

REFERENCE: B-5323

PROJECT: 46037

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

|       |                             |           |              |
|-------|-----------------------------|-----------|--------------|
| STATE | STATE PROJECT REFERENCE NO. | SHEET NO. | TOTAL SHEETS |
| N.C.  | B-5323                      | 1         | 18           |

**STRUCTURE**  
**SUBSURFACE INVESTIGATION**

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COUNTY GRANVILLE  
PROJECT DESCRIPTION BRIDGE NO. 143 ON SR 1442  
(DAVE WINSTON RD.) OVER JOHN H. KERR  
RESERVOIR  
SITE DESCRIPTION 14+66.00 -L-

**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

C.T. TANG, PE

CAROLINA DRILLING

J. ANDERSON

S. ANDERSON

INVESTIGATED BY C.T. TANG, PE

DRAWN BY C.T. TANG, PE

CHECKED BY D. BROWN, PE

SUBMITTED BY C.T. TANG, PE

DATE DECEMBER 2018



SIGNATURE \_\_\_\_\_ DATE \_\_\_\_\_

**DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED**



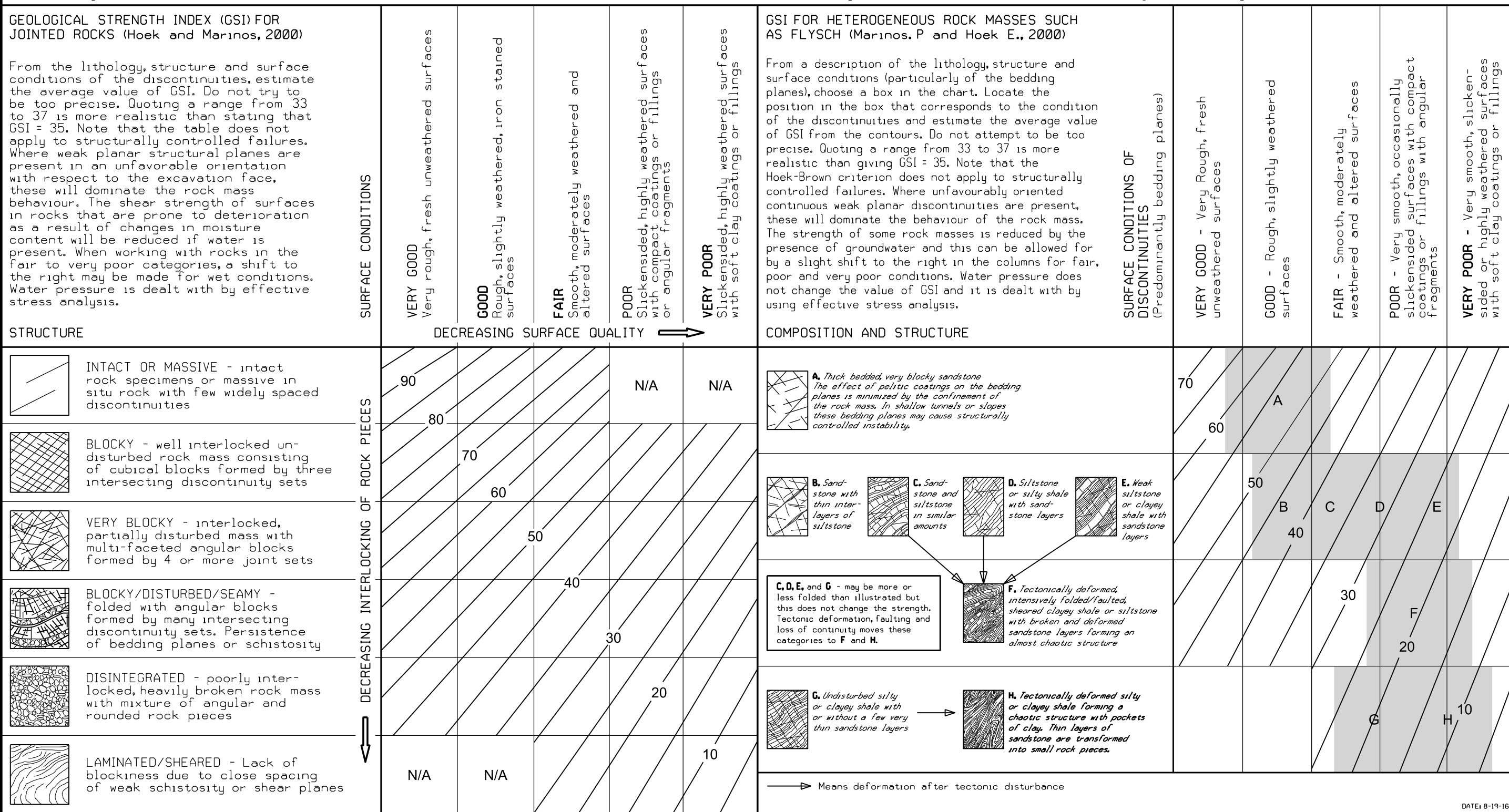
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

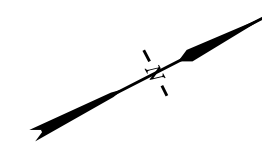
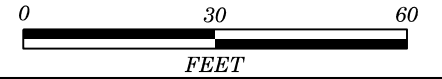
SUPPLEMENTAL LEGEND, GEOLOGICAL STRENGTH INDEX (GSI) TABLES
FROM AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS

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

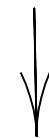
AASHTO LRFD Figure 10.4.6.4-2 — Determination of GSI for Tectonically Deformed Heterogeneous Rock Masses (Marinos and Hoek, 2000)



# SITE PLAN



JOHN H KERR RESERVOIR



14

BENT LINES

15

RIP-RAP

16

RIP-RAP

BRIDGE NO. 143

EBI-A

BI-A

B2-A

B3-A

EB2-A

-L-

SR 1442 (DAVE WINSTON RDJ)

TO SR 1444 (WILLIAMSON RDJ)

TO SR 1431 (GRASSY CREEK RDJ)

EBI-B

BI-B

B2-B

B3-B

EB2-B

RIP-RAP

RIP-RAP

TOP OF RAIL #1  
STA. 13+89 -L-,  
10 FT RT  
EL. 311.3 FT

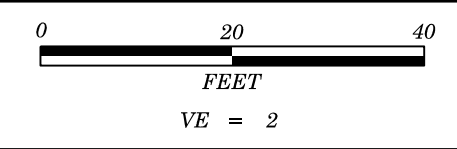
TOP OF RAIL #2  
STA. 15+44 -L-,  
10 FT RT  
EL. 311.3 FT

JOHN H KERR RESERVOIR



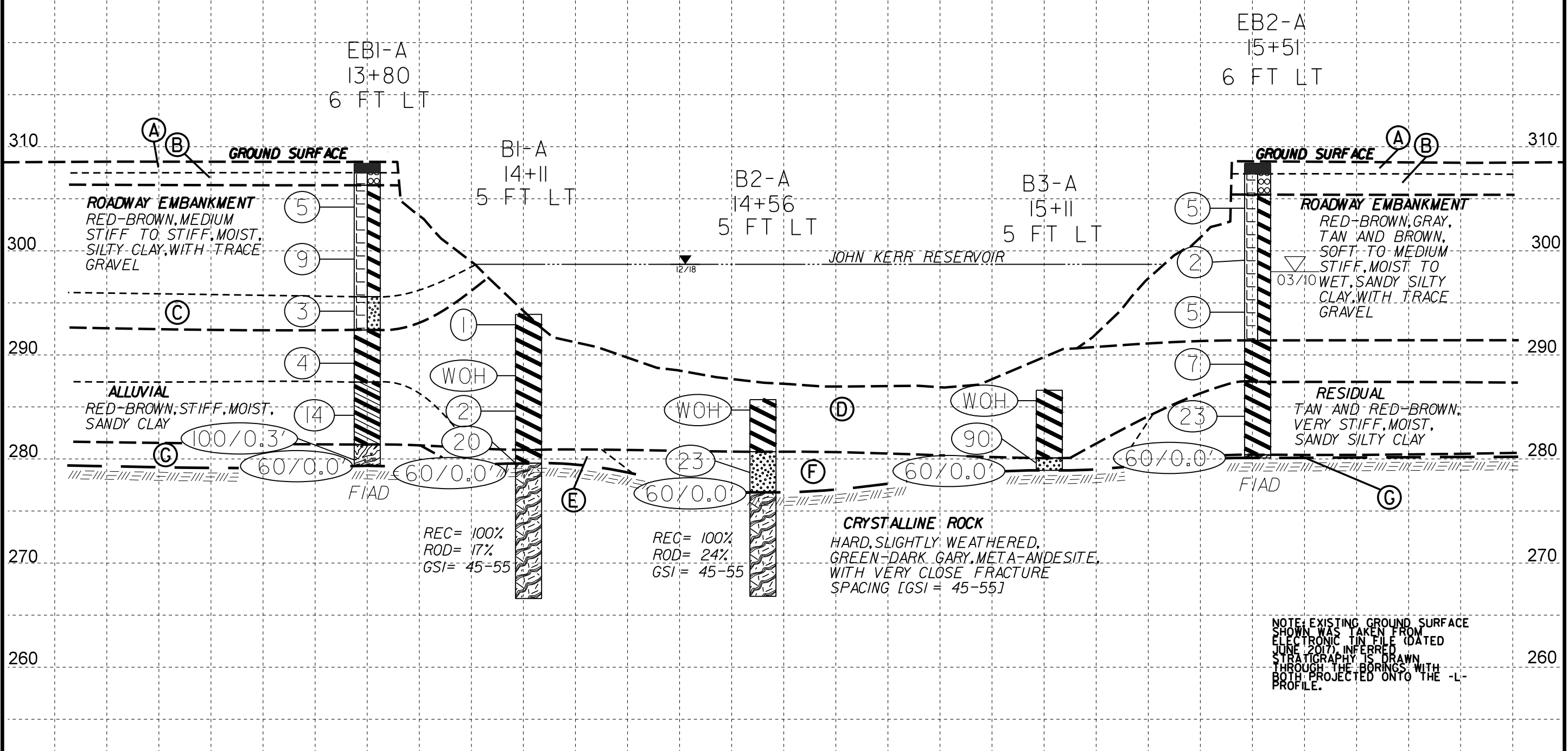
SKEW = 90 DEG.

JS



|                              |           |
|------------------------------|-----------|
| PROJECT REFERENCE NO.        | SHEET NO. |
| B-5323                       | 4         |
| PROFILE ALONG -L- CENTERLINE |           |

- (A) ROADWAY EMBANKMENT BITUMINOUS CONCRETE
- (B) ROADWAY EMBANKMENT AGGREGATE BASE COURSE
- (C) ROADWAY EMBANKMENT BROWN AND GRAY-GREEN, VERY LOOSE, SATURATED, CLAYEY SILTY SAND, WITH SOME GRAVEL
- (D) ALLUVIAL DARK GRAY AND BROWN, VERY SOFT TO MEDIUM STIFF, WET TO SATURATED, SILTY CLAY, WITH SOME GRAVEL, TRACE WOOD FRAGMENTS, LEAVES AND ORGANICS
- (E) RESIDUAL BROWN, VERY STIFF, SATURATED, SILTY CLAY, WITH SOME ROCK FRAGMENTS
- (F) RESIDUAL BROWN AND GRAY, MEDIUM DENSE TO VERY DENSE, SATURATED, SILTY SAND, WITH SOME ROCK FRAGMENTS
- (G) WEATHERED ROCK META-ANDESITE



NOTE: EXISTING GROUND SURFACE SHOWN WAS TAKEN FROM ELECTRONIC TIN FILE (DATED JUNE 2017). INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE -L- PROFILE.

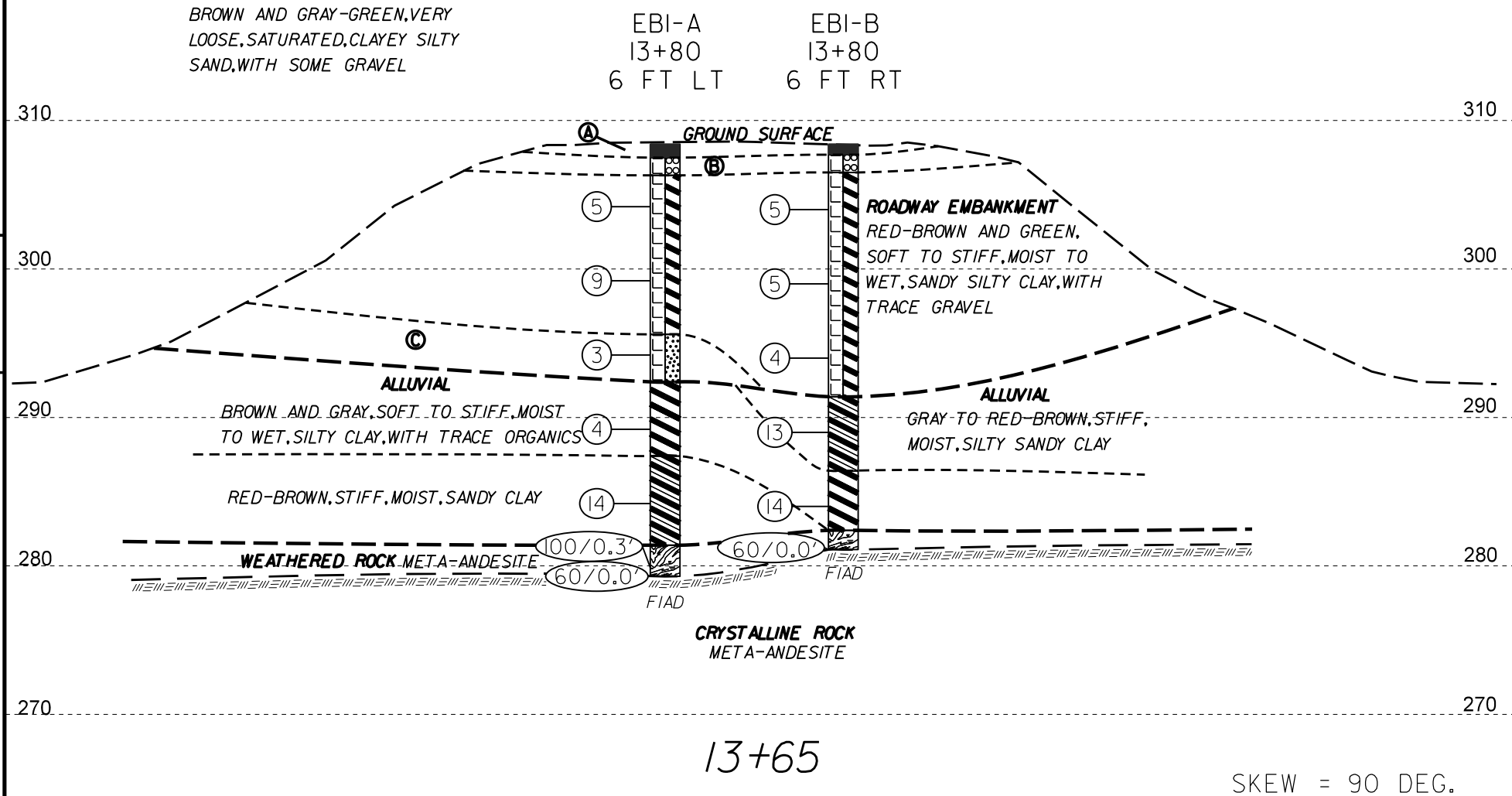
14+00

15+00

HORIZ. SCALE 0 (FEET) 10 20  
 VE = 1  
 CROSS SECTION AT END BENT #1

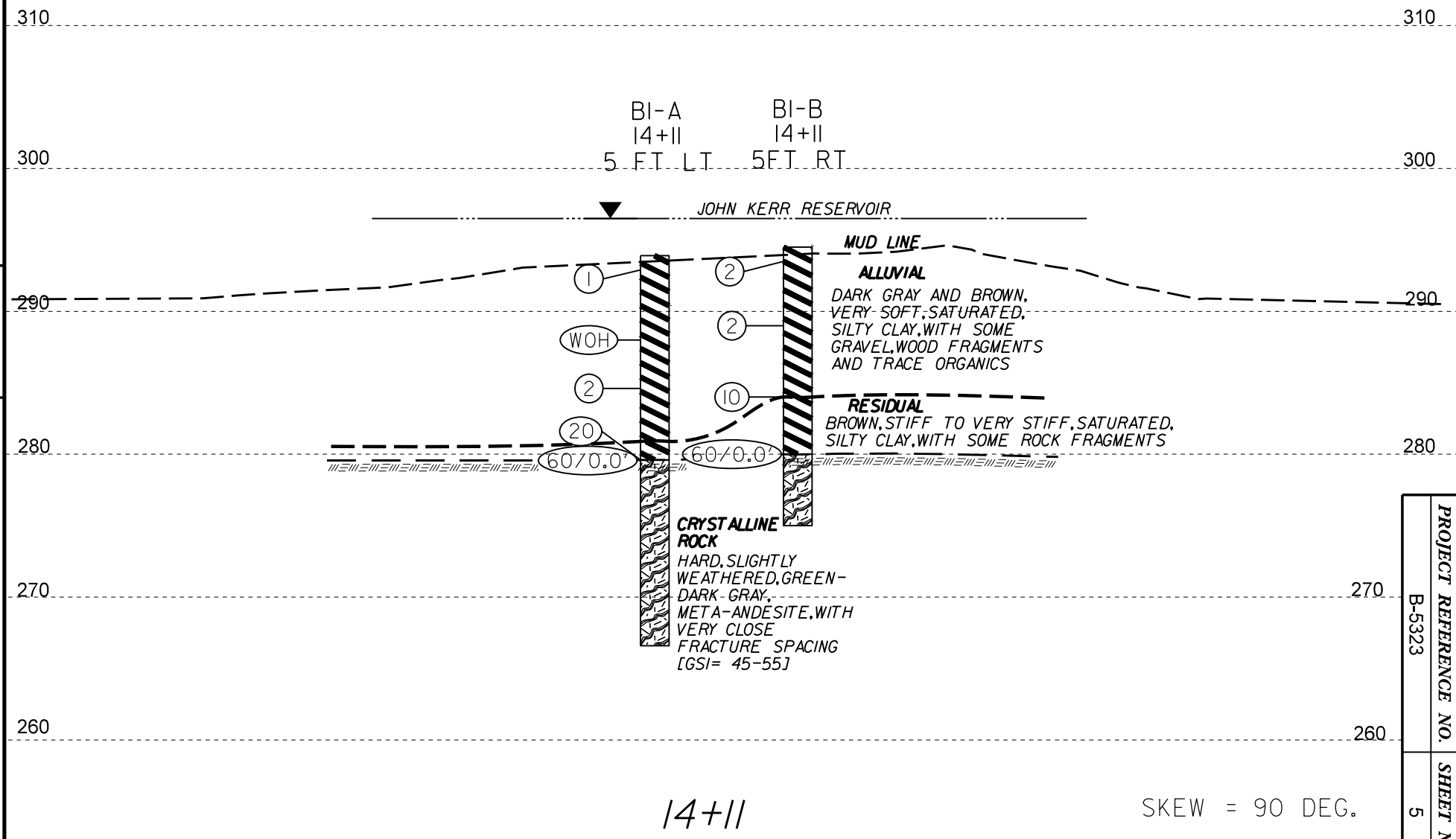
- Ⓐ ROADWAY EMBANKMENT  
BITUMINOUS CONCRETE
- Ⓑ ROADWAY EMBANKMENT  
AGGREGATE BASE COURSE
- Ⓒ ROADWAY EMBANKMENT  
BROWN AND GRAY-GREEN, VERY LOOSE, SATURATED, CLAYEY SILTY SAND, WITH SOME GRAVEL

NOTE: EXISTING GROUND SURFACE AT BENT NO. 1 TAKEN FROM ELECTRONIC TIN FILE DATED 06-01-17. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE CROSS SECTION.



HORIZ. SCALE 0 (FEET) 10 20  
 VE = 1  
 CROSS SECTION AT BENT #1

NOTE: EXISTING GROUND SURFACE AT BENT NO. 1 TAKEN FROM ELECTRONIC TIN FILE DATED 06-01-17. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE CROSS SECTION.



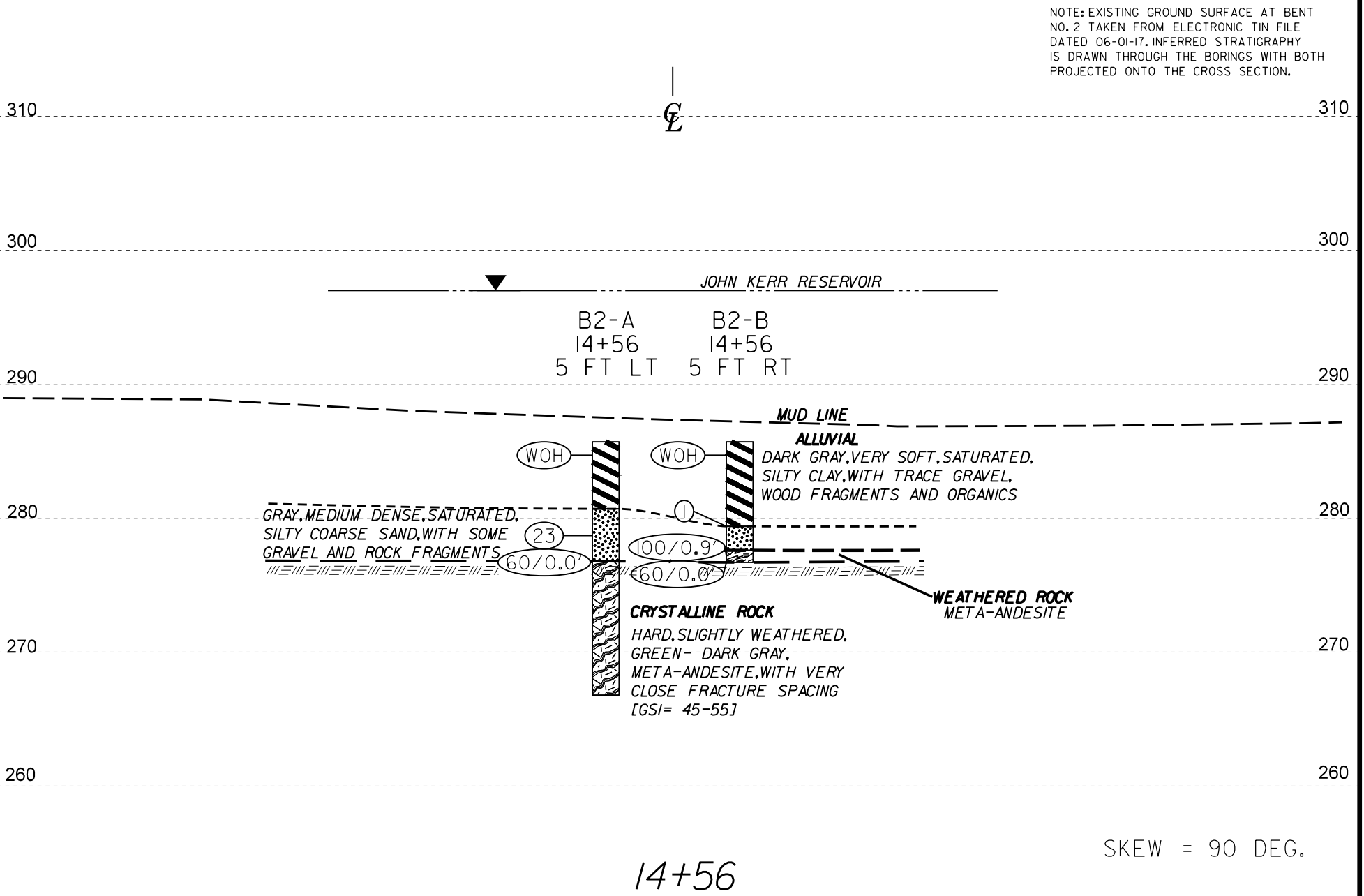
PROJECT REFERENCE NO.  
B-5323  
SHEET NO.  
5

HORIZ. SCALE  
(FEET)



VE = 1

CROSS SECTION AT BENT #2

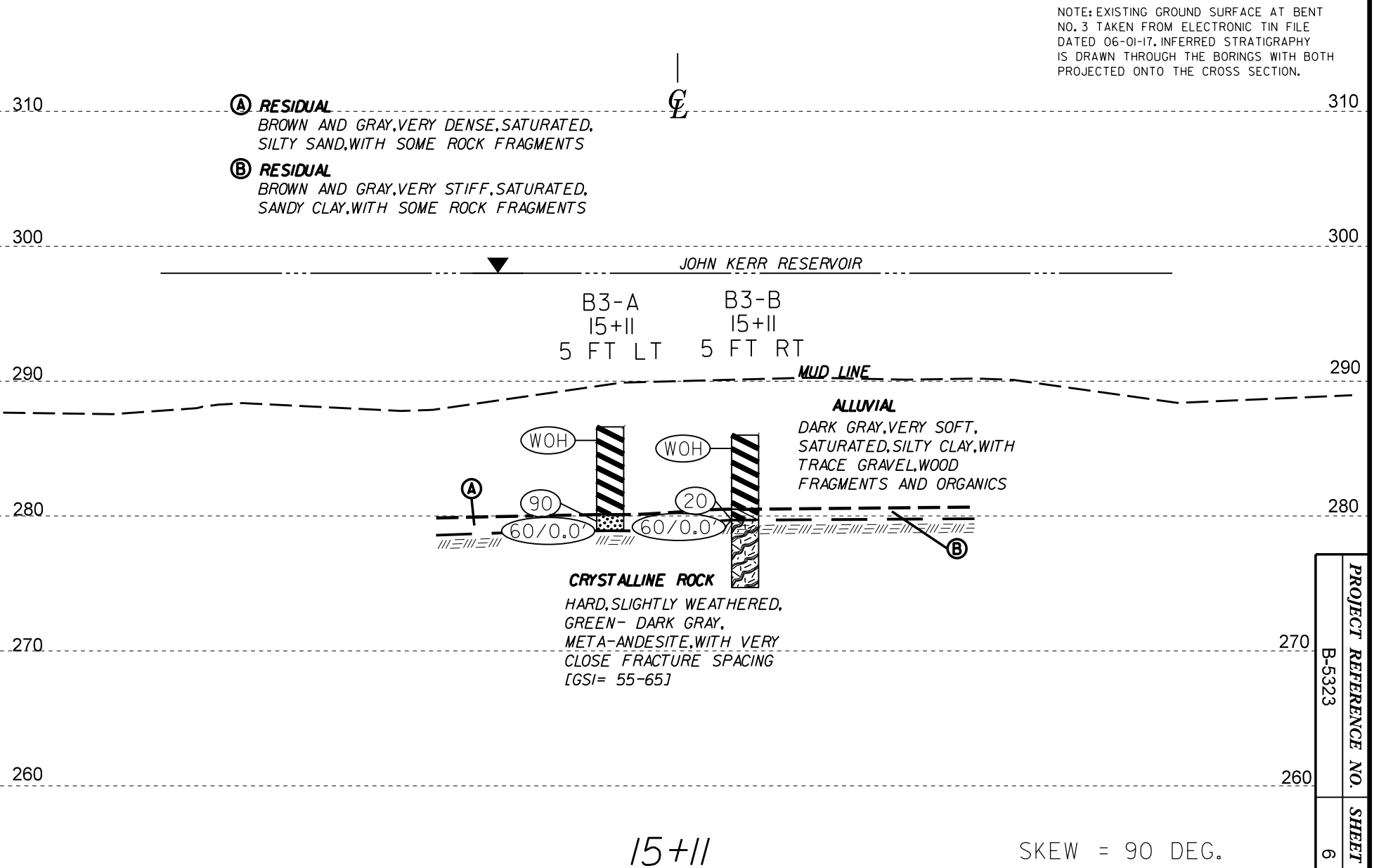


HORIZ. SCALE  
(FEET)



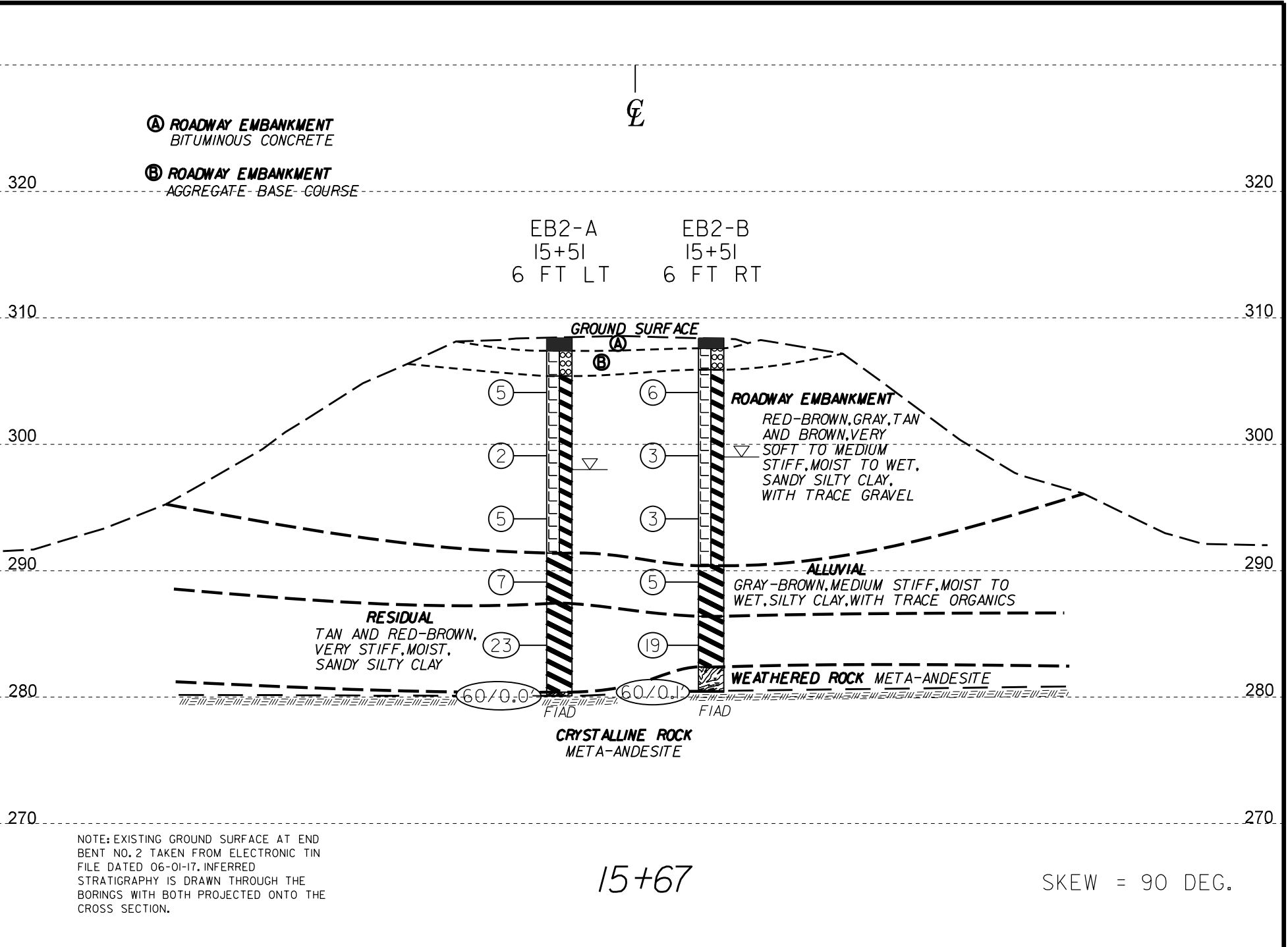
VE = 1

CROSS SECTION AT BENT #3



|                       |        |
|-----------------------|--------|
| PROJECT REFERENCE NO. | B-5323 |
| SHEET NO.             | 6      |

HORIZ. SCALE 0 (FEET)  
 10  
 20  
 VE = 1  
 CROSS SECTION AT END BENT #2



NOTE: EXISTING GROUND SURFACE AT END BENT NO. 2 TAKEN FROM ELECTRONIC TIN FILE DATED 06-01-17. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE CROSS SECTION.

HORIZ. SCALE 0 (FEET)  
 10  
 20



# GEOTECHNICAL BORING REPORT

## BORE LOG

| WBS 46037.1.1   |                 | TIP B-5323          |                          | COUNTY GRANVILLE    |       | GEOLOGIST Bruinsma, C. M. |                 |    |    |     |           |         |                           |  |      |
|---|-----------------|---------------------|--------------------------|---------------------|-------|---------------------------|-----------------|----|----|-----|-----------|---------|---------------------------|--|------|
| SITE DESCRIPTION Bridge No. 143 on SR 1442 (Dave Winston Rd.) over John H. Kerr Reservoir |                 |                     |                          |                     |       |                           | GROUND WTR (ft) |    |    |     |           |         |                           |  |      |
| BORING NO. EB1-A  |                 | STATION 13+80       |                          | OFFSET 6 ft LT      |       | ALIGNMENT -L-             |                 |    |    |     |           |         |                           |  |      |
| COLLAR ELEV. 308.4 ft   |                 | TOTAL DEPTH 29.1 ft |                          | NORTHING 1,013,525  |       | EASTING 2,114,452         |                 |    |    |     |           |         |                           |  |      |
| DRILL RIG/HAMMER EFF./DATE DIEDRICH D-50  |                 |                     | DRILL METHOD H.S. Augers |                     |       | HAMMER TYPE Automatic     |                 |    |    |     |           |         |                           |  |      |
| DRILLER Contract Driller  |                 | START DATE 03/02/10 |                          | COMP. DATE 03/02/10 |       | 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 |           |         |                           |  |      |
| 310   |                 |                     |                          |                     |       |                           |                 |    |    |     |           |         |                           | 308.4 GROUND SURFACE 0.0   |      |
|   |                 |                     |                          |                     |       |                           |                 |    |    |     |           |         |                           | 307.5 Bituminous Concrete 0.9  |      |
|   |                 |                     |                          |                     |       |                           |                 |    |    |     |           |         |                           | 306.3 Aggregate Base Course 2.1  |      |
| 305   | 305.2           | 3.2                 | 1                        | 2                   | 3     | 5                         |                 |    |    |     |           | SS-1    | M                         | ROADWAY EMBANKMENT   |      |
|   |                 |                     |                          |                     |       |                           |                 |    |    |     |           |         |                           | Red-Brown, Sandy Silty Clay, with Trace Gravel   |      |
| 300   | 300.2           | 8.2                 | 3                        | 4                   | 5     |                           |                 |    |    |     |           |         | M                         |  |      |
| 295   | 295.2           | 13.2                | 2                        | 1                   | 2     |                           |                 |    |    |     |           |         |                           | Brown and Gray-Green, Clayey Silty Sand, with Some Gravel  | 12.8 |
|   |                 |                     |                          |                     |       |                           |                 |    |    |     |           |         |                           |  |      |
| 290   | 290.2           | 18.2                | 1                        | 2                   | 2     |                           |                 |    |    |     |           |         |                           | ALLUVIAL   |      |
|   |                 |                     |                          |                     |       |                           |                 |    |    |     |           |         |                           | Brown, Silty Clay, with Trace Organics   |      |
| 285   | 285.2           | 23.2                | 5                        | 6                   | 8     |                           |                 |    |    |     |           |         |                           | Red-Brown, Sandy Clay  | 21.0 |
|   |                 |                     |                          |                     |       |                           |                 |    |    |     |           |         |                           |  |      |
| 280   | 280.2           | 28.2                |                          |                     |       |                           |                 |    |    |     |           |         |                           | WEATHERED ROCK   | 27.0 |
|   | 279.3           | 29.1                | 100/0.3                  |                     |       |                           |                 |    |    |     |           |         |                           | Brown and Gray-Green, Meta-Volcanic Rock (Meta-Andesite)   | 29.1 |
|   |                 |                     | 60/0.0                   |                     |       |                           |                 |    |    |     |           |         |                           | Boring Terminated with Standard Penetration Test Refusal at Elevation 279.3 ft on Crystalline Rock (Meta-Andesite) |      |

| WBS 46037.1.1   |                 | TIP B-5323          |                          | COUNTY GRANVILLE    |       | GEOLOGIST Bruinsma, C. M. |                 |    |    |     |           |         |                           |  |      |
|---|-----------------|---------------------|--------------------------|---------------------|-------|---------------------------|-----------------|----|----|-----|-----------|---------|---------------------------|--|------|
| SITE DESCRIPTION Bridge No. 143 on SR 1442 (Dave Winston Rd.) over John H. Kerr Reservoir |                 |                     |                          |                     |       |                           | GROUND WTR (ft) |    |    |     |           |         |                           |  |      |
| BORING NO. EB1-B  |                 | STATION 13+80       |                          | OFFSET 6 ft RT      |       | ALIGNMENT -L-             |                 |    |    |     |           |         |                           |  |      |
| COLLAR ELEV. 308.4 ft   |                 | TOTAL DEPTH 27.3 ft |                          | NORTHING 1,013,521  |       | EASTING 2,114,463         |                 |    |    |     |           |         |                           |  |      |
| DRILL RIG/HAMMER EFF./DATE DIEDRICH D-50  |                 |                     | DRILL METHOD H.S. Augers |                     |       | HAMMER TYPE Automatic     |                 |    |    |     |           |         |                           |  |      |
| DRILLER Contract Driller  |                 | START DATE 03/02/10 |                          | COMP. DATE 03/02/10 |       | 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 |           |         |                           |  |      |
| 310   |                 |                     |                          |                     |       |                           |                 |    |    |     |           |         |                           | 308.4 GROUND SURFACE 0.0   |      |
|   |                 |                     |                          |                     |       |                           |                 |    |    |     |           |         |                           | 307.7 Bituminous Concrete 0.7  |      |
|   |                 |                     |                          |                     |       |                           |                 |    |    |     |           |         |                           | 306.5 Aggregate Base Course 1.9  |      |
| 305   | 305.0           | 3.4                 | 2                        | 2                   | 3     | 5                         |                 |    |    |     |           |         | M                         | ROADWAY EMBANKMENT   |      |
|   |                 |                     |                          |                     |       |                           |                 |    |    |     |           |         |                           | Red-Brown and Green, Silty Clay, with Trace Gravel   |      |
| 300   | 300.0           | 8.4                 | 3                        | 2                   | 3     |                           |                 |    |    |     |           |         | M                         |  |      |
| 295   | 295.0           | 13.4                | 2                        | 1                   | 3     |                           |                 |    |    |     |           |         |                           | Brown and Gray-Green, Clayey Silty Sand, with Some Gravel  | 12.8 |
|   |                 |                     |                          |                     |       |                           |                 |    |    |     |           |         |                           |  |      |
| 290   | 290.0           | 18.4                | 5                        | 5                   | 8     |                           |                 |    |    |     |           |         |                           | ALLUVIAL   |      |
|   |                 |                     |                          |                     |       |                           |                 |    |    |     |           |         |                           | Gray to Red-Brown, Silty Sandy Clay  |      |
| 285   | 285.0           | 23.4                | 7                        | 7                   | 7     |                           |                 |    |    |     |           |         |                           | Gray, Silty Clay   | 22.0 |
|   |                 |                     |                          |                     |       |                           |                 |    |    |     |           |         |                           |  |      |
|   | 281.1           | 27.3                | 60/0                     |                     |       |                           |                 |    |    |     |           |         |                           | WEATHERED ROCK   | 26.0 |
|   |                 |                     |                          |                     |       |                           |                 |    |    |     |           |         |                           | Gray-Green, Meta-Volcanic Rock (Meta-Andesite)   | 27.3 |
|   |                 |                     |                          |                     |       |                           |                 |    |    |     |           |         |                           | Boring Terminated with Standard Penetration Test Refusal at Elevation 281.1 ft on Crystalline Rock (Meta-Andesite) |      |

NCDOT BORE DOUBLE B5323\_GEO\_BRDG0143.GPJ NC\_DOT\_GDT 12/18/18

# GEOTECHNICAL BORING REPORT

## BORE LOG

| WBS 46037.1.1   |                 | TIP B-5323          |                         | COUNTY GRANVILLE    |                       | GEOLOGIST C.T. Tang       |                 |    |    |     |           |     |     |                           |   |      |
|---|-----------------|---------------------|-------------------------|---------------------|-----------------------|---------------------------|-----------------|----|----|-----|-----------|-----|-----|---------------------------|---|------|
| SITE DESCRIPTION Bridge No. 143 on SR 1442 (Dave Winston Rd.) over John H. Kerr Reservoir |                 |                     |                         |                     |                       |                           | GROUND WTR (ft) |    |    |     |           |     |     |                           |   |      |
| BORING NO. B1-A   |                 | STATION 14+11       |                         | OFFSET 5 ft LT      |                       | ALIGNMENT -L-             |                 |    |    |     |           |     |     |                           |   |      |
| COLLAR ELEV. 293.9 ft   |                 | TOTAL DEPTH 27.3 ft |                         | NORTHING 1,013,550  |                       | EASTING 2,114,467         |                 |    |    |     |           |     |     |                           |   |      |
| DRILL RIG/HAMMER EFF./DATE BRI3895 CME-55 96% 04/19/2018                                  |                 |                     | DRILL METHOD Mud Rotary |                     | HAMMER TYPE Automatic |                           |                 |    |    |     |           |     |     |                           |   |      |
| DRILLER J. Anderson   |                 | START DATE 12/06/18 |                         | COMP. DATE 12/06/18 |                       | SURFACE WATER DEPTH 2.6ft |                 |    |    |     |           |     |     |                           |   |      |
| ELEV (ft)   | DRIVE ELEV (ft) | DEPTH (ft)          | BLOW COUNT              |                     |                       | BLOWS PER FOOT            |                 |    |    |     | SAMP. NO. | MOI | LOG | SOIL AND ROCK DESCRIPTION |   |      |
|   |                 |                     | 0.5ft                   | 0.5ft               | 0.5ft                 | 0                         | 25              | 50 | 75 | 100 |           |     |     | ELEV. (ft)                | DEPTH (ft)  |      |
| 295   | 293.9           | 0.0                 | 1                       | 0                   | 1                     |                           |                 |    |    |     |           |     |     |                           | 293.9   | 0.0  |
| 290   | 289.0           | 4.9                 | WOH                     | WOH                 | WOH                   |                           |                 |    |    |     |           |     |     |                           |   |      |
| 285   | 285.6           | 8.3                 | WOH                     | WOH                 | 2                     |                           |                 |    |    |     |           |     |     |                           |   |      |
| 280   | 280.6           | 13.3                | 14                      | 20                  | 60/0.0                |                           |                 |    |    |     |           |     |     |                           | 280.9   | 13.0 |
| 275   |                 |                     |                         |                     |                       |                           |                 |    |    |     |           |     |     |                           | 279.6   | 14.3 |
| 270   |                 |                     |                         |                     |                       |                           |                 |    |    |     |           |     |     |                           | 266.6   | 27.3 |
|   |                 |                     |                         |                     |                       |                           |                 |    |    |     |           |     |     |                           | Boring Terminated at Elevation 266.6 ft in Crystalline Rock (Meta-Andesite) |      |

| WBS 46037.1.1   |               | TIP B-5323          |                         | COUNTY GRANVILLE                     |                       | GEOLOGIST C.T. Tang       |                 |                |                         |
|---|---------------|---------------------|-------------------------|--------------------------------------|-----------------------|---------------------------|-----------------|----------------|-------------------------|
| SITE DESCRIPTION Bridge No. 143 on SR 1442 (Dave Winston Rd.) over John H. Kerr Reservoir |               |                     |                         |                                      |                       |                           | GROUND WTR (ft) |                |                         |
| BORING NO. B1-A   |               | STATION 14+11       |                         | OFFSET 5 ft LT                       |                       | ALIGNMENT -L-             |                 |                |                         |
| COLLAR ELEV. 293.9 ft   |               | TOTAL DEPTH 27.3 ft |                         | NORTHING 1,013,550                   |                       | EASTING 2,114,467         |                 |                |                         |
| DRILL RIG/HAMMER EFF./DATE BRI3895 CME-55 96% 04/19/2018                                  |               |                     | DRILL METHOD Mud Rotary |                                      | HAMMER TYPE Automatic |                           |                 |                |                         |
| DRILLER J. Anderson   |               | START DATE 12/06/18 |                         | COMP. DATE 12/06/18                  |                       | SURFACE WATER DEPTH 2.6ft |                 |                |                         |
| CORE SIZE NQ  |               |                     | TOTAL RUN 13.0 ft       |                                      |                       |                           |                 | LOG            | DESCRIPTION AND REMARKS |
| ELEV (ft)   | RUN ELEV (ft) | DEPTH (ft)          | RUN (ft)                | DRILL RATE (Min/ft)                  | RUN REC. (%)          | RQD (%)                   | SAMP. NO.       |                |                         |
| 279.6   | 279.6         | 14.3                | 3.0                     | 7:07<br>8:26<br>3:16                 | (3.0)<br>100%         | (0.6)<br>20%              | RS-1            | (13.0)<br>100% | (2.2)<br>17%            |
| 275   | 276.6         | 17.3                | 5.0                     | 5:01<br>5:20<br>3:16<br>4:21<br>3:24 | (5.0)<br>100%         | (0.8)<br>16%              |                 |                |                         |
| 270   | 271.6         | 22.3                | 5.0                     | 4:02<br>3:33<br>3:02<br>5:37<br>4:50 | (5.0)<br>100%         | (0.8)<br>16%              |                 |                |                         |
|   | 266.6         | 27.3                |                         |                                      |                       |                           |                 |                |                         |
| Boring Terminated at Elevation 266.6 ft in Crystalline Rock (Meta-Andesite)               |               |                     |                         |                                      |                       |                           |                 |                |                         |

# GEOTECHNICAL BORING REPORT BORE LOG

| WBS 46037.1.1   |                 | TIP B-5323          |            | COUNTY GRANVILLE        |       | GEOLOGIST C.T. Tang       |                 |    |    |     |           |      |                           |            |            |  |
|---|-----------------|---------------------|------------|-------------------------|-------|---------------------------|-----------------|----|----|-----|-----------|------|---------------------------|------------|------------|--|
| SITE DESCRIPTION Bridge No. 143 on SR 1442 (Dave Winston Rd.) over John H. Kerr Reservoir |                 |                     |            |                         |       |                           | GROUND WTR (ft) |    |    |     |           |      |                           |            |            |  |
| BORING NO. B1-B   |                 | STATION 14+11       |            | OFFSET 5 ft RT          |       | ALIGNMENT -L-             |                 |    |    |     |           |      |                           |            |            |  |
| COLLAR ELEV. 294.5 ft   |                 | TOTAL DEPTH 19.5 ft |            | NORTHING 1,013,544      |       | EASTING 2,114,478         |                 |    |    |     |           |      |                           |            |            |  |
| DRILL RIG/HAMMER EFF./DATE BRI3895 CME-55 96% 04/19/2018                                  |                 |                     |            | DRILL METHOD Mud Rotary |       | HAMMER TYPE Automatic     |                 |    |    |     |           |      |                           |            |            |  |
| DRILLER J. Anderson   |                 | START DATE 12/03/18 |            | COMP. DATE 12/03/18     |       | SURFACE WATER DEPTH 4.3ft |                 |    |    |     |           |      |                           |            |            |  |
| 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) |  |
| 295   | 294.5           | 0.0                 |            |                         |       |                           |                 |    |    |     |           |      |                           | 294.5      | 0.0        | MUD LINE   |
|   |                 |                     | 1          | 1                       | 1     | 2                         |                 |    |    |     |           | Sat. |                           |            |            | <b>ALLUVIAL</b><br>Dark Gray, Silty Clay, with Some Rock Fragments and Trace Organics  |
| 290   | 290.0           | 4.5                 | WOH        | 1                       | 1     |                           |                 |    |    |     |           | Sat. |                           |            |            |  |
| 285   | 285.0           | 9.5                 | WOH        | 5                       | 5     | 10                        |                 |    |    |     |           | Sat. |                           |            |            |  |
| 280   | 280.0           | 14.5                |            |                         |       |                           |                 |    |    |     |           |      |                           | 280.0      | 14.5       | <b>RESIDUAL</b><br>Brown, Silty Clay, with Some Rock Fragments   |
|   |                 |                     |            |                         |       |                           |                 |    |    |     |           |      |                           | 275.0      | 19.5       | <b>CRYSTALLINE ROCK</b><br>Hard, Slightly Weathered, Green-Dark Gray, Meta-Andesite, with Very Close Fracture Spacing [GSI = 45-55]<br>[REC = 26%, RQD = 14%]<br>Boring Terminated at Elevation 275.0 ft in Crystalline Rock (Meta-Andesite) |

| WBS 46037.1.1   |               | TIP B-5323          |          | COUNTY GRANVILLE             |                 | GEOLOGIST C.T. Tang       |                 |                    |                   |     |                         |   |
|---|---------------|---------------------|----------|------------------------------|-----------------|---------------------------|-----------------|--------------------|-------------------|-----|-------------------------|---|
| SITE DESCRIPTION Bridge No. 143 on SR 1442 (Dave Winston Rd.) over John H. Kerr Reservoir |               |                     |          |                              |                 |                           | GROUND WTR (ft) |                    |                   |     |                         |   |
| BORING NO. B1-B   |               | STATION 14+11       |          | OFFSET 5 ft RT               |                 | ALIGNMENT -L-             |                 |                    |                   |     |                         |   |
| COLLAR ELEV. 294.5 ft   |               | TOTAL DEPTH 19.5 ft |          | NORTHING 1,013,544           |                 | EASTING 2,114,478         |                 |                    |                   |     |                         |   |
| DRILL RIG/HAMMER EFF./DATE BRI3895 CME-55 96% 04/19/2018                                  |               |                     |          | DRILL METHOD Mud Rotary      |                 | HAMMER TYPE Automatic     |                 |                    |                   |     |                         |   |
| DRILLER J. Anderson   |               | START DATE 12/03/18 |          | COMP. DATE 12/03/18          |                 | SURFACE WATER DEPTH 4.3ft |                 |                    |                   |     |                         |   |
| CORE SIZE NQ  |               |                     |          | TOTAL RUN 5.0 ft             |                 |                           |                 |                    |                   |     |                         |   |
| ELEV (ft)   | RUN ELEV (ft) | DEPTH (ft)          | RUN (ft) | DRILL RATE (Min/ft)          | RUN REC. (ft) % | RUN RQD (ft) %            | SAMP. NO.       | STRATA REC. (ft) % | STRATA RQD (ft) % | LOG | DESCRIPTION AND REMARKS |   |
| 280   | 280.0         | 14.5                | 4.0      | 1:14<br>1:09<br>2:15<br>7:18 | (0.3)<br>8%     | (0.3)<br>8%               |                 | (1.3)<br>26%       | (0.7)<br>14%      |     | 280.0                   | Begin Coring @ 14.5 ft<br><b>CRYSTALLINE ROCK</b><br>Hard, Slightly Weathered, Green-Dark Gray, Meta-Andesite, with Very Close Fracture Spacing [GSI = 45-55] |
| 275   | 275.0         | 19.5                | 1.0      | 5:40                         | (1.0)<br>100%   | (0.4)<br>40%              |                 |                    |                   |     | 275.0                   | Boring Terminated at Elevation 275.0 ft in Crystalline Rock (Meta-Andesite)   |

NCDOT BORE DOUBLE B5323\_GEO\_BRDG0143.GPJ NC\_DOT\_GDT 12/18/18

# GEOTECHNICAL BORING REPORT

## BORE LOG

| WBS 46037.1.1   |                 | TIP B-5323          |                         | COUNTY GRANVILLE    |                       | GEOLOGIST C.T. Tang        |                 |    |    |     |           |     |                           |            |      |  |
|---|-----------------|---------------------|-------------------------|---------------------|-----------------------|----------------------------|-----------------|----|----|-----|-----------|-----|---------------------------|------------|------|--|
| SITE DESCRIPTION Bridge No. 143 on SR 1442 (Dave Winston Rd.) over John H. Kerr Reservoir |                 |                     |                         |                     |                       |                            | GROUND WTR (ft) |    |    |     |           |     |                           |            |      |  |
| BORING NO. B2-A   |                 | STATION 14+56       |                         | OFFSET 5 ft LT      |                       | ALIGNMENT -L-              |                 |    |    |     |           |     |                           |            |      |  |
| COLLAR ELEV. 285.7 ft   |                 | TOTAL DEPTH 18.9 ft |                         | NORTHING 1,013,590  |                       | EASTING 2,114,487          |                 |    |    |     |           |     |                           |            |      |  |
| DRILL RIG/HAMMER EFF./DATE BRI3895 CME-55 96% 04/19/2018                                  |                 |                     | DRILL METHOD Mud Rotary |                     | HAMMER TYPE Automatic |                            |                 |    |    |     |           |     |                           |            |      |  |
| DRILLER J. Anderson   |                 | START DATE 12/05/18 |                         | COMP. DATE 12/05/18 |                       | SURFACE WATER DEPTH 11.3ft |                 |    |    |     |           |     |                           |            |      |  |
| 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   |                 |                     |                         |                     |                       |                            |                 |    |    |     |           |     |                           |            |      |  |
| 290   |                 |                     |                         |                     |                       |                            |                 |    |    |     |           |     |                           |            |      |  |
| 285   | 285.7           | 0.0                 | WOH                     | WOH                 | WOH                   |                            |                 |    |    |     |           |     |                           | 285.7      | 0.0  |  |
| 280   | 279.7           | 6.0                 |                         |                     |                       |                            |                 |    |    |     |           |     |                           | 280.7      | 5.0  |  |
| 275   | 276.8           | 8.9                 | 8                       | 9                   | 14                    |                            |                 |    |    |     |           |     |                           | 276.8      | 8.9  |  |
| 270   |                 |                     |                         |                     |                       |                            |                 |    |    |     |           |     |                           | 266.8      | 18.9 |  |
|   |                 |                     |                         |                     |                       |                            |                 |    |    |     |           |     |                           |            |      |  |

| WBS 46037.1.1   |               | TIP B-5323          |                         | COUNTY GRANVILLE                     |                       | GEOLOGIST C.T. Tang        |                 |
|---|---------------|---------------------|-------------------------|--------------------------------------|-----------------------|----------------------------|-----------------|
| SITE DESCRIPTION Bridge No. 143 on SR 1442 (Dave Winston Rd.) over John H. Kerr Reservoir |               |                     |                         |                                      |                       |                            | GROUND WTR (ft) |
| BORING NO. B2-A   |               | STATION 14+56       |                         | OFFSET 5 ft LT                       |                       | ALIGNMENT -L-              |                 |
| COLLAR ELEV. 285.7 ft   |               | TOTAL DEPTH 18.9 ft |                         | NORTHING 1,013,590                   |                       | EASTING 2,114,487          |                 |
| DRILL RIG/HAMMER EFF./DATE BRI3895 CME-55 96% 04/19/2018                                  |               |                     | DRILL METHOD Mud Rotary |                                      | HAMMER TYPE Automatic |                            |                 |
| DRILLER J. Anderson   |               | START DATE 12/05/18 |                         | COMP. DATE 12/05/18                  |                       | SURFACE WATER DEPTH 11.3ft |                 |
| CORE SIZE NQ  |               |                     |                         | TOTAL RUN 10.0 ft                    |                       |                            |                 |
| ELEV (ft)   | RUN ELEV (ft) | DEPTH (ft)          | RUN (ft)                | DRILL RATE (Min/ft)                  | RUN REC. (%)          | RQD (%)                    | STRATA REC. (%) |
| 276.8   | 276.8         | 8.9                 | 5.0                     | 9:49<br>7:13<br>7:20<br>7:59<br>7:15 | (5.0)<br>100%         | (0.6)<br>12%               | (10.0)<br>24%   |
| 270   | 271.8         | 13.9                | 5.0                     | 5:01<br>5:20<br>2:52<br>5:14<br>7:35 | (5.0)<br>100%         | (1.8)<br>36%               |                 |
|   | 266.8         | 18.9                |                         |                                      |                       |                            |                 |
|   |               |                     |                         |                                      |                       |                            |                 |

| ELEV (ft) | DESCRIPTION AND REMARKS   |
|-----------|---|
| 276.8     | Begin Coring @ 8.9 ft   |
| 276.8     | <b>CRYSTALLINE ROCK</b><br>Hard, Slightly Weathered, Green-Dark Gray, Meta-Andesite, with Very Close Fracture Spacing [GSI = 45-55] |
| 266.8     | Boring Terminated at Elevation 266.8 ft in Crystalline Rock (Meta-Andesite)   |

# GEOTECHNICAL BORING REPORT

## BORE LOG

| WBS 46037.1.1   |                 | TIP B-5323          |                         | COUNTY GRANVILLE    |       | GEOLOGIST C.T. Tang        |                 |    |    |     |           |     |                           |            |            |
|---|-----------------|---------------------|-------------------------|---------------------|-------|----------------------------|-----------------|----|----|-----|-----------|-----|---------------------------|------------|------------|
| SITE DESCRIPTION Bridge No. 143 on SR 1442 (Dave Winston Rd.) over John H. Kerr Reservoir |                 |                     |                         |                     |       |                            | GROUND WTR (ft) |    |    |     |           |     |                           |            |            |
| BORING NO. B2-B   |                 | STATION 14+56       |                         | OFFSET 5 ft RT      |       | ALIGNMENT -L-              |                 |    |    |     |           |     |                           |            |            |
| COLLAR ELEV. 285.7 ft   |                 | TOTAL DEPTH 9.0 ft  |                         | NORTHING 1,013,584  |       | EASTING 2,114,498          |                 |    |    |     |           |     |                           |            |            |
| DRILL RIG/HAMMER EFF./DATE BRI3895 CME-55 96% 04/19/2018                                  |                 |                     | DRILL METHOD Mud Rotary |                     |       | HAMMER TYPE Automatic      |                 |    |    |     |           |     |                           |            |            |
| DRILLER J. Anderson   |                 | START DATE 12/04/18 |                         | COMP. DATE 12/04/18 |       | SURFACE WATER DEPTH 12.6ft |                 |    |    |     |           |     |                           |            |            |
| 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) |
| 295   |                 |                     |                         |                     |       |                            |                 |    |    |     |           |     |                           |            |            |
| 290   |                 |                     |                         |                     |       |                            |                 |    |    |     |           |     |                           |            |            |
| 285   | 285.7           | 0.0                 | WOH                     | WOH                 | WOH   |                            |                 |    |    |     |           |     |                           | 285.7      | 0.0        |
|   |                 |                     |                         |                     |       |                            |                 |    |    |     |           |     |                           |            |            |
| 280   | 280.4           | 5.3                 |                         |                     |       |                            |                 |    |    |     |           |     |                           | 279.4      | 6.3        |
|   | 278.1           | 7.6                 | WOH                     | WOH                 | 1     |                            |                 |    |    |     |           |     |                           | 277.6      | 8.1        |
|   | 276.7           | 9.0                 |                         |                     |       |                            |                 |    |    |     |           |     |                           | 276.7      | 9.0        |
|   |                 |                     | 60/0.0'                 |                     |       |                            |                 |    |    |     |           |     |                           |            |            |
|   |                 |                     |                         |                     |       |                            |                 |    |    |     |           |     |                           |            |            |

| WBS 46037.1.1   |                 | TIP B-5323          |                         | COUNTY GRANVILLE    |       | GEOLOGIST C.T. Tang        |                 |    |    |     |           |     |                           |            |            |
|---|-----------------|---------------------|-------------------------|---------------------|-------|----------------------------|-----------------|----|----|-----|-----------|-----|---------------------------|------------|------------|
| SITE DESCRIPTION Bridge No. 143 on SR 1442 (Dave Winston Rd.) over John H. Kerr Reservoir |                 |                     |                         |                     |       |                            | GROUND WTR (ft) |    |    |     |           |     |                           |            |            |
| BORING NO. B3-A   |                 | STATION 15+11       |                         | OFFSET 5 ft LT      |       | ALIGNMENT -L-              |                 |    |    |     |           |     |                           |            |            |
| COLLAR ELEV. 286.6 ft   |                 | TOTAL DEPTH 7.7 ft  |                         | NORTHING 1,013,639  |       | EASTING 2,114,512          |                 |    |    |     |           |     |                           |            |            |
| DRILL RIG/HAMMER EFF./DATE BRI3895 CME-55 96% 04/19/2018                                  |                 |                     | DRILL METHOD Mud Rotary |                     |       | HAMMER TYPE Automatic      |                 |    |    |     |           |     |                           |            |            |
| DRILLER J. Anderson   |                 | START DATE 12/04/18 |                         | COMP. DATE 12/04/18 |       | SURFACE WATER DEPTH 11.4ft |                 |    |    |     |           |     |                           |            |            |
| 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 |           |     |                           | ELEV. (ft) | DEPTH (ft) |
| 295   |                 |                     |                         |                     |       |                            |                 |    |    |     |           |     |                           |            |            |
| 290   |                 |                     |                         |                     |       |                            |                 |    |    |     |           |     |                           |            |            |
| 285   | 286.6           | 0.0                 | WOH                     | WOH                 | WOH   |                            |                 |    |    |     |           |     |                           | 286.6      | 0.0        |
|   |                 |                     |                         |                     |       |                            |                 |    |    |     |           |     |                           |            |            |
| 280   | 280.6           | 6.0                 |                         |                     |       |                            |                 |    |    |     |           |     |                           | 280.1      | 6.5        |
|   | 278.9           | 7.7                 |                         |                     |       |                            |                 |    |    |     |           |     |                           | 278.9      | 7.7        |
|   |                 |                     |                         |                     |       |                            |                 |    |    |     |           |     |                           |            |            |
|   |                 |                     |                         |                     |       |                            |                 |    |    |     |           |     |                           |            |            |

NCDOT BORE DOUBLE B5323\_GEO\_BRDG0143.GPJ NC\_DOT.GDT 12/12/18

# GEOTECHNICAL BORING REPORT

## BORE LOG

| WBS 46037.1.1   |                 | TIP B-5323          |                         | COUNTY GRANVILLE    |                       | GEOLOGIST C.T. Tang        |                 |    |    |     |           |     |                           |            |            |
|---|-----------------|---------------------|-------------------------|---------------------|-----------------------|----------------------------|-----------------|----|----|-----|-----------|-----|---------------------------|------------|------------|
| SITE DESCRIPTION Bridge No. 143 on SR 1442 (Dave Winston Rd.) over John H. Kerr Reservoir |                 |                     |                         |                     |                       |                            | GROUND WTR (ft) |    |    |     |           |     |                           |            |            |
| BORING NO. B3-B   |                 | STATION 15+11       |                         | OFFSET 5 ft RT      |                       | ALIGNMENT -L-              |                 |    |    |     |           |     |                           |            |            |
| COLLAR ELEV. 286.0 ft   |                 | TOTAL DEPTH 11.3 ft |                         | NORTHING 1,013,634  |                       | EASTING 2,114,522          |                 |    |    |     |           |     |                           |            |            |
| DRILL RIG/HAMMER EFF./DATE BRI3895 CME-55 96% 04/19/2018                                  |                 |                     | DRILL METHOD Mud Rotary |                     | HAMMER TYPE Automatic |                            |                 |    |    |     |           |     |                           |            |            |
| DRILLER J. Anderson   |                 | START DATE 12/04/18 |                         | COMP. DATE 12/04/18 |                       | SURFACE WATER DEPTH 12.2ft |                 |    |    |     |           |     |                           |            |            |
| 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) |
| 295   |                 |                     |                         |                     |                       |                            |                 |    |    |     |           |     |                           |            |            |
| 290   |                 |                     |                         |                     |                       |                            |                 |    |    |     |           |     |                           |            |            |
| 285   | 286.0           | 0.0                 | WOH                     | WOH                 | WOH                   |                            |                 |    |    |     |           |     |                           |            |            |
| 280   | 280.2           | 5.8                 |                         |                     |                       |                            |                 |    |    |     |           |     |                           |            |            |
| 275   |                 |                     |                         |                     |                       |                            |                 |    |    |     |           |     |                           |            |            |

| WBS 46037.1.1   |               | TIP B-5323          |                         | COUNTY GRANVILLE                      |                       | GEOLOGIST C.T. Tang        |                 |                 |              |     |   |
|---|---------------|---------------------|-------------------------|---------------------------------------|-----------------------|----------------------------|-----------------|-----------------|--------------|-----|---|
| SITE DESCRIPTION Bridge No. 143 on SR 1442 (Dave Winston Rd.) over John H. Kerr Reservoir |               |                     |                         |                                       |                       |                            | GROUND WTR (ft) |                 |              |     |   |
| BORING NO. B3-B   |               | STATION 15+11       |                         | OFFSET 5 ft RT                        |                       | ALIGNMENT -L-              |                 |                 |              |     |   |
| COLLAR ELEV. 286.0 ft   |               | TOTAL DEPTH 11.3 ft |                         | NORTHING 1,013,634                    |                       | EASTING 2,114,522          |                 |                 |              |     |   |
| DRILL RIG/HAMMER EFF./DATE BRI3895 CME-55 96% 04/19/2018                                  |               |                     | DRILL METHOD Mud Rotary |                                       | HAMMER TYPE Automatic |                            |                 |                 |              |     |   |
| DRILLER J. Anderson   |               | START DATE 12/04/18 |                         | COMP. DATE 12/04/18                   |                       | SURFACE WATER DEPTH 12.2ft |                 |                 |              |     |   |
| CORE SIZE NQ  |               |                     |                         | TOTAL RUN 5.0 ft                      |                       |                            |                 |                 |              |     |   |
| ELEV (ft)   | RUN ELEV (ft) | DEPTH (ft)          | RUN (ft)                | DRILL RATE (Min/ft)                   | RUN REC. (%)          | RQD (%)                    | SAMP. NO.       | STRATA REC. (%) | RQD (%)      | LOG | DESCRIPTION AND REMARKS   |
| 279.7   | 279.7         | 6.3                 | 5.0                     | 11:36<br>5:40<br>5:01<br>5:48<br>8:51 | (4.4)<br>88%          | (3.3)<br>66%               |                 | (4.4)<br>88%    | (3.3)<br>66% |     | Begin Coring @ 6.3 ft<br><b>CRYSTALLINE ROCK</b><br>Hard, Slightly Weathered, Green-Dark Gray, Meta-Andesite, with Very Close Fracture Spacing<br>[GSI = 55-65] |
| 275   | 274.7         | 11.3                |                         |                                       |                       |                            | RS-3            |                 |              |     | Boring Terminated at Elevation 274.7 ft in Crystalline Rock (Meta-Andesite)   |

GEOTECHNICAL BORING REPORT
BORE LOG

Table for Bore Log EB2-A. Columns include: WBS (46037.1.1), TIP (B-5323), COUNTY (GRANVILLE), GEOLOGIST (Bruinsma, C. M.), SITE DESCRIPTION (Bridge No. 143 on SR 1442...), BORING NO., STATION (15+51), OFFSET (6 ft LT), ALIGNMENT (-L-), GROUND WTR (ft) (0 HR: 10.4, 24 HR: FIAD), COLLAR ELEV. (308.4 ft), TOTAL DEPTH (28.3 ft), NORTHING (1,013,676), EASTING (2,114,528), DRILL RIG/HAMMER EFF./DATE (DIEDRICH D-50), DRILL METHOD (H.S. Augers), HAMMER TYPE (Automatic), DRILLER (Contract Driller), START DATE (03/02/10), COMP. DATE (03/02/10), SURFACE WATER DEPTH (N/A). Main data columns: ELEV (ft), DRIVE ELEV (ft), DEPTH (ft), BLOW COUNT (0.5ft, 0.5ft, 0.5ft), BLOWS PER FOOT (0-100), SAMP. NO., LOG (MOI, G), SOIL AND ROCK DESCRIPTION, and DEPTH (ft). Stratigraphic units include: GROUND SURFACE, Bituminous Concrete, Aggregate Base Course, ROADWAY EMBANKMENT (Red-Brown, Gray, Tan and Brown, Sandy Silty Clay, with Trace Gravel), ALLUVIAL (Gray-Brown, Silty Clay, with Trace Organics), RESIDUAL (Tan and Red-Brown, Sandy Silty Clay), and WEATHERED ROCK (Brown and Green, Meta-Volcanic Rock (Meta-Andesite)).

Table for Bore Log EB2-B. Columns include: WBS (46037.1.1), TIP (B-5323), COUNTY (GRANVILLE), GEOLOGIST (Bruinsma, C. M.), SITE DESCRIPTION (Bridge No. 143 on SR 1442...), BORING NO., STATION (15+51), OFFSET (6 ft RT), ALIGNMENT (-L-), GROUND WTR (ft) (0 HR: 9.4, 24 HR: FIAD), COLLAR ELEV. (308.4 ft), TOTAL DEPTH (28.0 ft), NORTHING (1,013,670), EASTING (2,114,539), DRILL RIG/HAMMER EFF./DATE (DIEDRICH D-50), DRILL METHOD (H.S. Augers), HAMMER TYPE (Automatic), DRILLER (Contract Driller), START DATE (03/02/10), COMP. DATE (03/02/10), SURFACE WATER DEPTH (N/A). Main data columns: ELEV (ft), DRIVE ELEV (ft), DEPTH (ft), BLOW COUNT (0.5ft, 0.5ft, 0.5ft), BLOWS PER FOOT (0-100), SAMP. NO., LOG (MOI, G), SOIL AND ROCK DESCRIPTION, and DEPTH (ft). Stratigraphic units include: GROUND SURFACE, Bituminous Concrete, Aggregate Base Course, ROADWAY EMBANKMENT (Red-Brown, Sandy Silty Clay, with Trace Gravel), ALLUVIAL (Gray-Brown, Silty Clay, with Trace Organics), RESIDUAL (Red-Brown, Sandy Silty Clay), WEATHERED ROCK (Brown and Green, Meta-Volcanic Rock (Meta-Andesite)), and CRYSTALLINE ROCK (Brown and Green, Meta-Volcanic Rock (Meta-Andesite)).

NCDOT BORE DOUBLE B5323\_GEO\_BRDG0143.GPJ NC\_DOT.GDT 12/12/18

# LAB TEST RESULTS



## UNCONFINED COMPRESSIVE STRENGTH OF INTACT ROCK CORE SPECIMEN

ASTM D7012

WBS No.: 46037.1.1

Test Date: 12/12/2018

TIP No.: B-5323

Tested By: J. Evans

County: Granville

Description: Bridge No. 143 on SR 1442 (Dave Winston Road) over John Kerr Reservoir

|                                   |               |              |               |  |
|-----------------------------------|---------------|--------------|---------------|--|
| Test No.                          | 1             | 2            | 3             |  |
| Boring ID                         | B1-A          | B2-A         | B3-B          |  |
| Station                           | 14+11         | 14+56        | 15+11         |  |
| Sample ID                         | RS-1          | RS-2         | RS-3          |  |
| Sample Depth, ft                  | 14.8          | 16.7         | 9             |  |
| Core Length #1, in.               | 4.169         | 4.181        | 4.132         |  |
| Core Length #2, in.               | 4.167         | 4.182        | 4.134         |  |
| Core Length #3, in.               | 4.168         | 4.180        | 4.133         |  |
| Avg. Core Length, in.             | 4.168         | 4.181        | 4.133         |  |
| Core Dia. #1, in.                 | 1.977         | 1.979        | 1.978         |  |
| Core Dia. #2, in.                 | 1.977         | 1.979        | 1.978         |  |
| Avg. Core Dia., in.               | 1.977         | 1.979        | 1.978         |  |
| Length/Dia. Ratio                 | 2.11          | 2.11         | 2.09          |  |
| X-Sectional Area, in <sup>2</sup> | 3.07          | 3.08         | 3.07          |  |
| Weight, lb                        | 1.24          | 1.24         | 1.23          |  |
| Unit Weight, pcf                  | 167.47        | 166.62       | 167.36        |  |
| Break Type                        | 3             | 3            | 3             |  |
| Load at Failure, lb               | 50,330        | 25,334       | 63,711        |  |
| Correction Factor                 | 1.00          | 1.00         | 1.00          |  |
| <b>Comp. Strength, psi</b>        | <b>16,396</b> | <b>8,236</b> | <b>20,734</b> |  |
| <b>Comp. Strength, ksf</b>        | <b>2,361</b>  | <b>1,186</b> | <b>2,986</b>  |  |

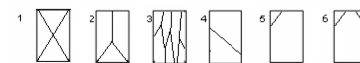
#### Rock Descriptions:

Test 1: Dark Gray, Slight Weathered, Hard, Meta-Andesite, with Very Close Fracture Spacing

Test 2: Dark Gray, Slight Weathered, Hard, Meta-Andesite, with Very Close Fracture Spacing

Test 3: Dark Gray, Slight Weathered, Hard, Meta-Andesite, with Very Close Fracture Spacing

#### Break Types:





# CORE PHOTOGRAPHS

BORING BI-A (BOTTOM THREE ROWS) AND BI-A (UPPER ROW)

BI-A: STA. 14+11-L-, 5 FT LT  
CORE DEPTH: 14.3 FT TO 27.3 FT

BI-B: STA. 14+11-L-, 5 FT RT  
CORE DEPTH: 14.5 FT TO 19.5 FT



# CORE PHOTOGRAPHS

BORING B2-A  
STA. 14+56 -L-, 5 FT LT  
CORE DEPTH: 8.9 FT TO 18.9 FT

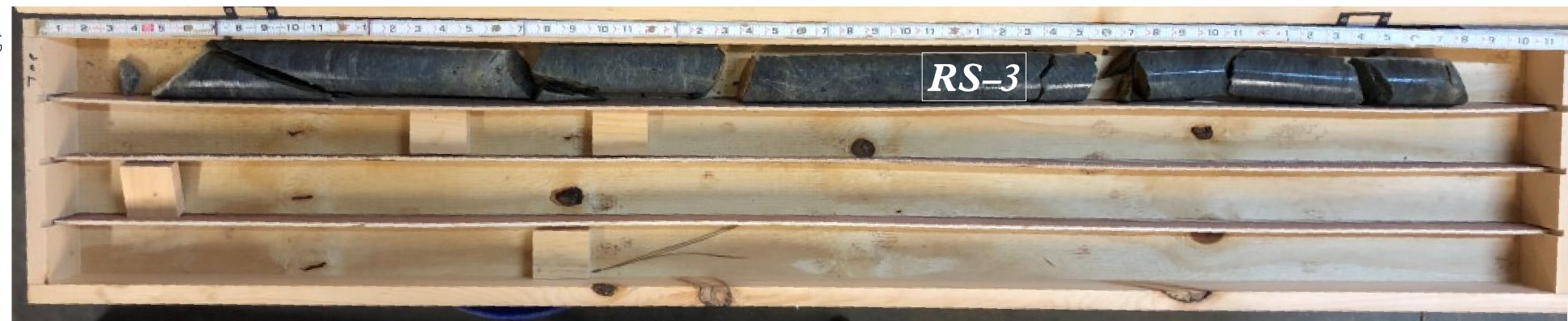
START OF CORING  
RUN #1 8.9 FT  
START OF CORING  
RUN #2 13.9 FT



END OF  
CORING  
18.9 FT

BORING B3-B  
STA. 15+11 -L-, 5 FT RT  
CORE DEPTH: 6.3 FT TO 11.3 FT

START OF CORING  
RUN #1 6.3 FT



END OF  
CORING  
11.3 FT





# SITE PHOTOGRAPH

## BRIDGE 143



PHOTOGRAPH NO.1.: VIEW LOOKING NORTHEAST.