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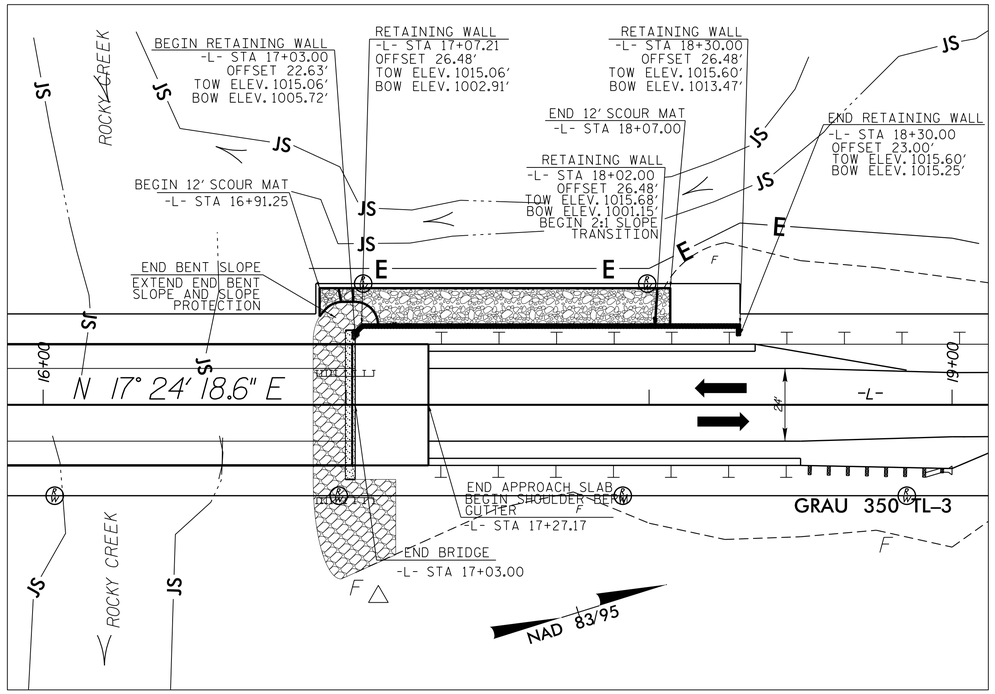
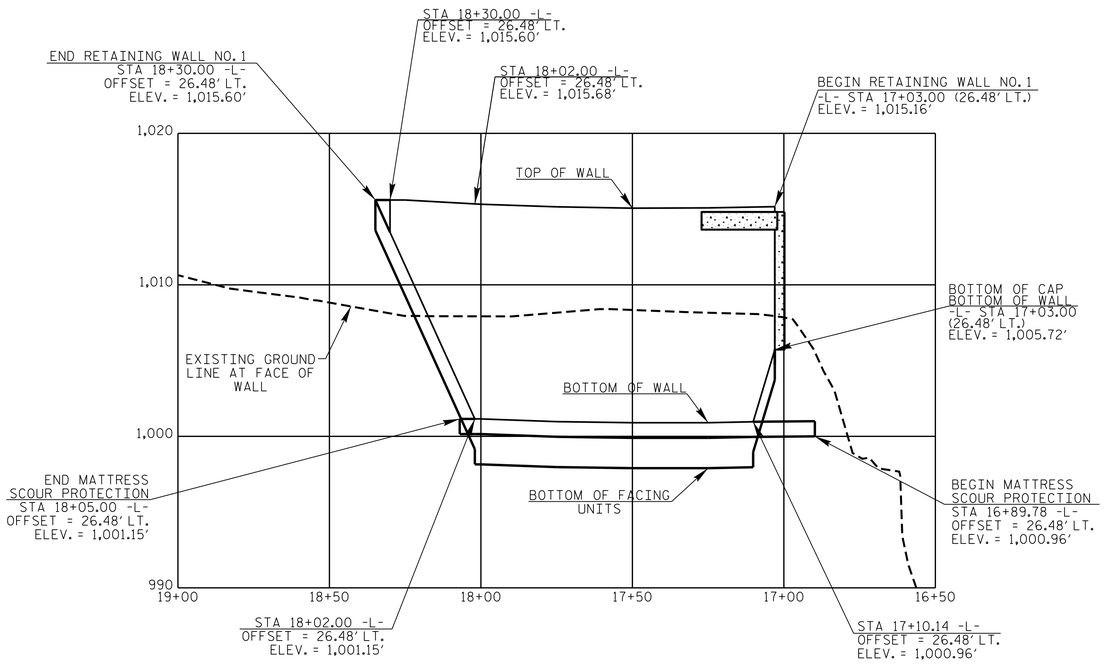



## WALL NO. 1 PLAN VIEW




## WALL NO. 1 ENVELOPE

| PREPARED BY: MHS | DATE: 4-7-2016 |
|---|---|
| REVIEWED BY: SCC/JDH | DATE: 4-7-2016 |

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 028893 ENGINEER MICHAEL H. STEPHENS

DocuSigned by: Michael H. Stephens C44768209314CC...

4/18/2016

SIGNATURE DATE

ENGINEER

SIGNATURE DATE

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## RETAINING WALL ELEVATIONS

| -L- STA | OFFSET FROM ℄ (LEFT) | ELEV @ TOP OF WALL | ✳ ELEV @ BOTTOM OF WALL | ✳ DESIGN WALL HEIGHT | ✳✳ TOTAL WALL HEIGHT "H" |
|---|---|---|---|---|---|
| 17+03.00 | 22.6 | 1,015.16 | 1,005.72 | 9.44 | 11.44 |
| 17+03.00 | 26.5 | 1,015.16 | 1,005.72 | 9.44 | 12.44 |
| 17+10.14 | 26.5 | 1,015.13 | 1,000.96 | 14.17 | 17.17 |
| 18+02.00 | 26.5 | 1,015.68 | 1,001.15 | 14.53 | 17.53 |
| 18+30.00 | 26.5 | 1,015.60 | 1,013.47 | 2.13 | 4.13 |
| 18+30.00 | 23.0 | 1,358.01 | 1,342.10 | 0.00 | 2.00 |

✳ ADJUST TOP OF WALL ELEVATION AS NECESSARY TO MATCH THE TOP OF EXPRESSWAY GUTTER

✳✳ FOR DESIGN WALL HEIGHT "H" AND ADDITIONAL CONSTRUCTION DETAILS, SEE SHEET 3 OF 4

## ESTIMATED WALL QUANTITY

| | |
|---|---|
| RETAINING WALL | ✳ 2,000 SQUARE FEET |

✳ WALL AREA IS MEASURED USING THE TOTAL HEIGHT "H"

NOTE:
1) FOR WIRE FACED MSE WALL TO END BENT NO. 2 CAP CONNECTION, SEE DETAIL A (SHEET 4 OF 4)

PROJECT NO.: B-4766

IREDELL COUNTY

STATION: 16+28.00 -L-

SHEET 1 OF 4

*NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS*

***GEOTECHNICAL ENGINEERING UNIT***

# WIRE FACED MSE WALL

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

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 028893 ENGINEER MICHAEL H. STEPHENS

Docusigned by: Michael H. Stephens C44768209231 4CC...

4/18/2016

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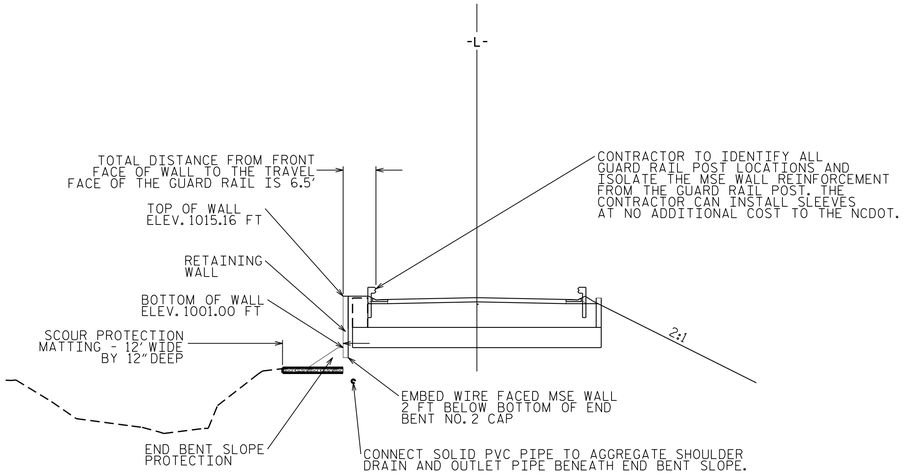
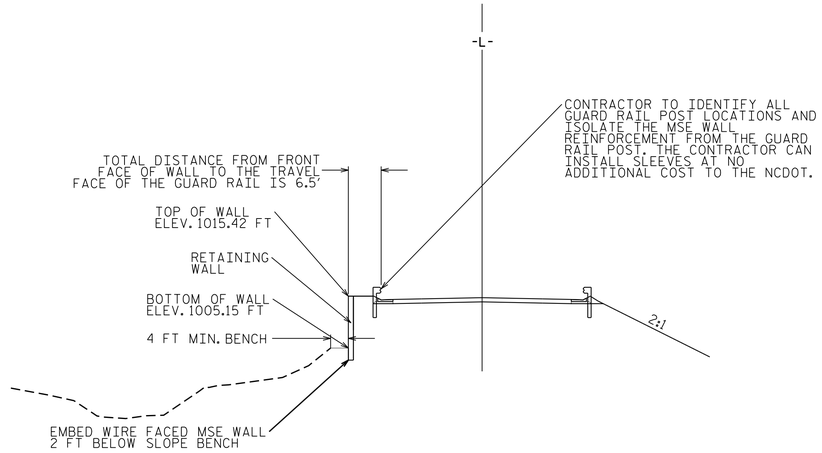
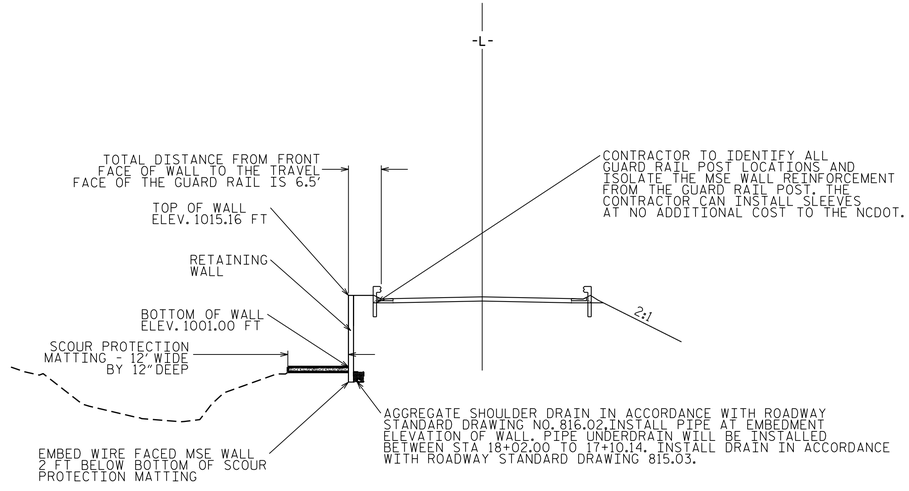



CROSS SECTION @ STA 17+03
MSE WIRE FACED WALL AT END BENT 2




CROSS SECTION @ STA 18+02
MSE WIRE FACED WALL AT ROADWAY
WITH NO SCOUR PROTECTION MATTING




CROSS SECTION @ STA 17+40
MSE WIRE FACED WALL AT ROADWAY

| | |
|---|---|
| PREPARED BY: MHS | DATE: 4-7-2016 |
| REVIEWED BY: SCC/JDH | DATE: 4-7-2016 |

PROJECT NO.: B-4766

IREDELL COUNTY

STATION: 16+28.00 -L-

SHEET 2 OF 4

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

***GEOTECHNICAL ENGINEERING UNIT***

WIRE FACED MSE WALL

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

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 028893 ENGINEER MICHAEL H. STEPHENS

Digitally signed by Michael H. Stephens
C447682092314CC...

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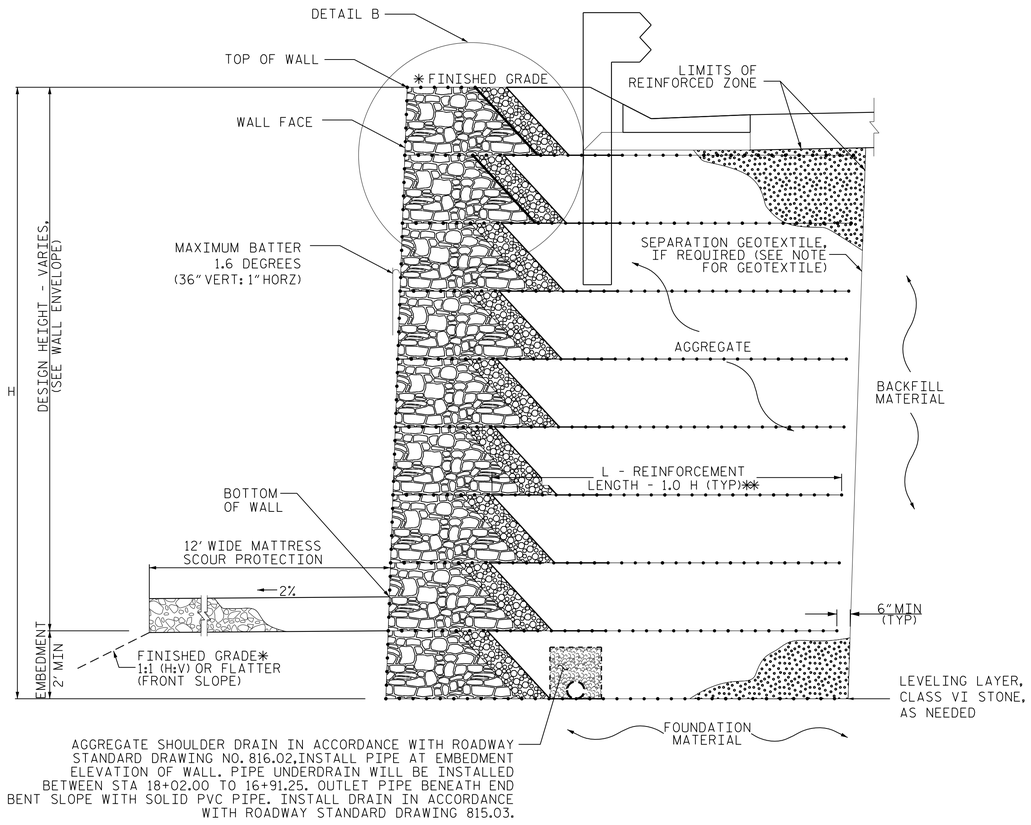
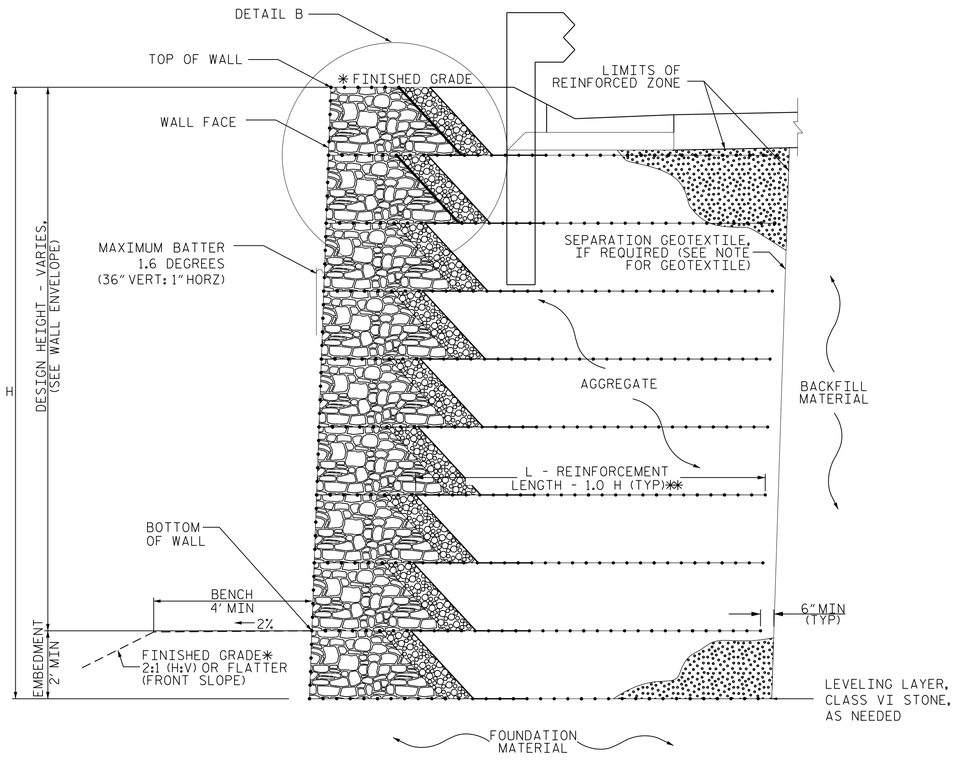



## MSE WIRE FACED WALL - TYPICAL SECTION FROM STA. 17+03 FT. TO 18+07 FT.

✳ SEE ROADWAY PLANS FOR FINISHED GRADE DETAILS.
✳✳ SEE WIRE FACED MSE RETAINING WALLS PROVISION AND IF APPLICABLE, MSE WALL NOTES FOR EMBEDMENT AND REINFORCEMENT LENGTH REQUIREMENTS.




## MSE WIRE FACED WALL - TYPICAL SECTION FROM STA. 18+07 FT. TO 18+30 FT.

✳ SEE ROADWAY PLANS FOR FINISHED GRADE DETAILS.
✳✳ SEE WIRE FACED MSE RETAINING WALLS PROVISION AND IF APPLICABLE, MSE WALL NOTES FOR EMBEDMENT AND REINFORCEMENT LENGTH REQUIREMENTS.

PROJECT NO.: B-4766

IREDELL COUNTY

STATION: 16+28.00 -L-

SHEET 3 OF 4

| PREPARED BY: MHS | DATE: 4-7-2016 |
|---|---|
| REVIEWED BY: SCC/JDH | DATE: 4-7-2016 |

*NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS*

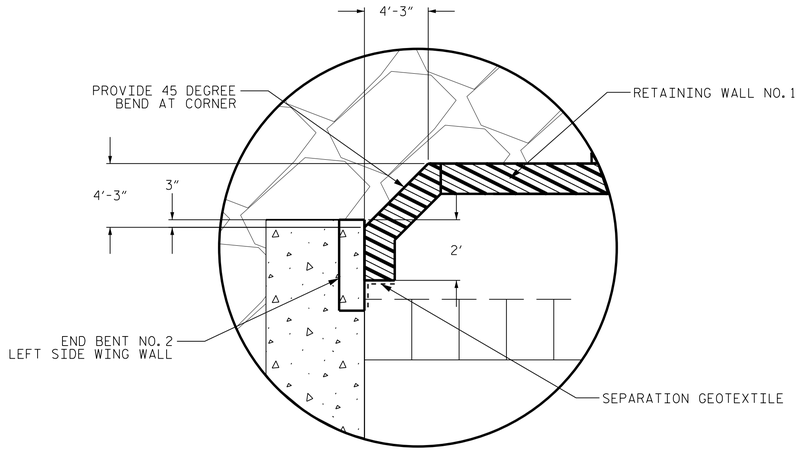
***GEOTECHNICAL ENGINEERING UNIT***

# WIRE FACED MSE WALL

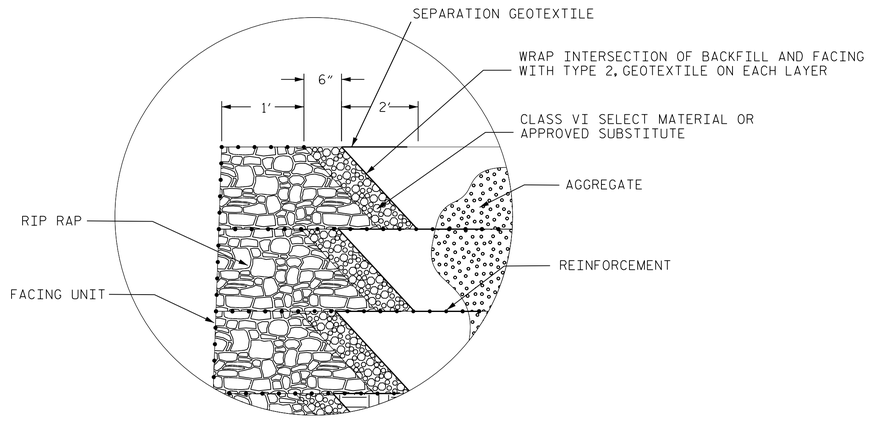
***REVISIONS***

| NO. | BY | DATE | NO. | BY | DATE |
|---|---|---|---|---|---|
| 1 | – | – | 3 | – | – |
| 2 | – | – | 4 | – | – |

SHEET NO. W-3




DETAIL A - END BENT CORNER (NTS)




DETAIL B (NTS)

NOTES:

FOR WIRE FACED MSE RETAINING WALLS, SEE WIRE FACED MSE RETAINING WALL PROVISION.

SEE ROADWAY PLANS FOR FINISHED GRADE DETAILS.

FOR STEEL BEAM GUARDRAIL, SEE ROADWAY PLANS AND SECTION 862 OF THE STANDARD SPECIFICATIONS. CONTRACTOR TO IDENTIFY ALL GUARD RAIL POST LOCATIONS AND ISOLATE THE MSE WALL REINFORCEMENT FROM THE GUARD RAIL POST. THE CONTRACTOR CAN INSTALL LEEVES AT NO ADDITIONAL COST TO THE NCDOT.

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

A SEPARATION GEOTEXTILE IS REQUIRED AT THE BACK OF THE REINFORCED ZONE FOR RETAINING WALL NO.1 WHEN COARSE AGGREGATE IS USED.

A DRAIN IS REQUIRED FOR RETAINING WALL NO. 1.

GALVANIZED AND PVC-COATED FACING UNITS ARE REQUIRED FOR RETAINING WALL NO. 1.

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.

DESIGN RETAINING WALL NO. 1 FOR THE FOLLOWING:
1) H = DESIGN HEIGHT + EMBEDMENT
2) DESIGN LIFE = 100 YEARS
3) MAXIMUM FACTORED VERTICAL PRESSURE ON FOUNDATION MATERIAL = 3,300 LB/SF
4) MINIMUM REINFORCEMENT LENGTH (L) = 1.0H OR 6 FT, WHICHEVER IS LONGER
5) REINFORCED ZONE AGGREGATE PARAMETERS:

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

6) IN-SITU ASSUMED MATERIAL PARAMETERS

| MATERIAL TYPE | UNIT WEIGHT (gamma) PCF | FRICTION ANGLE (phi) DEGREES | COHESION (c) PSF |
|---|---|---|---|
| BACKFILL | 120 | 30 | 0 |
| FOUNDATION | 115 | 28 | 0 |

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

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

WHERE THE WIRE FACED RETAINING WALL INTERSECTS DRAINAGE PIPES, SUBMIT PENETRATION REINFORCEMENT DETAILS FOR APPROVAL PRIOR TO ORDERING MATERIALS OR BEGINNING CONSTUCTION. SEE DRAINAGE PLANS FOR ADDITIONAL INFORMATION.

THE TOP OF WALL LOCATION, AS SHOWN IN DETAIL, CORRESPONDS TO THE TOP OF EXPRESSWAY GUTTER ELEVATION AS SHOWN IN ROADWAY PLANS.

ADJUST THE OFFSET OF THE BOTTOM FACING UNIT TO ACCOUNT FOR WALL BATTER AND MEET THE TOP OF OFFSET SHOWN OF THE PLANS.

EXISTING OR FUTURE OBSTRUCTIONS SUCH AS FOUNDATIONS, GUARDRAIL POSTS, PAVEMENTS, PIPES, INLETS, OR UTILITIES MAY INTERFERE WITH THE REINFORCEMENT FOR WIRE FACED RETAINING WALLS.

DO NOT PLACE LEVELING LAYER STONE, AGGREGATE OR REINFORCEMENT UNTIL OBTAINING APPROVAL OF THE EXCAVATION DEPTH AND FOUNDATION MATERIAL.

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 028893 ENGINEER MICHAEL H. STEPHENS

Digitally signed by Michael H. Stephens
C447682092314CC...

4/18/2016

SIGNATURE DATE

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PROJECT NO.: B-4766

IREDELL COUNTY

STATION: 16+28.00 -L-

SHEET 4 OF 4

| | |
|---|---|
| PREPARED BY: MHS | DATE: 4-7-2016 |
| REVIEWED BY: SCC/JDH | DATE: 4-7-2016 |

*NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS*

***GEOTECHNICAL ENGINEERING UNIT***

# WIRE FACED MSE WALL

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

# STANDARD NOTES

## DESIGN DATA:

| | |
|---|---|
| SPECIFICATIONS | A.A.S.H.T.O. (CURRENT) |
| LIVE LOAD | SEE PLANS |
| IMPACT ALLOWANCE | SEE A.A.S.H.T.O. |
| STRESS IN EXTREME FIBER OF | |
| STRUCTURAL STEEL - AASHTO M270 GRADE 36 | 20,000 LBS. PER SQ. IN. |
| - AASHTO M270 GRADE 50W | 27,000 LBS. PER SQ. IN. |
| - AASHTO M270 GRADE 50 | 27,000 LBS. PER SQ. IN. |
| REINFORCING STEEL IN TENSION | |
| GRADE 60 | 24,000 LBS. PER SQ. IN. |
| CONCRETE IN COMPRESSION | 1,200 LBS. PER SQ. IN. |
| CONCRETE IN SHEAR | SEE A.A.S.H.T.O. |
| STRUCTURAL TIMBER - TREATED OR | |
| UNTREATED - EXTREME FIBER STRESS | 1,800 LBS. PER SQ. IN. |
| COMPRESSION PERPENDICULAR TO GRAIN OF TIMBER | 375 LBS. PER SQ. IN. |
| EQUIVALENT FLUID PRESSURE OF EARTH | 30 LBS. PER CU. FT. (MINIMUM) |

## MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2012 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

STEEL SHEET PILING FOR PERMANENT OR TEMPORARY APPLICATIONS SHALL BE HOT ROLLED.

## CONCRETE:

UNLESS OTHERWISE REQUIRED ON PLANS, CLASS A CONCRETE SHALL BE USED FOR ALL PORTIONS OF ALL STRUCTURES WITH THE EXCEPTION THAT: CLASS AA CONCRETE SHALL BE USED IN BRIDGE SUPERSTRUCTURES, ABUTMENT BACKWALLS, AND APPROACH SLABS; AND CLASS B CONCRETE SHALL BE USED FOR SLOPE PROTECTION AND RIP RAP.

## CONCRETE CHAMFERS:

UNLESS OTHERWISE NOTED ON THE PLANS, ALL EXPOSED CORNERS ON STRUCTURES SHALL BE CHAMFERED 3/4" WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO 1-1/2" RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A 1/4" FINISHING TOOL UNLESS OTHERWISE REQUIRED ON PLANS; AND CORNERS OF EXPANSION JOINTS IN THE ROADWAY FACES AND TOPS OF CURBS AND SIDEWALKS SHALL BE ROUNDED TO A 1/4" RADIUS WITH A FINISHING STONE OR TOOL UNLESS OTHERWISE REQUIRED ON PLANS.

## DOWELS:

DOWELS WHEN INDICATED ON PLANS AS FOR CULVERT EXTENSIONS, SHALL BE EMBEDDED AT LEAST 12" INTO THE OLD CONCRETE AND GROUTED INTO PLACE WITH 1:2 CEMENT MORTAR.

## ALLOWANCE FOR DEAD LOAD DEFLECTION, SETTLEMENT, ETC. IN CASTING SUPERSTRUCTURES:

BRIDGES SHALL BE BUILT ON THE GRADE OR VERTICAL CURVE SHOWN ON PLANS. SLABS, CURBS AND PARAPETS SHALL CONFORM TO THE GRADE OR CURVE.

ALL DIMENSIONS WHICH ARE GIVEN IN SECTION AND ARE AFFECTED BY DEAD LOAD DEFLECTIONS ARE DIMENSIONS AT CENTER LINE OF BEARING UNLESS OTHERWISE NOTED ON PLANS. IN SETTING FORMS FOR STEEL BEAM BRIDGES AND PRESTRESSED CONCRETE GIRDER BRIDGES, ADJUSTMENTS SHALL BE MADE DUE TO THE DEAD LOAD DEFLECTIONS FOR THE ELEVATIONS SHOWN. WHERE BLOCKS ARE SHOWN OVER BEAMS FOR BUILDING UP TO THE SLAB, THE VERTICAL DIMENSIONS OF THE BLOCKS SHALL BE ADJUSTED BETWEEN BEARINGS TO COMPENSATE FOR DEAD LOAD DEFLECTIONS, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER. WHERE BOTTOM OF SLAB IS IN LINE WITH BOTTOM OF TOP FLANGES, DEPTH OF SLAB BETWEEN BEARINGS SHALL BE ADJUSTED TO COMPENSATE FOR DEAD LOAD DEFLECTION, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER.

IN SETTING FALSEWORK AND FORMS FOR REINFORCED CONCRETE SPANS, AN ALLOWANCE SHALL BE MADE FOR DEAD LOAD DEFLECTIONS, SETTLEMENT OF FALSEWORK, AND PERMANENT CAMBER WHICH SHALL BE PROVIDED FOR IN ADDITION TO THE ELEVATIONS SHOWN. AFTER REMOVAL OF THE FALSEWORK, THE FINISHED STRUCTURES SHALL CONFORM TO THE PROFILE AND ELEVATIONS SHOWN ON THE PLANS AND CONSTRUCTION ELEVATIONS FURNISHED BY THE ENGINEER.

DETAILED DRAWINGS FOR FALSEWORK OR FORMS FOR BRIDGE SUPERSTRUCTURE AND ANY STRUCTURE OR PARTS OF A STRUCTURE AS NOTED ON THE PLANS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL BEFORE CONSTRUCTION OF THE FALSEWORK OR FORMS IS STARTED.

## REINFORCING STEEL:

ALL REINFORCING STEEL SHALL BE DEFORMED. DIMENSIONS RELATIVE TO PLACEMENT OF REINFORCING ARE TO CENTERS OF BARS UNLESS OTHERWISE INDICATED IN THE PLANS. DIMENSIONS ON BAR DETAILS ARE TO CENTERS OF BARS OR ARE OUT TO OUT AS INDICATED ON PLANS.

WIRE BAR SUPPORTS SHALL BE PROVIDED FOR REINFORCING STEEL WHERE INDICATED ON THE PLANS. WHEN BAR SUPPORT PIECES ARE PLACED IN CONTINUOUS LINES, THEY SHALL BE SO PLACED THAT THE ENDS OF THE SUPPORTING WIRES SHALL BE LAPPED TO LOCK LEGS ON ADJOINING PIECES.

## STRUCTURAL STEEL:

AT THE CONTRACTOR'S OPTION, HE MAY SUBSTITUTE 7/8" Ø SHEAR STUDS FOR THE 3/4" Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF 7/8" Ø STUDS ALONG THE BEAM AS SHOWN FOR 3/4" Ø STUDS BASED ON THE RATIO OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS. STUDS OF THE LENGTH SPECIFIED ON THE PLANS MUST BE PROVIDED. THE MAXIMUM SPACING SHALL BE 2'-0".

EXCEPT AT THE INTERIOR SUPPORTS OF CONTINUOUS BEAMS WHERE THE COVER PLATE IS IN CONTACT WITH BEARING PLATE, THE CONTRACTOR MAY, AT HIS OPTION, SUBSTITUTE FOR THE COVER PLATES DESIGNATED ON THE PLANS COVER PLATES OF THE EQUIVALENT AREA PROVIDED THESE PLATES ARE AT LEAST 5/16" IN THICKNESS AND DO NOT EXCEED A WIDTH EQUAL TO THE FLANGE WIDTH LESS 2" OR A THICKNESS EQUAL TO 2 TIMES THE FLANGE THICKNESS. THE SIZE OF FILLET WELDS SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT ANSI/AASHTO/AWS "BRIDGE WELDING CODE". ELECTROSLAG WELDING WILL NOT BE PERMITTED.

WITH THE SOLE EXCEPTION OF EDGES AT SURFACES WHICH BEAR ON OTHER SURFACES, ALL SHARP EDGES AND ENDS OF SHAPES AND PLATES SHALL BE SLIGHTLY ROUNDED BY SUITABLE MEANS TO A RADIUS OF APPROXIMATELY 1/16 INCH OR EQUIVALENT FLAT SURFACE AT A SUITABLE ANGLE PRIOR TO PAINTING, GALVANIZING, OR METALLIZING.

## HANDRAILS AND POSTS:

METAL STANDARDS AND FACES OF THE CONCRETE END POSTS FOR THE METAL RAIL SHALL BE SET NORMAL TO THE GRADE OF THE CURB, UNLESS OTHERWISE SHOWN ON PLANS. THE METAL RAIL AND TOPS OF CONCRETE POSTS USED WITH THE ALUMINUM RAIL SHALL BE BUILT PARALLEL TO THE GRADE OF THE CURB.

METAL HANDRAILS SHALL BE IN ACCORDANCE WITH THE PLANS. RAILS SHALL BE AS MANUFACTURED FOR BRIDGE RAILING. CASTINGS SHALL BE OF A UNIFORM APPEARANCE. FINS AND OTHER DEFORMATIONS RESULTING FROM CASTING OR OTHERWISE SHALL BE REMOVED IN A MANNER SO THAT A UNIFORM COLORING OF THE COMPLETED CASTING SHALL BE OBTAINED. CASTINGS WITH DISCOLORATIONS OR OF NON-UNIFORM COLORING WILL NOT BE ACCEPTED. CERTIFIED MILL REPORTS ARE REQUIRED FOR METAL RAILS AND POSTS.

## SPECIAL NOTES:

GENERALLY, IN CASE OF DISCREPANCY, THIS STANDARD SHEET OF NOTES SHALL GOVERN OVER THE SPECIFICATIONS, BUT THE REMAINDER OF THE PLANS SHALL GOVERN OVER NOTES HEREON, AND SPECIAL PROVISIONS SHALL GOVERN OVER ALL. SEE SPECIFICATIONS ARTICLE 105-4.

ENGLISH

JANUARY, 1990

REV. 6-16-95 EEM (W) RGW REV. 5-7-03 RWW (W) JTE REV. 10-1-11 MAA (W) GM
REV. 8-16-99 RWW (W) LES REV. 5-1-06 TLA (W) GM
27-AUG-2014 11:58
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