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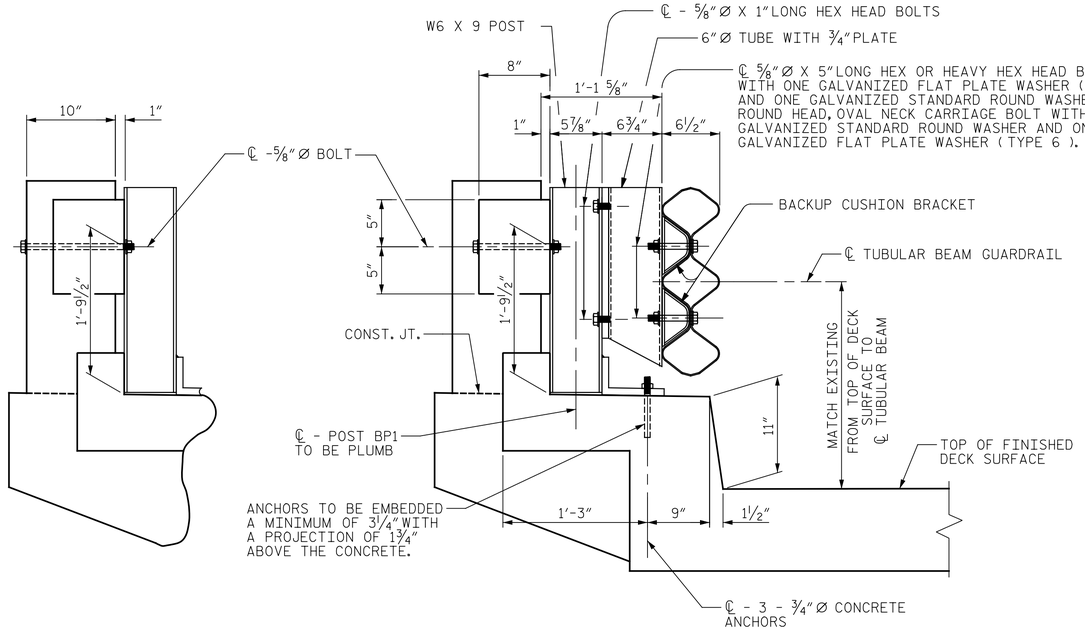
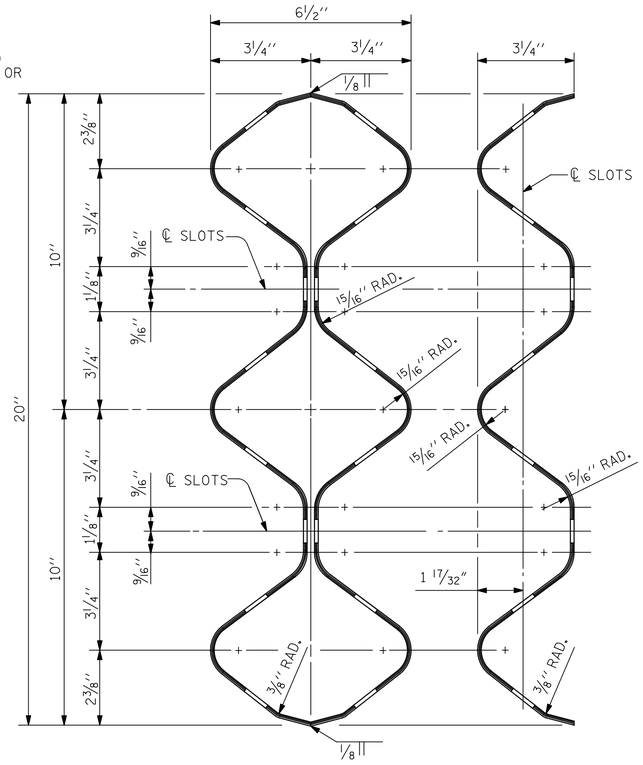


BOLT THRU CONCRETE POST

BOLT THRU CONCRETE RAIL

RETROFIT EXISTING RAIL WITH TUBULAR BEAM GUARDRAIL

(WITHOUT WEARING SURFACE)



SECTION THRU TUBULAR BEAM

SECTION THRU 20'' TRIPLE CORRUGATED BEAM

CONCRETE ANCHOR NOTES:

1. FOR ADHESIVELY ANCHORED BOLTS OR DOWELS, SEE STANDARD SPECIFICATIONS.
   A) THE 3/4"DIAMETER ANCHOR BOLTS SHALL BE TESTED USING LEVEL 2 FIELD TESTING AS SHOWN IN THE STANDARD SPECIFICATIONS. THE YIELD LOAD OF THE 3/4"DIAMETER ANCHOR IS 10 KIPS.
   B) THE SUCCESSFULLY TESTED ANCHOR MAY BE USED IN THE FINAL RAIL ASSEMBLY, IF APPROPRIATELY LOCATED. IF NOT SO LOCATED, OR IF THE ANCHOR FAILS THE TEST, THE TEST AREA SHALL BE REPAIRED AS DAMAGED CONCRETE, SEE ''GENERAL NOTES''.
2. EMBEDMENT SHOWN ON THE PLANS IS A MINIMUM, BUT THE MANUFACTURER'S RECOMMENDATIONS SHALL BE FOLLOWED.
3. THE 3/4"DIAMETER CONCRETE ANCHOR SHALL CONSIST OF A STUD, THREADED ON ONE END, WITH NUT AND WASHERS. THE ANCHOR SHALL BE GALVANIZED TO CONFORM TO THE REQUIREMENTS OF ASTM A-153.
4. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL ANCHORS MAY BE USED AS AN ALTERNATE FOR THE GALVANIZED CONCRETE ANCHORS. THEY SHALL MEET OR EXCEED THE MECHANICAL REQUIREMENTS FOR THE GALVANIZED ANCHORS. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.
5. EXPANSION ANCHORS WILL NOT BE PERMITTED.
6. FOR ANCHOR BOLTS, SEE STANDARD SPECIFICATIONS.

NOTES:

TUBULAR BEAM POSTS ARE TO BE MOUNTED AGAINST THE EXISTING CONCRETE RAIL.

HOLES FOR THE 5/8"DIAMETER BOLTS, THRU THE EXISTING CONCRETE RAIL OR POST, SHALL BE 3/4"DIAMETER.

3/4"AND 5/8"DIAMETER BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A-307 AND SHALL BE GALVANIZED TO CONFORM TO THE REQUIREMENTS OF ASTM A-153

GENERAL NOTES:

1. THE 20"TRIPLE TUBULAR CORRUGATED BEAM RAIL SECTION SHALL BE FABRICATED BY WELDING TWO (2) 20"TRIPLE CORRUGATED BEAM RAIL ELEMENTS AS SHOWN AND THE GUARDRAIL SHALL CONFORM TO THE NCDOT STANDARD SPECIFICATIONS EXCEPT AS NOTED AND SHOWN ON THE PLANS.
2. 20"TRIPLE TUBULAR CORRUGATED BEAM RAIL SHALL BE 10 GAGE.
3. POSTS, BASE ANGLES AND/OR BASE PLATES, 6"DIA. TUBES, AND OFFSET BLOCKS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A-36. SHIMS SHALL MEET THE REQUIREMENTS OF ASTM A-570 GRADE 33 OR A-611 GRADE C.
4. POSTS, BASE ANGLES AND/OR BASE PLATES, TUBES, BLOCKS AND SHIMS SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A-123.
5. POSTS ARE TO BE PLUMB. SHIMS MAY BE USED BENEATH THE ROADWAY EDGE OF THE BASE ANGLES AND/OR BASE PLATES AS NECESSARY FOR POST ALIGNMENT. PROVIDE ONE 1/8"AND TWO 1/16"STEEL SHIMS FOR 25% OF THE POSTS ON THE BRIDGE.
6. ''BP'' POST HEIGHT TO BE DETERMINED IN THE FIELD BY THE CONTRACTOR.
7. PROPOSED RAIL POST MAY BE SHIFTED SLIGHTLY TO CLEAR REINFORCING STEEL. STANDARD SLOTS MAY BE USED IN THE RAIL TO ALLOW ADJUSTMENT.
8. HOLES SHALL BE DRILLED HORIZONTAL OR VERTICAL USING A ROTARY DRILL OR A ROTARY IMPACT DRILL. IMPACT TOOLS WILL NOT BE PERMITTED. CARBIDE TIPPED BITS SHALL BE USED UNLESS REINFORCING STEEL IS ENCOUNTERED. AN APPROPRIATE BIT FOR DRILLING THROUGH REINFORCING STEEL SHALL BE USED WHEN NECESSARY. THE CONTRACTOR SHALL BE PREPARED TO DRILL THROUGH REINFORCING STEEL AT TIMES.
9. POST SPACINGS AS SHOWN ON THE PLANS SHALL BE CHECKED BEFORE HOLES ARE DRILLED IN THE 20"TRIPLE TUBULAR CORRUGATED BEAM RAIL. STANDARD SLOTS WILL BE ALLOWED. FIELD PUNCHING OF THE HOLES OR SLOTS WILL NOT BE PERMITTED.
10. A SEALANT WILL BE REQUIRED IN THE AREA OF THE ANCHOR BOLTS AND WILL BE PLACED IN THE FOLLOWING MANNER:
    A. BEFORE THE BASE PLATE HAS BEEN SET IN PLACE, IF THE GROUT DOES NOT COMPLETELY FILL THE ANCHOR HOLE, SEAL THE AREA AROUND EACH CONCRETE ANCHOR BOLT TO KEEP MOISTURE FROM ENTERING THE HOLE.
    B. AFTER THE BASE PLATE HAS BEEN SET IN PLACE AND BEFORE THE WASHERS AND NUTS HAVE BEEN PLACED ON THE BOLT, SEAL THE HOLE REMAINING AROUND THE ANCHOR BOLT.

    THE SEALANT SHALL BE A ONE-COMPONENT POLYSULFIDE GUN GRADE MEETING FEDERAL SPECIFICATION TT-S-230. SEALANT SHALL BE GRAY IN COLOR AND APPLIED ACCORDING TO THE MANUFACTURER'S RECOMMENDATION. THE FOLLOWING SEALANTS MEET THE ABOVE REQUIREMENTS:
    ''SONOLASTIC ONE PART'', MANUFACTURED BY SONNEBORN-DESOTO CO., DES PLAINES, ILLINOIS, 60018.
    ''THOROSPAN ONE COMPONENT'', MANUFACTURED BY STANDARD DRY WALL PRODUCTS, INC., MIAMI, FLORIDA, 33166.
    ''HORNFLEX ONE COMPONENT'', MANUFACTURED BY W. R. GRACE AND CO., CAMBRIDGE, MASSACHUSETTS, 02140.
11. ALL CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.
12. VERTICAL SLOTS IN THE 6" TUBE ALLOW FOR SOME VERTICAL ADJUSTMENT OF RAIL HEIGHT IN ORDER TO OBTAIN THE CENTERLINE OF RAIL HEIGHT OF 2'-1"ABOVE RIDING SURFACE.
13. THE SIZE OF FILLET WELDS SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT AASHTO ''STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES''. ELECTROSLAG WELDING WILL NOT BE PERMITTED.
14. LAP BEAM RAIL JOINTS IN DIRECTION OF TRAFFIC.
15. THE EXISTING DIMENSIONS AND BRIDGE CONDITIONS ARE FROM THE BEST INFORMATION AVAILABLE. PRIOR TO FABRICATION OF THE RAIL SYSTEM, THE CONTRACTOR SHALL FIELD VERIFY THE INFORMATION SHOWN ON THE PLANS AND NOTIFY THE ENGINEER IF ACTUAL DIMENSIONS AND CONDITIONS DIFFER.

PROJECT NO. I-5955

GUILFORD COUNTY

BRIDGE NO. 400299, 400339 & 400340

SHEET 1 OF 4

NORTH CAROLINA PROFESSIONAL SEAL 032492 ENGINEER JOHN A. YANNACCONE

DocuSigned by: John Yannaccone 781361754678456

11/17/2022

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

TUBULAR BEAM GUARDRAIL DETAILS

DRAWN BY : J. MYA DATE : 10/2022
CHECKED BY : J. YANNACCONE DATE : 10/2022

GANNETT FLEMING
One Glenwood Avenue
Suite 900
Raleigh, NC 27603
919-420-7660
NC Lic. No. F-0270

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NO.	BY:	DATE:	NO.	BY:	DATE:	SD-1
1			3			TOTAL SHEETS
2			4			127

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