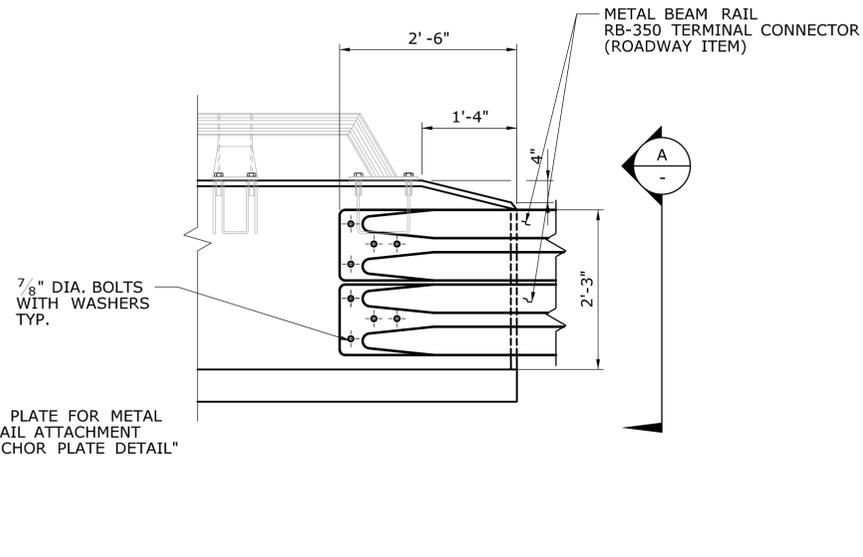
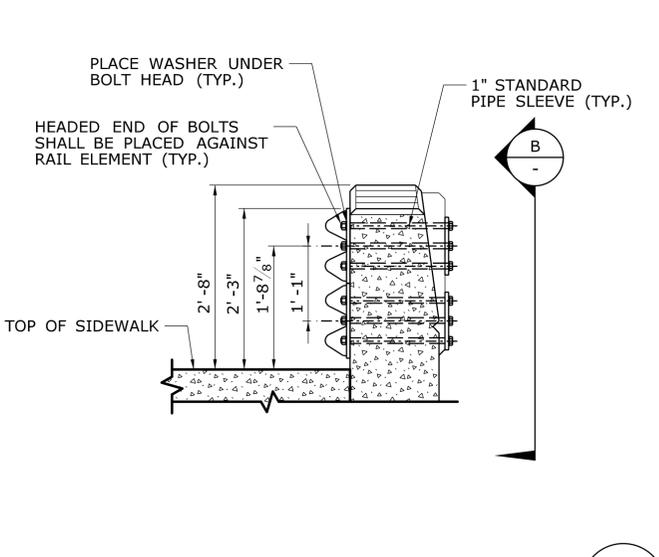


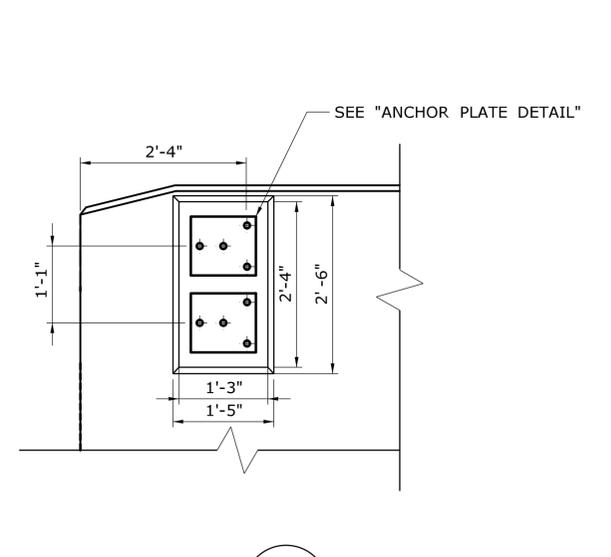
ELEVATION - PARAPET REINFORCEMENT
SCALE: 3/4" = 1'-0"



ELEVATION - METAL BEAM RAIL ATTACHMENT
SCALE: 3/4" = 1'-0"

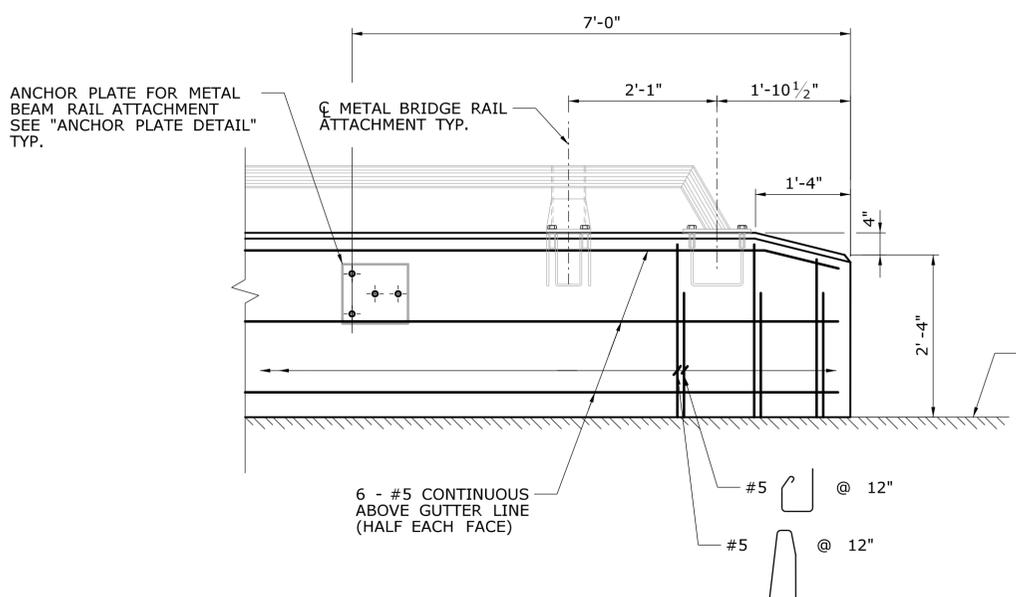


SECTION - METAL BEAM RAIL ATTACHMENT A
SCALE: 3/4" = 1'-0"

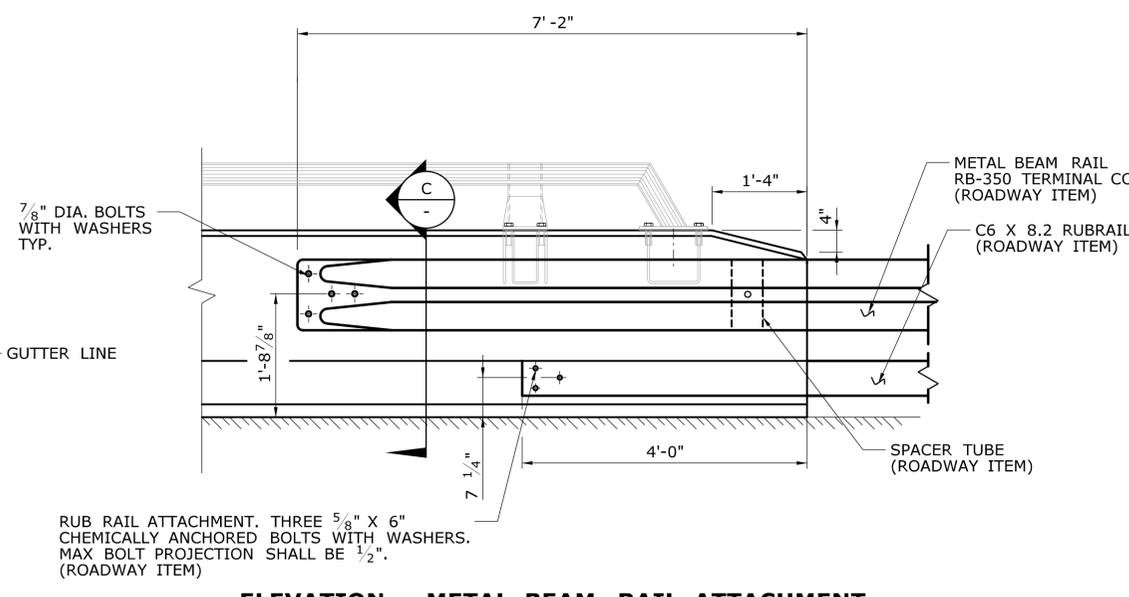


VIEW B
N.T.S.

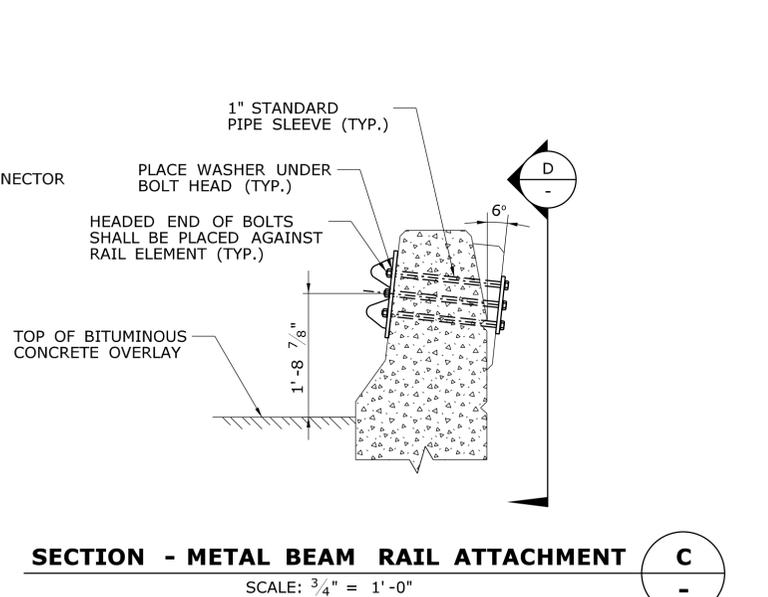
VERTICAL FACE PARAPET



ELEVATION - PARAPET REINFORCEMENT
SCALE: 3/4" = 1'-0"

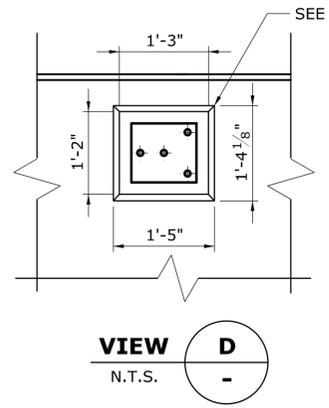


ELEVATION - METAL BEAM RAIL ATTACHMENT
SCALE: 3/4" = 1'-0"

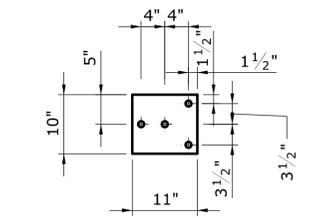


SECTION - METAL BEAM RAIL ATTACHMENT C
SCALE: 3/4" = 1'-0"

SAFETY SHAPE PARAPET



VIEW D
N.T.S.



ANCHOR PLATE DETAIL
N.T.S.

NOTES FOR METAL BEAM RAIL ATTACHMENTS

THE 7/8" DIAMETER ANCHOR BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A449.

NUTS SHALL BE HEAVY HEX AND CONFORM TO THE REQUIREMENTS OF ASTM A563, PROPERTY CLASS 10S.

WASHERS SHALL BE CIRCULAR, HARDENED WASHERS CONFORMING TO THE REQUIREMENTS OF ASTM F436

ALL ANCHOR BOLTS, NUTS, AND WASHERS SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH ASTM A153

ANCHOR PLATES SHALL CONFORM TO ASTM A36 AND SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A123.

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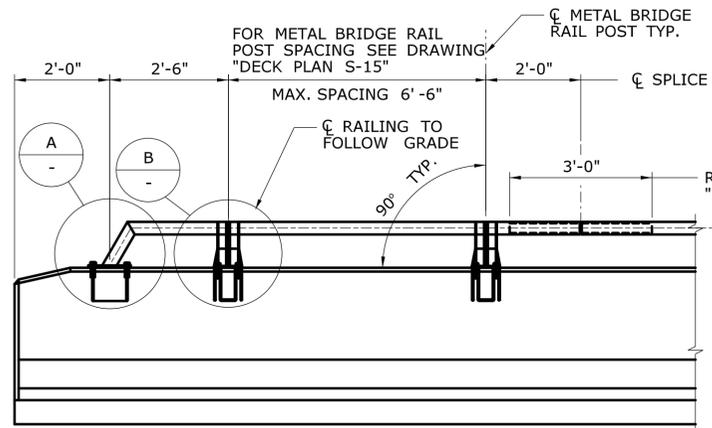
STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION

File name: ...MISCELLANEOUS BRIDGE RAILS.dgn

SIGNATURE/BLOCK: -
APPROVED BY: - DATE: -

PROJECT TITLE: -
DRAWING TITLE: **METAL BEAM RAIL ATTACHMENT**

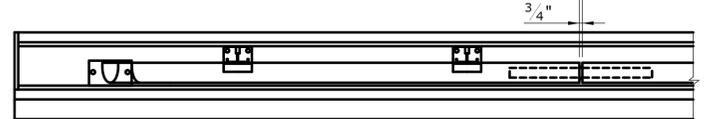
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ELEVATION

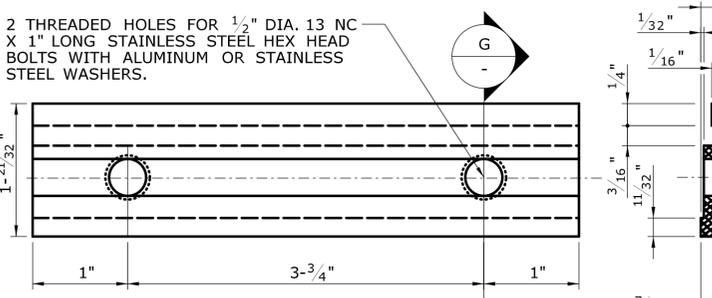
SCALE: 1/2" = 1'-0"

1/2" + OPEN JOINT DIMENSION AT REAL PANELS OVER OPEN JOINTS



PLAN

SCALE: 3/4" = 1'-0"

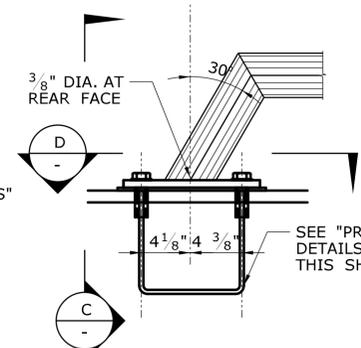


POST CONNECTION DEVICE DETAILS

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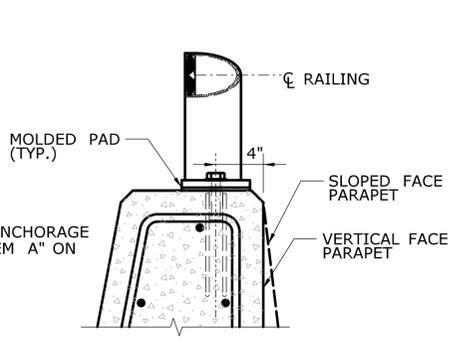
SECTION G

N.T.S.



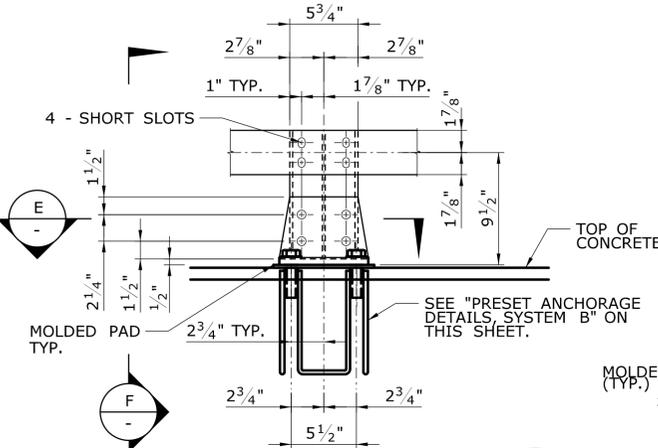
DETAIL-END RAIL A

SCALE: 1 1/2" = 1'-0"



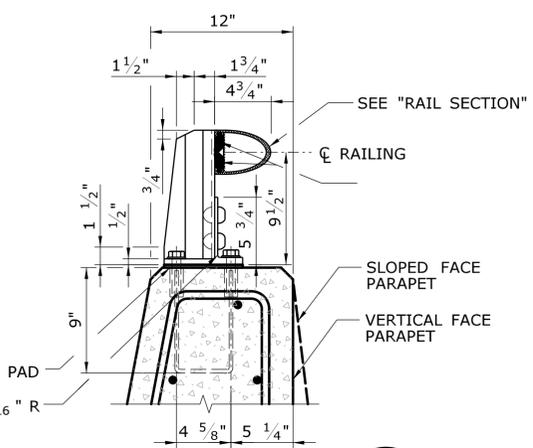
DETAIL-END RAIL C

SCALE: 1 1/2" = 1'-0"



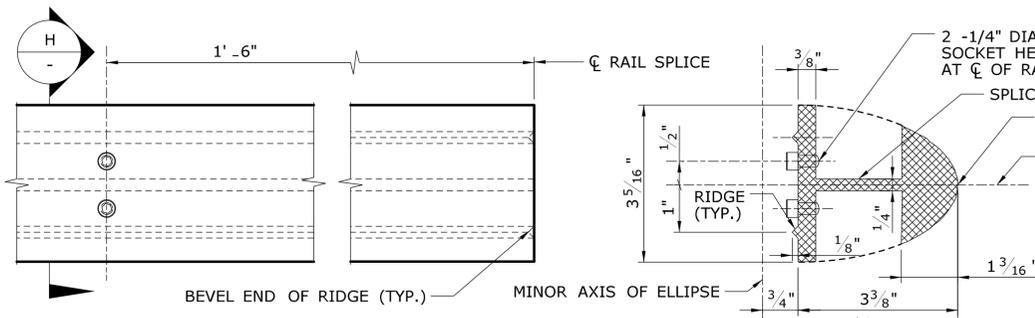
DETAIL-INTERIOR POST B

SCALE: 1 1/2" = 1'-0"



DETAIL-INTERIOR POST F

SCALE: 1 1/2" = 1'-0"



ELEVATION OF SPLICE BAR

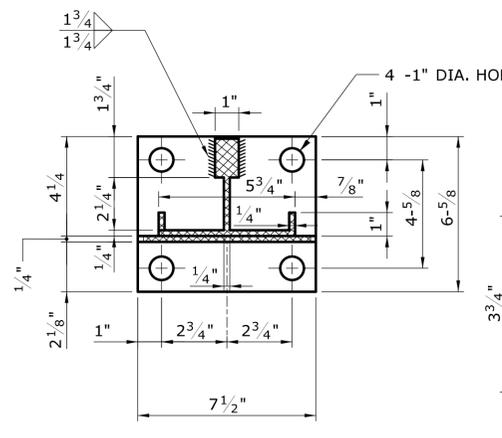
RAIL SPLICE DETAILS

SCALE: 6" = 1'-0"

3/4" DIA. STAINLESS STEEL HEAVY HEX HEAD BOLT AND STAINLESS STEEL WASHER

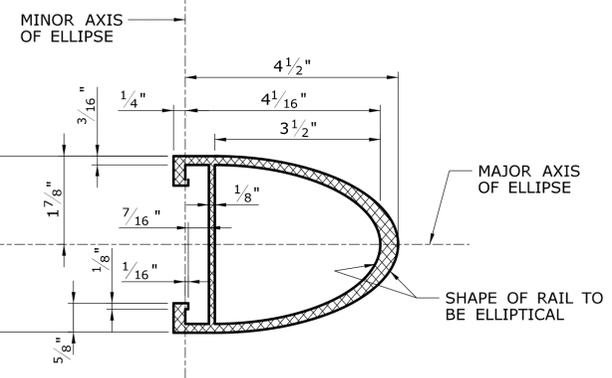
BOLT FOR PRESET ANCHORAGE

SCALE: 3" = 1'-0"



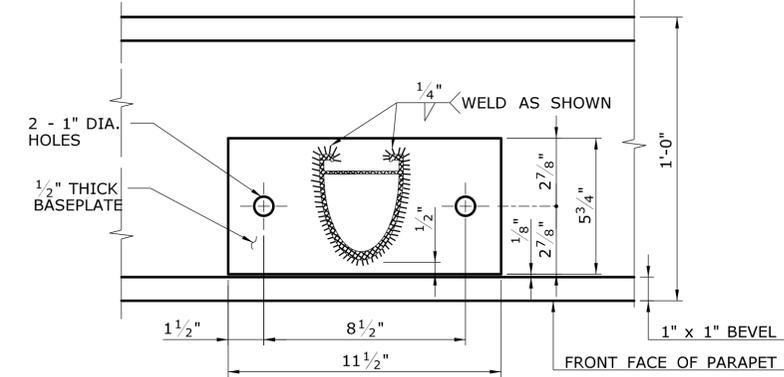
SECTION E

SCALE: 3" = 1'-0"



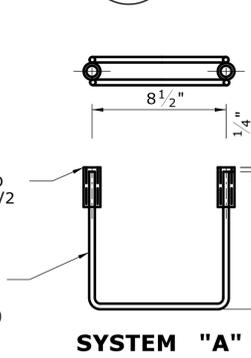
RAIL SECTION

SCALE: 6" = 1'-0"

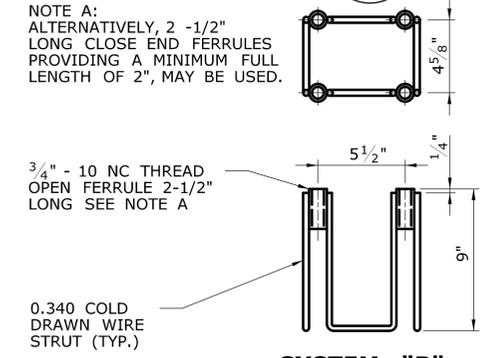


SECTION-END RAIL D

SCALE: 3" = 1'-0"



SYSTEM "A"



SYSTEM "B"

PRESET ANCHORAGE DETAILS

NOTES:

N.T.S.

ALUMINUM WELDING SHALL BE IN ACCORDANCE WITH THE AMERICAN WELDING SOCIETY "STRUCTURAL WELDING CODE-ALUMINUM", ANSI/AWS D1.2.

RIVETING SHALL BE DONE IN ACCORDANCE WITH ARTICLE 6.5 - RIVETING OF THE AASHTO SPECIFICATIONS FOR ALUMINUM STRUCTURES".

METAL BRIDGE RAIL: THE RAILING POSTS, POST CONNECTION DEVICES, SPLICE BARS AND RAILS SHALL BE EXTRUDED ALUMINUM AND CONFORM TO THE REQUIREMENTS OF ASTM B221, ALUMINUM ALLOY 6061-T6 OR 6005-T5.

SOCKET HEAD CAP SCREWS SHALL BE STAINLESS STEEL SHALL BE STAINLESS STEEL AND CONFORM TO THE REQUIREMENTS OF ASTM F837, GROUP 1 (ANSI TYPE 304).

ALL BOLTS SHALL BE STAINLESS STEEL AND CONFORMS TO THE REQUIREMENTS OF ASTM F593, GROUP 1, (ANSI TYPE 304). NUTS SHALL BE STAINLESS STEEL AND CONFORM TO THE REQUIREMENTS OF ASTM F594, GROUP 1. WASHERS SHALL BE STAINLESS AND CONFORM TO THE REQUIREMENTS OF ASTM A167, TYP302 THROUGH 305.

CONE POINT RIVETS SHALL CONFORM TO ASTM B316, ALUMINUM ALLOY 6061-T6 OR ASTM B221, ALUMINUM ALLOY 6061-T6.

LENGTHS OF RAIL ELEMENTS SHALL BE CONTINUOUS OVER FOUR RAIL POSTS WHEREVER POSSIBLE BUT IN NO CASE LESS THAN TWO. WELDING OF TWO OR MORE RAILS TO FORM AN ELEMENT WILL NOT BE ALLOWED. RAIL SPLICES SHALL BE LOCATED IN RAIL PANELS OVER OPEN JOINTS IN PARAPETS. SPLICE BARS SHALL HAVE A SLIDING FIT IN THE RAIL SECTIONS.

ALUMINUM RAILINGS SHALL BE CAREFULLY ADJUSTED PRIOR TO FIXING IN PLACE TO INSURE PROPER MATCHING AT ABUTTING JOINTS AND CORRECT ALIGNMENT AND CURVATURE THROUGHOUT THEIR LENGTH. AFTER INSTALLATION, ALL RAILS AND POSTS SHALL BE FREE OF BURRS, SHARP EDGES AND IRREGULARITIES.

PRESET ANCHORAGES: THE WIRE STRUTS SHALL BE COLD-DRAWN ADN CONFORM TO ASTM A510, GRADE 1030. THE FERRULES SHALL CONFORM TO ASTM 108, GRADE 12L14. AFTER FABRICATION, THE PRESET ANCHORAGES SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH ASTM A153. THE BOLTS SHALL BE "FREE RUNNING" IN THE FERRULES AFTER GALVANIZATION.

THE ANCHORAGE ASSEMBLIES SHALL BE INSTALLED PERPENDICULAR TO THE GRADE OF THE BRIDGE DECK. THE ANCHORAGES SHALL BE FIRMLY AND ACCURATELY HELD IN POSITION PRIOR TO AND DURING THE PLACING OF CONCRETE.

MOLDED PADS: MOLDED PADS SHALL BE MANUFACTURED FROM NEW UNVULCANIZED ELASTOMER AND UNUSED SYNTHETIC FIBERS, WITH A WEIGHT PROPORTION OF FIBER CONTENT EQUAL TO APPROXIMATELY ONE-HALF OF THE TOTAL WEIGHT OF THE PAD.

ANODIZING: METAL BRIDGE RAIL SHALL NOT BE ANODIZED.

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STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION

FILENAME: ...MISCELLANOUS BRIDGE RAILS.dgn

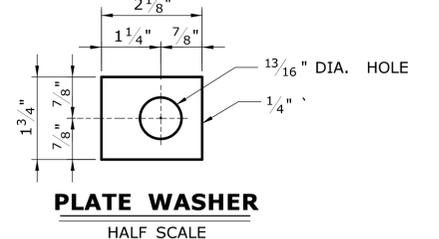
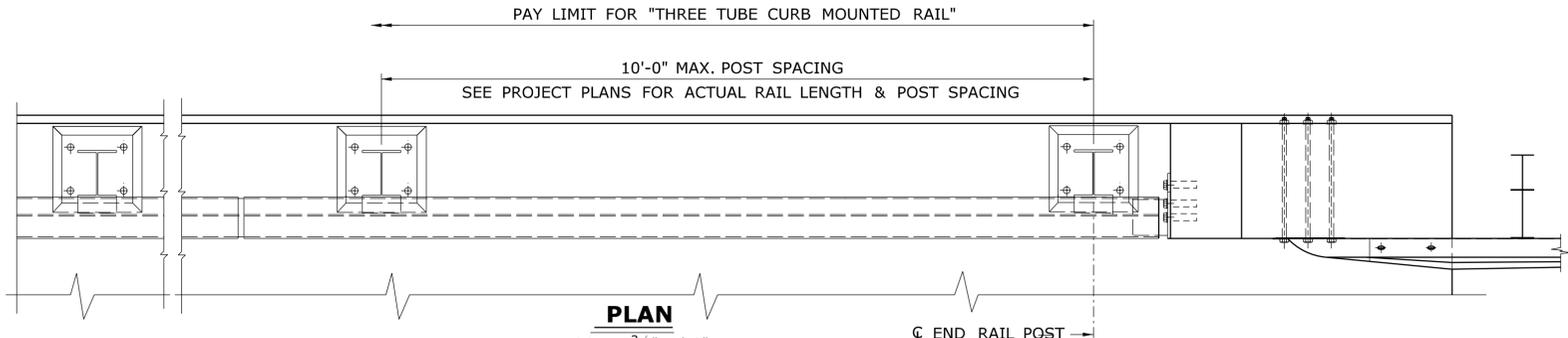
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NOTES
 THIS SHEET IS BASED ON A DESIGN DEVELOPED BY THE OREGON DEPARTMENT OF TRANSPORTATION WHICH MET ALL THE EVALUATION CRITERIA FOR AN NCHRP REPORT 350 BRIDGE RAIL AT TEST LEVEL 4 (TL-4). THIS DESIGN WAS TESTED BY THE TEXAS TRANSPORTATION INSTITUTE TO NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM (NCHRP) REPORT 350 TEST LEVEL 4 (TL-4) AND DOCUMENTED IN THREE SEPARATE REPORTS, ALL DATED MAY 2000, ENTITLED "NCHRP REPORT 350 TEST 4-10 OF THE OREGON 3-TUBE BRIDGE RAIL", "NCHRP REPORT 350 TEST 4-11 OF THE OREGON 3-TUBE BRIDGE RAIL", AND "NCHRP REPORT 350 TEST 4-12 OF THE OREGON 3-TUBE BRIDGE RAIL", RESPECTIVELY. THIS SYSTEM WAS ACCEPTED FOR USE ON THE NATIONAL HIGHWAY SYSTEM (NHS) BY THE FHWA BY MEMORANDUM DATED APRIL 22, 2003.

THIS RAIL SYSTEM IS ACCEPTABLE FOR USE AS A TL-4 RAIL SYSTEM AS A TRAFFIC RAIL (ADJACENT TO VEHICULAR TRAFFIC) AND ALSO AS A COMBINATION BARRIER (ALONG OUTER EDGES OF BRIDGE SIDEWALKS) AS DEFINED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.

FABRICATE RAILS TO THE HORIZONTAL AND VERTICAL ALIGNMENT OF THE STRUCTURE. INSTALL POSTS NORMAL TO GRADE.

WEIGHT: WEIGHT OF SYSTEM IS 70 POUNDS PER LINEAR FOOT. THIS INCLUDES WEIGHT OF THE POSTS AT AN ASSUMED SPACING OF 8' BUT NOT THE WEIGHT OF THE CONCRETE CURB.

MATERIALS:
 7/8" DIA. THREADED RODS FOR USE AS ANCHORAGES IN CONCRETE SHALL CONFORM TO ASTM A449. THREADED RODS SHALL BE BOLTED TO THE BASE PLATES USING 2 LEVELING NUTS AND WASHERS BELOW THE BASE PLATE AND STANDARD NUTS ABOVE THE BASE PLATE. ALL SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH ASTM A153.

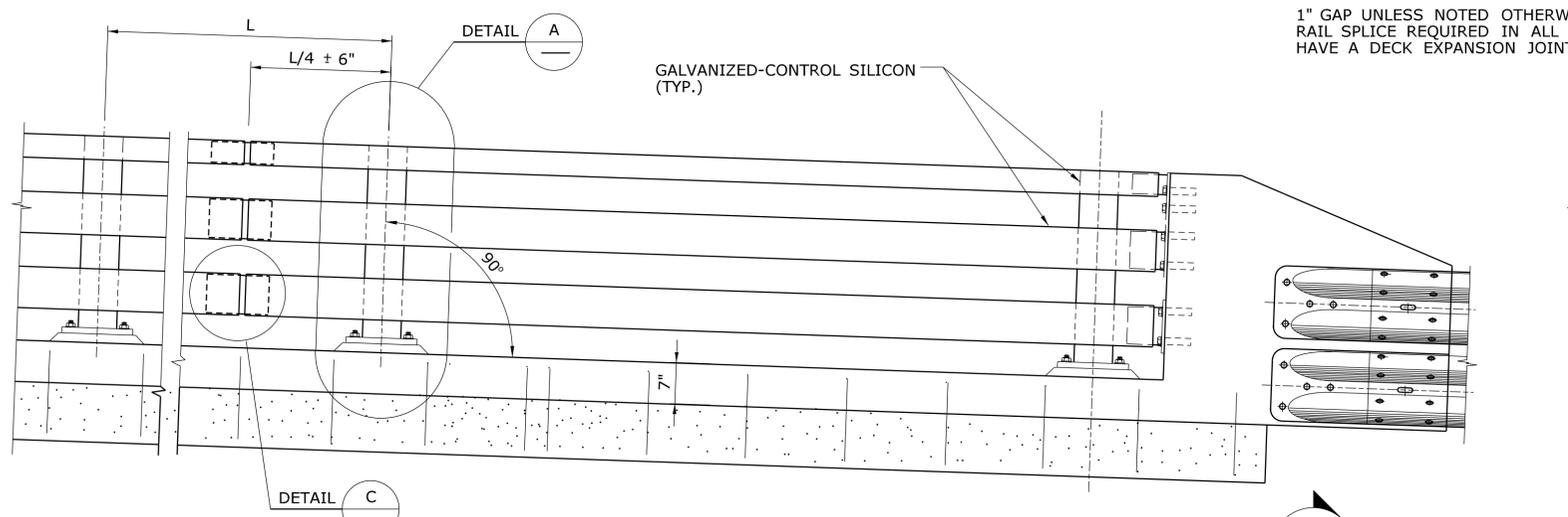
BOLTS USED FOR ATTACHING THE LOWER TUBES TO POSTS SHALL CONFORM TO ASTM A325. NUTS SHALL CONFORM TO ASTM A563 GRADES DH, DH3, C, C3 AND D OR A194 GRADES 2 OR 2H. WASHERS SHALL CONFORM TO ASTM F436. DOME HEAD BOLTS WITH WRENCH SLOTS USED FOR THE TOP RAIL SHALL CONFORM TO ASTM A307. ALL HARDWARE SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH ASTM A153.

TUBULAR MEMBERS SHALL CONFORM TO ASTM A500 GRADE B, A618 OR A501.

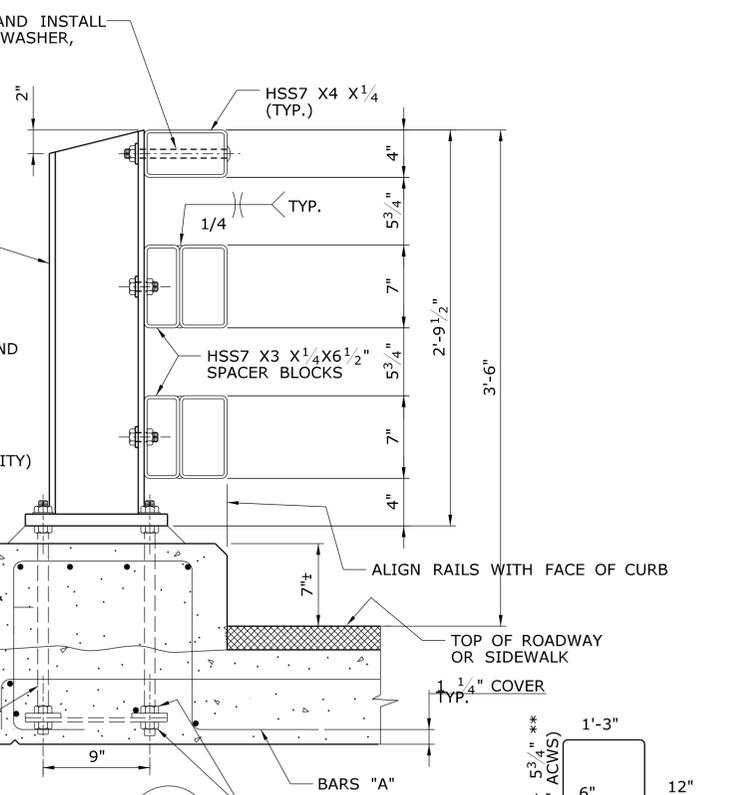
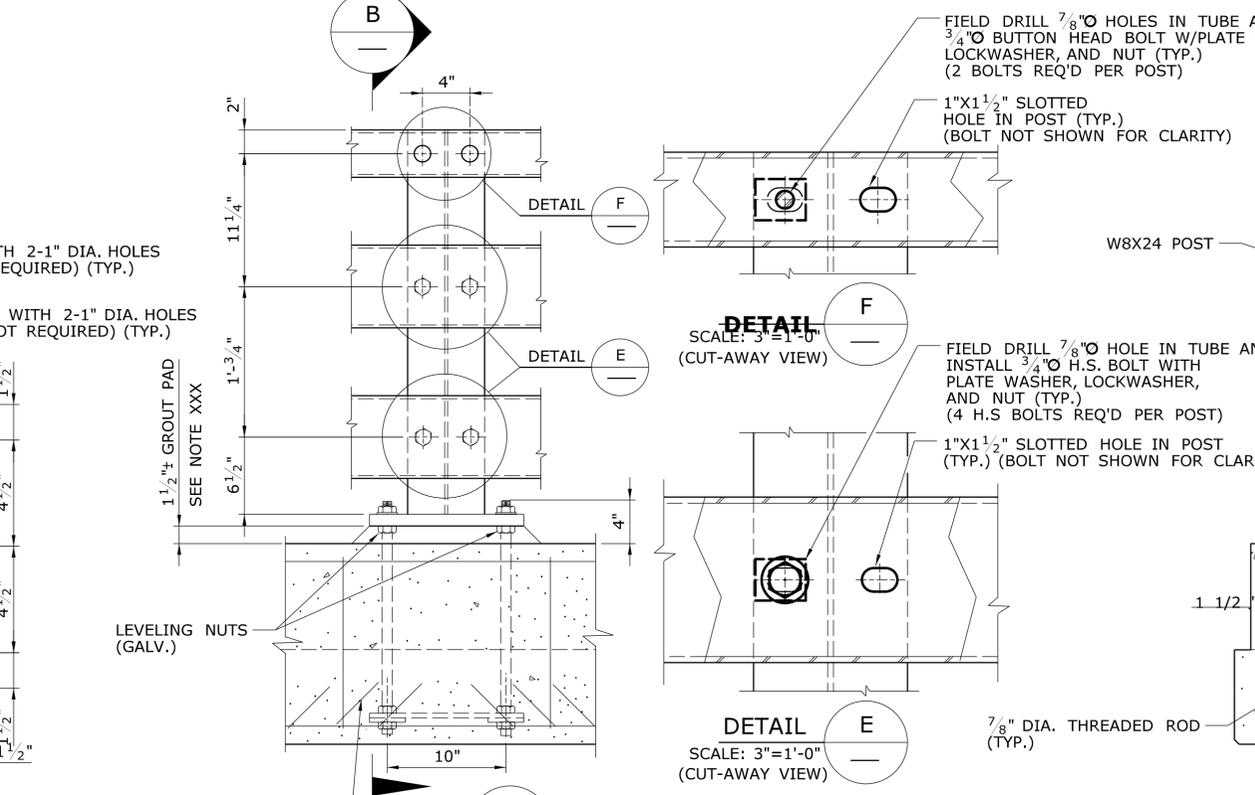
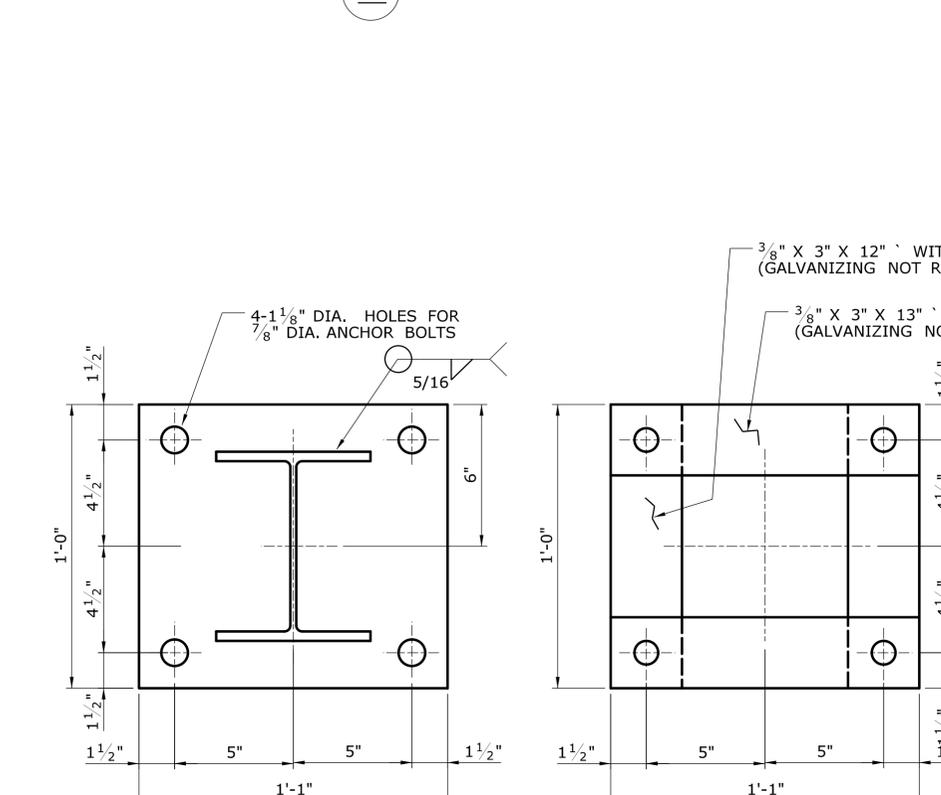
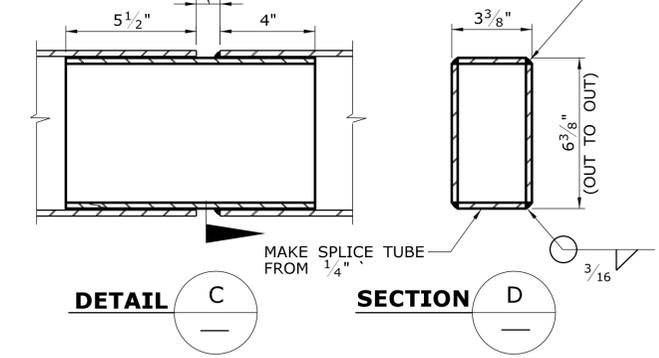
ALL OTHER STEEL SHALL CONFORM TO ASTM A36 UNLESS NOTED OTHERWISE.

HOT-DIP GALVANIZE STRUCTURAL STEEL INCLUDING FASTENERS AFTER FABRICATION. GALVANIZED-CONTROL SILICON MEANS SILICON CONTENT OF 0 TO 0.04% OR 0.15% TO 0.25%.

MORTAR: SEE SPECIAL PROVISIONS



1" GAP UNLESS NOTED OTHERWISE ON PLANS. RAIL SPLICE REQUIRED IN ALL PANELS THAT HAVE A DECK EXPANSION JOINT.



6-#5 X 5'-0" (WITH 6" 90° HOOK ONE END) AT EACH POST. BUNDLE WITH TOP TRANSVERSE DECK BARS @ 6" MAX. SLANT HOOK AS REQUIRED

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| | | | | | Filename: ...MISCELLANEOUS BRIDGE RAILS.dgn | | | | | | | | DRAWING TITLE: 3 TUBE BRIDGE RAIL |
| | | | | | | | | | | | | | SHEET NO. \$\$\$ |