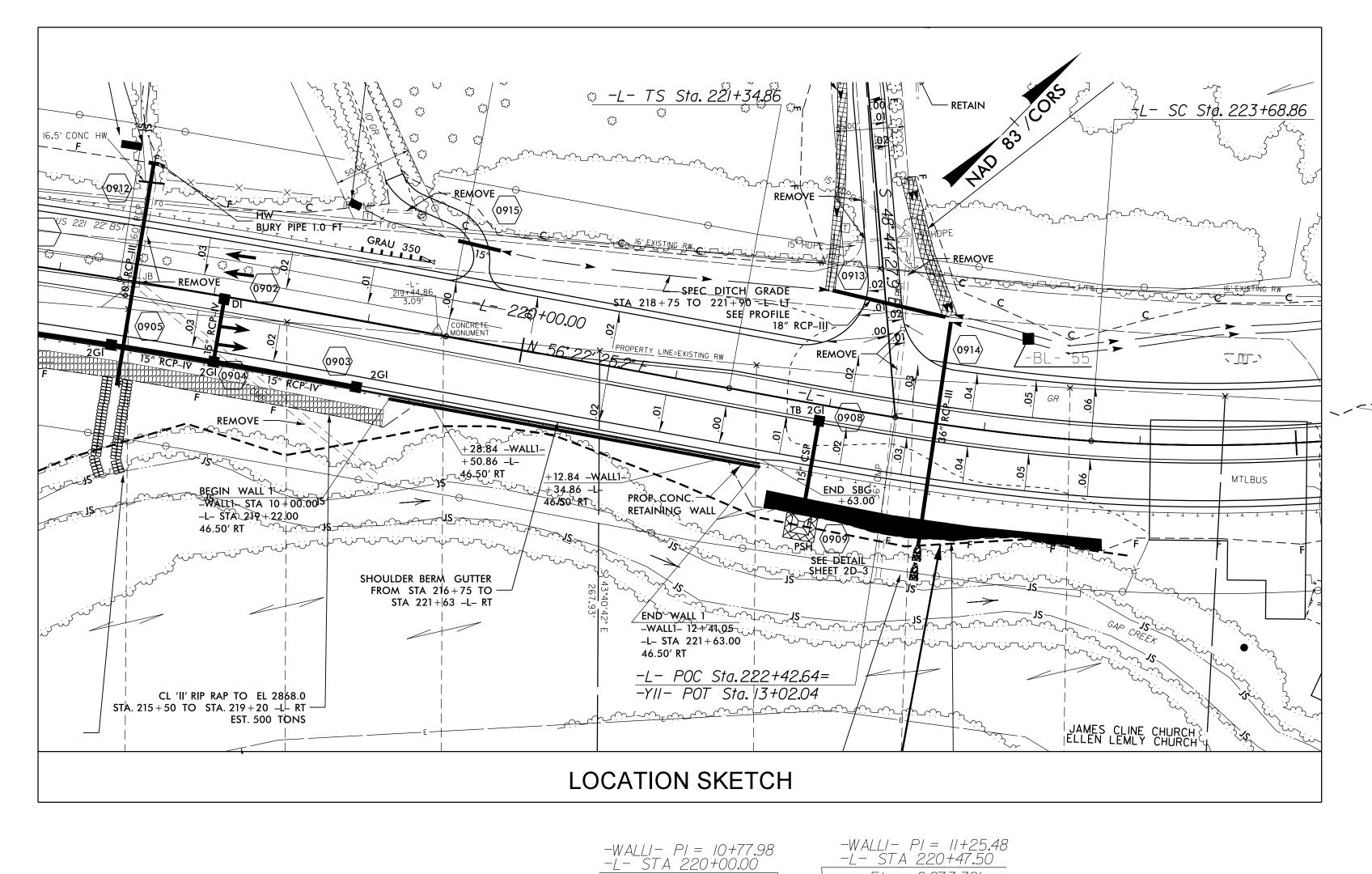
This electronic collection of documents is provided for the convenience of the user and is Not a Certified Document –

The documents contained herein were originally issued and sealed by the individuals whose names and license numbers appear on each page, on the dates appearing with their signature on that page.

This file or an individual page shall not be considered a certified document.



EL = 2,873.17'

-WALLI- PI = 10+47.98 -L- STA 219+70.00

> -WALLI- PI = 10+28.84 -L- STA 219+50.86

-WALLI- PI = 10+27.98 / -L- STA 219+50.00 / EL = 2,861.68'

EL = 2,872.93'

BEGIN RETAINING WALL -WALLI- STA 10+00.00 -L- STA 219+22.00

EL = 2,872.80'

BEGIN RETAINING WALL -WALLI- STA 10+00.00 -L- STA 219+22.00

-WALLI- PI = 10+28.84 -L- STA 219+50.86

EL = 2,862.95'

EL = 2,861.62'

EL = 2,873.02'

-WALLI- PI = 10+27.98 -L- STA 219+50.00

EL = 2,872.93'

2,880

2**,**870

2,860

2**,**850

EL = 2,873.39'

— 2:1 FILL SLOPE ALONG FACE OF WALL

ESTIMATED BOTTOM
OF LEVELING PAD —
EL.2854.0

GROUND LINE

EL = 2,873.40'

-WALLI- PI = 12+12.84 -L- STA 221+34.86

EL = 2,874.51'

-WALLI- PI = 11+77.98 -L- STA 221+00.00

EL = 2,862.37'

-WALLI- PI = 11+77.98 -L- STA 221+00.00

-WALLI-PI = 12+28.00-L-STA 22I+50.00

> END RETAINING WALL -WALLI- STA 12+41.05 -L- STA 221+63.00

EL = 2,864.53'

EL = 2,874.03'

EL = 2,874.71'

END RETAINING WALL -WALLI- STA 12+41.05 -L- STA 221+63.00

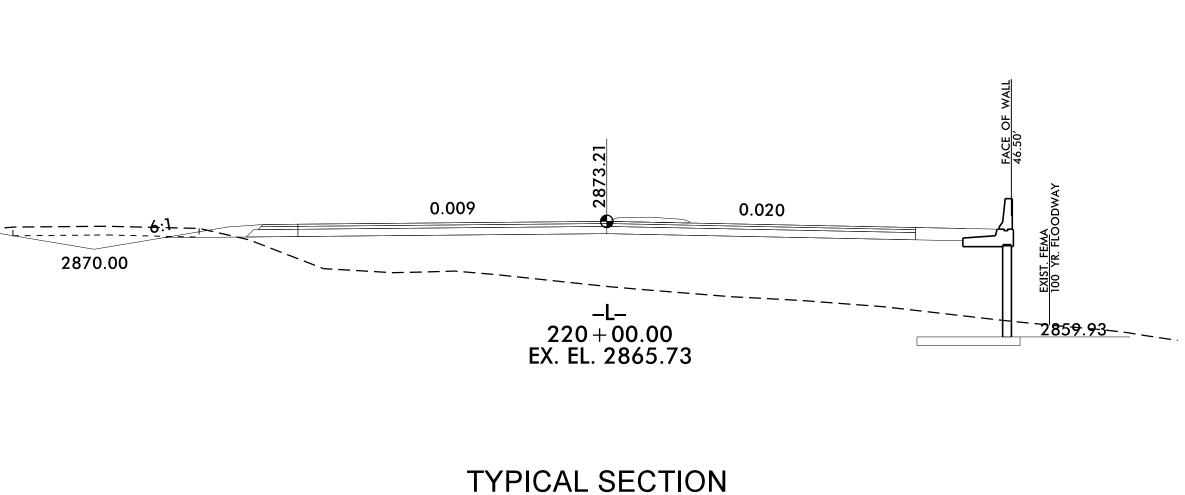
EL = 2,874.88'

-WALLI-PI = 12+28.00-L-STA 22I+50.00

EL = 2,864.36'

-WALLI- PI = 12+12.84 -L- STA 221+34.86

EL = 2,863.93'



ENGINEER

ENGINEER

SIGNATURE

TOTAL STRUCTURE QUANTITIES

MECHANICALLY STABILIZED EARTH WALL

*****4692 SQ. FT.

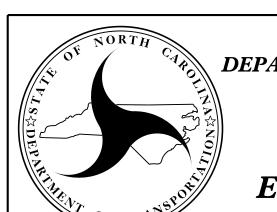
NOTE: MSE SQUARE FOOT QUANTITY IS BASED ON AN ESTIMATED BOTTOM OF LEVELING PAD ELEVATION OF 2854.0. THE BOTTOM OF LEVELING PAD SHALL EXTEND 1 FT. INTO WEATHERED/ HARD ROCK. WEATHERED/ HARD ROCK ELEVATIONS SHOULD BE VERIFIED PRIOR TO DESIGNING OF THE WALL.

PROJECT NO.: R-2915B

ASHE COUNTY

STATION: 219+22.00-L- TO 221+63.00-L-

SHEET 1 OF 4



NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT MSE RETAINING WALL

REVISIONS

NO. BY DATE NO. BY DATE NO. 1 3 W-1

-WALLI- PI = 10+47.98 -L- STA 219+70.00 EL = 2,861.16' -WALLI- PI = 11+27.98 -L- STA 220+50.00 ALL OFFSETS ARE 46.50' RT. EL = 2,862.00' -WALLI- PI = 10+77.98 -L- STA 220+00.00 -WALLI- PI = 11+25.48 -L- STA 220+47.50 OF -L- LINE EL = 2,861.73' EL = 2,862.07' WALL ENVELOPE PREPARED BY: EJS DATE: 4/15 DATE: 4/15 REVIEWED BY: SCC

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. SEE PLANS FOR CONCRETE BARRIER RAIL WITH MOMENT SLAB DETAILS.

USE AN MSE WALL SYSTEM WITH PRECAST CONCRETE PANELS THAT MEET SECTION 1077 OF THE STANDARD SPECIFICATIONS FOR RETAINING WALL.

BEFORE BEGINNING MSE WALL DESIGN FOR RETAINING WALL, 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 FOR THE FOLLOWING:

1) H = DESIGN HEIGHT + EMBEDMENT

2) DESIGN LIFE = 100 YEARS

3) MAXIMUM FACTORED VERTICAL STRESS ON FOUNDATION MATERIAL = 3000 LB/SF 4) MINIMUM REINFORCEMENT LENGTH (L) = 6 FT. OR 0.85 X HT. WHICHEVER IS GREATER

5) MINIMUM EMBEDMENT ELEVATION = 1 FT. INTO WEATHERED ROCK

6) AGGREGATE PARAMETERS:

AGGREGATE TYPE*	UNIT WEIGHT (γ) LB/CF	FRICTION ANGLE (φ) Degrees	COHESION (c) LB/SF			
COARSE	110	38	0			
FINE	125	34	0			
*SEE MSE RETAINING WALLS PROVISION FOR COARSE AND FINE AGGREGATE MATERIAL REQUIREMENTS.						

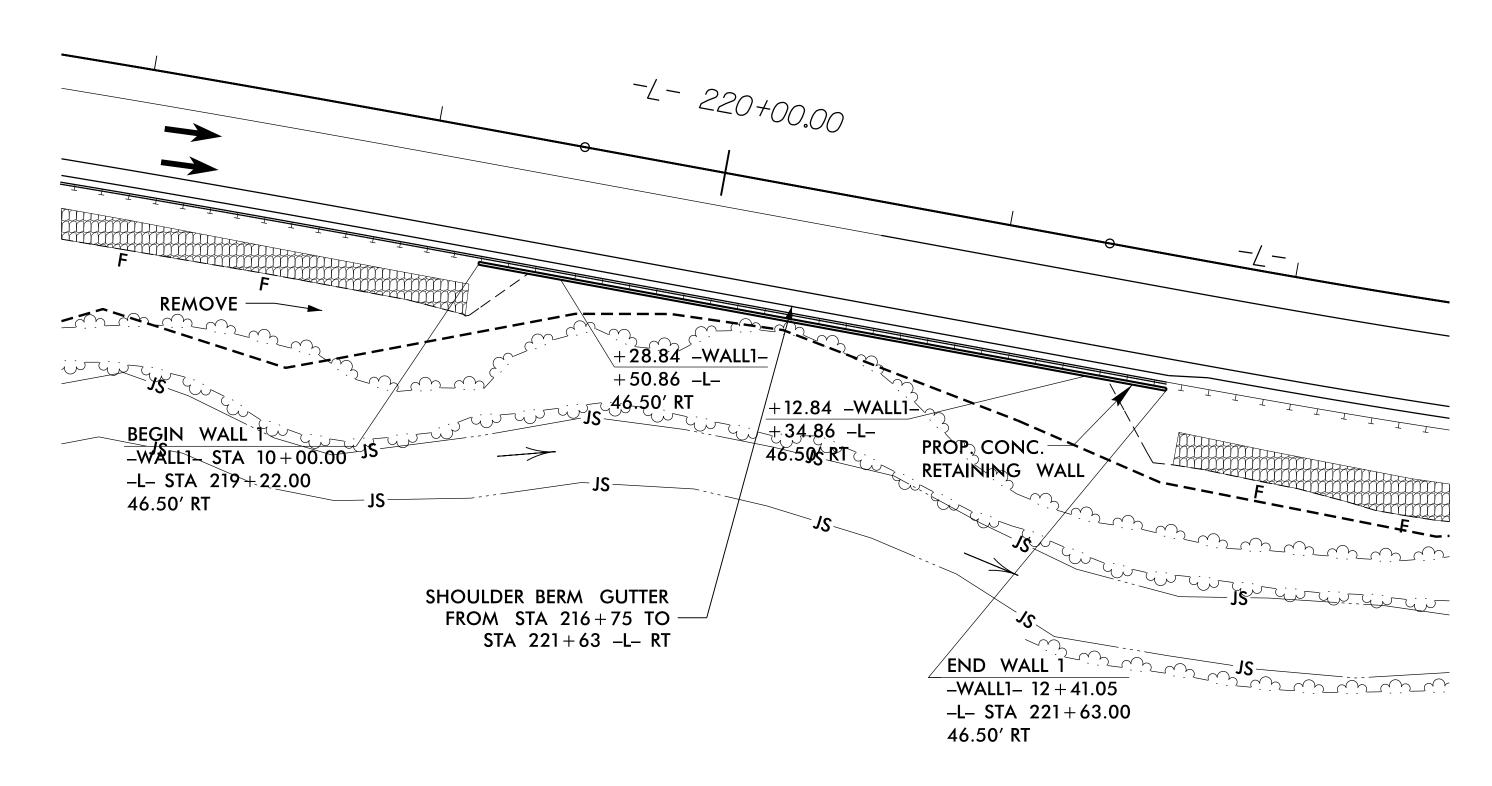
7) IN-SITU ASSUMED MATERIAL PARAMETERS:

MATERIAL TYPE	UNIT WEIGHT (γ) LB/CF	FRICTION ANGLE (φ) Degrees	COHESION (c) LB/SF
BACKFILL	120	30	0
FOUNDATION	120	30	0

DESIGN RETAINING WALL FOR A LIVE LOAD (TRAFFIC) SURCHARGE.

EXISTING OR FUTURE OBSTRUCTIONS SUCH AS FOUNDATIONS, GUARDRAIL, FENCE OR HANDRAIL POSTS, PAVEMENTS, PIPES, INLETS OR UTILITIES MAY INTERFERE WITH REINFORCEMENT FOR RETAINING WALL.

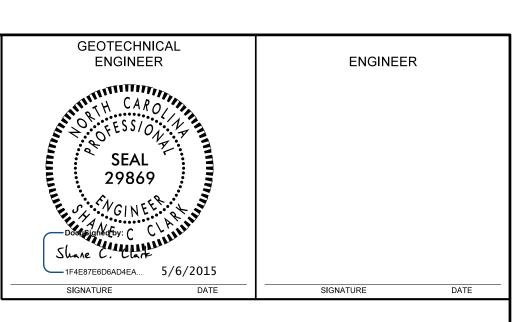
DO NOT PLACE LEVELING PAD CONCRETE, AGGREGATE OR REINFORCEMENT FOR RETAINING WALL UNTIL EXCAVATION DIMENSIONS AND FOUNDATION MATERIAL ARE APPROVED.

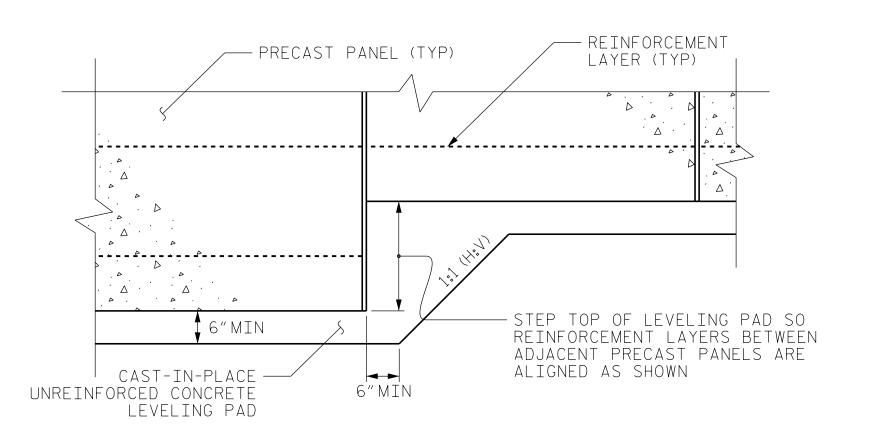


PLAN OF WALL

PREPARED BY: EJS DATE: 4/15

REVIEWED BY: SCC DATE: 4/15





PRECAST CONCRETE PANELS

LEVELING PAD STEP DETAILS

PROJECT NO.:

R-2915B

COUNTY

ASHE

STATION: 219+22.00-L- TO 221+63.00-L-

SHEET 2 OF 4

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL

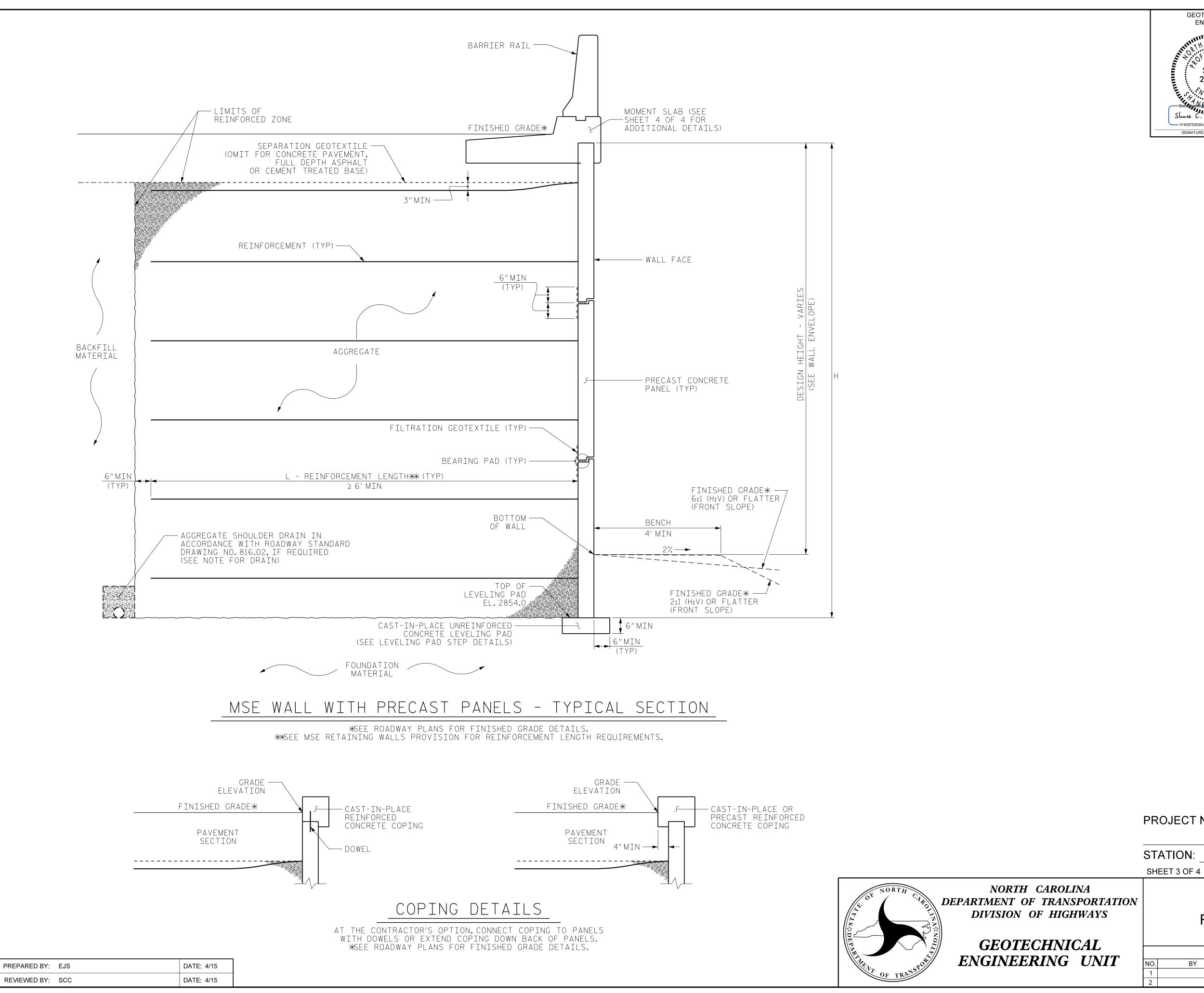
ENGINEERING UNIT

MSE RETAINING WALL

 REVISIONS

 NO.
 BY
 DATE
 NO.
 BY
 DATE
 NO.

 1
 3
 W-2



ENGINEER

SIGNATURE

DATE

GEOTECHNICAL ENGINEER

PROJECT NO.:

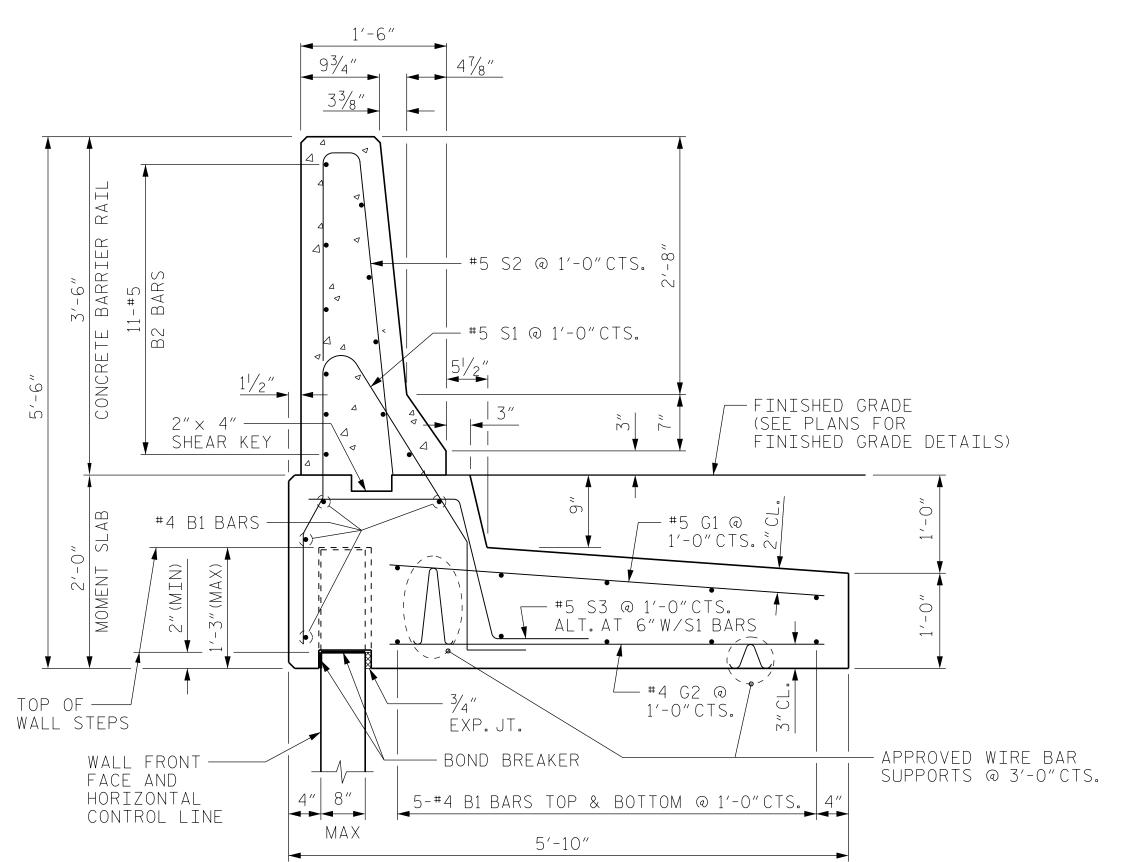
R-2915B

COUNTY

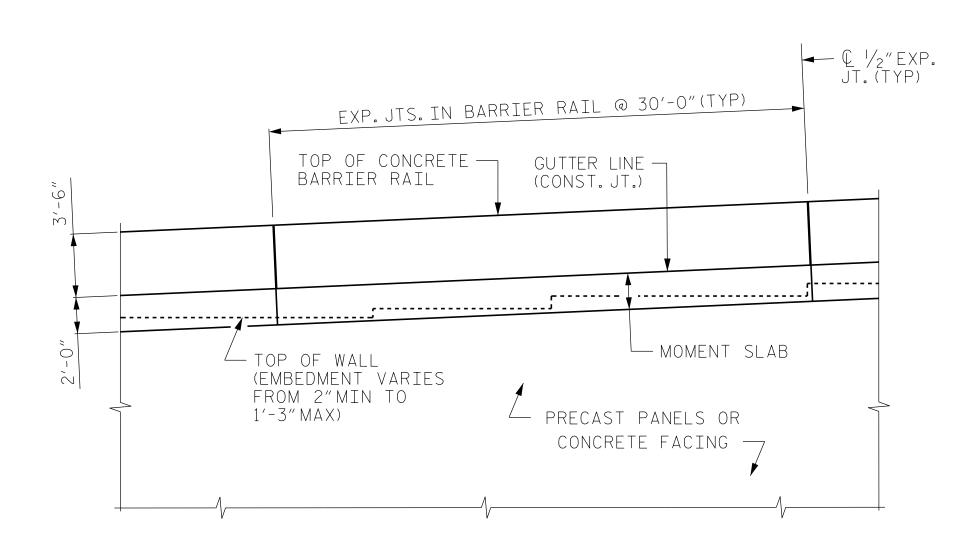
ASHE STATION: 219+22.00-L- TO 221+63.00-L-

MSE **RETAINING WALL**

REVISIONS DATE NO. DATE NO. BY 3 4



CONCRETE BARRIER RAIL WITH MOMENT SLAB



CONCRETE BARRIER RAIL WITH MOMENT SLAB - PARTIAL ELEVATION

NOTES:

FOR CONCRETE BARRIER RAIL WITH MOMENT SLAB, SEE CONCRETE BARRIER RAIL WITH MOMENT SLAB PROVISION.

CONCRETE BARRIER RAIL WITH MOMENT SLAB SHALL BE A MINIMUM OF 15' IN LENGTH.

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(B) 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 LENGTH

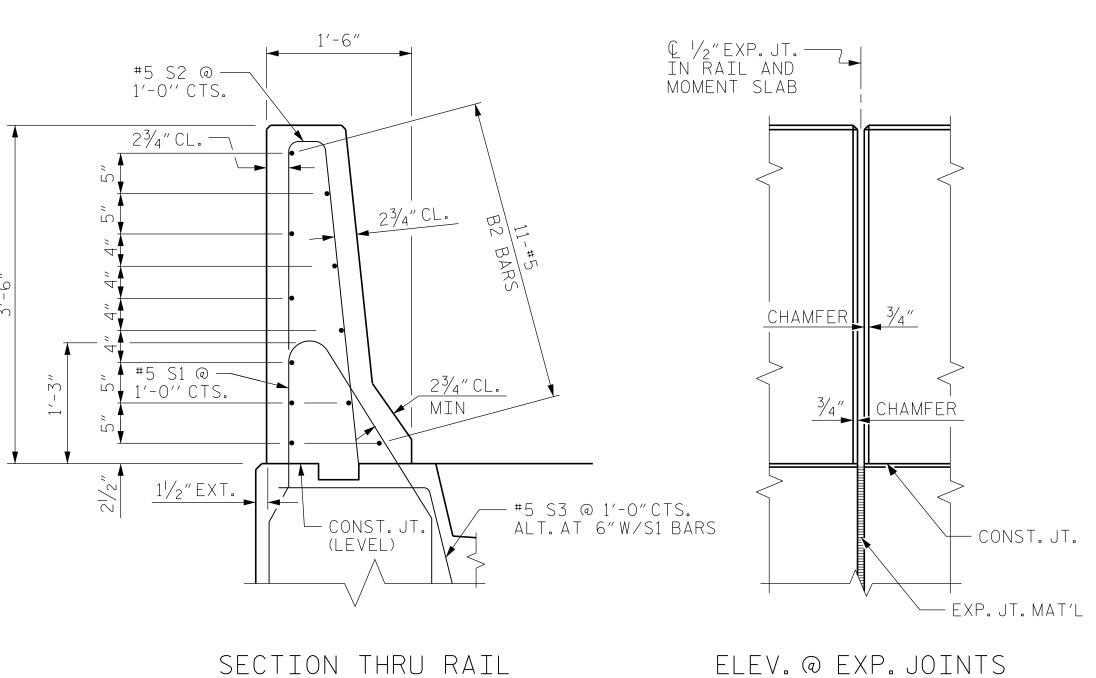
THE BARRIER RAIL SHALL NOT BE CAST UNTIL THE MOMENT SLAB HAS ATTAINED AN AGE OF THREE CURING DAYS OR A MINIMUM COMPRESSIVE STRENGTH OF 2,000 PSI. IN ADDITION, NO FILL MATERIAL, ASPHALT, OR CONSTRUCTION EQUIPMENT IS ALLOWED ON THE MOMENT SLAB PRIOR TO SATISFYING THE MINIMUM CONCRETE CURING AND STRENGTH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

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

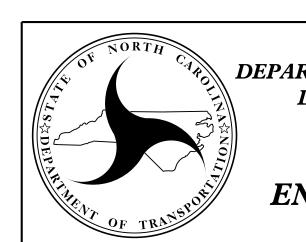
IF EXISTING OR FUTURE OBSTRUCTIONS SUCH AS FOUNDATIONS, BARRIERS, PIPES, INLETS OR UTILITIES WILL INTERFERE WITH CONCRETE BARRIER RAIL WITH MOMENT SLAB OR CONCRETE FACING FOR RETAINING WALL WILL BE THICKER THAN 8", CONCRETE BARRIER RAIL WITH MOMENT SLAB DETAILS SHALL BE REVISED AND SUBMITTED FOR APPROVAL.

CONCRETE BARRIER RAIL
WITH MOMENT SLAB

PAY LENGTH = 241 LIN FT



BARRIER RAIL DETAILS



NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

GEOTECHNICAL ENGINEER ENGINEER SEAL 29869 DOGSIGNAGO: 1F4E87E6D6AD4EA... 5/6/2015 SIGNATURE DATE SIGNATURE ENGINEER ENGINEER ENGINEER ENGINEER ENGINEER ENGINEER ENGINEER ENGINEER

BAR TYPES

	21/4" RAD. 21/4" RAD. 33/4" 4" 1'-6" 8/4" ALL BAR DIMENSIONS ARE OUT TO OUT									
	BILL OF MATERIAL FOR ONE 30'-0" SECTION OF CONCRETE									
	BARRIER RAIL WITH MOMENT SLAB									
	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT				
	B1	14	#4	STR	29'-7"	277				
JLC I LUIN	* B2	11	#5	STR	29'-7"	339				
-	11. 02	* * *								
۱	G1	31	#5	STR	4'-4"	140				
) L	01	71	# /	CTD	1/ 1//	00				

PROJECT NO.: R-2915B

31

REINFORCING STEEL

REINFORCING STEEL

CLASS AA CONCRETE BARRIER RAIL

CLASS A CONCRETE

WITH MOMENT SLAB

CONCRETE BARRIER RAIL

* S1

* S2 31

S3 30

* EPOXY COATED

MOMENT SLAB

ASHE COUNTY

STATION: 219+22.00-L- TO 221+63.00-L-

G2 | 31 | #4 | STR | 4'-4"

7'-3"

7'-0"

4'-1"

234

226

128

635 LB

799 LB

4.1 CY

9.1 CY

30 LIN FT

#5

#5

#5

SHEET 4 OF 4

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

 REVISIONS

 NO.
 BY
 DATE
 NO.
 BY
 DATE
 NO.

 1
 3
 W-4
 W-4

PREPARED BY: EJS

DATE: 4/15

REVIEWED BY: SCC

DATE: 4/15

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 ---- 1.800 LBS. PER SQ. IN. UNTREATED - EXTREME FIBER STRESS COMPRESSION PERPENDICULAR TO GRAIN OF TIMBER ----375 LBS. PER SQ. IN.

MATERIAL AND WORKMANSHIP:

EQUIVALENT FLUID PRESSURE OF EARTH

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

30 LBS. PER CU. FT.

(MINIMUM)