

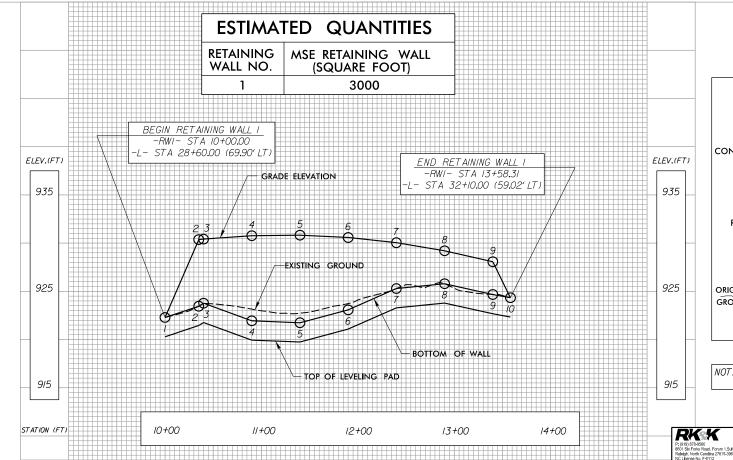
DATE: 03/06/23

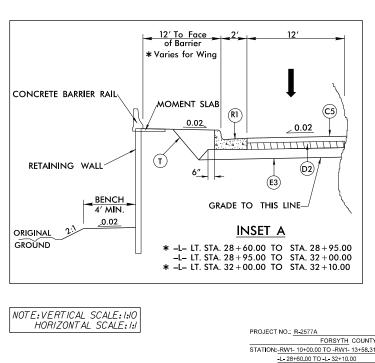
DATE: 03/06/23

* Bottom elevations include 4' bench for steep existing slope

PREPARED BY: MAXIME METRY

REVIEWED BY: JAMEY BATTS

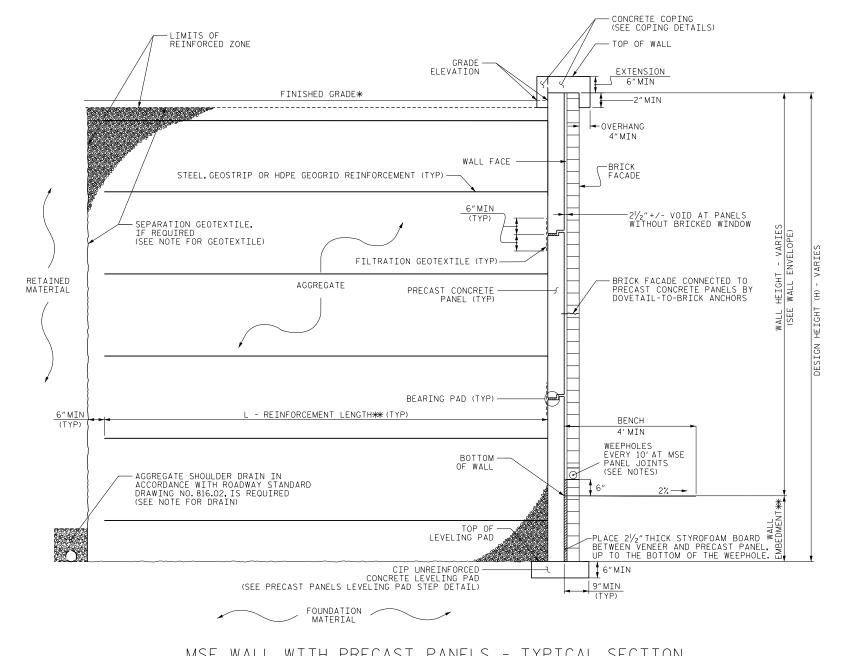




NORTH CAROLINA PARTMENT OF TRANSPORTAT DIVISION OF HIGHWAYS

GEOTECHNICAL

MSE RETAINING WALL WALL NO. 1 DETAILS



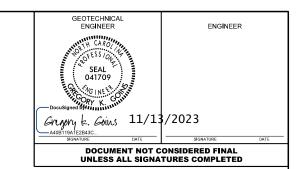
MSE WALL WITH PRECAST PANELS - TYPICAL SECTION

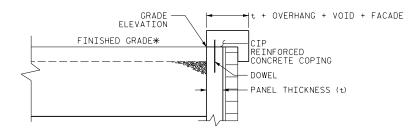
**SEE ROADWAY PLANS FOR FINISHED GRADE DETAILS.

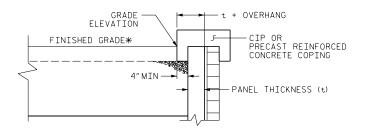
***SEE MSE RETAINING WALLS PROVISION AND IF APPLICABLE, MSE WALL NOTES FOR WALL EMBEDMENT AND REINFORCEMENT LENGTH REQUIREMENTS.

THIS TYPICAL SECTION IS FOR POINT NO.1 TO 2 FROM -RW1- 10+00.0 TO 10+40.24 (-L- 28+60.00 TO 28+95.00)

THIS TYPICAL SECTION IS FOR POINT NO.9 TO 10 FROM -RW1- 13+44.90 TO 13+58.31 (-L- 32+00.00 TO 32+10.00)

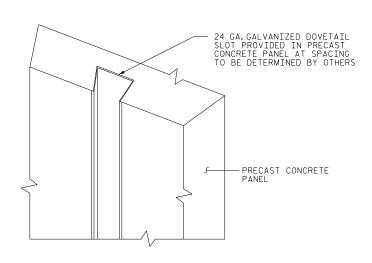






COPING DETAILS

AT THE CONTRACTOR'S OPTION, CONNECT COPING TO PANELS WITH DOWELS OR EXTEND COPING DOWN BACK OF PANELS. **SEE ROADWAY PLANS FOR FINISHED GRADE DETAILS.



DOVETAIL SLOT

PROJECT NO: R-2577A

FORSYTH COUNTY

STATION: -RW1- 10+00.00 TO -RW1- 13+58.31

-L- 28+60.00 TO -L- 32+10.00

SHEET 2 OF 5

WALL ID RW- 1

MSE RETAINING WALL WALL NO. 1 **DETAILS**

REVISIONS DATE NO.



Responsive People | Creative Solutions

GEOTECHNICAL

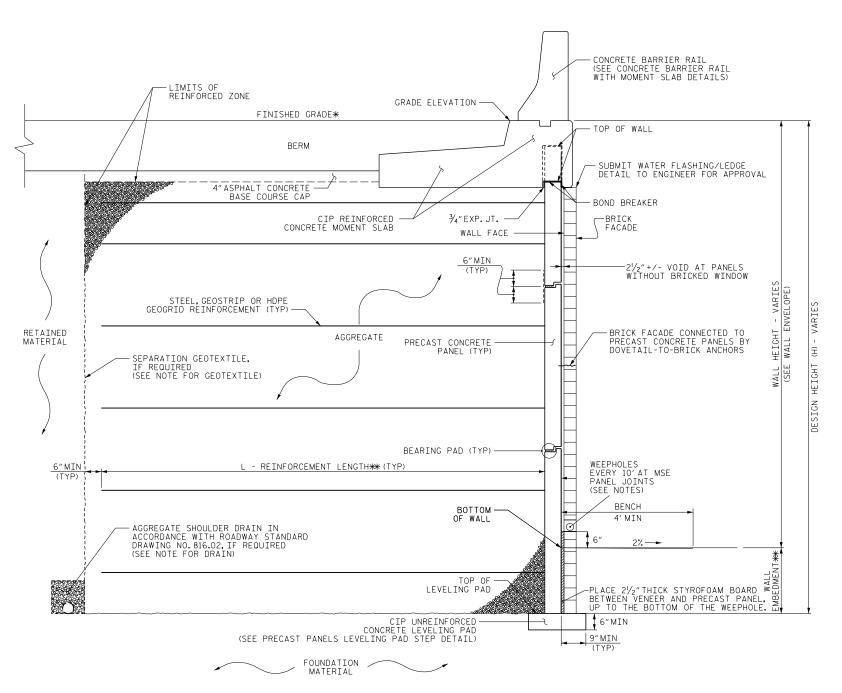
DATE: 03/06/23 PREPARED BY: MAXIME METRY DATE: 03/06/23 REVIEWED BY: JAMEY BATTS

ENGINEERING UNIT

NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS



MSE WALL WITH PRECAST PANELS - TYPICAL SECTION

#SEE ROADWAY PLANS FOR FINISHED GRADE, GUARDRAIL AND HANDRAILS DETAILS.

***SEE MSE RETAINING WALLS PROVISION AND IF APPLICABLE, MSE WALL NOTES FOR WALL EMBEDMENT AND REINFORCEMENT LENGTH REQUIREMENTS.

THIS TYPICAL SECTION IS FOR POINT NO. 2 TO 9 FROM -RW1- 10+40.24 TO 13+44.90 (-L- 28+95.00 TO 32+00.00)



NORTH CAROLINA DEPARTMENT OF TRANSPORTATION **DIVISION OF HIGHWAYS**

> **GEOTECHNICAL** ENGINEERING UNIT

SEAL 041709 Gragory L. Goins 11/13/2023 DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGINEER

GEOTECHNICAL ENGINEER

PROJECT NO.: R-2577A

FORSYTH COUNTY

STATION: -RW1- 10+00.00 TO -RW1- 13+58.31

-L- 28+60.00 TO -L- 32+10.00

SHEET 3 OF 5

MSE RETAINING WALL WALL NO. 1 **DETAILS**

REVISIONS DATE NO.

PREPARED BY: MAXIME METRY DATE: 03/06/23 DATE: 03/06/23 REVIEWED BY: JAMEY BATTS

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NOTES:

FOR MECHANICALLY STABILIZED EARTH (MSE) RETAINING WALLS. SEE MECHANICALLY STABILIZED EARTH RETAINING WALLS PROVISION.

A CONCRETE BARRIER RAIL WITH MOMENT SLAB IS REQUIRED ABOVE RETAINING WALL NO.1. SEE PLANS FOR CONCRETE BARRIER RAIL WITH MOMENT SLAB DETAILS

AT THE CONTRACTOR'S OPTION, USE FINE AGGREGATE IN THE REINFORCED ZONE OF RETAINING WALL NO.1.

A SEPARATION GEOTEXTILE IS NOT REQUIRED AT THE BACK OF THE REINFORCED ZONE FOR RETAINING WALL NO.1, PROVIDED FINE AGGREGATE IS USED IN THE REINFORCED ZONE.

A DRAIN IS REQUIRED FOR RETAINING WALL NO.1.

CIP REINFORCED CONCRETE COPING IS REQUIRED FOR RETAINING WALL NO.1.

A BRICK VENEER IS REQUIRED IN FRONT OF THE PRECAST CONCRETE PANELS FOR RETAINING WALL NO.1.

BRICK VENEER SHALL REST ON TOP OF THE LEVELING PAD, AS SHOWN IN THE TYPICAL SECTION.

FOR BRICK VENEERS, SUBMIT BRICK SAMPLES FOR APPROVAL BEFORE BEGINNING STANDARD MSE WALL CONSTRUCTION.

A HAND-LAID BRICK FACADE IS REQUIRED FOR RETAINING WALL NO.1. SEE ARCHITECTURAL DETAILS FOR SURFACE FINISH AND PATTERNS. THE PRECAST MSE PANEL WALL SHOULD BE CONSTRUCTED AND ALLOWED TO SETTLE PRIOR TO CONSTRUCTION OF THE BRICK FACADE.

A WAITING PERIOD IS REQUIRED PRIOR TO CONSTRUCTION OF THE BRICK FACADE FOOTING AND THE BRICK FACADE. THE WALLS SHOULD BE ALLOWED TO SETTLE FOR A MINIMUM OF 2 MONTHS FROM COMPLETION TO THEIR PROPOSED HEIGHT.

PROVIDE WEEPHOLES IN THE BRICK VENEER AS RECOMMENDED BY THE ENGINEER APPROXIMATELY EVERY 10' AT MSE PANEL JOINTS.

BEFORE BEGINNING MSE WALL DESIGN FOR RETAINING WALL NO.1, 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.

PREPARED BY: MAXIME METRY

REVIEWED BY: JAMEY BATTS

DESIGN RETAINING WALL NO.1 FOR THE FOLLOWING:
1) DESIGN HEIGHT (H) = WALL HEIGHT + WALL EMBEDMENT
2) DESIGN LIFE = 100 YEARS
3) MAXIMUM FACTORED VERTICAL PRESSURE ON FOUNDATION MATERIAL = 3,300 PSF

4) MINIMUM REINFORCEMENT LENGTH (L) = 0.7H OR 6 FT, WHICHEVER IS LONGER 5) MINIMUM EMBEDMENT DEPTH = 2 FT

6) REINFORCED ZONE AGGREGATE PARAMETERS:

| AGGREGATE TYPE* | UNIT WEIGHT (γ) PCF | FRICTION ANGLE (φ) DEGREES | COHESION (c) PSF | |
|--|---------------------------|----------------------------------|------------------------|--|
| COARSE | 110 | 38 | 0 | |
| FINE | 115 | 34 | 0 | |
| *SEE MSE RETAINING WALLS PROVISION FOR COARSE AND FINE AGGREGATE | | | | |

7) IN-SITU ASSUMED MATERIAL PARAMETERS:

| MATERIAL TYPE | UNIT WEIGHT (7) PCF | FRICTION ANGLE (φ) DEGREES | COHESION (c) PSF | |
|---------------|---------------------------|----------------------------------|------------------------|--|
| RETAINED | 120 | 30 | 0 | |
| FOUNDATION | 115 | 29 | 0 | |

DESIGN RETAINING WALL NO.1 FOR A LIVE LOAD (TRAFFIC) SURCHARGE.

FOUNDATIONS FOR SIGNS, LIGHTING OR SIGNALS WILL BE LOCATED BEHIND RETAINING WALL NO.1 AND MAY INTERFERE WITH REINFORCEMENT. BEFORE BEGINNING MSE WALL CONSTRUCTION, SUBMIT PROPOSED CONSTRUCTION METHODS FOR THESE FOUNDATIONS FOR APPROVAL.

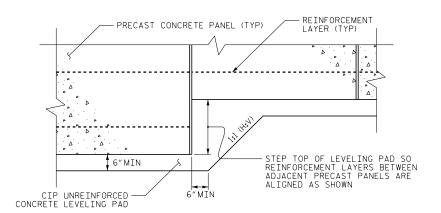
EXISTING OR FUTURE OBSTRUCTIONS SUCH AS FOUNDATIONS, GUARDRAIL, FENCE OR HANDRAIL POSTS, PAVEMENTS, PIPES, INLETS OR UTILITIES MAY INTERFERE WITH REINFORCEMENT FOR RETAINING WALL NO. 1.

DO NOT PLACE LEVELING PAD CONCRETE, AGGREGATE OR REINFORCEMENT FOR RETAINING WALL NO.1 UNTIL EXCAVATION DIMENSIONS AND FOUNDATION MATERIAL ARE APPROVED.

AT THE CONTRACTOR'S OPTION, "TEMPORARY SHORING FOR WALL CONSTRUCTION" MAY BE USED TO CONSTRUCT RETAINING WALL NO.1. SEE MSE RETAINING WALLS PROVISION FOR TEMPORARY SHORING FOR WALL CONSTRUCTION.

MSE LEVELING PAD WIDTH SHALL ALLOW A MINIMUM OF 9 INCHES IN FRONT OF THE MSE PANEL FACE FOR A BRICK LEDGER.





PRECAST PANELS LEVELING PAD STEP DETAIL

PROJECT NO: R-2577A

FORSYTH COUNTY

STATION: -RW1- 10+00.00 TO -RW1- 13+58.31 -L- 28+60.00 TO -L- 32+10.00

SHEET 4 OF 5

NORTH CAROLINA

DIVISION OF HIGHWAYS

GEOTECHNICAL

ENGINEERING UNIT

WALL ID RW- 1

MSE RETAINING WALL WALL NO. 1 **DETAILS**

REVISIONS DATE NO. DATE

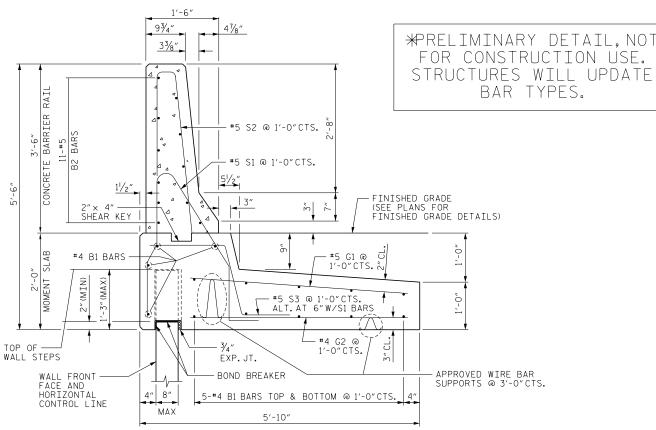
: (919) 878-9560 8601 Six Forks Road, Forum 1, Suite 700 Raleigh, North Carolina 27615-3960 NC License No. F-0112

Engineers | Construction Managers | Planners | Scientists

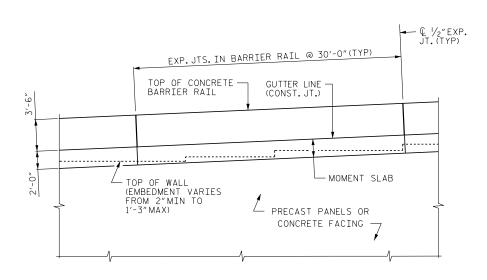
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DATE: 03/06/23 DATE: 03/06/23

DEPARTMENT OF TRANSPORTATION



CONCRETE BARRIER RAIL WITH MOMENT SLAB



CONCRETE BARRIER RAIL WITH MOMENT SLAB - PARTIAL ELEVATION

NOTES:

FOR CONCRETE BARRIER RAIL WITH MOMENT SLAB, SEE SECTION 460 OF THE STANDARD SPECIFICATIONS.

CONCRETE BARRIER RAIL WITH MOMENT SLAB SHALL BE A

EXPANSION JOINTS SHALL BE PLACED IN THE BARRIER RAIL AND MOMENT SLAB AT A MAXIMUM SPACING OF 30'.

GROOVED CONTRACTION JOINTS, 1/2"IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED SURFACES OF THE BARRIER RAIL AND IN ACCORDANCE WITH ARTICLE 825-10(8) OF THE STANDARD SPECIFICATIONS. A CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN BARRIER RAIL EXPANSION JOINTS.ONLY ONE CONTRACTION JOINT IS REQUIRED AT MID-POINT OF BARRIER RAIL SEGMENTS LESS THAN 20'IN

EXPANSION OR CONTRACTION JOINTS IN THE BARRIER RAIL AND MOMENT SLAB SHALL BE ALIGNED WITH JOINTS IN WALL FACING BELOW.

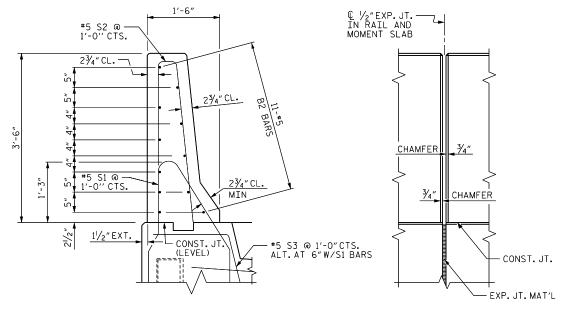
THE BARRIER RAIL SHALL NOT BE CAST UNTIL THE MOMENT SLAB HAS ATTAINED AN AGE OF THREE CURING DAYS OR A MINIMUM COMPRESSIVE STRENGTH OF 2,000 PSI. IN ADDITION, NO FILL MATERIAL, ASPHALT, OR CONSTRUCTION EQUIPMENT IS ALLOWED ON THE MOMENT SLAB PRIOR TO SATISFYING THE MINIMUM CONCRETE CURING AND STRENGTH REQUIREMENTS.

ALL REINFORCING STEEL IN THE BARRIER RAIL SHALL BE EPOXY COATED.

IF EXISTING OR FUTURE OBSTRUCTIONS SUCH AS FOUNDATIONS, BARRIERS, PIPES, INLETS OR UTILITIES WILL INTERFERE WITH CONCRETE BARRIER RAIL WITH MOMENT SLAB OR CONCRETE FACING FOR RETAINING WALL WILL BE THICKER THAN 8", CONCRETE BARRIER RAIL WITH MOMENT SLAB DETAILS SHALL BE REVISED AND SUBMITTED FOR APPROVAL.

CONCRETE BARRIER RAIL WITH MOMENT SLAB

PAY LENGTH = 305 LIN FT



BARRIER RAIL DETAILS



Engineers | Construction Managers | Planners | Scientists www.rkk.com

SECTION THRU RAIL

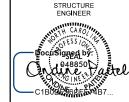
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NORTH CAROLINA DEPARTMENT OF TRANSPORTATION **DIVISION OF HIGHWAYS**

ELEV. @ EXP. JOINTS

GEOTECHNICAL ENGINEERING UNIT

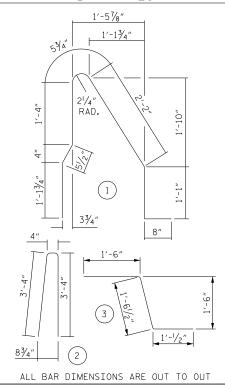


11/13/2023

FNGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BAR TYPES



BILL OF MATERIAL

| DILL OF MATERIAL | | | | | | | |
|--|----------------------|----|------|--------|--------|--|--|
| FOR ONE 30'-O"SECTION OF CONCRETE BARRIER RAIL WITH MOMENT SLAB | | | | | | | |
| BAR | AR NO. SIZE | | TYPE | LENGTH | WEIGHT | | |
| | | | | | | | |
| B1 | 14 | #4 | STR | 29'-7" | 277 | | |
| * B2 | * B2 11 #5 | | | 29'-7" | 339 | | |
| | | | | | | | |
| G1 | 31 | #5 | STR | 4'-4" | 140 | | |
| G2 | 31 | #4 | STR | 4'-4" | 90 | | |
| | | | | | | | |
| * S1 | 31 | #5 | 1 | 7′-4″ | 237 | | |
| * S2 | * S2 31 #5 | | | 7′-0″ | 226 | | |
| S3 | S3 30 #5 3 4'-1" 128 | | 128 | | | | |
| | | | | | | | |
| REINFORCING STEEL | | | | 635 LB | | | |
| * EPOXY COATED REINFORCING STEEL | | | | | 802 LB | | |

BARRIER RAIL CLASS A CONCRETE MOMENT SLAB CONCRETE BARRIER RAIL WITH MOMENT SLAB

PROJECT NO.: R-2577A

CLASS AA CONCRETE

FORSYTH COUNTY

4.1 CY

9.1 CY

30 LIN FT

STATION: -RW1- 10+00.00 TO -RW1- 13+58.31 SHEET 5 OF 5 WALL ID RW-1

> CONCRETE BARRIER RAIL WITH MOMENT SLAB FOR PRECAST PANELS AND CONCRETE FACING

| REVISIONS | | | | | SHEET | |
|-----------|----|------|-----|----|-------|-----|
| NO. | BY | DATE | NO. | BY | DATE | NO. |
| 1 | | | 3 | | | W-5 |
| 2 | | | 4 | | | *** |

PREPARED BY: MAXIME METRY DATE: 03/06/23 REVIEWED BY: JAMEY BATTS DATE: 03/06/23