

REFERENCE: B-6046

PROJECT: 48409

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

STRUCTURE
SUBSURFACE INVESTIGATION

COUNTY STANLY
PROJECT DESCRIPTION REPLACE BRIDGE NO. 102 ON
SR 1917 (BETHLEHEM CHURCH ROAD) OVER
LONG CREEK

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STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-6046	1	19

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 1919 T07-6850. 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:
- 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.
 - 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
C. ODOM
M. BREWER
J.K. STICKNEY

INVESTIGATED BY J.E. BEVERLY
CAROLINAS
GEOTECHNICAL GROUP
 DRAWN BY C.R. LAVENDER, III
 CHECKED BY K. B. MILLER
 SUBMITTED BY APRIL 2022
 DATE

Prepared in the Office of:
 **CAROLINAS GEOTECHNICAL GROUP**
 2400 CROWNPOINT EXECUTIVE DRIVE
 SUITE 800
 CHARLOTTE, NC 28227
 (980) 339-8684

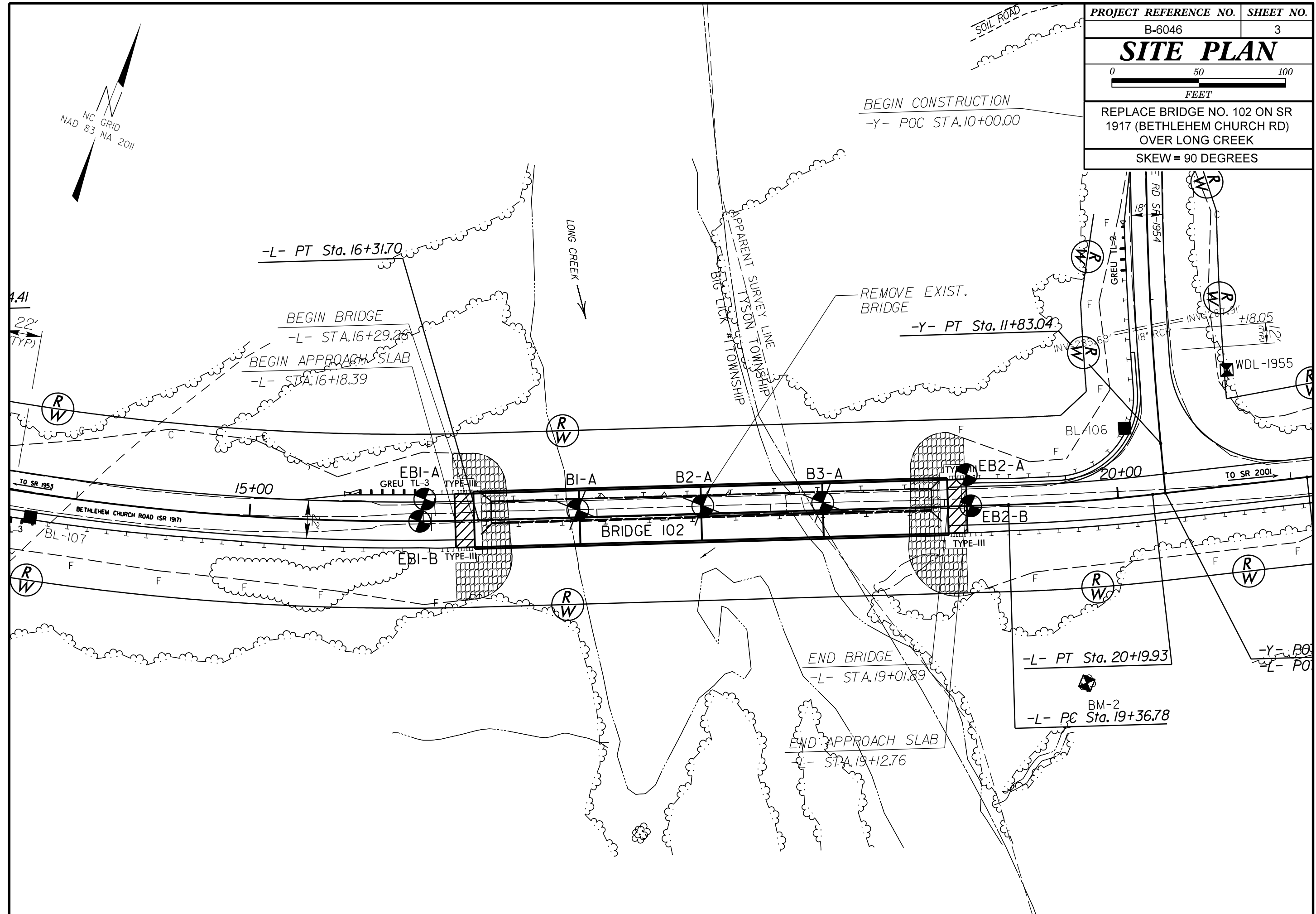
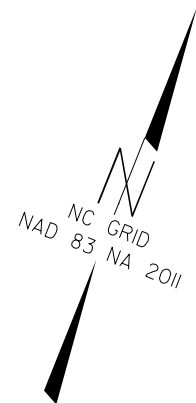
NORTH CAROLINA LICENSED SEAL 2029
 GEOLOGIST
 KEVIN BENNETT MILLER
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DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT
SUBSURFACE INVESTIGATION
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

| SOIL DESCRIPTION
 | | | | | | | | | | GRADATION | | | | | | | | | | ROCK DESCRIPTION | | | | | | | | | | TERMS AND DEFINITIONS
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| <p>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</p>
 | | | | | | | | | | <p>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.</p> | | | | | | | | | | <p>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:</p> | | | | | | | | | | <p>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 (ROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.
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 (SROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.
TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| <p style="text-align: center;">SOIL LEGEND AND AASHTO CLASSIFICATION</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th rowspan="2">GENERAL CLASS.</th> <th colspan="5">GRANULAR MATERIALS (≤ 35% PASSING #200)</th> <th colspan="5">SILT-CLAY MATERIALS (> 35% PASSING #200)</th> <th colspan="5">ORGANIC MATERIALS</th> </tr> <tr> <th>A-1</th> <th>A-3</th> <th>A-2</th> <th>A-2-6</th> <th>A-2-7</th> <th>A-4</th> <th>A-5</th> <th>A-6</th> <th>A-7</th> <th>A-1, A-2</th> <th>A-3</th> <th>A-4, A-5</th> <th>A-6, A-7</th> <th></th> <th></th> <th></th> </tr> <tr> <td>GROUP CLASS.</td> <td>A-1-a</td> <td>A-1-b</td> <td>A-2-4</td> <td>A-2-5</td> <td>A-2-6</td> <td>A-2-7</td> <td></td> <td></td> <td></td> <td>A-1, A-2</td> <td>A-3</td> <td>A-4, A-5</td> <td>A-6, A-7</td> <td></td> <td></td> <td></td> </tr> <tr> <td>SYMBOL</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>% PASSING #10 #40 #200</td> <td>50 MX 30 MX 15 MX</td> <td>50 MX 25 MX</td> <td>51 MN 35 MX 35 MX</td> <td>40 MX 35 MX</td> <td>41 MN 35 MX</td> <td>41 MN 35 MX</td> <td>40 MX 36 MN</td> <td>41 MN 36 MN</td> <td>40 MX 36 MN</td> <td>41 MN 36 MN</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>MATERIAL PASSING #40 LL PI</td> <td>-</td> <td>-</td> <td>40 MX 10 MX</td> <td>41 MN 10 MX</td> <td>41 MN 11 MN</td> <td>40 MX 11 MN</td> <td>40 MX 11 MN</td> <td>40 MX 11 MN</td> <td>40 MX 11 MN</td> <td>40 MX 11 MN</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>GROUP INDEX</td> <td>0</td> <td>0</td> <td>0</td> <td>4 MX</td> <td>8 MX</td> <td>12 MX</td> <td>16 MX</td> <td>NO MX</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>USUAL TYPES OF MAJOR MATERIALS</td> <td>STONE FRAGS. GRAVEL, AND SAND</td> <td>FINE SAND</td> <td>SILTY OR CLAYEY GRAVEL AND SAND</td> <td>SILTY SOILS</td> <td>CLAYEY SOILS</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>GEN. RATING AS SUBGRADE</td> <td colspan="5">EXCELLENT TO GOOD</td> <td colspan="5">FAIR TO POOR</td> <td>FAIR TO POOR</td> <td>POOR</td> <td>UNSATURABLE</td> <td></td> <td></td> <td></td> </tr> <tr> <td colspan="10">PI OF A-7-5 SUBGROUP IS ≤ LL - 30 ; PI OF A-7-6 SUBGROUP IS > LL - 30</td> <td colspan="10"></td> <td colspan="10"></td> </tr> <tr> <td colspan="10"> <p style="text-align: center;">CONSISTENCY OR DENSENESS</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>PRIMARY SOIL TYPE</th> <th>COMPACTNESS OR CONSISTENCY</th> <th>RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE)</th> <th>RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT²)</th> </tr> <tr> <td>GENERALLY GRANULAR MATERIAL (NON-COHESIVE)</td> <td>VERY LOOSE
LOOSE
MEDIUM DENSE
DENSE
VERY DENSE</td> <td>< 4
4 TO 10
10 TO 30
30 TO 50
> 50</td> <td>N/A</td> </tr> <tr> <td>GENERALLY SILT-CLAY MATERIAL (COHESIVE)</td> <td>VERY SOFT
SOFT
MEDIUM STIFF
STIFF
VERY STIFF
HARD</td> <td>< 2
2 TO 4
4 TO 8
8 TO 15
15 TO 30
> 30</td> <td>< 0.25
0.25 TO 0.5
0.5 TO 1.0
1 TO 2
2 TO 4
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SS - SPLIT SPOON
ST - SHELBY TUBE
RS - ROCK
RT - RECOMPACTED TRIAXIAL
CBR - CALIFORNIA BEARING RATIO</p> </td> </tr> </table> </td> </tr> <tr> <td colspan="10"> <p style="text-align: center;">SOIL MOISTURE - CORRELATION OF TERMS</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>SOIL MOISTURE SCALE (ATTERBERG LIMITS)</th> <th>FIELD MOISTURE DESCRIPTION</th> <th>GUIDE FOR FIELD MOISTURE DESCRIPTION</th> </tr> <tr> <td>LL - LIQUID LIMIT</td> <td>- SATURATED - (SAT.)</td> <td>USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE</td> </tr> <tr> <td>PLASTIC RANGE (PI)</td> <td>- WET - (W)</td> <td>SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE</td> </tr> <tr> <td>OM - OPTIMUM MOISTURE SHRINKAGE LIMIT</td> <td>- MOIST - (M)</td> <td>SOLID; AT OR NEAR OPTIMUM MOISTURE</td> </tr> <tr> <td>SL - SHRINKAGE LIMIT</td> <td>- DRY - (D)</td> <td>REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE</td> </tr> </table> </td> <td colspan="10"> <p style="text-align: center;">EQUIPMENT USED ON SUBJECT PROJECT</p> <table border="1"
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 | A-4 | A-5 | A-6 | A-7 | A-1, A-2 | A-3 | A-4, A-5 | A-6, A-7 | | | | GROUP CLASS. | A-1-a | A-1-b | A-2-4 | A-2-5 | A-2-6 | A-2-7 | | | | A-1, A-2 | A-3 | A-4, A-5 | A-6, A-7 | | | | SYMBOL | | | | | | | | | | | | | | | | | % PASSING #10 #40 #200 | 50 MX 30 MX 15 MX | 50 MX 25 MX | 51 MN 35 MX 35 MX | 40 MX 35 MX | 41 MN 35 MX | 41 MN 35 MX | 40 MX 36 MN | 41 MN 36 MN | 40 MX 36 MN | 41 MN 36 MN | | | | | | | MATERIAL PASSING #40 LL PI | - | - | 40 MX 10 MX | 41 MN 10 MX | 41 MN 11 MN | 40 MX 11 MN | 40 MX 11 MN | 40 MX 11 MN | 40 MX 11 MN | 40 MX 11 MN | | | | | | | 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 | UNSATURABLE | | | | PI OF A-7-5 SUBGROUP IS ≤ LL - 30 ; PI OF A-7-6 SUBGROUP IS > LL - 30 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | <p style="text-align: center;">CONSISTENCY OR DENSENESS</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>PRIMARY SOIL TYPE</th> <th>COMPACTNESS OR CONSISTENCY</th> <th>RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE)</th> <th>RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT²)</th> </tr> <tr> <td>GENERALLY GRANULAR MATERIAL (NON-COHESIVE)</td> <td>VERY LOOSE
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MEDIUM STIFF
STIFF
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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 FINGER NAIL. | <p style="text-align: center;">TEXTURE OR GRAIN SIZE</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>U.S. STD. 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SD.)</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>FINE SAND (F SD.)</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>SILT (SL.)</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>CLAY (CL.)</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>GRAIN SIZE</td> <td>305</td> <td>75</td> <td>2.0</td> <td>0.25</td> <td>0.05</td> <td>0.005</td> </tr> <tr> <td>MM</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>IN.</td> <td>12</td> <td>3</td> <td></td> <td></td> <td></td> <td></td> </tr> </table> | | | | | | | | | | U.S. STD. SIEVE SIZE OPENING (MM) | 4 | 10 | 40 | 60 | 200 | 270 | | 4.76 | 2.00 | 0.42 | 0.25 | 0.075 | 0.053 | BOULDER (BLDR.) | | | | | | | COBBLE (COB.) | | | | | | | GRAVEL (GR.) | | | | | | | COARSE SAND (CS. SD.) | | | | | | | FINE SAND (F SD.) | | | | | | | SILT (SL.) | | | | | | | CLAY (CL.) | | | | | | | GRAIN SIZE | 305 | 75 | 2.0 | 0.25 | 0.05 | 0.005 | MM | | | | | | | IN. | 12 | 3 | | | | | <p style="text-align: center;">RECOMMENDATION SYMBOLS</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td></td> <td>UNDERCUT</td> <td></td> <td>UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE</td> <td></td> <td>UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL</td> </tr> <tr> <td></td> <td>SHALLOW UNDERCUT</td> <td></td> <td>UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK</td> <td></td> <td></td> </tr> </table> | | | | | | | | | | | UNDERCUT | | UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE | | UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL | | SHALLOW UNDERCUT | | UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK | | | <p style="text-align: center;">ABBREVIATIONS</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>AR - AUGER REFUSAL</td> <td>CL. - CLAY</td> <td>CPT - CONE PENETRATION TEST</td> <td>CSE. - COARSE</td> <td>DPT -
DILATOMETER TEST</td> <td>DMT - DYNAMIC PENETRATION TEST</td> <td>e - VOID RATIO</td> <td>F - FINE</td> <td>FOSS. - FOSSILIFEROUS</td> <td>FRAC. - FRACTURED, FRACTURES</td> <td>FRAGS. - FRAGMENTS</td> <td>HI. - HIGHLY</td> <td>MED. - MEDIUM</td> <td>MICA. - MICACEOUS</td> <td>MOD. - MODERATELY</td> <td>NP - NON PLASTIC</td> <td>ORG. - ORGANIC</td> <td>PMT - PRESSUREMETER TEST</td> <td>SAP. - SAPROLITIC</td> <td>SD. - SAND, SANDY</td> <td>SL. - SILT, SILTY</td> <td>SLI. - SLIGHTLY</td> <td>TCR - TRICONE REFUSAL</td> <td>w - MOISTURE CONTENT</td> <td>V - VERY</td> <td>VST - VANE SHEAR TEST</td> <td>WEA. - WEATHERED</td> <td>W - UNIT WEIGHT</td> <td>W_d - DRY UNIT WEIGHT</td> </tr> <tr> <td colspan="15"></td> <td colspan="10"> <p style="text-align: center;">SAMPLE ABBREVIATIONS</p> <p>S - BULK
SS - SPLIT SPOON
ST - SHELBY TUBE
RS - ROCK
RT - RECOMPACTED TRIAXIAL
CBR - CALIFORNIA BEARING RATIO</p> </td> </tr> </table> | | | | | | | | | | AR - AUGER REFUSAL | CL. - CLAY | CPT - CONE PENETRATION TEST | CSE. - COARSE | DPT - DILATOMETER TEST | DMT - 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 | W - UNIT WEIGHT | W _d - DRY UNIT WEIGHT | | | | | | | | | | | | | | | | <p style="text-align: center;">SAMPLE ABBREVIATIONS</p> <p>S - BULK
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VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE | PLASTIC RANGE (PI) | - WET - (W) | SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE | OM - OPTIMUM MOISTURE SHRINKAGE LIMIT | - MOIST - (M) | SOLID; AT OR NEAR OPTIMUM MOISTURE | SL - SHRINKAGE LIMIT | - DRY - (D) | REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE | <p style="text-align: center;">EQUIPMENT USED ON SUBJECT PROJECT</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td><input type="checkbox"/> CME-45C</td> <td><input type="checkbox"/> ADVANCING TOOLS:</td> <td><input checked="" type="checkbox"/> AUTOMATIC</td> <td><input type="checkbox"/> MANUAL</td> </tr> <tr> <td><input type="checkbox"/> CME-55</td> <td><input type="checkbox"/> CLAY BITS</td> <td colspan="2">CORE SIZE:</td> </tr> <tr> <td><input type="checkbox"/> CME-550</td> <td><input type="checkbox"/> 6" CONTINUOUS FLIGHT AUGER</td> <td><input type="checkbox"/> -B</td> <td><input type="checkbox"/> -H</td> </tr> <tr> <td><input type="checkbox"/> VANE SHEAR TEST</td> <td><input checked="" type="checkbox"/> 8" HOLLOW AUGERS</td> <td colspan="2">HAND TOOLS:</td> </tr> <tr> <td><input type="checkbox"/> PORTABLE HOIST</td> <td><input type="checkbox"/> HARD FACED FINGER BITS</td> <td><input type="checkbox"/> POST HOLE DIGGER</td> <td></td> </tr> <tr> <td><input checked="" type="checkbox"/> MOBILE B-29</td> <td><input type="checkbox"/> TUNG-CARBIDE INSERTS</td> <td><input type="checkbox"/> HAND AUGER</td> <td></td> </tr> <tr> <td><input type="checkbox"/> DIEDRICH D-50</td> <td><input checked="" type="checkbox"/> CASING</td> <td><input type="checkbox"/> SOUNDING ROD</td> <td></td> </tr> <tr> <td></td> <td><input checked="" type="checkbox"/> W/ ADVANCER</td> <td><input type="checkbox"/> VANE SHEAR TEST</td> <td></td> </tr> <tr> <td></td> <td><input type="checkbox"/> TRICONE</td> <td></td> <td></td> </tr> <tr> <td></td> <td><input type="checkbox"/> TRICONE</td> <td></td> <td></td> </tr> <tr> <td></td> <td><input type="checkbox"/> CORE BIT</td> <td></td> <td></td> </tr> </table> | | | | | | | | | | <input type="checkbox"/> CME-45C | <input type="checkbox"/> ADVANCING TOOLS: | <input checked="" type="checkbox"/> AUTOMATIC | <input type="checkbox"/> MANUAL | <input type="checkbox"/> CME-55 | <input type="checkbox"/> CLAY BITS | CORE SIZE: | | <input type="checkbox"/> CME-550 | <input type="checkbox"/> 6" CONTINUOUS FLIGHT AUGER | <input type="checkbox"/> -B | <input type="checkbox"/> -H | <input type="checkbox"/> VANE SHEAR TEST | <input checked="" type="checkbox"/> 8" HOLLOW AUGERS | HAND TOOLS: | | <input type="checkbox"/> PORTABLE HOIST | <input type="checkbox"/> HARD FACED FINGER BITS | <input type="checkbox"/> POST HOLE DIGGER | | <input checked="" type="checkbox"/> MOBILE B-29 | <input type="checkbox"/> TUNG-CARBIDE INSERTS | <input type="checkbox"/> HAND AUGER | | <input type="checkbox"/> DIEDRICH D-50 | <input checked="" type="checkbox"/> CASING | <input type="checkbox"/> SOUNDING ROD | | | <input checked="" type="checkbox"/> W/ ADVANCER | <input type="checkbox"/> VANE SHEAR TEST | | | <input type="checkbox"/> TRICONE | | | | <input type="checkbox"/> TRICONE | | | | <input type="checkbox"/> CORE BIT | | | <p style="text-align: center;">FRACTURE SPACING</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>TERM</th> <th>SPACING</th> </tr> <tr> <td>VERY WIDE</td> <td>MORE THAN 10 FEET</td> </tr> <tr> <td>WIDE</td> <td>3 TO 10 FEET</td> </tr> <tr> <td>MODERATELY CLOSE</td> <td>1 TO 3 FEET</td> </tr> <tr> <td>CLOSE</td> <td>0.16 TO 1 FOOT</td> </tr> <tr> <td>VERY CLOSE</td> <td>LESS THAN 0.16 FEET</td> </tr> </table> | | | | | | | | | | 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 | <p style="text-align: center;">BEDDING</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>TERM</th> <th>THICKNESS</th> </tr> <tr> <td>VERY THICKLY BEDDED</td> <td>4 FEET</td> </tr> <tr> <td>THICKLY BEDDED</td> <td>1.5 - 4 FEET</td> </tr> <tr> <td>THINLY BEDDED</td> <td>0.16 - 1.5 FEET</td> </tr> <tr> <td>VERY THINLY BEDDED</td> <td>0.03 - 0.16 FEET</td> </tr> <tr> <td>THICKLY LAMINATED</td> <td>0.008 - 0.03 FEET</td> </tr> <tr> <td>THINLY LAMINATED</td> <td>< 0.008 FEET</td> </tr> </table> | | | | | | | | | | 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 | <p style="text-align: center;">PLASTICITY</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>NON PLASTIC</th> <th>PLASTICITY INDEX (PI)</th> <th>DRY STRENGTH</th> </tr> <tr> <td></td> <td>0-5</td> <td>VERY LOW</td> </tr> <tr> <td>SLIGHTLY PLASTIC</td> <td>6-15</td> <td>SLIGHT</td> </tr> <tr> <td>MODERATELY PLASTIC</td> <td>16-25</td> <td>MEDIUM</td> </tr> <tr> <td>HIGHLY PLASTIC</td> <td>26 OR MORE</td> <td>HIGH</td> </tr> </table> | | | | | | | | | | NON PLASTIC | PLASTICITY INDEX (PI) | DRY STRENGTH | | 0-5 | VERY LOW | SLIGHTLY PLASTIC | 6-15 | SLIGHT | MODERATELY PLASTIC | 16-25 | MEDIUM | HIGHLY PLASTIC | 26 OR MORE | HIGH | <p style="text-align: center;">INDURATION</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>TERM</th> <th>DESCRIPTION</th> </tr> <tr> <td>FRIABLE</td> <td>RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.</td> </tr> <tr> <td>MODERATELY INDURATED</td> <td>GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.</td> </tr> <tr> <td>INDURATED</td> <td>GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; 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MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.</p> | | | | | | | | | | <p style="text-align: center;">NOTES:</p> <p>ROADWAY DESIGN FILES PROVIDED BY NCDOT ON 03/10/2022.</p> <p>FIAD = FILLED IMMEDIATELY AFTER DRILLING</p> | | | | | | | | | | <p style="text-align: center;">BENCH MARK: BL-107, N-538, 629, 6280, E-1, 623, 668, 9390, ELEV. - 306.19 FT</p> <p style="text-align: center;">BL-106, N-538, 910, 1580, E-1,
624, 234, 7820, ELEV. - 291.22 FT</p> <p style="text-align: center;">ELEVATION: FEET</p> | | | | | | | | | |
| GENERAL CLASS.
 | GRANULAR MATERIALS (≤ 35% PASSING #200) | | | | | SILT-CLAY MATERIALS (> 35% PASSING #200) | | | | | ORGANIC MATERIALS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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 | A-1 | A-3 | A-2 | A-2-6 | A-2-7 | A-4 | A-5 | A-6 | A-7 | A-1, A-2 | A-3 | A-4, A-5 | A-6, A-7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| GROUP CLASS.
 | A-1-a | A-1-b | A-2-4 | A-2-5 | A-2-6 | A-2-7 | | | | A-1, A-2 | A-3 | A-4, A-5 | A-6, A-7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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 | 50 MX 30 MX 15 MX | 50 MX 25 MX | 51 MN 35 MX 35 MX | 40 MX 35 MX | 41 MN 35 MX | 41 MN 35 MX | 40 MX 36 MN | 41 MN 36 MN | 40 MX 36 MN | 41 MN 36 MN | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| <p style="text-align: center;">CONSISTENCY OR DENSENESS</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>PRIMARY SOIL TYPE</th> <th>COMPACTNESS OR CONSISTENCY</th> <th>RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE)</th> <th>RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT²)</th> </tr> <tr> <td>GENERALLY GRANULAR MATERIAL (NON-COHESIVE)</td> <td>VERY LOOSE
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 | | | | | | | | | | PRIMARY SOIL TYPE | COMPACTNESS OR CONSISTENCY | RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE) | RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT ²) | GENERALLY GRANULAR MATERIAL (NON-COHESIVE) | VERY LOOSE
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10 TO 30
30 TO 50
> 50 | N/A | GENERALLY SILT-CLAY MATERIAL (COHESIVE) | VERY SOFT
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> 4 | <p style="text-align: center;">MISCELLANEOUS SYMBOLS</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td></td> <td>ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION</td> <td></td> <td>DIP & DIP DIRECTION OF ROCK STRUCTURES</td> <td></td> <td>SOIL SYMBOL</td> <td></td> <td>TEST BORING</td> <td></td> <td>SLOPE INDICATOR INSTALLATION</td> </tr> <tr> <td></td> <td>ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT</td> <td></td> <td>AUGER BORING</td> <td></td> <td>CONE PENETROMETER TEST</td> <td></td> <td>CORE BORING</td> <td></td> <td>SOUNDING ROD</td> </tr> <tr> <td></td> <td>INFERRED SOIL BOUNDARY</td> <td></td> <td>MONITORING WELL</td> <td></td> <td>PIEZOMETER INSTALLATION</td> <td></td> <td>TEST BORING WITH CORE</td> <td></td> <td>SPT N-VALUE</td> </tr> <tr> <td></td> <td>INFERRED ROCK LINE</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td>ALLUVIAL SOIL BOUNDARY</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| <p style="text-align: center;">TEXTURE OR GRAIN SIZE</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>U.S. STD. SIEVE SIZE OPENING (MM)</th> <th>4</th> <th>10</th> <th>40</th> <th>60</th> <th>200</th> <th>270</th> </tr> <tr> <td></td> <td>4.76</td> <td>2.00</td> <td>0.42</td> <td>0.25</td> <td>0.075</td> <td>0.053</td> </tr> <tr> <td>BOULDER (BLDR.)</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>COBBLE (COB.)</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>GRAVEL (GR.)</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>COARSE SAND (CS. SD.)</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>FINE SAND (F SD.)</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>SILT (SL.)</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>CLAY (CL.)</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>GRAIN SIZE</td> <td>305</td> <td>75</td> <td>2.0</td> <td>0.25</td> <td>0.05</td> <td>0.005</td> </tr> <tr> <td>MM</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>IN.</td> <td>12</td> <td>3</td> <td></td> <td></td> <td></td> <td></td> </tr> </table>
 | | | | | | | | | | U.S. STD. SIEVE SIZE OPENING (MM) | 4 | 10 | 40 | 60 | 200 | 270 | | 4.76 | 2.00 | 0.42 | 0.25 | 0.075 | 0.053 | BOULDER (BLDR.) | | | | | |
 | COBBLE (COB.) | | | | | | | GRAVEL (GR.) | | | | | | | COARSE SAND (CS. SD.) | | | | | | | FINE SAND (F SD.) | | | | | | | SILT (SL.) | | | | | | | CLAY (CL.) | | | | | | | GRAIN SIZE | 305 | 75 | 2.0 | 0.25 | 0.05 | 0.005 | MM | | | | | | | IN. | 12 | 3 | | | | | <p style="text-align: center;">RECOMMENDATION SYMBOLS</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td></td> <td>UNDERCUT</td> <td></td> <td>UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE</td> <td></td> <td>UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL</td> </tr> <tr> <td></td> <td>SHALLOW UNDERCUT</td> <td></td> <td>UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK</td> <td></td> <td></td> </tr> </table> | | | | | | | | | | | UNDERCUT | | UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE | | UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL | | SHALLOW UNDERCUT | | UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK | | | <p style="text-align: center;">ABBREVIATIONS</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>AR - AUGER REFUSAL</td> <td>CL. - CLAY</td> <td>CPT - CONE PENETRATION TEST</td> <td>CSE. - COARSE</td> <td>DPT - DILATOMETER TEST</td> <td>DMT - DYNAMIC PENETRATION TEST</td> <td>e - VOID RATIO</td> <td>F - FINE</td> <td>FOSS. - FOSSILIFEROUS</td> <td>FRAC. - FRACTURED, FRACTURES</td> <td>FRAGS. - FRAGMENTS</td> <td>HI. - HIGHLY</td> <td>MED. - MEDIUM</td> <td>MICA. - MICACEOUS</td> <td>MOD. - MODERATELY</td> <td>NP - NON PLASTIC</td> <td>ORG. - ORGANIC</td> <td>PMT - PRESSUREMETER TEST</td> <td>SAP. - SAPROLITIC</td> <td>SD. - SAND, SANDY</td> <td>SL. - SILT, SILTY</td> <td>SLI. - SLIGHTLY</td> <td>TCR - TRICONE REFUSAL</td> <td>w - MOISTURE CONTENT</td> <td>V - VERY</td>
<td>VST - VANE SHEAR TEST</td> <td>WEA. - WEATHERED</td> <td>W - UNIT WEIGHT</td> <td>W_d - DRY UNIT WEIGHT</td> </tr> <tr> <td colspan="15"></td> <td colspan="10"> <p style="text-align: center;">SAMPLE ABBREVIATIONS</p> <p>S - BULK
SS - SPLIT SPOON
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RT - RECOMPACTED TRIAXIAL
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SS - SPLIT SPOON
ST - SHELBY TUBE
RS - ROCK
RT - RECOMPACTED TRIAXIAL
CBR - CALIFORNIA BEARING RATIO</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| <p style="text-align: center;">SOIL MOISTURE - CORRELATION OF TERMS</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>SOIL MOISTURE SCALE (ATTERBERG LIMITS)</th> <th>FIELD MOISTURE DESCRIPTION</th> <th>GUIDE FOR FIELD MOISTURE DESCRIPTION</th> </tr> <tr> <td>LL - LIQUID LIMIT</td> <td>- SATURATED - (SAT.)</td> <td>USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE</td> </tr> <tr> <td>PLASTIC RANGE (PI)</td> <td>- WET - (W)</td> <td>SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE</td> </tr> <tr> <td>OM - OPTIMUM MOISTURE SHRINKAGE LIMIT</td> <td>- MOIST - (M)</td> <td>SOLID; AT OR NEAR OPTIMUM MOISTURE</td> </tr> <tr> <td>SL - SHRINKAGE LIMIT</td> <td>- DRY - (D)</td> <td>REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE</td> </tr> </table>
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 | FIELD MOISTURE DESCRIPTION | GUIDE FOR FIELD MOISTURE DESCRIPTION | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| LL - LIQUID LIMIT
 | - SATURATED - (SAT.) | USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| OM - OPTIMUM MOISTURE SHRINKAGE LIMIT
 | - MOIST - (M) | SOLID; AT OR NEAR OPTIMUM MOISTURE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| SL - SHRINKAGE LIMIT
 | - DRY - (D) | REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| <input type="checkbox"/> CME-45C
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| <input type="checkbox"/> CME-550
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| <p style="text-align: center;">PLASTICITY</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>NON PLASTIC</th> <th>PLASTICITY INDEX (PI)</th> <th>DRY STRENGTH</th> </tr> <tr> <td></td> <td>0-5</td> <td>VERY LOW</td> </tr> <tr> <td>SLIGHTLY PLASTIC</td> <td>6-15</td> <td>SLIGHT</td> </tr> <tr> <td>MODERATELY PLASTIC</td> <td>16-25</td> <td>MEDIUM</td> </tr> <tr> <td>HIGHLY PLASTIC</td> <td>26 OR MORE</td> <td>HIGH</td> </tr> </table>
 | | | | | | | | | | NON PLASTIC | PLASTICITY INDEX (PI) | DRY STRENGTH | | 0-5 | VERY LOW | SLIGHTLY PLASTIC | 6-15 | SLIGHT | MODERATELY PLASTIC | 16-25 | MEDIUM | HIGHLY PLASTIC | 26 OR MORE | HIGH | <p style="text-align: center;">INDURATION</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>TERM</th> <th>DESCRIPTION</th> </tr> <tr> <td>FRIABLE</td> <td>RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.</td> </tr> <tr> <td>MODERATELY INDURATED</td> <td>GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.</td> </tr> <tr> <td>INDURATED</td> <td>GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.</td> </tr> <tr> <td>EXTREMELY INDURATED</td> <td>SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.</td> </tr> </table> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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 | SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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 | | | | | | | | | |
| <p style="text-align: center;">COLOR</p> <p>DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-BROWN). MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.</p>
 | | | | | | | | | | <p style="text-align: center;">NOTES:</p> <p>ROADWAY DESIGN FILES PROVIDED BY NCDOT ON 03/10/2022.</p> <p>FIAD = FILLED IMMEDIATELY AFTER DRILLING</p> | | | | | | | | | | <p style="text-align: center;">BENCH MARK: BL-107, N-538, 629, 6280, E-1, 623, 668, 9390, ELEV. - 306.19 FT</p> <p style="text-align: center;">BL-106, N-538, 910, 1580, E-1, 624, 234, 7820, ELEV. - 291.22 FT</p> <p style="text-align: center;">ELEVATION: FEET</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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PROJECT REFERENCE NO.	SHEET NO.
B-6046	3
SITE PLAN	
 0 50 100 FEET	
REPLACE BRIDGE NO. 102 ON SR 1917 (BETHLEHEM CHURCH RD) OVER LONG CREEK SKEW = 90 DEGREES	



BEGIN CONSTRUCTION
-Y- POC STA. 10+00.00

-L- PT Sta. 16+31.70
BEGIN BRIDGE
-L- STA. 16+29.26
BEGIN APPROACH SLAB
-L- STA. 16+18.39

REMOVE EXIST.
BRIDGE
-Y- PT Sta. 11+83.04

END BRIDGE
-L- STA. 19+01.89
END APPROACH SLAB
-L- STA. 19+12.76

-L- PT Sta. 20+19.93
BM-2
-L- PC Sta. 19+36.78

4.41
22'
(TYP)

TO SR 1953

BETHLEHEM CHURCH ROAD (SR 1917)

BL-107

R/W

15+00

EBI-A
GREU TL-3
TYPE III

R/W

R/W

BI-A

B2-A

B3-A

EB2-A

EB2-B

TYPE-III

R/W

R/W

20+00

TO SR 2001

-Y- POC
-L- PO

GREU TL-3

BL-106

WDL-1955

+18.05

RD STA-1954

18' RCP

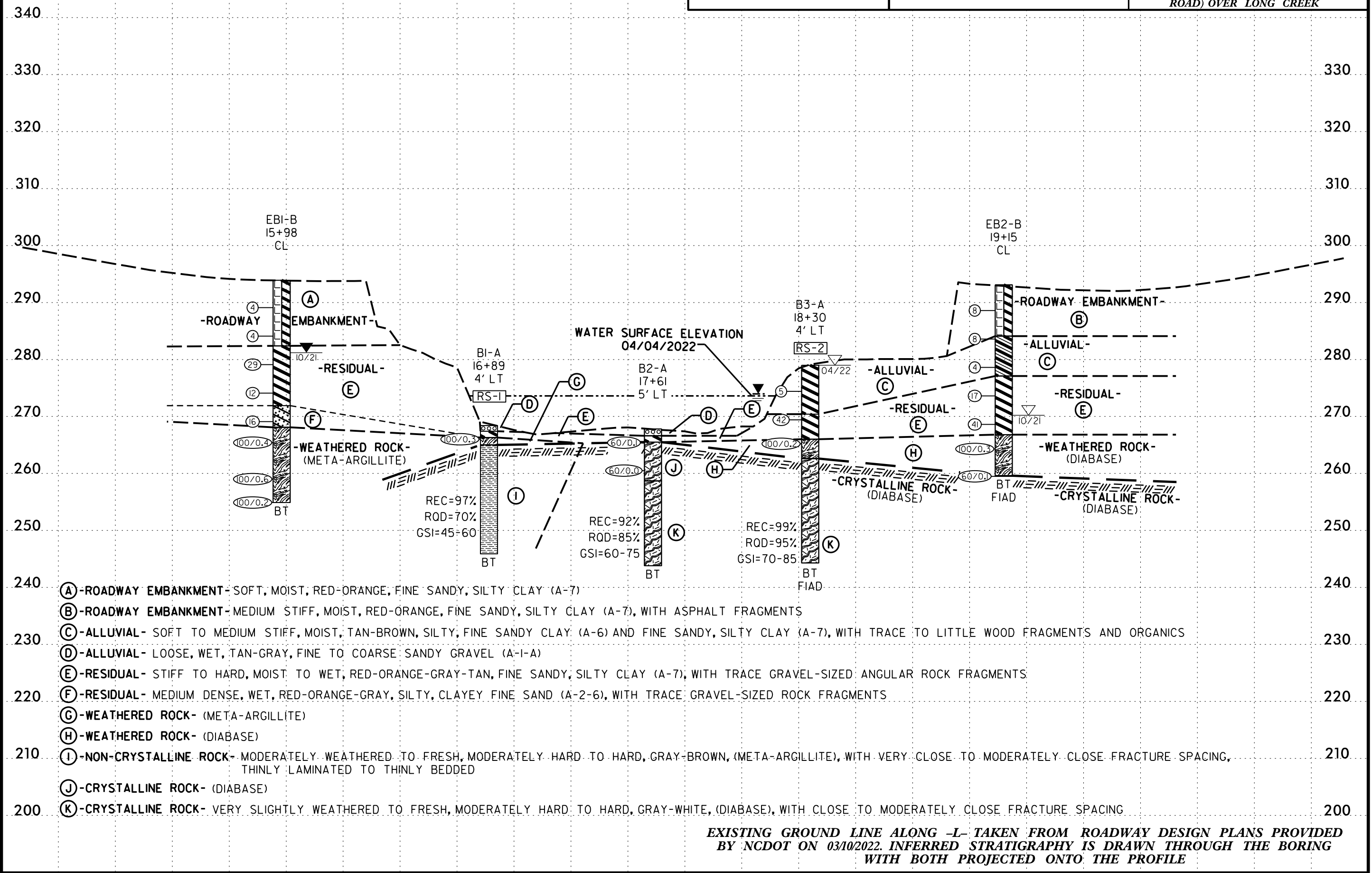
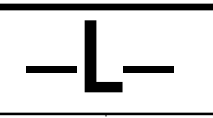
INV. 235.69'

APPARENT SURVEY LINE
TYSON TOWNSHIP
BIG LICK #1 TOWNSHIP

LONG CREEK

SOIL ROAD

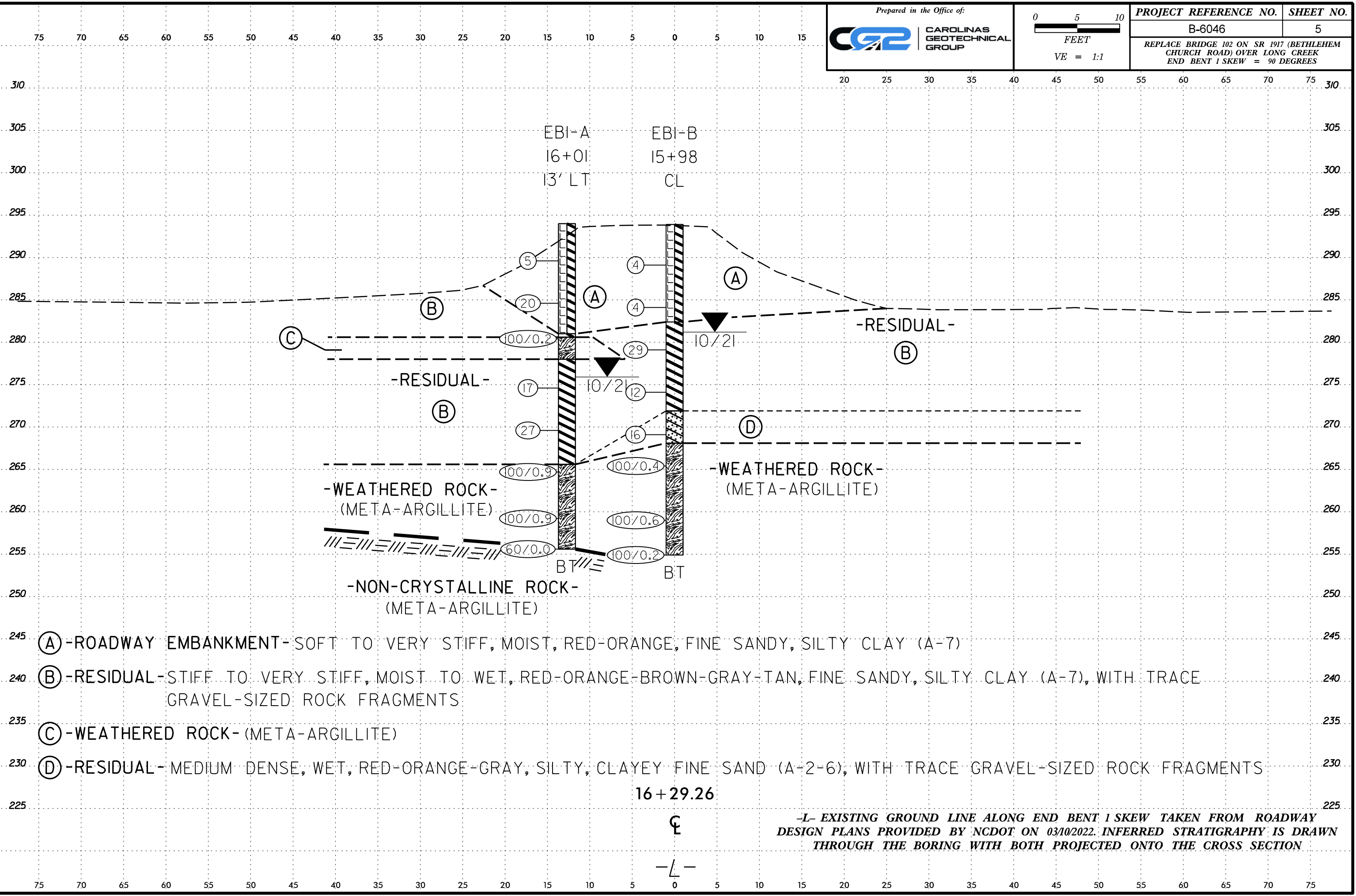
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- (A) -ROADWAY EMBANKMENT- SOFT, MOIST, RED-ORANGE, FINE SANDY, SILTY CLAY (A-7)
- (B) -ROADWAY EMBANKMENT- MEDIUM STIFF, MOIST, RED-ORANGE, FINE SANDY, SILTY CLAY (A-7), WITH ASPHALT FRAGMENTS
- (C) -ALLUVIAL- SOFT TO MEDIUM STIFF, MOIST, TAN-BROWN, SILTY, FINE SANDY CLAY (A-6) AND FINE SANDY, SILTY CLAY (A-7), WITH TRACE TO LITTLE WOOD FRAGMENTS AND ORGANICS
- (D) -ALLUVIAL- LOOSE, WET, TAN-GRAY, FINE TO COARSE SANDY GRAVEL (A-1-A)
- (E) -RESIDUAL- STIFF TO HARD, MOIST TO WET, RED-ORANGE-GRAY-TAN, FINE SANDY, SILTY CLAY (A-7), WITH TRACE GRAVEL-SIZED ANGULAR ROCK FRAGMENTS
- (F) -RESIDUAL- MEDIUM DENSE, WET, RED-ORANGE-GRAY, SILTY, CLAYEY FINE SAND (A-2-6), WITH TRACE GRAVEL-SIZED ROCK FRAGMENTS
- (G) -WEATHERED ROCK- (META-ARGILLITE)
- (H) -WEATHERED ROCK- (DIABASE)
- (I) -NON-CRYSTALLINE ROCK- MODERATELY WEATHERED TO FRESH, MODERATELY HARD TO HARD, GRAY-BROWN, (META-ARGILLITE), WITH VERY CLOSE TO MODERATELY CLOSE FRACTURE SPACING, THINLY LAMINATED TO THINLY BEDDED
- (J) -CRYSTALLINE ROCK- (DIABASE)
- (K) -CRYSTALLINE ROCK- VERY SLIGHTLY WEATHERED TO FRESH, MODERATELY HARD TO HARD, GRAY-WHITE, (DIABASE), WITH CLOSE TO MODERATELY CLOSE FRACTURE SPACING

EXISTING GROUND LINE ALONG -L- TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY NCDOT ON 03/10/2022. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING WITH BOTH PROJECTED ONTO THE PROFILE

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16+29.26

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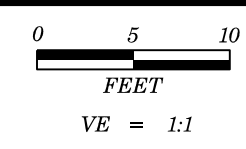
-L- EXISTING GROUND LINE ALONG END BENT 1 SKEW TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY NCDOT ON 03/10/2022. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING WITH BOTH PROJECTED ONTO THE CROSS SECTION

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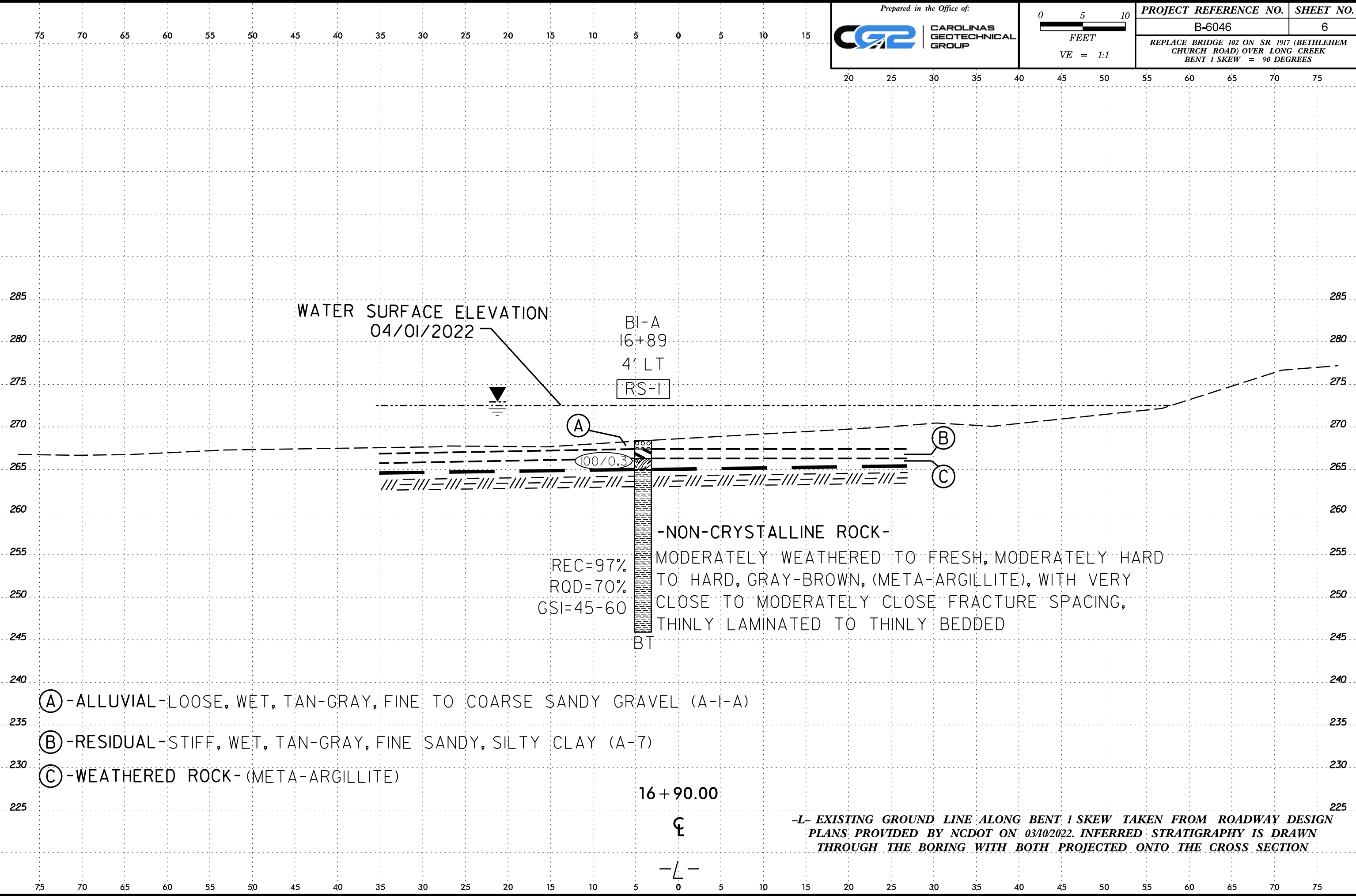
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**CAROLINAS
GEOTECHNICAL
GROUP**



PROJECT REFERENCE NO. B-6046	SHEET NO. 6
REPLACE BRIDGE 102 ON SR 1917 (BETHLEHEM CHURCH ROAD) OVER LONG CREEK BENT 1 SKEW = 90 DEGREES	



WATER SURFACE ELEVATION
04/01/2022

BI-A
16+89
4' LT
RS-1

REC=97%
RQD=70%
GSI=45-60

-NON-CRYSTALLINE ROCK-
MODERATELY WEATHERED TO FRESH, MODERATELY HARD
TO HARD, GRAY-BROWN, (META-ARGILLITE), WITH VERY
CLOSE TO MODERATELY CLOSE FRACTURE SPACING,
THINLY LAMINATED TO THINLY BEDDED


- Ⓐ - ALLUVIAL - LOOSE, WET, TAN-GRAY, FINE TO COARSE SANDY GRAVEL (A-I-A)
- Ⓑ - RESIDUAL - STIFF, WET, TAN-GRAY, FINE SANDY, SILTY CLAY (A-7)
- Ⓒ - WEATHERED ROCK - (META-ARGILLITE)

16+90.00

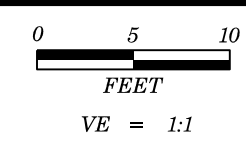
-L- EXISTING GROUND LINE ALONG BENT 1 SKEW TAKEN FROM ROADWAY DESIGN
PLANS PROVIDED BY NCDOT ON 03/10/2022. INFERRED STRATIGRAPHY IS DRAWN
THROUGH THE BORING WITH BOTH PROJECTED ONTO THE CROSS SECTION

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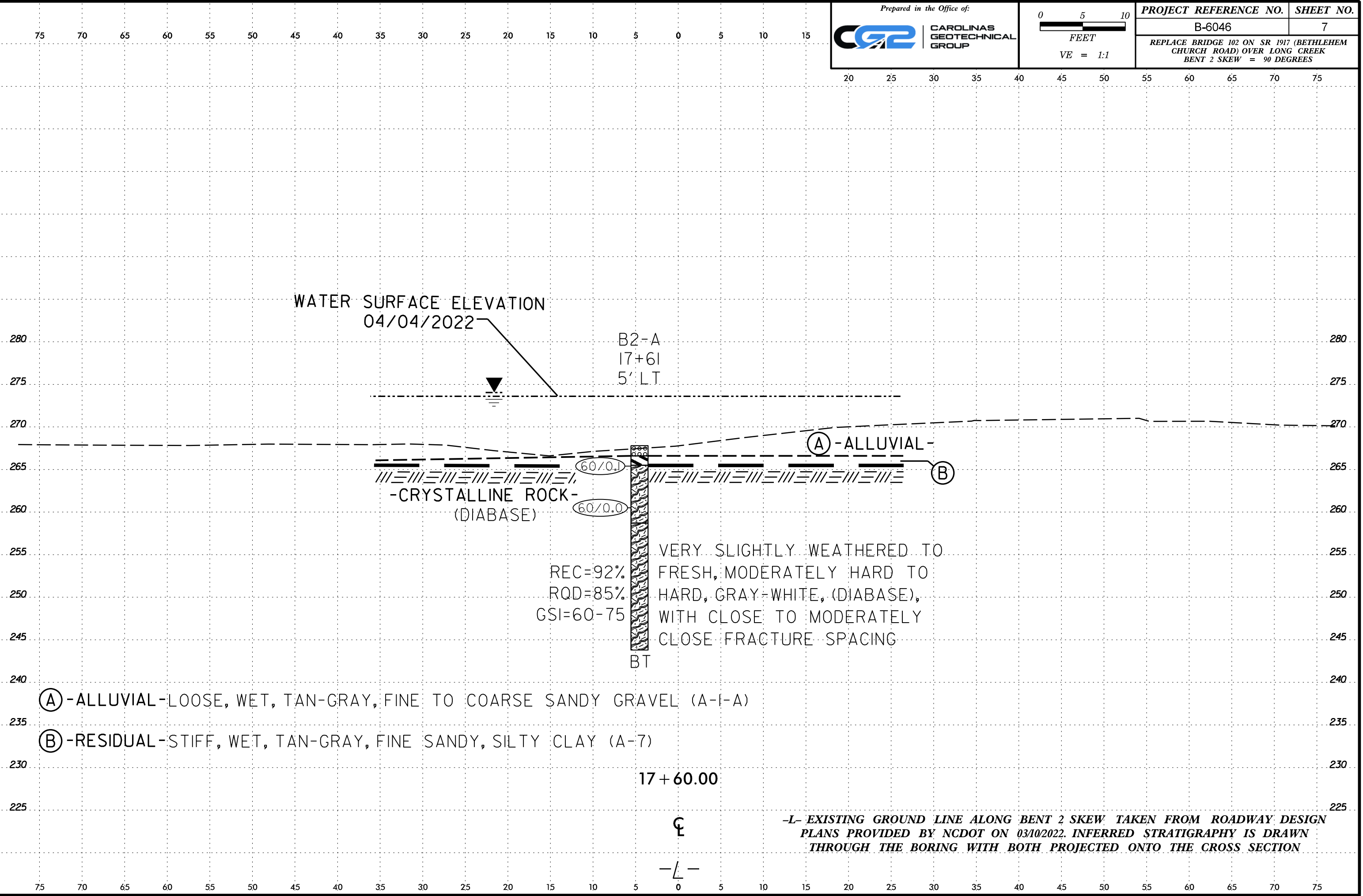
Prepared in the Office of:



**CAROLINAS
GEOTECHNICAL
GROUP**



PROJECT REFERENCE NO.	SHEET NO.
B-6046	7
REPLACE BRIDGE 102 ON SR 1917 (BETHLEHEM CHURCH ROAD) OVER LONG CREEK BENT 2 SKEW = 90 DEGREES	



WATER SURFACE ELEVATION
04/04/2022

B2-A
17+61
5' LT

CRYSTALLINE ROCK -
(DIABASE)

REC=92%
RQD=85%
GSI=60-75

VERY SLIGHTLY WEATHERED TO
FRESH, MODERATELY HARD TO
HARD, GRAY-WHITE, (DIABASE),
WITH CLOSE TO MODERATELY
CLOSE FRACTURE SPACING

BT

(A) - ALLUVIAL -

(B)

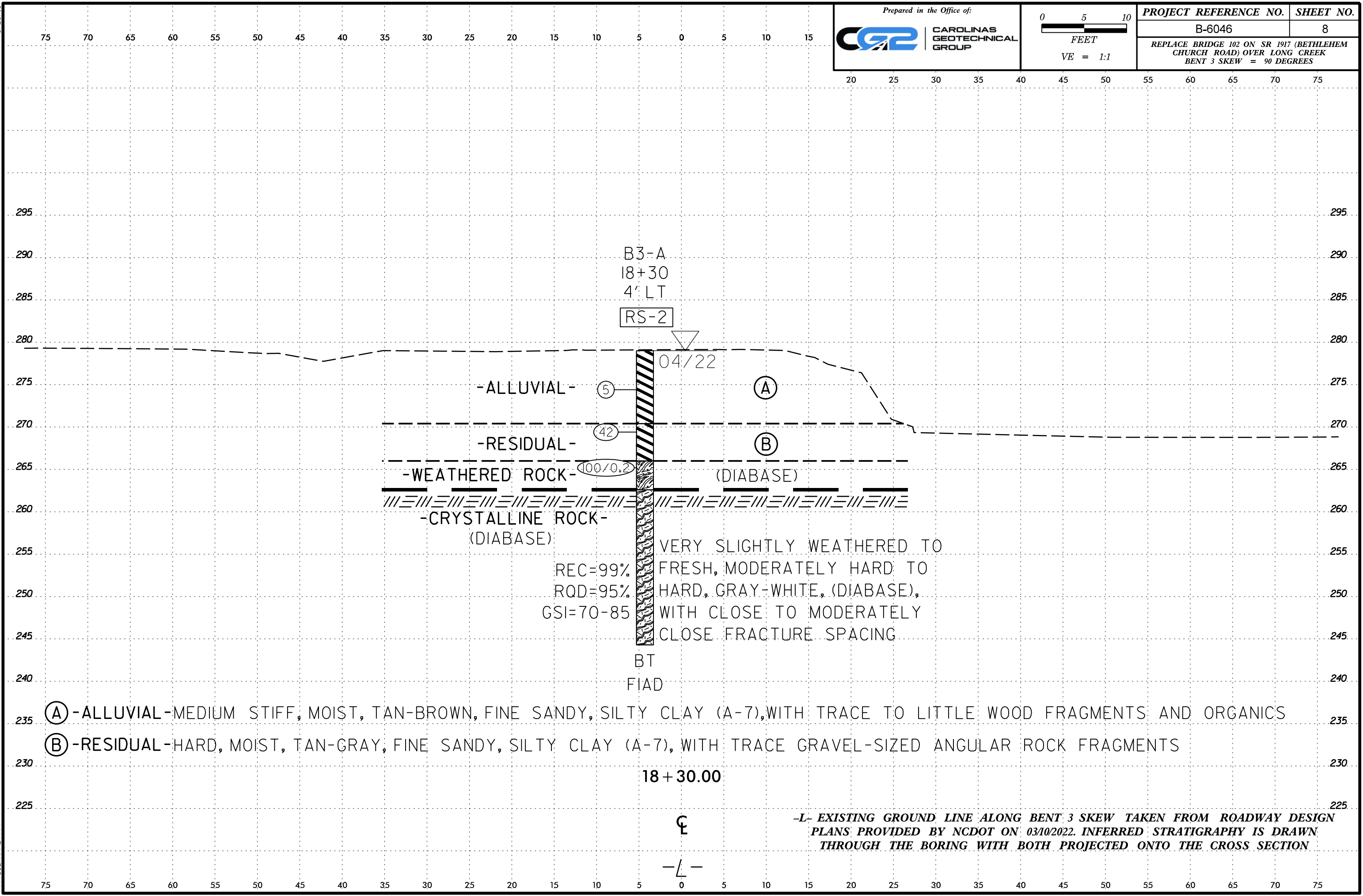
(A) - ALLUVIAL - LOOSE, WET, TAN-GRAY, FINE TO COARSE SANDY GRAVEL (A-I-A)

(B) - RESIDUAL - STIFF, WET, TAN-GRAY, FINE SANDY, SILTY CLAY (A-7)

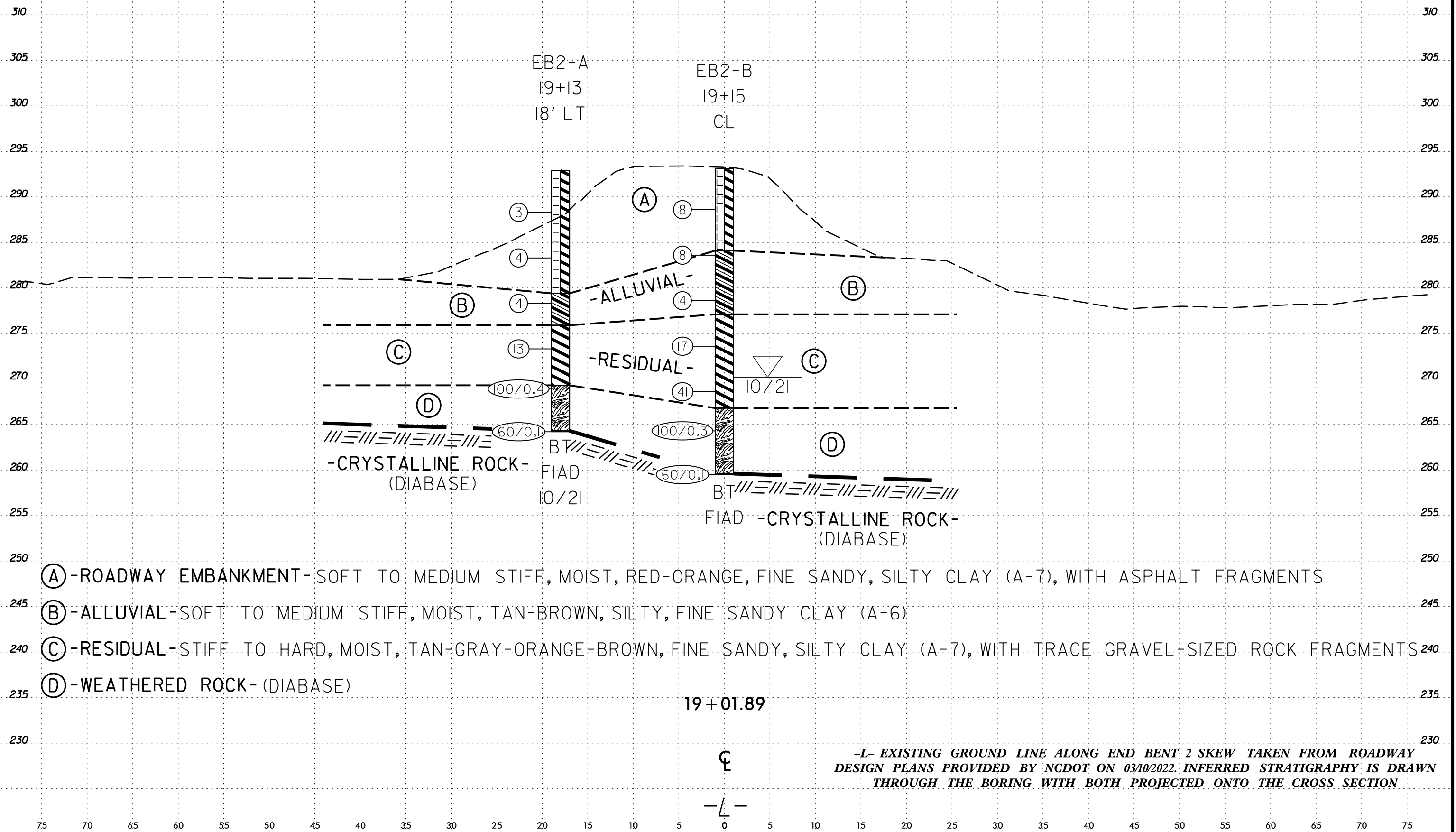
17 + 60.00

-L- EXISTING GROUND LINE ALONG BENT 2 SKEW TAKEN FROM ROADWAY DESIGN
PLANS PROVIDED BY NCDOT ON 03/10/2022. INFERRED STRATIGRAPHY IS DRAWN
THROUGH THE BORING WITH BOTH PROJECTED ONTO THE CROSS SECTION

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-L- EXISTING GROUND LINE ALONG END BENT 2 SKEW TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY NCDOT ON 03/10/2022. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING WITH BOTH PROJECTED ONTO THE CROSS SECTION

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 48409.1.1		TIP B-6046		COUNTY STANLY		GEOLOGIST Stickney, J. K.											
SITE DESCRIPTION Replace Bridge No. 102 on SR 1917 (Bethlehem Church Road) over Long Creek							GROUND WTR (ft)										
BORING NO. EB1-A		STATION 16+01		OFFSET 13 ft LT		ALIGNMENT -L-											
COLLAR ELEV. 294.0 ft		TOTAL DEPTH 38.4 ft		NORTHING 538,723		EASTING 1,623,876											
DRILL RIG/HAMMER EFF./DATE CG29022 Mobile B-29 81%/03/12/2021			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic											
DRILLER M. Brewer		START DATE 10/27/21		COMP. DATE 10/27/21		SURFACE WATER DEPTH N/A											
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)			
			0.5ft	0.5ft	0.5ft	0	25	50	75	100							
295														294.0	0.0	GROUND SURFACE	
290	290.6	3.4	3	2	3								M			ROADWAY EMBANKMENT Medium Stiff to Very Stiff, Red-Orange, Fine Sandy, Silty CLAY (A-7)	
285	285.6	8.4	10	9	11								M				
280	280.6	13.4	100/0.2										M				
275	275.6	18.4	8	8	9								W			RESIDUAL Very Stiff, Orange-Tan-Brown, Fine Sandy, Silty CLAY (A-7), with trace gravel-sized rock fragments	
270	270.6	23.4	12	8	19								W			RESIDUAL Very Stiff, Orange-Tan-Brown, Fine Sandy, Silty CLAY (A-7), with trace gravel-sized rock fragments	
265	265.6	28.4	47	53/0.4													
260	260.6	33.4	47	30	70/0.4												
	255.6	38.4	60/0.0														Boring Terminated with Standard Penetration Test Refusal at Elevation 255.6 ft On Non-Crystalline Rock (META-ARGILLITE)
															Notes: Intermittent Layers of Hard and Soft Drilling between 28.4-38.4 ft below existing grade.		

WBS 48409.1.1		TIP B-6046		COUNTY STANLY		GEOLOGIST Stickney, J. K.											
SITE DESCRIPTION Replace Bridge No. 102 on SR 1917 (Bethlehem Church Road) over Long Creek							GROUND WTR (ft)										
BORING NO. EB1-B		STATION 15+98		OFFSET CL		ALIGNMENT -L-											
COLLAR ELEV. 293.9 ft		TOTAL DEPTH 39.0 ft		NORTHING 538,710		EASTING 1,623,878											
DRILL RIG/HAMMER EFF./DATE CG29022 Mobile B-29 81%/03/12/2021			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic											
DRILLER M. Brewer		START DATE 10/27/21		COMP. DATE 10/27/21		SURFACE WATER DEPTH N/A											
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)			
			0.5ft	0.5ft	0.5ft	0	25	50	75	100							
295														293.9	0.0	GROUND SURFACE	
290	290.1	3.8	1	2	2								M			ROADWAY EMBANKMENT Soft, Red-Orange, Fine Sandy, Silty CLAY (A-7)	
285	285.1	8.8	1	2	2								M				
280	280.1	13.8	8	12	17								M				
275	275.1	18.8	5	6	6								W			RESIDUAL Stiff to Very Stiff, Red-Orange-Gray, Fine Sandy, Silty CLAY (A-7), with trace gravel-sized rock fragments	
270	270.1	23.8	6	6	10								W			RESIDUAL Stiff to Very Stiff, Red-Orange-Gray, Fine Sandy, Silty CLAY (A-7), with trace gravel-sized rock fragments	
265	265.8	28.1	100/0.4														
260	260.1	33.8	6	42	58/0.1												
255	255.1	38.8	100/0.2														Boring Terminated at Elevation 254.9 ft In Weathered Rock (META-ARGILLITE)
															Notes: Intermittent Layers of Hard and Soft Drilling between 25.8-38.8 ft below existing grade.		

NCDOT BORE DOUBLE B-6046_GEO_BRDG102_STANLY.GPJ_NC_DOT.GDT 4/15/22

GEOTECHNICAL BORING REPORT BORE LOG

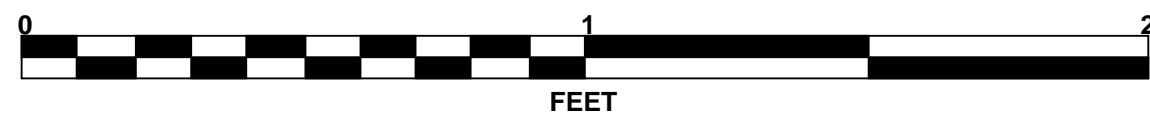
GEOTECHNICAL BORING REPORT CORE LOG

WBS 48409.1.1		TIP B-6046		COUNTY STANLY		GEOLOGIST Stickney, J. K.										
SITE DESCRIPTION Replace Bridge No. 102 on SR 1917 (Bethlehem Church Road) over Long Creek							GROUND WTR (ft)									
BORING NO. B1-A		STATION 16+89		OFFSET 4 ft LT		ALIGNMENT -L-										
COLLAR ELEV. 268.4 ft		TOTAL DEPTH 22.5 ft		NORTHING 538,750		EASTING 1,623,960										
DRILL RIGHAMMER EFF./DATE CG20446 Diedrich D50 76% 06/14/2021		DRILL METHOD SPT Core Boring		HAMMER TYPE Automatic												
DRILLER C. Odom		START DATE 04/01/22		COMP. DATE 04/01/22		SURFACE WATER DEPTH 4.1ft										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION			
			0.5ft	0.5ft	0.5ft	0	25	50	75	100			ELEV. (ft)	DEPTH (ft)		
270																
	266.3	2.1														
265			100/0.3													
260																
255																
250																

WBS 48409.1.1		TIP B-6046		COUNTY STANLY		GEOLOGIST Stickney, J. K.						
SITE DESCRIPTION Replace Bridge No. 102 on SR 1917 (Bethlehem Church Road) over Long Creek							GROUND WTR (ft)					
BORING NO. B1-A		STATION 16+89		OFFSET 4 ft LT		ALIGNMENT -L-						
COLLAR ELEV. 268.4 ft		TOTAL DEPTH 22.5 ft		NORTHING 538,750		EASTING 1,623,960						
DRILL RIGHAMMER EFF./DATE CG20446 Diedrich D50 76% 06/14/2021		DRILL METHOD SPT Core Boring		HAMMER TYPE Automatic								
DRILLER C. Odom		START DATE 04/01/22		COMP. DATE 04/01/22		SURFACE WATER DEPTH 4.1ft						
CORE SIZE NQ		TOTAL RUN 19.1 ft										
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		SAMP. NO.	STRATA		LOG	DESCRIPTION AND REMARKS	
					REC. (ft) %	RQD (ft) %		REC. (ft) %	RQD (ft) %		ELEV. (ft)	DEPTH (ft)
264.97	265.0	3.4	4.1		(4.0) 98%	(3.1) 76%		(18.5) 97%	(13.3) 70%			
	260.9	7.5			(4.8) 96%	(2.9) 58%	RS-1					
260			5.0									
	255.9	12.5			(5.0) 100%	(3.0) 60%						
255			5.0									
	250.9	17.5			(4.7) 94%	(4.3) 86%						
250			5.0									
	245.9	22.5										



Bridge No. 102 on SR 1917 (Bethlehem Church Road) over
Long Creek
Rock Core Photographs
Boring: B1-A
3.4 to 22.5 Feet



GEOTECHNICAL BORING REPORT BORE LOG

GEOTECHNICAL BORING REPORT CORE LOG

WBS 48409.1.1		TIP B-6046		COUNTY STANLY		GEOLOGIST Stickney, J. K.							
SITE DESCRIPTION Replace Bridge No. 102 on SR 1917 (Bethlehem Church Road) over Long Creek							GROUND WTR (ft)						
BORING NO. B2-A		STATION 17+61		OFFSET 5 ft LT		ALIGNMENT -L-							
COLLAR ELEV. 267.8 ft		TOTAL DEPTH 24.0 ft		NORTHING 538,779		EASTING 1,624,026							
DRILL RIG/HAMMER EFF/DATE CG20446 Diedrich D50 76%/06/14/2021			DRILL METHOD SPT Core Boring			HAMMER TYPE Automatic							
DRILLER C. Odom		START DATE 04/04/22		COMP. DATE 04/04/22		SURFACE WATER DEPTH 5.8ft							
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT				SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)
			0.5ft	0.5ft	0.5ft	0	25	50	75				
275													
270													
265	265.5	2.3											
260	260.5	7.3	60/0.1										
255													
250													
245													

WATER SURFACE (04/04/22) -----

GROUND SURFACE -----

267.8 GROUND SURFACE 0.0

266.6 ALLUVIAL 1.2

265.5 Loose, Tan-Gray, Fine to Coarse Sandy GRAVEL (A-1-a) 2.3

RESIDUAL

Stiff, Tan-Gray, Fine Sandy, Silty CLAY (A-7)

CRYSTALLINE ROCK

Gray, (DIABASE) 9.1

Gray-White (DIABASE)

REC=92%

RQD=85%

GSI=60-75

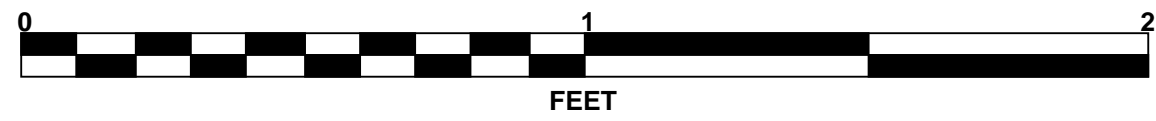
258.7

243.8 Boring Terminated at Elevation 243.8 ft In Crystalline Rock (DIABASE) 24.0

WBS 48409.1.1		TIP B-6046		COUNTY STANLY		GEOLOGIST Stickney, J. K.						
SITE DESCRIPTION Replace Bridge No. 102 on SR 1917 (Bethlehem Church Road) over Long Creek							GROUND WTR (ft)					
BORING NO. B2-A		STATION 17+61		OFFSET 5 ft LT		ALIGNMENT -L-						
COLLAR ELEV. 267.8 ft		TOTAL DEPTH 24.0 ft		NORTHING 538,779		EASTING 1,624,026						
DRILL RIG/HAMMER EFF/DATE CG20446 Diedrich D50 76%/06/14/2021			DRILL METHOD SPT Core Boring			HAMMER TYPE Automatic						
DRILLER C. Odom		START DATE 04/04/22		COMP. DATE 04/04/22		SURFACE WATER DEPTH 5.8ft						
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	TOTAL RUN 14.9 ft		SAMP. NO.	STRATA		LOG	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC. (ft) %	RQD (ft) %		REC. (ft) %	RQD (ft) %			
258.67	258.7	9.1	4.9		(3.7) 76%	(2.8) 57%		(13.7) 92%	(12.6) 85%		Begin Coring @ 9.1 ft	9.1
255	253.8	14.0	5.0		(5.0) 100%	(4.8) 96%					Very Slightly Weathered to Fresh, Moderately Hard to Hard, Gray-White (DIABASE), with Close to Moderately Close Fracture Spacing	9.1
250	248.8	19.0	5.0		(5.0) 100%	(5.0) 100%						
245	243.8	24.0									Boring Terminated at Elevation 243.8 ft In Crystalline Rock (DIABASE)	24.0



Bridge No. 102 on SR 1917 (Bethlehem Church Road) over
Long Creek
Rock Core Photographs
Boring: B2-A
9.1 to 24.0 Feet



GEOTECHNICAL BORING REPORT

BORE LOG

GEOTECHNICAL BORING REPORT

CORE LOG

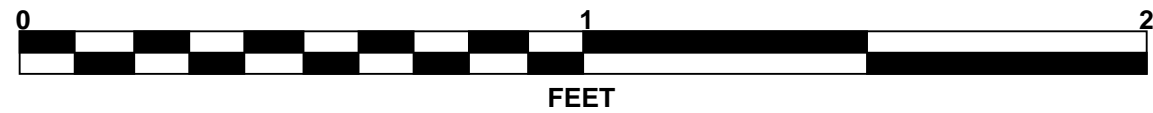
WBS 48409.1.1		TIP B-6046		COUNTY STANLY		GEOLOGIST Stickney, J. K.										
SITE DESCRIPTION Replace Bridge No. 102 on SR 1917 (Bethlehem Church Road) over Long Creek							GROUND WTR (ft)									
BORING NO. B3-A		STATION 18+30		OFFSET 4 ft LT		ALIGNMENT -L-										
COLLAR ELEV. 279.0 ft		TOTAL DEPTH 34.7 ft		NORTHING 538,806		EASTING 1,624,089										
DRILL RIGHAMMER EFF./DATE CG20446 Diedrich D60 76%/06/14/2021			DRILL METHOD SPT Core Boring			HAMMER TYPE Automatic										
DRILLER C. Odom		START DATE 04/04/22		COMP. DATE 04/04/22		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION			
			0.5ft	0.5ft	0.5ft	0	25	50	75	100			ELEV. (ft)	DEPTH (ft)		
280														279.0	0.0	GROUND SURFACE
275	275.4	3.6	1	1	4							M		270.4	8.6	ALLUVIAL Medium Stiff, Tan-Brown, Fine Sandy, Silty CLAY (A-7), with trace to little wood fragments and organics
270	270.4	8.6	6	18	24							M		266.0	13.0	RESIDUAL Hard, Tan-Gray, Fine Sandy, Silty CLAY (A-7), with trace gravel-sized angular rock fragments
265	265.4	13.6	100/0.2											262.6	16.4	WEATHERED ROCK Gray, (DIABASE)
260																CRYSTALLINE ROCK Gray-White, (DIABASE)
255												RS-2				REC=99% RQD=95% GSI=70-85
250																
245														244.3	34.7	Boring Terminated at Elevation 244.3 ft In Crystalline Rock (DIABASE)

WBS 48409.1.1		TIP B-6046		COUNTY STANLY		GEOLOGIST Stickney, J. K.	
SITE DESCRIPTION Replace Bridge No. 102 on SR 1917 (Bethlehem Church Road) over Long Creek							GROUND WTR (ft)
BORING NO. B3-A		STATION 18+30		OFFSET 4 ft LT		ALIGNMENT -L-	
COLLAR ELEV. 279.0 ft		TOTAL DEPTH 34.7 ft		NORTHING 538,806		EASTING 1,624,089	
DRILL RIGHAMMER EFF./DATE CG20446 Diedrich D60 76%/06/14/2021			DRILL METHOD SPT Core Boring			HAMMER TYPE Automatic	
DRILLER C. Odom		START DATE 04/04/22		COMP. DATE 04/04/22		SURFACE WATER DEPTH N/A	
CORE SIZE NQ		TOTAL RUN 18.3 ft					
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.
262.57	262.6	16.4	3.3		(3.1) 94%	(2.7) 82%	
260	259.3	19.7	5.0		(5.0) 100%	(5.0) 100%	
255	254.3	24.7	5.0		(5.0) 100%	(4.8) 96%	RS-2
250	249.3	29.7	5.0		(5.0) 100%	(4.8) 96%	
245	244.3	34.7					
		STRATA					
		REC. (ft) %	RQD (ft) %	LOG		DESCRIPTION AND REMARKS	
		(18.1) 99%	(17.3) 95%			Begin Coring @ 16.4 ft	
						CRYSTALLINE ROCK	
						Very Slightly Weathered to Fresh, Moderately Hard to Hard, Gray-White (DIABASE), with Close to Moderately Close Fracture Spacing	
						RS-2: 22.9-23.6' Unit Weight: 181.9 pcf Unconfined Compressive Strength: 9,570 psi (1,378 ksf)	
						Boring Terminated at Elevation 244.3 ft In Crystalline Rock (DIABASE)	

NCDOT BORE DOUBLE B-6046_GEO_BRDG102_STANLY_BL_GPJ_NC_DOT.GDT 4/15/22



Bridge No. 102 on SR 1917 (Bethlehem Church Road) over
Long Creek
Rock Core Photographs
Boring: B3-A
16.4 to 35.1 Feet



GEOTECHNICAL BORING REPORT

BORE LOG

WBS 48409.1.1		TIP B-6046		COUNTY STANLY		GEOLOGIST Stickney, J. K.											
SITE DESCRIPTION Replace Bridge No. 102 on SR 1917 (Bethlehem Church Road) over Long Creek							GROUND WTR (ft)										
BORING NO. EB2-A		STATION 19+13		OFFSET 18 ft LT		ALIGNMENT -L-											
COLLAR ELEV. 292.9 ft		TOTAL DEPTH 28.7 ft		NORTHING 538,852		EASTING 1,624,160											
DRILL RIGHAMMER EFF./DATE CG29022 Mobile B-29 81% 03/12/2021			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic											
DRILLER M. Brewer		START DATE 10/28/21		COMP. DATE 10/28/21		SURFACE WATER DEPTH N/A											
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)			
			0.5ft	0.5ft	0.5ft	0	25	50	75	100							
295															292.9	GROUND SURFACE	0.0
290	289.3	3.6	2	1	2								M	ROADWAY EMBANKMENT Soft, Red-Orange, Fine Sandy, Silty CLAY (A-7)			
285	284.3	8.6	2	2	2								M				
280	279.3	13.6	1	1	3								M	ALLUVIAL Soft, Tan-Brown, Silty, Fine Sandy CLAY (A-6)	13.5		
275	274.3	18.6	4	6	7								M	RESIDUAL Stiff, Tan-Brown, Fine Sandy, Silty CLAY (A-7)	17.0		
270	269.3	23.6	100/0.4										M	WEATHERED ROCK Brown-Gray, (DIABASE)	23.6		
265	264.3	28.6	60/0.1										M	CRYSTALLINE ROCK Gray, (DIABASE) Boring Terminated with Standard Penetration Test Refusal at Elevation 264.2 ft In Crystalline Rock (DIABASE)	28.6		

WBS 48409.1.1		TIP B-6046		COUNTY STANLY		GEOLOGIST Stickney, J. K.											
SITE DESCRIPTION Replace Bridge No. 102 on SR 1917 (Bethlehem Church Road) over Long Creek							GROUND WTR (ft)										
BORING NO. EB2-B		STATION 19+15		OFFSET CL		ALIGNMENT -L-											
COLLAR ELEV. 293.1 ft		TOTAL DEPTH 33.6 ft		NORTHING 538,836		EASTING 1,624,169											
DRILL RIGHAMMER EFF./DATE CG29022 Mobile B-29 81% 03/12/2021			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic											
DRILLER M. Brewer		START DATE 10/28/21		COMP. DATE 10/28/21		SURFACE WATER DEPTH N/A											
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)			
			0.5ft	0.5ft	0.5ft	0	25	50	75	100							
295															293.1	GROUND SURFACE	0.0
290	289.6	3.5	4	3	5								M	ROADWAY EMBANKMENT Medium Stiff, Red-Orange, Fine Sandy, Silty CLAY (A-7), with asphalt fragments			
285	284.6	8.5	2	4	4								M				
280	279.6	13.5	1	2	2								M	ALLUVIAL Soft to Medium Stiff, Tan-Brown, Silty, Fine Sandy CLAY (A-6)	13.5		
275	274.6	18.5	5	7	10								M	RESIDUAL Very Stiff to Hard, Tan-Gray-Orange, Fine Sandy, Silty CLAY (A-7), with trace gravel-sized rock fragments	16.0		
270	269.6	23.5	15	22	19								M	WEATHERED ROCK Brown-Gray, (DIABASE)	23.5		
265	264.6	28.5	100/0.3										M	CRYSTALLINE ROCK Gray, (DIABASE) Boring Terminated with Standard Penetration Test Refusal at Elevation 259.5 ft In Crystalline Rock (DIABASE)	28.5		
260	259.6	33.5	60/0.1										M	CRYSTALLINE ROCK (DIABASE) Boring Terminated with Standard Penetration Test Refusal at Elevation 259.5 ft In Crystalline Rock (DIABASE)	33.5		

Notes:
Intermittent Layers of Hard and Soft Drilling between 30.5-31.3 ft below existing grade.

NCDOT BORE DOUBLE B-6046_GEO_BRDG102_STANLY.GPJ_NC_DOT.GDT 4/15/22

LAB RESULTS

<i>ROCK TEST RESULTS</i>							
<i>SAMPLE NO.</i>	<i>BORING</i>	<i>STATION</i>	<i>OFFSET</i>	<i>DEPTH INTERVAL</i>	<i>ROCK TYPE</i>	<i>UNIT WEIGHT (PCF)</i>	<i>UNCONFINED COMPRESSIVE STRENGTH</i>
<i>RS-1</i>	<i>B1-A</i>	<i>16+89 -L-</i>	<i>4' LT</i>	<i>4.8 - 5.4'</i>	<i>META-ARGILLITE</i>	<i>161.8</i>	<i>7,530 psi /1,084 ksf</i>
<i>RS-2</i>	<i>B3-A</i>	<i>18+30 -L-</i>	<i>4' LT</i>	<i>22.9 - 23.5'</i>	<i>DIABASE</i>	<i>181.9</i>	<i>9,570 psi /1,378 ksf</i>

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

SITE PHOTOS



Photo #1: North side of existing bridge looking south/southwest (downstation)



Photo #2: North side of existing bridge looking south/southwest (downstation)



Photo #3: End Bent 1 looking north/northeast (upstation)