

6/2/99

REVISIONS

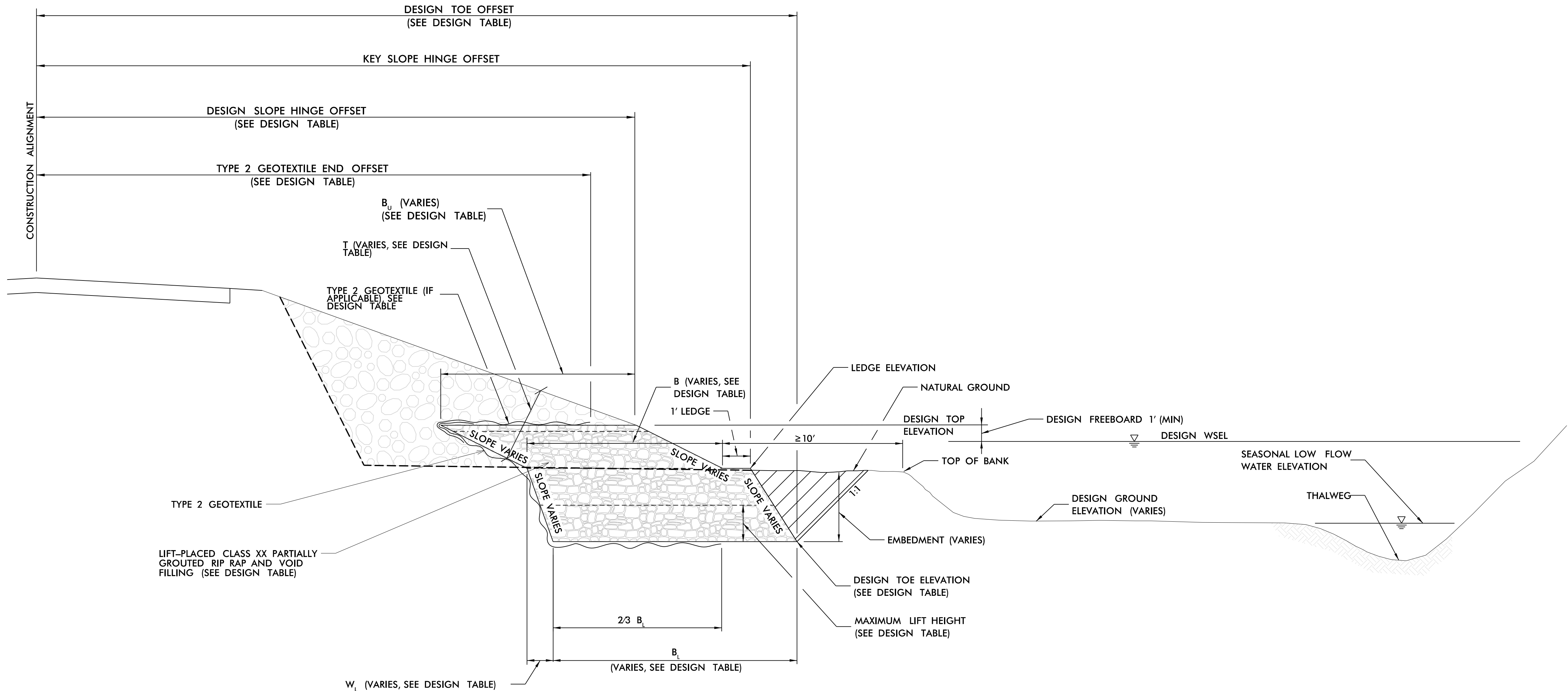
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PENTABLE: NCDOT\_pshp.fltd  
USER: MWDER  
DATE: 5/12/2026  
TIME: 9:24:54 PM  
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GENERAL NOTES:

1. INSTALL ALL TYPE 2 GEOTEXTILE PER THE PLANS AND MANUFACTURER'S RECOMMENDED INSTALLATION SPECIFICATIONS. OVERLAP TYPE 2 GEOTEXTILE MIN 18 INCHES OR PER MANUFACTURER'S RECOMMENDED INSTALLATION SPECIFICATIONS, WHICHEVER IS GREATER.
2. PLACE TYPE 2 GEOTEXTILE AS A SINGLE PIECE FROM THE TOP OF PLACEMENT DOWN TO THE TOE OF SLOPE.
3. MECHANICALLY INTERLOCK RIP RAP OR SELECT MATERIAL CLASS VIII, FOR PGR TO MAXIMUM PRACTICABLE DENSITY.
4. EXTEND TYPE 2 GEOTEXTILE OVER PGR WHEN PGR EXTENDS INTO THE BEARING PRISM OF THE ROADWAY. SEE DESIGN TABLE FOR REQUIRED EXTENTS.
5. INSTALL VOID FILL ONLY WHEN INDICATED ON THE PLANS OR AS DIRECTED BY THE ENGINEER.
6. WHEN DEWATERING IS NOT PRACTICABLE, SUBSTITUTE LOOSE CLASS 3 OR SELECT MATERIAL CLASS VIII ROCK AND DOCUMENT EXTENTS OF CHANGE DIRECTED BY THE ENGINEER.
7. WHERE LARGE ROCK OR BEDROCK PREVENTS EXCAVATION TO DESIGN TOE ELEVATION, FOUND EMBANKMENT PROTECTION ON ROCK AND DOCUMENT EXTENTS OF CHANGE AS DIRECTED BY ENGINEER.
8. ENSURE GEOTECHNICAL STABILITY OF TOE. DESIGN OF  $B_L$  DIMENSION REQUIRED.
9. MAX PARTIALLY GROUTED RIP RAP (PGR) SLOPE PLACED PER THIS DETAIL IS 1.25:1. THE PGR BASE SECTION MAY HAVE VERTICAL FACES (SEE DESIGN TABLE AND CROSS SECTIONS).

GEOTECHNICALLY-STABILIZED FILL NOTES

1. SEE TABLE FOR MINIMUM REQUIRED THICKNESS OF GEOTECHNICALLY-STABILIZED FILL BEHIND THE PARTIALLY GROUTED RIP RAP. THIS THICKNESS REFLECTS THE MINIMUM REQUIRED BASED ON SLOPE STABILITY ANALYSIS USING THE PRESUMED ROCK LINE SHOWN IN THE CROSS SECTIONS, INCLUDING INTERPOLATION BETWEEN BORING LOCATIONS TO DEVELOP A CONTINUOUS ESTIMATED ROCK PROFILE. MODIFICATIONS TO THESE THICKNESSES MAY REQUIRE ADDITIONAL SLOPE STABILITY ANALYSIS BASED ON VERIFIED ROCK DEPTHS ENCOUNTERED DURING CONSTRUCTION.
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LEGEND

- NATIVE MATERIAL BACK FILL
- GEOTECHNICALLY-STABILIZED FILL (REFER TO SHEET 2G-5 FOR ROCK EMBANKMENT DETAIL)

LIFT-PLACED PARTIALLY GROUTED RIP RAP  
EMBANKMENT PROTECTION TYPICAL SECTION  
WITH GREATER THAN 10' OF OVBANK

| PROJECT REFERENCE NO.                                                                                                                | SHEET NO.                                                                                                                       |
|--------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|
| 183141045999.3.3                                                                                                                     | 2G-1                                                                                                                            |
| ROADWAY DESIGN ENGINEER<br>NORTH CAROLINA PROFESSIONAL SEAL<br>046198<br>ENGINEER<br>MATTHEW J. WERDER<br>Matthew Werder 5/13/2026   | HYDRAULICS ENGINEER<br>NORTH CAROLINA PROFESSIONAL SEAL<br>038053<br>ENGINEER<br>DAVIN C. MORRISON<br>Davin Morrison 5/13/2026  |
|                                                                                                                                      | GEOTECHNICAL ENGINEER<br>NORTH CAROLINA PROFESSIONAL SEAL<br>037998<br>ENGINEER<br>THOMAS R. WELLS<br>Thomas R. Wells 5/14/2026 |
| DOCUMENT NOT CONSIDERED FINAL<br>UNLESS ALL SIGNATURES COMPLETED                                                                     |                                                                                                                                 |
| HDR Engineering, Inc. of the Carolinas<br>555 Fayetteville St, Suite 900, Raleigh, N.C. 27601<br>N.C.B.E.L.S. License Number: F-0116 |                                                                                                                                 |



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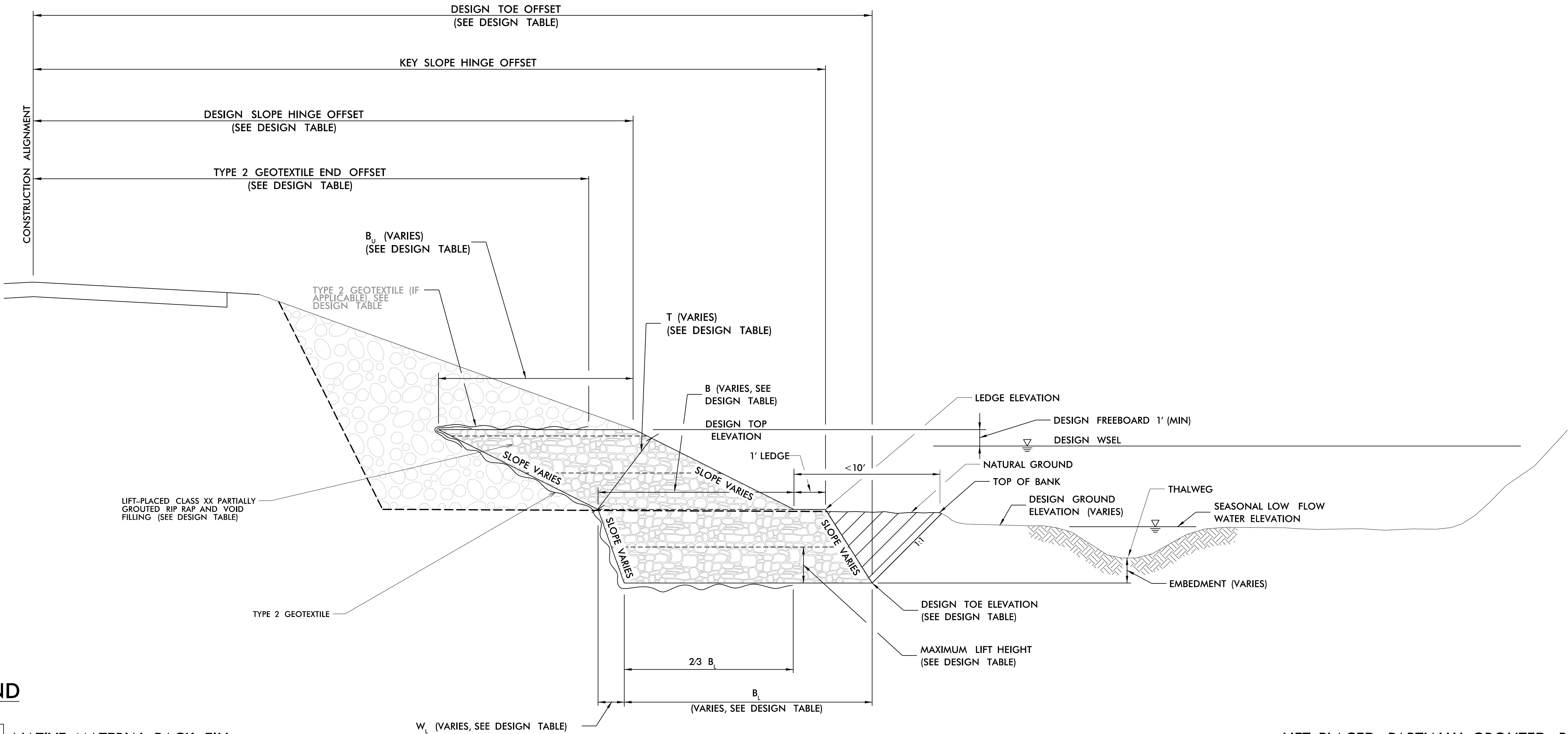
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LIFT-PLACED PARTIALLY GROUTED RIP RAP  
EMBANKMENT PROTECTION TYPICAL SECTION  
WITH LESS THAN 10' OF OVERBANK

| PROJECT REFERENCE NO.                                                                                                                 | SHEET NO.                                                                                                                          |
|---------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|
| 183141045999.3.3                                                                                                                      | 2G-2                                                                                                                               |
| ROADWAY DESIGN ENGINEER<br>NORTH CAROLINA PROFESSIONAL SEAL<br>046198<br>ENGINEER<br>MATTHEW J. WARDER<br>Matthew Warder<br>5/13/2026 | HYDRAULICS ENGINEER<br>NORTH CAROLINA PROFESSIONAL SEAL<br>038053<br>ENGINEER<br>DAVIN C. MORRISON<br>Davin Morrison<br>5/13/2026  |
|                                                                                                                                       | GEOTECHNICAL ENGINEER<br>NORTH CAROLINA PROFESSIONAL SEAL<br>037998<br>ENGINEER<br>THOMAS R. WELLS<br>Thomas R. Wells<br>5/14/2026 |
| DOCUMENT NOT CONSIDERED FINAL<br>UNLESS ALL SIGNATURES COMPLETED                                                                      |                                                                                                                                    |
| HDR Engineering, Inc. of the Carolinas<br>555 Fayetteville St, Suite 900, Raleigh, N.C. 27601<br>N.C.B.E.L.S. License Number: F-0116  |                                                                                                                                    |



6/2/2026

REVISIONS

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DATE: 5/12/2026  
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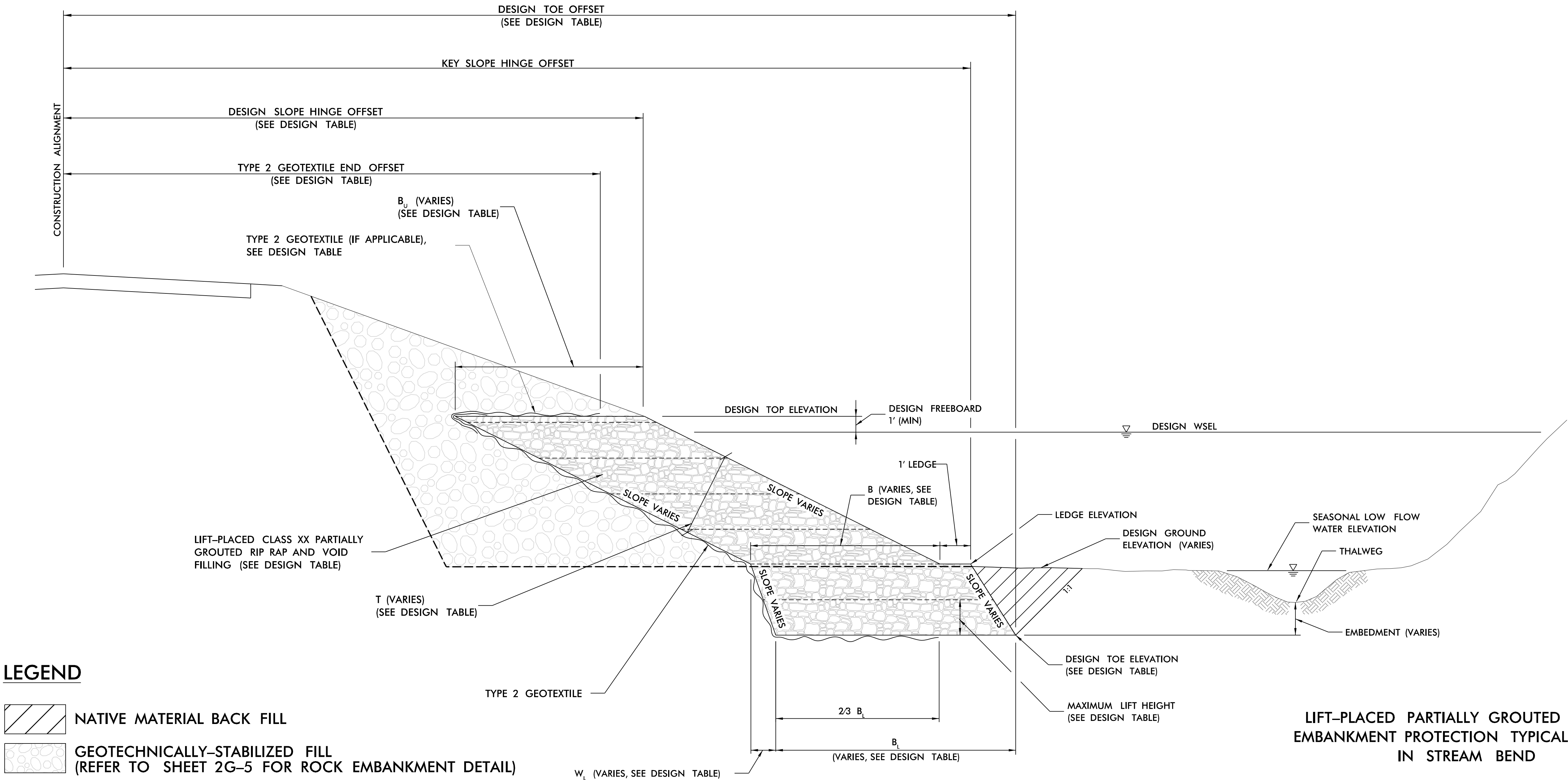
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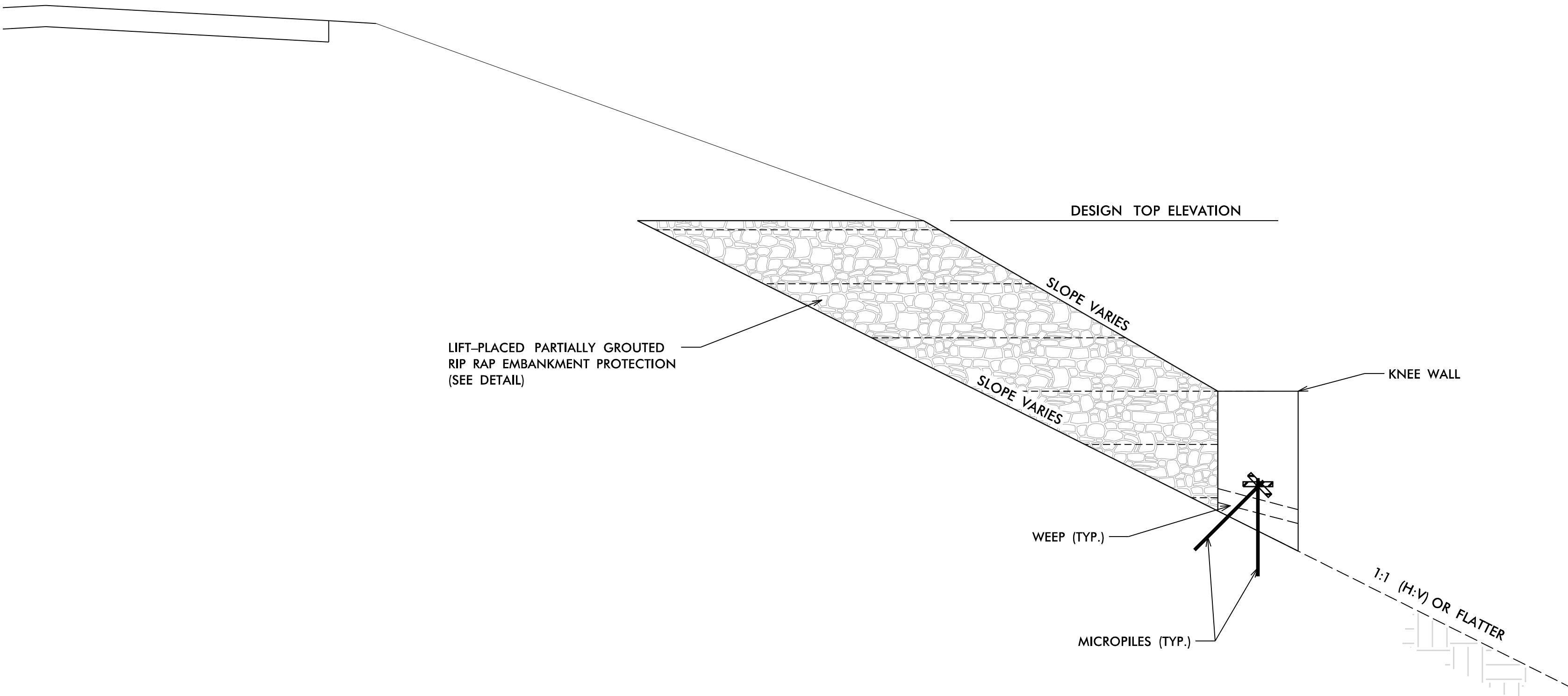
LIFT-PLACED PARTIALLY GROUTED RIP RAP  
EMBANKMENT PROTECTION TYPICAL SECTION  
IN STREAM BEND

|                                                                                                                                                                           |  |                                                                                                                                                                        |  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| PROJECT REFERENCE NO.<br><b>18314.1045999.3.3</b>                                                                                                                         |  | SHEET NO.<br><b>2G-3</b>                                                                                                                                               |  |
| <div>ROADWAY DESIGN<br/>ENGINEER<br/>NORTH CAROLINA<br/>PROFESSIONAL<br/>SEAL<br/>046198<br/>ENGINEER<br/>MATTHEW J. WOODER<br/><i>Matthew Wooder</i><br/>5/13/2026</div> |  | <div>HYDRAULICS<br/>ENGINEER<br/>NORTH CAROLINA<br/>PROFESSIONAL<br/>SEAL<br/>038053<br/>ENGINEER<br/>DAVIN C. MORRISON<br/><i>Davin Morrison</i><br/>5/13/2026</div>  |  |
|                                                                                                                                                                           |  | <div>GEOTECHNICAL<br/>ENGINEER<br/>NORTH CAROLINA<br/>PROFESSIONAL<br/>SEAL<br/>037998<br/>ENGINEER<br/>THOMAS R. WELLS<br/><i>Thomas R. Wells</i><br/>5/14/2026</div> |  |
| <b>DOCUMENT NOT CONSIDERED FINAL<br/>UNLESS ALL SIGNATURES COMPLETED</b>                                                                                                  |  |                                                                                                                                                                        |  |
| <div> HDR Engineering, Inc. of the Carolinas<br/>555 Fayetteville St. Suite 900 Raleigh, N.C. 27601<br/>N.C.B.E.L.S. License Number: F-0116</div>                         |  |                                                                                                                                                                        |  |



REVISIONS

6/2/99



LIFT-PLACED PARTIALLY GROUTED RIP RAP  
EMBANKMENT PROTECTION MICROPILE KNEE WALL

GENERAL NOTES:

- FOR LIFT-PLACED PARTIALLY GROUTED RIP RAP EMBANKMENT PROTECTION, SEE LIFT-PLACED PARTIALLY GROUTED RIP RAP EMBANKMENT PROTECTION DETAIL AND PROVISIONS.
- FOR MICROPILE KNEE WALL, SEE MICROPILE AND KNEE WALL DETAILS AND PROVISIONS.
- ESTIMATED MICROPILE AVERAGE LENGTH FOR KNEE WALL=15'
- MINIMUM MICROPILE ROCK BOND LENGTH=5'
- BEFORE BEGINNING KNEE WALL DESIGN, SURVEY WALL LOCATION AND SUBMIT A REVISED WALL PROFILE VIEW (WALL ENVELOPE) FOR REVIEW. DO NOT START WALL DESIGN OR CONSTRUCTION UNTIL THE REVISED WALL ENVELOPE IS ACCEPTED.
- THIS DETAIL IS NOT SPECIFIED IN THE PLANS BUT MAY BE USED AS A DESIGN ALTERNATIVE IF CONSTRAINTS ARISE DURING CONSTRUCTION AS DETERMINED BY THE ENGINEER.

|                                                                                                                                                                                                                                      |  |                                                                                                                                                            |  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| PROJECT REFERENCE NO.<br><b>183141045999.3.3</b>                                                                                                                                                                                     |  | SHEET NO.<br><b>26-4</b>                                                                                                                                   |  |
| <div>ROADWAY DESIGN ENGINEER<br/>NORTH CAROLINA PROFESSIONAL SEAL<br/>046198<br/>ENGINEER<br/>MATTHEW J. WERDER<br/><i>Matthew Werder</i><br/>5/13/2026</div>                                                                        |  | <div>HYDRAULICS ENGINEER<br/>NORTH CAROLINA PROFESSIONAL SEAL<br/>038053<br/>ENGINEER<br/>DAVIN C. MORRISON<br/><i>Davin Morrison</i><br/>5/13/2026</div>  |  |
|                                                                                                                                                                                                                                      |  | <div>GEOTECHNICAL ENGINEER<br/>NORTH CAROLINA PROFESSIONAL SEAL<br/>037998<br/>ENGINEER<br/>THOMAS R. WELLS<br/><i>Thomas R. Wells</i><br/>5/14/2026</div> |  |
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