STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	38452.1.1 (B-4645)	1	28

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

STRUCTURE SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 38452.1.1 (B-4645) F.A. PROJ. BRNHS-52(25)

COUNTY STOKES

PROJECT DESCRIPTION REPLACEMENT OF BRIDGES NO. 29 & 30 ON US 52 OVER LITTLE YADKIN RIVER

SITE DESCRIPTION BRIDGES NO. 29 & 30 ON US 52 OVER LITTLE YADKIN RIVER

ID: B-4645

PROJECT: 38452.1.1

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CAUTION NOTICE

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PERSONNEL

M. GRAGG

R. DeLOST

F. WOODARD

INVESTIGATED BY FLORENCE & HUTCHESON

CHECKED BY S. PROVANCE

SUBMITTED BY FLORENCE & HUTCHESON

DATE 10/31/2012

NORTH CAROLINA PROFESSIONAL SEAL 036026 ENGINEER C. SHANNON PROVANCE

DRAWN BY: W. SHUECRAFT/T. RIDEOUT

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PROJECT REFERENCE NO.	SHEET NO.
38452.1.1 (B-4645)	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 TO BE THE 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 STANDARD PENETRATION TEST (AASHTO T206, ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. 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
LIQUID LIMIT PLASTIC INDEX	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 A 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/FT²)
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 0.50 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
LL — LIQUID LIMIT		
PLASTIC RANGE (PI)	- WET - (W)	SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE
PL — PLASTIC LIMIT		
OM — OPTIMUM MOISTURE	- MOIST - (M)	SOLID; AT OR NEAR OPTIMUM MOISTURE
SL — SHRINKAGE LIMIT		
	- DRY - (D)	REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE

PLASTICITY

	PLASTICITY INDEX (PI)	DRY STRENGTH
NONPLASTIC	0-5	VERY LOW
LOW PLASTICITY	6-15	SLIGHT
MED. PLASTICITY	16-25	MEDIUM
HIGH PLASTICITY	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.
UNIFORM - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. (ALSO POORLY GRADED)
GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLES 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 WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.

COMPRESSIBILITY

SLIGHTLY COMPRESSIBLE	LIQUID LIMIT LESS THAN 31
MODERATELY COMPRESSIBLE	LIQUID LIMIT EQUAL TO 31-50
HIGHLY COMPRESSIBLE	LIQUID LIMIT GREATER THAN 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 W/ CORE
- SPT N-VALUE
- REF — SPT REFUSAL

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:
- ☐ MOBILE B-___
- ☐ BK-51
- ☒ CME-45C
- ☐ CME-550
- ☐ PORTABLE HOIST
- ☐ _____
- ☐ _____

ADVANCING TOOLS:
- ☐ CLAY BITS
- ☐ 6" CONTINUOUS FLIGHT AUGER
- ☐ 8" HOLLOW AUGERS
- ☐ HARD FACED FINGER BITS
- ☐ TUNG.-CARBIDE INSERTS
- ☒ CASING ☒ W/ ADVANCER
- ☐ TRICONE _____" STEEL TEETH
- ☐ TRICONE _____" TUNG.-CARB.
- ☒ CORE BIT
- ☒ 3 1/4" HOLLOW AUGERS

HAMMER TYPE:
- ☒ AUTOMATIC ☐ MANUAL

CORE SIZE:
- ☐ -B-____
- ☒ -N Q2
- ☐ -H-____

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

ROCK DESCRIPTION

HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT IF TESTED, WOULD YIELD SPT REFUSAL. 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, YIELDS SPT N VALUES > 100 BPF*
VERY SEVERE (V SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT THE MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE SUCH THAT ONLY MINOR VESTIGES OF THE ORIGINAL ROCK FABRIC REMAIN. *IF TESTED, YIELDS 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 FEET
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 THE 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, 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: BM #3, -L- STA. 24+08.00, 231' LEFT, R/R SPIKE SET IN ROOT OF 28 INCH FORKED BIRCH ON SE SIDE OF CREEK.
ELEVATION: 381.88 FT.

NOTES:

REVISED 09/23/09

BORING LOCATION PLAN

BRIDGES NO. 29 & 30 ON US 52
OVER LITTLE YADKIN RIVER
TIP No. B-4645
WBS 38452.1.1

STOKES COUNTY, NORTH CAROLINA

PROJECT REFERENCE NO.	SHEET NO.
38452.1.1 (B-4645)	3

BM #3
N = 932075
E = 1582898
ELEV. = 381.88'

LITTLE YADKIN RIVER

WOODS

NC GRID NAD 83/95

BEGIN APPROACH SLAB
-NBL- STA. 23+31.00

BEGIN BRIDGE
-NBL- STA. 23+55.11

END BRIDGE
-NBL- STA. 26+25.11

END APPROACH SLAB
-NBL- STA. 26+49.22

EBI-A NBL | BI-A NBL | B2-A NBL | EB2-A NBL

-NBL- BRIDGE #29

EBI-B NBL | BI-B NBL | B2-B NBL | EB2-B NBL

S 47° 55' 24.4" E

-L-

-NBLDET- BRIDGE #30

EBI-A SBL | BI-A SBL | B2-A SBL | EB2-A SBL

-SBL-

EBI-B SBL | BI-B SBL | B2-B SBL | EB2-B SBL

BEGIN BRIDGE
-SBL- STA. 24+08.07
-L- STA. 24+08.07 (81' RT)

BEGIN APPROACH SLAB
-SBL- STA. 23+83.96

END APPROACH SLAB
-SBL- STA. 27+02.18

END BRIDGE
-SBL- STA. 26+78.07
-L- STA. 26+76.49 (81' RT)

22 | 25

JS | ST

E — E

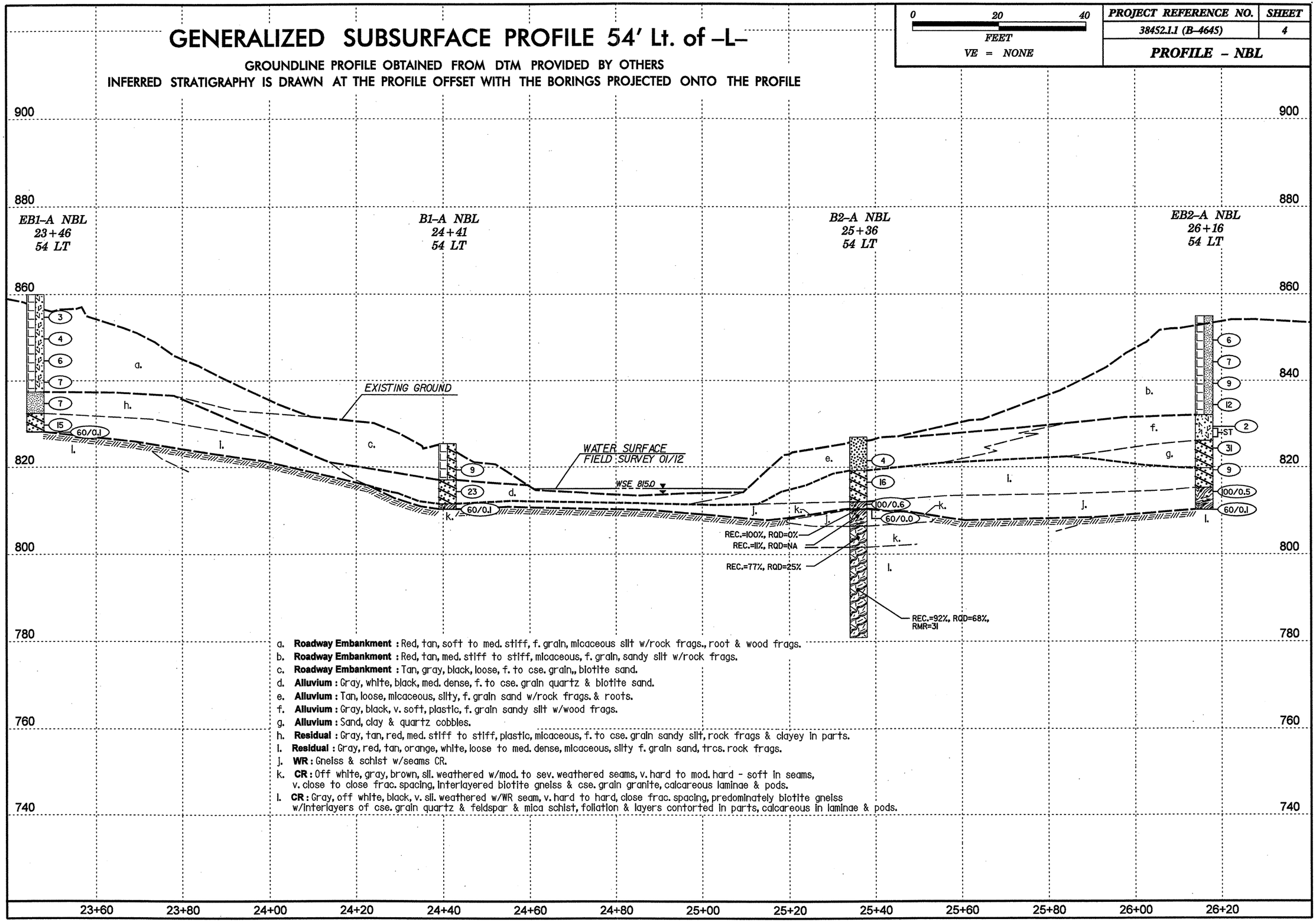
0 50 100
SCALE IN FEET

GENERALIZED SUBSURFACE PROFILE 54' Lt. of –L–

GROUNDLINE PROFILE OBTAINED FROM DTM PROVIDED BY OTHERS
INFERRED STRATIGRAPHY IS DRAWN AT THE PROFILE OFFSET WITH THE BORINGS PROJECTED ONTO THE PROFILE

0 20 40
FEET
VE = NONE

PROJECT REFERENCE NO.	SHEET
38452.1.1 (B-4645)	4
PROFILE – NBL	



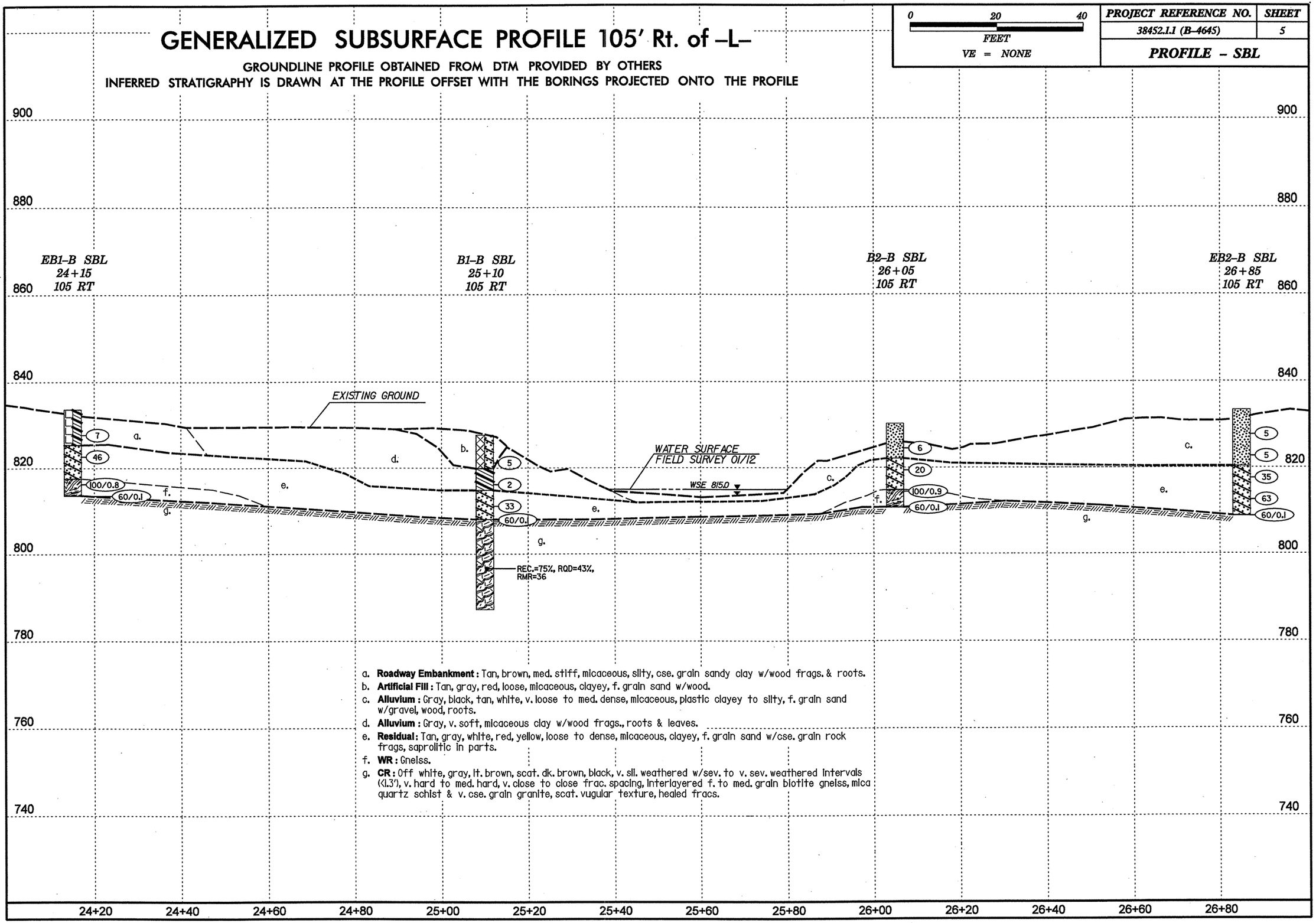
a. **Roadway Embankment** : Red, tan, soft to med. stiff, f. grain, micaceous silt w/rock frags., root & wood frags.
b. **Roadway Embankment** : Red, tan, med. stiff to stiff, micaceous, f. grain, sandy silt w/rock frags.
c. **Roadway Embankment** : Tan, gray, black, loose, f. to cse. grain,, biotite sand.
d. **Alluvium** : Gray, white, black, med. dense, f. to cse. grain quartz & biotite sand.
e. **Alluvium** : Tan, loose, micaceous, silty, f. grain sand w/rock frags. & roots.
f. **Alluvium** : Gray, black, v. soft, plastic, f. grain sandy silt w/wood frags.
g. **Alluvium** : Sand, clay & quartz cobbles.
h. **Residual** : Gray, tan, red, med. stiff to stiff, plastic, micaceous, f. to cse. grain sandy silt, rock frags & clayey in parts.
i. **Residual** : Gray, red, tan, orange, white, loose to med. dense, micaceous, silty f. grain sand, trcs. rock frags.
j. **WR** : Gneiss & schist w/seams CR.
k. **CR** : Off white, gray, brown, sli. weathered w/mod. to sev. weathered seams, v. hard to mod. hard - soft in seams, v. close to close frac. spacing, interlayered biotite gneiss & cse. grain granite, calcareous laminae & pods.
l. **CR** : Gray, off white, black, v. sli. weathered w/WR seam, v. hard to hard, close frac. spacing, predominately biotite gneiss w/interlayers of cse. grain quartz & feldspar & mica schist, foliation & layers contorted in parts, calcareous in laminae & pods.

GENERALIZED SUBSURFACE PROFILE 105' Rt. of –L–

GROUNDLINE PROFILE OBTAINED FROM DTM PROVIDED BY OTHERS
INFERRED STRATIGRAPHY IS DRAWN AT THE PROFILE OFFSET WITH THE BORINGS PROJECTED ONTO THE PROFILE

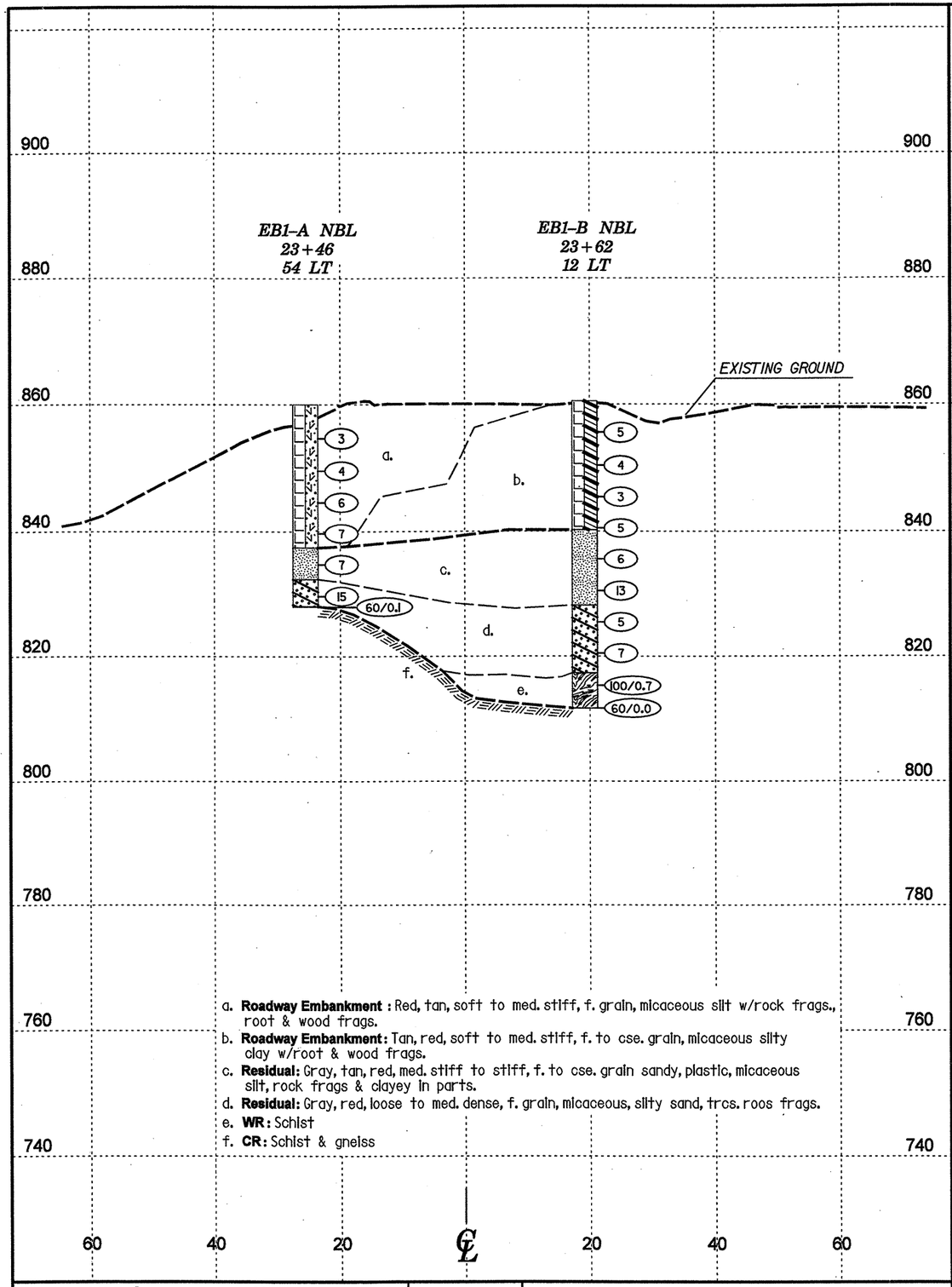
0 20 40
FEET
VE = NONE

PROJECT REFERENCE NO.	SHEET
38452.1.1 (B-4645)	5
PROFILE – SBL	



a. **Roadway Embankment :** Tan, brown, med. stiff, micaceous, silty, cse. grain sandy clay w/wood frags. & roots.
b. **Artificial Fill :** Tan, gray, red, loose, micaceous, clayey, f. grain sand w/wood.
c. **Alluvium :** Gray, black, tan, white, v. loose to med. dense, micaceous, plastic clayey to silty, f. grain sand w/gravel, wood, roots.
d. **Alluvium :** Gray, v. soft, micaceous clay w/wood frags., roots & leaves.
e. **Residual :** Tan, gray, white, red, yellow, loose to dense, micaceous, clayey, f. grain sand w/cse. grain rock frags, saprolitic in parts.
f. **WR :** Gneiss.
g. **CR :** Off white, gray, lt. brown, scat. dk. brown, black, v. sli. weathered w/sev. to v. sev. weathered intervals (<1.3'), v. hard to med. hard, v. close to close frac. spacing, interlayered f. to med. grain biotite gneiss, mica quartz schist & v. cse. grain granite, scat. vugular texture, healed fracs.

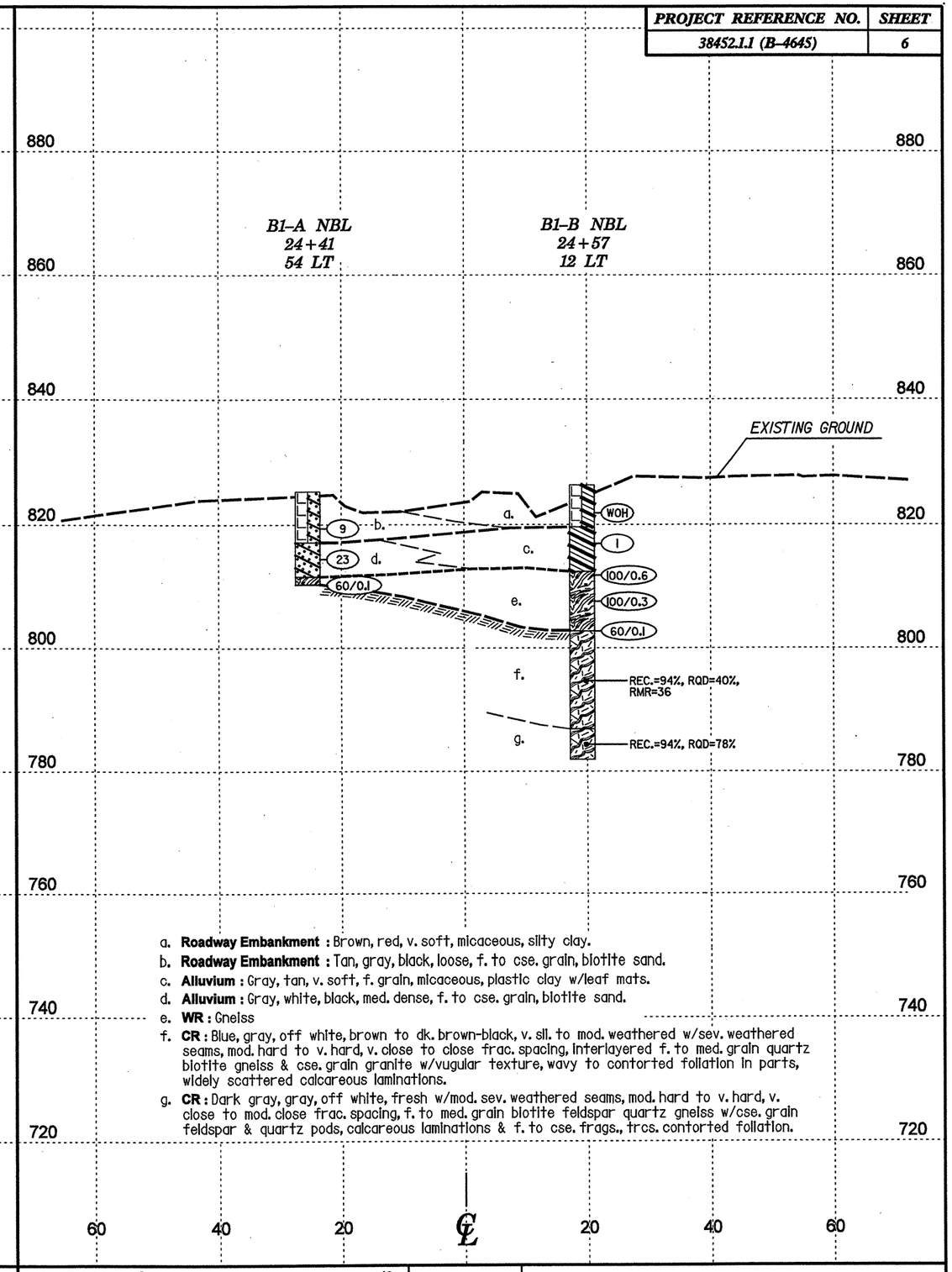
PROJECT REFERENCE NO.	SHEET
38452.1.1 (B-4645)	6



a. **Roadway Embankment :** Red, tan, soft to med. stiff, f. grain, micaceous silt w/rock frags., root & wood frags.
b. **Roadway Embankment:** Tan, red, soft to med. stiff, f. to cse. grain, micaceous silty clay w/root & wood frags.
c. **Residual:** Gray, tan, red, med. stiff to stiff, f. to cse. grain sandy, plastic, micaceous silt, rock frags & clayey in parts.
d. **Residual:** Gray, red, loose to med. dense, f. grain, micaceous, silty sand, trcs. roos frags.
e. **WR :** Schist
f. **CR:** Schist & gneiss

60 40 20 ℄ 20 40 60

HORIZ. SCALE (FEET) 0 20 40	VE = NONE	END BENT 1 - NBL CROSS SECTION

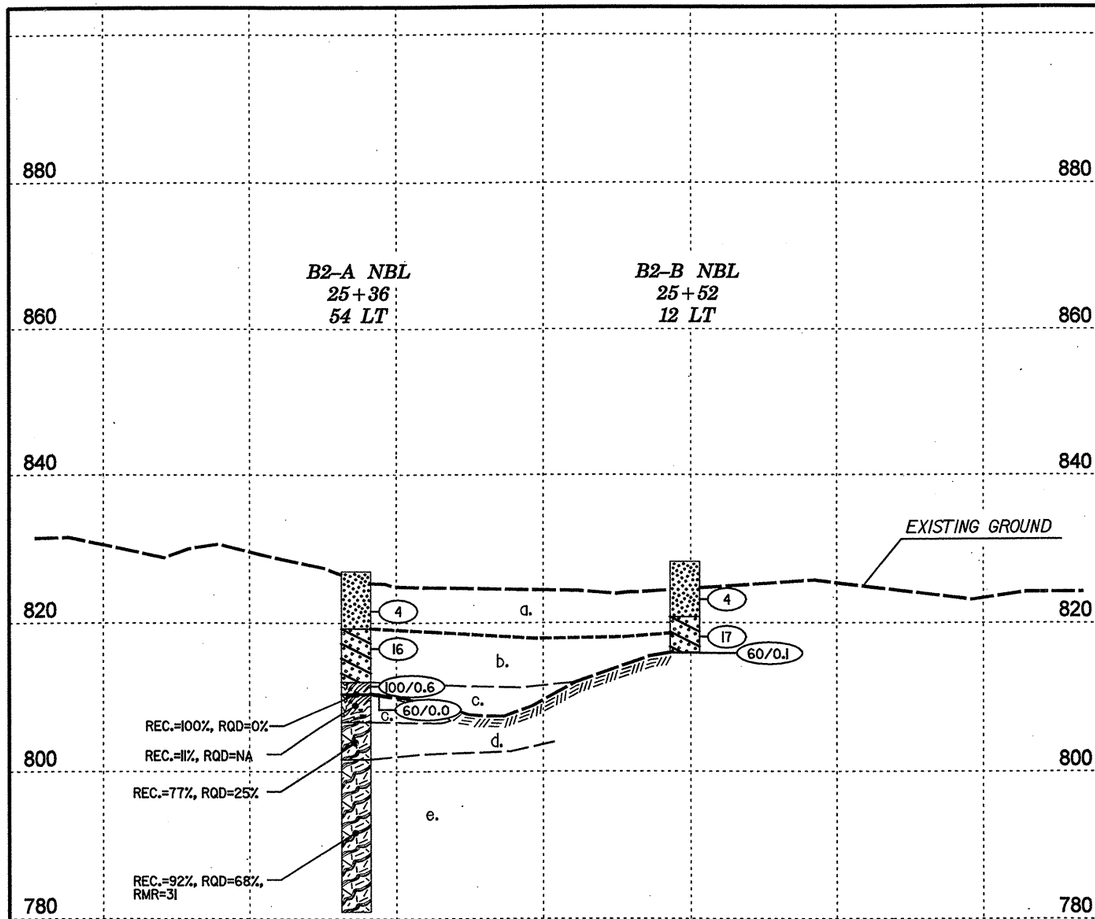


a. **Roadway Embankment :** Brown, red, v. soft, micaceous, silty clay.
b. **Roadway Embankment :** Tan, gray, black, loose, f. to cse. grain, biotite sand.
c. **Alluvium :** Gray, tan, v. soft, f. grain, micaceous, plastic clay w/leaf mats.
d. **Alluvium :** Gray, white, black, med. dense, f. to cse. grain, biotite sand.
e. **WR :** Gneiss
f. **CR :** Blue, gray, off white, brown to dk. brown-black, v. sli. to mod. weathered w/sev. weathered seams, mod. hard to v. hard, v. close to close frac. spacing, interlayered f. to med. grain quartz biotite gneiss & cse. grain granite w/vugular texture, wavy to contorted foliation in parts, widely scattered calcareous laminations.
g. **CR :** Dark gray, gray, off white, fresh w/mod. sev. weathered seams, mod. hard to v. hard, v. close to mod. close frac. spacing, f. to med. grain biotite feldspar quartz gneiss w/cse. grain feldspar & quartz pods, calcareous laminations & f. to cse. frags., trcs. contorted foliation.

60 40 20 ℄ 20 40 60

HORIZ. SCALE (FEET) 0 20 40	VE = NONE	BENT 1 - NBL CROSS SECTION

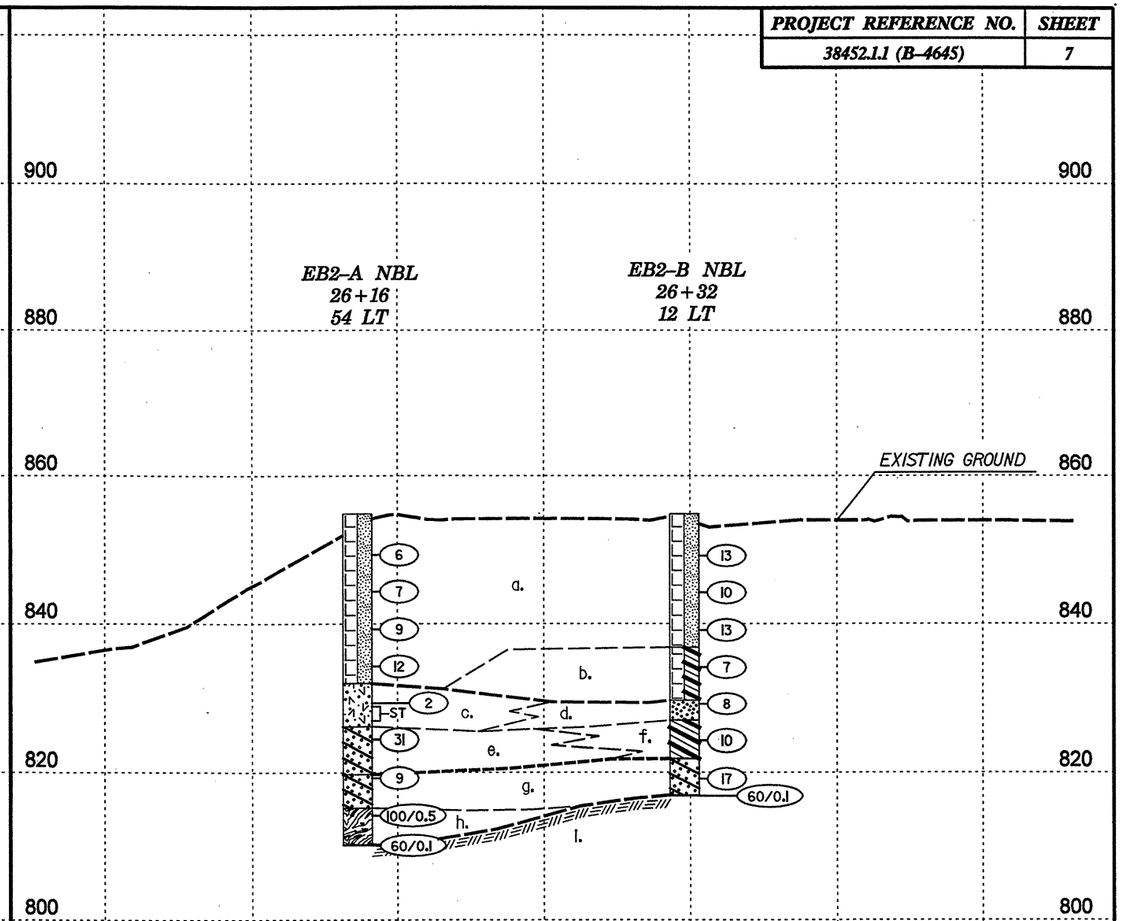
PROJECT REFERENCE NO.	SHEET
38452.1.1 (B-4645)	7



a. **Alluvium** : Tan, loose, micaceous, silty, f. grain sand w/rock frags. & roots.
b. **Residual** : White, gray, tan, med. dense, micaceous, saprolitic, f. to cse. grain feldspar sand.
c. **WR** : Schist & gneiss w/sev. weathered CR seams.
d. **CR** : Off white, gray, brown, sli. weathered w/mod. to sev. weathered seams, v. hard to mod. hard - soft in seams, v. close to close frac. spacing, interlayered biotite gneiss & cse. grain granite, calcareous laminae & pods.
e. **CR** : Gray, off white, black, v. sli. weathered w/WR seam, v. hard to hard, close frac. spacing, predominately biotite gneiss w/interlayers of cse. grain quartz & feldspar & mica schist, foliation & layers contorted in parts, calcareous in laminae & pods.

60 40 20 ℄ 20 40 60

HORIZ. SCALE (FEET) 0 20 40 | VE = NONE | **BENT 2 - NBL CROSS SECTION**

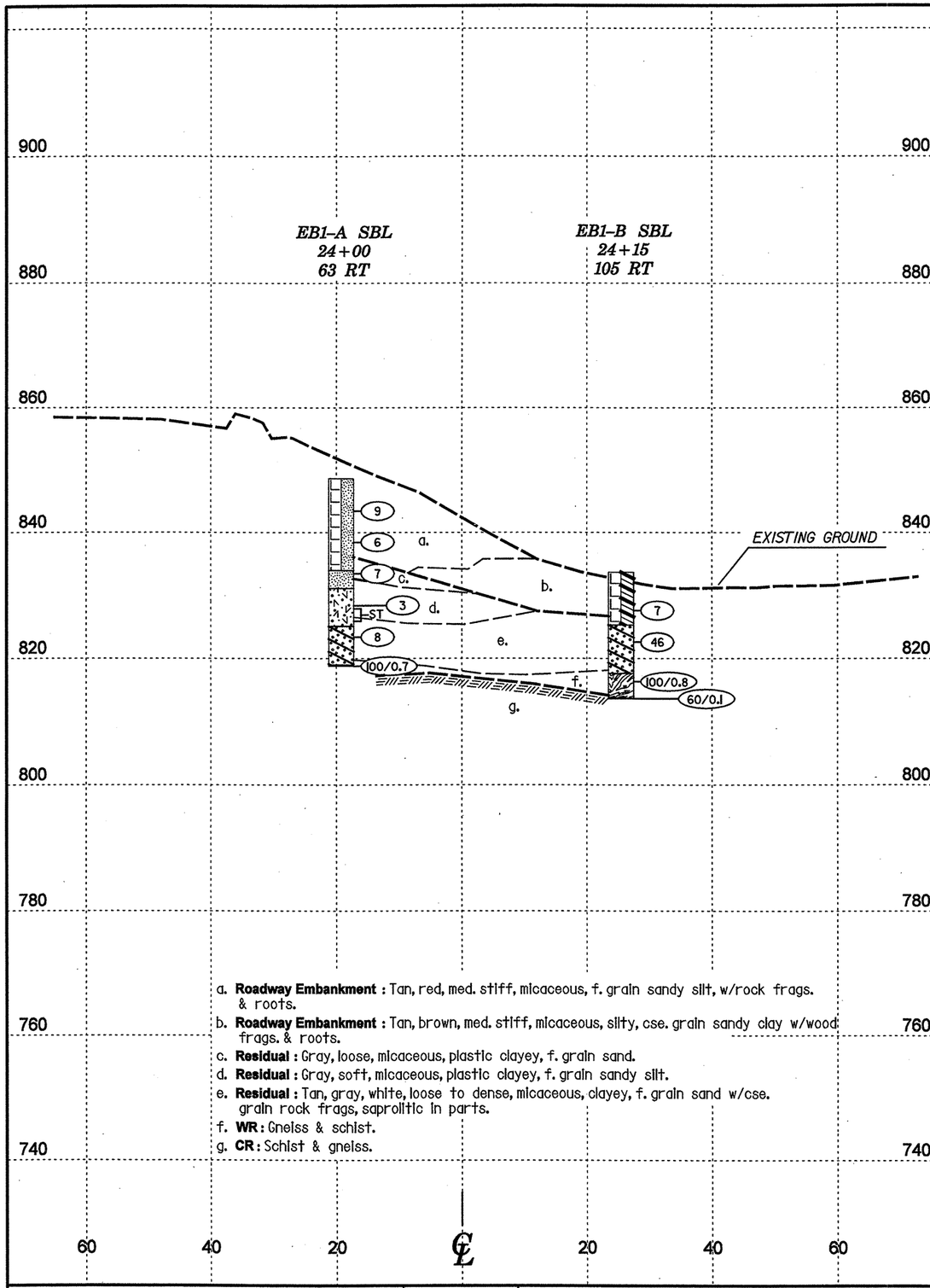


a. **Roadway Embankment** : Red, tan, med. stiff to stiff, micaceous, f. grain, sandy silt w/rock frags.
b. **Roadway Embankment** : Tan, red, med. stiff, micaceous, f. grain sand, plastic clay.
c. **Alluvium** : Gray, black, v. soft, f. grain sandy, plastic silt w/wood frags.
d. **Alluvium** : Tan, loose, micaceous, f. grain sand w/wood frags.
e. **Alluvium** : Sand, clay & quartz cobbles.
f. **Alluvium** : Gray, tan, stiff, micaceous, f. grain sandy, plastic clay.
g. **Residual** : Tan, orange, white, red, loose to med. dense, micaceous, f. grain sand w/rock frags.
h. **WR** : Schist
l. **CR** : Schist & gneiss.

60 40 20 ℄ 20 40 60

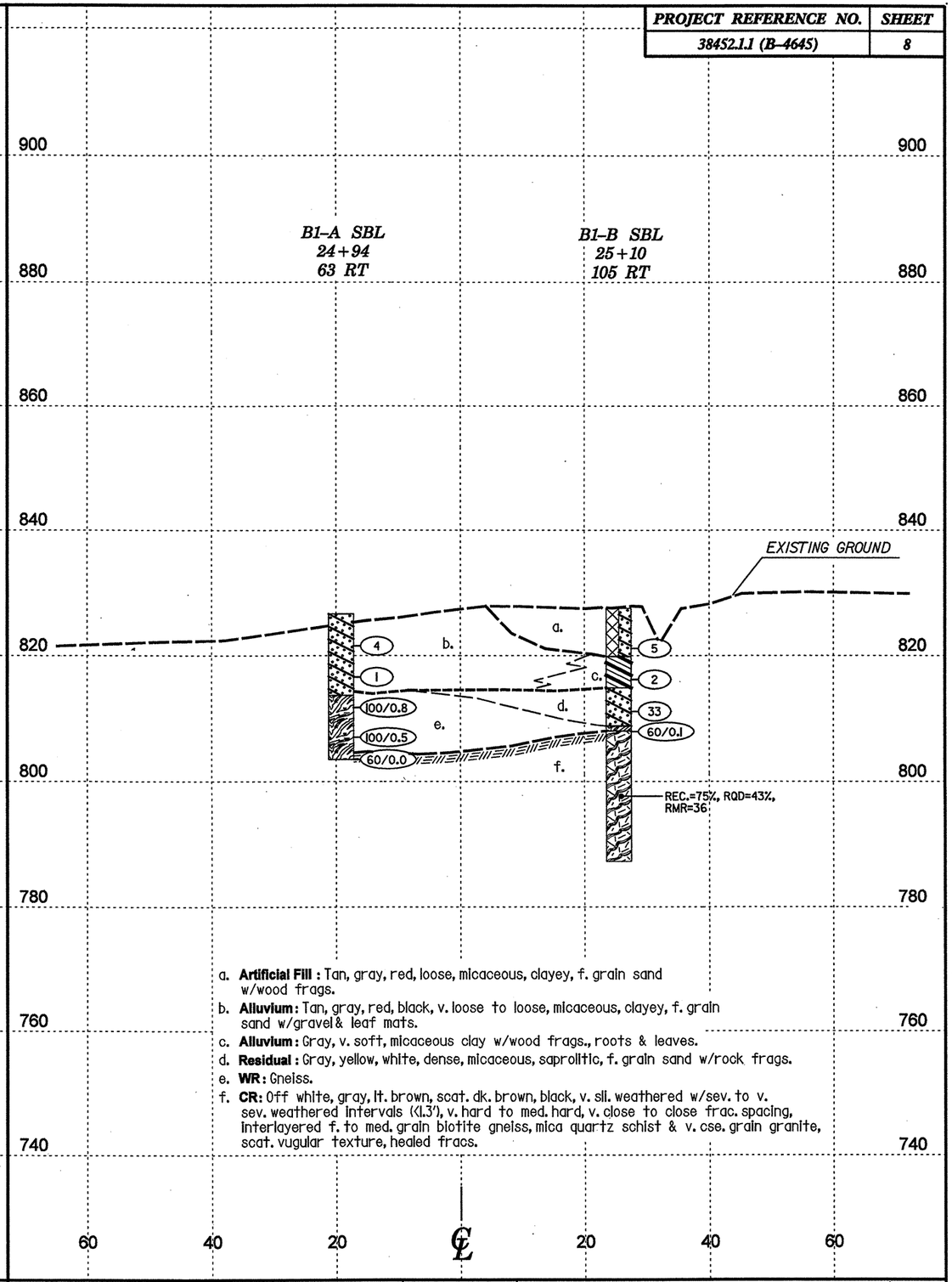
HORIZ. SCALE (FEET) 0 20 40 | VE = NONE | **END BENT 2 - NBL CROSS SECTION**

PROJECT REFERENCE NO.	SHEET
38452.1.1 (B-4645)	8



a. **Roadway Embankment :** Tan, red, med. stiff, micaceous, f. grain sandy silt, w/rock frags. & roots.
b. **Roadway Embankment :** Tan, brown, med. stiff, micaceous, silty, cse. grain sandy clay w/wood frags. & roots.
c. **Residual :** Gray, loose, micaceous, plastic clayey, f. grain sand.
d. **Residual :** Gray, soft, micaceous, plastic clayey, f. grain sandy silt.
e. **Residual :** Tan, gray, white, loose to dense, micaceous, clayey, f. grain sand w/cse. grain rock frags, saprolitic in parts.
f. **WR :** Gneiss & schist.
g. **CR :** Schist & gneiss.

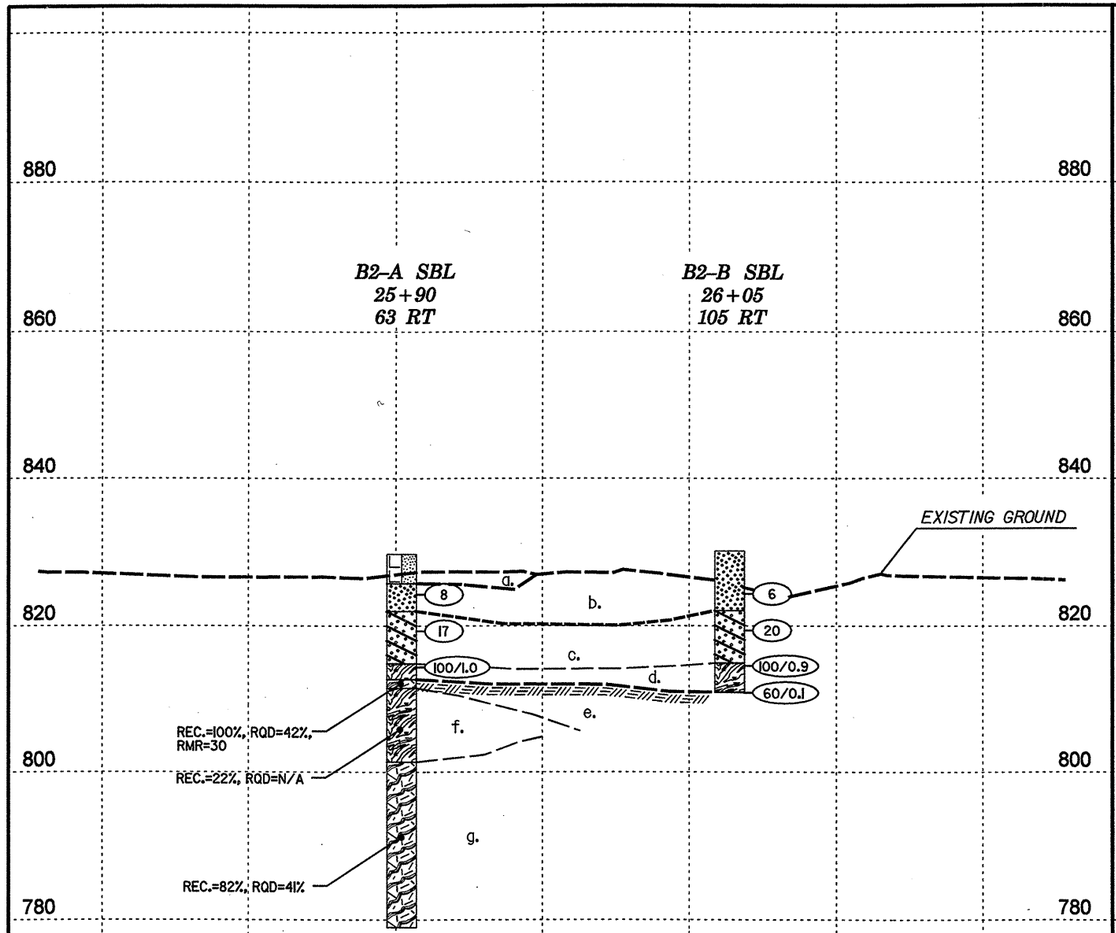
HORIZ. SCALE (FEET) 0 20 40	VE = NONE	END BENT 1 - SBL CROSS SECTION



a. **Artificial Fill :** Tan, gray, red, loose, micaceous, clayey, f. grain sand w/wood frags.
b. **Alluvium:** Tan, gray, red, black, v. loose to loose, micaceous, clayey, f. grain sand w/gravel & leaf mats.
c. **Alluvium:** Gray, v. soft, micaceous clay w/wood frags., roots & leaves.
d. **Residual :** Gray, yellow, white, dense, micaceous, saprolitic, f. grain sand w/rock frags.
e. **WR:** Gneiss.
f. **CR:** Off white, gray, lt. brown, scat. dk. brown, black, v. sli. weathered w/sev. to v. sev. weathered intervals (1.3'), v. hard to med. hard, v. close to close frac. spacing, interlayered f. to med. grain biotite gneiss, mica quartz schist & v. cse. grain granite, scat. vugular texture, healed fracs.

HORIZ. SCALE (FEET) 0 20 40	VE = NONE	BENT 1 - SBL CROSS SECTION

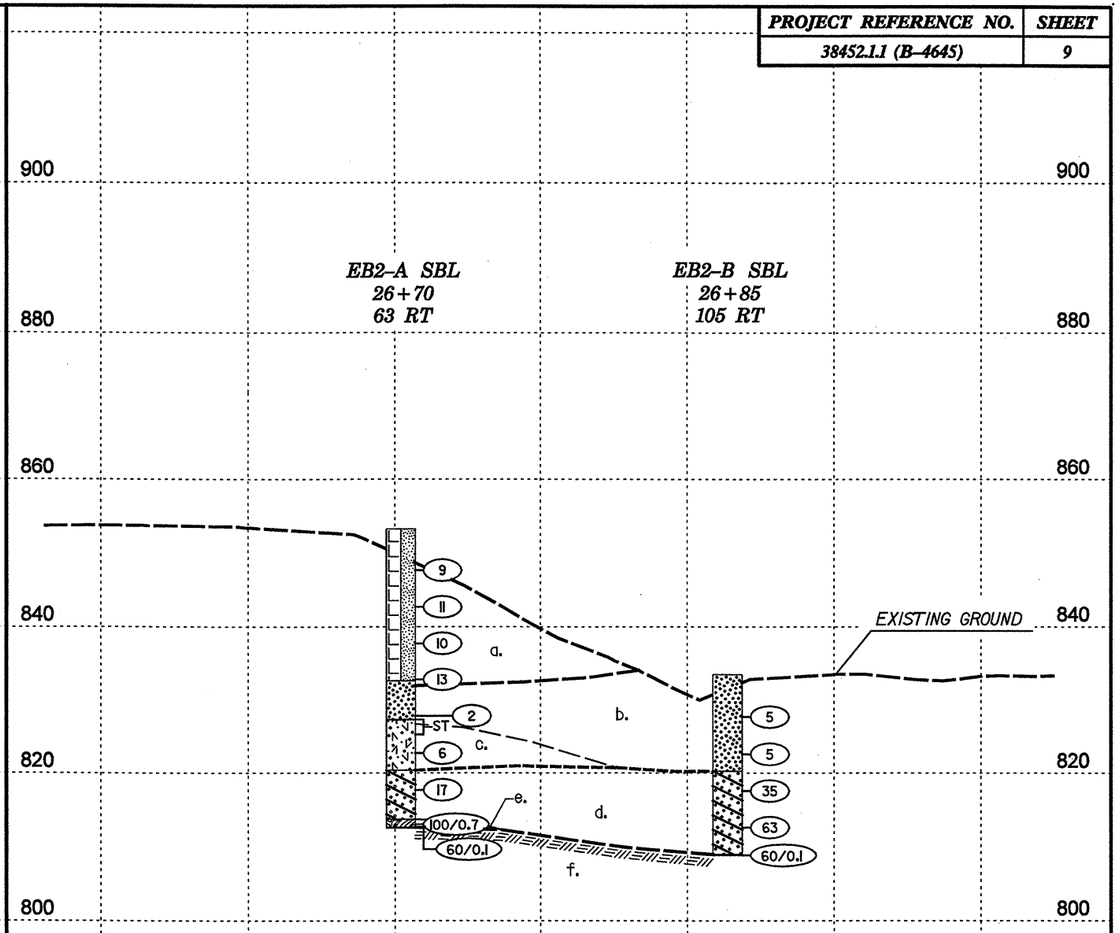
PROJECT REFERENCE NO.	SHEET
38452.1.1 (B-4645)	9



a. **Roadway Embankment :** Not sampled
b. **Alluvium :** Tan, white, loose, micaceous, silty, f. grain sand w/topsoil, roots & gravel.
c. **Residual :** Red, tan, white, med. dense, micaceous, saprolitic, f. to cse. grain sand w/rock frags.
d. **WR :** Schist.
e. **CR :** Off white, lt. brown, gray, mod. weathered, med. hard to hard, v. close to close frac. spacing, f. grain feldspar quartz schist w/biotite & cse. grain quartz veins.
f. **WR :** Dark brown, off white, lt. brown, gray, sev. weathered w/intervals v. sev. weathered, frags. of biotite gneiss, f. grain quartzite & cse. feldspar & quartz veins.
g. **CR :** Gray, white, dk. brown, black, fresh to sli. weathered w/intervals & laminae sev. weathered, close to v. close frac. spacing, interlayered biotite gneiss, quartzite, v. cse. grain granite & f. grain feldspar quartz schist, vugular texture in pods & along foliation, calcareous laminae & frags.

HORIZ. SCALE (FEET) 0 20 40 | VE = NONE

BENT 2 – SBL CROSS SECTION



a. **Roadway Embankment :** Tan, red, stiff, micaceous, f. grain sandy silt w/rock frags., roots.
b. **Alluvium:** Gray, black, tan, v. loose to med. dense, micaceous, plastic clayey to silty, f. grain sand w/wood.
c. **Alluvium :** Gray, tan, med. stiff, micaceous, f. grain sandy, plastic clayey silt w/gravel.
d. **Residual :** White, tan, yellow, red, gray, med. dense to v. dense, micaceous, saprolitic, f. to cse. grain sand.
e. **WR :** Schist & gneiss.
f. **CR :** Schist & gneiss.

HORIZ. SCALE (FEET) 0 20 40 | VE = NONE

END BENT 2 – SBL CROSS SECTION

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 38452.1.1	**TIP** B-4645	**COUNTY** STOKES	**GEOLOGIST** DeLost, R.	
SITE DESCRIPTION Bridges 29 and 30 on -L- (US 52) over Little Yadkin River				**GROUND WTR (ft)**
BORING NO. EB1-A NBL	**STATION** 23+46	**OFFSET** 54 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 860.0 ft	**TOTAL DEPTH** 32.1 ft	**NORTHING** 931,985	**EASTING** 1,582,734	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE F&H0404 CME-45C 79.0% 08/8/2012		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Woodard, F.	**START DATE** 09/06/12	**COMP. DATE** 09/06/12	**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)
860										860.0 GROUND SURFACE 0.0
	855.7	4.3	2	1	2	3		W		**ROADWAY EMBANKMENT** Tan & red, soft to med. stiff, f. grain, micaceous, silt w/roots & rock frags. (A-5).
855	850.7	9.3	1	2	2	4		W		
850	845.7	14.3	1	2	4	6		M		
845	840.7	19.3	1	3	4	7		M		
840	835.7	24.3	2	3	4	7		M		837.4 22.6 **RESIDUAL** Gray, red & tan, med. stiff, f. grain, semi-plastic, micaceous, clayey silt w/rock frags. (A-4).
835	830.7	29.3	1	4	11	15		M		832.4 27.6 Gray & red, med. dense, f. to cse. grain, micaceous, silty saprolitic sand (A-2-6).
830	828.0	32.0	60/0.1			60/0.1				828.0 32.0 827.9 32.1 **CRYSTALLINE ROCK** Crystalline rock (Schist-Gneiss) Boring Terminated with Standard Penetration Test Refusal at Elevation 827.9 ft in Crystalline Rock (Schist-Gneiss).

NCDOT BORE SINGLE B4645_GEO_BRDG0029 & 0030_BORE.GPJ NC_DOT.GDT 10/31/12

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 38452.1.1	**TIP** B-4645	**COUNTY** STOKES	**GEOLOGIST** DeLost, R.	
SITE DESCRIPTION Bridges 29 and 30 on -L- (US 52) over Little Yadkin River				**GROUND WTR (ft)**
BORING NO. EB1-B NBL	**STATION** 23+62	**OFFSET** 12 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 860.5 ft	**TOTAL DEPTH** 48.8 ft	**NORTHING** 931,943	**EASTING** 1,582,718	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE F&H0404 CME-45C 79.0% 08/8/2012		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Woodard, F.	**START DATE** 09/06/12	**COMP. DATE** 09/06/12	**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)
865										
860										860.5 GROUND SURFACE 0.0
	856.5	4.0	2	2	3	5		M		**ROADWAY EMBANKMENT** Tan & red, soft to med. stiff, f. to cse. grain, micaceous, sandy silt w/roots (A-6).
855	851.5	9.0	1	2	2	4		M		
850	846.5	14.0	1	2	1	3		W		
845	841.5	19.0	1	2	3	5		W		840.2 20.3 **RESIDUAL** Gray, tan & red, med. stiff to stiff, f. to cse. grain, semi-plastic, micaceous, silt w/rock frags. (A-4).
840	836.5	24.0	1	2	4	6		W		
835	831.5	29.0	2	4	9	13		W		
830	826.5	34.0	1	2	3	5		W		828.2 32.3 Gray & tan, loose, f. grain, micaceous, silty sand (A-2-6).
825	821.5	39.0	2	3	4	7		W		
820	816.5	44.0	32	54	46/0.2	100/0.7				817.3 43.2 **WEATHERED ROCK** Weathered rock (Schist-Gneiss)
815	811.7	48.8	60/0.0			60/0.0				811.7 48.8 Boring Terminated with Standard Penetration Test Refusal at Elevation 811.7 ft on Crystalline Rock (Schist-Gneiss).

NCDOT BORE SINGLE B4645_GEO_BRDG0029 & 0030_BORE.GPJ NC_DOT.GDT 10/31/12

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 38452.1.1	**TIP** B-4645	**COUNTY** STOKES	**GEOLOGIST** DeLost, R.	
SITE DESCRIPTION Bridges 29 and 30 on -L- (US 52) over Little Yadkin River				**GROUND WTR (ft)**
BORING NO. B1-A NBL	**STATION** 24+41	**OFFSET** 54 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 825.4 ft	**TOTAL DEPTH** 15.1 ft	**NORTHING** 931,921	**EASTING** 1,582,805	**24 HR.** 10.5
DRILL RIG/HAMMER EFF./DATE F&H0404 CME-45C 79.0% 08/8/2012		**DRILL METHOD** NW Casing w/ Advancer	**HAMMER TYPE** Automatic	
DRILLER Woodard, F.	**START DATE** 08/27/12	**COMP. DATE** 08/27/12	**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)
830										
825										825.4 GROUND SURFACE 0.0
										ROADWAY EMBANKMENT Tan, gray & black, loose, f. to cse. grain, biotite sand (A-2-6).
820	820.4	5.0	3	4	5	9		W		817.1 8.3
										ALLUVIAL Gray, white & black, med. dense, f. to cse. grain, biotite sand (A-2-6).
815	815.4	10.0	4	9	14	23		Sat.		811.6 13.8
	810.4	15.0	60/0.1			60/0.1				810.4 15.0 **WEATHERED ROCK** Weathered rock (Gneiss)
										810.3 15.1 **CRYSTALLINE ROCK** Crystalline rock (Gneiss)
										Boring Terminated with Standard Penetration Test Refusal at Elevation 810.3 ft in Crystalline Rock (Gneiss).

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 38452.1.1	**TIP** B-4645	**COUNTY** STOKES	**GEOLOGIST** DeLost, R.	
SITE DESCRIPTION Bridges 29 and 30 on -L- (US 52) over Little Yadkin River				**GROUND WTR (ft)**
BORING NO. B1-B NBL	**STATION** 24+57	**OFFSET** 12 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 826.4 ft	**TOTAL DEPTH** 44.4 ft	**NORTHING** 931,880	**EASTING** 1,582,788	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE F&H0404 CME-45C 79.0% 08/8/2012		**DRILL METHOD** NW Casing w/ Advancer	**HAMMER TYPE** Automatic	
DRILLER Woodard, F.	**START DATE** 08/27/12	**COMP. DATE** 08/27/12	**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)
830										
										826.4 GROUND SURFACE 0.0
825										**ROADWAY EMBANKMENT** Brown & red, v. soft, micaceous, silty clay (A-6).
	822.9	3.5	WOH	WOH	WOH	0		D		
820										819.6 6.8
	817.9	8.5	WOH	WOH	1	1		Sat.		**ALLUVIAL** Gray & tan, v. soft, semi-plastic, f. grain, micaceous, sandy clay w/leaf mats (A-6).
815										
	812.9	13.5	19	67	33/0.1	100/0.6				812.4 14.0
810										**WEATHERED ROCK** Weathered rock (Gneiss)
	807.9	18.5	100/0.3			100/0.3				
805										
	802.9	23.5	60/0.1			60/0.1	RS-1			
800										801.4 25.0
										CRYSTALLINE ROCK Crystalline rock (Interlayered Quartz Biotite Gneiss & Granite)
795										
790										786.9 39.5
										Crystalline rock (Biotite Feldspar Quartz Gneiss)
785										782.0 44.4
										Boring Terminated at Elevation 782.0 ft in Crystalline Rock (Biotite Feldspar Quartz Gneiss).

NCDOT BORE SINGLE B4645_GEO_BRDG0029 & 0030_BORE.GPJ NC_DOT.GDT 10/31/12

NCDOT GEOTECHNICAL ENGINEERING UNIT
CORE BORING REPORT

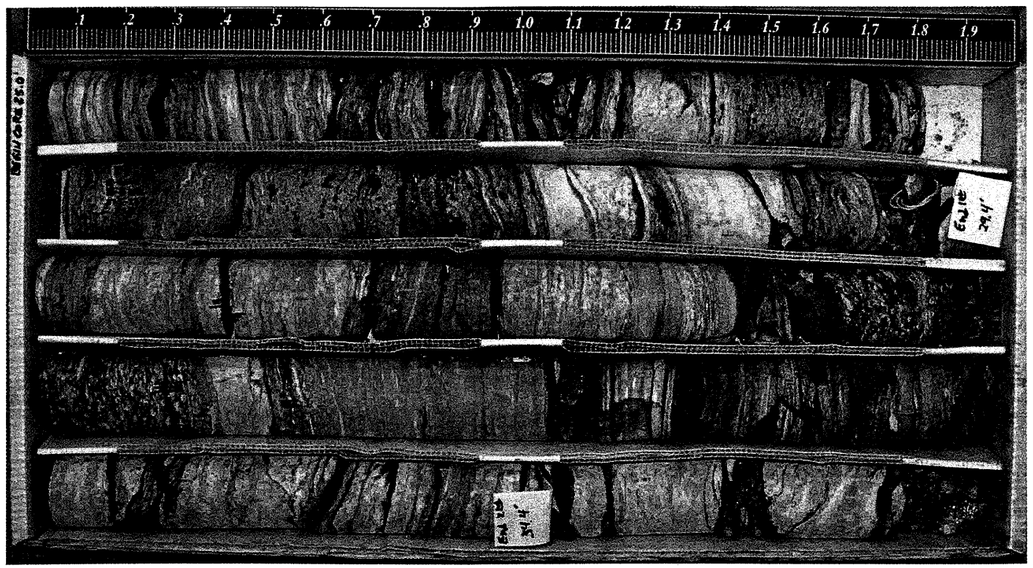
WBS 38452.1.1	**TIP** B-4645	**COUNTY** STOKES	**GEOLOGIST** DeLost, R.	
SITE DESCRIPTION Bridges 29 and 30 on -L- (US 52) over Little Yadkin River				**GROUND WTR (ft)**
BORING NO. B1-B NBL	**STATION** 24+57	**OFFSET** 12 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 826.4 ft	**TOTAL DEPTH** 44.4 ft	**NORTHING** 931,880	**EASTING** 1,582,788	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE F&H0404 CME-45C 79.0% 08/8/2012		**DRILL METHOD** NW Casing w/ Advancer	**HAMMER TYPE** Automatic	
DRILLER Woodard, F.	**START DATE** 08/27/12	**COMP. DATE** 08/27/12	**SURFACE WATER DEPTH** N/A	
CORE SIZE NQ2	**TOTAL RUN** 19.4 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)
801.4											Begin Coring @ 25.0 ft
800	801.4	25.0	4.4	4:27/0.4 3:47 2:20 3:33 1:42	(3.9) 89%	(1.0) 23%		(13.7) 94%	(5.8) 40%		801.4 **CRYSTALLINE ROCK** 25.0
	797.0	29.4					RS-1				Blue, gray, off-white, brown to dk. brown/black, v. sli. to mod. weathered, v. sev. weathered seams, mod. hard to v. hard, v. close to close frac. spacing, interlayered f. to med. grain Quartz Biotite Gneiss & cse. grain Granite, vugular texture, wavy to contorted foliation in parts, widely scat. calcareous laminations. 60 0°-20° joints, parallel foliation, mod. to sev. weathered, iron stain on some; 3 40°-43° w/iron stain, 1 parallel contact. Uniaxial compressive strength=336 KSF R1=2, R2=8, R3=10, R4=6, R5=10, RMR=36 Rock Type D
795			5.0	2:58 1:17 3:22 3:35 1:39	(5.0) 100%	(2.2) 44%					
	792.0	34.4									
790			5.0	3:45 5:16 3:34 3:11 2:19	(4.7) 94%	(2.5) 50%					
	787.0	39.4									786.9 39.5
785			5.0	2:55 3:20 2:06 3:00 3:42	(4.7) 94%	(3.9) 78%		(4.6) 94%	(3.8) 78%		Dk. gray, gray, off-white, fresh w/mod. sev. weathered seams, mod. hard to v. hard, v. close to mod. close frac. spacing, f. to med. grain Biotite Feldspar Quartz Gneiss, cse. grain Feldspar & Quartz pods, calcareous laminations & f. to med. frags., trcs. contorted foliation.
	782.0	44.4									782.0 10 0°-20° joints, parallel foliation, hard walls; 1 30° foliation jt. in Granite; 1 45° jt. w/rough, hard walls; 1 90° jt. w/rough, hard walls partially healed. 44.4
											Boring Terminated at Elevation 782.0 ft in Crystalline Rock (Biotite Feldspar Quartz Gneiss).

NCDOT CORE SINGLE B4645_GEO_BRDG0029 & 0030_BORE.GPJ NC_DOT.GDT 10/31/12

CORE PHOTOGRAPHIC RECORD

Bridge No. 29 – US 52 over Little Yadkin River



B1-B NBL, 24+57 @ 12' LT. Box 1 of 2

B1-B NBL, 24+57 @ 12' LT. Box 2 of 2

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 38452.1.1	**TIP** B-4645	**COUNTY** STOKES	**GEOLOGIST** DeLost, R.	
SITE DESCRIPTION Bridges 29 and 30 on -L- (US 52) over Little Yadkin River				**GROUND WTR (ft)**
BORING NO. B2-A NBL	**STATION** 25+36	**OFFSET** 54 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 826.8 ft	**TOTAL DEPTH** 45.9 ft	**NORTHING** 931,857	**EASTING** 1,582,875	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE F&H0404 CME-45C 79.0% 08/8/2012		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Woodard, F.	**START DATE** 09/07/12	**COMP. DATE** 09/07/12	**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)
830											
										826.8 GROUND SURFACE	0.0
825										**ALLUVIAL** Tan, loose, f. grain, micaceous, silty sand w/rock frags & roots (A-2-5).	
	822.5	4.3	1	1	3	4		Sat.			
820										819.2	7.6
	817.5	9.3	13	10	6	16		M		**RESIDUAL** White, gray & tan, med. dense, f. grain, micaceous, silty saprolitic sand (A-2-6).	
815											
	812.5	14.3								812.0	14.8
			9	48	52/0.1	100/0.6				**WEATHERED ROCK**	
810	810.4	16.4	60/0.0			60/0.0				810.4 Weathered rock (Schist & Gneiss)	16.4
										810.2 **CRYSTALLINE ROCK** Crystalline rock (Biotite Gneiss)	16.6
										806.4 **WEATHERED ROCK** Weathered rock (Biotite Gneiss & Mica-Schist)	20.4
805											
										CRYSTALLINE ROCK	
										801.6 Crystalline rock (Biotite Gneiss & Granite)	25.2
800							RS-5			Crystalline rock (Biotite Gneiss w/Mica-Schist, Quartz & Feldspar layers)	
795											
790											
785										780.9	45.9
										Boring Terminated at Elevation 780.9 ft in Crystalline Rock (Schist).	

NCDOT BORE SINGLE B4645_GEO_BRDG0029 & 0030_BORE.GPJ NC_DOT.GDT 10/31/12

NCDOT GEOTECHNICAL ENGINEERING UNIT
CORE BORING REPORT

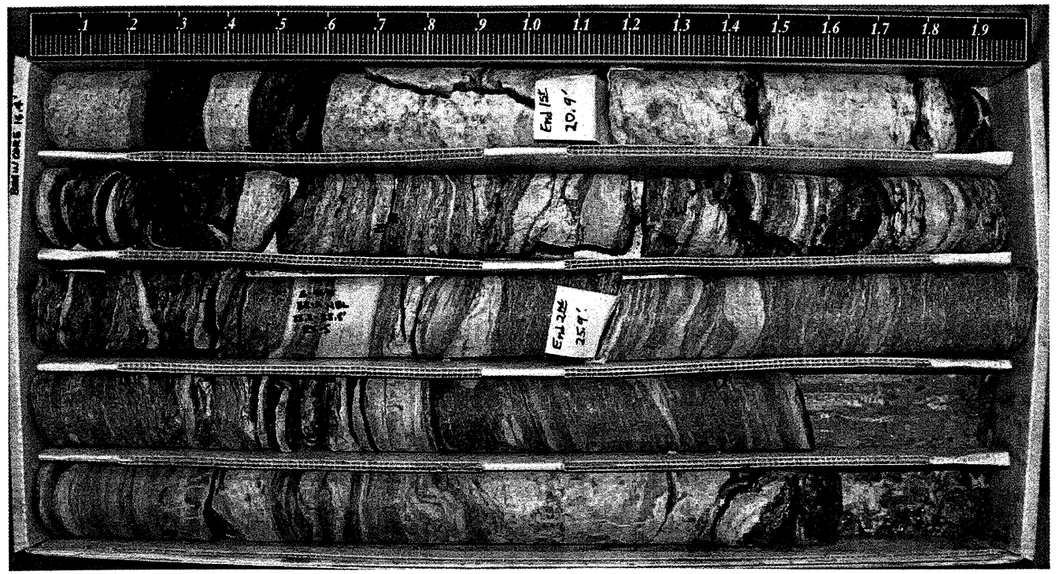
WBS 38452.1.1	**TIP** B-4645	**COUNTY** STOKES	**GEOLOGIST** DeLost, R.	
SITE DESCRIPTION Bridges 29 and 30 on -L- (US 52) over Little Yadkin River				**GROUND WTR (ft)**
BORING NO. B2-A NBL	**STATION** 25+36	**OFFSET** 54 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 826.8 ft	**TOTAL DEPTH** 45.9 ft	**NORTHING** 931,857	**EASTING** 1,582,875	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE F&H0404 CME-45C 79.0% 08/8/2012		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Woodard, F.	**START DATE** 09/07/12	**COMP. DATE** 09/07/12	**SURFACE WATER DEPTH** N/A	
CORE SIZE NQ2	**TOTAL RUN** 29.5 ft			

ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS ELEV. (ft)	DEPTH (ft)
810.4											Begin Coring @ 16.4 ft	
	810.4	16.4	4.5	N=60/0.0	(1.1) 24%	(0.0) 0%		(0.2) 100%	(0.0) 0%		810.4 **CRYSTALLINE ROCK**	16.4
				1:22/0.5							810.2 Off-white, gray, lt. brown stain, hard, no frac., Biotite Gneiss.	16.6
				1:45				(0.4) 11%	N/A		**WEATHERED ROCK**	
	805.9	20.9		1:52							806.4 Brown, black, off-white, sev. weathered, soft w/hard frags., Biotite Gneiss & Mica Schist w/frags. poorly foliated Gneiss.	20.4
805			5.0	6:58							**CRYSTALLINE ROCK**	
				1:13	(3.9) 78%	(1.4) 28%		(3.7) 77%	(1.2) 25%		Off-white, gray, brown, sli. weathered w/mod. to sev. weathered seams, v. hard to mod. hard-soft in seams, v. close to close frac. spacing,	
				1:19							801.6 interlayered Biotite Gneiss & cse. grain Granite, calcareous laminae & pods.	25.2
				1:17							WR seam 21.6'-23.3'; 1 75° jt. w/rough walls; 1 50° jt. w/rough walls & stain; 18 0°-10° jts. w/iron stain & sev. weathering	
				1:31							Gray, off-white, black, v. sli. weathered, v. hard to hard, close frac. spacing, predominately Biotite Gneiss w/interlayers of cse. grain quartz & Feldspar & Mica Schist, gneissosity & layers, contorted in parts, calcareous in laminae & pods.	
				1:47							WR seam 27.2'-28.3'; 1 55° jt. w/rough walls; 2 30°-40° jts. w/rough walls; 49 10°-20° jts., LS along foliation, smooth, hard walls	
				2:22			RS-5	(19.1) 92%	(14.1) 68%		Uniaxial compressive strength=453 KSF	
800	800.9	25.9	5.0	2:11	(4.0) 80%	(3.1) 62%					R1=2, R2=8, R3=5, R4=6, R5=10, RMR=31	
				4:04							Rock Type D	
				4:29								
				5:33								
				1:45								
795	795.9	30.9	5.0	3:43	(5.0) 100%	(3.6) 72%						
				5:05								
				3:59								
				3:00								
				3:14								
790	790.9	35.9	5.0	1:38	(4.8) 96%	(3.2) 64%						
				3:10								
				2:47								
				2:44								
				1:15								
785	785.9	40.9	5.0	4:34	(4.6) 92%	(3.5) 70%						
				1:27								
				2:04								
				2:17								
	780.9	45.9		2:09							780.9 Boring Terminated at Elevation 780.9 ft in Crystalline Rock (Schist).	45.9

NCDOT CORE SINGLE B4645_GEO_BRDG0029 & 0030_BORE.GPJ NC_DOT.GDT 10/31/12

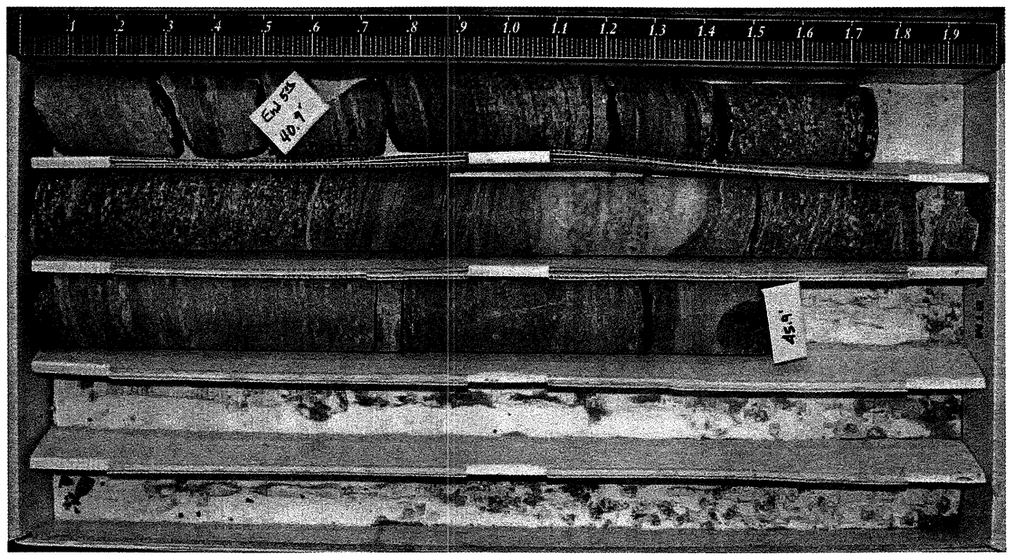
CORE PHOTOGRAPHIC RECORD

Bridge No. 29 – US 52 over Little Yadkin River



B2-A NBL, 25+36 @ 54' LT. Box 1 of 3

B2-A NBL, 25+36 @ 54' LT. Box 2 of 3



B2-A NBL, 25+36 @ 54' LT. Box 3 of 3

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 38452.1.1	**TIP** B-4645	**COUNTY** STOKES	**GEOLOGIST** DeLost, R.
SITE DESCRIPTION Bridges 29 and 30 on -L- (US 52) over Little Yadkin River			**GROUND WTR (ft)**
BORING NO. B2-B NBL	**STATION** 25+52	**OFFSET** 12 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 828.2 ft	**TOTAL DEPTH** 12.4 ft	**NORTHING** 931,816	**EASTING** 1,582,859	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE F&H0404 CME-45C 79.0% 08/8/2012		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Woodard, F.	**START DATE** 09/07/12	**COMP. DATE** 09/07/12	**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)
830											
										828.2 GROUND SURFACE	0.0
825										**ALLUVIAL** Tan, v. loose, micaceous, f. grain, silty sand (A-2-5).	
	824.1	4.1	1	2	2	4		W			
										820.8 **RESIDUAL** White, tan & gray, med. dense, f. to cse. grain, micaceous, saprolitic sand w/ alluvium & roots in upper portion (A-2-6).	7.4
820	819.1	9.1	12	7	10	17		W			
	815.9	12.3	60/0.1			60/0.1				815.9 **CRYSTALLINE ROCK** Crystalline rock (Schist) Boring Terminated with Standard Penetration Test Refusal at Elevation 815.8 ft in Crystalline Rock (Schist).	12.3
										815.8	12.4

NCDOT BORE SINGLE B4645_GEO_BRDG0029 & 0030_BORE.GPJ NC_DOT.GDT 10/31/12

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 38452.1.1	**TIP** B-4645	**COUNTY** STOKES	**GEOLOGIST** DeLost, R.
SITE DESCRIPTION Bridges 29 and 30 on -L- (US 52) over Little Yadkin River			**GROUND WTR (ft)**
BORING NO. EB2-A NBL	**STATION** 26+16	**OFFSET** 54 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 854.8 ft	**TOTAL DEPTH** 44.7 ft	**NORTHING** 931,804	**EASTING** 1,582,935	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE F&H0404 CME-45C 79.0% 08/8/2012		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Woodard, F.	**START DATE** 09/10/12	**COMP. DATE** 09/10/12	**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)
855											
										854.8 GROUND SURFACE	0.0
850	850.2	4.6	2	3	3	6		W		**ROADWAY EMBANKMENT** Red, tan & gold, med. stiff to stiff, f. grain, micaceous, sandy silt w/rock frags. (A-4).	
845	845.2	9.6	2	3	4	7		M			
840	840.2	14.6	3	4	5	9		M			
835	835.2	19.6	3	5	7	12		M			
830	830.2	24.6	1	1	1	2		W		831.9 **ALLUVIAL** Gray & black, v. soft, micaceous, f. grain, sandy, plastic silt w/wood frags. (A-5).	22.9
825	825.2	29.6	13	16	15	31		Sat.		825.9 Orange, tan & red, loose, f. to cse. grain, micaceous sand w/rock frags. (A-2-6).	28.9
820	820.2	34.6	2	4	5	9		Sat.		819.7 **RESIDUAL** Orange, tan & red, loose, f. to cse. grain, micaceous sand w/rock frags. (A-2-6).	35.1
815	815.2	39.6	100/0.5			100/0.5				815.2 **WEATHERED ROCK** Weathered rock (Schist)	39.6
	810.2	44.6	60/0.1			60/0.1				810.2	44.6
										810.1 **CRYSTALLINE ROCK** Crystalline rock (Schist) Boring Terminated with Standard Penetration Test Refusal at Elevation 810.1 ft in Crystalline Rock (Schist).	44.7

NCDOT BORE SINGLE B4645_GEO_BRDG0029 & 0030_BORE.GPJ NC_DOT.GDT 10/31/12

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 38452.1.1	**TIP** B-4645	**COUNTY** STOKES	**GEOLOGIST** DeLost, R.	
SITE DESCRIPTION Bridges 29 and 30 on -L- (US 52) over Little Yadkin River				**GROUND WTR (ft)**
BORING NO. EB2-B NBL	**STATION** 26+32	**OFFSET** 12 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 854.8 ft	**TOTAL DEPTH** 38.0 ft	**NORTHING** 931,762	**EASTING** 1,582,918	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE F&H0404 CME-45C 79.0% 08/8/2012		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Woodard, F.	**START DATE** 09/10/12	**COMP. DATE** 09/10/12	**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)
855										854.8 GROUND SURFACE 0.0
										ROADWAY EMBANKMENT Tan & red, med. stiff to stiff, f. grain, micaceous, sandy silt w/rock frags. (A-4).
850	850.1	4.7	4	6	7	13		M		
845	845.1	9.7	2	4	6	10		M		
840	840.1	14.7	2	4	9	13		M		
835	835.1	19.7	3	3	4	7		W		836.8 18.0 Tan & red, med. stiff, f. grain, micaceous, sandy semi-plastic clay (A-6).
830	830.1	24.7	3	4	4	8		W		829.6 25.2 **ALLUVIAL** Tan, loose, f. grain, micaceous, sand w/wood frags. (A-2-5).
825	825.1	29.7	1	4	6	10		W		826.8 28.0 Gray & tan, stiff, f. grain, micaceous sandy plastic clay (A-6).
820	820.1	34.7	1	6	11	17		Sat.		821.8 33.0 **RESIDUAL** White & tan, med. dense, f. grain, micaceous, sand w/rock frags. (A-2-6).
	816.9	37.9	60/0.1			60/0.1				816.9 37.9 / 816.8 38.0 **CRYSTALLINE ROCK** Crystalline rock (Schist) Boring Terminated with Standard Penetration Test Refusal at Elevation 816.8 ft in Crystalline Rock (Schist).

NCDOT BORE SINGLE B4645_GEO_BRDG0029 & 0030_BORE.GPJ NC_DOT.GDT 10/31/12

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 38452.1.1	**TIP** B-4645	**COUNTY** STOKES	**GEOLOGIST** DeLost, R.
SITE DESCRIPTION Bridges 29 and 30 on -L- (US 52) over Little Yadkin River			**GROUND WTR (ft)**
BORING NO. EB1-A SBL	**STATION** 24+00	**OFFSET** 63 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 848.6 ft	**TOTAL DEPTH** 29.9 ft	**NORTHING** 931,862	**EASTING** 1,582,696	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE F&H0404 CME-45C 79.0% 08/8/2012		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER Woodard, F.	**START DATE** 09/05/12	**COMP. DATE** 09/05/12	**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)
850										848.6 GROUND SURFACE	0.0
										ROADWAY EMBANKMENT Tan & red, med. stiff to stiff, f. grain, micaceous, sandy silt w/rock frags., roots & leaf mats (A-4).	
845	844.4	4.2	3	4	5	9		M			
840	839.4	9.2	3	2	4	6		M			
835	834.4	14.2	2	3	4	7		M		833.9 **RESIDUAL** Gray, loose, f. grain, micaceous, semi-plastic, clayey sand (A-4).	14.7
830	829.4	19.2	1	2	1	3		W		831.1 Gray, soft, micaceous, semi-plastic, f. grain, sandy, clayey silt (A-5).	17.5
825	824.4	24.2	2	3	5	8		D		825.1 Tan & gray, loose, f. grain, micaceous, clayey sand w/cse. size quartz rock frags. (A-2-6).	23.5
820	819.4	29.2	4	96/0.2		100/0.7				818.9 **WEATHERED ROCK** Weathered rock (Schist-Gneiss)	29.7
										818.7 Boring Terminated by Auger Refusal at Elevation 818.7 ft in Weathered Rock (Schist-Gneiss).	29.9

NCDOT BORE SINGLE B4645_GEO_BRDG0029 & 0030_BORE.GPJ NC_DOT.GDT 10/31/12

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 38452.1.1	**TIP** B-4645	**COUNTY** STOKES	**GEOLOGIST** DeLost, R.
SITE DESCRIPTION Bridges 29 and 30 on -L- (US 52) over Little Yadkin River			**GROUND WTR (ft)**
BORING NO. EB1-B SBL	**STATION** 24+15	**OFFSET** 105 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 833.6 ft	**TOTAL DEPTH** 20.1 ft	**NORTHING** 931,821	**EASTING** 1,582,679	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE F&H0404 CME-45C 79.0% 08/8/2012		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER Woodard, F.	**START DATE** 08/28/12	**COMP. DATE** 08/28/12	**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)
835										833.6 GROUND SURFACE	0.0
										ROADWAY EMBANKMENT Tan & brown, med. stiff, cse. grain, silty, micaceous, sandy clay w/wood & root frags. (A-6).	
830	828.6	5.0	1	3	4	7		D			
825	823.6	10.0	4	15	31	46		D		825.3 **RESIDUAL** White, gray & tan, dense, f. grain, saprolitic sand (A-2-6).	8.3
820	818.6	15.0	15	29	71/0.3	100/0.8				817.6 **WEATHERED ROCK** Weathered rock (Gneiss)	16.0
815	813.6	20.0	60/0.1			60/0.1				813.6 **CRYSTALLINE ROCK** Crystalline rock (Gneiss)	20.0
										813.5 Boring Terminated with Standard Penetration Test Refusal at Elevation 813.5 ft in Crystalline Rock (Gneiss).	20.1

NCDOT BORE SINGLE B4645_GEO_BRDG0029 & 0030_BORE.GPJ NC_DOT.GDT 10/31/12

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 38452.1.1	**TIP** B-4645	**COUNTY** STOKES	**GEOLOGIST** DeLost, R.	
SITE DESCRIPTION Bridges 29 and 30 on -L- (US 52) over Little Yadkin River				**GROUND WTR (ft)**
BORING NO. B1-A SBL	**STATION** 24+94	**OFFSET** 63 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 826.7 ft	**TOTAL DEPTH** 23.1 ft	**NORTHING** 931,798	**EASTING** 1,582,766	**24 HR.** 10.0
DRILL RIG/HAMMER EFF./DATE F&H0404 CME-45C 79.0% 08/8/2012		**DRILL METHOD** NW Casing w/ Advancer	**HAMMER TYPE** Automatic	
DRILLER Woodard, F.	**START DATE** 08/27/12	**COMP. DATE** 08/27/12	**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)
830										
										826.7 GROUND SURFACE 0.0
825										**ALLUVIAL** Tan, gray, red & black, v. loose to loose, f. grain, micaceous, clayey sand w/gravel & leaf mats (A-2-6).
	822.6	4.1	2	2	2	4		Sat.		
820										
	817.6	9.1	WOH	WOH	1	1		Sat.		
815										
										813.7 13.0
	812.6	14.1	60	40/0.3		100/0.8				**WEATHERED ROCK** Weathered rock (Gneiss)
810										
	807.6	19.1	100/0.5			100/0.5				
805										
	803.6	23.1	60/0.0			60/0.0				803.6 23.1
										Boring Terminated with Standard Penetration Test Refusal at Elevation 803.6 ft on Crystalline Rock (Gneiss).

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 38452.1.1	**TIP** B-4645	**COUNTY** STOKES	**GEOLOGIST** DeLost, R.	
SITE DESCRIPTION Bridges 29 and 30 on -L- (US 52) over Little Yadkin River				**GROUND WTR (ft)**
BORING NO. B1-B SBL	**STATION** 25+10	**OFFSET** 105 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 827.6 ft	**TOTAL DEPTH** 40.3 ft	**NORTHING** 931,757	**EASTING** 1,582,749	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE F&H0404 CME-45C 79.0% 08/8/2012		**DRILL METHOD** NW Casing w/ Advancer	**HAMMER TYPE** Automatic	
DRILLER Woodard, F.	**START DATE** 08/28/12	**COMP. DATE** 08/28/12	**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)
830										
										827.6 GROUND SURFACE 0.0
825	823.2	4.4	2	3	2	5		W		**ARTIFICIAL FILL** Tan, gray & red, loose, f. grain, micaceous, clayey sand w/wood frags. (A-2-6).
820	818.2	9.4	WOH	1	1	2		Sat.		819.9 7.7 **ALLUVIAL** Gray, v. soft, micaceous clay, w/wood frags., roots & leaves (A-6).
815	813.2	14.4	8	13	20	33		Sat.		814.9 12.7 **RESIDUAL** Gray, yellow & white, dense, f. grain, saprolitic sand w/rock frags. (A-2-6).
810	808.2	19.4	60/0.1			60/0.1				808.1 19.5 **CRYSTALLINE ROCK** Crystalline rock (Interlayered Gneiss, Schist & Granite w/WR seams)
805										
800							RS-2			
795										
790										787.3 40.3 Boring Terminated at Elevation 787.3 ft in Core Loss Interval Interpreted as Weathered Rock (Biotite Gneiss).

NCDOT BORE SINGLE B4645_GEO_BRDG0029 & 0030_BORE.GPJ NC_DOT.GDT 10/31/12

NCDOT GEOTECHNICAL ENGINEERING UNIT
CORE BORING REPORT

WBS 38452.1.1	**TIP** B-4645	**COUNTY** STOKES	**GEOLOGIST** DeLost, R.	
SITE DESCRIPTION Bridges 29 and 30 on -L- (US 52) over Little Yadkin River				**GROUND WTR (ft)**
BORING NO. B1-B SBL	**STATION** 25+10	**OFFSET** 105 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 827.6 ft	**TOTAL DEPTH** 40.3 ft	**NORTHING** 931,757	**EASTING** 1,582,749	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE F&H0404 CME-45C 79.0% 08/8/2012		**DRILL METHOD** NW Casing w/ Advancer	**HAMMER TYPE** Automatic	
DRILLER Woodard, F.	**START DATE** 08/28/12	**COMP. DATE** 08/28/12	**SURFACE WATER DEPTH** N/A	
CORE SIZE NQ2	**TOTAL RUN** 20.8 ft			

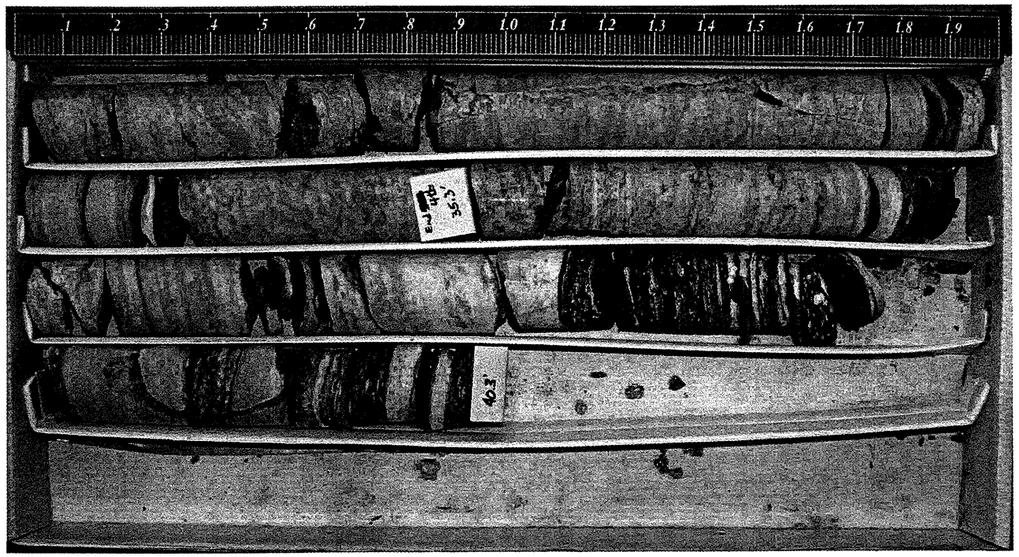
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS
											ELEV. (ft) DEPTH (ft)
808.1											Begin Coring @ 19.5 ft
	808.1	19.5	1.1	1:33/1.1	(1.1)	(0.7)		(15.7)	(8.9)		808.1 **CRYSTALLINE ROCK** 19.5
805	807.0	20.6	5.0	2:13 1:40 3:52 2:04 3:24	100% (4.0) 80%	64% (3.0) 60%		75%	43%		Off-white, gray, lt. brown, scat. dk. brown, black, v. sli. weathered w/sev. weathered intervals (<1.3'), v. hard to med. hard, v. close to close frac. spacing, interlayered f. to med. grain Biotite Gneiss, Mica Quartz Schist & v. cse. grain Granite, scat. vugular texture, healed fracs. WR seams 20.5'-20.6', 24.3'-25.6', 27.0'-27.7', 28.4'-28.9', 32.4'-33.7', 34.2'-35.3', 36.2'-36.5', 37.0'-37.5', 39.5'-40.3'; 65+ 15°-30° jts. parallel foliation, iron stain, mod. to sev. weathering on walls; 9 0°-10° jts. (in Granite) w/rough, hard walls; 4 40°-70° jts., rough, hard walls; 1 20° jt. w/rough, hard walls; 1 90° healed jt. w/0.5-25mm cse. grain quartz infill. Uniaxial compressive strength=271 KSF R1=2, R2=8, R3=10, R4=6, R5=10, RMR=36 Rock Type D
800	802.0	25.6	5.0	5:28 4:13 6:57 2:09 6:01	(4.0) 80%	(2.8) 56%	RS-2				
795	797.0	30.6	4.7	6:33 8:12/0.7 6:57 8:05 8:36	(2.9) 62%	(1.8) 38%					
790	792.3	35.3	5.0	3:44 2:07 1:25 3:51 1:47	(3.7) 74%	(0.6) 12%					
	787.3	40.3									787.3 40.3 Boring Terminated at Elevation 787.3 ft in Core Loss Interval Interpreted as Weathered Rock (Biotite Gneiss).

NCDOT CORE SINGLE B4645_GEO_BRDG0029 & 0030_BORE.GPJ NC_DOT.GDT 10/31/12

CORE PHOTOGRAPHIC RECORD

Bridge No. 30 – US 52 over Little Yadkin River

B1-B SBL, 25+10 @ 105' RT. Box 1 of 2



B1-B SBL, 25+10 @ 105' RT. Box 2 of 2

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 38452.1.1	**TIP** B-4645	**COUNTY** STOKES	**GEOLOGIST** DeLost, R.
SITE DESCRIPTION Bridges 29 and 30 on -L- (US 52) over Little Yadkin River			**GROUND WTR (ft)**
BORING NO. B2-A SBL	**STATION** 25+90	**OFFSET** 63 ft RT	**ALIGNMENT** -L- — **0 HR.** N/A
COLLAR ELEV. 829.8 ft	**TOTAL DEPTH** 50.8 ft	**NORTHING** 931,735	**EASTING** 1,582,837 — **24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE F&H0404 CME-45C 79.0% 08/8/2012		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER Woodard, F.	**START DATE** 09/08/12	**COMP. DATE** 09/08/12	**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)
830										829.8 — GROUND SURFACE — 0.0
										ROADWAY EMBANKMENT Not sampled, interpreted as sandy silt w/rock frags. (A-4).
825	825.3	4.5	4	4	4	8		W		825.8 — 4.0
										ALLUVIAL Tan, loose, f. grain, micaceous, silty sand w/roots, rock frags. (A-2-5)
820	820.3	9.5	4	7	10	17		Sat.		822.0 — 7.8
										RESIDUAL Red, tan & white, med. dense, f. to cse. grain, saprolitic sand (A-2-6).
815	815.3	14.5	15	85/0.5		100/1.0				814.8 — 15.0
										WEATHERED ROCK Weathered rock (Schist) — 812.6 — 17.2
810							RS-3			811.4 — 18.4 — **CRYSTALLINE ROCK** Crystalline rock (Schist with Quartz viens)
										WEATHERED ROCK Weathered rock (Biotite Gneiss, Quartzite, Feldspar & Quartz Veins)
805										
800							RS-4			801.4 — 28.4 — **CRYSTALLINE ROCK** Crystalline rock (interlayered Biotite Gneiss, Quartzite, Granite & Schist)
795										
790										
785										
780										779.0 — 50.8 — Boring Terminated at Elevation 779.0 ft in Crystalline Rock (v. cse. grain Granite).

NCDOT BORE SINGLE B4645_GEO_BRDG0029 & 0030_BORE.GPJ NC_DOT.GDT 10/31/12

NCDOT GEOTECHNICAL ENGINEERING UNIT
CORE BORING REPORT

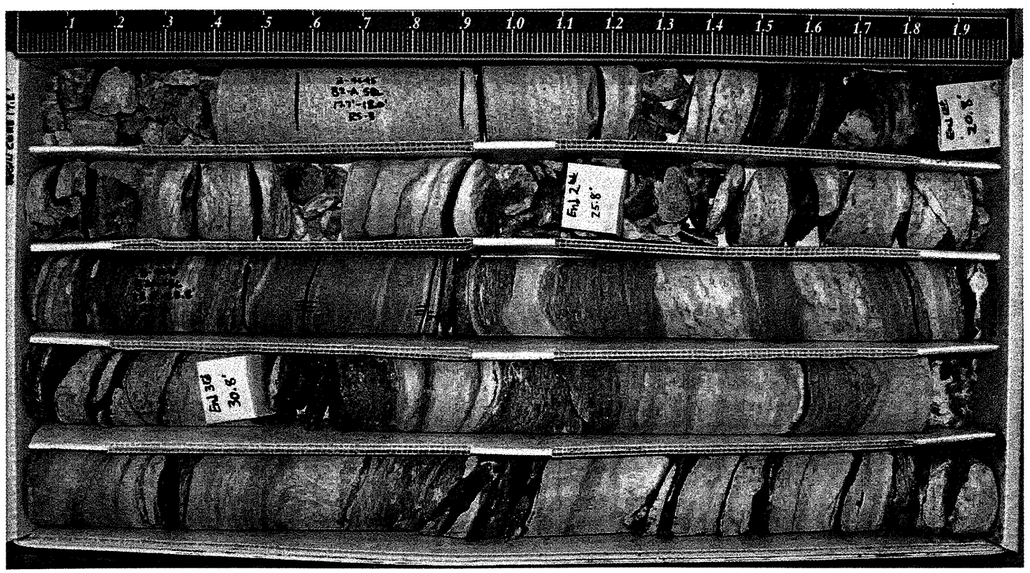
WBS 38452.1.1	**TIP** B-4645	**COUNTY** STOKES	**GEOLOGIST** DeLost, R.	
SITE DESCRIPTION Bridges 29 and 30 on -L- (US 52) over Little Yadkin River				**GROUND WTR (ft)**
BORING NO. B2-A SBL	**STATION** 25+90	**OFFSET** 63 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 829.8 ft	**TOTAL DEPTH** 50.8 ft	**NORTHING** 931,735	**EASTING** 1,582,837	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE F&H0404 CME-45C 79.0% 08/8/2012		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Woodard, F.	**START DATE** 09/08/12	**COMP. DATE** 09/08/12	**SURFACE WATER DEPTH** N/A	
CORE SIZE NQ2	**TOTAL RUN** 33.6 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)
812.6											Begin Coring @ 17.2 ft
	812.6	17.2	3.6	1:39	(1.7)	(0.5)	RS-3	(1.2)	(0.5)		812.6 — **CRYSTALLINE ROCK** — 17.2
810				2:29	47%	14%		100%	42%		811.4 — 18.4 — Off-white, lt. brown, gray, mod. weathered, med. hard to hard, v. vlose to close frac. spacing, f. grain feldspar, quartz schist w/Biotite & cse. Quartz veins.
				1:43				(2.2)	N/A		4 5°-10° jts. w/iron stain
				0:41/0.6				22%			Uniaxial compressive strength=1632 KSF
	809.0	20.8	5.0	2:24	(1.0)	N/A					R1=7, R2=8, R3=5, , R5=10, RMR=30
805				1:28	20%						Rock Type D
				1:41							**WEATHERED ROCK**
	804.0	25.8		1:54							Dk. brown, off-white, lt. brown, gray, sev. weathered w/intervals v. sev. weathered, frags., Biotite Gneiss, f. grain Quartzite, cse. Feldspar & Quartz veins.
				1:05							801.4 — 28.4
			5.0	1:08	(3.1)	(1.8)					**CRYSTALLINE ROCK**
800				1:39	62%	36%					Gray, white, dk. brown, black, fresh to sli. weathered w/intervals & laminae sev. weathered, close to v. close frac. spacing, interlayered Biotite Gneiss, Quartzite, v. cse. grain Granite, v. f. grain Feldspar Quartz Schist; vugular texure in pods & along foliation, calcareous laminae & fracs., WR seams 39.1'-40.7', 42.1'-43.9', 46.7'-48.6'.
				3:43							83+ 10°-20° jts., parallel foliation, some w/sev. weathering, some w/iron stain; 3 20°-30°jts. w/iron stain & Biotite frags.; 1 50° jt. w/rough & hard walls.
				4:12							Uniaxial compressive strength=1889 KSF
				2:35							R1=7, R2=8, R3=5, R5=10, RMR=30
	799.0	30.8					RS-4	(18.3)	(9.1)		Rock Type D
			5.0	3:45	(4.6)	(1.9)		82%	41%		
795				4:06	92%	38%					
				4:04							
				3:23							
	794.0	35.8		6:00							
			5.0	4:05	(4.0)	(2.4)					
				6:01	80%	48%					
790				4:25							
				2:59							
	789.0	40.8		3:23							
			5.0	6:00	(3.8)	(1.6)					
				5:02	76%	32%					
785				9:34							
				8:32							
	784.0	45.8		3:58							
			5.0	7:14	(3.5)	(1.4)					
				5:09	70%	28%					
780				2:22							
				1:35							
	779.0	50.8		5:59							779.0 — 50.8 — Boring Terminated at Elevation 779.0 ft in Crystalline Rock (v. cse. grain Granite).

NCDOT CORE SINGLE B4645_GEO_BRDG0029 & 0030_BORE.GPJ NC_DOT.GDT 10/31/12

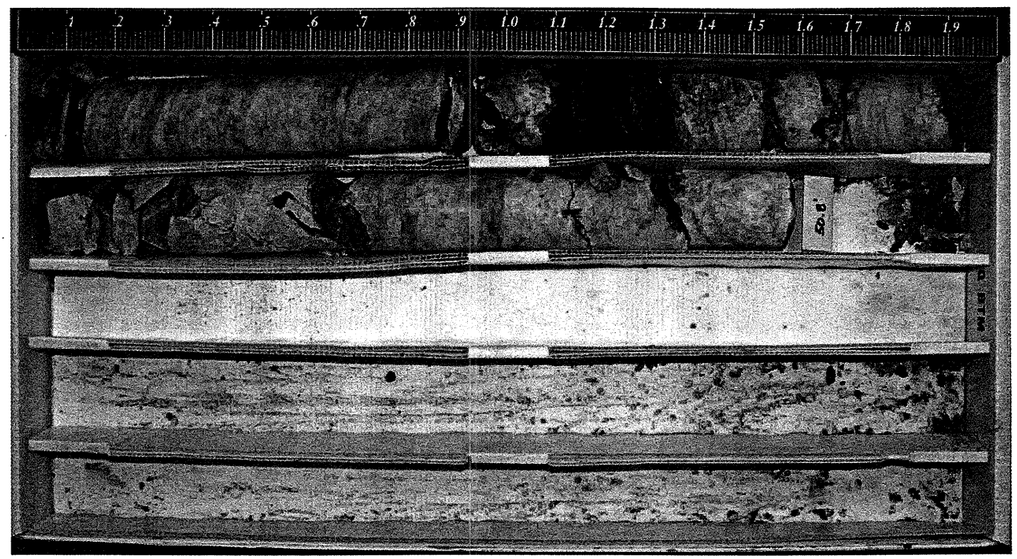
CORE PHOTOGRAPHIC RECORD

Bridge No. 30 – US 52 over Little Yadkin River



B2-A SBL, 25+90 @ 63' RT. Box 1 of 3

B2-A SBL, 25+90 @ 63' RT. Box 2 of 3



B2-A SBL, 25+90 @ 63' RT. Box 3 of 3

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 38452.1.1	**TIP** B-4645	**COUNTY** STOKES	**GEOLOGIST** DeLost, R.
SITE DESCRIPTION Bridges 29 and 30 on -L- (US 52) over Little Yadkin River			**GROUND WTR (ft)**
BORING NO. B2-B SBL	**STATION** 26+05	**OFFSET** 105 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 830.2 ft	**TOTAL DEPTH** 19.5 ft	**NORTHING** 931,693	**EASTING** 1,582,820	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE F&H0404 CME-45C 79.0% 08/8/2012		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Woodard, F.	**START DATE** 09/08/12	**COMP. DATE** 09/08/12	**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)
835											
830										830.2 GROUND SURFACE	0.0
825	825.4	4.8	2	3	3	6		M		**ALLUVIAL** Tan & white, loose, f. grain, micaceous, sand (A-2-5).	
820	820.4	9.8	6	9	11	20		Sat.		822.1 **RESIDUAL** Tan & white, med. dense, cse. grain, micaceous, saprolitic sand w/rock frags. (A-2-6).	8.1
815	815.4	14.8	26	74/0.4		100/0.9				814.9 **WEATHERED ROCK** Weathered rock (Schist)	15.3
	810.8	19.4	60/0.1			60/0.1				810.8 / 810.7 **CRYSTALLINE ROCK** Crystalline rock (Schist)	19.4 / 19.5

Boring Terminated with Standard Penetration Test Refusal at Elevation 810.7 ft in Crystalline Rock (Schist).

NCDOT BORE SINGLE B4645_GEO_BRDG0029 & 0030_BORE.GPJ NC_DOT.GDT 10/31/12

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 38452.1.1	**TIP** B-4645	**COUNTY** STOKES	**GEOLOGIST** DeLost, R.
SITE DESCRIPTION Bridges 29 and 30 on -L- (US 52) over Little Yadkin River			**GROUND WTR (ft)**
BORING NO. EB2-A SBL	**STATION** 26+70	**OFFSET** 63 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 853.3 ft	**TOTAL DEPTH** 40.9 ft	**NORTHING** 931,681	**EASTING** 1,582,896	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE F&H0404 CME-45C 79.0% 08/8/2012		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Woodard, F.	**START DATE** 09/09/12	**COMP. DATE** 09/09/12	**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)
855											
850	848.7	4.6	2	4	5	9		M		853.3 GROUND SURFACE	0.0
845	843.7	9.6	1	5	6	11		D		**ROADWAY EMBANKMENT** Tan & red, stiff, f. grain, micaceous, sandy silt w/rock frags. & roots (A-4).	
840	838.7	14.6	2	4	6	10		M			
835	833.7	19.6	1	3	10	13		W		832.5 **ALLUVIAL** Gray, black & tan, v. loose to med. dense, f. grain, micaceous, sand w/root frags. (A-2-5).	20.8
830	828.7	24.6	1	2	WOH	2		Sat.		827.2 Gray & tan, soft to med. stiff, f. grain sandy, micaceous, semi-plastic, clayey silt w/rock frags. in lower part (A-5).	26.1
825	823.7	29.6	5	4	2	6		W		820.4 **RESIDUAL** White, tan & yellow, med. dense, f. grain, micaceous, saprolitic sand (A-2-6).	32.9
820	818.7	34.6	6	9	8	17		M			
815	813.7	39.6	52	48/0.2		100/0.7				813.7	39.6
	812.5	40.8	60/0.1			60/0.1				812.5 **WEATHERED ROCK** Weathered rock (Schist-Gneiss) / 812.4 **CRYSTALLINE ROCK** Crystalline rock (Schist-Gneiss)	40.8 / 40.9

Boring Terminated with Standard Penetration Test Refusal at Elevation 812.4 ft in Crystalline Rock (Schist-Gneiss).

NCDOT BORE SINGLE B4645_GEO_BRDG0029 & 0030_BORE.GPJ NC_DOT.GDT 11/5/12

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 38452.1.1	**TIP** B-4645	**COUNTY** STOKES	**GEOLOGIST** DeLost, R.	
SITE DESCRIPTION Bridges 29 and 30 on -L- (US 52) over Little Yadkin River				**GROUND WTR (ft)**
BORING NO. EB2-B SBL	**STATION** 26+85	**OFFSET** 105 ft RT	**ALIGNMENT** -L-	**0 HR.** 14.0
COLLAR ELEV. 833.4 ft	**TOTAL DEPTH** 24.7 ft	**NORTHING** 931,640	**EASTING** 1,582,879	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE F&H0404 CME-45C 79.0% 08/8/2012		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Woodard, F.	**START DATE** 09/09/12	**COMP. DATE** 09/09/12	**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)
835										833.4 GROUND SURFACE 0.0
830	828.6	4.8	2	3	2	5		W		**ALLUVIAL** Tan & gray, loose, f. grain, micaceous, silty, saprolitic sand w/root frags. (A-2-5).
825	823.6	9.8	1	3	2	5		M		
820	818.6	14.8	10	18	17	35		Sat.		820.3 13.1 **RESIDUAL** Red, white, gray & tan, v. dense to dense, f. to cse. grain, micaceous, saprolitic sand (A-2-6).
815	813.6	19.8	10	19	44	63		W		
810	808.8	24.6	60/0.1			60/0.1				808.8 24.6 808.7 24.7 **CRYSTALLINE ROCK** Crystalline rock (Schist) Boring Terminated with Standard Penetration Test Refusal at Elevation 808.7 ft in Crystalline Rock (Schist).

STATE PROJECT NO.: 38452.1.1
TIP NO.: B-4645
COUNTY: STOKES
SITE DESC.: Bridges No. 29 & 30 on US 52 Over Little Yadkin River

SUMMARY OF SOIL CLASSIFICATIONS AND GRADATIONS

Boring No.	Sample No.	Depth Interval (ft.)	AASHTO Class.	N	Percent Passing No.10	Percent Passing No.40	Percent Retained No. 60	Percent Passing No.200	SOIL MORTAR			LL	PI	PL	Percent Moisture
									Coarse Sand	Fine Sand	Silt + Clay				
EB1-A SBL	ST-1	20.7' - 22.2'	A-4(0)	NA	96.2	90.3	13.6	56.5	10.1	34.7	55.2	NA	NA	NA	NA
EB2-A NBL	ST-2	26.1' - 27.8'	A-4(0)	NA	99.5	93.7	18.5	42.3	18.0	42.4	39.6	NA	NA	NA	NA
EB2-A SBL	ST-3	26.1' - 27.7'	A-4 (0)	NA	100.0	97.4	4.3	77.9	4.3	19.0	76.7	NA	NA	NA	NA

F&H, CERT. No. 102-0603

Don Schmidt, CERT. No. 102-01-0603

Michael Garrison, CERT. No. 102-02-0603

LABORATORY SUMMARY SHEET FOR ROCK CORE SAMPLES

STATE PROJECT NO.: 38452.1.1
TIP NO.: B-4645
COUNTY: Stokes
SITE DESC.: Bridges 29 & 30 on US 52 over Little Yadkin River

Sample #	Boring #	Depth (ft)	Rock Type	Geologic Map Unit	Run RQD	Length (ft)	Diameter (ft)	Unit Weight (PCF)	Unconfined Compressive Strength (PSI)	Young's Modulus (PSI)	Splitting Tensile Strength (PSI)	Remarks
RS-1	B1-B NBL	27.5-27.9	Gneiss	CZmg/Yg	23%	4.00	1.98	163.7	2,332			sli. wthd. w/vugs
RS-2	B1-B SBL	26.2-26.5	Schist	CZmg/Yg	56%	4.03	1.99	161.1	1,882			v. sli. wthd. w/trc. vugs
RS-3	B2-A SBL	17.7-18.0	Schist	CZmg/Yg	14%	4.04	1.99	162.3	13,117			v. sli. wthd.
RS-4	B2-A SBL	28.5-28.8	Gneiss	CZmg/Yg	36%	4.05	1.99	174.3	11,334			fresh
RS-5	B2-A NBL	25.2-25.5	Gneiss	CZmg/Yg	28%	3.97	1.99	163.5	3,147			fresh

SITE PHOTOGRAPHIC RECORD

Bridges No. 29 & 30 – US 52 over Little Yadkin River

End Bent 2, NBL Looking Northwest

Interior Bents NBL Looking Southeast

End Bent 1, Looking Southeast

Interior Bents Looking Up-Stream