USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE
LL — LIQUID LIMIT		
PLASTIC RANGE (PI)	- WET - (W)	SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE
PL — PLASTIC LIMIT		
OM — OPTIMUM MOISTURE	- MOIST - (M)	SOLID; AT OR NEAR OPTIMUM MOISTURE
SL — SHRINKAGE LIMIT		
	- DRY - (D)	REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE

PLASTICITY

	PLASTICITY INDEX (PI)	DRY STRENGTH
NON PLASTIC	0-5	VERY LOW
SLIGHTLY PLASTIC	6-15	SLIGHT
MODERATELY PLASTIC	16-25	MEDIUM
HIGHLY PLASTIC	26 OR MORE	HIGH

COLOR

DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY). MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.

GRADATION

WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE.
UNIFORMLY GRADED - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE.
GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLE SIZES OF TWO OR MORE SIZES.

ANGULARITY OF GRAINS

THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.

MINERALOGICAL COMPOSITION

MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.

COMPRESSIBILITY

SLIGHTLY COMPRESSIBLE	LL < 31
MODERATELY COMPRESSIBLE	LL = 31 - 50
HIGHLY COMPRESSIBLE	LL > 50

PERCENTAGE OF MATERIAL

ORGANIC MATERIAL	GRANULAR SOILS	SILT - CLAY SOILS	OTHER MATERIAL	
TRACE OF ORGANIC MATTER	2 - 3%	3 - 5%	TRACE	1 - 10%
LITTLE 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

GROUND WATER

- WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING
- STATIC WATER LEVEL AFTER 24 HOURS
- PW — PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA
- SPRING OR SEEP

MISCELLANEOUS SYMBOLS

- ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION
- SOIL SYMBOL
- ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT
- INFERRED SOIL BOUNDARY
- INFERRED ROCK LINE
- ALLUVIAL SOIL BOUNDARY
- 25/025 — DIP & DIP DIRECTION OF ROCK STRUCTURES
- SPT, DPT, DMT, VST, PMT — TEST BORING
- AUGER BORING
- CORE BORING
- MW — MONITORING WELL
- PIEZOMETER INSTALLATION
- SLOPE INDICATOR INSTALLATION
- CONE PENETROMETER TEST
- SOUNDING ROD
- TEST BORING WITH CORE
- SPT N-VALUE

RECOMMENDATION SYMBOLS

- UNDERCUT
- SHALLOW UNDERCUT
- UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE
- UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK
- UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL

ABBREVIATIONS

AR - AUGER REFUSAL
BT - BORING TERMINATED
CL. - CLAY
CPT - CONE PENETRATION TEST
CSE. - COARSE
DMT - DILATOMETER TEST
DPT - DYNAMIC PENETRATION TEST
e - VOID RATIO
F - FINE
FOSS. - FOSSILIFEROUS
FRAC. - FRACTURED, FRACTURES
FRAGS. - FRAGMENTS
HI. - HIGHLY
MED. - MEDIUM
MICA. - MICACEOUS
MOD. - MODERATELY
NP - NON PLASTIC
ORG. - ORGANIC
PMT - PRESSUREMETER TEST
SAP. - SAPROLITIC
SD. - SAND, SANDY
SL. - SILT, SILTY
SLI. - SLIGHTLY
TCR - TRICONE REFUSAL
w - MOISTURE CONTENT
V - VERY
VST - VANE SHEAR TEST
WEA. - WEATHERED
γ - UNIT WEIGHT
γ_d - DRY UNIT WEIGHT

SAMPLE ABBREVIATIONS

S - BULK
SS - SPLIT SPOON
ST - SHELBY TUBE
RS - ROCK
RT - RECOMPACTED TRIAXIAL
CBR - CALIFORNIA BEARING RATIO

EQUIPMENT USED ON SUBJECT PROJECT

DRILL UNITS:
- [ ] CME-45C
- [ ] CME-55
- [X] CME-550X
- [ ] VANE SHEAR TEST
- [ ] PORTABLE HOIST
- [ ] _____
- [ ] _____

ADVANCING TOOLS:
- [ ] CLAY BITS
- [ ] 6" CONTINUOUS FLIGHT AUGER
- [X] 3 ¼" HOLLOW STEM AUGERS
- [ ] HARD FACED FINGER BITS
- [ ] TUNG.-CARBIDE INSERTS
- [ ] CASING [ ] W/ ADVANCER
- [ ] TRICONE _____" STEEL TEETH
- [ ] TRICONE _____" TUNG.-CARB.
- [X] CORE BIT
- [ ] _____

HAMMER TYPE:
- [X] AUTOMATIC [ ] MANUAL

CORE SIZE:
- [ ] -B _____ [ ] -H _____
- [X] -N Q

HAND TOOLS:
- [ ] POST HOLE DIGGER
- [ ] HAND AUGER
- [ ] SOUNDING ROD
- [ ] VANE SHEAR TEST
- [ ] _____

ROCK DESCRIPTION

HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT REFUSAL IF TESTED. AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS IN NON-COASTAL PLAIN MATERIAL, THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK.
ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:

WEATHERED ROCK (WR)	NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED.
CRYSTALLINE ROCK (CR)	FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.
NON-CRYSTALLINE ROCK (NCR)	FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YEILD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.
COASTAL PLAIN SEDIMENTARY ROCK (CP)	COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.

WEATHERING

FRESH	ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE.
VERY SLIGHT (V SLI.)	ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN, CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE.
SLIGHT (SLI.)	ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS.
MODERATE (MOD.)	SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED WITH FRESH ROCK.
MODERATELY SEVERE (MOD. SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK. *IF TESTED, WOULD YIELD SPT REFUSAL*
SEVERE (SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. *IF TESTED, WOULD YIELD SPT N VALUES > 100 BPF*
VERY SEVERE (V SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE 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 VESTIGES OF ORIGINAL ROCK FABRIC REMAIN. *IF TESTED, WOULD YIELD SPT N VALUES < 100 BPF*
COMPLETE	ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS ALSO AN EXAMPLE.

ROCK HARDNESS

VERY HARD	CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.
HARD	CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.
MODERATELY HARD	CAN BE SCRATCHED BY KNIFE OR PICK. GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK. HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS.
MEDIUM HARD	CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PEICES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK.
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 PIECES CAN BE BROKEN BY FINGER PRESSURE.
VERY SOFT	CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES 1 INCH OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGERNAIL.

FRACTURE SPACING

TERM	SPACING
VERY WIDE	MORE THAN 10 FEET
WIDE	3 TO 10 FEET
MODERATELY CLOSE	1 TO 3 FEET
CLOSE	0.16 TO 1 FOOT
VERY CLOSE	LESS THAN 0.16 FEET

BEDDING

TERM	THICKNESS
VERY THICKLY BEDDED	4 FEET
THICKLY BEDDED	1.5 - 4 FEET
THINLY BEDDED	0.16 - 1.5 FEET
VERY THINLY BEDDED	0.03 - 0.16 FEET
THICKLY LAMINATED	0.008 - 0.03 FEET
THINLY LAMINATED	< 0.008 FEET

INDURATION

FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.

FRIABLE	RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.
MODERATELY INDURATED	GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.
INDURATED	GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.
EXTREMELY INDURATED	SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.

TERMS AND DEFINITIONS

ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.

AQUIFER - A WATER BEARING FORMATION OR STRATA.

ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.

ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, SUCH AS SHALE, SLATE, ETC.

ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE.

CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.

COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.

CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.

DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.

DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.

DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.

FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.

FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.

FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL.

FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.

FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.

JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.

LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.

LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.

MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.

PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.

RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.

ROCK QUALITY DESIGNATION (RQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.

SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.

SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS.

SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.

STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.

STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.

STRATA ROCK QUALITY DESIGNATION (SRQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.

TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.

BENCH MARK: B-5527-2
N 966405 E 1560952
ELEVATION: 958.96 FEET

NOTES:

FIAD = Filled Immediately After Drilling

MnO = Manganese Oxide

Elevations for North Bound Interior Bent Borings optained using the TIN file (B5527_Ls_tin.tin)

DATE: 8-15-14

PROJECT REFERENCE NO.	SHEET NO.
B-5527	2A

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

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

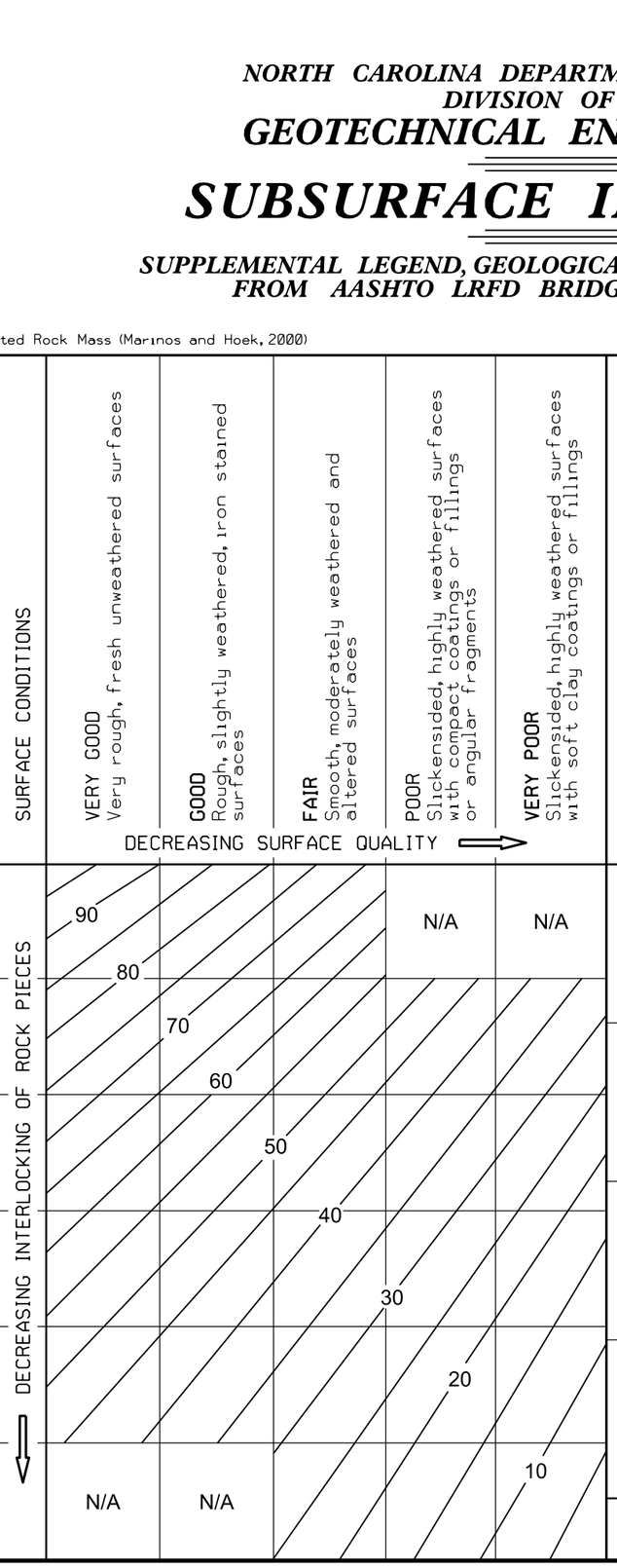
AASHTO LRFD Figure 10.4.6.4-1 — Determination of GSI for Jointed Rock Mass (Marinos and Hoek, 2000)

GEOLOGICAL STRENGTH INDEX (GSI) FOR JOINTED ROCKS (Hoek and Marinos, 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.

STRUCTURE

- INTACT OR MASSIVE - intact rock specimens or massive in situ rock with few widely spaced discontinuities
- BLOCKY - well interlocked undisturbed rock mass consisting of cubical blocks formed by three intersecting discontinuity sets
- 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 formed by many intersecting discontinuity sets. Persistence of bedding planes or schistosity
- DISINTEGRATED - poorly interlocked, heavily broken rock mass with mixture of angular and rounded rock pieces
- LAMINATED/SHEARED - Lack of blockiness due to close spacing of weak schistosity or shear planes

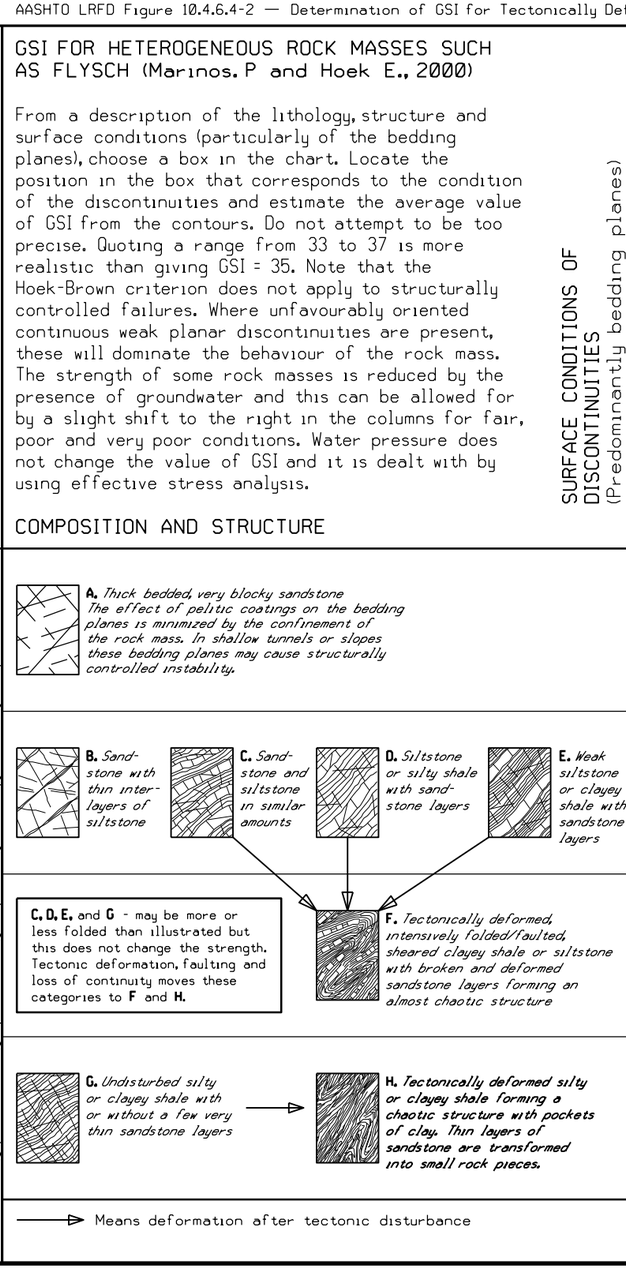


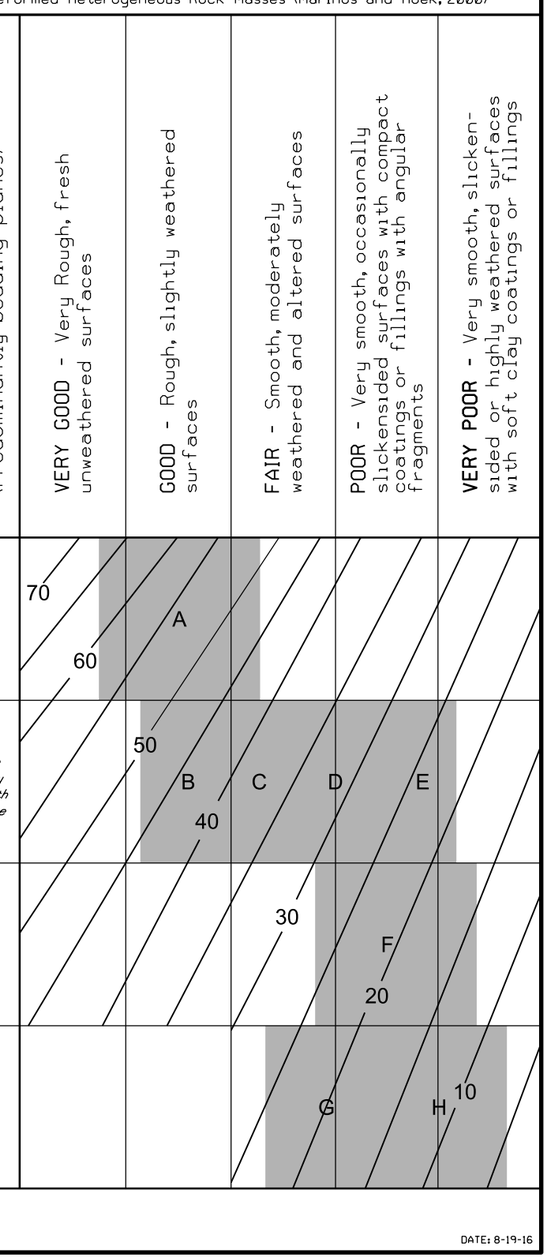
AASHTO LRFD Figure 10.4.6.4-2 — Determination of GSI for Tectonically Deformed Heterogeneous Rock Masses (Marinos and Hoek, 2000)

GSI FOR HETEROGENEOUS ROCK MASSES SUCH AS FLYSCH (Marinos. P and Hoek E., 2000)

From a description of the lithology, structure and surface conditions (particularly of the bedding planes), choose a box in the chart. Locate the position in the box that corresponds to the condition of the discontinuities and estimate the average value of GSI from the contours. Do not attempt to be too precise. Quoting a range from 33 to 37 is more realistic than giving GSI = 35. Note that the Hoek-Brown criterion does not apply to structurally controlled failures. Where unfavourably oriented continuous weak planar discontinuities are present, these will dominate the behaviour of the rock mass. The strength of some rock masses is reduced by the presence of groundwater and this can be allowed for by a slight shift to the right in the columns for fair, poor and very poor conditions. Water pressure does not change the value of GSI and it is dealt with by using effective stress analysis.

COMPOSITION AND STRUCTURE





DATE: 8-19-16

PROJECT REFERENCE NO.	SHEET NO.
B-5527 (Bridge no. 122)	3

SITE PLAN

0 40 80
FEET

NAD 83/2011

North Bound Lane Bridge 122

RESIDUAL/SAPROLITE

ALLUVIAL

CRYSTALLINE ROCK

ALLUVIAL

RESIDUAL/SAPROLITE

ROADWAY EMBANKMENT

22+00

-LSB-

US-52 SB

To Pilot Mountain

Bridge 126

26+00

-LSB-

ROADWAY EMBANKMENT

Begin Bridge
-LNB- Sta.22+03

EBI-A

BI-A

ALLUVIAL

21+00

-LNB-

US-52 NB

Skew = 90°

B2-A

EB2-A

ROADWAY EMBANKMENT

End Bridge
-LNB- Sta.24+33

ROADWAY EMBANKMENT

ARTIFICIAL FILL

BI-B

B2-B

26+00

-LNB-

To Mount Airy

EBI-B

ALLUVIAL

BL-3

ROADWAY EMBANKMENT

RESIDUAL/SAPROLITE

TOMS CREEK

CRYSTALLINE ROCK

EB2-B

ALLUVIAL

RESIDUAL/SAPROLITE

JS

NOTE: NUMEROUS BOULDERS (RIP-RAP) IN THIS AREA

(B) **ROADWAY EMBANKMENT:** brown, tan, and white, moist, stiff, sandy SILT (A-4) with trace clay and gravel

(C) **ROADWAY EMBANKMENT:** brown, moist, medium dense, silty SAND (A-2-4) with little gravel

(H) **ARTIFICIAL FILL:** brown, moist, soft, sandy SILT (A-4) with trace mica

(I) **ARTIFICIAL FILL:** brown, moist, loose to medium dense, silty SAND (A-2-4) with some to trace boulders and trace mica

SS-57

EBI-A
-LNB-
22+03
25'LT

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-57	25'LT	22+03	0.0' - 1.5'	A-4(0)	28	4	22.0	33.1	36.3	8.6	78	66	44	N/A	N/A

NOTE: GROUND-LINE PRODUCED BY TIN (B5527_LS_TIN.TIN)

955.3240

100/0.4
100/0.3
60/0.0
REC: 97%
ROD: 17%
GSI: 55-60
REC: 91%
ROD: 72%
GSI: 75-80
03/22
BT

EBI-B
-LNB-
22+03
58'RT

NOTE: POSSIBLE FORMER TRIBUTARY TO TOMS CREEK THAT WAS FILLED IN DURING CONSTRUCTION.

8 6 17 4 45 100/0.3 60/0.0
03/22
AR

(L) **ALLUVIAL:** gray, tan, red, and white, saturated, loose to dense, silty SAND (A-2-4) and GRAVEL (A-1-a) with some sand (sub rounded grains)

(E) **SAPROLITE:** brown, gray, and white, dry to moist, medium dense to very dense, silty SAND (A-2-4) with some to little mica, trace MnO

(M) **WEATHERED ROCK:** (Granitic Gneiss)

(N) **CRYSTALLINE ROCK:** (Granitic Gneiss)

NOTE: STRATIGRAPHY DRAWN THROUGH OFFSET BORING WITH BOTH PROJECTED ONTO THE NEAREST CROSS SECTION.

End Bent 1
22+03.00
-LNB-

(H) **ARTIFICIAL FILL:** *red-brown, wet, very soft, clayey SILT (A-5) with trace mica*

BI-A
-LNB-
22+78
7'LT

BI-B
-LNB-
22+77
10'RT

927.1697

NOTE: GROUND-LINE PRODUCED BY TIN (B5527_LS_TIN.TIN)

WOH

WOH

37

100/0.6'

60/0.1'

REC: 79%
ROD: 79%
GSI: 75-80

REC: 96%
ROD: 91%
GSI: 85-90

REC: 93%
ROD: 77%
GSI: 80-85

REC: 100%
ROD: 100%
GSI: 85-90

BT
DRY
(07/22)

BT
DRY
(07/22)

(L) **ALLUVIAL:** *gray, wet, medium dense to very dense, silty SAND (A-2-4) with trace mica and gravel-sized rock fragments*

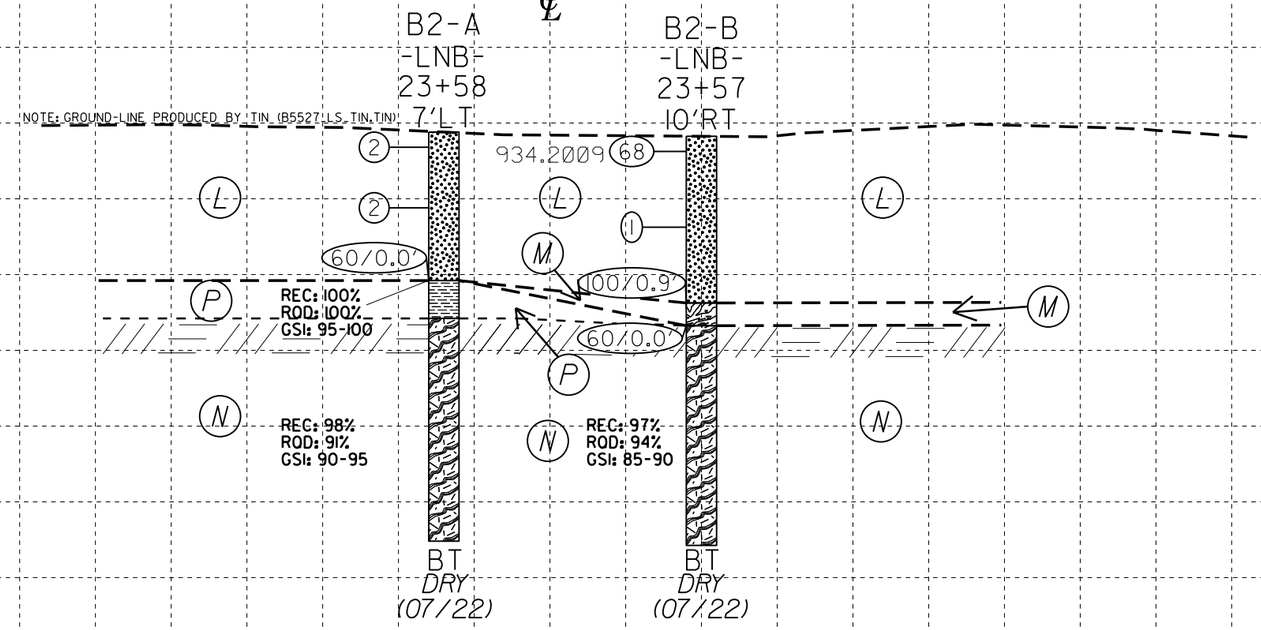
(N) **CRYSTALLINE ROCK:** *(Granitic Gneiss)*

NOTE: STRATIGRAPHY DRAWN THROUGH OFFSET BORING WITH BOTH PROJECTED ONTO THE NEAREST CROSS SECTION.

Bent 1

22+77.59

-LNB-



(L) **ALLUVIAL:** *brown to gray, wet, very loose to very dense, silty SAND (A-2-4) with no to trace organics, mica and gravel-sized rock fragments*

(M) **WEATHERED ROCK:** *(Granitic Gneiss)*

(N) **CRYSTALLINE ROCK:** *(Granitic Gneiss)*

(P) **NON-CRYSTALLINE ROCK:** *(Concrete with Aggregate)*

NOTE: STRATIGRAPHY DRAWN THROUGH OFFSET BORING WITH BOTH PROJECTED ONTO THE NEAREST CROSS SECTION.

Bent 2

23+57.59

-LNB-

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) #10	#40	#200	% MOISTURE	% ORGANIC
SS-75	10'LT	24+33	3.7' - 5.2'	A-7-5(4)	42	12	15.4	45.1	15.2	24.3	98	90	49	N/A	N/A
SS-77	10'LT	24+33	13.7' - 15.2'	A-7-5(9)	54	19	12.2	33.8	15.1	38.9	92	87	56	N/A	N/A
SS-78	10'LT	24+33	18.7' - 20.2'	A-2-4(0)	18	0	24.4	54.7	10.8	10.1	99	91	26	N/A	N/A
SS-79	10'LT	24+33	23.7' - 25.2'	A-2-4(0)	27	6	21.2	47.6	12.9	18.3	93	86	33	N/A	N/A
SS-41	65'RT	24+33	0.0' - 1.5'	A-6(1)	28	12	18.1	47.2	6.6	28.1	95	91	38	N/A	N/A
SS-42	65'RT	24+33	4.0' - 5.5'	A-2-4(0)	34	6	29.3	43.6	7.3	19.8	89	74	34	N/A	N/A

(A) **ROADWAY EMBANKMENT:** *red-brown to red, dry, medium stiff, slightly to moderately plastic, highly sandy, silty CLAY (A-7-5) with trace mica*

SS-75
SS-77
SS-78
SS-79
EB2-A
-LNB-
24+33
10'LT

NOTE: GROUND-LINE PRODUCED BY TIN (B5527_LS_TIN.TIN)

957.6210

SS-41
SS-42
EB2-B
-LNB-
24+33
65'RT

100/0.5
100/0.6
100/0.2
60/0.0
AR
03/22

100/0.8
60/0.0
REC: 88%
ROD: 64%
GSI: 60-65
REC: 44%
ROD: 0%
GSI: 25-30
REC: 98%
ROD: 96%
GSI: 85-90
BT
CAVED
(03/22)

(J) **ALLUVIAL:** *tan, moist, soft, slightly plastic, sandy CLAY (A-6)*

(L) **ALLUVIAL:** *red-brown to red-tan, brown, orange, and white, moist, loose to medium dense, silty SAND (A-2-4) with little clay, trace boulders and mica, and GRAVEL (A-1-a) with some sand (rounded grains)*

(M) **WEATHERED ROCK:** *(Granitic Gneiss)*

(N) **CRYSTALLINE ROCK:** *(Granitic Gneiss)*

NOTE: STRATIGRAPHY DRAWN THROUGH OFFSET BORING WITH BOTH PROJECTED ONTO THE NEAREST CROSS SECTION.

End Bent 2

24+33.00

-LNB-

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 55027.1.FS1	**TIP** B-5527	**COUNTY** SURRY	**GEOLOGIST** Fischer, H. & Gross, A.	
SITE DESCRIPTION BRIDGE NO. 122 OVER TOMS CREEK ON US 52 NB				**GROUND WTR (ft)**
BORING NO. LNB_EB1A	**STATION** 22+03	**OFFSET** 25 ft LT	**ALIGNMENT** -LNB-	**0 HR.** N/A
COLLAR ELEV. 955.4 ft	**TOTAL DEPTH** 24.9 ft	**NORTHING** 966,670	**EASTING** 1,560,974	**24 HR.** 18.5
DRILL RIG/HAMMER EFF./DATE SUM3123 CME-550X 86% 11/2/2021		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER Moseley, M.B.	**START DATE** 02/24/22	**COMP. DATE** 03/03/22	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
960										
955	955.4	0.0	2	3	5	8	SS-57	M		955.4 GROUND SURFACE 0.0 **ARTIFICIAL FILL** brown, tan, and white, sandy SILT (A-4) with trace clay and gravel 952.7 2.7
950	951.5	3.9	100/0.4			100/0.4				**WEATHERED ROCK** (Granitic Gneiss)
945	946.5 944.7	8.9 10.7	100/0.3 60/0.0			100/0.3 60/0.0				944.7 10.7 **CRYSTALLINE ROCK** (Begin Core at 10.7 Feet) (Granitic Gneiss) REC: 97% RQD: 17% GSI: 55-60 938.7 16.7
940										(Granitic Gneiss) REC: 91% RQD: 72% GSI: 75-80
935										930.5 24.9 Boring Terminated at Elevation 930.5 ft in Crystalline Rock (Granitic Gneiss) - Topsoil Thickness = 0.3 Feet - Boring deepened on 3/3/22 to confirm in-situ bedrock.

GEOTECHNICAL BORING REPORT
CORE LOG

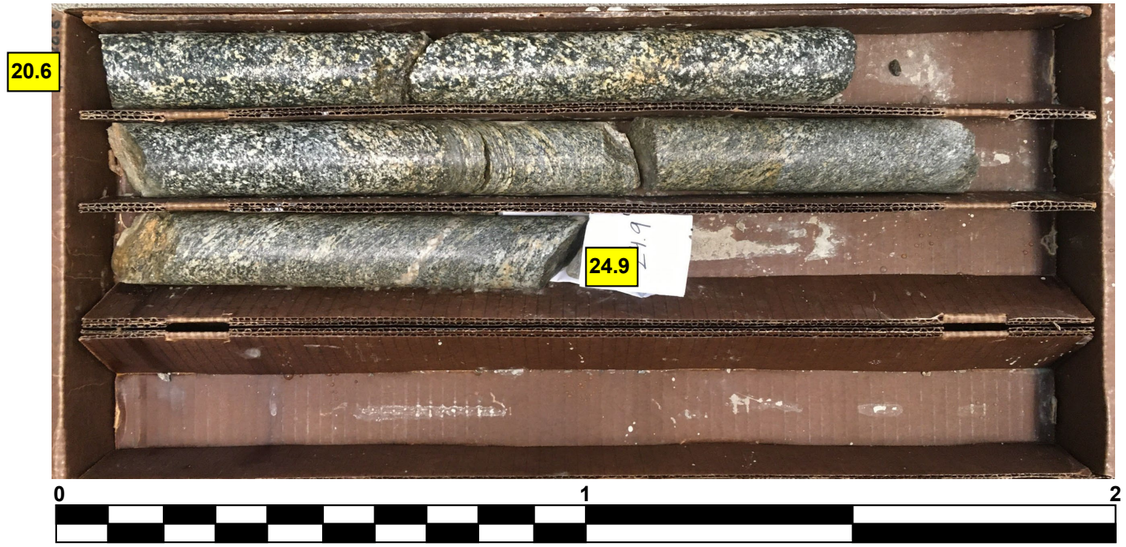
WBS 55027.1.FS1	**TIP** B-5527	**COUNTY** SURRY	**GEOLOGIST** Fischer, H. & Gross, A.	
SITE DESCRIPTION BRIDGE NO. 122 OVER TOMS CREEK ON US 52 NB				**GROUND WTR (ft)**
BORING NO. LNB_EB1A	**STATION** 22+03	**OFFSET** 25 ft LT	**ALIGNMENT** -LNB-	**0 HR.** N/A
COLLAR ELEV. 955.4 ft	**TOTAL DEPTH** 24.9 ft	**NORTHING** 966,670	**EASTING** 1,560,974	**24 HR.** 18.5
DRILL RIG/HAMMER EFF./DATE SUM3123 CME-550X 86% 11/2/2021		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER Moseley, M.B.	**START DATE** 02/24/22	**COMP. DATE** 03/03/22	**SURFACE WATER DEPTH** N/A	
CORE SIZE NQ2	**TOTAL RUN** 14.2 ft			

ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS
944.74											Begin Coring @ 10.7 ft
	944.7	10.7	4.2	*N=60/0.0* 0:51/1.2 0:47/1.0 1:03/1.0 1:18/1.0	(4.0) 95%	(0.6) 14%		(5.8) 97%	(1.0) 17%		944.7 **CRYSTALLINE ROCK** 10.7 white, dark green, black, and brown, moderate to moderate severe weathering, medium hard to moderately hard, close fracture spacing, GRANITIC GNEISS
940	940.5	14.9	5.0	0:51/1.0 0:51/1.0 1:03/1.0 1:04/1.0 1:08/1.0	(4.4) 88%	(2.7) 54%		(7.5) 91%	(5.9) 72%		938.7 GSI: 55-60 16.7 white, gray, dark green, and black, slight to very slight weathering, hard to very hard, close fracture spacing, GRANITIC GNEISS
935	935.5	19.9	5.0	0:56/1.0 0:52/1.0 0:55/1.0 0:47/1.0 1:06/1.0	(4.8) 96%	(3.6) 72%					GSI: 75-80
	930.5	24.9									930.5 24.9 Boring Terminated at Elevation 930.5 ft in Crystalline Rock (Granitic Gneiss) - Topsoil Thickness = 0.3 Feet - Boring deepened on 3/3/22 to confirm in-situ bedrock.

CORE PHOTOGRAPHS

LNB_EB1A
BOX 1 : 10.7 - 20.6 FEET

LNB_EB1A
BOX 2: 20.6 - 24.9 FEET



GEOTECHNICAL BORING REPORT
BORE LOG

WBS 55027.1.FS1	**TIP** B-5527	**COUNTY** SURRY	**GEOLOGIST** Gross, A.	
SITE DESCRIPTION BRIDGE NO. 122 OVER TOMS CREEK ON US 52 NB				**GROUND WTR (ft)**
BORING NO. LNB_EB1B	**STATION** 22+03	**OFFSET** 58 ft RT	**ALIGNMENT** -LNB-	**0 HR.** 11.7
COLLAR ELEV. 942.3 ft	**TOTAL DEPTH** 26.4 ft	**NORTHING** 966,672	**EASTING** 1,561,057	**24 HR.** 8.9
DRILL RIG/HAMMER EFF./DATE SUM3123 CME-550X 86% 11/2/2021		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Moseley, M.B.	**START DATE** 02/28/22	**COMP. DATE** 02/28/22	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
945										
	942.3	0.0								942.3 GROUND SURFACE 0.0
940			1	2	2	4		M		**ARTIFICIAL FILL** brown, sandy SILT (A-4) with trace mica
	938.1	4.2								939.3 3.0
			13	4	2	6		M		brown, silty SAND (A-2-4) with some to trace boulders and trace mica
935	933.1	9.2								
			7	9	8	17		M		
930										929.8 12.5
	928.1	14.2								**ALLUVIAL** gray and tan, silty SAND (A-2-4)
			1	2	2	4		Sat.		
925	923.1	19.2								922.8 19.5
			7	22	23	45		Sat.		921.3 red and white, GRAVEL (A-1-a) with some sand (sub-rounded grains) 21.0
920										**WEATHERED ROCK** (Granitic Gneiss)
	918.1	24.2	100/0.3			100/0.3				
	915.9	26.4								915.9 26.4
			60/0.0			60/0.0				**CRYSTALLINE ROCK** (Granitic Gneiss) Boring Terminated with Standard Penetration Test Refusal at Elevation 915.9 ft on Crystalline Rock (Granitic Gneiss)
										- Topsoil Thickness = Not Reported

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 55027.1.FS1	**TIP** B-5527	**COUNTY** SURRY	**GEOLOGIST** Shipman, M.	
SITE DESCRIPTION BRIDGE NO. 122 OVER TOMS CREEK ON US 52 NB				**GROUND WTR (ft)**
BORING NO. LNB_B1A	**STATION** 22+78	**OFFSET** 7 ft LT	**ALIGNMENT** -LNB-	**0 HR.** N/A
COLLAR ELEV. 927.3 ft	**TOTAL DEPTH** 33.3 ft	**NORTHING** 966,746	**EASTING** 1,560,990	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE SUM3123 CME-550X 86% 11/2/2021		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER Moseley, M.B.	**START DATE** 07/22/22	**COMP. DATE** 07/22/22	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
										ELEV. (ft) DEPTH (ft)
930										
										927.3 GROUND SURFACE 0.0
	926.5	0.8	WOH	WOH	WOH	0		W		**ARTIFICIAL FILL** red-brown, clayey SILT (A-5)
925										923.3 4.0
	921.5	5.8	7	4	33	37		W		**ALLUVIAL** gray, silty SAND (A-2-4) with trace gravel-sized rock fragments and trace mica
920										
915	915.5	11.8	60/0.1'			60/0.1'				915.5 11.8 **CRYSTALLINE ROCK** (Begin Core at 11.8 Feet) (Granitic Gneiss) REC: 79% RQD: 79% GSI: 75-80
										914.1 13.2 (Granitic Gneiss) REC: 93% RQD: 77% GSI: 80-85
910										
905										
900										899.1 28.2 (Granitic Gneiss) REC: 100% RQD: 100% GSI: 85-90
895										894.0 33.3 Boring Terminated at Elevation 894.0 ft in Crystalline Rock (Granitic Gneiss) - Drilled Through Existing Bridge Deck

NCDOT BORE SINGLE B5527_GEO_BRDG_LNB_REV2UPDATED.GPJ NC_DOT.GDT 3/15/23

GEOTECHNICAL BORING REPORT
CORE LOG

WBS 55027.1.FS1	**TIP** B-5527	**COUNTY** SURRY	**GEOLOGIST** Shipman, M.	
SITE DESCRIPTION BRIDGE NO. 122 OVER TOMS CREEK ON US 52 NB				**GROUND WTR (ft)**
BORING NO. LNB_B1A	**STATION** 22+78	**OFFSET** 7 ft LT	**ALIGNMENT** -LNB-	**0 HR.** N/A
COLLAR ELEV. 927.3 ft	**TOTAL DEPTH** 33.3 ft	**NORTHING** 966,746	**EASTING** 1,560,990	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE SUM3123 CME-550X 86% 11/2/2021		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER Moseley, M.B.	**START DATE** 07/22/22	**COMP. DATE** 07/22/22	**SURFACE WATER DEPTH** N/A	
CORE SIZE NQ2	**TOTAL RUN** 21.4 ft			

ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS
											ELEV. (ft) DEPTH (ft)
915.4											Begin Coring @ 11.9 ft
	915.4	11.9	1.4	1:52/1.0 0:41/0.4	(1.1) 79%	(1.1) 79%				914.1	**CRYSTALLINE ROCK** 13.2
	914.0	13.3	5.0	2:45/1.0 2:18/1.0 2:23/1.0 2:22/1.0 2:12/1.0	(4.3) 86%	(3.7) 74%					white and gray, slight to moderate weathering, moderately hard to hard, close fracture spacing, GRANITIC GNEISS GSI: 75-80 *(continued)*
910	909.0	18.3	5.0	3:01/1.0 3:27/1.0 2:08/1.0 2:06/1.0 3:27/1.0	(5.0) 100%	(3.9) 78%					white and gray to dark gray, very slight to slight weathering, moderately hard to hard, close to moderately close fracture spacing, GRANITIC GNEISS GSI: 80-85
905	904.0	23.3	5.0	2:14/1.0 2:32/1.0 1:54/1.0 1:54/1.0 1:57/1.0	(4.7) 94%	(3.9) 78%					
900	899.0	28.3	5.0	2:08/1.0 2:21/1.0 2:41/1.0 2:14/1.0 2:51/1.0	(5.0) 100%	(5.0) 100%				899.1	28.2 dark gray and white, very slight to fresh weathering, hard, moderately close fracture spacing, GRANITIC GNEISS GSI: 85-90
895	894.0	33.3								894.0	33.3 Boring Terminated at Elevation 894.0 ft in Crystalline Rock (Granitic Gneiss) - Drilled Through Existing Bridge Deck

NCDOT CORE SINGLE B5527_GEO_BRDG_LNB_REV2UPDATED.GPJ NC_DOT.GDT 3/15/23

CORE PHOTOGRAPHS

LNB_B1A

BOXES 1 & 2: 11.9 - 30.3 FEET

LNB_B1A

BOX 3: 30.3 - 33.3 FEET

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 55027.1.FS1	**TIP** B-5527	**COUNTY** SURRY	**GEOLOGIST** Shipman, M.	
SITE DESCRIPTION BRIDGE NO. 122 OVER TOMS CREEK ON US 52 NB				**GROUND WTR (ft)**
BORING NO. LNB_B1B	**STATION** 22+77	**OFFSET** 10 ft RT	**ALIGNMENT** -LNB-	**0 HR.** N/A
COLLAR ELEV. 927.5 ft	**TOTAL DEPTH** 24.7 ft	**NORTHING** 966,745	**EASTING** 1,561,008	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE SUM3123 CME-550X 86% 11/2/2021		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER Moseley, M.B.	**START DATE** 07/19/22	**COMP. DATE** 07/19/22	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
930										ELEV. (ft) DEPTH (ft)
										927.5 GROUND SURFACE 0.0
925	924.2	3.3	WOH	WOH	WOH	0		W		**ARTIFICIAL FILL** red-brown, clayey SILT (A-5) with trace mica
920	919.2	8.3	9	91/0.1'		100/0.6	RS-1			918.6 8.9 **CRYSTALLINE ROCK** (Begin Core at 8.9 Feet) (Granitic Gneiss) REC: 96% RQD: 91% GSI: 85-90
915										
910										
905										902.8 24.7 Boring Terminated at Elevation 902.8 ft in Crystalline Rock (Granitic Gneiss) - Drilled Through Existing Bridge Deck

NCDOT BORE SINGLE B5527_GEO_BRDG_LNB_REV2UPDATED.GPJ NC_DOT.GDT 3/15/23

GEOTECHNICAL BORING REPORT
CORE LOG

WBS 55027.1.FS1	**TIP** B-5527	**COUNTY** SURRY	**GEOLOGIST** Shipman, M.	
SITE DESCRIPTION BRIDGE NO. 122 OVER TOMS CREEK ON US 52 NB				**GROUND WTR (ft)**
BORING NO. LNB_B1B	**STATION** 22+77	**OFFSET** 10 ft RT	**ALIGNMENT** -LNB-	**0 HR.** N/A
COLLAR ELEV. 927.5 ft	**TOTAL DEPTH** 24.7 ft	**NORTHING** 966,745	**EASTING** 1,561,008	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE SUM3123 CME-550X 86% 11/2/2021		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER Moseley, M.B.	**START DATE** 07/19/22	**COMP. DATE** 07/19/22	**SURFACE WATER DEPTH** N/A	
CORE SIZE NQ2	**TOTAL RUN** 15.8 ft			

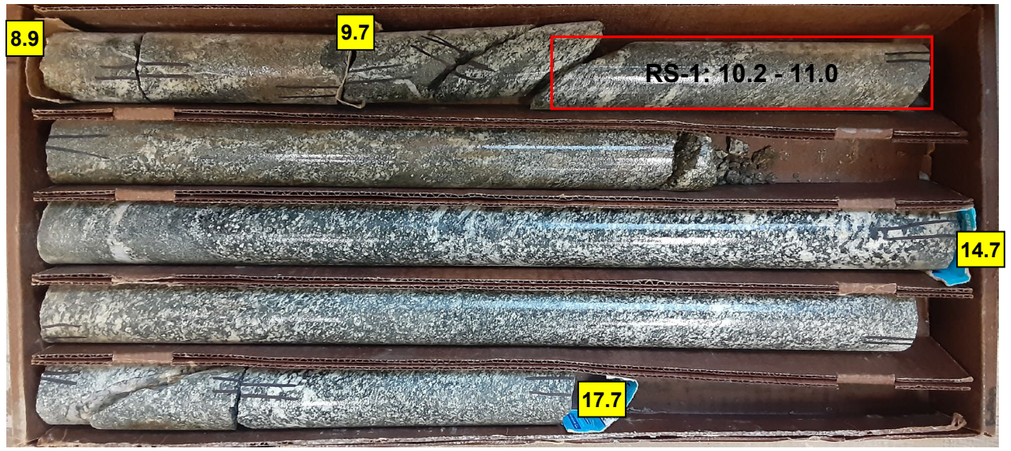
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS
918.6											ELEV. (ft) DEPTH (ft) Begin Coring @ 8.9 ft
	918.6	8.9	0.8	1:12/0.8	(0.6)	(0.4)					918.6 8.9 **CRYSTALLINE ROCK** gray and white, slight to fresh weathering, close to wide fracture spacing, GRANITIC GNEISS GSI: 85-90
	917.8	9.7	5.0	2:06/1.0 1:36/1.0 1:45/1.0 2:22/1.0 1:46/1.0	75% (4.7) 94%	50% (4.3) 86%	RS-1				
915											
	912.8	14.7	5.0	1:34/1.0 2:08/1.0 1:21/1.0 2:10/1.0 1:43/1.0	(5.0) 100%	(4.6) 92%					
910											
	907.8	19.7	5.0	2:00/1.0 2:00/1.0 2:14/1.0 1:56/1.0 2:48/1.0	(5.0) 100%	(5.0) 100%					
905											
	902.8	24.7									902.8 24.7 Boring Terminated at Elevation 902.8 ft in Crystalline Rock (Granitic Gneiss) - Drilled Through Existing Bridge Deck

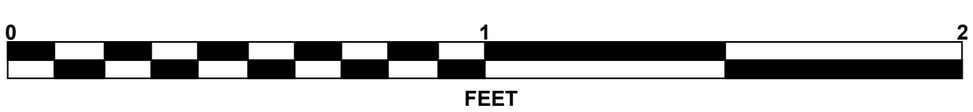
NCDOT CORE SINGLE B5527_GEO_BRDG_LNB_REV2UPDATED.GPJ NC_DOT.GDT 3/15/23

CORE PHOTOGRAPHS

LNB-B1B

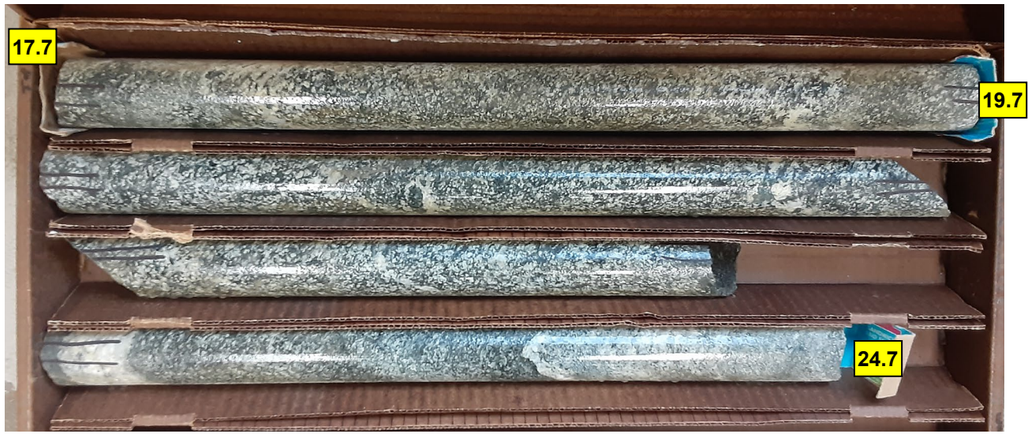
BOX 1: 8.9 - 17.7 FEET

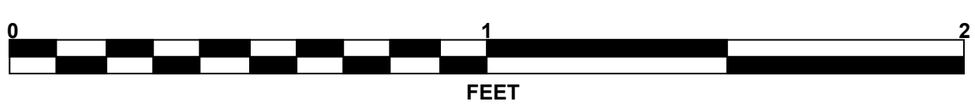




LNB_B1B

BOX 2: 17.7 - 24.7 FEET





GEOTECHNICAL BORING REPORT
BORE LOG

WBS 55027.1.FS1	**TIP** B-5527	**COUNTY** SURRY	**GEOLOGIST** Shipman, M.	
SITE DESCRIPTION BRIDGE NO. 122 OVER TOMS CREEK ON US 52 NB				**GROUND WTR (ft)**
BORING NO. LNB_B2A	**STATION** 23+58	**OFFSET** 7 ft LT	**ALIGNMENT** -LNB-	**0 HR.** N/A
COLLAR ELEV. 934.4 ft	**TOTAL DEPTH** 27.0 ft	**NORTHING** 966,826	**EASTING** 1,560,989	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE SUM3123 CME-550X 86% 11/2/2021		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER Moseley, M.B.	**START DATE** 07/21/22	**COMP. DATE** 07/21/22	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
										ELEV. (ft) DEPTH (ft)
935	934.4	0.0								934.4 GROUND SURFACE 0.0
			6	1	1	2		W		**ALLUVIAL** brown to gray, silty SAND (A-2-4) with trace organics and trace gravel-sized rock fragments
930	930.4	4.0								(no sample recovered in 4.0 ft drive)
			1	1	1	2				(very hard drilling through layers of boulders and cobbles from 4.0'-9.8')
925	924.6	9.8	60/0.0'			60/0.0'				924.6 9.8 **NON-CRYSTALLINE ROCK** (Begin Core at 9.8 feet)
										922.1 12.3 (Concrete with Aggregate) REC: 100% RQD: 100% GSI: 95-100
920										**CRYSTALLINE ROCK** (Granitic Gneiss)
915										REC: 98% RQD: 91% GSI: 90-95
910										907.4 27.0 Boring Terminated at Elevation 907.4 ft in Crystalline Rock (Granitic Gneiss)
										- Drilled Through Existing Bridge Deck

NCDOT BORE DOUBLE B5527_GEO_BRDG_LNB_REV2UPDATED.GPJ NC_DOT.GDT 2/24/23

GEOTECHNICAL BORING REPORT
CORE LOG

WBS 55027.1.FS1	**TIP** B-5527	**COUNTY** SURRY	**GEOLOGIST** Shipman, M.	
SITE DESCRIPTION BRIDGE NO. 122 OVER TOMS CREEK ON US 52 NB				**GROUND WTR (ft)**
BORING NO. LNB_B2A	**STATION** 23+58	**OFFSET** 7 ft LT	**ALIGNMENT** -LNB-	**0 HR.** N/A
COLLAR ELEV. 934.4 ft	**TOTAL DEPTH** 27.0 ft	**NORTHING** 966,826	**EASTING** 1,560,989	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE SUM3123 CME-550X 86% 11/2/2021		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER Moseley, M.B.	**START DATE** 07/21/22	**COMP. DATE** 07/21/22	**SURFACE WATER DEPTH** N/A	
CORE SIZE NQ2	**TOTAL RUN** 17.2 ft			

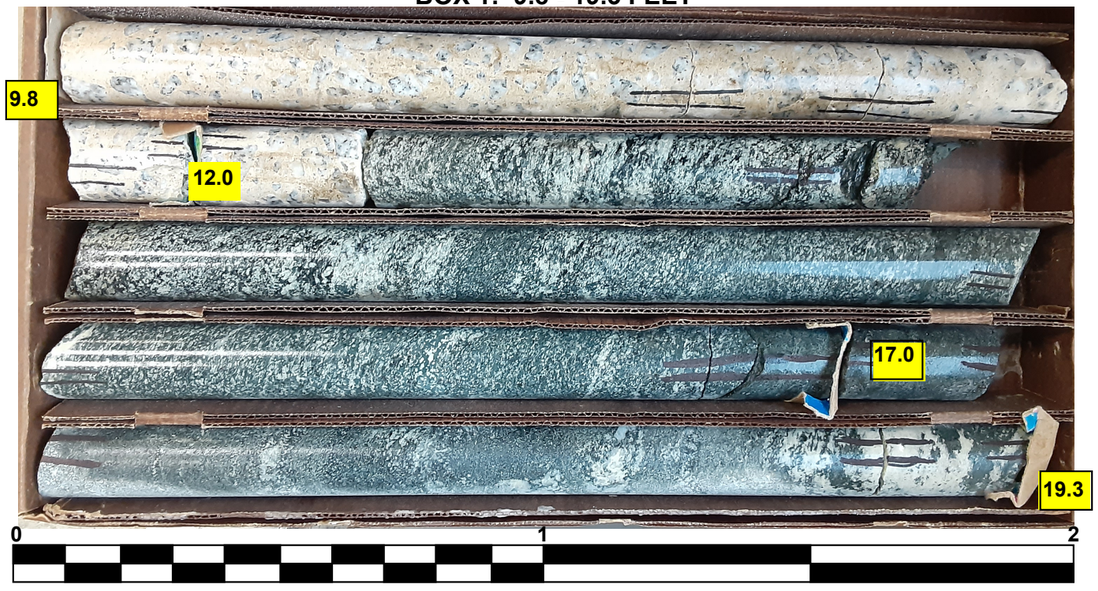
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS
											ELEV. (ft) DEPTH (ft)
924.6											Begin Coring @ 9.8 ft
	924.6	9.8	2.2	*N=60/0.0'*	(2.2)	(2.2)					924.6 9.8 **NON-CRYSTALLINE ROCK**
	922.4	12.0		2:51/1.0 3:15/1.0	100%	100%					922.1 12.3 CONCRETE WITH AGGREGATE
920			5.0	0.54/0.2	(4.9)	(4.4)					GSI: 95-100
				2:39/1.0 2:27/1.0 2:23/1.0 2:34/1.0	98%	88%					**CRYSTALLINE ROCK**
	917.4	17.0		2:05/1.0							green-gray and white, fresh to moderate weathering, moderately hard to hard, close to moderately close fracture spacing, GRANITIC GNEISS
915			5.0	2:25/1.0 2:44/1.0 2:59/1.0 2:17/1.0	(4.8) 96%	(4.8) 96%					GSI: 90-95
	912.4	22.0		2:28/1.0							
910			5.0	2:16/1.0 2:04/1.0 2:01/1.0 1:39/1.0	(5.0) 100%	(4.5) 90%					
	907.4	27.0		1:56/1.0							907.4 27.0 Boring Terminated at Elevation 907.4 ft in Crystalline Rock (Granitic Gneiss)
											- Drilled Through Existing Bridge Deck

NCDOT CORE SINGLE B5527_GEO_BRDG_LNB_REV2UPDATED.GPJ NC_DOT.GDT 3/15/23

CORE PHOTOGRAPHS

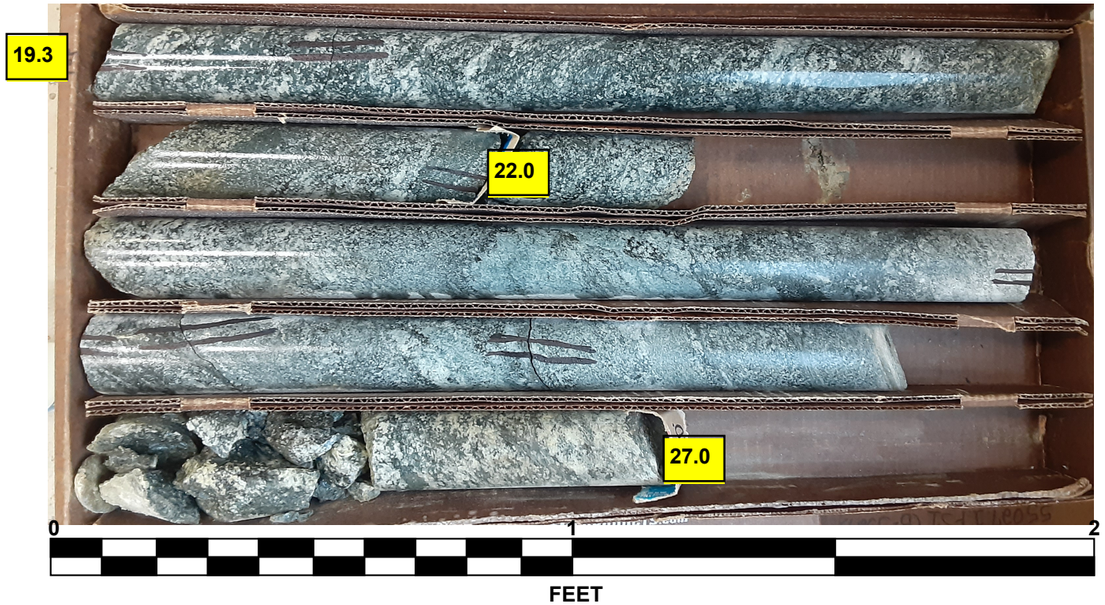
LNB_B2A

BOX 1: 9.8 - 19.3 FEET



LNB_B2A

BOX 2: 19.3 - 27.0 FEET



GEOTECHNICAL BORING REPORT
BORE LOG

WBS 55027.1.FS1	**TIP** B-5527	**COUNTY** SURRY	**GEOLOGIST** Shipman, M.	
SITE DESCRIPTION BRIDGE NO. 122 OVER TOMS CREEK ON US 52 NB				**GROUND WTR (ft)**
BORING NO. LNB_B2B	**STATION** 23+57	**OFFSET** 10 ft RT	**ALIGNMENT** -LNB-	**0 HR.** N/A
COLLAR ELEV. 934.1 ft	**TOTAL DEPTH** 27.0 ft	**NORTHING** 966,825	**EASTING** 1,561,007	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE SUM3123 CME-550X 86% 11/2/2021		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER Moseley, M.B.	**START DATE** 07/20/22	**COMP. DATE** 07/20/22	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
935	934.1	0.0								934.1 GROUND SURFACE 0.0
			3	64	4	68		W		**ALLUVIAL** brown to gray, silty SAND (A-2-4) with no to trace organics, mica, and gravel-sized rock fragments
930	929.1	5.0								(layer of boulders/cobbles from 0.8'-1.0')
			2	1	0			W		
925	924.1	10.0								
			3	3	97/0.4'	100/.9 60/0.0				923.1 11.0
	921.6	12.5	60/0.0'							921.6 **WEATHERED ROCK** (Granitic Gneiss) 12.5
920										**CRYSTALLINE ROCK** (Begin Core at 12.5 Feet)
										(Granitic Gneiss)
915										REC: 97% RQD: 94% GSI: 85-90
910										
										907.1 27.0
										Boring Terminated at Elevation 907.1 ft in Crystalline Rock (Granitic Gneiss)
										- Drilled Through Existing Bridge Deck

NCDOT CORE DOUBLE B5527_GEO_BRDG_LNB_REV2UPDATED.GPJ NC_DOT.GDT 2/24/23

GEOTECHNICAL BORING REPORT
CORE LOG

WBS 55027.1.FS1	**TIP** B-5527	**COUNTY** SURRY	**GEOLOGIST** Shipman, M.	
SITE DESCRIPTION BRIDGE NO. 122 OVER TOMS CREEK ON US 52 NB				**GROUND WTR (ft)**
BORING NO. LNB_B2B	**STATION** 23+57	**OFFSET** 10 ft RT	**ALIGNMENT** -LNB-	**0 HR.** N/A
COLLAR ELEV. 934.1 ft	**TOTAL DEPTH** 27.0 ft	**NORTHING** 966,825	**EASTING** 1,561,007	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE SUM3123 CME-550X 86% 11/2/2021		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER Moseley, M.B.	**START DATE** 07/20/22	**COMP. DATE** 07/20/22	**SURFACE WATER DEPTH** N/A	
CORE SIZE NQ2	**TOTAL RUN** 14.5 ft			

ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS ELEV. (ft) DEPTH (ft)
921.6											Begin Coring @ 12.5 ft
920	921.6	12.5	4.5	N=60/0.0' 2:32/1.0 1:51/1.0 1:46/1.0 1:43/1.0 0:36/0.5	(4.5) 100%	(4.3) 96%					921.6 **CRYSTALLINE ROCK** 12.5 gray to blue-gray and white, slight to fresh weathering, moderately hard to hard, close to wide fracture spacing, GRANITIC GNEISS
	917.1	17.0									GSI: 85-90
915			5.0	1:56/1.0 2:52/1.0 2:25/1.0 2:40/1.0 3:10/1.0	(5.0) 100%	(4.7) 94%					
	912.1	22.0									
910			5.0	1:55/1.0 2:20/1.0 2:12/1.0 2:26/1.0 1:40/1.0	(4.7) 94%	(4.4) 88%					
	907.1	27.0									907.1 27.0
											Boring Terminated at Elevation 907.1 ft in Crystalline Rock (Granitic Gneiss)
											- Drilled Through Existing Bridge Deck

NCDOT CORE SINGLE B5527_GEO_BRDG_LNB_REV2UPDATED.GPJ NC_DOT.GDT 3/15/23

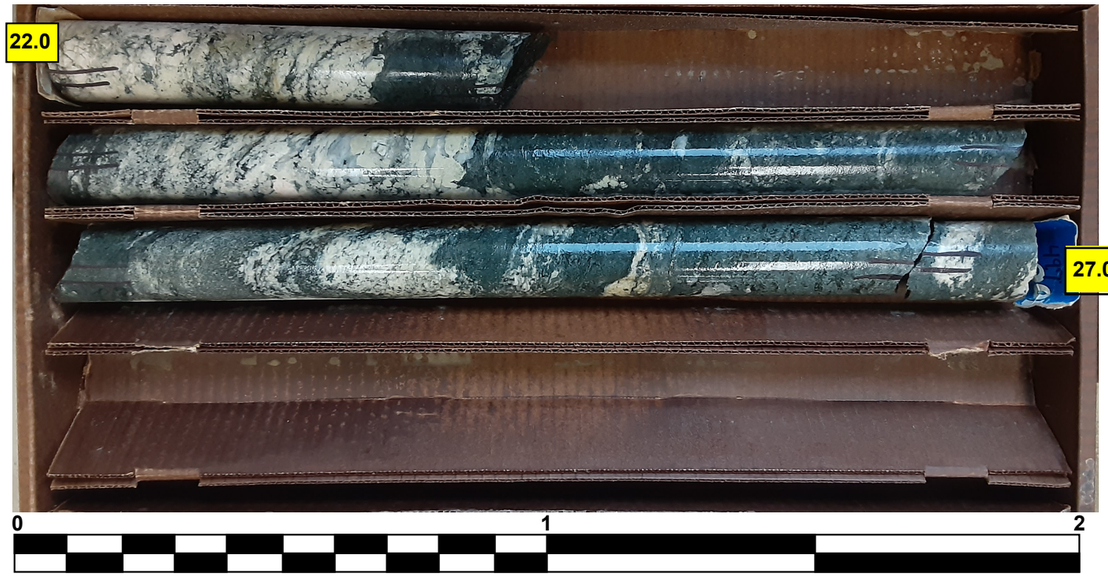
CORE PHOTOGRAPHS

LNB_B2B

BOX 1: 12.5 - 22.0 FEET

LNB_B2B

BOX 2: 22.0 - 27.0 FEET



GEOTECHNICAL BORING REPORT
BORE LOG

WBS 55027.1.FS1	**TIP** B-5527	**COUNTY** SURRY	**GEOLOGIST** Gross, A.	
SITE DESCRIPTION BRIDGE NO. 122 OVER TOMS CREEK ON US 52 NB				**GROUND WTR (ft)**
BORING NO. LNB_EB2A	**STATION** 24+33	**OFFSET** 10 ft LT	**ALIGNMENT** -LNB-	**0 HR.** 35.5
COLLAR ELEV. 958.2 ft	**TOTAL DEPTH** 41.5 ft	**NORTHING** 966,901	**EASTING** 1,560,986	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE SUM3123 CME-550X 86% 11/2/2021		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Moseley, M.B.	**START DATE** 03/01/22	**COMP. DATE** 03/01/22	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
										ELEV. (ft) DEPTH (ft)
960										
										958.2 GROUND SURFACE 0.0
										957.2 **ROADWAY EMBANKMENT** 1.0
										CONCRETE
955	954.5	3.7	2	2	3	5	SS-75	D		red-brown to red, slightly to moderately plastic, highly sandy, silty CLAY (A-7-5) with trace mica
950	949.5	8.7	5	4	3	7		D		
945	944.5	13.7	3	3	3	6	SS-77	D		
										940.7 17.5
940	939.5	18.7	8	6	4	10	SS-78	M		**ALLUVIAL** red-brown to red-tan, silty SAND (A-2-4) with little clay
935	934.5	23.7	2	3	3	6	SS-79	M		
										931.7 26.5
										930.2 red-brown to red-tan, GRAVEL (A-1-a) with some sand (rounded grains) 28.0
930	929.5	28.7	70	30/0.0		100/0.5				**WEATHERED ROCK** (Granitic Gneiss)
925	924.5	33.7	12	75	25/0.1	100/0.6		▽		
920	919.5	38.7	100/0.2			100/0.2				
	916.7	41.5	60/0.0			60/0.0				916.7 41.5
										CRYSTALLINE ROCK (Granitic Gneiss) Boring Terminated with Standard Penetration Test Refusal at Elevation 916.7 ft on Crystalline Rock (Granitic Gneiss)
										- Topsoil Thickness = N/A
										- Boring drilled through existing roadway.

NCDOT BORE DOUBLE B5527_GEO_BRDG_LNB_REV2UPDATED.GPJ NC_DOT.GDT 2/24/23

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 55027.1.FS1	**TIP** B-5527	**COUNTY** SURRY	**GEOLOGIST** Fischer, H. & Gross, A.	
SITE DESCRIPTION BRIDGE NO. 122 OVER TOMS CREEK ON US 52 NB				**GROUND WTR (ft)**
BORING NO. LNB_EB2B	**STATION** 24+33	**OFFSET** 65 ft RT	**ALIGNMENT** -LNB-	**0 HR.** N/A
COLLAR ELEV. 939.2 ft	**TOTAL DEPTH** 26.0 ft	**NORTHING** 966,902	**EASTING** 1,561,061	**24 HR.** Caved
DRILL RIG/HAMMER EFF./DATE SUM3123 CME-550X 86% 11/2/2021		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER Moseley, M.B.	**START DATE** 02/23/22	**COMP. DATE** 03/02/22	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
940										
	939.2	0.0	2	1	1	2	SS-41	M		939.2 GROUND SURFACE 0.0 **ALLUVIAL** tan, slightly plastic, sandy CLAY (A-6)
										936.7 2.5 brown, tan, orange, and white, silty SAND (A-2-4) with little clay and gravel
935	935.2	4.0	6	3	6	9	SS-42	M		
										931.9 7.3 **WEATHERED ROCK** (Granitic Gneiss)
930	930.2	9.0	30	70/0.3		100/0.8				
	928.2	11.0	60/0.0			60/0.0				928.2 11.0 **CRYSTALLINE ROCK** (Begin Core at 11.0 Feet) (Granitic Gneiss) REC: 88% RQD: 64% GSI: 60-65
925										923.2 16.0 (Granitic Gneiss) REC: 44% RQD: 0% GSI: 25-30
920										917.9 21.3 (Granitic Gneiss) REC: 98% RQD: 96% GSI: 85-90
915										913.2 26.0 Boring Terminated at Elevation 913.2 ft in Crystalline Rock (Granitic Gneiss) - Topsoil Thickness = 0.0 Feet - Boring deepened on 3/2/22 to confirm in-situ bedrock.

GEOTECHNICAL BORING REPORT
CORE LOG

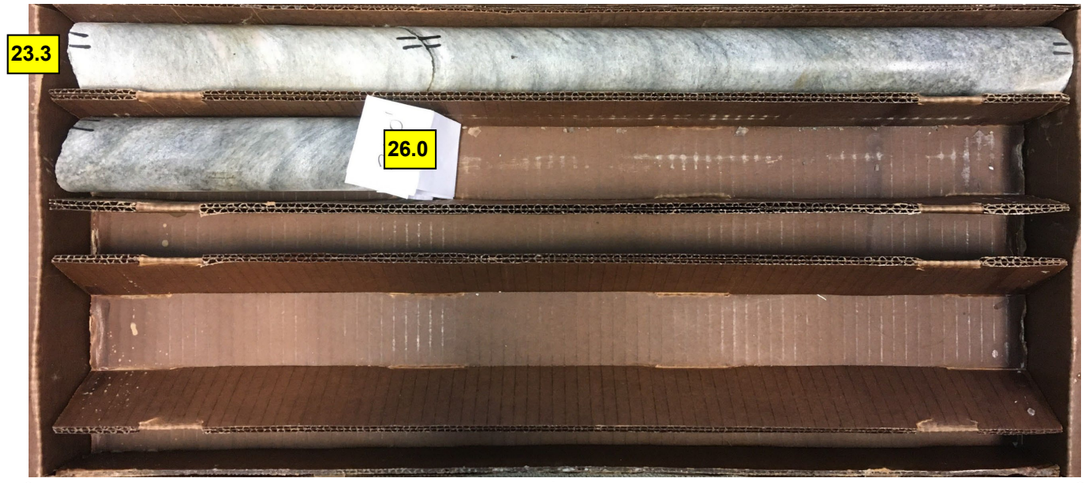
WBS 55027.1.FS1	**TIP** B-5527	**COUNTY** SURRY	**GEOLOGIST** Fischer, H. & Gross, A.	
SITE DESCRIPTION BRIDGE NO. 122 OVER TOMS CREEK ON US 52 NB				**GROUND WTR (ft)**
BORING NO. LNB_EB2B	**STATION** 24+33	**OFFSET** 65 ft RT	**ALIGNMENT** -LNB-	**0 HR.** N/A
COLLAR ELEV. 939.2 ft	**TOTAL DEPTH** 26.0 ft	**NORTHING** 966,902	**EASTING** 1,561,061	**24 HR.** Caved
DRILL RIG/HAMMER EFF./DATE SUM3123 CME-550X 86% 11/2/2021		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER Moseley, M.B.	**START DATE** 02/23/22	**COMP. DATE** 03/02/22	**SURFACE WATER DEPTH** N/A	
CORE SIZE NQ2	**TOTAL RUN** 15.0 ft			

ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS
928.23											Begin Coring @ 11.0 ft
	928.2	11.0	5.0	*N=60/0.0* 0:46/1.0 2:02/1.0 3:27/1.0 2:15/1.0 2:05/1.0	(4.4) 88%	(3.2) 64%		(4.4) 88%	(3.2) 64%		928.2 **CRYSTALLINE ROCK** 11.0 white, gray, black, and brown, very slight to moderate severe weathering (very severe weathering 12.1' - 12.7'), medium hard to hard, close fracture spacing, GRANITIC GNEISS
925											923.2 16.0 GSI: 60-65 dark gray and brown, moderate to moderate severe weathering, medium hard to moderately hard, close to very close fracture spacing, GRANITIC GNEISS
	923.2	16.0	5.0	0:40/1.0 0:43/1.0 0:54/1.0 0:52/1.0 0:57/1.0	(1.9) 38%	(0.0) 0%		(2.2) 42%	(0.0) 0%		917.9 21.3 GSI: 25-30 white, gray, and black, fresh to very slight weathering, hard to very hard, moderately close fracture spacing, GRANITIC GNEISS
920											913.2 26.0 GSI: 85-90 Boring Terminated at Elevation 913.2 ft in Crystalline Rock (Granitic Gneiss) - Topsoil Thickness = 0.0 Feet - Boring deepened on 3/2/22 to confirm in-situ bedrock.
	918.2	21.0	5.0	1:22/1.0 2:47/1.0 1:56/1.0 1:21/1.0 1:30/1.0	(4.9) 98%	(4.5) 90%		(4.6) 98%	(4.5) 96%		
915											
	913.2	26.0									

CORE PHOTOGRAPHS

LNB_EB2B
BOX 1: 11.0 - 23.3 FEET

LNB_EB2B
BOX 2: 23.3 - 26.0 FEET



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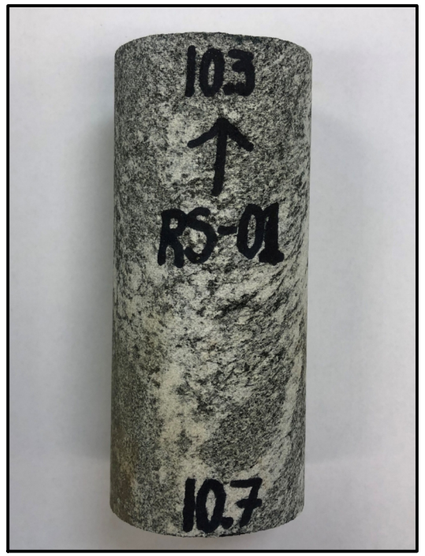
UNCONFINED COMPRESSIVE STRENGTH OF ROCK

ASTM D7012

Project No.: 55027	**Tested By:** C. Sullivan	**Test Date:** 2022-15-09
Project Name: B-5527		
Boring ID: LNB_B1B	**Sample ID:** RS-01	**Sample Depth:** 10.3-10.7 ft
Sample Description: Gray Schist		

Initial Specimen Measurements

Diameter: 1.950 in L/D: 2.27
Area: 2.986 in^2
Length: 4.43 in
Weight: 619.4 g
Unit Weight: 178.4 pcf



LOAD TEST DATA

Deflection Reading (in)	Load Reading (lb)	Strain (%)	Stress (psi)
0.000	0	0.000	0
0.005	1040	0.113	350
0.010	2500	0.226	840
0.015	6700	0.339	2240
0.020	17500	0.451	5860
0.025	31200	0.564	10450
0.029	40780	0.655	13650

Strain Rate: %/min

Failure Mode:

Remarks:

Note: Uniaxial compressive strength was determined in general accordance with ASTM D7012-14 Method C. Deflection, Strain, and Young's modulus (E) data is provided for reference only and is not intended to be in accordance with ASTM D7012-14 Method D as deflection and strain is not measured in accordance with that procedure. Young's Modulus is calculated using this data to determine the secant modulus at each data interval per Figure 2 (C) in ASTM D 7012-14.