

REFERENCE: SF-040474

PROJECT: BP11.R012

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

STRUCTURE  
SUBSURFACE INVESTIGATION

COUNTY ASHE  
SITE DESCRIPTION REPLACE BRIDGE NO. 474 ON  
SR 1193 (LEWIS RD.) OVER BUFFALO CREEK

CONTENTS

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| STATE | STATE PROJECT REFERENCE NO. | SHEET NO. | TOTAL SHEETS |
|-------|-----------------------------|-----------|--------------|
| N.C.  | SF-040474                   | 1         |              |

CAUTION NOTICE

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- 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. Sailer, GIT

S. Davis

J. Sales

C. Wang, P.E.

T. T. Walker

INVESTIGATED BY F&R, Inc.

DRAWN BY T.T. Walker

CHECKED BY P. Alton, P.E.

SUBMITTED BY C. Wang, P.E.

DATE April 2024

SINCE *Prepared in the Office of:*  

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DocuSigned by:  
Cheng Wang 09/09/2024  
17412248FB30493 SIGNATURE DATE

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UNLESS ALL SIGNATURES COMPLETED



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


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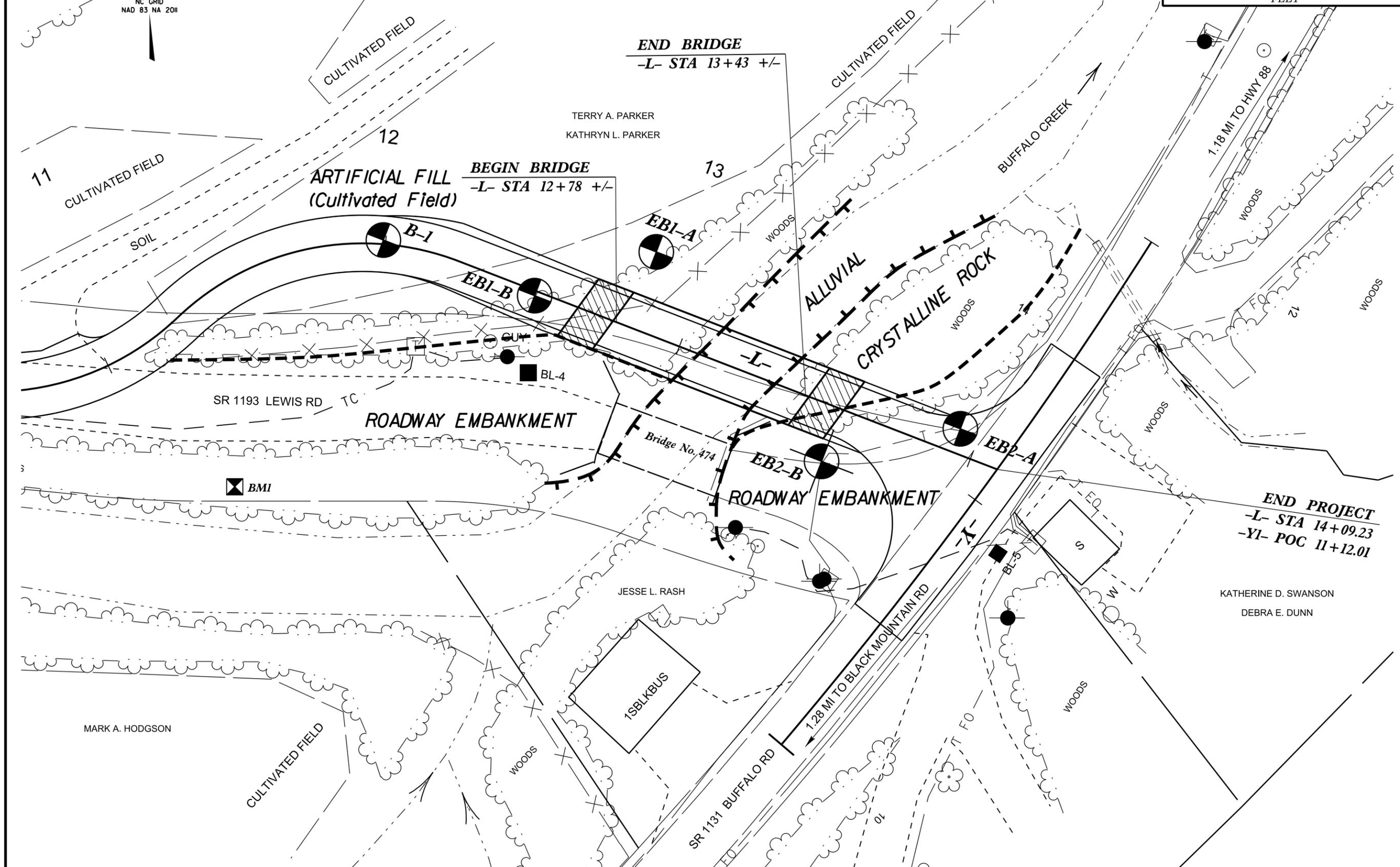
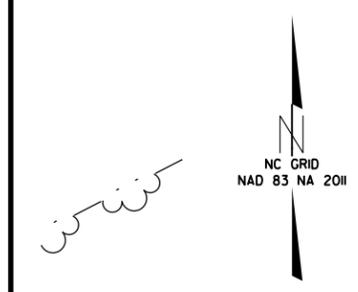
**SUBSURFACE INVESTIGATION**

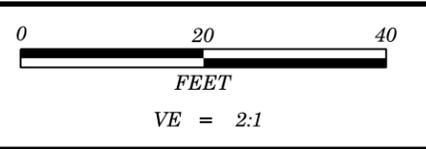
**SUPPLEMENTAL LEGEND, GEOLOGICAL STRENGTH INDEX (GSI) TABLES**  
**FROM AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS**

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

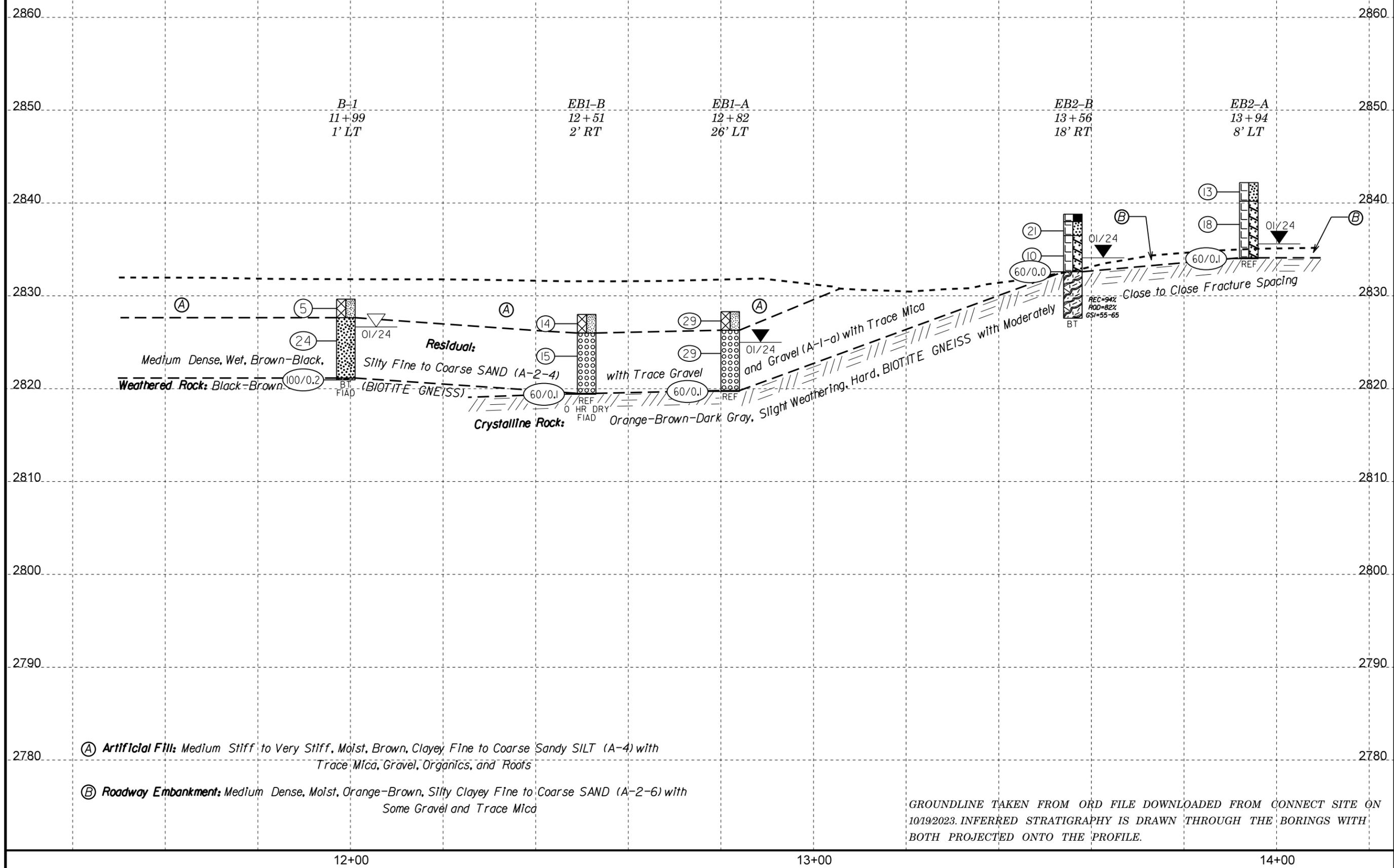
AASHTO LRFD Figure 10.4.6.4-2 — Determination of GSI for Tectonically Deformed Heterogeneous Rock Masses (Marinos and Hoek, 2000)

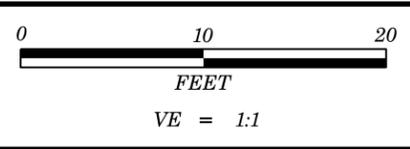
| GEOLOGICAL STRENGTH INDEX (GSI) FOR JOINTED ROCKS (Hoek and Marinos, 2000)   | SURFACE CONDITIONS   |   |  |   |   | GSI FOR HETEROGENEOUS ROCK MASSES SUCH AS FLYSCH (Marinos, P and Hoek E., 2000)   | SURFACE CONDITIONS OF DISCONTINUITIES (Predominantly bedding planes)  |   |  |   |  |   |
|--|--|---|--|---|---|---|---|---|--|---|--|---|
| <p>From the lithology, structure and surface conditions of the discontinuities, estimate the average value of GSI. Do not try to be too precise. Quoting a range from 33 to 37 is more realistic than stating that GSI = 35. Note that the table does not apply to structurally controlled failures. Where weak planar structural planes are present in an unfavorable orientation with respect to the excavation face, these will dominate the rock mass behaviour. The shear strength of surfaces in rocks that are prone to deterioration as a result of changes in moisture content will be reduced if water is present. When working with rocks in the fair to very poor categories, a shift to the right may be made for wet conditions. Water pressure is dealt with by effective stress analysis.</p>      | <p><b>VERY GOOD</b><br/>Very rough, fresh unweathered surfaces</p>   | <p><b>GOOD</b><br/>Rough, slightly weathered, iron stained surfaces</p> | <p><b>FAIR</b><br/>Smooth, moderately weathered and altered surfaces</p> | <p><b>POOR</b><br/>Slickensided, highly weathered surfaces with compact coatings or fillings or angular fragments</p> | <p><b>VERY POOR</b><br/>Slickensided, highly weathered surfaces with soft clay coatings or fillings</p> | <p>From a description of the lithology, structure and surface conditions (particularly of the bedding planes), choose a box in the chart. Locate the position in the box that corresponds to the condition of the discontinuities and estimate the average value of GSI from the contours. Do not attempt to be too precise. Quoting a range from 33 to 37 is more realistic than giving GSI = 35. Note that the Hoek-Brown criterion does not apply to structurally controlled failures. Where unfavourably oriented continuous weak planar discontinuities are present, these will dominate the behaviour of the rock mass. The strength of some rock masses is reduced by the presence of groundwater and this can be allowed for by a slight shift to the right in the columns for fair, poor and very poor conditions. Water pressure does not change the value of GSI and it is dealt with by using effective stress analysis.</p>  | <p><b>VERY GOOD</b> - Very Rough, fresh unweathered surfaces</p>      | <p><b>GOOD</b> - Rough, slightly weathered surfaces</p>           | <p><b>FAIR</b> - Smooth, moderately weathered and altered surfaces</p> | <p><b>POOR</b> - Very smooth, occasionally slickensided surfaces with compact coatings or fillings with angular fragments</p> | <p><b>VERY POOR</b> - Very smooth, slickensided or highly weathered surfaces with soft clay coatings or fillings</p> |   |
| STRUCTURE  | DECREASING SURFACE QUALITY →   |   |  |   |   | COMPOSITION AND STRUCTURE   |   |   |  |   |  |   |
| <p> <b>INTACT OR MASSIVE</b> - intact rock specimens or massive in situ rock with few widely spaced discontinuities</p> <p> <b>BLOCKY</b> - well interlocked undisturbed rock mass consisting of cubical blocks formed by three intersecting discontinuity sets</p> <p> <b>VERY BLOCKY</b> - interlocked, partially disturbed mass with multi-faceted angular blocks formed by 4 or more joint sets</p> <p> <b>BLOCKY/DISTURBED/SEAMY</b> - folded with angular blocks formed by many intersecting discontinuity sets. Persistence of bedding planes or schistosity</p> <p> <b>DISINTEGRATED</b> - poorly interlocked, heavily broken rock mass with mixture of angular and rounded rock pieces</p> <p> <b>LAMINATED/SHEARED</b> - Lack of blockiness due to close spacing of weak schistosity or shear planes</p> | <p style="writing-mode: vertical-rl; transform: rotate(180deg);">DECREASING INTERLOCKING OF ROCK PIECES</p> <p style="writing-mode: vertical-rl; transform: rotate(180deg);">↓</p> |   |  |   |   | <p> <b>A. Thick bedded, very blocky sandstone</b><br/>The effect of pelitic coatings on the bedding planes is minimized by the confinement of the rock mass. In shallow tunnels or slopes these bedding planes may cause structurally controlled instability.</p> <p> <b>B. Sandstone with thin inter-layers of siltstone</b></p> <p> <b>C. Sandstone and siltstone in similar amounts</b></p> <p> <b>D. Siltstone or silty shale with sandstone layers</b></p> <p> <b>E. Weak siltstone or clayey shale with sandstone layers</b></p> <p> <b>F. Tectonically deformed, intensively folded/faulted, sheared clayey shale or siltstone with broken and deformed sandstone layers forming an almost chaotic structure</b></p> <p> <b>G. Undisturbed silty or clayey shale with or without a few very thin sandstone layers</b></p> <p> <b>H. Tectonically deformed silty or clayey shale forming a chaotic structure with pockets of clay. Thin layers of sandstone are transformed into small rock pieces.</b></p> <p>→ Means deformation after tectonic disturbance</p> | <p>70</p> <p>60</p> <p>50</p> <p>40</p> <p>30</p> <p>20</p> <p>10</p> | <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> | <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p>      | <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p>   | <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p>  | <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> |



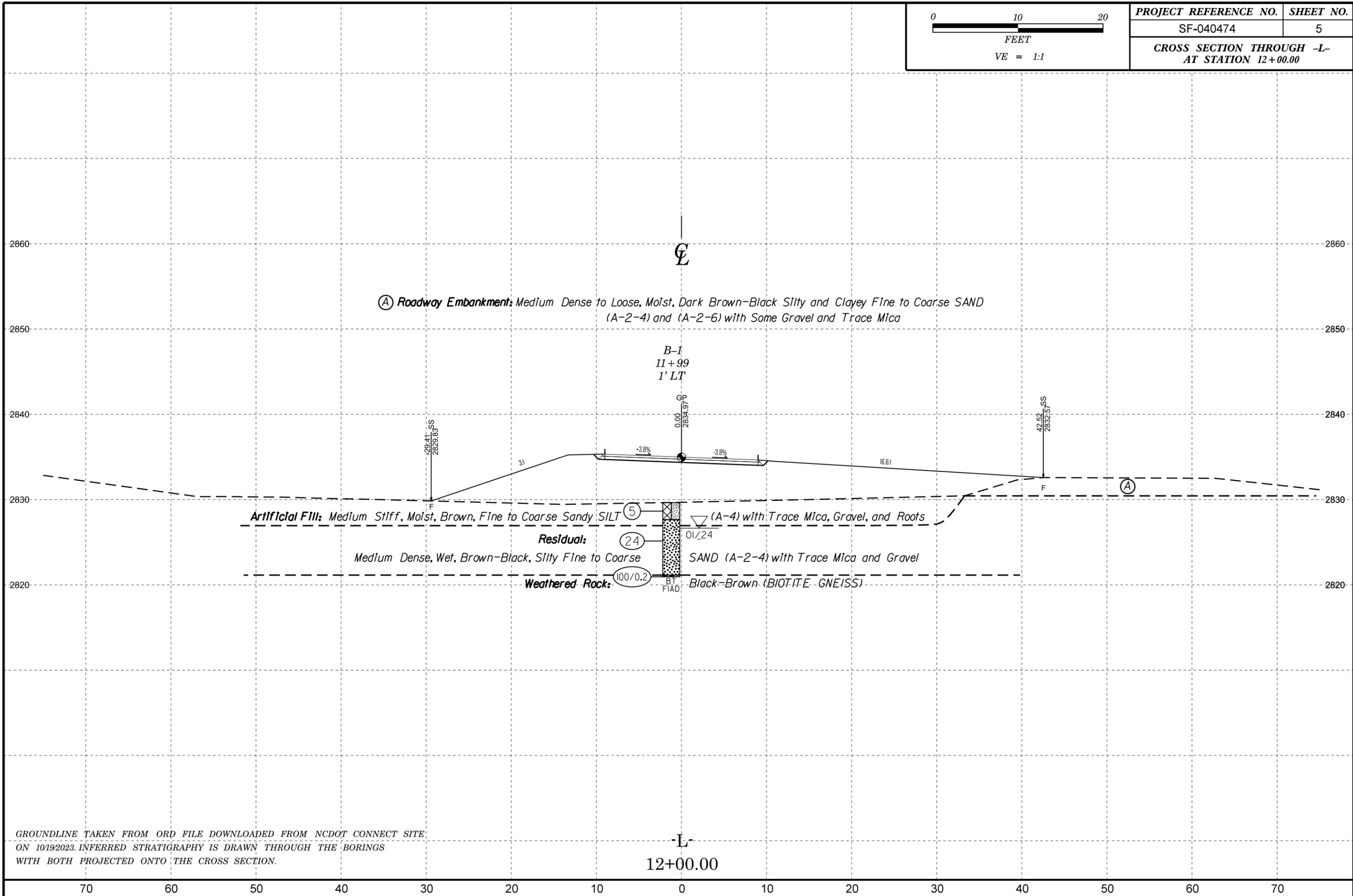


|  |                  |
|--|------------------|
| <b>PROJECT REFERENCE NO.</b>                                 | <b>SHEET NO.</b> |
| SF-040474  | 4                |
| <b>PROFILE BORINGS PROJECTED<br/>ALONG CENTERLINE OF -L-</b> |                  |





| PROJECT REFERENCE NO.                                    | SHEET NO. |
|--|-----------|
| SF-040474  | 5         |
| <b>CROSS SECTION THROUGH -L-<br/>AT STATION 12+00.00</b> |           |



Ⓐ **Roadway Embankment:** Medium Dense to Loose, Moist, Dark Brown-Black Silty and Clayey Fine to Coarse SAND (A-2-4) and (A-2-6) with Some Gravel and Trace Mica

B-1  
11+99  
1' LT

29.41  
2829.85  
F

GP  
0.00  
2834.97

42.52  
2832.15  
F

**Artificial Fill:** Medium Stiff, Moist, Brown, Fine to Coarse Sandy SILT (5) (A-4) with Trace Mica, Gravel, and Roots

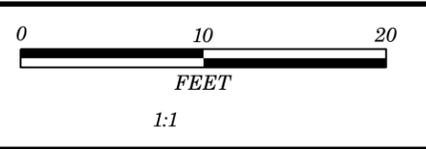
**Residual:** (24) Medium Dense, Wet, Brown-Black, Silty Fine to Coarse SAND (A-2-4) with Trace Mica and Gravel

**Weathered Rock:** (100/0.2) BT FIAD Black-Brown (BIOTITE GNEISS)

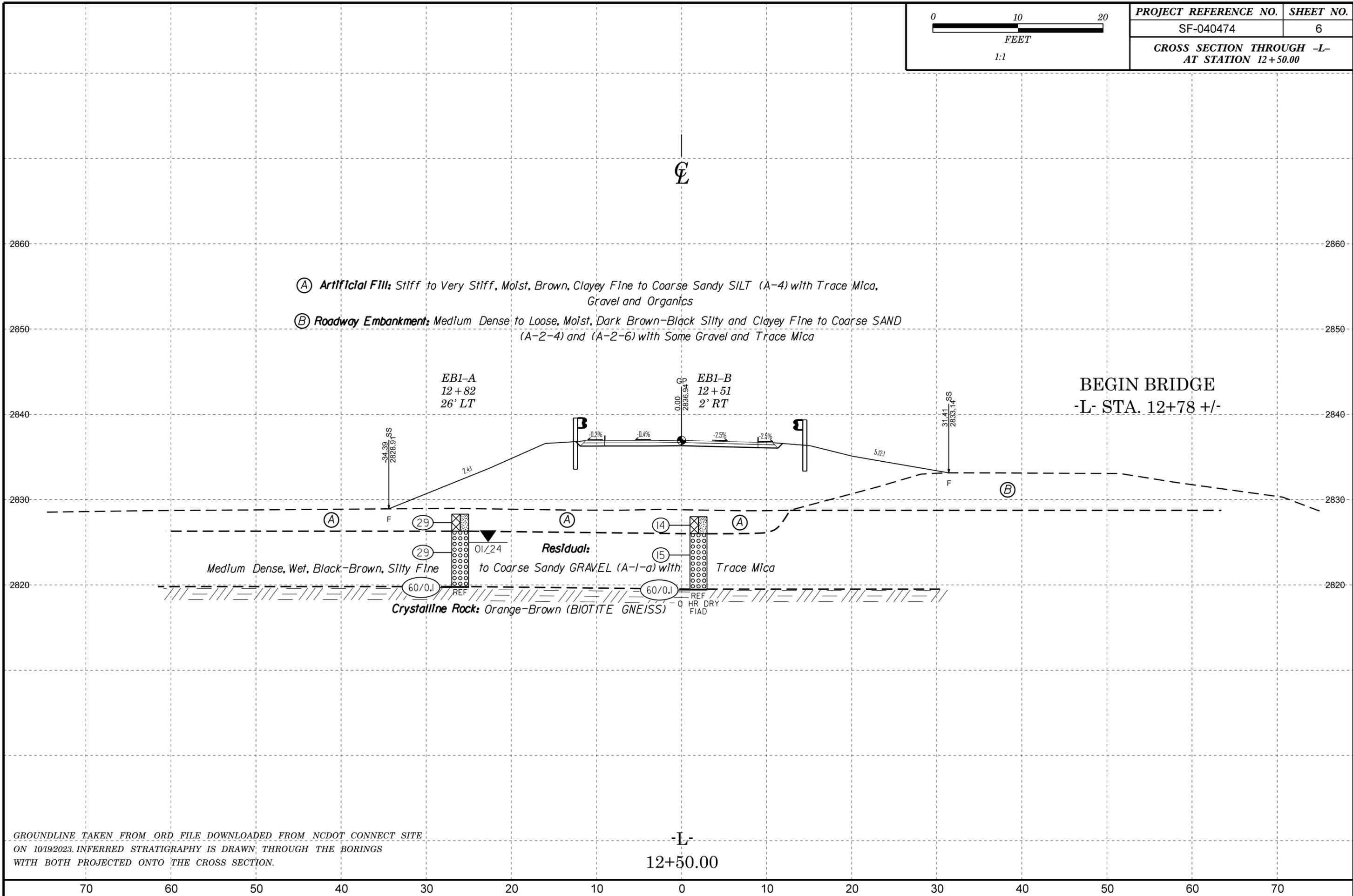
GROUNDLINE TAKEN FROM ORD FILE DOWNLOADED FROM NCDOT CONNECT SITE ON 10/19/2023. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE CROSS SECTION.

-L-  
12+00.00

70 60 50 40 30 20 10 0 10 20 30 40 50 60 70



|  |                  |
|--|------------------|
| <b>PROJECT REFERENCE NO.</b>                             | <b>SHEET NO.</b> |
| SF-040474  | 6                |
| <b>CROSS SECTION THROUGH -L-<br/>AT STATION 12+50.00</b> |                  |



- Ⓐ **Artificial Fill:** Stiff to Very Stiff, Moist, Brown, Clayey Fine to Coarse Sandy SILT (A-4) with Trace Mica, Gravel and Organics
- Ⓑ **Roadway Embankment:** Medium Dense to Loose, Moist, Dark Brown-Black Silty and Clayey Fine to Coarse SAND (A-2-4) and (A-2-6) with Some Gravel and Trace Mica

EB1-A  
12+82  
26' LT

EB1-B  
12+51  
2' RT

BEGIN BRIDGE  
-L- STA. 12+78 +/-

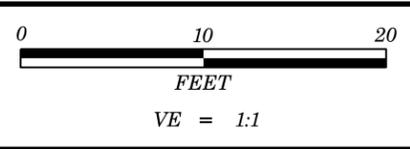
Residual: Medium Dense, Wet, Black-Brown, Silty Fine to Coarse Sandy GRAVEL (A-1-a) with Trace Mica

Crystalline Rock: Orange-Brown (BIOTITE GNEISS)

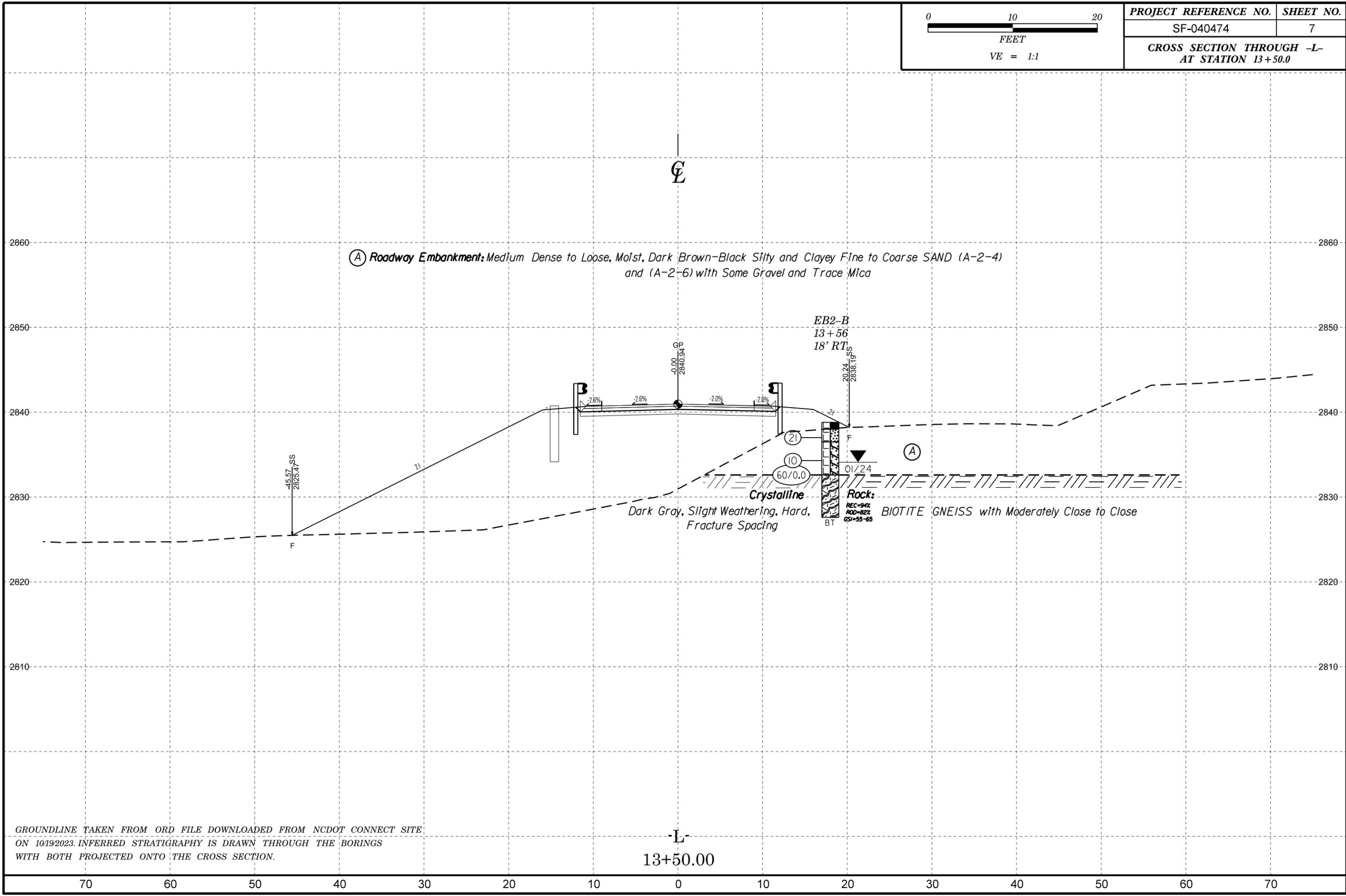
GROUNDLINE TAKEN FROM ORD FILE DOWNLOADED FROM NCDOT CONNECT SITE ON 10/19/2023. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE CROSS SECTION.

-L-  
12+50.00

70 60 50 40 30 20 10 0 10 20 30 40 50 60 70



|   |                  |
|---|------------------|
| <b>PROJECT REFERENCE NO.</b>                            | <b>SHEET NO.</b> |
| SF-040474   | 7                |
| <b>CROSS SECTION THROUGH -L-<br/>AT STATION 13+50.0</b> |                  |



(A) **Roadway Embankment:** Medium Dense to Loose, Moist, Dark Brown-Black Silty and Clayey Fine to Coarse SAND (A-2-4) and (A-2-6) with Some Gravel and Trace Mica

EB2-B  
13+56  
18' RT

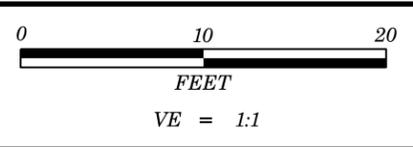
Crystalline  
Dark Gray, Slight Weathering, Hard,  
Fracture Spacing

Rock:  
REC-94%  
ROD-82%  
GSI-55-65

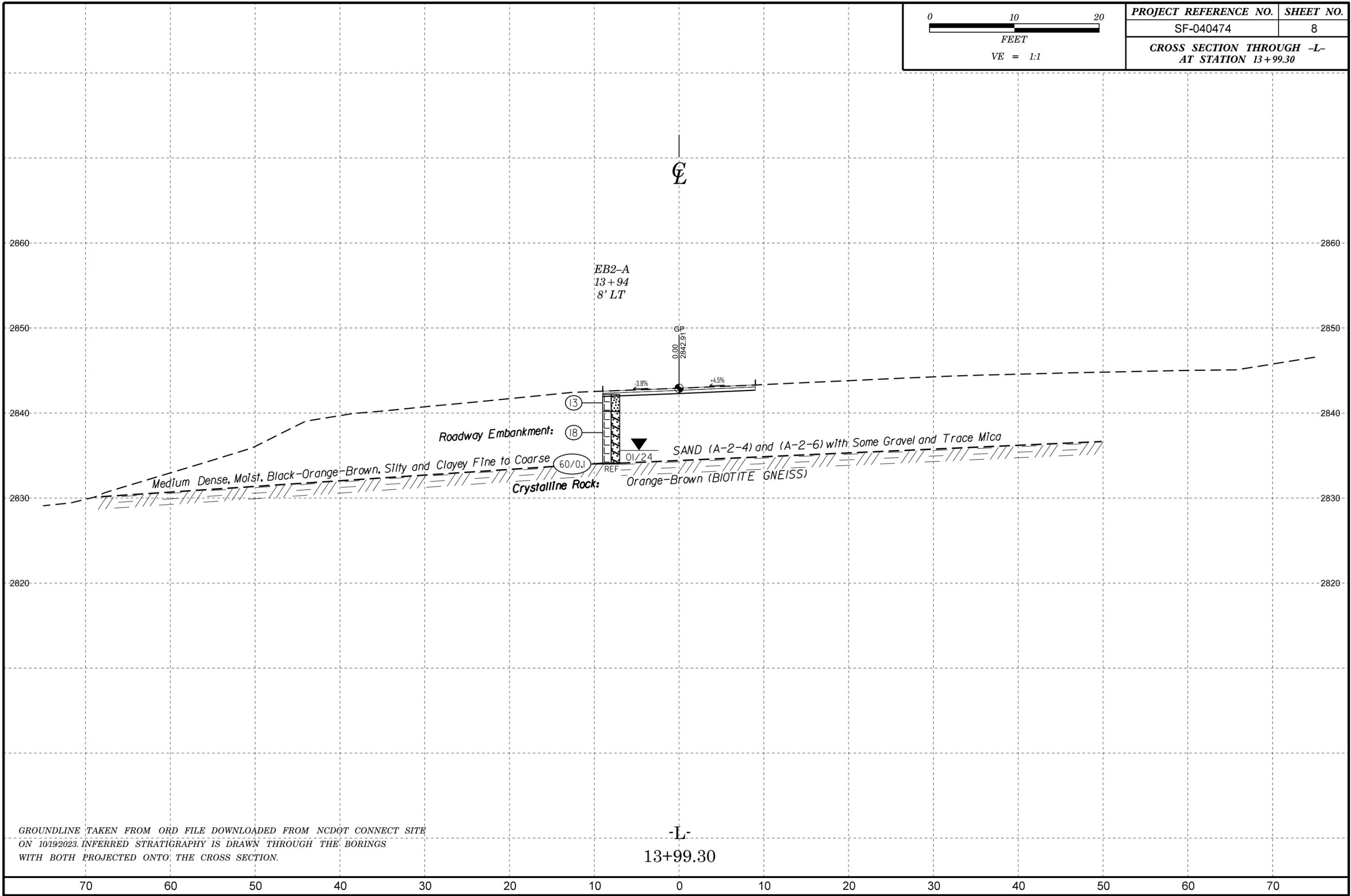
BIOTITE GNEISS with Moderately Close to Close

GROUNDLINE TAKEN FROM ORD FILE DOWNLOADED FROM NCDOT CONNECT SITE  
ON 10/19/2023. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS  
WITH BOTH PROJECTED ONTO THE CROSS SECTION.

-L-  
13+50.00



| PROJECT REFERENCE NO.                                    | SHEET NO. |
|--|-----------|
| SF-040474  | 8         |
| <b>CROSS SECTION THROUGH -L-<br/>AT STATION 13+99.30</b> |           |



GROUNDLINE TAKEN FROM ORD FILE DOWNLOADED FROM NCDOT CONNECT SITE ON 10/19/2023. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE CROSS SECTION.

-L-  
13+99.30

70      60      50      40      30      20      10      0      10      20      30      40      50      60      70

# GEOTECHNICAL BORING REPORT BORE LOG

|   |                     |                          |                         |
|---|---------------------|--------------------------|-------------------------|
| WBS BP11.R012   | TIP SF-040474       | COUNTY ASHE              | GEOLOGIST C. Sailer     |
| SITE DESCRIPTION Replace Bridge No. 474 on SR 1193 (Lewis Rd.) over Buffalo Creek |                     |                          | GROUND WTR (ft)         |
| BORING NO. B-1  | STATION 11+99       | OFFSET 1 ft LT           | ALIGNMENT -L-           |
| COLLAR ELEV. 2,829.7 ft   | TOTAL DEPTH 8.7 ft  | NORTHING 983,456         | EASTING 1,256,346       |
| DRILL RIG/HAMMER EFF./DATE F&R4637 CME-75 86%07/11/2022                           |                     | DRILL METHOD H.S. Augers | HAMMER TYPE Automatic   |
| DRILLER S. Davis  | START DATE 01/30/24 | COMP. DATE 01/30/24      | 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 |           |     |                           |            |     |   |
| 2830      | 2,829.7         | 0.0        | 1          | 3     | 2     | 5              |    |    |    |     |           |     |                           | 2,829.7    | 0.0 | GROUND SURFACE  |
|           | 2,827.7         | 2.0        |            |       |       |                |    |    |    |     |           | M   | X                         | 2,827.7    | 2.0 | ARTIFICIAL FILL<br>Brown, Fine to Coarse Sandy SILT (A-4)<br>with Trace Mica, Gravel, and Roots |
| 2825      | 2,826.2         | 3.5        | 11         | 10    | 14    | 24             |    |    |    |     |           |     |                           |            |     | RESIDUAL<br>Brown, Black, Silty Fine to Coarse SAND<br>(A-2-4) with Trace Mica and Gravel       |
|           | 2,821.2         | 8.5        |            |       |       |                |    |    |    |     |           |     |                           | 2,821.2    | 8.5 | WEATHERED ROCK<br>Black, Brown (BIOTITE GNEISS)   |
|           |                 |            |            |       |       |                |    |    |    |     |           |     |                           | 2,821.0    | 8.7 | Boring Terminated at Elevation 2,821.0 ft in<br>Weathered Rock (BIOTITE GNEISS)                 |

NCDOT BORE DOUBLE 66C-0002\_GEO\_BH\_BRDG474.GPJ NC\_DOT.GDT 4/18/24

# GEOTECHNICAL BORING REPORT

## BORE LOG

| WBS BP11.R012   |                 | TIP SF-040474       |                          | COUNTY ASHE         |       | GEOLOGIST C. Sailer     |                 |    |    |     |           |     |                           |            |     |  |
|---|-----------------|---------------------|--------------------------|---------------------|-------|-------------------------|-----------------|----|----|-----|-----------|-----|---------------------------|------------|-----|--|
| SITE DESCRIPTION Replace Bridge No. 474 on SR 1193 (Lewis Rd.) over Buffalo Creek |                 |                     |                          |                     |       |                         | GROUND WTR (ft) |    |    |     |           |     |                           |            |     |  |
| BORING NO. EB1-A  |                 | STATION 12+82       |                          | OFFSET 26 ft LT     |       | ALIGNMENT -L-           |                 |    |    |     |           |     |                           |            |     |  |
| COLLAR ELEV. 2,828.3 ft   |                 | TOTAL DEPTH 8.6 ft  |                          | NORTHING 983,452    |       | EASTING 1,256,433       |                 |    |    |     |           |     |                           |            |     |  |
| DRILL RIG/HAMMER EFF./DATE F&R4637 CME-75 86% 07/11/2022                          |                 |                     | DRILL METHOD H.S. Augers |                     |       | HAMMER TYPE Automatic   |                 |    |    |     |           |     |                           |            |     |  |
| DRILLER S. Davis  |                 | START DATE 01/30/24 |                          | COMP. DATE 01/30/24 |       | 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 |           |     |                           |            |     |  |
| 2830  | 2,828.3         | 0.0                 | 3                        | 12                  | 17    |                         |                 |    |    |     |           |     |                           | 2,828.3    | 0.0 | GROUND SURFACE   |
| 2825  | 2,824.8         | 3.5                 | 8                        | 14                  | 15    |                         |                 |    |    |     |           |     | M                         | 2,826.3    | 2.0 | ARTIFICIAL FILL<br>Brown, Clayey Fine to Coarse Sandy SILT (A-4) with Trace Gravel, Mica, and Organics   |
| 2820  | 2,819.8         | 8.5                 |                          |                     |       |                         |                 |    |    |     |           |     | W                         | 2,819.8    | 8.5 | RESIDUAL<br>Brown, Black, Silty Fine to Coarse Sandy GRAVEL (A-1-a) with Trace Mica  |
|   |                 |                     |                          |                     |       |                         |                 |    |    |     |           |     |                           | 2,819.7    | 8.6 | CRYSTALLINE ROCK<br>Orange-Brown (BIOTITE GNEISS)<br>Boring Terminated with Standard Penetration Test Refusal at Elevation 2,819.7 ft in Crystalline Rock (BIOTITE GNEISS) |
|   |                 |                     |                          |                     |       |                         |                 |    |    |     |           |     |                           |            |     | Note:<br>1. Auger Refusal at 8.5'  |

| WBS BP11.R012   |                 | TIP SF-040474       |                          | COUNTY ASHE         |       | GEOLOGIST C. Sailer     |                 |    |    |     |           |     |                           |            |     |  |
|---|-----------------|---------------------|--------------------------|---------------------|-------|-------------------------|-----------------|----|----|-----|-----------|-----|---------------------------|------------|-----|--|
| SITE DESCRIPTION Replace Bridge No. 474 on SR 1193 (Lewis Rd.) over Buffalo Creek |                 |                     |                          |                     |       |                         | GROUND WTR (ft) |    |    |     |           |     |                           |            |     |  |
| BORING NO. EB1-B  |                 | STATION 12+51       |                          | OFFSET 2 ft RT      |       | ALIGNMENT -L-           |                 |    |    |     |           |     |                           |            |     |  |
| COLLAR ELEV. 2,828.0 ft   |                 | TOTAL DEPTH 8.6 ft  |                          | NORTHING 983,438    |       | EASTING 1,256,394       |                 |    |    |     |           |     |                           |            |     |  |
| DRILL RIG/HAMMER EFF./DATE F&R4637 CME-75 86% 07/11/2022                          |                 |                     | DRILL METHOD H.S. Augers |                     |       | HAMMER TYPE Automatic   |                 |    |    |     |           |     |                           |            |     |  |
| DRILLER S. Davis  |                 | START DATE 01/30/24 |                          | COMP. DATE 01/30/24 |       | 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 |           |     |                           |            |     |  |
| 2830  | 2,828.0         | 0.0                 |                          |                     |       |                         |                 |    |    |     |           |     |                           | 2,828.0    | 0.0 | GROUND SURFACE   |
| 2825  | 2,824.5         | 3.5                 | 1                        | 1                   | 13    |                         |                 |    |    |     |           |     | M                         | 2,826.0    | 2.0 | ARTIFICIAL FILL<br>Brown, Fine to Coarse Sandy SILT (A-4) with Trace Mica, Gravel, and Organics  |
| 2820  | 2,819.5         | 8.5                 | 6                        | 8                   | 7     |                         |                 |    |    |     |           |     | W                         | 2,819.5    | 8.5 | RESIDUAL<br>Black, Dark Brown, Silty Fine to Coarse Sandy GRAVEL (A-1-a) with Trace Mica   |
|   |                 |                     |                          |                     |       |                         |                 |    |    |     |           |     |                           | 2,819.4    | 8.6 | CRYSTALLINE ROCK<br>Orange-Brown (BIOTITE GNEISS)<br>Boring Terminated with Standard Penetration Test Refusal at Elevation 2,819.4 ft in Crystalline Rock (BIOTITE GNEISS) |
|   |                 |                     |                          |                     |       |                         |                 |    |    |     |           |     |                           |            |     | Note:<br>1. Auger Refusal at 8.5'  |

NCDOT BORE DOUBLE 66C-0002\_GEO\_BH\_BRDG474.GPJ\_NC\_DOT.GDT 4/18/24



# GEOTECHNICAL BORING REPORT BORE LOG

# GEOTECHNICAL BORING REPORT CORE LOG

| WBS BP11.R012   |                 | TIP SF-040474       |            | COUNTY ASHE              |       | GEOLOGIST C. Sailer     |                 |    |    |     |           |     |                           |  |  |
|---|-----------------|---------------------|------------|--------------------------|-------|-------------------------|-----------------|----|----|-----|-----------|-----|---------------------------|--|--|
| SITE DESCRIPTION Replace Bridge No. 474 on SR 1193 (Lewis Rd.) over Buffalo Creek |                 |                     |            |                          |       |                         | GROUND WTR (ft) |    |    |     |           |     |                           |  |  |
| BORING NO. EB2-B  |                 | STATION 13+56       |            | OFFSET 18 ft RT          |       | ALIGNMENT -L-           |                 |    |    |     |           |     |                           |  |  |
| COLLAR ELEV. 2,838.8 ft   |                 | TOTAL DEPTH 11.2 ft |            | NORTHING 983,385         |       | EASTING 1,256,486       |                 |    |    |     |           |     |                           |  |  |
| DRILL RIG/HAMMER EFF./DATE F&R4637 CME-75 86% 07/11/2022                          |                 |                     |            | DRILL METHOD H.S. Augers |       | HAMMER TYPE Automatic   |                 |    |    |     |           |     |                           |  |  |
| DRILLER S. Davis  |                 | START DATE 01/30/24 |            | COMP. DATE 01/30/24      |       | 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 |           |     |                           |  |  |
| 2840  |                 |                     |            |                          |       |                         |                 |    |    |     |           |     |                           | 2,838.8 GROUND SURFACE 0.0   |  |
|   | 2,838.0         | 0.8                 |            |                          |       |                         |                 |    |    |     |           |     |                           | 2,838.0 ASPHALT 0.8  |  |
|   |                 |                     | 7          | 13                       | 8     |                         |                 |    |    |     |           |     |                           | 2,836.5 ROADWAY EMBANKMENT 2.3   |  |
| 2835  | 2,835.3         | 3.5                 |            |                          |       |                         |                 |    |    |     |           |     |                           | 2,832.6 Dark Brown, Black, Clayey Silty Fine to Coarse SAND (A-2-4) with Some Gravel and Trace Mica 6.2          |  |
|   |                 |                     | 2          | 4                        | 6     |                         |                 |    |    |     |           |     |                           | 2,832.6 Brown, Black, Silty Clayey Fine to Coarse SAND (A-2-6) with Some Gravel and Trace Mica 6.2               |  |
|   | 2,832.6         | 6.2                 |            |                          |       |                         |                 |    |    |     |           |     |                           | 2,827.6 CRYSTALLINE ROCK 11.2  |  |
| 2830  |                 |                     |            |                          |       |                         |                 |    |    |     |           |     |                           | 2,827.6 Dark Gray, Slightly Weathered, Hard, BIOTITE GNEISS with Moderately Close to Close Fracture Spacing 11.2 |  |
|   |                 |                     |            |                          |       |                         |                 |    |    |     |           |     |                           | Boring Terminated at Elevation 2,827.6 ft in Crystalline Rock (BIOTITE GNEISS)                                   |  |
|   |                 |                     |            |                          |       |                         |                 |    |    |     |           |     |                           | Notes:<br>1. Auger Refusal at 6.2'<br>2. Start Coring at 6.2'  |  |

| WBS BP11.R012   |               | TIP SF-040474       |          | COUNTY ASHE  |              | GEOLOGIST C. Sailer     |                 |              |              |     |  |            |
|---|---------------|---------------------|----------|--|--------------|-------------------------|-----------------|--------------|--------------|-----|--|------------|
| SITE DESCRIPTION Replace Bridge No. 474 on SR 1193 (Lewis Rd.) over Buffalo Creek |               |                     |          |  |              |                         | GROUND WTR (ft) |              |              |     |  |            |
| BORING NO. EB2-B  |               | STATION 13+56       |          | OFFSET 18 ft RT  |              | ALIGNMENT -L-           |                 |              |              |     |  |            |
| COLLAR ELEV. 2,838.8 ft   |               | TOTAL DEPTH 11.2 ft |          | NORTHING 983,385   |              | EASTING 1,256,486       |                 |              |              |     |  |            |
| DRILL RIG/HAMMER EFF./DATE F&R4637 CME-75 86% 07/11/2022                          |               |                     |          | DRILL METHOD H.S. Augers   |              | HAMMER TYPE Automatic   |                 |              |              |     |  |            |
| DRILLER S. Davis  |               | START DATE 01/30/24 |          | COMP. DATE 01/30/24  |              | SURFACE WATER DEPTH N/A |                 |              |              |     |  |            |
| ELEV (ft)   | RUN ELEV (ft) | DEPTH (ft)          | RUN (ft) | DRILL RATE (Min/ft)  | RUN          |                         | SAMP. NO.       | STRATA       |              | LOG | DESCRIPTION AND REMARKS  | DEPTH (ft) |
|   |               |                     |          |  | REC. (%)     | RQD (%)                 |                 | REC. (%)     | RQD (%)      |     |  |            |
| 2832.6  | 2,832.6       | 6.2                 | 5.0      | N=60/0.0<br>2:30/1.0<br>1:58/1.0<br>2:03/1.0<br>2:13/1.0<br>2:22/1.0 | (4.7)<br>94% | (4.1)<br>82%            |                 | (4.7)<br>94% | (4.1)<br>82% |     | Begin Coring @ 6.2 ft  | 6.2        |
| 2830  |               |                     |          |  |              |                         |                 |              |              |     | CRYSTALLINE ROCK   | 6.2        |
|   |               |                     |          |  |              |                         |                 |              |              |     | Dark Gray, Slightly Weathered, Hard, BIOTITE GNEISS with Moderately Close to Close Fracture Spacing<br>GSI=55-65 | 11.2       |
|   | 2,827.6       | 11.2                |          |  |              |                         |                 |              |              |     | Boring Terminated at Elevation 2,827.6 ft in Crystalline Rock (BIOTITE GNEISS)                                   | 11.2       |
|   |               |                     |          |  |              |                         |                 |              |              |     | Notes:<br>1. Auger Refusal at 6.2'<br>2. Start Coring at 6.2'  |            |

NCDOT BORE DOUBLE 66C-0002\_GEO\_BH\_BRDG474.GPJ\_NC\_DOT.GDT 4/18/24

NCDOT CORE DOUBLE 66C-0002\_GEO\_BH\_BRDG474.GPJ\_NC\_DOT.GDT 4/18/24



**CORE PHOTOGRAPHS:**  
**Replace Bridge No. 474 on SR 1193 (Lewis Rd) over Buffalo Creek**  
**EB2-B: -L- Station 13+56, 18' RT**

Begin Run 1  
6.2 feet



End Run 1  
11.2 feet

0.0 0.2 0.4 0.6 0.8 1.0 1.2 1.4 1.6 1.8 2.0

SCALE IN FEET



### Replace Bridge 474 on SR 1193 over Buffalo Creek SITE PHOTOGRAPHS



Photograph No. 1: View Looking Southeast from End Bent 1 in the direction of alignment

Stream



Photograph No. 2: View looking northwest at End Bent 2 to End Bent 1