



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

PAT MCCRORY  
GOVERNOR

ANTHONY J. TATA  
SECRETARY

November 10, 2014

MEMORANDUM TO: Joey Hopkins, P.E.  
Division 5 Engineer

ATTENTION: Lisa B. Gilchrist, E.I.  
Division Bridge Program Manager

FROM: Kyung (K. J.) Kim, Ph.D., P.E. *KJ Kim*  
Eastern Regional Geotechnical Manager

STATE PROJECT: 17BP.5.R.56 (SF-920003)  
COUNTY: Warren

DESCRIPTION: Bridge No. 3 on SR 1001 (Dr. Martin Luther King Blvd.) over  
Fishing Creek

SUBJECT: Geotechnical Report - Design and Construction Recommendations

I. Slope/Embankment Stability

A. Slope Design

Recommend that all slopes be constructed at a ratio of 2:1 (H:V) or flatter.

B. Undercut

A quantity of 200 cubic yards of undercut for embankment stability should be included in the project contract as a contingency item to be used at the discretion of the Engineer.

C. Geotextile for Soil Stabilization

A quantity of 200 square yards of geotextile for soil stabilization should be included in the project contract as a contingency item to be used at the discretion of the Engineer.

II. Subgrade Stability

A. Subgrade Undercut

MAILING ADDRESS:  
NC DEPARTMENT OF TRANSPORTATION  
GEOTECHNICAL ENGINEERING UNIT  
1589 MAIL SERVICE CENTER  
RALEIGH NC 27699-1589

TELEPHONE: 919-662-4710  
FAX: 919-662-3095  
[connect.ncdot.gov/resources/Geological](http://connect.ncdot.gov/resources/Geological)

LOCATION:  
3301 JONES SAUSAGE RD., SUITE 100  
GARNER, NC 27529-9489

Recommend a quantity of 200 cubic yards of subgrade undercut be included in the project contract as a contingency item for areas of unsuitable subgrade soil to be used at the discretion of the Engineer.

B. Geotextile for Soil Stabilization

Recommend a quantity of 200 square yards of geotextile for soil stabilization be included in the project contract as a contingency item to be used at the discretion of the Engineer.

III. Borrow Specifications

A. Select Granular Material

Select Granular Material for embankment construction on geotextile for soil stabilization shall meet the criteria outlined in Standard Specification, Article 1016-3 Class II or Class III. Include 400 cubic yards of this material in the project contract as a contingency item. The backfill material should be placed on geotextile for soil stabilization to a height not less than three (3) feet above geotextile for soil stabilization.

B. Shrinkage Factor

A shrinkage factor of 20 percent is recommended in the calculation of all earthwork quantities. This is to compensate for loss of soils due to erosion, clearing and grubbing of fill areas, and an increase in embankment quantities required due to consolidation of underlying soils and other factors.

IV. Miscellaneous

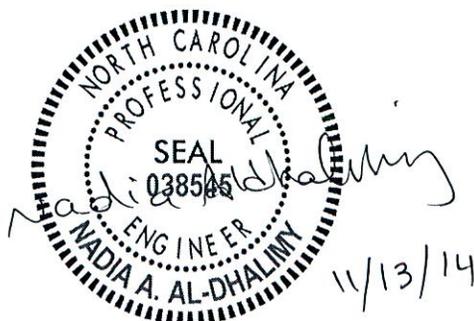
A. Reduction of Unclassified Excavation – Clearing and Grubbing

No significant loss of unclassified excavation is anticipated due to clearing and grubbing.

B. Reduction of Unclassified Excavation – Unsuitable Unclassified

Unclassified excavation will be derived from cut slope, ditch, and abutment embankment excavation. It is anticipated that 100 percent of unclassified excavation is suitable for embankment construction.

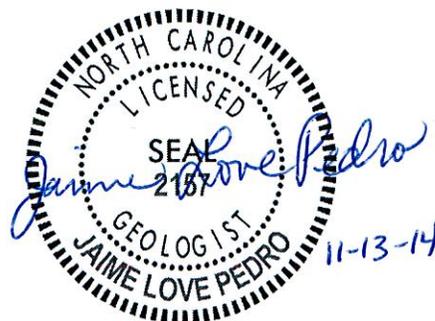
Prepared by,



Nadia Al-Dhalimy, PE  
Geotechnical Operations Engineer

JLP/CAK/NAA/jlp

Prepared by,



Jaime Love Pedro, LG  
Project Geological Engineer





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November 10, 2014

STATE PROJECT: 17BP.5.R.56 (SF-920003)  
COUNTY: Warren  
DESCRIPTION: Bridge No. 3 on -L- (SR 1001) over Fishing Creek  
SUBJECT: Geotechnical Report – Inventory

The Geotechnical Engineering Unit has completed a subsurface investigation for this project and presents the following inventory. No plans, profiles, or cross-sections will be submitted for this roadway project.

**Project Description**

The project consists of the replacement of Bridge No. 3 on SR 1001 (Dr. Martin Luther King Blvd.) over Fishing Creek. The total length of the roadway portion of the project is 0.2 miles. Bore logs from the bridge subsurface investigation in September and October 2014 were referenced for this project.

**Physiography & Geology**

The project is located in rolling terrain of central Warren County. Fishing Creek is part of the Tar River Basin. Geologically the site is characterized by sands, silts, and clays associated with biotite gneiss and schist of the Raleigh Belt.

**Soil Properties**

Soils encountered at the site are roadway embankment, alluvial, and residual soils. The soils consist of granular and cohesive materials.

Roadway embankment soils consist of soft to medium stiff, moist, sandy and silty clay (A-6, A-7). This material varies in depth up to 14.0 feet at the bridge approaches. Alluvial soils deposited by Fishing Creek consist primarily of very loose to medium dense, wet to saturated, silty and coarse sand (A-2-4 and A-1-b) with some rock fragments. Residual soils consist of medium stiff to stiff, moist, sandy silt (A-4). Residual soils are derived from weathering of the underlying weathered and crystalline rock.

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GARNER, NC 27529-9489

**Rock Properties**

Crystalline rock is approximately 10.0 to 25.0 feet below the ground surface and consists of black, white, and, pink, fresh, hard, to very hard, wide fracture spacing, granite gneiss. Crystalline rock is not anticipated to cause problems during construction.

**Groundwater**

The groundwater level is anticipated to be at elevations similar to Fishing Creek. Seasonal fluctuations in the water table can be expected. Groundwater is not anticipated to cause problems during construction.

Respectfully submitted,



Jaime Love Pedro, LG  
Project Geological Engineer

JLP/NTR/jlp



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November 10, 2014

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Division 5 Engineer

ATTENTION: Lisa B. Gilchrist, E.I.  
Division Bridge Program Manager

FROM: Kyung (K. J.) Kim, Ph.D., P.E. *KJK*  
Eastern Regional Geotechnical Manager

STATE PROJECT: 17BP.5.R.56 (SF-920003)  
FEDERAL PROJECT: N/A  
COUNTY: Warren

DESCRIPTION: Bridge No. 3 on SR 1001 over Fishing Creek

SUBJECT: Bridge Foundation Recommendations

The Geotechnical Engineering Unit has completed the subsurface investigation and has prepared the foundation design recommendations for the above structure and presents the following project data:

- Bridge Inventory (12) pages
- Foundation Design Recommendations (5) pages
- Design Calculations ( ) pages
- Special Provisions ( ) pages

Please call Nadia Al-Dhalimy, P.E. or Chris Kreider, P.E. at (919) 662-4710 if there are any questions concerning this memorandum.

KJK/CAK/NAA

MAILING ADDRESS:  
EASTERN REGIONAL OFFICE  
GEOTECHNICAL ENGINEERING UNIT  
1570 MAIL SERVICE CENTER  
RALEIGH NC 27699-1570

TELEPHONE: 919-662-4710  
FAX: 919-662-3095

WEBSITE: [WWW.DOH.DOT.STATE.NC.US](http://WWW.DOH.DOT.STATE.NC.US)

LOCATION:  
3301 JONES SAUSAGE RD., SUITE 100  
GARNER, NC 27529-9489

# FOUNDATION RECOMMENDATIONS

PROJECT 17BP.5.R.56

DESCRIPTION Bridge No. 3 on SR 1001

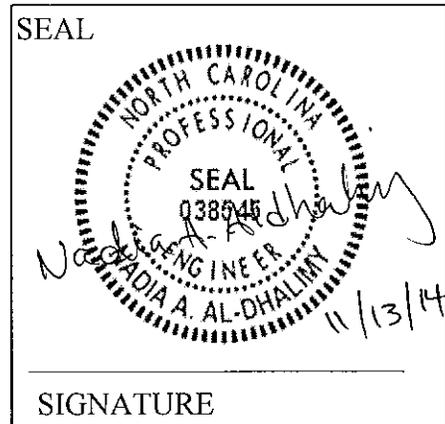
T.I.P. NO. SF-920003

over Fishing Creek between SR 1149 and SR 1120

COUNTY Warren

STATION 15+60.00 -L-

	INITIALS	DATE
DESIGN	NAA	11/10/2014
CHECK	CRZ	11/12/14
APPROVAL	KJMC	11/13/14



BENT NO.	STATION	FOUNDATION TYPE	FACTORED RESISTANCE	MISCELLANEOUS DETAILS
END BENT 1	14+83.77 -L-	Cap on HP 12 x 53 Steel Piles	115 Tons/Pile	Bottom of Cap Elevation = 253.9 ft. ± Estimated Pile Length = 15 ft. ± (Lt) & 20 ft. ± (Rt) Number of Vertical Piles = 5 ✓ Number of Braced Piles = 2
BENT 1	15+75.00 -L-	36 in. Diameter Drilled Piers	415 Tons/Pier	Bottom of Cap Elevation = 255.8 ft. ± Estimated Drilled Pier Top El. = 246.3 ft. ± Point of Fixity Elevation = 226 ft. ± (Lt) & 224 ft. ± (Rt) Tip Elevation No Higher Than = 220 ft. ✓ Number of Piers = 3
END BENT 2	16+36.23 -L-	Cap on HP 12 x 53 Steel Piles	90 Tons/Pile	Bottom of Cap Elevation = 256.7 ft. ± Estimated Pile Length = 15 ft. ± Number of Vertical Piles = 5 ✓ Number of Braced Piles = 2

COMMENTS & NOTES (See Following Page)

**FOUNDATION RECOMMENDATION NOTES ON PLANS**

1. FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
2. PILES AT END BENT NO. 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 115 TONS PER PILE.
3. DRIVE PILES AT END BENT NO. 1 TO A REQUIRED DRIVING RESISTANCE OF 195 TONS PER PILE.
4. PILES AT END BENT NO. 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 90 TONS PER PILE.
5. DRIVE PILES AT END BENT NO. 2 TO A REQUIRED DRIVING RESISTANCE OF 150 TONS PER PILE.
6. STEEL H-PILE POINTS ARE REQUIRED FOR STEEL H-PILES AT END BENT NO. 1 AND END BENT NO. 2. FOR STEEL PILE POINTS, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
7. FOR DRILLED PIERS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.
8. DRILLED PIERS AT BENT NO. 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 415 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 40 TSF.
9. PERMANENT STEEL CASINGS ARE REQUIRED FOR DRILLED PIERS AT BENT NO. 1. DO NOT EXTEND PERMANENT CASINGS BELOW ELEVATION 230 FT WITHOUT PRIOR APPROVAL FROM THE ENGINEER.
10. INSTALL DRILLED PIERS AT BENT NO. 1 TO A TIP ELEVATION NO HIGHER THAN 220 FT AND WITH THE REQUIRED TIP RESISTANCE.
11. THE SCOUR CRITICAL ELEVATION AT BENT NO. 1 IS ELEVATION 227 FEET. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.
12. SPT MAY BE REQUIRED FOR DRILLED PIERS. THE ENGINEER WILL DETERMINE THE NEED FOR SPT. FOR SPT TESTING, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.
13. CSL TUBES ARE REQUIRED AND CSL TESTING MAY BE REQUIRED FOR DRILLED PIERS AT BENT NO.1. FOR CSL TESTING, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

Designed by: NAA Date: 11/10/14

Checked by: JK Date: 11/13/14

14. SID INSPECTIONS MAY BE REQUIRED FOR DRILLED PIERS. THE ENGINEER WILL DETERMINE THE NEED FOR SID INSPECTIONS. FOR SID INSPECTIONS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

**FOUNDATION RECOMMENDATION COMMENTS**

1. 1.5:1 (H:V) SLOPES FOR END BENTS WITH SLOPE PROTECTION TO BERM ARE OK.
2. NO WAITING PERIOD IS REQUIRED BEFORE BEGINNING ANY WORK FOR END BENT CONSTRUCTION AFTER COMPLETION OF THE EMBANKMENT AT EACH END BENT.
3. USE REINFORCED BRIDGE APPROACH FILL DETAILS AT BOTH END BENTS.
4. DESIGN SCOUR ELEVATIONS AT BENT NO. 1 ARE 230.2 FEET (LT) AND 229.3 FEET (RT).

Designed by: NAA

Date: 11/10/14

Checked by: *CMK*

Date: 11/12/14

## PILE PAY ITEMS

(Revised 8/15/12)

WBS ELEMENT 17BP.5.R.56

TIP NO. SF-920003

COUNTY Warren

STATION 15+60.00 -L-

DATE 11/10/2014

DESIGNED BY NAA

CHECKED BY KGK

DESCRIPTION Bridge No. 3 on SR 1001 over Fishing Creek between SR 1149 and 1120

NUMBER OF BENTS WITH PILES \_\_\_\_\_

NUMBER OF PILES PER BENT \_\_\_\_\_

NUMBER OF END BENTS WITH PILES \_\_\_\_\_

NUMBER OF PILES PER END BENT \_\_\_\_\_

Only required for "Predrilling  
for Piles" & "Pile  
Excavation" pay items

Bent # or End Bent #	PILE PAY ITEM QUANTITIES						PDA Testing (per each)
	Steel Pile Points (yes/no)	Pipe Pile Plates (yes/no/maybe)	Predrilling For Piles (per linear ft)	Pile Redrives (per each)	Pile Excavation (per linear ft)		
					In Soil	Not In Soil	
End Bent #1	yes						X
End Bent #2	yes						
TOTALS			0	0	0	0	0

Notes:

Blanks or "no" represent quantity of zero.

If steel pile points are required, calculate quantity of "Steel Pile Points" as equal to the number of steel piles.

If pipe pile plates are or may be required, calculate the quantity of "Pipe Pile Plates" as equal to the number of pipe piles.

Show quantity of "PDA Testing" on the plans as total only.

If quantity of "PDA Testing" is 3 or less, reference "Pile Driving Criteria" provision in PDA notes on plans and include "Pile Driving Criteria" provision in the contract.

**DRILLED PIER PAY ITEMS**  
**(For LRFD Projects - Revised 8/15/12)**

WBS ELEMENT 17BP.5.R.56 DATE 11/10/2014  
 TIP NO. SF-920003 DESIGNED BY NAA  
 COUNTY Warren CHECKED BY CAK  
 STATION 15+60.00 -L-  
 \_\_\_\_\_  
 DESCRIPTION Bridge No. 3 on SR 1001 over Fishing Creek  
Between SR 1149 and SR 1120

NUMBER OF BENTS WITH DRILLED PIERS 1  
 NUMBER OF DRILLED PIERS PER BENT 3  
 NUMBER OF END BENTS WITH DRILLED PIERS \_\_\_\_\_  
 NUMBER OF DRILLED PIERS PER END BENT \_\_\_\_\_

Bent # or End Bent #	DRILLED PIER PAY ITEM QUANTITIES				
	Permanent Steel Casing For 36" Dia. Drilled Pier (yes/no/maybe)	36" Dia. Drilled Piers Not In Soil (per linear ft)	SID Inspections (per each)	SPT Testing (per each)	CSL Testing (per each)
Bent # 1	yes	29			
TOTALS		29	1	1	1

*Notes:*

Blanks or "no" represent quantity of zero.

*If drilled piers not in soil are required, calculate quantity of "36" Dia. Drilled Piers in Soil" as the difference between the total drilled pier length and the "36" Dia. Drilled Piers Not in Soil" from the table above. If there is none or zero quantity for drilled piers not in soil in the table above, calculate quantity of "36" Dia. Drilled Piers" as the total drilled pier length and do not use the "36" Dia. Drilled Piers in Soil" pay item.*

*If permanent steel casing is or may be required, calculate quantity of "Permanent Steel Casing for 36" Dia. Drilled Pier" as the difference between the ground line or top of drilled pier elevation, whichever is higher, and the elevation the permanent casing can not extend below from the foundation recommendations.*

*If "SID Inspections", "SPT Testing" or "CSL Testing" may be required, show quantities of these pay items on the plans as totals only. If "SID Inspections", "SPT Testing" or "CSL Testing" is required, show quantities of these pay items on the plans for each bent or end bent.*

*The number of CSL tubes required per drilled pier is equal to one tube per foot of design pier diameter with at least 4 tubes per pier. Calculate the length of each CSL tube as the total drilled pier length plus 1.5 ft.*

REFERENCE: SF-920003

PROJECT: 17BP.5.R.56

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	SF-920003	1	12

CONTENTS

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	LEGEND
3	SITE PLAN
4	PROFILE(S)
5-6	CROSS SECTION(S)
7-10	BORE LOG(S) & CORE REPORT(S)
11	CORE PHOTOGRAPH(S)
12	SITE PHOTOGRAPH(S)

STRUCTURE  
SUBSURFACE INVESTIGATION

COUNTY WARREN  
SITE DESCRIPTION BRIDGE NO. 3 ON -L- (SR 1001)  
OVER FISHING CREEK AT STA. 15+60

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:
- 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

O. B. OTI

D. G. PINTER

R. E. SMITH

INVESTIGATED BY J. L. PEDRO

DRAWN BY W. D. FIELDS

CHECKED BY N. T. ROBERSON

SUBMITTED BY N. T. ROBERSON

DATE OCTOBER 2014

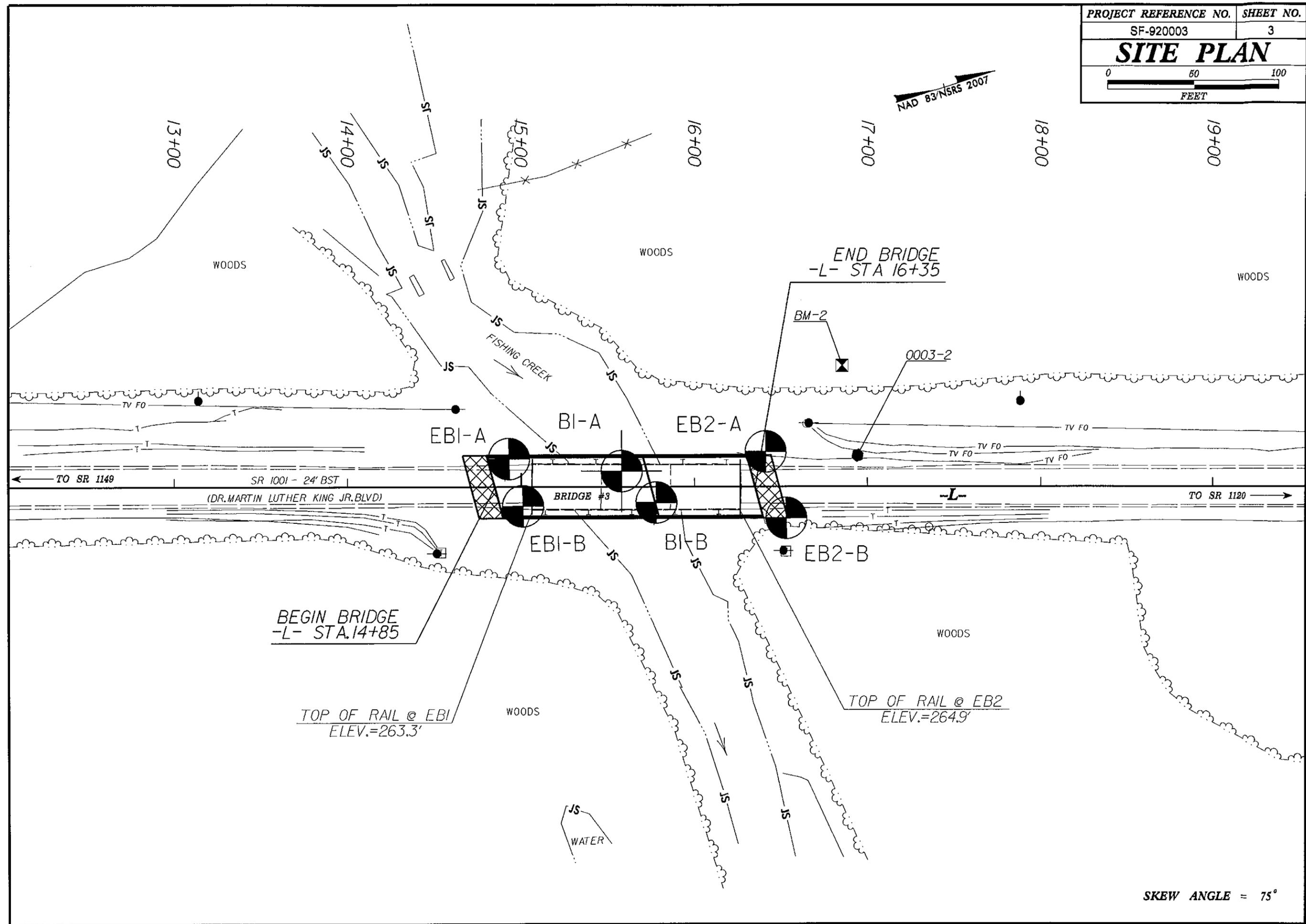


*Jaime Love Pedro* 11-13-14  
SIGNATURE DATE

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																																																																																																																																																								
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.										<b>WELL GRADED</b> - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. <b>UNIFORMLY GRADED</b> - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. <b>GAP-GRADED</b> - INDICATES A MIXTURE OF UNIFORM PARTICLE SIZES OF TWO OR MORE SIZES.										<b>HARD ROCK</b> 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) CRYSTALLINE ROCK (CR) NON-CRYSTALLINE ROCK (NCR) COASTAL PLAIN SEDIMENTARY ROCK (CP)										<b>ALLUVIUM (ALLUV.)</b> - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. <b>AQUIFER</b> - A WATER BEARING FORMATION OR STRATA. <b>ARENACEOUS</b> - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND. <b>ARGILLACEOUS</b> - 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. <b>ARTESIAN</b> - 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. <b>CALCAREOUS (CALC.)</b> - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE. <b>COLLUVIUM</b> - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE. <b>CORE RECOVERY (REC.)</b> - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. <b>DIKE</b> - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK. <b>DIP</b> - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL. <b>DIP DIRECTION (DIP AZIMUTH)</b> - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH. <b>FAULT</b> - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE. <b>FISSILE</b> - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES. <b>FLOAT</b> - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL. <b>FLOOD PLAIN (FP)</b> - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM. <b>FORMATION (FM)</b> - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD. <b>JOINT</b> - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED. <b>LEDGE</b> - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT. <b>LENS</b> - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS. <b>MOTTLED (MOT.)</b> - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE. <b>PERCHED WATER</b> - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM. <b>RESIDUAL (RES.) SOIL</b> - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. <b>ROCK QUALITY DESIGNATION (RQD)</b> - 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. <b>SAPROLITE (SAP.)</b> - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK. <b>SILL</b> - 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. <b>SLICKENSIDE</b> - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE. <b>STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT)</b> - NUMBER OF BLOWS IN 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. <b>STRATA CORE RECOVERY (SCRC)</b> - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE. <b>STRATA ROCK QUALITY DESIGNATION (SRQD)</b> - 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. <b>TOPSOIL (TS)</b> - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.																																																																																																																																																								
<b>SOIL LEGEND AND AASHTO CLASSIFICATION</b> <table border="1"> <tr> <th rowspan="2">GENERAL CLASS.</th> <th colspan="5">GRANULAR MATERIALS (&lt;= 35% PASSING #200)</th> <th colspan="5">SILT-CLAY MATERIALS (&gt; 35% PASSING #200)</th> <th colspan="5">ORGANIC MATERIALS</th> </tr> <tr> <th>A-1-a</th> <th>A-1-b</th> <th>A-2</th> <th>A-2-4</th> <th>A-2-5</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-7-5</th> <th>A-7-6</th> <th>A-1, A-2 A-3</th> <th>A-4, A-5 A-6, A-7</th> </tr> <tr> <td>GROUP CLASS.</td> <td colspan="5">A-1</td> <td colspan="5">A-2</td> <td colspan="5">A-3</td> </tr> <tr> <td>SYMBOL</td> <td colspan="5">[Symbol]</td> <td colspan="5">[Symbol]</td> <td colspan="5">[Symbol]</td> </tr> <tr> <td>% PASSING #10 #40 #200</td> <td colspan="5">[Table]</td> <td colspan="5">[Table]</td> <td colspan="5">[Table]</td> </tr> <tr> <td>MATERIAL PASSING #40 LL PI</td> <td colspan="5">[Table]</td> <td colspan="5">[Table]</td> <td colspan="5">[Table]</td> </tr> <tr> <td>GROUP INDEX</td> <td colspan="5">[Table]</td> <td colspan="5">[Table]</td> <td colspan="5">[Table]</td> </tr> <tr> <td>USUAL TYPES OF MAJOR MATERIALS</td> <td colspan="5">[Table]</td> <td colspan="5">[Table]</td> <td colspan="5">[Table]</td> </tr> <tr> <td>GEN. RATING AS SUBGRADE</td> <td colspan="5">[Table]</td> <td colspan="5">[Table]</td> <td colspan="5">[Table]</td> </tr> </table>										GENERAL CLASS.	GRANULAR MATERIALS (<= 35% PASSING #200)					SILT-CLAY MATERIALS (> 35% PASSING #200)					ORGANIC MATERIALS					A-1-a	A-1-b	A-2	A-2-4	A-2-5	A-2-6	A-2-7	A-4	A-5	A-6	A-7	A-7-5	A-7-6	A-1, A-2 A-3	A-4, A-5 A-6, A-7	GROUP CLASS.	A-1					A-2					A-3					SYMBOL	[Symbol]					[Symbol]					[Symbol]					% PASSING #10 #40 #200	[Table]					[Table]					[Table]					MATERIAL PASSING #40 LL PI	[Table]					[Table]					[Table]					GROUP INDEX	[Table]					[Table]					[Table]					USUAL TYPES OF MAJOR MATERIALS	[Table]					[Table]					[Table]					GEN. RATING AS SUBGRADE	[Table]					[Table]					[Table]					<b>ANGULARITY OF GRAINS</b> THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.										<b>NON-COASTAL PLAIN MATERIAL</b> THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED. <b>FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK</b> THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC. <b>FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK</b> THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC. <b>COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK</b> , BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.										<b>WEATHERING</b> <b>FRESH</b> - ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE. <b>VERY SLIGHT (V SL.)</b> - 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. <b>SLIGHT (SL.)</b> - 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. <b>MODERATE (MOD.)</b> - 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. <b>MODERATELY SEVERE (MOD. SEV.)</b> - 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. <i>IF TESTED, WOULD YIELD SPT REFUSAL</i> <b>SEVERE (SEV.)</b> - 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. <i>IF TESTED, WOULD YIELD SPT N VALUES &gt; 100 BPF</i> <b>VERY SEVERE (V SEV.)</b> - 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. <i>IF TESTED, WOULD YIELD SPT N VALUES &lt; 100 BPF</i> <b>COMPLETE</b> - 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.									
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<b>MINERALOGICAL COMPOSITION</b> MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.										<b>COMPRESSIONIBILITY</b> SLIGHTLY COMPRESSIBLE LL < 31 MODERATELY COMPRESSIBLE LL = 31 - 50 HIGHLY COMPRESSIBLE LL > 50										<b>PERCENTAGE OF MATERIAL</b> <table border="1"> <tr> <th>ORGANIC MATERIAL</th> <th>GRANULAR SOILS</th> <th>SILT - CLAY SOILS</th> <th>OTHER MATERIAL</th> </tr> <tr> <td>TRACE OF ORGANIC MATTER</td> <td>2 - 3%</td> <td>3 - 5%</td> <td>TRACE</td> </tr> <tr> <td>LITTLE ORGANIC MATTER</td> <td>3 - 5%</td> <td>5 - 12%</td> <td>LITTLE</td> </tr> <tr> <td>MODERATELY ORGANIC</td> <td>5 - 10%</td> <td>12 - 20%</td> <td>SOME</td> </tr> <tr> <td>HIGHLY ORGANIC</td> <td>&gt; 10%</td> <td>&gt; 20%</td> <td>HIGHLY</td> </tr> </table>										ORGANIC MATERIAL	GRANULAR SOILS	SILT - CLAY SOILS	OTHER MATERIAL	TRACE OF ORGANIC MATTER	2 - 3%	3 - 5%	TRACE	LITTLE ORGANIC MATTER	3 - 5%	5 - 12%	LITTLE	MODERATELY ORGANIC	5 - 10%	12 - 20%	SOME	HIGHLY ORGANIC	> 10%	> 20%	HIGHLY																																																																																																																																					
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<b>GROUND WATER</b> WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING STATIC WATER LEVEL AFTER 24 HOURS PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA SPRING OR SEEP										<b>MISCELLANEOUS SYMBOLS</b> ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION SOIL SYMBOL ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT INFERRED SOIL BOUNDARY INFERRED ROCK LINE ALLUVIAL SOIL BOUNDARY DIP & DIP DIRECTION OF ROCK STRUCTURES SPT TEST BORING AUGER BORING CORE BORING MONITORING WELL PIEZOMETER INSTALLATION SLOPE INDICATOR INSTALLATION CONE PENETROMETER TEST SOUNDING ROD TEST BORING WITH CORE SPT N-VALUE																																																																																																																																																																												
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<b>INDURATION</b> <b>FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC. RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.</b> <b>FRIABLE</b> <b>MODERATELY INDURATED</b> <b>INDURATED</b> <b>EXTREMELY INDURATED</b>										<b>NOTES:</b> TOP OF RAIL AT EB1 STA. 15+06, OFFSET - 14' RT ELEV. = 263.3' TOP OF RAIL AT EB2 STA. 16+27, OFFSET - 14' RT ELEV. = 264.9' BENCH MARK: 0003-2 at -L- Sta. 16+94, Offset - 17.8' Lt ELEVATION: 263.43 FEET DATE: 8-15-14																																																																																																																																																																												

NAD 83/NSRS 2007



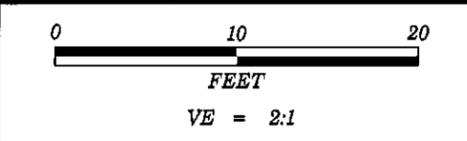
BEGIN BRIDGE  
-L- STA. 14+85

END BRIDGE  
-L- STA 16+35

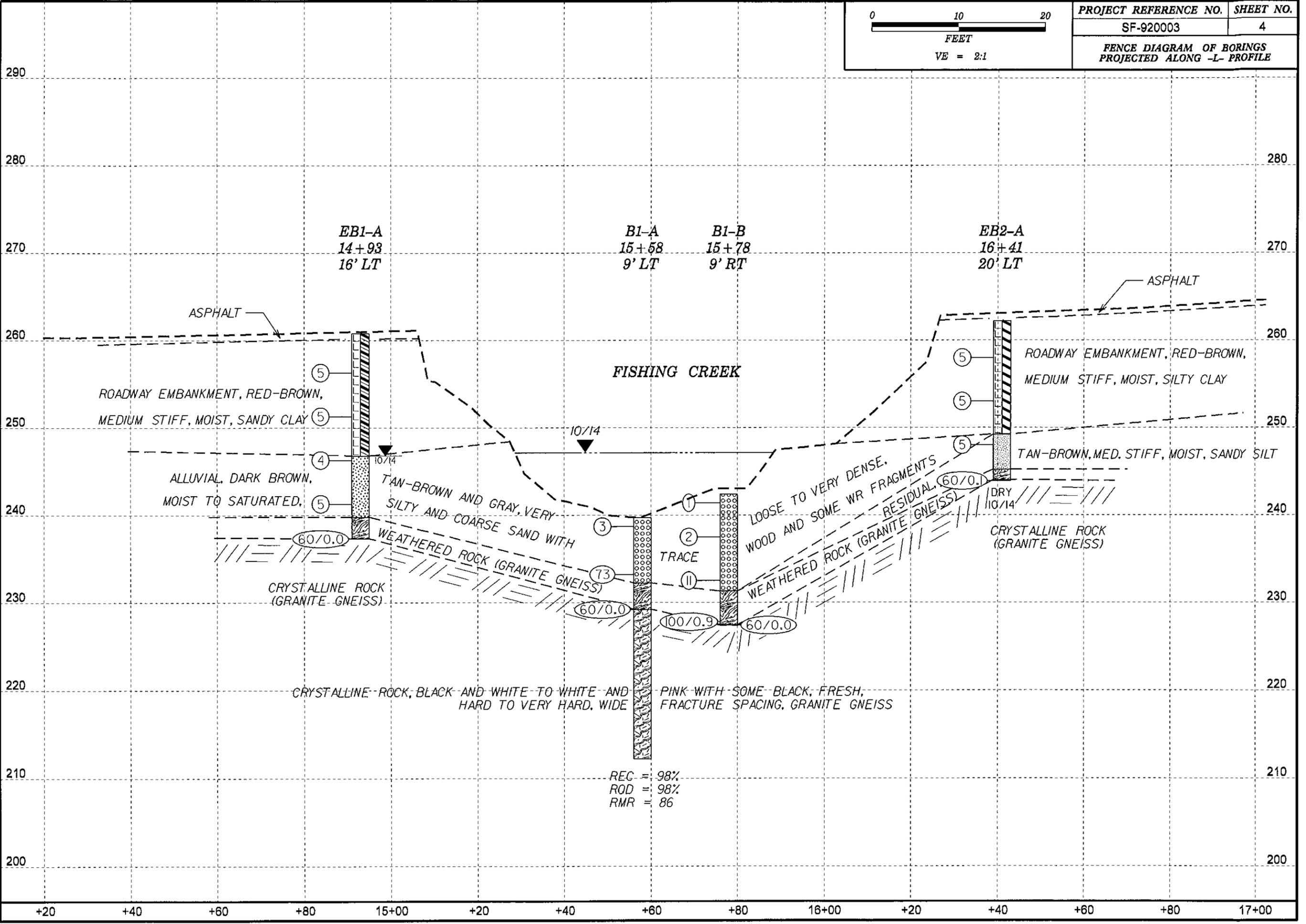
TOP OF RAIL @ EBI  
ELEV.=263.3'

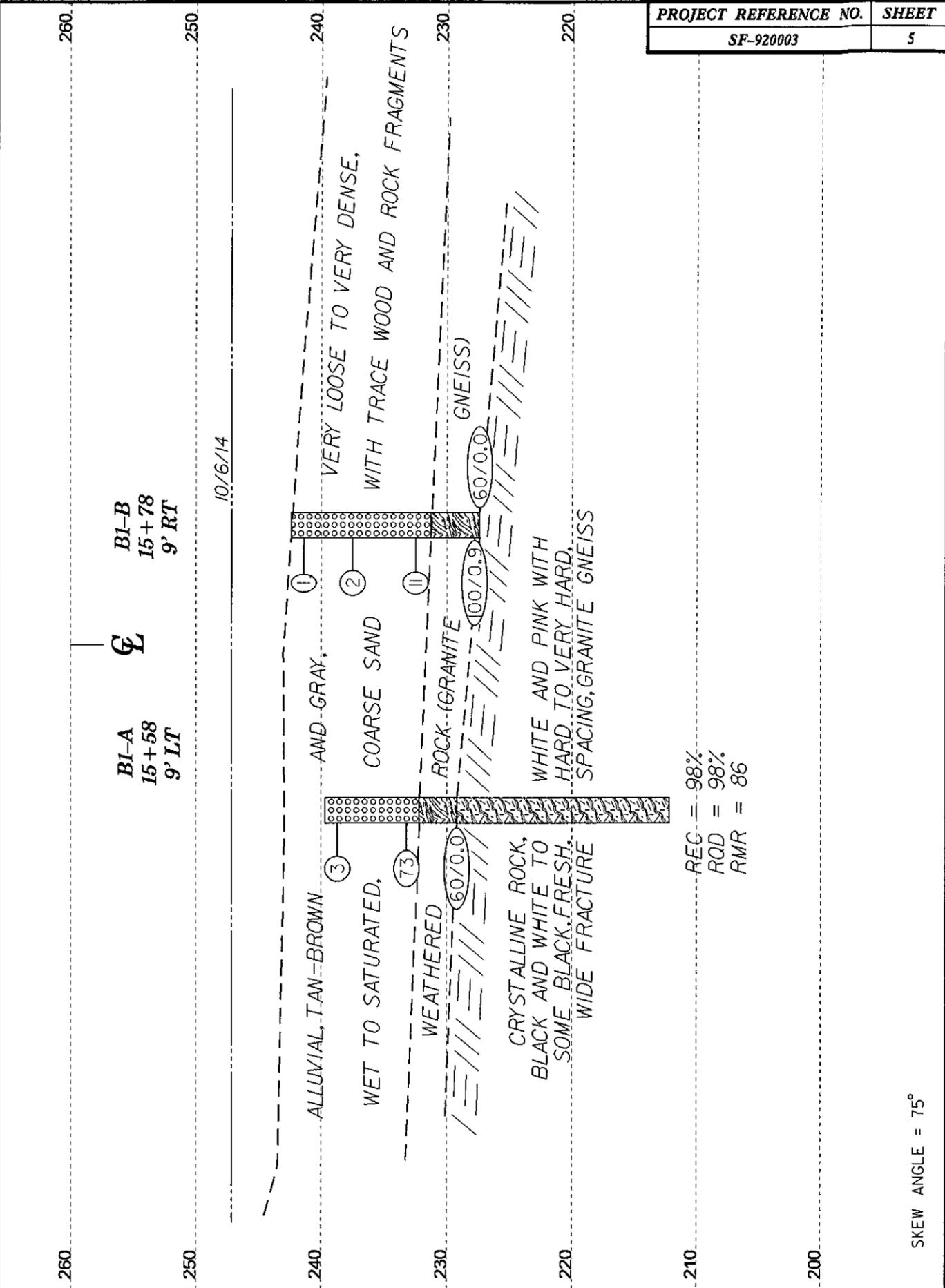
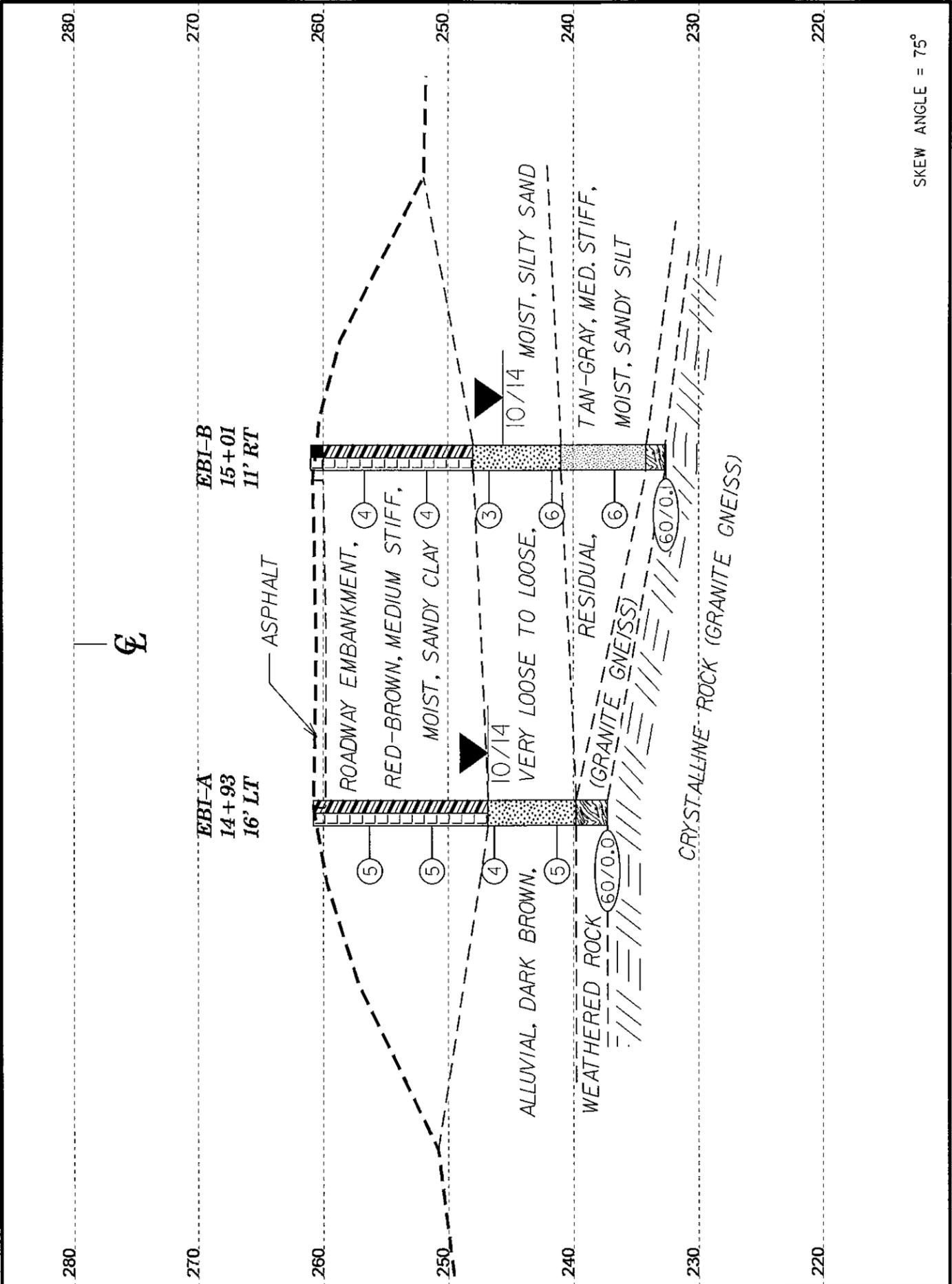
TOP OF RAIL @ EB2  
ELEV.=264.9'

SKEW ANGLE = 75°



PROJECT REFERENCE NO.	SHEET NO.
SF-920003	4
FENCE DIAGRAM OF BORINGS PROJECTED ALONG -L- PROFILE	





HORIZ. SCALE 0 10 20 (FEET)

VE = 1:1

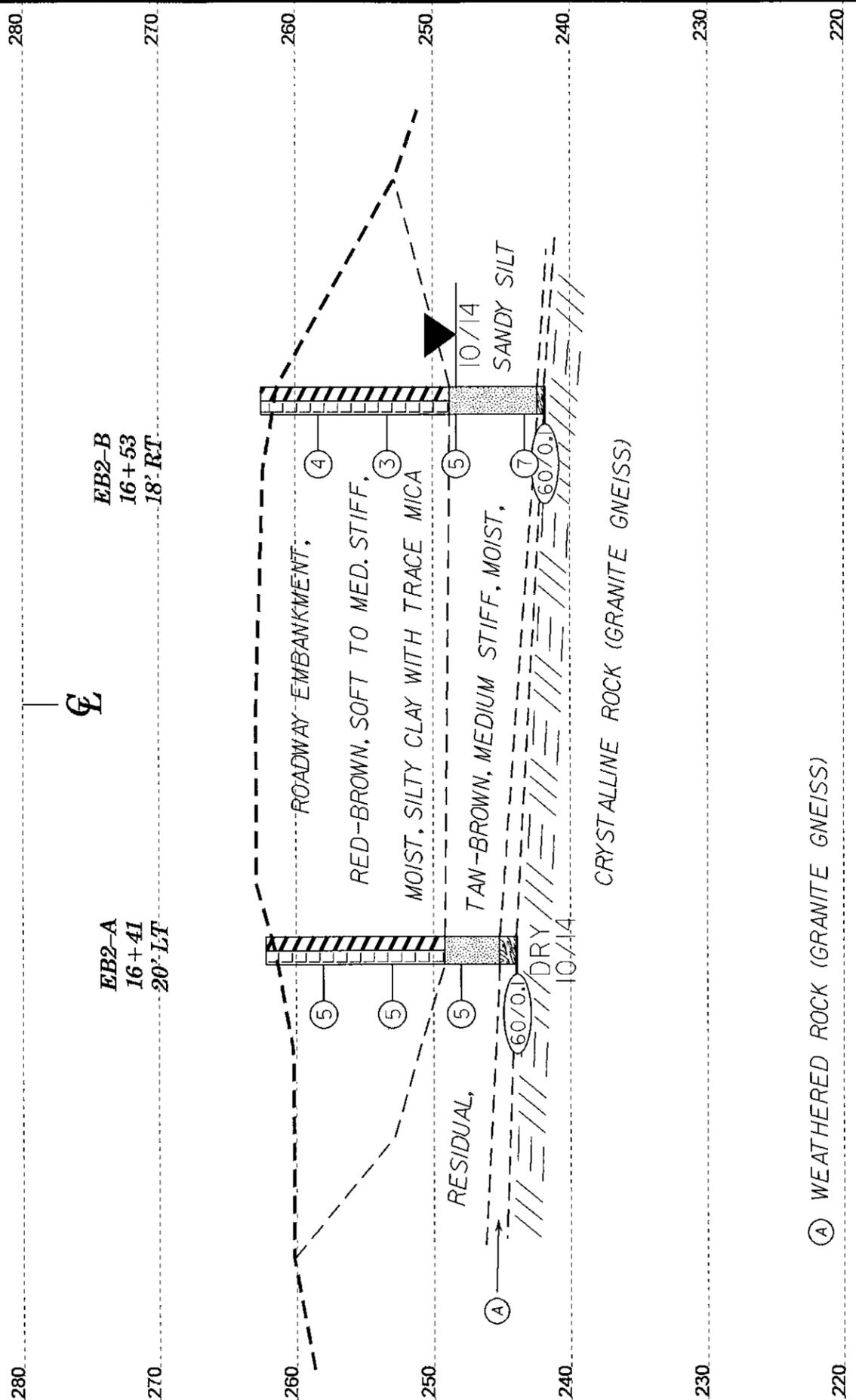
CROSS SECTION THROUGH END BENT 1

HORIZ. SCALE 0 10 20 (FEET)

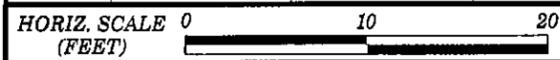
VE = 1:1

CROSS SECTION THROUGH BENT 1

SKW ANGLE = 75°



SKEW ANGLE = 75°



VE = 1:1

CROSS SECTION THROUGH END BENT 2

**NCDOT GEOTECHNICAL ENGINEERING UNIT**  
**BORELOG REPORT**

WBS 17BP.5.R.56	TIP SF-920003	COUNTY WARREN	GEOLOGIST Oti, O. B.	
SITE DESCRIPTION BRIDGE NO. 3 ON -L- (SR 1001) OVER FISHING CREEK				GROUND WTR (ft)
BORING NO. EB1-A	STATION 14+93	OFFSET 16 ft LT	ALIGNMENT -L-	0 HR. Dry
COLLAR ELEV. 260.8 ft	TOTAL DEPTH 23.5 ft	NORTHING 959,624	EASTING 2,240,979	24 HR. 14.0
DRILL RIG/HAMMER EFF./DATE RFO0074 CME-55 92% 07/12/2011		DRILL METHOD H.S. Augers	HAMMER TYPE Automatic	
DRILLER Pinter, D. G.	START DATE 09/30/14	COMP. DATE 09/30/14	SURFACE WATER DEPTH N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (ft)
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				
265														
260													GROUND SURFACE	0.0
													ROADWAY EMBANKMENT	
													RED-BROWN, SANDY CLAY	
255	257.3	3.5	2	3	2							M		
	252.3	8.5	1	2	3							M		
250	247.3	13.5	1	2	2							M		
	242.3	18.5	1	2	3							M		
240	237.3	23.5	60/0.0									M		
													ALLUVIAL	
													DARK BROWN, SILTY SAND	14.0
													WEATHERED ROCK	
													(GRANITE GNEISS)	21.0
													Boring Terminated with Standard	
													Penetration Test Refusal at Elevation 237.3	
													ft ON CRYSTALLINE ROCK (GRANITE	
													GNEISS)	23.5

WBS 17BP.5.R.56	TIP SF-920003	COUNTY WARREN	GEOLOGIST Oti, O. B.	
SITE DESCRIPTION BRIDGE NO. 3 ON -L- (SR 1001) OVER FISHING CREEK				GROUND WTR (ft)
BORING NO. EB1-B	STATION 15+01	OFFSET 11 ft RT	ALIGNMENT -L-	0 HR. 15.0
COLLAR ELEV. 261.0 ft	TOTAL DEPTH 28.4 ft	NORTHING 959,623	EASTING 2,241,007	24 HR. 15.4
DRILL RIG/HAMMER EFF./DATE RFO0074 CME-55 92% 07/12/2011		DRILL METHOD H.S. Augers	HAMMER TYPE Automatic	
DRILLER Pinter, D. G.	START DATE 10/01/14	COMP. DATE 10/01/14	SURFACE WATER DEPTH N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (ft)
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				
265														
260													GROUND SURFACE	0.0
													ROADWAY EMBANKMENT	
													ASPHALT	1.0
													RED-BROWN, SANDY CLAY	
255	257.7	3.3	2	2	2							M		
	252.7	8.3	2	2	2							M		
250	247.7	13.3	1	1	2							M		
	242.7	18.3	2	2	4							M		
240	237.7	23.3	2	2	4							M		
	232.7	28.3	60/0.1									M		
													ALLUVIAL	
													DARK BROWN AND GRAY,	
													SILTY SAND	13.0
													RESIDUAL	
													TAN-GRAY, SANDY SILT	20.0
													WEATHERED ROCK	
													(GRANITE GNEISS)	26.8
													CRYSTALLINE ROCK	
													(GRANITE GNEISS)	28.3
													Boring Terminated with Standard	
													Penetration Test Refusal at Elevation 232.6	
													ft IN CRYSTALLINE ROCK (GRANITE	
													GNEISS)	28.4

NCDOT BORE DOUBLE 920003\_GEO\_BH.GPJ NC\_DOT\_GDT 10/15/14



WBS 17BP.5.R.56		TIP SF-920003		COUNTY WARREN		GEOLOGIST Pedro, J. L.								
SITE DESCRIPTION BRIDGE NO. 3 ON -L- (SR 1001) OVER FISHING CREEK							GROUND WTR (ft)							
BORING NO. B1-B		STATION 15+78		OFFSET 9 ft RT		ALIGNMENT -L-								
COLLAR ELEV. 242.4 ft		TOTAL DEPTH 15.0 ft		NORTHING 959,697		EASTING 2,241,028								
DRILL RIG/HAMMER EFF./DATE RFO0074 CME-55 92% 07/12/2011				DRILL METHOD NW Casing w/ Advancer		HAMMER TYPE Automatic								
DRILLER Pinter, D. G.		START DATE 10/03/14		COMP. DATE 10/03/14		SURFACE WATER DEPTH 3.4ft								
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				
245														WATER SURFACE (10/03/14)
	242.4	0.0	1	0	1	1								242.4 GROUND SURFACE 0.0
240	238.5	3.9	1	1	1	1						Sat.		ALLUVIAL TAN-BROWN, COARSE SAND WITH TRACE WOOD AND SOME ROCK FRAGMENTS
235	233.5	8.9	2	4	7	11						Sat.		
230	228.7	13.7	21	79	0.4							W		231.3 WEATHERED ROCK (GRANITE GNEISS) 11.1
	227.4	15.0	60	0.0										227.4 Boring Terminated at Elevation 227.4 ft ON CRYSTALLINE ROCK (GRANITE GNEISS) 15.0

**NCDOT GEOTECHNICAL ENGINEERING UNIT**  
**BORELOG REPORT**

WBS 17BP.5.R.56		TIP SF-920003		COUNTY WARREN		GEOLOGIST Oti, O. B.									
SITE DESCRIPTION BRIDGE NO. 3 ON -L- (SR 1001) OVER FISHING CREEK							GROUND WTR (ft)								
BORING NO. EB2-A		STATION 16+41		OFFSET 20 ft LT		ALIGNMENT -L-									
COLLAR ELEV. 262.2 ft		TOTAL DEPTH 18.3 ft		NORTHING 959,766		EASTING 2,241,020									
DRILL RIG/HAMMER EFF./DATE RFO0074 CME-55 92% 07/12/2011				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic									
DRILLER Pinter, D. G.		START DATE 10/01/14		COMP. DATE 10/01/14		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					
265														262.2	0.0
260	259.0	3.2	2	3	2							M	ROADWAY EMBANKMENT RED-BROWN, SILTY CLAY		
255	254.0	8.2	1	2	3							M			
250	249.0	13.2	1	2	3							M	RESIDUAL TAN-BROWN, SANDY SILT	13.0	
245	244.0	18.2	60/0.1									M	WEATHERED ROCK (GRANITE GNEISS)	17.0	
												M	CRYSTALLINE ROCK (GRANITE GNEISS)	18.2	
												M	CRYSTALLINE ROCK (GRANITE GNEISS)	18.3	
Boring Terminated with Standard Penetration Test Refusal at Elevation 243.9 ft IN CRYSTALLINE ROCK (GRANITE GNEISS)															

WBS 17BP.5.R.56		TIP SF-920003		COUNTY WARREN		GEOLOGIST Oti, O. B.									
SITE DESCRIPTION BRIDGE NO. 3 ON -L- (SR 1001) OVER FISHING CREEK							GROUND WTR (ft)								
BORING NO. EB2-B		STATION 16+53		OFFSET 18 ft RT		ALIGNMENT -L-									
COLLAR ELEV. 262.5 ft		TOTAL DEPTH 20.7 ft		NORTHING 959,766		EASTING 2,241,060									
DRILL RIG/HAMMER EFF./DATE RFO0074 CME-55 92% 07/12/2011				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic									
DRILLER Pinter, D. G.		START DATE 10/01/14		COMP. DATE 10/01/14		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					
265														262.5	0.0
260	259.3	3.2	1	2	2							M	ROADWAY EMBANKMENT RED-BROWN, SILTY CLAY WITH TRACE MICA		
255	254.3	8.2	1	1	2							M			
250	249.3	13.2	1	2	3							M	RESIDUAL TAN-BROWN, SANDY SILT	13.7	
245	244.3	18.2	2	3	4							M	WEATHERED ROCK (GRANITE GNEISS)	20.1	
	241.9	20.6	60/0.1									M	CRYSTALLINE ROCK (GRANITE GNEISS)	20.6	
												M	CRYSTALLINE ROCK (GRANITE GNEISS)	20.7	
Boring Terminated with Standard Penetration Test Refusal at Elevation 241.8 ft IN CRYSTALLINE ROCK (GRANITE GNEISS)															

NCDOT BORE DOUBLE GEO. BH.GPJ NC\_DOT.GDT 10/15/14

# CORE PHOTOGRAPHS

**B1-A**  
BOXES 1 & 2: 10.5 - 27.5 FEET



# SITE PHOTOGRAPH

Bridge No. 3 on -L- (SR 1001) over Fishing Creek



Looking Southeast towards End Bent 1