CONTRACT NO.: SS-4913CN PROJECT: 47340

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	47340		

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
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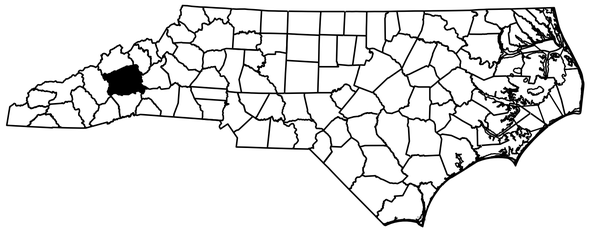
47340.2.1		ROW
47340.3.1		CONST

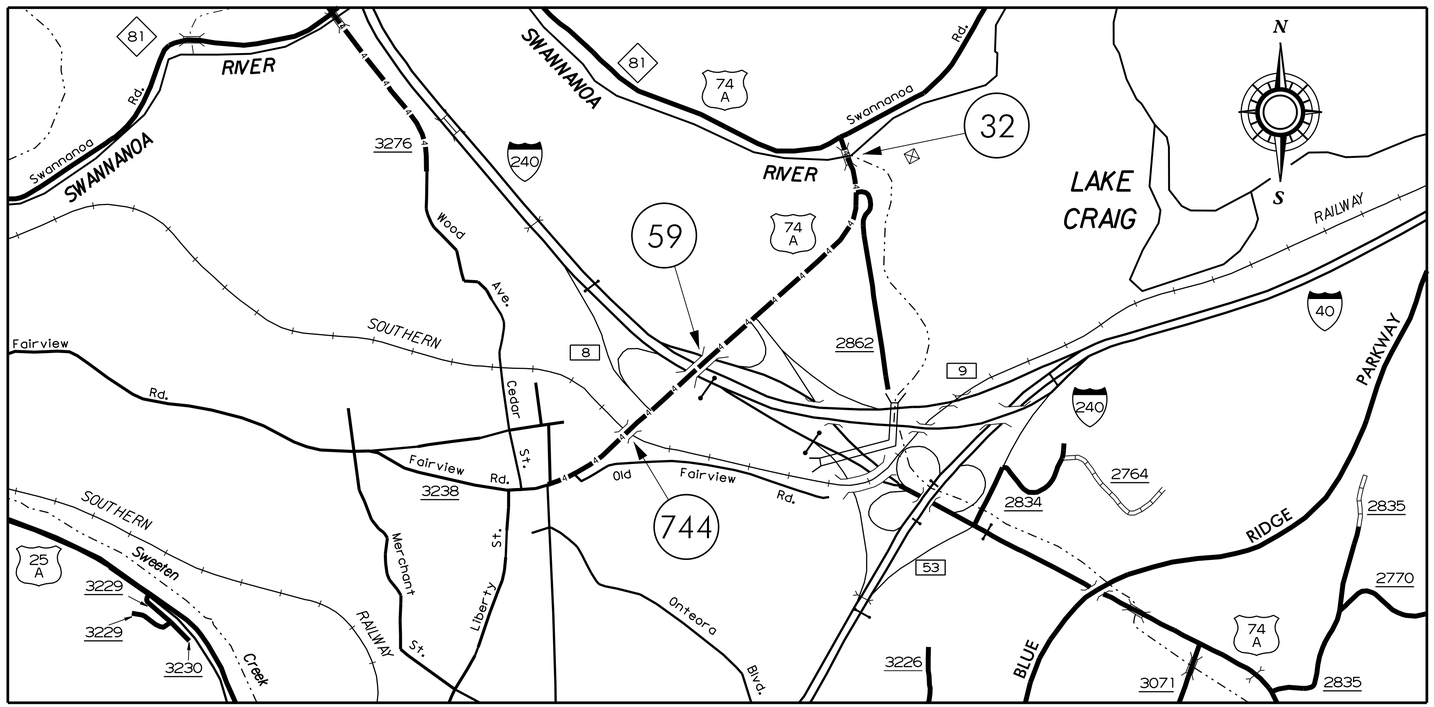


STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

BUNCOMBE COUNTY

LOCATION: BRIDGE #32 ON US 74 ALT (FAIRVIEW RD.) OVER SWANNANOA RIVER
BRIDGE #59 ON US 74 ALT (FAIRVIEW RD.) OVER I–240
BRIDGE #744 ON SR 3238 (FAIRVIEW RD.) OVER SOUTHERN RAILROAD

TYPE OF WORK: REMOVAL OF EXISTING PARAPET AND ONE BAR METAL RAIL AND REPLACED WITH SIDEWALK AND THREE BAR METAL RAIL



STRUCTURES

DESIGN DATA

#32 ADT 2012 = 13,000
#59 ADT 2012 = 16,000
#744 ADT 2012 = 16,000

PROJECT LENGTH

BRIDGE #32 = 0.02 MILE
BRIDGE #59 = 0.07 MILE
BRIDGE #744 = 0.03 MILE

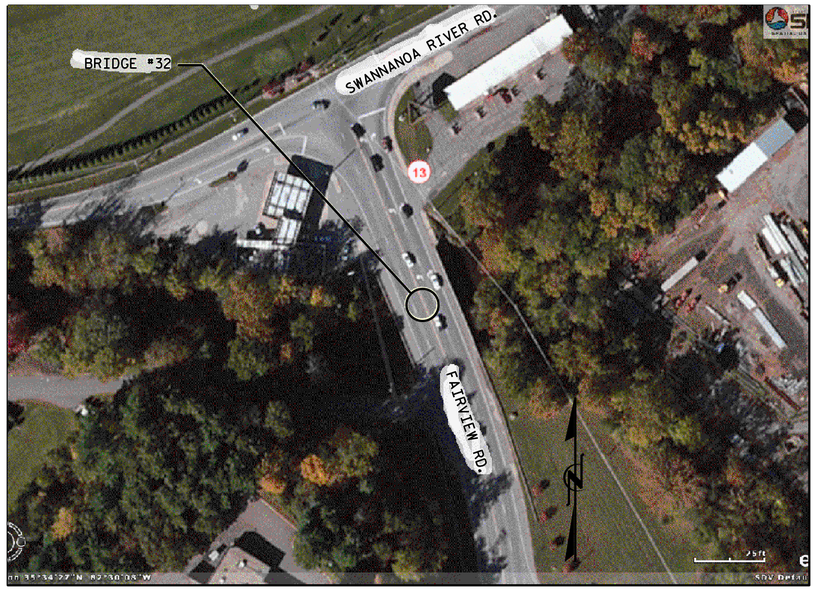
Prepared in the Office of:
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
STRUCTURES MANAGEMENT UNIT
1000 BIRCH RIDGE DR. RALEIGH, N.C. 27610

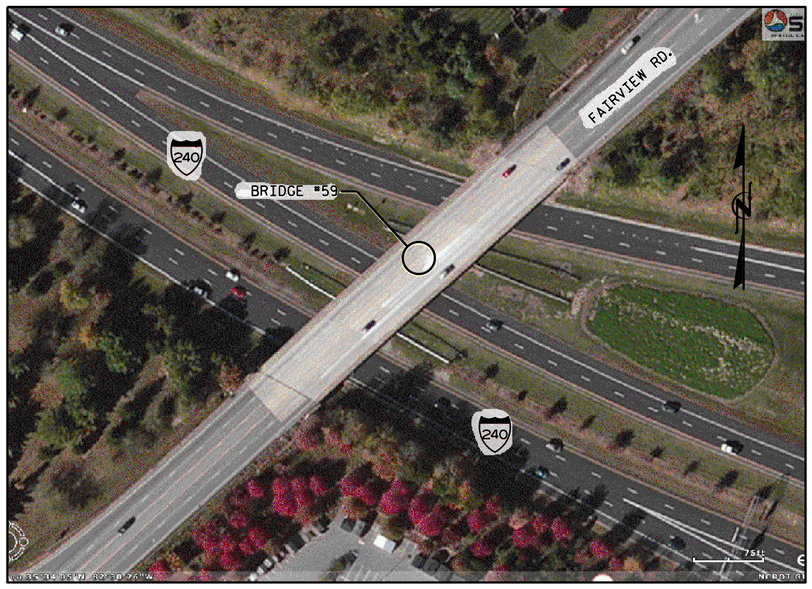
2018 STANDARD SPECIFICATIONS

LETTING DATE:

A. KEITH PASCHAL, P.E.
PROJECT ENGINEER

AMBER LEE, P.E.
PROJECT DESIGN ENGINEER





NOTES

EXISTING DIMENSIONS AND BRIDGE CONDITION ARE FROM THE BEST INFORMATION AVAILABLE. THE CONTRACTOR SHALL FIELD VERIFY THE INFORMATION SHOWN ON THE PLANS AND NOTIFY THE ENGINEER IF ACTUAL DIMENSIONS AND CONDITIONS DIFFER.

IT IS THE CONTRACTOR'S RESPONSIBILITY TO FOLLOW ALL STATE AND FEDERAL SAFETY REQUIREMENTS.

FOR CONTROL OF TRAFFIC AND LIMITS ON PHASING OF CONSTRUCTION, SEE TRANSPORTATION MANAGEMENT PLANS.

FOR PARTIAL REMOVAL OF EXISTING STRUCTURE, SEE SPECIAL PROVISIONS.

FOR MAINTENANCE AND PROTECTION OF TRAFFIC BENEATH STRUCTURES, SEE SPECIAL PROVISIONS.

FOR SCARIFYING BRIDGE DECK, SEE SPECIAL PROVISIONS.

FOR SILICONE JOINT SEALANT, SEE SPECIAL PROVISIONS.

FOR FOAM JOINT SEALS, SEE SPECIAL PROVISIONS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR SPECIAL PROVISION FOR PROTECTION OF RAILWAY INTEREST, SEE SPECIAL PROVISIONS.

LOCATION SKETCH

INFORMATION INDICATED ON THE LOCATION SKETCH SHALL BE CONSIDERED GENERAL INFORMATION ONLY. THE CONTRACTOR SHALL CONFIRM, THROUGH OTHER SOURCES, SPECIFIC INFORMATION REGARDING BRIDGES, ROADWAYS, UTILITIES, THE SURROUNDING AREA, AND ANY OTHER ASPECTS THAT MAY BE NECESSARY TO PERFORM AND COMPLETE THE PROJECT.

TOTAL BILL OF MATERIAL

	CLASS AA CONCRETE	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL	THREE BAR METAL RAIL	FOAM JOINT SEALS	PARTIAL REMOVAL OF EXISTING STRUCTURE	SILICONE SEALANT JOINT	SCARIFYING BRIDGE DECK
	CU. YDS.	LBS.	LBS.	LIN. FT.	LUMP SUM	LUMP SUM	LIN. FT.	SQ. YDS.
BRIDGE 32	47.5	1558	2540	104.40		LUMP SUM	12.58	88.0
BRIDGE 59	121.6	4825	7245	335.82	LUMP SUM	LUMP SUM	7.42	202.7
BRIDGE 744	80.1	5196	5367	122.97		LUMP SUM	13.00	76.9
TOTAL	249.2	11579	15152	563.19	LUMP SUM	LUMP SUM	33.00	367.6

WBS NO. 47340

BUNCOMBE COUNTY

BRIDGE NO. 32, 59, & 744

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

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12/5/2017

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

LOCATION MAPS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-1
1			3			TOTAL SHEETS
2			4			20

DRAWN BY : D.V. JOYNER DATE : 08/17

CHECKED BY : A.M.LEE DATE : 09/17

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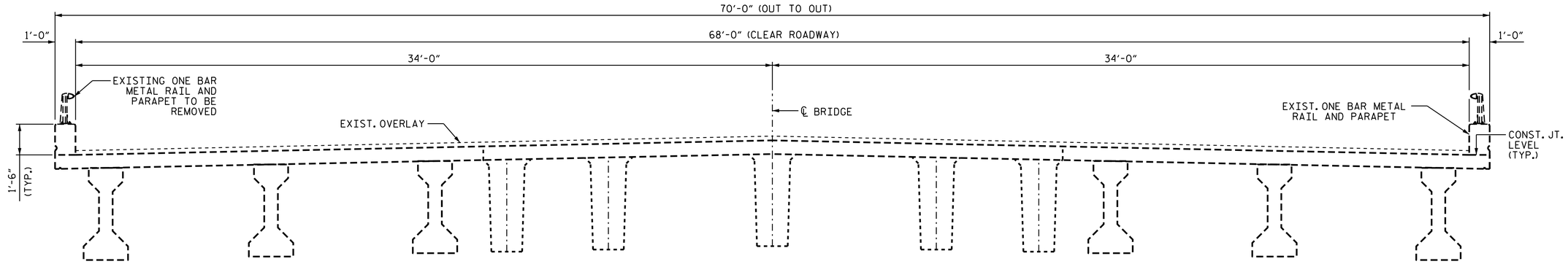
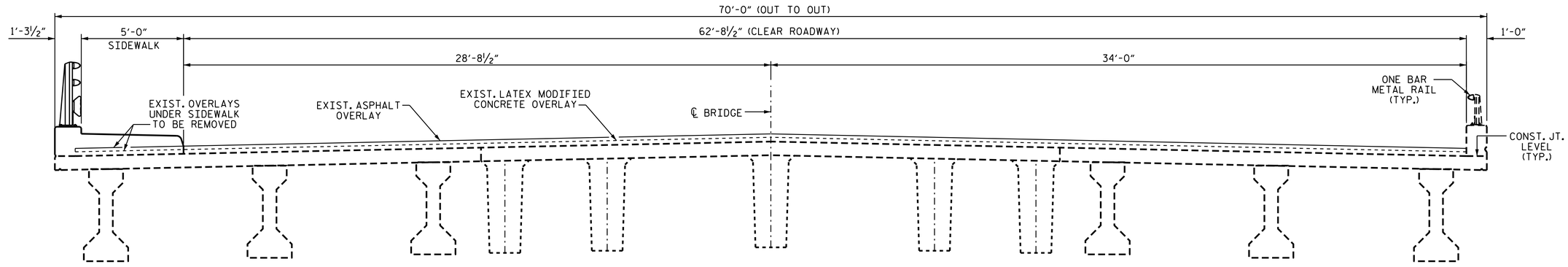


EXISTING TYPICAL SECTION



PROPOSED TYPICAL SECTION

WBS NO. 47340

BUNCOMBE COUNTY

BRIDGE NO. 32

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

TYPICAL SECTION

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

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SHEET NO. S-2

TOTAL SHEETS 20

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CHECKED BY : A. SORSENGINH DATE : 08/17

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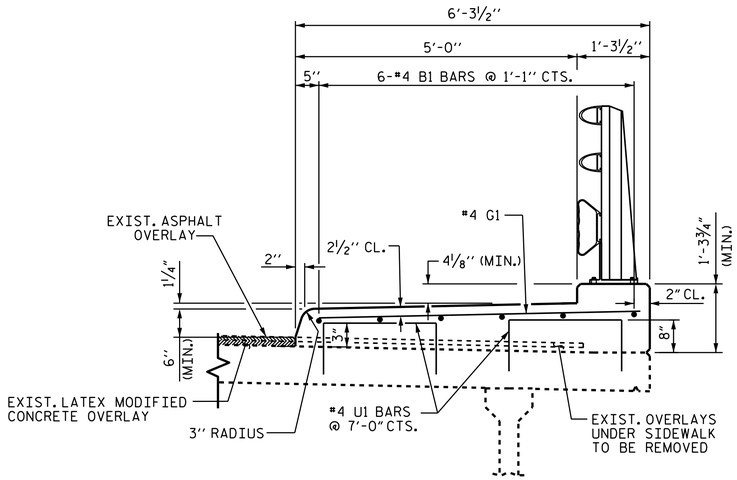


SECTION THRU SIDEWALK

NOTES

FOR END POST DETAILS AND REINFORCING STEEL SEE "RAIL POST SPACINGS AND END OF RAIL DETAILS" SHEET.

ALL REINFORCING STEEL IN SIDEWALK SHALL BE EPOXY COATED.

GROOVED CONTRACTION JOINTS ½" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF SIDEWALK IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINTS SHALL BE LOCATED AT A SPACING OF 8 FEET TO 10 FEET BETWEEN EXPANSION JOINTS. NO CONTRACTION JOINTS WILL BE REQUIRED FOR SEGMENTS LESS THAN 10 FEET IN LENGTH.

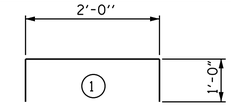
DOWEL U1 BARS INTO EXISTING SLAB.

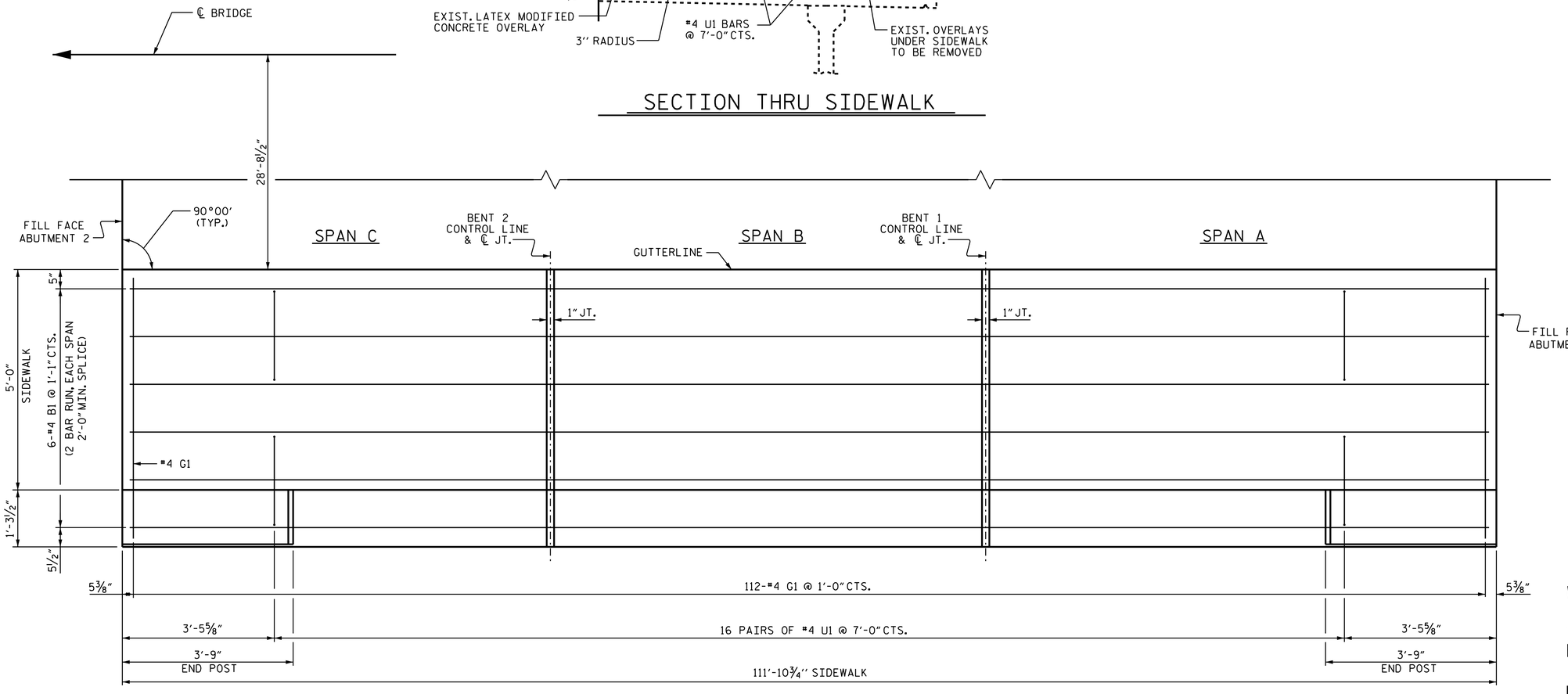
BRIDGE ORIENTATION CONFORMS TO EXISTING BRIDGE PLANS.

BILL OF MATERIAL FOR SIDEWALK

BAR	NO	SIZE	TYPE	LENGTH	WEIGHT
✱ B1	36	4	STR	19'-8"	473
✱ G1	112	4	STR	5'-11"	443
✱ U1	32	4	1	4'-0"	86
✱ EPOXY COATED REINFORCING STEEL				LBS.	1002
CLASS AA CONCRETE				CU. YDS.	24.7
SCARIFYING BRIDGE DECK				SQ. YDS.	65.8
SILICONE JOINT SEALANT				LIN. FT.	12.58

BAR TYPE





PLAN OF SIDEWALK

WBS NO. 47340

BUNCOMBE COUNTY

BRIDGE NO. 32

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

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10/2/2017

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SIDEWALK DETAILS

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
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CHECKED BY : A. SORSENGINH DATE : 08/17

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amlee

NOTES

FOR DETAILS OF CONCRETE INSERTS, AND GUARDRAIL ANCHOR ASSEMBLIES, SEE "GUARDRAIL ANCHORAGE DETAILS FOR METAL RAILS" AND "3 BAR METAL RAIL" SHEETS.

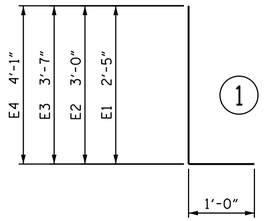
FOR DETAIL OF GUARDRAIL ANCHOR ASEMBLY, SEE STD. BMR5.

ALL REINFORCEMENT STEEL IN END POSTS SHALL BE EPOXY COATED.

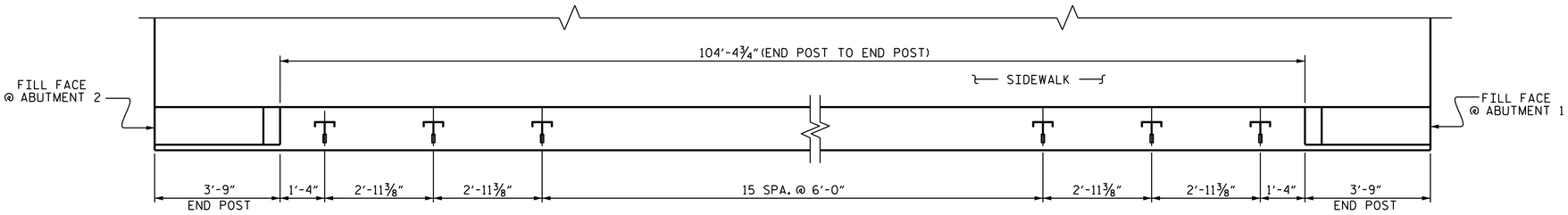
BILL OF MATERIAL TWO END POST

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳E1	4	#7	1	3'-5"	28
✳E2	4	#7	1	4'-0"	33
✳E3	4	#7	1	4'-7"	37
✳E4	4	#7	1	5'-1"	42
✳F1	4	#6	STR	3'-2"	19
✳F2	4	#6	STR	3'-5"	21
✳F3	4	#6	STR	3'-7"	22
✳EPOXY COATED REINFORCING STEEL					202 LBS.
CLASS AA CONCRETE					0.8 CY

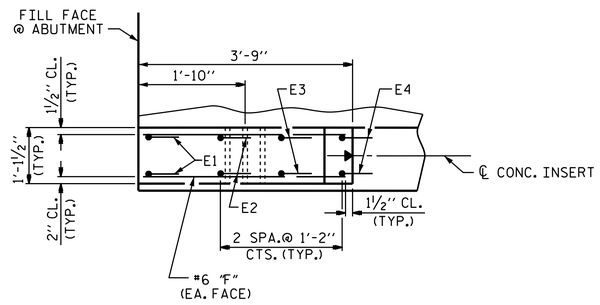
BAR TYPE



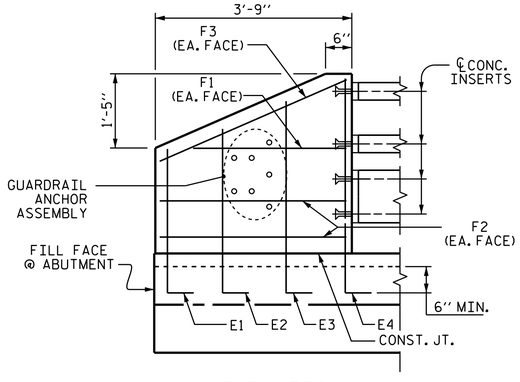
ALL BAR DIMENSIONS ARE OUT TO OUT



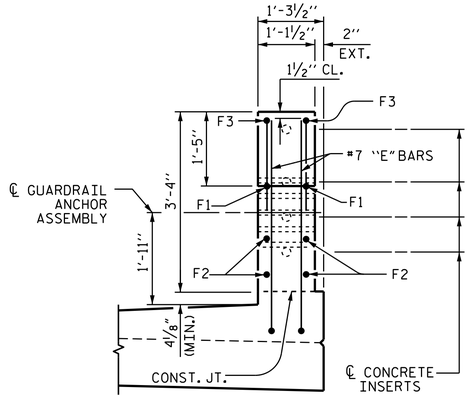
PLAN OF RAIL POST SPACING



PLAN



ELEVATION



END VIEW

END POST DETAILS

WBS NO. 47340

BUMCOMBE COUNTY

BRIDGE NO.: 32

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

RAIL POST SPACING AND END POST DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

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10/2/2017

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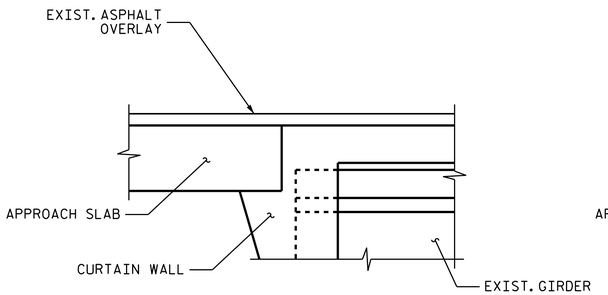
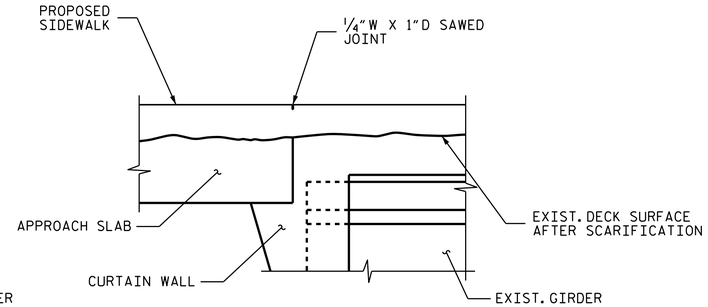


SECTION THRU JOINT @ END BENTS
(EXISTING JOINT)



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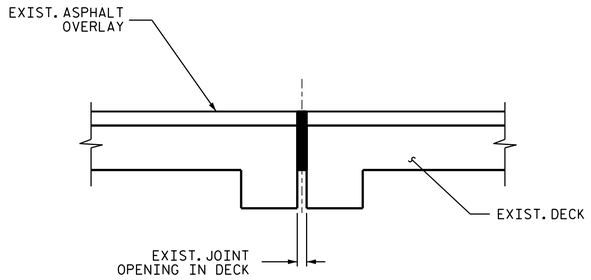
(PROPOSED CONTRACTION JOINT)



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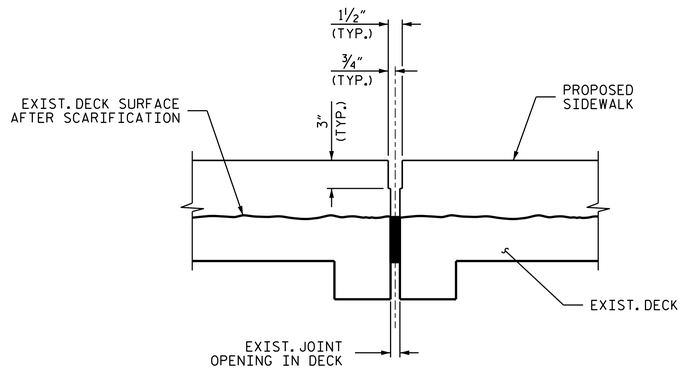
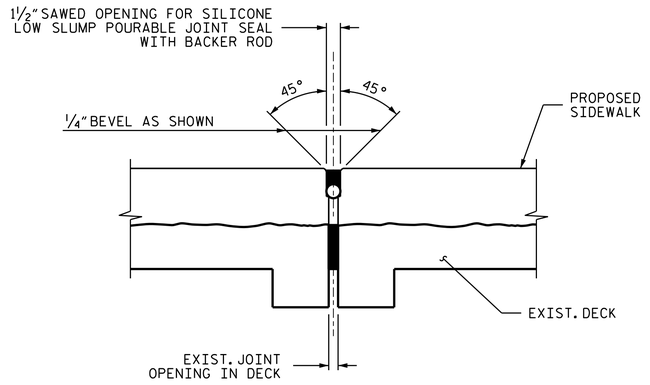


SECTION THRU JOINT @ BENTS
(PROPOSED FORMED JOINT)



SECTION THRU JOINT @ BENTS
(PROPOSED SILICONE JOINT SEAL)

WBS NO. 47340

BUNCOMBE COUNTY

BRIDGE NO. 32

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

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10/2/2017

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

JOINT DETAILS

REVISIONS						SHEET NO.
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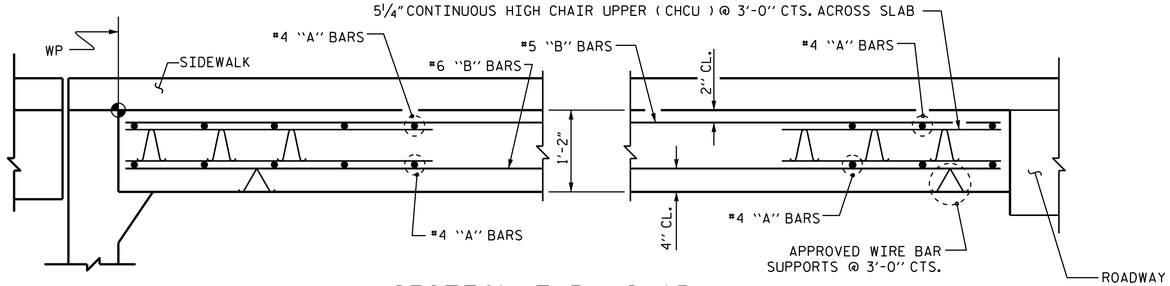
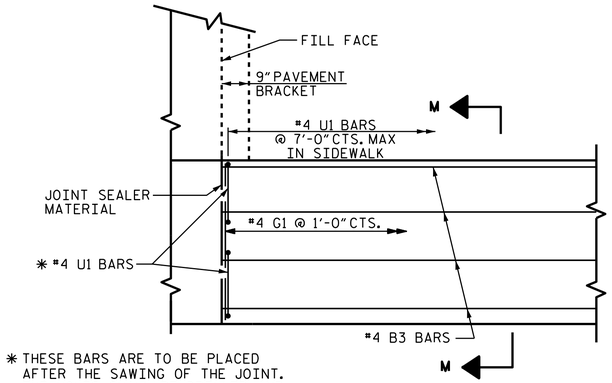


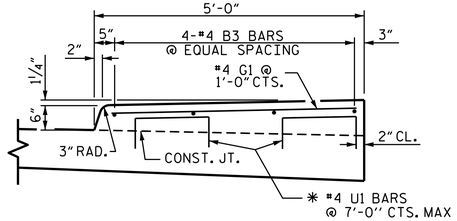
SECTION THRU SLAB

(IF NEEDED)



* THESE BARS ARE TO BE PLACED AFTER THE SAWING OF THE JOINT. THE HOLES SHALL BE DRILLED AND THE BARS GROUTED INTO PLACE.

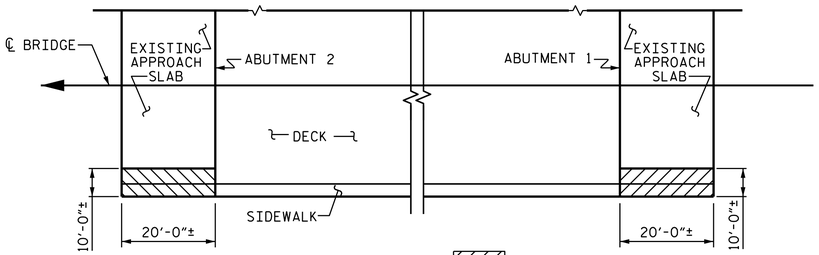
PLAN



SECTION M-M

DETAILS OF SIDEWALK ON APPROACH SLAB

(AT ABUTMENT 1 SHOWN, AT ABUTMENT 2 SIMILAR)



PROPOSED APPROACH SLAB & SIDEWALK

LOCATION PLAN

NOTES

AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED.

THE JOINT SHALL BE SAWED PRIOR TO THE CASTING OF THE BARRIER RAIL. OR PARAPET AND END POST.

FOR SILICONE JOINT SEALS, SEE SPECIAL PROVISIONS.

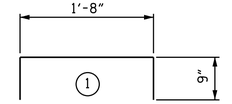
BILL OF MATERIAL APPROACH SLAB AT END BENT (2 REQUIRED)

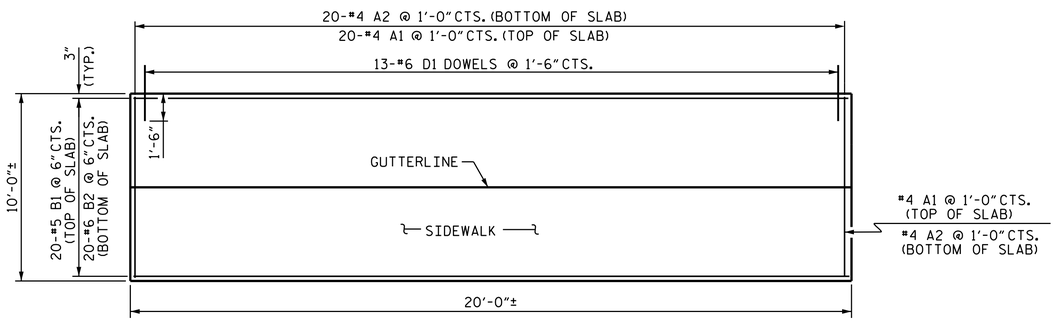
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	20	#4	STR	9'-8"	129
A2	20	#4	STR	9'-8"	129
* B1	20	#5	STR	19'-8"	410
B2	20	#6	STR	19'-8"	591
D1	13	#6	STR	3'-0"	99
REINFORCING STEEL				LBS.	779
* EPOXY COATED REINFORCING STEEL				LBS.	539
CLASS AA CONCRETE				C.Y.	8.7

BILL OF MATERIAL SIDEWALK AT END BENT (2 REQUIRED)

BAR	NO	SIZE	TYPE	LENGTH	WEIGHT
* B3	4	#4	STR	19'-8"	53
* G1	20	#4	STR	4'-5"	59
* U1	8	#4	1	3'-2"	17
* EPOXY COATED REINFORCING STEEL				LBS.	129
CLASS AA CONCRETE				C.Y.	2.3
SCARIFYING BRIDGE DECK				SQ. YD.	22.2

BAR TYPE





APPROACH SLAB AT EB 1

(APPROACH SLAB AT EB 2 SIMILAR)

WBS NO. 47340

BUNCOMBE COUNTY

STATION: 32

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

APPROACH SLAB DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

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10/2/2017

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2			4			20

DRAWN BY : B.N.BARODAWALA DATE : 9-17
CHECKED BY : A.M.LEE DATE : 9-17
DESIGN ENGINEER OF RECORD: A.M.LEE DATE : 9-17

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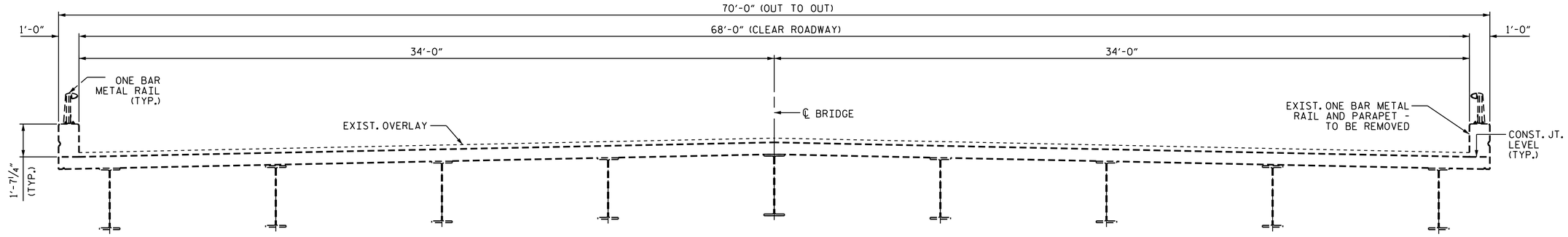

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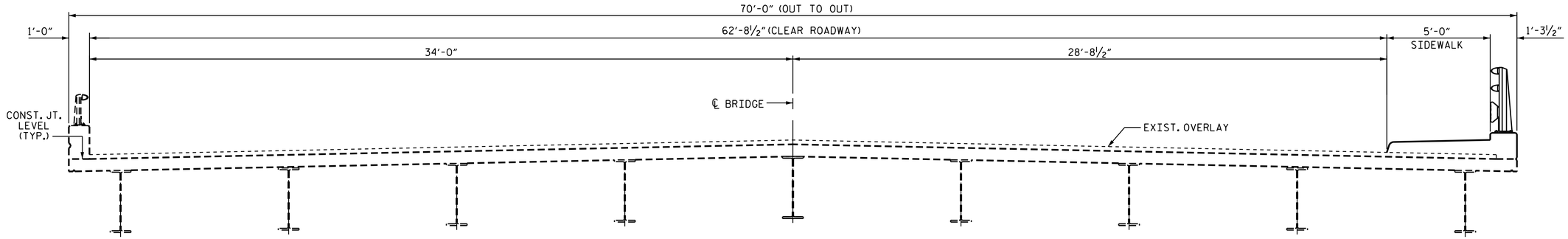

PROPOSED TYPICAL SECTION

WBS NO. 47340

BUNCOMBE COUNTY

BRIDGE NO. 59

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

TYPICAL SECTION

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

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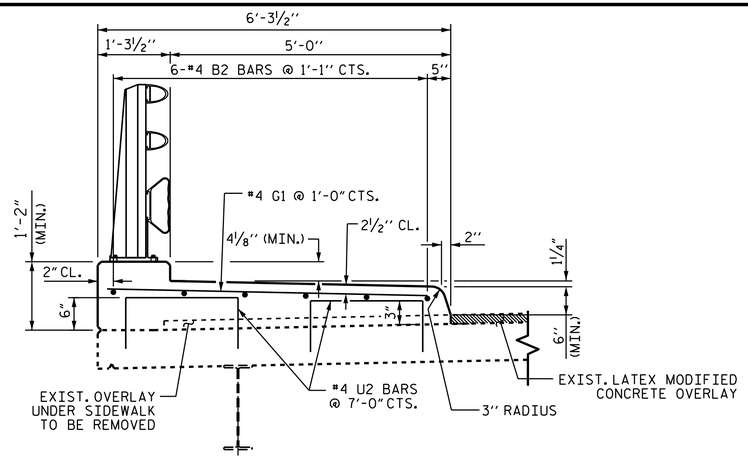


SECTION THRU SIDEWALK

NOTES

FOR END POST DETAILS AND REINFORCING STEEL SEE "RAIL POST SPACINGS AND END OF RAIL DETAILS" SHEET.

ALL REINFORCING STEEL IN SIDEWALK SHALL BE EPOXY COATED.

GROOVED CONTRACTION JOINTS ½" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF SIDEWALK IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINTS SHALL BE LOCATED AT A SPACING OF 8 FEET TO 10 FEET BETWEEN EXPANSION JOINTS. NO CONTRACTION JOINTS WILL BE REQUIRED FOR SEGMENTS LESS THAN 10 FEET IN LENGTH.

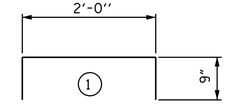
DOWEL U2 BARS INTO EXISTING SLAB.

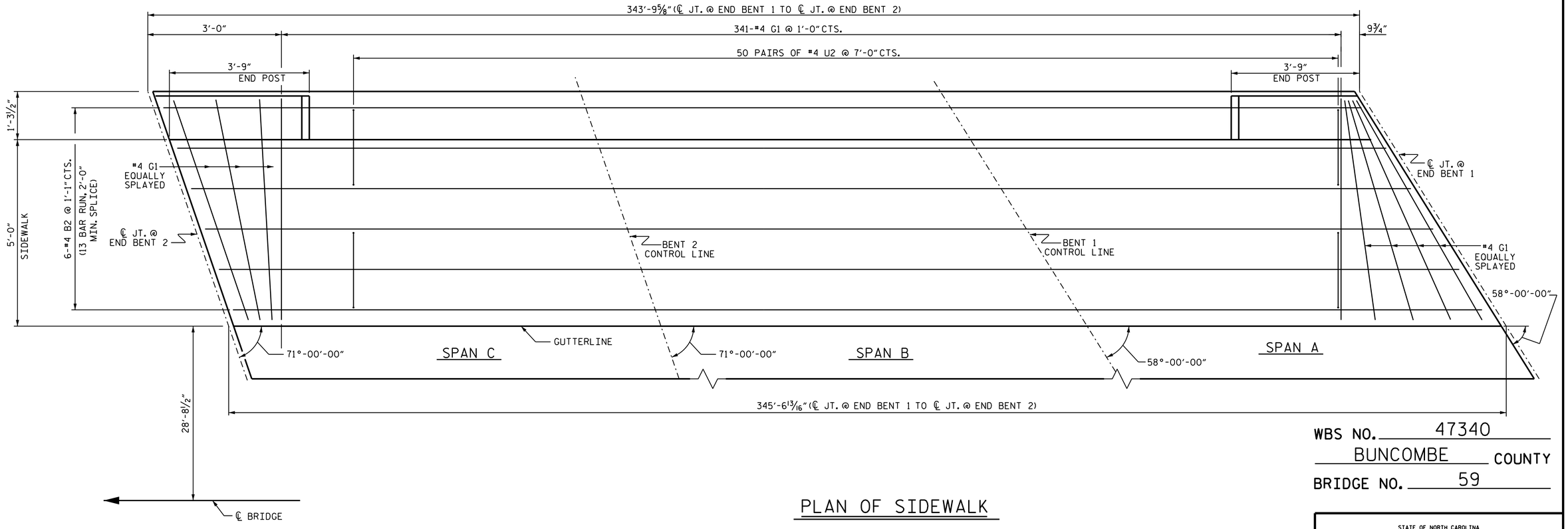
BRIDGE ORIENTATION CONFORMS TO EXISTING BRIDGE PLANS.

BILL OF MATERIAL FOR SIDEWALK

BAR	NO	SIZE	TYPE	LENGTH	WEIGHT
✱B2	78	4	STR	29'-1"	1515
✱G1	348	4	STR	5'-11"	1375
✱U2	100	4	1	3'-6"	234
✱EPOXY COATED REINFORCING STEEL				LBS.	3124
CLASS AA CONCRETE				CU. YDS.	66.1
SCARIFYING BRIDGE DECK				SQ. YDS.	202.7
SILICONE JOINT SEALANT				LIN. FT.	7.42

BAR TYPE





PLAN OF SIDEWALK

WBS NO. 47340

BUNCOMBE COUNTY

BRIDGE NO. 59

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

DocuSigned by: Amber Lee B04B5A4F2FAD484...

10/2/2017

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SIDEWALK DETAILS

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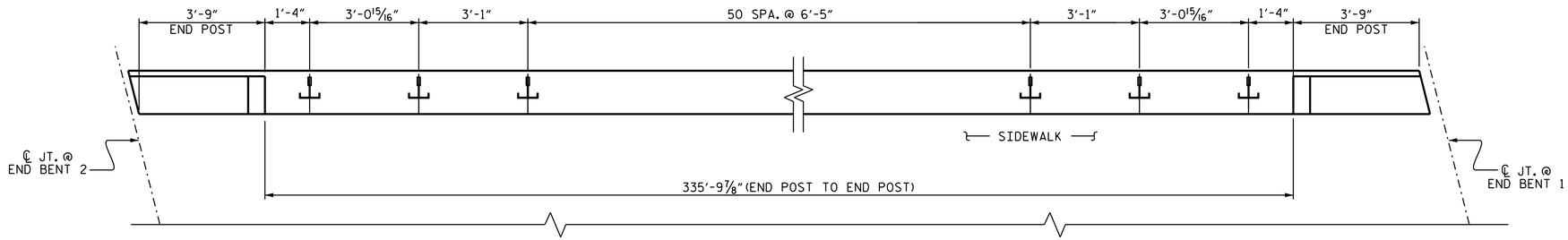
NOTES

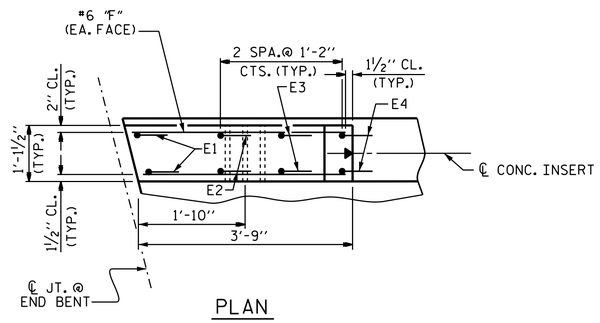
FOR DETAILS OF CONCRETE INSERTS, AND GUARDRAIL ANCHOR ASSEMBLIES, SEE "GUARDRAIL ANCHORAGE DETAILS FOR METAL RAILS" AND "3 BAR METAL RAIL" SHEETS.

FOR DETAIL OF GUARDRAIL ANCHOR ASEMBLY, SEE STD. BMR5.

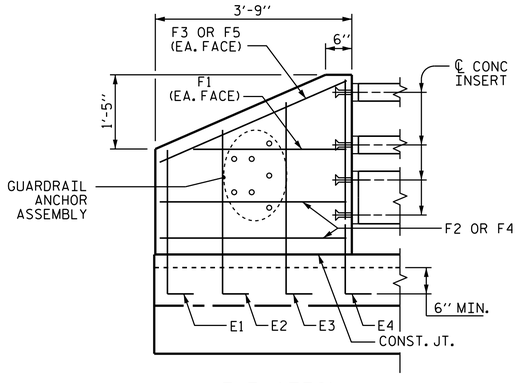
ALL REINFORCEMENT STEEL IN END POSTS SHALL BE EPOXY COATED.



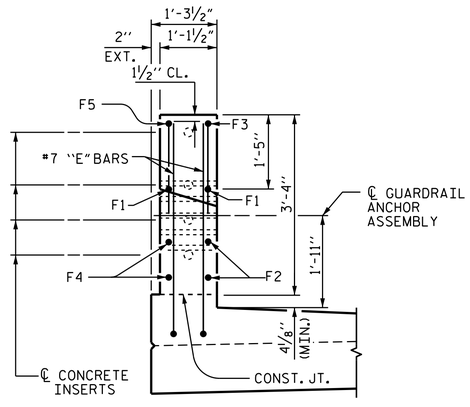
PLAN OF RAIL POST SPACING



PLAN



ELEVATION



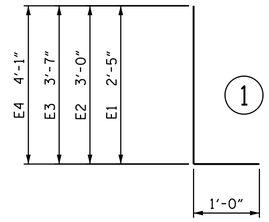
END VIEW

END POST DETAILS

BILL OF MATERIAL TWO END POST

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳E1	4	#7	1	3'-5"	28
✳E2	4	#7	1	4'-0"	33
✳E3	4	#7	1	4'-7"	37
✳E4	4	#7	1	5'-1"	42
✳F1	4	#6	STR	3'-2"	19
✳F2	4	#6	STR	3'-5"	21
✳F3	2	#6	STR	3'-7"	11
✳F4	4	#6	STR	3'-9"	23
✳F5	2	#6	STR	4'-0"	12
✳EPOXY COATED REINFORCING STEEL					226 LBS.
CLASS AA CONCRETE					0.9 CY

BAR TYPE



ALL BAR DIMENSIONS ARE OUT TO OUT

WBS NO. 47340

BUMCOMBE COUNTY

BRIDGE NO.: 59

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

RAIL POST SPACING AND END POST DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

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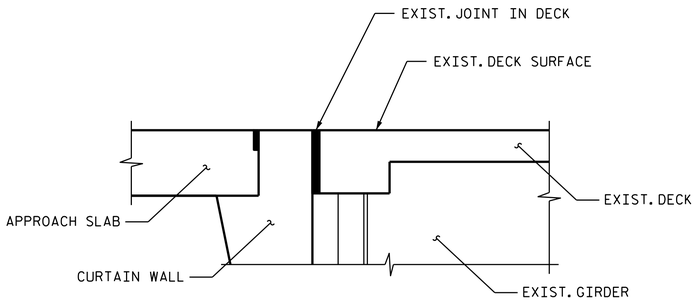
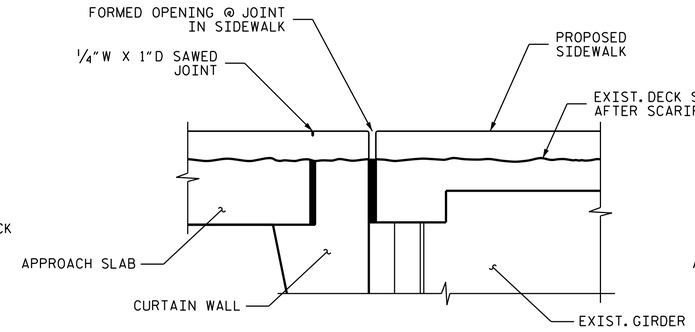
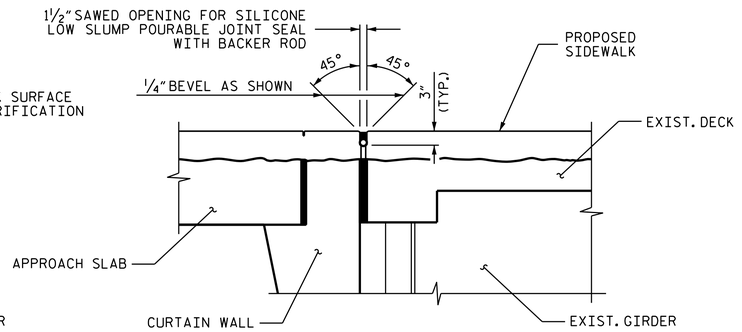


SECTION THRU JOINT @ END BENT 1
(EXISTING JOINT)



SECTION THRU JOINT @ END BENT 1
(PROPOSED FORMED JOINT)



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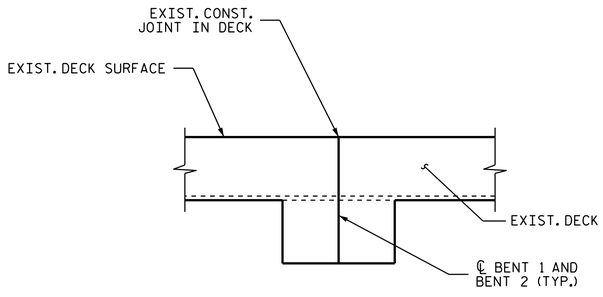
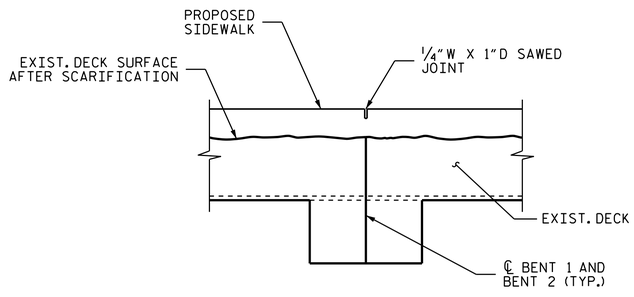
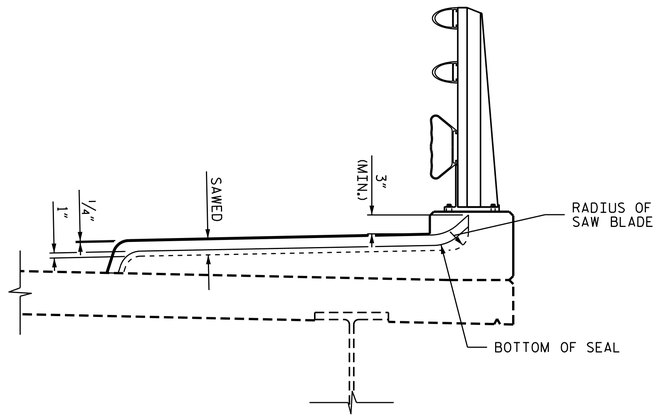
(PROPOSED SILICONE JOINT SEAL)



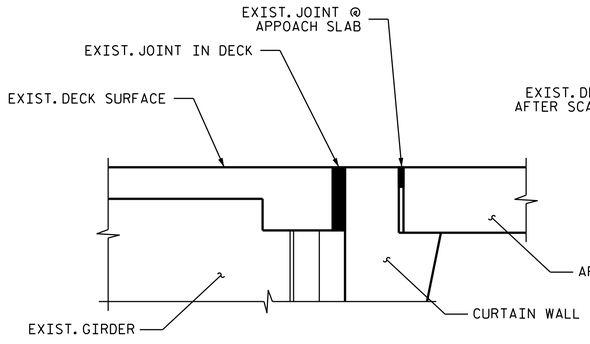
SECTION THRU JOINT @ BENTS
(EXISTING JOINT)



SECTION THRU JOINT @ BENTS
(PROPOSED SAWED CONTRACTION JOINT)



SECTION THRU SIDEWALK @ END BENT 2
(FOAM JOINT SHALL BE FACTORY FORMED OR CUT, TURNED UP PARALLEL TO RAIL, AND TURNED DOWN PARALLEL TO CURB.)



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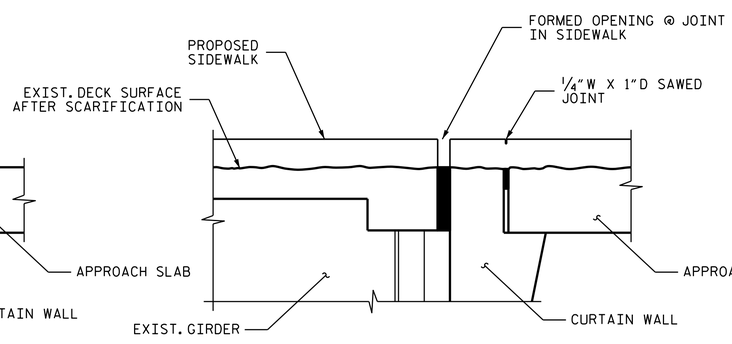

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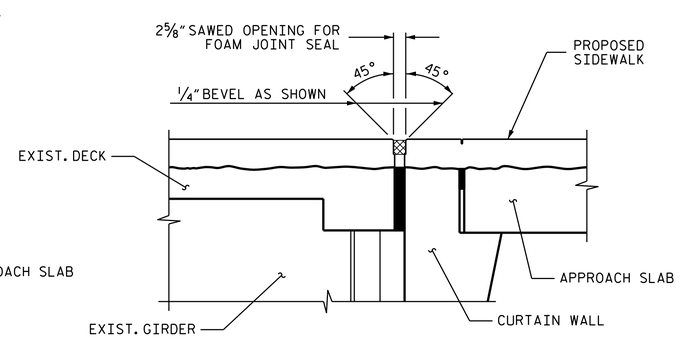
(PROPOSED FORMED JOINT)



SECTION THRU JOINT @ END BENT 2
(PROPOSED FOAM JOINT SEAL)

WBS NO. 47340

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BRIDGE NO. 59

STATE OF NORTH CAROLINA
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JOINT DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

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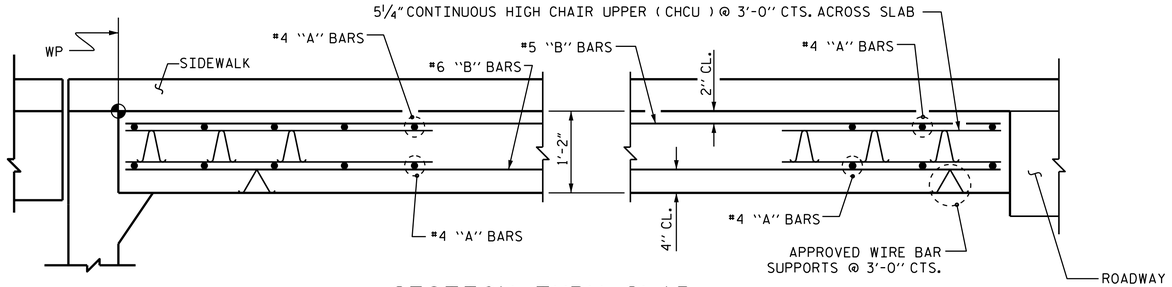
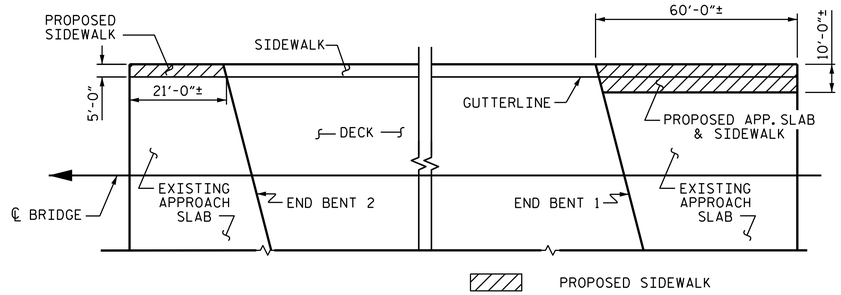
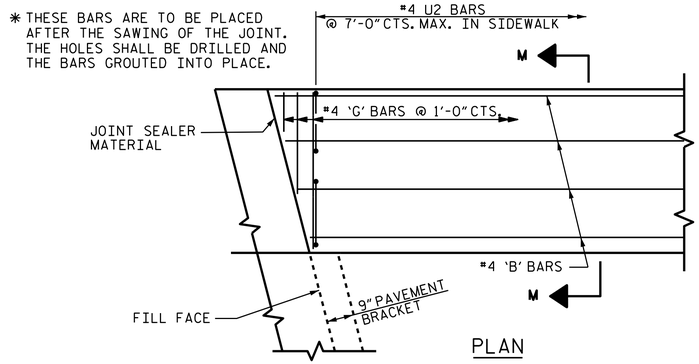


SECTION THRU SLAB

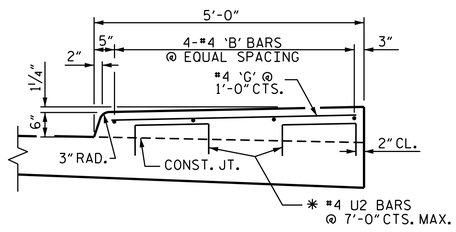


LOCATION PLAN

* THESE BARS ARE TO BE PLACED AFTER THE SAWING OF THE JOINT. THE HOLES SHALL BE DRILLED AND THE BARS GROUTED INTO PLACE.



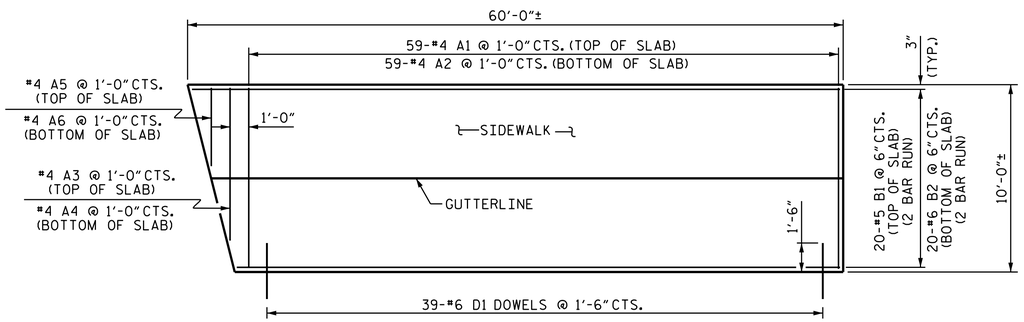
PLAN



SECTION M-M

DETAILS OF SIDEWALK ON APPROACH SLAB

(AT END BENT 1 SHOWN, AT END BENT 2 SIMILLAR)



APPROACH SLAB AT EB 1

NOTES

AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED.

THE JOINT SHALL BE SAWED PRIOR TO THE CASTING OF THE BARRIER RAIL. OR PARAPET AND END POST.

FOR SILICONE JOINT SEALS, SEE SPECIAL PROVISIONS.

SPLICE LENGTHS

BAR SIZE	EPOXY COATED	UNCOATED
#4	2'-0"	1'-9"
#5	2'-6"	2'-2"
#6	3'-10"	2'-7"

BILL OF MATERIAL SIDEWALK @ END BENT 2

BAR	NO	SIZE	TYPE	LENGTH	WEIGHT
* B4	8	4	STR	12'-0"	64
* G1	21	4	STR	4'-5"	62
* G2	1	4	STR	1'-6"	1
* U2	8	4	1	3'-2"	17
* EPOXY COATED REINFORCING STEEL			LBS.		144
CLASS AA CONCRETE			CU. YDS.		2.4

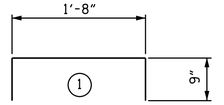
BILL OF MATERIAL APPROACH SLAB AT END BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	59	#4	STR	9'-8"	381
A2	59	#4	STR	9'-8"	381
* A3	1	#4	STR	4'-6"	3
A4	1	#4	STR	4'-6"	3
* A5	1	#4	STR	2'-11"	2
A6	1	#4	STR	2'-11"	2
* B1	40	#5	STR	34'-3"	1428
B2	40	#6	STR	34'-3"	2058
D1	39	#6	STR	3'-0"	176
REINFORCING STEEL				LBS.	2620
* EPOXY COATED REINFORCING STEEL				LBS.	1814
CLASS AA CONCRETE				C. Y.	24.6

BILL OF MATERIAL SIDEWALK @ END BENT 1

BAR	NO	SIZE	TYPE	LENGTH	WEIGHT
* B3	12	4	STR	23'-4"	280
* G1	59	4	STR	4'-5"	174
* G2	1	4	STR	3'-5"	2
* G3	1	4	STR	1'-11"	1
* U2	18	4	1	3'-2"	38
* EPOXY COATED REINFORCING STEEL			LBS.		495
CLASS AA CONCRETE			CU. YDS.		6.8

BAR TYPE



WBS NO. 47340

BUNCOMBE COUNTY

STATION: 59

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

APPROACH SLAB DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

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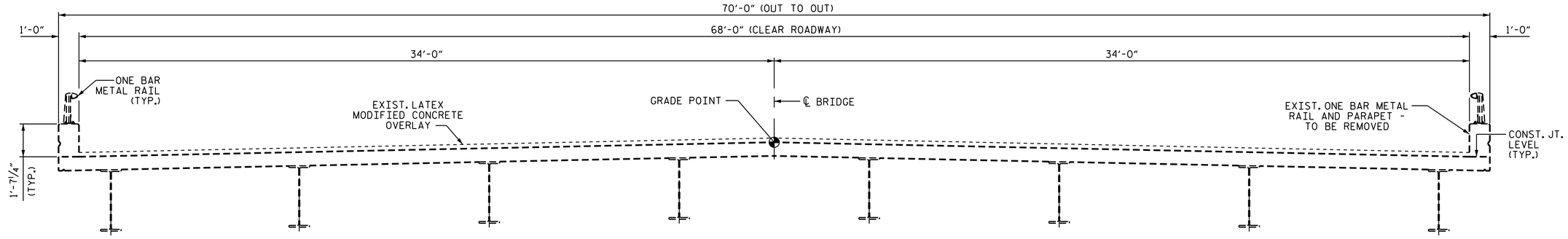

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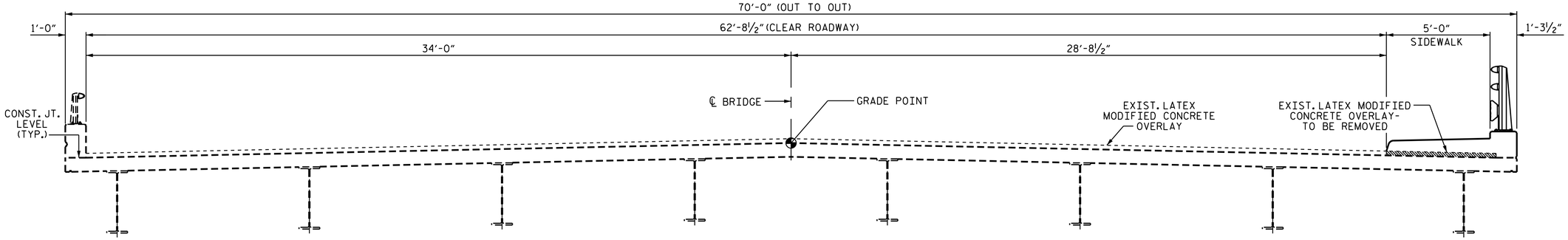

PROPOSED TYPICAL SECTION

WBS NO. 47340

BUNCOMBE COUNTY

BRIDGE NO. 744

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

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RALEIGH

TYPICAL SECTION

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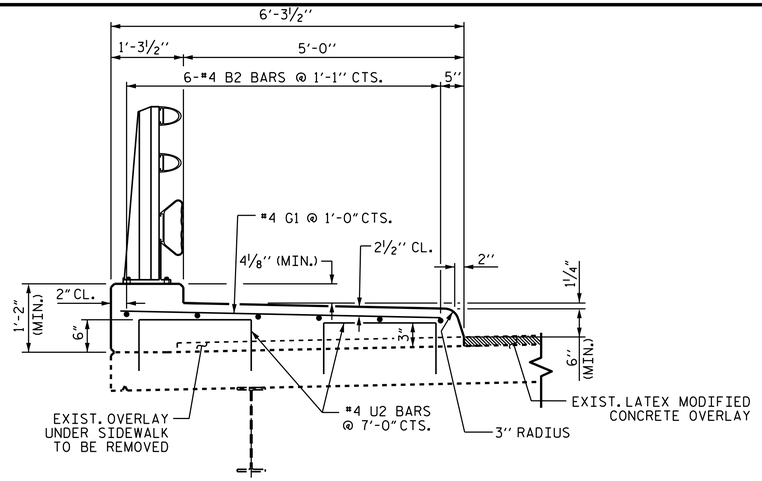

SECTION THRU SIDEWALK

NOTES

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BRIDGE ORIENTATION CONFORMS TO EXISTING BRIDGE PLANS.

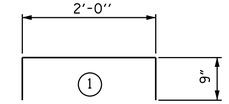
DOWEL U2 BARS INTO EXISTING SLAB.

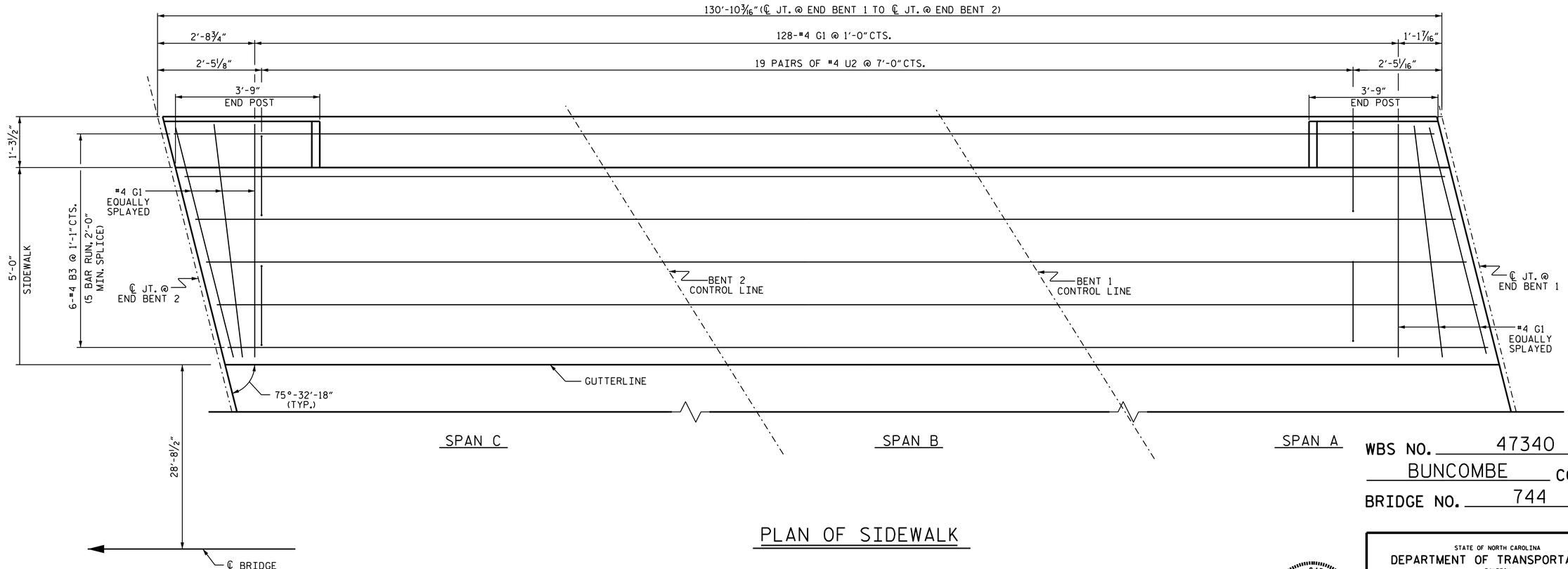
CLASS AA CONCRETE CU. YDS. 24.5

BILL OF MATERIAL FOR SIDEWALK

BAR	NO	SIZE	TYPE	LENGTH	WEIGHT
✱B3	30	4	STR	27'-9"	556
✱G1	132	4	STR	5'-11"	522
✱U2	38	4	1	3'-6"	89
✱EPOXY COATED REINFORCING STEEL				LBS.	1167
CLASS AA CONCRETE				CU. YDS.	24.5
SCARIFYING BRIDGE DECK				SQ. YDS.	76.9
SILICONE JOINT SEALANT				LIN. FT.	13.00

BAR TYPE





PLAN OF SIDEWALK

WBS NO. 47340

BUNCOMBE COUNTY

BRIDGE NO. 744

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

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RALEIGH

SIDEWALK DETAILS

REVISIONS						SHEET NO.
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NOTES

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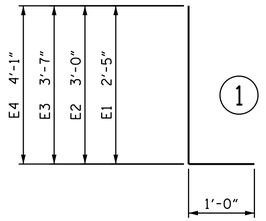
FOR DETAIL OF GUARDRAIL ANCHOR ASEMBLY, SEE STD. BMR5.

ALL REINFORCEMENT STEEL IN END POSTS SHALL BE EPOXY COATED.

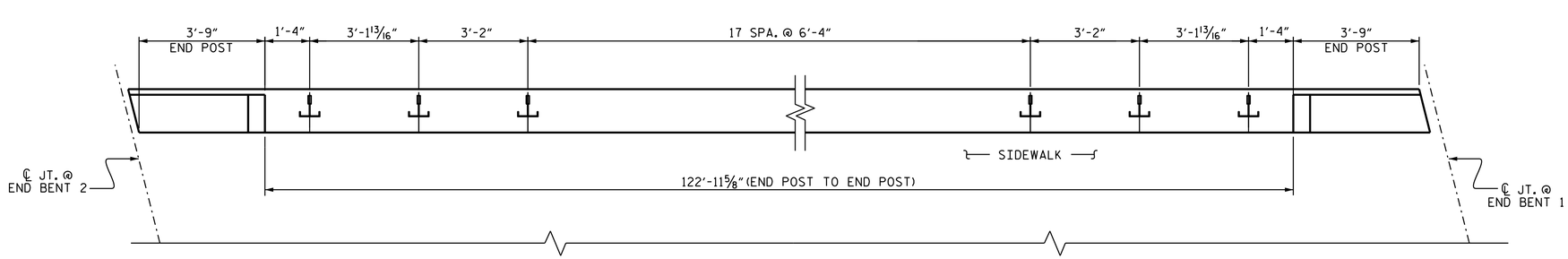
BILL OF MATERIAL TWO END POST

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳E1	4	#7	1	3'-5"	28
✳E2	4	#7	1	4'-0"	33
✳E3	4	#7	1	4'-7"	37
✳E4	4	#7	1	5'-1"	42
✳F1	4	#6	STR	3'-2"	19
✳F2	4	#6	STR	3'-5"	21
✳F3	2	#6	STR	3'-7"	11
✳F4	4	#6	STR	3'-9"	23
✳F5	2	#6	STR	4'-0"	12
✳EPOXY COATED REINFORCING STEEL					226 LBS.
CLASS AA CONCRETE					0.9 CY

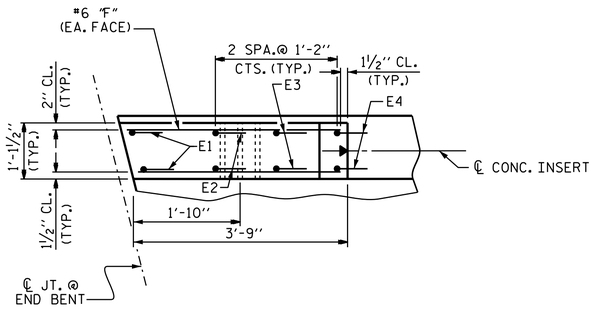
BAR TYPE



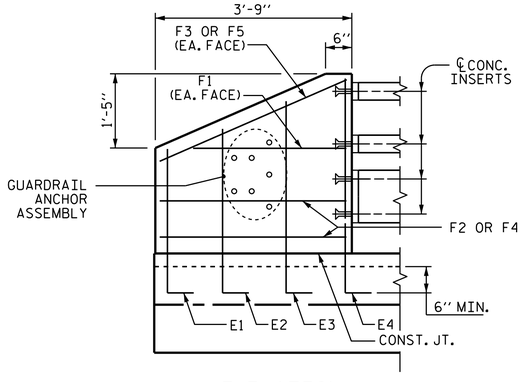
ALL BAR DIMENSIONS ARE OUT TO OUT



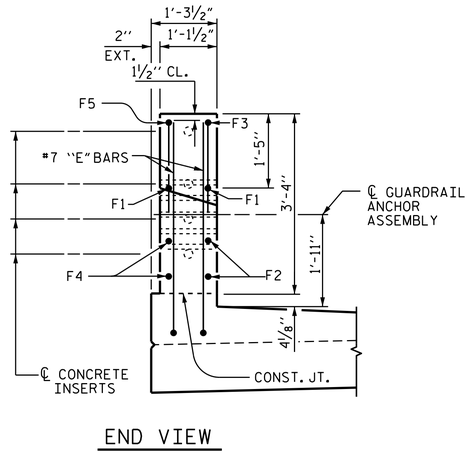
PLAN OF RAIL POST SPACING



PLAN



ELEVATION



END VIEW

END POST DETAILS

WBS NO. 47340

BUMCOMBE COUNTY

BRIDGE NO.: 744

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

RAIL POST SPACING AND END POST DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

DocuSigned by: B04B5A4F2FAD484...

10/2/2017

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CHECKED BY : A. SORSENGINH DATE : 08/2017

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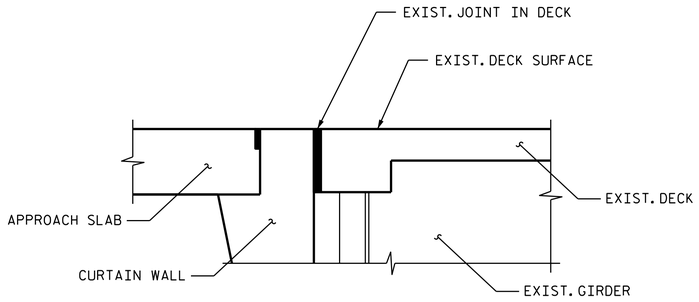
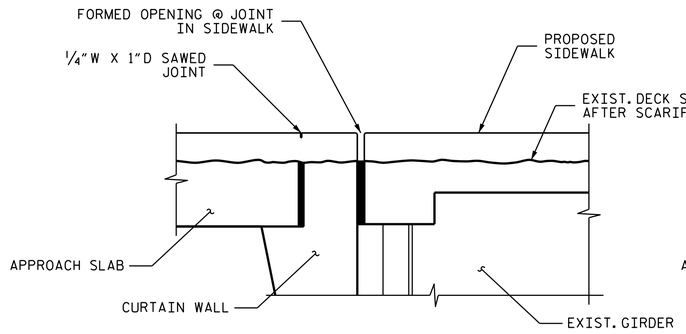


SECTION THRU JOINT @ END BENTS
(EXISTING JOINT)



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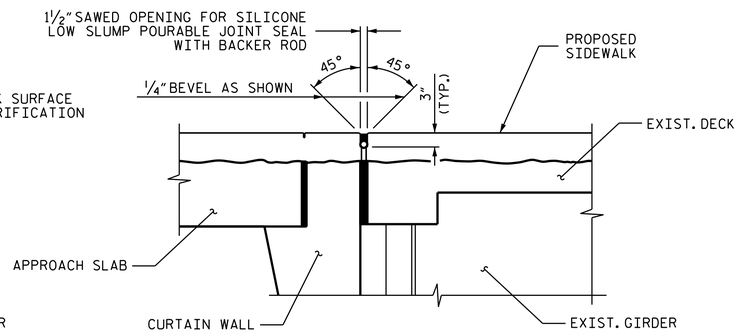
(PROPOSED FORMED JOINT)



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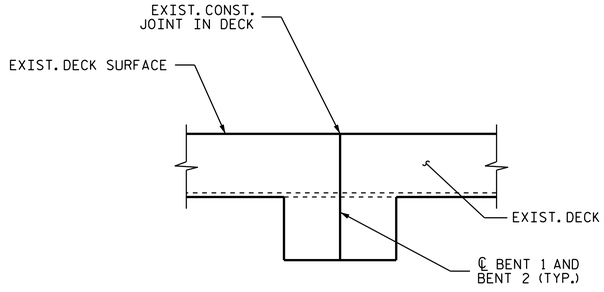
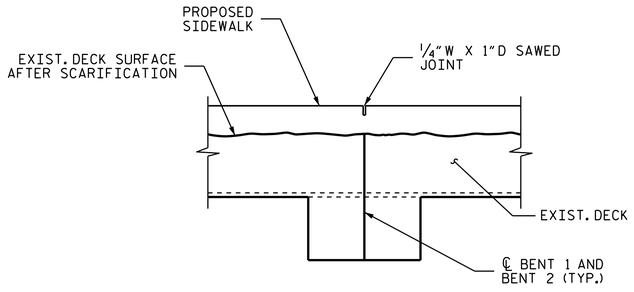


SECTION THRU JOINT @ BENTS
(EXISTING JOINT)



SECTION THRU JOINT @ BENTS
(PROPOSED SAWED CONTRACTION JOINT)

WBS NO. 47340

BUNCOMBE COUNTY

BRIDGE NO. 744

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

JOINT DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

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CHECKED BY : A.M.LEE DATE : 09/17

02-OCT-2017 07:12
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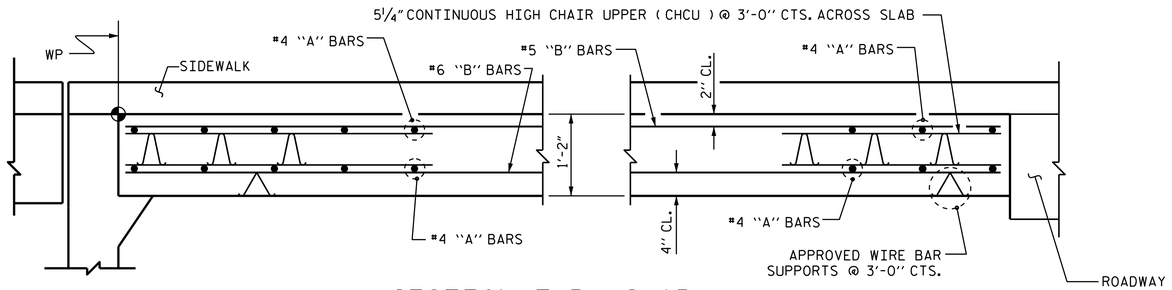
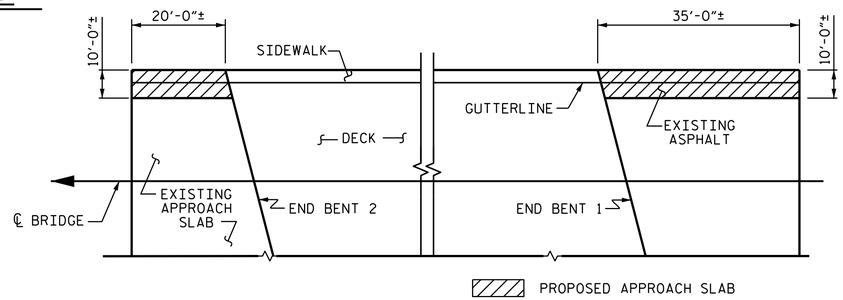


SECTION THRU SLAB



LOCATION PLAN

NOTES

AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED.

THE JOINT SHALL BE SAWED PRIOR TO THE CASTING OF THE BARRIER RAIL. OR PARAPET AND END POST.

FOR SILICONE JOINT SEALS, SEE SPECIAL PROVISIONS.

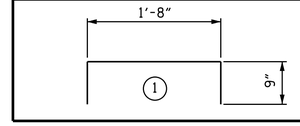
BILL OF MATERIAL SIDEWALK @ END BENT 1

BAR	NO	SIZE	TYPE	LENGTH	WEIGHT
✱ B3	8	4	STR	19'-9"	106
✱ G1	35	4	STR	4'-5"	103
✱ U2	12	4	1	3'-2"	25
✱ EPOXY COATED REINFORCING STEEL				LBS.	234
CLASS AA CONCRETE				CU. YDS.	4.3

BILL OF MATERIAL SIDEWALK @ END BENT 2

BAR	NO	SIZE	TYPE	LENGTH	WEIGHT
✱ B4	8	4	STR	12'-0"	64
✱ G1	20	4	STR	4'-5"	59
✱ U2	8	4	1	3'-2"	17
✱ EPOXY COATED REINFORCING STEEL				LBS.	140
CLASS AA CONCRETE				CU. YDS.	2.8

BAR TYPE



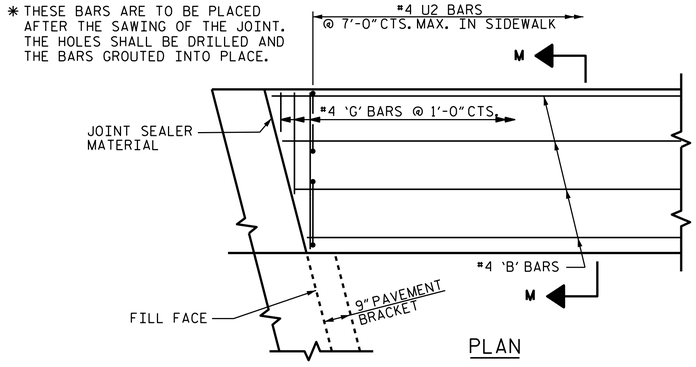
BILL OF MATERIAL APPROACH SLAB AT END BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱ A1	35	#4	STR	9'-8"	226
A2	35	#4	STR	9'-8"	226
✱ A3	1	#4	STR	5'-9"	4
A4	1	#4	STR	5'-9"	4
✱ A5	1	#4	STR	1'-11"	1
A6	1	#4	STR	1'-11"	1
✱ B1	60	#5	STR	13'-9"	860
B2	60	#6	STR	13'-9"	1239
D1	22	#6	STR	3'-0"	99
REINFORCING STEEL				LBS.	1569
✱ EPOXY COATED REINFORCING STEEL				LBS.	1091
CLASS AA CONCRETE APPROACH SLAB				CU. YDS.	14.6

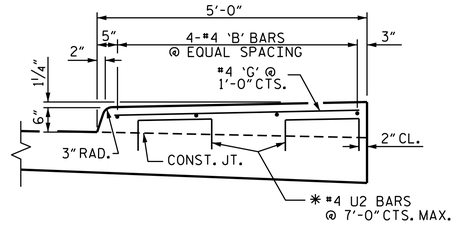
BILL OF MATERIAL APPROACH SLAB AT END BENT 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱ A1	20	#4	STR	9'-8"	129
A2	20	#4	STR	9'-8"	129
✱ A3	1	#4	STR	5'-9"	4
A4	1	#4	STR	5'-9"	4
✱ A5	1	#4	STR	1'-11"	1
A6	1	#4	STR	1'-11"	1
✱ B1	40	#5	STR	13'-9"	574
B2	40	#6	STR	13'-9"	826
D1	15	#6	STR	3'-0"	68
REINFORCING STEEL				LBS.	1028
✱ EPOXY COATED REINFORCING STEEL				LBS.	708
CLASS AA CONCRETE APPROACH SLAB				CU. YDS.	9.2

✱ THESE BARS ARE TO BE PLACED AFTER THE SAWING OF THE JOINT. THE HOLES SHALL BE DRILLED AND THE BARS GROUTED INTO PLACE.



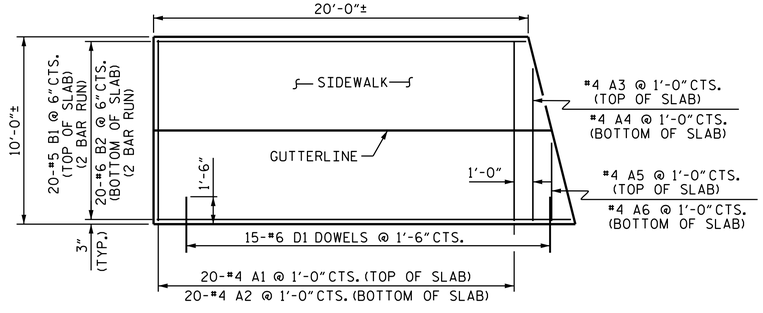
PLAN



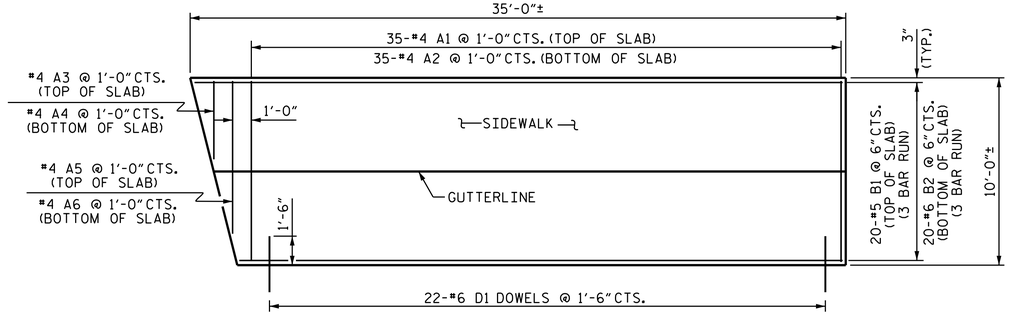
SECTION M-M

DETAILS OF SIDEWALK ON APPROACH SLAB

(AT END BENT 1 SHOWN, AT END BENT 2 SIMILLAR)



APPROACH SLAB AT END BENT 2



APPROACH SLAB AT END BENT 1

SPLICE LENGTHS

BAR SIZE	EPOXY COATED	UNCOATED
#4	2'-0"	1'-9"
#5	2'-6"	2'-2"
#6	3'-10"	2'-7"

WBS NO. 47340

BUNCOMBE COUNTY

STATION: 744

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

APPROACH SLAB DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

DocuSigned by: B04B5A4F2FAD484...

10/2/2017

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CHECKED BY : A.M.LEE DATE : 9-17
DESIGN ENGINEER OF RECORD: A.M.LEE DATE : 9-17

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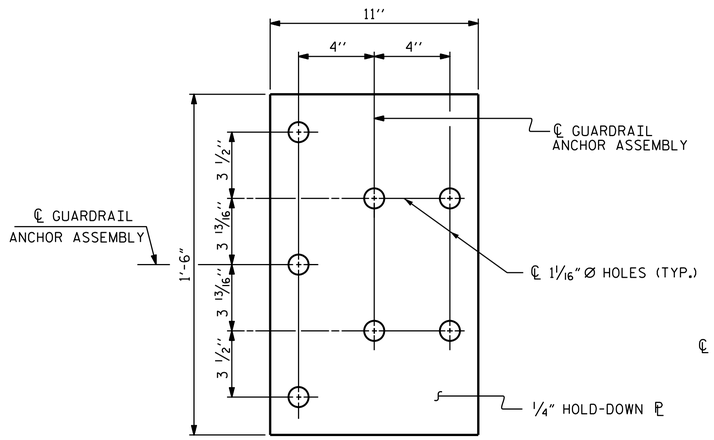
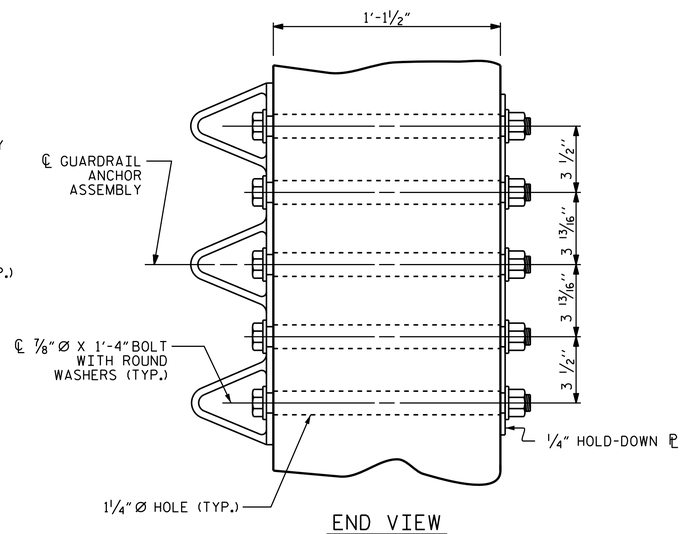


PLAN



END VIEW

GUARDRAIL ANCHOR ASSEMBLY DETAILS

NOTES

THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A 1/4'' HOLD DOWN PLATE AND 7 - 7/8'' Ø BOLTS WITH NUTS AND WASHERS.

THE HOLD-DOWN PLATE SHALL CONFORM TO AASHTO M270 GRADE 36. AFTER FABRICATION, THE HOLD-DOWN PLATE SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH AASHTO M111.

BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 7/8'' Ø GALVANIZED BOLTS, NUTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.

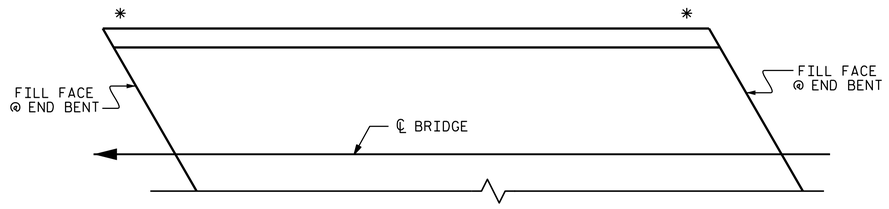
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF THE PARAPET. FOR POINTS OF ATTACHMENT, SEE SKETCH.

AFTER INSTALLATION, THE EXPOSED THREAD OF THE BOLT SHALL BE BURRED WITH A SHARP POINTED TOOL.

THE COST OF THE GUARDRAIL ANCHOR ASSEMBLIES WITH BOLTS, NUTS AND WASHERS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

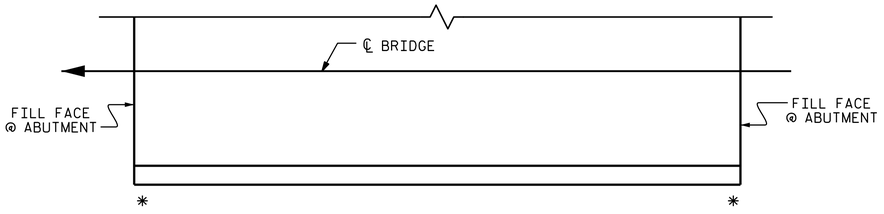
THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE END POST TO CLEAR ASSEMBLY BOLTS.

THE 1 1/4'' Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.



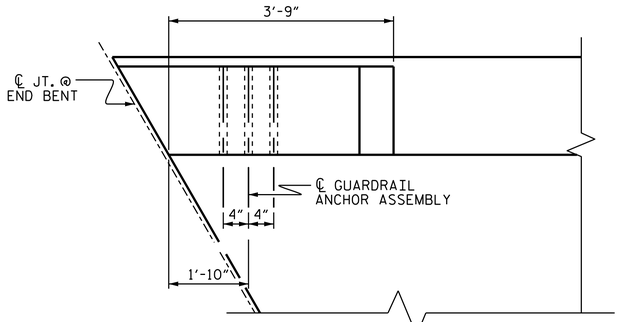
SKETCH SHOWING POINTS OF ATTACHMENT

*LOCATION OF GUARDRAIL ATTACHMENT FOR 3 BAR METAL RAIL BRIDGES NO. 59 AND 744

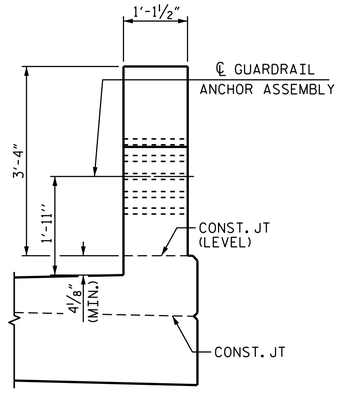


SKETCH SHOWING POINTS OF ATTACHMENT

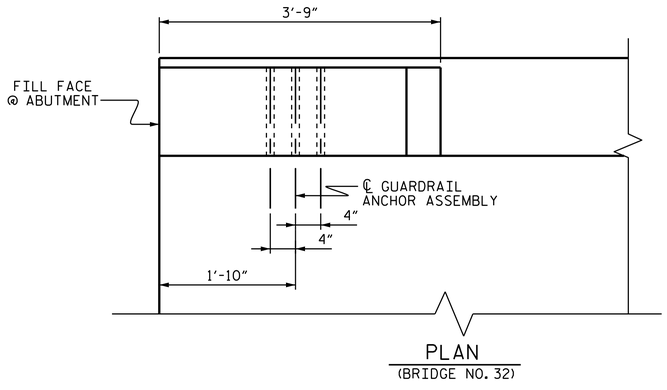
*LOCATION OF GUARDRAIL ATTACHMENT FOR 3 BAR METAL RAIL BRIDGE NO. 32



PLAN
(BRIDGE NO. 59 & 744)



END VIEW
(THREE BAR METAL RAIL)



PLAN
(BRIDGE NO. 32)

LOCATION OF GUARDRAIL ANCHOR AT END POST

WBS NO. 47340

BUNCOMBE COUNTY

BRIDGE NO.: 32, 59, & 744

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GUARDRAIL ANCHORAGE DETAILS FOR METAL RAILS

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

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10/2/2017

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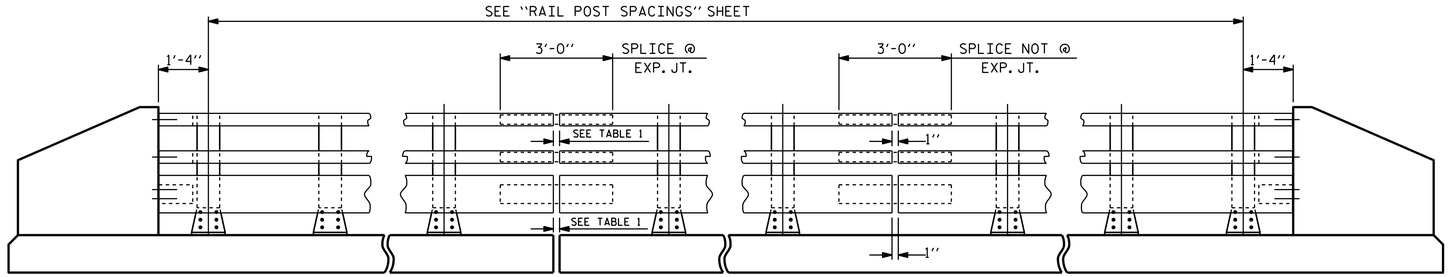
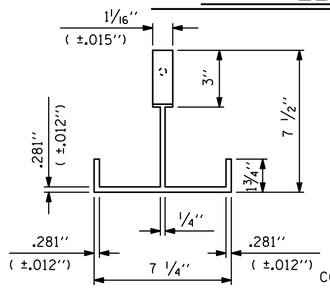


ELEVATION

NOTE:
FOR ATTACHMENT OF METAL RAIL TO END POST, SEE STANDARD NO. BMR7.

TABLE 1 BRIDGE 32	
℄ EXP.JT. @ BENT	RAIL OPENING
BENT 1	1"
BENT 2	1"



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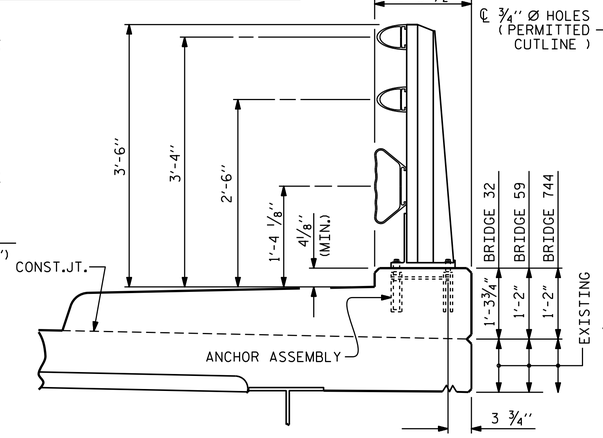
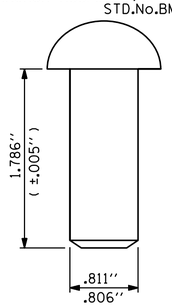
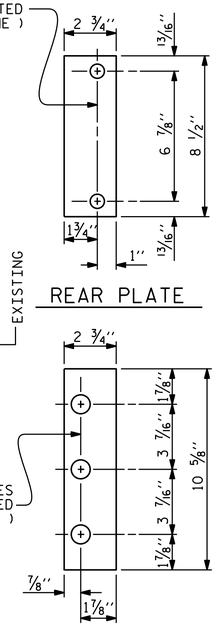


SECTION THRU RAIL

FOR ANCHOR ASSEMBLY, SEE "3 BAR METAL RAIL" STD.No.BMR6



RIVET DETAIL

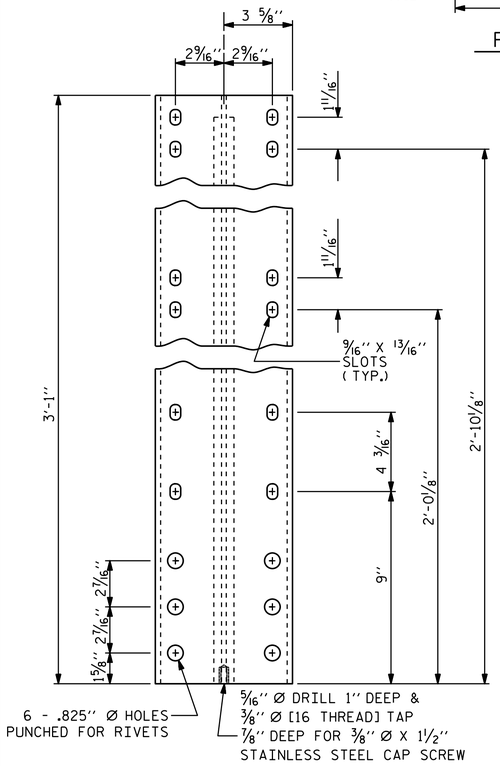


REAR PLATE

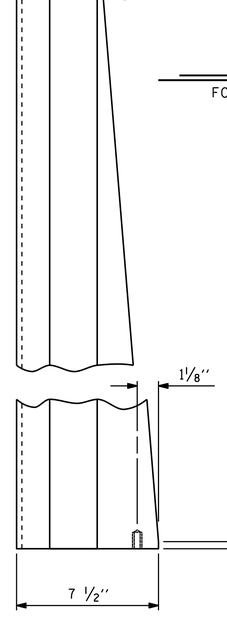
FRONT PLATE

SHIM DETAILS

NOTE :
SHIMS MAY BE CUT ALONG PERMITTED CUTLINE OR SLOTTED TO EDGE OF PLATE TO FACILITATE PLACEMENT.

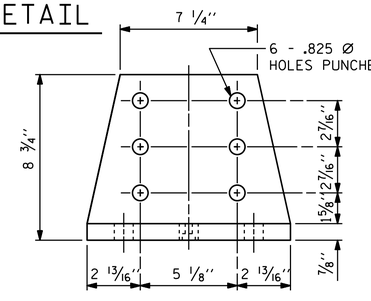


FRONT ELEVATION

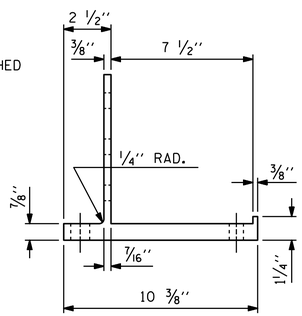


SIDE ELEVATION

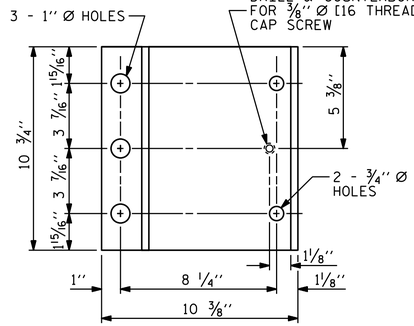
DETAILS OF POST



FRONT ELEVATION



SIDE ELEVATION



PLAN

POST BASE DETAILS

NOTES

AT THE CONTRACTOR'S OPTION, METAL RAIL MAY BE EITHER ALUMINUM OR GALVANIZED STEEL IN ACCORDANCE WITH THE REQUIREMENTS OF THE GENERAL NOTES AND THE FOLLOWING SPECIFICATIONS FOR THE ALTERNATE MATERIALS; HOWEVER, THE CONTRACTOR WILL BE REQUIRED TO USE THE SAME RAIL MATERIAL ON ALL STRUCTURES ON THE PROJECT FOR WHICH METAL RAIL IS DESIGNATED.

ALUMINUM RAILS

MATERIAL FOR POSTS, BASES AND RAILS, EXPANSION BARS AND CLAMP BARS SHALL BE ASTM B221 ALLOY 6061-T6.

MATERIAL FOR RIVETS SHALL BE ASTM B316 ALLOY 6061-T6. RIVETS SHALL BE STANDARD BUTTON HEAD AND CONE POINT COLD DRIVEN AS PER DRAWING.

THE BASE OF RAIL POSTS, OR ANY OTHER ALUMINUM SURFACE IN CONTACT WITH CONCRETE SHALL BE THOROUGHLY COATED WITH AN ALUMINUM IMPREGNATED CAULKING COMPOUND OF APPROVED QUALITY.

MATERIAL FOR SHIMS TO BE ASTM B209 ALLOY 6061-T6.

GALVANIZED STEEL RAILS

MATERIAL AND GALVANIZING ARE TO CONFORM TO THE FOLLOWING SPECIFICATIONS:

POST, POST BASES, RAILS, EXPANSION BARS AND CLAMP BARS : AASHTO M270 GRADE 36 STRUCTURAL STEEL - GALVANIZED TO AASHTO M111.

RIVETS: RIVETS SHALL MEET THE REQUIREMENTS OF ASTM A502 FOR GRADE 1 RIVETS.

THE CUT ENDS OF GALVANIZED STEEL RAILING, AFTER GRINDING SMOOTH SHALL BE GIVEN TWO COATS OF ZINC RICH PAINT MEETING THE REQUIREMENTS OF FEDERAL SPECIFICATION MIL-P-26915 USAF TYPE 1, OR OF FEDERAL SPECIFICATIONS TT-P-641.

SHIMS: SHIMS SHALL MEET THE REQUIREMENTS OF ASTM A570 FOR GRADE 33 OR A611 FOR GRADE C AND SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO M111.

RAIL CAPS: RAIL CAPS SHALL MEET THE REQUIREMENTS OF ASTM A570 FOR GRADE 33 OR A611 FOR GRADE C AND SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO M111.

GENERAL NOTES

RAILING SHALL BE CONTINUOUS FROM END POST TO END POST OF BRIDGE. EACH JOINT IN RAIL LENGTH SHALL BE SPLICED AS DETAILED. PANEL LENGTHS OF RAIL SHALL BE ATTACHED TO A MINIMUM OF THREE POSTS. PLACE ONE JOINT SPLICE JUST BEYOND THE 3RD RAIL POST FROM EACH END, TYPICALLY 14' FROM THE END. PLACE OTHER JOINTS AS NEEDED.

FOR END OF RAIL TO CLEAR FACE OF CONCRETE END POST DIMENSION, SEE STANDARD NO. BMR7.

CAP SCREWS SHALL BE ASTM F593 ALLOY 305 STAINLESS STEEL. WASHERS FOR RAIL ATTACHMENT SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL.

CERTIFIED MILL REPORTS ARE REQUIRED FOR RAILS AND POSTS. SHOP INSPECTION IS NOT REQUIRED.

METAL RAIL POSTS SHALL BE SET NORMAL TO CURB GRADE.

METHOD OF MEASUREMENT FOR METAL RAILS: FOR LENGTH OF METAL RAILS TO BE PAID FOR, SEE THE STANDARD SPECIFICATIONS.

CURVED RAIL USAGE: WHERE RAILS ARE TO BE USED ON BRIDGES ON HORIZONTAL AND/OR VERTICAL CURVATURE THE CONTRACTOR MAY, AT HIS OPTION, HAVE THE REQUIRED CURVATURE IN THE RAIL FORMED IN THE SHOP OR IN THE FIELD. IN EITHER EVENT, THE RAIL SHALL CONFORM WITHOUT BUCKLING OR KINKING TO THE REQUIRED CURVATURE IN A UNIFORM MANNER ACCEPTABLE TO THE ENGINEER.

TO INSURE FUTURE IDENTIFICATION OF THE FABRICATOR, A PERMANENT IDENTIFYING MARK SHALL BE PLACED ON EACH POST. THE METHOD OF MARKING AND LOCATION SHALL BE SUCH THAT IT DOES NOT DETRACT FROM THE APPEARANCE OF THE POST, BUT REMAIN VISIBLE AFTER RAIL PLACEMENT.

SHIMS SHALL BE USED AS NECESSARY FOR POST ALIGNMENT.

ALLOY 6351-T5 MAY BE SUBSTITUTED FOR ALLOY 6061-T6 WHERE APPLICABLE.

MINOR VARIATIONS IN DETAILS OF METAL RAIL WILL BE CONSIDERED. DETAILS OF SUCH VARIATIONS, IF DESIRED, SHALL BE SUBMITTED FOR APPROVAL.

BRIDGE	PAY LENGTH
32	104.40 LIN. FT.
59	335.82 LIN. FT.
744	122.97 LIN. FT.
TOTAL	563.19 LIN. FT.

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

DocuSigned by: Amber Lee B04B5AAF2FAD484...

10/2/2017

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

WBS NO. 47340

BUMCOMBE COUNTY

BRIDGE NO.: 32, 59, & 744

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

3 BAR METAL RAIL

ASSEMBLED BY : D.V. JOYNER		DATE : 08/2017			
CHECKED BY : A. SORSENGINH		DATE : 08/2017			
DRAWN BY : JMB	1/88	REV. 5/7/03	RWW/JTE		
CHECKED BY : GGH	1/88	REV. 5/1/06	TLA/GM		
		REV. 10/1/11	MAA/GM		

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1			3			TOTAL SHEETS
2			4			20

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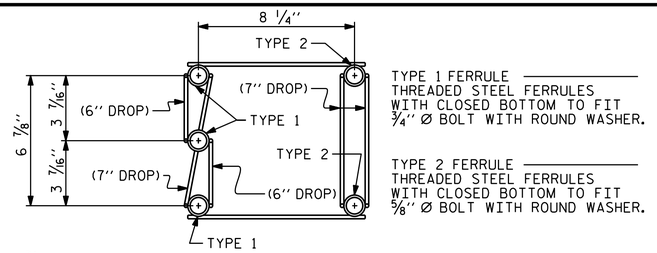
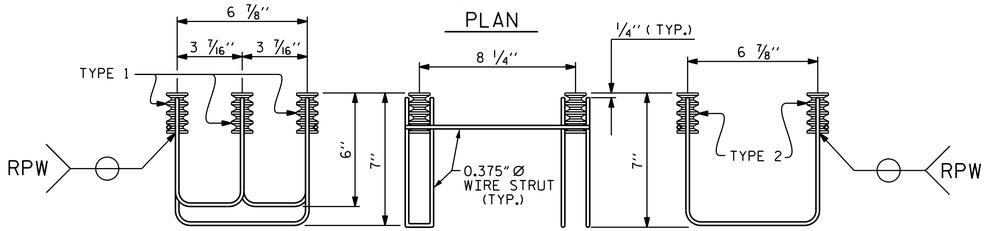
STD. NO. BMR5



TYPE 1 FERRULE
THREADED STEEL FERRULES
WITH CLOSED BOTTOM TO FIT
3/4'' Ø BOLT WITH ROUND WASHER.

TYPE 2 FERRULE
THREADED STEEL FERRULES
WITH CLOSED BOTTOM TO FIT
5/8'' Ø BOLT WITH ROUND WASHER.

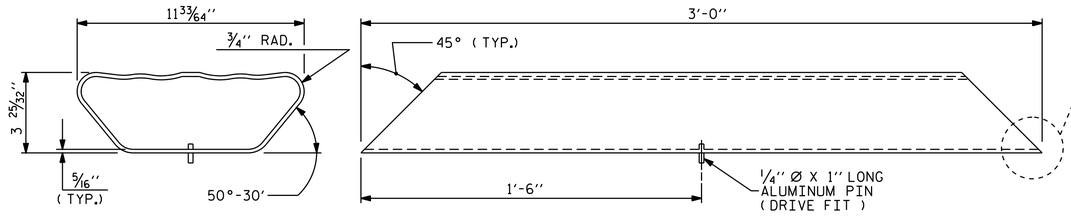
PLAN



LEFT SIDE VIEW ELEVATION RIGHT SIDE VIEW

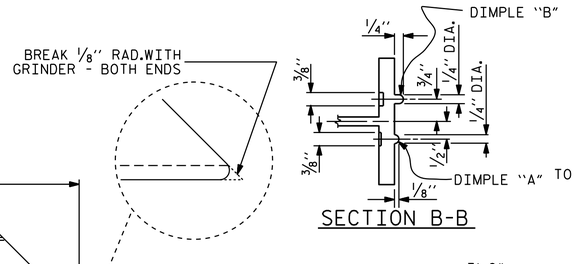
5-BOLT METAL RAIL ANCHOR ASSEMBLY

BRIDGE	ASSEMBLIES REQUIRED
32	19
59	57
744	22

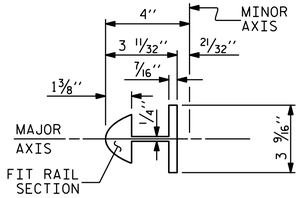


END VIEW PLAN VIEW

BOTTOM RAIL EXPANSION BAR



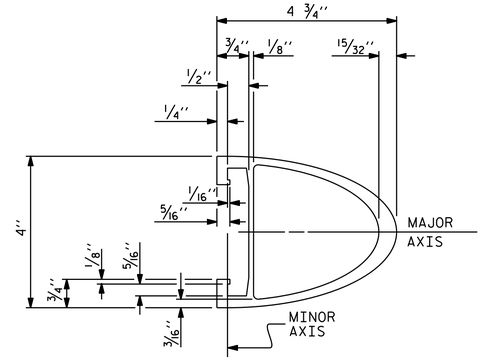
SECTION B-B



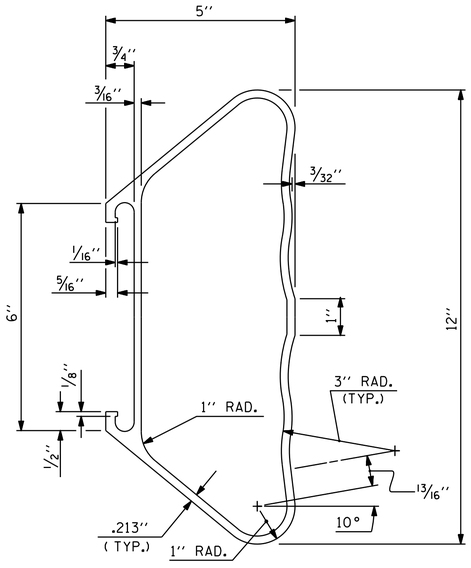
BAR SECTION

BACK ELEVATION

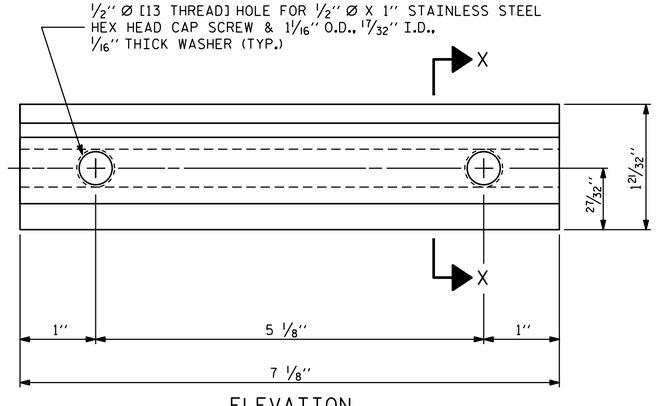
TOP & MIDDLE RAIL EXPANSION BAR



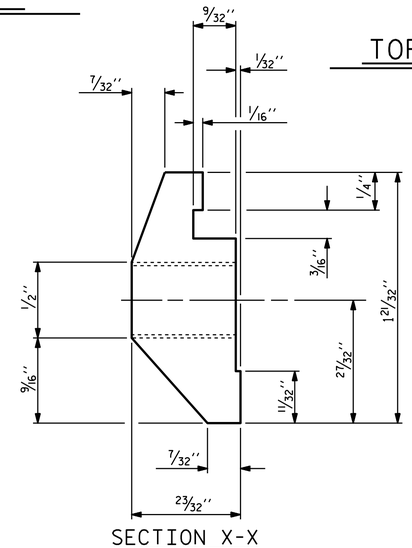
TOP & MIDDLE RAIL SECTION



BOTTOM RAIL SECTION



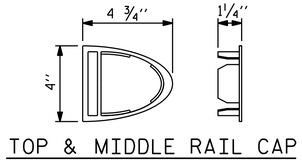
ELEVATION



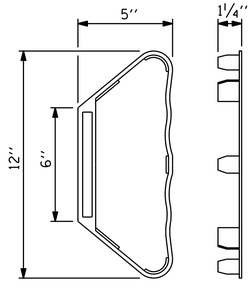
SECTION X-X

CLAMP BAR DETAIL

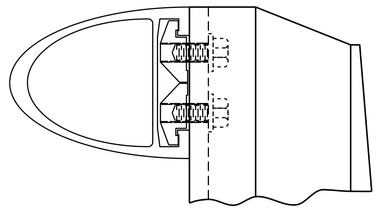
(6 REQUIRED PER POST)



TOP & MIDDLE RAIL CAP



BOTTOM RAIL CAP



CLAMP ASSEMBLY

TOP RAIL SHOWN
(MIDDLE & BOTTOM RAIL ARE SIMILAR)

NOTES

STRUCTURAL CONCRETE ANCHOR ASSEMBLY

THE STRUCTURAL CONCRETE ANCHOR ASSEMBLY SHALL CONSIST OF THE FOLLOWING COMPONENTS:

A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 2'' FOR 3/4'' FERRULES AND 1 3/4'' FOR 5/8'' FERRULES.

B. 3 - 3/4'' Ø X 2 1/2'' BOLTS WITH WASHERS. BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 3/4'' Ø X 2 1/2'' GALVANIZED BOLTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.

C. 2 - 5/8'' Ø X 2 1/4'' BOLTS WITH WASHERS. BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 5/8'' Ø X 2 1/4'' GALVANIZED BOLTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.

D. WIRE STRUT SHOWN IN THE CONCRETE ANCHOR ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI. AS AN OPTION, A 7/16'' Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.

E. THE METAL RAIL ANCHOR ASSEMBLIES TO BE HOT DIPPED GALVANIZED TO CONFORM TO REQUIREMENTS OF AASHTO M111.

F. THE COST OF THE METAL RAIL ANCHOR ASSEMBLY WITH BOLTS AND WASHERS COMPLETE IN PLACE SHALL BE INCLUDED IN THE PRICE BID FOR LINEAR FEET OF METAL RAIL.

G. BOLTS TO BE TIGHTENED ONE-HALF TURN WITH A WRENCH FROM A FINGER-TIGHT POSITION.

WBS NO. 47340
BUMCOMBE COUNTY
BRIDGE NO.: 32, 59, & 744

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

3 BAR METAL RAIL

ASSEMBLED BY :	D.V. JOYNER
CHECKED BY :	A. SORSENGINH
DATE :	08/2017
DATE :	08/2017
DRAWN BY :	JMB 1/88
CHECKED BY :	GGH 1/88
REV. 5/7/03	RWW/JTE
REV. 5/1/06	TLA/GM
REV. 10/1/11	MAA/GM

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

DocuSigned by: Amber Lee B04B5A4F2FAD484...
10/2/2017

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2			4			20

STD. NO. BMR6

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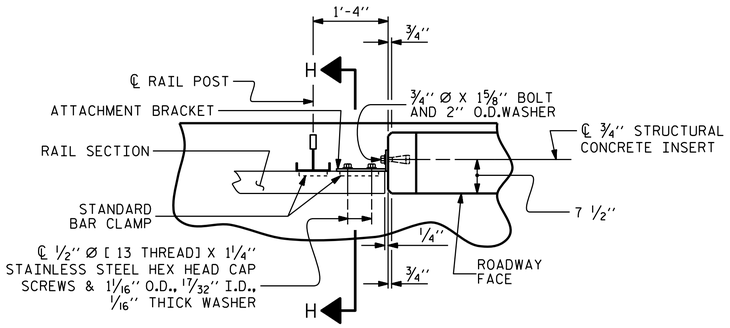
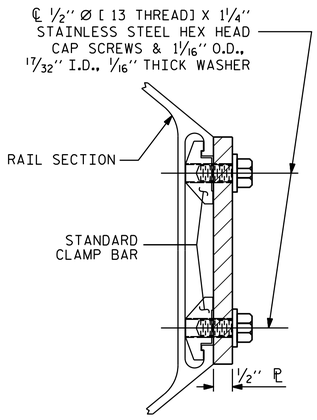


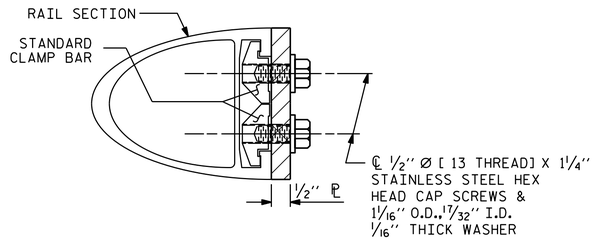
PLAN OF RAIL AND END POST

(STIFFENER ON 1/2'' ℙ NOT SHOWN FOR CLARITY)



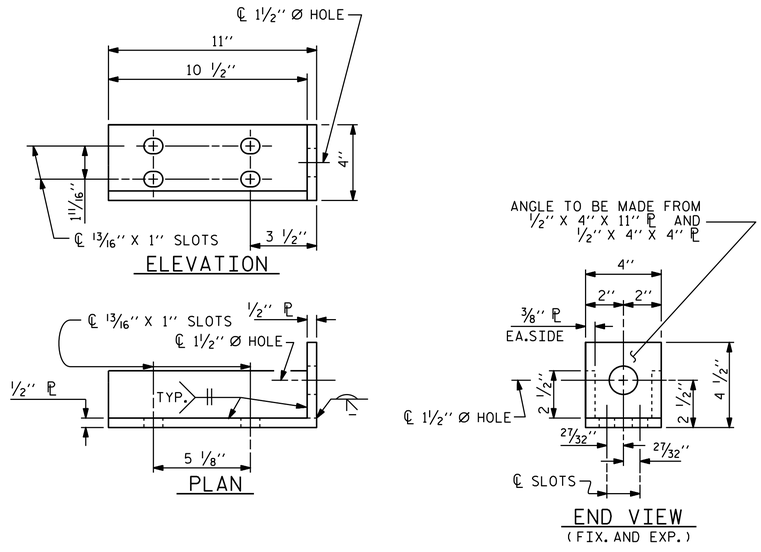
SECTION H-H

(FOR BOTTOM RAIL)



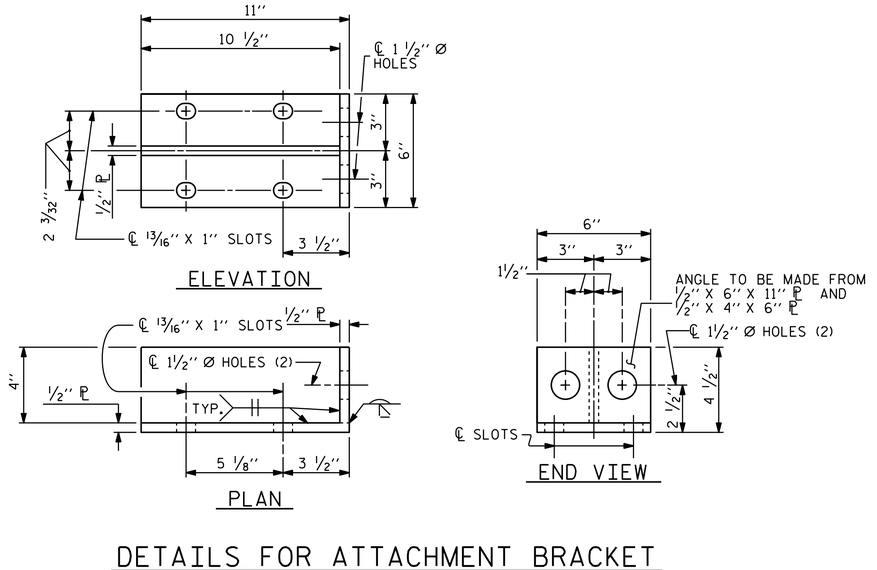
SECTION H-H

(FOR TOP & MIDDLE RAIL)



DETAILS FOR ATTACHMENT BRACKET

(TOP & MIDDLE RAIL ONLY)



DETAILS FOR ATTACHMENT BRACKET

(BOTTOM RAIL ONLY)

NOTES

METAL RAIL TO END POST CONNECTION

THE METAL RAIL TO END POST CONNECTION SHALL CONSIST OF THE FOLLOWING COMPONENTS:

A. 1/2'' PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 AND SHALL BE GALVANIZED AFTER FABRICATION.

B. 3/4'' STRUCTURAL CONCRETE INSERT SHALL HAVE A WORKING LOAD SHEAR CAPACITY OF 4800 LBS. THE FERRULES SHALL ENGAGE A 3/4'' Ø X 1 5/8'' BOLT WITH 2'' O.D. WASHER IN PLACE. THE 3/4'' Ø X 1 5/8'' BOLT SHALL HAVE N. C. THREADS.

C. CAP SCREWS FOR RAIL ATTACHMENT TO ANGLE SHALL CONFORM TO THE REQUIREMENTS OF ASTM F593 ALLOY 305 STAINLESS STEEL. CAP SCREWS TO BE CENTERED IN SLOTS AT 60°F. WASHERS FOR RAIL ATTACHMENT SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL.

D. STANDARD CLAMP BARS (STD. No. BMR6).

THE COST OF THE STANDARD CLAMP BARS AND CAP SCREWS USED IN THE METAL RAIL TO END POST CONNECTION SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR LINEAR FEET OF 3 BAR METAL RAIL.

THE 3/4'' STRUCTURAL CONCRETE INSERT WITH BOLT SHALL BE ASSEMBLED IN THE SHOP.

THE COST OF THE 3/4'' STRUCTURAL CONCRETE INSERT ASSEMBLY, AND THE 1/2'' PLATES COMPLETE IN PLACE SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

THE CONTRACTOR, AT HIS OPTION, MAY USE AN ADHESIVE BONDING SYSTEM IN LIEU OF THE STRUCTURAL CONCRETE INSERT EMBEDDED IN THE END POST. IF THE ADHESIVE BONDING SYSTEM IS USED, THE 3/4'' Ø X 1 5/8'' BOLT WITH WASHER SHALL BE REPLACED WITH A 3/4'' Ø X 6 1/2'' BOLT AND 2'' O.D. WASHER. ALL SPECIFICATIONS THAT APPLY TO THE 3/4'' Ø X 1 5/8'' BOLT SHALL APPLY TO THE 3/4'' Ø X 6 1/2'' BOLT. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.

NOTES

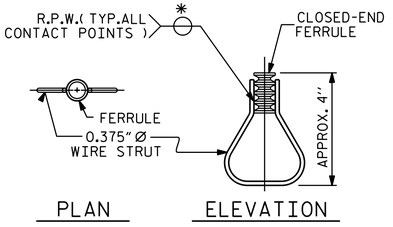
STRUCTURAL CONCRETE INSERT

THE STRUCTURAL CONCRETE INSERT ASSEMBLY SHALL CONSIST OF THE FOLLOWING COMPONENTS:

A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 1 1/2''.

B. 1 - 3/4'' Ø X 1 5/8'' BOLT WITH WASHER. BOLT SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLT AND WASHER SHALL BE GALVANIZED. AT THE CONTRACTORS OPTION, STAINLESS STEEL BOLT AND WASHER MAY BE USED AS AN ALTERNATE FOR THE 3/4'' Ø X 1 5/8'' GALVANIZED BOLT AND WASHER. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.

C. WIRE STRUT SHOWN IN THE CONCRETE INSERT ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI. AS AN OPTION, A 7/16'' Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.



STRUCTURAL CONCRETE INSERT

* EACH WELDED ATTACHMENT OF WIRE TO FERRULE SHALL DEVELOP THE TENSILE STRENGTH OF THE WIRE.

WBS NO. 47340

BUMCOMBE COUNTY

BRIDGE NO.: 32, 59, & 744

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

3 BAR METAL RAIL

NORTH CAROLINA PROFESSIONAL SEAL 031021 ENGINEER AMBER M. LEE

DocuSigned by: B04B5A4F2FAD484...

10/2/2017

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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	REV. 10/1/11		MAA/GM

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amlee

STD. NO. BMR7

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 2018 "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 ¾" 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

STD. NO. SN

REV. 6-16-95 EEM (c) RGW REV. 5-7-03 RWW (c) JTE REV. 10-1-11 MAA (c) GM
REV. 8-16-99 RWW (c) LES REV. 5-1-06 TLA (c) GM

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