REFERENCE: B-6051/U-6143

PROJECT: 48708

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-6051/U-6143	1	

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

STRUCTURE SUBSURFACE INVESTIGATION

COUNTY GASTON AND MECKLENBURG

PROJECT DESCRIPTION BRIDGE NO. 91 OVER CATAWBA RIVER ON US 29/US 74 AND INTERSECTION IMPROVEMENTS ON US 29/US 74 (WILKINSON BLVD) AND NC 7 (CATAWBA ST)

CONTENTS

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Gregory Goins 05/31/2023
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PROJECT REFERENCE NO.	SHEET NO.
B-6051/U-6143	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 LOOSE MEDIUM DENSE DENSE VERY DENSE	< 4 4 TO 10 10 TO 30 30 TO 50 > 50	N/A
GENERALLY SILT-CLAY MATERIAL (COHESIVE)	VERY SOFT SOFT MEDIUM STIFF STIFF VERY STIFF HARD	< 2 2 TO 4 4 TO 8 8 TO 15 15 TO 30 > 30	< 0.25 0.25 TO 0.5 0.5 TO 1.0 1 TO 2 2 TO 4 > 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
PLASTIC RANGE (PI): LL — LIQUID LIMIT		
	- WET - (W)	SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE
PL — PLASTIC LIMIT		
OM — OPTIMUM MOISTURE SL — SHRINKAGE LIMIT	- MOIST - (M)	SOLID; AT OR NEAR OPTIMUM MOISTURE
	- 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-550
- [ ] VANE SHEAR TEST
- [ ] PORTABLE HOIST
- [X] CME 45B
- [X] B-57

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

HAMMER TYPE:
- [X] AUTOMATIC [ ] MANUAL

CORE SIZE:
- [ ] -B ____ [ ] -H ____
- [X] -N W-2

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: N/A

ELEVATION: N/A FEET

NOTES:

BORING ELEVATIONS WERE DETERMINED AT THE TIME OF DRILLING WITH A SURVEY GRADE GPS UNIT.

ABBREVIATIONS:

FIAD - FILLED IMMEDIATELY AFTER DRILLING
CT - CORING TERMINATED
AR - AUGER AND STANDARD PENETRATION TEST REFUSAL
NA - NOT APPLICABLE / NOT MEASURED

PROJECT REFERENCE NO.	SHEET NO.
B-6051/U-6143	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

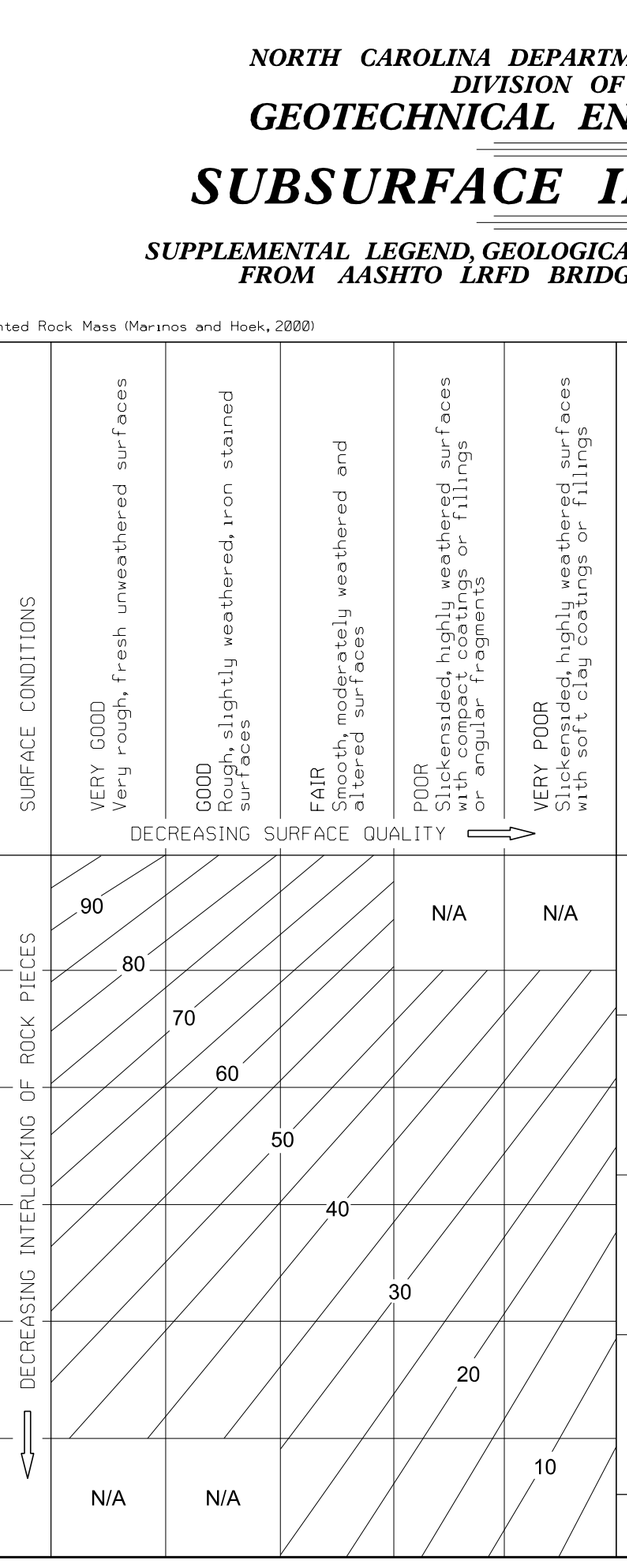
AASHTO LRFD Figure 10.4.6.4-1 — Determination of GSI for Jointed Rock Mass (Marinos and Hoek, 2000)

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

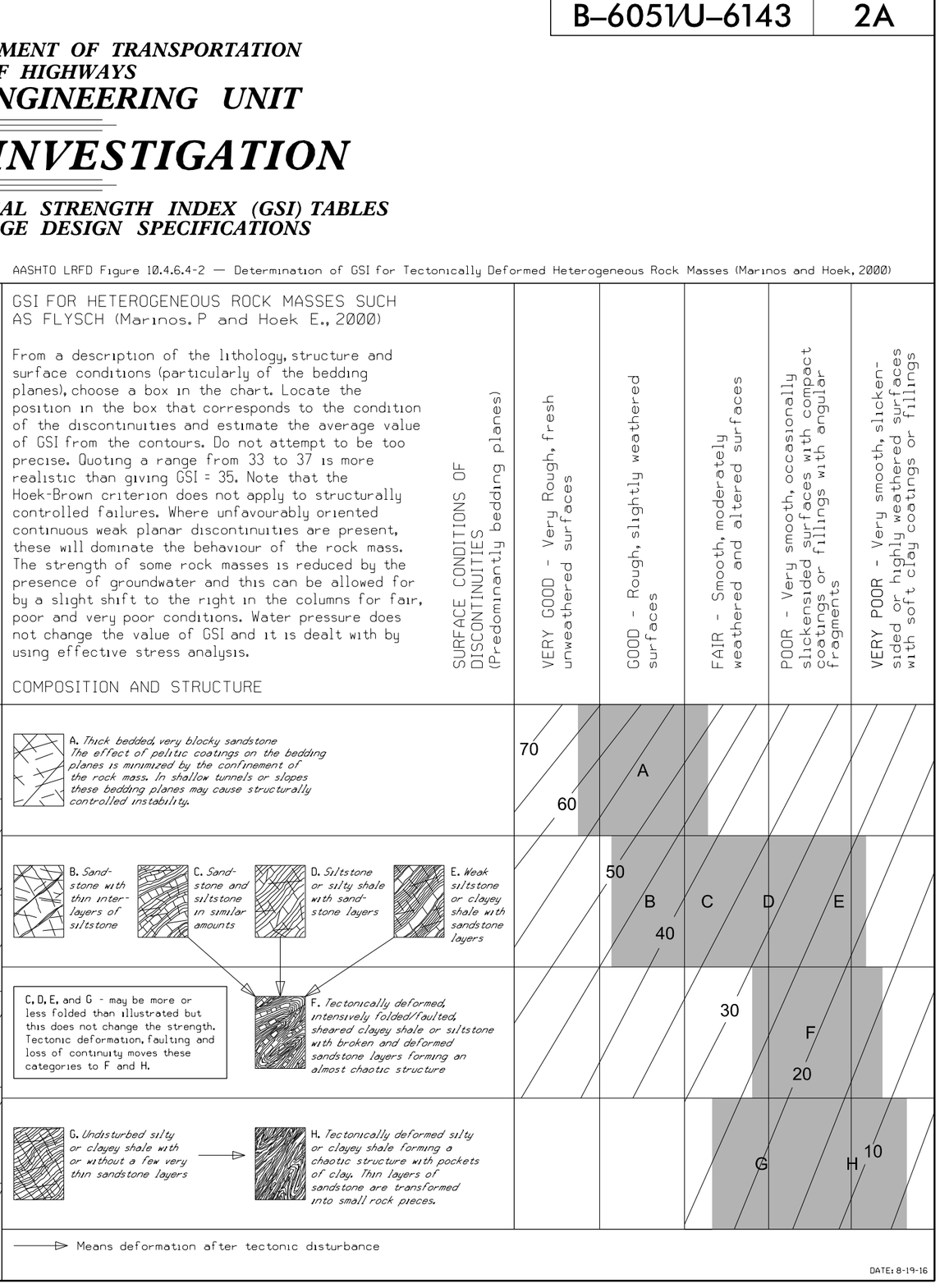


AASHTO LRFD Figure 10.4.6.4-2 — Determination of GSI for Tectonically Deformed Heterogeneous Rock Masses (Marinos and Hoek, 2000)

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



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.*

B. *Sandstone with thin interlayers of siltstone*

C. *Sandstone and siltstone in similar amounts*

D. *Siltstone or silty shale with sandstone layers*

E. *Weak siltstone or clayey shale with sandstone layers*

C, D, E, and G - may be more or less folded than illustrated but this does not change the strength. Tectonic deformation, faulting and loss of continuity moves these categories to F and H.

F. *Tectonically deformed, intensively folded/faulted, sheared clayey shale or siltstone with broken and deformed sandstone layers forming an almost chaotic structure*

G. *Undisturbed silty or clayey shale with or without a few very thin sandstone layers* → H. *Tectonically deformed silty or clayey shale forming a chaotic structure with pockets of clay. Thin layers of sandstone are transformed into small rock pieces.*

→ Means deformation after tectonic disturbance

DATE: 8-19-16

PROJECT REFERENCE NO.	SHEET NO.
B-6051/U-6143	3

SITE PLAN

0 50 100

FEET

NAD 83/NA 2011

MATCHLINE –L– STA. 45+00.00 SEE SHEET 4

CONC

GR

WOODS

END BENT 1
40+70.00

BRIDGE 350091

BENT 4
44+77.50

EBI-A

EBI-C

EBI-D

EBI-B

BST

SOIL

CONC ISL

15" RCP

15" CMP

EXISTING R/W

US 29/74 WILKINSON BLVD BST VARIES

40+00

42+00

12+00

11+00

BI-D

BI-B

B2-A

B2-C

B2-D

B2-B

B3-A

B3-C

B3-D

B3-B

B4-D

B4-B

BENT 1
41+80.00

BENT 2
42+90.00

BENT 3
44+00.00

EIP

TV FO

SKEW = 90 DEGREES

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blamer

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
B-6051/U-6143	4

SITE PLAN

0 50 100

FEET

NAD 83/NA 2011

MATCHLINE –L– STA. 45+00.00 SEE SHEET 3

MATCHLINE –L– STA. 52+00.00 SEE SHEET 5

BENT 5
45+55.00

CATAWBA RIVER

GASTON COUNTY
MECKLENBURG COUNTY

BRIDGE 350091

BENT 10
59+05.00

B6-A

B7-A

B8-A

B9-A

B6-C

B6-D

B7-C

B7-D

B8-C

B8-D

B9-C

B9-D

B10-A

B10-C

B10-D

B5-D

B5-B

B6-B (2)

B6-B

B7-B

B8-B

B9-B

B10-B

B4-B

–L–

46+00

50+00

TC

TV FO

EXISTING R/W

JS

F

BENT 6
46+65.00

BENT 7
47+75.00

BENT 8
48+85.00

BENT 9
49+95.00

SKEW = 90 DEGREES

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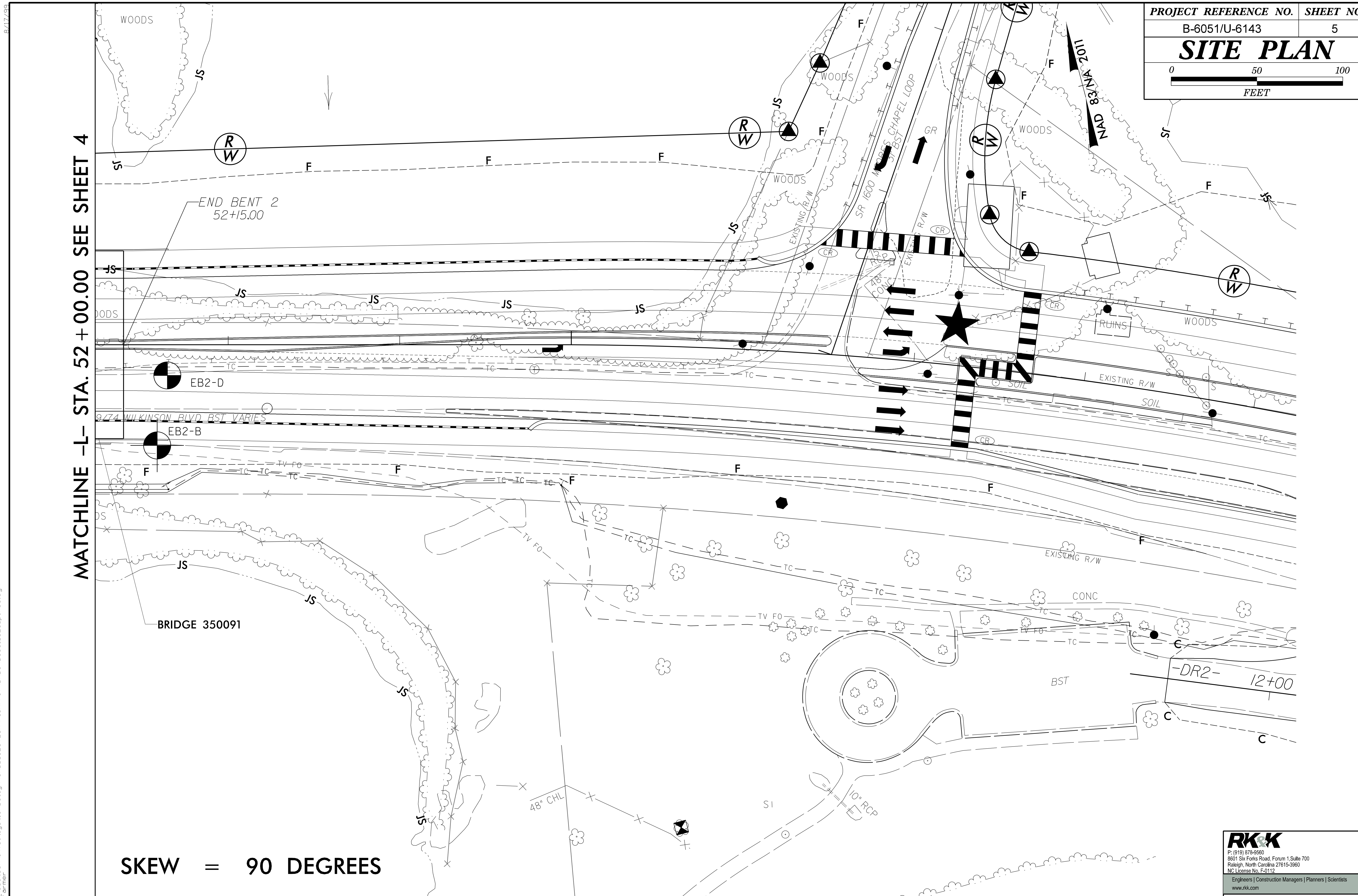
blarmer

PROJECT REFERENCE NO.	SHEET NO.
B-6051/U-6143	5

SITE PLAN



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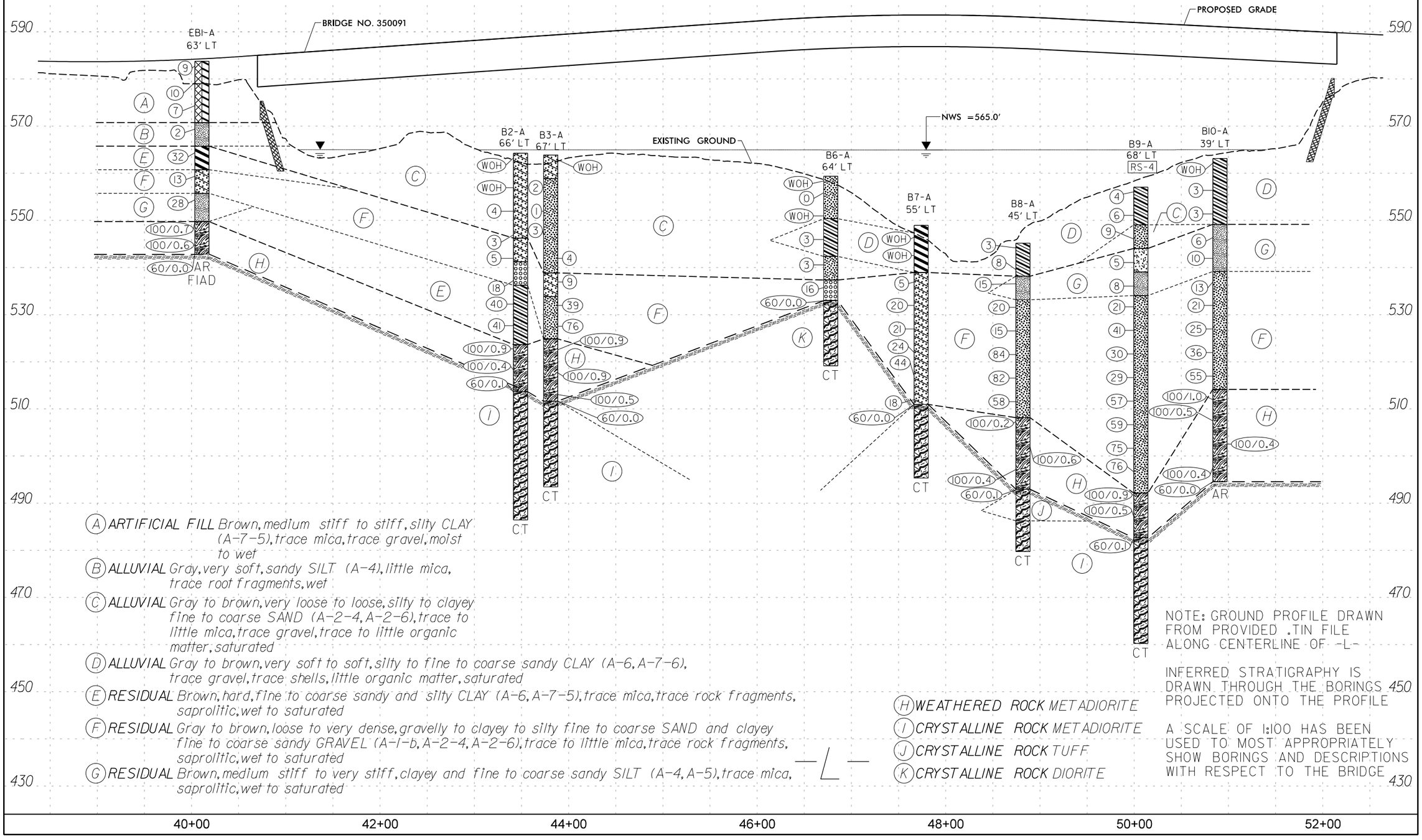
PROJECT REFERENCE NO.	SHEET NO.
B-6051/U-6143	6

PROFILE THROUGH A LINE
BORINGS PROJECTED ALONG –L–

0 100 200
FEET
VE = 5:1

ROCK TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	HEIGHT (in)	DIAMETER (in)	AREA (sq in)	H:D	Mass (g)	Unit Weight (pcf)	Load (lbs)	Comp. Strength (psi)
RS-4	50+07	68 LT	82.4 - 83.0	4.13	2.00	3.14	2.07	620.22	182.2	84990	27067



(A) **ARTIFICIAL FILL** *Brown, medium stiff to stiff, silty CLAY (A-7-5), trace mica, trace gravel, moist to wet*

(B) **ALLUVIAL** *Gray, very soft, sandy SILT (A-4), little mica, trace root fragments, wet*

(C) **ALLUVIAL** *Gray to brown, very loose to loose, silty to clayey fine to coarse SAND (A-2-4, A-2-6), trace to little mica, trace gravel, trace to little organic matter, saturated*

(D) **ALLUVIAL** *Gray to brown, very soft to soft, silty to fine to coarse sandy CLAY (A-6, A-7-6), trace gravel, trace shells, little organic matter, saturated*

(E) **RESIDUAL** *Brown, hard, fine to coarse sandy and silty CLAY (A-6, A-7-5), trace mica, trace rock fragments, saprolitic, wet to saturated*

(F) **RESIDUAL** *Gray to brown, loose to very dense, gravelly to clayey to silty fine to coarse SAND and clayey fine to coarse sandy GRAVEL (A-1-b, A-2-4, A-2-6), trace to little mica, trace rock fragments, saprolitic, wet to saturated*

(G) **RESIDUAL** *Brown, medium stiff to very stiff, clayey and fine to coarse sandy SILT (A-4, A-5), trace mica, saprolitic, wet to saturated*

(H) **WEATHERED ROCK** *METADIORITE*

(I) **CRYSTALLINE ROCK** *METADIORITE*

(J) **CRYSTALLINE ROCK** *TUFF*

(K) **CRYSTALLINE ROCK** *DIORITE*

NOTE: GROUND PROFILE DRAWN FROM PROVIDED .TIN FILE ALONG CENTERLINE OF -L-

INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS PROJECTED ONTO THE PROFILE

A SCALE OF 1:100 HAS BEEN USED TO MOST APPROPRIATELY SHOW BORINGS AND DESCRIPTIONS WITH RESPECT TO THE BRIDGE

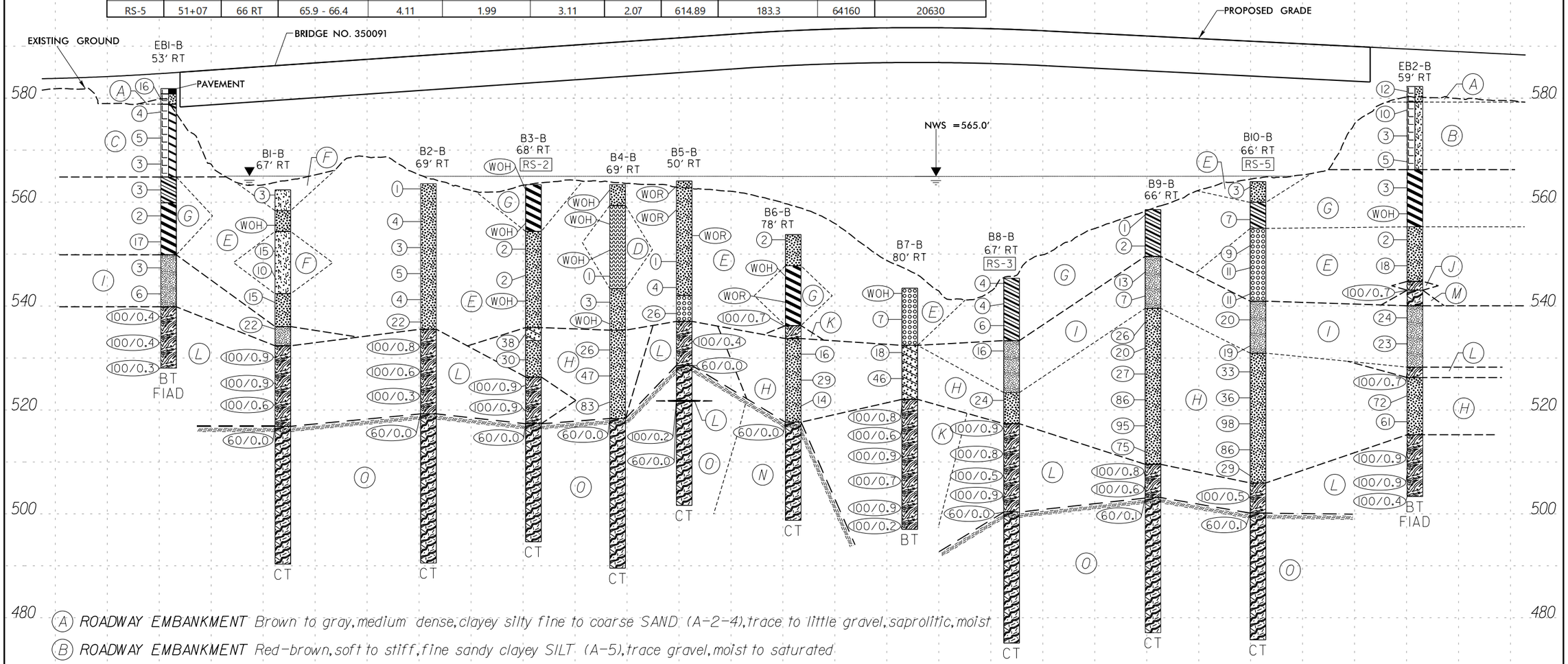
PROJECT REFERENCE NO.	SHEET NO.
B-6051/U-6143	7

PROFILE THROUGH B LINE
BORINGS PROJECTED ALONG –L–

0 100 200
FEET
VE = 5:1

ROCK TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	HEIGHT (in)	DIAMETER (in)	AREA (sq in)	H:D	Mass (g)	Unit Weight (pcf)	Load (lbs)	Comp. Strength (psi)
RS-2	44+10	68 RT	46.3 - 46.7	4.12	1.99	3.11	2.07	578.61	172.0	42470	13656
RS-3	48+70	67 RT	61.9 - 62.5	4.12	1.99	3.11	2.07	622.87	185.2	104440	33582
RS-5	51+07	66 RT	65.9 - 66.4	4.11	1.99	3.11	2.07	614.89	183.3	64160	20630



(A) **ROADWAY EMBANKMENT** *Brown to gray, medium dense, clayey silty fine to coarse SAND (A-2-4), trace to little gravel, saprolitic, moist*

(B) **ROADWAY EMBANKMENT** *Red-brown, soft to stiff, fine sandy clayey SILT (A-5), trace gravel, moist to saturated*

(C) **ROADWAY EMBANKMENT** *Brown, soft to medium stiff, silty CLAY (A-7-5), trace gravel, moist to saturated*

(D) **ALLUVIAL** *Gray, fine sandy clayey MUCK, saturated*

(E) **ALLUVIAL** *Brown to gray to black, very loose to medium dense, clayey to silty fine to coarse SAND (A-1-b, A-2-4, A-2-5), trace mica, trace gravel, trace wood fragments, trace of organic matter, saturated*

(F) **ALLUVIAL** *Dark brown to brown, soft to very stiff, fine sandy clayey SILT (A-5), trace clams, saturated*

(G) **ALLUVIAL** *Dark gray to brown, soft to very stiff, silty to fine to coarse sandy silty to fine to coarse sandy CLAY (A-6, A-7-5, A-7-6), trace mica, trace shells, trace of organic matter, saturated*

(H) **RESIDUAL** *Brown to gray to dark orange, medium dense to very dense, silty to clayey fine to coarse SAND (A-2-4, A-2-6), trace mica, trace rock fragments, saprolitic, saturated*

(I) **RESIDUAL** *Brown to tan to gray, soft to medium stiff, fine to coarse sandy SILT (A-4), trace mica, trace rock fragments, saprolitic, saturated*

(J) **WEATHERED ROCK** *ALLUVIAL BOULDERS*

(K) **WEATHERED ROCK** *DIORITE*

(L) **WEATHERED ROCK** *METADIORITE*

(M) **CRYSTALLINE ROCK** *ALLUVIAL BOULDERS*

(N) **CRYSTALLINE ROCK** *DIORITE*

(O) **CRYSTALLINE ROCK** *METADIORITE*

NOTE: GROUND PROFILE DRAWN FROM PROVIDED .TIN FILE ALONG CENTERLINE OF -L-

INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS PROJECTED ONTO THE PROFILE

A SCALE OF 1:100 HAS BEEN USED TO MOST APPROPRIATELY SHOW BORINGS AND DESCRIPTIONS WITH RESPECT TO THE BRIDGE

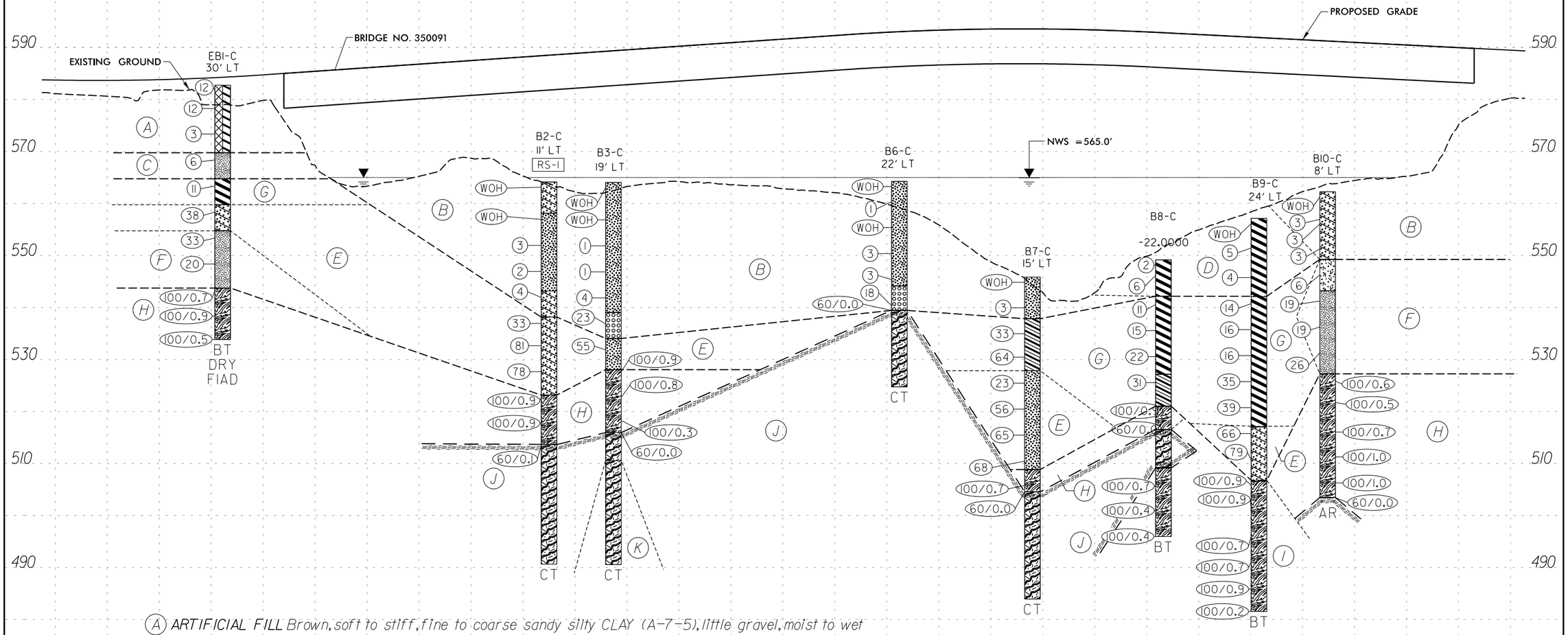
PROJECT REFERENCE NO.	SHEET NO.
B-6051/U-6143	8

PROFILE THROUGH C LINE
BORINGS PROJECTED ALONG –L–

0 100 200
FEET
VE = 5:1

ROCK TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	HEIGHT (in)	DIAMETER (in)	AREA (sq in)	H:D	Mass (g)	Unit Weight (pcf)	Load (lbs)	Comp. Strength (psi)
RS-1	43+55	8 LT	53.5 - 64.3	4.11	1.98	3.08	2.08	602.08	181.2	10610	3445



(A) **ARTIFICIAL FILL** Brown, soft to stiff, fine to coarse sandy silty CLAY (A-7-5), little gravel, moist to wet

(B) **ALLUVIAL** Gray to tan to brown, very loose to medium dense, silty to clayey to gravelly fine to coarse SAND (A-1-a, A-2-4, A-2-6), trace mica, trace of organic matter, saturated

(C) **ALLUVIAL** Gray, medium stiff, fine to coarse sandy SILT (A-4), little mica, trace root fragments, trace gravel, wet

(D) **ALLUVIAL** Gray to brown, very soft to medium stiff, silty CLAY (A-7-5), trace mica, saturated

(E) **RESIDUAL** Gray to red-brown, medium dense to very dense, silty to clayey fine to coarse SAND (A-2-4, A-2-6, A-2-7), trace mica, trace rock fragments, saprolitic, saturated

(F) **RESIDUAL** Brown to gray, fine sandy to clayey SILT (A-4, A-5), saprolitic, saturated

(G) **RESIDUAL** Brown, fine to coarse sandy to silty CLAY (A-6, A-7-5), trace rock fragments, saprolitic, saturated

(H) **WEATHERED ROCK** METADIORITE

(I) **WEATHERED ROCK** DIORITE

(J) **CRYSTALLINE ROCK** METADIORITE

(K) **CRYSTALLINE ROCK** TUFF

NOTE: GROUND PROFILE DRAWN FROM PROVIDED .TIN FILE ALONG CENTERLINE OF -L-

INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS PROJECTED ONTO THE PROFILE

A SCALE OF 1:100 HAS BEEN USED TO MOST APPROPRIATELY SHOW BORINGS AND DESCRIPTIONS WITH RESPECT TO THE BRIDGE

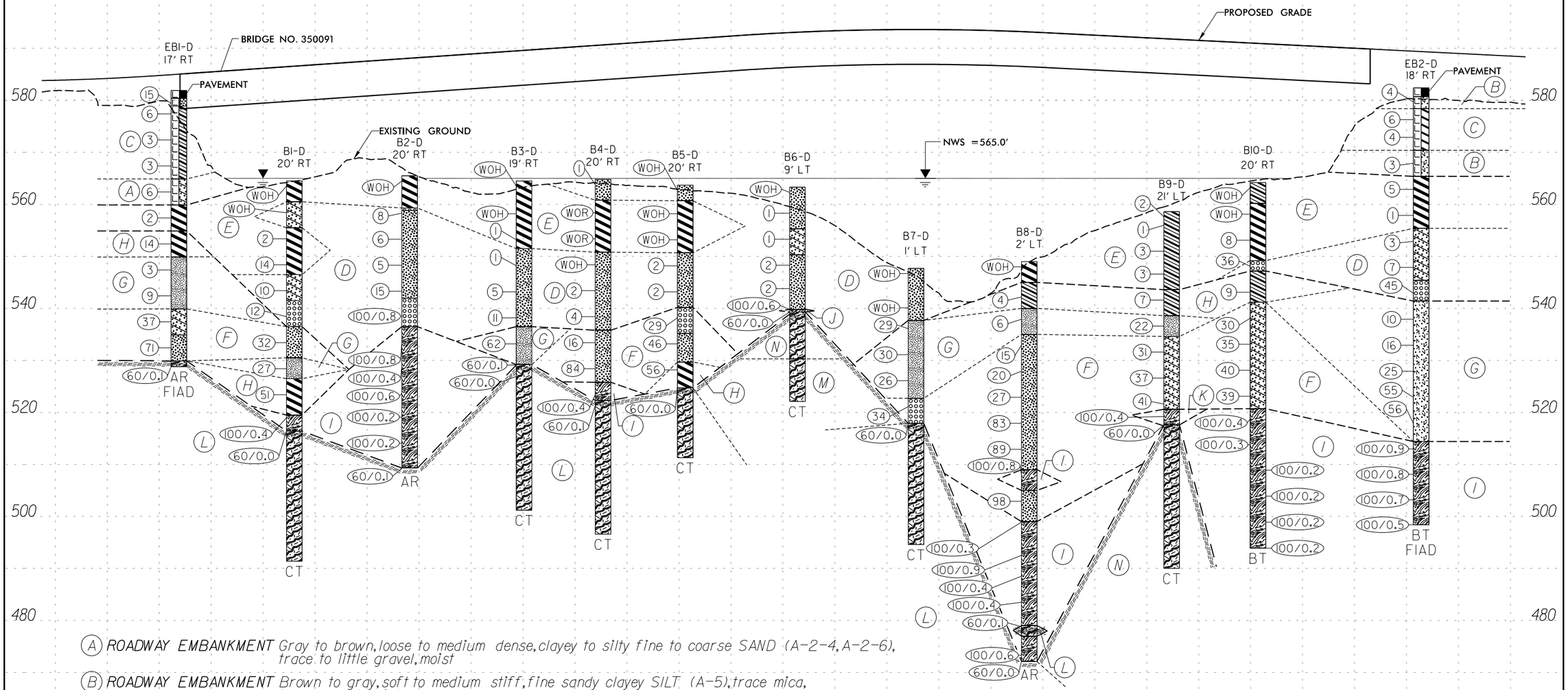
0	100	200

FEET

VE = 5:1

PROJECT REFERENCE NO.	SHEET NO.
B-6051/U-6143	9

PROFILE THROUGH D LINE
BORINGS PROJECTED ALONG –L–



(A) **ROADWAY EMBANKMENT** *Gray to brown, loose to medium dense, clayey to silty fine to coarse SAND (A-2-4, A-2-6), trace to little gravel, moist*

(B) **ROADWAY EMBANKMENT** *Brown to gray, soft to medium stiff, fine sandy clayey SILT (A-5), trace mica, trace gravel, moist*

(C) **ROADWAY EMBANKMENT** *Brown, soft to medium stiff, silty to fine to coarse sandy CLAY (A-6, A-7-5), moist to saturated*

(D) **ALLUVIAL** *Gray to brown to orange, very loose to very dense, silty to clayey to gravelly fine to coarse SAND (A-1-a, A-1-b, A-2-4, A-2-6), trace to little mica, trace root fragments, trace to little organic matter, saturated*

(E) **ALLUVIAL** *Gray to brown, very soft to stiff, fine to coarse sandy to silty CLAY (A-6, A-7-5, A-7-6), trace mica, trace to little organic matter, mottled, saturated*

(F) **RESIDUAL** *Brown to gray to white, medium dense to very dense, clayey to silty fine to coarse SAND (A-1-a, A-1-b, A-2-4, A-2-6, A-2-7), trace mica, trace to little rock fragments, saprolitic, saturated*

(G) **RESIDUAL** *Gray to brown, soft to hard, fine to coarse sandy to clayey SILT (A-4, A-5), trace to little mica, trace to little rock fragments, saprolitic, saturated*

(H) **RESIDUAL** *Brown to white, stiff to hard, fine to coarse sandy to silty CLAY (A-6, A-7-5, A-7-6), trace mica, trace rock fragments, saprolitic, saturated*

(I) **WEATHERED ROCK** *META DIORITE*

(J) **WEATHERED ROCK** *DIORITE*

(K) **WEATHERED ROCK** *TUFF*

(L) **CRYSTALLINE ROCK** *META DIORITE*

(M) **CRYSTALLINE ROCK** *DIORITE*

(N) **CRYSTALLINE ROCK** *TUFF*

—L—

NOTE: A SCALE OF 1:100 HAS BEEN USED TO MOST APPROPRIATELY SHOW BORINGS AND DESCRIPTIONS WITH RESPECT TO THE BRIDGE

GROUND PROFILE DRAWN FROM PROVIDED .TIN FILE ALONG CENTERLINE OF -L-

INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS PROJECTED ONTO THE PROFILE

40+00 42+00 44+00 46+00 48+00 50+00 52+00

6/23/16

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-6051/U-6143	10

(A) **ROADWAY EMBANKMENT** *Gray to brown, loose to medium dense, silty to clayey fine to coarse SAND (A-2-4, A-2-6), trace to little gravel, saprolitic, moist to saturated*

(B) **ROADWAY EMBANKMENT** *Brown, soft to medium stiff, sandy to silty CLAY (A-6, A-7-5), trace gravel, moist to saturated*

(C) **ALLUVIAL** *Gray, very soft to medium stiff, fine to coarse sandy SILT (A-4), little mica, trace root fragments, trace gravel, wet*

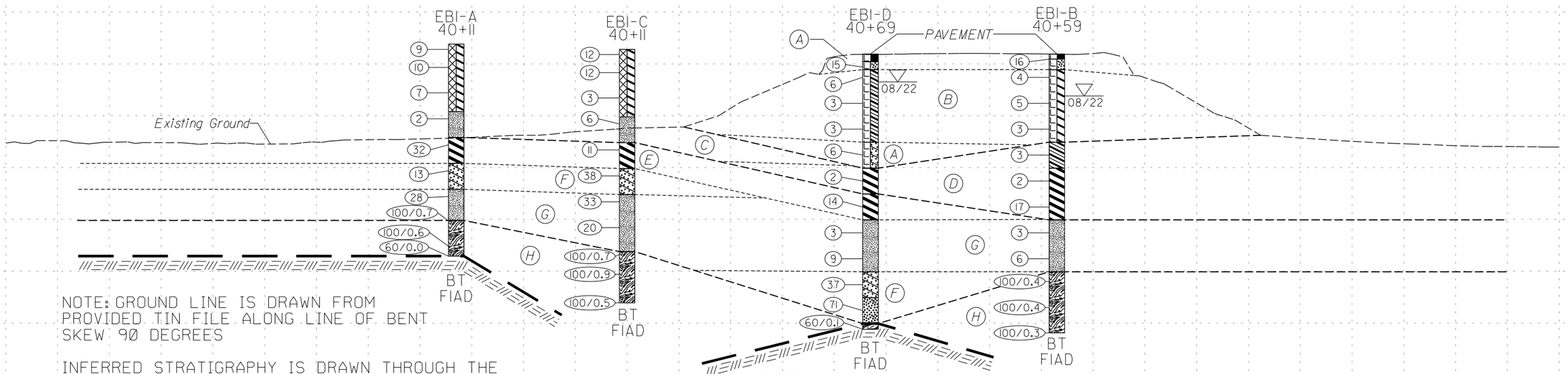
(D) **ALLUVIAL** *Dark gray, very soft to very stiff, sandy to silty CLAY (A-6, A-7-5, A-7-6), saturated*

(E) **RESIDUAL** *Brown, stiff to hard, fine to coarse sandy silty CLAY (A-7-5), trace rock fragments, saprolitic, wet to saturated*

(F) **RESIDUAL** *Brown, medium dense to very dense, silty to clayey fine to coarse SAND (A-2-4, A-2-6), trace rock fragments, saprolitic, wet to saturated*

(G) **RESIDUAL** *Gray to brown, soft to hard, fine to coarse sandy SILT (A-4), saprolitic, wet to saturated*

(H) **WEATHERED ROCK** *METADIORITE*



NOTE: GROUND LINE IS DRAWN FROM PROVIDED TIN FILE ALONG LINE OF BENT SKEW 90 DEGREES

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

CROSS SECTION ALONG END BENT 1 (40+70.00)

—L—

2/20/2023
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6/23/16

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-6051/U-6143	11

(A) **ALLUVIAL** *Gray, very soft to stiff, silty CLAY (A-7-5, A-7-6), trace of organic matter, trace mica, mottled, saturated*

(B) **ALLUVIAL** *Dark brown to brown, soft to very stiff, fine sandy clayey SILT (A-5), trace clams, saturated*

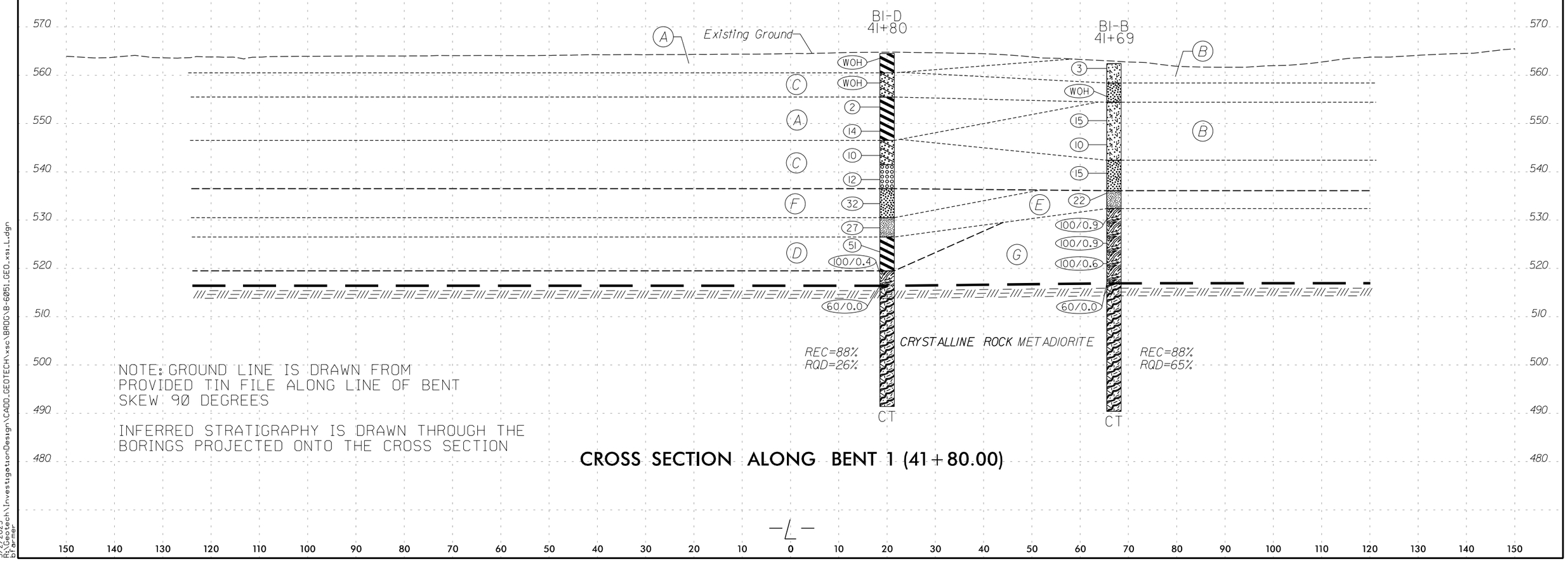
(C) **ALLUVIAL** *Gray to tan to brown, very loose to medium dense, clayey to gravelly silty fine to coarse SAND (A-1-b, A-2-4, A-2-6), trace mica, trace of organic matter, saturated*

(D) **RESIDUAL** *Brown, hard, silty CLAY (A-7-5), trace mica, saprolitic, saturated*

(E) **RESIDUAL** *Brown to tan, very stiff, fine to coarse sandy SILT (A-4), trace rock fragments, saprolitic, saturated*

(F) **RESIDUAL** *Brown, dense, silty fine to coarse SAND (A-2-4), trace mica, saprolitic, saturated*

(G) **WEATHERED ROCK** *METADIORITE*



NOTE: GROUND LINE IS DRAWN FROM PROVIDED TIN FILE ALONG LINE OF BENT SKEW 90 DEGREES

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

CROSS SECTION ALONG BENT 1 (41+80.00)

3/27/2023
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bfarmer

ROCK TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	HEIGHT (in)	DIAMETER (in)	AREA (sq in)	H:D	Mass (g)	Unit Weight (pcf)	Load (lbs)	Comp. Strength (psi)
RS-1	43+25	8 LT	53.5 - 54.3	4.11	1.98	3.08	2.08	602.08	181.2	10610	3445

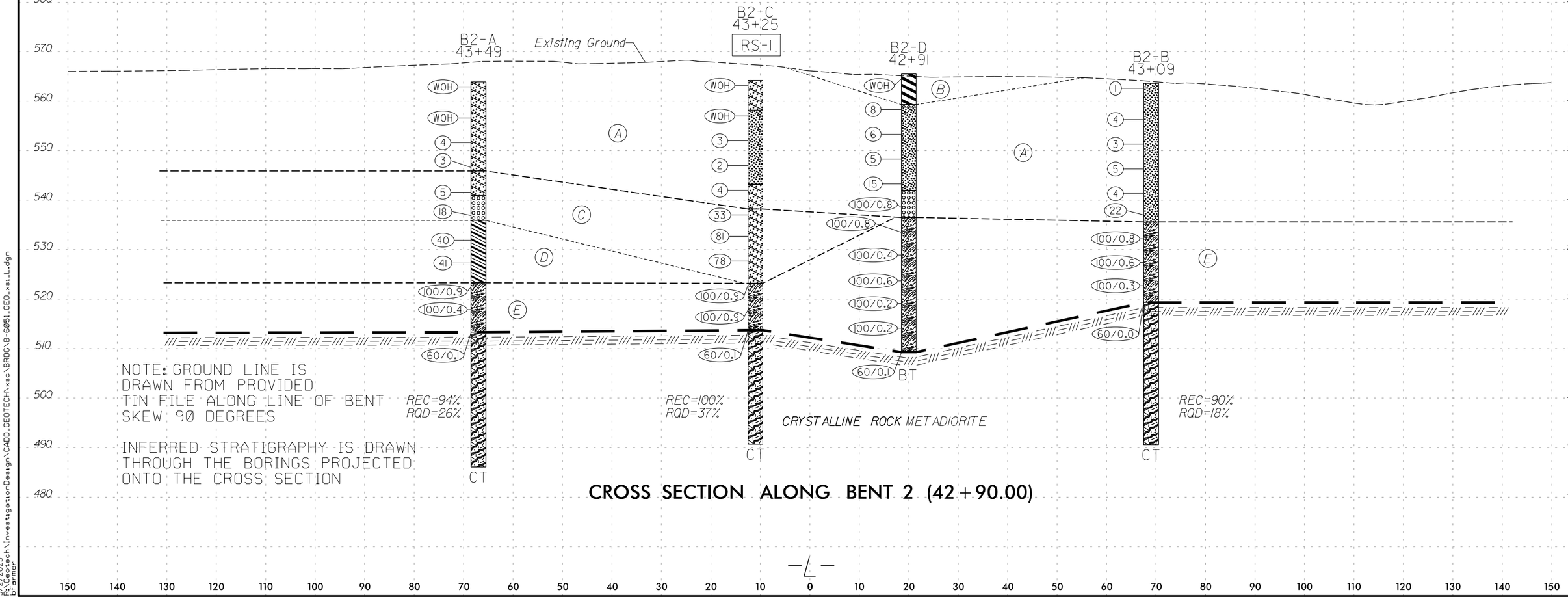
(A) *ALLUVIAL Gray to brown, very loose to very dense, clayey to silty to gravelly fine to coarse SAND (A-1-a, A-2-4, A-2-6), trace mica, trace to little organic matter, saturated*

(B) *ALLUVIAL Gray, very soft, silty CLAY (A-7-5), trace of organic matter, trace mica, saturated*

(C) *RESIDUAL Gray to tan to brown, clayey to gravelly fine to coarse SAND (A-1-b, A-2-6), trace to little mica, trace rock fragments, saturated*

(D) *RESIDUAL Brown, hard, fine to coarse sandy CLAY (A-6), trace mica, trace rock fragments, saturated*

(E) *WEATHERED ROCK METADIORITE*



CROSS SECTION ALONG BENT 2 (42+90.00)

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

ROCK TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	HEIGHT (in)	DIAMETER (in)	AREA (sq in)	H:D	Mass (g)	Unit Weight (pcf)	Load (lbs)	Comp. Strength (psi)
RS-2	44+10	68 RT	46.3 - 46.7	4.12	1.99	3.11	2.07	578.61	172.0	42470	13656

600 590 580 570 560 550 540 530 520 510 500 490 480

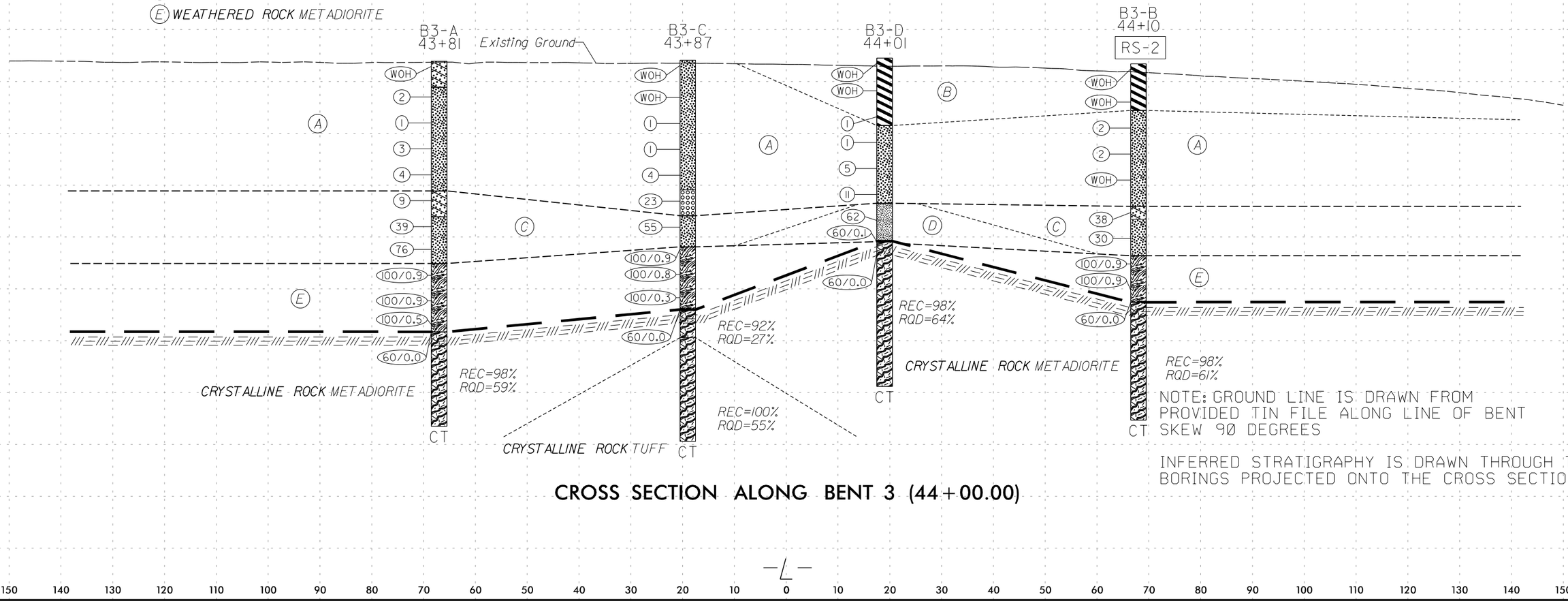
(A) *ALLUVIAL Gray to tan to brown, very loose to medium dense, clayey to silty to gravelly fine to coarse SAND (A-1-a, A-2-4, A-2-6), trace mica, trace organics, trace wood fragments, saturated*

(B) *ALLUVIAL Gray, silty CLAY (A-7-5, A-7-6), trace mica, trace to little organic matter, saturated*

(C) *RESIDUAL Brown, loose to very dense, silty to clayey fine to coarse SAND (A-2-4, A-2-6), trace mica, trace rock fragments, saprolitic, saturated*

(D) *RESIDUAL Brown, hard, fine sandy SILT (A-4), trace rock fragments, saturated*

(E) *WEATHERED ROCK METADIORITE*



CROSS SECTION ALONG BENT 3 (44+00.00)

6/23/16

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-6051/U-6143	14

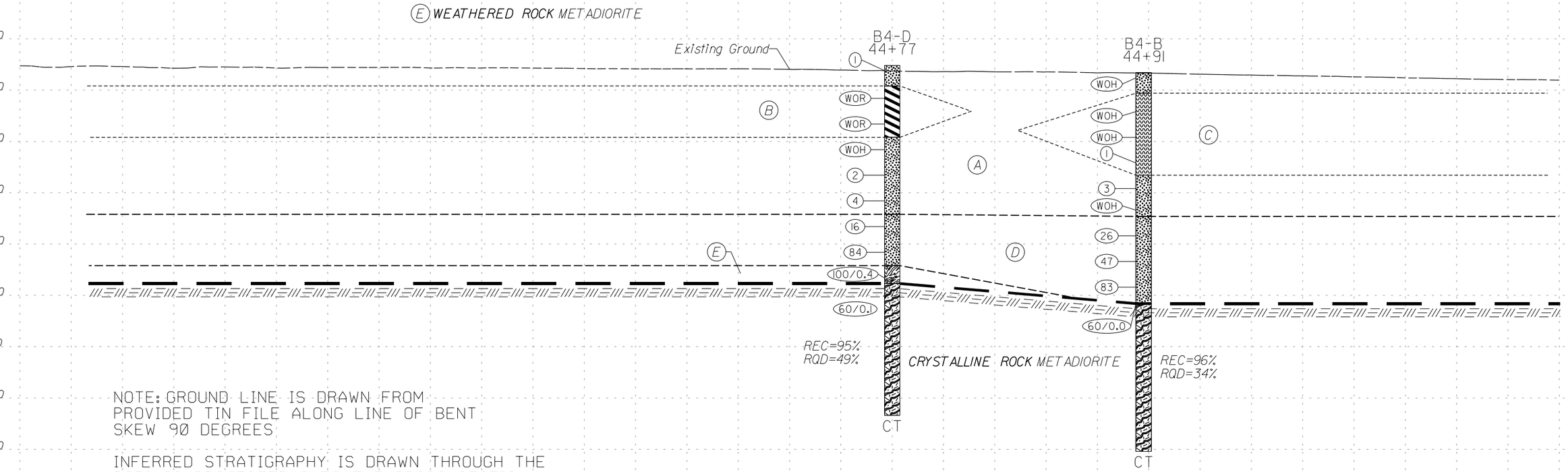
(A) *ALLUVIAL Gray, very loose to loose, silty fine to coarse SAND (A-2-4), trace mica, trace to little organic matter, saturated*

(B) *ALLUVIAL Gray, very soft, silty CLAY (A-7-5), trace mica, trace to little organic matter, saturated*

(C) *ALLUVIAL Gray, very soft, fine sandy clayey MUCK, saturated*

(D) *RESIDUAL Gray to white, medium dense to very dense, silty fine to coarse SAND (A-2-4), trace mica, trace to little rock fragments, saprolitic, saturated*

(E) *WEATHERED ROCK METADIORITE*



NOTE: GROUND LINE IS DRAWN FROM PROVIDED TIN FILE ALONG LINE OF BENT SKEW 90 DEGREES

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

CROSS SECTION ALONG BENT 4 (44+77.50)

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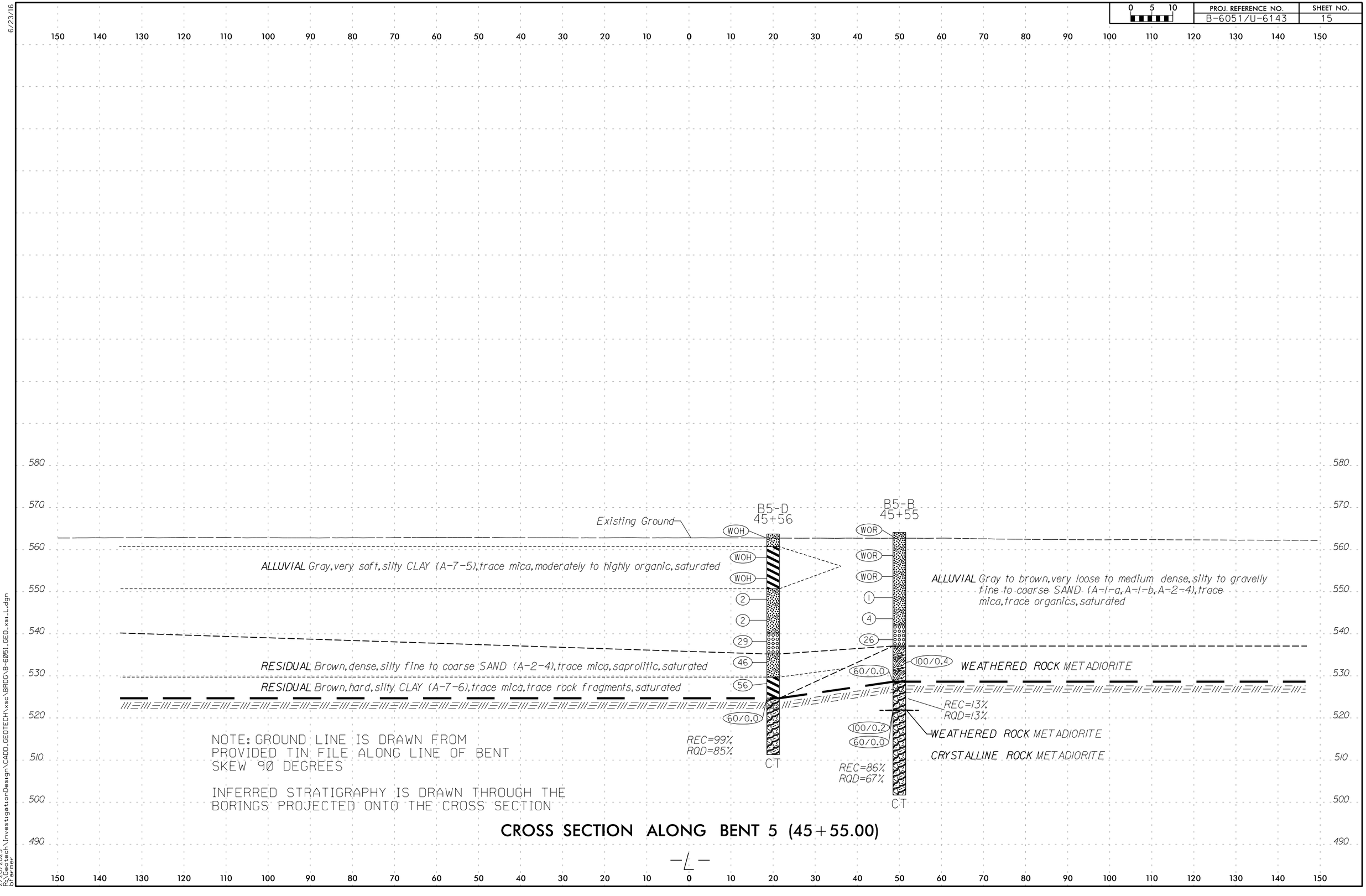
6/23/16

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-6051/U-6143	15



CROSS SECTION ALONG BENT 5 (45+55.00)

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6/23/16

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-6051/U-6143	16

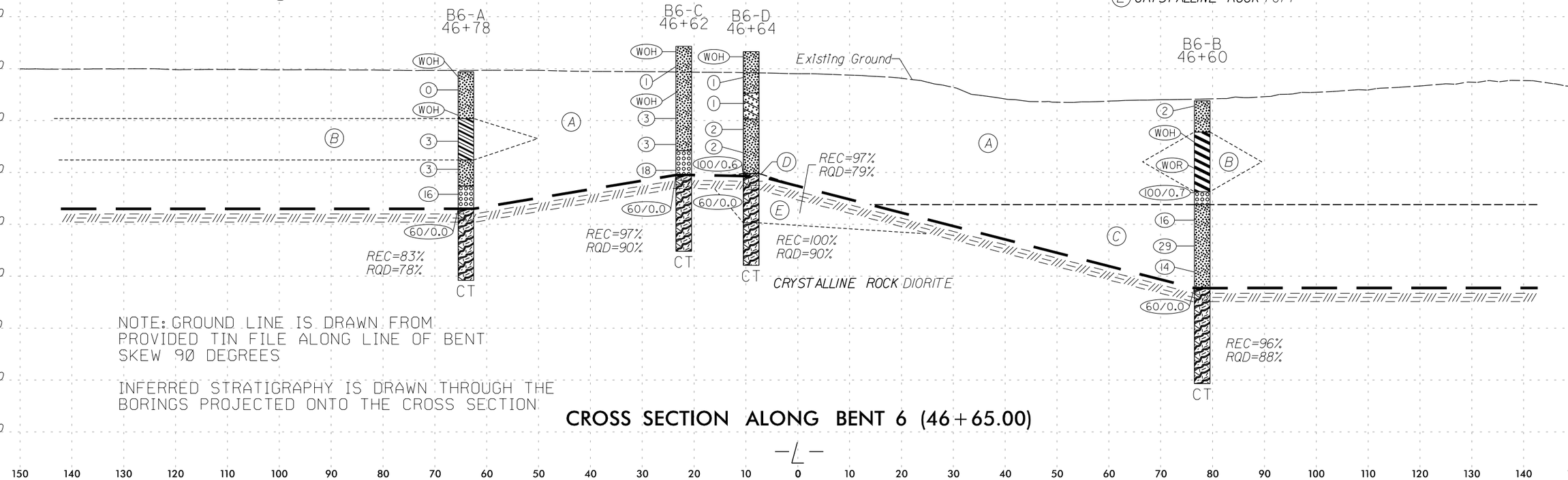
(A) *ALLUVIAL* Gray to brown, clayey to silty to gravelly fine to coarse SAND (A-1-a, A-1-b, A-2-4, A-2-6), trace to little mica, trace to little organic matter, trace root fragments, saturated

(B) *ALLUVIAL* Gray, very soft to soft, fine to coarse sandy to silty CLAY (A-6, A-7-5), little organic matter, saturated

(C) *RESIDUAL* Brown, medium dense, clayey silty fine to coarse SAND (A-2-4), trace mica, trace rock fragments, saturated

(D) *WEATHERED ROCK* TUFF

(E) *CRYSTALLINE ROCK* TUFF



NOTE: GROUND LINE IS DRAWN FROM PROVIDED TIN FILE ALONG LINE OF BENT SKEW 90 DEGREES

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

CROSS SECTION ALONG BENT 6 (46+65.00)

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PROJ. REFERENCE NO.	SHEET NO.
B-6051/U-6143	17

6/23/16

Ⓐ **ALLUVIAL** *Tan to black, very loose to loose, silty fine to coarse SAND (A-1-b, A-2-4), little mica, trace gravel, saturated*

Ⓑ **ALLUVIAL** *Gray, very soft, fine to coarse sandy silty CLAY (A-7-6), trace shells*

Ⓒ **RESIDUAL** *White to gray to brown, loose to very dense, silty to clayey to gravelly fine to coarse SAND (A-1-a, A-2-4, A-2-6), trace rock fragments, saprolitic, saturated*

Ⓓ **RESIDUAL** *Tan, very stiff, fine to coarse sandy SILT (A-4), trace to little rock fragments, saprolitic, saturated*

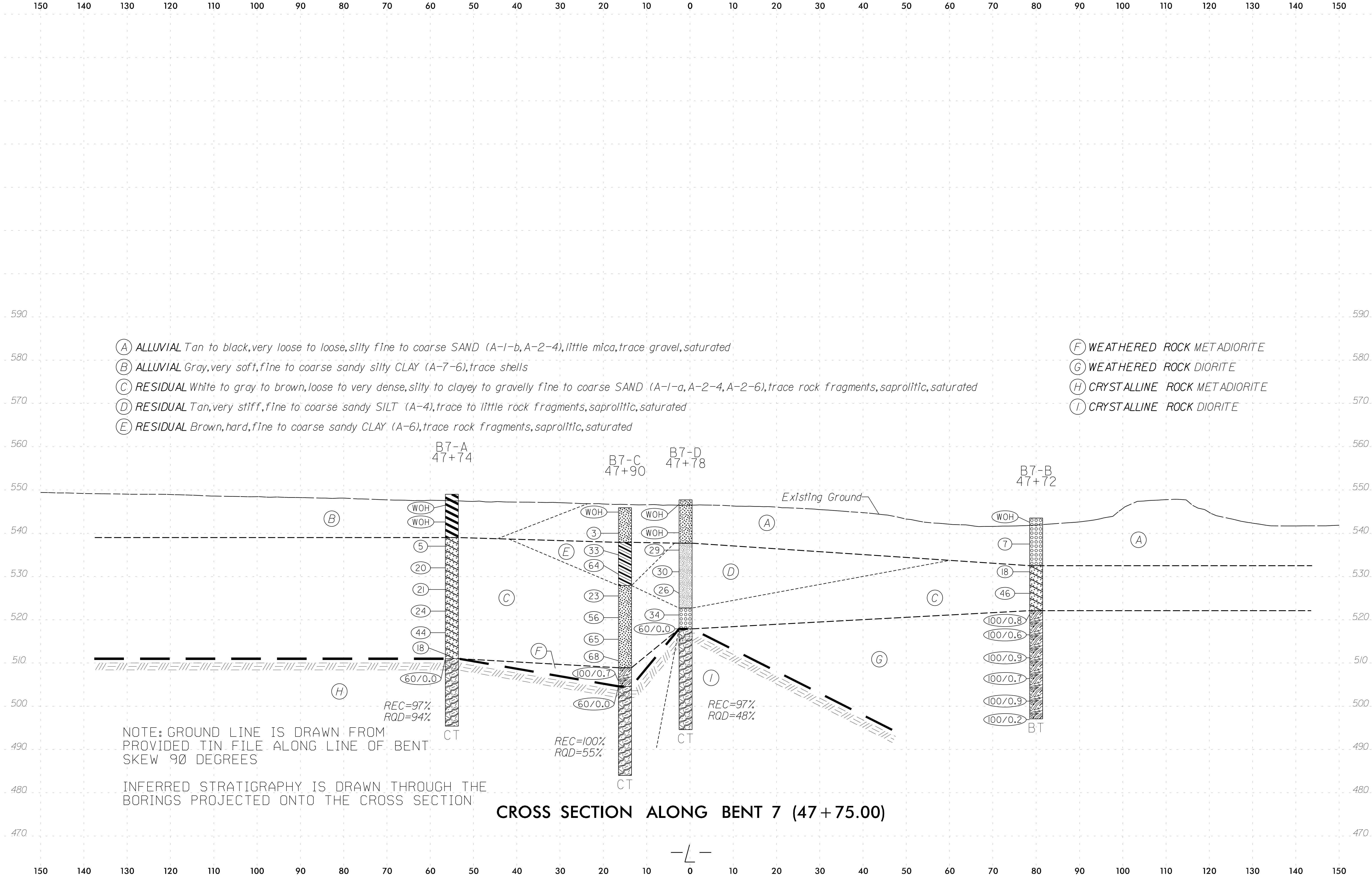
Ⓔ **RESIDUAL** *Brown, hard, fine to coarse sandy CLAY (A-6), trace rock fragments, saprolitic, saturated*

Ⓕ **WEATHERED ROCK** *METADIORITE*

Ⓖ **WEATHERED ROCK** *DIORITE*

Ⓗ **CRYSTALLINE ROCK** *METADIORITE*

Ⓘ **CRYSTALLINE ROCK** *DIORITE*



NOTE: GROUND LINE IS DRAWN FROM PROVIDED TIN FILE ALONG LINE OF BENT SKEW 90 DEGREES

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

CROSS SECTION ALONG BENT 7 (47+75.00)

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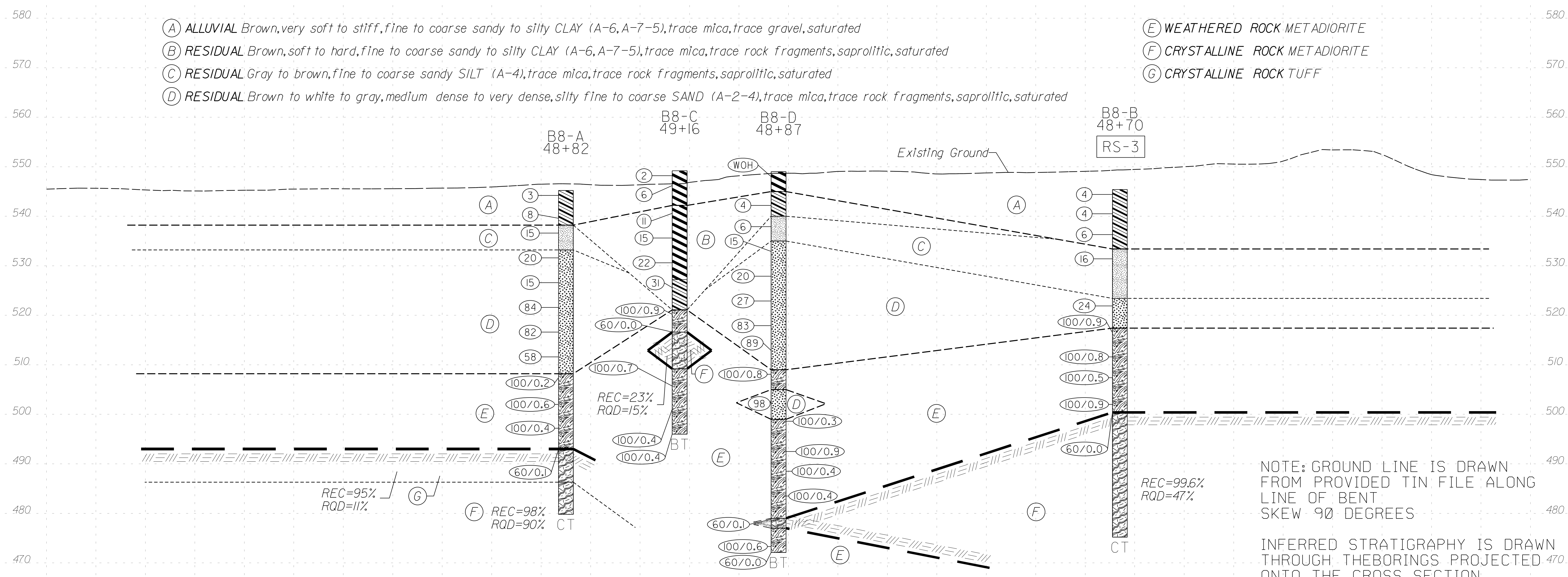
ROCK TEST RESULTS											
SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	HEIGHT (in)	DIAMETER (in)	AREA (sq in)	H:D	Mass (g)	Unit Weight (pcf)	Load (lbs)	Comp. Strength (psi)
RS-3	48+70	67 RT	61.9 - 62.5	4.12	1.99	3.11	2.07	622.87	185.2	104440	33582


A ALLUVIAL Brown, very soft to stiff, fine to coarse sandy to silty CLAY (A-6, A-7-5), trace mica, trace gravel, saturated
B RESIDUAL Brown, soft to hard, fine to coarse sandy to silty CLAY (A-6, A-7-5), trace mica, trace rock fragments, saprolitic, saturated
C RESIDUAL Gray to brown, fine to coarse sandy SILT (A-4), trace mica, trace rock fragments, saprolitic, saturated
D RESIDUAL Brown to white to gray, medium dense to very dense, silty fine to coarse SAND (A-2-4), trace mica, trace rock fragments, saprolitic, saturated
E WEATHERED ROCK METADIORITE
F CRYSTALLINE ROCK METADIORITE
G CRYSTALLINE ROCK TUFF
B8-A 48+82
B8-C 49+16
B8-D 48+87
B8-B 48+70
RS-3
Existing Ground
REC=95% RQD=11%
REC=98% RQD=90%
REC=23% RQD=15%
REC=99.6% RQD=47%
CT
BT
NOTE: GROUND LINE IS DRAWN FROM PROVIDED TIN FILE ALONG LINE OF BENT SKEW 90 DEGREES
INFERRED STRATIGRAPHY IS DRAWN THROUGH THEBORINGS PROJECTED ONTO THE CROSS SECTION

CROSS SECTION ALONG BENT 8 (48+85.00)

PROJ. REFERENCE NO.	SHEET NO.
B-6051/U-6143	19

ROCK TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	HEIGHT (in)	DIAMETER (in)	AREA (sq in)	H:D	Mass (g)	Unit Weight (pcf)	Load (lbs)	Comp. Strength (psi)
RS-4	50+07	68 LT	82.4 - 83.0	4.13	2.00	3.14	2.07	620.22	182.2	84990	27067

(A) ALLUVIAL Brown to gray, very soft to medium stiff, fine sandy to silty CLAY (A-6, A-7-5), trace mica, trace shells, saturated

(B) ALLUVIAL Brown, loose, silty fine to coarse SAND (A-2-4), trace gravel, saturated

(C) RESIDUAL Brown, medium stiff to very stiff, fine to coarse sandy to clayey SILT (A-4, A-5), trace mica, saprolitic, saturated

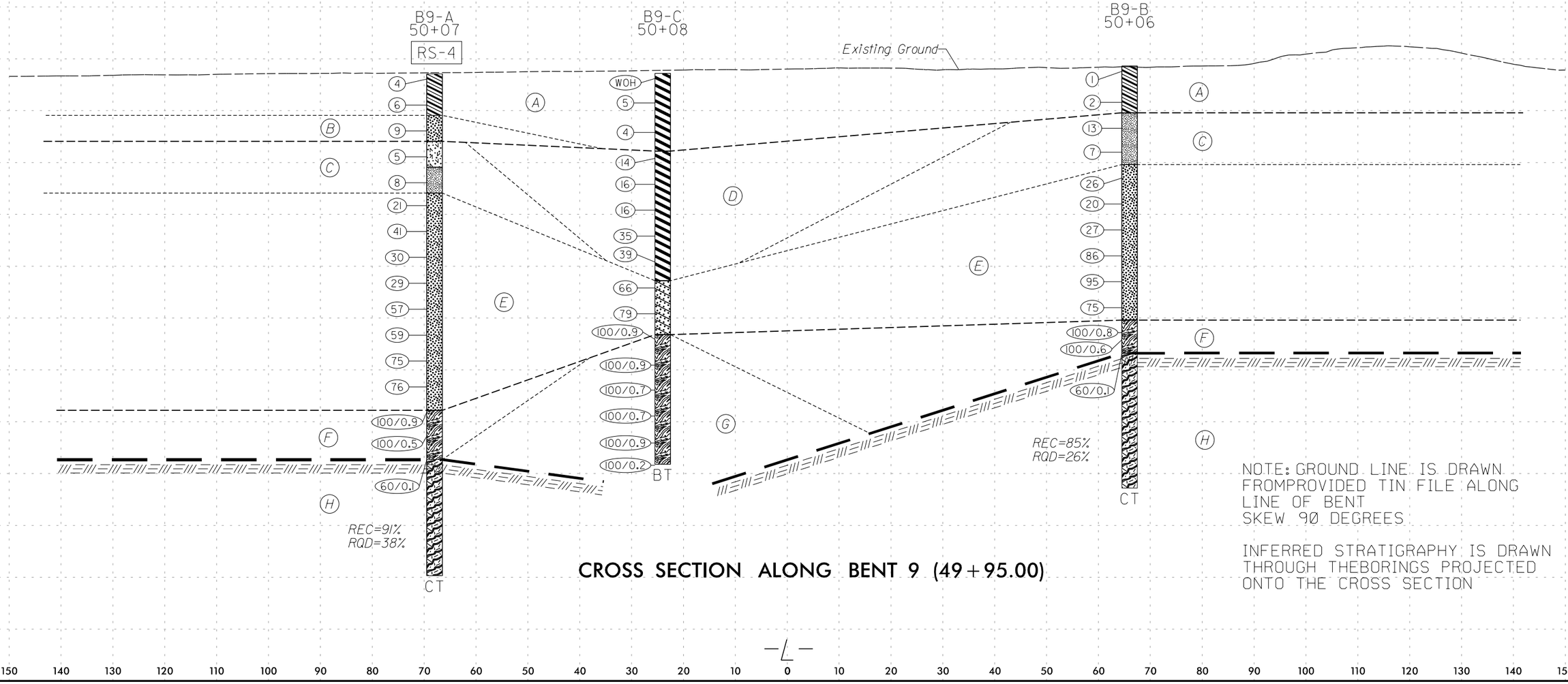
(D) RESIDUAL Brown, stiff to hard, fine sandy silty CLAY (A-7-5), trace rock fragments, saprolitic, saturated

(E) RESIDUAL Gray to brown to white, medium dense to very dense, silty to clayey fine to coarse SAND (A-2-4, A-2-7), trace mica, saprolitic, saturated

(F) WEATHERED ROCK METADIORITE

(G) WEATHERED ROCK DIORITE

(H) CRYSTALLINE ROCK METADIORITE



NOTE: GROUND LINE IS DRAWN FROMPROVIDED TIN FILE ALONG LINE OF BENT
SKEW 90 DEGREES

INFERRED STRATIGRAPHY IS DRAWN THROUGH THEBORINGS PROJECTED ONTO THE CROSS SECTION

CROSS SECTION ALONG BENT 9 (49+95.00)

6/23/16

PROJ. REFERENCE NO.	SHEET NO.
B-6051/U-6143	20

ROCK TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	HEIGHT (in)	DIAMETER (in)	AREA (sq in)	H:D	Mass (g)	Unit Weight (pcf)	Load (lbs)	Comp. Strength (psi)
RS-5	51+07	66 RT	65.9 - 66.4	4.11	1.99	3.11	2.07	614.89	183.3	64160	20630

(A) ALLUVIAL Brown, very soft to stiff, fine to coarse sandy to silty CLAY (A-6, A-7-6), trace mica, trace of organic matter, saturated

(B) ALLUVIAL Brown to gray to orange, very loose to dense, silty to clayey to gravelly fine to coarse SAND (A-1-a, A-1-b, A-2-5, A-2-6), trace mica, saturated

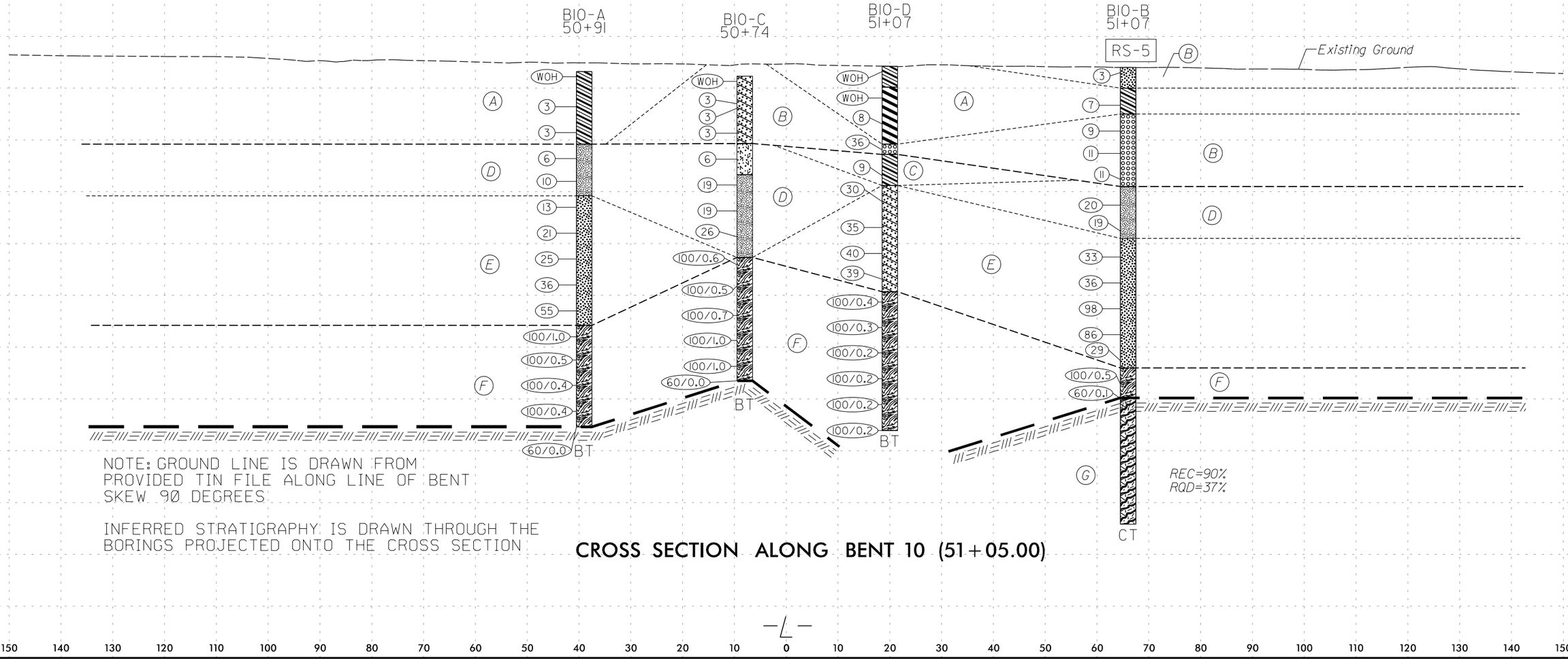
(C) RESIDUAL Brown to white, stiff, fine to coarse sandy CLAY (A-6), trace rock fragments, saprolitic, saturated

(D) RESIDUAL Brown, clayey to fine to coarse sandy SILT (A-4, A-5), trace mica, saprolitic, saturated

(E) RESIDUAL Brown to gray to white, silty to clayey fine to coarse SAND (A-2-4, A-2-6), trace mica, trace rock fragments, saprolitic, saturated

(F) WEATHERED ROCK METADIORITE

(G) CRYSTALLINE ROCK METADIORITE



NOTE: GROUND LINE IS DRAWN FROM PROVIDED TIN FILE ALONG LINE OF BENT SKEW 90 DEGREES

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

CROSS SECTION ALONG BENT 10 (51+05.00)

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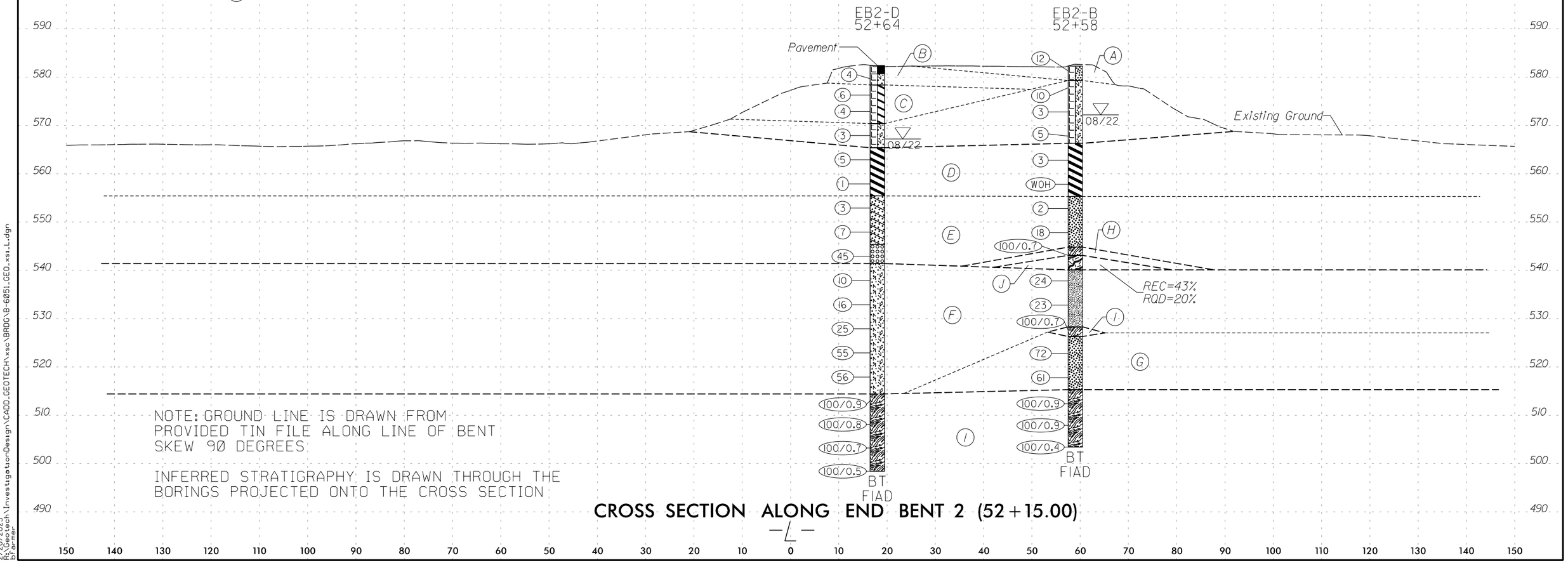
6/23/16

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-6051/U-6143	21

(A) ROADWAY EMBANKMENT Brown, medium dense, clayey silty fine to coarse SAND (A-2-4), trace gravel, saturated
(B) ROADWAY EMBANKMENT Gray to red-brown, soft to stiff, fine sandy clayey SILT (A-5), trace mica, trace gravel, saturated
(C) ROADWAY EMBANKMENT Brown, soft to medium stiff, silty CLAY (A-7-5), saturated
(D) ALLUVIAL Brown to gray, very soft to medium stiff, fine to coarse sandy silty CLAY (A-7-5), saturated
(E) ALLUVIAL Dark orange-brown, clayey to silty fine to coarse SAND and fine to coarse sandy GRAVEL (A-1-b, A-2-4, A-2-6), saturated
(F) RESIDUAL Gray, medium stiff to very stiff, fine to coarse sandy to clayey SILT (A-4, A-5), saprolitic, saturated
(G) RESIDUAL Gray, medium dense to very dense, fine to coarse SAND (A-2-4), saprolitic, saturated

(H) WEATHERED ROCK ALLUVIAL BOULDERS
(I) WEATHERED ROCK METADIORITE
(J) CRYSTALLINE ROCK ALLUVIAL BOULDERS



NOTE: GROUND LINE IS DRAWN FROM PROVIDED TIN FILE ALONG LINE OF BENT SKEW 90 DEGREES

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

CROSS SECTION ALONG END BENT 2 (52+15.00)

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GEOTECHNICAL BORING REPORT
BORE LOG

WBS 48708.1.1	**TIP** B-6051/U-6143	**COUNTY** GASTON	**GEOLOGIST** B. Farmer	
SITE DESCRIPTION US 29 / US 74 REPLACE BRIDGE NO. 91 OVER CATAWBA RIVER (COMB W/U-6143)				**GROUND WTR (ft)**
BORING NO. EB1-A	**STATION** 40+11	**OFFSET** 63 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 583.8 ft	**TOTAL DEPTH** 40.9 ft	**NORTHING** 550,712	**EASTING** 1,399,547	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE CAT1303 CME-550 92% 02/03/2022		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER P. McCain	**START DATE** 08/24/22	**COMP. DATE** 08/24/22	**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)
585											
	583.8	0.0	2	3	6	9		M		583.8 GROUND SURFACE	0.0
580	580.3	3.5	4	6	4	10		M		**ARTIFICIAL FILL** Brown, silty CLAY (A-7-5), trace mica, trace gravel	
575	575.4	8.4	2	3	4	7		W			
570	570.4	13.4	WOH	1	1	2		W		570.8 **ALLUVIAL** Gray, fine to coarse sandy SILT (A-4), little mica, trace root fragments	13.0
565	565.4	18.4	6	13	19	32		W		565.8 **RESIDUAL** Brown, silty CLAY (A-7-5), saprolitic	18.0
560	560.4	23.4	3	5	8	13		W		560.8 Brown, clayey fine to coarse SAND (A-2-6), saprolitic	23.0
555	555.4	28.4	5	9	19	28		W		555.8 Brown, fine to coarse sandy SILT (A-4), saprolitic	28.0
550	550.4	33.4	25	64	36/0.2	100/0.7				549.8 **WEATHERED ROCK** METADIORITE	34.0
545	545.4	38.4	70	30/0.1		100/0.6					
	542.9	40.9	60/0.0			60/0.0				542.9 Boring Terminated with Standard Penetration Test Refusal at Elevation 542.9 ft on Crystalline Rock: METADIORITE	40.9

WBS 48708.1.1	**TIP** B-6051/U-6143	**COUNTY** GASTON	**GEOLOGIST** J. Mize	
SITE DESCRIPTION US 29 / US 74 REPLACE BRIDGE NO. 91 OVER CATAWBA RIVER (COMB W/U-6143)				**GROUND WTR (ft)**
BORING NO. EB1-B	**STATION** 40+59	**OFFSET** 53 ft RT	**ALIGNMENT** -L-	**0 HR.** 8.1
COLLAR ELEV. 581.9 ft	**TOTAL DEPTH** 53.8 ft	**NORTHING** 550,588	**EASTING** 1,399,564	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE CAT1303 CME-550 92% 02/03/2022		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER P. McCain	**START DATE** 08/17/22	**COMP. DATE** 08/18/22	**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
585										
	581.9	0.0	8	7	9	16		M		581.9 GROUND SURFACE 0.0
580	578.4	3.5	1	2	2	4		M		580.9 **ROADWAY EMBANKMENT** 0.7' Asphalt; 0.3' ABC 1.0
575	573.4	8.5	2	2	3	5		▽		578.9 Gray to brown, clayey silty fine to coarse SAND (A-2-4), little gravel, saprolitic 3.0
570	568.4	13.5	1	1	2	3		Sat.		Brown, silty CLAY (A-7-5), trace gravel
565	563.4	18.5	WOH	1	2	3		Sat.		564.9 **ALLUVIAL** Dark gray, fine sandy CLAY (A-6) 17.0
560	558.4	23.5	1	1	1	2		Sat.		559.9 Dark gray, silty CLAY (A-7-6) 22.0
555	553.4	28.5	5	7	10	17		Sat.		549.9 **RESIDUAL** Brown, fine sandy SILT (A-4) 32.0
550	548.4	33.5	2	1	2	3		Sat.		
545	543.4	38.5	2	3	3	6		Sat.		539.9 **WEATHERED ROCK** METADIORITE 42.0
540	538.4	43.5	100/0.4			100/0.4				
535	533.4	48.5	100/0.4			100/0.4				
530	528.4	53.5	100/0.3			100/0.3				528.1 Boring Terminated at Elevation 528.1 ft in Weathered Rock: METADIORITE 53.8

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 48708.1.1	**TIP** B-6051/U-6143	**COUNTY** GASTON	**GEOLOGIST** B. Farmer	
SITE DESCRIPTION US 29 / US 74 REPLACE BRIDGE NO. 91 OVER CATAWBA RIVER (COMB W/U-6143)				**GROUND WTR (ft)**
BORING NO. EB1-C	**STATION** 40+11	**OFFSET** 30 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 582.8 ft	**TOTAL DEPTH** 48.9 ft	**NORTHING** 550,680	**EASTING** 1,399,539	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE CAT1303 CME-550 92% 02/03/2022		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER P. McCain	**START DATE** 08/24/22	**COMP. DATE** 08/24/22	**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))
585										
	582.8	0.0								582.8 — GROUND SURFACE — 0.0
			3	7	5	12		M		**ARTIFICIAL FILL** Brown, fine to coarse sandy silty CLAY (A-7-5), little gravel
580	579.3	3.5	4	6	6	12				
575	574.4	8.4	2	1	2	3		W		
570	569.4	13.4								569.8 — 13.0
			2	3	3	6		W		**ALLUVIAL** Gray, fine to coarse sandy SILT (A-4), little mica, trace root fragments, trace gravel
565	564.4	18.4								564.8 — 18.0
			1	4	7	11		W		**RESIDUAL** Brown, fine to coarse sandy silty CLAY (A-7-5), saprolitic
560	559.4	23.4								559.8 — 23.0
			7	17	21	38		W		Gray, clayey fine to coarse SAND (A-2-6), trace rock fragments, saprolitic
555	554.4	28.4								554.8 — 28.0
			11	14	19	33		W		Gray, fine to coarse sandy SILT (A-4)
550	549.4	33.4								
			7	8	12	20		W		
545	544.4	38.4								543.8 — 39.0
			23	53	47/0.2	100/0.7				**WEATHERED ROCK** METADIORITE
540	539.4	43.4	38	62/0.4		100/0.9				
535	534.4	48.4	100/0.5			100/0.5				533.9 — 48.9
										Boring Terminated at Elevation 533.9 ft in Weathered Rock: METADIORITE

WBS 48708.1.1	**TIP** B-6051/U-6143	**COUNTY** GASTON	**GEOLOGIST** J. Mize	
SITE DESCRIPTION US 29 / US 74 REPLACE BRIDGE NO. 91 OVER CATAWBA RIVER (COMB W/U-6143)				**GROUND WTR (ft)**
BORING NO. EB1-D	**STATION** 40+69	**OFFSET** 17 ft RT	**ALIGNMENT** -L-	**0 HR.** 5.4
COLLAR ELEV. 581.9 ft	**TOTAL DEPTH** 53.1 ft	**NORTHING** 550,620	**EASTING** 1,399,583	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE CAT1303 CME-550 92% 02/03/2022		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER P. McCain	**START DATE** 08/18/22	**COMP. DATE** 08/18/22	**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
585										
										581.9 — GROUND SURFACE — 0.0
	580.4	1.5								580.4 — **ROADWAY EMBANKMENT** 0.8' Asphalt; 0.7' ABC — 1.5
580	578.4	3.5	17	10	5	15		Sat.		578.9 — Gray, silty fine to coarse SAND (A-2-4), trace gravel — 3.0
			3	3	3	6				Brown, fine to coarse sandy CLAY (A-6)
575	573.4	8.5								
			2	1	2	3		Sat.		
570	568.4	13.5								
			1	1	2	3		Sat.		
565	563.4	18.5								564.9 — 17.0
			2	2	4	6		Sat.		Brown, clayey fine to coarse SAND (A-2-6), little gravel
560	558.4	23.5								559.9 — 22.0
			1	1	1	2		Sat.		**ALLUVIAL** Dark gray, fine to coarse sandy silty CLAY (A-7-5)
555	553.4	28.5								554.9 — 27.0
			3	6	8	14		Sat.		**RESIDUAL** Brown, silty CLAY (A-7-5), trace rock fragments
550	548.4	33.5								549.9 — 32.0
			2	1	2	3		Sat.		Brown, fine sandy SILT (A-4)
545	543.4	38.5								
			3	4	5	9		Sat.		
540	538.4	43.5								539.9 — 42.0
			7	15	22	37		Sat.		Brown, clayey fine to coarse SAND (A-2-6), trace rock fragments, saprolitic
535	533.4	48.5								534.9 — 47.0
			19	36	35	71		Sat.		Brown, silty fine to coarse SAND (A-2-4), trace rock fragments, saprolitic
530	528.9	53.0	60/0.1			60/0.1				529.9 — 52.0; 528.8 — 53.1
										CRYSTALLINE ROCK METADIORITE
										Boring Terminated with Standard Penetration Test Refusal at Elevation 528.8 ft in Crystalline Rock: METADIORITE

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 48708.1.1	**TIP** B-6051/U-6143	**COUNTY** GASTON	**GEOLOGIST** J. Mize	
SITE DESCRIPTION US 29 / US 74 REPLACE BRIDGE NO. 91 OVER CATAWBA RIVER (COMB W/U-6143)				**GROUND WTR (ft)**
BORING NO. B1-B	**STATION** 41+69	**OFFSET** 67 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 562.4 ft	**TOTAL DEPTH** 72.0 ft	**NORTHING** 550,547	**EASTING** 1,399,667	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT1314 CME-45B 86% 02/03/2022		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER J. White	**START DATE** 08/25/22	**COMP. DATE** 08/29/22	**SURFACE WATER DEPTH** 2.9ft	

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))
570										
565										WATER SURFACE (08/25/22)
	562.4	0.0	WOH	1	2	3		Sat.		562.4 GROUND SURFACE 0.0
560										**ALLUVIAL** Dark brown, fine sandy clayey SILT (A-5), trace clams
	556.6	5.8	WOH	WOH	WOH	0		Sat.		558.4 4.0 Gray, silty fine to medium SAND (A-2-4)
555										554.4 8.0 Brown, fine sandy clayey SILT (A-5)
	551.6	10.8	5	7	8	15		Sat.		
550										
	546.6	15.8	3	4	6	10		Sat.		
545										
	540.7	21.7	2	7	8	15		Sat.		542.4 20.0 Tan, silty coarse SAND (A-2-4)
540										
	536.6	25.8	25	10	12	22		Sat.		536.1 26.3 **RESIDUAL** Tan, fine to coarse sandy SILT (A-4), saprolitic
535										532.4 30.0 **WEATHERED ROCK** METADIORITE
	531.6	30.8	33	50	50/0.4	100/0.9				
530										
	526.6	35.8	13	47	53/0.4	100/0.9				
525										
	521.6	40.8	62	38/0.1		100/0.6				
520										
	516.9	45.5	60/0.0			60/0.0				516.9 45.5 **CRYSTALLINE ROCK** METADIORITE
515										
510										
505										
500										
495										490.4 72.0

WBS 48708.1.1	**TIP** B-6051/U-6143	**COUNTY** GASTON	**GEOLOGIST** J. Mize	
SITE DESCRIPTION US 29 / US 74 REPLACE BRIDGE NO. 91 OVER CATAWBA RIVER (COMB W/U-6143)				**GROUND WTR (ft)**
BORING NO. B1-B	**STATION** 41+69	**OFFSET** 67 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 562.4 ft	**TOTAL DEPTH** 72.0 ft	**NORTHING** 550,547	**EASTING** 1,399,667	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT1314 CME-45B 86% 02/03/2022		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER J. White	**START DATE** 08/25/22	**COMP. DATE** 08/29/22	**SURFACE WATER DEPTH** 2.9ft	

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
490						Match Line				Boring Terminated at Elevation 490.4 ft on Crystalline Rock: METADIORITE

GEOTECHNICAL BORING REPORT
CORE LOG

WBS 48708.1.1	**TIP** B-6051/U-6143	**COUNTY** GASTON	**GEOLOGIST** J. Mize
SITE DESCRIPTION US 29 / US 74 REPLACE BRIDGE NO. 91 OVER CATAWBA RIVER (COMB W/U-6143)			**GROUND WTR (ft)**
BORING NO. B1-B	**STATION** 41+69	**OFFSET** 67 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 562.4 ft	**TOTAL DEPTH** 72.0 ft	**NORTHING** 550,547	**EASTING** 1,399,667	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT1314 CME-45B 86% 02/03/2022		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER J. White	**START DATE** 08/25/22	**COMP. DATE** 08/29/22	**SURFACE WATER DEPTH** 2.9ft	
CORE SIZE NQ2	**TOTAL RUN** 26.5 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
516.9											Begin Coring @ 45.5 ft
	516.9	45.5	1.5	4:01/1.5	(1.5) 100%	(0.0) 0%		(26.2) 99%	(17.1) 65%		ELEV. (ft) 516.9 **CRYSTALLINE ROCK** DEPTH (ft) 45.5
515	515.4	47.0	5.0	3:40/1.0 2:09/1.0 2:45/1.0 2:24/1.0 2:13/1.0	(4.7) 94%	(3.2) 64%					Black to white, fresh to slightly weathered, hard to very hard, moderately close to very close fracture spacing, METADIORITE GSI = 35 to 45
510	510.4	52.0	5.0	2:31/1.0 2:31/1.0 2:12/1.0 2:18/1.0 2:32/1.0	(5.0) 100%	(2.1) 42%					Abundant steep-angle quartz viens that fracture
505	505.4	57.0	5.0	3:04/1.0 2:46/1.0 2:41/1.0 2:31/1.0 2:03/1.0	(5.0) 100%	(3.4) 68%					Quartz veins
500	500.4	62.0	5.0	1:51/1.0 1:56/1.0 2:04/1.0 2:09/1.0 2:41/1.0	(5.0) 100%	(4.2) 84%					
495	495.4	67.0	5.0	1:56/1.0 2:15/1.0 2:19/1.0 2:09/1.0 2:08/1.0	(5.0) 100%	(4.2) 84%					
	490.4	72.0									ELEV. (ft) 490.4 DEPTH (ft) 72.0 Boring Terminated at Elevation 490.4 ft on Crystalline Rock: METADIORITE

CORE PHOTOGRAPHS
B1-B
-L- 41+69 67 RT

BOX 1: 45.5 - 54.0 FEET

0 1 2
FEET

BOX 2: 54.0 - 62.0 FEET

0 1 2
FEET

BOX 3: 62.0 - 72.0 FEET

0 1 2
FEET

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 48708.1.1	**TIP** B-6051/U-6143	**COUNTY** GASTON	**GEOLOGIST** M. Shipman	
SITE DESCRIPTION US 29 / US 74 REPLACE BRIDGE NO. 91 OVER CATAWBA RIVER (COMB W/U-6143)				**GROUND WTR (ft)**
BORING NO. B1-D	**STATION** 41+80	**OFFSET** 20 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 564.5 ft	**TOTAL DEPTH** 73.1 ft	**NORTHING** 550,590	**EASTING** 1,399,690	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT2002 B-57 92% 12/23/2022		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER J. White	**START DATE** 11/15/22	**COMP. DATE** 11/17/22	**SURFACE WATER DEPTH** 1.9ft	

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))
570										
565										WATER SURFACE (11/15/22)
	564.5	0.0	WOH	WOH	WOH	0		Sat.		564.5 GROUND SURFACE 0.0
										ALLUVIAL Gray, silty CLAY (A-7-5), trace of organic matter, trace mica
560	559.4	5.1	WOH	WOH	WOH	0		Sat.		560.5 4.0 Gray, very loose, clayey fine SAND (A-2-6), trace of organic matter, trace mica
555	554.4	10.1	WOH	WOH	2	2		Sat.		555.5 9.0 Gray, silty CLAY (A-7-6), trace of organic matter, trace mica, mottled
550	549.4	15.1	3	6	8	14		Sat.		546.5 18.0 Gray, clayey fine to coarse SAND (A-2-6), trace mica
545	544.4	20.1	2	3	7	10		Sat.		541.5 23.0 Brown, fine to coarse SAND (A-1-b)
540	539.4	25.1	2	4	8	12		Sat.		536.5 28.0 **RESIDUAL** Brown, silty fine to coarse SAND (A-2-4), trace mica, saprolitic
535	534.4	30.1	37	15	17	32		Sat.		530.5 34.0 Brown, fine to coarse sandy SILT (A-4), trace rock fragments, saprolitic
530	529.4	35.1	9	12	15	27		Sat.		526.5 38.0 Brown, silty CLAY (A-7-5), trace mica, saprolitic
525	524.4	40.1	20	24	27	51		Sat.		519.5 45.0 **WEATHERED ROCK** METADIORITE
520	519.4	45.1	100/0.4			100/0.4				516.4 48.1 **CRYSTALLINE ROCK** METADIORITE
515	516.4	48.1	60/0.0			60/0.0				
510										
505										
500										
495										491.4 73.1 Boring Terminated at Elevation 491.4 ft in

WBS 48708.1.1	**TIP** B-6051/U-6143	**COUNTY** GASTON	**GEOLOGIST** M. Shipman	
SITE DESCRIPTION US 29 / US 74 REPLACE BRIDGE NO. 91 OVER CATAWBA RIVER (COMB W/U-6143)				**GROUND WTR (ft)**
BORING NO. B1-D	**STATION** 41+80	**OFFSET** 20 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 564.5 ft	**TOTAL DEPTH** 73.1 ft	**NORTHING** 550,590	**EASTING** 1,399,690	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT2002 B-57 92% 12/23/2022		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER J. White	**START DATE** 11/15/22	**COMP. DATE** 11/17/22	**SURFACE WATER DEPTH** 1.9ft	

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
490						Match Line				Crystalline Rock: METADIORITE

GEOTECHNICAL BORING REPORT
CORE LOG

WBS 48708.1.1	**TIP** B-6051/U-6143	**COUNTY** GASTON	**GEOLOGIST** M. Shipman	
SITE DESCRIPTION US 29 / US 74 REPLACE BRIDGE NO. 91 OVER CATAWBA RIVER (COMB W/U-6143)				**GROUND WTR (ft)**
BORING NO. B1-D	**STATION** 41+80	**OFFSET** 20 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 564.5 ft	**TOTAL DEPTH** 73.1 ft	**NORTHING** 550,590	**EASTING** 1,399,690	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT2002 B-57 92% 12/23/2022		**DRILL METHOD** SPT Core Boring		**HAMMER TYPE** Automatic
DRILLER J. White	**START DATE** 11/15/22	**COMP. DATE** 11/17/22	**SURFACE WATER DEPTH** 1.9ft	
CORE SIZE NQ2	**TOTAL RUN** 25.0 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
516.4											Begin Coring @ 48.1 ft
515	516.4	48.1	5.0	1:54/1.0 2:51/1.0 2:50/1.0 3:57/1.0 1:54/1.0	(3.2) 64%	(0.0) 0%		(21.9) 88%	(6.5) 26%		ELEV. (ft) 516.4 **CRYSTALLINE ROCK** DEPTH (ft) 48.1 Gray, moderately severe to slight weathering, medium hard to hard, very close to close fracture spacing, METADIORITE GSI= 40 to 50
510	511.4	53.1	5.0	2:11/1.0 1:57/1.0 2:06/1.0 3:11/1.0 2:27/1.0	(4.2) 84%	(0.0) 0%					
505	506.4	58.1	5.0	2:11/1.0 2:27/1.0 1:51/1.0 1:57/1.0 2:01/1.0	(5.0) 100%	(1.4) 28%					
500	501.4	63.1	5.0	2:35/1.0 1:45/1.0 2:46/1.0 2:33/1.0 1:49/1.0	(5.0) 100%	(3.0) 60%					
495	496.4	68.1	5.0	1:28/1.0 1:51/1.0 1:42/1.0 2:14/1.0 1:41/1.0	(4.5) 90%	(2.1) 42%					
	491.4	73.1									ELEV. (ft) 491.4 DEPTH (ft) 73.1 Boring Terminated at Elevation 491.4 ft in Crystalline Rock: METADIORITE

CORE PHOTOGRAPHS
B1-D

-L- 41+80 20 RT

BOX 1: 48.1 - 59.9 FEET

0 1 2

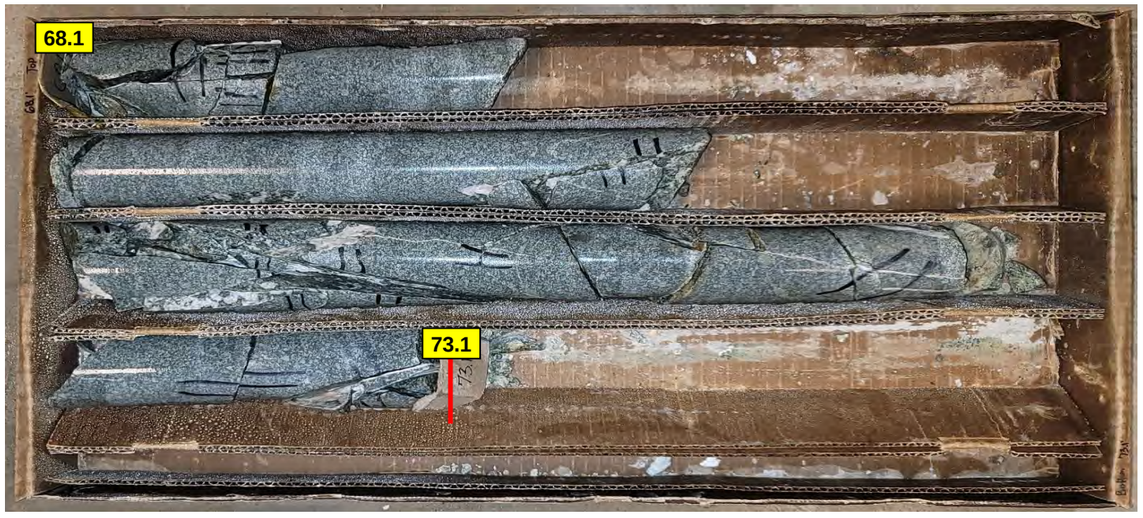
FEET

BOX 2: 59.9 - 68.1 FEET

0 1 2

FEET

BOX 3: 68.1 - 73.1 FEET



0 1 2

FEET

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 48708.1.1	**TIP** B-6051/U-6143	**COUNTY** GASTON	**GEOLOGIST** B. Farmer	
SITE DESCRIPTION US 29 / US 74 REPLACE BRIDGE NO. 91 OVER CATAWBA RIVER (COMB W/U-6143)				**GROUND WTR (ft)**
BORING NO. B2-A	**STATION** 43+23	**OFFSET** 63 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 564.3 ft	**TOTAL DEPTH** 77.8 ft	**NORTHING** 550,634	**EASTING** 1,399,849	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT1303 CME-550 92% 02/03/2022		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER P. McCain	**START DATE** 09/15/22	**COMP. DATE** 09/20/22	**SURFACE WATER DEPTH** 1.6ft	

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))
570										
										WATER SURFACE (09/15/22)
565	564.3	0.0	WOH	WOH	WOH	0		Sat.		564.3 GROUND SURFACE 0.0
										ALLUVIAL
										Gray to brown, clayey fine to coarse SAND (A-2-6), trace to little mica, trace of organic matter
560	558.0	6.3	WOH	WOH	WOH	0		Sat.		
555	553.0	11.3	1	2	2	4		Sat.		
550	548.0	16.3	1	1	2	3		Sat.		546.3 18.0 **RESIDUAL**
545	543.0	21.3	2	3	2	5		Sat.		Gray to brown, clayey fine to coarse SAND (A-2-6), little mica
540	538.3	26.0	10	9	9	18		Sat.		541.3 23.0 Tan, gravelly fine to coarse SAND (A-1-b)
535	533.3	31.0	12	18	22	40		Sat.		536.3 28.0 Brown, fine to coarse sandy CLAY (A-6), trace mica, trace rock fragments
530	528.7	35.6	5	13	28	41		Sat.		
525	523.7	40.6	35	65/0.4		100/0.9				523.7 40.6 **WEATHERED ROCK** METADIORITE
520	518.7	45.6	100/0.4			100/0.4				
515	513.7	50.6	60/0.1			60/0.1				513.7 50.6 **CRYSTALLINE ROCK** METADIORITE
510										
505										
500										
495										
490										

WBS 48708.1.1	**TIP** B-6051/U-6143	**COUNTY** GASTON	**GEOLOGIST** B. Farmer	
SITE DESCRIPTION US 29 / US 74 REPLACE BRIDGE NO. 91 OVER CATAWBA RIVER (COMB W/U-6143)				**GROUND WTR (ft)**
BORING NO. B2-A	**STATION** 43+23	**OFFSET** 63 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 564.3 ft	**TOTAL DEPTH** 77.8 ft	**NORTHING** 550,634	**EASTING** 1,399,849	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT1303 CME-550 92% 02/03/2022		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER P. McCain	**START DATE** 09/15/22	**COMP. DATE** 09/20/22	**SURFACE WATER DEPTH** 1.6ft	

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
490						Match Line				**CRYSTALLINE ROCK** METADIORITE *(continued)*
										486.5 77.8 Boring Terminated at Elevation 486.5 ft in Crystalline Rock: METADIORITE

GEOTECHNICAL BORING REPORT
CORE LOG

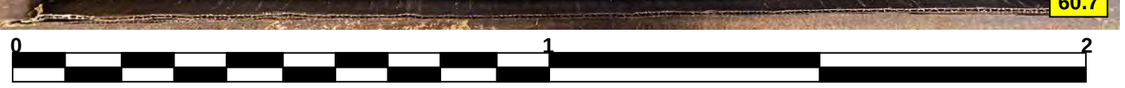
WBS 48708.1.1	**TIP** B-6051/U-6143	**COUNTY** GASTON	**GEOLOGIST** B. Farmer
SITE DESCRIPTION US 29 / US 74 REPLACE BRIDGE NO. 91 OVER CATAWBA RIVER (COMB W/U-6143)			**GROUND WTR (ft)**
BORING NO. B2-A	**STATION** 43+23	**OFFSET** 63 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 564.3 ft	**TOTAL DEPTH** 77.8 ft	**NORTHING** 550,634	**EASTING** 1,399,849	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT1303 CME-550 92% 02/03/2022		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER P. McCain	**START DATE** 09/15/22	**COMP. DATE** 09/20/22	**SURFACE WATER DEPTH** 1.6ft	
CORE SIZE NQ2	**TOTAL RUN** 27.2 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
513.7											Begin Coring @ 50.6 ft
	513.7	50.6	2.6	2:35/1.0 3:48/1.0 3:30/0.6	(1.0) 38%	(0.0) 0%		(25.6) 94%	(7.1) 26%		ELEV. (ft) 513.7 — **CRYSTALLINE ROCK** — DEPTH (ft) 50.6 Gray, moderately hard, moderately severe weathering, very close fracture spacing, METADIORITE GSI = 25 to 35
	511.1	53.2									
510			5.0	2:22/1.0 2:55/1.0 5:36/1.0 2:59/1.0 4:49/1.0	(5.0) 100%	(0.6) 12%					
	506.1	58.2									
505			5.0	2:46/1.0 1:44/1.0 1:40/1.0 2:05/1.0 6:07/1.0	(5.0) 100%	(1.3) 26%					
	501.1	63.2									
500			5.0	2:33/1.0 1:38/1.0 3:24/1.0 2:20/1.0 2:34/1.0	(5.0) 100%	(1.8) 36%					
	496.1	68.2									
495			5.0	2:06/1.0 3:29/1.0 4:34/1.0 4:01/1.0 2:39/1.0	(5.0) 100%	(1.8) 36%					
	491.1	73.2									
490			4.6	2:18/1.0 1:57/1.0 2:20/1.0 2:08/1.0 2:12/0.6	(4.6) 100%	(1.6) 35%					
	486.5	77.8									ELEV. (ft) 486.5 — DEPTH (ft) 77.8 Boring Terminated at Elevation 486.5 ft in Crystalline Rock: METADIORITE

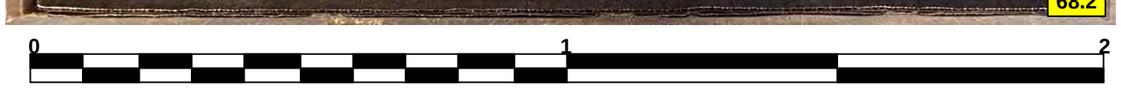
CORE PHOTOGRAPHS
B2-A

-L- 43+23 63 LT

BOX 1: 50.6 - 60.7 FEET



BOX 2: 60.7 - 68.2 FEET



BOX 3: 68.2 - 76.3 FEET

BOX 4: 76.3 - 77.8 FEET

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 48708.1.1	**TIP** B-6051/U-6143	**COUNTY** GASTON	**GEOLOGIST** J. Mize	
SITE DESCRIPTION US 29 / US 74 REPLACE BRIDGE NO. 91 OVER CATAWBA RIVER (COMB W/U-6143)				**GROUND WTR (ft)**
BORING NO. B2-B	**STATION** 43+09	**OFFSET** 69 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 563.6 ft	**TOTAL DEPTH** 73.0 ft	**NORTHING** 550,510	**EASTING** 1,399,803	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT1314 CME-45B 86% 02/03/2022		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER J. White	**START DATE** 09/01/22	**COMP. DATE** 09/02/22	**SURFACE WATER DEPTH** 2.0ft	

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
570										ELEV. (ft) DEPTH (ft)
565										WATER SURFACE (09/01/22)
	563.6	0.0	WOH	WOH	1	1		Sat.		563.6 GROUND SURFACE 0.0 **ALLUVIAL** Gray to brown, clayey silty to gravelly fine SAND (A-2-4), trace mica
560	557.3	6.3	1	2	2	4		Sat.		
555	552.3	11.3	1	1	2	3		Sat.		
550	547.3	16.3	2	2	3	5		Sat.		
545	542.3	21.3	2	2	2	4		Sat.		
540	538.0	25.6	25	13	9	22		Sat.		535.6 28.0 **WEATHERED ROCK** METADIORITE
535	533.0	30.6	32	68/0.3		100/0.8				
530	528.0	35.6	53	47/0.1		100/0.6				
525	523.0	40.6	100/0.3			100/0.3				
520	519.3	44.3	60/0.0			60/0.0				519.3 44.3 **CRYSTALLINE ROCK** METADIORITE
515										
510										
505										
500										
495										490.6 73.0

WBS 48708.1.1	**TIP** B-6051/U-6143	**COUNTY** GASTON	**GEOLOGIST** J. Mize	
SITE DESCRIPTION US 29 / US 74 REPLACE BRIDGE NO. 91 OVER CATAWBA RIVER (COMB W/U-6143)				**GROUND WTR (ft)**
BORING NO. B2-B	**STATION** 43+09	**OFFSET** 69 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 563.6 ft	**TOTAL DEPTH** 73.0 ft	**NORTHING** 550,510	**EASTING** 1,399,803	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT1314 CME-45B 86% 02/03/2022		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER J. White	**START DATE** 09/01/22	**COMP. DATE** 09/02/22	**SURFACE WATER DEPTH** 2.0ft	

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
490						Match Line				Boring Terminated at Elevation 490.6 ft in Crystalline Rock: METADIORITE

NCDOT BORE DOUBLE B-6051 - BRIDGE LOGS_2023.GPJ NC_DOT.GDT 4/19/23

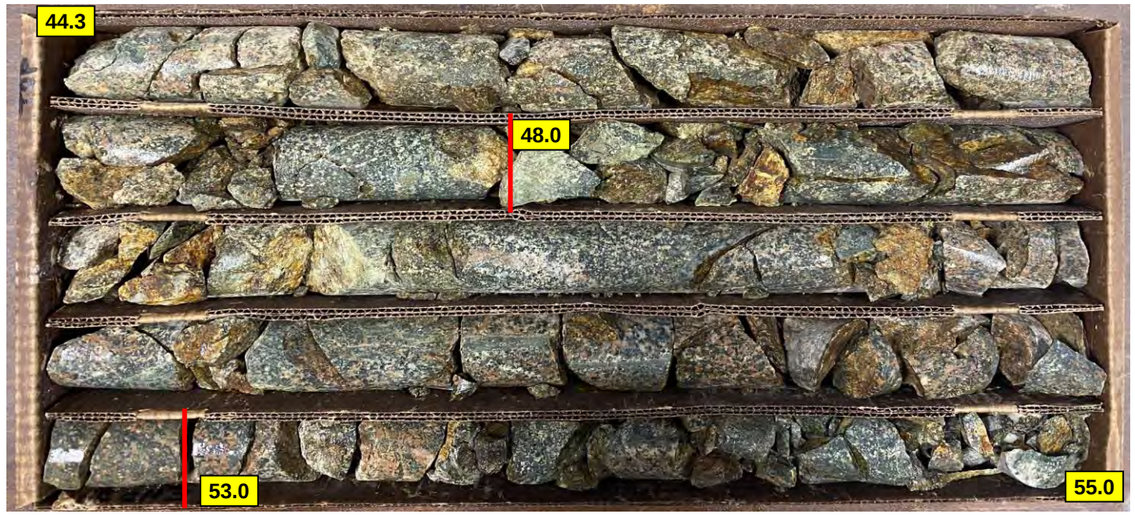
GEOTECHNICAL BORING REPORT
CORE LOG

WBS 48708.1.1	**TIP** B-6051/U-6143	**COUNTY** GASTON	**GEOLOGIST** J. Mize	
SITE DESCRIPTION US 29 / US 74 REPLACE BRIDGE NO. 91 OVER CATAWBA RIVER (COMB W/U-6143)				**GROUND WTR (ft)**
BORING NO. B2-B	**STATION** 43+09	**OFFSET** 69 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 563.6 ft	**TOTAL DEPTH** 73.0 ft	**NORTHING** 550,510	**EASTING** 1,399,803	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT1314 CME-45B 86% 02/03/2022		**DRILL METHOD** SPT Core Boring		**HAMMER TYPE** Automatic
DRILLER J. White	**START DATE** 09/01/22	**COMP. DATE** 09/02/22	**SURFACE WATER DEPTH** 2.0ft	
CORE SIZE NQ2	**TOTAL RUN** 28.7 ft			

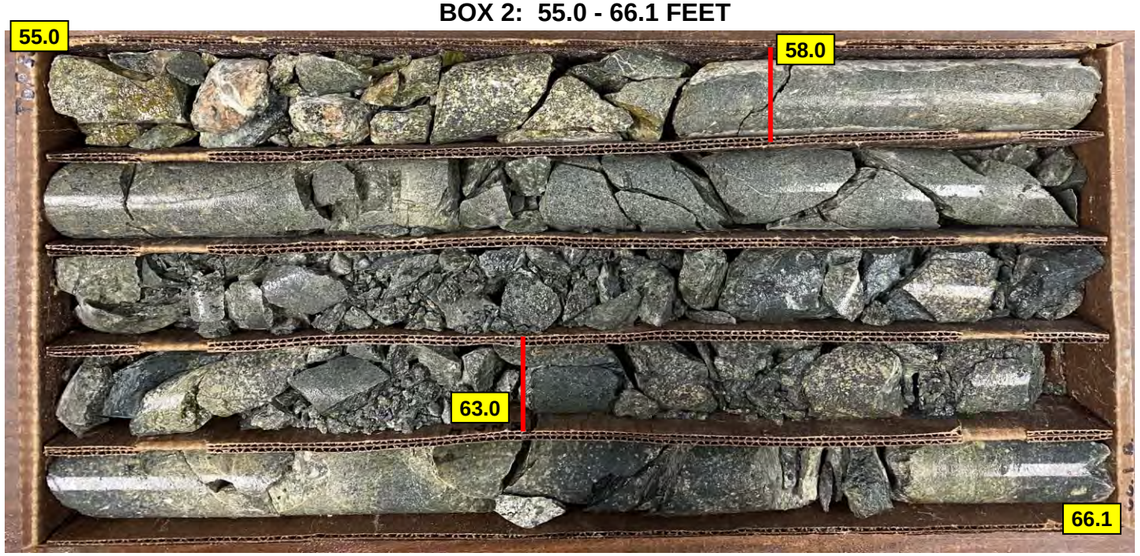
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS
519.3											Begin Coring @ 44.3 ft
	519.3	44.3	3.7	2:22/1.0 2:46/1.0 4:41/1.0 1:46/0.7	(2.8) 76%	(0.4) 11%		(25.8) 90%	(5.3) 18%		ELEV. (ft) 519.3 DEPTH (ft) 44.3 **CRYSTALLINE ROCK** Black to white, fresh to slight weathering, hard to vrey hard, very close to close fracture spacing, METADIORITE GSI = 25 to 35
515	515.6	48.0									
			5.0	2:30/1.0 2:15/1.0 2:05/1.0 1:49/1.0 3:01/1.0	(5.0) 100%	(0.5) 10%					
510	510.6	53.0									
			5.0	1:39/1.0 3:05/1.0 2:10/1.0 2:05/1.0 2:12/1.0	(3.0) 60%	(0.0) 0%					
505	505.6	58.0									
			5.0	1:53/1.0 2:04/1.0 2:33/1.0 3:55/1.0 2:07/1.0	(5.0) 100%	(1.0) 20%					
500	500.6	63.0									
			5.0	1:55/1.0 2:10/1.0 3:37/1.0 3:41/1.0 3:54/1.0	(5.0) 100%	(1.5) 30%					
495	495.6	68.0									
			5.0	2:35/1.0 2:24/1.0 3:56/1.0 2:50/1.0 2:22/1.0	(5.0) 100%	(1.9) 38%					
	490.6	73.0									ELEV. (ft) 490.6 DEPTH (ft) 73.0 Boring Terminated at Elevation 490.6 ft in Crystalline Rock: METADIORITE

CORE PHOTOGRAPHS
B2-B
-L- 43+09 69 RT

BOX 1: 44.3 - 55.0 FEET



BOX 2: 55.0 - 66.1 FEET



BOX 3: 66.1 - 73.0 FEET

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 48708.1.1	**TIP** B-6051/U-6143	**COUNTY** GASTON	**GEOLOGIST** B. Farmer	
SITE DESCRIPTION US 29 / US 74 REPLACE BRIDGE NO. 91 OVER CATAWBA RIVER (COMB W/U-6143)				**GROUND WTR (ft)**
BORING NO. B2-C	**STATION** 43+25	**OFFSET** 11 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 564.2 ft	**TOTAL DEPTH** 73.5 ft	**NORTHING** 550,583	**EASTING** 1,399,839	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT1314 CME-45B 86% 02/03/2022		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER P. McCain	**START DATE** 09/14/22	**COMP. DATE** 09/15/22	**SURFACE WATER DEPTH** 2.1ft	

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))
570										
565										WATER SURFACE (09/14/22)
	564.2	0.0	WOH	WOH	WOH	0		Sat.		564.2 GROUND SURFACE 0.0
560										**ALLUVIAL** Gray, clayey fine to coarse SAND (A-2-6), trace to little organic matter
	558.0	6.2	WOH	WOH	WOH	0		Sat.		558.2 6.0
555										Gray, silty fine to coarse SAND (A-2-4), trace of organic matter, trace mica
	553.0	11.2	1	1	2	3		Sat.		
550										
	548.0	16.2	1	1	1	2		Sat.		
545										
	543.0	21.2	1	2	2	4		Sat.		543.2 21.0 Gray, clayey fine to coarse SAND (A-2-6)
540										
	538.0	26.2	9	12	21	33		Sat.		538.2 26.0 **RESIDUAL** Gray, clayey fine to coarse SAND (A-2-6), trace mica, trace rock fragments
535										
	533.7	30.5	12	33	48	81		Sat.		
530										
	528.7	35.5	12	34	44	78		Sat.		
525										
	523.7	40.5	19	48	52/0.4	100/0.9				523.2 41.0 **WEATHERED ROCK** METADIORITE
520										
	518.7	45.5	9	12	88/0.4	100/0.9				
515										
	513.7	50.5	60/0.1			60/0.1	RS-1			513.7 50.5 **CRYSTALLINE ROCK** METADIORITE
510										
505										
500										
495										490.7 73.5

WBS 48708.1.1	**TIP** B-6051/U-6143	**COUNTY** GASTON	**GEOLOGIST** B. Farmer	
SITE DESCRIPTION US 29 / US 74 REPLACE BRIDGE NO. 91 OVER CATAWBA RIVER (COMB W/U-6143)				**GROUND WTR (ft)**
BORING NO. B2-C	**STATION** 43+25	**OFFSET** 11 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 564.2 ft	**TOTAL DEPTH** 73.5 ft	**NORTHING** 550,583	**EASTING** 1,399,839	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT1314 CME-45B 86% 02/03/2022		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER P. McCain	**START DATE** 09/14/22	**COMP. DATE** 09/15/22	**SURFACE WATER DEPTH** 2.1ft	

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
490						Match Line				Boring Terminated at Elevation 490.7 ft in Crystalline Rock: METADIORITE

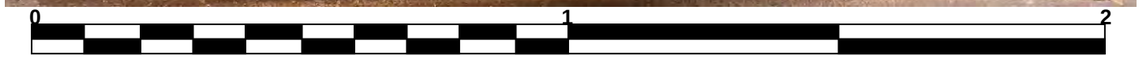
GEOTECHNICAL BORING REPORT
CORE LOG

WBS 48708.1.1	**TIP** B-6051/U-6143	**COUNTY** GASTON	**GEOLOGIST** B. Farmer
SITE DESCRIPTION US 29 / US 74 REPLACE BRIDGE NO. 91 OVER CATAWBA RIVER (COMB W/U-6143)			**GROUND WTR (ft)**
BORING NO. B2-C	**STATION** 43+25	**OFFSET** 11 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 564.2 ft	**TOTAL DEPTH** 73.5 ft	**NORTHING** 550,583	**EASTING** 1,399,839	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT1314 CME-45B 86% 02/03/2022		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER P. McCain	**START DATE** 09/14/22	**COMP. DATE** 09/15/22	**SURFACE WATER DEPTH** 2.1ft	
CORE SIZE NQ2	**TOTAL RUN** 23.0 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
513.7											Begin Coring @ 50.5 ft
	513.7	50.5	3.0	3:54/1.0 2:42/1.0 5:22/1.0	(3.0) 100%	(0.4) 13%		(23.0) 100%	(8.4) 37%		ELEV. (ft) 513.7 **CRYSTALLINE ROCK** DEPTH (ft) 50.5 Gray, moderately severe to slighly weathered, moderately hard to hard, very close to moderately close fracture spacing, METADIORITE GSI = 25 to 40
510	510.7	53.5	5.0	4:07/1.0 2:37/1.0 2:13/1.0 2:16/1.0 3:35/1.0	(5.0) 100%	(2.7) 54%	RS-1				
505	505.7	58.5	5.0	1:32/1.0 1:06/1.0 1:37/1.0 5:00/1.0 3:46/1.0	(5.0) 100%	(1.5) 30%					
500	500.7	63.5	5.0	2:10/1.0 1:58/1.0 2:06/1.0 1:59/1.0 5:10/1.0	(5.0) 100%	(2.3) 46%					
495	495.7	68.5	5.0	2:52/1.0 2:54/1.0 1:45/1.0 3:51/1.0 2:36/1.0	(5.0) 100%	(1.5) 30%					
	490.7	73.5									ELEV. (ft) 490.7 DEPTH (ft) 73.5 Boring Terminated at Elevation 490.7 ft in Crystalline Rock: METADIORITE

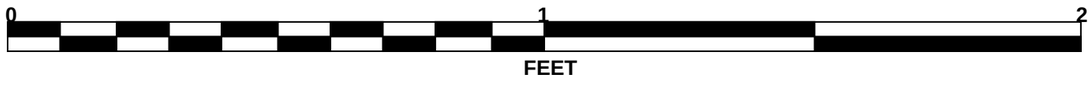
CORE PHOTOGRAPHS
B2-C
-L- 43+25 11 LT

BOX 1: 50.5 - 58.0 FEET



BOX 2: 58.0 - 65.2 FEET

BOX 3: 65.2 - 73.5 FEET



GEOTECHNICAL BORING REPORT
BORE LOG

WBS 48708.1.1	**TIP** B-6051/U-6143	**COUNTY** GASTON	**GEOLOGIST** M. Shipman	
SITE DESCRIPTION US 29 / US 74 REPLACE BRIDGE NO. 91 OVER CATAWBA RIVER (COMB W/U-6143)				**GROUND WTR (ft)**
BORING NO. B2-D	**STATION** 42+91	**OFFSET** 20 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 565.5 ft	**TOTAL DEPTH** 56.3 ft	**NORTHING** 550,562	**EASTING** 1,399,797	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT2002 B-57 92% 12/23/2022		**DRILL METHOD** Mud Rotary		**HAMMER TYPE** Automatic
DRILLER J. White	**START DATE** 11/17/22	**COMP. DATE** 11/17/22	**SURFACE WATER DEPTH** 0.5ft	

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
570										ELEV. (ft) DEPTH (ft)
565	565.5	0.0	WOH	WOH	WOH	0				565.5 0.0 WATER SURFACE (11/17/22)
								Sat.		GROUND SURFACE — **ALLUVIAL** Gray, silty CLAY (A-7-5), trace of organic matter, trace mica
560	559.3	6.2	19	6	2	8				559.3 6.2
								Sat.		558.8 6.7 Gray, gravel with fine to coarse SAND (A-1-a) Brown, silty fine to coarse SAND (A-2-4), little gravel
555	554.3	11.2	2	3	3	6				
								Sat.		
550	549.3	16.2	3	2	3	5				
								Sat.		
545	544.3	21.2	3	6	9	15				
								Sat.		542.0 23.5 Brown, gravel with fine to coarse SAND (A-1-a)
540	539.3	26.2	16	84/0.3		100/0.8				536.5 29.0 **WEATHERED ROCK** METADIORITE
535	534.3	31.2	50	50/0.3		100/0.8				
530	529.3	36.2	100/0.4			100/0.4				
525	524.3	41.2	75	25/0.1		100/0.6				
520	519.3	46.2	100/0.2			100/0.2				
515	514.3	51.2	100/0.2			100/0.2				
510	509.3	56.2	60/0.1			60/0.1				509.2 56.3 Boring Terminated with Standard Penetration Test Refusal at Elevation 509.2 ft in Crystalline Rock: METADIORITE

NCDOT BORE DOUBLE B-6051 - BRIDGE LOGS_2023.GPJ NC_DOT.GDT 4/19/23

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 48708.1.1	**TIP** B-6051/U-6143	**COUNTY** GASTON	**GEOLOGIST** B. Farmer	
SITE DESCRIPTION US 29 / US 74 REPLACE BRIDGE NO. 91 OVER CATAWBA RIVER (COMB W/U-6143)				**GROUND WTR (ft)**
BORING NO. B3-A	**STATION** 43+81	**OFFSET** 67 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 563.9 ft	**TOTAL DEPTH** 73.2 ft	**NORTHING** 550,623	**EASTING** 1,399,906	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT1303 CME-550 92% 02/03/2022		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER P. McCain	**START DATE** 09/21/22	**COMP. DATE** 09/22/22	**SURFACE WATER DEPTH** 2.1ft	

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))
570										
565										WATER SURFACE (09/21/22)
	563.9	0.0	WOH	WOH	WOH	0		Sat.		563.9 GROUND SURFACE 0.0
560										**ALLUVIAL** Gray, clayey fine to coarse SAND (A-2-6), trace mica, trace of organic matter
	558.0	5.9	WOH	1	1	2		Sat.		558.9 5.0
555										Gray, silty fine to coarse SAND (A-2-4), trace mica
	553.0	10.9	WOH	WOH	1	1		Sat.		
550										
	548.0	15.9	1	2	1	3		Sat.		
545										
	543.0	20.9	1	2	2	4		Sat.		
540										
	538.0	25.9	10	4	5	9		Sat.		538.9 25.0
535										**RESIDUAL** Brown, clayey fine to coarse SAND (A-2-6), trace mica, trace rock fragments
	533.0	30.9	12	16	23	39		Sat.		533.9 30.0
530										Brown, silty fine to coarse SAND (A-2-4), trace rock fragments, saprolitic
	528.6	35.3	16	21	55	76		Sat.		
525										524.9 39.0
	523.6	40.3	26	50	50/0.4	100/0.9				**WEATHERED ROCK** METADIORITE
520										
	518.6	45.3	38	62/0.4		100/0.9				
515										
	513.6	50.3	100/0.5			100/0.5				
	511.7	52.2	60/0.0			60/0.0				511.7 52.2
510										**CRYSTALLINE ROCK** METADIORITE
505										
500										
495										490.7 73.2

WBS 48708.1.1	**TIP** B-6051/U-6143	**COUNTY** GASTON	**GEOLOGIST** B. Farmer	
SITE DESCRIPTION US 29 / US 74 REPLACE BRIDGE NO. 91 OVER CATAWBA RIVER (COMB W/U-6143)				**GROUND WTR (ft)**
BORING NO. B3-A	**STATION** 43+81	**OFFSET** 67 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 563.9 ft	**TOTAL DEPTH** 73.2 ft	**NORTHING** 550,623	**EASTING** 1,399,906	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT1303 CME-550 92% 02/03/2022		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER P. McCain	**START DATE** 09/21/22	**COMP. DATE** 09/22/22	**SURFACE WATER DEPTH** 2.1ft	

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
490						Match Line				Boring Terminated at Elevation 490.7 ft in Crystalline Rock: METADIORITE

GEOTECHNICAL BORING REPORT
CORE LOG

WBS 48708.1.1	**TIP** B-6051/U-6143	**COUNTY** GASTON	**GEOLOGIST** B. Farmer	
SITE DESCRIPTION US 29 / US 74 REPLACE BRIDGE NO. 91 OVER CATAWBA RIVER (COMB W/U-6143)				**GROUND WTR (ft)**
BORING NO. B3-A	**STATION** 43+81	**OFFSET** 67 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 563.9 ft	**TOTAL DEPTH** 73.2 ft	**NORTHING** 550,623	**EASTING** 1,399,906	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT1303 CME-550 92% 02/03/2022		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER P. McCain	**START DATE** 09/21/22	**COMP. DATE** 09/22/22	**SURFACE WATER DEPTH** 2.1ft	
CORE SIZE NQ2	**TOTAL RUN** 21.0 ft			

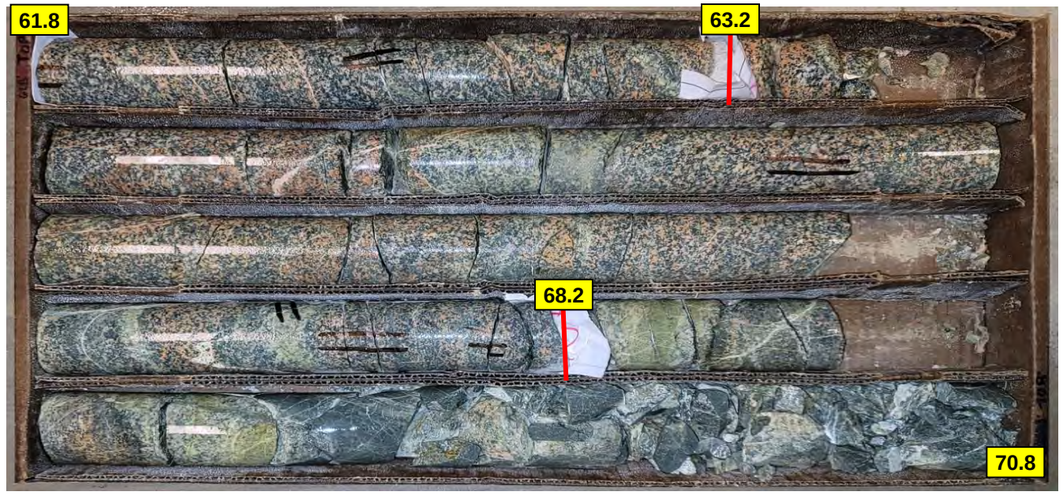
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS
511.7											Begin Coring @ 52.2 ft
	511.7	52.2	1.0	4:54/1.0	(0.6)	(0.4)		(20.6)	(12.4)		ELEV. (ft) 511.7 **CRYSTALLINE ROCK** DEPTH (ft) 52.2
510	510.7	53.2	5.0	3:06/1.0	60%	40%		98%	59%		Gray, moderately hard to hard, moderately to very slightly weathered, close to very close fracture spacing, METADIORITE
				2:22/1.0	(5.0)	(4.2)					GSI = 35 to 45
				3:00/1.0	100%	84%					(70' - 72' Highly fractured zone)
				2:01/1.0							
	505.7	58.2		2:38/1.0							
505			5.0	2:01/1.0	(5.0)	(4.5)					
				2:24/1.0	100%	90%					
				2:09/1.0							
				2:21/1.0							
	500.7	63.2		2:11/1.0							
500			5.0	3:12/1.0	(5.0)	(2.9)					
				4:25/1.0	100%	58%					
				2:15/1.0							
				1:56/1.0							
	495.7	68.2		3:12/1.0							
495			5.0	3:34/1.0	(5.0)	(0.4)					
				4:17/1.0	100%	8%					
				5:03/1.0							
				4:15/1.0							
	490.7	73.2		4:20/1.0							ELEV. (ft) 490.7 DEPTH (ft) 73.2
											Boring Terminated at Elevation 490.7 ft in Crystalline Rock: METADIORITE

CORE PHOTOGRAPHS
B3-A
-L- 43+81 67 LT

BOX 1: 52.2 - 61.8 FEET

0 1 2
FEET

BOX 2: 61.8 - 70.8 FEET



0 1 2
FEET

BOX 3: 70.8 - 73.2 FEET

0 1 2
FEET

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 48708.1.1	**TIP** B-6051/U-6143	**COUNTY** GASTON	**GEOLOGIST** J. Mize	
SITE DESCRIPTION US 29 / US 74 REPLACE BRIDGE NO. 91 OVER CATAWBA RIVER (COMB W/U-6143)				**GROUND WTR (ft)**
BORING NO. B3-B	**STATION** 44+10	**OFFSET** 68 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 563.4 ft	**TOTAL DEPTH** 68.7 ft	**NORTHING** 550,485	**EASTING** 1,399,900	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT1314 CME-45B 86% 02/03/2022		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER J. White	**START DATE** 08/30/22	**COMP. DATE** 08/30/22	**SURFACE WATER DEPTH** 2.0ft	

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)
570										
565										WATER SURFACE (08/30/22)
	563.4	0.0	WOH	WOH	WOH	0		Sat.		563.4 GROUND SURFACE 0.0
560										**ALLUVIAL** Gray, silty CLAY (A-7-6), trace of organic matter
	557.0	6.4	WOH	WOH	WOH	0		Sat.		
555										554.4 9.0
	552.0	11.4	4	1	1	2		Sat.		Gray, silty fine to coarse SAND (A-2-4), wood in shoe
550										
	547.0	16.4	WOH	1	1	2		Sat.		
545										
	542.0	21.4	WOH	WOH	WOH	0		Sat.		
540										
	535.7	27.7	9	16	22	38		Sat.		535.9 27.5 **RESIDUAL** Brown, silty clayey fine to coarse SAND (A-2-6)
535										533.4 30.0 Brown, clayey silty fine to coarse SAND (A-2-4)
	530.7	32.7	19	15	15	30		Sat.		
530										
	525.7	37.7	30	70/0.4		100/0.9				526.4 37.0 **WEATHERED ROCK** METADIORITE
525										
	520.7	42.7	56	44/0.4		100/0.9				
520										
	517.4	46.0	60/0.0			60/0.0	RS-2			517.4 46.0 **CRYSTALLINE ROCK** METADIORITE
515										
510										
505										
500										
495										494.7 68.7 Boring Terminated at Elevation 494.7 ft in Crystalline Rock: METADIORITE

NCDOT BORE DOUBLE B-6051 - BRIDGE LOGS_2023.GPJ NC_DOT.GDT 4/19/23

GEOTECHNICAL BORING REPORT
CORE LOG

WBS 48708.1.1	**TIP** B-6051/U-6143	**COUNTY** GASTON	**GEOLOGIST** J. Mize	
SITE DESCRIPTION US 29 / US 74 REPLACE BRIDGE NO. 91 OVER CATAWBA RIVER (COMB W/U-6143)				**GROUND WTR (ft)**
BORING NO. B3-B	**STATION** 44+10	**OFFSET** 68 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 563.4 ft	**TOTAL DEPTH** 68.7 ft	**NORTHING** 550,485	**EASTING** 1,399,900	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT1314 CME-45B 86% 02/03/2022		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER J. White	**START DATE** 08/30/22	**COMP. DATE** 08/30/22	**SURFACE WATER DEPTH** 2.0ft	
CORE SIZE NQ2	**TOTAL RUN** 22.7 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)
517.4											Begin Coring @ 46.0 ft
	517.4	46.0	2.2	3:16/1.2 1:26/1.0	(2.1) 95%	(1.0) 45%	RS-2	(22.2) 98%	(13.9) 61%		517.4 **CRYSTALLINE ROCK** 46.0 Gray to green, fresh to slight weathering, hard to very hard, moderately close to very close fracture spacing, METADIORITE GSI = 45 to 55
515	515.2	48.2									
			5.0	1:45/1.0 1:28/1.0 1:34/1.0 1:47/1.0 2:30/1.0	(4.7) 94%	(3.0) 60%					
510	510.2	53.2									
			5.0	2:06/1.0 1:40/1.0 2:10/1.0 2:37/1.0 3:15/1.0	(5.0) 100%	(1.9) 38%					
505	505.2	58.2									
			5.0	1:22/1.0 2:19/1.0 1:34/1.0 2:14/1.0 2:27/1.0	(5.0) 100%	(4.1) 82%					
500	500.2	63.2									
			5.0	1:24/1.0 1:37/1.0 2:03/1.0 1:45/1.0 1:43/0.5	(4.9) 98%	(3.4) 68%					
495	495.2	68.2									
	494.7	68.7	0.5	0:51	(0.5) 100%	(0.5) 100%					494.7 68.7 Boring Terminated at Elevation 494.7 ft in Crystalline Rock: METADIORITE

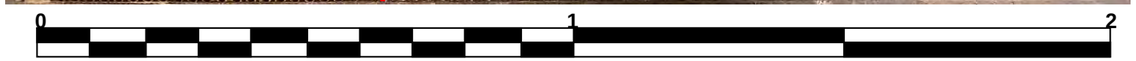
CORE PHOTOGRAPHS

B3-B

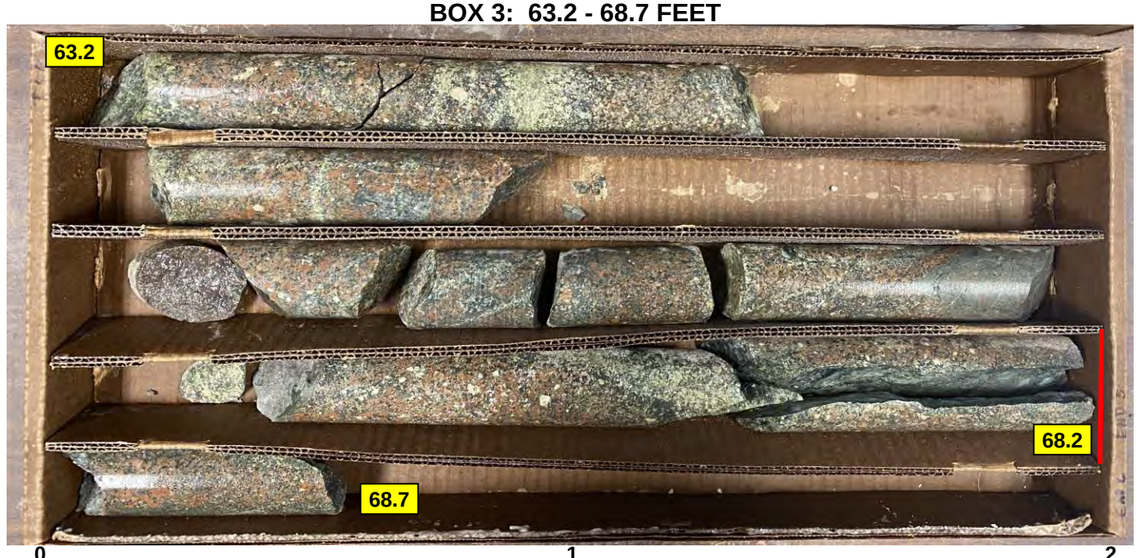
-L- 44+10 68 RT

BOX 1: 46.0 - 56.2 FEET

BOX 2: 56.2 - 63.2 FEET



BOX 3: 63.2 - 68.7 FEET



GEOTECHNICAL BORING REPORT
BORE LOG

WBS 48708.1.1	**TIP** B-6051/U-6143	**COUNTY** GASTON	**GEOLOGIST** B. Farmer	
SITE DESCRIPTION US 29 / US 74 REPLACE BRIDGE NO. 91 OVER CATAWBA RIVER (COMB W/U-6143)				**GROUND WTR (ft)**
BORING NO. B3-C	**STATION** 43+87	**OFFSET** 19 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 564.1 ft	**TOTAL DEPTH** 73.5 ft	**NORTHING** 550,575	**EASTING** 1,399,900	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT1303 CME-550 92% 02/03/2022		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER P. McCain	**START DATE** 09/20/22	**COMP. DATE** 09/21/22	**SURFACE WATER DEPTH** 1.8ft	

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
570										ELEV. (ft) DEPTH (ft)
										WATER SURFACE (09/20/22)
565	564.1	0.0	WOH	WOH	WOH	0		Sat.		564.1 GROUND SURFACE 0.0
										ALLUVIAL
										Gray, silty fine to coarse SAND (A-2-4), trace mica, trace of organic matter
560	557.9	6.2	WOH	WOH	WOH	0		Sat.		
555	552.9	11.2	WOH	WOH	1	1		Sat.		
550	547.9	16.2	1	1	0	1		Sat.		
545	542.9	21.2	WOH	2	2	4		Sat.		
540	539.1	25.0								Tan, gravel with fine to coarse SAND (A-1-a)
	537.9	26.2	9	12	11	23		Sat.		
535	534.1	30.0								**RESIDUAL**
	532.9	31.2	13	25	30	55		Sat.		Brown, silty fine to coarse SAND (A-2-4), saprolitic
530	528.6	35.5	31	69/0.4		100/0.9				528.1 36.0
										WEATHERED ROCK
525	523.6	40.5	55	45/0.3		100/0.8				METADIORITE
520	518.6	45.5	100/0.3			100/0.3				
	516.0	48.1	60/0.0			60/0.0				516.0 48.1
515										**CRYSTALLINE ROCK**
										METADIORITE
510										510.8 53.3
										TUFF
505										
500										
495										490.6 73.5

WBS 48708.1.1	**TIP** B-6051/U-6143	**COUNTY** GASTON	**GEOLOGIST** B. Farmer	
SITE DESCRIPTION US 29 / US 74 REPLACE BRIDGE NO. 91 OVER CATAWBA RIVER (COMB W/U-6143)				**GROUND WTR (ft)**
BORING NO. B3-C	**STATION** 43+87	**OFFSET** 19 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 564.1 ft	**TOTAL DEPTH** 73.5 ft	**NORTHING** 550,575	**EASTING** 1,399,900	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT1303 CME-550 92% 02/03/2022		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER P. McCain	**START DATE** 09/20/22	**COMP. DATE** 09/21/22	**SURFACE WATER DEPTH** 1.8ft	

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
490						Match Line				Boring Terminated at Elevation 490.6 ft in Crystalline Rock: TUFF

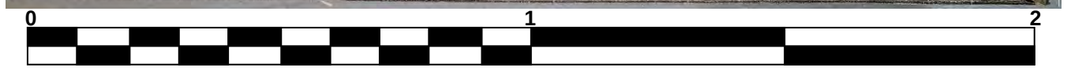
GEOTECHNICAL BORING REPORT
CORE LOG

WBS 48708.1.1	**TIP** B-6051/U-6143	**COUNTY** GASTON	**GEOLOGIST** B. Farmer	
SITE DESCRIPTION US 29 / US 74 REPLACE BRIDGE NO. 91 OVER CATAWBA RIVER (COMB W/U-6143)				**GROUND WTR (ft)**
BORING NO. B3-C	**STATION** 43+87	**OFFSET** 19 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 564.1 ft	**TOTAL DEPTH** 73.5 ft	**NORTHING** 550,575	**EASTING** 1,399,900	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT1303 CME-550 92% 02/03/2022		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER P. McCain	**START DATE** 09/20/22	**COMP. DATE** 09/21/22	**SURFACE WATER DEPTH** 1.8ft	
CORE SIZE NQ2	**TOTAL RUN** 25.4 ft			

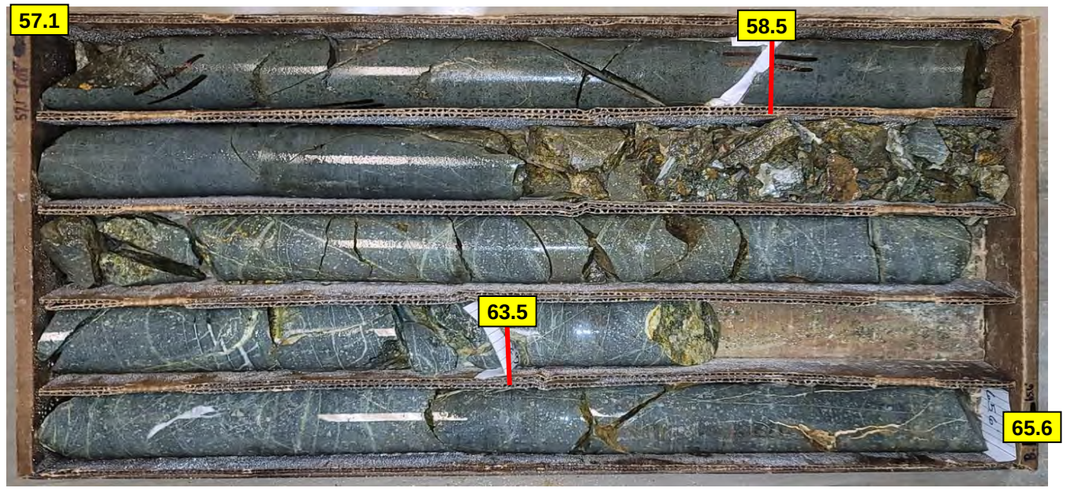
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS
516											Begin Coring @ 48.1 ft
515	516.0	48.1	5.4	4:00/1.4 4:58/1.0 3:04/1.0 5:57/1.0 3:40/1.0	(5.0) 93%	(1.6) 30%		(4.8) 92%	(1.4) 27%		ELEV. (ft) 516.0 DEPTH (ft) 48.1 **CRYSTALLINE ROCK** Gray, moderately hard to hard, moderately weathered, very close to close fracture spacing, METADIORITE GSI = 25 to 40
510	510.6	53.5	5.0	4:21/1.0 3:10/1.0 3:22/1.0 2:34/1.0 2:51/1.0	(5.0) 100%	(2.2) 44%		(20.2) 100%	(11.2) 55%		ELEV. (ft) 510.8 DEPTH (ft) 53.3 Gray, moderately severe to slightly weathered, moderately hard to hard, very close to close fracture spacing, TUFF GSI = 25 to 40
505	505.6	58.5	5.0	3:21/1.0 3:24/1.0 4:05/1.0 2:32/1.0 3:13/1.0	(5.0) 100%	(1.2) 24%					
500	500.6	63.5	5.0	2:04/1.0 2:19/1.0 2:20/1.0 2:28/1.0 3:04/1.0	(5.0) 100%	(3.3) 66%					
495	495.6	68.5	5.0	1:49/1.0 3:29/1.0 3:57/1.0 2:50/1.0 3:06/1.0	(5.0) 100%	(4.3) 86%					
	490.6	73.5									ELEV. (ft) 490.6 DEPTH (ft) 73.5 Boring Terminated at Elevation 490.6 ft in Crystalline Rock: TUFF

CORE PHOTOGRAPHS
B3-C
-L- 43+87 19 LT

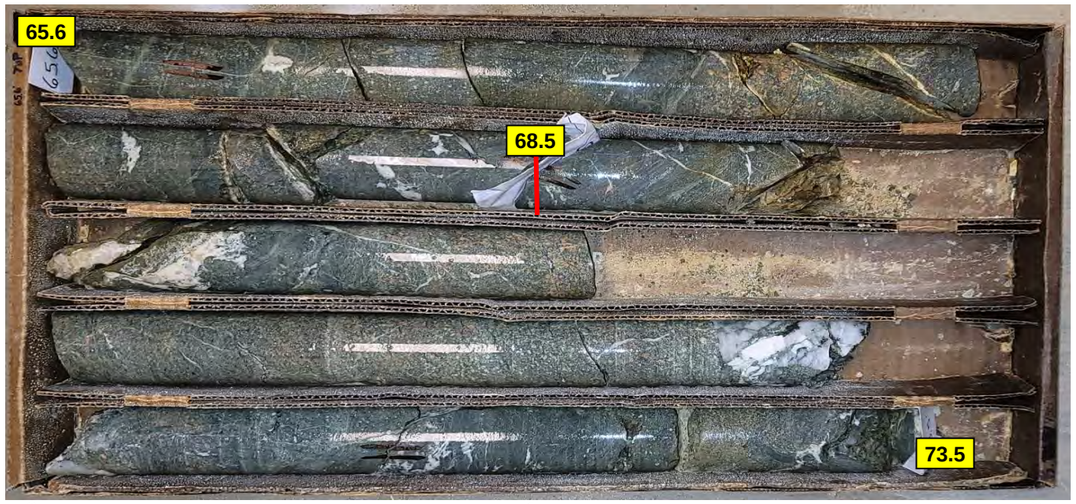
BOX 1: 48.1 - 57.1 FEET

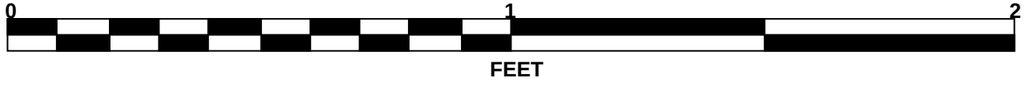


BOX 2: 57.1 - 65.6 FEET



BOX 3: 65.6 - 73.5 FEET





GEOTECHNICAL BORING REPORT
BORE LOG

WBS 48708.1.1	**TIP** B-6051/U-6143	**COUNTY** GASTON	**GEOLOGIST** M. Shipman	
SITE DESCRIPTION US 29 / US 74 REPLACE BRIDGE NO. 91 OVER CATAWBA RIVER (COMB W/U-6143)				**GROUND WTR (ft)**
BORING NO. B3-D	**STATION** 44+01	**OFFSET** 19 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 564.5 ft	**TOTAL DEPTH** 63.3 ft	**NORTHING** 550,535	**EASTING** 1,399,904	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT2002 B-57 92% 12/23/2022		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER J. White	**START DATE** 11/17/22	**COMP. DATE** 11/29/22	**SURFACE WATER DEPTH** 0.5ft	

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)
565										WATER SURFACE (11/17/22) 564.5 / 0.0
	564.5	0.0	WOH	WOH	WOH	0		Sat.		GROUND SURFACE — **ALLUVIAL** Gray, silty CLAY (A-7-5), trace mica, trace to little organic matter
560	559.2	5.3	WOH	WOH	WOH	0		Sat.		
555	554.2	10.3	2	0	1	1		Sat.		551.5 / 13.0 Brown, silty fine to coarse SAND (A-2-4), trace mica
550	549.2	15.3	WOH	WOH	1	1		Sat.		
545	544.2	20.3	3	2	3	5		Sat.		
540	539.2	25.3	3	2	9	11		Sat.		536.5 / 28.0 **RESIDUAL** Brown, fine sandy SILT (A-4), trace rock fragments
535	534.2	30.3	16	31	31	62		Sat.		
530	529.2	35.3	60/0.1			60/0.1				529.2 / 35.3 **CRYSTALLINE ROCK** METADIORITE
	526.9	37.6	60/0.0			60/0.0				525.2 / 39.3 METADIORITE
525										
520										
515										
510										
505										501.2 / 63.3 Boring Terminated at Elevation 501.2 ft in Crystalline Rock: METADIORITE

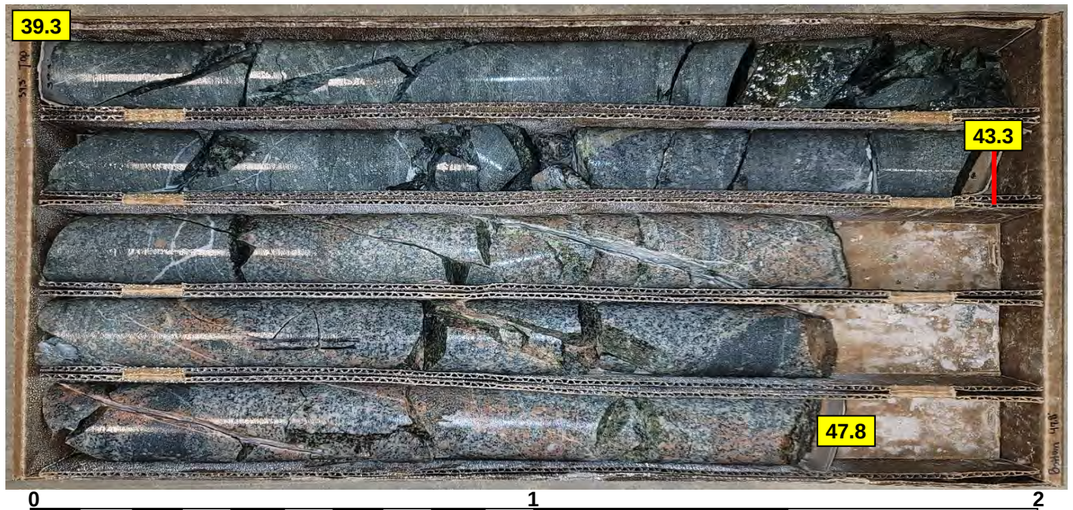
GEOTECHNICAL BORING REPORT
CORE LOG

WBS 48708.1.1	**TIP** B-6051/U-6143	**COUNTY** GASTON	**GEOLOGIST** M. Shipman	
SITE DESCRIPTION US 29 / US 74 REPLACE BRIDGE NO. 91 OVER CATAWBA RIVER (COMB W/U-6143)				**GROUND WTR (ft)**
BORING NO. B3-D	**STATION** 44+01	**OFFSET** 19 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 564.5 ft	**TOTAL DEPTH** 63.3 ft	**NORTHING** 550,535	**EASTING** 1,399,904	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT2002 B-57 92% 12/23/2022		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER J. White	**START DATE** 11/17/22	**COMP. DATE** 11/29/22	**SURFACE WATER DEPTH** 0.5ft	
CORE SIZE NQ2	**TOTAL RUN** 24.0 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 ELEV. (ft) / DEPTH (ft)
525											Begin Coring @ 39.3 ft
	525.2	39.3	4.0	1:29/1.0 2:19/1.0 2:57/1.0 4:16/1.0	(3.6) 90%	(0.9) 23%		(23.6) 98%	(13.9) 58%		525.2 / 39.3 Gray to pink, moderate to very slight weathering, moderately hard to hard, very close to moderately close fracture spacing, METADIORITE GSI=40 to 50
520	521.2	43.3	5.0	2:26/1.0 2:26/1.0 3:02/1.0 2:34/1.0 3:10/1.0	(5.0) 100%	(2.3) 46%					
515	516.2	48.3	5.0	2:15/1.0 2:39/1.0 2:09/1.0 2:15/1.0 2:17/1.0	(5.0) 100%	(3.8) 76%					
510	511.2	53.3	5.0	2:11/1.0 1:54/1.0 2:21/1.0 2:01/1.0 1:56/1.0	(5.0) 100%	(4.4) 88%					
505	506.2	58.3	5.0	1:52/1.0 2:01/1.0 2:20/1.0 1:28/1.0 3:13/1.0	(5.0) 100%	(2.5) 50%					
	501.2	63.3									501.2 / 63.3 Boring Terminated at Elevation 501.2 ft in Crystalline Rock: METADIORITE

CORE PHOTOGRAPHS
B3-D
-L- 44+01 19 RT

BOX 1: 39.3 - 47.8 FEET

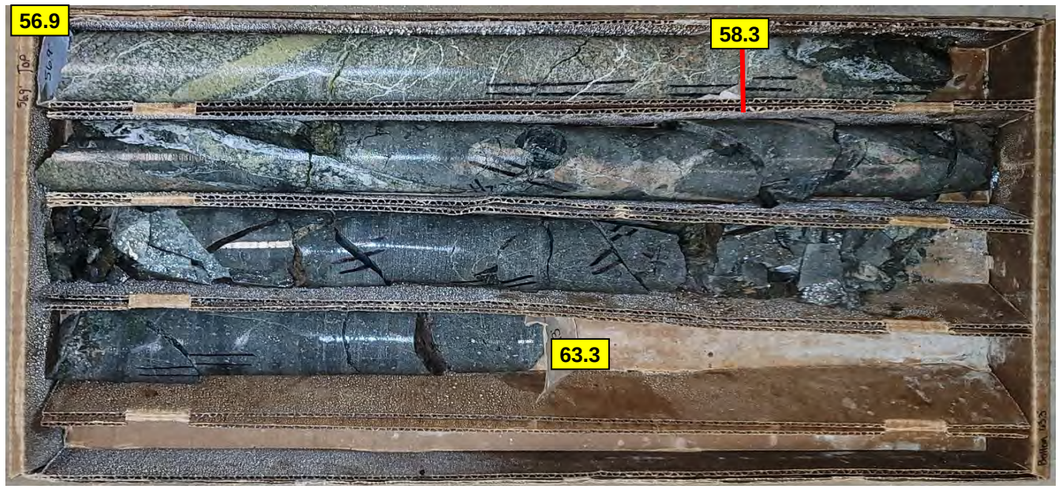


0 1 2
FEET

BOX 2: 47.8 - 56.9 FEET

0 1 2
FEET

BOX 3: 56.9 - 63.3 FEET



0 1 2
FEET

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 48708.1.1	**TIP** B-6051/U-6143	**COUNTY** GASTON	**GEOLOGIST** J. Mize	
SITE DESCRIPTION US 29 / US 74 REPLACE BRIDGE NO. 91 OVER CATAWBA RIVER (COMB W/U-6143)				**GROUND WTR (ft)**
BORING NO. B4-B	**STATION** 44+91	**OFFSET** 69 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 563.4 ft	**TOTAL DEPTH** 73.8 ft	**NORTHING** 550,464	**EASTING** 1,399,979	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT1314 CME-45B 86% 02/03/2022		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER J. White	**START DATE** 08/30/22	**COMP. DATE** 09/01/22	**SURFACE WATER DEPTH** 2.0ft	

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))
570										
565										WATER SURFACE (08/30/22)
	563.4	0.0	WOH	WOH	WOH	0		Sat.		563.4 GROUND SURFACE 0.0
560										**ALLUVIAL** Gray, silty fine SAND (A-2-4)
	559.4	4.0								559.4 Gray, fine sandy clayey MUCK 4.0
	556.8	6.6	WOH	WOH	WOH	0		Sat.		
555										
	551.8	11.6	WOH	WOH	WOH	0		Sat.		
550										
	546.8	16.6	WOH	WOH	1	1		Sat.		
545										
	543.4	20.0								543.4 Gray, silty fine SAND (A-2-4), trace mica 20.0
	541.8	21.6	WOH	WOH	3	3		Sat.		
540										
	537.6	25.8	WOH	WOH	WOH	0		Sat.		
535										535.4 **RESIDUAL** 28.0
	532.6	30.8	11	15	11	26		Sat.		Gray, silty fine SAND (A-2-4), trace rock fragments, saprolitic
530										
	527.6	35.8	5	13	34	47		Sat.		
525										
	522.6	40.8	18	34	49	83		Sat.		
520										
	518.4	45.0	60/0.0			60/0.0				518.4 **CRYSTALLINE ROCK** 45.0
515										METADIORITE
510										
505										
500										
495										
490										

WBS 48708.1.1	**TIP** B-6051/U-6143	**COUNTY** GASTON	**GEOLOGIST** J. Mize	
SITE DESCRIPTION US 29 / US 74 REPLACE BRIDGE NO. 91 OVER CATAWBA RIVER (COMB W/U-6143)				**GROUND WTR (ft)**
BORING NO. B4-B	**STATION** 44+91	**OFFSET** 69 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 563.4 ft	**TOTAL DEPTH** 73.8 ft	**NORTHING** 550,464	**EASTING** 1,399,979	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT1314 CME-45B 86% 02/03/2022		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER J. White	**START DATE** 08/30/22	**COMP. DATE** 09/01/22	**SURFACE WATER DEPTH** 2.0ft	

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
490						Match Line				489.6 Boring Terminated at Elevation 489.6 ft in Crystalline Rock: METADIORITE 73.8

NCDOT BORE DOUBLE B-6051 - BRIDGE LOGS_2023.GPJ NC_DOT.GDT 4/19/23

GEOTECHNICAL BORING REPORT
CORE LOG

WBS 48708.1.1	**TIP** B-6051/U-6143	**COUNTY** GASTON	**GEOLOGIST** J. Mize
SITE DESCRIPTION US 29 / US 74 REPLACE BRIDGE NO. 91 OVER CATAWBA RIVER (COMB W/U-6143)			**GROUND WTR (ft)**
BORING NO. B4-B	**STATION** 44+91	**OFFSET** 69 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 563.4 ft	**TOTAL DEPTH** 73.8 ft	**NORTHING** 550,464	**EASTING** 1,399,979	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT1314 CME-45B 86% 02/03/2022		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER J. White	**START DATE** 08/30/22	**COMP. DATE** 09/01/22	**SURFACE WATER DEPTH** 2.0ft	
CORE SIZE NQ2	**TOTAL RUN** 28.3 ft			

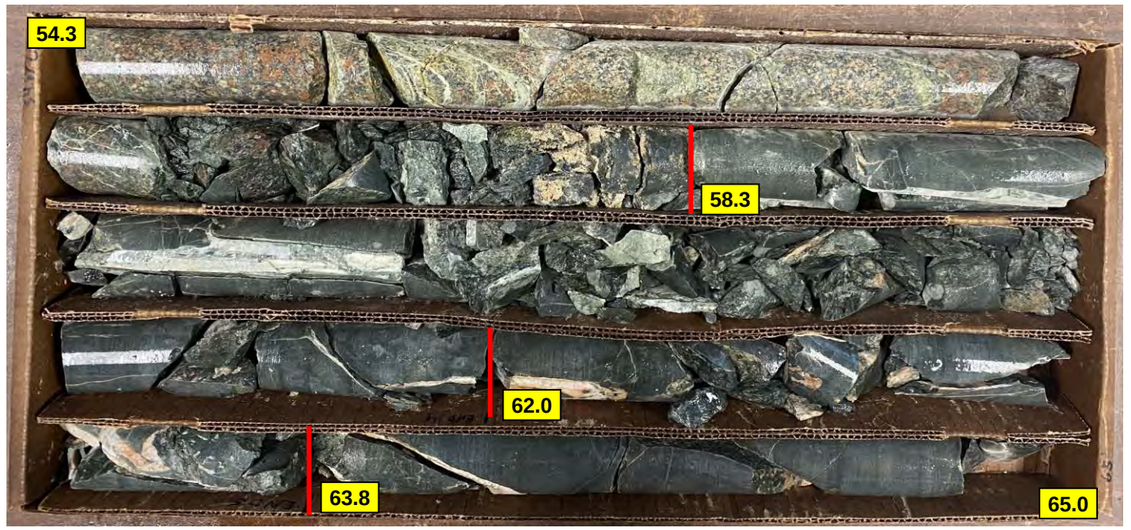
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS
518.4											Begin Coring @ 45.0 ft
	518.4	45.0	3.3	1:15/1.0 1:57/1.0 2:30/1.0	(3.0) 91%	(1.5) 45%		(27.2) 94%	(9.7) 34%		ELEV. (ft) 518.4 **CRYSTALLINE ROCK** DEPTH (ft) 45.0 Black to white to pink to green, fresh to very slight weathering, very hard to hard, very close to moderately close fracture spacing, METADIORITE GSI = 35 to 45
515	515.1	48.3		0:50/0.3							
	514.6	48.8	5.0	1:46/1.0 1:48/1.0 1:50/1.0 2:26/1.0 5:31/1.0	(5.0) 100%	(2.5) 50%					
510	509.6	53.8									
			5.0	3:41/1.0 2:06/1.0 1:48/1.0 1:41/1.0 6:03/1.0	(4.2) 84%	(1.9) 38%					
505	504.6	58.8									
	502.4	61.0	3.2	1:53/1.0 2:47/1.0	(3.2) 100%	(0.0) 0%					
	501.4	62.0	1.8	3:45/1.2	(1.8)	(0.4)					
500	500.6 499.6	62.8 63.8		2:55/0.8 5:33/1.0	100%	22%					
			5.0	1:52/1.0 1:35/1.0 1:41/1.0 1:38/1.0 2:49/1.0	(5.0) 100%	(1.3) 26%					
495	494.6	68.8									
			5.0	2:00/1.0 2:30/1.0 2:22/1.0 3:46/1.0 1:25/1.0	(5.0) 100%	(2.1) 42%					
490	489.6	73.8									ELEV. (ft) 489.6 DEPTH (ft) 73.8 Boring Terminated at Elevation 489.6 ft in Crystalline Rock: METADIORITE

CORE PHOTOGRAPHS
B4-B

-L- 44+91 69 RT

BOX 1: 45.0 - 54.3 FEET

BOX 2: 54.3 - 65.0 FEET



BOX 3: 65.0 - 73.3 FEET

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 48708.1.1	**TIP** B-6051/U-6143	**COUNTY** GASTON	**GEOLOGIST** M. Shipman	
SITE DESCRIPTION US 29 / US 74 REPLACE BRIDGE NO. 91 OVER CATAWBA RIVER (COMB W/U-6143)				**GROUND WTR (ft)**
BORING NO. B4-D	**STATION** 44+77	**OFFSET** 20 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 564.8 ft	**TOTAL DEPTH** 68.2 ft	**NORTHING** 550,515	**EASTING** 1,399,977	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT2002 B-57 92% 12/23/2022		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER J. White	**START DATE** 11/29/22	**COMP. DATE** 11/30/22	**SURFACE WATER DEPTH** 1.0ft	

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)
570										
565	564.8	0.0								WATER SURFACE (11/29/22) GROUND SURFACE 564.8 / 0.0
	559.4	5.4	WOH	WOH	1	1		Sat.		**ALLUVIAL** Gray, silty fine to coarse SAND (A-2-4), trace gravel, trace of organic matter
560										560.8 / 4.0
555	554.4	10.4	WOR	WOR	WOR	0		Sat.		Gray, silty CLAY (A-7-5), trace mica, trace to little organic matter
550	549.4	15.4	WOR	WOR	WOR	0		Sat.		550.8 / 14.0
545	544.4	20.4	WOH	WOH	WOH	0		Sat.		Gray, silty fine to coarse SAND (A-2-4), trace mica, little organic matter
540	539.4	25.4	1	1	1	2		Sat.		
535	534.4	30.4	2	2	2	4		Sat.		535.8 / 29.0
530	529.4	35.4	9	8	8	16		Sat.		**RESIDUAL** Gray to white, silty fine to coarse SAND (A-2-4), trace mica, trace to little rock fragments, saprolitic
525	524.4	40.4	25	33	51	84		Sat.		525.8 / 39.0
520	522.3	42.5	100/0.4			100/0.4				**WEATHERED ROCK** METADIORITE
			60/0.0			60/0.0				522.3 / 42.5
515										**CRYSTALLINE ROCK** METADIORITE
510										
505										
500										496.6 / 68.2 Boring Terminated at Elevation 496.6 ft in Crystalline Rock: METADIORITE

NCDOT BORE DOUBLE B-6051 - BRIDGE LOGS_2023.GPJ NC_DOT.GDT 4/19/23

GEOTECHNICAL BORING REPORT
CORE LOG

WBS 48708.1.1	**TIP** B-6051/U-6143	**COUNTY** GASTON	**GEOLOGIST** M. Shipman
SITE DESCRIPTION US 29 / US 74 REPLACE BRIDGE NO. 91 OVER CATAWBA RIVER (COMB W/U-6143)			**GROUND WTR (ft)**
BORING NO. B4-D	**STATION** 44+77	**OFFSET** 20 ft RT	**ALIGNMENT** -L- / **0 HR.** N/A
COLLAR ELEV. 564.8 ft	**TOTAL DEPTH** 68.2 ft	**NORTHING** 550,515	**EASTING** 1,399,977 / **24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT2002 B-57 92% 12/23/2022		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic
DRILLER J. White	**START DATE** 11/29/22	**COMP. DATE** 11/30/22	**SURFACE WATER DEPTH** 1.0ft
CORE SIZE NQ2	**TOTAL RUN** 25.7 ft		

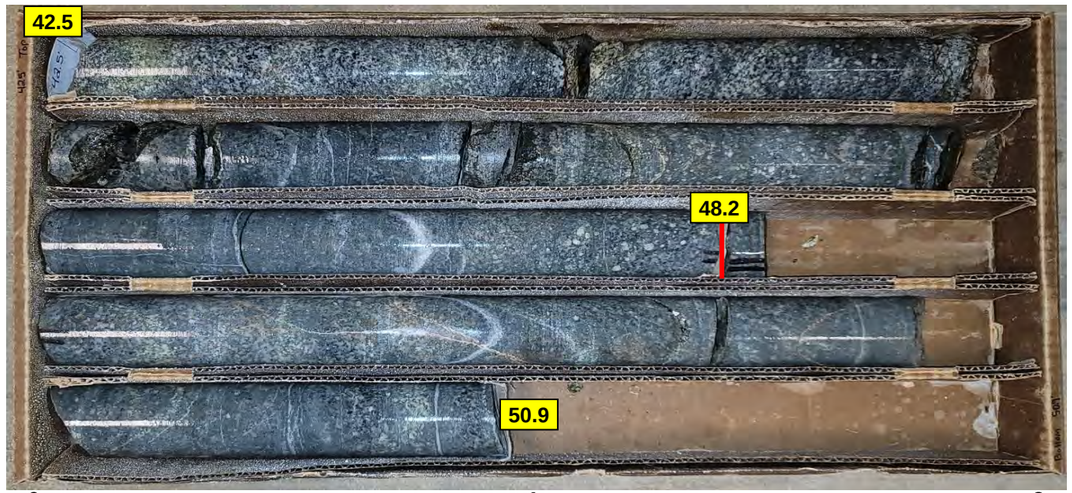
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS ELEV. (ft) / DEPTH (ft)
522.3											Begin Coring @ 42.5 ft
520	522.3	42.5	5.7	2:10/1.7 1:20/1.0 2:29/1.0 2:17/1.0 2:42/1.0	(5.0) 88%	(4.0) 70%		(24.3) 95%	(12.5) 49%		522.3 / 42.5 **CRYSTALLINE ROCK** Gray, fresh to moderately severe weathering, medium hard to hard, very close to moderately close fracture spacing, METADIORITE GSI= 40 to 50
515	516.6	48.2	5.0	2:14/1.0 2:16/1.0 2:04/1.0 2:21/1.0 1:41/1.0	(5.0) 100%	(3.9) 78%					
510	511.6	53.2	5.0	2:30/1.0 1:56/1.0 4:54/1.0 2:12/1.0 1:58/1.0	(4.6) 92%	(0.0) 0%					
505	506.6	58.2	5.0	3:58/1.0 4:02/1.0 2:58/1.0 1:49/1.0 1:56/1.0	(5.0) 100%	(1.6) 32%					
500	501.6	63.2	5.0	2:39/1.0 3:11/1.0 3:31/1.0 2:34/1.0 2:37/1.0	(4.7) 94%	(3.0) 60%					
	496.6	68.2									496.6 / 68.2 Boring Terminated at Elevation 496.6 ft in Crystalline Rock: METADIORITE

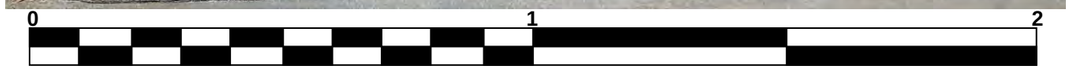
CORE PHOTOGRAPHS

B4-D

-L- 44+77 20 RT

BOX 1: 42.5 - 50.9 FEET



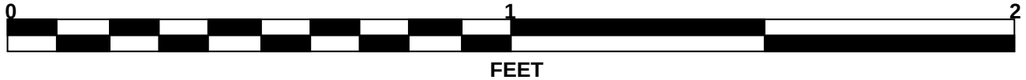


FEET

BOX 2: 50.9 - 60.5 FEET

FEET

BOX 3: 60.5 - 68.2 FEET



FEET

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 48708.1.1	**TIP** B-6051/U-6143	**COUNTY** GASTON	**GEOLOGIST** M. Shipman	
SITE DESCRIPTION US 29 / US 74 REPLACE BRIDGE NO. 91 OVER CATAWBA RIVER (COMB W/U-6143)				**GROUND WTR (ft)**
BORING NO. B5-B	**STATION** 45+55	**OFFSET** 50 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 564.1 ft	**TOTAL DEPTH** 62.4 ft	**NORTHING** 550,466	**EASTING** 1,400,045	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT2002 B-57 92% 12/23/2022		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER J. White	**START DATE** 11/13/22	**COMP. DATE** 11/15/22	**SURFACE WATER DEPTH** 1.3ft	

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)
										WATER SURFACE (11/13/22)	
	564.1	0.0	WOR	WOR	WOR	0		Sat.		564.1 GROUND SURFACE	0.0
										ALLUVIAL Gray, silty fine to coarse SAND (A-2-4), trace mica, trace of organic matter	
	559.6	4.5	WOR	WOR	WOR	0					
	554.6	9.5	WOR	WOR	WOR	0		Sat.			
	549.6	14.5	WOH	1	0	1		Sat.			
	544.6	19.5	1	2	2	4		Sat.		542.1	22.0
	539.6	24.5	10	13	13	26		Sat.		Brown, gravel with fine to coarse SAND (A-1-b), trace mica	
	533.6	30.5	100/0.4			100/0.4				537.1 **WEATHERED ROCK** METADIORITE	27.0
	528.6	35.5	60/0.0			60/0.0				528.6 **CRYSTALLINE ROCK** METADIORITE	35.5
	521.9	42.2								521.9	42.2
	521.7	42.4	100/0.2			100/0.2				521.7 **WEATHERED ROCK** METADIORITE	42.4
			60/0.0			60/0.0				**CRYSTALLINE ROCK** METADIORITE	
										501.7	62.4
										Boring Terminated at Elevation 501.7 ft in Crystalline Rock: METADIORITE	

GEOTECHNICAL BORING REPORT
CORE LOG

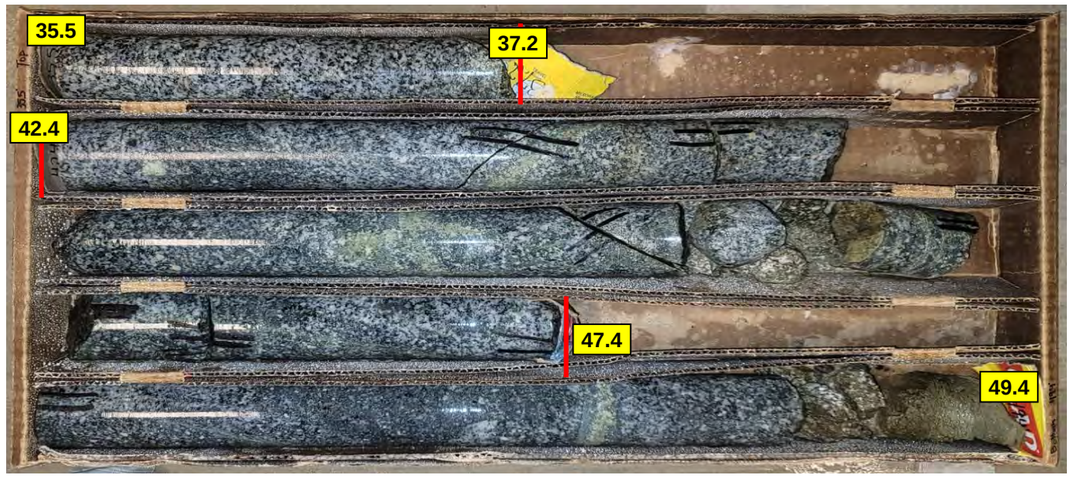
WBS 48708.1.1	**TIP** B-6051/U-6143	**COUNTY** GASTON	**GEOLOGIST** M. Shipman	
SITE DESCRIPTION US 29 / US 74 REPLACE BRIDGE NO. 91 OVER CATAWBA RIVER (COMB W/U-6143)				**GROUND WTR (ft)**
BORING NO. B5-B	**STATION** 45+55	**OFFSET** 50 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 564.1 ft	**TOTAL DEPTH** 62.4 ft	**NORTHING** 550,466	**EASTING** 1,400,045	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT2002 B-57 92% 12/23/2022		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER J. White	**START DATE** 11/13/22	**COMP. DATE** 11/15/22	**SURFACE WATER DEPTH** 1.3ft	
CORE SIZE NQ2	**TOTAL RUN** 26.7 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)
528.6											Begin Coring @ 35.5 ft	
	528.6	35.5	1.7	1:21/1.0	(0.9)	(0.9)		(0.9)	(0.9)		528.6 **CRYSTALLINE ROCK**	35.5
	526.9	37.2		0:26/0.7	53%	53%		13%	13%		Gray, slight to very slight weathering, moderately hard to hard, close fracture spacing, METADIORITE GSI=75 to 85	
525			5.0	0:22/1.0	(0.0)	(0.0)						
				1:16/1.0	0%	0%						
				0:15/1.0								
				0:52/1.0								
	521.9	42.2		0:36/1.0							521.9	42.2
	521.7	42.4									521.7 **WEATHERED ROCK**	42.4
520			5.0	1:17/1.0	(4.2)	(3.1)		(17.1)	(13.3)		**CRYSTALLINE ROCK**	
				2:12/1.0	84%	62%		86%	67%		Gray, moderately severe to fresh weathering, moderately hard to hard, very close to wide fracture spacing, METADIORITE GSI= 60 to 70	
				2:48/1.0								
				3:00/1.0								
	516.7	47.4		3:23/1.0								
515			5.0	2:01/1.0	(2.9)	(1.5)						
				1:38/1.0	58%	30%						
				3:03/1.0								
				0:57/1.0								
	511.7	52.4		2:54/1.0								
510			5.0	2:02/1.0	(5.0)	(4.2)						
				2:10/1.0	100%	84%						
				2:31/1.0								
				2:53/1.0								
	506.7	57.4		2:29/1.0								
505			5.0	1:22/1.0	(5.0)	(4.5)						
				1:55/1.0	100%	90%						
				2:44/1.0								
				2:23/1.0								
	501.7	62.4		2:37/1.0							501.7	62.4
											Boring Terminated at Elevation 501.7 ft in Crystalline Rock: METADIORITE	

CORE PHOTOGRAPHS
B5-B

-L- 45+55 50 RT

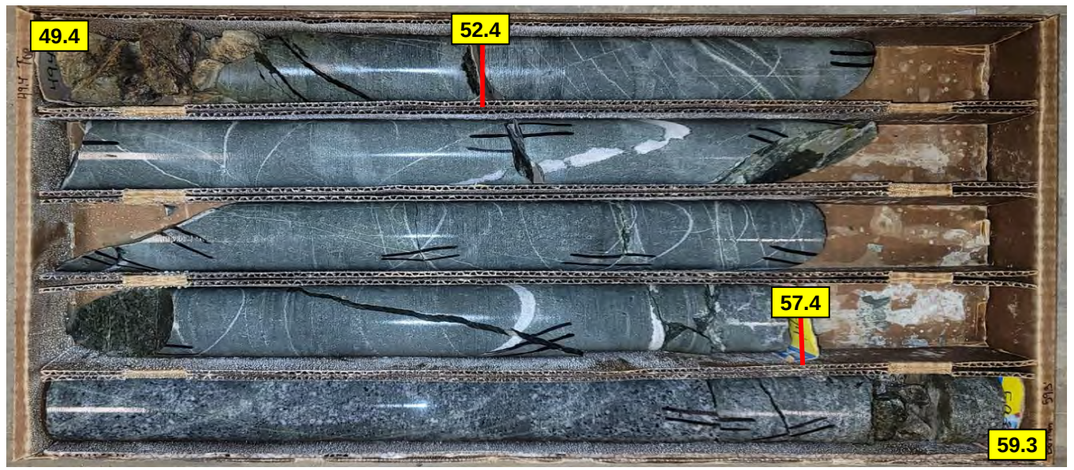
BOX 1: 35.5 - 49.4 FEET



0 1 2

FEET

BOX 2: 49.4 - 59.3 FEET



0 1 2

FEET

BOX 3: 59.3 - 62.4 FEET

0 1 2

FEET

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 48708.1.1	**TIP** B-6051/U-6143	**COUNTY** GASTON	**GEOLOGIST** M. Shipman	
SITE DESCRIPTION US 29 / US 74 REPLACE BRIDGE NO. 91 OVER CATAWBA RIVER (COMB W/U-6143)				**GROUND WTR (ft)**
BORING NO. B5-D	**STATION** 45+56	**OFFSET** 20 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 563.7 ft	**TOTAL DEPTH** 52.4 ft	**NORTHING** 550,495	**EASTING** 1,400,054	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT2002 B-57 92% 12/23/2022		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER J. White	**START DATE** 11/30/22	**COMP. DATE** 12/01/22	**SURFACE WATER DEPTH** 4.4ft	

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)
570										WATER SURFACE (11/30/22)
565	563.7	0.0	WOH	WOH	WOH	0		Sat.		563.7 GROUND SURFACE 0.0 **ALLUVIAL** Gray, silty fine to coarse SAND (A-2-4), trace mica, trace of organic matter
560	559.2	4.5	WOH	WOH	WOH	0		Sat.		560.7 3.0 Gray, silty CLAY (A-7-5), trace mica, little organic matter
555	554.2	9.5	WOH	WOH	WOH	0		Sat.		
550	549.2	14.5	3	1	1	2		Sat.		550.7 13.0 Gray, silty fine to coarse SAND (A-2-4), trace mica
545	544.2	19.5	1	1	1	2		Sat.		
540	539.2	24.5	29	16	13	29		Sat.		540.2 23.5 **RESIDUAL** Gray, gravel with fine to coarse SAND (A-1-a), trace mica
535	534.2	29.5	19	24	22	46		Sat.		535.2 28.5 Brown, silty fine to coarse SAND (A-2-4), trace mica, saprolitic
530	529.2	34.5	24	32	24	56		Sat.		529.7 34.0 Brown, silty CLAY (A-7-6), trace mica, trace rock fragments
525	524.7	39.0	60/0.0			60/0.0				524.7 39.0 **CRYSTALLINE ROCK** METADIORITE
520										
515										511.3 52.4 Boring Terminated at Elevation 511.3 ft in Crystalline Rock: METADIORITE

GEOTECHNICAL BORING REPORT
CORE LOG

WBS 48708.1.1	**TIP** B-6051/U-6143	**COUNTY** GASTON	**GEOLOGIST** M. Shipman	
SITE DESCRIPTION US 29 / US 74 REPLACE BRIDGE NO. 91 OVER CATAWBA RIVER (COMB W/U-6143)				**GROUND WTR (ft)**
BORING NO. B5-D	**STATION** 45+56	**OFFSET** 20 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 563.7 ft	**TOTAL DEPTH** 52.4 ft	**NORTHING** 550,495	**EASTING** 1,400,054	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT2002 B-57 92% 12/23/2022		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER J. White	**START DATE** 11/30/22	**COMP. DATE** 12/01/22	**SURFACE WATER DEPTH** 4.4ft	
CORE SIZE NQ2	**TOTAL RUN** 13.4 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)
524.7											Begin Coring @ 39.0 ft
	524.7	39.0	3.4	2:37/1.0 2:56/1.0 3:12/1.0	(3.2) 94%	(2.2) 65%		(13.2) 99%	(11.4) 85%		524.7 **CRYSTALLINE ROCK** 39.0 Gray, fresh to slight weathering, moderately hard to hard, close to wide fracture spacing, METADIORITE GSI= 60 to 70
520	521.3	42.4	5.0	1:29/0.4 2:21/1.0 2:30/1.0 1:51/1.0 2:10/1.0 2:37/1.0	(5.0) 100%	(4.2) 84%					
515	516.3	47.4	5.0	2:32/1.0 2:46/1.0 2:32/1.0 2:28/1.0 2:45/1.0	(5.0) 100%	(5.0) 100%					
	511.3	52.4									511.3 52.4 Boring Terminated at Elevation 511.3 ft in Crystalline Rock: METADIORITE

CORE PHOTOGRAPHS

B5-D

-L- 45+56 20 RT

BOX 1: 39.0 - 47.4 FEET

BOX 2: 47.4 - 52.4 FEET

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 48708.1.1	**TIP** B-6051/U-6143	**COUNTY** GASTON	**GEOLOGIST** J. Mize	
SITE DESCRIPTION US 29 / US 74 REPLACE BRIDGE NO. 91 OVER CATAWBA RIVER (COMB W/U-6143)				**GROUND WTR (ft)**
BORING NO. B6-A	**STATION** 46+78	**OFFSET** 64 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 559.4 ft	**TOTAL DEPTH** 40.2 ft	**NORTHING** 550,546	**EASTING** 1,400,193	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT1303 CME-550 92% 02/03/2022		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER P. McCain	**START DATE** 10/12/22	**COMP. DATE** 10/19/22	**SURFACE WATER DEPTH** 5.8ft	

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)
570										
565										WATER SURFACE (10/12/22)
560	559.4	0.0	WOH	WOH	WOH					559.4 GROUND SURFACE 0.0
	556.9	2.5	3	0	0	0		Sat.		**ALLUVIAL** Brown, clayey silty fine to coarse SAND (A-2-4)
555						0		Sat.		
	552.0	7.4	WOH	WOH	WOH					
550						0		Sat.		550.4 9.0 Gray, silty fine to coarse sandy CLAY (A-6), little organic matter
	547.0	12.4	WOH	1	2					
545						3		Sat.		
	541.6	17.8	1	2	1					542.4 17.0 Gray, silty fine to coarse SAND (A-2-4), trace clay, little organic matter
540						3		Sat.		
	536.8	22.6	52	9	7					537.4 22.0 **RESIDUAL** Gray to brown, clayey fine to coarse sandy GRAVEL (A-1-b)
535						16		Sat.		
	533.0	26.4	60/0.0							533.0 26.4 **CRYSTALLINE ROCK** DIORITE
530						60/0.0				
525										
520										519.2 40.2 Boring Terminated at Elevation 519.2 ft in Crystalline Rock: METADIORITE

GEOTECHNICAL BORING REPORT
CORE LOG

WBS 48708.1.1	**TIP** B-6051/U-6143	**COUNTY** GASTON	**GEOLOGIST** J. Mize	
SITE DESCRIPTION US 29 / US 74 REPLACE BRIDGE NO. 91 OVER CATAWBA RIVER (COMB W/U-6143)				**GROUND WTR (ft)**
BORING NO. B6-A	**STATION** 46+78	**OFFSET** 64 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 559.4 ft	**TOTAL DEPTH** 40.2 ft	**NORTHING** 550,546	**EASTING** 1,400,193	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT1303 CME-550 92% 02/03/2022		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER P. McCain	**START DATE** 10/12/22	**COMP. DATE** 10/19/22	**SURFACE WATER DEPTH** 5.8ft	
CORE SIZE NQ2	**TOTAL RUN** 13.8 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
											ELEV. (ft) DEPTH (ft)
533											Begin Coring @ 26.4 ft
	533.0	26.4	1.8	3:05/0.8 5:14/1.0	(1.7) 94%	(1.7) 94%		(11.5) 83%	(10.8) 78%		533.0 **CRYSTALLINE ROCK** 26.4 Black to white, fresh to very slight weathering, hard to very hard, moderately close fracture spacing, DIORITE GSI = 50 to 60
530	531.2	28.2	5.0	3:55/1.0 4:52/1.0 3:49/1.0 2:32/1.0 4:25/1.0	(4.8) 96%	(4.8) 96%					
	526.2	33.2	5.0	5:01/1.0 5:04/1.0 5:21/1.0 6:05/1.0 6:48/1.0	(4.2) 84%	(3.5) 70%					
525	521.2	38.2									
520	519.2	40.2	2.0	5:42/1.0 11:33/1.0	(0.8) 40%	(0.8) 40%					519.2 40.2 Boring Terminated at Elevation 519.2 ft in Crystalline Rock: METADIORITE

CORE PHOTOGRAPHS

B6-A

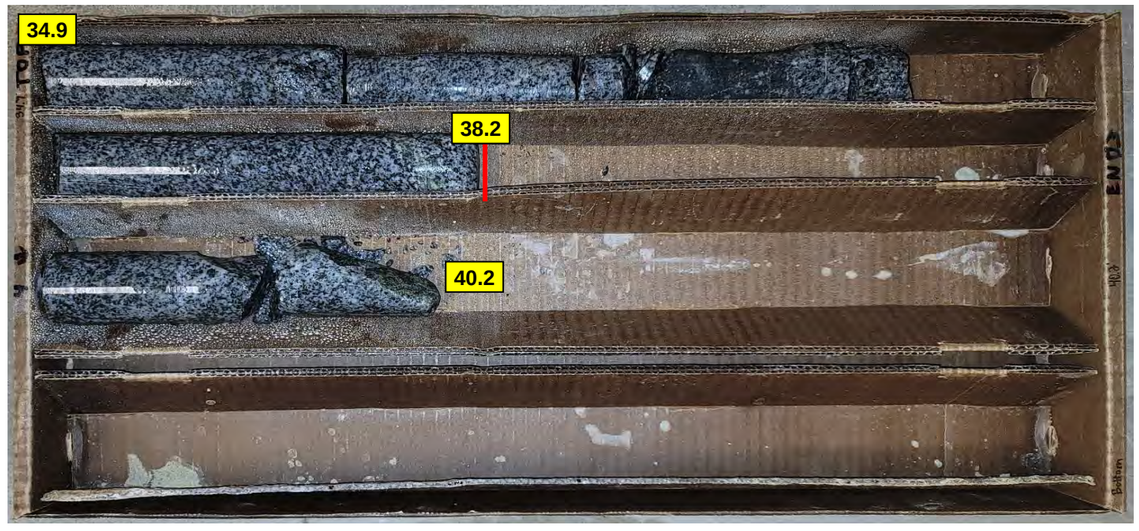
-L- 46+78 64 LT

BOX 1: 26.4 - 34.9 FEET

0 1 2

FEET

BOX 2: 34.9 - 40.2 FEET



0 1 2

FEET

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 48708.1.1	**TIP** B-6051/U-6143	**COUNTY** GASTON	**GEOLOGIST** B. Farmer	
SITE DESCRIPTION US 29 / US 74 REPLACE BRIDGE NO. 91 OVER CATAWBA RIVER (COMB W/U-6143)				**GROUND WTR (ft)**
BORING NO. B6-B	**STATION** 46+60	**OFFSET** 78 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 553.8 ft	**TOTAL DEPTH** 54.5 ft	**NORTHING** 558,413	**EASTING** 1,400,140	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT1314 CME-45B 86% 02/03/2022		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER P. McCain	**START DATE** 11/08/22	**COMP. DATE** 11/09/22	**SURFACE WATER DEPTH** 10.3ft	

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)
570										
565										WATER SURFACE (11/08/22)
560										
555										
	553.8	0.0								553.8 0.0 GROUND SURFACE
550			1	1	1	2		Sat.		**ALLUVIAL** Gray, silty fine to coarse SAND (A-2-4), trace mica
	546.8	7.0	WOH	WOH	WOH	0		Sat.		547.8 6.0 Gray, fine sandy silty CLAY (A-7-5)
545										
	541.8	12.0	WOR	WOR	WOR	0		Sat.		
540										
	536.8	17.0	2	98/0.2		100/0.7				536.3 17.5 Brown, dense, gravel with fine to coarse SAND (A-1-a)
535										533.8 20.0 **RESIDUAL**
	531.8	22.0	3	8	8	16		Sat.		Brown, clayey silty fine to coarse SAND (A-2-4), trace mica, trace rock fragments
530										
	526.8	27.0	11	13	16	29		Sat.		
525										
	521.8	32.0	11	6	8	14		Sat.		
520										
	517.7	36.1	60/0.0			60/0.0				517.7 36.1 **CRYSTALLINE ROCK** DIORITE
515										
510										
505										
500										499.3 54.5 Boring Terminated at Elevation 499.3 ft in Crystalline Rock: DIORITE

GEOTECHNICAL BORING REPORT
CORE LOG

WBS 48708.1.1	**TIP** B-6051/U-6143	**COUNTY** GASTON	**GEOLOGIST** B. Farmer	
SITE DESCRIPTION US 29 / US 74 REPLACE BRIDGE NO. 91 OVER CATAWBA RIVER (COMB W/U-6143)				**GROUND WTR (ft)**
BORING NO. B6-B	**STATION** 46+60	**OFFSET** 78 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 553.8 ft	**TOTAL DEPTH** 54.5 ft	**NORTHING** 558,413	**EASTING** 1,400,140	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT1314 CME-45B 86% 02/03/2022		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER P. McCain	**START DATE** 11/08/22	**COMP. DATE** 11/09/22	**SURFACE WATER DEPTH** 10.3ft	
CORE SIZE NQ2	**TOTAL RUN** 18.4 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)
517.7											Begin Coring @ 36.1 ft
515	517.7	36.1	3.4	0:50/0.4 3:54/1.0 4:04/1.0 5:40/1.0	(3.1) 91%	(2.7) 79%		(17.7) 96%	(16.1) 88%		517.7 36.1 **CRYSTALLINE ROCK** Black to white, moderate to very slight weathering, moderately hard to hard, very close to wide fracture spacing, DIORITE GSI= 50 to 70
510	514.3	39.5	5.0	2:22/1.0 2:44/1.0 2:13/1.0 3:28/1.0 1:55/1.0	(5.0) 100%	(4.7) 94%					
505	509.3	44.5	5.0	1:56/1.0 2:37/1.0 3:40/1.0 3:44/1.0 6:03/1.0	(4.9) 98%	(4.3) 86%					
500	504.3	49.5	5.0	1:50/1.0 4:21/1.0 3:24/1.0 6:13/1.0 3:56/1.0	(4.7) 94%	(4.4) 88%					
	499.3	54.5									499.3 54.5 Boring Terminated at Elevation 499.3 ft in Crystalline Rock: DIORITE

CORE PHOTOGRAPHS
B6-B

-L- 46+60 78 RT

BOX 1: 36.1 - 44.5 FEET

0 1 2

FEET

BOX 2: 44.5 - 53.4 FEET

0 1 2

FEET

BOX 3: 53.4 - 54.5 FEET

0 1 2

FEET

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 48708.1.1	**TIP** B-6051/U-6143	**COUNTY** MECKLENBURG	**GEOLOGIST** M. Shipman	
SITE DESCRIPTION US 29 / US 74 REPLACE BRIDGE NO. 91 OVER CATAWBA RIVER (COMB W/U-6143)				**GROUND WTR (ft)**
BORING NO. B6-B (2)	**STATION** 46+66	**OFFSET** 50 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 554.0 ft	**TOTAL DEPTH** 36.3 ft	**NORTHING** 550,438	**EASTING** 1,400,153	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT2002 B-57 92% 12/23/2022		**DRILL METHOD** H.S. Augers		**HAMMER TYPE** Automatic
DRILLER J. White	**START DATE** 11/15/22	**COMP. DATE** 11/15/22	**SURFACE WATER DEPTH** 10.5ft	

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)
570										
565										WATER SURFACE (11/15/22)
560										
555										
	554.0	0.0								554.0 GROUND SURFACE 0.0
550	549.5	4.5	WOH	WOH	WOH	0				**ALLUVIAL** Gray, silty fine to coarse SAND (A-2-4), trace mica
			WOH	1	0	1				
545	544.5	9.5								545.0 9.0
			WOR	WOR	WOR	0		Sat.		Gray, silty CLAY (A-7-6), little organic matter
540	539.5	14.5								540.0 14.0
			27	15	15	30		Sat.		Brown, gravel with SAND (A-1-a)
535	534.5	19.5								535.5 18.5
			5	3	4	7		Sat.		**RESIDUAL** Black and white, silty fine to coarse SAND (A-2-4), trace mica, saprolitic
530	529.1	24.9								
			8	8	8	16		Sat.		
525	524.1	29.9								526.0 28.0
			10	15	12	27		Sat.		Orange-brown, silty CLAY (A-7-5)
520	519.1	34.9								
			10	12	88/0.4	100/0.9				518.1 35.9
										517.7 36.3 **WEATHERED ROCK** METADIORITE
										Boring Terminated at Elevation 517.7 ft in Weathered Rock: METADIORITE
										This is a repeat of B6-B, but drilled from the bridge deck instead of the barge.

NCDOT BORE DOUBLE B-6051 - BRIDGE LOGS.GPJ NC_DOT.GDT 4/19/23

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 48708.1.1	**TIP** B-6051/U-6143	**COUNTY** GASTON	**GEOLOGIST** J. Mize/B. Farmer	
SITE DESCRIPTION US 29 / US 74 REPLACE BRIDGE NO. 91 OVER CATAWBA RIVER (COMB W/U-6143)				**GROUND WTR (ft)**
BORING NO. B6-C	**STATION** 46+62	**OFFSET** 22 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 564.3 ft	**TOTAL DEPTH** 39.5 ft	**NORTHING** 550,509	**EASTING** 1,400,167	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT1314 CME-45B 86% 02/03/2022		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER P. McCain	**START DATE** 10/28/22	**COMP. DATE** 11/01/22	**SURFACE WATER DEPTH** 4.8ft	

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)
570										WATER SURFACE (10/28/22)	
565	564.3	0.0	WOH	WOH	WOH	0		Sat.		564.3 GROUND SURFACE	0.0
	561.4	2.9	WOH	WOH	1	1		Sat.		**ALLUVIAL** Brown, silty fine SAND (A-2-4), trace mica, trace of organic matter	
560	556.4	7.9	WOH	WOH	WOH	0		Sat.			
555	551.4	12.9	1	1	2	3		Sat.			
550	546.4	17.9	1	2	1	3		Sat.			
545	541.4	22.9	7	8	10	18		Sat.		544.2 Brown to gray, gravel with fine to coarse SAND (A-1-a)	20.1
540	539.5	24.8	60/0.0			60/0.0				539.5 **CRYSTALLINE ROCK** DIORITE	24.8
535											
530											
525										524.8 Boring Terminated at Elevation 524.8 ft in Crystalline Rock: DIORITE	39.5

GEOTECHNICAL BORING REPORT
CORE LOG

WBS 48708.1.1	**TIP** B-6051/U-6143	**COUNTY** GASTON	**GEOLOGIST** J. Mize/B. Farmer	
SITE DESCRIPTION US 29 / US 74 REPLACE BRIDGE NO. 91 OVER CATAWBA RIVER (COMB W/U-6143)				**GROUND WTR (ft)**
BORING NO. B6-C	**STATION** 46+62	**OFFSET** 22 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 564.3 ft	**TOTAL DEPTH** 39.5 ft	**NORTHING** 550,509	**EASTING** 1,400,167	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT1314 CME-45B 86% 02/03/2022		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER P. McCain	**START DATE** 10/28/22	**COMP. DATE** 11/01/22	**SURFACE WATER DEPTH** 4.8ft	
CORE SIZE NQ2	**TOTAL RUN** 14.7 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)
539.5											Begin Coring @ 24.8 ft	
	539.5	24.8	0.6	3:52/0.6	(0.5)	(0.5)		(14.3)	(13.2)		539.5 **CRYSTALLINE ROCK** Black to white, slight to very slight weathering, hard, very close to wide fracture spacing, DIORITE GSI= 60 to 80	24.8
	538.9	25.4	5.0	5:06/1.0 6:51/1.0	83%	83%		97%	90%			
535				5:56/1.0 10:05/1.0	(4.8) 96%	(4.2) 84%						
	533.9	30.4	5.0	10:34/1.0 13:41/1.0	(4.9) 98%	(4.4) 88%						
530				18:18/1.0 6:26/1.0 9:02/1.0 4:41/1.0								
	528.9	35.4	4.1	5:28/1.0 7:18/1.0 10:18/1.0 31:00/1.0	(4.1) 100%	(4.1) 100%						
525	524.8	39.5		16:01/0.1							524.8 Boring Terminated at Elevation 524.8 ft in Crystalline Rock: DIORITE	39.5

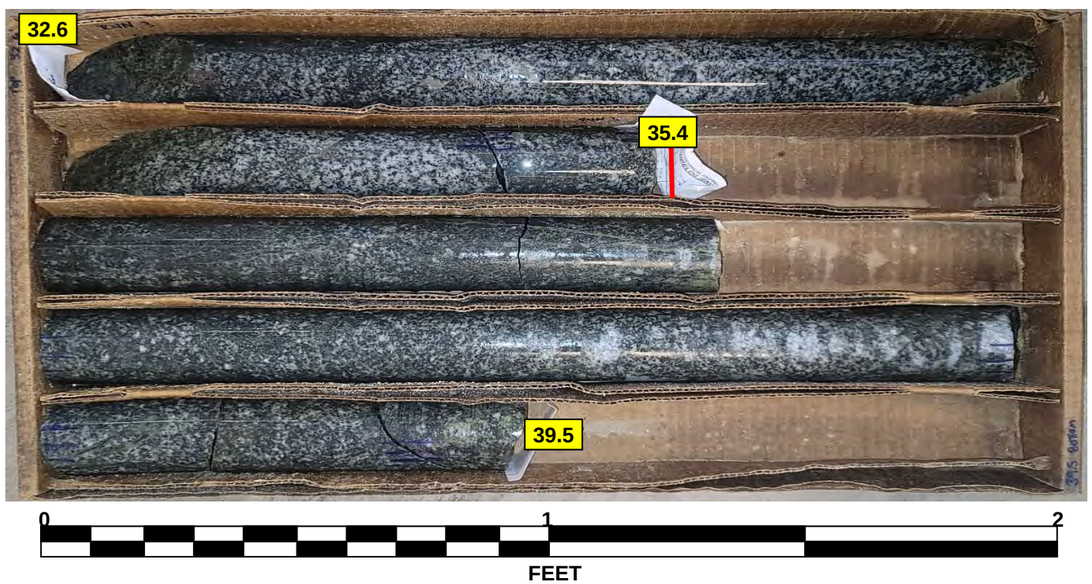
CORE PHOTOGRAPHS

B6-C

-L- 46+62 22 LT

BOX 1: 24.8 - 32.6 FEET

BOX 2: 32.6 - 39.5 FEET



GEOTECHNICAL BORING REPORT
BORE LOG

WBS 48708.1.1	**TIP** B-6051/U-6143	**COUNTY** GASTON	**GEOLOGIST** B. Farmer	
SITE DESCRIPTION US 29 / US 74 REPLACE BRIDGE NO. 91 OVER CATAWBA RIVER (COMB W/U-6143)				**GROUND WTR (ft)**
BORING NO. B6-D	**STATION** 46+64	**OFFSET** 9 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 563.3 ft	**TOTAL DEPTH** 41.2 ft	**NORTHING** 550,496	**EASTING** 1,400,166	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT1314 CME-45B 86% 02/03/2022		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER P. McCain	**START DATE** 11/01/22	**COMP. DATE** 11/02/22	**SURFACE WATER DEPTH** 3.8ft	

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)
										WATER SURFACE (11/01/22)
	563.3	0.0	WOH	WOH	WOH	0		Sat.		563.3 GROUND SURFACE 0.0
										ALLUVIAL
	559.3	4.0	WOH	WOH	1	1		Sat.		Gray, silty fine to coarse SAND (A-2-4), little mica
	554.3	9.0	1	1	0	1		Sat.		555.3 8.0 Gray, clayey fine SAND (A-2-6), little mica, trace root fragments
	549.3	14.0	WOH	1	1	2		Sat.		550.3 13.0 Gray, silty fine to coarse SAND (A-2-4), little mica
	544.8	18.5	1	1	1	2		Sat.		
	539.8	23.5	50	50/0.1		100/0.6				539.8 23.5
	539.1	24.2	60/0.0			60/0.0				539.3 24.0 **WEATHERED ROCK** TUFF **CRYSTALLINE ROCK** TUFF
										530.3 33.0 **CRYSTALLINE ROCK** DIORITE
										522.1 41.2 Boring Terminated at Elevation 522.1 ft in Crystalline Rock: DIORITE

GEOTECHNICAL BORING REPORT
CORE LOG

WBS 48708.1.1	**TIP** B-6051/U-6143	**COUNTY** GASTON	**GEOLOGIST** B. Farmer	
SITE DESCRIPTION US 29 / US 74 REPLACE BRIDGE NO. 91 OVER CATAWBA RIVER (COMB W/U-6143)				**GROUND WTR (ft)**
BORING NO. B6-D	**STATION** 46+64	**OFFSET** 9 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 563.3 ft	**TOTAL DEPTH** 41.2 ft	**NORTHING** 550,496	**EASTING** 1,400,166	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT1314 CME-45B 86% 02/03/2022		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER P. McCain	**START DATE** 11/01/22	**COMP. DATE** 11/02/22	**SURFACE WATER DEPTH** 3.8ft	
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)
539.3											Begin Coring @ 24.0 ft
	539.3	24.0	2.2	0:48/0.2 11:21/1.0 7:29/1.0	(2.0) 91%	(1.2) 55%		(8.7) 97%	(7.1) 79%		539.3 **CRYSTALLINE ROCK** 24.0 Dark gray, moderate to slight weathering, hard, close to moderately close fracture spacing, TUFF GSI= 55 to 75
535	537.1	26.2	5.0	3:21/1.0 4:58/1.0 3:45/1.0 3:55/1.0 7:22/1.0	(4.9) 98%	(3.8) 76%					
	532.1	31.2	5.0	3:22/1.0 4:11/1.0 3:14/1.0 5:55/1.0 5:38/1.0	(5.0) 100%	(4.5) 90%					530.3 33.0
530								(8.2) 100%	(7.4) 90%		**CRYSTALLINE ROCK** Black to white, slight to fresh weathering, hard, moderately close to wide fracture spacing, DIORITE GSI= 60 to 80
525	527.1	36.2	5.0	5:54/1.0 5:40/1.0 7:20/1.0 12:20/1.0 11:50/1.0	(5.0) 100%	(5.0) 100%					
	522.1	41.2									522.1 41.2 Boring Terminated at Elevation 522.1 ft in Crystalline Rock: DIORITE

CORE PHOTOGRAPHS

B6-D

-L- 46+64 9 LT

BOX 1: 24.0 - 33.0 FEET

BOX 2: 33.0 - 41.2 FEET

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 48708.1.1	**TIP** B-6051/U-6143	**COUNTY** MECKLENBURG	**GEOLOGIST** J. Mize	
SITE DESCRIPTION US 29 / US 74 REPLACE BRIDGE NO. 91 OVER CATAWBA RIVER (COMB W/U-6143)				**GROUND WTR (ft)**
BORING NO. B7-A	**STATION** 47+74	**OFFSET** 55 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 549.0 ft	**TOTAL DEPTH** 53.6 ft	**NORTHING** 550,513	**EASTING** 1,400,284	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT1303 CME-550 92% 02/03/2022		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER P. McCain	**START DATE** 10/19/22	**COMP. DATE** 10/20/22	**SURFACE WATER DEPTH** 16.2ft	

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)
570											
565										WATER SURFACE (10/19/22)	
560											
555											
550											
										549.0 GROUND SURFACE	0.0
545	547.5	1.5	WOH	WOH	WOH	0		Sat.		**ALLUVIAL** Gray, fine to coarse sandy silty CLAY (A-7-6), trace shells	
	543.6	5.4	WOH	WOH	WOH	0		Sat.			
540											
	538.0	11.0	4	2	3	5		Sat.			
535											
	533.0	16.0	5	7	13	20		Sat.			
530											
	528.0	21.0	9	9	12	21		Sat.			
525											
	523.0	26.0	7	11	13	24		Sat.			
520											
	518.0	31.0	17	24	20	44		Sat.			
515											
	513.0	36.0									
	511.0	38.0	10	10	8	18		Sat.		539.0	10.0
			60/0.0			60/0.0				**RESIDUAL** White to gray, clayey fine to coarse SAND (A-2-6), saprolitic	
510										511.0 **CRYSTALLINE ROCK** METADIORITE	38.0
505											
500										495.4	53.6
										Boring Terminated at Elevation 495.4 ft in Crystalline Rock: METADIORITE	

GEOTECHNICAL BORING REPORT
CORE LOG

WBS 48708.1.1	**TIP** B-6051/U-6143	**COUNTY** MECKLENBURG	**GEOLOGIST** J. Mize	
SITE DESCRIPTION US 29 / US 74 REPLACE BRIDGE NO. 91 OVER CATAWBA RIVER (COMB W/U-6143)				**GROUND WTR (ft)**
BORING NO. B7-A	**STATION** 47+74	**OFFSET** 55 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 549.0 ft	**TOTAL DEPTH** 53.6 ft	**NORTHING** 550,513	**EASTING** 1,400,284	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT1303 CME-550 92% 02/03/2022		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER P. McCain	**START DATE** 10/19/22	**COMP. DATE** 10/20/22	**SURFACE WATER DEPTH** 16.2ft	
CORE SIZE NQ2	**TOTAL RUN** 15.6 ft			

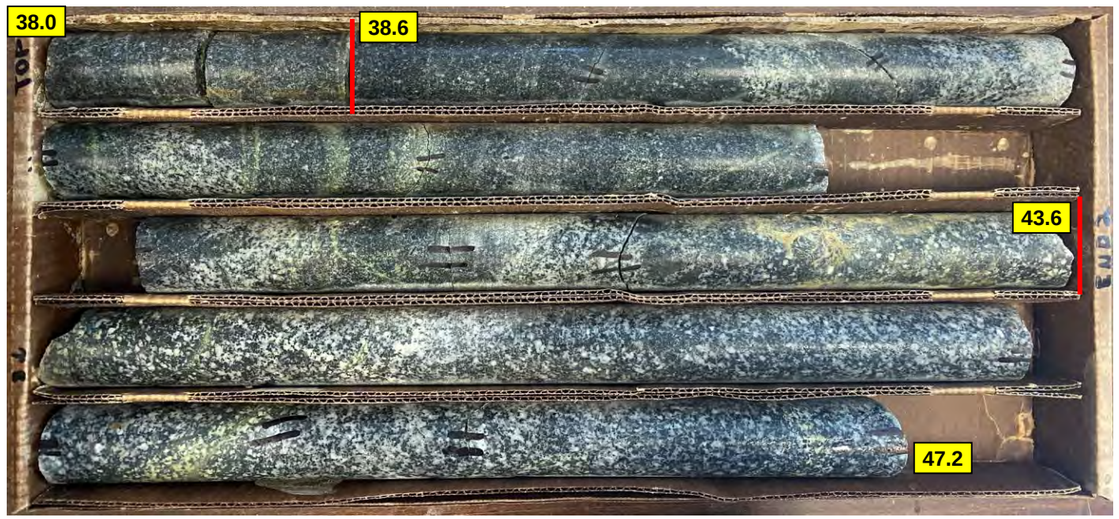
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS ELEV. (ft)	DEPTH (ft)
511											Begin Coring @ 38.0 ft	
510	511.0	38.0	0.6	2:20/0.6	(0.6) 100%	(0.0) 0%		(15.2) 97%	(14.6) 94%		511.0 **CRYSTALLINE ROCK** Black to white, fresh to very slight weathering, hard to very hard, close to wide fracture spacing, METADIORITE GSI = 55 to 65	38.0
	510.4	38.6	5.0	4:11/1.0 3:05/1.0 2:56/1.0 3:50/1.0 3:48/1.0	(4.8) 96%	(4.8) 96%						
505	505.4	43.6	5.0	3:50/1.0 4:18/1.0 4:35/1.0 6:12/1.0 5:01/1.0	(4.8) 96%	(4.8) 96%						
500	500.4	48.6	5.0	4:43/1.0 5:33/1.0 5:49/1.0 5:56/1.0 5:58/1.0	(5.0) 100%	(5.0) 100%						
	495.4	53.6									495.4 Boring Terminated at Elevation 495.4 ft in Crystalline Rock: METADIORITE	53.6

CORE PHOTOGRAPHS

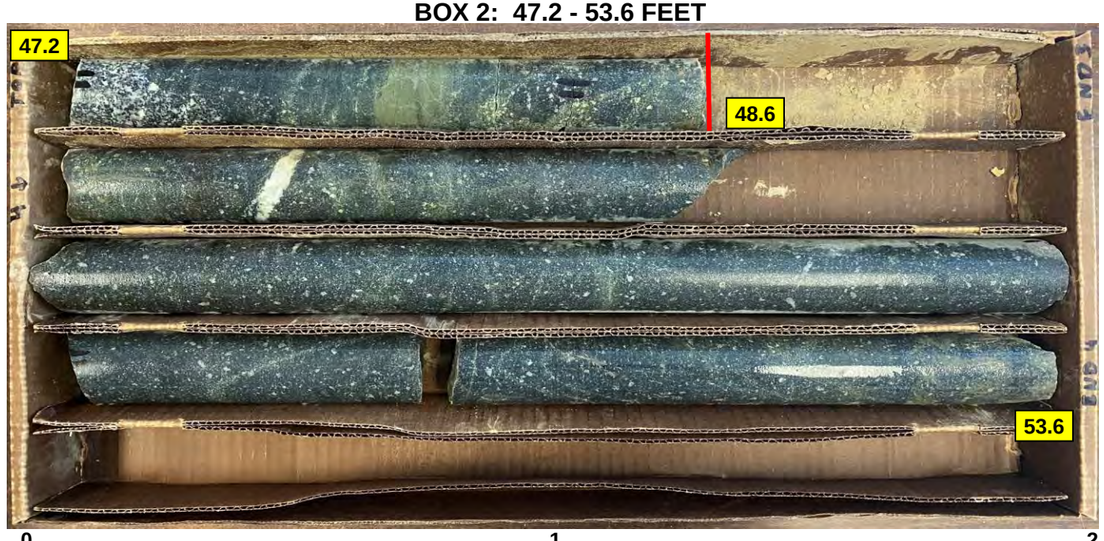
B7-A

-L- 47+74 55 LT

BOX 1: 38.0 - 47.2 FEET

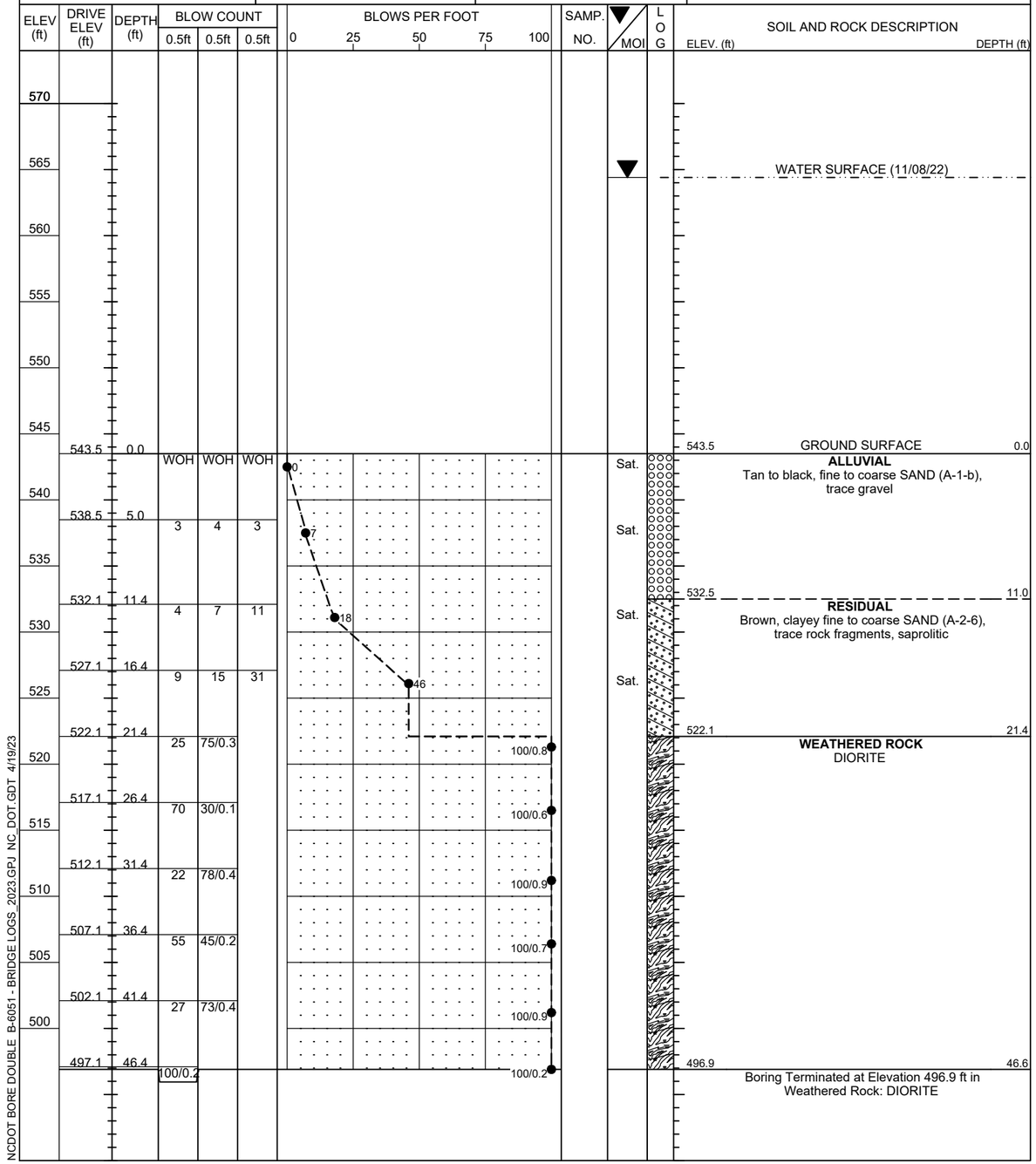


BOX 2: 47.2 - 53.6 FEET



GEOTECHNICAL BORING REPORT
BORE LOG

WBS 48708.1.1	**TIP** B-6051/U-6143	**COUNTY** MECKLENBURG	**GEOLOGIST** B. Farmer	
SITE DESCRIPTION US 29 / US 74 REPLACE BRIDGE NO. 91 OVER CATAWBA RIVER (COMB W/U-6143)				**GROUND WTR (ft)**
BORING NO. B7-B	**STATION** 47+72	**OFFSET** 80 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 543.5 ft	**TOTAL DEPTH** 46.6 ft	**NORTHING** 550,383	**EASTING** 1,400,248	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT1314 CME-45B 86% 02/03/2022		**DRILL METHOD** Mud Rotary		**HAMMER TYPE** Automatic
DRILLER P. McCain	**START DATE** 11/08/22	**COMP. DATE** 11/08/22	**SURFACE WATER DEPTH** 20.9ft	



NCDOT BORE DOUBLE B-6051 - BRIDGE LOGS_2023.GPJ NC_DOT.GDT 4/19/23

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 48708.1.1	**TIP** B-6051/U-6143	**COUNTY** MECKLENBURG	**GEOLOGIST** J. Mize	
SITE DESCRIPTION US 29 / US 74 REPLACE BRIDGE NO. 91 OVER CATAWBA RIVER (COMB W/U-6143)				**GROUND WTR (ft)**
BORING NO. B7-C	**STATION** 47+90	**OFFSET** 15 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 545.9 ft	**TOTAL DEPTH** 61.9 ft	**NORTHING** 550,470	**EASTING** 1,400,289	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT1303 CME-550 92% 02/03/2022		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER P. McCain	**START DATE** 10/27/22	**COMP. DATE** 10/27/22	**SURFACE WATER DEPTH** 18.0ft	

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))
570										
565										WATER SURFACE (10/27/22)
560										
555										
550										
545	545.9	0.0	WOH	WOH	WOH	0		Sat.		545.9 / 0.0 GROUND SURFACE **ALLUVIAL** Gray, silty fine SAND (A-2-4)
540	541.0	4.9	1	2	1	3		Sat.		
535	536.0	9.9	9	15	18	33		Sat.		537.9 / 8.0 **RESIDUAL** Brown, fine to coarse sandy CLAY (A-6), trace rock fragments, saprolitic
530	531.5	14.4	15	29	35	64		Sat.		
525	526.5	19.4	4	9	14	23		Sat.		527.9 / 18.0 Red-brown, silty fine to coarse SAND (A-2-4), saprolitic
520	521.5	24.4	14	25	31	56		Sat.		
515	516.5	29.4	35	39	26	65		Sat.		
510	511.5	34.4	40	36	32	68		Sat.		508.9 / 37.0 **WEATHERED ROCK** METADIORITE
505	506.5	39.4	60	40/0.2		100/0.7				504.6 / 41.3 **CRYSTALLINE ROCK** METADIORITE
	504.6	41.3	60/0.0			60/0.0				
500										
495										
490										

WBS 48708.1.1	**TIP** B-6051/U-6143	**COUNTY** MECKLENBURG	**GEOLOGIST** J. Mize	
SITE DESCRIPTION US 29 / US 74 REPLACE BRIDGE NO. 91 OVER CATAWBA RIVER (COMB W/U-6143)				**GROUND WTR (ft)**
BORING NO. B7-C	**STATION** 47+90	**OFFSET** 15 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 545.9 ft	**TOTAL DEPTH** 61.9 ft	**NORTHING** 550,470	**EASTING** 1,400,289	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT1303 CME-550 92% 02/03/2022		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER P. McCain	**START DATE** 10/27/22	**COMP. DATE** 10/27/22	**SURFACE WATER DEPTH** 18.0ft	

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
490						Match Line				**CRYSTALLINE ROCK** METADIORITE*(continued)*
485										484.0 / 61.9 Boring Terminated at Elevation 484.0 ft in Crystalline Rock: METADIORITE

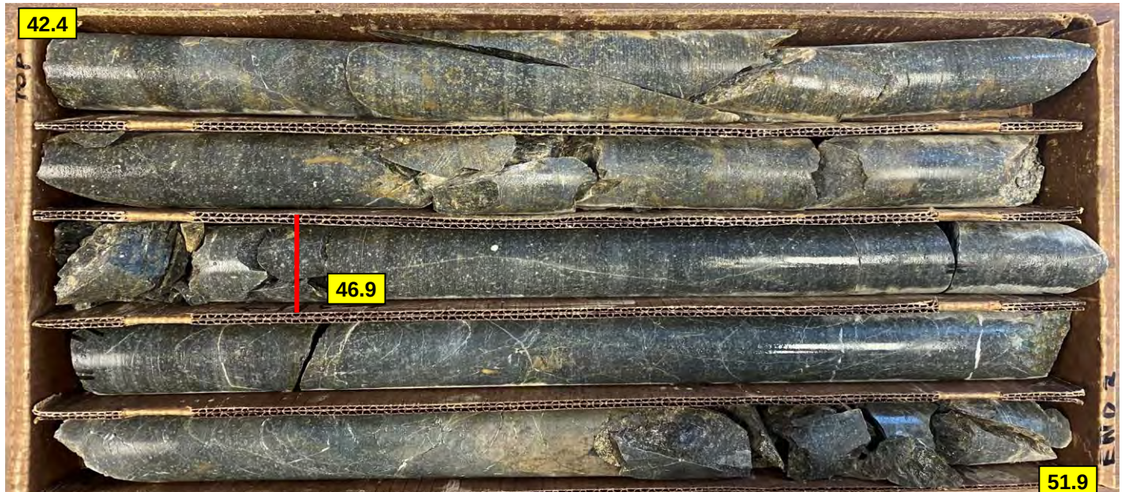
GEOTECHNICAL BORING REPORT
CORE LOG

WBS 48708.1.1	**TIP** B-6051/U-6143	**COUNTY** MECKLENBURG	**GEOLOGIST** J. Mize	
SITE DESCRIPTION US 29 / US 74 REPLACE BRIDGE NO. 91 OVER CATAWBA RIVER (COMB W/U-6143)				**GROUND WTR (ft)**
BORING NO. B7-C	**STATION** 47+90	**OFFSET** 15 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 545.9 ft	**TOTAL DEPTH** 61.9 ft	**NORTHING** 550,470	**EASTING** 1,400,289	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT1303 CME-550 92% 02/03/2022		**DRILL METHOD** SPT Core Boring		**HAMMER TYPE** Automatic
DRILLER P. McCain	**START DATE** 10/27/22	**COMP. DATE** 10/27/22	**SURFACE WATER DEPTH** 18.0ft	
CORE SIZE NQ2	**TOTAL RUN** 19.5 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
504.6											Begin Coring @ 41.3 ft
	503.5	42.4						(19.5) 95%	(10.8) 52%		504.6 **CRYSTALLINE ROCK** 41.3 Gray, fresh to slight weathering, very hard, very close to moderately close fracture spacing, METADIORITE GSI = 35 to 45
500	499.0	46.9	4.5	2:24/0.5 5:21/1.0 3:32/1.0 3:52/1.0 8:07/1.0	(4.5) 100%	(2.4) 53%					
495	494.0	51.9	5.0	7:12/1.0 4:21/1.0 4:36/1.0 4:36/1.0 4:55/1.0	(5.0) 100%	(4.3) 86%					
490	489.0	56.9	5.0	4:49/1.0 4:08/1.0 4:42/1.0 5:22/1.0 6:09/1.0	(5.0) 100%	(1.6) 32%					
485	484.0	61.9	5.0	6:25/1.0 7:47/1.0 10:01/1.0 7:30/1.0 6:47/1.0	(5.0) 100%	(2.5) 50%					484.0 61.9 Boring Terminated at Elevation 484.0 ft in Crystalline Rock: METADIORITE

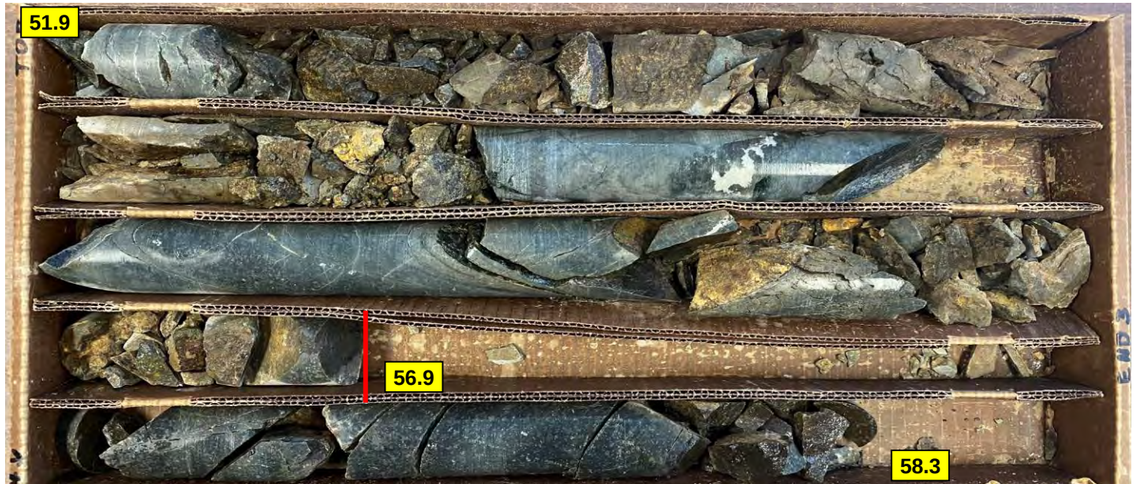
CORE PHOTOGRAPHS
B7-C
-L- 47+90 15 LT

BOX 1: 42.4 - 51.9 FEET



0 1 2
FEET

BOX 2: 51.9 - 58.3 FEET



0 1 2
FEET

BOX 3: 58.3 - 61.9 FEET

0 1 2
FEET

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 48708.1.1	**TIP** B-6051/U-6143	**COUNTY** MECKLENBURG	**GEOLOGIST** B. Farmer	
SITE DESCRIPTION US 29 / US 74 REPLACE BRIDGE NO. 91 OVER CATAWBA RIVER (COMB W/U-6143)				**GROUND WTR (ft)**
BORING NO. B7-D	**STATION** 47+78	**OFFSET** 1 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 547.7 ft	**TOTAL DEPTH** 53.1 ft	**NORTHING** 550,460	**EASTING** 1,400,274	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT1303 CME-550 92% 02/03/2022		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER P. McCain	**START DATE** 11/02/22	**COMP. DATE** 11/03/22	**SURFACE WATER DEPTH** 16.7ft	

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)
570										
565										WATER SURFACE (11/02/22)
560										
555										
550										
	547.7	0.0	WOH	WOH	WOH	0		Sat.		547.7 GROUND SURFACE 0.0
545										**ALLUVIAL** Gray, silty fine to coarse SAND (A-2-4), little mica
	541.1	6.6	WOH	WOH	WOH	0		Sat.		
540										
	537.1	10.6	13	12	17	29		Sat.		537.7 10.0 **RESIDUAL** Tan, fine to coarse sandy SILT (A-4), trace to little rock fragments, saprolitic
535										
	532.1	15.6	11	14	16	30		Sat.		
530										
	527.1	20.6	8	15	11	26		Sat.		
525										
	522.1	25.6	26	22	12	34		Sat.		522.7 25.0 Tan, gravel with fine to coarse SAND (A-1-a)
520										
	517.9	29.8	60/0.0			60/0.0				517.9 29.8 **CRYSTALLINE ROCK** METADIORITE
515										
510										
505										
500										
495										494.6 53.1 Boring Terminated at Elevation 494.6 ft in Crystalline Rock: METADIORITE

GEOTECHNICAL BORING REPORT
CORE LOG

WBS 48708.1.1	**TIP** B-6051/U-6143	**COUNTY** MECKLENBURG	**GEOLOGIST** B. Farmer	
SITE DESCRIPTION US 29 / US 74 REPLACE BRIDGE NO. 91 OVER CATAWBA RIVER (COMB W/U-6143)				**GROUND WTR (ft)**
BORING NO. B7-D	**STATION** 47+78	**OFFSET** 1 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 547.7 ft	**TOTAL DEPTH** 53.1 ft	**NORTHING** 550,460	**EASTING** 1,400,274	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT1303 CME-550 92% 02/03/2022		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER P. McCain	**START DATE** 11/02/22	**COMP. DATE** 11/03/22	**SURFACE WATER DEPTH** 16.7ft	
CORE SIZE NQ2	**TOTAL RUN** 23.3 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)
517.9											Begin Coring @ 29.8 ft
	517.9	29.8	3.3	3:45/0.3 7:16/1.0 11:18/1.0 4:34/1.0	(2.9) 88%	(0.9) 27%		(22.6) 97%	(11.1) 48%		517.9 **CRYSTALLINE ROCK** 29.8 Dark gray, slight to moderate weathering, moderately hard to hard, very close to close fracture spacing, METADIORITE GSI= 40 to 60
515	514.6	33.1	5.0	5:45/1.0 4:12/1.0 6:17/1.0 4:08/1.0 3:42/1.0	(4.9) 98%	(2.2) 44%					
510	509.6	38.1	5.0	3:35/1.0 2:35/1.0 2:56/1.0 2:53/1.0 2:12/1.0	(5.0) 100%	(3.6) 72%					
505	504.6	43.1	5.0	1:46/1.0 1:14/1.0 2:28/1.0 2:40/1.0 3:18/1.0	(4.8) 96%	(2.1) 42%					
500	499.6	48.1	5.0	3:27/1.0 7:50/1.0 6:17/1.0 3:56/1.0 4:08/1.0	(5.0) 100%	(2.3) 46%					
495	494.6	53.1									494.6 53.1 Boring Terminated at Elevation 494.6 ft in Crystalline Rock: METADIORITE

CORE PHOTOGRAPHS

B7-D

-L- 47+78 1 LT

BOX 1: 29.8 - 39.6 FEET

0 1 2

FEET

BOX 2: 39.6 - 48.1 FEET

0 1 2

FEET

BOX 3: 48.1 - 53.1 FEET

0 1 2

FEET

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 48708.1.1	**TIP** B-6051/U-6143	**COUNTY** MECKLENBURG	**GEOLOGIST** J. Mize	
SITE DESCRIPTION US 29 / US 74 REPLACE BRIDGE NO. 91 OVER CATAWBA RIVER (COMB W/U-6143)				**GROUND WTR (ft)**
BORING NO. B8-A	**STATION** 48+82	**OFFSET** 45 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 544.8 ft	**TOTAL DEPTH** 65.4 ft	**NORTHING** 550,476	**EASTING** 1,400,386	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT1303 CME-550 92% 02/03/2022		**DRILL METHOD** SPT Core Boring		**HAMMER TYPE** Automatic
DRILLER P. McCain	**START DATE** 10/21/22	**COMP. DATE** 10/21/22	**SURFACE WATER DEPTH** 19.8ft	

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))
570										
565										WATER SURFACE (10/21/22)
560										
555										
550										
545	544.8	0.0	1	2	1	3		Sat.		544.8 / 0.0 GROUND SURFACE **ALLUVIAL** Brown, silty fine to coarse sandy CLAY (A-6), trace gravel
540	540.2	4.6	4	4	4	8		Sat.		537.8 / 7.0 **RESIDUAL** Brown, fine sandy SILT (A-4), saprolitic
	537.2	7.6	2	5	10	15		Sat.		532.8 / 12.0 Brown to white, silty fine to coarse SAND (A-2-4), trace rock fragments, saprolitic
535	532.2	12.6	15	9	11	20		Sat.		
530	527.2	17.6	6	6	9	15		Sat.		
525	522.2	22.6	18	37	47	84		Sat.		
520	517.2	27.6	19	36	46	82		Sat.		
515	512.2	32.6	11	24	34	58		Sat.		
510	507.2	37.6	100/0.2			100/0.2				507.8 / 37.0 **WEATHERED ROCK** METADIORITE
505	502.2	42.6	78	22/0.1		100/0.6				
500	497.2	47.6	100/0.4			100/0.4				
495	492.6	52.2	60/0.1			60/0.1				492.6 / 52.2 **CRYSTALLINE ROCK** TUFF
490										

WBS 48708.1.1	**TIP** B-6051/U-6143	**COUNTY** MECKLENBURG	**GEOLOGIST** J. Mize	
SITE DESCRIPTION US 29 / US 74 REPLACE BRIDGE NO. 91 OVER CATAWBA RIVER (COMB W/U-6143)				**GROUND WTR (ft)**
BORING NO. B8-A	**STATION** 48+82	**OFFSET** 45 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 544.8 ft	**TOTAL DEPTH** 65.4 ft	**NORTHING** 550,476	**EASTING** 1,400,386	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT1303 CME-550 92% 02/03/2022		**DRILL METHOD** SPT Core Boring		**HAMMER TYPE** Automatic
DRILLER P. McCain	**START DATE** 10/21/22	**COMP. DATE** 10/21/22	**SURFACE WATER DEPTH** 19.8ft	

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
490						Match Line				**CRYSTALLINE ROCK** TUFF *(continued)*
485										485.4 / 59.4 METADIORITE
480										479.4 / 65.4 Boring Terminated at Elevation 479.4 ft in Crystalline Rock: METADIORITE

GEOTECHNICAL BORING REPORT
CORE LOG

WBS 48708.1.1	**TIP** B-6051/U-6143	**COUNTY** MECKLENBURG	**GEOLOGIST** J. Mize	
SITE DESCRIPTION US 29 / US 74 REPLACE BRIDGE NO. 91 OVER CATAWBA RIVER (COMB W/U-6143)				**GROUND WTR (ft)**
BORING NO. B8-A	**STATION** 48+82	**OFFSET** 45 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 544.8 ft	**TOTAL DEPTH** 65.4 ft	**NORTHING** 550,476	**EASTING** 1,400,386	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT1303 CME-550 92% 02/03/2022		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER P. McCain	**START DATE** 10/21/22	**COMP. DATE** 10/21/22	**SURFACE WATER DEPTH** 19.8ft	
CORE SIZE NQ2	**TOTAL RUN** 13.1 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
492.6											Begin Coring @ 52.2 ft
	492.5	52.3	3.1	3:55/1.1 10:45/1.0 16:19/1.0	(2.9) 94%	(1.3) 42%		(6.8) 94%	(0.8) 11%		ELEV. (ft) 492.6 **CRYSTALLINE ROCK** DEPTH (ft) 52.2 Green-gray, fresh to slight weathering, hard, close fracture spacing, TUFF GSI = 40 to 50 (52.2' - 54.2' Highly fractured zone)
490	489.4	55.4									
			5.0	2:39/1.0 6:51/1.0 2:44/1.0 2:52/1.0 4:08/1.0	(4.9) 98%	(2.9) 58%					
485	484.4	60.4									ELEV. (ft) 485.4 DEPTH (ft) 59.4
			5.0	2:09/1.0 2:35/1.0 2:59/1.0 3:43/1.0 4:20/1.0	(4.9) 98%	(4.9) 98%		(5.9) 98%	(5.4) 90%		Black to white, fresh weathering, very hard, moderately close fracture spacing, METADIORITE GSI = 50 to 60
480	479.4	65.4									ELEV. (ft) 479.4 DEPTH (ft) 65.4
											Boring Terminated at Elevation 479.4 ft in Crystalline Rock: METADIORITE

CORE PHOTOGRAPHS

B8-A

-L- 48+82 45 LT

BOX 1: 52.3 - 60.4 FEET

0 1 2

FEET

BOX 2: 60.4 - 65.4 FEET

0 1 2

FEET

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 48708.1.1	**TIP** B-6051/U-6143	**COUNTY** MECKLENBURG	**GEOLOGIST** B. Farmer	
SITE DESCRIPTION US 29 / US 74 REPLACE BRIDGE NO. 91 OVER CATAWBA RIVER (COMB W/U-6143)				**GROUND WTR (ft)**
BORING NO. B8-B	**STATION** 48+70	**OFFSET** 67 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 545.4 ft	**TOTAL DEPTH** 70.2 ft	**NORTHING** 550,371	**EASTING** 1,400,346	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT1303 CME-550 92% 02/03/2022		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER P. McCain	**START DATE** 09/12/22	**COMP. DATE** 09/13/22	**SURFACE WATER DEPTH** 20.2ft	

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))
570										
565								▼		WATER SURFACE (09/12/22)
560										
555										
550										
545	545.4	0.0	5	3	1	4				545.4 GROUND SURFACE 0.0 **ALLUVIAL** Brown, fine to coarse sandy CLAY (A-6), trace mica
	541.5	3.9	1	2	2	4				
540	537.3	8.1	1	2	4	6				
535	532.4	13.0	4	6	10	16				533.4 12.0 **RESIDUAL** Gray, fine to coarse sandy SILT (A-4), trace mica, trace rock fragments, saprolitic
530										
525	522.9	22.5	7	10	14	24				523.4 22.0 Gray to brown to white, silty fine SAND (A-2-4), trace mica, saprolitic
520	517.9	27.5	11	41	59/0.4	100/0.9				517.4 28.0 **WEATHERED ROCK** METADIORITE
515	512.9	32.5	28	57	43/0.3	100/0.8				
510	507.9	37.5	100							
505	502.9	42.5	37	63/0.4		100/0.9				
500	500.4	45.0	60/0.0			60/0.0				500.4 45.0 **CRYSTALLINE ROCK** METADIORITE
495										
490										

NCDOT BORE DOUBLE B-6051 - BRIDGE LOGS_2023.GPJ NC_DOT.GDT 4/19/23

WBS 48708.1.1	**TIP** B-6051/U-6143	**COUNTY** MECKLENBURG	**GEOLOGIST** B. Farmer	
SITE DESCRIPTION US 29 / US 74 REPLACE BRIDGE NO. 91 OVER CATAWBA RIVER (COMB W/U-6143)				**GROUND WTR (ft)**
BORING NO. B8-B	**STATION** 48+70	**OFFSET** 67 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 545.4 ft	**TOTAL DEPTH** 70.2 ft	**NORTHING** 550,371	**EASTING** 1,400,346	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT1303 CME-550 92% 02/03/2022		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER P. McCain	**START DATE** 09/12/22	**COMP. DATE** 09/13/22	**SURFACE WATER DEPTH** 20.2ft	

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
490						Match Line				**CRYSTALLINE ROCK** METADIORITE *(continued)*
485							RS-3			
480										475.2 70.2 Boring Terminated at Elevation 475.2 ft in Crystalline Rock: METADIORITE

GEOTECHNICAL BORING REPORT
CORE LOG

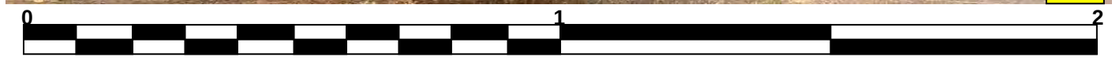
WBS 48708.1.1	**TIP** B-6051/U-6143	**COUNTY** MECKLENBURG	**GEOLOGIST** B. Farmer	
SITE DESCRIPTION US 29 / US 74 REPLACE BRIDGE NO. 91 OVER CATAWBA RIVER (COMB W/U-6143)				**GROUND WTR (ft)**
BORING NO. B8-B	**STATION** 48+70	**OFFSET** 67 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 545.4 ft	**TOTAL DEPTH** 70.2 ft	**NORTHING** 550,371	**EASTING** 1,400,346	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT1303 CME-550 92% 02/03/2022		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER P. McCain	**START DATE** 09/12/22	**COMP. DATE** 09/13/22	**SURFACE WATER DEPTH** 20.2ft	
CORE SIZE NQ2	**TOTAL RUN** 25.2 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
~~500~~ 500.4											Begin Coring @ 45.0 ft
	500.4	45.0	5.2	2:47/1.0 4:48/1.0 4:35/1.0 5:46/1.0 2:19/1.2	(5.2) 100%	(0.0) 0%		(25.1) 100%	(11.9) 47%		ELEV. (ft) 500.4 DEPTH (ft) 45.0 **CRYSTALLINE ROCK** Gray, slight to moderate weathering, moderately hard to hard, very close to close fracture spacing, METADIORITE GSI = 45 to 55
495	495.2	50.2	5.0	5:44/1.0 6:00/1.0 5:14/1.0 3:09/1.0 3:02/1.0	(4.9) 98%	(3.3) 66%					
490	490.2	55.2	5.0	2:17/1.0 2:51/1.0 3:06/1.0 3:22/1.0 8:42/1.0	(5.0) 100%	(2.8) 56%					
485	485.2	60.2	5.0	2:12/1.0 3:38/1.0 4:59/1.0 5:35/1.0 1:58/1.0	(5.0) 100%	(2.1) 42%	RS-3				
480	480.2	65.2	5.0	1:52/1.0 2:22/1.0 2:05/1.0 2:12/1.0 2:44/1.0	(5.0) 100%	(3.7) 74%					
	475.2	70.2									ELEV. (ft) 475.2 DEPTH (ft) 70.2 Boring Terminated at Elevation 475.2 ft in Crystalline Rock: METADIORITE

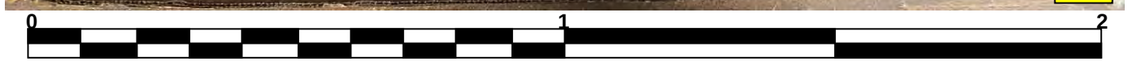
CORE PHOTOGRAPHS
B8-B

-L- 48+70 67 RT

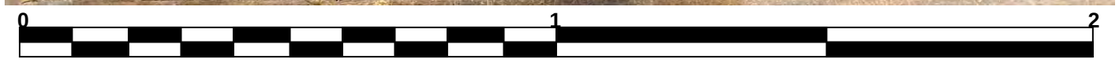
BOX 1: 45.0 - 53.0 FEET



BOX 2: 53.0 - 62.5 FEET



BOX 3: 62.5 - 70.2 FEET



GEOTECHNICAL BORING REPORT
BORE LOG

WBS 48708.1.1	**TIP** B-6051/U-6143	**COUNTY** MECKLENBURG	**GEOLOGIST** B. Farmer	
SITE DESCRIPTION US 29 / US 74 REPLACE BRIDGE NO. 91 OVER CATAWBA RIVER (COMB W/U-6143)				**GROUND WTR (ft)**
BORING NO. B8-C	**STATION** 49+16	**OFFSET** 22 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 549.2 ft	**TOTAL DEPTH** 53.2 ft	**NORTHING** 550,445	**EASTING** 1,400,413	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT1303 CME-550 92% 02/03/2022		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER P. McCain	**START DATE** 11/03/22	**COMP. DATE** 11/03/22	**SURFACE WATER DEPTH** 14.7ft	

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)
570										
565										WATER SURFACE (11/03/22)
560										
555										
550	549.2	0.0								549.2 — 0.0 GROUND SURFACE
545	547.2	2.0	WOH	WOH	2	2		Sat.		**ALLUVIAL** Brown, silty CLAY (A-7-5), trace mica
			WOH	3	3	6		Sat.		
	541.6	7.6	2	4	7	11		Sat.		542.2 — 7.0 **RESIDUAL** Brown, silty CLAY (A-7-5), trace mica, trace rock fragments, saprolitic
540										
535	536.6	12.6	4	6	9	15		Sat.		
530	531.6	17.6	6	10	12	22		Sat.		
525	526.6	22.6	6	12	19	31		Sat.		527.2 — 22.0 Brown, fine to coarse sandy CLAY (A-6)
520	521.6	27.6	18	65	35/0.1	100/0.9				521.1 — 28.1 **WEATHERED ROCK** METADIORITE
515	516.6	32.6	60/0.0			60/0.0				516.6 — 32.6 **CRYSTALLINE ROCK** METADIORITE
510										509.2 — 40.0 **WEATHERED ROCK** METADIORITE
505	506.4	42.8	33	67/0.2		100/0.7				
500	501.4	47.8	100/0.4			100/0.4				
	496.4	52.8	100/0.4			100/0.4				496.0 — 53.2 Boring Terminated at Elevation 496.0 ft in Weathered Rock: METADIORITE

NCDOT BORE DOUBLE B-6051 - BRIDGE LOGS_2023.GPJ NC_DOT.GDT 4/19/23

GEOTECHNICAL BORING REPORT
CORE LOG

WBS 48708.1.1	**TIP** B-6051/U-6143	**COUNTY** MECKLENBURG	**GEOLOGIST** B. Farmer	
SITE DESCRIPTION US 29 / US 74 REPLACE BRIDGE NO. 91 OVER CATAWBA RIVER (COMB W/U-6143)				**GROUND WTR (ft)**
BORING NO. B8-C	**STATION** 49+16	**OFFSET** 22 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 549.2 ft	**TOTAL DEPTH** 53.2 ft	**NORTHING** 550,445	**EASTING** 1,400,413	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT1303 CME-550 92% 02/03/2022		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER P. McCain	**START DATE** 11/03/22	**COMP. DATE** 11/03/22	**SURFACE WATER DEPTH** 14.7ft	
CORE SIZE NQ2	**TOTAL RUN** 7.4 ft			

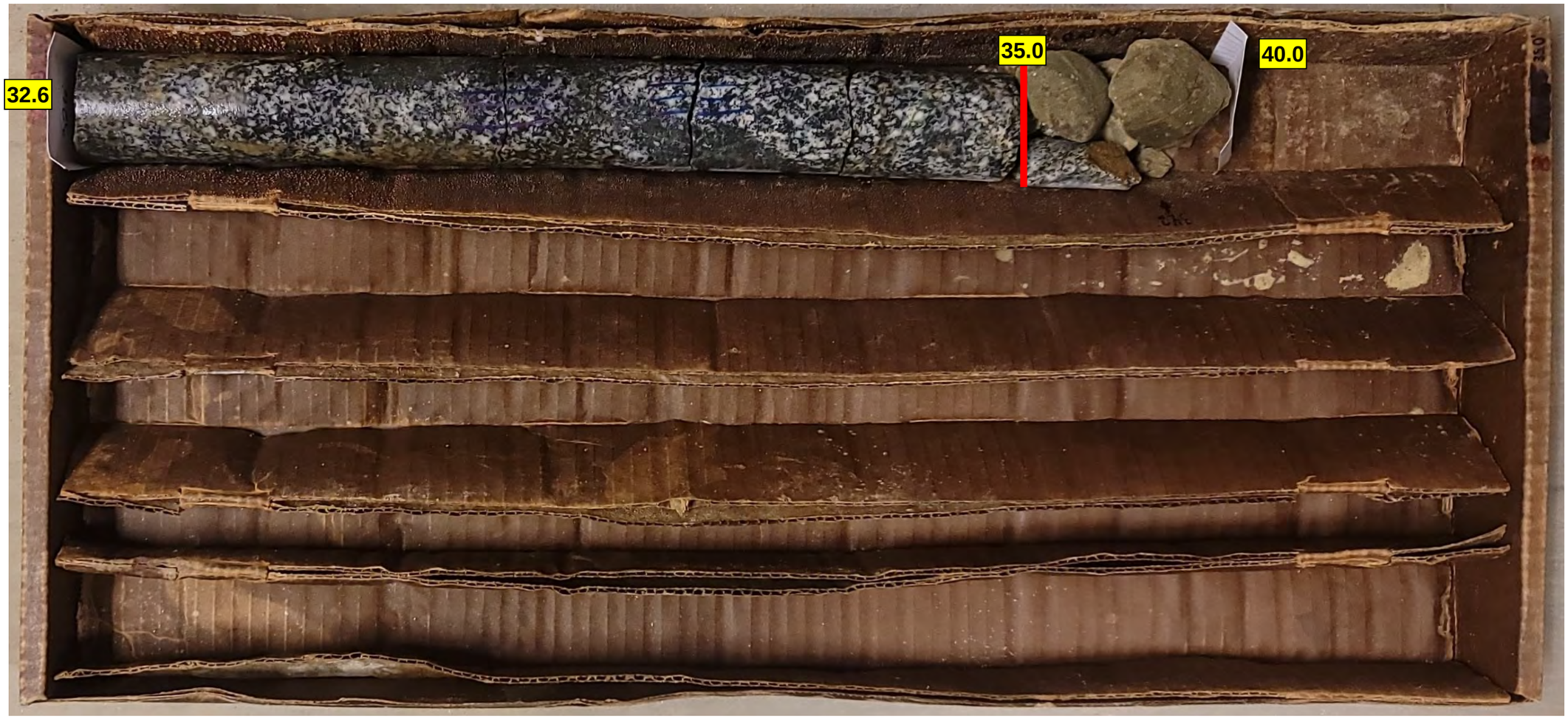
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS ELEV. (ft) / DEPTH (ft)
516.6											Begin Coring @ 32.6 ft
515	516.6	32.6	2.4	1:52/0.4 7:03/1.0 6:41/1.0	(1.6) 67%	(1.1) 46%		(1.7) 23%	(1.1) 15%		516.6 — 32.6 **CRYSTALLINE ROCK** Black to white, moderate to slightly weathered, very close to close fracture spacing, METADIORITE GSI= 45 to 65
	514.2	35.0	5.0	0:58/1.0 0:55/1.0 0:59/1.0 2:29/1.0 2:15/1.0	(0.0) 0%	(0.0) 0%					
510	509.2	40.0									509.2 — 40.0 **WEATHERED ROCK**
505											
500											496.0 — 53.2 Boring Terminated at Elevation 496.0 ft in Weathered Rock: METADIORITE

CORE PHOTOGRAPHS

B8-C

-L- 49+16 22 LT

BOX 1: 32.6 - 40.0 FEET



GEOTECHNICAL BORING REPORT
BORE LOG

WBS 48708.1.1	**TIP** B-6051/U-6143	**COUNTY** MECKLENBURG	**GEOLOGIST** B. Farmer	
SITE DESCRIPTION US 29 / US 74 REPLACE BRIDGE NO. 91 OVER CATAWBA RIVER (COMB W/U-6143)				**GROUND WTR (ft)**
BORING NO. B8-D	**STATION** 48+87	**OFFSET** 2 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 549.0 ft	**TOTAL DEPTH** 76.9 ft	**NORTHING** 550,433	**EASTING** 1,400,380	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT1303 CME-550 92% 02/03/2022		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER P. McCain	**START DATE** 09/22/22	**COMP. DATE** 09/23/22	**SURFACE WATER DEPTH** 17.2ft	

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))
570										
										WATER SURFACE (09/22/22)
565										
560										
555										
550										
	549.0	0.0	WOH	WOH	WOH	0		Sat.		549.0 / 0.0 GROUND SURFACE
545										**ALLUVIAL** Brown, silty CLAY (A-7-5), trace mica
	543.2	5.8	3	2	2	4		Sat.		545.0 / 4.0 **RESIDUAL** Brown, fine to coarse sandy CLAY (A-6), trace mica, trace rock fragments, saprolitic
540										540.0 / 9.0
	538.9	10.1	2	2	4	6		Sat.		Brown, fine to coarse sandy SILT (A-4), trace mica, saprolitic
535										535.0 / 14.0
	533.9	15.1	4	6	9	15		Sat.		Brown, silty fine to coarse SAND (A-2-4), trace mica, saprolitic
530										
	528.9	20.1	4	8	12	20		Sat.		
525										
	523.9	25.1	7	12	15	27		Sat.		
520										
	518.9	30.1	17	36	47	83		Sat.		
515										
	513.9	35.1	19	40	49	89		Sat.		
510										
	508.9	40.1	53	47/0.3		100/0.8				509.0 / 40.0 **WEATHERED ROCK** METADIORITE
505										505.0 / 44.0
	503.9	45.1	19	37	61	98		Sat.		**RESIDUAL** Brown, silty fine to coarse SAND (A-2-4), trace mica, saprolitic
500										499.0 / 50.0
	498.9	50.1	100/0.3			100/0.3				**WEATHERED ROCK** METADIORITE
495										
	493.9	55.1	29	60	40/0.1	100/0.9				
490										

WBS 48708.1.1	**TIP** B-6051/U-6143	**COUNTY** MECKLENBURG	**GEOLOGIST** B. Farmer	
SITE DESCRIPTION US 29 / US 74 REPLACE BRIDGE NO. 91 OVER CATAWBA RIVER (COMB W/U-6143)				**GROUND WTR (ft)**
BORING NO. B8-D	**STATION** 48+87	**OFFSET** 2 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 549.0 ft	**TOTAL DEPTH** 76.9 ft	**NORTHING** 550,433	**EASTING** 1,400,380	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT1303 CME-550 92% 02/03/2022		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER P. McCain	**START DATE** 09/22/22	**COMP. DATE** 09/23/22	**SURFACE WATER DEPTH** 17.2ft	

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
490						Match Line				
	488.9	60.1	100/0.4			100/0.4				**WEATHERED ROCK** METADIORITE *(continued)*
485										
	483.9	65.1	100/0.4			100/0.4				
480										
	478.9	70.1	60/0.1			60/0.1				479.0 / 70.0 **CRYSTALLINE ROCK** METADIORITE
475										477.0 / 72.0 **WEATHERED ROCK** METADIORITE
	473.9	75.1	60	40/0.1						
	472.1	76.9	60/0.0			100/0.6 60/0.0				472.1 / 76.9 Boring Terminated with Standard Penetration Test Refusal at Elevation 472.1 ft on Crystalline Rock: METADIORITE

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 48708.1.1	**TIP** B-6051/U-6143	**COUNTY** MECKLENBURG	**GEOLOGIST** J. Mize	
SITE DESCRIPTION US 29 / US 74 REPLACE BRIDGE NO. 91 OVER CATAWBA RIVER (COMB W/U-6143)				**GROUND WTR (ft)**
BORING NO. B9-A	**STATION** 50+07	**OFFSET** 68 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 557.1 ft	**TOTAL DEPTH** 96.8 ft	**NORTHING** 550,467	**EASTING** 1,400,512	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT1314 CME-45B 86% 02/03/2022		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER P. McCain	**START DATE** 10/05/22	**COMP. DATE** 10/06/22	**SURFACE WATER DEPTH** 8.0ft	

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))
570										
565										WATER SURFACE (10/05/22)
560										
	557.1	0.0								557.1 GROUND SURFACE 0.0
555			1	2	2	4		Sat.		**ALLUVIAL** Gray to brown, fine sandy CLAY (A-6)
	552.1	5.0								
550			2	3	3	6		Sat.		
	547.1	10.0								549.1 8.0 Brown, silty fine to coarse SAND (A-2-4), trace gravel
545			7	5	4	9		Sat.		
	542.1	15.0								544.1 13.0 **RESIDUAL** Brown, clayey SILT (A-5), saprolitic
540			2	2	3	5		Sat.		
	537.1	20.0								539.1 18.0 Brown, fine to coarse sandy SILT (A-4), trace mica, saprolitic
535			2	3	5	8		Sat.		
	532.7	24.4								534.1 23.0 Gray to brown, silty fine SAND (A-2-4), trace mica, saprolitic
530			4	9	12	21		Sat.		
	527.7	29.4								
525			9	17	24	41		Sat.		
	522.7	34.4								
520			8	12	18	30		Sat.		
	517.7	39.4								
515			9	11	18	29		Sat.		
	512.7	44.4								
510			12	26	31	57		Sat.		
	507.7	49.4								
505			10	27	32	59		Sat.		
	502.7	54.4								
500			16	31	44	75		Sat.		
	497.7	59.4								
495			18	35	41	76		Sat.		
	492.7	64.4								492.2 64.9 **WEATHERED ROCK** METADIORITE
490			20	80/0.4		100/0.9				

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
490						Match Line				
	487.7	69.4		100/0.5		100/0.5				**WEATHERED ROCK** METADIORITE *(continued)*
485										
	482.7	74.4		60/0.1		60/0.1				482.7 74.4 **CRYSTALLINE ROCK** METADIORITE
480										
475							RS-4			
470										
465										
										460.3 96.8 Boring Terminated at Elevation 460.3 ft in Crystalline Rock: METADIORITE

NCDOT BORE DOUBLE B-6051 - BRIDGE LOGS_2023.GPJ NC_DOT.GDT 4/19/23

GEOTECHNICAL BORING REPORT
CORE LOG

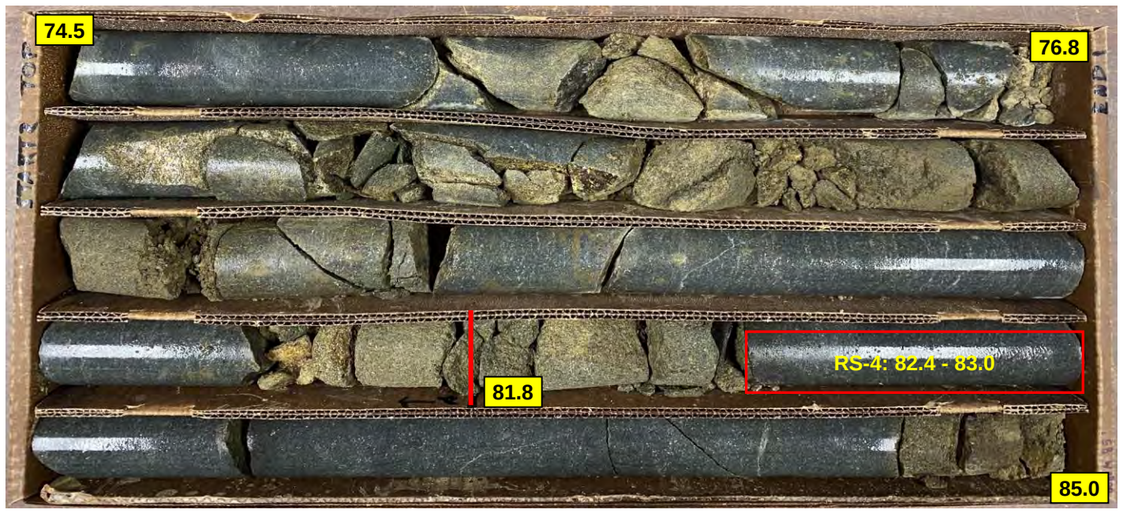
WBS 48708.1.1	**TIP** B-6051/U-6143	**COUNTY** MECKLENBURG	**GEOLOGIST** J. Mize	
SITE DESCRIPTION US 29 / US 74 REPLACE BRIDGE NO. 91 OVER CATAWBA RIVER (COMB W/U-6143)				**GROUND WTR (ft)**
BORING NO. B9-A	**STATION** 50+07	**OFFSET** 68 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 557.1 ft	**TOTAL DEPTH** 96.8 ft	**NORTHING** 550,467	**EASTING** 1,400,512	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT1314 CME-45B 86% 02/03/2022		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER P. McCain	**START DATE** 10/05/22	**COMP. DATE** 10/06/22	**SURFACE WATER DEPTH** 8.0ft	
CORE SIZE NQ2	**TOTAL RUN** 22.3 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
482.7											Begin Coring @ 74.4 ft
	482.7	74.4	2.3	2:40/1.3 1:50/1.0	(2.0) 87%	(1.0) 43%		(20.4) 91%	(8.5) 38%		ELEV. (ft) 482.7 DEPTH (ft) 74.4 **CRYSTALLINE ROCK** Dark gray, fresh to moderate weathering, very hard to medium hard, very close to moderately close fracture spacing, METADIORITE GSI = 35 to 45
480	480.4	76.7									
	480.3	76.8	5.0	1:54/1.0 1:59/1.0 3:04/1.0 2:33/1.0 3:20/1.0	(4.6) 92%	(1.6) 32%					
475	475.3	81.8									
			5.0	1:41/1.0 1:50/1.0 2:10/1.0 1:23/1.0 2:50/1.0	(4.3) 86%	(2.1) 42%	RS-4				
470	470.3	86.8									
			5.0	2:03/1.0 1:58/1.0 2:42/1.0 4:58/1.0 3:18/1.0	(4.7) 94%	(1.5) 30%					
465	465.3	91.8									
			5.0	2:15/1.0 1:59/1.0 2:34/1.0 3:30/1.0 4:23/1.0	(4.8) 96%	(2.3) 46%					
	460.3	96.8									460.3 96.8 Boring Terminated at Elevation 460.3 ft in Crystalline Rock: METADIORITE

CORE PHOTOGRAPHS
B9-A

-L- 50+07 68 LT

BOX 1: 74.5 - 85.0 FEET



0 1 2
FEET

BOX 2: 85.0 - 91.8 FEET

0 1 2
FEET

BOX 3: 91.8 - 96.8 FEET

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 48708.1.1	**TIP** B-6051/U-6143	**COUNTY** MECKLENBURG	**GEOLOGIST** J. Mize	
SITE DESCRIPTION US 29 / US 74 REPLACE BRIDGE NO. 91 OVER CATAWBA RIVER (COMB W/U-6143)				**GROUND WTR (ft)**
BORING NO. B9-B	**STATION** 50+06	**OFFSET** 66 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 558.6 ft	**TOTAL DEPTH** 81.4 ft	**NORTHING** 550,338	**EASTING** 1,400,478	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT1314 CME-45B 86% 02/03/2022		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER P. McCain	**START DATE** 09/08/22	**COMP. DATE** 09/09/22	**SURFACE WATER DEPTH** 7.1ft	

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))
570										
565										WATER SURFACE (09/08/22)
560										
	558.6	0.0	WOH	1	0	1		Sat.		558.6 GROUND SURFACE 0.0
555										**ALLUVIAL** Brown to gray, fine sandy CLAY (A-6), trace shells
	552.6	6.0	1	1	1	2		Sat.		
550										549.6 9.0
	547.6	11.0	3	5	8	13		Sat.		**RESIDUAL** Brown, fine sandy SILT (A-4), saprolitic
545										
	543.0	15.6	2	3	4	7		Sat.		
540										539.6 19.0
	538.0	20.6	9	12	14	26		Sat.		Dark brown to gray to white, silty fine SAND (A-2-4), trace mica, saprolitic
535										
	533.0	25.6	6	8	12	20		Sat.		
530										
	528.0	30.6	9	11	16	27		Sat.		
525										
	523.0	35.6	15	31	55	86		Sat.		
520										
	518.0	40.6	18	30	65	95		Sat.		
515										
	513.0	45.6	24	28	47	75		Sat.		
510										509.6 49.0
	508.0	50.6	37	63/0.3		100/0.8				**WEATHERED ROCK** METADIORITE
	506.4	52.2	66	34/0.1		100/0.6				
505										
	503.2	55.4	60/0.1			60/0.1				503.2 55.4 **CRYSTALLINE ROCK** METADIORITE
500										
495										
490										

WBS 48708.1.1	**TIP** B-6051/U-6143	**COUNTY** MECKLENBURG	**GEOLOGIST** J. Mize	
SITE DESCRIPTION US 29 / US 74 REPLACE BRIDGE NO. 91 OVER CATAWBA RIVER (COMB W/U-6143)				**GROUND WTR (ft)**
BORING NO. B9-B	**STATION** 50+06	**OFFSET** 66 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 558.6 ft	**TOTAL DEPTH** 81.4 ft	**NORTHING** 550,338	**EASTING** 1,400,478	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT1314 CME-45B 86% 02/03/2022		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER P. McCain	**START DATE** 09/08/22	**COMP. DATE** 09/09/22	**SURFACE WATER DEPTH** 7.1ft	

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
490						Match Line				
485										**CRYSTALLINE ROCK** METADIORITE *(continued)*
480										477.2 81.4
										Boring Terminated at Elevation 477.2 ft in Crystalline Rock: METADIORITE

GEOTECHNICAL BORING REPORT
CORE LOG

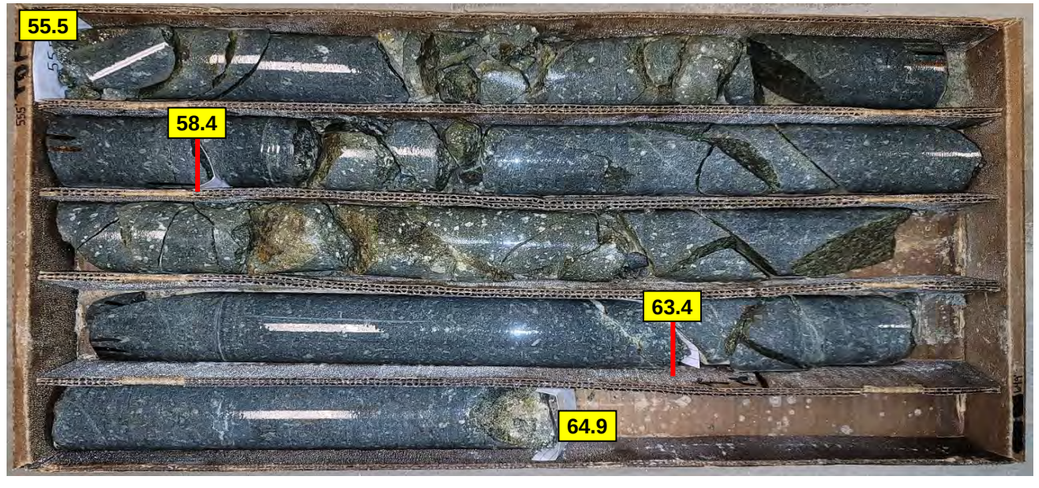
WBS 48708.1.1	**TIP** B-6051/U-6143	**COUNTY** MECKLENBURG	**GEOLOGIST** J. Mize	
SITE DESCRIPTION US 29 / US 74 REPLACE BRIDGE NO. 91 OVER CATAWBA RIVER (COMB W/U-6143)				**GROUND WTR (ft)**
BORING NO. B9-B	**STATION** 50+06	**OFFSET** 66 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 558.6 ft	**TOTAL DEPTH** 81.4 ft	**NORTHING** 550,338	**EASTING** 1,400,478	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT1314 CME-45B 86% 02/03/2022		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER P. McCain	**START DATE** 09/08/22	**COMP. DATE** 09/09/22	**SURFACE WATER DEPTH** 7.1ft	
CORE SIZE NQ2	**TOTAL RUN** 25.9 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
503.2											Begin Coring @ 55.4 ft
	503.1	55.5	2.9	1:05/0.9 6:11/1.0 3:49/1.0	(2.2) 76%	(0.6) 21%		(21.9) 84%	(6.8) 26%		ELEV. (ft) 503.2 **CRYSTALLINE ROCK** DEPTH (ft) 55.4 Gray to brown, fresh to moderately severe weathering, very hard to medium hard, very close to moderately close fracture spacing, METADIORITE GSI = 10 to 55 (78.4' - 81.4' Highly fractured zone)
500	500.2	58.4	5.0	2:29/1.0 1:45/1.0 4:26/1.0 3:47/1.0 1:34/1.0	(4.7) 94%	(1.7) 34%					
495	495.2	63.4	5.0	1:01/1.0 1:04/1.0 1:32/1.0 2:35/1.0 4:15/1.0	(4.3) 86%	(3.0) 60%					
490	490.2	68.4	5.0	2:06/1.0 2:16/1.0 2:17/1.0 1:31/1.0 2:00/1.0	(4.7) 94%	(0.4) 8%					
485	485.2	73.4	5.0	2:55/1.0 3:42/1.0 3:07/1.0 2:49/1.0 2:54/1.0	(5.0) 100%	(1.1) 22%					
480	480.2	78.4	3.0	2:57/1.0 4:06/1.0 2:00/1.0	(1.0) 33%	(0.0) 0%					
	477.2	81.4									ELEV. (ft) 477.2 DEPTH (ft) 81.4 Boring Terminated at Elevation 477.2 ft in Crystalline Rock: METADIORITE

CORE PHOTOGRAPHS
B9-B

-L- 50+06 66 RT

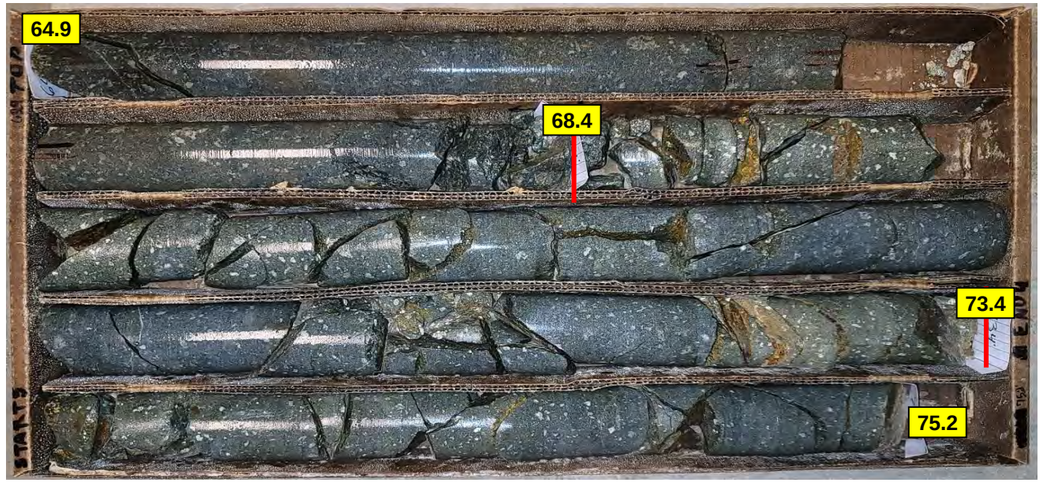
BOX 1: 55.5 - 64.9 FEET



0 1 2

FEET

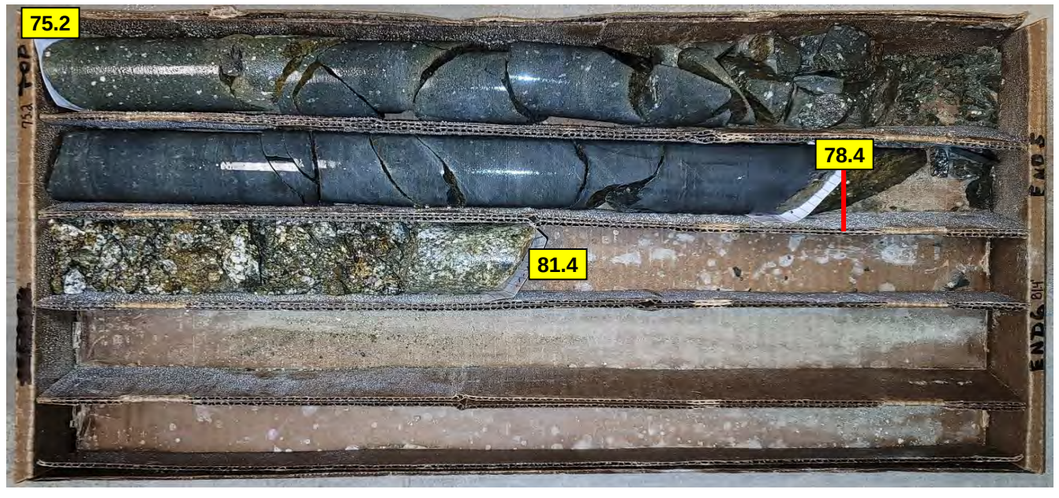
BOX 2: 64.9 - 75.2 FEET



0 1 2

FEET

BOX 3: 75.2 - 81.4 FEET



0 1 2

FEET

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 48708.1.1	**TIP** B-6051/U-6143	**COUNTY** MECKLENBURG	**GEOLOGIST** B. Farmer	
SITE DESCRIPTION US 29 / US 74 REPLACE BRIDGE NO. 91 OVER CATAWBA RIVER (COMB W/U-6143)				**GROUND WTR (ft)**
BORING NO. B9-C	**STATION** 50+08	**OFFSET** 24 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 557.2 ft	**TOTAL DEPTH** 75.6 ft	**NORTHING** 550,424	**EASTING** 1,400,502	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT1314 CME-45B 86% 02/03/2022		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER P. McCain	**START DATE** 11/04/22	**COMP. DATE** 11/07/22	**SURFACE WATER DEPTH** 6.9ft	

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))
570										
565										WATER SURFACE (11/04/22)
560										
	557.2	0.0	WOH	WOH	WOH	0		Sat.		557.2 GROUND SURFACE 0.0
555										**ALLUVIAL** Gray to brown, silty CLAY (A-7-5), trace mica
	552.5	4.7	2	2	3	5		Sat.		
550										
	546.8	10.4	1	2	2	4		Sat.		
545										
	541.8	15.4	3	7	7	14		Sat.		542.2 15.0 **RESIDUAL** Brown, fine sandy silty CLAY (A-7-5), trace rock fragments, saprolitic
540										
	536.8	20.4	5	6	10	16		Sat.		
535										
	531.8	25.4	4	6	10	16		Sat.		
530										
	526.8	30.4	6	11	24	35		Sat.		
525										
	521.8	35.4	6	15	24	39		Sat.		
520										
	516.8	40.4	12	20	46	66		Sat.		517.2 40.0 Brown, clayey fine to coarse SAND (A-2-7)
515										
	511.8	45.4	10	23	56	79		Sat.		
510										
	506.8	50.4	30	70/0.4		100/0.9				506.8 50.4 **WEATHERED ROCK** DIORITE
505										
	501.8	55.4	46	54/0.4		100/0.9				
500										
	496.8	60.4	72	28/0.2		100/0.7				
495										
	491.8	65.4	50	50/0.2		100/0.7				
490										

WBS 48708.1.1	**TIP** B-6051/U-6143	**COUNTY** MECKLENBURG	**GEOLOGIST** B. Farmer	
SITE DESCRIPTION US 29 / US 74 REPLACE BRIDGE NO. 91 OVER CATAWBA RIVER (COMB W/U-6143)				**GROUND WTR (ft)**
BORING NO. B9-C	**STATION** 50+08	**OFFSET** 24 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 557.2 ft	**TOTAL DEPTH** 75.6 ft	**NORTHING** 550,424	**EASTING** 1,400,502	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT1314 CME-45B 86% 02/03/2022		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER P. McCain	**START DATE** 11/04/22	**COMP. DATE** 11/07/22	**SURFACE WATER DEPTH** 6.9ft	

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
490						Match Line				**WEATHERED ROCK** DIORITE *(continued)*
485	486.8	70.4	30	70/0.4		100/0.9				
	481.8	75.4	100/0.2			100/0.2				481.6 75.6 Boring Terminated at Elevation 481.6 ft in Weathered Rock: DIORITE

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 48708.1.1	**TIP** B-6051/U-6143	**COUNTY** MECKLENBURG	**GEOLOGIST** B. Farmer	
SITE DESCRIPTION US 29 / US 74 REPLACE BRIDGE NO. 91 OVER CATAWBA RIVER (COMB W/U-6143)				**GROUND WTR (ft)**
BORING NO. B9-D	**STATION** 50+24	**OFFSET** 21 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 558.6 ft	**TOTAL DEPTH** 68.6 ft	**NORTHING** 550,417	**EASTING** 1,400,517	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT1303 CME-550 92% 02/03/2022		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER P. McCain	**START DATE** 09/28/22	**COMP. DATE** 09/29/22	**SURFACE WATER DEPTH** 6.4ft	

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))
570										
565										WATER SURFACE (09/28/22)
560										
	558.6	0.0								558.6 GROUND SURFACE 0.0
	557.0	1.6	WOH	1	1	2		Sat.		**ALLUVIAL** Brown, fine to coarse sandy CLAY (A-6), trace mica
555			WOH	WOH	1	1		Sat.		
	552.0	6.6	1	1	2	3		Sat.		
550										
	547.6	11.0	WOH	1	2	3		Sat.		
545										
	542.6	16.0	2	2	5	7		Sat.		543.6 15.0 **RESIDUAL** Brown, fine to coarse sandy CLAY (A-6), trace mica, saprolitic
540										
	537.6	21.0	4	10	12	22		Sat.		538.6 20.0 Brown, fine to coarse sandy SILT (A-4), little mica, saprolitic
535										
	532.6	26.0	5	12	19	31		Sat.		534.6 24.0 Brown, clayey fine SAND (A-2-7), trace rock fragments
530										
	527.6	31.0	6	17	20	37		Sat.		
525										
	522.6	36.0	8	15	26	41		Sat.		520.6 38.0 **WEATHERED ROCK** TUFF
520	519.6	39.0	100/0.4			100/0.4				
	517.6	41.0	60/0.0			60/0.0				517.6 41.0 **CRYSTALLINE ROCK** TUFF
515										
510										
505										
500										
495										
490										490.0 68.6

WBS 48708.1.1	**TIP** B-6051/U-6143	**COUNTY** MECKLENBURG	**GEOLOGIST** B. Farmer	
SITE DESCRIPTION US 29 / US 74 REPLACE BRIDGE NO. 91 OVER CATAWBA RIVER (COMB W/U-6143)				**GROUND WTR (ft)**
BORING NO. B9-D	**STATION** 50+24	**OFFSET** 21 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 558.6 ft	**TOTAL DEPTH** 68.6 ft	**NORTHING** 550,417	**EASTING** 1,400,517	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT1303 CME-550 92% 02/03/2022		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER P. McCain	**START DATE** 09/28/22	**COMP. DATE** 09/29/22	**SURFACE WATER DEPTH** 6.4ft	

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
490						Match Line				Boring Terminated at Elevation 490.0 ft in Crystalline Rock: TUFF

GEOTECHNICAL BORING REPORT
CORE LOG

WBS 48708.1.1	**TIP** B-6051/U-6143	**COUNTY** MECKLENBURG	**GEOLOGIST** B. Farmer
SITE DESCRIPTION US 29 / US 74 REPLACE BRIDGE NO. 91 OVER CATAWBA RIVER (COMB W/U-6143)			**GROUND WTR (ft)**
BORING NO. B9-D	**STATION** 50+24	**OFFSET** 21 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 558.6 ft	**TOTAL DEPTH** 68.6 ft	**NORTHING** 550,417	**EASTING** 1,400,517	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT1303 CME-550 92% 02/03/2022		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic
DRILLER P. McCain	**START DATE** 09/28/22	**COMP. DATE** 09/29/22	**SURFACE WATER DEPTH** 6.4ft
CORE SIZE NQ2	**TOTAL RUN** 27.2 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
517.2											Begin Coring @ 41.4 ft
	517.2	41.4	2.2	0:36/0.2 1:51/1.0	(1.0) 45%	(0.4) 16%					**CRYSTALLINE ROCK** Black to white, hard, slight to very severe weathering, very close fracture spacing, TUFF GSI = 30 to 40 *(continued)*
515	515.0	43.6		2:30/1.0							
			5.0	3:40/1.0 2:10/1.0 1:40/1.0 3:01/1.0	(3.4) 68%	(0.7) 14%					
510	510.0	48.6		1:14/1.0							
			5.0	2:57/1.0 2:34/1.0 2:09/1.0 2:33/1.0	(1.7) 34%	(0.8) 16%					
505	505.0	53.6		3:07/1.0							
			5.0	1:18/1.0 2:24/1.0 1:13/1.0 1:17/1.0	(1.6) 32%	(0.0) 0%					
500	500.0	58.6		1:40/1.0							
			5.0	1:13/1.0 1:21/1.0 1:03/1.0 1:50/1.0	(2.4) 48%	(0.0) 0%					
495	495.0	63.6		1:08/1.0							
			5.0	1:06/1.0 1:22/1.0 1:28/1.0 1:15/1.0	(3.4) 68%	(0.0) 0%					
490	490.0	68.6		3:19/1.0							ELEV. (ft) 490.0 DEPTH (ft) 68.6
											Boring Terminated at Elevation 490.0 ft in Crystalline Rock: TUFF

CORE PHOTOGRAPHS
B9-D

BOX 1: 41.4 - 61.0 FEET

BOX 2: 61.0 - 68.6 FEET

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 48708.1.1	**TIP** B-6051/U-6143	**COUNTY** MECKLENBURG	**GEOLOGIST** J. Mize	
SITE DESCRIPTION US 29 / US 74 REPLACE BRIDGE NO. 91 OVER CATAWBA RIVER (COMB W/U-6143)				**GROUND WTR (ft)**
BORING NO. B10-A	**STATION** 50+91	**OFFSET** 39 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 563.2 ft	**TOTAL DEPTH** 68.6 ft	**NORTHING** 550,418	**EASTING** 1,400,587	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT1314 CME-45B 86% 02/03/2022		**DRILL METHOD** Mud Rotary		**HAMMER TYPE** Automatic
DRILLER P. McCain	**START DATE** 10/07/22	**COMP. DATE** 10/11/22	**SURFACE WATER DEPTH** 2.1ft	

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)
570										
565										WATER SURFACE (10/07/22)
	563.2	0.0	WOH	WOH	WOH	0				563.2 GROUND SURFACE 0.0
560										**ALLUVIAL** Brown, fine to coarse sandy CLAY (A-6)
	557.4	5.8	WOH	1	2	3		Sat.		
555										
	552.4	10.8	2	1	2	3		Sat.		
550										549.2 14.0
	547.4	15.8	1	3	3	6		Sat.		**RESIDUAL** Brown, fine to coarse sandy SILT (A-4), trace mica, saprolitic
545										
	543.0	20.2	2	3	7	10		Sat.		
540										539.2 24.0
	538.0	25.2	3	5	8	13		Sat.		Gray, silty fine SAND (A-2-4), trace mica, saprolitic
535										
	533.0	30.2	5	9	12	21		Sat.		
530										
	528.0	35.2	6	10	15	25		Sat.		
525										
	523.0	40.2	10	14	22	36		Sat.		
520										
	518.0	45.2	15	26	29	55		Sat.		
515										514.2 49.0
	513.0	50.2	22	78/0.5		100/1.0				**WEATHERED ROCK** METADIORITE
510										
	508.0	55.2	100/0.5			100/0.5				
505										
	503.0	60.2	100/0.4			100/0.4				
500										
	498.0	65.2	100/0.4			100/0.4				
495										
	494.6	68.6	60/0.0			60/0.0				494.6 68.6
										Boring Terminated with Standard Penetration Test Refusal at Elevation 494.6 ft on Crystalline Rock: METADIORITE

NCDOT BORE DOUBLE B-6051 - BRIDGE LOGS_2023.GPJ NC_DOT.GDT 4/19/23

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 48708.1.1	**TIP** B-6051/U-6143	**COUNTY** MECKLENBURG	**GEOLOGIST** J. Mize	
SITE DESCRIPTION US 29 / US 74 REPLACE BRIDGE NO. 91 OVER CATAWBA RIVER (COMB W/U-6143)				**GROUND WTR (ft)**
BORING NO. B10-B	**STATION** 51+07	**OFFSET** 66 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 564.0 ft	**TOTAL DEPTH** 88.2 ft	**NORTHING** 550,312	**EASTING** 1,400,576	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT1314 CME-45B 86% 02/03/2022		**DRILL METHOD** SPT Core Boring		**HAMMER TYPE** Automatic
DRILLER J. White	**START DATE** 09/06/22	**COMP. DATE** 09/07/22	**SURFACE WATER DEPTH** 1.8ft	

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))
570										
565										WATER SURFACE (09/06/22)
	564.0	0.0	1	1	2	3		Sat.		564.0 GROUND SURFACE 0.0 **ALLUVIAL** Brown to gray, clayey silty fine SAND (A-2-5), trace gravel
560										560.0 4.0 Brown, fine sandy CLAY (A-6)
	557.7	6.3	2	3	4	7		Sat.		
555										555.0 9.0 Brown, gravelly fine to coarse SAND (A-1-b)
	552.7	11.3	4	5	4	9		Sat.		
550										
	548.4	15.6	8	7	4	11		Sat.		
545										
	543.4	20.6	3	4	7	11		Sat.		
540										541.0 23.0 **RESIDUAL** Brown, fine to coarse sandy SILT (A-4), saprolitic
	538.4	25.6	6	7	13	20		Sat.		
535										
	533.4	30.6	5	8	11	19		Sat.		
530										531.0 33.0 Brown to gray to white, silty fine SAND (A-2-4), saprolitic
	528.4	35.6	7	14	19	33		Sat.		
525										
	523.4	40.6	15	15	21	36		Sat.		
520										
	518.4	45.6	27	39	59	98		Sat.		
515										
	513.4	50.6	18	35	51	86		Sat.		
510										
	508.4	55.6	12	12	17	29		Sat.		
505										506.0 58.0 **WEATHERED ROCK** METADIORITE
	503.4	60.6	100/0.5			100/0.5				
500	500.2	63.8	60/0.1			60/0.1	RS-5			500.2 63.8 **CRYSTALLINE ROCK** METADIORITE
495										
490										

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
490						Match Line				
485										**CRYSTALLINE ROCK** METADIORITE *(continued)*
480										475.8 88.2 Boring Terminated at Elevation 475.8 ft in Crystalline Rock: METADIORITE

GEOTECHNICAL BORING REPORT
CORE LOG

WBS 48708.1.1	**TIP** B-6051/U-6143	**COUNTY** MECKLENBURG	**GEOLOGIST** J. Mize
SITE DESCRIPTION US 29 / US 74 REPLACE BRIDGE NO. 91 OVER CATAWBA RIVER (COMB W/U-6143)			**GROUND WTR (ft)**
BORING NO. B10-B	**STATION** 51+07	**OFFSET** 66 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 564.0 ft	**TOTAL DEPTH** 88.2 ft	**NORTHING** 550,312	**EASTING** 1,400,576	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT1314 CME-45B 86% 02/03/2022		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic
DRILLER J. White	**START DATE** 09/06/22	**COMP. DATE** 09/07/22	**SURFACE WATER DEPTH** 1.8ft
CORE SIZE NQ2	**TOTAL RUN** 24.3 ft		

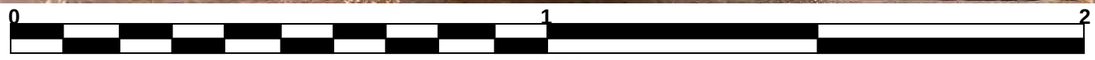
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS
500											Begin Coring @ 63.8 ft
	500.1	63.9	4.3	1:40/1.3 1:20/1.0 3:30/1.0 2:18/1.0	(3.2) 74%	(0.6) 14%	RS-5	(21.8) 89%	(8.9) 36%		ELEV. (ft) 500.2 DEPTH (ft) 63.8 **CRYSTALLINE ROCK** Gray, fresh to moderate weathering, very hard to hard, moderately close to very close fracture spacing, METADIORITE GSI = 45 to 55
	495.8	68.2									
495			5.0	2:47/1.0 2:22/1.0 2:06/1.0 3:54/1.0 4:31/1.0	(4.5) 90%	(3.6) 72%					
	490.8	73.2									
490			5.0	1:12/1.0 1:20/1.0 1:26/1.0 1:46/1.0 1:35/1.0	(4.8) 96%	(3.5) 70%					
	485.8	78.2									
485			5.0	1:22/1.0 2:08/1.0 3:16/1.0 3:45/1.0 3:32/1.0	(5.0) 100%	(0.8) 16%					
	480.8	83.2									
480			5.0	4:49/1.0 3:06/1.0 2:57/1.0 5:28/1.0 2:57/1.0	(4.3) 86%	(0.4) 8%					
	475.8	88.2									ELEV. (ft) 475.8 DEPTH (ft) 88.2
											Boring Terminated at Elevation 475.8 ft in Crystalline Rock: METADIORITE

CORE PHOTOGRAPHS

B10-B

-L- 51+07 66 RT

BOX 1: 63.9 - 73.2 FEET



BOX 2: 73.2 - 80.5 FEET

BOX 3: 80.5 - 88.2 FEET

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 48708.1.1	**TIP** B-6051/U-6143	**COUNTY** MECKLENBURG	**GEOLOGIST** J. Mize	
SITE DESCRIPTION US 29 / US 74 REPLACE BRIDGE NO. 91 OVER CATAWBA RIVER (COMB W/U-6143)				**GROUND WTR (ft)**
BORING NO. B10-C	**STATION** 50+74	**OFFSET** 8 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 560.8 ft	**TOTAL DEPTH** 58.8 ft	**NORTHING** 550,392	**EASTING** 1,400,562	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT1303 CME-550 92% 02/03/2022		**DRILL METHOD** H.S. Augers		**HAMMER TYPE** Automatic
DRILLER P. McCain	**START DATE** 10/26/22	**COMP. DATE** 10/26/22	**SURFACE WATER DEPTH** 2.4ft	

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))
570										
565										WATER SURFACE (10/26/22)
	560.8	0.0	WOH	WOH	WOH	0		Sat.		560.8 GROUND SURFACE 0.0
560										**ALLUVIAL** Gray to brown, silty clayey fine SAND (A-2-6), trace mica
	556.5	4.3	1	2	1	3		Sat.		
555	555.6	5.2	WOH	1	2	3		Sat.		
	550.8	10.0	1	2	1	3		Sat.		
550										547.8 13.0 **RESIDUAL** Brown, fine sandy clayey SILT (A-5), saprolitic
	545.8	15.0	2	2	4	6		Sat.		
545										541.8 19.0 Brown, clayey fine sandy SILT (A-4), saprolitic
	540.8	20.0	3	7	12	19		Sat.		
540										
	535.8	25.0	4	7	12	19		Sat.		
535										
	530.8	30.0	6	11	15	26		Sat.		
530										
	525.8	35.0	24	65	35/0.1	100/0.6				525.8 35.0 **WEATHERED ROCK** METADIORITE
525										
	520.8	40.0	100/0.5			100/0.5				
520										
	515.8	45.0	33	55	45/0.2	100/0.7				
515										
	510.8	50.0	36	64/0.5		100/1.0				
510										
	505.8	55.0	14	86/0.5		100/1.0				
505										
	502.0	58.8	60/0.0			60/0.0				502.0 58.8 Boring Terminated with Standard Penetration Test Refusal at Elevation 502.0 ft in Crystalline Rock: METADIORITE

WBS 48708.1.1	**TIP** B-6051/U-6143	**COUNTY** MECKLENBURG	**GEOLOGIST** M. Shipman	
SITE DESCRIPTION US 29 / US 74 REPLACE BRIDGE NO. 91 OVER CATAWBA RIVER (COMB W/U-6143)				**GROUND WTR (ft)**
BORING NO. B10-D	**STATION** 51+07	**OFFSET** 20 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 564.2 ft	**TOTAL DEPTH** 70.3 ft	**NORTHING** 550,357	**EASTING** 1,400,587	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CAT2002 B-57 92% 12/23/2022		**DRILL METHOD** Mud Rotary		**HAMMER TYPE** Automatic
DRILLER J. White	**START DATE** 12/01/22	**COMP. DATE** 12/02/22	**SURFACE WATER DEPTH** 2.0ft	

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
570										
565										WATER SURFACE (12/01/22)
	564.2	0.0	WOH	WOH	WOH	0		Sat.		564.2 GROUND SURFACE 0.0
560										**ALLUVIAL** Gray, fine sandy CLAY (A-6), trace of organic matter
	559.1	5.1	WOH	WOH	WOH	0		Sat.		560.2 4.0 Gray to brown, silty CLAY (A-7-6), trace mica
555	554.1	10.1	2	4	4	8		Sat.		
550	549.1	15.1	8	16	20	36		Sat.		549.2 15.0 Orange-brown to green-brown, gravel with fine to coarse SAND (A-1-a) 547.2 17.0 **RESIDUAL** Brown to white, fine to coarse sandy CLAY (A-6), trace rock fragments, saprolitic
545	544.1	20.1	4	4	5	9		Sat.		
540	539.1	25.1	9	10	20	30		Sat.		541.2 23.0 Brown to white, clayey fine to coarse SAND (A-2-6), trace rock fragments, saprolitic
535	534.1	30.1	12	15	20	35		Sat.		
530	529.1	35.1	12	18	22	40		Sat.		
525	524.1	40.1	12	18	21	39		Sat.		
520	519.1	45.1	100/0.4			100/0.4				520.7 43.5 **WEATHERED ROCK** METADIORITE
515	514.1	50.1	100/0.3			100/0.3				
510	509.1	55.1	100/0.2			100/0.2				
505	504.1	60.1	100/0.2			100/0.2				
500	499.1	65.1	100/0.2			100/0.2				
495	494.1	70.1	100/0.2			100/0.2				493.9 70.3 Boring Terminated at Elevation 493.9 ft in Weathered Rock: METADIORITE

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 48708.1.1	**TIP** B-6051/U-6143	**COUNTY** MECKLENBURG	**GEOLOGIST** J. Mize	
SITE DESCRIPTION US 29 / US 74 REPLACE BRIDGE NO. 91 OVER CATAWBA RIVER (COMB W/U-6143)				**GROUND WTR (ft)**
BORING NO. EB2-B	**STATION** 52+58	**OFFSET** 59 ft RT	**ALIGNMENT** -L-	**0 HR.** 10.1
COLLAR ELEV. 582.3 ft	**TOTAL DEPTH** 78.9 ft	**NORTHING** 550,281	**EASTING** 1,400,724	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE CAT1303 CME-550 92% 02/03/2022		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER P. McCain	**START DATE** 08/16/22	**COMP. DATE** 08/17/22	**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)
585											
	582.3	0.0	2	5	7	12		Sat.		582.3 GROUND SURFACE	0.0
580	578.8	3.5								**ROADWAY EMBANKMENT** Brown, clayey silty fine to coarse SAND (A-2-4), trace gravel	
			5	5	5	10		Sat.		579.3	3.0
575	573.8	8.5								Red-brown, fine sandy clayey SILT (A-5), trace gravel	
			WOH	1	2	3					
570	568.8	13.5									
			2	2	3	5		Sat.		566.3	16.0
565	563.8	18.5								**ALLUVIAL** Gray to brown, fine to coarse sandy silty CLAY (A-7-5)	
			2	1	2	3		Sat.			
560	558.8	23.5									
			WOH	WOH	WOH	0		Sat.			
555	553.8	28.5								555.3	27.0
			2	1	1	2		Sat.		Brown to dark orange-brown, silty fine to coarse SAND (A-2-4)	
550	548.8	33.5									
			6	10	8	18		Sat.			
545	543.8	38.5								544.8	37.5
	543.1	39.2	40	60/0.2		100/0.7 60/0.0				**WEATHERED ROCK** ALLUVIAL BOULDERS	39.2
540			60/0.0							**CRYSTALLINE ROCK** ALLUVIAL BOULDERS	
	538.8	43.5								540.1	42.2
			7	11	13	24		Sat.		**RESIDUAL** Gray, fine to coarse sandy SILT (A-4), saprolitic	
535	533.8	48.5									
			6	9	14	23		Sat.			
530	528.8	53.5								528.3	54.0
			12	53	47/0.2	100/0.7				**WEATHERED ROCK** METADIORITE	
525	523.8	58.5								526.3	56.0
			12	27	45	72		Sat.		**RESIDUAL** Gray, silty fine to coarse SAND (A-2-4), saprolitic	
520	518.8	63.5									
			7	22	39	61		Sat.			
515	513.8	68.5								515.3	67.0
			11	18	82/0.4	100/0.9				**WEATHERED ROCK** METADIORITE	
510	508.8	73.5									
			44	56/0.4		100/0.9					
505											

WBS 48708.1.1	**TIP** B-6051/U-6143	**COUNTY** MECKLENBURG	**GEOLOGIST** J. Mize	
SITE DESCRIPTION US 29 / US 74 REPLACE BRIDGE NO. 91 OVER CATAWBA RIVER (COMB W/U-6143)				**GROUND WTR (ft)**
BORING NO. EB2-B	**STATION** 52+58	**OFFSET** 59 ft RT	**ALIGNMENT** -L-	**0 HR.** 10.1
COLLAR ELEV. 582.3 ft	**TOTAL DEPTH** 78.9 ft	**NORTHING** 550,281	**EASTING** 1,400,724	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE CAT1303 CME-550 92% 02/03/2022		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER P. McCain	**START DATE** 08/16/22	**COMP. DATE** 08/17/22	**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
505						Match Line				
	503.8	78.5	100/0.4			100/0.4				503.4 78.9
										Boring Terminated at Elevation 503.4 ft in Weathered Rock: METADIORITE

GEOTECHNICAL BORING REPORT
CORE LOG

WBS 48708.1.1	**TIP** B-6051/U-6143	**COUNTY** MECKLENBURG	**GEOLOGIST** J. Mize	
SITE DESCRIPTION US 29 / US 74 REPLACE BRIDGE NO. 91 OVER CATAWBA RIVER (COMB W/U-6143)				**GROUND WTR (ft)**
BORING NO. EB2-B	**STATION** 52+58	**OFFSET** 59 ft RT	**ALIGNMENT** -L-	**0 HR.** 10.1
COLLAR ELEV. 582.3 ft	**TOTAL DEPTH** 78.9 ft	**NORTHING** 550,281	**EASTING** 1,400,724	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE CAT1303 CME-550 92% 02/03/2022		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER P. McCain	**START DATE** 08/16/22	**COMP. DATE** 08/17/22	**SURFACE WATER DEPTH** N/A	
CORE SIZE NQ2	**TOTAL RUN** 2.0 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	ELEV. (ft)	DEPTH (ft)
543.1											Begin Coring @ 39.2 ft		
	543.1	39.2	1.5	3:52/1.5	(0.7) 47%	(0.0) 0%		(1.3) 43%	(0.6) 20%		**CRYSTALLINE ROCK** ALLUVIAL BOULDERS	543.1	39.2
	541.6	40.7											
540	541.1	41.2	0.5	1:55/1.5	(0.6) 120%	(0.6) 120%					**RESIDUAL**	540.1	42.2
				N=24									
535				*N=23*									
530												528.3	54.0
											WEATHERED ROCK	526.3	56.0
525											**RESIDUAL**		
				N=72									
520													
				N=61									
515												515.3	67.0
											WEATHERED ROCK		
510													
505												503.4	78.9
											Boring Terminated at Elevation 503.4 ft in Weathered Rock: METADIORITE		

NCDOT CORE SINGLE B-6051 - BRIDGE LOGS_CORE.GPJ NC_DOT.GDT 4/19/23

CORE PHOTOGRAPHS

EB2-B

-L- 52+58 59 RT

BOX 1: 39.2 - 42.2 FEET

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 48708.1.1	**TIP** B-6051/U-6143	**COUNTY** MECKLENBURG	**GEOLOGIST** J. Mize	
SITE DESCRIPTION US 29 / US 74 REPLACE BRIDGE NO. 91 OVER CATAWBA RIVER (COMB W/U-6143)				**GROUND WTR (ft)**
BORING NO. EB2-D	**STATION** 52+64	**OFFSET** 18 ft RT	**ALIGNMENT** -L-	**0 HR.** 15.2
COLLAR ELEV. 582.4 ft	**TOTAL DEPTH** 84.0 ft	**NORTHING** 550,319	**EASTING** 1,400,740	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE CAT1303 CME-550 92% 02/03/2022		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER P. McCain	**START DATE** 08/10/22	**COMP. DATE** 08/11/22	**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))
585										
										582.4 / 0.0 GROUND SURFACE
580	580.7	1.7	3	2	2	4		Sat.		**ROADWAY EMBANKMENT** 1.3' Asphalt, 0.4' ABC — 580.7 / 1.7
	577.3	5.1	2	3	3	6		Sat.		**ROADWAY EMBANKMENT** Brown to gray, fine sandy clayey SILT (A-5), trace gravel — 578.4 / 4.0
575	573.9	8.5	2	2	2	4		Sat.		Brown, silty CLAY (A-7-5)
570	568.9	13.5	1	2	1	3				Gray-brown, clayey SILT (A-5), trace mica — 570.4 / 12.0
565	563.9	18.5	WOH	2	3	5		Sat.		**ALLUVIAL** Brown, fine sandy silty CLAY (A-7-5) — 565.4 / 17.0
560	558.9	23.5	1	0	1	1		Sat.		
555	553.9	28.5	1	1	2	3		Sat.		Brown, clayey fine to coarse SAND (A-2-6) — 555.4 / 27.0
550	548.9	33.5	3	3	4	7		Sat.		
545	543.9	38.5	19	20	25	45		Sat.		Brown, fine to coarse sandy GRAVEL (A-1-b) — 545.4 / 37.0
540	538.9	43.5	3	4	6	10		Sat.		**RESIDUAL** Gray, fine to coarse sandy clayey SILT (A-5), saprolitic — 541.4 / 41.0
535	533.9	48.5	3	5	11	16		Sat.		
530	528.9	53.5	6	10	15	25		Sat.		
525	523.9	58.5	10	25	30	55		Sat.		
520	518.9	63.5	10	19	37	56		Sat.		
515	513.9	68.5	17	36	64/0.4	100/0.9				514.4 / 68.0 **WEATHERED ROCK** METADIORITE
510	508.9	73.5	30	62	38/0.3	100/0.8				
505										

WBS 48708.1.1	**TIP** B-6051/U-6143	**COUNTY** MECKLENBURG	**GEOLOGIST** J. Mize	
SITE DESCRIPTION US 29 / US 74 REPLACE BRIDGE NO. 91 OVER CATAWBA RIVER (COMB W/U-6143)				**GROUND WTR (ft)**
BORING NO. EB2-D	**STATION** 52+64	**OFFSET** 18 ft RT	**ALIGNMENT** -L-	**0 HR.** 15.2
COLLAR ELEV. 582.4 ft	**TOTAL DEPTH** 84.0 ft	**NORTHING** 550,319	**EASTING** 1,400,740	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE CAT1303 CME-550 92% 02/03/2022		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER P. McCain	**START DATE** 08/10/22	**COMP. DATE** 08/11/22	**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
505						Match Line				
	503.9	78.5		48	52/0.2	100/0.7				**WEATHERED ROCK** METADIORITE *(continued)*
500	498.9	83.5	100/0.5			100/0.5				498.4 / 84.0 Boring Terminated at Elevation 498.4 ft in Weathered Rock: METADIORITE

ASTM D7012 - Method C

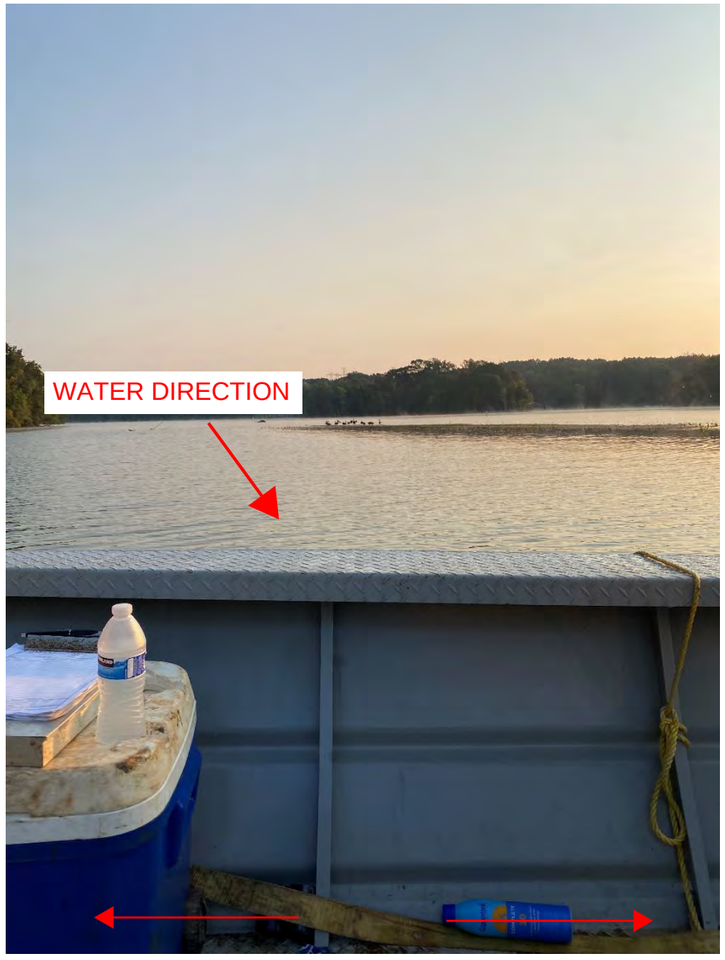
Unconfined Compression Test

Client: RK&K
Report Date: 11/2/2022
Project: Gaston and Mecklenburg County B-6051/U-6143
Project No.: 2205

SAMPLE NO.	*STATION*	*OFFSET*	*DEPTH INTERVAL*	*HEIGHT (in)*	*DIAMETER (in)*	*AREA (sq in)*	*H:D*	*Mass (g)*	*Unit Weight (pcf)*	*Moisture (%)*	*Load (lbs)*	*Comp. Strength (psi)*
RS-1	43+25	8 LT	53.5 - 54.3	4.11	1.98	3.08	2.08	602.08	181.2	0.3	10610	3445
RS-2	44+10	68 RT	46.3 - 46.7	4.12	1.99	3.11	2.07	578.61	172.0	0.3	42470	13656
RS-3	48+70	67 RT	61.9 - 62.5	4.12	1.99	3.11	2.07	622.87	185.2	0.1	104440	33582
RS-4	50+07	68 LT	82.4 - 83.0	4.13	2.00	3.14	2.07	620.22	182.2	0.2	84990	27067
RS-5	51+07	66 RT	65.9 - 66.4	4.11	1.99	3.11	2.07	614.89	183.3	0.1	64160	20630

Drill Rig Photo on Barge (-L-)

Catawba River Downstream



Catawba River Upstream