| STATE | STATE PROJECT REFERENCE NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|
| N.C. | B-5846 | 1 | 21 |

REFERENCE: B-5846

PROJECT: 45799

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

# STRUCTURE SUBSURFACE INVESTIGATION

COUNTY *IREDELL*

PROJECT DESCRIPTION *REPLACE BRIDGE NO. 189 ON SR 1892 (JENNINGS ROAD) OVER SOUTH YADKIN RIVER*

## CONTENTS



## CAUTION NOTICE

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANNING AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N. C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT (919) 707-6850. THE SUBSURFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA ARE NOT PART OF THE CONTRACT.

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

THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE SUBSURFACE PLANS ARE PRELIMINARY ONLY AND IN MANY CASES THE FINAL DESIGN DETAILS ARE DIFFERENT. FOR BIDDING AND CONSTRUCTION PURPOSES, REFER TO THE CONSTRUCTION PLANS AND DOCUMENTS FOR FINAL DESIGN INFORMATION ON THIS PROJECT. THE DEPARTMENT DOES NOT WARRANT OR GUARANTEE THE SUFFICIENCY OR ACCURACY OF THE INVESTIGATION MADE, NOR THE INTERPRETATIONS MADE, OR OPINION OF THE DEPARTMENT AS TO THE TYPE OF MATERIALS AND CONDITIONS TO BE ENCOUNTERED. THE BIDDER OR CONTRACTOR IS CAUTIONED TO MAKE SUCH INDEPENDENT SUBSURFACE INVESTIGATIONS AS HE DEEMS NECESSARY TO SATISFY HIMSELF AS TO CONDITIONS TO BE ENCOUNTERED ON THE PROJECT. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OR FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FROM THE ACTUAL CONDITIONS ENCOUNTERED AT THE SITE DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.

NOTES:
1. THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N. C. DEPARTMENT OF TRANSPORTATION AS ACCURATE NOR IS IT CONSIDERED PART OF THE PLANS, SPECIFICATIONS OR CONTRACT FOR THE PROJECT.
2. BY HAVING REQUESTED THIS INFORMATION, THE CONTRACTOR SPECIFICALLY WAIVES ANY CLAIMS FOR INCREASED COMPENSATION OR EXTENSION OF TIME BASED ON DIFFERENCES BETWEEN THE CONDITIONS INDICATED HEREIN AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

PERSONNEL

*CG2 EXPLORATION*

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SUBMITTED BY *CG2, PLLC*

DATE *MAY 2022*


*Prepared in the Office of:*

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*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<br>A-3 | A-4, A-5<br>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,<br>A-7-6 | | | |
| SYMBOL | | | | | | | | | | | | | | |
| % PASSING<br>#10<br>#40<br>#200 | 50 MX<br>30 MX<br>15 MX | 50 MX<br>25 MX | 51 MN<br>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<br>LL<br>PI | —<br>6 MX | | —<br>NP | 40 MX<br>10 MX | 41 MN<br>10 MX | 40 MX<br>11 MN | 41 MN<br>11 MN | 40 MX<br>10 MX | 41 MN<br>10 MX | 40 MX<br>11 MN | 41 MN<br>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<br>LOOSE<br>MEDIUM DENSE<br>DENSE<br>VERY DENSE | < 4<br>4 TO 10<br>10 TO 30<br>30 TO 50<br>> 50 | N/A |
| GENERALLY SILT-CLAY MATERIAL (COHESIVE) | VERY SOFT<br>SOFT<br>MEDIUM STIFF<br>STIFF<br>VERY STIFF<br>HARD | < 2<br>2 TO 4<br>4 TO 8<br>8 TO 15<br>15 TO 30<br>> 30 | < 0.25<br>0.25 TO 0.5<br>0.5 TO 1.0<br>1 TO 2<br>2 TO 4<br>> 4 |

## TEXTURE OR GRAIN SIZE

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

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

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

## SOIL MOISTURE - CORRELATION OF TERMS

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

## PLASTICITY

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

## COLOR

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

## GRADATION

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

## ANGULARITY OF GRAINS

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

## MINERALOGICAL COMPOSITION

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

## COMPRESSIBILITY

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

## PERCENTAGE OF MATERIAL

| ORGANIC MATERIAL | GRANULAR SOILS | SILT - CLAY SOILS | OTHER MATERIAL | |
|---|---|---|---|---|
| TRACE OF ORGANIC MATTER | 2 - 3% | 3 - 5% | TRACE | 1 - 10% |
| LITTLE ORGANIC MATTER | 3 - 5% | 5 - 12% | LITTLE | 10 - 20% |
| MODERATELY ORGANIC | 5 - 10% | 12 - 20% | SOME | 20 - 35% |
| HIGHLY ORGANIC | > 10% | > 20% | HIGHLY | 35% AND ABOVE |

## GROUND WATER

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

## MISCELLANEOUS SYMBOLS

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

## RECOMMENDATION SYMBOLS

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

## ABBREVIATIONS

AR - AUGER REFUSAL
BT - BORING TERMINATED
CL. - CLAY
CPT - CONE PENETRATION TEST
CSE. - COARSE
DMT - DILATOMETER TEST
DPT - DYNAMIC PENETRATION TEST
e - VOID RATIO
F - FINE
FOSS. - FOSSILIFEROUS
FRAC. - FRACTURED, FRACTURES
FRAGS. - FRAGMENTS
HI. - HIGHLY
MED. - MEDIUM
MICA. - MICACEOUS
MOD. - MODERATELY
NP - NON PLASTIC
ORG. - ORGANIC
PMT - PRESSUREMETER TEST
SAP. - SAPROLITIC
SD. - SAND, SANDY
SL. - SILT, SILTY
SLI. - SLIGHTLY
TCR - TRICONE REFUSAL
$w$ - MOISTURE CONTENT
V - VERY
VST - VANE SHEAR TEST
WEA. - WEATHERED
$\gamma$ - UNIT WEIGHT
$\gamma_d$ - 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
- [ ] CME-550
- [ ] VANE SHEAR TEST
- [ ] PORTABLE HOIST
- [X] DIEDRICH D-50
- [X] MOBILE B-29

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

HAMMER TYPE:
- [X] AUTOMATIC [ ] MANUAL

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

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

## ROCK DESCRIPTION

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

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

## WEATHERING

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

## ROCK HARDNESS

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

## FRACTURE SPACING

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

## BEDDING

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

## INDURATION

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

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

## TERMS AND DEFINITIONS

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

AQUIFER - A WATER BEARING FORMATION OR STRATA.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

BENCH MARK: EXISTING END BENT 1: BRIDGE SEAT LEFT OF -EL-

ELEVATION: 789.86 FEET

NOTES:

F.I.A.D. = FILLED IMMEDIATELY AFTER DRILLING

ROADWAY DESIGN AND SURVEY INFORMATION DATED 10/06/2021 PROVIDED BY TGS ENGINEERS.

NO AVAILABLE BENCHMARKS WERE SET OR LOCATABLE AT THE PROJECT SITE DURING THE INVESTIGATION. A TBM WAS UTILIZED WITH THE ELEVATION AS REFERENCED ON THE SURVEY DGN.

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| B-5846 | 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

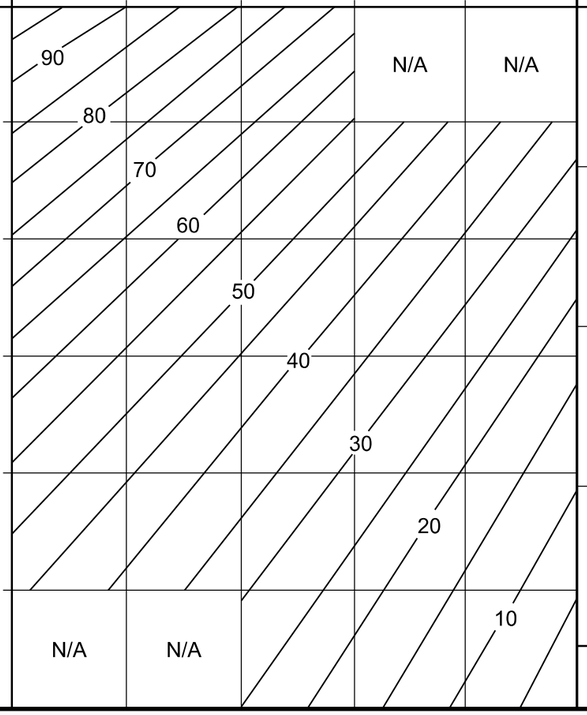
- INTACT OR MASSIVE - intact rock specimens or massive in situ rock with few widely spaced discontinuities
- BLOCKY - well interlocked undisturbed rock mass consisting of cubical blocks formed by three intersecting discontinuity sets
- VERY BLOCKY - interlocked, partially disturbed mass with multi-faceted 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

DECREASING INTERLOCKING OF ROCK PIECES ⇩

SURFACE CONDITIONS

| VERY GOOD | GOOD | FAIR | POOR | VERY POOR |
|---|---|---|---|---|
| Very rough, fresh unweathered surfaces | Rough, slightly weathered, iron stained surfaces | Smooth, moderately weathered and altered surfaces | Slickensided, highly weathered surfaces with compact coatings or fillings or angular fragments | Slickensided, highly weathered surfaces with soft clay coatings or fillings |

DECREASING SURFACE QUALITY ⇨




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.**

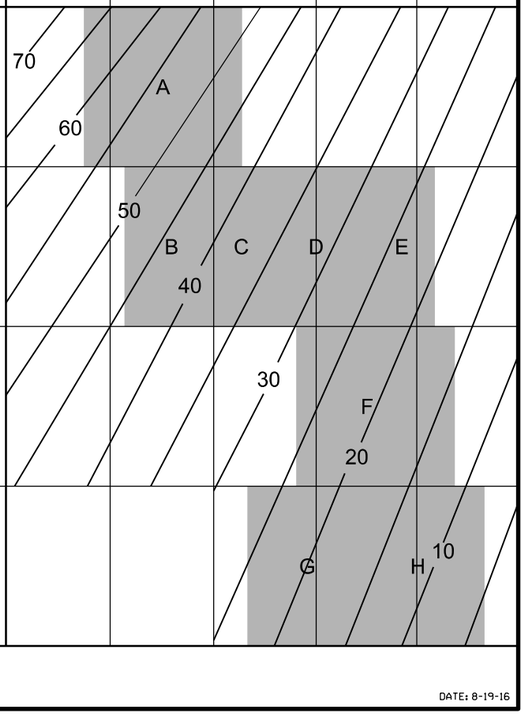
**F.** *Tectonically deformed, intensively folded/faulted, sheared clayey shale or siltstone with broken and deformed sandstone layers forming an almost chaotic structure*

**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

SURFACE CONDITIONS OF DISCONTINUITIES (Predominantly bedding planes)

| VERY GOOD | GOOD | FAIR | POOR | VERY POOR |
|---|---|---|---|---|
| Very Rough, fresh unweathered surfaces | Rough, slightly weathered surfaces | Smooth, moderately weathered and altered surfaces | Very smooth, occasionally slickensided surfaces with compact coatings or fillings with angular fragments | Very smooth, slickensided or highly weathered surfaces with soft clay coatings or fillings |




DATE: 8-19-16

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| B-5846 | 3 |

# SITE PLAN

0 50 100
FEET

REPLACE BRIDGE NO. 189 ON SR 1892 (JENNINGS RD) OVER SOUTH YADKIN RIVER

SKEW = 75 DEGREES

NC GRID
NAD 83 NA 2011

END BRIDGE
–L– STA 23+97.36

BEGIN BRIDGE
–L– STA 20+64.64

REMOVE EXIST. BRIDGE

BRIDGE 189
CONC

SOUTH YADKIN RIVER

SR 1892 (JENNINGS ROAD)

TO SR 2001

TO SR 1916

283732

FO&T

FO

18" CMP

SEAT=789.86'

SEAT=789.83'

SEAT=779.43'

SEAT=779.35'

EBI-A

BI-A

B2-A

B3-A

EB2-A

EBI-B

BI-B

B2-B

B3-B

EB2-B

JS

Prepared in the Office of:
CAROLINAS GEOTECHNICAL GROUP

0 50 100
FEET
VE = 2.5:1

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| B-5846 | 4 |

REPLACE BRIDGE NO. 189 ON SR 1892 (JENNINGS ROAD) OVER SOUTH YADKIN RIVER

EB1-A
20+48
11' LT

BI-A
21+41
13' LT
RS-1
RS-2

WATER SURFACE LEVEL
FROM BSR 09/2021

B2-A
22+41
23' LT
RS-3
RS-4

B3-B
23+29
20' RT
RS-5
RS-6

EB2-B
24+01
21' RT
ST-1
ST-2

EXISTING GROUND

-ROADWAY EMBANKMENT-
MEDIUM STIFF TO HARD, MOIST, RED-BROWN, HIGHLY PLASTIC, FINE TO COARSE SANDY, SILTY CLAY (A-6(2)) WITH TRACE MICA AND GRAVEL

-RESIDUAL- Ⓒ

-WEATHERED ROCK-
(HORNBLENDE GNEISS) AND (METAGRANITE)

-CRYSTALLINE ROCK-
(METAGRANITE)

-ALLUVIAL-
SOFT TO MEDIUM FINE TO COARSE

STIFF, MOIST TO WET, SANDY, SILTY CLAY

BLACK-RED-BROWN, HIGHLY PLASTIC, (A-7-5), WITH TRACE MICA AND GRAVEL

-WEATHERED ROCK-
(MICA SCHIST)

-CRYSTALLINE ROCK-
(MICA SCHIST)

BT
DRY
12/21

CT

REC=96%
ROD=93%
GSI=70-80

REC=100%
ROD=100%
GSI=80-90

REC=100%
ROD=58%
GSI=40-50

REC=100%
ROD=100%
GSI=80-90

REC=100%
ROD=97%
GSI=80-90

REC=88%
ROD=59%
GSI=40-50

REC=97%
ROD=93%
GSI=70-80

Ⓐ -ALLUVIAL- DENSE, WET, GRAY-ORANGE-BROWN, SILTY, GRAVELLY FINE TO COARSE SAND (A-1-B) WITH SUBANGULAR TO SUBROUNDED GRAVEL
Ⓑ -ALLUVIAL- VERY SOFT TO VERY STIFF, MOIST TO WET, TAN-RED-ORANGE-GRAY-BROWN, FINE TO COARSE SANDY SILT (A-4), WITH TRACE MICA AND ORGANICS
Ⓒ -RESIDUAL- VERY SOFT TO HARD, WET, BLACK-ORANGE-TAN-BROWN-GRAY, FINE TO COARSE SANDY SILT (A-4) WITH TRACE TO LITTLE MICA AND TRACE GRAVEL-SIZED ROCK FRAGMENTS
Ⓓ -RESIDUAL- DENSE, WET, WHITE-BROWN-TAN, SILTY, GRAVELLY FINE TO COARSE SAND (A-1-B)
Ⓔ -CRYSTALLINE ROCK- FRESH TO SLIGHTLY WEATHERED, MODERATELY HARD TO HARD, GREEN-RED-WHITE-BLACK, (HORNBLENDE GNEISS) WITH VERY CLOSE TO MODERATELY CLOSE FRACTURE SPACING AND THICKLY LAMINATED TO THICKLY BEDDED
Ⓕ -CRYSTALLINE ROCK- FRESH TO VERY SLIGHTLY WEATHERED, MODERATELY HARD TO HARD, BLACK-GRAY-WHITE (METAGRANITE) WITH VERY CLOSE TO WIDE FRACTURE SPACING AND THICKLY LAMINATED TO THINLY BEDDED

*EXISTING GROUND LINE ALONG -L- TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 10/06/2021. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING WITH BOTH PROJECTED ONTO THE PROFILE*

840 830 820 810 800 790 780 770 760 750 740 730 720 710 700 690 680 670

19+50 20+00 20+50 21+00 21+50 22+00 22+50 23+00 23+50 24+00 24+50 25+00 25+50 26+00

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0 5 10
FEET
VE = 1:1

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| B-5846 | 5 |

REPLACE BRIDGE 189 ON SR 1892 (JENNINGS ROAD) OVER SOUTH YADKIN RIVER
END BENT 1 SKEW = 75 DEGREES

75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

805 800 795 790 785 780 775 770 765 760 755 750 745

EBI-A
20+48
11' LT

EBI-B
20+65
19' RT

EXISTING GROUND

-RESIDUAL- (A)
11
6
7
60/0.1
60/0.0
100/0.3

-WEATHERED ROCK-
INTERLAYERS OF
(METAGRANITE) AND
(HORNBLENDE GNEISS)
100/0.6
100/0.2
BT
DRY
12/21

-RESIDUAL- (A)
41
67
100/0.8
60/0.1

-WEATHERED ROCK- (METAGRANITE)

-CRYSTALLINE ROCK- (METAGRANITE)

-RESIDUAL-
HARD, MOIST, (A-4), WITH
97
100/0.5

DENSE TO VERY DENSE, MOIST, BLACK-WHITE-GRAY, SILTY, GRAVELLY FINE TO COARSE SAND (A-1-B)

BLACK-RED-GRAY, FINE SANDY SILT
TRACE GRAVEL-SIZED ROCK FRAGMENTS

-WEATHERED ROCK-
60/0.0
BT
DRY
11/21

-CRYSTALLINE ROCK-
(METAGRANITE)

(A)-RESIDUAL- MEDIUM STIFF TO STIFF, MOIST, ORANGE-BROWN, FINE SANDY SILT (A-4), WITH TRACE MICA AND GRAVEL-SIZED ROCK FRAGMENTS

20+64.64

℄

-L-

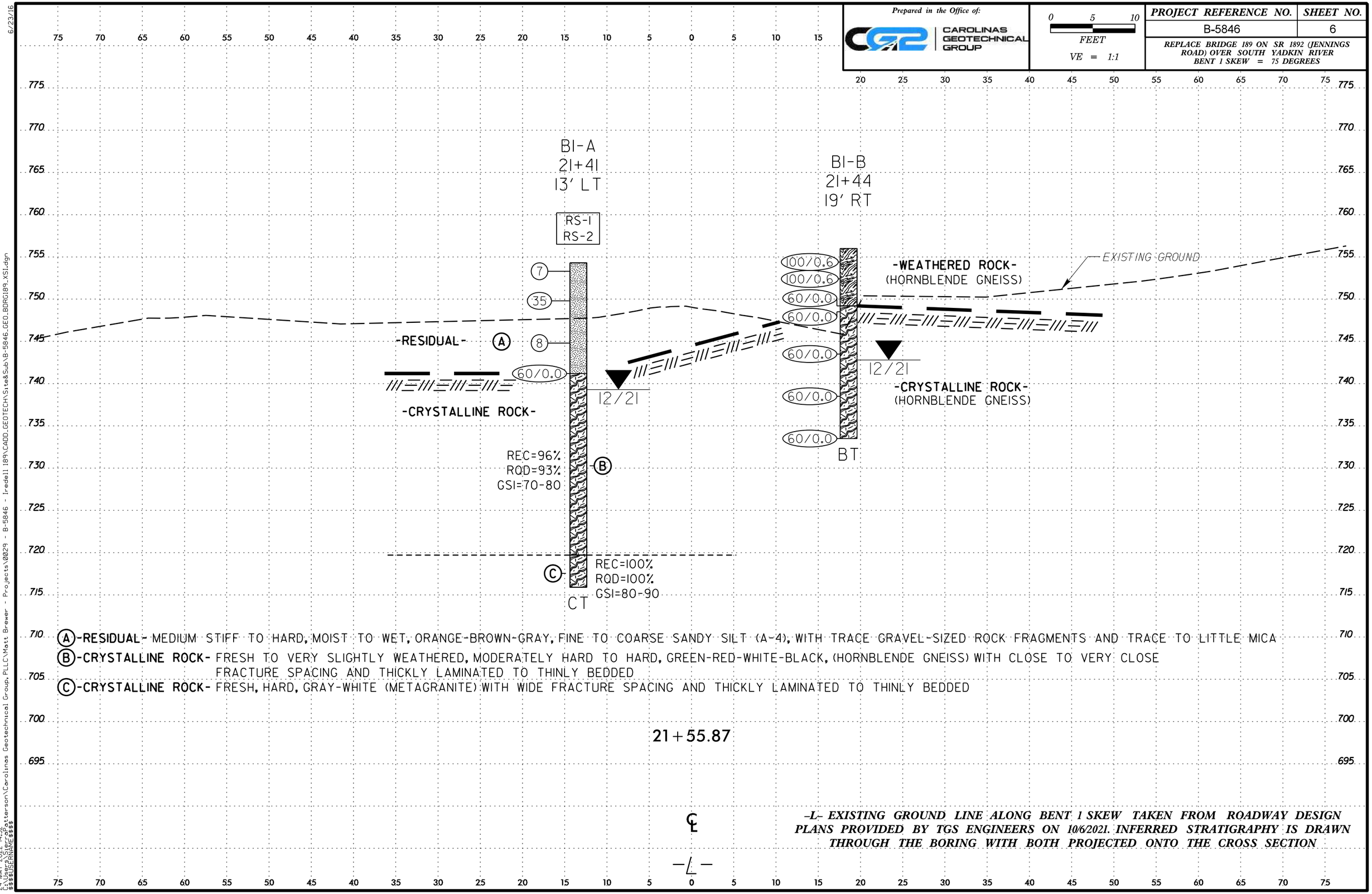
*-L- EXISTING GROUND LINE ALONG END BENT 1 SKEW TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 10/06/2021. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING WITH BOTH PROJECTED ONTO THE CROSS SECTION*

Prepared in the Office of:
CAROLINAS GEOTECHNICAL GROUP

0 5 10
FEET
VE = 1:1

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| B-5846 | 6 |

REPLACE BRIDGE 189 ON SR 1892 (JENNINGS ROAD) OVER SOUTH YADKIN RIVER
BENT 1 SKEW = 75 DEGREES




(A)-**RESIDUAL-** MEDIUM STIFF TO HARD, MOIST TO WET, ORANGE-BROWN-GRAY, FINE TO COARSE SANDY SILT (A-4), WITH TRACE GRAVEL-SIZED ROCK FRAGMENTS AND TRACE TO LITTLE MICA

(B)-**CRYSTALLINE ROCK-** FRESH TO VERY SLIGHTLY WEATHERED, MODERATELY HARD TO HARD, GREEN-RED-WHITE-BLACK, (HORNBLENDE GNEISS) WITH CLOSE TO VERY CLOSE FRACTURE SPACING AND THICKLY LAMINATED TO THINLY BEDDED

(C)-**CRYSTALLINE ROCK-** FRESH, HARD, GRAY-WHITE (METAGRANITE) WITH WIDE FRACTURE SPACING AND THICKLY LAMINATED TO THINLY BEDDED

21+55.87

℄

*-L- EXISTING GROUND LINE ALONG BENT 1 SKEW TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 10/6/2021. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING WITH BOTH PROJECTED ONTO THE CROSS SECTION*

6/23/16

24-MAY-2022 14:52
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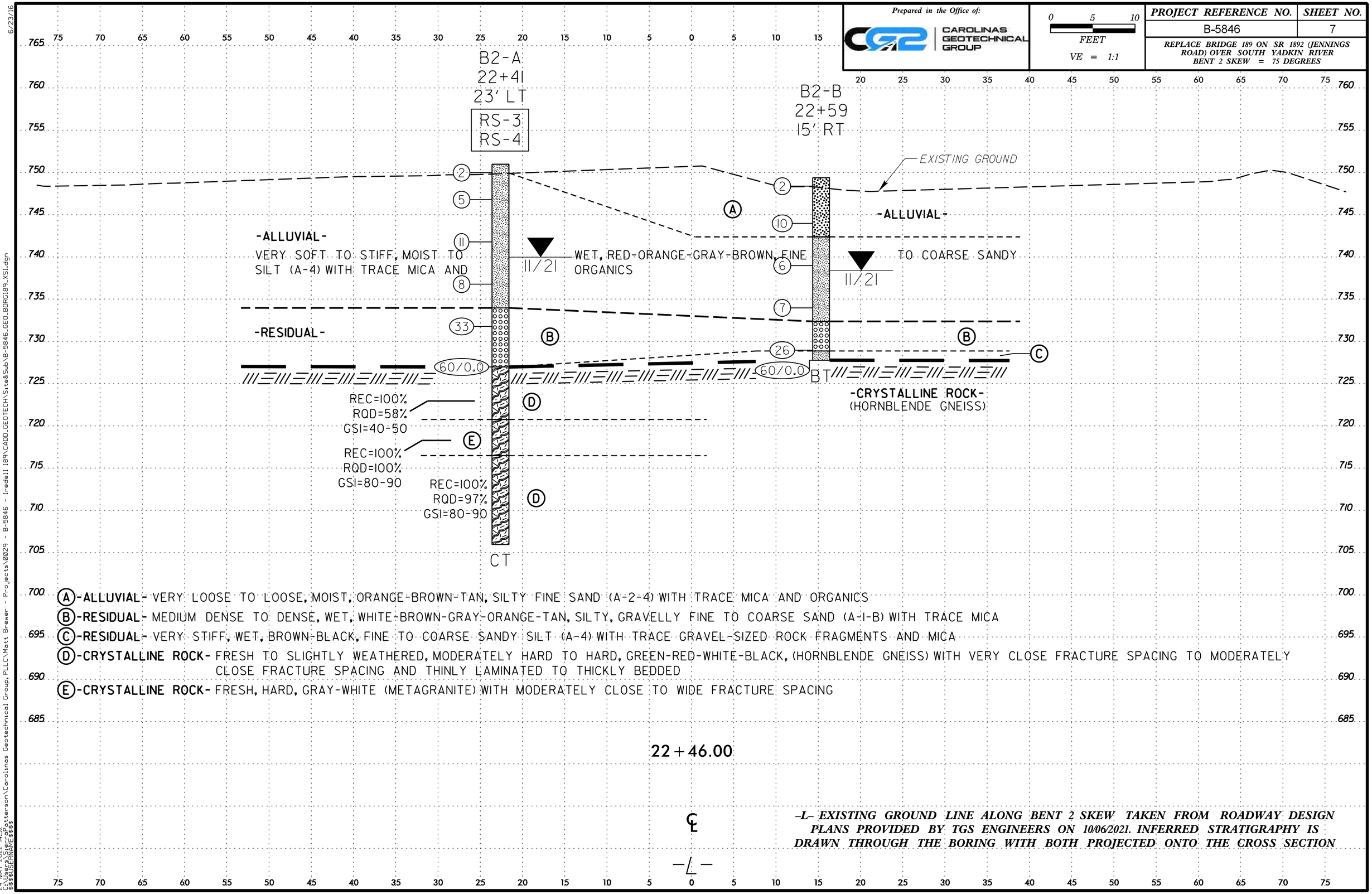
Prepared in the Office of: CAROLINAS GEOTECHNICAL GROUP

0 5 10
FEET
VE = 1:1

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| B-5846 | 7 |

REPLACE BRIDGE 189 ON SR 1892 (JENNINGS ROAD) OVER SOUTH YADKIN RIVER
BENT 2 SKEW = 75 DEGREES




(A)-**ALLUVIAL**- VERY LOOSE TO LOOSE, MOIST, ORANGE-BROWN-TAN, SILTY FINE SAND (A-2-4) WITH TRACE MICA AND ORGANICS

(B)-**RESIDUAL**- MEDIUM DENSE TO DENSE, WET, WHITE-BROWN-GRAY-ORANGE-TAN, SILTY, GRAVELLY FINE TO COARSE SAND (A-1-B) WITH TRACE MICA

(C)-**RESIDUAL**- VERY STIFF, WET, BROWN-BLACK, FINE TO COARSE SANDY SILT (A-4) WITH TRACE GRAVEL-SIZED ROCK FRAGMENTS AND MICA

(D)-**CRYSTALLINE ROCK**- FRESH TO SLIGHTLY WEATHERED, MODERATELY HARD TO HARD, GREEN-RED-WHITE-BLACK, (HORNBLENDE GNEISS) WITH VERY CLOSE FRACTURE SPACING TO MODERATELY CLOSE FRACTURE SPACING AND THINLY LAMINATED TO THICKLY BEDDED

(E)-**CRYSTALLINE ROCK**- FRESH, HARD, GRAY-WHITE (METAGRANITE) WITH MODERATELY CLOSE TO WIDE FRACTURE SPACING

22+46.00

℄

*–L– EXISTING GROUND LINE ALONG BENT 2 SKEW TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 10/06/2021. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING WITH BOTH PROJECTED ONTO THE CROSS SECTION*

–L–

Prepared in the Office of:
CAROLINAS GEOTECHNICAL GROUP

0 5 10
FEET
VE = 1:1

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| B-5846 | 8 |

REPLACE BRIDGE 189 ON SR 1892 (JENNINGS ROAD) OVER SOUTH YADKIN RIVER
BENT 3 SKEW = 75 DEGREES

B3-A
23+17
23' LT

B3-B
23+29
20' RT
RS-5 RS-6

EXISTING GROUND

-ALLUVIAL-

-RESIDUAL-
MEDIUM STIFF TO VERY COARSE SANDY SILT

STIFF, MOIST TO WET, WHITE-TAN (A-4) WITH TRACE GRAVEL-SIZED

-WEATHERED ROCK-
(METAGRANITE)

-CRYSTALLINE ROCK-
(METAGRANITE)

-RESIDUAL-
-ORANGE-BROWN, FINE TO
ROCK FRAGMENTS

REC=88%
RQD=59%
GSI=40-50

REC=97%
RQD=93%
GSI=70-80

BT

CT

Ⓐ-ALLUVIAL- SOFT TO MEDIUM STIFF, MOIST TO WET, RED-BROWN-ORANGE, SLIGHTLY PLASTIC, FINE TO COARSE SANDY, SILTY CLAY (A-7-5) AND FINE TO COARSE SANDY SILT (A-4), WITH TRACE MICA AND ORGANICS

Ⓑ-ALLUVIAL- VERY LOOSE TO DENSE, MOIST TO WET, GRAY-ORANGE-BROWN-TAN-RED, SILTY, GRAVELLY FINE TO COARSE SAND (A-1-B) AND SILTY FINE TO COARSE SAND (A-2-4), WITH TRACE MICA AND PEA-SIZED SUBANGULAR TO SUBROUNDED GRAVEL

Ⓒ-ALLUVIAL- STIFF TO VERY STIFF, WET, ORANGE-TAN-BROWN, FINE TO COARSE SANDY SILT (A-4) WITH TRACE MICA AND GRAVEL

Ⓓ-CRYSTALLINE ROCK- FRESH TO VERY SLIGHTLY WEATHERED, MODERATELY HARD TO HARD, BLACK-GRAY-WHITE (METAGRANITE) WITH VERY CLOSE TO MODERATELY CLOSE FRACTURE SPACING

Ⓔ-CRYSTALLINE ROCK- FRESH, MODERATELY HARD, GREEN-RED-WHITE-BLACK, (HORNBLENDE GNEISS) WITH CLOSE TO MODERATELY CLOSE FRACTURE SPACING AND VERY THINLY BEDDED TO THICKLY BEDDED

23+21.13

℄

*-L- EXISTING GROUND LINE ALONG BENT 3 SKEW TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 10/06/2021. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING WITH BOTH PROJECTED ONTO THE CROSS SECTION*

Prepared in the Office of: CAROLINAS GEOTECHNICAL GROUP

0 5 10
FEET
VE = 1:1

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| B-5846 | 9 |

REPLACE BRIDGE 189 ON SR 1892 (JENNINGS ROAD) OVER SOUTH YADKIN RIVER
END BENT 2 SKEW = 75 DEGREES

EB2-A
23+93
33' LT

EB2-B
24+01
21' RT

ST-1
ST-2

PAVEMENT

EXISTING GROUND

-ROADWAY EMBANKMENT-

-ROADWAY EMBANKMENT-
SOFT TO HARD, MOIST, HIGHLY PLASTIC, RED-ORANGE-BROWN, SILTY
FINE TO COARSE SANDY CLAY (A-6), TRACE GRAVEL AND MICA

-ALLUVIAL-
SOFT TO MEDIUM STIFF, MOIST TO WET, BLACK-
LITTLE MICA AND TRACE GRAVEL AND ROOT FRAGMENTS

BROWN-RED, HIGHLY PLASTIC, FINE TO COARSE SANDY, CLAY

-ALLUVIAL-
(A-7-5), WITH TRACE TO

11/21

-RESIDUAL-
VERY SOFT TO VERY STIFF, MOIST TO WET
MICA AND TRACE GRAVEL-SIZED ROCK

-RESIDUAL-
BLACK-RED-BROWN-TAN, FINE TO COARSE SANDY SILT
FRAGMENTS

-RESIDUAL-
(A-4), WITH TRACE TO LITTLE

-WEATHERED ROCK- (MICA SCHIST)

-WEATHERED ROCK-
(MICA SCHIST)

-CRYSTALLINE ROCK-
(MICA SCHIST)

BT

Ⓐ -ROADWAY EMBANKMENT- LOOSE TO MEDIUM DENSE, MOIST, BROWN-GRAY, SILTY, GRAVELLY FINE TO COARSE SAND (A-1-B)

23+97.36
℄
-L-

*-L- EXISTING GROUND LINE ALONG END BENT 2 SKEW TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 10/06/2021. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING WITH BOTH PROJECTED ONTO THE CROSS SECTION*

6/23/16

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25-MAY-2022 12:56
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# GEOTECHNICAL BORING REPORT
# BORE LOG

| | | | | |
|---|---|---|---|---|
| **WBS** 45799.1.2 | **TIP** B-5846 | **COUNTY** IREDELL | **GEOLOGIST** S.N. Patterson | |
| **SITE DESCRIPTION** Replace Bridge 189 on SR 1892 (Jennings Road) over South Yadkin River | | | | **GROUND WTR (ft)** |
| **BORING NO.** EB1-A | **STATION** 20+48 | **OFFSET** 11 ft LT | **ALIGNMENT** L | **0 HR.** Dry |
| **COLLAR ELEV.** 791.9 ft | **TOTAL DEPTH** 23.7 ft | **NORTHING** 783,313 | **EASTING** 1,442,854 | **24 HR.** Dry |
| **DRILL RIG/HAMMER EFF./DATE** CG20446 Diedrich D50 76% 06/14/2021 | | **DRILL METHOD** H.S. Augers | **HAMMER TYPE** Automatic | |
| **DRILLER** C. Odom | **START DATE** 12/09/21 | **COMP. DATE** 12/09/21 | **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) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 795 | | | | | | | | | | | | |
| | | | | | | | | | | GROUND SURFACE | 791.9 | 0.0 |
| | 790.9 | 1.0 | | | | | | | | **RESIDUAL** Medium Stiff to Stiff, Orange-Brown, Fine Sandy SILT (A-4), with trace mica and gravel-sized rock fragments | | |
| 790 | 788.4 | 3.5 | 2 | 7 | 4 | 11 | | M | | | | |
| | 785.9 | 6.0 | 2 | 3 | 3 | 6 | | M | | | | |
| 785 | 783.4 | 8.5 | 2 | 3 | 4 | 7 | | M | | | 783.4 | 8.5 |
| | 781.9 | 10.0 | 60/0.1 | | | 60/0.1 | | | | **CRYSTALLINE ROCK** White-Brown, (METAGRANITE) | | |
| 780 | 778.4 | 13.5 | 60/0.0 | | | 60/0.0 | | | | | 779.9 | 12.0 |
| | | | 100/0.3 | | | 100/0.3 | | | | **WEATHERED ROCK** White-Black, (HORNBLENDE GNEISS) | | |
| 775 | 773.4 | 18.5 | | | | | | | | | 774.9 | 17.0 |
| | | | 27 | 54 | 46/0.1 | 100/0.6 | | | | **WEATHERED ROCK** White-Brown, (METAGRANITE) | 772.9 | 19.0 |
| 770 | 768.4 | 23.5 | | | | | | | | **WEATHERED ROCK** White-Black, (HORNBLENDE GNEISS) | | |
| | | | 100/0.2 | | | 100/0.2 | | | | | 768.2 | 23.7 |
| | | | | | | | | | | Boring Terminated at Elevation 768.2 ft In Weathered Rock (HORNBLENDE GNEISS) | | |

| | | | | |
|---|---|---|---|---|
| **WBS** 45799.1.2 | **TIP** B-5846 | **COUNTY** IREDELL | **GEOLOGIST** S.N. Patterson | |
| **SITE DESCRIPTION** Replace Bridge 189 on SR 1892 (Jennings Road) over South Yadkin River | | | | **GROUND WTR (ft)** |
| **BORING NO.** EB1-B | **STATION** 20+65 | **OFFSET** 19 ft RT | **ALIGNMENT** L | **0 HR.** Dry |
| **COLLAR ELEV.** 790.7 ft | **TOTAL DEPTH** 21.3 ft | **NORTHING** 783,330 | **EASTING** 1,442,884 | **24 HR.** Dry |
| **DRILL RIG/HAMMER EFF./DATE** CG29022 Mobile B-29 81% 03/12/2021 | | **DRILL METHOD** H.S. Augers | **HAMMER TYPE** Automatic | |
| **DRILLER** D. Demby | **START DATE** 11/04/21 | **COMP. DATE** 11/04/21 | **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) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 795 | | | | | | | | | | | | |
| | | | | | | | | | | GROUND SURFACE | 790.7 | 0.0 |
| 790 | 789.2 | 1.5 | 15 | 23 | 18 | 41 | | M | | **RESIDUAL** Dense to Very Dense, Black-White-Gray, Silty, Gravelly Fine to Coarse SAND (A-1-b) | | |
| | 786.7 | 4.0 | 11 | 25 | 42 | 67 | | M | | | | |
| 785 | 784.2 | 6.5 | 32 | 61 | 39/0.3 | 100/0.8 | | | | | 783.7 | 7.0 |
| | 781.2 | 9.5 | 60/0.1 | | | 60/0.1 | | | | **WEATHERED ROCK** White-Brown, (METAGRANITE) | 781.2 | 9.5 |
| 780 | | | | | | | | | | **CRYSTALLINE ROCK** Gray-White, (METAGRANITE) | | |
| | 776.2 | 14.5 | 14 | 31 | 66 | 97 | | | | | 776.7 | 14.0 |
| 775 | | | | | | | | M | | **RESIDUAL** Hard, Black-Red-Gray, Fine Sandy SILT (A-4), with trace gravel-sized rock fragments | | |
| | 771.2 | 19.5 | 100/0.5 | | | 100/0.5 | | | | | 771.2 | 19.5 |
| 770 | 769.4 | 21.3 | 60/0.0 | | | 60/0.0 | | | | **WEATHERED ROCK** White-Brown, (METAGRANITE) | 769.4 | 21.3 |
| | | | | | | | | | | Boring Terminated with Standard Penetration Test Refusal at Elevation 769.4 ft On Crystalline Rock (METAGRANITE) | | |

# GEOTECHNICAL BORING REPORT
## BORE LOG

| | | | | |
|---|---|---|---|---|
| **WBS** 45799.1.2 | **TIP** B-5846 | **COUNTY** IREDELL | **GEOLOGIST** S.N. Patterson | |
| **SITE DESCRIPTION** Replace Bridge 189 on SR 1892 (Jennings Road) over South Yadkin River | | | | **GROUND WTR (ft)** |
| **BORING NO.** B1-A | **STATION** 21+41 | **OFFSET** 13 ft LT | **ALIGNMENT** L | **0 HR.** N/A |
| **COLLAR ELEV.** 754.3 ft | **TOTAL DEPTH** 38.4 ft | **NORTHING** 783,406 | **EASTING** 1,442,852 | **24 HR.** 15.0 |
| **DRILL RIG/HAMMER EFF./DATE** CG20446 Diedrich D50 76% 06/14/2021 | | **DRILL METHOD** NW Casing w/ Advancer | **HAMMER TYPE** Automatic | |
| **DRILLER** C. Odom | **START DATE** 12/07/21 | **COMP. DATE** 12/08/21 | **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) |
|---|---|---|---|---|---|---|---|---|---|---|
| 755 | | | | | | | | | | |
| | 754.3 | 0.0 | 2 | 2 | 5 | 7 / 35 | | M | | 754.3 / 0.0 GROUND SURFACE |
| 750 | 750.8 | 3.5 | 7 | 14 | 21 | | | M | | **RESIDUAL** Medium Stiff to Hard, Orange-Brown-Gray, Fine to Coarse Sandy SILT (A-4), with trace gravel-sized rock fragments and trace to little mica |
| 745 | 745.8 | 8.5 | 2 | 2 | 6 | 8 | | W | | |
| | 741.2 | 13.1 | 60/0.0 | | | 60/0.0 | | | | 741.2 / 13.1 **CRYSTALLINE ROCK** Green-Red-White-Black, (HORNBLENDE GNEISS) |
| 740 | | | | | | | | | | |
| 735 | | | | | | | RS-1 | | | REC=96% RQD=93% GSI=70-80 |
| 730 | | | | | | | RS-2 | | | |
| 725 | | | | | | | | | | |
| 720 | | | | | | | | | | 719.7 / 34.6 Gray-White, (METAGRANITE) REC=100% RQD=100% GSI=80-90 715.9 / 38.4 Boring Terminated at Elevation 715.9 ft In Crystalline Rock (METAGRANITE) |

NCDOT BORE DOUBLE B-5846_GEO_BRDG_GTM.GPJ NC_DOT.GDT 5/24/22

# GEOTECHNICAL BORING REPORT
## CORE LOG

| | | | | |
|---|---|---|---|---|
| **WBS** 45799.1.2 | **TIP** B-5846 | **COUNTY** IREDELL | **GEOLOGIST** S.N. Patterson | |
| **SITE DESCRIPTION** Replace Bridge 189 on SR 1892 (Jennings Road) over South Yadkin River | | | | **GROUND WTR (ft)** |
| **BORING NO.** B1-A | **STATION** 21+41 | **OFFSET** 13 ft LT | **ALIGNMENT** L | **0 HR.** N/A |
| **COLLAR ELEV.** 754.3 ft | **TOTAL DEPTH** 38.4 ft | **NORTHING** 783,406 | **EASTING** 1,442,852 | **24 HR.** 15.0 |
| **DRILL RIG/HAMMER EFF./DATE** CG20446 Diedrich D50 76% 06/14/2021 | | **DRILL METHOD** NW Casing w/ Advancer | **HAMMER TYPE** Automatic | |
| **DRILLER** C. Odom | **START DATE** 12/07/21 | **COMP. DATE** 12/08/21 | **SURFACE WATER DEPTH** N/A | |
| **CORE SIZE** NQ | **TOTAL RUN** 25.3 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) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 741.2 | | | | | | | | | | | Begin Coring @ 13.1 ft |
| 740 | 741.2 | 13.1 | 1.5 | *N=60/0.0* 6:56/1.5 | (1.1) 73% | (1.0) 67% | | (20.6) 96% | (20.0) 93% | | 741.2 / 13.1 **CRYSTALLINE ROCK** Fresh to Very Slightly Weathered, Moderately Hard to Hard, Green-Red-White-Black, (HORNBLENDE GNEISS), with Very Close to Close Fracture Spacing and Thickly Laminated to Thinly Bedded |
| | 739.7 | 14.6 | 5.0 | 4:01/1.0 4:05/1.0 4:21/1.0 3:48/1.0 4:23/1.0 | (4.5) 90% | (4.2) 84% | RS-1 | | | | RS-1: 17.4 - 17.9' Unit Weight: 176.5 pcf Unconfined Compressive Strength: 8,030 psi (1,156 ksf) |
| 735 | 734.7 | 19.6 | 5.0 | 3:14/1.0 3:45/1.0 3:11/1.0 3:35/1.0 3:39/1.0 | (4.9) 98% | (4.9) 98% | RS-2 | | | | RS-2: 22.2 - 22.8' Unit Weight: 178.1 pcf Unconfined Compressive Strength: 11,110 psi (1,600 ksf) |
| 730 | 729.7 | 24.6 | 5.1 | 4:05/1.0 3:59/1.0 4:16/1.0 3:53/1.0 4:36/1.1 | (5.1) 100% | (4.9) 96% | | | | | GSI=70-80 |
| 725 | 724.6 | 29.7 | 5.2 | 4:54/1.0 4:48/1.0 4:47/1.0 2:41/1.0 2:54/1.2 | (5.2) 100% | (5.2) 100% | | | | | |
| 720 | 719.4 | 34.9 | 3.5 | 5:55/1.0 9:58/1.0 15:51/1.0 42:06/0.5 | (3.5) 100% | (3.5) 100% | | (3.8) 100% | (3.8) 100% | | 719.7 / 34.6 Fresh, Hard, Gray-White (METAGRANITE), with Wide Fracture Spacing and Thickly Laminated to Thinly Bedded |
| | 715.9 | 38.4 | | | | | | | | | 715.9 / 38.4 GSI=80-90 Boring Terminated at Elevation 715.9 ft In Crystalline Rock (METAGRANITE) |

NCDOT CORE SINGLE B-5846_GEO_BRDG_GTM.GPJ NC_DOT.GDT 5/24/22

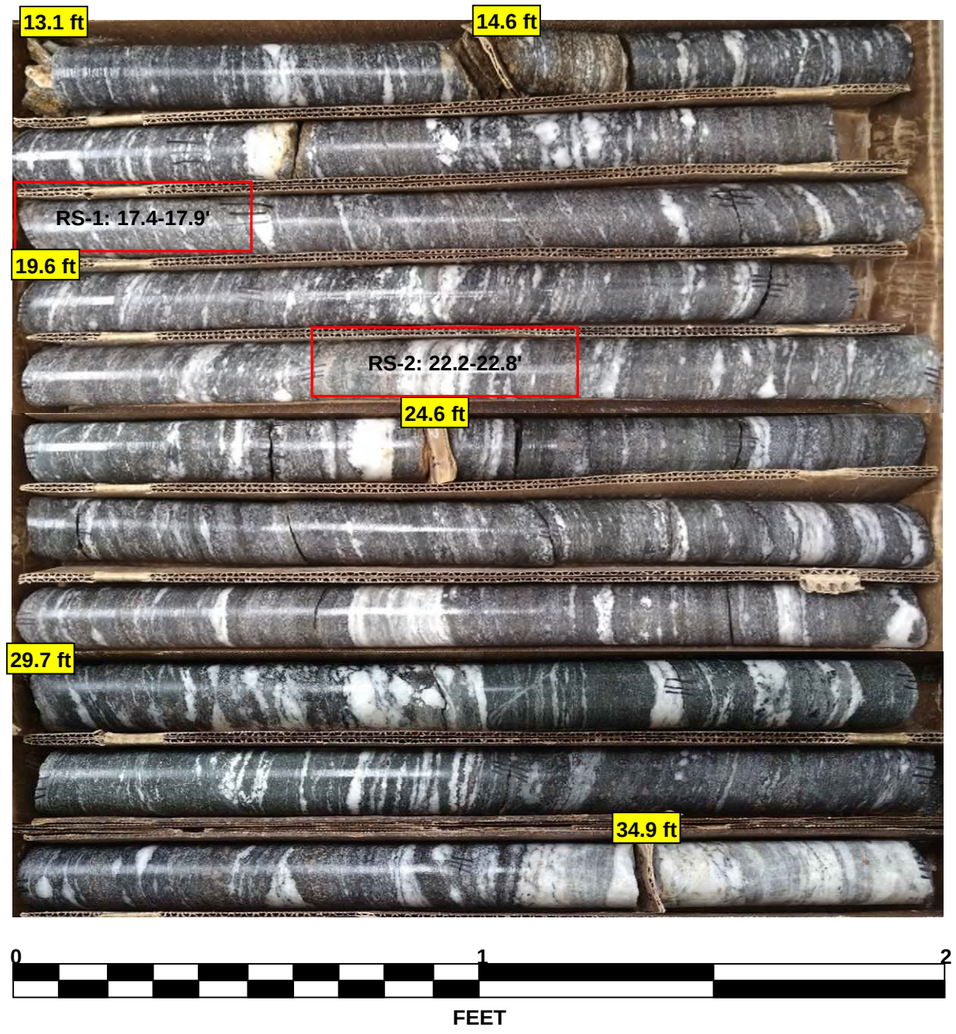
CAROLINAS GEOTECHNICAL GROUP

# Replace Bridge 189 on SR 1892 (Jennings Road) over South Yadkin River, Iredell County, NC

## Rock Core Photographs

### Boring: B1-A

13.1 to 38.4 Feet




# GEOTECHNICAL BORING REPORT
# BORE LOG

| | | | | |
|---|---|---|---|---|
| **WBS** 45799.1.2 | **TIP** B-5846 | **COUNTY** IREDELL | **GEOLOGIST** S.N. Patterson | |
| **SITE DESCRIPTION** Replace Bridge 189 on SR 1892 (Jennings Road) over South Yadkin River | | | | **GROUND WTR (ft)** |
| **BORING NO.** B1-B | **STATION** 21+44 | **OFFSET** 19 ft RT | **ALIGNMENT** L | **0 HR.** N/A |
| **COLLAR ELEV.** 756.0 ft | **TOTAL DEPTH** 22.5 ft | **NORTHING** 783,409 | **EASTING** 1,442,884 | **24 HR.** 13.2 |
| **DRILL RIG/HAMMER EFF./DATE** CG20446 Diedrich D50 76% 06/14/2021 | | **DRILL METHOD** NW Casing w/ SPT | | **HAMMER TYPE** Automatic |
| **DRILLER** C. Odom | **START DATE** 12/06/21 | **COMP. DATE** 12/06/21 | **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) |
| 760 | | | | | | | | | | |
| | 756.0 | 0.0 | | | | | | | | 756.0 GROUND SURFACE 0.0 |
| 755 | 755.0 | 1.0 | 50 | 50/0.1 | | 100/0.6 | | | | **WEATHERED ROCK** Brown-Black, (HORNBLENDE GNEISS) |
| | 753.0 | 3.0 | 87 | 13/0.1 | | 100/0.6 | | | | |
| 750 | 749.2 | 6.8 | | | | | | | | 749.2 6.8 |
| | 748.5 | 7.5 | 60/0.0 | | | 60/0.0 | | | | **CRYSTALLINE ROCK** Gray-Black, (HORNBLENDE GNEISS) |
| | | | 60/0.0 | | | 60/0.0 | | | | |
| 745 | | | | | | | | | | |
| | 743.5 | 12.5 | 60/0.0 | | | 60/0.0 | | | | |
| 740 | | | | | | | | | | |
| | 738.5 | 17.5 | 60/0.0 | | | 60/0.0 | | | | |
| 735 | | | | | | | | | | |
| | 733.5 | 22.5 | 60/0.0 | | | 60/0.0 | | | | 733.5 22.5 |
| | | | | | | | | | | Boring Terminated with Standard Penetration Test Refusal at Elevation 733.5 ft In Crystalline Rock (HORNBLENDE GNEISS) |
| | | | | | | | | | | Notes: Switch to PDC Bit at 7.5 ft |

# GEOTECHNICAL BORING REPORT
## BORE LOG

| | | | | |
|---|---|---|---|---|
| **WBS** 45799.1.2 | **TIP** B-5846 | **COUNTY** IREDELL | **GEOLOGIST** S.N. Patterson | |
| **SITE DESCRIPTION** Replace Bridge 189 on SR 1892 (Jennings Road) over South Yadkin River | | | | **GROUND WTR (ft)** |
| **BORING NO.** B2-A | **STATION** 22+41 | **OFFSET** 23 ft LT | **ALIGNMENT** L | **0 HR.** 10.0 |
| **COLLAR ELEV.** 751.3 ft | **TOTAL DEPTH** 45.0 ft | **NORTHING** 783,506 | **EASTING** 1,442,843 | **24 HR.** 11.0 |
| **DRILL RIG/HAMMER EFF./DATE** CG20446 Diedrich D50 76% 06/14/2021 | | **DRILL METHOD** NW Casing w/ Advancer | **HAMMER TYPE** Automatic | |
| **DRILLER** C. Odom | **START DATE** 11/04/21 | **COMP. DATE** 11/05/21 | **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) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 755 | | | | | | | | | | | |
| | 751.3 | 0.0 | 1 | 1 | 1 | 2 | | M | | 751.3 GROUND SURFACE | 0.0 |
| 750 | | | | | | | | | | **ALLUVIAL** Very Soft to Stiff, Red-Orange-Gray-Brown, Fine to Coarse Sandy SILT (A-4), with trace mica and organics | |
| | 748.1 | 3.2 | 2 | 2 | 3 | 5 | | M | | | |
| 745 | | | | | | | | | | | |
| | 743.1 | 8.2 | 4 | 6 | 5 | 11 | | M | | | |
| 740 | | | | | | | | | | | |
| | 738.1 | 13.2 | 3 | 3 | 5 | 8 | | W | | | |
| 735 | | | | | | | | | | 734.3 | 17.0 |
| | 733.1 | 18.2 | 18 | 20 | 13 | 33 | | W | | **RESIDUAL** Dense, White-Brown-Tan, Silty, Gravelly Fine to Coarse SAND (A-1-b) | |
| 730 | | | | | | | | | | | |
| | 727.3 | 24.0 | 60/0.0 | | | 60/0.0 | | | | 727.3 | 24.0 |
| 725 | | | | | | | | | | **CRYSTALLINE ROCK** Red-White-Black, (HORNBLENDE GNEISS) | |
| | | | | | | | | | | REC=100% RQD=58% GSI=40-50 | |
| 720 | | | | | | | RS-3 | | | 721.1 Gray-White, (METAGRANITE) | 30.2 |
| | | | | | | | | | | REC=100% RQD=100% GSI=80-90 | |
| 715 | | | | | | | RS-4 | | | 716.8 Green-Red-White-Black, (HORNBLENDE GNEISS) | 34.5 |
| | | | | | | | | | | REC=100% RQD=97% GSI=80-90 | |
| 710 | | | | | | | | | | 706.3 Boring Terminated at Elevation 706.3 ft In Crystalline Rock (HORNBLENDE GNEISS) | 45.0 |

NCDOT BORE DOUBLE B-5846_GEO_BRDG_GTM.GPJ NC_DOT.GDT 5/24/22

# GEOTECHNICAL BORING REPORT
## CORE LOG

| | | | | |
|---|---|---|---|---|
| **WBS** 45799.1.2 | **TIP** B-5846 | **COUNTY** IREDELL | **GEOLOGIST** S.N. Patterson | |
| **SITE DESCRIPTION** Replace Bridge 189 on SR 1892 (Jennings Road) over South Yadkin River | | | | **GROUND WTR (ft)** |
| **BORING NO.** B2-A | **STATION** 22+41 | **OFFSET** 23 ft LT | **ALIGNMENT** L | **0 HR.** 10.0 |
| **COLLAR ELEV.** 751.3 ft | **TOTAL DEPTH** 45.0 ft | **NORTHING** 783,506 | **EASTING** 1,442,843 | **24 HR.** 11.0 |
| **DRILL RIG/HAMMER EFF./DATE** CG20446 Diedrich D50 76% 06/14/2021 | | **DRILL METHOD** NW Casing w/ Advancer | **HAMMER TYPE** Automatic | |
| **DRILLER** C. Odom | **START DATE** 11/04/21 | **COMP. DATE** 11/05/21 | **SURFACE WATER DEPTH** N/A | |
| **CORE SIZE** NQ | **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 ELEV. (ft) | DEPTH (ft) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 727.3 | | | | | | | | | | | Begin Coring @ 24.0 ft | |
| | 727.3 | 24.0 | 1.0 | N=60/0.0 | (1.0) | (0.8) | | (6.2) | (3.6) | | 727.3 **CRYSTALLINE ROCK** | 24.0 |
| 725 | 726.3 | 25.0 | 5.0 | 04:24/1.0 | 100% | 80% | | 100% | 58% | | Slightly Weathered, Moderately Hard to Hard, Red-White-Black, (HORNBLENDE GNEISS), with Very Close to Moderately Close Fracture Spacing and Thinly Bedded to Thickly Bedded | |
| | | | | 03:05/1.0 | | | | | | | | |
| | | | | 03:07/1.0 | (2.6) | (0.4) | | | | | | |
| | | | | 01:18/1.0 | 52% | 8% | | | | | | |
| | | | | 02:56/1.0 | | | | | | | | |
| | 721.3 | 30.0 | | 02:46/1.0 | | | | | | | GSI=40-50 | 30.2 |
| 720 | | | 5.0 | 05:15/1.0 | (5.0) | (5.0) | RS-3 | (4.3) | (4.3) | | 721.1 Fresh, Hard, Gray-White (METAGRANITE), with Moderately Close to Wide Fracture Spacing | |
| | | | | 06:39/1.0 | 100% | 100% | | 100% | 100% | | | |
| | | | | 06:14/1.0 | | | | | | | | |
| | | | | 09:51/1.0 | | | | | | | | |
| | 716.3 | 35.0 | | 12:36/1.0 | | | | | | | RS-3: 30.2 - 30.6' | 34.5 |
| 715 | | | 5.0 | 02:56/1.0 | (4.5) | (3.3) | RS-4 | (10.5) | (10.2) | | 716.8 Unit Weight: 160.0 pcf Unconfined Compressive Strength: 7,570 psi (1,090 ksf) | |
| | | | | 04:40/1.0 | 90% | 66% | | 100% | 97% | | | |
| | | | | 02:44/1.0 | | | | | | | GSI=80-90 | |
| | | | | 02:10/1.0 | | | | | | | | |
| | 711.3 | 40.0 | | 02:59/1.0 | | | | | | | Fresh to Slightly Weathered, Moderately Hard to Hard, Green-Red-White-Black, (HORNBLENDE GNEISS), with Very Close to Moderately Close Fracture Spacing and Thinly Laminated to Thinly Bedded | |
| 710 | | | 5.0 | 03:16/1.0 | (5.0) | (4.9) | | | | | | |
| | | | | 02:43/1.0 | 100% | 98% | | | | | RS-4: 34.5 - 35.0' | |
| | | | | 02:38/1.0 | | | | | | | Unit Weight: 168.4 pcf | |
| | | | | 03:11/1.0 | | | | | | | Unconfined Compressive Strength: 8,230 psi (1,185 ksf) | |
| | 706.3 | 45.0 | | 02:30/1.0 | | | | | | | 706.3 GSI=80-90 | 45.0 |
| | | | | | | | | | | | Boring Terminated at Elevation 706.3 ft In Crystalline Rock (HORNBLENDE GNEISS) | |

NCDOT CORE SINGLE B-5846_GEO_BRDG_GTM.GPJ NC_DOT.GDT 5/24/22

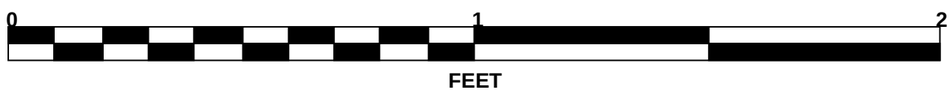
CAROLINAS GEOTECHNICAL GROUP

# Replace Bridge 189 on SR 1892 (Jennings Road) over South Yadkin River, Iredell County, NC

## Rock Core Photographs

### Boring: B2-A

24.0 to 45.0 Feet

# GEOTECHNICAL BORING REPORT
# BORE LOG

| | | | | |
|---|---|---|---|---|
| **WBS** 45799.1.2 | **TIP** B-5846 | **COUNTY** IREDELL | **GEOLOGIST** S.N. Patterson | |
| **SITE DESCRIPTION** Replace Bridge 189 on SR 1892 (Jennings Road) over South Yadkin River | | | | **GROUND WTR (ft)** |
| **BORING NO.** B2-B | **STATION** 22+59 | **OFFSET** 15 ft RT | **ALIGNMENT** L | **0 HR.** 8.7 |
| **COLLAR ELEV.** 749.7 ft | **TOTAL DEPTH** 21.6 ft | **NORTHING** 783,524 | **EASTING** 1,442,881 | **24 HR.** 11.0 |
| **DRILL RIG/HAMMER EFF./DATE** CG20446 Diedrich D50 76% 06/14/2021 | | **DRILL METHOD** NW Casing w/ Advancer | **HAMMER TYPE** Automatic | |
| **DRILLER** C. Odom | **START DATE** 11/05/21 | **COMP. DATE** 11/05/21 | **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) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 750 | | | | | | | | | | | |
| | 749.7 | 0.0 | 1 | 1 | 1 | 2 | | M | | 749.7 GROUND SURFACE | 0.0 |
| | | | | | | | | | | **ALLUVIAL** Very Loose to Medium Dense, Orange-Brown-Tan, Silty Fine SAND (A-2-4), with trace mica and organics | |
| 745 | 745.3 | 4.4 | 3 | 5 | 5 | 10 | | M | | | |
| | | | | | | | | | | 742.7 | 7.0 |
| | | | | | | | | | | Medium Stiff, Red-Orange-Brown, Fine to Coarse Sandy SILT (A-4), with trace mica | |
| 740 | 740.3 | 9.4 | 3 | 3 | 3 | 6 | | W | | | |
| | | | | | | | | | | | |
| 735 | 735.3 | 14.4 | 3 | 4 | 3 | 7 | | W | | 732.7 | 17.0 |
| | | | | | | | | | | **RESIDUAL** Medium Dense, Gray-Orange-Tan, Gravelly Fine to Coarse SAND (A-1-b), with trace mica | |
| 730 | 730.3 | 19.4 | 10 | 10 | 16 | 26 | | W | | 729.2 | 20.5 |
| | 728.1 | 21.6 | 60/0.0 | | | 60/0.0 | | | | 728.1 Very Stiff, Brown-Black, Fine to Coarse Sandy SILT (A-4), with trace gravel-sized rock fragments and mica | 21.6 |
| | | | | | | | | | | Boring Terminated with Standard Penetration Test Refusal at Elevation 728.1 ft On Crystalline Rock (HORNBLENDE GNEISS) | |

| | | | | |
|---|---|---|---|---|
| **WBS** 45799.1.2 | **TIP** B-5846 | **COUNTY** IREDELL | **GEOLOGIST** S.N. Patterson | |
| **SITE DESCRIPTION** Replace Bridge 189 on SR 1892 (Jennings Road) over South Yadkin River | | | | **GROUND WTR (ft)** |
| **BORING NO.** B3-A | **STATION** 23+17 | **OFFSET** 23 ft LT | **ALIGNMENT** L | **0 HR.** 5.1 |
| **COLLAR ELEV.** 750.0 ft | **TOTAL DEPTH** 35.0 ft | **NORTHING** 783,582 | **EASTING** 1,442,843 | **24 HR.** 10.3 |
| **DRILL RIG/HAMMER EFF./DATE** CG20446 Diedrich D50 76% 06/14/2021 | | **DRILL METHOD** NW Casing w/ Advancer | **HAMMER TYPE** Automatic | |
| **DRILLER** C. Odom | **START DATE** 11/03/21 | **COMP. DATE** 11/03/21 | **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 |
|---|---|---|---|---|---|---|---|---|---|---|
| 750 | | | | | | | | | | |
| | 748.5 | 1.5 | 2 | 2 | 2 | 4 | | M | | 750.0 GROUND SURFACE 0.0 |
| | | | | | | | | | | **ALLUVIAL** Soft to Medium Stiff, Red-Orange-Brown, Fine to Coarse Sandy SILT (A-4), with trace mica and organics |
| 745 | 746.0 | 4.0 | 3 | 3 | 3 | 6 | | M | | 746.5 3.5 |
| | 743.5 | 6.5 | 1 | 1 | 1 | 2 | | M | | Very Loose to Medium Dense, Tan-Red-Orange, Silty Fine to Coarse SAND (A-2-4), with trace mica and pea-sized gravel |
| 740 | 741.0 | 9.0 | 5 | 6 | 18 | 24 | | W | | |
| | 736.0 | 14.0 | 4 | 2 | 3 | 5 | | W | | 733.0 17.0 |
| 735 | | | | | | | | | | **RESIDUAL** Medium Stiff to Very Stiff, White-Orange-Brown, Fine to Coarse Sandy SILT (A-4), with trace gravel-sized rock fragments |
| | 731.0 | 19.0 | 3 | 3 | 5 | 8 | | M | | |
| 730 | 726.0 | 24.0 | 3 | 6 | 12 | 18 | | M | | |
| 725 | 721.0 | 29.0 | 23 | 49 | 51/0.4 | 100/0.9 | | | | 720.5 29.5 |
| 720 | 716.0 | 34.0 | | | | | | | | **WEATHERED ROCK** Orange-Brown, (METAGRANITE) |
| | 715.0 | 35.0 | 66 | 34/0.2 | | 100/0.7 | | | | 715.0 35.0 |
| | | | 60/0.0 | | | 60/0.0 | | | | Boring Terminated with Standard Penetration Test Refusal at Elevation 715.0 ft On Crystalline Rock (METAGRANITE) |

# GEOTECHNICAL BORING REPORT
## BORE LOG

| | | | | |
|---|---|---|---|---|
| **WBS** 45799.1.2 | **TIP** B-5846 | **COUNTY** IREDELL | **GEOLOGIST** S.N. Patterson | |
| **SITE DESCRIPTION** Replace Bridge 189 on SR 1892 (Jennings Road) over South Yadkin River | | | | **GROUND WTR (ft)** |
| **BORING NO.** B3-B | **STATION** 23+29 | **OFFSET** 20 ft RT | **ALIGNMENT** L | **0 HR.** N/A |
| **COLLAR ELEV.** 748.7 ft | **TOTAL DEPTH** 50.4 ft | **NORTHING** 783,594 | **EASTING** 1,442,886 | **24 HR.** 11.0 |
| **DRILL RIG/HAMMER EFF./DATE** CG20446 Diedrich D50 76% 06/14/2021 | | **DRILL METHOD** NW Casing w/ Advancer | **HAMMER TYPE** Automatic | |
| **DRILLER** C. Odom | **START DATE** 11/08/21 | **COMP. DATE** 11/08/21 | **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) |
|---|---|---|---|---|---|---|---|---|---|---|
| 750 | | | | | | | | | | |
| | 748.7 | 0.0 | 1 | 2 | 1 | 3 | | M | | 748.7 / 0.0 **GROUND SURFACE**<br>**ALLUVIAL**<br>Soft, Red-Brown, Highly Plastic, Fine to Coarse Sandy, Silty CLAY (A-7-5), with trace mica |
| 745 | 744.6 | 4.1 | 2 | 2 | 1 | 3 | | W | | |
| 740 | 739.6 | 9.1 | 7 | 12 | 19 | 31 | | W | | 741.7 / 7.0<br>Dense, Gray-Orange-Brown, Silty, Gravelly Fine to Coarse SAND (A-1-b), with subangular to subrounded gravel |
| 735 | 734.6 | 14.1 | 10 | 11 | 13 | 24 | | W | | 736.7 / 12.0<br>Stiff to Very Stiff, Orange-Tan-Brown, Fine to Coarse Sandy SILT (A-4), with trace mica and gravel |
| 730 | 729.6 | 19.1 | 4 | 4 | 6 | 10 | | W | | 729.1 / 19.6<br>**RESIDUAL**<br>Medium Stiff to Stiff, Orange-Tan-Brown-Gray, Fine to Coarse Sandy SILT (A-4), with trace gravel-sized rock fragments |
| 725 | 724.6 | 24.1 | 2 | 2 | 4 | 6 | | W | | |
| 720 | 719.5 | 29.2 | 60/0.0 | | | 60/0.0 | | | | 719.5 / 29.2<br>**CRYSTALLINE ROCK**<br>Black-Gray-White, (METAGRANITE)<br>REC=88%<br>RQD=59%<br>GSI=40-50 |
| 715 | | | | | | | RS-5 | | | 712.7 / 36.0<br>**CRYSTALLINE ROCK**<br>Green-Red-White-Black, (HORNBLENDE GNEISS)<br>REC=97%<br>RQD=93%<br>GSI=70-80 |
| 710 | | | | | | | RS-6 | | | |
| 705 | | | | | | | | | | |
| 700 | | | | | | | | | | 698.3 / 50.4<br>Boring Terminated at Elevation 698.3 ft In Crystalline Rock (HORNBLENDE GNEISS) |

NCDOT BORE DOUBLE B-5846_GEO_BRDG_GTM.GPJ NC_DOT.GDT 5/24/22

# GEOTECHNICAL BORING REPORT
## CORE LOG

| | | | | |
|---|---|---|---|---|
| **WBS** 45799.1.2 | **TIP** B-5846 | **COUNTY** IREDELL | **GEOLOGIST** S.N. Patterson | |
| **SITE DESCRIPTION** Replace Bridge 189 on SR 1892 (Jennings Road) over South Yadkin River | | | | **GROUND WTR (ft)** |
| **BORING NO.** B3-B | **STATION** 23+29 | **OFFSET** 20 ft RT | **ALIGNMENT** L | **0 HR.** N/A |
| **COLLAR ELEV.** 748.7 ft | **TOTAL DEPTH** 50.4 ft | **NORTHING** 783,594 | **EASTING** 1,442,886 | **24 HR.** 11.0 |
| **DRILL RIG/HAMMER EFF./DATE** CG20446 Diedrich D50 76% 06/14/2021 | | **DRILL METHOD** NW Casing w/ Advancer | **HAMMER TYPE** Automatic | |
| **DRILLER** C. Odom | **START DATE** 11/08/21 | **COMP. DATE** 11/08/21 | **SURFACE WATER DEPTH** N/A | |
| **CORE SIZE** NQ | **TOTAL RUN** 21.2 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) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 719.5 | | | | | | | | | | | Begin Coring @ 29.2 ft |
| | 719.5 | 29.2 | 1.2 | *N=60/0.0* | (1.2) 100% | (1.0) 83% | | (6.0) 88% | (4.0) 59% | | 719.5 / 29.2<br>**CRYSTALLINE ROCK**<br>Fresh to Very Slightly Weathered, Moderately Hard to Hard, Black-Gray-White (METAGRANITE), with Very Close to Moderately Close Fracture Spacing<br>RS-5: 35.3 - 35.6'<br>Unit Weight: 162.7 pcf<br>Unconfined Compressive Strength: 14,800 psi (2,130 ksf)<br>GSI=40-50 |
| 715 | 718.3 | 30.4 | 4.6 | 07:03/1.2<br>02:25/1.0<br>03:32/1.0<br>04:07/1.0<br>03:43/1.0<br>09:45/0.6 | (3.9) 85% | (2.2) 48% | | | | | |
| | 713.7 | 35.0 | 5.2 | 04:09/1.0<br>02:45/1.0<br>03:17/1.0<br>02:44/1.0<br>04:31/1.2 | (4.8) 92% | (4.1) 79% | RS-5 | (13.9) 97% | (13.4) 93% | | 712.7 / 36.0<br>**CRYSTALLINE ROCK**<br>Fresh, Moderately Hard, Green-Red-White-Black, (HORNBLENDE GNEISS), with Close to Moderately Close Fracture Spacing and Very Thinly Bedded to Thickly Bedded<br>RS-6: 39.3 - 39.8'<br>Unit Weight: 190.6 pcf<br>Unconfined Compressive Strength: 9,700 psi (1,397 ksf)<br>GSI=70-80 |
| 710 | 708.5 | 40.2 | 5.0 | 04:01/1.0<br>03:13/1.0<br>02:42/1.0<br>03:42/1.0<br>03:57/1.0 | (5.0) 100% | (4.8) 96% | RS-6 | | | | |
| 705 | 703.5 | 45.2 | 5.2 | 4:20/1.0<br>4:34/1.0<br>4:20/1.0<br>3:58/1.0<br>5:02/1.2 | (5.1) 98% | (4.8) 92% | | | | | |
| 700 | 698.3 | 50.4 | | | | | | | | | 698.3 / 50.4<br>Boring Terminated at Elevation 698.3 ft In Crystalline Rock (HORNBLENDE GNEISS) |

NCDOT CORE SINGLE B-5846_GEO_BRDG_GTM.GPJ NC_DOT.GDT 5/24/22

CAROLINAS GEOTECHNICAL GROUP

# Replace Bridge 189 on SR 1892 (Jennings Road) over South Yadkin River, Iredell County, NC

## Rock Core Photographs

### Boring: B3-B

29.2 to 50.4 Feet

# GEOTECHNICAL BORING REPORT
# BORE LOG

| | | | | |
|---|---|---|---|---|
| **WBS** 45799.1.2 | **TIP** B-5846 | **COUNTY** IREDELL | **GEOLOGIST** S.N. Patterson | |
| **SITE DESCRIPTION** Replace Bridge 189 on SR 1892 (Jennings Road) over South Yadkin River | | | | **GROUND WTR (ft)** |
| **BORING NO.** EB2-A | **STATION** 23+93 | **OFFSET** 33 ft LT | **ALIGNMENT** L | **0 HR.** 41.2 |
| **COLLAR ELEV.** 781.4 ft | **TOTAL DEPTH** 58.5 ft | **NORTHING** 783,658 | **EASTING** 1,442,833 | **24 HR.** FIAD |
| **DRILL RIG/HAMMER EFF./DATE** CG29022 Mobile B-29 81% 03/12/2021 | | **DRILL METHOD** H.S. Augers | **HAMMER TYPE** Automatic | |
| **DRILLER** D. Demby | **START DATE** 11/03/21 | **COMP. DATE** 11/03/21 | **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) |
| 785 | | | | | | | | | | |
| | | | | | | | | | | 781.4 GROUND SURFACE 0.0 |
| 780 | | | | | | | | | | 780.1 ASPHALT and ABC 1.3 |
| | 777.8 | 3.6 | | | | | | | | **ROADWAY EMBANKMENT** Loose to Medium Dense, Brown-Gray, Gravelly Fine to Coarse SAND (A-1-b) |
| 775 | 775.3 | 6.1 | 9 | 6 | 5 | 11 | | M | | |
| | 772.8 | 8.6 | 6 | 4 | 1 | 5 | | M | | 773.4 8.0 |
| 770 | | | 2 | 2 | 3 | 5 | | M | | Soft to Medium Stiff, Red-Orange-Brown, Highly Plastic, Silty, Fine to Coarse Sandy CLAY (A-6), with trace mica and gravel |
| | 767.8 | 13.6 | 0 | 2 | 2 | 4 | | M | | |
| 765 | 762.8 | 18.6 | 1 | 1 | 2 | 3 | | M | | |
| 760 | 757.8 | 23.6 | 1 | 2 | 2 | 4 | | M | | 756.4 25.0 |
| 755 | 752.8 | 28.6 | 3 | 3 | 2 | 5 | | M | | **ALLUVIAL** Medium Stiff, Brown, Highly Plastic, Fine to Coarse Sandy, Silty CLAY (A-7-5), with trace gravel, mica, and root fragments |
| 750 | 747.8 | 33.6 | 2 | 3 | 8 | 11 | | M | | 749.4 32.0 |
| 745 | 742.8 | 38.6 | 2 | 3 | 5 | 8 | | M | | **RESIDUAL** Medium Stiff to Very Stiff, Red-Brown-Tan, Fine to Coarse Sandy SILT (A-4), with trace mica and gravel-sized rock fragments |
| 740 | 737.8 | 43.6 | 5 | 8 | 11 | 19 | | M | | |
| 735 | 732.8 | 48.6 | 4 | 4 | 7 | 11 | | M | | |
| 730 | 727.8 | 53.6 | 35 | 51 | 49/0.4 | 100/0.9 | | | | 727.3 54.1 |
| 725 | 723.0 | 58.4 | 60/0.1 | | | 60/0.1 | | | | **WEATHERED ROCK** Brown-Orange-Tan, (MICA SCHIST) |
| | | | | | | | | | | 723.0 58.4 |
| | | | | | | | | | | 722.9 58.5 **CRYSTALLINE ROCK** (MICA SCHIST) |
| | | | | | | | | | | Boring Terminated with Standard Penetration Test Refusal at Elevation 722.9 ft In Crystalline Rock (MICA SCHIST) |

| | | | | |
|---|---|---|---|---|
| **WBS** 45799.1.2 | **TIP** B-5846 | **COUNTY** IREDELL | **GEOLOGIST** S.N. Patterson | |
| **SITE DESCRIPTION** Replace Bridge 189 on SR 1892 (Jennings Road) over South Yadkin River | | | | **GROUND WTR (ft)** |
| **BORING NO.** EB2-B | **STATION** 24+01 | **OFFSET** 21 ft RT | **ALIGNMENT** L | **0 HR.** 13.1 |
| **COLLAR ELEV.** 754.4 ft | **TOTAL DEPTH** 34.0 ft | **NORTHING** 783,666 | **EASTING** 1,442,887 | **24 HR.** 11.0 |
| **DRILL RIG/HAMMER EFF./DATE** CG20446 Diedrich D50 76% 06/14/2021 | | **DRILL METHOD** H.S. Augers | **HAMMER TYPE** Automatic | |
| **DRILLER** C. Odom | **START DATE** 11/08/21 | **COMP. DATE** 11/08/21 | **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 |
|---|---|---|---|---|---|---|---|---|---|---|
| 755 | | | | | | | | | | |
| | 753.4 | 1.0 | | | | | | | | 754.4 GROUND SURFACE 0.0 |
| 750 | 750.9 | 3.5 | 5 | 3 | 3 | 6 | | M | | **ROADWAY EMBANKMENT** Medium Stiff to Hard, Red-Brown, Highly Plastic, Silty, Fine to Coarse Sandy CLAY (A-6(2)), with trace mica and gravel |
| | 748.4 | 6.0 | 5 | 21 | 14 | 35 | | 16% M | | 748.9 5.5 |
| 745 | 745.9 | 8.5 | 5 | 2 | 2 | 4 | | M | | **ALLUVIAL** Soft to Medium Stiff, Black-Brown-Red, Highly Plastic, Fine to Coarse Sandy, Silty CLAY (A-7-5(13)), with trace mica and gravel |
| | 740.9 | 13.5 | 3 | 4 | 3 | 7 | | 37% M | | 742.4 12.0 |
| 740 | 735.9 | 18.5 | 3 | 4 | 5 | 9 | | W | | **RESIDUAL** Very Soft, Black-Yellow-Brown, Fine to Coarse Sandy SILT (A-4), with little mica |
| 735 | 730.9 | 23.5 | WOH | WOH | 2 | 2 | | W | | 730.9 23.5 |
| 730 | 725.9 | 28.5 | 18 | 82/0.3 | | 100/0.8 | | | | **WEATHERED ROCK** (MICA SCHIST) |
| 725 | 720.4 | 34.0 | 100/0.4 | | | 100/0.4 | | | | 720.4 34.0 |
| | | | 60/0.0 | | | 60/0.0 | | | | Boring Terminated with Standard Penetration Test Refusal at Elevation 720.4 ft On Crystalline Rock (MICA SCHIST) |

Other Samples:
ST-1 (3.0 - 5.0)
ST-2 (6.0 - 8.0)

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| B-5846 | 20 |

# LAB RESULTS

## ROCK TEST RESULTS

| SAMPLE NO. | BORING | STATION | OFFSET | DEPTH INTERVAL | ROCK TYPE | UNIT WEIGHT (PCF) | UNCONFINED COMPRESSIVE STRENGTH |
|---|---|---|---|---|---|---|---|
| RS-1 | B1-A | 21+41 -L- | 13' LT | 17.4 - 17.9' | HORNBLENDE GNEISS | 176.5 | 8,030 psi /1,156 ksf |
| RS-2 | B1-A | 21+41 -L- | 13' LT | 22.2 - 22.8' | HORNBLENDE GNEISS | 178.1 | 11,110 psi /1,600 ksf |
| RS-3 | B2-A | 22+41 -L- | 23' LT | 30.2 - 30.6' | METAGRANITE | 160.0 | 7,570 psi /1,090 ksf |
| RS-4 | B2-A | 22+41 -L- | 23' LT | 34.5 - 35.0' | HORNBLENDE GNEISS | 168.4 | 8,230 psi /1,185 ksf |
| RS-5 | B3-B | 23+29 -L- | 20' RT | 35.3 - 35.6' | METAGRANITE | 162.7 | 14,800 psi /2,130 ksf |
| RS-6 | B3-B | 23+29 -L- | 20' RT | 39.3 - 39.8' | HORNBLENDE GNEISS | 190.6 | 9,700 psi /1,397 ksf |

LAB TESTING PERFORMED BY NCDOT LAB CERT NO. 117-1104

## SOIL TEST RESULTS

| SAMPLE NO. | OFFSET | STATION | DEPTH INTERVAL | AASHTO CLASS. | L.L. | P.I. | % BY WEIGHT | | | | % PASSING (SIEVES) | | | % MOISTURE | % ORGANIC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | C. SAND | F. SAND | SILT | CLAY | 10 | 40 | 200 | | |
| ST-1 | 21' RT | 24+01 -L- | 3.0 - 5.0' | A-6(2) | 31 | 13 | 25.2 | 31.3 | 15.2 | 28.2 | 88.1 | 76.9 | 40.8 | 16.0 | - |
| ST-2 | 21' RT | 24+01 -L- | 6.0 - 8.0' | A-7-5(13) | 71 | 28 | 18.7 | 21.8 | 12.8 | 46.7 | 82.0 | 67.1 | 52.0 | 36.8 | - |

LAB TESTING PERFORMED BY NCDOT LAB CERT NO. 134-04

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| B-5846 | 21 |

# SITE PHOTOS


Photo #1: End Bent 2 looking south (downstation)


Photo #2: End Bent 1 looking north/northeast (upstation)


Photo #3: Right side of existing bridge looking north/northwest (upstation)