STATE OF RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

BRIDGE DESIGN
STANDARD DETAILS

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14.20 ABUTMENTS, PIERS AND WALLS IN CUT
14.30 ABUTMENTS, PIERS AND WALLS ON FILL

Newly Issued Standard Drawings		
Std. Drawing No.	**Description**	**Type of System**
MASH TL-3		
RI-TL3A.0 to 3A.2	Two Bar Steel Bridge Rail & End Post Details	Steel Railing
MASH TL-4		
RI-TL-4A.0 & 4A.1	Vertical Face Concrete Parapet & End Post Details	Concrete Barrier
RI-TL-4B.0 to 4B.3	Four Bar Steel Bridge Rail & End Post Details	Steel Railing
RI-TL4C.0 to 4C.2	Bridge Combination Rail & End Post Details	Combination Steel Railing/Parapet
RI-TL4D.0	42" Barrier Transition to 36" RI Standard 40.2.1 Barrier	Concrete Barrier Transition
MASH TL-5		
RI-TL5A.0	54" Barrier at Piers and Substructure Elements	Concrete Barrier for Piers & Substructures
RI-TL5A.1	54" Barrier Transition to 42" F-Shape Barrier	Concrete Barrier Transition
RI-TL5B.0 & 5B.1	F-Shape Barrier Details - w/ HMA Wearing Surface & End Post Details	Concrete Barrier
RI-TL5B.0 & 5B.2	F-Shape Barrier Details - w/ Exposed Concrete Deck Surface & End Post Details	Concrete Barrier
RI-TL5C.0 to 5C.2	Bridge Combination Rail & End Post Details	Combination Steel Railing/Parapet
FENCE – (MASH TL-3 Compliant)		
RI-FENCE.0 to FENCE.3	Protective Screen Chain Link Fence	Chain Link
RI-FENCE.4	Snow Fence	Chain Link

** – SUPERSEDED BY TAC 0405 NOVEMBER 2022
SEE NEWLY ISSUED STANDARD DRAWINGS ABOVE

RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

APPROVED
Chady Tahmassian 7/21/15
MANAGING ENGINEER
BRIDGE DESIGN DATE

APPROVED
Georgette K Chahine 7/21/15
DEPUTY CHIEF ENGINEER DATE

APPROVED
David W. Fish 7-21-15
CHIEF ENGINEER DATE

LIST OF ABBREVIATIONS

A

ABUTMENT = ABUT.
ALTERNATE = ALT.
ANCHOR BOLT = A.B.
APPROVED = APPD.
APPROXIMATE = APPROX.
AVERAGE = AVG.

B

BEAM = BM.
BACK TO BACK = B TO B
BETWEEN = BTWN
BEARING = BRG.
BITUMINOUS = BIT.
BUILDING = BLDG.
BUILDING LINE = B.L.
BOLT CIRCLE = B.C.
BOTTOM = BOT.

C

CENTER TO CENTER = C TO C
CENTERLINE = ℄
CIRCLE = CIR.
CLEARANCE = CL.
COLUMN = COL.
CONCRETE = CONC.
CONDUIT = COND.
CONNECTION = CONN.
CONSTRUCTION = CONST.
CONTRACTION = CONTR.
COUNTERSINK = CSK.
COUPLING = CPLG.
CLASS I CONTROLLED LOW STRENGTH MATERIAL = CLSM

D

DETAIL = DET.
DIAGONAL = DIAG.
DIAPHRAGM = DIAPHM.
DIAMETER = DIA.
DIMENSION = DIM.
DRAWING = DWG.
DRAIN = DR.

E

EACH = EA.
EACH FACE = E.F.
ELEVATION = EL.
EXISTING = EXIST.
EXPANSION = EXP.

F

FAR FACE = F.F.
FAR SIDE = F.S.
FABRICATE = FAB.
FACE TO FACE = F TO F
FLANGE = FLG.
FLAT HEAD = F.H.
FOOTING = FTG.
FOUNDATION = FDN.
FURNISH, FABRICATE & ERECT = F.F. & E.

G

GAGE = GA.
GALVANIZE = GALV.
GRADE = GR.
GRATING = GRTG.
GROUND = GND.

H

HEIGHT = HGT.
HEXAGON = HEX.
HOT MIX ASPHALT = HMA
HORIZONTAL = HORIZ.

I

INCH = IN.
INFORMATION = INFO.
INSIDE DIAMETER = I.D.
INVERT = INV.

J

JOINT = JT.

L

LENGTH = LGTH.
LIGHTING = LTG.
LONG = LG.
LOAD & RESISTANCE FACTOR DESIGN = LRFD

M

MATERIAL = MATL.
MAXIMUM = MAX.
MEAN HIGH WATER = M.H.W.
MEAN SEA LEVEL = M.S.L.
MINIMUM = MIN.
MISCELLANEOUS = MISC.

N

NEAR FACE = N.F.
NEAR SIDE = N.S.
NOT TO SCALE = N.T.S.
NUMBER = NO.

O

ON CENTER = O.C.
OPENING = OPNG.
OUTSIDE DIAMETER = O.D.
OPTIONAL = OPT.

P

PLATE = ⅊
POINT OF VERTICAL CURVATURE = P.V.C.
POINT OF VERTICAL TANGENCY = P.V.T.
POLYVINYL CHLORIDE = PVC
POINT OF TANGENCY = P.T.
POUNDS PER SQUARE INCH = P.S.I.
POUNDS PER SQUARE FOOT = P.S.F.

R

RADIUS = RAD.
RAILROAD = RR
REQUIRED = REQD.
REINFORCING = REINF.
REHABILITATION = REHAB.
REMOVE & DISPOSE = R & D

S

SECTION = SECT.
SCHEDULE = SCH.
SCHEMATIC = SCHEM.
SHEET = SH.
SPACES = SP.
STATION = STA.
SYMMETRICAL = SYM.
STAY IN PLACE = S.I.P.

T

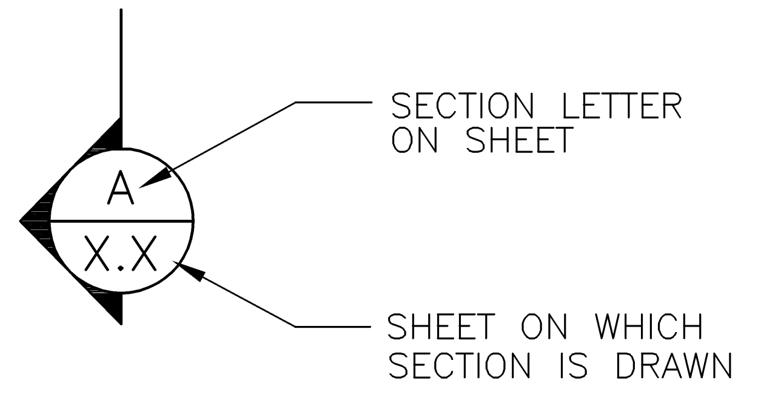
TOP = T
TYPICAL = TYP.

V

VARIES = VAR.
VERTICAL CURVE = V.C.
VERTICAL = VERT.

W

WELDED WIRE FABRIC = W.W.F.
WITH = W/
WIDE FLANGE = W
WORKING POINT = W.P.



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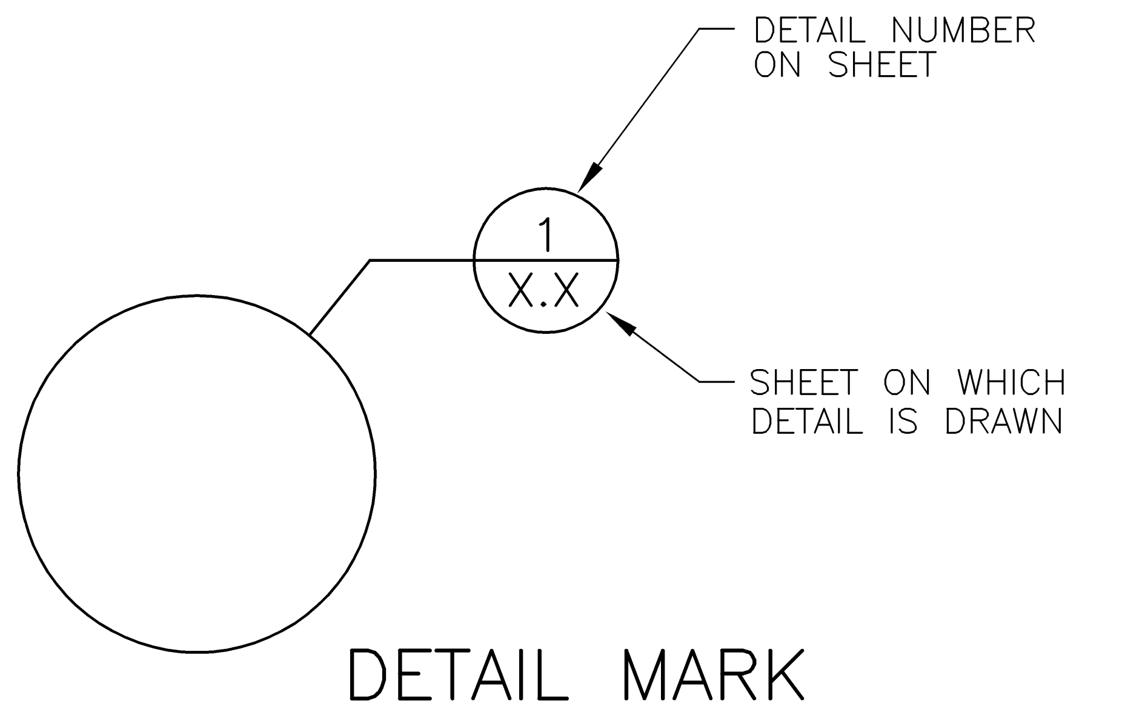

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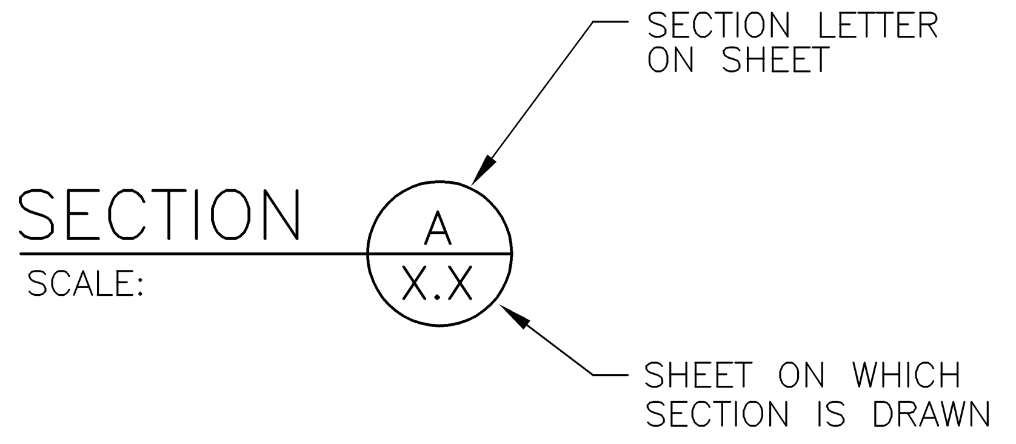

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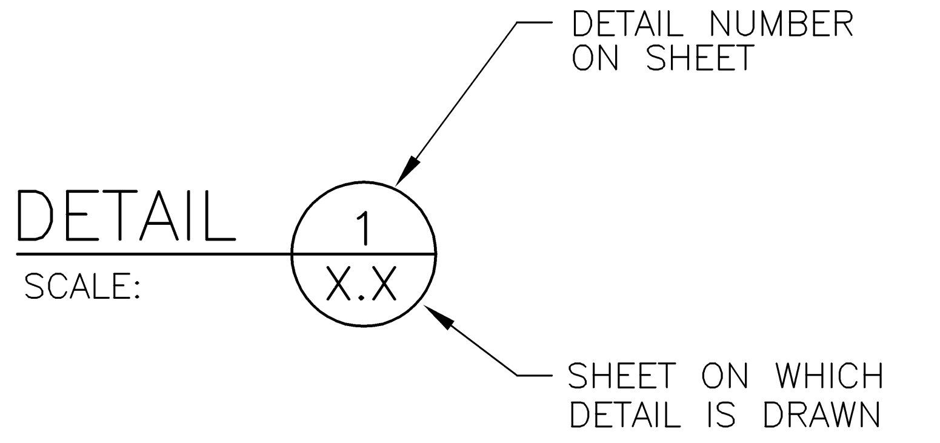

DETAIL TITLE

SECTION & DETAIL DESIGNATIONS

REVISIONS	
No.	DATE

RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

BRIDGE STANDARDS

LIST OF ABBREVIATIONS

DRAWING NUMBER: A1

P:\10000\10027.00 On-Call Bridge Design\10027.20 Bridge Design Std Details_Drawings\Structural_Current_Drawings\Ris-a1.dwg, 7/22/2015 1:30:42 PM, JTA

DESIGNER NOTES:

1. *THROUGHOUT THESE GENERAL NOTES AND THROUGHOUT THE STANDARD DRAWINGS, ALL INSTRUCTIONAL COMMENTS TO THE DESIGNER ARE INDICATED IN ITALICS.*
2. *THE DESIGNER MUST THOROUGHLY REVIEW THE CONTENT OF ALL THE GENERAL NOTES (AS SHOWN ON SHEETS 1 THROUGH 4) FOR THEIR APPLICABILITY TO A SPECIFIC PROJECT AND SHALL MODIFY ANY NOTES AS NECESSARY. ANY NOTES THAT ARE NOT APPLICABLE MUST BE DELETED.*
3. *WHERE IT HAS BEEN IDENTIFIED IN THE GENERAL NOTES, THE YEAR AND/OR EDITION OF THE PROJECT DESIGN SPECIFICATIONS MUST BE INCLUDED.*
4. *ELECTRONIC COPIES OF THESE NOTES ARE AVAILABLE UPON REQUEST.*

GENERAL NOTES

1. ALL CONSTRUCTION INDICATED ON THESE PLANS SHALL BE IN ACCORDANCE WITH:
    - THE *(*STATE YEAR*)* EDITION OF AND SUPPLEMENTS TO THE RHODE ISLAND DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION (RI STANDARD SPECIFICATIONS).
    - THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO) LRFD BRIDGE CONSTRUCTION SPECIFICATIONS, *(*STATE NUMBER*) EDITION, (*STATE YEAR*),* INCLUDING THE LATEST INTERIM REVISIONS.
    - THE SPECIFICATIONS ACCOMPANYING THESE PLANS.
2. DIMENSIONS, STATIONS, AND ELEVATIONS ARE SHOWN TO THE NEAREST ONE-HUNDREDTH OF A FOOT OR ONE-EIGHTH OF AN INCH, EXCEPT STRUCTURAL STEEL DIMENSIONS WHICH ARE TO THE NEAREST ONE-SIXTEENTH OF AN INCH.
3. ALL ELEVATIONS ARE REFERENCED TO THE NATIONAL GEODETIC VERTICAL DATUM OF *(*DESIGNER TO SPECIFY - NGVD 29, NAVD 88, OR PROVIDENCE M.H.W.)* .
4. COORDINATES USED ON THESE PLANS ARE BASED ON THE STATEWIDE COORDINATE SYSTEM, THE NORTH AMERICAN DATUM OF 1983 (NAD 83).
5. TOPOGRAPHIC CONDITIONS WERE OBTAINED FROM AERIAL PHOTOGRAMMETRY. ACCURACY OF VERTICAL TOPOGRAPHY IS WITHIN (**DESIGNER TO SPECIFY ACCURACY, FOR EXAMPLE "ONE-HALF OF A FOOT"**).
6. FOR BENCH MARKS AND TIES SEE HIGHWAY LOCATION PLANS.
7. ANGLES ARE SHOWN TO THE NEAREST SECOND.
8. ALL FOOTINGS SHALL BE APPROVED BY THE ENGINEER AS TO DIMENSIONS, ELEVATIONS, AND SUITABILITY OF FOUNDATION MATERIAL BEFORE THE PLACING OF CONCRETE.
9. ALL WORKING POINTS ARE SHOWN AT THE CENTERLINES OF BEARINGS OF ABUTMENTS AND AT THE CENTERLINES OF PIERS, UNLESS OTHERWISE NOTED.
10. ALL ABUTMENTS AND WALLS ARE DRAWN LOOKING AT THE EXPOSED FACES.
11. IF THIS PROJECT IS ON A HURRICANE EVACUATION AND DIVERSIONARY ROUTE AS DESIGNATED ON THE COVER SHEET, THE CONTRACTOR IS ADVISED THAT, UPON 12 (TWELVE) HOURS NOTICE, THE ROADWAY SHALL BE OPEN TO EVACUEES AND EMERGENCY PERSONNEL. ANY EXTRA WORK NECESSARY TO COMPLY WITH THIS REQUIREMENT WILL BE REIMBURSED UNDER FORCE ACCOUNT PROCEDURES.
12. THE EXISTING UTILITIES SHOWN ON THE PLANS ARE APPROXIMATE AND WERE LOCATED USING THE BEST AVAILABLE INFORMATION. NO BUILDING SERVICE CONNECTIONS (ELECTRIC, TELEPHONE, GAS, WATER, SANITARY AND OTHERS) ARE SHOWN. THE CONTRACTOR IS TO ASSUME THAT SERVICES TO ALL BUILDINGS ARE PRESENT.
13. BOTH FEDERAL AND STATE LAW (RI. GENERAL LAW 39-1.2) REQUIRE NOTIFICATION OF APPROPRIATE UTILITY COMPANIES BEFORE DIGGING, TRENCHING, BLASTING, DEMOLISHING, BORING, BACK FILLING, GRADING, LANDSCAPING, OR OTHER EARTH MOVING OPERATIONS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO NOTIFY ALL UTILITY COMPANIES (INCLUDING THROUGH THE "DIG SAFE" PROGRAM) TO ENSURE THAT ALL UTILITIES, BOTH UNDERGROUND AND OVERHEAD, HAVE BEEN MARKED BEFORE COMMENCEMENT OF SUCH WORK. THE CONTRACTOR SHOULD UNDERSTAND THAT NOT ALL UTILITIES SUBSCRIBE TO THE "DIG SAFE" PROGRAM. ANY DAMAGE TO EXISTING UTILITIES MARKED IN THE FIELD, OR AS A RESULT OF FAILING TO CONTACT THE APPROPRIATE UTILITY COMPANIES, SHALL BE REPAIRED OR REPLACED (AS DEEMED APPROPRIATE BY THE STATE AND/OR THE IMPACTED UTILITY COMPANY) AT NO ADDITIONAL COST TO THE STATE.

DESIGN DATA

1. DESIGN SPECIFICATIONS

- THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, *(* STATE NUMBER)* EDITION, *(* STATE YEAR),* INCLUDING ALL INTERIM REVISIONS TO DATE.
- THE RHODE ISLAND LRFD BRIDGE DESIGN MANUAL *(* STATE YEAR)* EDITION INCLUDING ALL REVISIONS TO DATE.
- ALL OTHER APPLICABLE DESIGN SPECIFICATIONS ARE REFERENCED IN SECTION 1 OF THE RHODE ISLAND LRFD BRIDGE DESIGN MANUAL DATED *(* STATE YEAR)*.
- THE *(* STATE YEAR)* REVISION OF AND SUPPLEMENTS TO THE RHODE ISLAND DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION (RI STANDARD SPECIFICATIONS).
- IN CASE OF CONFLICT, THE RHODE ISLAND LRFD BRIDGE DESIGN MANUAL SHALL GOVERN.

2. LOAD MODIFIERS

THE LOAD MODIFIERS FOR THIS PROJECT ARE AS FOLLOWS:

- THE LOAD MODIFIER FOR DUCTILITY SHALL BE TAKEN AS 1.0 FOR ALL LIMIT STATES.
- THE LOAD MODIFIER FOR REDUNDANCY SHALL BE TAKEN AS *(* STATE VALUE FOR EACH LIMIT STATE).*
- THE LOAD MODIFIER FOR OPERATIONAL IMPORTANCE SHALL BE TAKEN AS *(* STATE VALUE FOR EACH LIMIT STATE)*.

3. LOAD FACTORS

ALL LOAD FACTORS SHALL BE IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, EXCEPT AS MODIFIED IN THE RHODE ISLAND LRFD BRIDGE DESIGN MANUAL (SPECIFIED BELOW).

- THE LOAD FACTOR FOR TEMPERATURE GRADIENT SHALL BE TAKEN AS *(* STATE VALUE FOR EACH LIMIT STATE)*.
- THE LOAD FACTOR FOR LIVE LOAD FOR THE EXTREME EVENT I SHALL BE TAKEN AS ZERO.
- THE LOAD FACTOR FOR DEAD LOAD FOR THE EXTREME EVENT I AND EXTREME EVENT II SHALL BE TAKEN AS 1.0
- THE LOAD FACTOR FOR SETTLEMENT FOR ALL LIMIT STATES SHALL BE TAKEN AS 1.0

4. LIVE LOADS

- THE DESIGN VEHICULAR LIVE LOAD SHALL BE THE HL-93 DESIGNATION ADJUSTED FOR DYNAMIC LOAD ALLOWANCE AND MULTIPLE PRESENCE FACTOR.
- THE DESIGN PEDESTRIAN LIVE LOAD SHALL BE (** DESIGNER TO SPECIFY VALUE OF IN ACCORDANCE WITH RI LRFD 3.4.2*) PSF.

5. FOUNDATION DESIGN DATA

SPREAD FOOTINGS:

THE FACTORED BEARING RESISTANCE FOR THE VARIOUS TYPES OF BEARING MATERIAL ARE AS FOLLOWS:

		FACTORED BEARING RESISTANCE (KSF)	
LOCATION	TYPE OF BEARING MATERIAL	STRENGTH LIMIT STATES	EXTREME LIMIT STATES
*	*	*	*
*	*	*	*

*(*DESIGNER TO SPECIFY THE NOMINAL BEARING RESISTANCE AND ASSOCIATED TOLERABLE MOVEMENT FOR EACH OF THE ABOVE LIMIT STATES*).*

DEEP FOUNDATIONS:

THE FACTORED AXIAL AND UPLIFT RESISTANCES FOR THE VARIOUS DEEP FOUNDATION TYPES ARE AS FOLLOWS:

		FACTORED AXIAL RESISTANCE (KIPS)			
		GEOTECHNICAL		STRUCTURAL	
LOCATION	TYPE	STRENGTH LIMIT STATES	EXTREME LIMIT STATES	STRENGTH LIMIT STATES	EXTREME LIMIT STATES
*	*	*	*	*	*
*	*	*	*	*	*

		FACTORED UPLIFT RESISTANCE (KIPS)	
LOCATION	TYPE	STRENGTH LIMIT STATES	EXTREME LIMIT STATES
*	*	*	*
*	*	*	*

*(*DESIGNER TO COMPLETE TABLE*)*

- THE FACTORED DESIGN AXIAL RESISTANCE AT EACH LOCATION IS THE LESSER VALUE OF THE FACTORED GEOTECHNICAL AND THE FACTORED STRUCTURAL RESISTANCES INDICATED.
- THE FACTORED GEOTECHNICAL AXIAL RESISTANCE FOR THE STRENGTH LIMIT STATE IS BASED ON THE NOMINAL AXIAL RESISTANCE AS DETERMINED USING *(*DESIGNER TO SPECIFY METHOD*)* AND A RESISTANCE FACTOR OF *(*DESIGNER TO SPECIFY RESISTANCE FACTOR*)* .
- THE FACTORED GEOTECHNICAL AXIAL RESISTANCE FOR THE EXTREME LIMIT STATE IS BASED ON THE NOMINAL AXIAL RESISTANCE AS DETERMINED USING *(*DESIGNER TO SPECIFY METHOD*)* AND A RESISTANCE FACTOR OF *(*DESIGNER TO SPECIFY RESISTANCE FACTOR*)* .
- THE FACTORED GEOTECHNICAL UPLIFT RESISTANCE FOR THE STRENGTH LIMIT STATE IS BASED ON THE NOMINAL UPLIFT RESISTANCE AS DETERMINED USING *(*DESIGNER TO SPECIFY METHOD*)* AND A RESISTANCE FACTOR OF *(*DESIGNER TO SPECIFY RESISTANCE FACTOR*)* .
- THE FACTORED GEOTECHNICAL UPLIFT RESISTANCE FOR THE EXTREME LIMIT STATE IS BASED ON THE NOMINAL UPLIFT RESISTANCE AS DETERMINED USING *(*DESIGNER TO SPECIFY METHOD*)* AND A RESISTANCE FACTOR OF *(*DESIGNER TO SPECIFY RESISTANCE FACTOR*)* .

6. WIND LOADING DESIGN DATA

THE WIND LOADING DESIGN SHALL BE IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, THE RHODE ISLAND LRFD BRIDGE DESIGN MANUAL, AND AS MODIFIED HEREIN.

- EXCEPT DURING CONSTRUCTION, THE DESIGN WIND PRESSURE IS BASED ON A DESIGN WIND SPEED OF (**DESIGNER TO SPECIFY - REFER TO RI LRFD SECTION 3**) MPH.
- THE DESIGN WIND PRESSURES DURING CONSTRUCTION SHALL BE AS SPECIFIED UNDER THE NOTES TITLED "GENERAL NOTES REGARDING TEMPORARY CONSTRUCTION CONDITIONS".

7. TRAFFIC DATA

*(*THE DESIGNER SHALL PROVIDE ALL PERTINENT TRAFFIC DATA SUCH AS ADT, DHV, AND PERCENT TRUCK TRAFFIC*).*

8. HYDRAULIC AND SCOUR DATA

*(*THE DESIGNER SHALL PROVIDE ALL PERTINENT HYDRAULIC DATA IN ACCORDANCE WITH THE RI LRFD BRIDGE DESIGN MANUAL, SECTION 2*).*

9. THERMAL DESIGN FORCE DATA

UNIFORM TEMPERATURE EFFECTS HAVE BEEN TAKEN INTO CONSIDERATION IN ACCORDANCE WITH THE PROCEDURE *(*DESIGNER TO SPECIFY PROCEDURE A OR B - REFER TO RI LRFD SECTION 3*)* OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS. THE MINIMUM DESIGN TEMPERATURE SHALL BE *(* STATE VALUE)* DEGREES F, AND THE MAXIMUM TEMPERATURE SHALL BE *(* STATE VALUE)* DEGREES F.

10. SEISMIC DESIGN DATA *(*FOR CRITICAL, NON-CRITICAL, OR SINGLE SPAN STRUCTURES, THE DESIGNER SHALL MODIFY AND/OR SPECIFY ONLY THE NOTES WHICH APPLY*)*

- THE SEISMIC ANALYSIS AND DESIGN SHALL BE IN ACCORDANCE WITH THE RHODE ISLAND LRFD BRIDGE DESIGN MANUAL *(*DESIGNER TO ALSO REFERENCE SITE-SPECIFIC STUDY REPORT IF ONE WAS PERFORMED*).*
- THE COMBINATION OF SEISMIC FORCE EFFECTS IS IN ACCORDANCE WITH THE RHODE ISLAND LRFD BRIDGE DESIGN MANUAL.
- THIS BRIDGE HAS BEEN CLASSIFIED AS *(*DESIGNER TO SPECIFY "CRITICAL" OR "NON-CRITICAL"*)* .
- THE SITE HAS BEEN CLASSIFIED AS SITE CLASS *(*DESIGNER TO INDICATE A, B, C, D, E OR F*).*
- SCOUR AND LIQUEFACTION EFFECTS HAVE BEEN CONSIDERED IN THE SEISMIC ANALYSIS OF THIS BRIDGE.
- THE SEISMIC ANALYSIS OF THIS BRIDGE WAS BASED ON THE FOLLOWING DESIGN SPECTRA: *(*DESIGNER TO PROVIDE VALUES BASED ON RI LRFD BRIDGE DESIGN MANUAL OR A SITE SPECIFIC STUDY IF ONE WAS PERFORMED*).*

HORIZONTAL DESIGN RESPONSE SPECTRA			
UPPER LEVEL EARTHQUAKE (3% IN 75 YEARS, 5% DAMPING)		LOWER LEVEL EARTHQUAKE (15% IN 75 YEARS, 5% DAMPING)	
PERIOD (SEC)	Sa (g)	PERIOD (SEC)	Sa (g)
*	*	*	*
*	*	*	*
*	*	*	*
*	*	*	*
*	*	*	*
*	*	*	*
*	*	*	*

*(*DESIGNER TO COMPLETE TABLE*)*

REVISIONS	
No.	DATE

RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

BRIDGE STANDARDS

GENERAL NOTES
SHEET 1

DRAWING NUMBER: A2

MATERIALS

STRUCTURAL STEEL:

- AASHTO DESIGNATION M 270, GRADE 36
- AASHTO DESIGNATION M 270, GRADE 50
- AASHTO DESIGNATION M 270, GRADE 50W

*(*DESIGNER TO LIST ALL OTHER STEEL TYPES SPECIFIED ON A PROJECT*)*

REINFORCING STEEL:

- AASHTO DESIGNATION M 31, GRADE 60

PRESTRESSING STEEL:

- UNCOATED SEVEN WIRE LOW-RELAXATION STRAND, AASHTO DESIGNATION M 203, GRADE 270
- UNCOATED HIGH STRENGTH STEEL BAR, AASHTO DESIGNATION M 275

CONCRETE STRENGTHS:

- CLASS HP ¾" f'c=5,000 PSI

  **DESIGNER TO INDICATE ALL COMPONENTS WITH ABOVE CLASS OF CONCRETE **

- CLASS XX ¾" f'c=4,000 PSI

  **DESIGNER TO INDICATE ALL COMPONENTS WITH ABOVE CLASS OF CONCRETE **

- CLASS A ¾" f'c=3,000 PSI

  **DESIGNER TO INDICATE ALL COMPONENTS WITH ABOVE CLASS OF CONCRETE **

- CLASS MC ¾" f'c=3,500 - 5,000 PSI

  **DESIGNER TO INDICATE ALL COMPONENTS WITH ABOVE CLASS OF CONCRETE **

(DESIGNER - THE STRENGTHS SHOWN ABOVE ARE THE MINIMUMS FROM THE RI STANDARD SPECIFICATIONS. HIGHER CONCRETE STRENGTH MAY BE SPECIFIED AS PER THE DESIGN, SUBJECT TO APPROVAL OF THE DEPARTMENT).*

FOUNDATIONS

1. THE FURNISHING AND INSTALLING OF THE DEEP FOUNDATIONS TYPES SPECIFIED IN THIS CONTRACT SHALL BE IN ACCORDANCE WITH *(*DESIGNER TO REFERENCE THE CONTRACT SPECIAL PROVISIONS OR THE RI STANDARD SPECIFICATIONS AS APPLICABLE*)* .

2. *(*DESIGNER TO INCLUDE A NOTE REGARDING THE DISCLOSURE AND AVAILABILITY OF PROJECT GEOTECHNICAL INFORMATION, DATA AND REPORTS IN ACCORDANCE WITH THE RI LRFD BRIDGE DESIGN MANUAL, SECTION 10*).*

CONCRETE NOTES

1. CLASSES OF CONCRETE SHALL BE HIGH PERFORMANCE CLASS HP, CLASS XX, CLASS A, AND CLASS MC AS DESCRIBED IN THE RI STANDARD SPECIFICATIONS AND THE SPECIAL PROVISIONS OF THE SPECIFICATIONS. REFER TO THE "MATERIAL" NOTES FOR CLASSES OF CONCRETE SPECIFIED FOR VARIOUS COMPONENTS.

2. THE CONTRACTOR MAY, AT THE APPROVAL OF THE ENGINEER, PROPOSE THE USE OF SELF-CONSOLIDATING CONCRETE FOR ANY CLASS OF CONCRETE ON THIS PROJECT. SECTION 606 "SELF CONSOLIDATING CONCRETE (SCC)", CONTAINS THE REQUIREMENTS FOR MODIFYING ALL CLASSES OF CONCRETE MIX DESIGN FOR SELF-CONSOLIDATING APPLICATIONS.

3. ALL PORTLAND CEMENT CONCRETE SHALL BE AIR-ENTRAINED.

4. EXCEPT FOR FOOTINGS CAST BELOW GRADE, ALL REINFORCING STEEL SHALL BE GALVANIZED. ALL WIRE TIES AND MISCELLANEOUS HARDWARE USED FOR PLACEMENT OF GALVANIZED REINFORCING SHALL ALSO BE GALVANIZED. GALVANIZED COATING FOR REINFORCING STEEL SHALL CONFORM TO ASTM A767 CLASS 1.

5. ALL CRITICAL LAP SPLICES SHALL BE AS SHOWN ON THE PLANS. ALL SPLICES NOT SHOWN ON THE PLANS SHALL BE LAPPED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS FOR CLASS C LAP SPLICES.

6. THE TOP BARS IN THE DECK SLABS SHALL BE SPLICED AT THE CENTER OF SPANS BETWEEN GIRDERS. THE BOTTOM BARS SHALL BE SPLICED OVER THE GIRDERS.

7. UNLESS OTHERWISE INDICATED ON THE PLANS, ALL MAIN REINFORCING BARS SHALL HAVE THE FOLLOWING MINIMUM COVER:

CONCRETE CAST AGAINST OR PERMANENTLY EXPOSED TO EARTH (FOOTINGS, ABUTMENT AND WALL FACES, BACKWALLS)		3"
CONCRETE DIRECTLY EXPOSED TO SALT WATER		4"
DECK SLABS (WITH WEARING SURFACE)	TOP	2" (+1/4", -0")
	BOTTOM	1" (+1/8", -0")
DECK SLABS (EXPOSED DECKS)	TOP	3" (+1/4", -0")
	BOTTOM	1" (+1/8", -0")
DECK OVERLAYS FOR PRESTRESSED BUTTED BOX BEAMS & VOIDED SLABS	TOP	2.5" (+1/4", -0")
BOTTOM OF DECK SLAB OVER SALT OR BRACKISH WATER	BOTTOM	1.5" (+1/8", -0")
ALL OTHER BARS		2"

COVER TO TIES AND STIRRUPS MAY BE 0.5 INCH LESS THAN THE ABOVE VALUES SPECIFIED FOR MAIN REINFORCING, BUT IN NO CASE LESS THAN 1.5 INCHES.

8. ALL ANCHOR BOLTS SHALL BE ASTM DESIGNATION A 307 AND SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO DESIGNATION M 232 OR METALIZED IN ACCORDANCE WITH SECTION M.05. SWEDGED RODS SHALL BE AASHTO DESIGNATION M 270 GRADE 36 AND SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO DESIGNATION M 232.

9. ALL ANCHOR BOLTS SHALL BE SET PRIOR TO PLACEMENT OF CONCRETE UNLESS OTHERWISE AUTHORIZED BY THE ENGINEER.

10. HORIZONTAL CONSTRUCTION JOINTS OTHER THAN THOSE SHOWN ON PLANS WILL NOT BE PERMITTED WITHOUT A WRITTEN REQUEST BY THE CONTRACTOR AND PRIOR AUTHORIZATION BY THE ENGINEER.

11. UNLESS OTHERWISE NOTED ON THE PLANS, ALL EXPOSED CONCRETE SURFACES VISIBLE IN ELEVATION TO ONE FOOT BELOW FINAL GROUND LINE (AND THE UNDERSIDE OF ALL CONCRETE DECK SLABS OUTSIDE OF THE FASCIA BEAMS), SHALL RECEIVE A CONCRETE SURFACE RUBBED FINISH IN ACCORDANCE WITH THE RI STANDARD SPECIFICATIONS.

12. THE ENTIRE TOPSIDE SURFACES OF ABUTMENT AND PIER CAP BEAM SEATS, AS WELL AS VERTICAL FACES OF BACKWALLS, AND PARAPETS/BARRIERS SHALL BE PROVIDED WITH A FILM-FORMING SEALER (M12.03.1) CONCRETE SURFACE TREATMENT-PROTECTIVE COATING IN ACCORDANCE WITH SECTION 820 OF THE RI STANDARD SPECIFICATIONS.

13 ALL EXPOSED EDGES AND REENTRANT CORNERS NOT OTHERWISE DETAILED ON THE PLANS SHALL HAVE A MINIMUM ¾" CHAMFER.

14. ALL JOINT SEALANT SHALL BE POLYURETHANE, POLYURETHANE ELASTOMERIC, OR SILICONE SEALANT AS DESIGNATED ON THE PLANS. THE COLOR OF THE JOINT SEALANT, WHERE EXPOSED, SHALL BE NEUTRAL (LIGHT GRAY OR TAN). THE COLOR OF THE SEALANT, WHERE NOT EXPOSED, WILL BE AT THE DISCRETION OF THE CONTRACTOR.

15. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PREVENTING CONCRETE STAINS OR DISCOLORATIONS DURING CONSTRUCTION UNTIL SUCH TIME WHEN THE SURFACES ARE APPROVED AND ACCEPTED. ANY CONCRETE STAINS OR DISCOLORATIONS OCCURRING PRIOR TO ACCEPTANCE OF THE SURFACES SHALL BE REMOVED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE STATE.

16. UNLESS OTHERWISE NOTED ON THE PLANS, JOINT FILLER IS TO BE A PREFORMED, NON-EXPANSIVE, NON-EXTRUDING TYPE IN ACCORDANCE WITH SECTION M.02.11.1 OF THE RI STANDARD SPECIFICATIONS.

17. PLACEMENT, FINISHING AND CURING OF BRIDGE DECK CONCRETE SHALL BE IN ACCORDANCE WITH SECTION 814 OF THE RI STANDARD SPECIFICATIONS AND IN ACCORDANCE WITH THE SEQUENCE AND DIRECTION OF POURS AS SHOWN ON THE PLANS.

    SUPPORT RAILS FOR THE FINISHING MACHINE(S) SHALL BE LOCATED BEYOND THE CURB LINE SUCH THAT THE ENTIRE BRIDGE DECK SHALL RECEIVE A MACHINE FINISH. THE CONTRACTOR SHALL INCLUDE THE LOADING OF THE FINISHING MACHINE(S) AND THE SUPPORT RAIL SYSTEM IN THE DESIGN OF THE CANTILEVER DECK SUPPORT SYSTEM. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE COST AND DESIGN OF THIS SUPPORT SYSTEM WHICH MAY REQUIRE THE ADDITION OF TEMPORARY DIAPHRAGMS OR BRACES TO PREVENT FASCIA STRINGER ROTATION.

17. UNLESS OTHERWISE INDICATED ON THE PLANS, ALL DECK FORMS SHALL BE OF THE REMOVABLE TYPE THAT WILL PRODUCE THE DIMENSIONS SHOWN ON THE PLANS.

18. EMBEDMENT LENGTHS FOR DRILLED AND GROUTED DOWELS SHALL BE IN ACCORDANCE WITH SECTION 819 OF THE RI STANDARD SPECIFICATIONS.

20. IN ACCORDANCE WITH THE RI STANDARD SPECIFICATIONS, ALL METAL TIES, NON-METALLIC TIES OR ANCHORAGES WHICH ARE REQUIRED FOR CONCRETE FORMWORK SHALL BE SO CONSTRUCTED THAT THEY CAN BE REMOVED TO AT LEAST ONE INCH BELOW THE EXPOSED SURFACE OF THE CONCRETE WITHOUT CAUSING DAMAGE TO THE CONCRETE SURFACE. SNAP TIES MAY BE USED ONLY IF APPROVED BY THE ENGINEER. IF THE CONTRACTOR PROPOSES TO USE THEM, A CATALOG CUT AND OTHER NECESSARY INFORMATION MUST BE SUBMITTED TO THE ENGINEER TO DEMONSTRATE THAT THE TIES WILL SNAP-OFF FAR ENOUGH INTO THE CONCRETE TO ALLOW FOR PROPER PATCHING. SNAP TIES MUST PROVIDE ADEQUATE STRENGTH TO SUPPORT THE FORMS. ALL CAVITIES SHALL BE FILLED WITH AN APPROVED CEMENT MORTAR MEETING THE REQUIREMENTS OF ASTM C 928.

21. WATER STOPS ARE REQUIRED FOR HORIZONTAL AND VERTICAL CONSTRUCTION JOINTS IN ABUTMENTS AND WALLS WHEN EXPOSED TO BACKFILL EARTH MATERIAL. WATER STOPS SHALL BE INSTALLED AT THE LOCATIONS DETAILED ON THE PLANS, AT THE LOCATIONS AS SPECIFIED ABOVE AND AT ALL LOCATIONS AS DIRECTED BY THE ENGINEER, ALL IN ACCORDANCE WITH SECTION 812 OF THE RI STANDARD SPECIFICATIONS.

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RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

BRIDGE STANDARDS

GENERAL NOTES
SHEET 2

DRAWING NUMBER: A3

STRUCTURAL STEEL NOTES

1. FRAMING DIMENSIONS ARE GIVEN ALONG CENTERLINES OF GIRDERS AND ALONG CENTERLINES OF BEARINGS ON ABUTMENTS AND PIERS. THE FABRICATOR IS RESPONSIBLE FOR INCORPORATING THE CAMBER, CROSS SLOPE, AND OTHER EFFECTS THAT MAY IMPACT THE OVERALL GIRDER LENGTHS, DIMENSIONS AND/OR THE DETAILING.

2. INSTABILITY DURING CONSTRUCTION OF THE HORIZONTALLY CURVED GIRDERS (INCLUDING DURING LIFTING, TRANSPORTING AND ERECTION) MAY PRESENT A HAZARDOUS SITUATION. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS AND MEASURES TO ENSURE STABILITY AND THEREBY SAFETY DURING THE STEEL ERECTION AND CONSTRUCTION.

3. THE SHOPS FABRICATING THE STRUCTURAL STEEL (EXCEPT FOR EXPANSION JOINTS, RAILINGS AND BEARINGS), MUST BE CERTIFIED FOR "MAJOR STEEL BRIDGES (CBR)" IN ACCORDANCE WITH THE AISC QUALITY CERTIFICATION PROGRAM OR EQUIVALENT. SHOPS FABRICATING THE EXPANSION JOINTS, RAILINGS AND BEARINGS SHALL, AT A MINIMUM, BE CERTIFIED FOR "SIMPLE STEEL BRIDGE STRUCTURES (SBR)".

   THE SHOPS SHALL ALSO BE CERTIFIED UNDER THE AISC "SOPHISTICATED PAINT ENDORSEMENT (SPE)" QUALITY PROGRAM OR THE SSPC-QP3 PAINT CERTIFICATION PROGRAM.

   THE FABRICATOR MUST SUBMIT PROOF OF CURRENT CERTIFICATION AS SPECIFIED.

4. THE STEEL ERECTOR/CONTRACTOR FOR THIS PROJECT SHALL BE CERTIFIED FOR "ADVANCED CERTIFIED STEEL ERECTOR (ASCE)" IN ACCORDANCE WITH THE AISC QUALITY CERTIFICATION PROGRAM. THE ERECTOR/CONTRACTOR OF THE STRUCTURAL STEEL SHALL BE REQUIRED TO SUBMIT PROOF OF CURRENT CERTIFICATION AS SPECIFIED.

5. THIS BRIDGE CONTAINS FRACTURAL CRITICAL MEMBERS (FCM). THESE MEMBERS HAVE BEEN DESIGNATED ON THE STEEL FRAMING AND/OR THE STEEL DETAIL SHEETS.

6. THIS BRIDGE CONTAINS FATIGUE SENSITIVE DETAILS (FSD). THESE DETAILS HAVE BEEN DESIGNATED ON THE STEEL FRAMING AND/OR THE STEEL DETAIL SHEETS. (**GENERALLY THESE ARE DETAILS IDENTIFIED AS DETAIL CATEGORY D, E OR E'. THE DESIGNER SHALL REFER TO THE RI LRFD SECTION 2 AND SECTION 6*).*

7. SHOP DRAWINGS FOR ALL FABRICATED STEEL INCLUDING BEARINGS, EXPANSION JOINTS, RAILINGS AND FALSEWORK SHALL BE SUBMITTED TO THE ENGINEER IN SUFFICIENT TIME TO PERMIT CAREFUL CHECKING PRIOR TO FABRICATION.

8. INSPECTION OF WELDS INCLUDING RADIOGRAPHIC TESTING (RT) AND MAGNETIC PARTICLE TESTING (MT) SHALL BE IN ACCORDANCE WITH THE RI STANDARD SPECIFICATIONS AND THE AASHTO/AWS BRIDGE WELDING CODE, EXCEPT THAT THE REMAINING PERCENTAGE OF ALL GROOVE WELDS NOT RT TESTED SHALL BE MT OR DYE-PENETRANT TESTED.

9. STRUCTURAL STEEL SHAPES AND PLATES SHALL CONFORM TO THE LATEST PROVISIONS OF AASHTO DESIGNATION M 270 GRADE 36, GRADE 50, AND 50W AS DESIGNATED ON THE PLANS.

10. ALL AASHTO M 270 STRUCTURAL STEEL USED IN GIRDERS (INCLUDING CONNECTION PLATES AND STIFFENERS), SHALL MEET THE ZONE 2 CHARPY V-NOTCH FRACTURE TOUGHNESS TEST REQUIREMENTS AS SPECIFIED IN TABLE 6.6.2-2 OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS FOR "NONFRACTURE-CRITICAL" AND "FRACTURE-CRITICAL" COMPONENTS. THE ZONE 2 FRACTURE TOUGHNESS REQUIREMENTS ARE AS FOLLOWS:

    NONFRACTURE-CRITICAL

GRADE 36	15 FT-LBS @ 40°F (UP TO 4 INCHES THICK)
GRADE 50 OR 50W	15 FT-LBS @ 40°F (UP TO AND INCLUDING 2 INCHES THICK)
GRADE 50 OR 50W	20 FT-LBS @ 40°F (FROM 2 INCH THICK UP TO AND INCLUDING 4 INCHES THICK)

    FRACTURAL-CRITICAL

GRADE 36	25 FT-LBS @ 40°F (UP TO 4 INCHES THICK)
GRADE 50 OR 5OW	25 FT-LBS @ 40°F (UP TO AND INCLUDING 2 INCHES THICK)
GRADE 50 OR 50W	30 FT-LBS @ 40°F (FROM 2 INCH THICK UP TO AND INCLUDING 4 INCHES THICK)

    SAMPLING AND TESTING PROCEDURES SHALL BE IN ACCORDANCE WITH AASHTO T 243. THE FREQUENCY OF TESTING SHALL BE IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.

    THE CHARPY V-NOTCH FRACTURE TOUGHNESS TEST REQUIREMENT IS NOT MANDATORY FOR THE FOLLOWING STEEL COMPONENTS:

    - BEARINGS, MASONRY PLATES AND SOLE PLATES
    - EXPANSION JOINTS AND MODULAR BRIDGE JOINT SYSTEMS
    - DRAINAGE MATERIAL
    - RAILINGS
    - FOUNDATION H-PILES AND PIPE PILES
    - SUPPORT OF EXCAVATION COMPONENTS

11. WELDING SHALL BE IN ACCORDANCE WITH THE LATEST BRIDGE WELDING CODE AASHTO/AWS D1.5 (INCLUDING ALL INTERIMS TO DATE) AND APPLICABLE SUPPLEMENTAL AWS PUBLICATIONS.

12. ALL HIGH STRENGTH BOLTS SHALL CONFORM TO AASHTO DESIGNATION M 164, AND THEY SHALL BE INSTALLED IN ACCORDANCE WITH SECTION 824 OF THE RI STANDARD SPECIFICATIONS.

13. WASHERS MEETING AASHTO DESIGNATION M 293 ARE TO BE USED OVER ALL HOLES THAT ARE MORE THAN 1/16" IN DIAMETER GREATER THAN THE BOLT DIAMETER AND UNDER ALL PARTS TURNED DURING ASSEMBLY.

14. WELDING ELECTRODES SHALL HAVE THE SAME CORROSION RESISTANCE AS THE BASE METAL AND SHALL BE FREE OF MOISTURE AT THE TIME OF USE.

15. STRUCTURAL STEEL SHALL BE PREPARED AND PAINTED IN ACCORDANCE WITH THE RI STANDARD SPECIFICATIONS.

16. UNLESS OTHERWISE SPECIFIED, THE UPPER SURFACES OF GIRDER TOP FLANGES SHALL BE FREE OF PAINT, OIL OR OTHER IMPURITIES THAT WOULD IN ANY WAY REDUCE THE BOND OF CONCRETE TO STEEL.

17. PRIOR TO FABRICATION, ALL MATERIALS SHALL FIRST BE SOLVENT CLEANED TO SSPC-SP1 TO REMOVE ALL OIL, GREASE AND DIRT; FOLLOWED BY BLAST-CLEANING TO SSPC-SP10 TO REMOVE ALL MILL SCALE, RUST, AND OTHER DELETERIOUS MATERIALS FROM THE SURFACES OF THE STEEL TO BE FABRICATED.

18. PRIOR TO SHOP COATING AS SPECIFIED IN SECTION 825 OF THE RI STANDARD SPECIFICATIONS, ALL CORNERS AND EDGES OF STEEL WHICH HAVE BEEN FLAME CUT OR OTHERWISE HARDENED SHALL BE SOFTENED BY GRINDING OR BLAST-CLEANING TO PROVIDE A SURFACE SUITABLE FOR APPLICATION OF THE SPECIFIED PAINT SYSTEM.

    UPON COMPLETION OF ALL FABRICATION AND PRIOR TO THE APPLICATION OF THE SHOP PRIMER COAT THE STRUCTURAL STEEL SHALL BE RESTORED TO AN SSPC-SP10 CONDITION.

19. WELDING OF ATTACHMENTS TO GIRDER FLANGES OR WEBS FOR CONSTRUCTION PURPOSES IS NOT PERMITTED EXCEPT WHEN APPROVED BY THE ENGINEER.

20. THE ENDS OF ALL GIRDERS SHALL BE VERTICAL AFTER ALL DEAD LOADS HAVE BEEN PLACED.

21. INTERMEDIATE STIFFENERS SHALL BE PLACED ON THE INTERIOR SIDE OF THE FASCIA PLATE GIRDER WEBS AND ON BOTH SIDES OF ALL INTERIOR PLATE GIRDER WEBS.

22. BEARING STIFFENERS SHALL BE FABRICATED AS SHOWN ON THE PLANS AND SHALL BE PLACED ON BOTH SIDES OF ALL PLATE GIRDER WEBS.

23. INTERMEDIATE STIFFENERS AND CONNECTION PLATES SHALL BE SET PERPENDICULAR TO THE FLANGES OF THE GIRDERS.

24. END BEARING STIFFENERS AT GIRDER ENDS SHALL BE PLUMB AFTER DEAD LOADS ARE APPLIED.

25. BOLTED CONNECTIONS SHALL BE DESIGNED AS SLIP-CRITICAL CONNECTIONS. THE FAYING SURFACES SHALL SATISFY CLASS B SURFACE CONDITION AS DEFINED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS. *(*DESIGNER - CLASS A OR C SURFACE CONDITIONS ARE PERMITTED SUBJECT TO APPROVAL OF THE ENGINEER).*

26. THE GIRDERS SHALL BE CAMBERED TO THE AMOUNTS SHOWN ON THE PLANS, THE FABRICATOR'S SHOP DRAWINGS SHALL INCLUDE, IN ADDITION TO ANY CUTTING OR CAMBER DIAGRAMS NECESSARY FOR THEIR PURPOSES, A SHOP ASSEMBLY DIAGRAM WHICH PROVIDES CAMBER OFFSETS CALCULATED BY THE FABRICATOR AT THE REFERENCE POINTS PROVIDED BY THE ENGINEER (USUALLY TENTH POINTS OF THE SPANS), THE INFORMATION PROVIDED SHALL BE SUFFICIENT ENOUGH FOR THE ENGINEER TO EVALUATE WHETHER THE CAMBER HAS BEEN CORRECTLY INTERPRETED.

27. ALL SHOP CONNECTIONS AND SPLICES SHALL BE WELDED. WELDING PROCEDURES AND TECHNIQUES TO BE USED IN FABRICATION AND ERECTION OF THE GIRDERS SHALL BE AS SHOWN ON THE SHOP DRAWINGS AND SHALL INCORPORATE THE FOLLOWING:

    - BOTH FLANGES AND THE WEB SHALL BE COMPLETELY FABRICATED FOR THEIR ENTIRE LENGTHS BEFORE THE WELDING OF THE FLANGES TO THE WEB IS PERFORMED.

    - ALL WEB AND FLANGE SPLICES OTHER THAN THOSE SHOWN ON THE PLANS MUST BE APPROVED BY THE ENGINEER. ALTERNATE OR ADDITIONAL SPLICES ARE TO BE LOCATED AND DESIGNED BY THE FABRICATOR AND SHOWN ON THE SHOP DRAWINGS. THESE SPLICES ARE TO FULLY DEVELOP THE STRENGTH OF THE WEB AND FLANGE PLATES. WEB SPLICES, IF USED, SHALL BE LOCATED 2'-0" MINIMUM FROM ANY STIFFENER.

    - NO MORE THAN TWO SHOP WEB SPLICES WILL BE PERMITTED BETWEEN FIELD SPLICES. SPLICING OF GIRDERS BY FIELD WELDING WILL NOT BE PERMITTED.

28. ALL FILLET WELDS SHALL BE IN ACCORDANCE WITH THE BRIDGE WELDING CODE AASHTO/AWS D1.5 TABLE 2.1 (¼" MINIMUM).

29. ALL SHEAR STUD CONNECTORS SHALL BE WELDED BY THE AUTOMATIC TIMED ELECTRIC ARC PROCESS. SHEAR STUDS SHALL BE INSPECTED AND TESTED IN ACCORDANCE WITH SECTION 824 OF THE RI STANDARD SPECIFICATIONS.

30. WHEN STEEL DIE STAMPS ARE USED TO IDENTIFY PIECES AND MEMBERS, FABRICATORS SHALL UTILIZE LOW STRESS STAMPS.

31. FOR SIZE AND LOCATION OF ANCHOR BOLTS, SEE PIER, ABUTMENT, AND BEARING DRAWINGS.

32. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO ENSURE THAT THE EXPANSION JOINT SYSTEM PROVIDED WILL BE COMPATIBLE WITH BOTH THE END OF DECK OR PIER HAUNCHES AND/OR THE STRUCTURAL STEEL FRAMING CONFIGURATION. THAT IS, THE EXPANSION JOINT SYSTEM AND ALL ITS INHERENT COMPONENTS AND ATTACHMENT DEVICES SHALL BE SIZED OR ARRANGED TO BE COMPATIBLE WITH THE GIRDER AND DIAPHRAGM FLANGES, CONNECTION PLATES, BOLTS, SHEAR STUDS AND REINFORCING STEEL THAT SHARE THE END HAUNCH REGION.

PRESTRESSED CONCRETE NOTES

1. THE FABRICATION OF ALL PRESTRESSED ELEMENTS SHALL BE IN ACCORDANCE WITH SECTION 809 "PRECAST/PRESTRESSED CONCRETE MASONRY" OF THE RI STANDARD SPECIFICATIONS.

2 ANY PRECAST MANUFACTURING PLANT FURNISHING PRECAST PRESTRESSED BRIDGE MEMBERS MUST BE CERTIFIED BY THE PRECAST PRESTRESSED CONCRETE INSTITUTE PLANT CERTIFICATION PROGRAM. THE CERTIFICATION SHALL BE AS A MINIMUM IN THE B3 CATEGORY, EXCEPT FOR DRAPED STRAND BRIDGE MEMBERS IN WHICH CASE A B4 CATEGORY WILL BE REQUIRED. THE MANUFACTURER SHALL SUBMIT PROOF OF CERTIFICATION PRIOR TO THE START OF PRODUCTION.

3. BOX BEAMS AND SLABS ARE DETAILED WITH NOMINAL DIMENSIONS (SUCH AS 47½ ") AND NOMINAL ½" JOINTS BETWEEN UNITS TO ACCOUNT FOR CONSTRUCTION TOLERANCES AND TO PROVIDE FOR AN EXACT OVERALL STRUCTURE WIDTH.

4. THE MINIMUM AGE OF THE GIRDERS PRIOR TO THE PLACEMENT OF THE CONTINUITY DIAPHRAGMS AND DECK SHALL BE 90 DAYS. (**THIS NOTE TO BE USED WHEN SINGLE SPAN PRECAST CONCRETE MEMBERS ARE MADE CONTINUOUS**)

5. LIFTING DEVICES ARE THE RESPONSIBILITY OF THE PRECASTER.

6. THE CONCRETE SHALL HAVE A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF *(*DESIGNER TO SPECIFY*)* PSI. THE MINIMUM REQUIRED COMPRESSIVE STRENGTH AT STRESS TRANSFER SHALL NOT BE LESS THAN *(*DESIGNER TO SPECIFY*)* PSI.

7. PRESTRESSING STRANDS SHALL CONSIST OF UNCOATED HIGH STRENGTH SEVEN WIRE LOW-RELAXATION STRANDS HAVING A NOMINAL DIAMETER OF 0.5" (OR 0.6" AS REQUIRED BY DESIGN) CONFORMING TO THE REQUIREMENTS OF AASHTO DESIGNATION M 203 GRADE 270.

8. LATERAL TIES SHALL CONSIST OF UNCOATED HIGH STRENGTH SEVEN WIRE LOW-RELAXATION STRANDS HAVING A NOMINAL DIAMETER OF 0.6" CONFORMING TO THE REQUIREMENTS OF AASHTO DESIGNATION M 203 GRADE 270. CORROSION PROTECTION OF THE LATERAL TIES SHALL BE AS DETAILED ON THE DRAWINGS. COST OF THE LATERAL TIES SHALL BE INCLUDED N THE UNIT PRICE FOR THE PRESTRESSED CONCRETE DECK OR BOX BEAM UNITS.

9. NON-PRESTRESSED REINFORCEMENT SHALL CONFORM TO AASHTO DESIGNATION M 31 GRADE 60 AND SHALL BE GALVANIZED.

10. ALL EXPOSED CORNERS SHALL BE CHAMFERED ¾ UNLESS OTHERWISE NOTED.

11. ANY STRUCTURAL MEMBERS DAMAGED DURING FABRICATION, SHIPPING OR ERECTION, SUCH THAT THEIR STRUCTURAL INTEGRITY IS COMPROMISED, SHALL BE REJECTED AND REPLACED AT THE CONTRACTOR'S OWN EXPENSE. THE ENGINEER SHALL BE THE SOLE JUDGE IN DETERMINING THE STRUCTURAL INTEGRITY OF DAMAGED PRESTRESSED MEMBERS. ANY DAMAGE THAT IS NOT STRUCTURAL IN NATURE SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER AT NO COST TO THE STATE.

12. DURING HANDLING, THE BEAMS MUST BE MAINTAINED IN AN UPRIGHT POSITION AT ALL TIMES AND MUST BE PICKED UP ONLY BY MEANS OF APPROVED LIFTING DEVICES AT THEIR APPROVED SUPPORT POINTS.

13. DIMENSIONAL TOLERANCES SHALL NOT EXCEED THOSE RECOMMENDED IN THE LATEST EDITION OF THE PCI "MANUAL FOR QUALITY CONTROL FOR PLANTS AND PRODUCTION OF PRECAST AND PRESTRESSED CONCRETE PRODUCTS".

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No.	DATE

RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

BRIDGE STANDARDS

GENERAL NOTES
SHEET 3

DRAWING NUMBER: A4

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14. THE EXTERIOR FACE OF FASCIA BEAMS SHALL RECEIVE A SELECTED FORMLINER OR RUBBED FINISH (IN FIELD OR IN THE PLANT) IN ACCORDANCE WITH THE RI STANDARD SPECIFICATIONS. THE COST SHALL BE INCLUDED IN THE UNIT PRICE BID FOR THE PRESTRESSED CONCRETE MEMBERS.

15. THE TOP SURFACES OF THE PRESTRESSED SLABS, BOX BEAMS, & GIRDERS SHALL HAVE EITHER A SMOOTH OR A RAKED FINISHED (1/4” AMPLITUDE) AS INDICATED ON THE PLANS.

16. ALL SHOP DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER IN SUFFICIENT TIME TO PERMIT CAREFUL CHECKING.

17. ALL GALVANIZED PRESTRESSING STEEL AND GALVANIZED REINFORCING BARS SHALL BE SECURELY TIED TO PREVENT DISLOCATION. TIES USED FOR THE GALVANIZED REINFORCING STEEL SHALL ALSO BE GALVANIZED.

18. THE DETAILS OF ALL INSERTS, ANCHORS, AND ANY OTHER ITEMS REQUIRED TO BE CAST INTO THE PRECAST PRESTRESSED UNITS (WHETHER DETAILED ON THE CONTRACT DRAWINGS OR PROVIDED FOR THE CONTRACTOR'S CONVENIENCE) SHALL BE SHOWN ON THE SHOP DRAWINGS. PRECAST UNITS SHALL NOT BE FIRED OR DRILLED INTO FOR ATTACHMENT PURPOSES. ALL HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO M 232.

19. THE NON-SHRINK GROUT SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 10,000 PSI AFTER 28 DAYS AS DETERMINED BY TESTING UNDER ASTM DESIGNATION C-109 AND SHALL NOT EXHIBIT ANY MEASURABLE DECREASE IN VOLUME AFTER CURING. THE CONTRACTOR SHALL STRICTLY FOLLOW THE MANUFACTURER'S RECOMMENDATIONS. GROUTING SHALL BE PERFORMED IN ACCORDANCE WITH THE DETAILS SHOWN. THE GROUT SHALL BE ON THE RIDOT APPROVED MATERIAL LIST.

20. THE ENDS OF BEAMS SHALL BE VERTICAL AFTER ALL DEAD LOADS HAVE BEEN PLACED.

21. HANDHELD VIBRATORS SHALL BE EQUIPPED WITH RUBBER TIPPED HEADS.

22. FOR SIZE AND LOCATION OF ANCHOR BOLTS, SEE PIER, ABUTMENT, AND BEARING DRAWINGS.

23. NO TRAFFIC OR HEAVY EQUIPMENT SHALL BE PERMITTED ON THE BRIDGE UNTIL THE POST TENSIONING OPERATION HAS BEEN COMPLETED AND THE GROUT HAS ATTAINED THE 28 DAY COMPRESSIVE STRENGTH.

GENERAL NOTES REGARDING TEMPORARY CONSTRUCTION CONDITIONS:

1. DESIGN WIND PRESSURES FOR CONSTRUCTION:

MINIMUM WIND PRESSURES TO BE USED BY THE CONTRACTOR FOR DESIGN DURING THE CONSTRUCTION CONTRACT (WITH THE EXCEPTION OF SIGNS) SHALL BE FROM THE FOLLOWING TABLE:

HEIGHT ABOVE GROUND	WIND PRESSURE (PSF)
UP TO 17'	*
OVER 17' AND UP TO 33'	*
OVER 33' AND UP TO 50'	*
OVER 50' AND UP TO 75'	*
OVER 75' AND UP TO 100'	*

TABLE NOTES:

A. APPLICATION OF THE TABULAR PRESSURE:

- BRIDGE COMPONENTS DURING CONSTRUCTION, PRIOR TO THE INSTALLATION OF THE PERMANENT BRACING SYSTEMS, NOT INCLUDING CRANE LIFTING.
- FALSE WORK, SHORING, AND SCAFFOLDING AS DEFINED IN FHWA “GUIDE DESIGN SPECIFICATION FOR BRIDGE TEMPORARY WORKS”, EXCLUDING 3-DIMENSIONAL LATTICED OR TRUSSED FRAMES OR TOWERS;
- TEMPORARY SHIELDING.

WIND PRESSURES FOR ALL OTHER STRUCTURES SHALL BE CALCULATED BASED ON ASCE “DESIGN LOADS ON STRUCTURES DURING CONSTRUCTION”, SEI/ASCE 37-02 (ALL REFERENCES TO THE ASCE 7 IN THE SEI/ASCE 37-02 PUBLICATION, SHALL BE THE LATEST REVISION OF ASCE 7). THE EXPOSURE CATEGORY SHALL BE _**_ (*DESIGNER SHALL COMPLETE PER DESIGNER NOTES BELOW*).

B. WHERE APPLICABLE HIGHER AMTRAK WIND REQUIREMENTS SHALL SUPERSEDE THESE REQUIREMENTS.

C. FOR STRUCTURES SITUATED ABOVE LIVE INTERSTATE TRAFFIC, THE TABULAR VALUES SHALL BE INCREASED BY 5 PSF.

DESIGNER NOTES:

a. THE DESIGNER IS TO FILL THE ABOVE TABULAR PRESSURES (INDICATED WITH ASTERISKS “”) USING THE FOLLOWING VALUES:*

HEIGHT ABOVE GROUND	*WIND PRESSURE (PSF)*	
(FEET)	*EXP B*	*EXP C*
UP TO 17'	*23*	*33*
OVER 17' AND UP TO 33'	*27*	*37*
OVER 33' AND UP TO 50'	*30*	*41*
OVER 50' AND UP TO 75'	*34*	*44*
OVER 75' AND UP TO 100'	*37*	*47*

b. EXPOSURE CATEGORIES ARE DEFINED AS FOLLOWS (NOTE THAT EXPOSURE “A” NO LONGER EXISTS AS OF THE RELEASE OF ASCE 7-05, AND THAT EXPOSURE ”D” IS NOT APPLICABLE TO RHODE ISLAND):

- *EXPOSURE B = URBAN AND SUBURBAN AREAS, WOODED AREAS OR OTHER TERRAIN WITH NUMEROUS CLOSELY SPACED OBSTRUCTIONS HAVING THE SIZE OF SINGLE-FAMILY DWELLINGS OR LARGER. THIS EXPOSURE SHALL PREVAIL IN THE UPWIND DIRECTION FOR A DISTANCE OF AT LEAST 2630 FEET, OR 10 TIMES THE HEIGHT OF THE STRUCTURE, WHICHEVER IS GREATER.*

- *EXPOSURE C = OPEN TERRAIN WITH SCATTERED OBSTRUCTIONS HAVING HEIGHTS GENERALLY LESS THAN 30 FEET, INCLUDING FLAT OPEN COUNTRY, GRASSLANDS, AND ALL WATER SURFACES IN HURRICANE-PRONE REGIONS. THIS EXPOSURE SHALL APPLY FOR ALL CASES WHERE EXPOSURE B DOES NOT APPLY.*

THE DESIGNER SHALL INDICATE THE APPROPRIATE EXPOSURE CATEGORY FOR THE PROJECT IN THE NOTES ABOVE. REFER TO THE RI LRFD BRIDGE DESIGN MANUAL AND THE COMMENTARY OF ASCE 7-05 FOR GUIDANCE IN THE APPLICATION OF EXPOSURE CATEGORIES.

2. ERECTION OF BRIDGE COMPONENTS:

FOR THE ERECTION OF STRUCTURES, THE FOLLOWING SHALL APPLY:

- THE CONTRACTOR SHALL SUBMIT AN ERECTION PLAN THAT PROVIDES COMPLETE DETAILS OF THE PROCESS INCLUDING, BUT NOT LIMITED TO, TEMPORARY SUPPORTS, SCHEDULING AND OPERATION SEQUENCING, CRANE PLACEMENT, AND ASSUMED LOADS AND CALCULATED STRESSES DURING VARYING STAGES OF LIFTING. THIS APPLIES TO STRUCTURES OF ANY KIND. THE CAPACITY OF THE CRANE AND ALL LIFTING AND CONNECTING DEVICES SHALL BE ADEQUATE FOR 125 PERCENT (150 PERCENT OVER AMTRAK) OF THE TOTAL PICK LOAD INCLUDING SPREADERS, RIGGING, HOOKS, AND ALL OTHER MATERIALS. THIS FACTOR OF SAFETY SHALL BE IN ADDITION TO ALL MANUFACTURERS' PUBLISHED FACTORS OF SAFETY.

- A REGISTERED PROFESSIONAL ENGINEER, LICENSED IN THE STATE OF RHODE ISLAND, WILL BE REQUIRED TO STAMP THE CONTRACTOR'S ERECTION PLAN.

- THE CONTRACTOR'S PROFESSIONAL ENGINEER WILL BE REQUIRED TO INSPECT AND PROVIDE WRITTEN APPROVAL OF INSTALLATION, PRIOR TO ALLOWING VEHICLES OR PEDESTRIANS ON OR BELOW THE STRUCTURE. THE PROFESSIONAL ENGINEER MUST ALSO STAMP ALL CHANGES TO THE CONTRACTOR'S ERECTION PLAN. ADDITIONALLY, ALL PROPOSED CHANGES MUST BE SUBMITTED TO RIDOT FOR REVIEW AND APPROVAL PRIOR TO IMPLEMENTATION.

- A MANDATORY PRE-ERECTION CONFERENCE WILL BE HELD AT LEAST TWO WEEKS PRIOR TO THE START OF THE GIRDER INSTALLATION TO DISCUSS THE PLAN AND PROCEDURES, WORK SCHEDULES, CONTINGENCY PLANS, SAFETY REQUIREMENTS AND TRAFFIC CONTROL. THE CONTRACTOR'S PROFESSIONAL ENGINEER AND ERECTION SUBCONTRACTOR WILL BE REQUIRED TO ATTEND THIS MEETING, AS WILL THE RIDOT RESIDENT ENGINEER, THE DESIGN PROJECT ENGINEER AND THE DESIGN CONSULTANT. BASED UPON DISCUSSIONS AT THIS MEETING AND A REVIEW OF THE CONTRACTOR'S ERECTION PLAN, RIDOT MAY ORDER THE CONTRACTOR TO MODIFY AND RESUBMIT THE ERECTION PLAN TO THE ENGINEER FOR REVIEW AND APPROVAL.

- THE CONTRACTOR WILL BE REQUIRED TO PERFORM DAILY INSPECTIONS OF THE ERECTED GIRDERS UNTIL THE BRIDGE DECK IS COMPLETELY POURED.

- THE COST OF PREPARING AND STAMPING THE ERECTION PLAN, COMPUTATIONS, AND REPORTS, RESPONDING TO RIDOT'S COMMENTS AND MAKING THE NECESSARY REVISIONS, AND ATTENDANCE AT MEETINGS SHALL BE CONSIDERED INCIDENTAL TO THE COST OF THE SUPERSTRUCTURE PAY ITEM, BE IT CONCRETE, STEEL OR TIMBER.

DESIGN TIDAL INFORMATION

MEAN HIGH TIDE WATER ELEVATION = (*DESIGNER TO PROVIDE ELEVATION*)
MEAN HIGH WATER ELEVATION = (*DESIGNER TO PROVIDE ELEVATION*)
NGVD 1929 ELEVATION = (*DESIGNER TO PROVIDE ELEVATION*)
MEAN LOW WATER ELEVATION = (*DESIGNER TO PROVIDE ELEVATION*)
MEAN LOW LOW WATER ELEVATION = (*DESIGNER TO PROVIDE ELEVATION*)

THE CONTRACTOR SHALL NOTE THAT HIGHER AND LOWER TIDES ARE POSSIBLE.

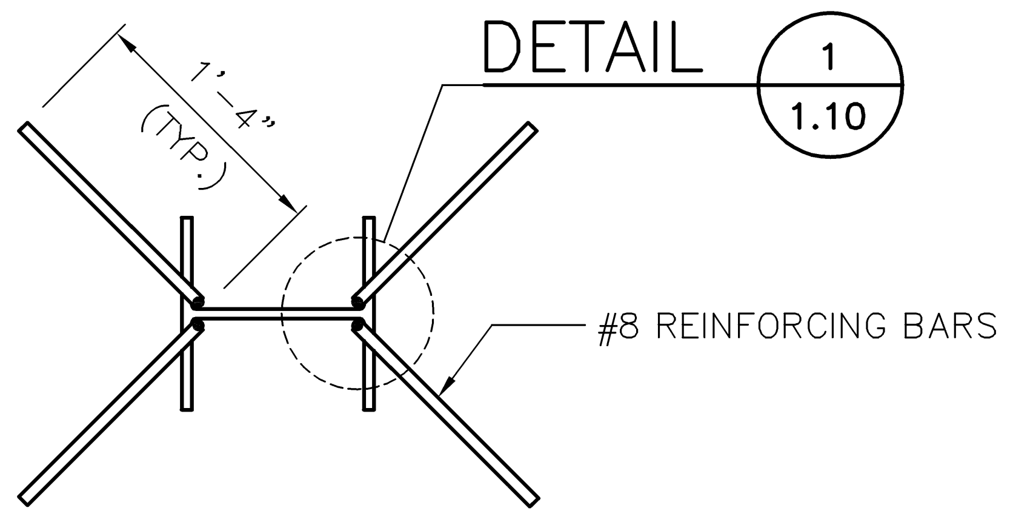
REVISIONS	
No.	DATE

RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

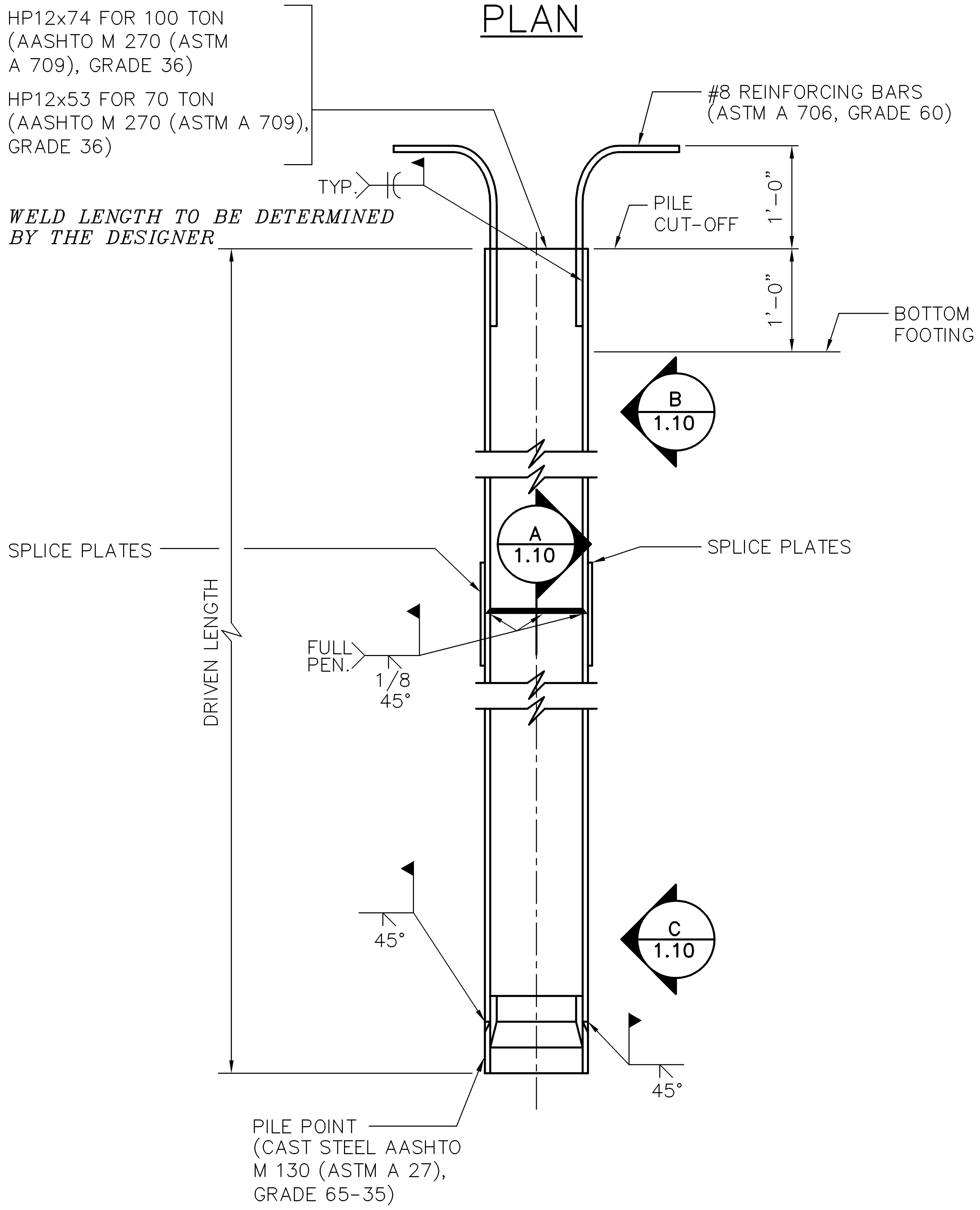
BRIDGE STANDARDS

GENERAL NOTES
SHEET 4

DRAWING NUMBER: A5

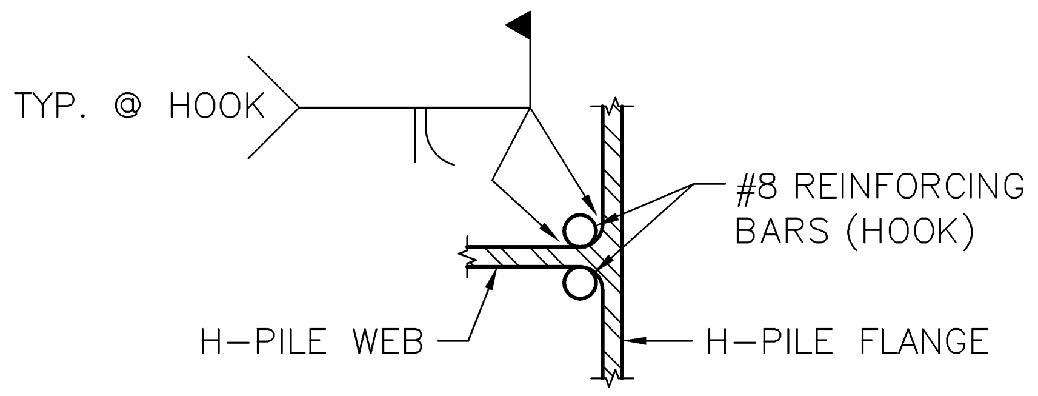


PLAN

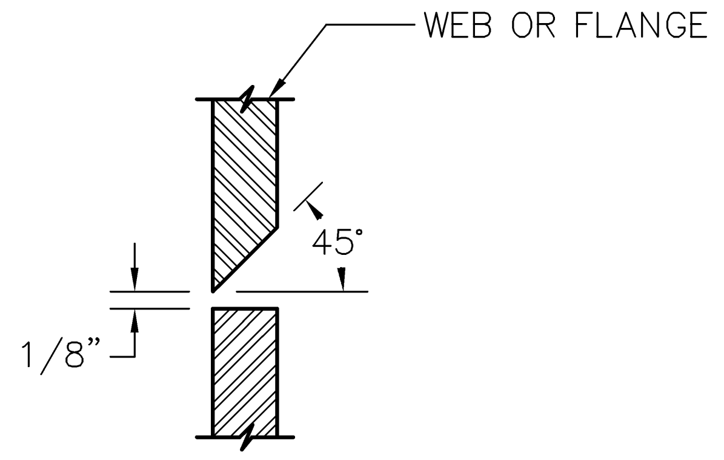

HP12x74 FOR 100 TON (AASHTO M 270 (ASTM A 709), GRADE 36)
HP12x53 FOR 70 TON (AASHTO M 270 (ASTM A 709), GRADE 36)
#8 REINFORCING BARS (ASTM A 706, GRADE 60)
TYP.
WELD LENGTH TO BE DETERMINED BY THE DESIGNER
PILE CUT-OFF
1'-0"
1'-0"
BOTTOM OF FOOTING
B
1.10
DRIVEN LENGTH
SPLICE PLATES
A
1.10
SPLICE PLATES
FULL PEN.
1/8
45°
45°
C
1.10
45°
PILE POINT (CAST STEEL AASHTO M 130 (ASTM A 27), GRADE 65-35)

ELEVATION

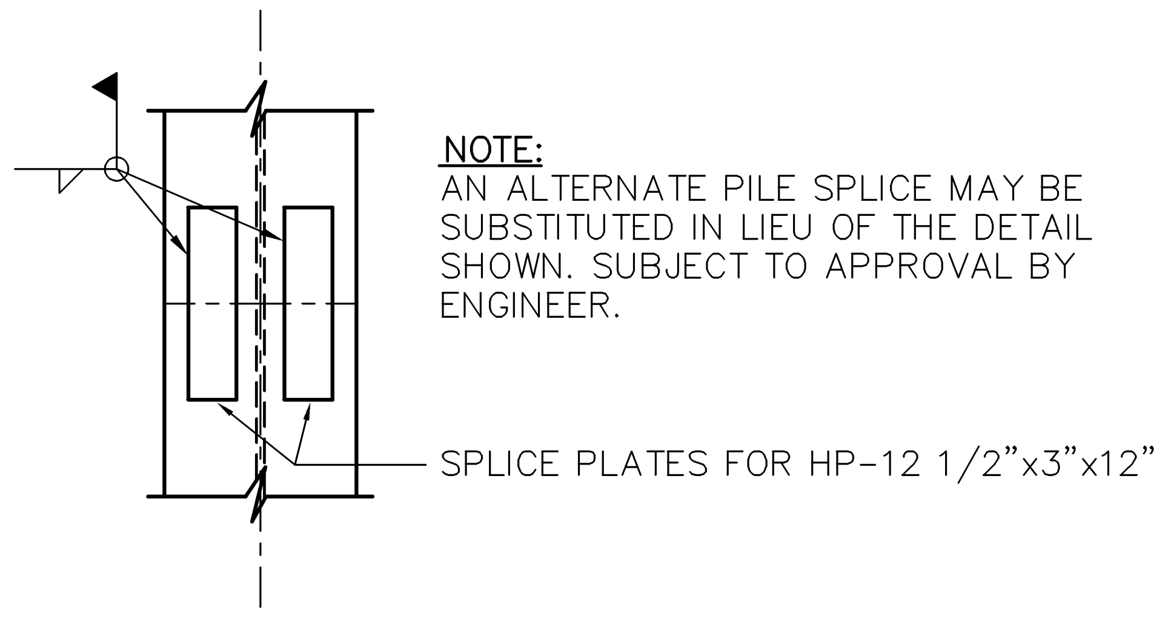
STEEL H-PILE



DETAIL 1 1.10

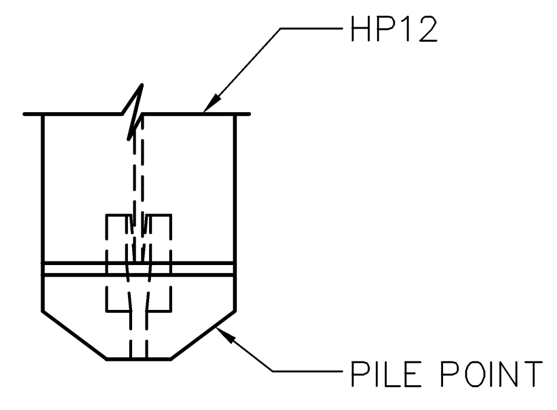


SECTION A 1.10



NOTE:
AN ALTERNATE PILE SPLICE MAY BE SUBSTITUTED IN LIEU OF THE DETAIL SHOWN. SUBJECT TO APPROVAL BY ENGINEER.

ELEVATION B 1.10



ELEVATION C 1.10

DESIGNER / CONSULTANT:

1. *REFER TO THE RHODE ISLAND LRFD BRIDGE DESIGN MANUAL FOR THE FOUNDATION PILE DESIGN REQUIREMENTS.*
2. *THE SELECTION OF THE APPROPRIATE PILE TYPE(S), INCLUDING TYPES NOT DETAILED HERE, SHALL BE BASED ON THE FINDINGS AND RECOMMENDATIONS OF THE GEOTECHNICAL INTERPRETIVE REPORT (GIR).*
3. *THE ESTIMATED PILE TAKE UP ELEVATION SHALL BE PROVIDED FOR EACH SUBSTRUCTURE UNIT.*
4. *THE APPLICABLE NOTES SHOWN BELOW SHALL BE FURNISHED ON THE CONTRACT DRAWINGS.*
5. *THE PILE REINFORCING DETAILS SHOWN ARE MINIMUM REQUIREMENTS. THE ENGINEER SHALL VERIFY THAT THE PILE REINFORCING DETAILS MEET THE SITE SPECIFIC SEISMIC REQUIREMENTS*

NOTES:

1. FOR THE REQUIREMENTS PERTAINING TO THE FURNISHING AND DRIVING OF THE PILE LOAD TEST AND THE FOUNDATION PILES, REFER TO THE RHODE ISLAND STANDARD SPECIFICATIONS.
2. FOUNDATION PILES SHALL BE DRIVEN TO A SUFFICIENT DEPTH AND RESISTANCE TO ADEQUATELY DEVELOP THEIR SPECIFIED LOAD SUPPORTING CAPACITY. THE ENGINEER SHALL BE THE SOLE JUDGE, BASED ON SOIL DATA AND THE RESULTS OF THE PILE LOAD TEST, OF THE REQUIRED DEPTH AND DRIVING RESISTANCE TO DEVELOP THE LOAD CAPACITY.
3. THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER, INFORMATION ON THE TYPE OF EQUIPMENT PROPOSED TO BE USED, PROPOSED METHODS OF OPERATION, PROPOSED SEQUENCE OF DRIVING, AND DETAILS OF ALL PILE DRIVING EQUIPMENT AND ACCESSORIES FOR EACH PILE TYPE SPECIFIED, ALL IN ACCORDANCE WITH SECTION 804. OF THE R.I. STANDARD SPECIFICATIONS.
4. ALL WELDING SHALL BE IN ACCORDANCE WITH THE LATEST BRIDGE WELDING CODE AASHTO/AWS D1.5.

THIS SHEET IS NOT TO SCALE

REVISIONS

No.	DATE

RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

BRIDGE STANDARDS

PILE DETAILS
SHEET 1

DRAWING NUMBER: 1.10

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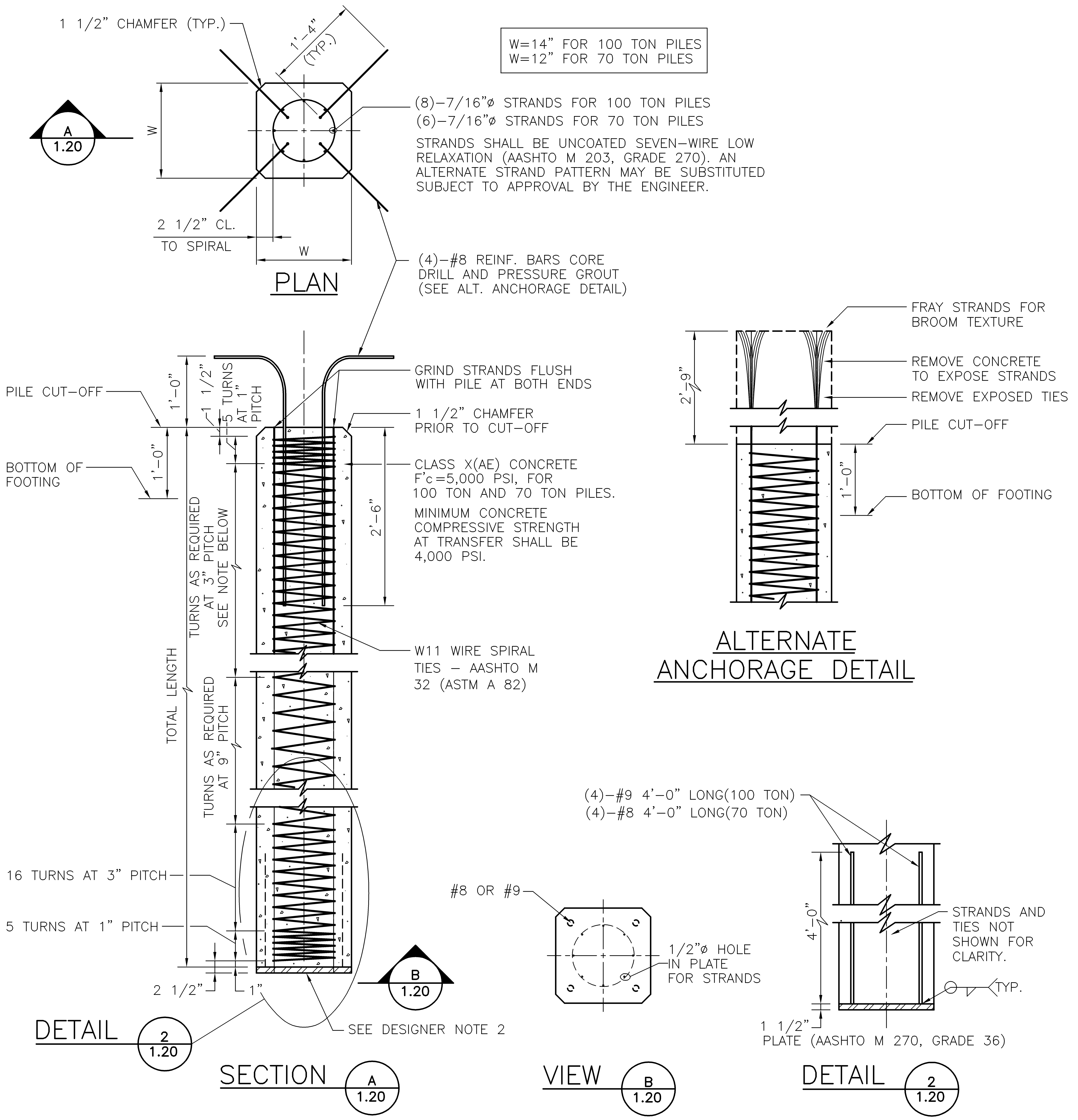
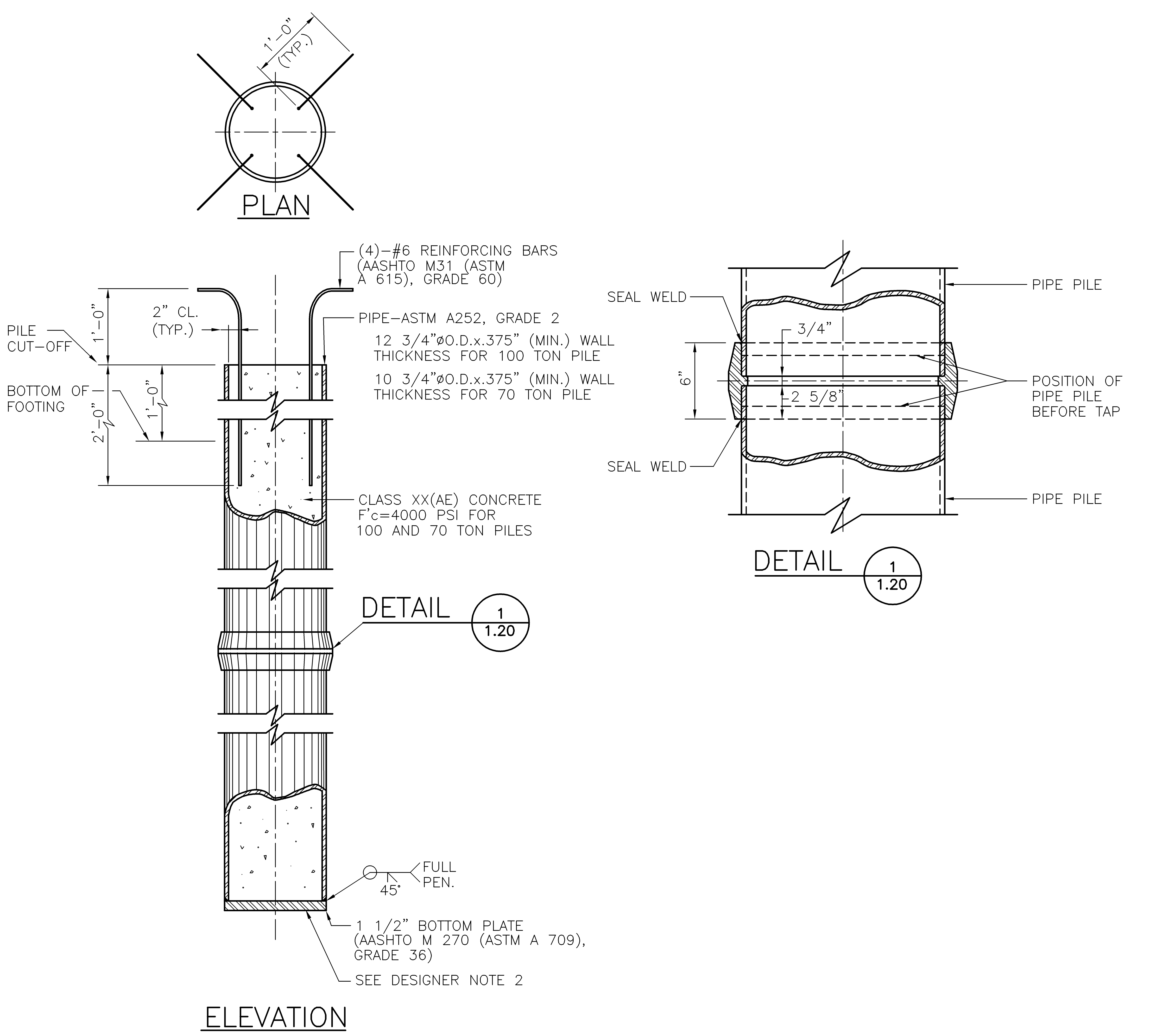

1 1/2" CHAMFER (TYP.)
1'-4" (TYP.)
W=14" FOR 100 TON PILES
W=12" FOR 70 TON PILES
A 1.20
W
(8)-7/16"ø STRANDS FOR 100 TON PILES
(6)-7/16"ø STRANDS FOR 70 TON PILES
STRANDS SHALL BE UNCOATED SEVEN-WIRE LOW RELAXATION (AASHTO M 203, GRADE 270). AN ALTERNATE STRAND PATTERN MAY BE SUBSTITUTED SUBJECT TO APPROVAL BY THE ENGINEER.
2 1/2" CL. TO SPIRAL
W
PLAN
(4)-#8 REINF. BARS CORE DRILL AND PRESSURE GROUT (SEE ALT. ANCHORAGE DETAIL)
PILE CUT-OFF
1'-0"
1 1/2"
5 TURNS AT 1" PITCH
GRIND STRANDS FLUSH WITH PILE AT BOTH ENDS
1 1/2" CHAMFER PRIOR TO CUT-OFF
BOTTOM OF FOOTING
1'-0"
CLASS X(AE) CONCRETE F'c=5,000 PSI, FOR 100 TON AND 70 TON PILES.
MINIMUM CONCRETE COMPRESSIVE STRENGTH AT TRANSFER SHALL BE 4,000 PSI.
2'-6"
TURNS AS REQUIRED AT 3" PITCH SEE NOTE BELOW
TOTAL LENGTH
W11 WIRE SPIRAL TIES - AASHTO M 32 (ASTM A 82)
TURNS AS REQUIRED AT 9" PITCH
16 TURNS AT 3" PITCH
5 TURNS AT 1" PITCH
2 1/2"
1"
B 1.20
SEE DESIGNER NOTE 2
DETAIL 2 1.20
SECTION A 1.20
FRAY STRANDS FOR BROOM TEXTURE
2'-9"
REMOVE CONCRETE TO EXPOSE STRANDS
REMOVE EXPOSED TIES
PILE CUT-OFF
1'-0"
BOTTOM OF FOOTING
ALTERNATE ANCHORAGE DETAIL
(4)-#9 4'-0" LONG(100 TON)
(4)-#8 4'-0" LONG(70 TON)
#8 OR #9
1/2"ø HOLE IN PLATE FOR STRANDS
VIEW B 1.20
4'-0"
STRANDS AND TIES NOT SHOWN FOR CLARITY.
TYP.
1 1/2" PLATE (AASHTO M 270, GRADE 36)
DETAIL 2 1.20

PRECAST PRESTRESSED CONCRETE PILE


1'-0" (TYP.)
PLAN
(4)-#6 REINFORCING BARS (AASHTO M31 (ASTM A 615), GRADE 60)
2" CL. (TYP.)
PILE CUT-OFF
1'-0"
BOTTOM OF FOOTING
1'-0"
2'-0"
PIPE-ASTM A252, GRADE 2
12 3/4"øO.D.x.375" (MIN.) WALL THICKNESS FOR 100 TON PILE
10 3/4"øO.D.x.375" (MIN.) WALL THICKNESS FOR 70 TON PILE
CLASS XX(AE) CONCRETE F'c=4000 PSI FOR 100 AND 70 TON PILES
DETAIL 1 1.20
FULL PEN.
45°
1 1/2" BOTTOM PLATE (AASHTO M 270 (ASTM A 709), GRADE 36)
SEE DESIGNER NOTE 2
ELEVATION
SEAL WELD
PIPE PILE
3/4"
6"
2 5/8"
POSITION OF PIPE PILE BEFORE TAP
SEAL WELD
PIPE PILE
DETAIL 1 1.20

CONCRETE FILLED STEEL PIPE PILE

NOTE FOR 3" PITCH WIRE SPIRAL AT TOP OF PILE:

THIS LENGTH SHALL BE EQUAL TO 1/4 OF THE ANTICIPATED PILE LENGTH PLUS THE DIFFERENCE BETWEEN THE ANTICIPATED LENGTH AND THE LENGTH OF PILE PROVIDED, BUT IN NO CASE LESS THAN FIVE FEET.

DESIGNER:

1. *DUE TO THE UNCERTAINTY IN THE ACTUAL DRIVEN PILE LENGTH, THE INTENT OF THE ABOVE 3" PITCH SPACING REQUIREMENT IS TO SATISFY AASHTO SEISMIC PROVISIONS FOR SPECIAL PILE REQUIREMENTS.*
2. *A TAPERED PILE POINT MAY BE REQUIRED FOR DIFFICULT DRIVING CONDITIONS.*

DESIGNER NOTES:

1. *FOR APPLICABLE NOTES SEE DRAWING NO. 1.10.*
2. *A TAPERED PILE POINT MAY BE REQUIRED FOR DIFFICULT DRIVING CONDITIONS.*

THIS SHEET IS NOT TO SCALE

REVISIONS	
No.	DATE

RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

BRIDGE STANDARDS

PILE DETAILS
SHEET 2

DRAWING NUMBER: 1.20

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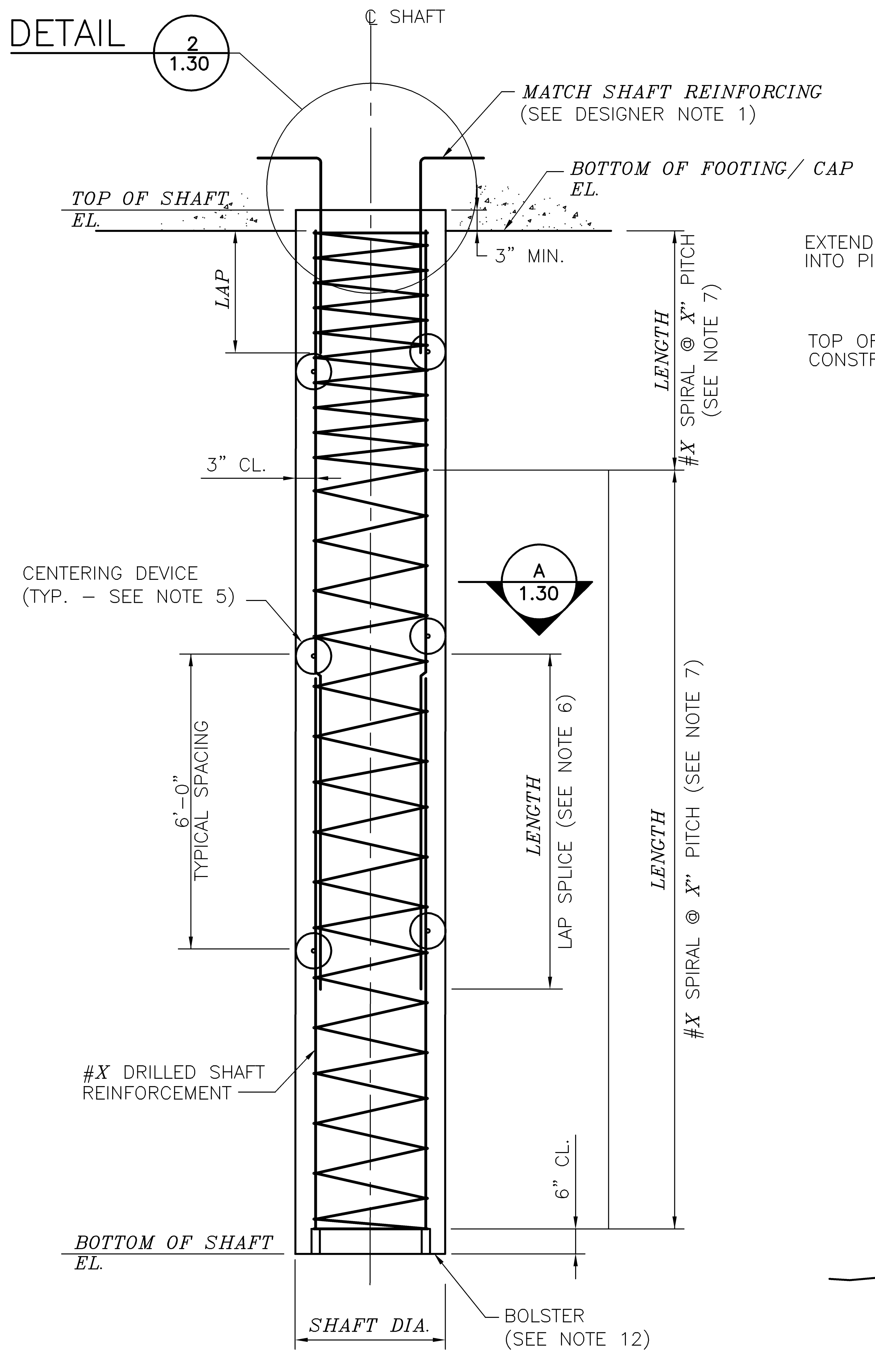
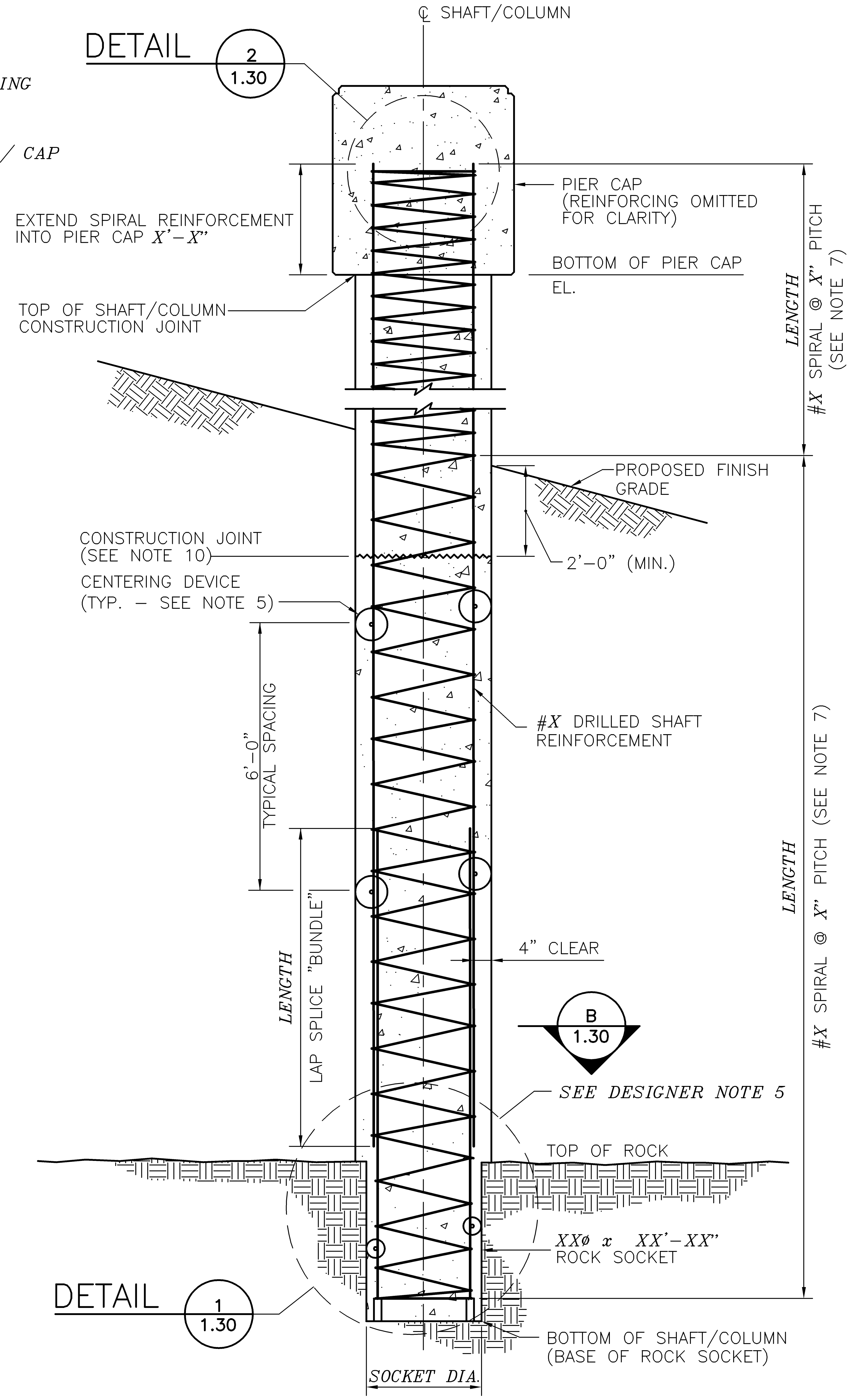
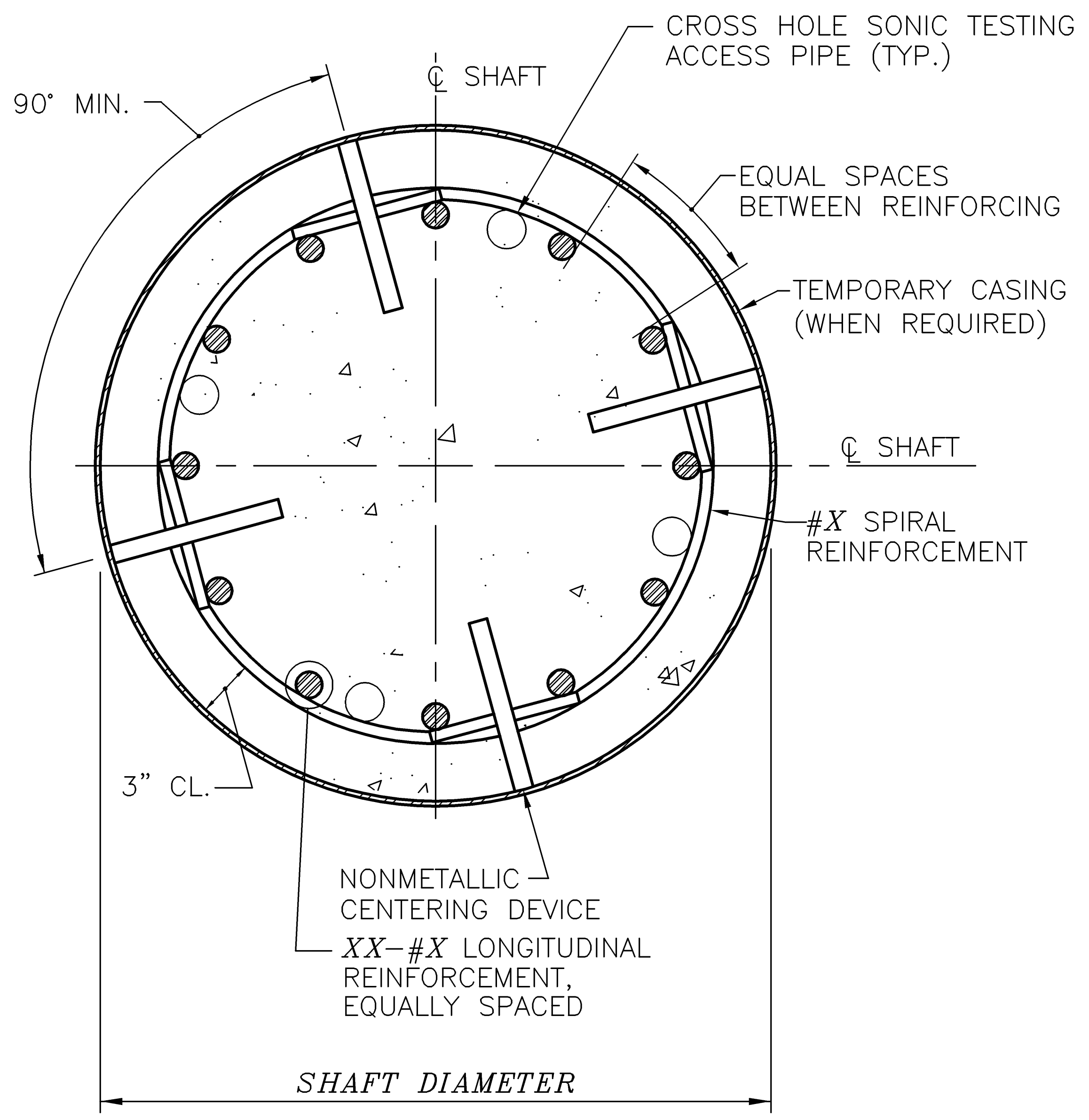

DETAIL 2 / 1.30
℄ SHAFT
MATCH SHAFT REINFORCING (SEE DESIGNER NOTE 1)
BOTTOM OF FOOTING/ CAP EL.
TOP OF SHAFT EL.
3" MIN.
LAP
#X SPIRAL @ X" PITCH (SEE NOTE 7)
LENGTH
3" CL.
A / 1.30
CENTERING DEVICE (TYP. – SEE NOTE 5)
6'-0" TYPICAL SPACING
LENGTH LAP SPLICE (SEE NOTE 6)
LENGTH #X SPIRAL @ X" PITCH (SEE NOTE 7)
#X DRILLED SHAFT REINFORCEMENT
6" CL.
BOTTOM OF SHAFT EL.
SHAFT DIA.
BOLSTER (SEE NOTE 12)

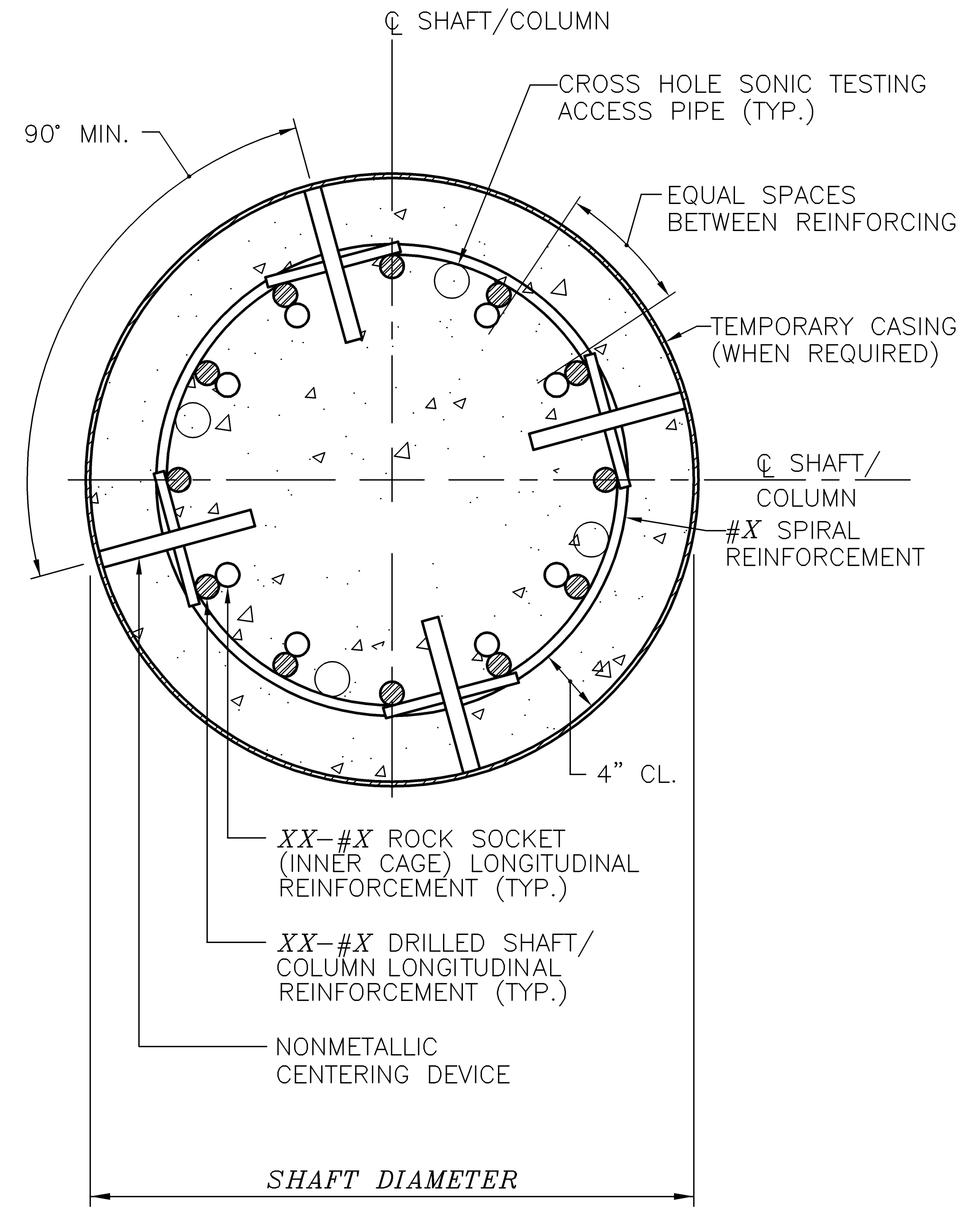
ELEVATION – DRILLED SHAFT IN SOIL


DETAIL 2 / 1.30
℄ SHAFT/COLUMN
EXTEND SPIRAL REINFORCEMENT INTO PIER CAP X'-X"
PIER CAP (REINFORCING OMITTED FOR CLARITY)
BOTTOM OF PIER CAP EL.
TOP OF SHAFT/COLUMN CONSTRUCTION JOINT
LENGTH #X SPIRAL @ X" PITCH (SEE NOTE 7)
PROPOSED FINISH GRADE
CONSTRUCTION JOINT (SEE NOTE 10)
2'-0" (MIN.)
CENTERING DEVICE (TYP. – SEE NOTE 5)
6'-0" TYPICAL SPACING
#X DRILLED SHAFT REINFORCEMENT
LENGTH LAP SPLICE "BUNDLE"
4" CLEAR
LENGTH #X SPIRAL @ X" PITCH (SEE NOTE 7)
B / 1.30
SEE DESIGNER NOTE 5
TOP OF ROCK
XXφ x XX'-XX" ROCK SOCKET
DETAIL 1 / 1.30
BOTTOM OF SHAFT/COLUMN (BASE OF ROCK SOCKET)
SOCKET DIA.

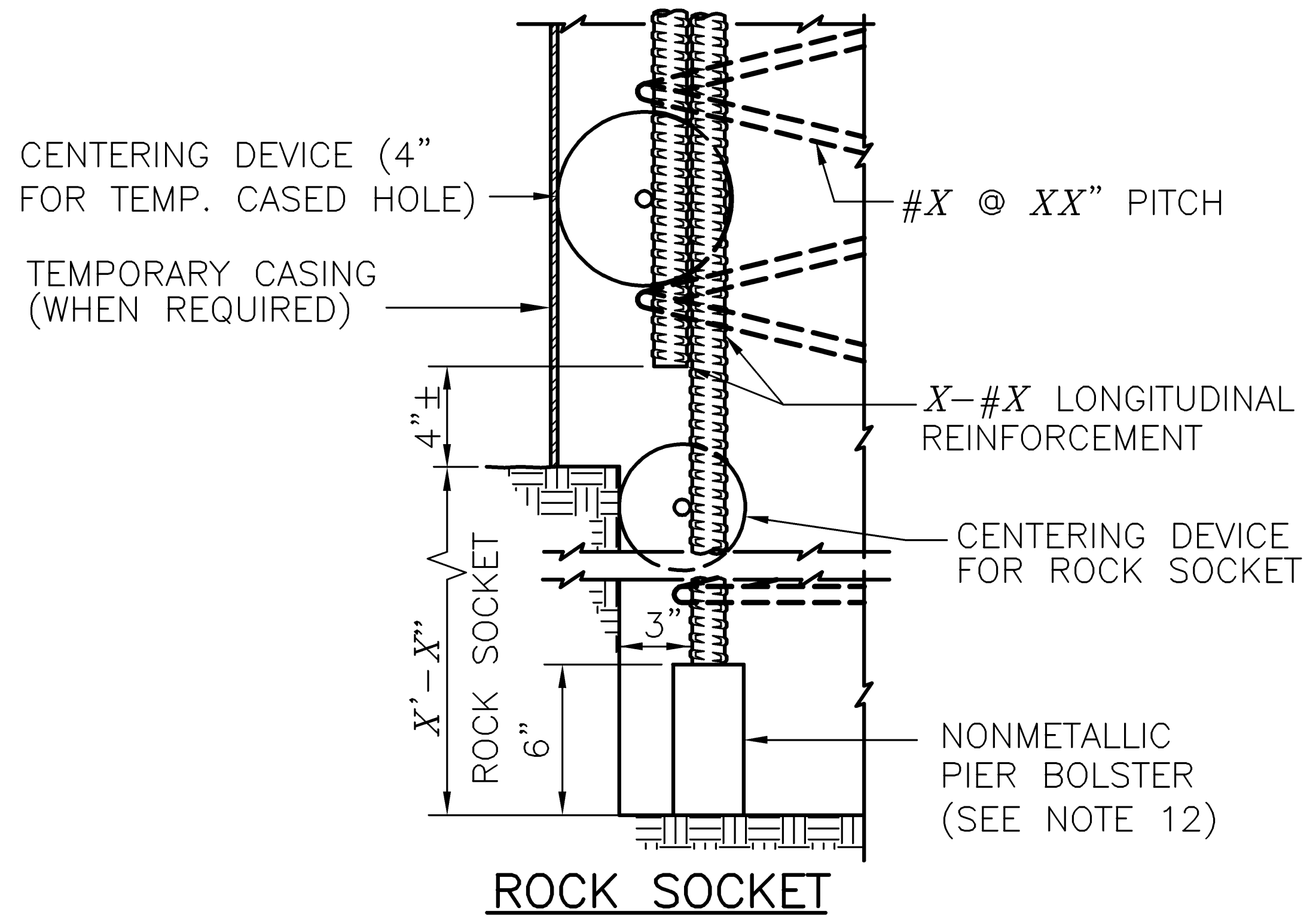
ELEVATION – DRILLED SHAFT/COLUMN IN ROCK


90° MIN.
℄ SHAFT
CROSS HOLE SONIC TESTING ACCESS PIPE (TYP.)
EQUAL SPACES BETWEEN REINFORCING
TEMPORARY CASING (WHEN REQUIRED)
℄ SHAFT
#X SPIRAL REINFORCEMENT
3" CL.
NONMETALLIC CENTERING DEVICE
XX–#X LONGITUDINAL REINFORCEMENT, EQUALLY SPACED
SHAFT DIAMETER

SECTION A / 1.30

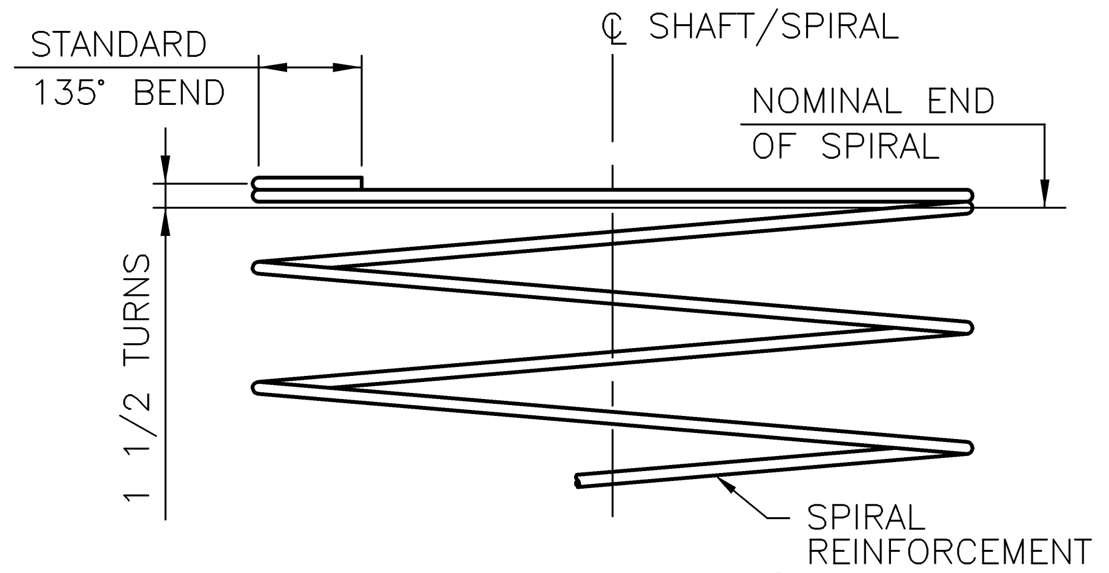

℄ SHAFT/COLUMN
90° MIN.
CROSS HOLE SONIC TESTING ACCESS PIPE (TYP.)
EQUAL SPACES BETWEEN REINFORCING
TEMPORARY CASING (WHEN REQUIRED)
℄ SHAFT/ COLUMN
#X SPIRAL REINFORCEMENT
4" CL.
XX–#X ROCK SOCKET (INNER CAGE) LONGITUDINAL REINFORCEMENT (TYP.)
XX–#X DRILLED SHAFT/ COLUMN LONGITUDINAL REINFORCEMENT (TYP.)
NONMETALLIC CENTERING DEVICE
SHAFT DIAMETER

SECTION B / 1.30


CENTERING DEVICE (4" FOR TEMP. CASED HOLE)
#X @ XX" PITCH
TEMPORARY CASING (WHEN REQUIRED)
X–#X LONGITUDINAL REINFORCEMENT
4"±
CENTERING DEVICE FOR ROCK SOCKET
3"
X'-X" ROCK SOCKET
6"
NONMETALLIC PIER BOLSTER (SEE NOTE 12)

ROCK SOCKET

DETAIL 1 / 1.30



DETAIL 2 / 1.30

DESIGNER NOTES:

1. *THE DESIGNER SHALL MODIFY THE TOP OF SHAFT ANCHORAGE DETAILS TO SUIT THE APPLICABLE SUBSTRUCTURE TYPE.*
2. *DESIGN SHALL BE IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.*
3. *THE ENGINEER SHALL ADJUST THE SHAFT REINFORCING DETAILS AS REQUIRED TO SUIT THE SPECIFIC CONSTRUCTION AND SEISMIC REQUIREMENTS.*
4. *THE APPLICABLE NOTES SHOWN BELOW SHALL BE INCLUDED ON THE CONTRACT DRAWINGS.*
5. *THE DESIGNER SHALL DETAIL THE ENTIRE SYSTEM TO ACCOMMODATE THE CONSTRUCTION TOLERANCES ANTICIPATED WITH THESE LARGE UNITS. THIS IS PARTICULAR CRITICAL WITH SINGLE COLUMN PIERS.*

NOTES:

1. CONCRETE SHALL BE PLACED AGAINST UNDISTURBED SOIL IMMEDIATELY AFTER DRILLING UNLESS PREVIOUSLY APPROVED BY THE ENGINEER.
2. THE CONTRACTOR SHALL SUBMIT FOR APPROVAL A METHOD TO REINFORCE THE DRILLED SHAFT REINFORCEMENT CAGE DURING LIFTING OPERATIONS AND INSTALLATION. REINFORCEMENT MAY BE INCREASED AS REQUIRED TO ASSIST WITH HANDLING AND PLACEMENT.
3. DRILLING SHALL BE PERFORMED IN SUCH A MANNER AS TO PREVENT LOSS OF GROUND BEYOND THE SPECIFIED DIAMETER. THE USE OF SURFACE CASING, TEMPORARY CASINGS, DRILLING MUD, DRILLING SLURRY OR OTHER METHODS SHALL BE EMPLOYED TO PREVENT COLLAPSE OF THE BORE HOLE AND LOSS OF GROUND BELOW THE BOTTOM OF THE TEMPORARY OR PERMANENT CASING.
4. THE BOTTOM OF THE EXCAVATION SHALL BE CLEANED OF LOOSE MATERIAL USING EQUIPMENT ACCEPTABLE TO THE ENGINEER PRIOR TO PLACING REINFORCEMENT STEEL AND CONCRETE.
5. NONMETALLIC CENTERING DEVICES SHALL BE OF THE TYPE, AND LOCATED AS SUCH, TO ENSURE THAT THE MINIMUM REINFORCING BAR CLEARANCES SHOWN ARE MAINTAINED.
6. LONGITUDINAL REINFORCEMENT SHALL NOT BE SPLICED WITHIN THE TOP 30 FEET OF THE DRILLED SHAFT. REINFORCING BARS BELOW THE TOP 30 FEET SHALL BE LAP SPLICED THE MINIMUM LENGTH SHOWN ON THE PLANS. LAP SPLICES SHALL BE STAGGERED SO THAT NO MORE THAN ½ OF THE SPLICES OCCUR AT THE SAME LOCATION.
7. SPIRAL REINFORCING SHALL BE SUPPLIED IN THE MAXIMUM POSSIBLE CONTINUOUS LENGTHS. WHERE POSSIBLE, NO SPIRAL REINFORCING SHALL BE SPLICED WITHIN THE TOP 30 FEET OF THE DRILLED SHAFT. WHERE SPLICES WITHIN THE TOP 30 FEET ARE REQUIRED, APPROVED MECHANICAL COUPLERS SHALL BE USED. SPLICES BELOW THE TOP 30 FEET MAY BE LAP SPLICED USING 1½ TURNS MINIMUM OR WITH APPROVED MECHANICAL COUPLERS.
8. MECHANICAL COUPLERS SHALL BE APPROVED BY THE ENGINEER AND SHALL BE CAPABLE OF DEVELOPING AT LEAST 125% OF THE ULTIMATE REBAR STRENGTH.
9. AT FREE AND DISCONTINUOUS ENDS OF SPIRALS, THE ENDS SHALL BE ANCHORED AS SHOWN IN DETAIL 2.
10. CONSTRUCTION JOINTS SHALL BE PLACED TWO (2) FEET MINIMUM BELOW GRADE. AT ALL CONSTRUCTION JOINTS, THE TOPS OF THE PREVIOUS POUR SHALL BE CLEANED OF ALL LAITANCE AND ANY OTHER DELETERIOUS MATTER, AND AN EPOXY BONDING AGENT SHALL BE APPLIED.
11. THE BOTTOM OF SHAFT ELEVATIONS SHOWN ON THE PLANS IS APPROXIMATE, AND MAY VARY BASED ON ACTUAL DRILLING CONDITIONS. THE CONTRACTOR SHALL ADJUST THE REINFORCING LENGTH AS REQUIRED TO SUIT THE FINAL SHAFT DEPTH.
12. EACH LONGITUDINAL REINFORCING BAR SHALL BE SUPPORTED BY A NONMETALLIC DURABLE MATERIAL BOLSTER.
13. WELDING OF LONGITUDINAL REINFORCEMENT SHALL NOT BE PERMITTED. WELDING OF OTHER REBAR MAY BE PERMITTED AT THE APPROVAL OF THE ENGINEER.

THIS SHEET NOT TO SCALE.

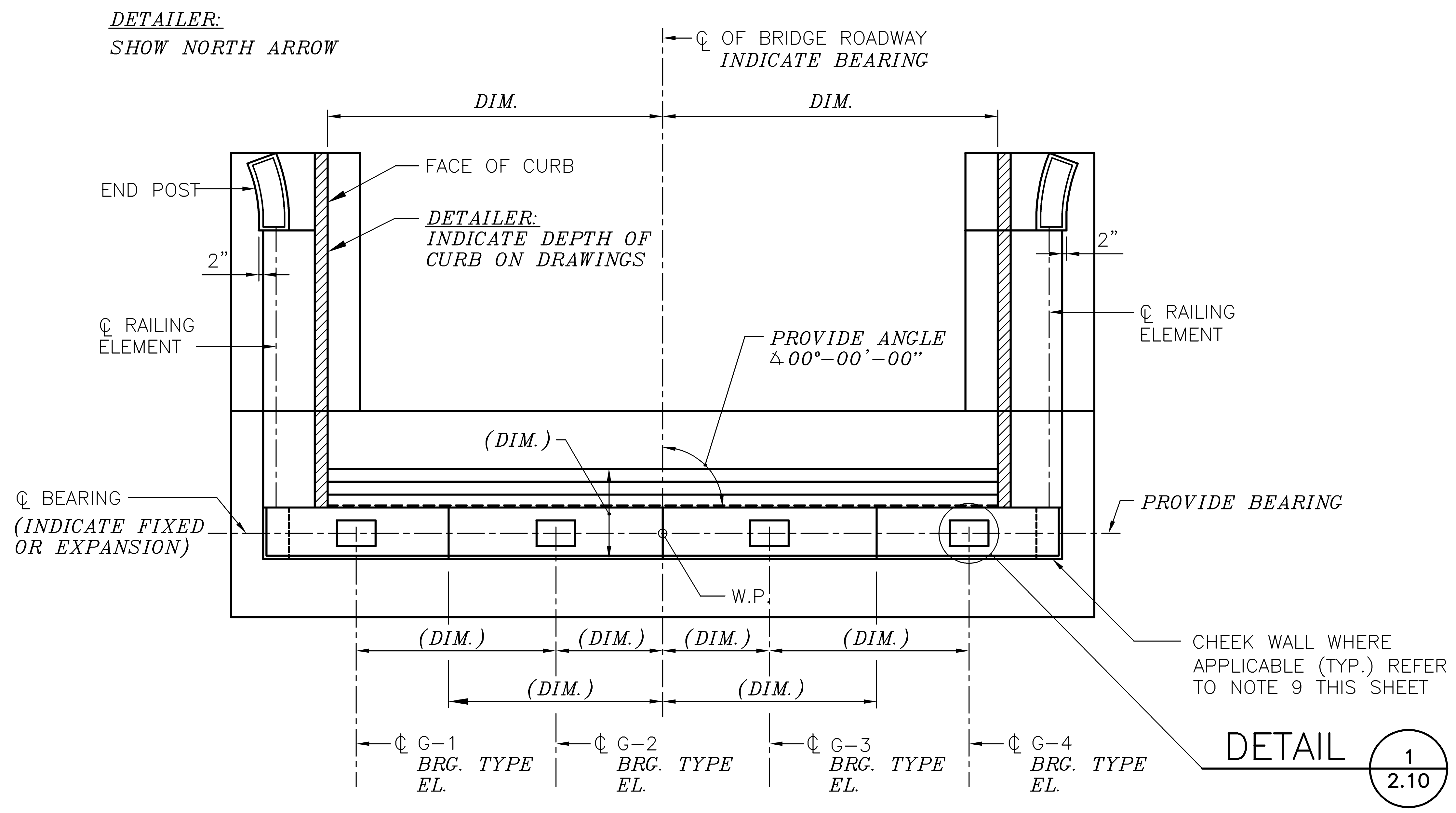
REVISIONS	
No.	DATE

RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

BRIDGE STANDARDS

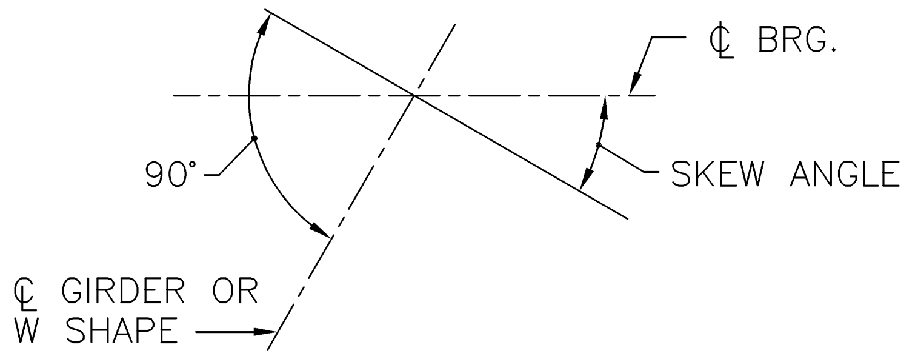
DRILLED SHAFT DETAILS

DRAWING NUMBER: 1.30

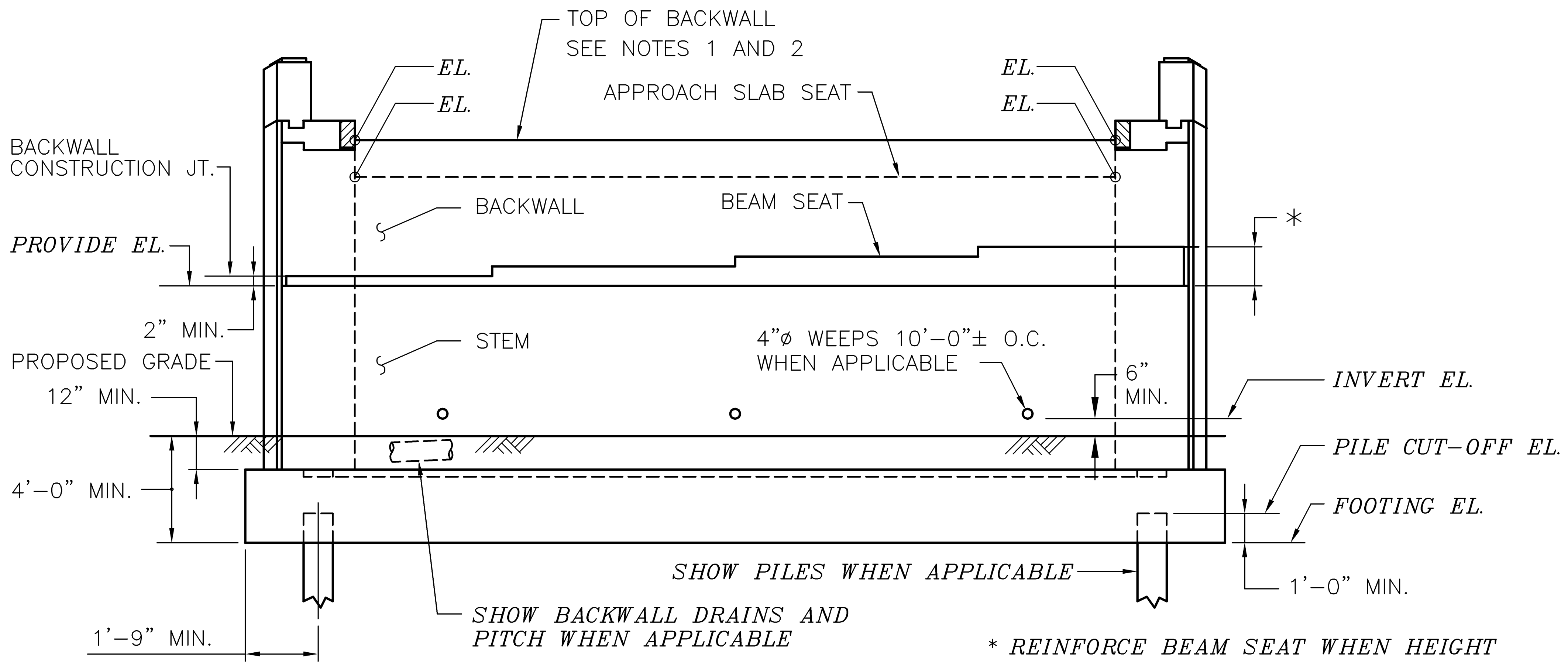


PLAN AT BEAM SEATS

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



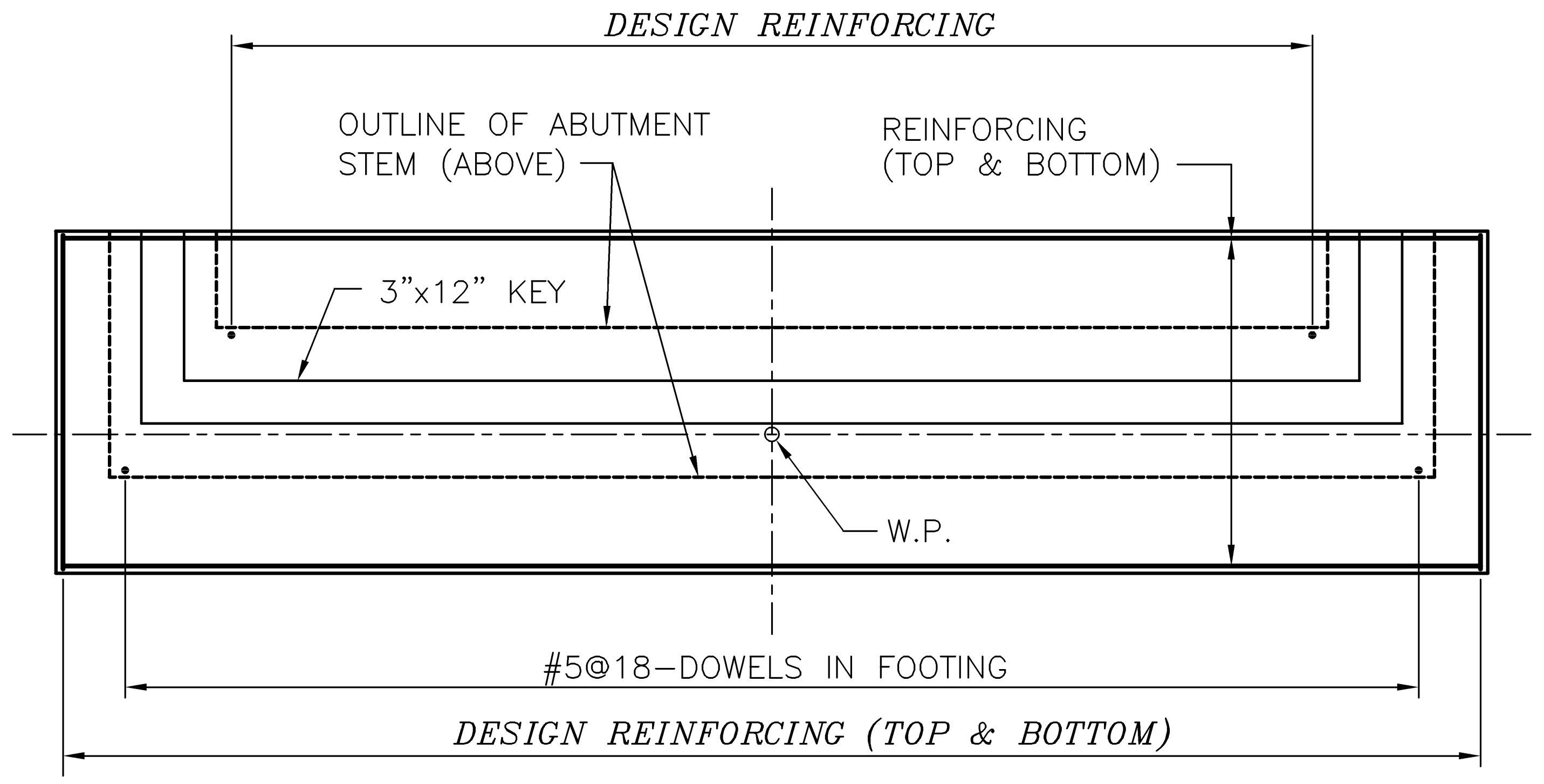
SKEW ANGLE DESIGNATION



* REINFORCE BEAM SEAT WHEN HEIGHT OF BEAM SEAT EXCEEDS 4".

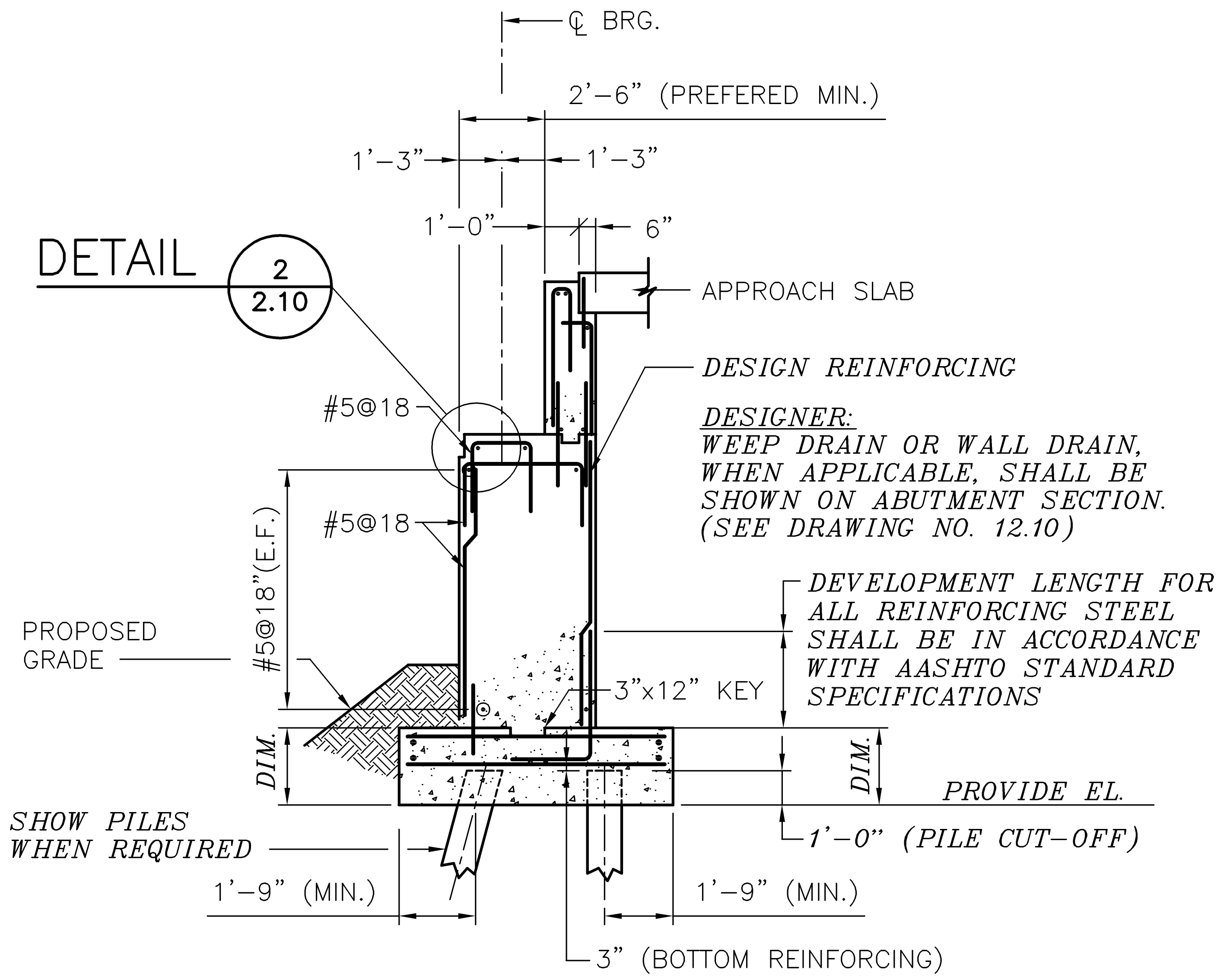
ELEVATION

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


DESIGN REINFORCING
OUTLINE OF ABUTMENT STEM (ABOVE)
REINFORCING (TOP & BOTTOM)
3"x12" KEY
W.P.
#5@18-DOWELS IN FOOTING
DESIGN REINFORCING (TOP & BOTTOM)

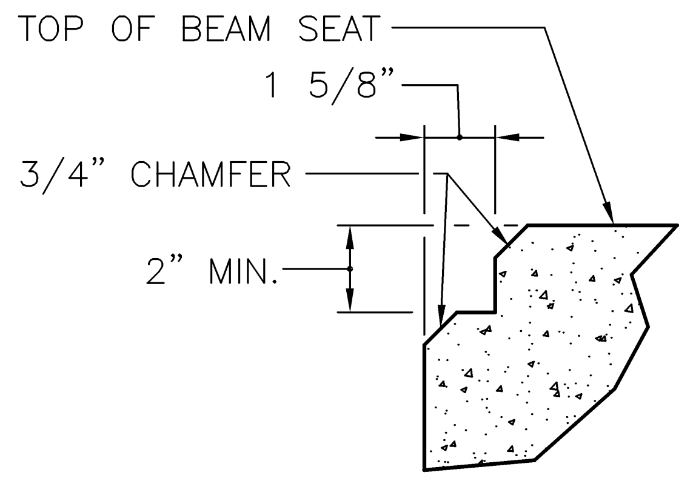
FOOTING REINFORCING PLAN

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



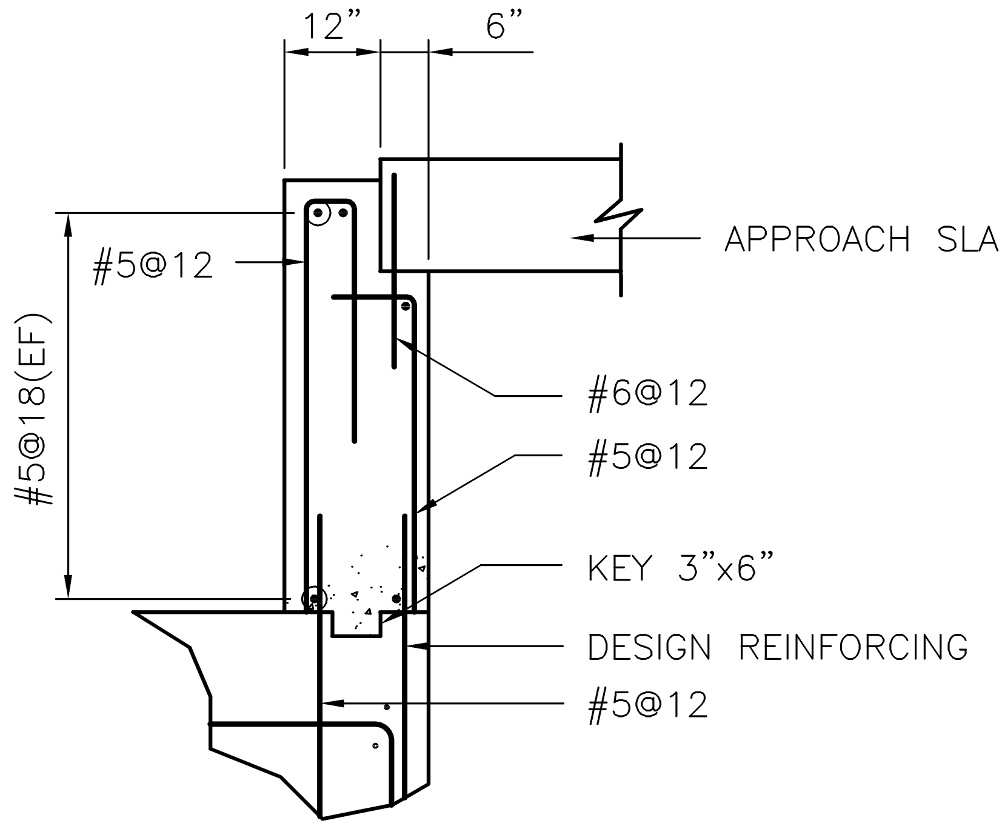
TYPICAL SECTION THROUGH ABUTMENT

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



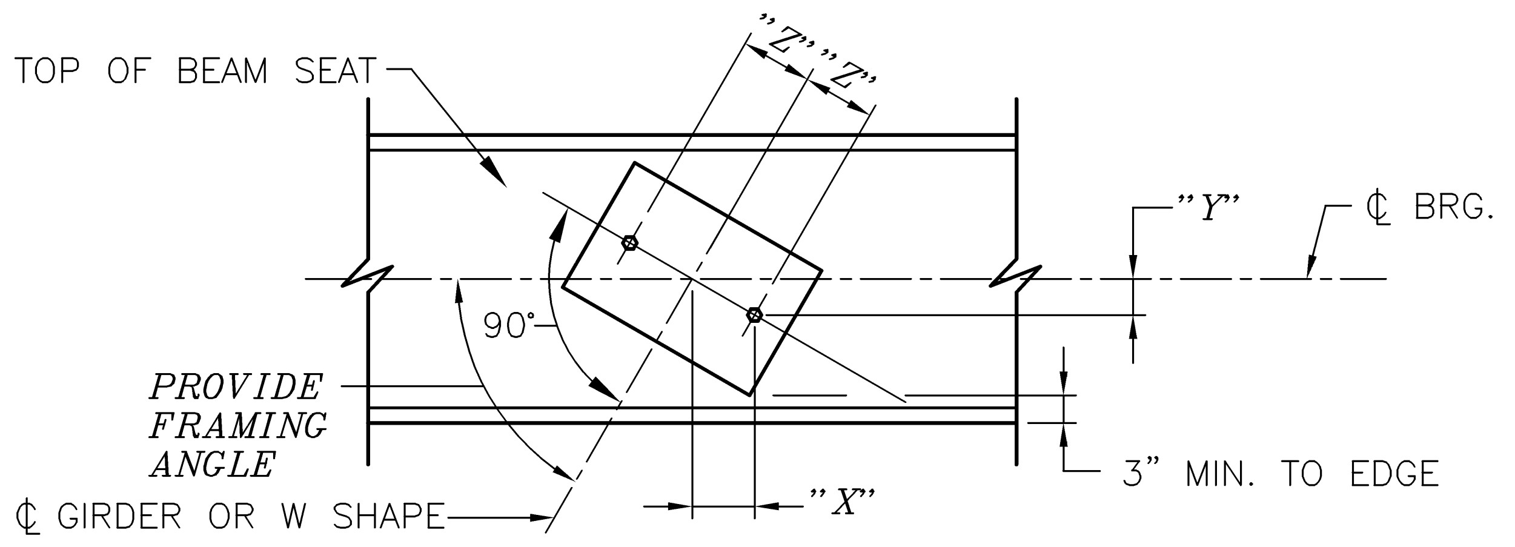
DETAIL 2 / 2.10

NOT TO SCALE



TYPICAL BACKWALL REINFORCING

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



ANCHOR BOLT LAYOUT PLAN
(WHEN SKEWED)

DETAIL 1 / 2.10

NOT TO SCALE

DESIGNER:
BE SURE TO GIVE THE "X","Y" AND "Z" OFFSET DIMENSIONS. IF THE MASONRY PLATE ENCROACHES ON THE 3" MIN. DIMENSION IT MAY BE NECESSARY TO CLIP THE CORNER OF THE PLATE. CHECK WITH THE ENGINEER.

DESIGNER NOTES:

1. *A NOTE SHALL BE PROVIDED ON THE CONTRACT DRAWINGS STATING THAT BACKWALL ELEVATIONS AT THE EXPANSION END ARE GIVEN AT FRONT FACE OF BACKWALL.*
2. *A NOTE SHALL BE PROVIDED ON THE CONTRACT DRAWINGS STATING THAT BACKWALL ELEVATIONS AT THE FIXED END ARE GIVEN TO FRONT FACE OF BACKWALL.*
3. *UTILITY PASSAGE THROUGH THE ABUTMENT BACKWALL SHALL BE COORDINATED WITH THE APPROPRIATE UTILITY COMPANIES AND SHALL BE PROVIDED FOR WHEN REQUIRED.*
4. *THE DEPTH OF FOOTING WILL VARY BY DESIGN. THE BOTTOM OF THE FOOTING SHOULD ALWAYS BE A MINIMUM OF 4'-0" BELOW FINISHED GROUND TO PREVENT FROST HEAVE.*
5. *ABUTMENT DETAILS SHOWN ARE SIMILAR IN CONCEPT WHEN ABUTMENT IS SKEWED.*
6. *REINFORCING SHOWN IS MINIMUM ONLY.*
7. *THE SUGGESTED SCALE FOR ANY ABUTMENT PLAN AND ELEVATION IS 1/4"=1'-0".*
8. *DETAILS OF END POSTS AND RAILINGS ARE SHOWN ELSEWHERE IN THESE BRIDGE STANDARDS (SEE APPROPRIATE DETAILS).*
9. *FOR PRESTRESSED CONCRETE SLABS AND BOX BEAMS, CHEEK WALLS WILL BE REQUIRED TO RESIST LATERAL FORCES*

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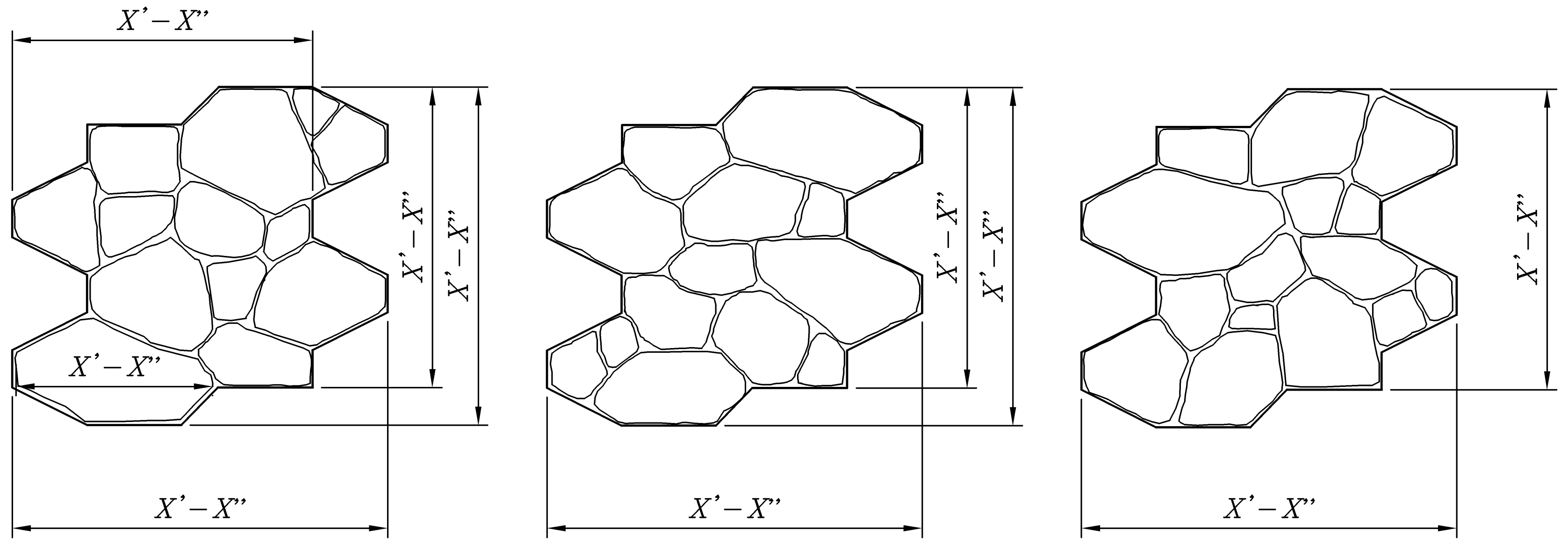
BRIDGE STANDARDS

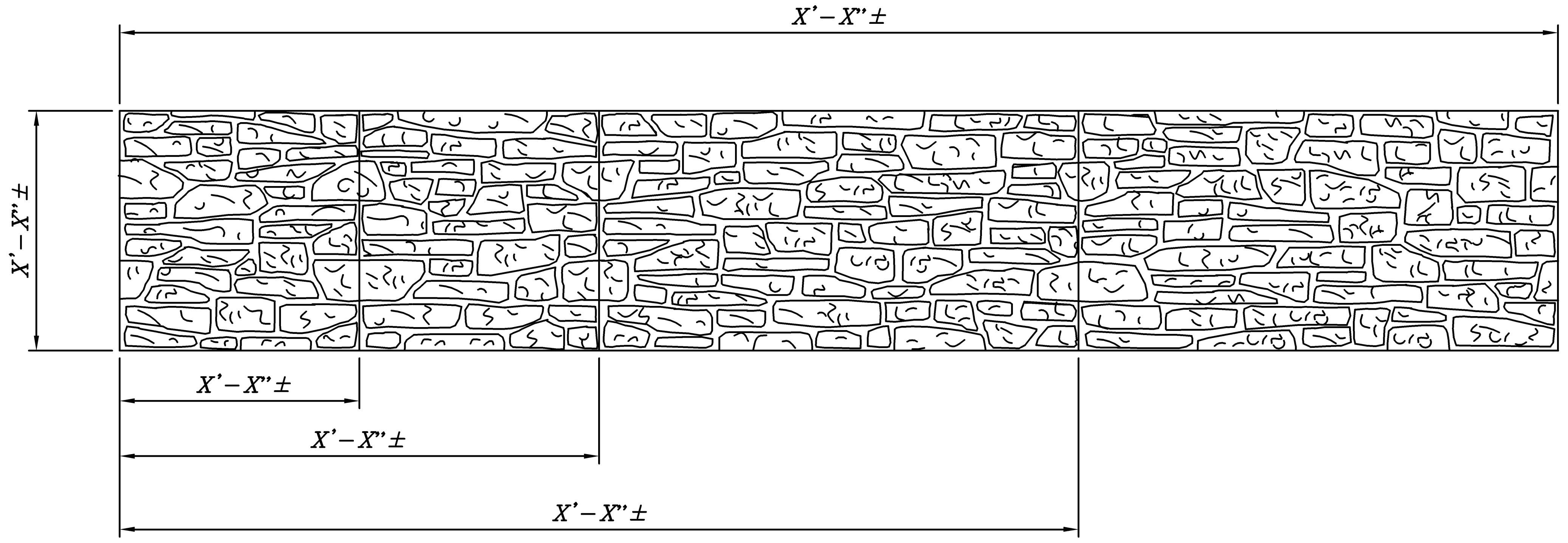
ABUTMENT DETAILS

DRAWING NUMBER: 2.10



SIMULATED GROUT IS 3/8" TO 3/4" WIDE AT BOTTOM & 1 1/2" TO 2 1/2" AT TOP. SIMULATED STONE DEPTH IS 2 1/8" AT DEEPEST POINTS. ALL DIMENSIONS ARE APPROXIMATE DUE TO ROUGHNESS OF STONE TEXTURE.

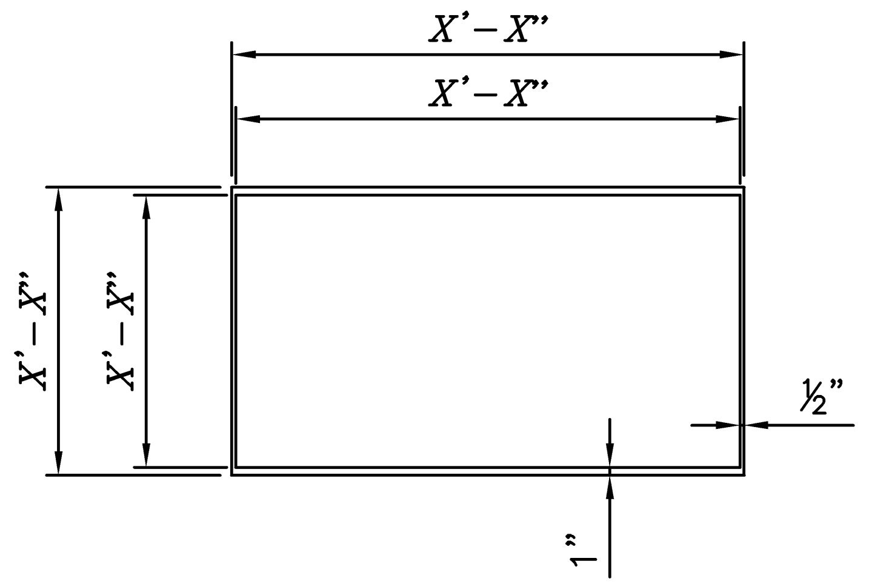
IRREGULAR JOINT
ELEVATION VIEW



VERTICAL JOINT
ELEVATION VIEW

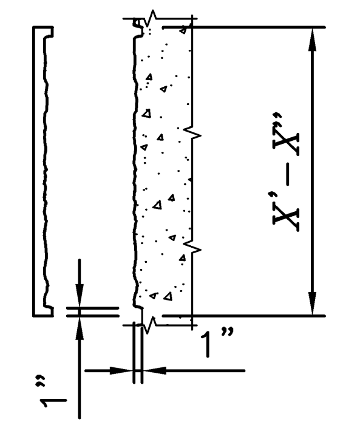
TYPICAL TYPES OF STONE PATTERN LAYOUTS

SCALE:1/2"=1'–0"



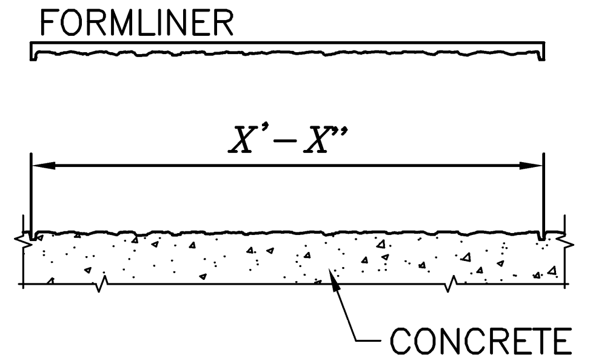
ELEVATION VIEW

FACE OF SIMULATED
STONE MAXIMUM
RELIEF IS 1"



SIDE VIEW

X'–X" TALL
WITH 1" HALF GROUTS,
TOP AND BOTTOM

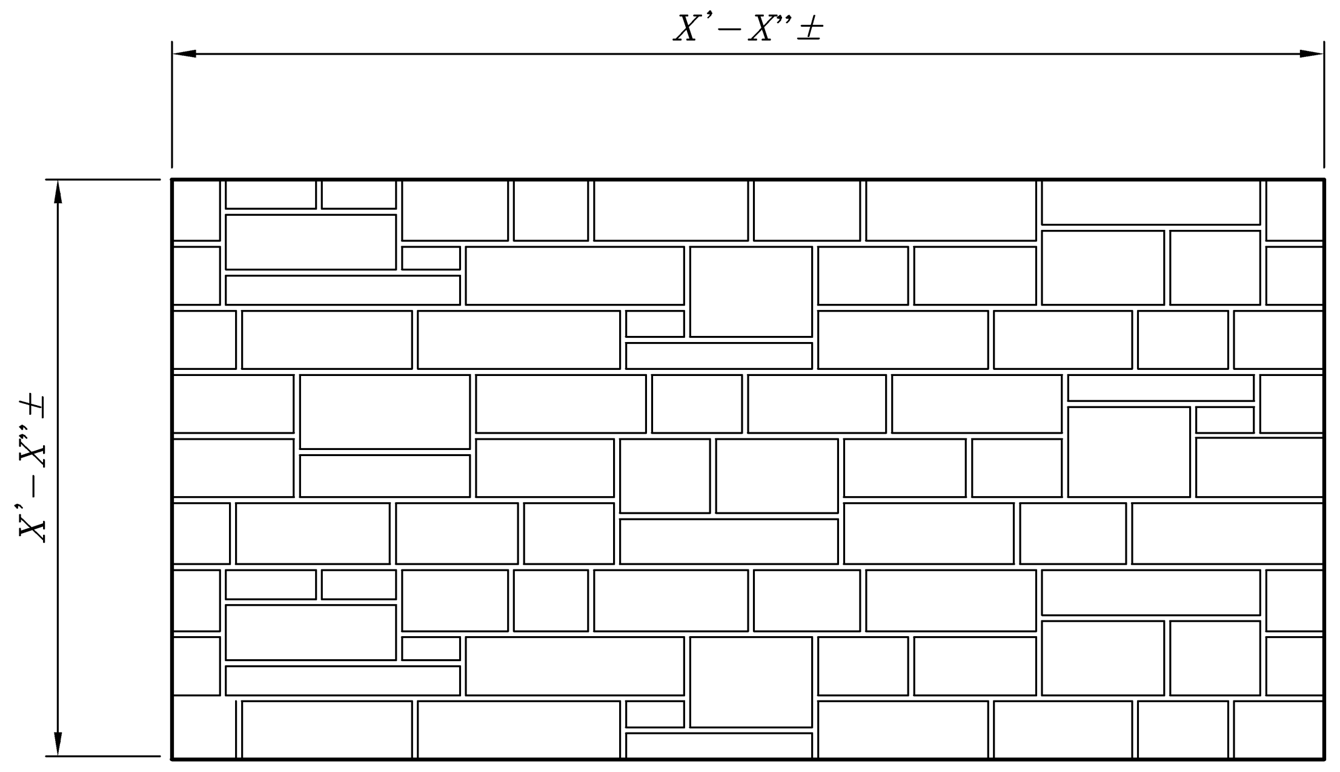


X'–X" WIDE WITH 1/2" HALF GROUTS, BOTH SIDES; 1" MAXIMUM DEPTH OF TEXTURE

TOP VIEW

TYPICAL FORMLINER DETAILS

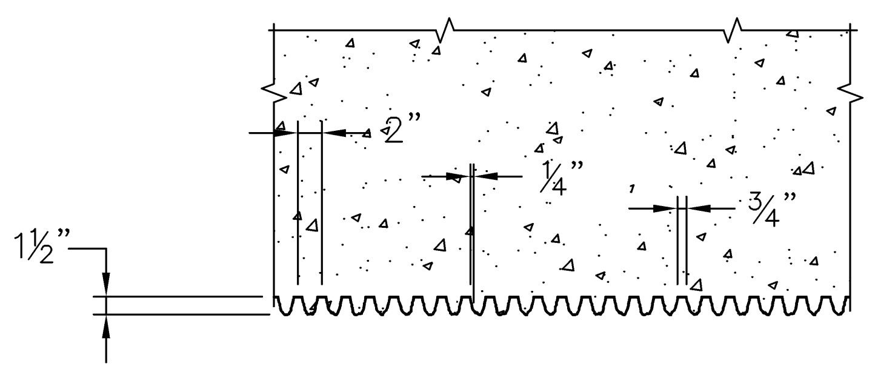
SCALE:1/2"=1'–0"



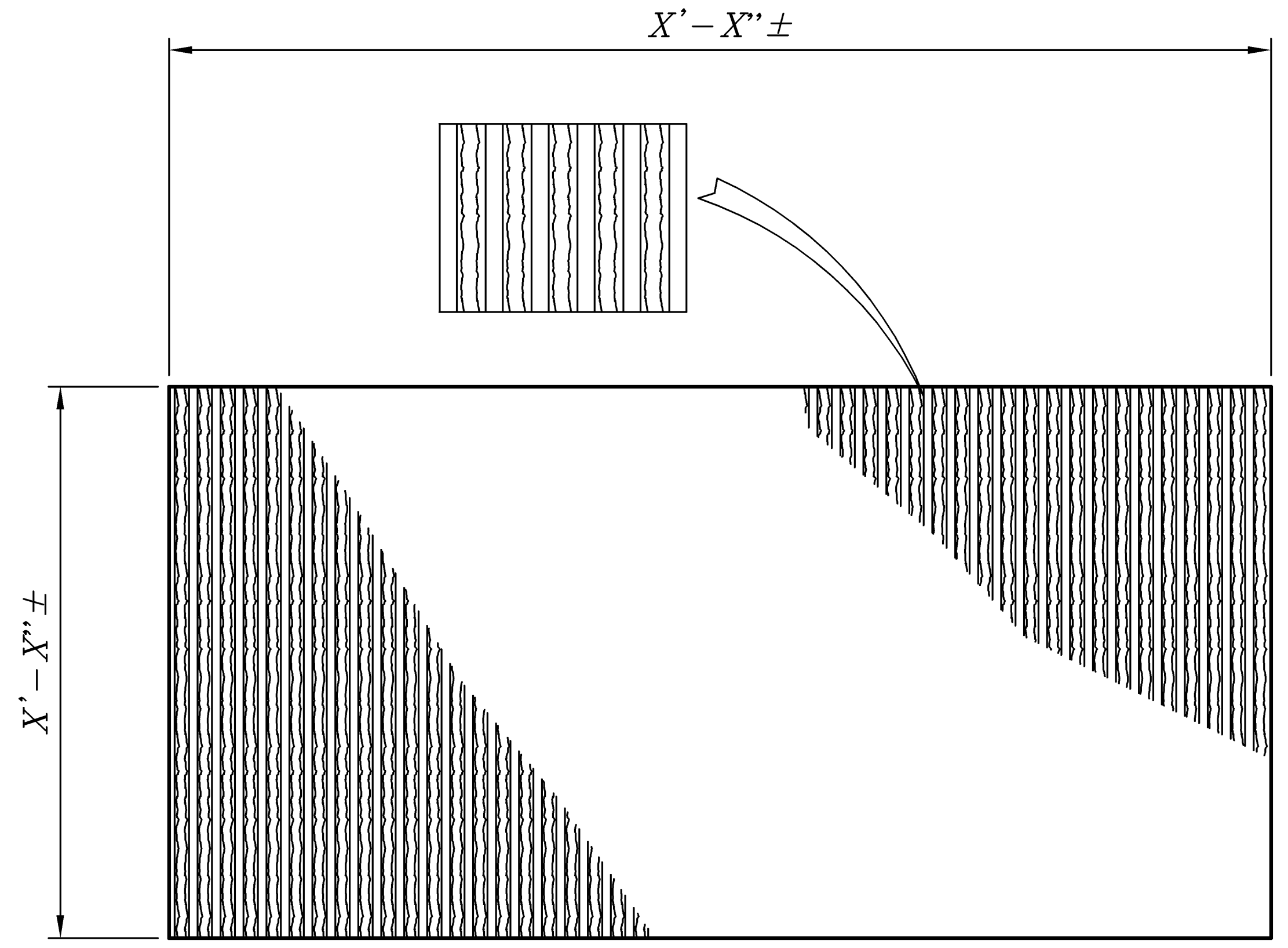
ELEVATION VIEW

TYPICAL ASHLAR MASONRY PATTERN LAYOUT

SCALE:1/2"=1'–0"



PARTIAL TOP VIEW



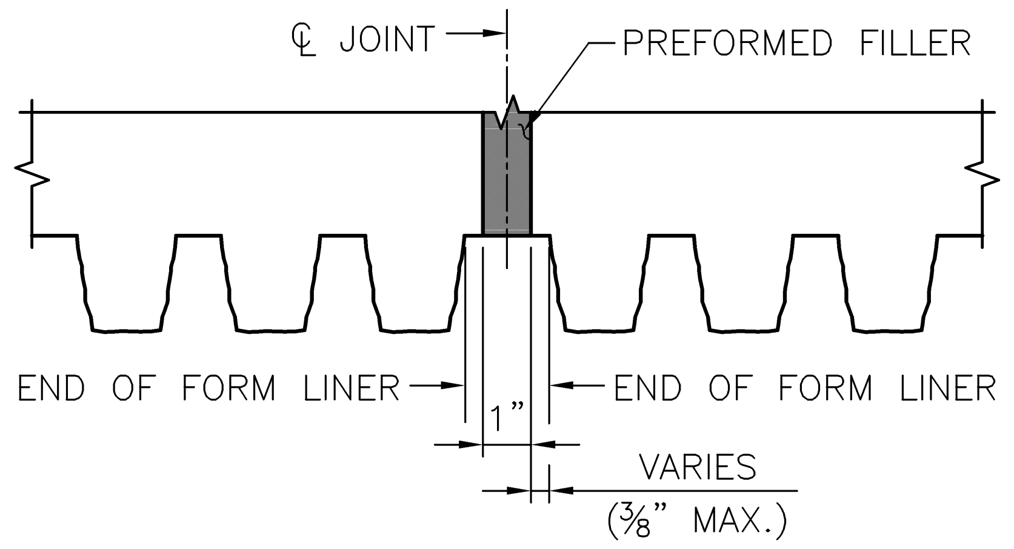
ELEVATION VIEW

TYPICAL FRACTURED RIB PATTERN LAYOUT

SCALE:3/4"=1'–0"

DESIGNER NOTE:

THIS DRAWING DEPICTS SOME POSSIBLE SURFACE TREATMENTS FOR ABUTMENTS AND WALLS, USING FORM LINERS. THE DESIGNER SHALL REFER TO THE RI LRFD BRIDGE DESIGN MANUAL – SECTION 2, FOR BRIDGE AESTHETICS REQUIREMENTS.



EXPANSION JOINT DETAIL

SCALE:3"=1'–0"

NOTES:

1. THE CONTRACTOR SHALL MAKE SURE THAT THE STRIATION FINS ARE PLUMB AND LINED UP VERTICALLY FROM PANEL TO PANEL.
2. THE HORIZONTAL JOINT MAY BE OMITTED.

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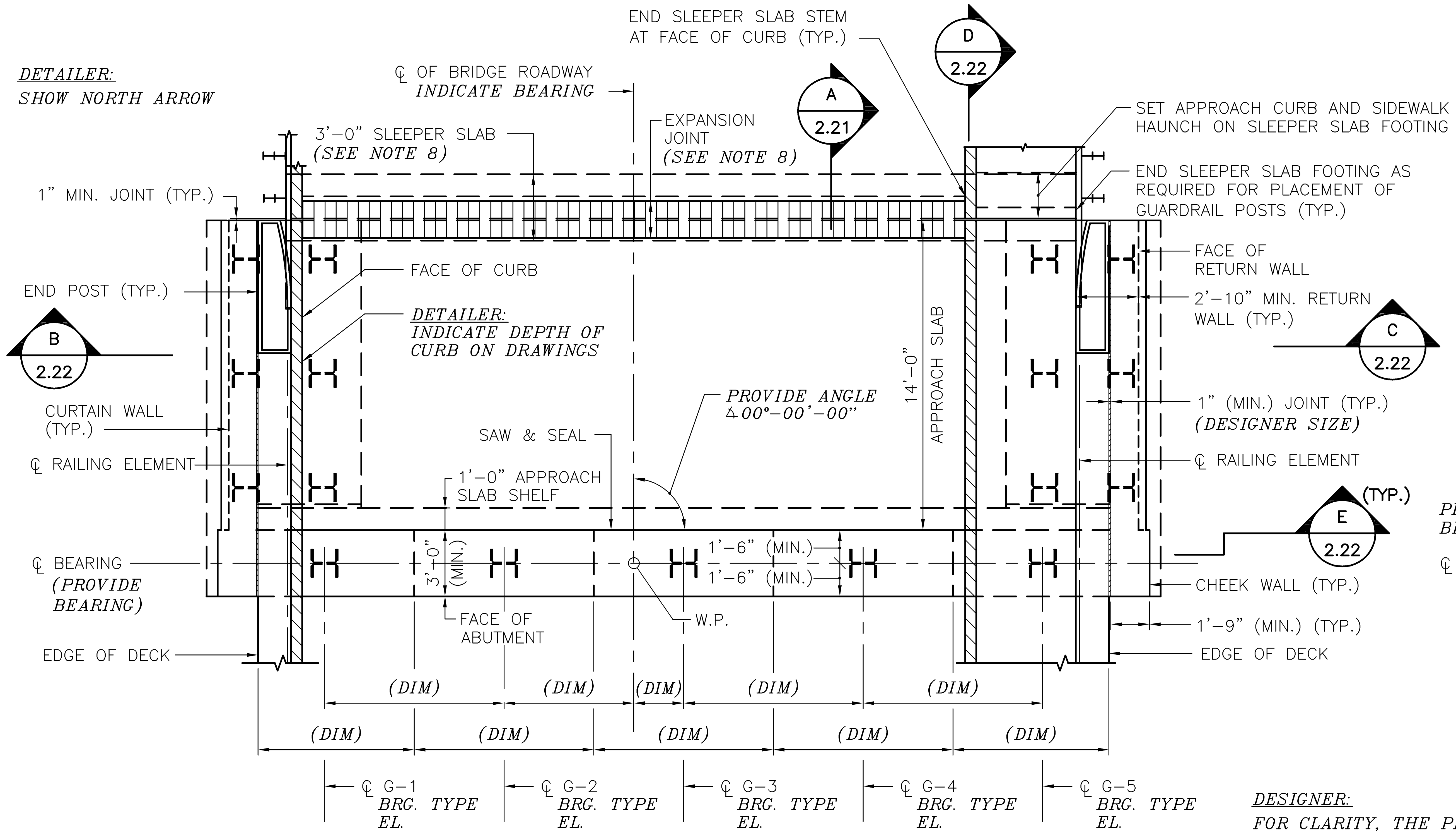
BRIDGE STANDARDS

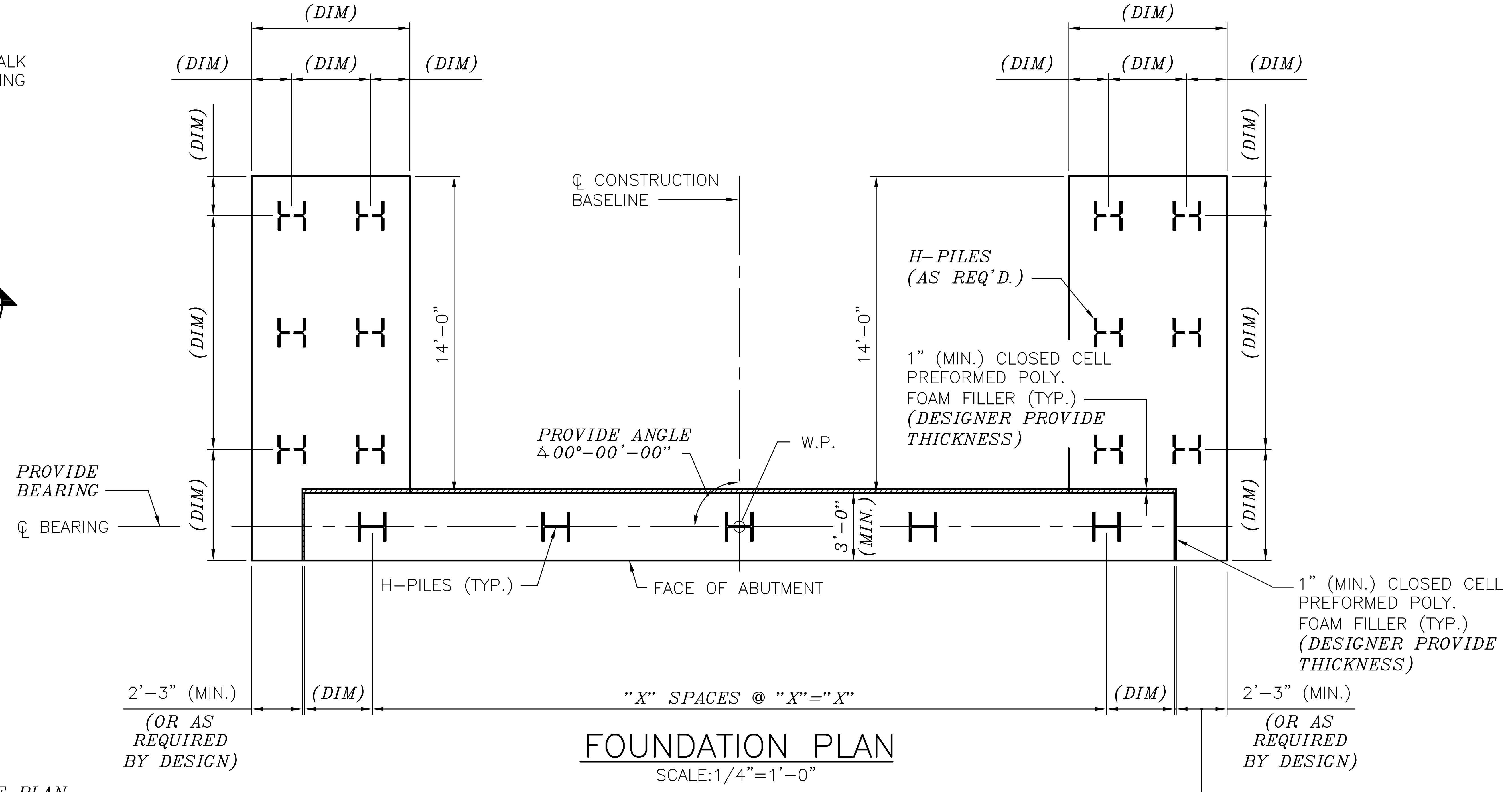
FORMLINER DETAILS

DRAWING NUMBER: 2.11

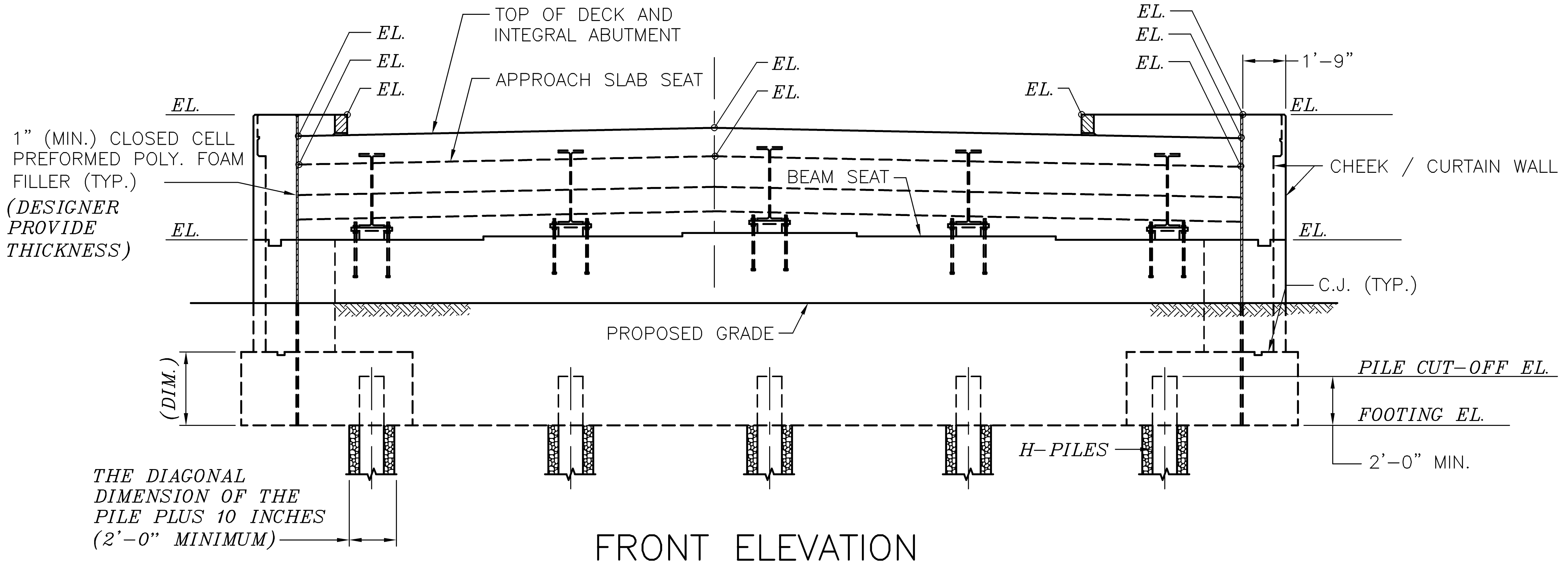

DETAILER:
SHOW NORTH ARROW
END SLEEPER SLAB STEM AT FACE OF CURB (TYP.)
℄ OF BRIDGE ROADWAY INDICATE BEARING
3'–0" SLEEPER SLAB (SEE NOTE 8)
EXPANSION JOINT (SEE NOTE 8)
A 2.21
D 2.22
SET APPROACH CURB AND SIDEWALK HAUNCH ON SLEEPER SLAB FOOTING
END SLEEPER SLAB FOOTING AS REQUIRED FOR PLACEMENT OF GUARDRAIL POSTS (TYP.)
1" MIN. JOINT (TYP.)
FACE OF RETURN WALL
END POST (TYP.)
FACE OF CURB
2'–10" MIN. RETURN WALL (TYP.)
B 2.22
DETAILER: INDICATE DEPTH OF CURB ON DRAWINGS
C 2.22
14'–0"
APPROACH SLAB
CURTAIN WALL (TYP.)
PROVIDE ANGLE ∆00°-00'-00"
1" (MIN.) JOINT (TYP.) (DESIGNER SIZE)
SAW & SEAL
℄ RAILING ELEMENT
℄ RAILING ELEMENT
1'–0" APPROACH SLAB SHELF
E 2.22 (TYP.)
℄ BEARING (PROVIDE BEARING)
3'–0" (MIN.)
1'–6" (MIN.)
1'–6" (MIN.)
CHEEK WALL (TYP.)
FACE OF ABUTMENT
W.P.
1'–9" (MIN.) (TYP.)
EDGE OF DECK
EDGE OF DECK
(DIM) (DIM) (DIM) (DIM) (DIM)
(DIM) (DIM) (DIM) (DIM) (DIM)
℄ G–1 BRG. TYPE EL.
℄ G–2 BRG. TYPE EL.
℄ G–3 BRG. TYPE EL.
℄ G–4 BRG. TYPE EL.
℄ G–5 BRG. TYPE EL.

DESIGNER:
FOR CLARITY, THE PLAN VIEW HAS BEEN DRAWN WITHOUT THE BEAMS AND ANCHOR ASSEMBLIES.

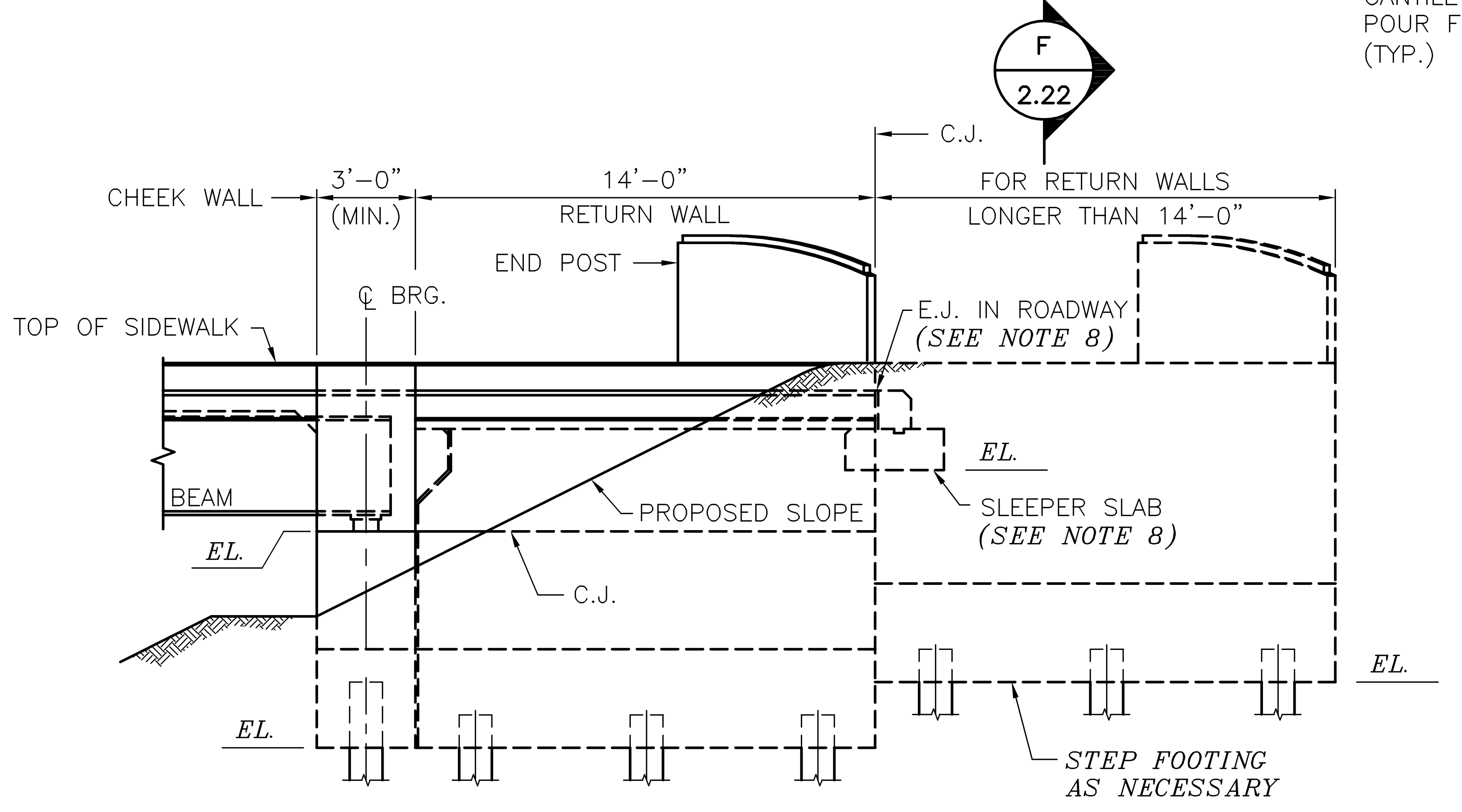
PLAN AT BEAM SEATS
SCALE:1/4"=1'–0"


(DIM) (DIM) (DIM) (DIM)
(DIM) (DIM) (DIM) (DIM)
(DIM) (DIM) (DIM)
(DIM) (DIM) (DIM)
℄ CONSTRUCTION BASELINE
14'–0"
14'–0"
H-PILES (AS REQ'D.)
1" (MIN.) CLOSED CELL PREFORMED POLY. FOAM FILLER (TYP.) (DESIGNER PROVIDE THICKNESS)
PROVIDE ANGLE ∆00°-00'-00"
W.P.
PROVIDE BEARING
℄ BEARING
3'–0" (MIN.)
H-PILES (TYP.)
FACE OF ABUTMENT
1" (MIN.) CLOSED CELL PREFORMED POLY. FOAM FILLER (TYP.) (DESIGNER PROVIDE THICKNESS)
2'–3" (MIN.) (OR AS REQUIRED BY DESIGN)
(DIM)
"X" SPACES @ "X"="X"
(DIM)
2'–3" (MIN.) (OR AS REQUIRED BY DESIGN)
CANTILEVERED FOOTING POUR FOR CHEEK WALL (TYP.)

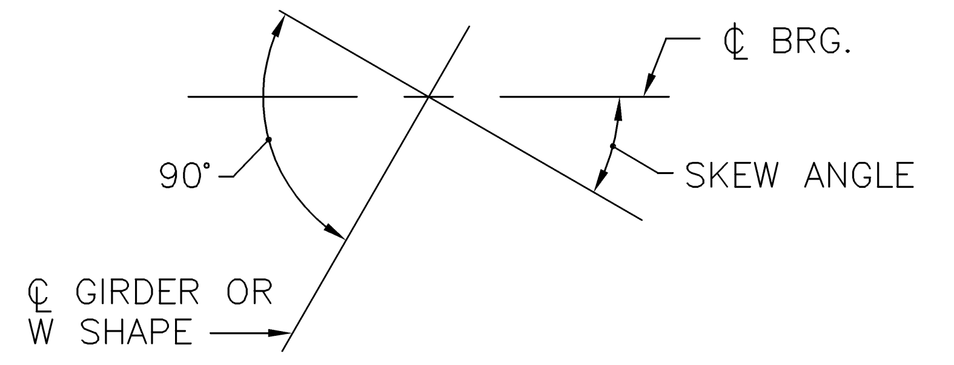
FOUNDATION PLAN
SCALE:1/4"=1'–0"


EL.
EL.
EL.
EL.
TOP OF DECK AND INTEGRAL ABUTMENT
APPROACH SLAB SEAT
EL.
EL.
EL.
EL.
EL.
EL.
1'–9"
EL.
1" (MIN.) CLOSED CELL PREFORMED POLY. FOAM FILLER (TYP.) (DESIGNER PROVIDE THICKNESS)
BEAM SEAT
CHEEK / CURTAIN WALL
EL.
EL.
C.J. (TYP.)
PROVIDED GRADE
(DIM.)
PILE CUT–OFF EL.
FOOTING EL.
H–PILES
2'–0" MIN.
THE DIAGONAL DIMENSION OF THE PILE PLUS 10 INCHES (2'–0" MINIMUM)

FRONT ELEVATION
SCALE:1/4"=1'–0"


F 2.22
C.J.
CHEEK WALL
3'–0" (MIN.)
14'–0" RETURN WALL
FOR RETURN WALLS LONGER THAN 14'–0"
END POST
℄ BRG.
TOP OF SIDEWALK
E.J. IN ROADWAY (SEE NOTE 8)
EL.
BEAM
PROPOSED SLOPE
SLEEPER SLAB (SEE NOTE 8)
EL.
C.J.
EL.
EL.
STEP FOOTING AS NECESSARY

RETURN WALL AT SIDEWALK / SAFETY WALK
SCALE:1/4"=1'–0"



SKEW ANGLE DESIGNATION

DESIGNER NOTES:

1. *THE DESIGNER SHALL REFER TO SECTION 11.3.3 (INTEGRAL ABUTMENTS) OF THE RIDOT LRFD BRIDGE DESIGN MANUAL FOR DESIGN AND DETAILING REQUIREMENTS AND LIMITATIONS ON THE USE OF INTEGRAL ABUTMENTS*
2. *A NOTE SHALL BE PROVIDED ON THE CONTRACT DRAWINGS STATING THAT THE TOP OF DECK ELEVATIONS ARE GIVEN AT THE FRONT FACE OF INTEGRAL ABUTMENTS.*
3. *UTILITY PASSAGE THROUGH THE INTEGRAL ABUTMENT SHOULD BE AVOIDED. (SEE SECTION 11.3.3 OF THE RIDOT LRFD BRIDGE DESIGN MANUAL).*
4. *ABUTMENT DETAILS FOR SKEWED ABUTMENTS ARE SIMILAR.*
5. *REINFORCING SHOWN IS MINIMUM ONLY.*
6. *THE SUGGESTED SCALE FOR ANY ABUTMENT PLAN AND ELEVATION IS 1/4"=1'–0".*
7. *REFERENCES TO END POSTS AND CENTERLINES OF RAILING ELEMENTS ARE INTENDED TO REFER TO THE DETAILS SHOWN ELSEWHERE IN THESE BRIDGE STANDARDS (SEE APPROPRIATE DETAILS).*
8. *SLEEPER SLAB AND EXPANSION JOINT IN ROADWAY MAY BE OMITTED FOR BRIDGE SUPERSTRUCTURE SPANS 60 FEET OR LESS.*
9. *SEE DWG. 2.22 FOR RETURN WALL DETAILS*

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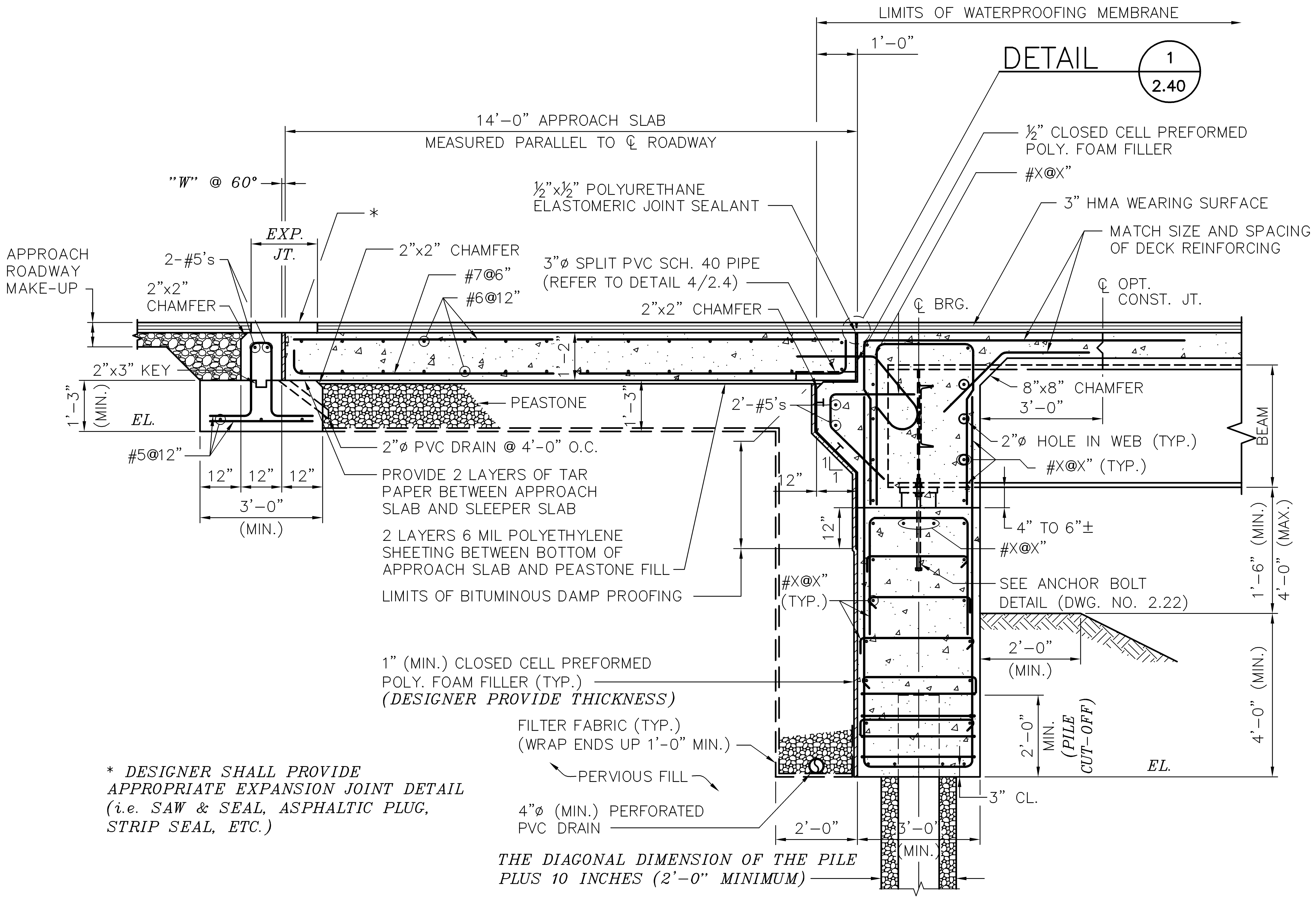
RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

BRIDGE STANDARDS

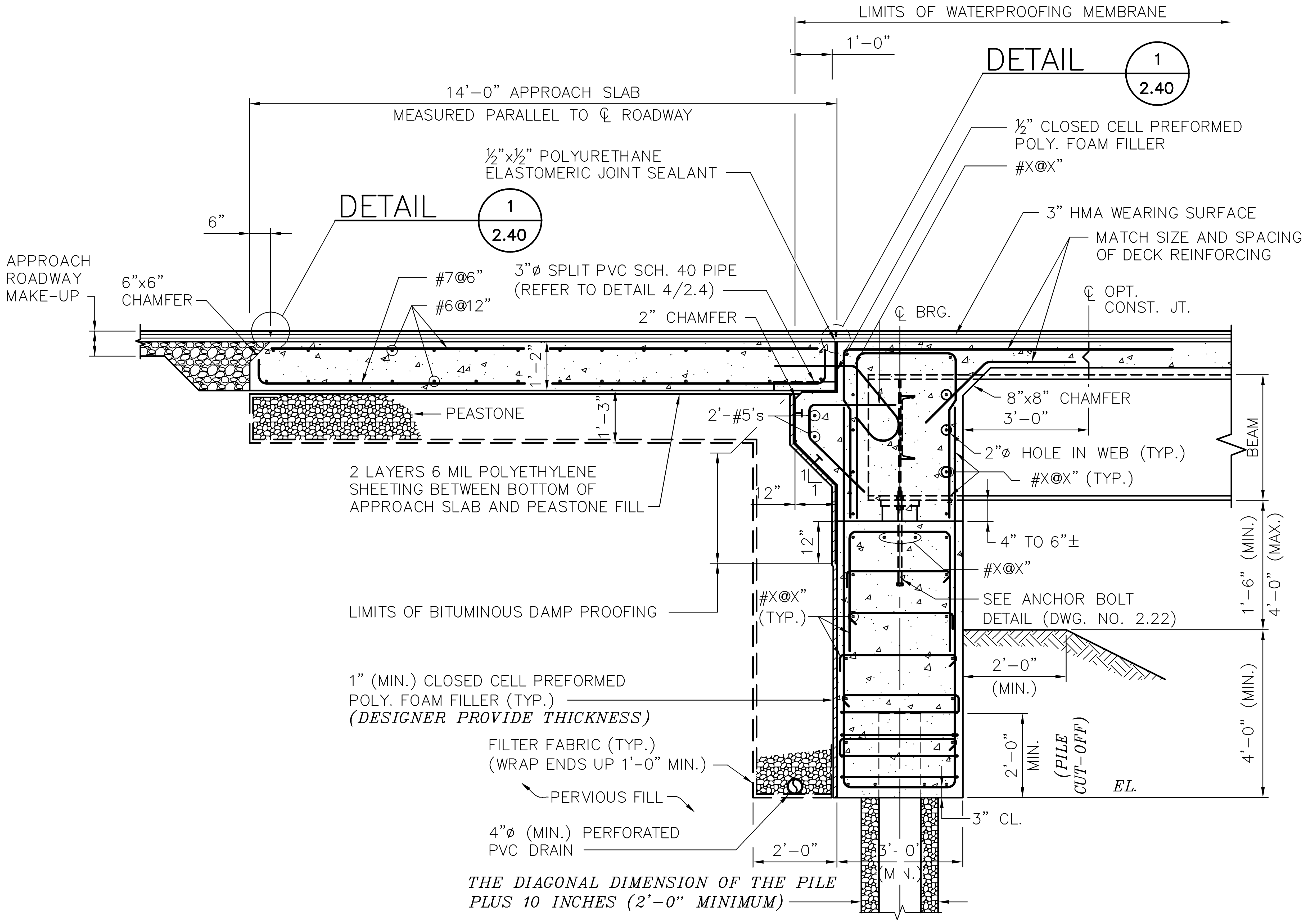
INTEGRAL ABUTMENT
SHEET 1

DRAWING NUMBER: 2.20



SPANS > 60'-0"

SECTION (A / 2.21)
SCALE:1/2"=1'-0"



SPANS ≤ 60'-0"

SECTION (A / 2.21)
SCALE:1/2"=1'-0"

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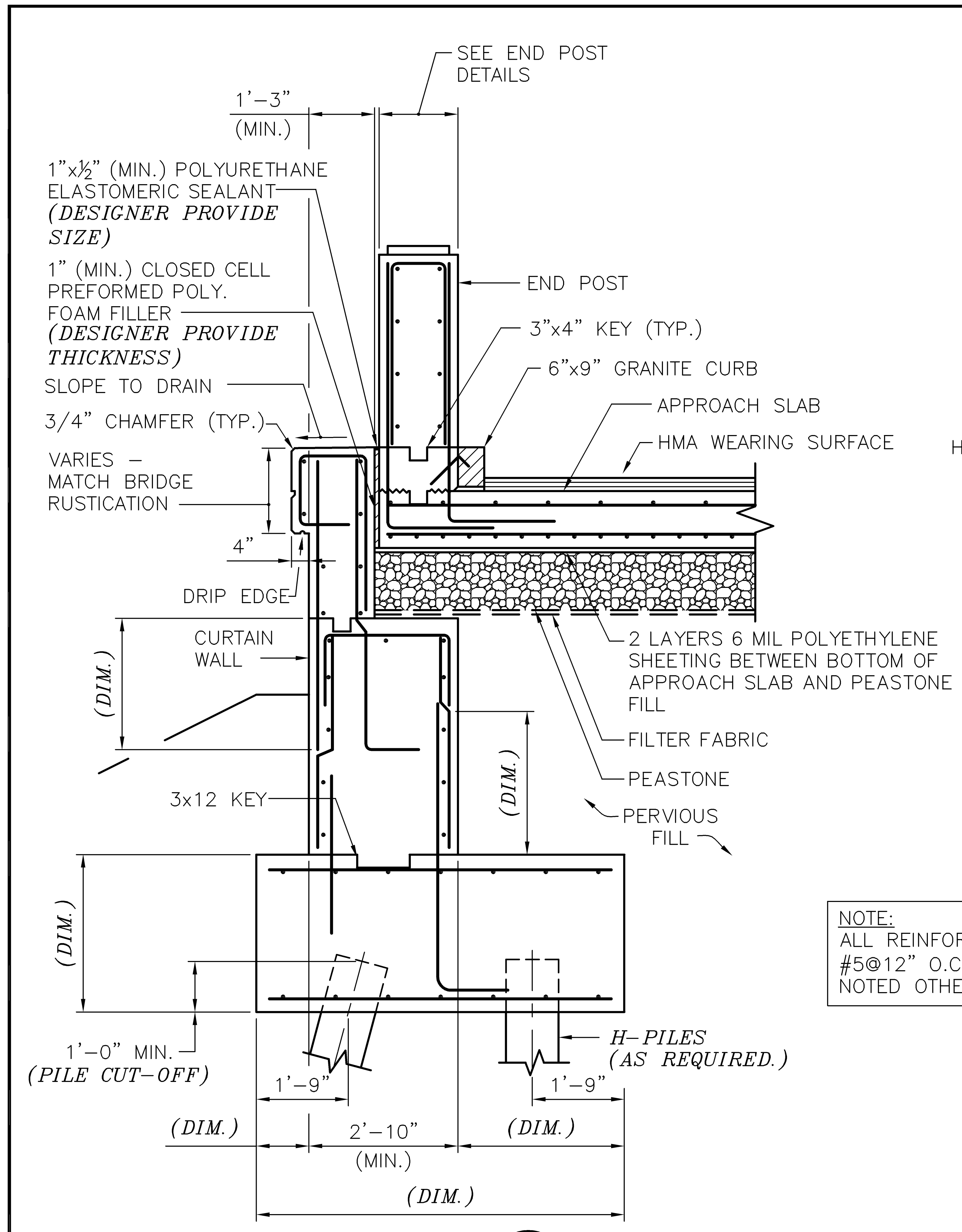
BRIDGE STANDARDS

INTEGRAL ABUTMENT
SHEET 2

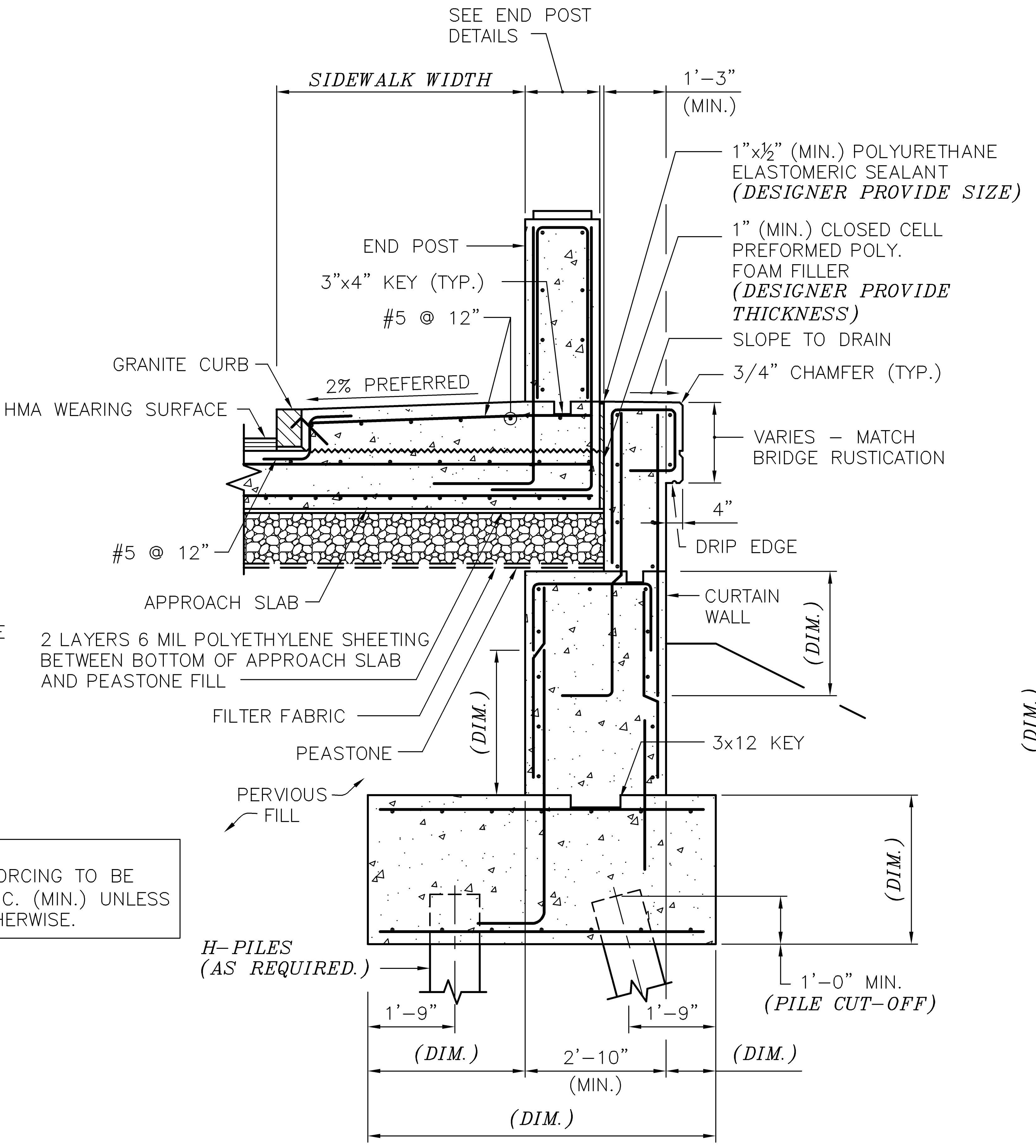
DRAWING NUMBER: 2.21


SEE END POST DETAILS
1'-3" (MIN.)
1"x½" (MIN.) POLYURETHANE ELASTOMERIC SEALANT (DESIGNER PROVIDE SIZE)
1" (MIN.) CLOSED CELL PREFORMED POLY. FOAM FILLER (DESIGNER PROVIDE THICKNESS)
SLOPE TO DRAIN
3/4" CHAMFER (TYP.)
VARIES – MATCH BRIDGE RUSTICATION
4"
DRIP EDGE
CURTAIN WALL
(DIM.)
3x12 KEY
END POST
3"x4" KEY (TYP.)
6"x9" GRANITE CURB
APPROACH SLAB
HMA WEARING SURFACE
2 LAYERS 6 MIL POLYETHYLENE SHEETING BETWEEN BOTTOM OF APPROACH SLAB AND PEASTONE FILL
FILTER FABRIC
PEASTONE
PERVIOUS FILL
H-PILES (AS REQUIRED.)
1'-0" MIN. (PILE CUT-OFF)
1'-9"
1'-9"
(DIM.)
2'-10" (MIN.)
(DIM.)
(DIM.)

SECTION B 2.22

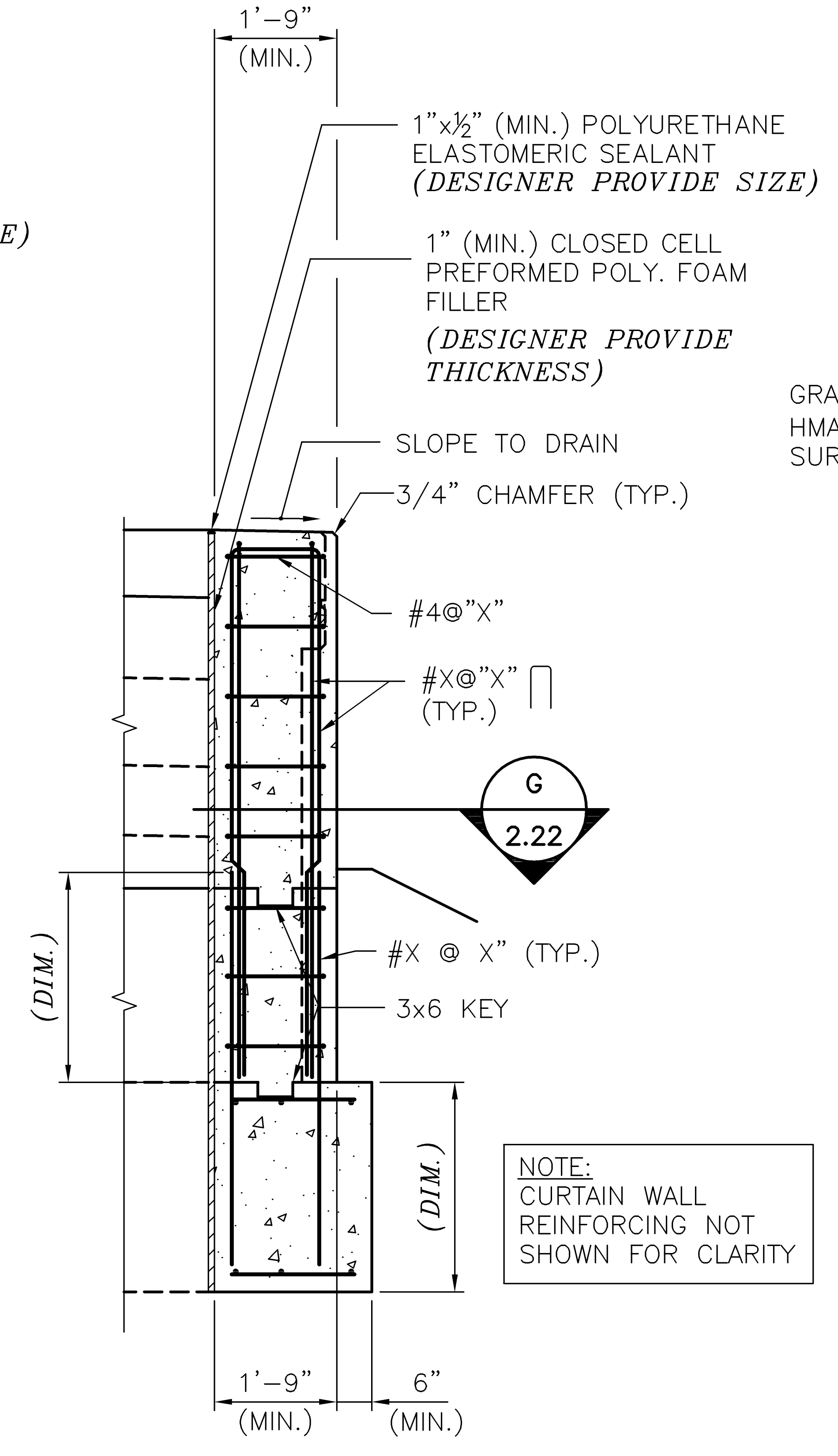
SCALE:1/2"=1'-0"

NOTE:
ALL REINFORCING TO BE #5@12" O.C. (MIN.) UNLESS NOTED OTHERWISE.



SECTION C 2.22

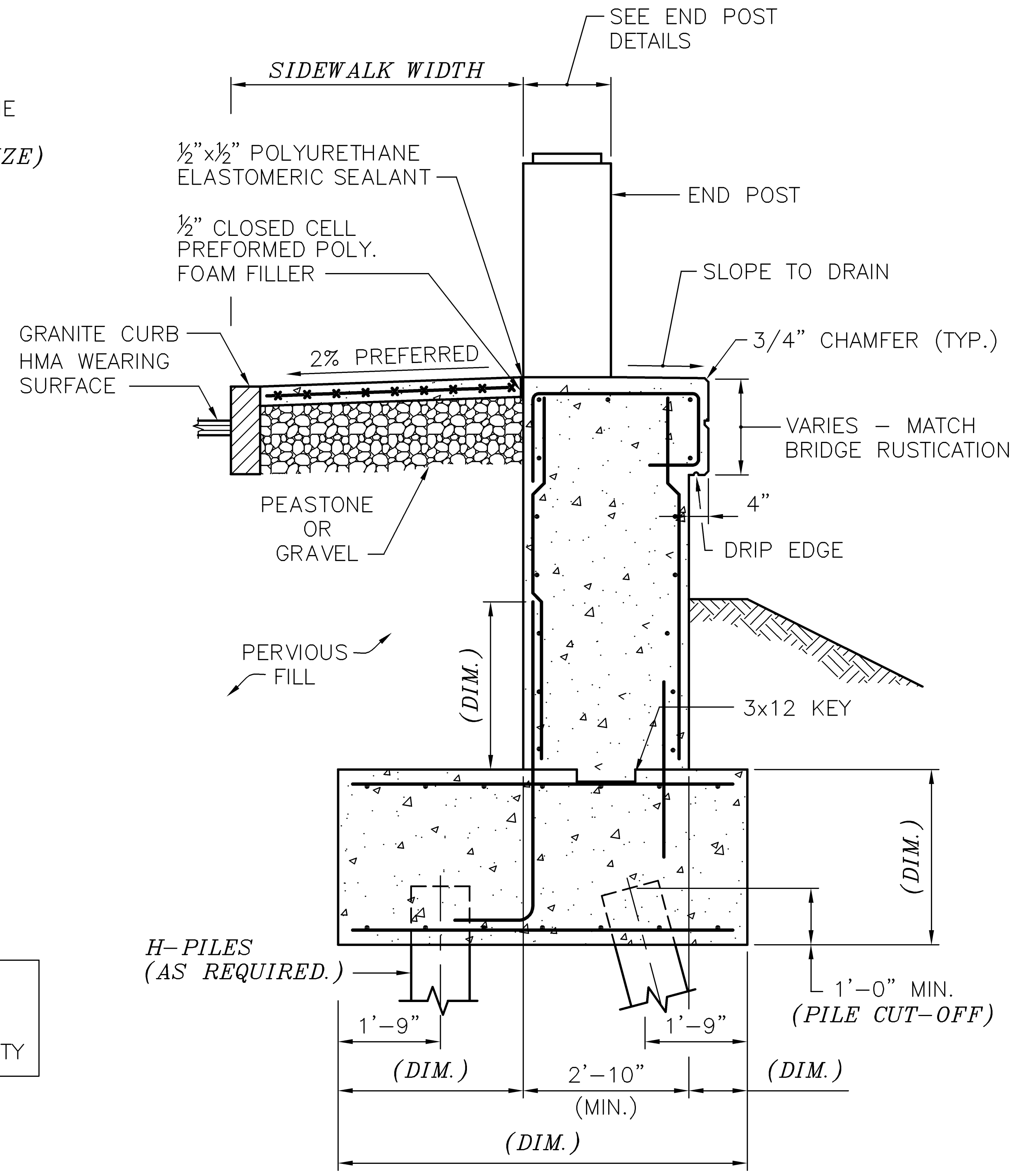
SCALE:1/2"=1'-0"


1'-9" (MIN.)
1"x½" (MIN.) POLYURETHANE ELASTOMERIC SEALANT (DESIGNER PROVIDE SIZE)
1" (MIN.) CLOSED CELL PREFORMED POLY. FOAM FILLER (DESIGNER PROVIDE THICKNESS)
SLOPE TO DRAIN
3/4" CHAMFER (TYP.)
#4@"X"
#X@"X" (TYP.)
G 2.22
(DIM.)
#X @ X" (TYP.)
3x6 KEY
(DIM.)
1'-9" (MIN.)
6" (MIN.)

NOTE:
CURTAIN WALL REINFORCING NOT SHOWN FOR CLARITY

SECTION E 2.22

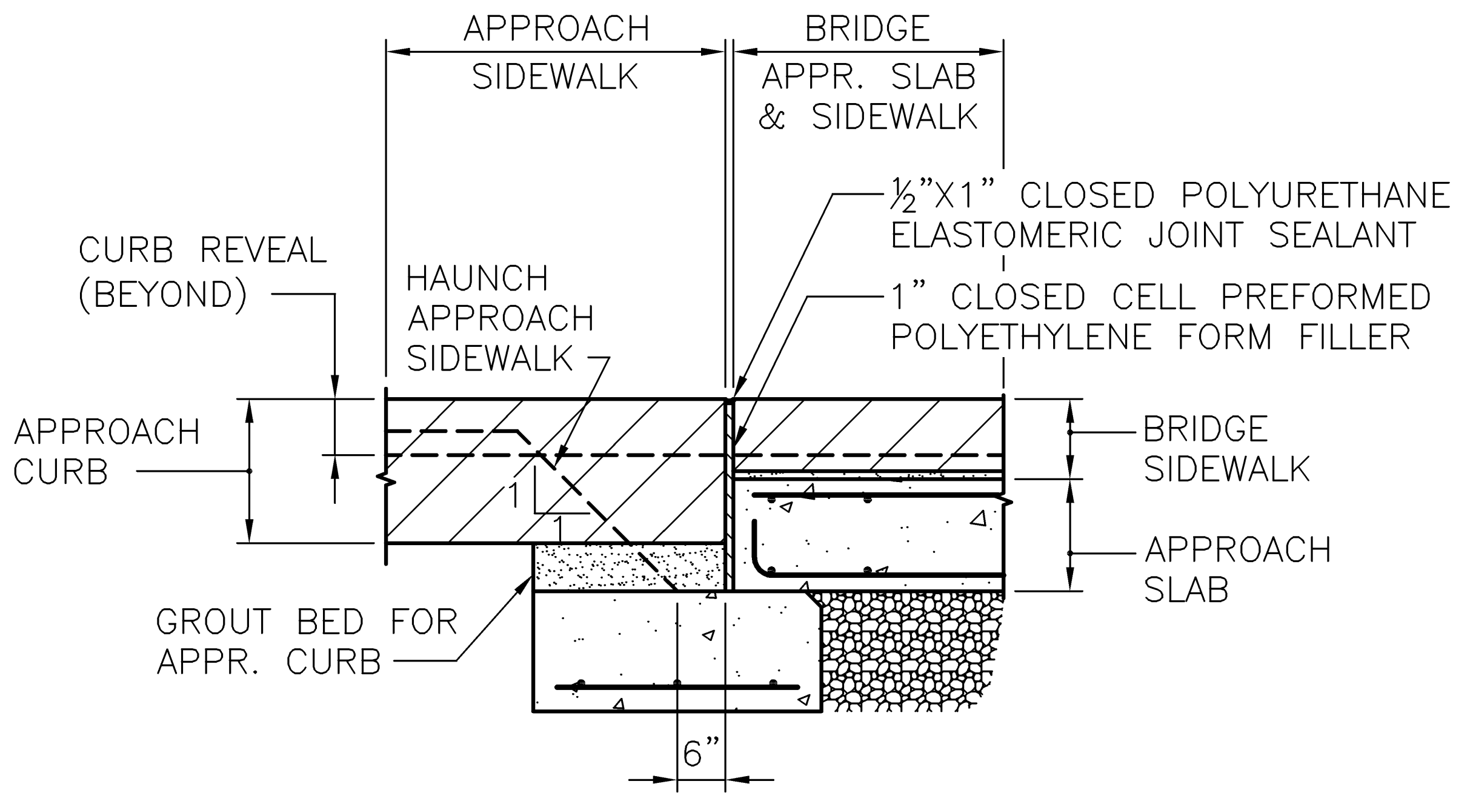
SCALE:1/2"=1'-0"



NOTE:
SECTION AT SAFETY WALK IS SIMILAR

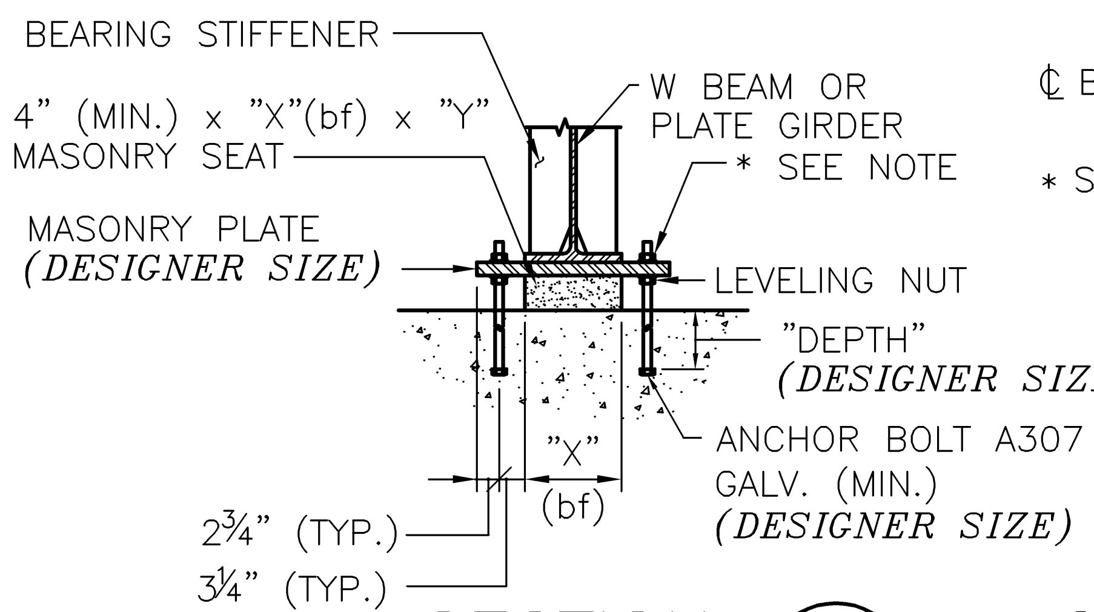
SECTION F 2.22

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

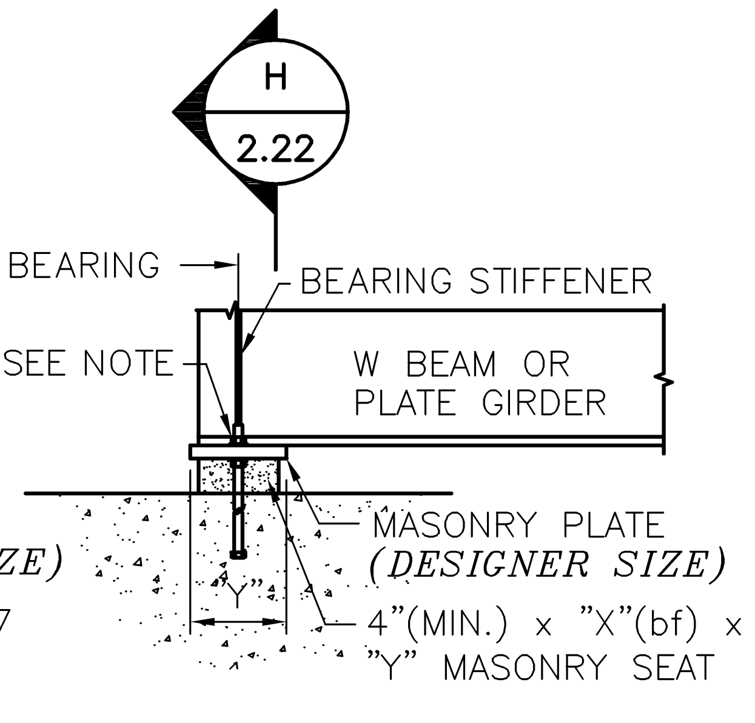


SECTION D 2.22

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


BEARING STIFFENER
4" (MIN.) x "X"(bf) x "Y" MASONRY SEAT
MASONRY PLATE (DESIGNER SIZE)
W BEAM OR PLATE GIRDER
* SEE NOTE
LEVELING NUT
"DEPTH" (DESIGNER SIZE)
ANCHOR BOLT A307 GALV. (MIN.) (DESIGNER SIZE)
"X"
(bf)
2¾" (TYP.)
3¼" (TYP.)

SECTION H 2.22

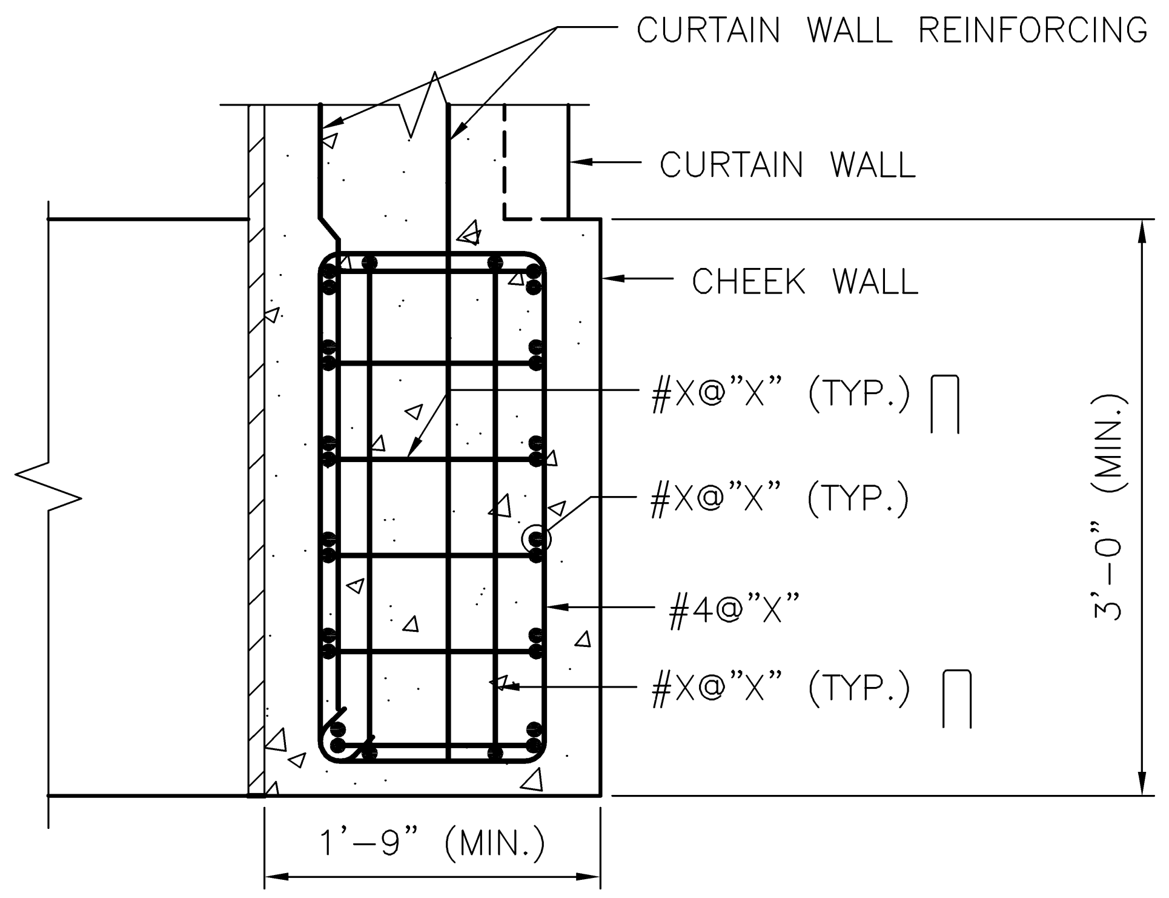


SIDE ELEVATION

* NOTE:
LEAVE TOP BOLT LOOSE UNTIL DECK CONCRETE IS PLACED

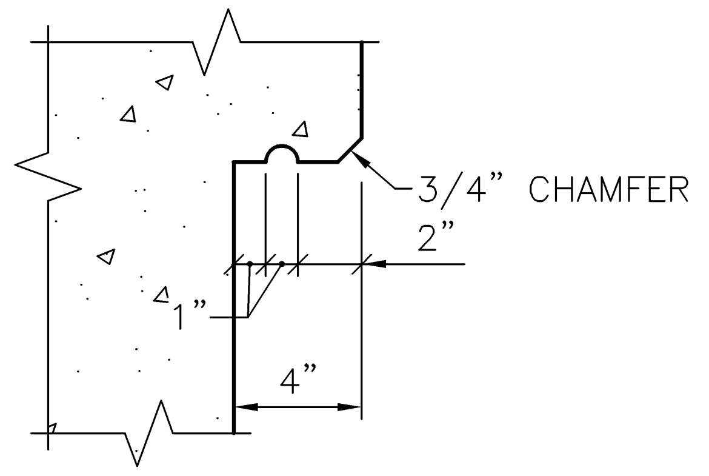
ANCHOR BOLT DETAIL

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



SECTION G 2.22

SCALE:1"=1'-0"



DRIP EDGE FOR COPING DETAIL

SCALE:3"=1'-0"

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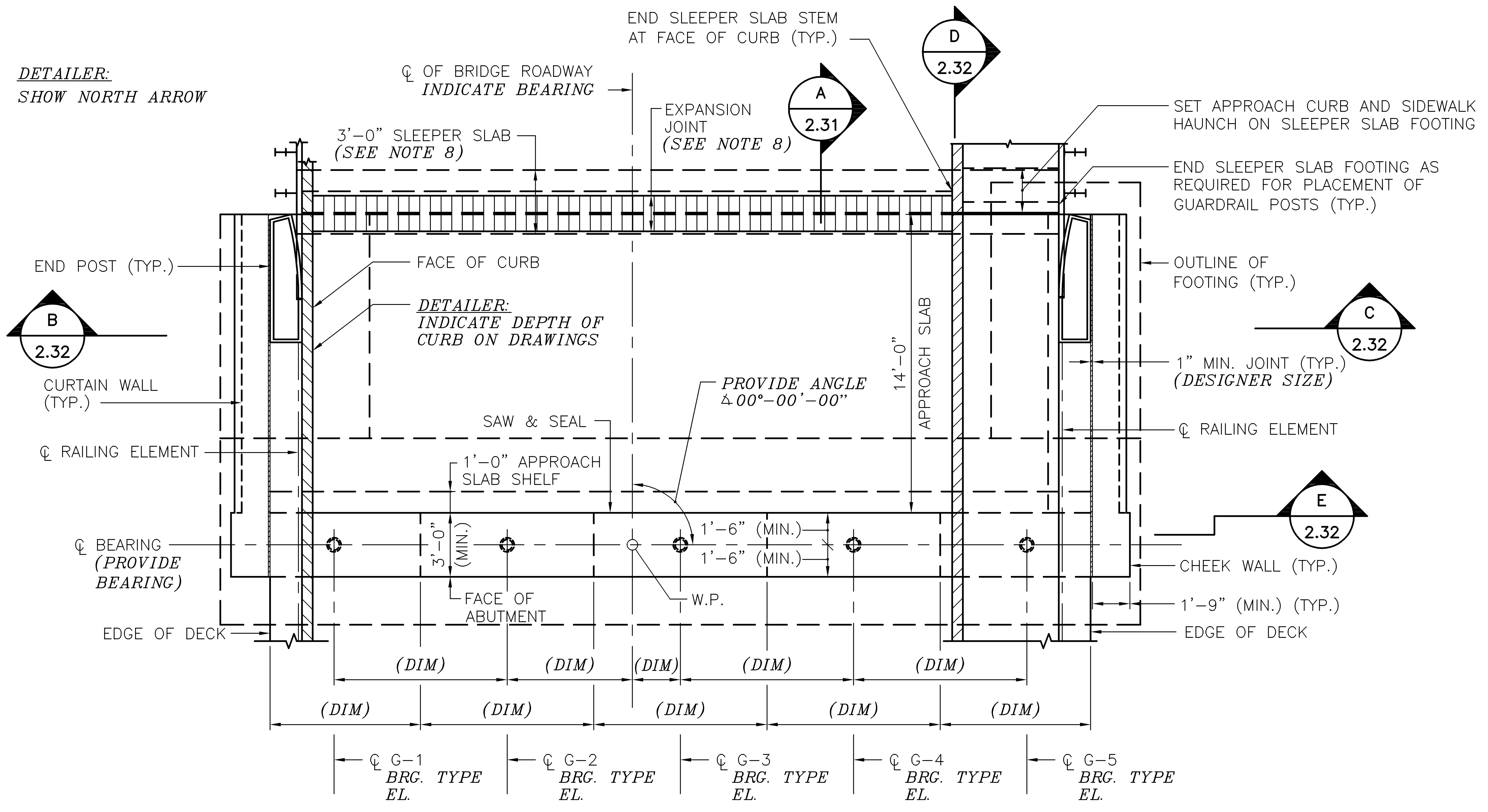
DEPARTMENT OF TRANSPORTATION

BRIDGE STANDARDS

INTEGRAL ABUTMENT
SHEET 3

DRAWING NUMBER: 2.22

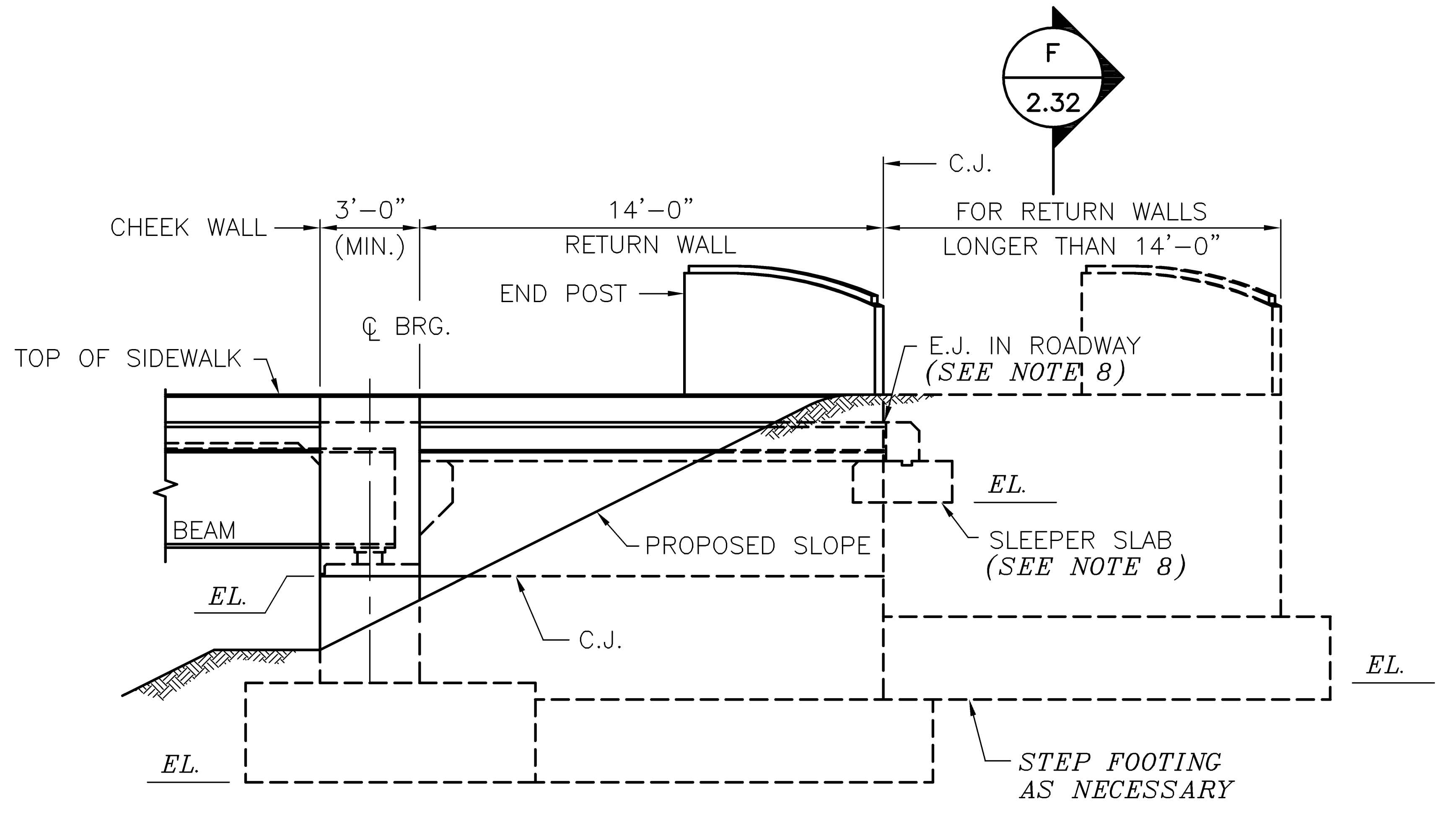
P:\10000\10027.00 On-Call Bridge Design\10027.20 Bridge Design Std Details_Drawings\Structural_Current_Drawings\Ris2-22.dwg, 7/22/2015 1:24:27 PM, JTA



PLAN AT BEAM SEATS

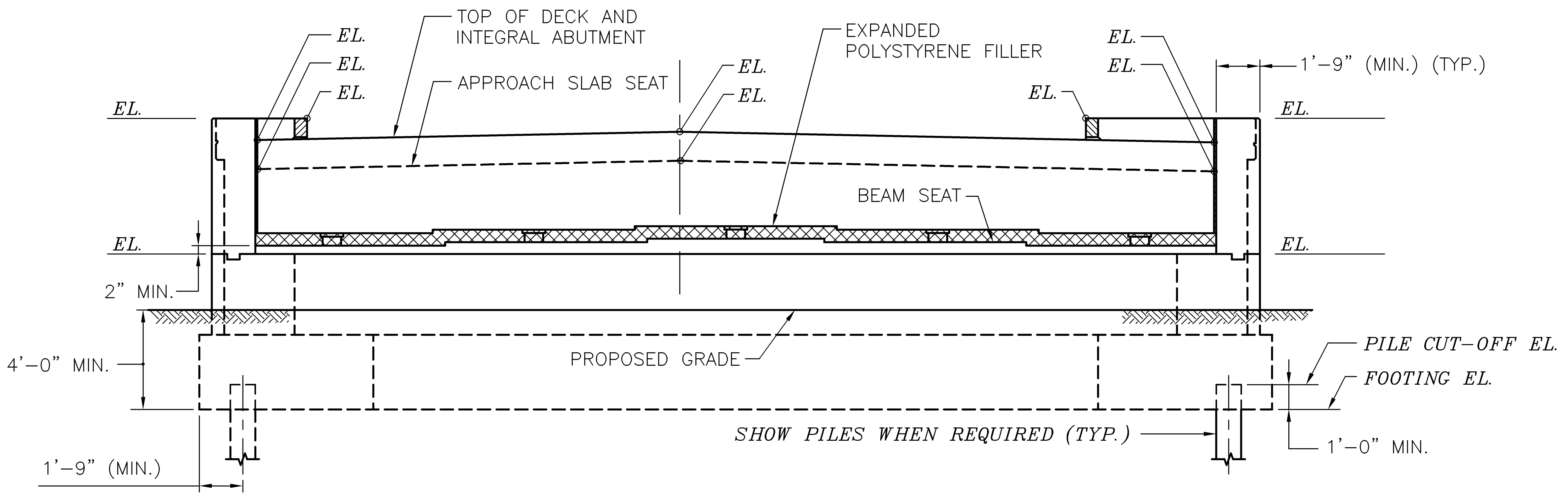
SCALE:1/4"=1'-0"

DESIGNER:
INTEGRAL DECK HAS BEEN REMOVED AT THE FACE OF ABUTMENT FOR CLARITY.



RETURN WALL AT SIDEWALK / SAFETY WALK

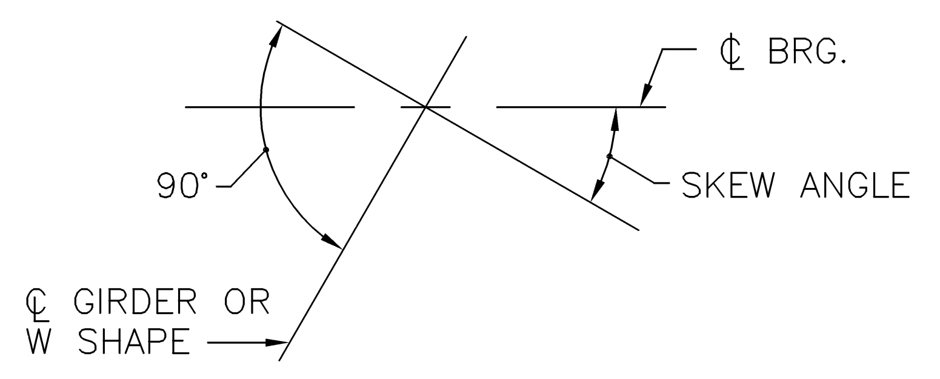
SCALE:1/4"=1'-0"



* REINFORCE BEAM SEAT WHEN HEIGHT OF BEAM SEAT EXCEEDS 4".

ELEVATION

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



SKEW ANGLE DESIGNATION

DESIGNER NOTES:

1. *THE DESIGNER SHALL REFER TO SECTION 11.3.4 (SEMI-INTEGRAL ABUTMENTS) OF THE RIDOT LRFD BRIDGE DESIGN MANUAL FOR DESIGN AND DETAILING REQUIREMENTS AND LIMITATIONS ON THE USE OF SEMI-INTEGRAL ABUTMENTS.*
2. *A NOTE SHALL BE PROVIDED ON THE CONTRACT DRAWINGS STATING THAT TOP OF DECK ELEVATIONS ARE GIVEN AT FRONT FACE OF INTEGRAL ABUTMENT.*
3. *UTILITY PASSAGE THROUGH THE SEMI-INTEGRAL ABUTMENT SHOULD BE AVOIDED. (SEE SECTION 11.3.4 OF THE RIDOT LRFD BRIDGE DESIGN MANUAL).*
4. *ABUTMENT DETAILS FOR SKEWED ABUTMENTS ARE SIMILAR.*
5. *REINFORCING SHOWN IS MINIMUM ONLY.*
6. *THE SUGGESTED SCALE FOR ANY ABUTMENT PLAN AND ELEVATION IS 1/4"=1'-0".*
7. *REFERENCES TO END POSTS AND CENTERLINES OF RAILING ELEMENTS ARE INTENDED TO REFER THE DETAILS SHOWN ELSEWHERE IN THESE BRIDGE STANDARDS (SEE APPROPRIATE DETAILS).*
8. *SLEEPER SLAB AND EXPANSION JOINT IN ROADWAY MAY BE OMITTED FOR BRIDGE SUPERSTRUCTURE SPANS 60 FEET OR LESS.*
9. *SEE DWG. 2.32 FOR RETURN WALL DETAILS*

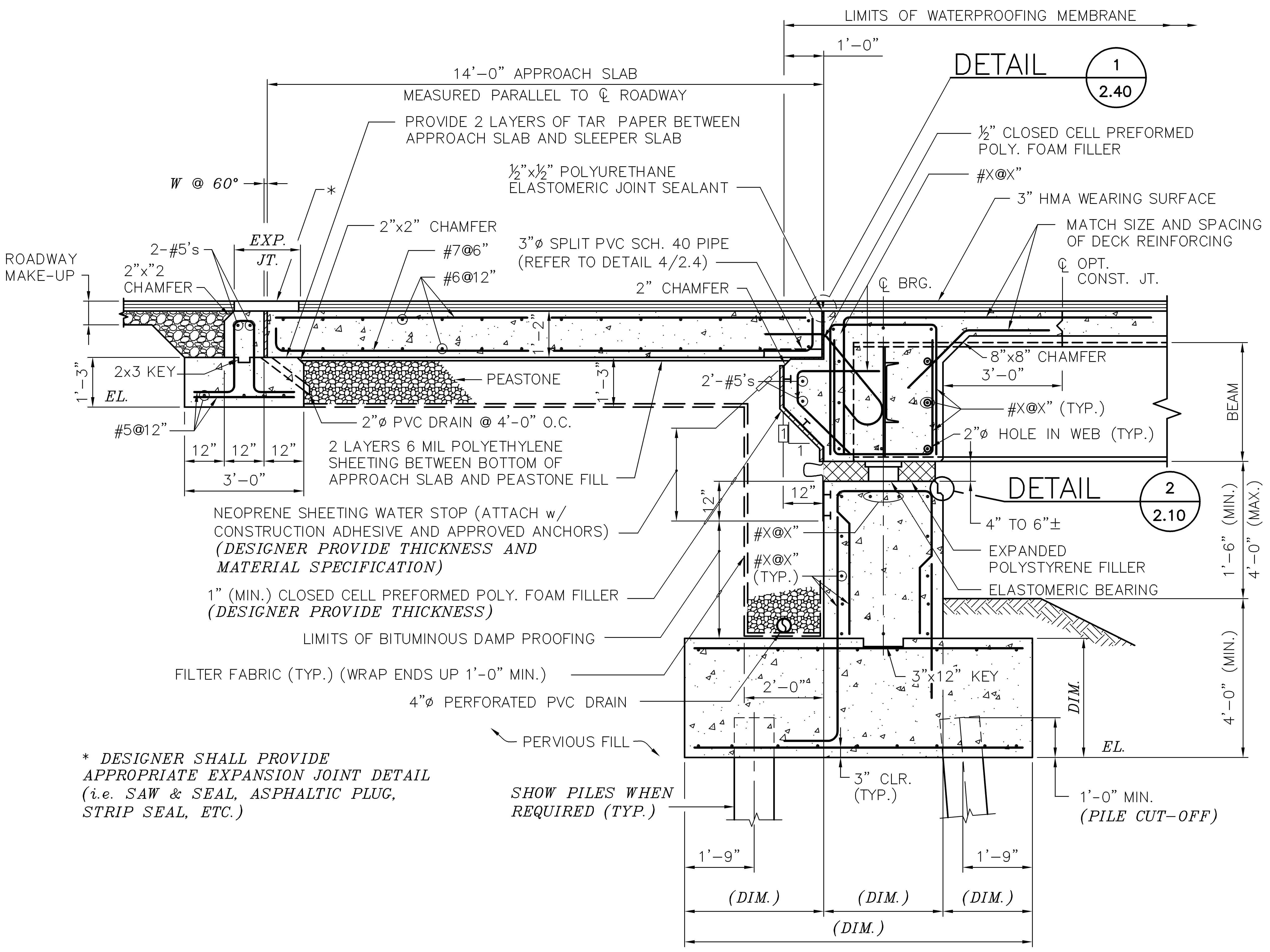
REVISIONS	
No.	DATE

RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

BRIDGE STANDARDS

SEMI INTEGRAL ABUTMENT
SHEET 1

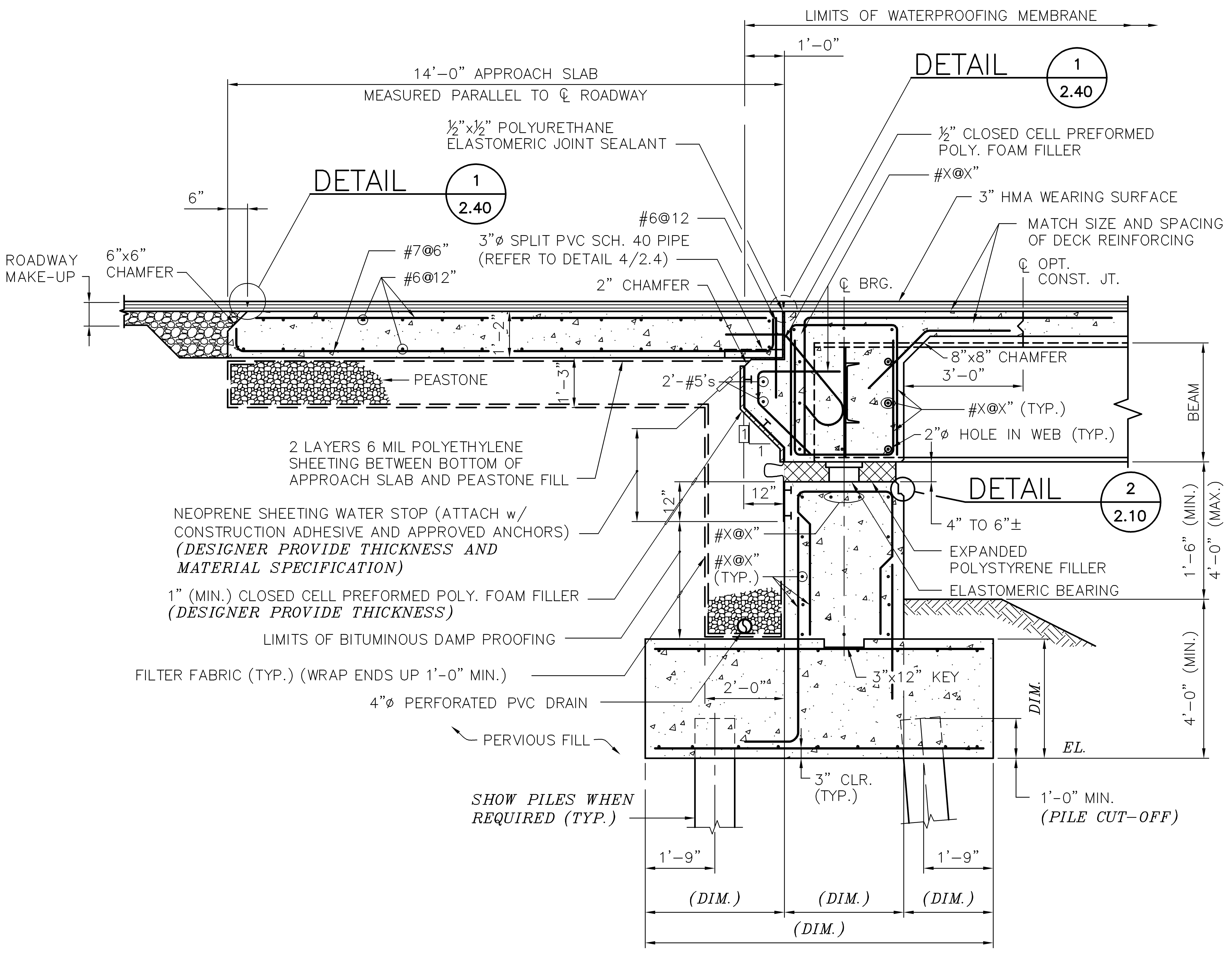
DRAWING NUMBER: 2.30


LIMITS OF WATERPROOFING MEMBRANE
1'-0"
DETAIL 1 2.40
14'-0" APPROACH SLAB
MEASURED PARALLEL TO ℄ ROADWAY
PROVIDE 2 LAYERS OF TAR PAPER BETWEEN APPROACH SLAB AND SLEEPER SLAB
½"x½" POLYURETHANE ELASTOMERIC JOINT SEALANT
½" CLOSED CELL PREFORMED POLY. FOAM FILLER
#X@X"
3" HMA WEARING SURFACE
MATCH SIZE AND SPACING OF DECK REINFORCING
℄ OPT. CONST. JT.
W @ 60°
*
EXP. JT.
2-#5's
2"x2" CHAMFER
ROADWAY MAKE-UP
2"x2" CHAMFER
#7@6"
#6@12"
3"ø SPLIT PVC SCH. 40 PIPE (REFER TO DETAIL 4/2.4)
2" CHAMFER
℄ BRG.
1'-2"
1'-3"
2x3 KEY
EL.
#5@12"
12" 12" 12"
3'-0"
PEASTONE
1'-3"
2"ø PVC DRAIN @ 4'-0" O.C.
2 LAYERS 6 MIL POLYETHYLENE SHEETING BETWEEN BOTTOM OF APPROACH SLAB AND PEASTONE FILL
2'-#5's
8"x8" CHAMFER
3'-0"
#X@X" (TYP.)
2"ø HOLE IN WEB (TYP.)
BEAM
1
1
DETAIL 2 2.10
12"
12"
NEOPRENE SHEETING WATER STOP (ATTACH w/ CONSTRUCTION ADHESIVE AND APPROVED ANCHORS)
(DESIGNER PROVIDE THICKNESS AND MATERIAL SPECIFICATION)
#X@X"
#X@X" (TYP.)
4" TO 6"±
EXPANDED POLYSTYRENE FILLER
ELASTOMERIC BEARING
1'-6" (MIN.)
4'-0" (MAX.)
1" (MIN.) CLOSED CELL PREFORMED POLY. FOAM FILLER
(DESIGNER PROVIDE THICKNESS)
LIMITS OF BITUMINOUS DAMP PROOFING
FILTER FABRIC (TYP.) (WRAP ENDS UP 1'-0" MIN.)
2'-0"
3"x12" KEY
4"ø PERFORATED PVC DRAIN
DIM.
4'-0" (MIN.)
PERVIOUS FILL
EL.
3" CLR. (TYP.)
SHOW PILES WHEN REQUIRED (TYP.)
1'-0" MIN. (PILE CUT-OFF)
1'-9"
1'-9"
(DIM.) (DIM.) (DIM.)
(DIM.)

* DESIGNER SHALL PROVIDE APPROPRIATE EXPANSION JOINT DETAIL (i.e. SAW & SEAL, ASPHALTIC PLUG, STRIP SEAL, ETC.)

SPANS > 60'-0"

SECTION (A / 2.31)
SCALE:1/2"=1'-0"


LIMITS OF WATERPROOFING MEMBRANE
1'-0"
DETAIL 1 2.40
14'-0" APPROACH SLAB
MEASURED PARALLEL TO ℄ ROADWAY
½"x½" POLYURETHANE ELASTOMERIC JOINT SEALANT
½" CLOSED CELL PREFORMED POLY. FOAM FILLER
#X@X"
3" HMA WEARING SURFACE
MATCH SIZE AND SPACING OF DECK REINFORCING
℄ OPT. CONST. JT.
DETAIL 1 2.40
6"
ROADWAY MAKE-UP
6"x6" CHAMFER
#6@12
#7@6"
#6@12"
3"ø SPLIT PVC SCH. 40 PIPE (REFER TO DETAIL 4/2.4)
2" CHAMFER
℄ BRG.
1'-2"
1'-3"
PEASTONE
2'-#5's
8"x8" CHAMFER
3'-0"
#X@X" (TYP.)
2"ø HOLE IN WEB (TYP.)
BEAM
2 LAYERS 6 MIL POLYETHYLENE SHEETING BETWEEN BOTTOM OF APPROACH SLAB AND PEASTONE FILL
1
1
DETAIL 2 2.10
12"
12"
NEOPRENE SHEETING WATER STOP (ATTACH w/ CONSTRUCTION ADHESIVE AND APPROVED ANCHORS)
(DESIGNER PROVIDE THICKNESS AND MATERIAL SPECIFICATION)
#X@X"
#X@X" (TYP.)
4" TO 6"±
EXPANDED POLYSTYRENE FILLER
ELASTOMERIC BEARING
1'-6" (MIN.)
4'-0" (MAX.)
1" (MIN.) CLOSED CELL PREFORMED POLY. FOAM FILLER
(DESIGNER PROVIDE THICKNESS)
LIMITS OF BITUMINOUS DAMP PROOFING
FILTER FABRIC (TYP.) (WRAP ENDS UP 1'-0" MIN.)
2'-0"
3"x12" KEY
4"ø PERFORATED PVC DRAIN
DIM.
4'-0" (MIN.)
PERVIOUS FILL
EL.
3" CLR. (TYP.)
SHOW PILES WHEN REQUIRED (TYP.)
1'-0" MIN. (PILE CUT-OFF)
1'-9"
1'-9"
(DIM.) (DIM.) (DIM.)
(DIM.)

SPANS ≤ 60'-0"

SECTION (A / 2.31)
SCALE:1/2"=1'-0"

REVISIONS	
No.	DATE

RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

BRIDGE STANDARDS

SEMI INTEGRAL ABUTMENT
SHEET 2

DRAWING NUMBER: 2.31

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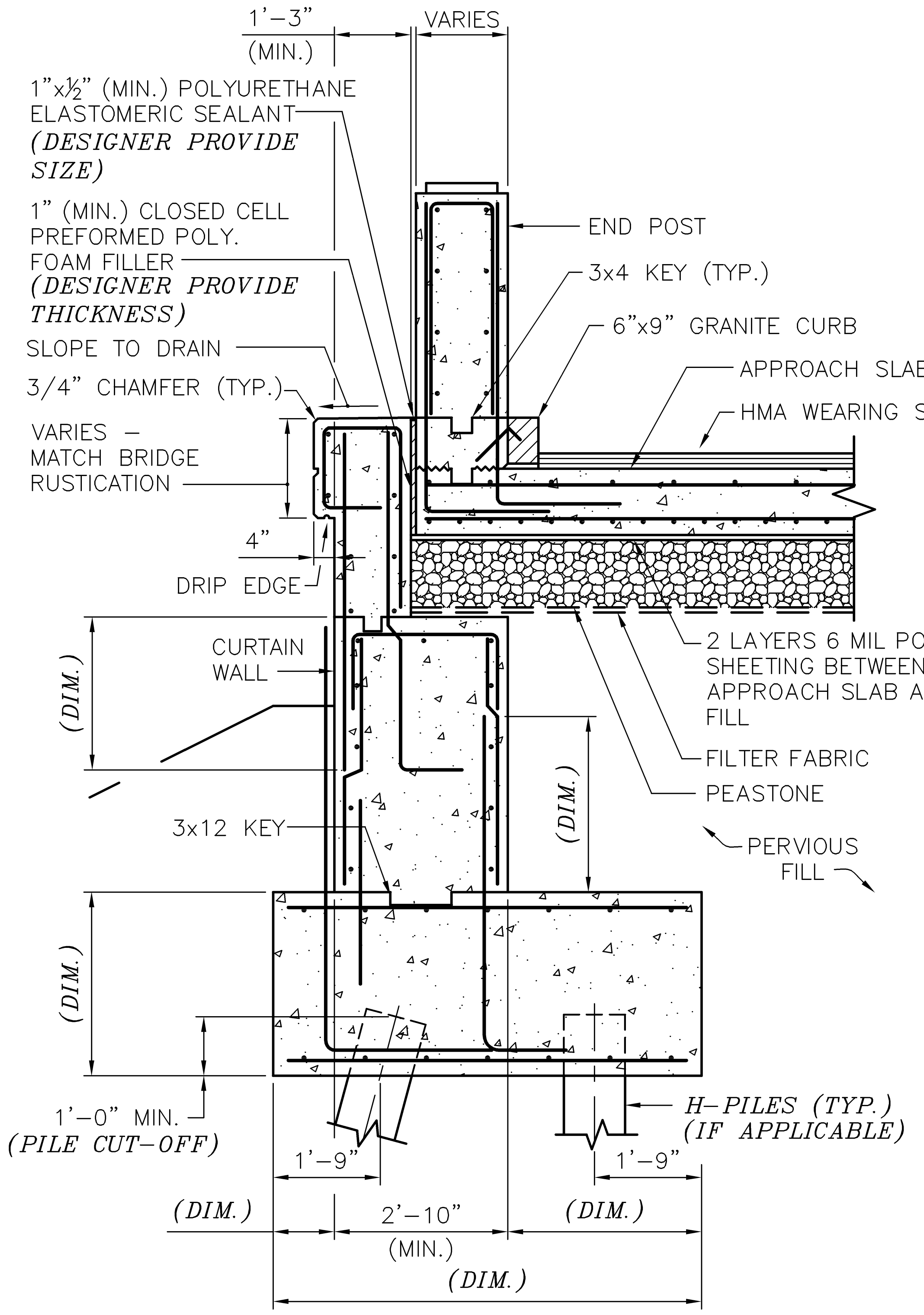
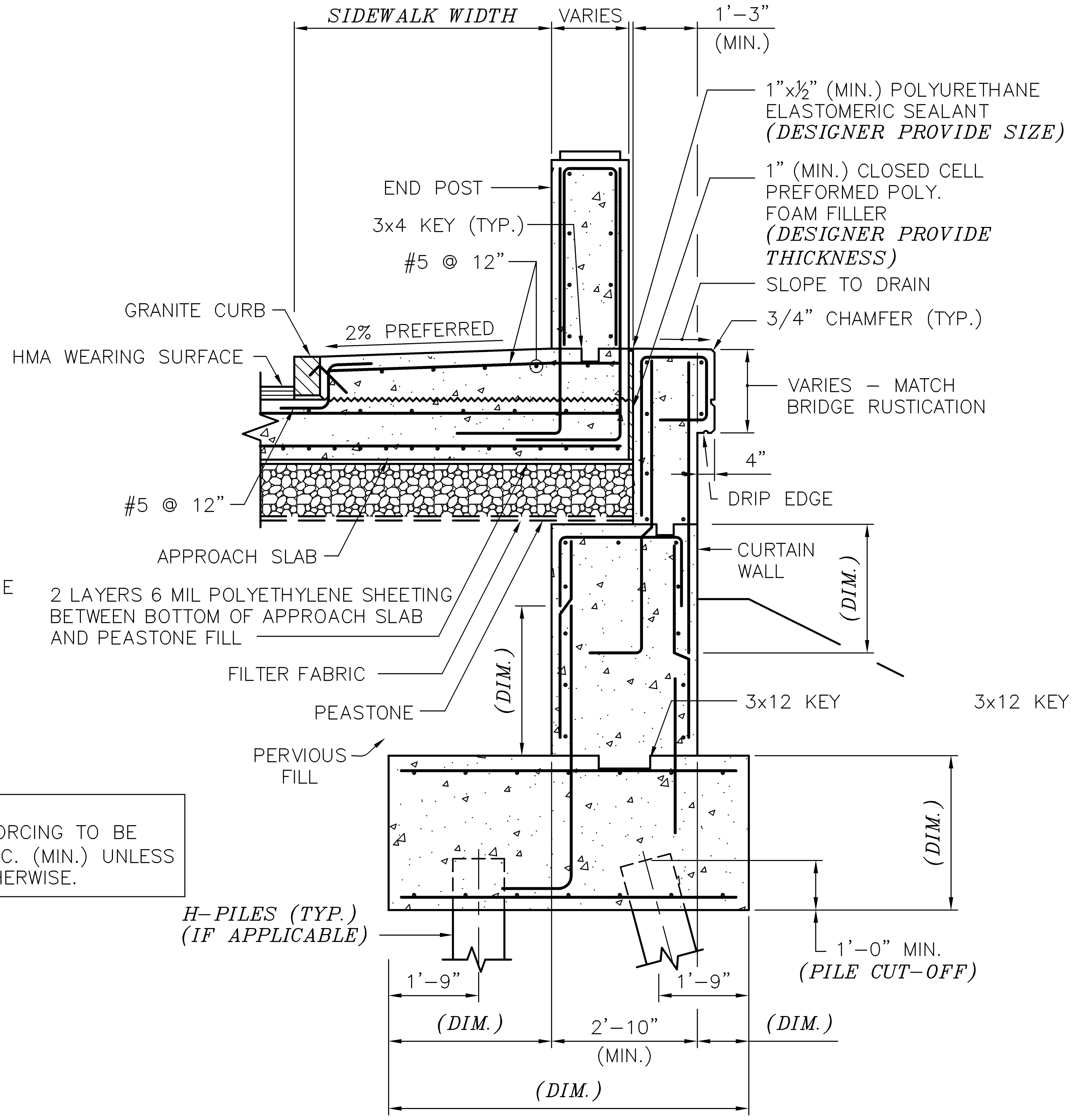
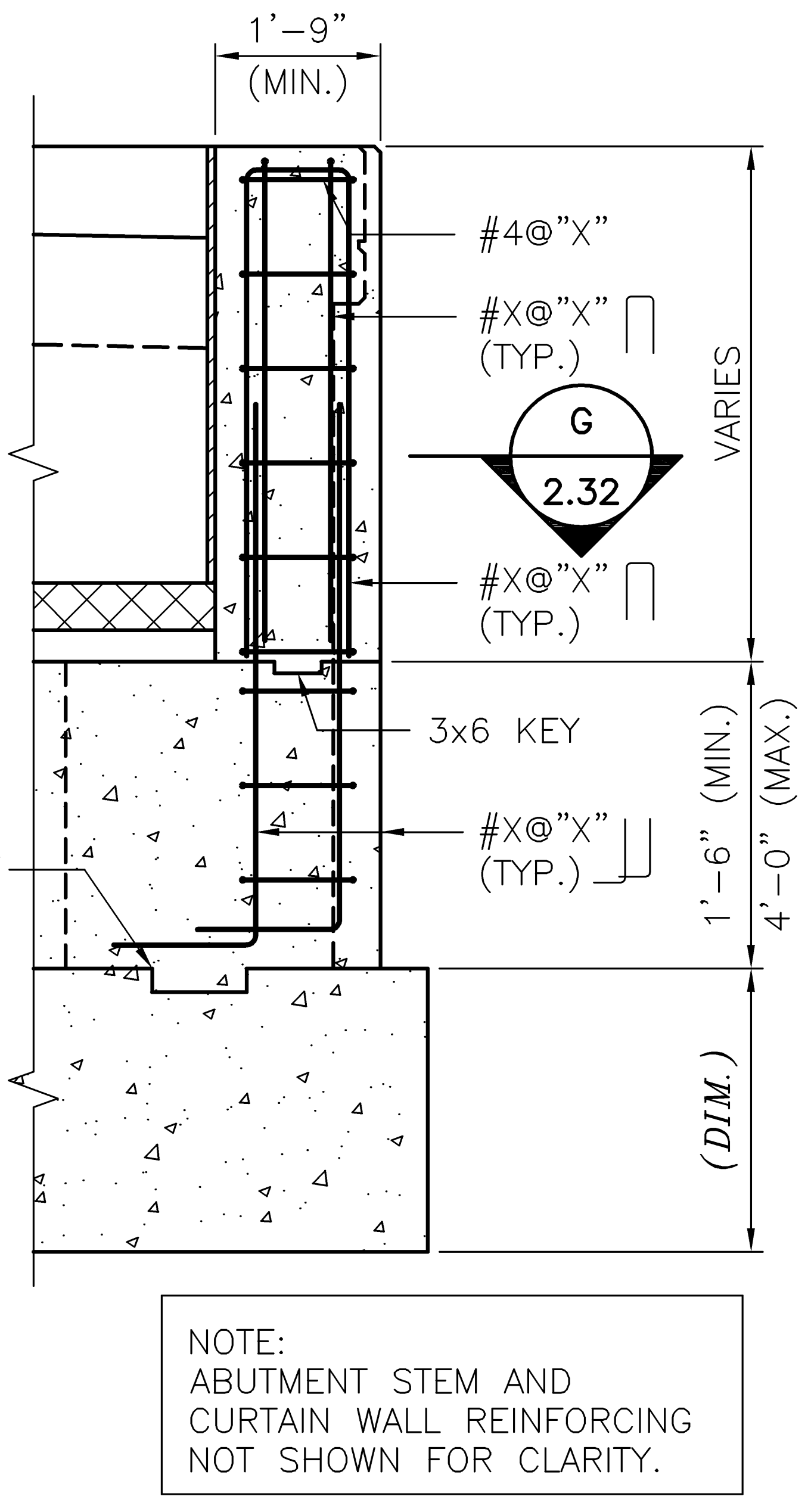

1'–3"
(MIN.)
VARIES
1"x½" (MIN.) POLYURETHANE ELASTOMERIC SEALANT (DESIGNER PROVIDE SIZE)
1" (MIN.) CLOSED CELL PREFORMED POLY. FOAM FILLER (DESIGNER PROVIDE THICKNESS)
SLOPE TO DRAIN
3/4" CHAMFER (TYP.)
VARIES – MATCH BRIDGE RUSTICATION
4"
DRIP EDGE
CURTAIN WALL
(DIM.)
3x12 KEY
(DIM.)
END POST
3x4 KEY (TYP.)
6"x9" GRANITE CURB
APPROACH SLAB
HMA WEARING SURFACE
2 LAYERS 6 MIL POLYETHYLENE SHEETING BETWEEN BOTTOM OF APPROACH SLAB AND PEASTONE FILL
FILTER FABRIC
PEASTONE
PERVIOUS FILL
(DIM.)
1'–0" MIN. (PILE CUT–OFF)
H–PILES (TYP.) (IF APPLICABLE)
1'–9"
1'–9"
(DIM.)
2'–10" (MIN.)
(DIM.)
(DIM.)

SECTION B 2.32
SCALE:1/2"=1'–0"

NOTE:
ALL REINFORCING TO BE #5@12" O.C. (MIN.) UNLESS NOTED OTHERWISE.

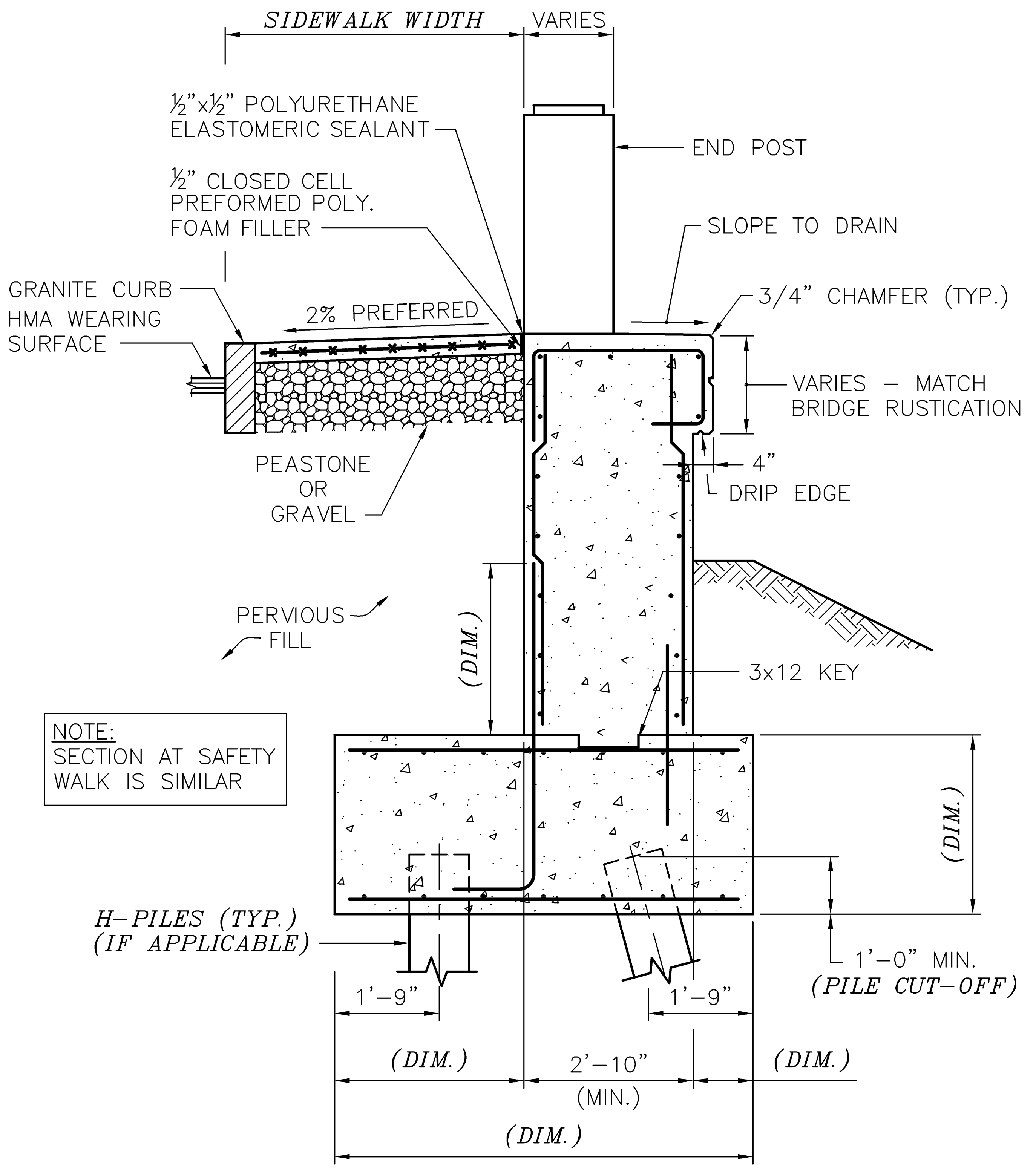

SIDEWALK WIDTH
VARIES
1'–3"
(MIN.)
END POST
3x4 KEY (TYP.)
#5 @ 12"
GRANITE CURB
2% PREFERRED
HMA WEARING SURFACE
#5 @ 12"
APPROACH SLAB
2 LAYERS 6 MIL POLYETHYLENE SHEETING BETWEEN BOTTOM OF APPROACH SLAB AND PEASTONE FILL
FILTER FABRIC
PEASTONE
PERVIOUS FILL
1"x½" (MIN.) POLYURETHANE ELASTOMERIC SEALANT (DESIGNER PROVIDE SIZE)
1" (MIN.) CLOSED CELL PREFORMED POLY. FOAM FILLER (DESIGNER PROVIDE THICKNESS)
SLOPE TO DRAIN
3/4" CHAMFER (TYP.)
VARIES – MATCH BRIDGE RUSTICATION
4"
DRIP EDGE
CURTAIN WALL
(DIM.)
(DIM.)
3x12 KEY
(DIM.)
H–PILES (TYP.) (IF APPLICABLE)
1'–0" MIN. (PILE CUT–OFF)
1'–9"
1'–9"
(DIM.)
2'–10" (MIN.)
(DIM.)
(DIM.)

SECTION C 2.32
SCALE:1/2"=1'–0"



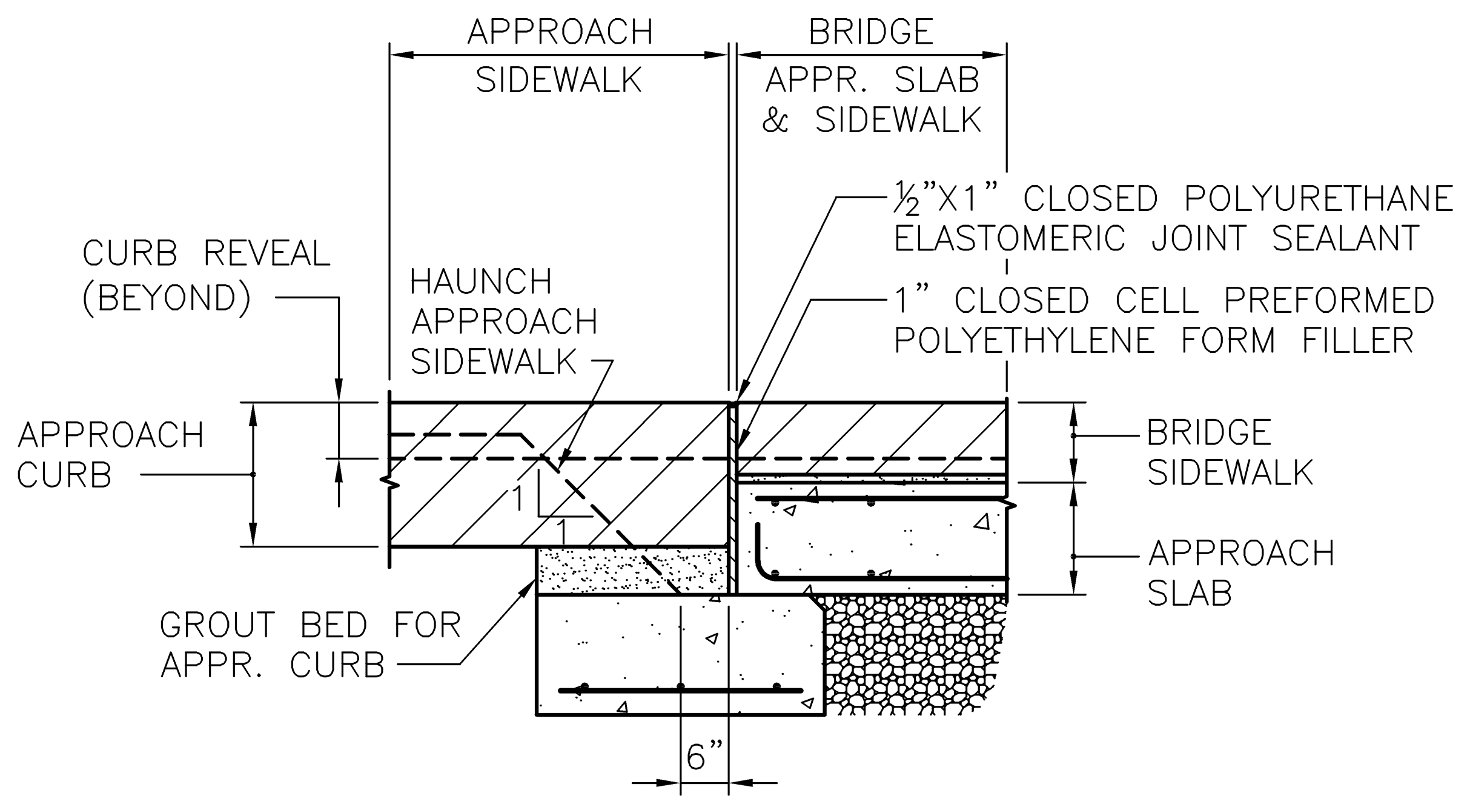
NOTE:
ABUTMENT STEM AND CURTAIN WALL REINFORCING NOT SHOWN FOR CLARITY.

SECTION E 2.32
SCALE:1/2"=1'–0"

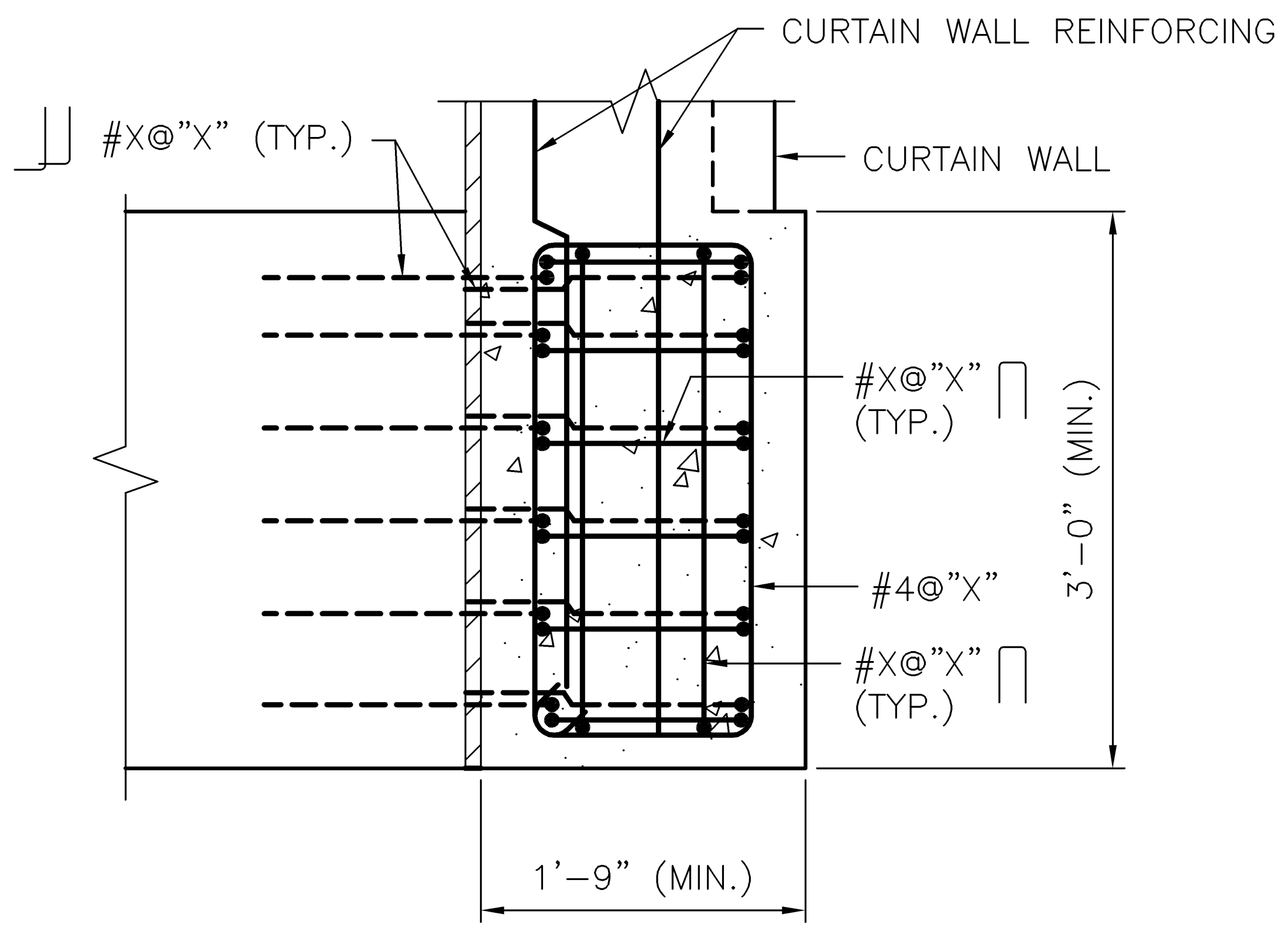


NOTE:
SECTION AT SAFETY WALK IS SIMILAR

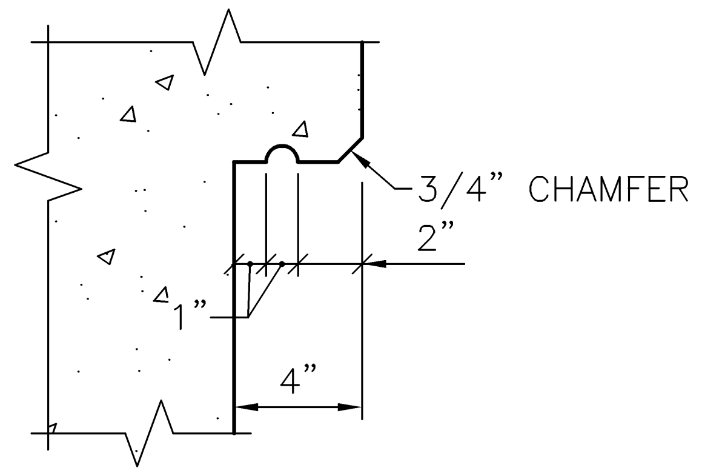
SECTION F 2.32
SCALE:1/2"=1'–0"



SECTION D 2.32
SCALE:1/2"=1'–0"



SECTION G 2.32
SCALE:1"=1'–0"



DRIP EDGE FOR COPING DETAIL
SCALE:3"=1'–0"

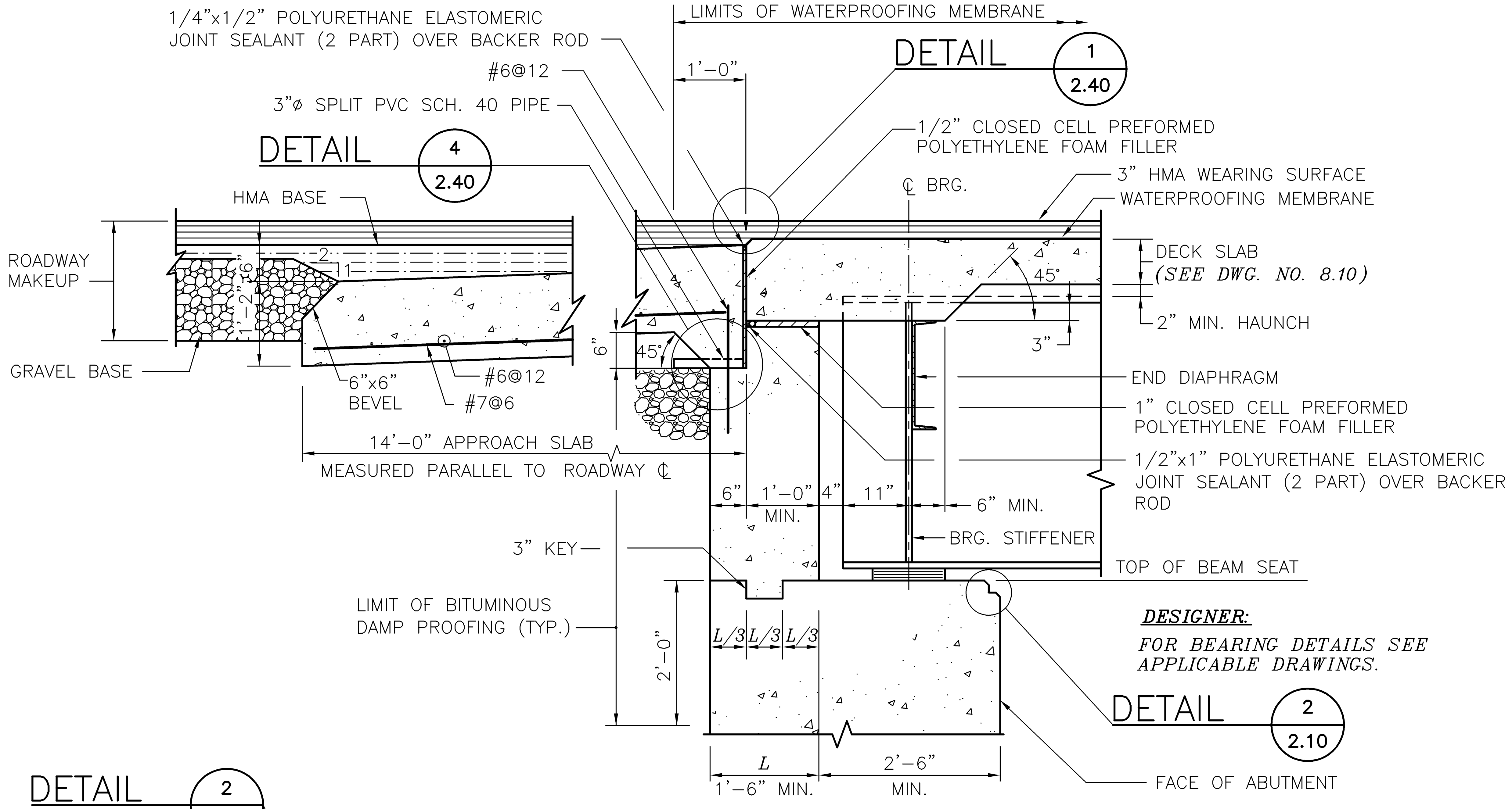
REVISIONS	
No.	DATE

RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

BRIDGE STANDARDS

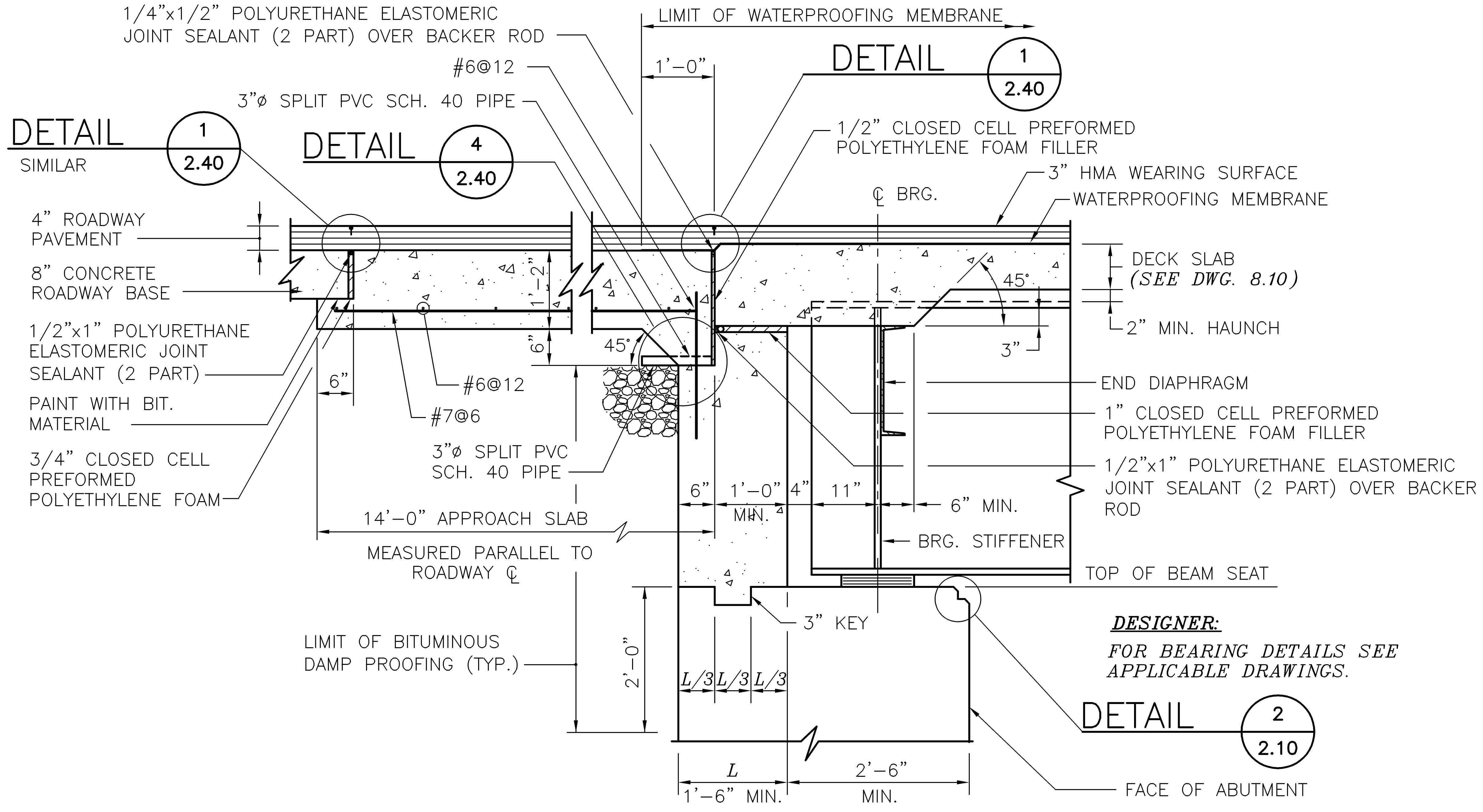
SEMI INTEGRAL ABUTMENT SHEET 3

DRAWING NUMBER: 2.32


1/4"x1/2" POLYURETHANE ELASTOMERIC JOINT SEALANT (2 PART) OVER BACKER ROD
LIMITS OF WATERPROOFING MEMBRANE
#6@12
1'-0"
DETAIL 1 2.40
3"ø SPLIT PVC SCH. 40 PIPE
1/2" CLOSED CELL PREFORMED POLYETHYLENE FOAM FILLER
DETAIL 4 2.40
℄ BRG.
3" HMA WEARING SURFACE
WATERPROOFING MEMBRANE
HMA BASE
ROADWAY MAKEUP
DECK SLAB (SEE DWG. NO. 8.10)
45°
2" MIN. HAUNCH
3"
6"
45°
GRAVEL BASE
6"x6" BEVEL
#6@12
#7@6
END DIAPHRAGM
1" CLOSED CELL PREFORMED POLYETHYLENE FOAM FILLER
14'-0" APPROACH SLAB
MEASURED PARALLEL TO ROADWAY ℄
1/2"x1" POLYURETHANE ELASTOMERIC JOINT SEALANT (2 PART) OVER BACKER ROD
6"
1'-0" MIN.
4"
11"
6" MIN.
3" KEY
BRG. STIFFENER
TOP OF BEAM SEAT
LIMIT OF BITUMINOUS DAMP PROOFING (TYP.)
2'-0"
L/3 L/3 L/3
DESIGNER:
FOR BEARING DETAILS SEE APPLICABLE DRAWINGS.
DETAIL 2 2.10
L
1'-6" MIN.
2'-6" MIN.
FACE OF ABUTMENT

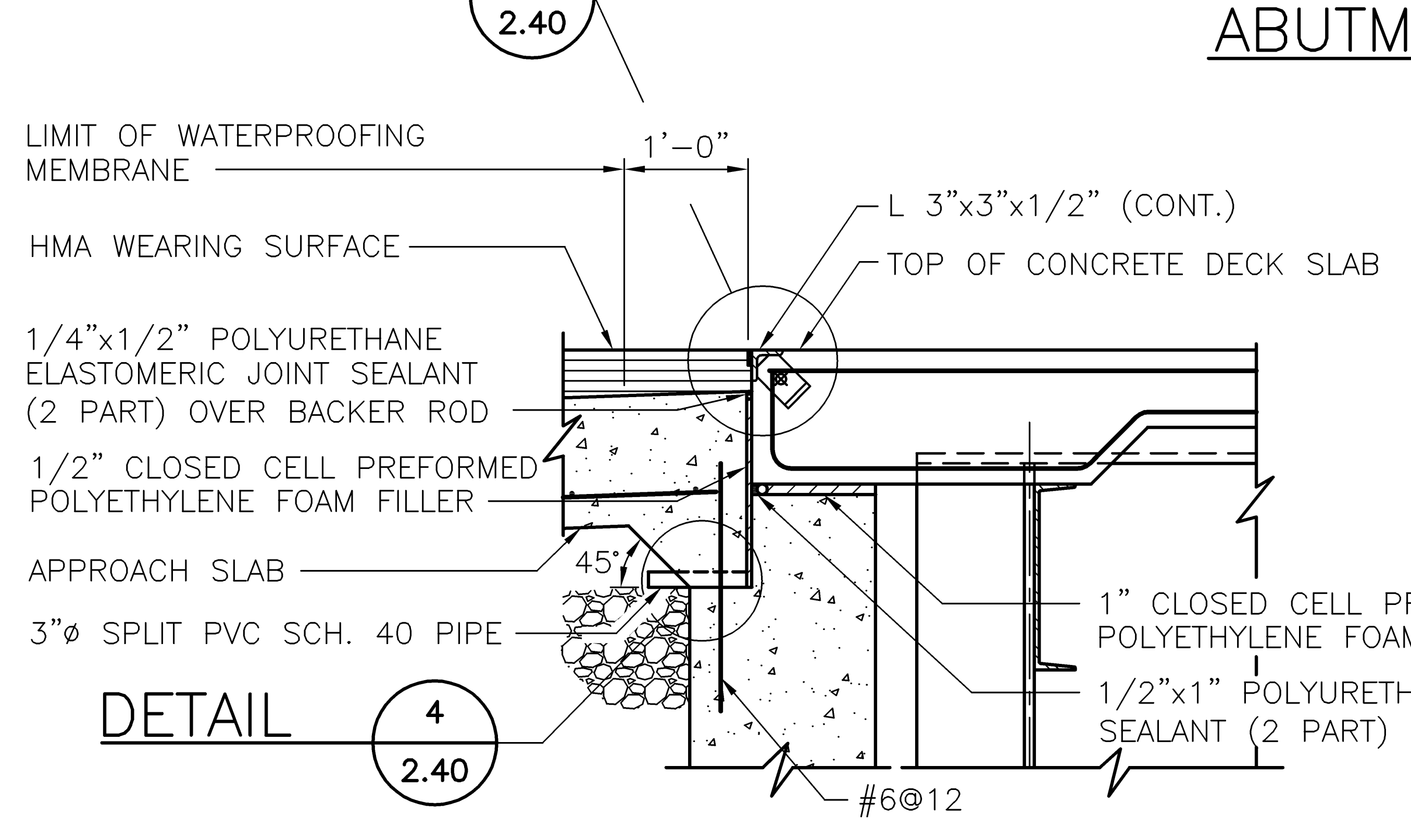
ABUTMENT BACKWALL TYPE-1

HMA WEARING SURFACE
LOW APPROACH SLAB
STEEL STRINGER OR GIRDER
SCALE:3/4"=1'-0"


1/4"x1/2" POLYURETHANE ELASTOMERIC JOINT SEALANT (2 PART) OVER BACKER ROD
LIMIT OF WATERPROOFING MEMBRANE
#6@12
1'-0"
DETAIL 1 2.40
3"ø SPLIT PVC SCH. 40 PIPE
DETAIL 1 2.40 SIMILAR
DETAIL 4 2.40
1/2" CLOSED CELL PREFORMED POLYETHYLENE FOAM FILLER
3" HMA WEARING SURFACE
WATERPROOFING MEMBRANE
℄ BRG.
4" ROADWAY PAVEMENT
8" CONCRETE ROADWAY BASE
DECK SLAB (SEE DWG. 8.10)
45°
2" MIN. HAUNCH
3"
1/2"x1" POLYURETHANE ELASTOMERIC JOINT SEALANT (2 PART)
6"
45°
#6@12
END DIAPHRAGM
PAINT WITH BIT. MATERIAL
#7@6
1" CLOSED CELL PREFORMED POLYETHYLENE FOAM FILLER
3/4" CLOSED CELL PREFORMED POLYETHYLENE FOAM
3"ø SPLIT PVC SCH. 40 PIPE
1/2"x1" POLYURETHANE ELASTOMERIC JOINT SEALANT (2 PART) OVER BACKER ROD
6"
1'-0" MIN.
4"
11"
6" MIN.
14'-0" APPROACH SLAB
MEASURED PARALLEL TO ROADWAY ℄
BRG. STIFFENER
TOP OF BEAM SEAT
3" KEY
LIMIT OF BITUMINOUS DAMP PROOFING (TYP.)
DESIGNER:
FOR BEARING DETAILS SEE APPLICABLE DRAWINGS.
2'-0"
L/3 L/3 L/3
DETAIL 2 2.10
L
1'-6" MIN.
2'-6" MIN.
FACE OF ABUTMENT

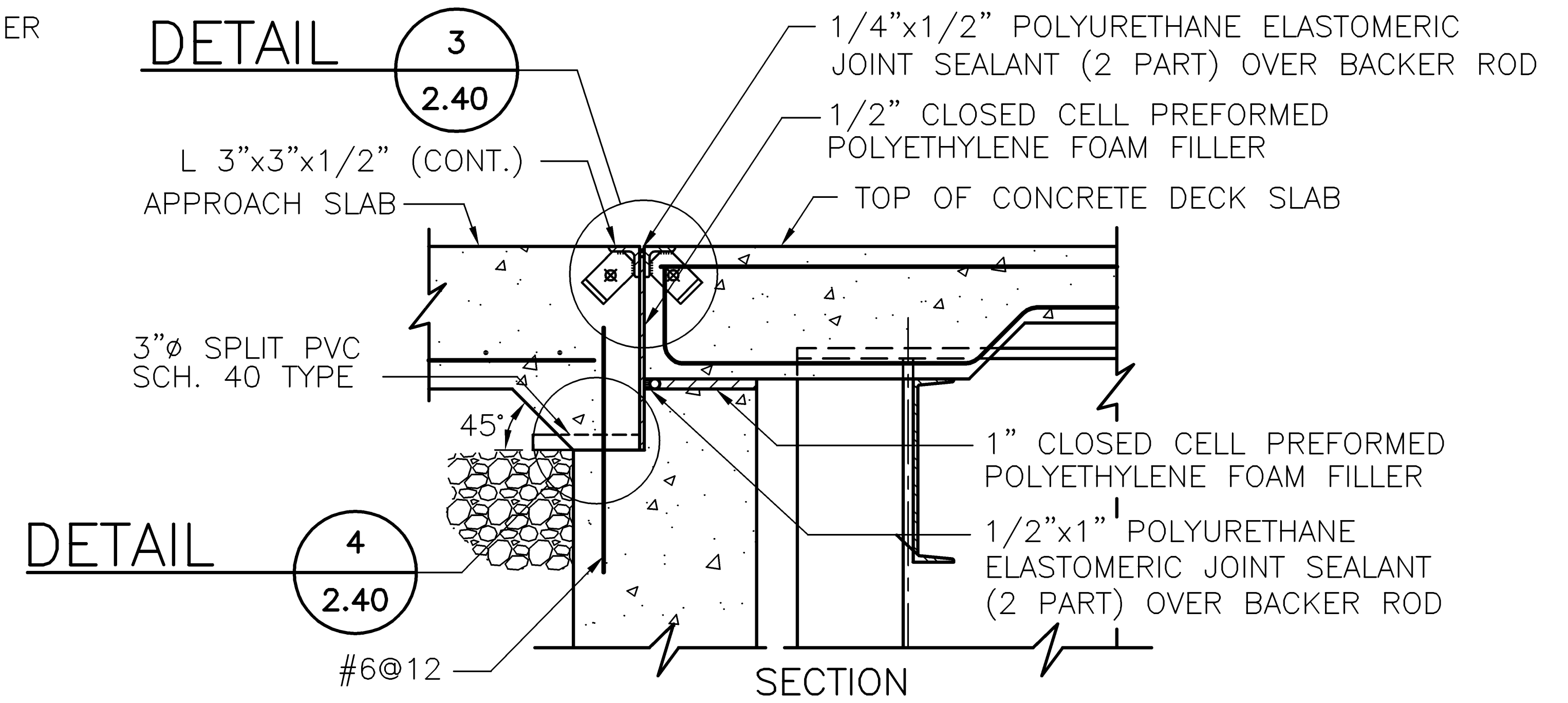
ABUTMENT BACKWALL TYPE-2

HMA WEARING SURFACE
HIGH APPROACH SLAB
STEEL STRINGER OR GIRDER
SCALE:3/4"=1'-0"


DETAIL 2 2.40
LIMIT OF WATERPROOFING MEMBRANE
1'-0"
L 3"x3"x1/2" (CONT.)
TOP OF CONCRETE DECK SLAB
HMA WEARING SURFACE
1/4"x1/2" POLYURETHANE ELASTOMERIC JOINT SEALANT (2 PART) OVER BACKER ROD
1/2" CLOSED CELL PREFORMED POLYETHYLENE FOAM FILLER
APPROACH SLAB
45°
3"ø SPLIT PVC SCH. 40 PIPE
1" CLOSED CELL PREFORMED POLYETHYLENE FOAM FILLER
1/2"x1" POLYURETHANE ELASTOMERIC JOINT SEALANT (2 PART) OVER BACKER ROD
DETAIL 4 2.40
#6@12

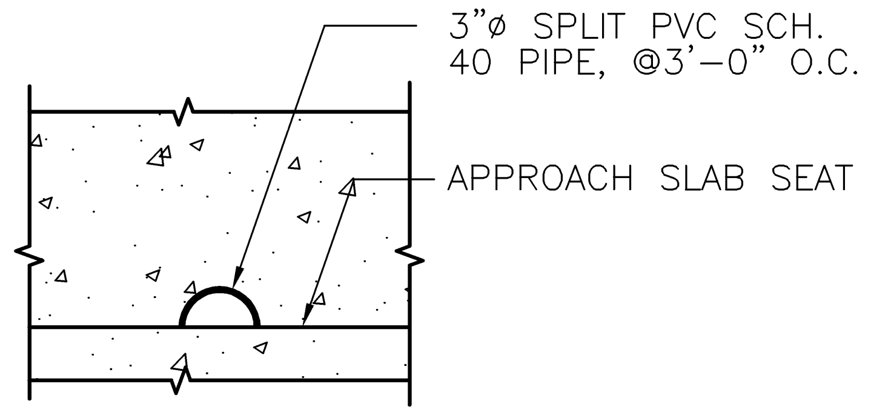
ABUTMENT BACKWALL TYPE-3

EXPOSED CONCRETE DECK SURFACE
LOW APPROACH SLAB
SCALE:3/4"=1'-0"


DETAIL 3 2.40
1/4"x1/2" POLYURETHANE ELASTOMERIC JOINT SEALANT (2 PART) OVER BACKER ROD
1/2" CLOSED CELL PREFORMED POLYETHYLENE FOAM FILLER
L 3"x3"x1/2" (CONT.)
APPROACH SLAB
TOP OF CONCRETE DECK SLAB
3"ø SPLIT PVC SCH. 40 TYPE
45°
1" CLOSED CELL PREFORMED POLYETHYLENE FOAM FILLER
DETAIL 4 2.40
1/2"x1" POLYURETHANE ELASTOMERIC JOINT SEALANT (2 PART) OVER BACKER ROD
#6@12
SECTION

ABUTMENT BACKWALL TYPE-4

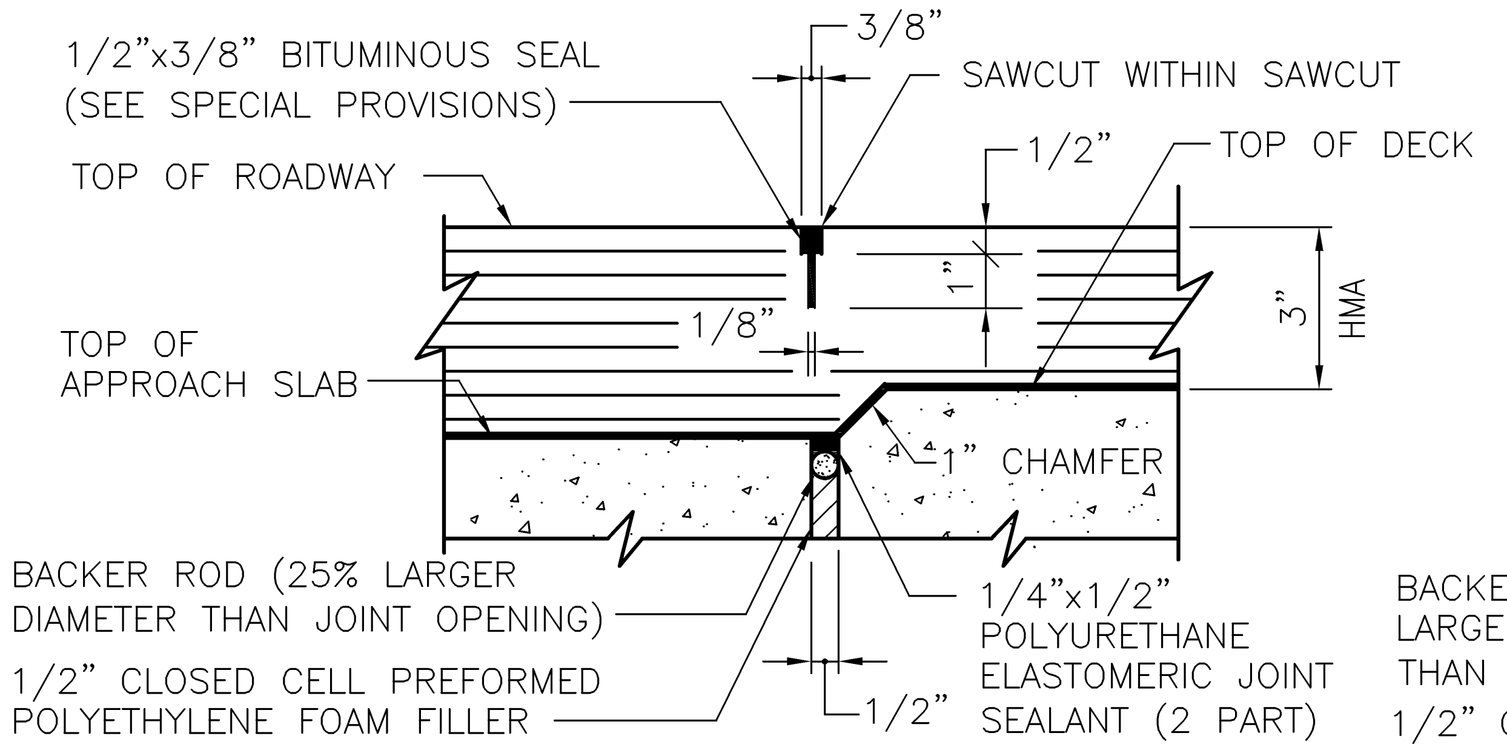
EXPOSED CONCRETE SURFACE
EXPOSED APPROACH SLAB
SCALE:3/4"=1'-0"



SECTION A 2.40
NOT TO SCALE

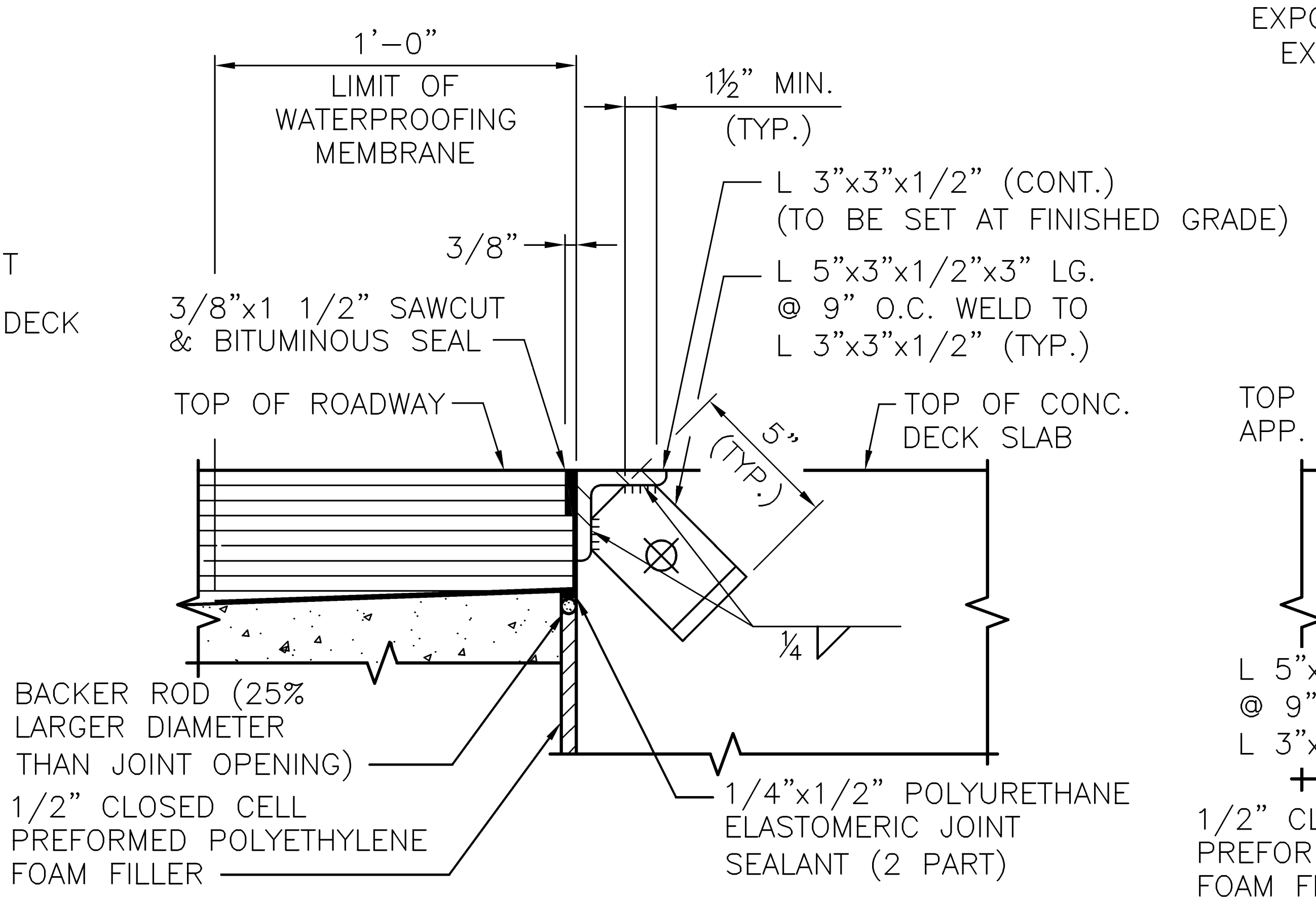
DESIGNER NOTES:

1. *THE BEAM SEAT WIDTH SPECIFIED IS THE MINIMUM. WHEN DETAILING BEAM SEAT WIDTHS, CONSIDERATION SHALL BE GIVEN TO SEISMIC REQUIREMENTS AS WELL AS SKEW ANGLE.*
2. *DETAILS SHOWN ARE FOR STEEL BEAMS SEE SHEETS 7.30 & 7.80 FOR PRESTRESSED BEAM JOINT DETAILS.*
3. *FOR DETAILS AT SIDEWALK, CURB AND BARRIER, REFER TO DWG. 2.50.*
4. *THESE DETAILS ARE ALSO APPLICABLE TO EXPANSION JOINTS FOR BEAMS WITH SHORT SPAN LENGTHS AND LIMITED SKEW ANGLES.*

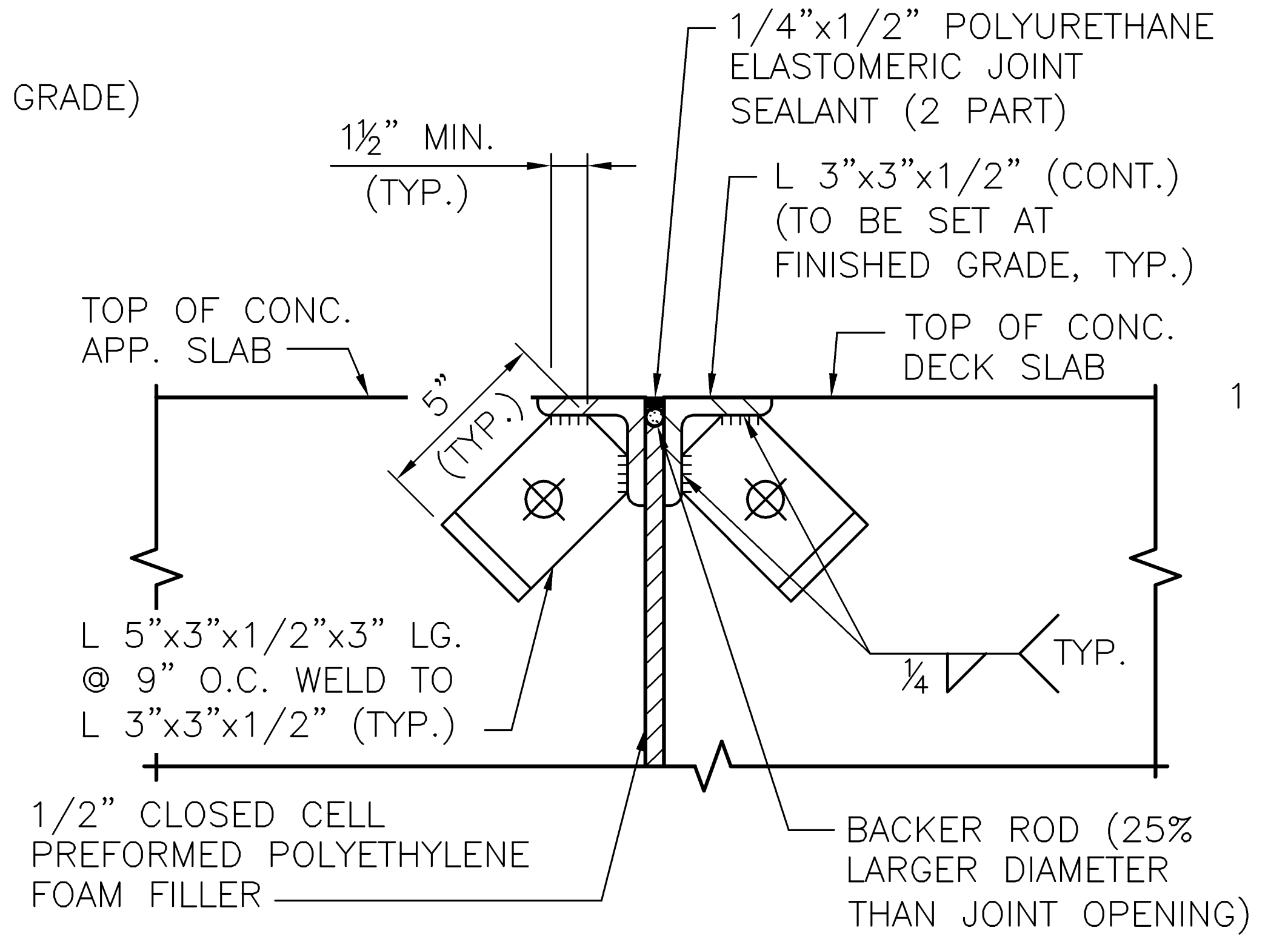

1/2"x3/8" BITUMINOUS SEAL (SEE SPECIAL PROVISIONS)
3/8"
SAWCUT WITHIN SAWCUT
TOP OF ROADWAY
1/2"
TOP OF DECK
1"
3"
HMA
1/8"
TOP OF APPROACH SLAB
1" CHAMFER
BACKER ROD (25% LARGER DIAMETER THAN JOINT OPENING)
1/4"x1/2" POLYURETHANE ELASTOMERIC JOINT SEALANT (2 PART)
1/2" CLOSED CELL PREFORMED POLYETHYLENE FOAM FILLER
1/2"

SAW AND SEAL DETAIL
FOR 3" HMA WEARING SURFACE

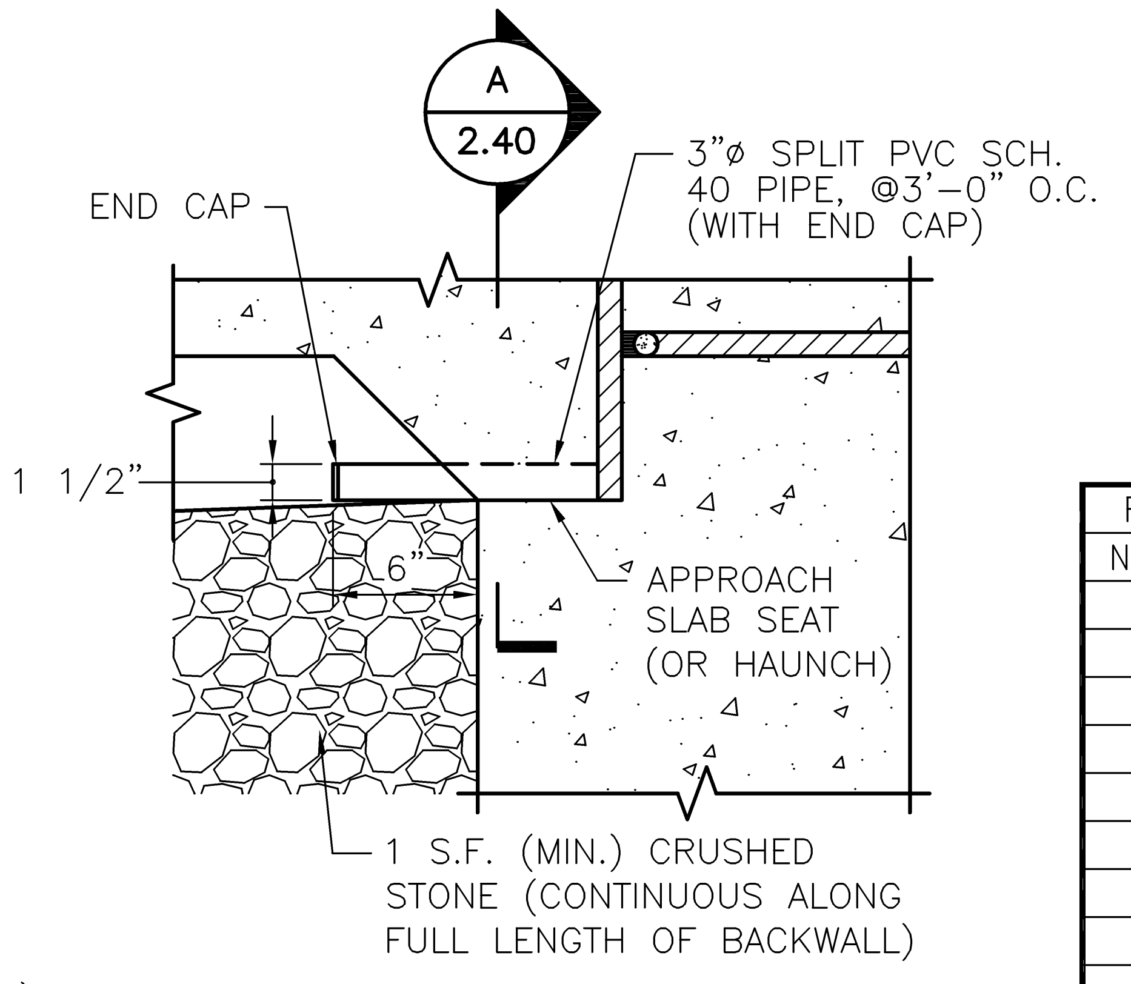
DETAIL 1 2.40
NOT TO SCALE


1'-0"
LIMIT OF WATERPROOFING MEMBRANE
1½" MIN. (TYP.)
L 3"x3"x1/2" (CONT.) (TO BE SET AT FINISHED GRADE)
3/8"
L 5"x3"x1/2"x3" LG. @ 9" O.C. WELD TO L 3"x3"x1/2" (TYP.)
3/8"x1 1/2" SAWCUT & BITUMINOUS SEAL
TOP OF ROADWAY
5" (TYP.)
TOP OF CONC. DECK SLAB
¼
BACKER ROD (25% LARGER DIAMETER THAN JOINT OPENING)
1/2" CLOSED CELL PREFORMED POLYETHYLENE FOAM FILLER
1/4"x1/2" POLYURETHANE ELASTOMERIC JOINT SEALANT (2 PART)

DETAIL 2 2.40
NOT TO SCALE


1/4"x1/2" POLYURETHANE ELASTOMERIC JOINT SEALANT (2 PART)
1½" MIN. (TYP.)
L 3"x3"x1/2" (CONT.) (TO BE SET AT FINISHED GRADE, TYP.)
TOP OF CONC. APP. SLAB
TOP OF CONC. DECK SLAB
5" (TYP.)
¼ TYP.
L 5"x3"x1/2"x3" LG. @ 9" O.C. WELD TO L 3"x3"x1/2" (TYP.)
1/2" CLOSED CELL PREFORMED POLYETHYLENE FOAM FILLER
BACKER ROD (25% LARGER DIAMETER THAN JOINT OPENING)

DETAIL 3 2.40
NOT TO SCALE


A 2.40
END CAP
3"ø SPLIT PVC SCH. 40 PIPE, @3'-0" O.C. (WITH END CAP)
1 1/2"
6"
APPROACH SLAB SEAT (OR HAUNCH)
1 S.F. (MIN.) CRUSHED STONE (CONTINUOUS ALONG FULL LENGTH OF BACKWALL)

DETAIL 4 2.40
NOT TO SCALE

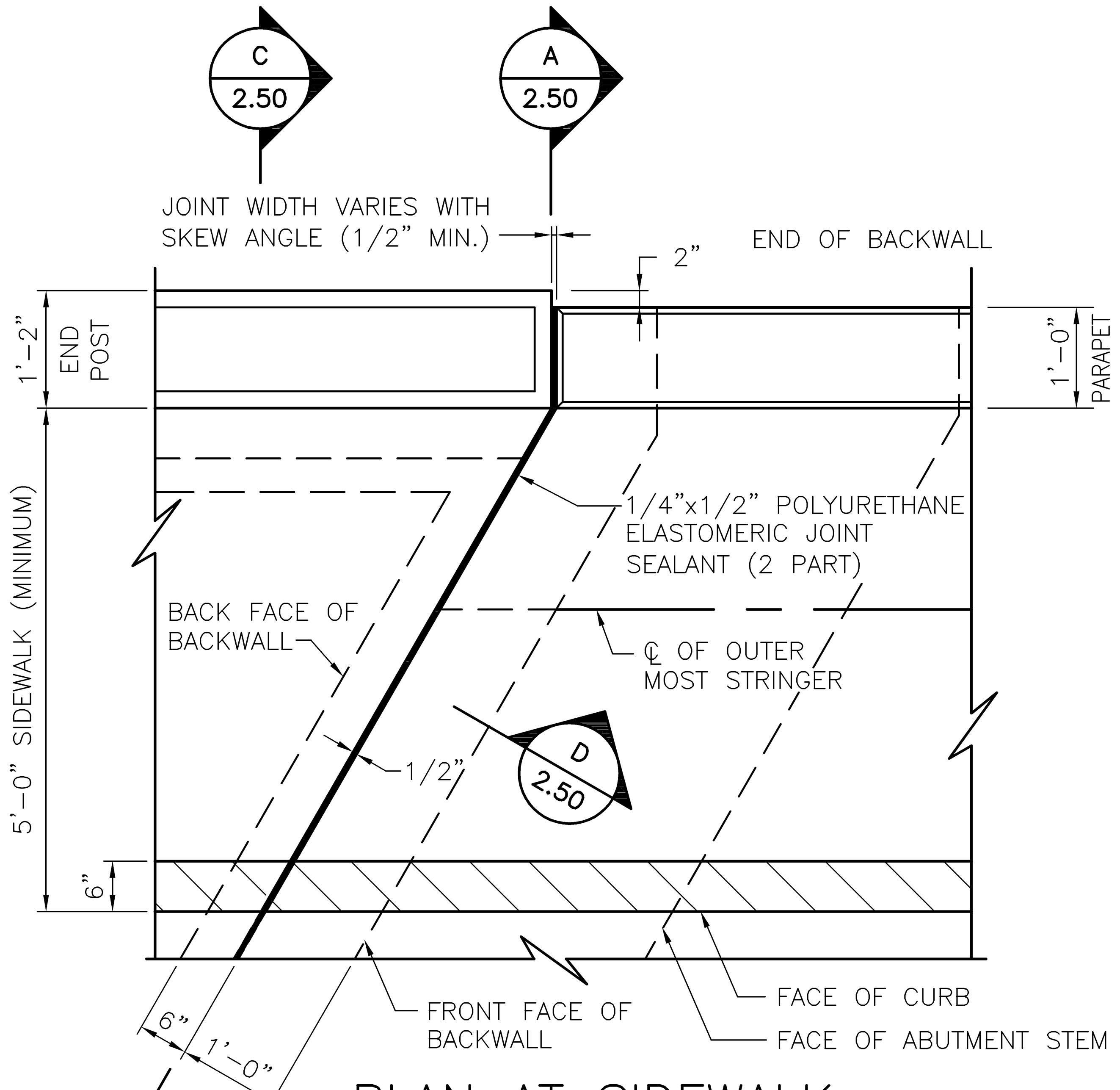
REVISIONS	
No.	DATE

RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

BRIDGE STANDARDS

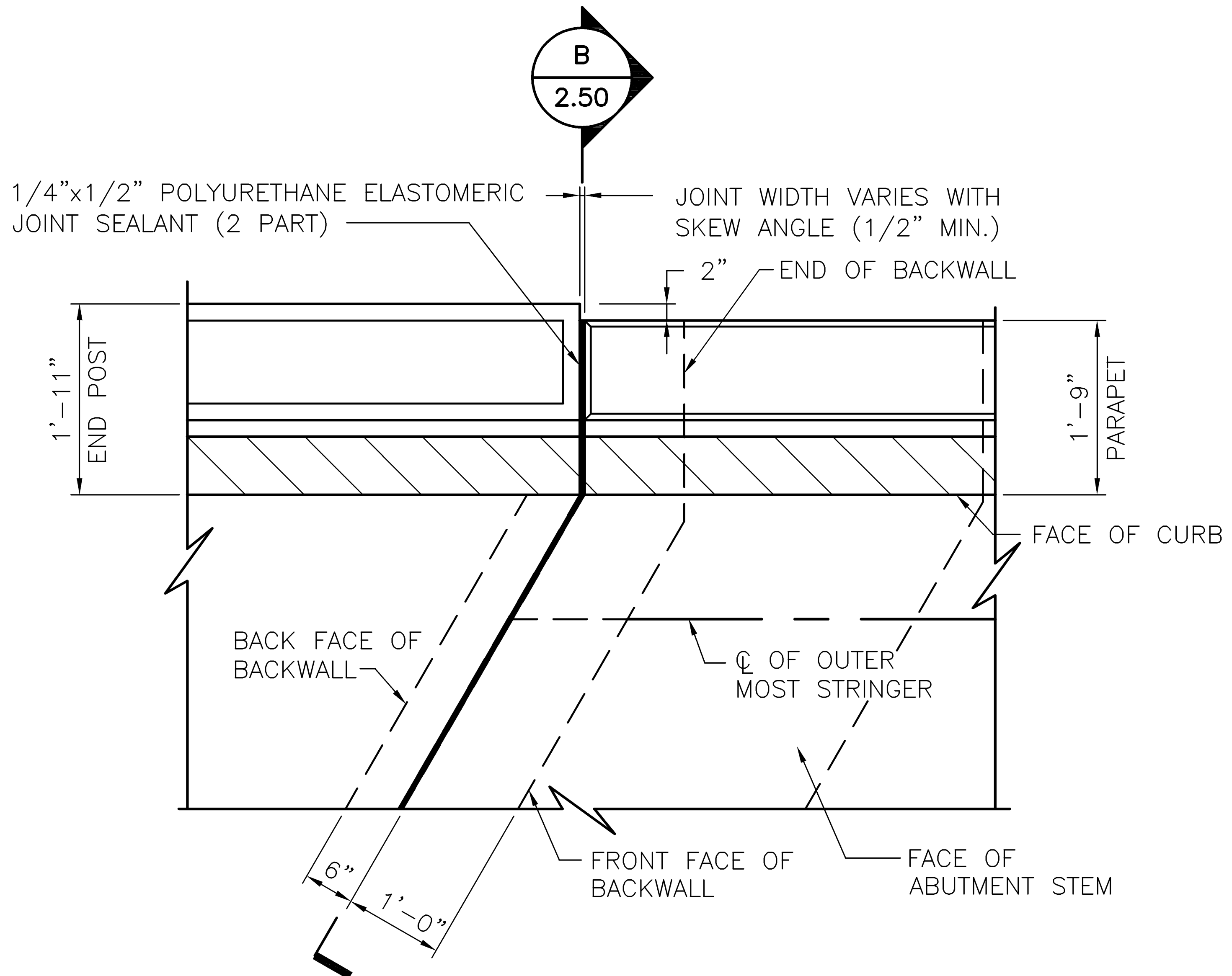
FIXED JOINTS AT ABUTMENTS SHEET 1

DRAWING NUMBER: 2.40



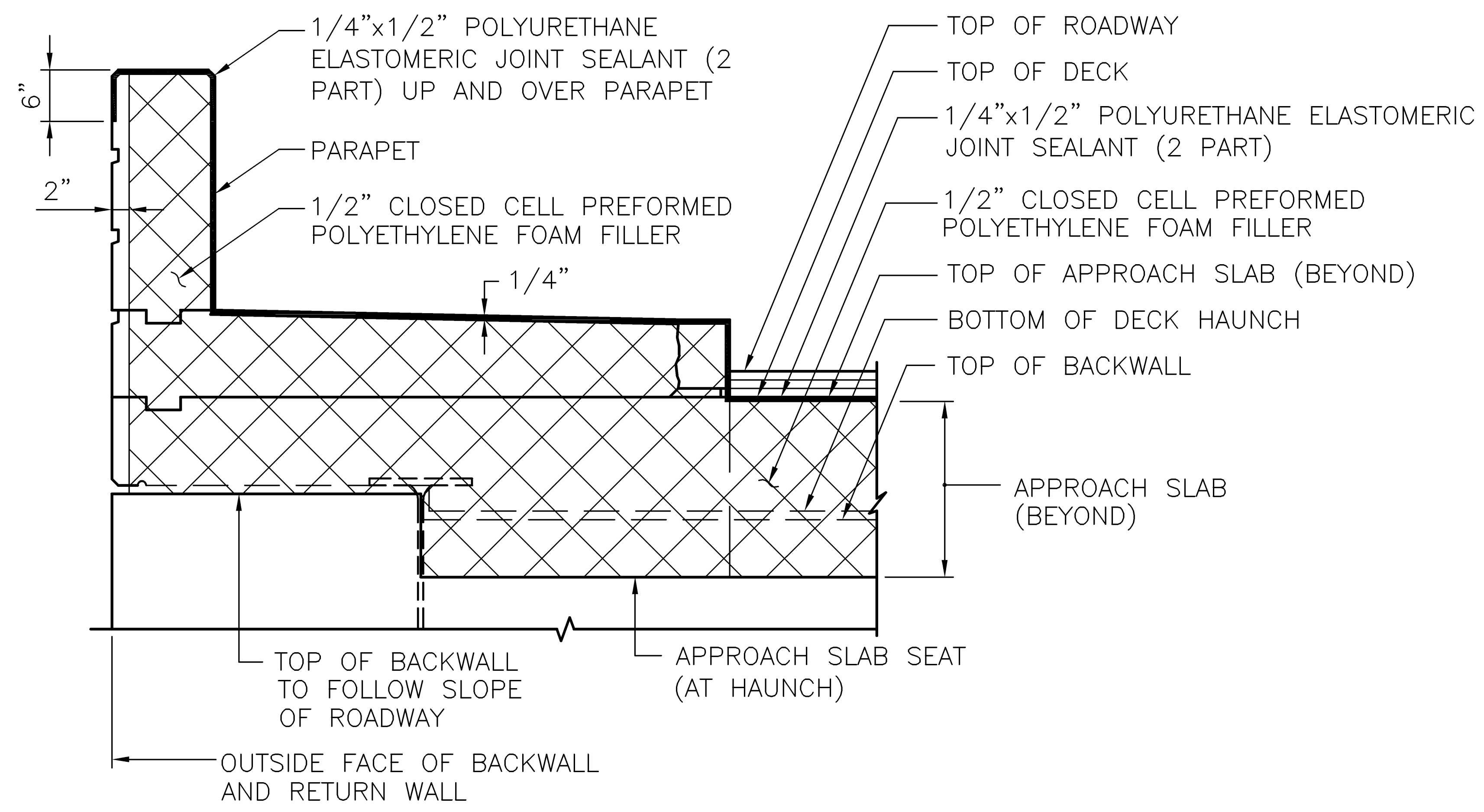
PLAN AT SIDEWALK

SKEW ANGLE LESS THAN 45° (30° SHOWN)
SCALE: 3/4"=1'-0"



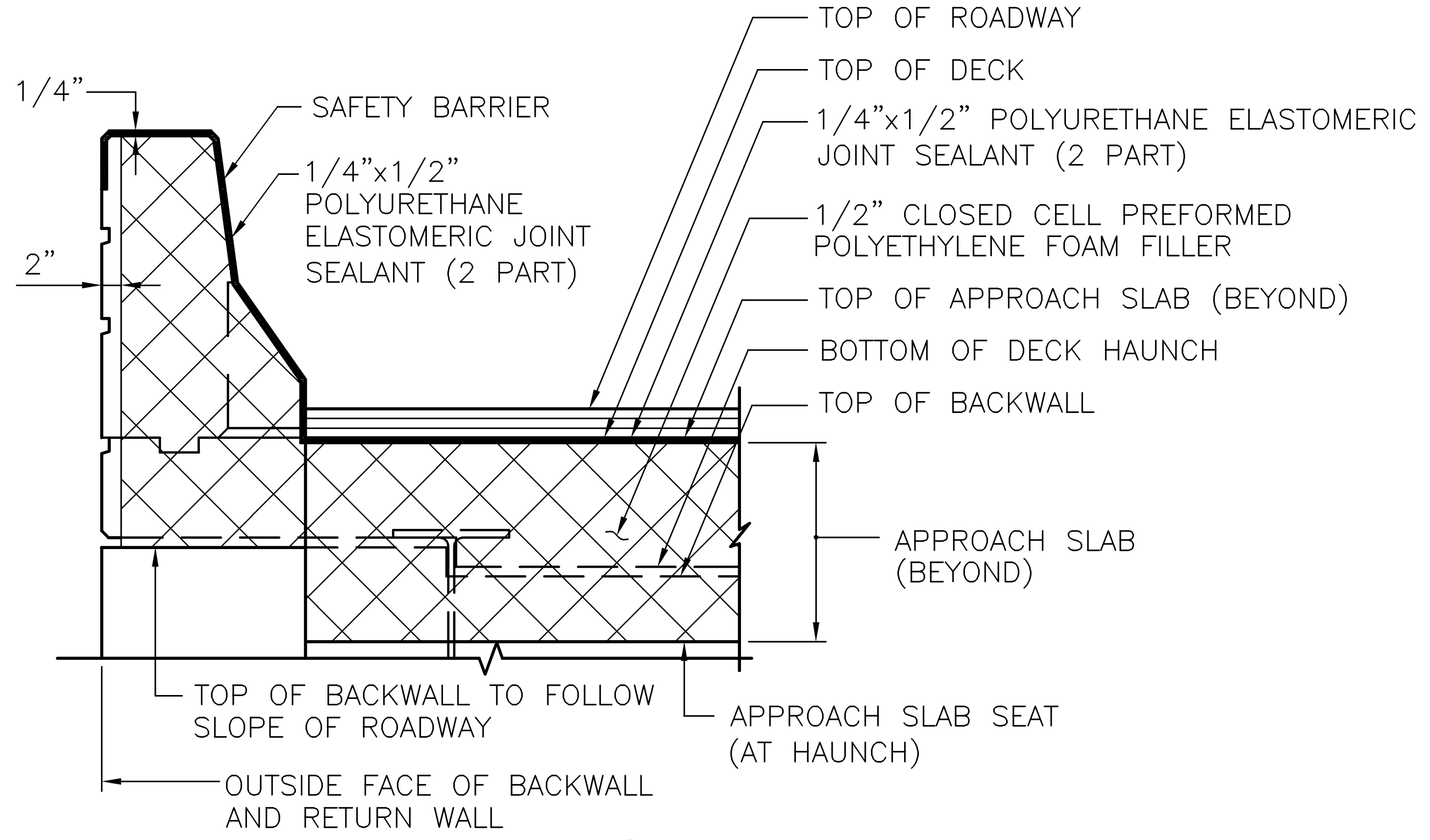
PLAN AT SAFETY BARRIER

SKEW ANGLE LESS THAN 45° (30° SHOWN)
SCALE: 3/4"=1'-0"


6"
2"
1/4"x1/2" POLYURETHANE ELASTOMERIC JOINT SEALANT (2 PART) UP AND OVER PARAPET
PARAPET
1/2" CLOSED CELL PREFORMED POLYETHYLENE FOAM FILLER
1/4"
TOP OF ROADWAY
TOP OF DECK
1/4"x1/2" POLYURETHANE ELASTOMERIC JOINT SEALANT (2 PART)
1/2" CLOSED CELL PREFORMED POLYETHYLENE FOAM FILLER
TOP OF APPROACH SLAB (BEYOND)
BOTTOM OF DECK HAUNCH
TOP OF BACKWALL
APPROACH SLAB (BEYOND)
TOP OF BACKWALL TO FOLLOW SLOPE OF ROADWAY
APPROACH SLAB SEAT (AT HAUNCH)
OUTSIDE FACE OF BACKWALL AND RETURN WALL

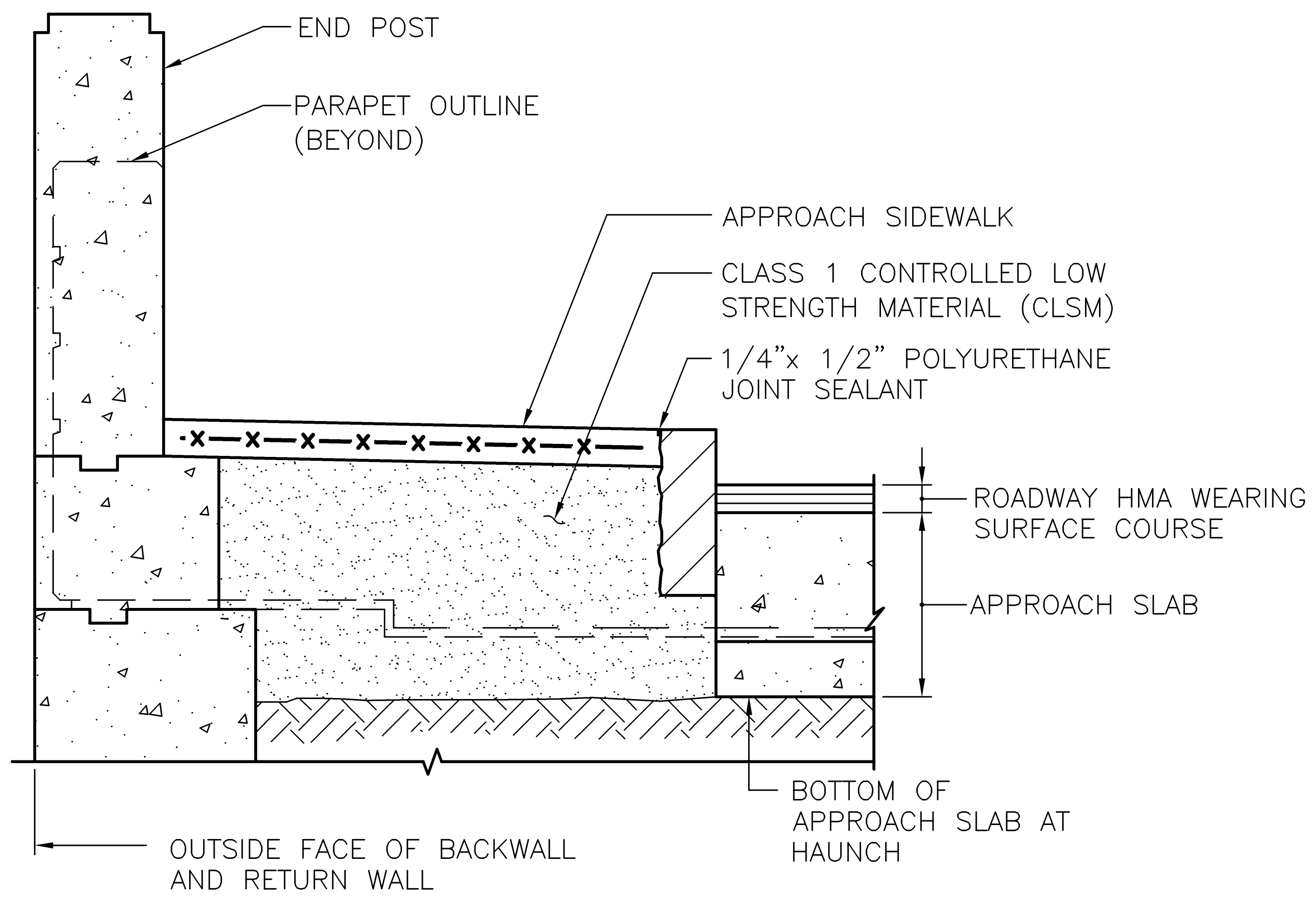
SECTION A 2.50

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


1/4"
SAFETY BARRIER
1/4"x1/2" POLYURETHANE ELASTOMERIC JOINT SEALANT (2 PART)
2"
TOP OF ROADWAY
TOP OF DECK
1/4"x1/2" POLYURETHANE ELASTOMERIC JOINT SEALANT (2 PART)
1/2" CLOSED CELL PREFORMED POLYETHYLENE FOAM FILLER
TOP OF APPROACH SLAB (BEYOND)
BOTTOM OF DECK HAUNCH
TOP OF BACKWALL
APPROACH SLAB (BEYOND)
TOP OF BACKWALL TO FOLLOW SLOPE OF ROADWAY
APPROACH SLAB SEAT (AT HAUNCH)
OUTSIDE FACE OF BACKWALL AND RETURN WALL

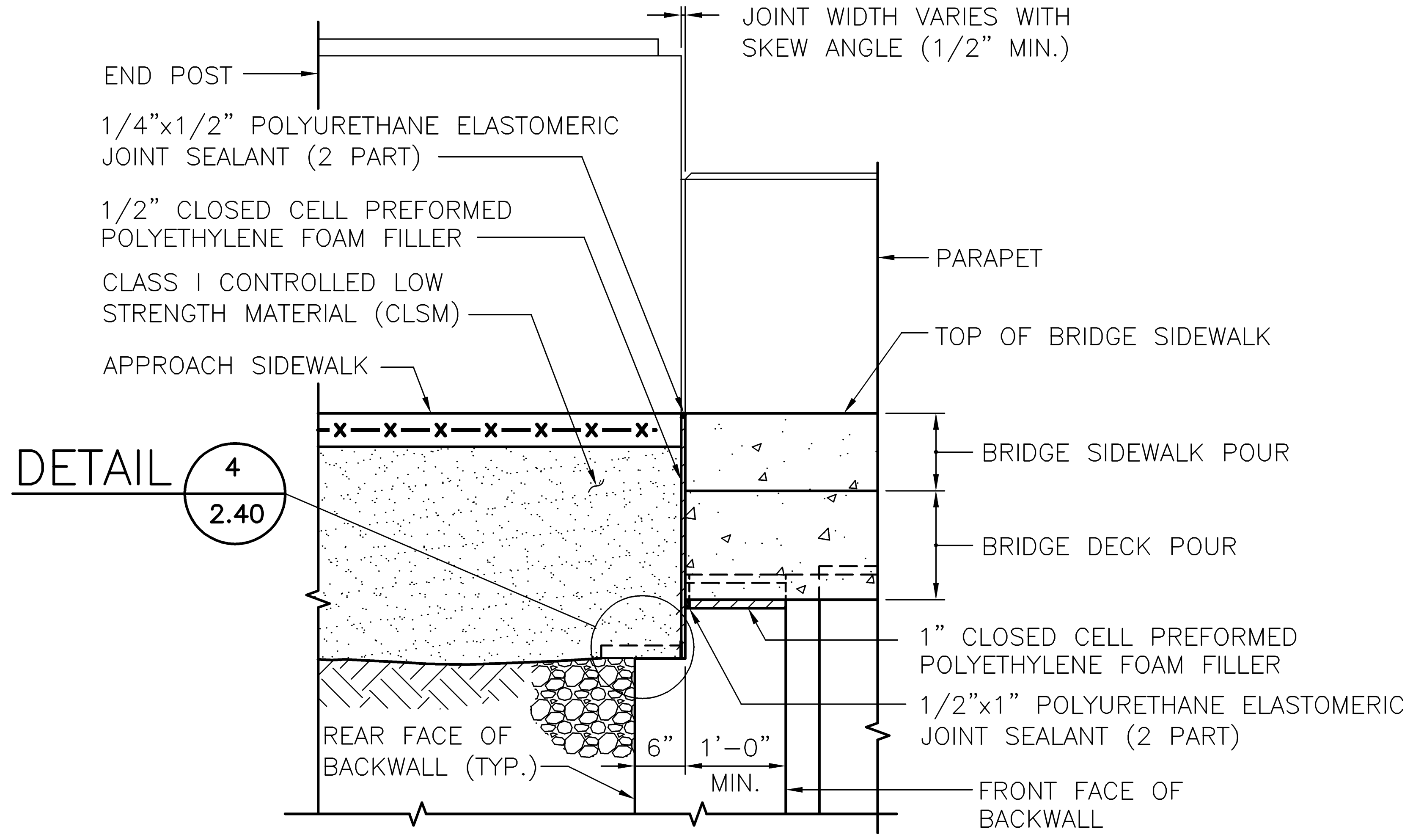
SECTION B 2.50

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


END POST
PARAPET OUTLINE (BEYOND)
APPROACH SIDEWALK
CLASS 1 CONTROLLED LOW STRENGTH MATERIAL (CLSM)
1/4"x 1/2" POLYURETHANE JOINT SEALANT
ROADWAY HMA WEARING SURFACE COURSE
APPROACH SLAB
BOTTOM OF APPROACH SLAB AT HAUNCH
OUTSIDE FACE OF BACKWALL AND RETURN WALL

SECTION C 2.50

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


END POST
JOINT WIDTH VARIES WITH SKEW ANGLE (1/2" MIN.)
1/4"x1/2" POLYURETHANE ELASTOMERIC JOINT SEALANT (2 PART)
1/2" CLOSED CELL PREFORMED POLYETHYLENE FOAM FILLER
CLASS I CONTROLLED LOW STRENGTH MATERIAL (CLSM)
APPROACH SIDEWALK
PARAPET
TOP OF BRIDGE SIDEWALK
BRIDGE SIDEWALK POUR
BRIDGE DECK POUR
DETAIL 4
2.40
1" CLOSED CELL PREFORMED POLYETHYLENE FOAM FILLER
1/2"x1" POLYURETHANE ELASTOMERIC JOINT SEALANT (2 PART)
REAR FACE OF BACKWALL (TYP.)
6"
1'-0" MIN.
FRONT FACE OF BACKWALL

SECTION D 2.50

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

DESIGNER:

1. *THE DETAILS SHOWN ON THIS SHEET CORRESPOND TO ABUTMENT BACKWALL TYPE-1 AS SHOWN ON DWG. 2.40. THE DETAILS FOR ABUTMENT BACKWALL TYPES-2, 3, AND 4 ARE SIMILAR.*

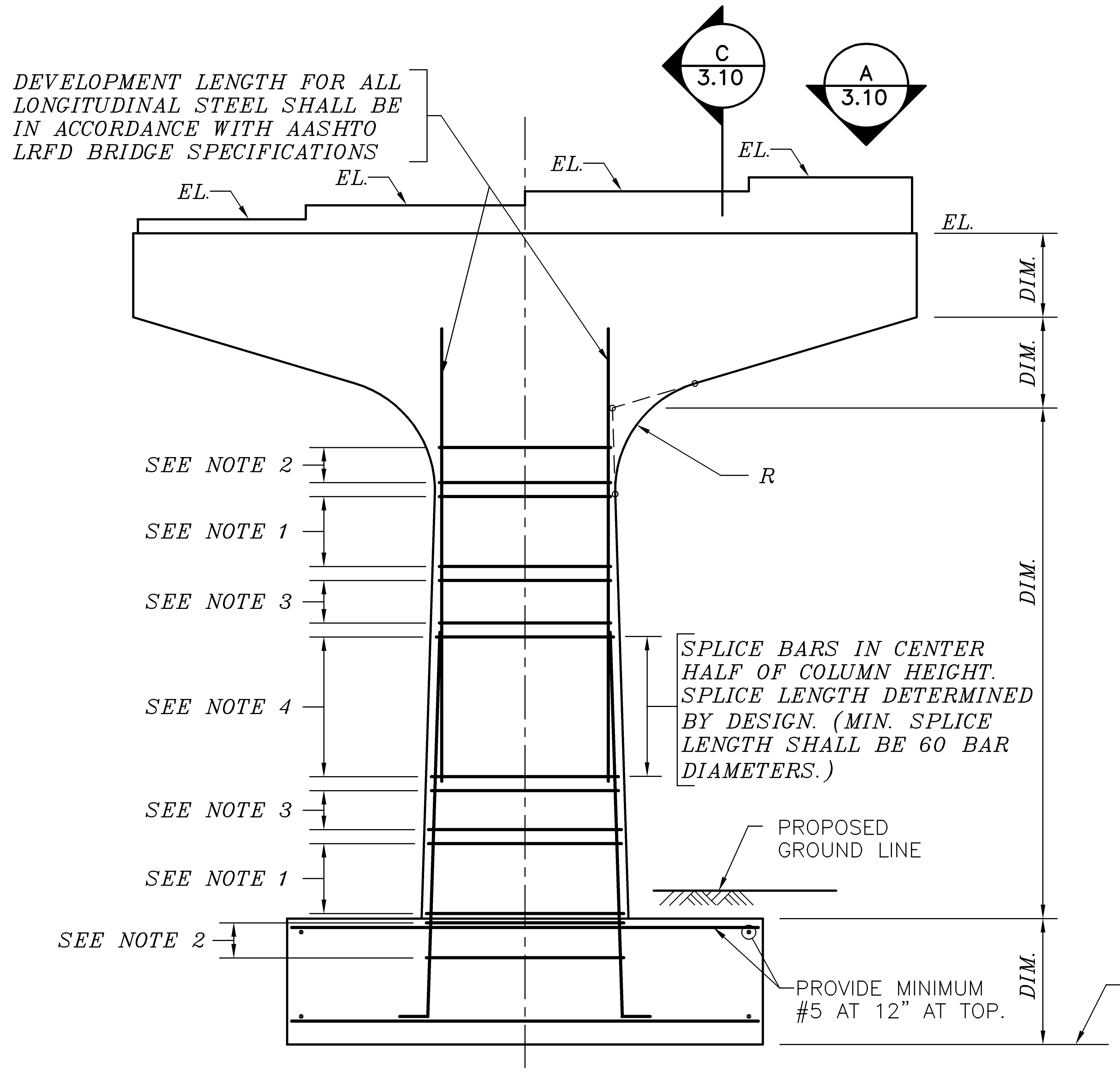
REVISIONS	
No.	DATE

RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

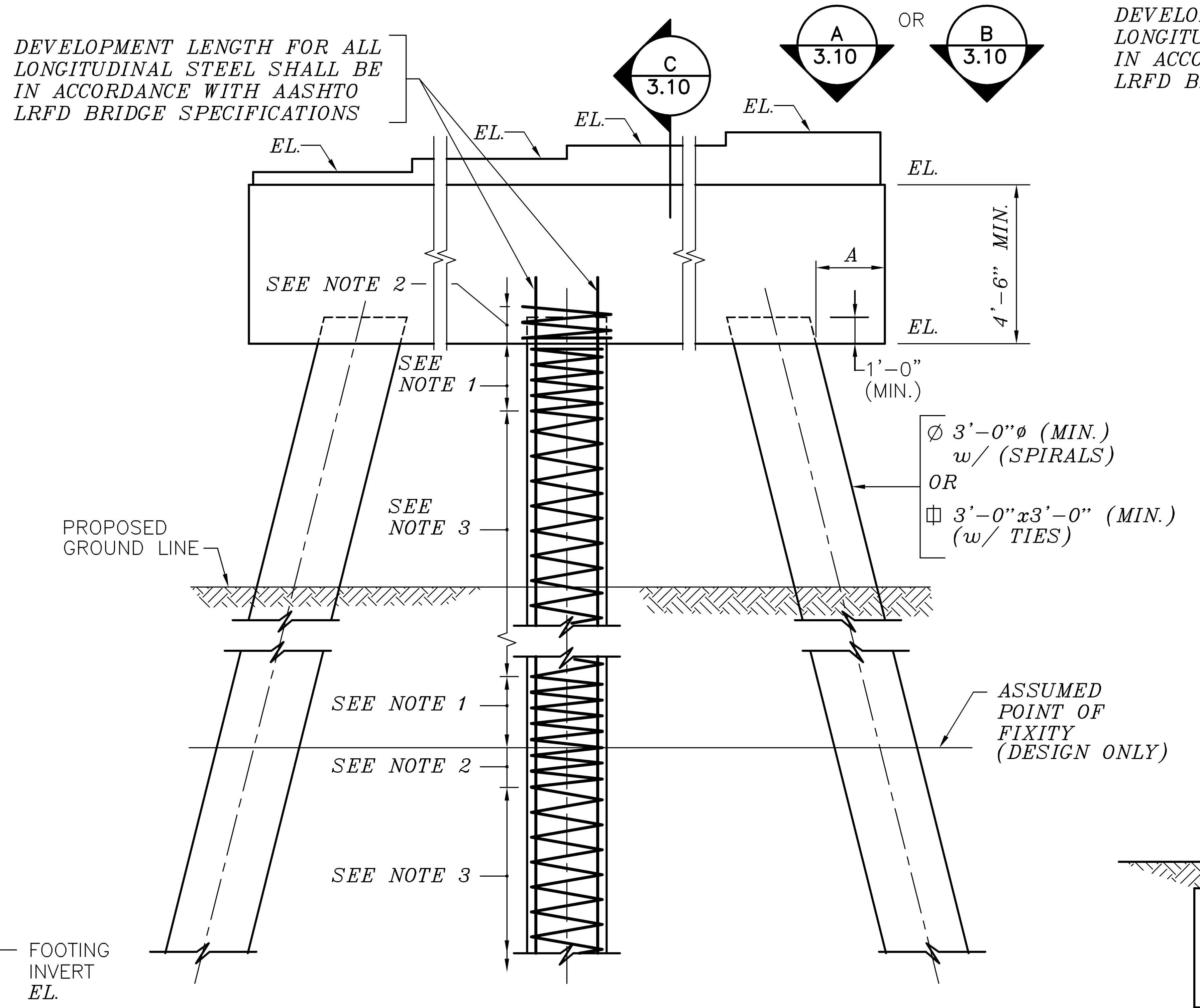
BRIDGE STANDARDS

FIXED JOINTS AT ABUTMENTS SHEET 2

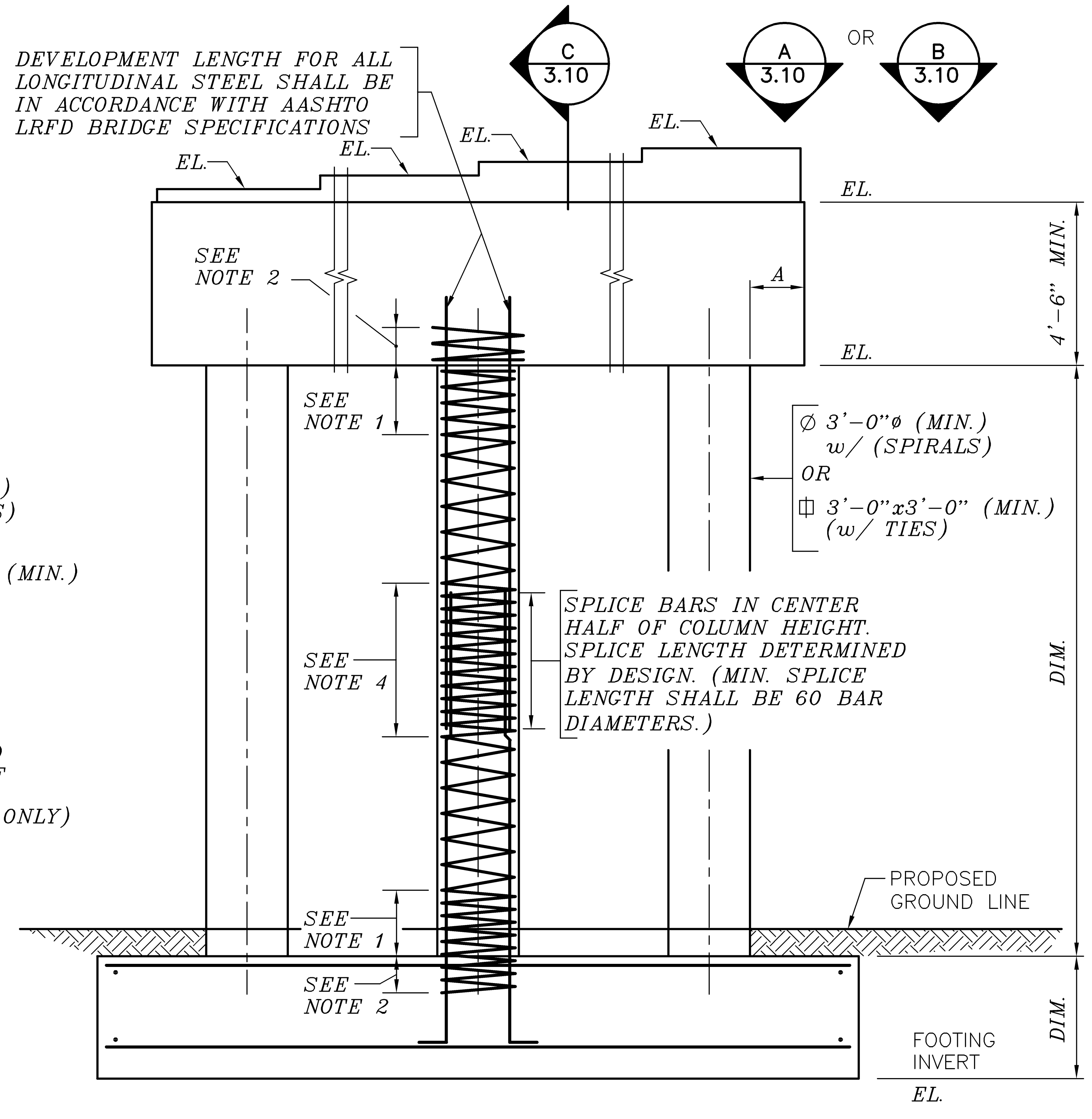
DRAWING NUMBER: 2.50


C 3.10
A 3.10
DEVELOPMENT LENGTH FOR ALL LONGITUDINAL STEEL SHALL BE IN ACCORDANCE WITH AASHTO LRFD BRIDGE SPECIFICATIONS
EL.
EL.
EL.
EL.
EL.
DIM.
DIM.
DIM.
DIM.
R
SEE NOTE 2
SEE NOTE 1
SEE NOTE 3
SEE NOTE 4
SEE NOTE 3
SEE NOTE 1
SEE NOTE 2
SPLICE BARS IN CENTER HALF OF COLUMN HEIGHT. SPLICE LENGTH DETERMINED BY DESIGN. (MIN. SPLICE LENGTH SHALL BE 60 BAR DIAMETERS.)
PROPOSED GROUND LINE
PROVIDE MINIMUM #5 AT 12" AT TOP.
FOOTING INVERT EL.

TEE PIER


DEVELOPMENT LENGTH FOR ALL LONGITUDINAL STEEL SHALL BE IN ACCORDANCE WITH AASHTO LRFD BRIDGE SPECIFICATIONS
C 3.10
A 3.10
OR
B 3.10
EL.
EL.
EL.
EL.
EL.
EL.
4'-6" MIN.
A
SEE NOTE 2
SEE NOTE 1
1'-0" (MIN.)
Ø 3'-0"ø (MIN.) w/ (SPIRALS)
OR
◫ 3'-0"x3'-0" (MIN.) (w/ TIES)
SEE NOTE 3
PROPOSED GROUND LINE
SEE NOTE 1
SEE NOTE 2
SEE NOTE 3
ASSUMED POINT OF FIXITY (DESIGN ONLY)

BENT TYPE PIER

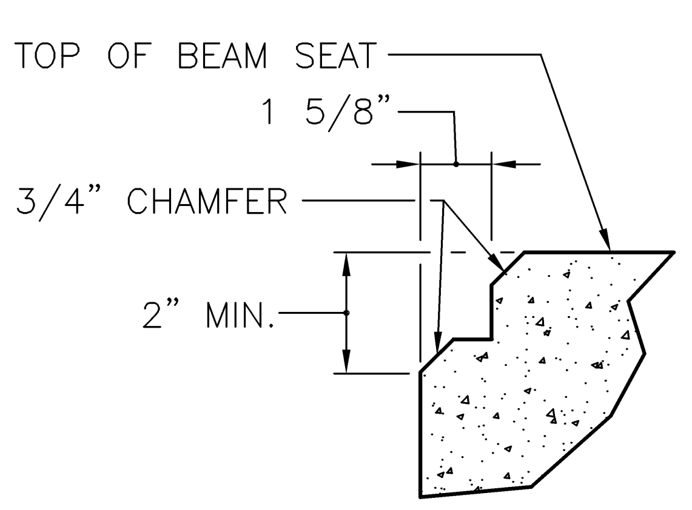

DEVELOPMENT LENGTH FOR ALL LONGITUDINAL STEEL SHALL BE IN ACCORDANCE WITH AASHTO LRFD BRIDGE SPECIFICATIONS
C 3.10
A 3.10
OR
B 3.10
EL.
EL.
EL.
EL.
EL.
EL.
4'-6" MIN.
A
SEE NOTE 2
SEE NOTE 1
Ø 3'-0"ø (MIN.) w/ (SPIRALS)
OR
◫ 3'-0"x3'-0" (MIN.) (w/ TIES)
SEE NOTE 4
SPLICE BARS IN CENTER HALF OF COLUMN HEIGHT. SPLICE LENGTH DETERMINED BY DESIGN. (MIN. SPLICE LENGTH SHALL BE 60 BAR DIAMETERS.)
DIM.
PROPOSED GROUND LINE
SEE NOTE 1
SEE NOTE 2
DIM.
FOOTING INVERT
EL.

BENT TYPE PIER

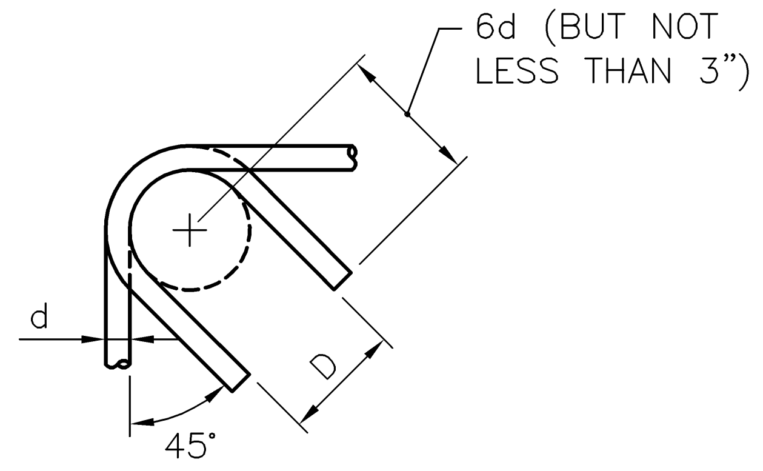
DESIGNER NOTES:

1. *PROVIDE TRANSVERSE (CONFINEMENT) STEEL IN ACCORDANCE WITH AASHTO SEISMIC AND OTHER LOADING CRITERIA.*
   TRANSVERSE (CONFINEMENT) STEEL SHALL BE PROVIDED FOR A MINIMUM LENGTH EQUAL TO THE GREATER OF:
   - *MAXIMUM CROSS-SECTIONAL COLUMN DIMENSION*
   - *1/6 OF THE CLEAR HEIGHT OF COLUMN*
   - *18 INCHES*

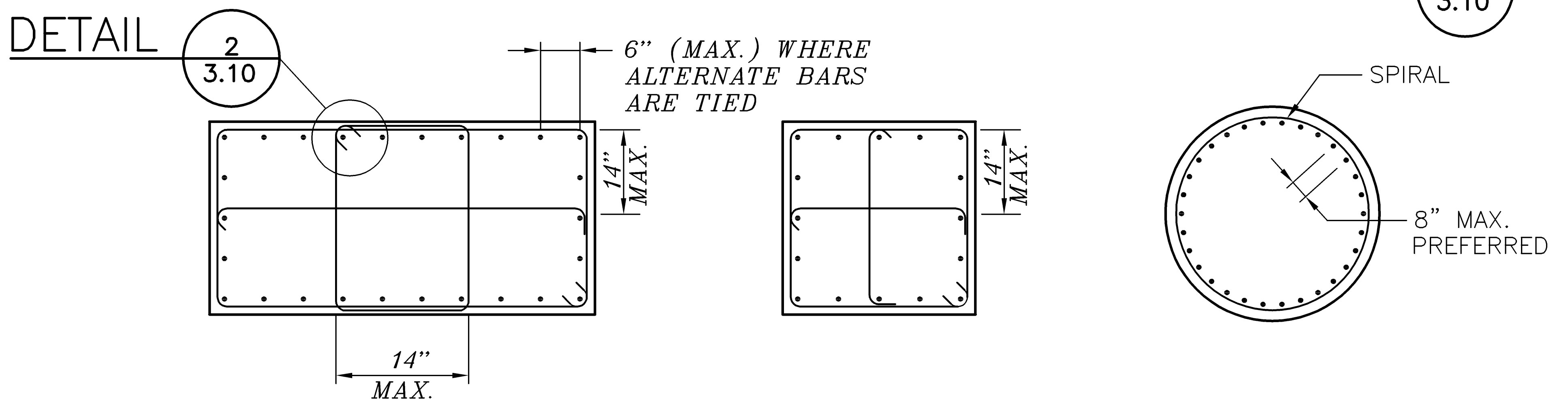
   MAXIMUM TIES (OR SPIRAL) SPACING SHALL BE 6 INCHES.
2. *EXTEND TRANSVERSE (CONFINEMENT) STEEL FOR A LENGTH EQUAL TO ONE-HALF THE MAXIMUM CROSS-SECTIONAL COLUMN DIMENSION BUT NOT LESS THAN 15 INCHES. MINIMUM TIES OR SPIRAL SPACING SHALL BE 6 INCHES.*
3. *PROVIDE TRANSVERSE (CONFINEMENT) STEEL IN ACCORDANCE WITH AASHTO SEISMIC AND OTHER LOADING REQUIREMENTS.*
4. *SPACING OF TRANSVERSE (CONFINEMENT) STEEL OVER THE LENGTH OF THE SPLICE SHALL NOT EXCEED ONE-QUARTER OF THE MINIMUM CROSS-SECTIONAL COLUMN DIMENSION OR 4 INCHES.*
5. *DESIGNER SHALL REFER TO THE RIDOT LRFD BRIDGE DESIGN MANUAL (SECTION 11.4) FOR CRASH PROTECTION WALL REQUIREMENTS ADJACENT TO AND IN CLOSE PROXIMITY OF RAILROAD TRACKS.*
6. *LAP SPLICES IN LONGITUDINAL REINFORCEMENT IN POTENTIAL PLASTIC HINGE REGIONS ARE NOT PERMITTED. FULL MECHANICAL CONNECTION SPLICES IN ACCORDANCE WITH AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS MAY BE USED. MECHANICAL SPLICES IN ADJACENT BARS SHALL BE STAGGERED 24" APART. TRANSVERSE SPACING SHALL BE IN ACCORDANCE WITH NOTE 4.*
7. *LAP SPLICES IN TRANSVERSE REINFORCEMENT IN POTENTIAL PLASTIC HINGE REGIONS ARE NOT PERMITTED. FULL MECHANICAL CONNECTION SPLICES IN ACCORDANCE WITH AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS MAY BE USED.*
8. *DESIGNER SHALL ADD A NOTE TO THE PLANS SPECIFYING THE REQUIREMENTS INDICATED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS FOR "FULL MECHANICAL CONNECTIONS".*



DETAIL 1/3.10
NOT TO SCALE

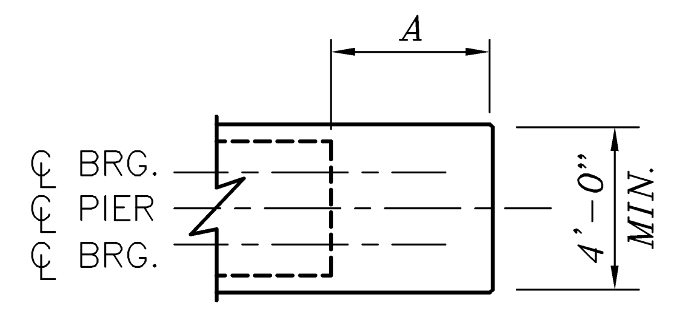


DETAIL 2/3.10
NOT TO SCALE

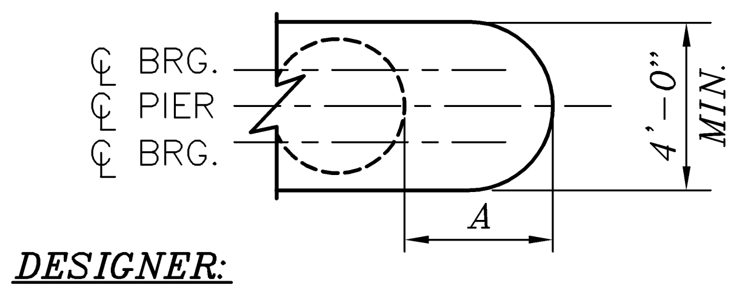


COLUMN TIE DETAILS

DESIGNER:
FOR ADDITIONAL REQUIREMENTS REFER TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.

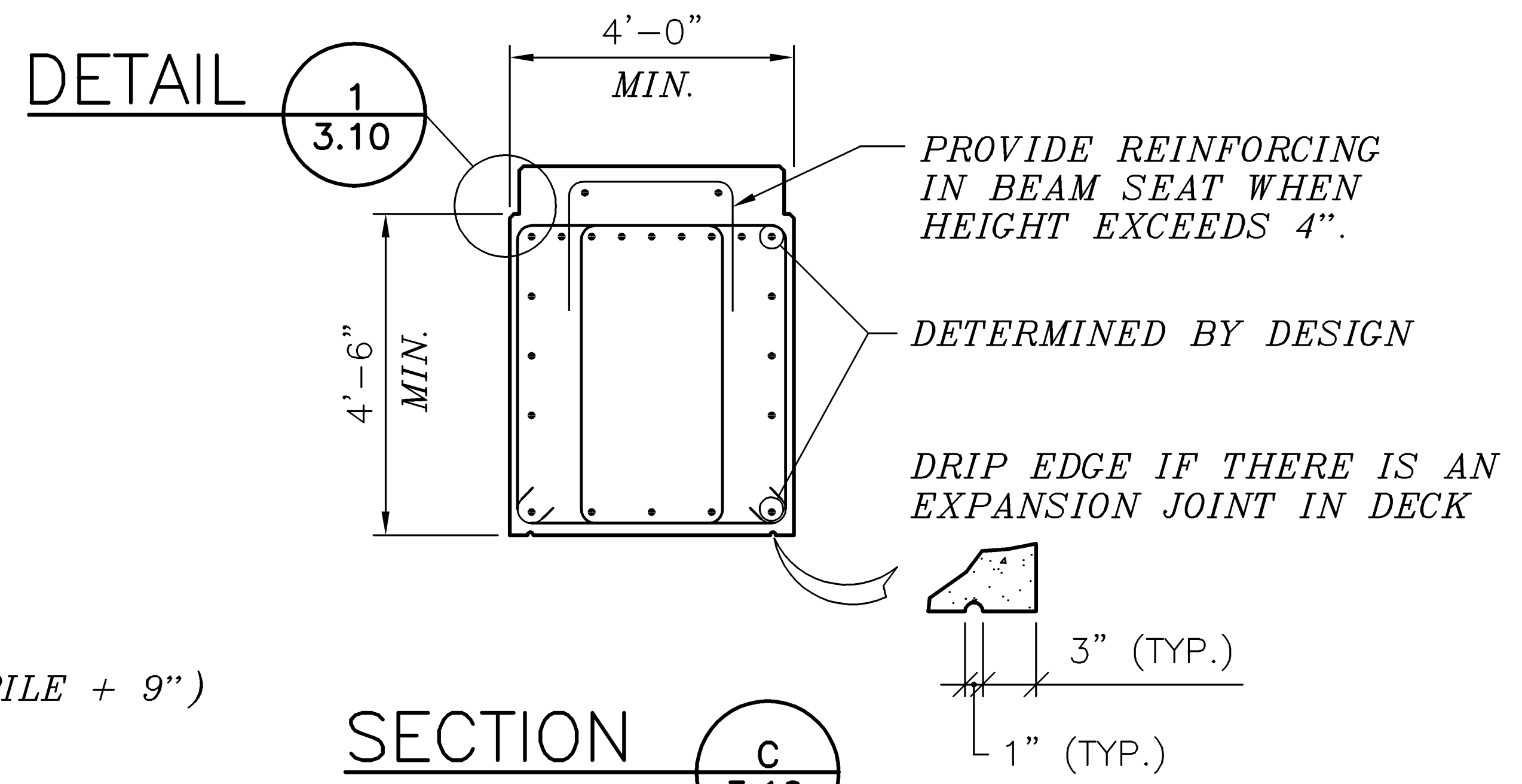


VIEW A/3.10



DESIGNER:
DIMENSION "A"=(1/2 WIDTH OF COLUMN/PILE + 9")

VIEW B/3.10


DETAIL 1/3.10
4'-0" MIN.
4'-6" MIN.
PROVIDE REINFORCING IN BEAM SEAT WHEN HEIGHT EXCEEDS 4".
DETERMINED BY DESIGN
DRIP EDGE IF THERE IS AN EXPANSION JOINT IN DECK
3" (TYP.)
1" (TYP.)

SECTION C/3.10

THIS SHEET IS NOT TO SCALE

REVISIONS	
No.	DATE

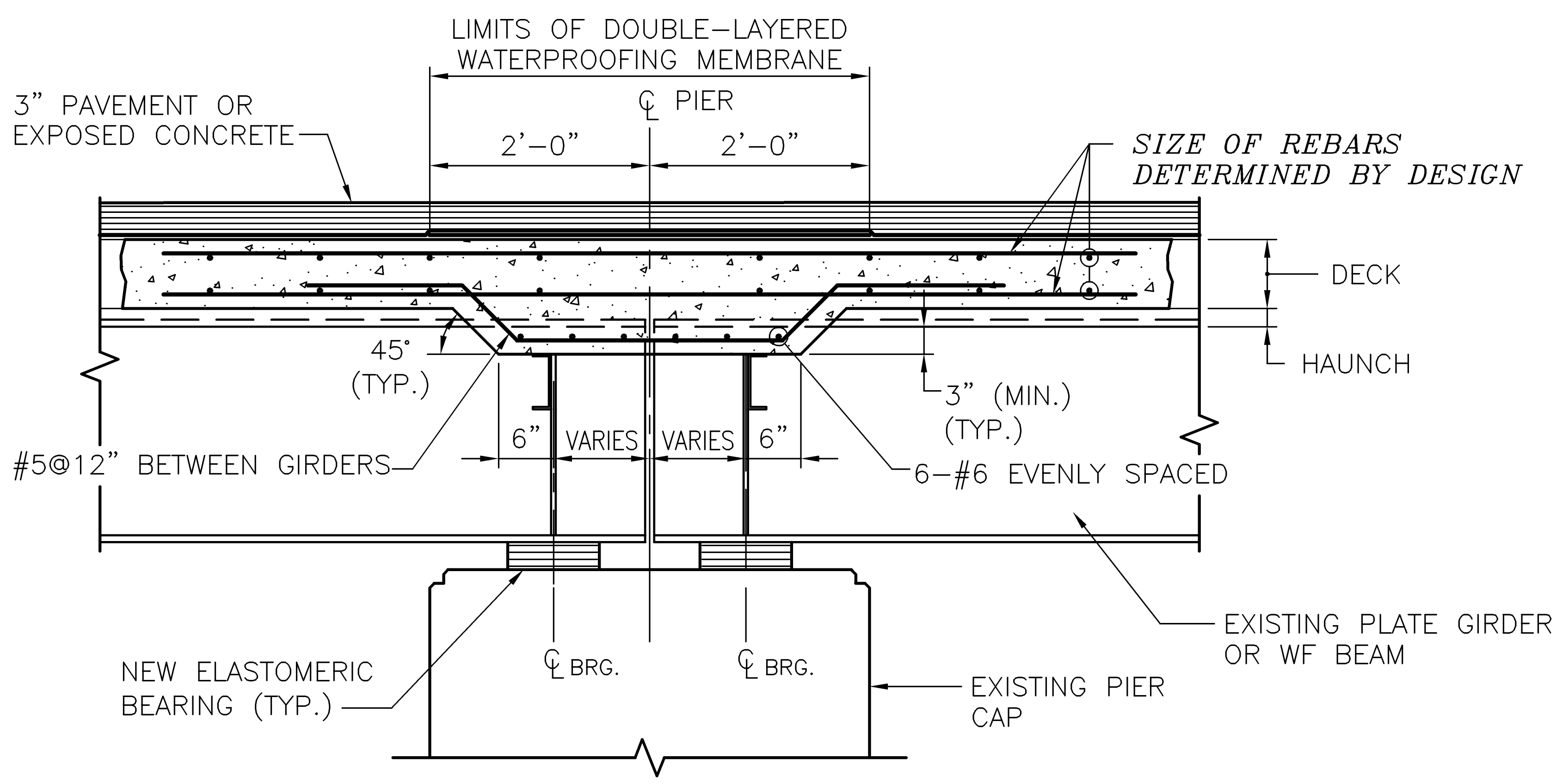
RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

BRIDGE STANDARDS

PIER DETAILS

DRAWING NUMBER: 3.10

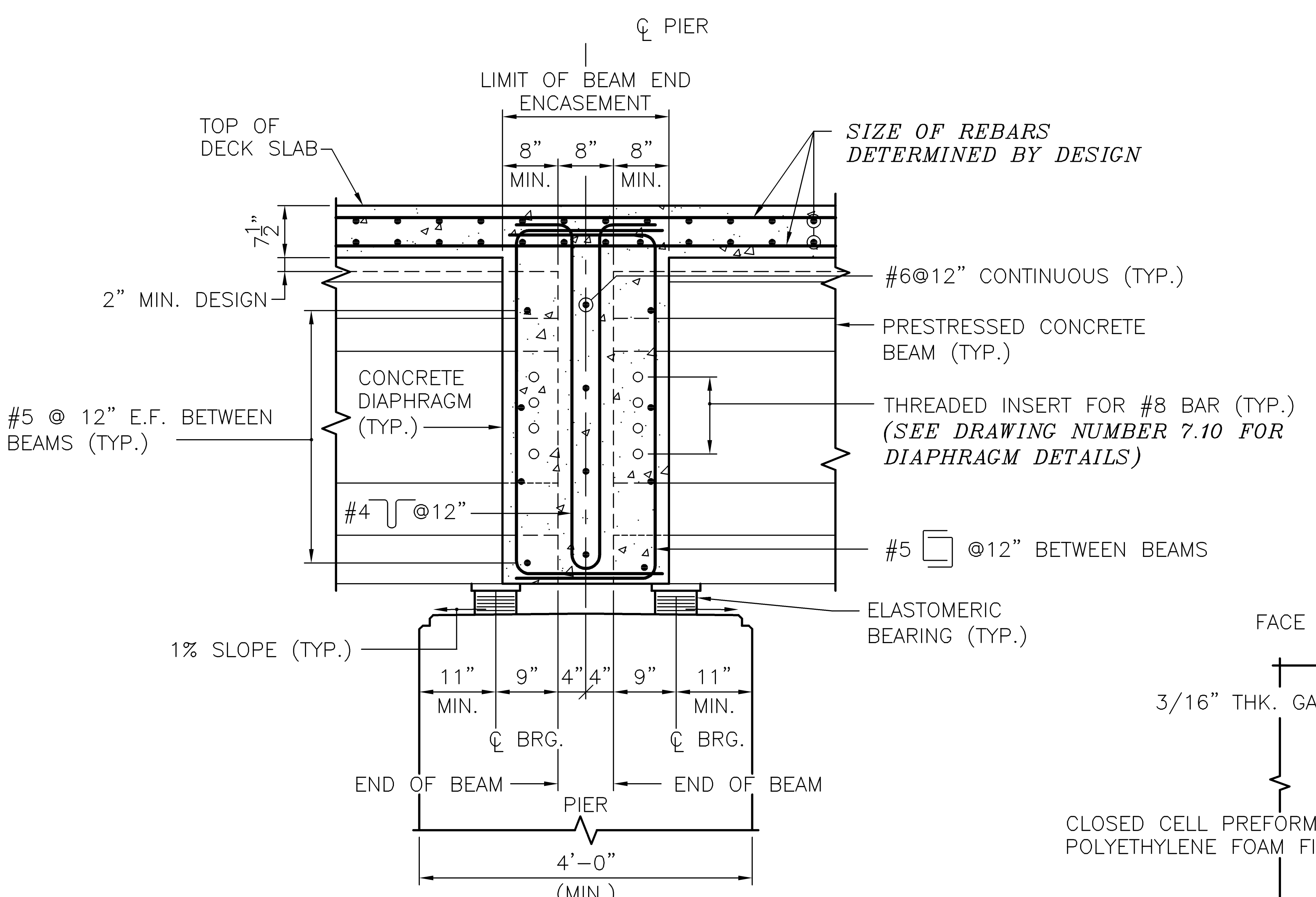
P:\10000\10027.00 On-Call Bridge Design\10027.20 Bridge Design Std Details_Drawings\Structural_Current_Drawings\Ris3-10.dwg, 7/22/2015 1:24:57 PM, JTA


LIMITS OF DOUBLE–LAYERED WATERPROOFING MEMBRANE
℄ PIER
3" PAVEMENT OR EXPOSED CONCRETE
2'–0"
2'–0"
SIZE OF REBARS DETERMINED BY DESIGN
DECK
HAUNCH
45° (TYP.)
3" (MIN.) (TYP.)
#5@12" BETWEEN GIRDERS
6"
VARIES
VARIES
6"
6–#6 EVENLY SPACED
EXISTING PLATE GIRDER OR WF BEAM
NEW ELASTOMERIC BEARING (TYP.)
℄ BRG.
℄ BRG.
EXISTING PIER CAP

TYPICAL PIER

EXISTING STEEL BEAM AT PIER
(BRIDGE REHABILITATION)

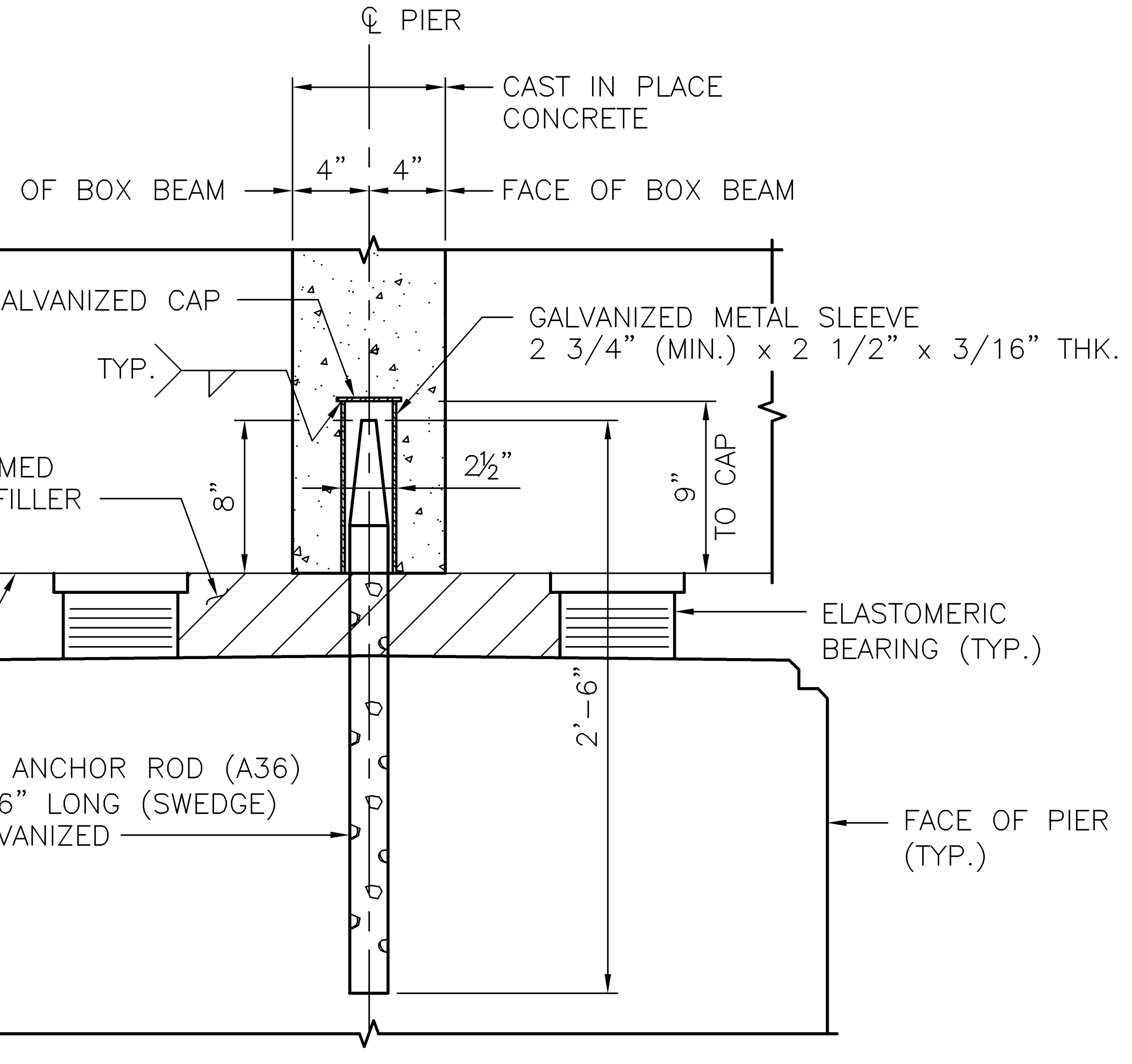
SCALE:3/4"=1'–0"


℄ PIER
LIMIT OF BEAM END ENCASEMENT
TOP OF DECK SLAB
8"
8"
8"
MIN.
MIN.
SIZE OF REBARS DETERMINED BY DESIGN
7½"
2" MIN. DESIGN
#6@12" CONTINUOUS (TYP.)
PRESTRESSED CONCRETE BEAM (TYP.)
CONCRETE DIAPHRAGM (TYP.)
#5 @ 12" E.F. BETWEEN BEAMS (TYP.)
THREADED INSERT FOR #8 BAR (TYP.)
(SEE DRAWING NUMBER 7.10 FOR DIAPHRAGM DETAILS)
#4 ⊓ @12"
#5 ⊔ @12" BETWEEN BEAMS
ELASTOMERIC BEARING (TYP.)
1% SLOPE (TYP.)
11"
MIN.
9"
4"
4"
9"
11"
MIN.
℄ BRG.
℄ BRG.
END OF BEAM
PIER
END OF BEAM
4'–0"
(MIN.)

TYPICAL PIER

(PRESTRESSED CONCRETE BEAMS)

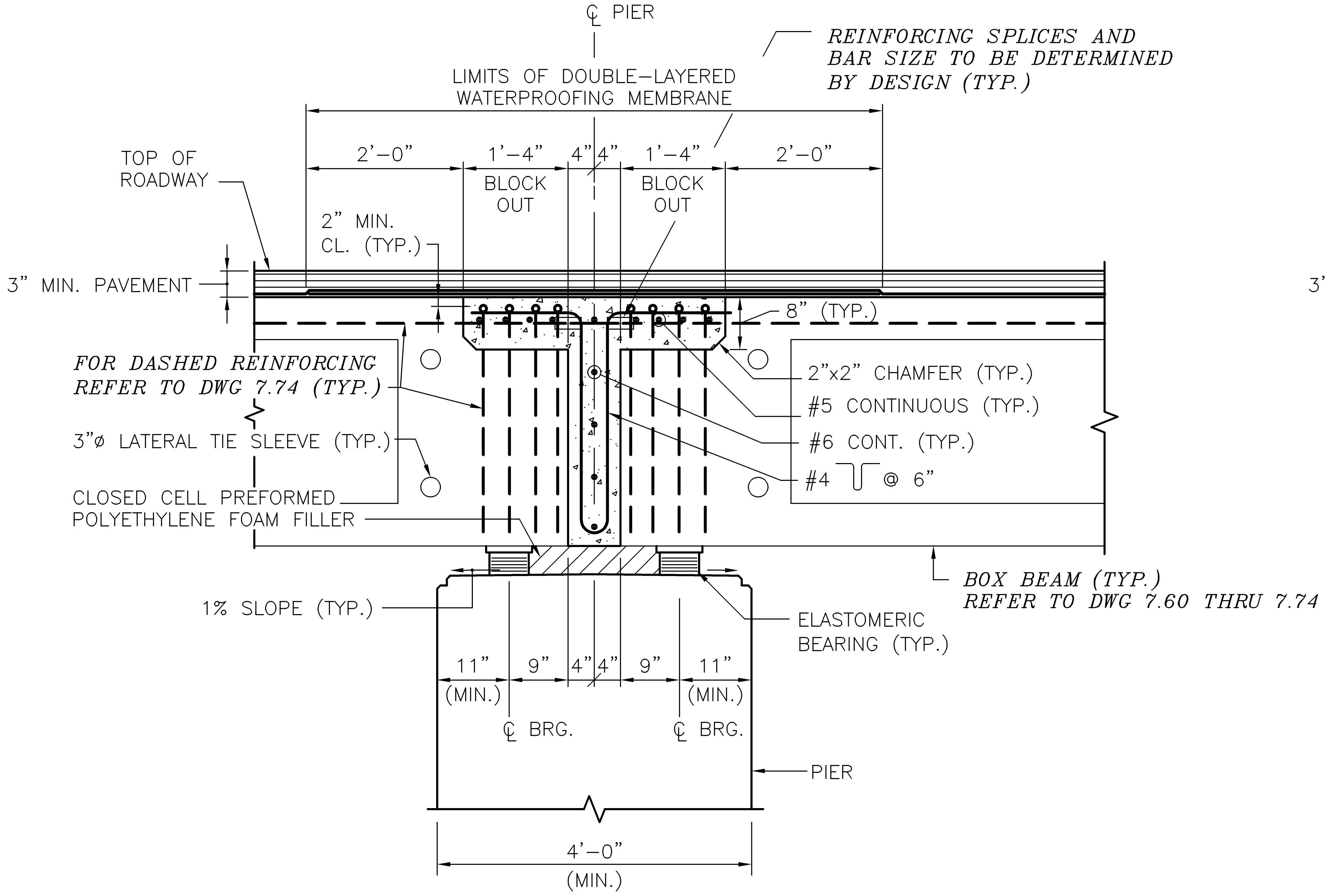
SCALE:3/4"=1'–0"


℄ PIER
CAST IN PLACE CONCRETE
FACE OF BOX BEAM
4"
4"
FACE OF BOX BEAM
3/16" THK. GALVANIZED CAP
TYP.
GALVANIZED METAL SLEEVE 2 3/4" (MIN.) x 2 1/2" x 3/16" THK.
CLOSED CELL PREFORMED POLYETHYLENE FOAM FILLER
8"
2½"
9" TO CAP
BOT. OF BOX BEAM (TYP.)
ELASTOMERIC BEARING (TYP.)
2'–6"
2"ø ANCHOR ROD (A36) 2'–6" LONG (SWEDGE) GALVANIZED
FACE OF PIER (TYP.)

DETAIL $\frac{1}{3.20}$

ANCHOR ROD DETAILS AT FIXED BEARINGS

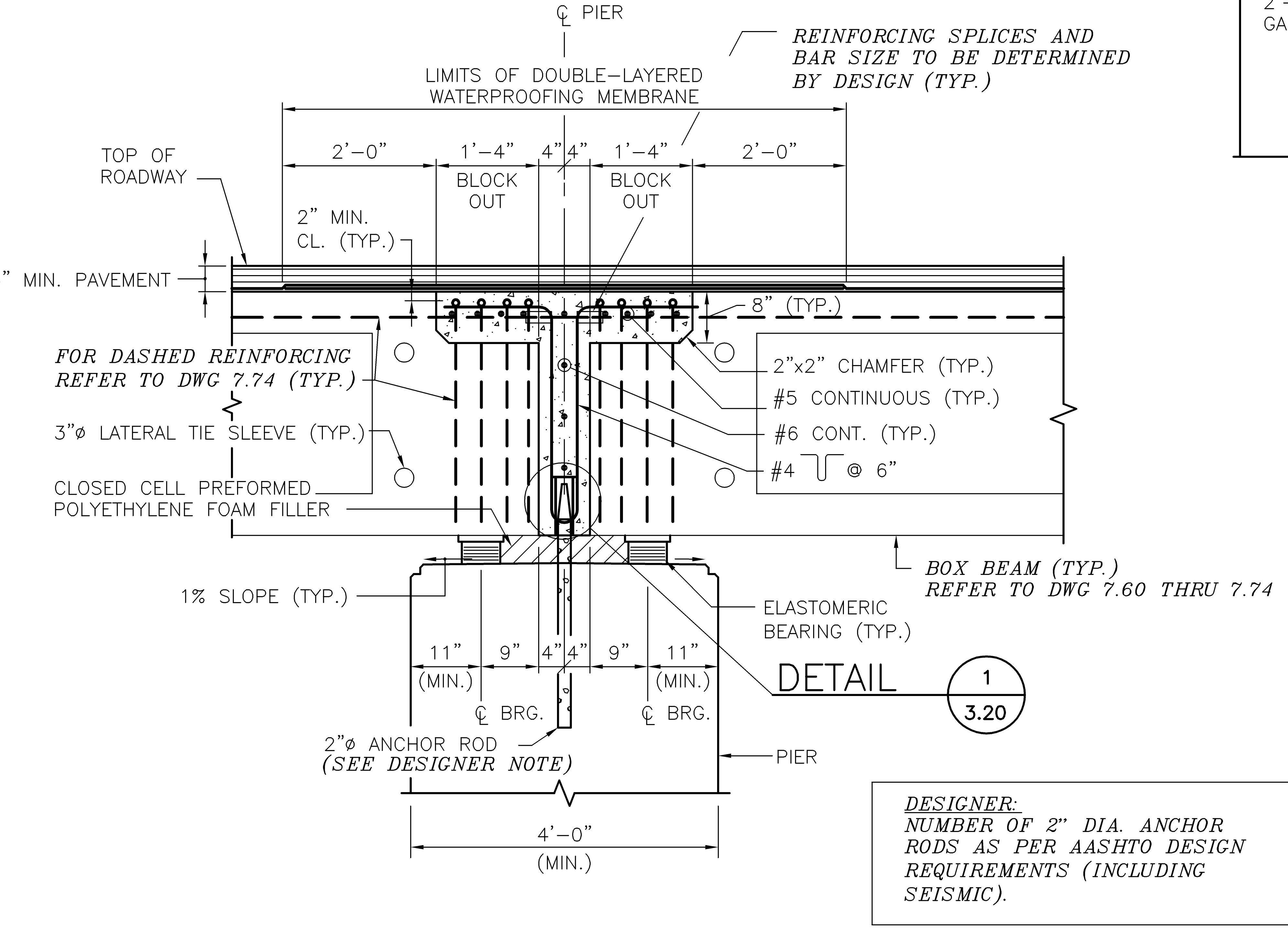
SCALE: 1 1/2"=1'–0"


℄ PIER
LIMITS OF DOUBLE–LAYERED WATERPROOFING MEMBRANE
REINFORCING SPLICES AND BAR SIZE TO BE DETERMINED BY DESIGN (TYP.)
TOP OF ROADWAY
2'–0"
1'–4"
4"
4"
1'–4"
2'–0"
BLOCK OUT
BLOCK OUT
2" MIN. CL. (TYP.)
3" MIN. PAVEMENT
8" (TYP.)
FOR DASHED REINFORCING REFER TO DWG 7.74 (TYP.)
2"x2" CHAMFER (TYP.)
#5 CONTINUOUS (TYP.)
3"ø LATERAL TIE SLEEVE (TYP.)
#6 CONT. (TYP.)
#4 ⊔ @ 6"
CLOSED CELL PREFORMED POLYETHYLENE FOAM FILLER
BOX BEAM (TYP.) REFER TO DWG 7.60 THRU 7.74
1% SLOPE (TYP.)
ELASTOMERIC BEARING (TYP.)
11"
9"
4"
4"
9"
11"
(MIN.)
(MIN.)
℄ BRG.
℄ BRG.
PIER
4'–0"
(MIN.)

TYPICAL PIER

(PRESTRESSED BUTTED BOX BEAMS AT EXPANSION PIER)

SCALE:3/4"=1'–0"


℄ PIER
LIMITS OF DOUBLE–LAYERED WATERPROOFING MEMBRANE
REINFORCING SPLICES AND BAR SIZE TO BE DETERMINED BY DESIGN (TYP.)
TOP OF ROADWAY
2'–0"
1'–4"
4"
4"
1'–4"
2'–0"
BLOCK OUT
BLOCK OUT
2" MIN. CL. (TYP.)
3" MIN. PAVEMENT
8" (TYP.)
FOR DASHED REINFORCING REFER TO DWG 7.74 (TYP.)
2"x2" CHAMFER (TYP.)
#5 CONTINUOUS (TYP.)
3"ø LATERAL TIE SLEEVE (TYP.)
#6 CONT. (TYP.)
#4 ⊔ @ 6"
CLOSED CELL PREFORMED POLYETHYLENE FOAM FILLER
BOX BEAM (TYP.) REFER TO DWG 7.60 THRU 7.74
1% SLOPE (TYP.)
ELASTOMERIC BEARING (TYP.)
11"
9"
4"
4"
9"
11"
(MIN.)
(MIN.)
DETAIL 1 3.20
℄ BRG.
℄ BRG.
2"ø ANCHOR ROD (SEE DESIGNER NOTE)
PIER
4'–0"
(MIN.)

DESIGNER:
NUMBER OF 2" DIA. ANCHOR RODS AS PER AASHTO DESIGN REQUIREMENTS (INCLUDING SEISMIC).

TYPICAL PIER

(PRESTRESSED BUTTED BOX BEAMS AT FIXED PIER)

SCALE:3/4"=1'–0"

DESIGNER NOTES:

1. *DEBONDED STRANDS SHALL BE EXTENDED BEYOND THE ENDS OF GIRDERS AND ANCHORED INTO CONTINUITY DIAPHRAGMS AS REQUIRED BY DESIGN.*
2. *REMAINDER OF REINFORCEMENT AND STRAND EXTENSIONS HAVE NOT BEEN SHOWN FOR CLARITY.*

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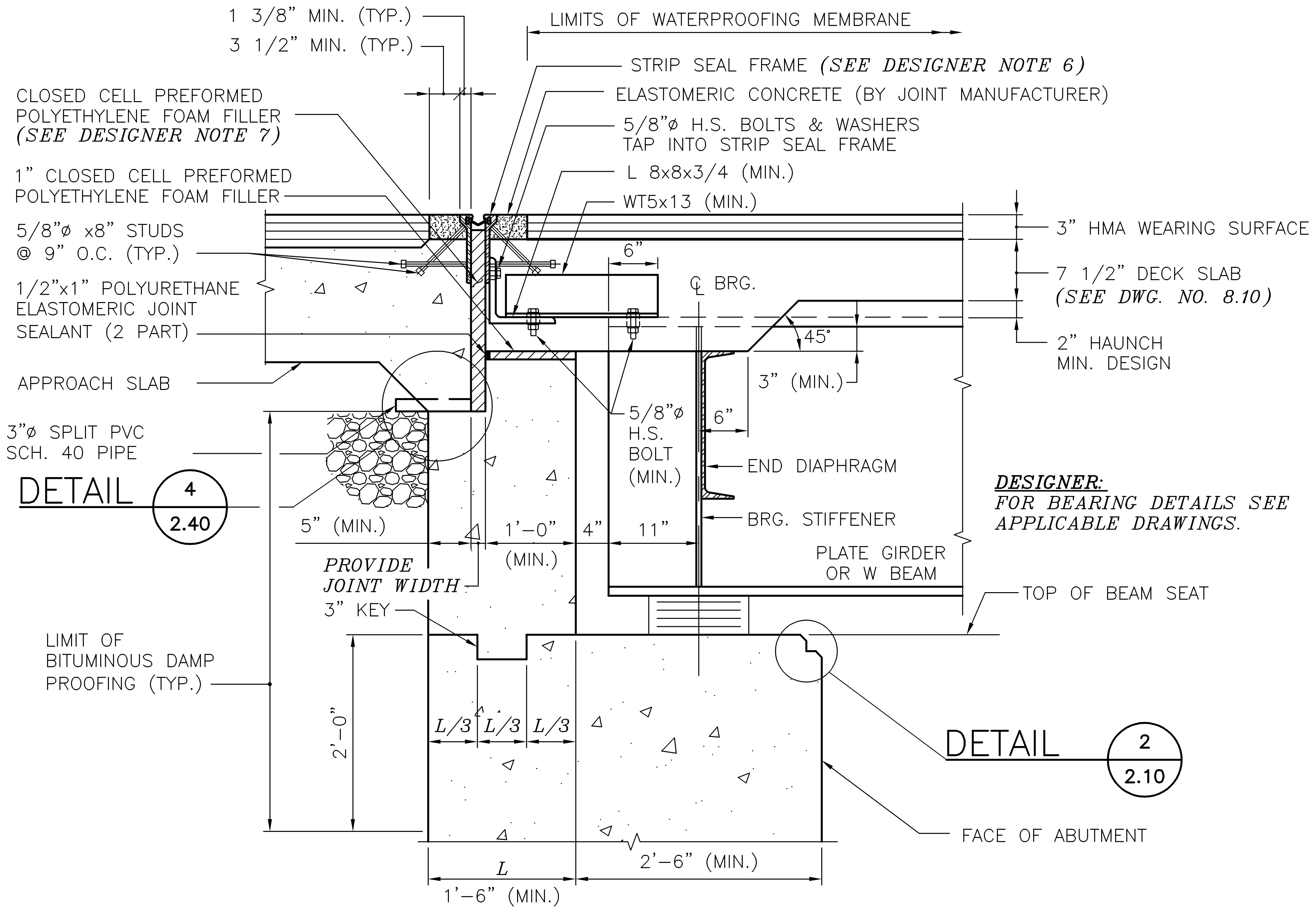
RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

BRIDGE STANDARDS

JOINTS AT PIERS

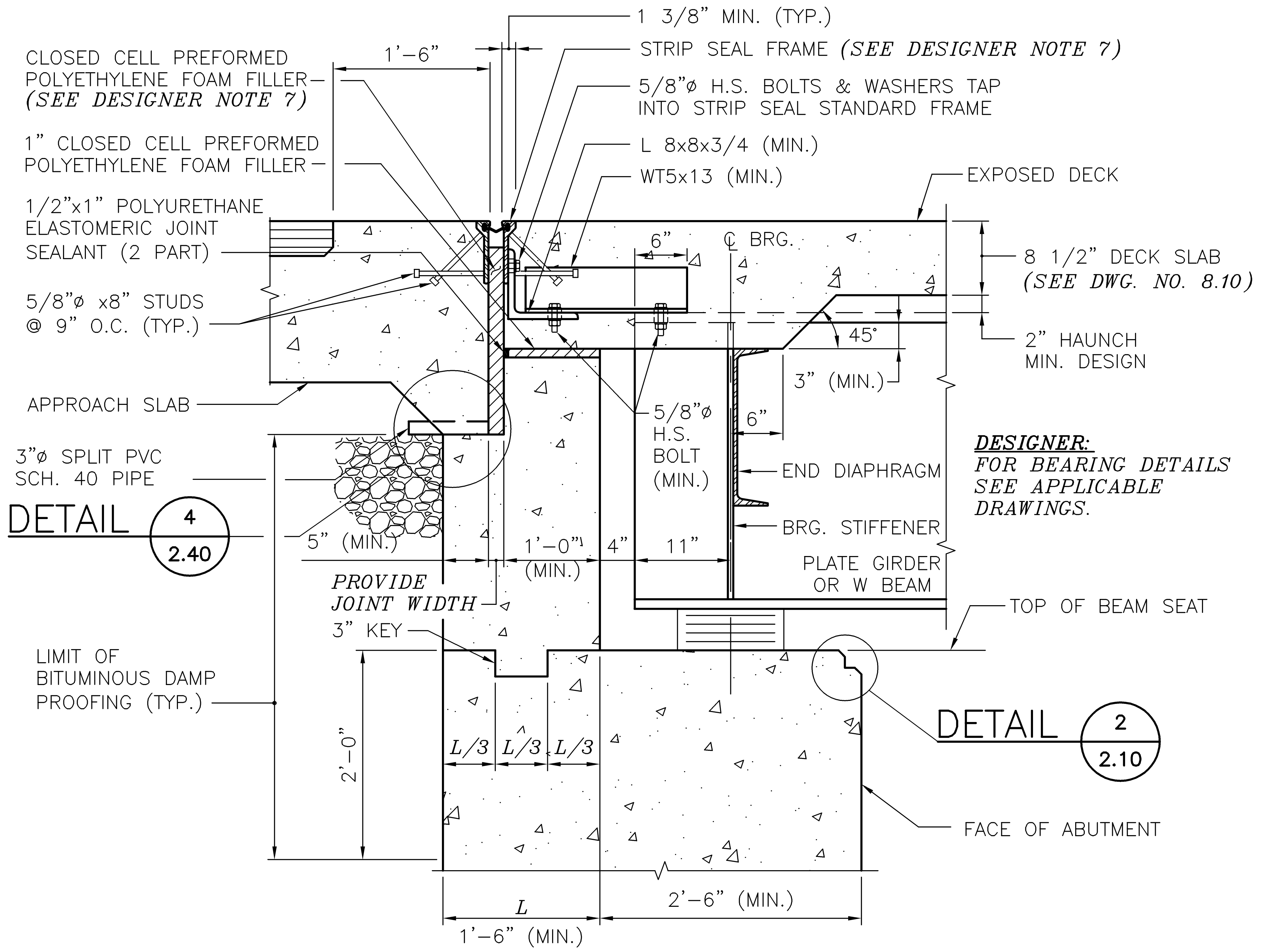
DRAWING NUMBER: 3.20


1 3/8" MIN. (TYP.)
3 1/2" MIN. (TYP.)
LIMITS OF WATERPROOFING MEMBRANE
STRIP SEAL FRAME (SEE DESIGNER NOTE 6)
ELASTOMERIC CONCRETE (BY JOINT MANUFACTURER)
CLOSED CELL PREFORMED POLYETHYLENE FOAM FILLER (SEE DESIGNER NOTE 7)
5/8"ø H.S. BOLTS & WASHERS TAP INTO STRIP SEAL FRAME
L 8x8x3/4 (MIN.)
1" CLOSED CELL PREFORMED POLYETHYLENE FOAM FILLER
WT5x13 (MIN.)
5/8"ø x8" STUDS @ 9" O.C. (TYP.)
6"
3" HMA WEARING SURFACE
7 1/2" DECK SLAB (SEE DWG. NO. 8.10)
1/2"x1" POLYURETHANE ELASTOMERIC JOINT SEALANT (2 PART)
℄ BRG.
45°
2" HAUNCH MIN. DESIGN
APPROACH SLAB
3" (MIN.)
3"ø SPLIT PVC SCH. 40 PIPE
5/8"ø H.S. BOLT (MIN.)
6"
END DIAPHRAGM
DETAIL 4 2.40
BRG. STIFFENER
5" (MIN.)
1'-0" (MIN.)
4"
11"
PROVIDE JOINT WIDTH
PLATE GIRDER OR W BEAM
3" KEY
TOP OF BEAM SEAT
LIMIT OF BITUMINOUS DAMP PROOFING (TYP.)
L/3 L/3 L/3
2'-0"
DETAIL 2 2.10
FACE OF ABUTMENT
L
2'-6" (MIN.)
1'-6" (MIN.)

DESIGNER:
FOR BEARING DETAILS SEE APPLICABLE DRAWINGS.

SECTION AT ABUTMENT – STEEL BEAM
STRIP SEAL WITH HMA WEARING SURFACE

SCALE:1"=1'-0"


1 3/8" MIN. (TYP.)
1'-6"
STRIP SEAL FRAME (SEE DESIGNER NOTE 7)
CLOSED CELL PREFORMED POLYETHYLENE FOAM FILLER (SEE DESIGNER NOTE 7)
5/8"ø H.S. BOLTS & WASHERS TAP INTO STRIP SEAL STANDARD FRAME
1" CLOSED CELL PREFORMED POLYETHYLENE FOAM FILLER
L 8x8x3/4 (MIN.)
WT5x13 (MIN.)
EXPOSED DECK
1/2"x1" POLYURETHANE ELASTOMERIC JOINT SEALANT (2 PART)
6"
℄ BRG.
8 1/2" DECK SLAB (SEE DWG. NO. 8.10)
5/8"ø x8" STUDS @ 9" O.C. (TYP.)
45°
2" HAUNCH MIN. DESIGN
3" (MIN.)
APPROACH SLAB
5/8"ø H.S. BOLT (MIN.)
6"
3"ø SPLIT PVC SCH. 40 PIPE
END DIAPHRAGM
DETAIL 4 2.40
BRG. STIFFENER
5" (MIN.)
1'-0" (MIN.)
4"
11"
PLATE GIRDER OR W BEAM
PROVIDE JOINT WIDTH
TOP OF BEAM SEAT
3" KEY
LIMIT OF BITUMINOUS DAMP PROOFING (TYP.)
DETAIL 2 2.10
L/3 L/3 L/3
2'-0"
FACE OF ABUTMENT
L
2'-6" (MIN.)
1'-6" (MIN.)

DESIGNER:
FOR BEARING DETAILS SEE APPLICABLE DRAWINGS.

SECTION AT ABUTMENT – STEEL BEAM
STRIP SEAL WITH EXPOSED CONCRETE WEARING SURFACE

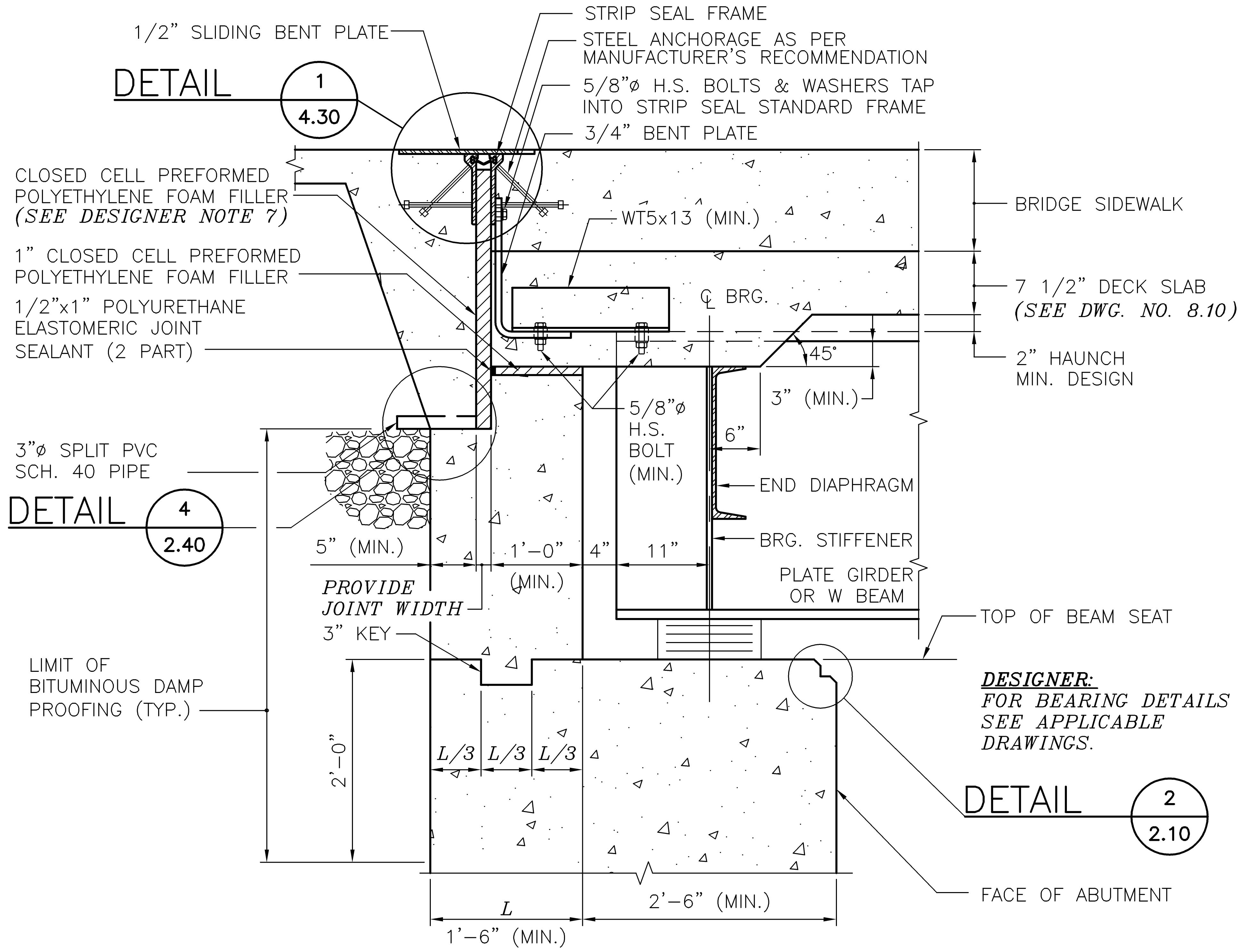
SCALE:1"=1'-0"

DESIGNER NOTES:

1. *THE REQUIRED TOTAL MOVEMENT CAPACITY SHALL BE PROVIDED ON THE CONTRACT DRAWINGS.*
2. *A TABLE OF JOINT OPENING (W) SHALL BE PROVIDED ON THE CONTRACT DRAWINGS. JOINT OPENING FOR THE TEMPERATURES OF 15, 30, 45, 60, 75, 90 AND 105 DEGREES F. SHALL BE FURNISHED.*
3. *THE NOTES SHOWN BELOW SHALL BE FURNISHED ON THE CONTRACT DRAWINGS WHERE APPLICABLE.*
4. *THESE DETAILS ARE INTENDED FOR TOTAL ANTICIPATED JOINT MOVEMENTS UP TO 2".*
5. *FOR DETAILS AT SIDEWALK & BARRIER SEE DWG. 4.30.*
6. *THE PORTION OF THE STRIP SEAL FRAME ASSEMBLY IN THE APPROACH SLAB SHALL BE SUPPORTED DURING INSTALLATION.*
7. *THE THICKNESS OF THE JOINT FILLER MATERIAL SHALL MATCH THE JOINT WIDTH OPENING AT 60°F.*
8. *FOR LARGE JOINT MOVEMENTS, THE DESIGNER SHALL DETAIL A MODULAR EXPANSION JOINT SYSTEM.*

NOTES:

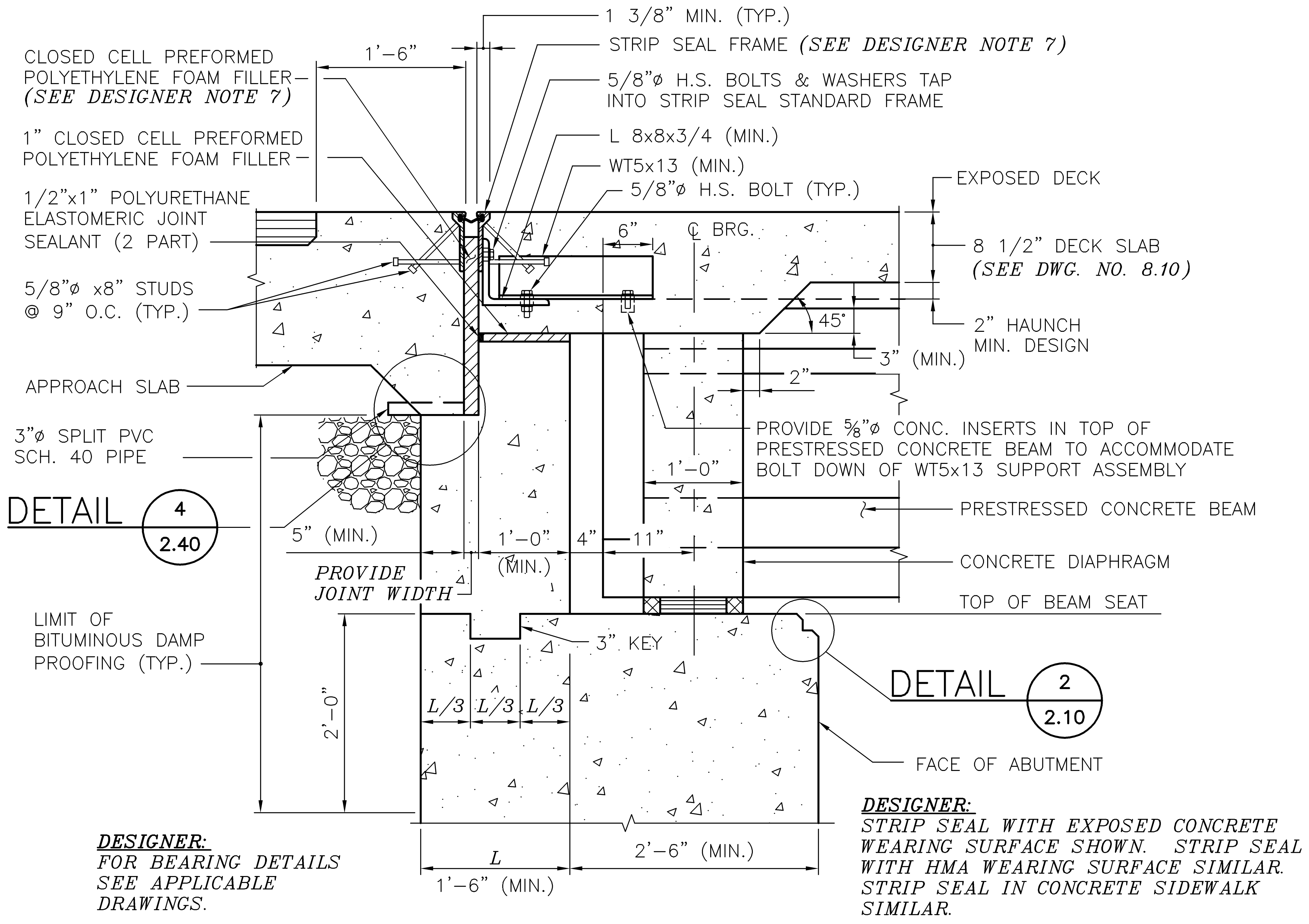
1. INSTALL CONTINUOUS NEOPRENE STRIP SEAL IN FIELD. FIELD SPLICING OF STRIP SEAL IS NOT PERMITTED.
2. THE ENTIRE EXPANSION STRIP SEAL FRAME SHALL BE ASSEMBLED, ERECTED AND SET TO GRADE PRIOR TO PLACING THE DECK *(OR ELASTOMERIC)* CONCRETE. THE EXPANSION DAM SHALL BE CONSTRUCTED TO FOLLOW THE ROADWAY GRADE AND CROSS SLOPE.
3. STRIP SEAL FRAME SHALL BE AASHTO DESIGNATION M 270 GRADE 36. THE STUDS SHALL BE ASTM DESIGNATION A 108, AND SHALL BE WELDED BY THE PRESSURE PROCESS.
4. A COAT OF ASPHALT CEMENT PAINT SHALL BE APPLIED TO STEEL SURFACES SLIDING ON THE CONCRETE.
5. ALL MATERIALS SHALL BE GALVANIZED OR METALIZED.
6. THESE DRAWINGS ARE TO BE USED AS A GUIDE IN THE PREPARATION OF THE SHOP DRAWINGS.
7. THE NEOPRENE STRIP SEAL SHALL BE BONDED TO THE SEAL FRAME WITH AN APPROVED ADHESIVE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
8. THE TRANSVERSE BUTT WELDS FOR SPLICING OF THE STEEL FRAME SHALL BE PARTIAL PENETRATION DOUBLE V-GROOVE WELDS ON PREPARED BEVELED EDGES EXTENDING ALL AROUND THE JOINT AS FAR AS PRACTICAL TO ACHIEVE A WATERTIGHT SEAL. THE INSIDE OF THE SEAL CAVITY SHALL NOT BE WELDED. WHERE A TRANSVERSE JOINT OCCURS, TWO ADDITIONAL STUDS MUST BE ADDED ON EACH SIDE OF THE JOINT.
9. THE MOVEMENT CLASSIFICATION OF THE JOINT SHALL NOT BE LESS THAN THE CLASSIFICATION SPECIFIED ON THE DRAWINGS.
10. PLACE CURBS AND SIDEWALKS WITH STEEL SLIDING PLATES, WITH INSERTS AND BOLTS IN PLACE TO INSURE ALIGNMENT OF INSERTS WITH HOLES IN THE STEEL SLIDING PLATES. REMOVE PLATES TO INSTALL SEAL. APPLY BOND BREAKER TO SLIDING PLATES PRIOR TO INSTALLATION.
11. THE SEALS FURNISHED WITH THE STRIP SEAL FRAME MUST BE COMPATIBLE WITH THE STEEL FRAME AND MUST PROVIDE A WATERTIGHT JOINT.


STRIP SEAL FRAME
1/2" SLIDING BENT PLATE
STEEL ANCHORAGE AS PER MANUFACTURER'S RECOMMENDATION
DETAIL 1 4.30
5/8"ø H.S. BOLTS & WASHERS TAP INTO STRIP SEAL STANDARD FRAME
3/4" BENT PLATE
CLOSED CELL PREFORMED POLYETHYLENE FOAM FILLER (SEE DESIGNER NOTE 7)
BRIDGE SIDEWALK
WT5x13 (MIN.)
1" CLOSED CELL PREFORMED POLYETHYLENE FOAM FILLER
7 1/2" DECK SLAB (SEE DWG. NO. 8.10)
1/2"x1" POLYURETHANE ELASTOMERIC JOINT SEALANT (2 PART)
℄ BRG.
45°
2" HAUNCH MIN. DESIGN
3" (MIN.)
5/8"ø H.S. BOLT (MIN.)
6"
3"ø SPLIT PVC SCH. 40 PIPE
END DIAPHRAGM
DETAIL 4 2.40
BRG. STIFFENER
5" (MIN.)
1'-0" (MIN.)
4"
11"
PLATE GIRDER OR W BEAM
PROVIDE JOINT WIDTH
TOP OF BEAM SEAT
3" KEY
LIMIT OF BITUMINOUS DAMP PROOFING (TYP.)
L/3 L/3 L/3
2'-0"
DETAIL 2 2.10
FACE OF ABUTMENT
L
2'-6" (MIN.)
1'-6" (MIN.)

DESIGNER:
FOR BEARING DETAILS SEE APPLICABLE DRAWINGS.

SECTION AT ABUTMENT – STEEL BEAM
STRIP SEAL IN CONCRETE SIDEWALK

SCALE:1"=1'-0"


1 3/8" MIN. (TYP.)
1'-6"
STRIP SEAL FRAME (SEE DESIGNER NOTE 7)
CLOSED CELL PREFORMED POLYETHYLENE FOAM FILLER (SEE DESIGNER NOTE 7)
5/8"ø H.S. BOLTS & WASHERS TAP INTO STRIP SEAL STANDARD FRAME
1" CLOSED CELL PREFORMED POLYETHYLENE FOAM FILLER
L 8x8x3/4 (MIN.)
WT5x13 (MIN.)
5/8"ø H.S. BOLT (TYP.)
1/2"x1" POLYURETHANE ELASTOMERIC JOINT SEALANT (2 PART)
EXPOSED DECK
6"
℄ BRG.
8 1/2" DECK SLAB (SEE DWG. NO. 8.10)
5/8"ø x8" STUDS @ 9" O.C. (TYP.)
45°
2" HAUNCH MIN. DESIGN
3" (MIN.)
APPROACH SLAB
2"
3"ø SPLIT PVC SCH. 40 PIPE
PROVIDE ⅝"ø CONC. INSERTS IN TOP OF PRESTRESSED CONCRETE BEAM TO ACCOMMODATE BOLT DOWN OF WT5x13 SUPPORT ASSEMBLY
1'-0"
DETAIL 4 2.40
PRESTRESSED CONCRETE BEAM
5" (MIN.)
1'-0" (MIN.)
4"
11"
CONCRETE DIAPHRAGM
PROVIDE JOINT WIDTH
TOP OF BEAM SEAT
3" KEY
LIMIT OF BITUMINOUS DAMP PROOFING (TYP.)
DETAIL 2 2.10
L/3 L/3 L/3
2'-0"
FACE OF ABUTMENT
L
2'-6" (MIN.)
1'-6" (MIN.)

DESIGNER:
STRIP SEAL WITH EXPOSED CONCRETE WEARING SURFACE SHOWN. STRIP SEAL WITH HMA WEARING SURFACE SIMILAR. STRIP SEAL IN CONCRETE SIDEWALK SIMILAR.

DESIGNER:
FOR BEARING DETAILS SEE APPLICABLE DRAWINGS.

SECTION AT ABUTMENT – PRESTRESSED CONCRETE BEAM
STRIP SEAL WITH EXPOSED CONCRETE WEARING SURFACE

SCALE:1"=1'-0"

REVISIONS	
No.	DATE

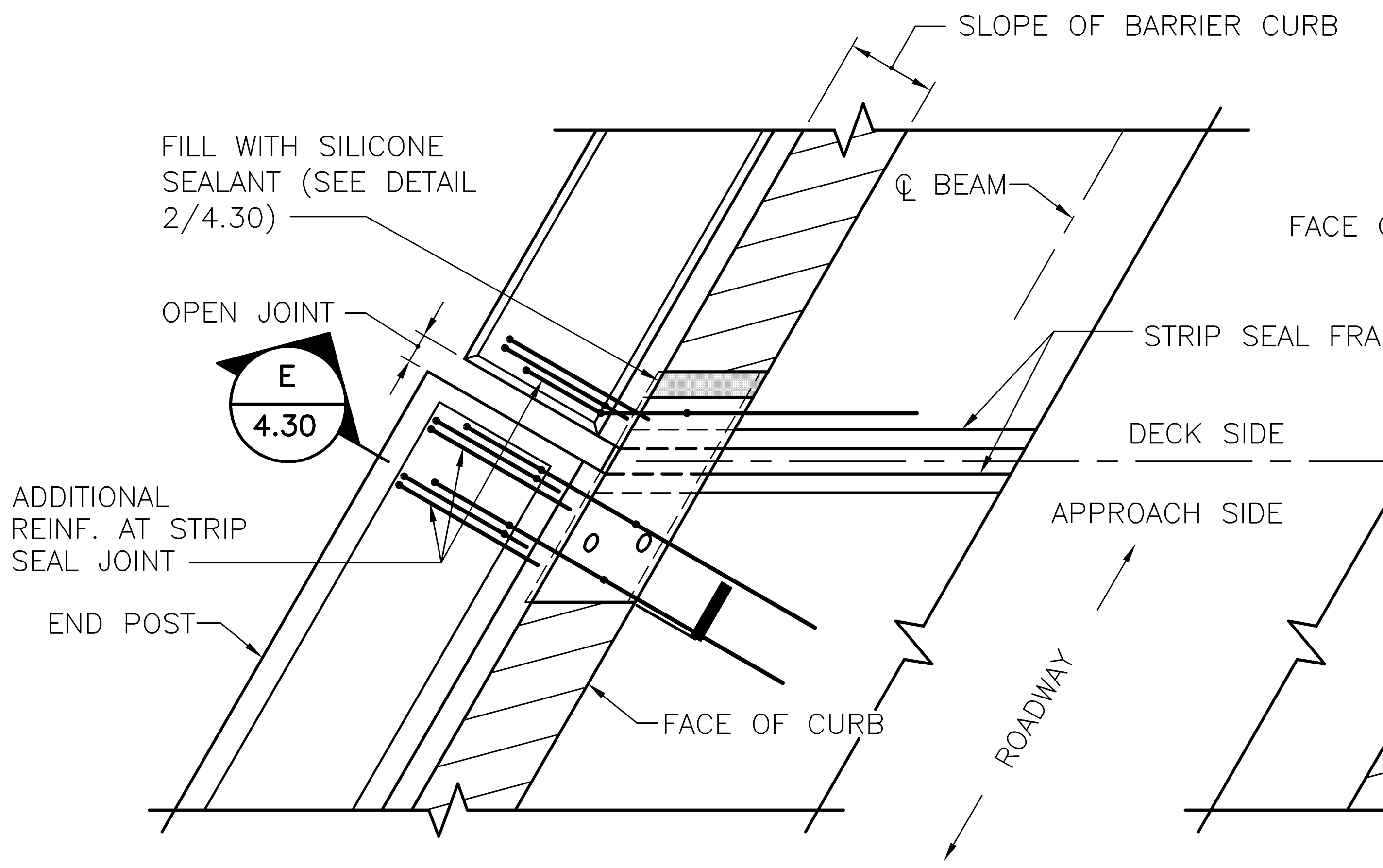
RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

BRIDGE STANDARDS

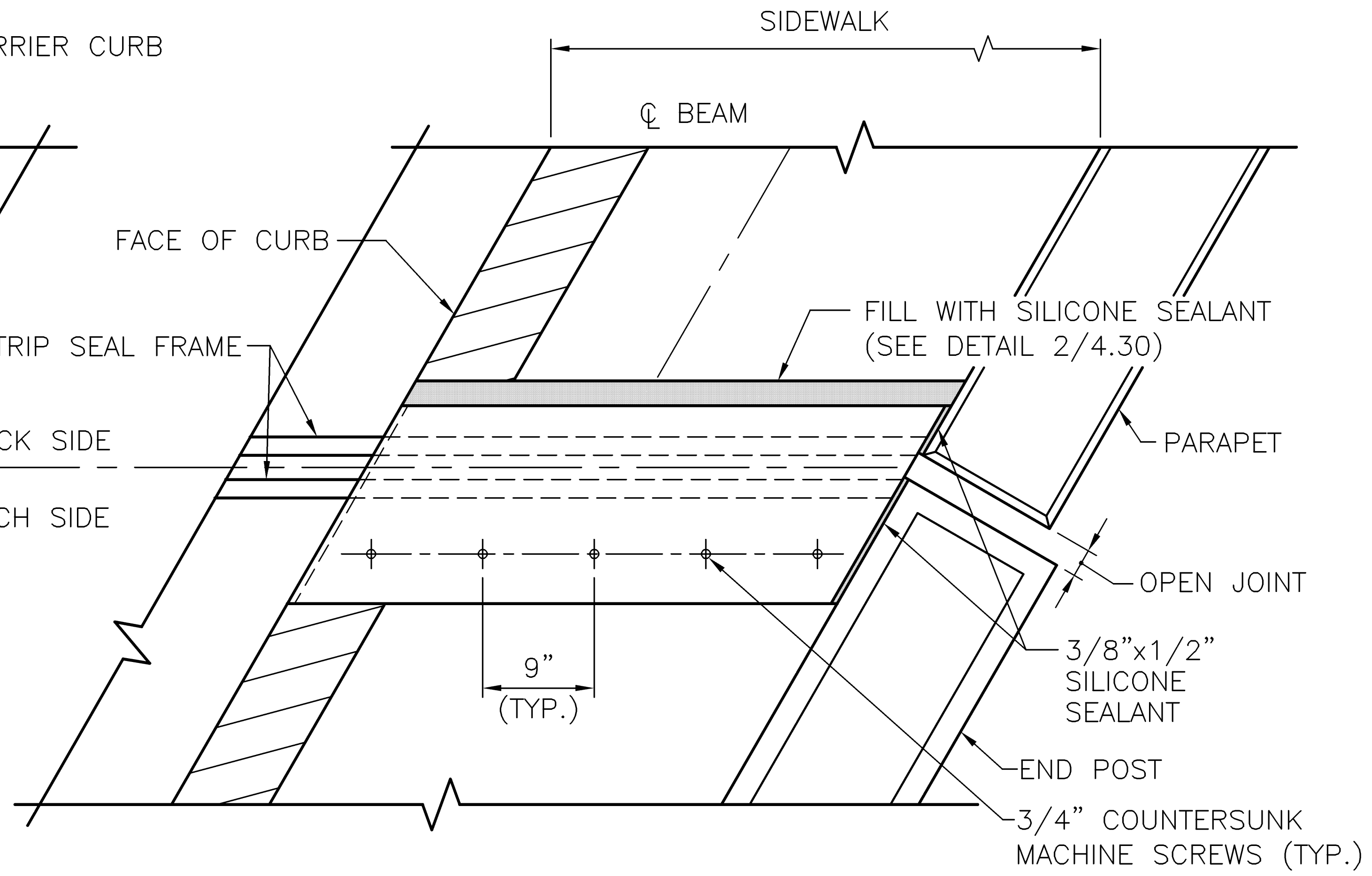
STRIP SEAL EXPANSION JOINTS
SHEET 1

DRAWING NUMBER: 4.20

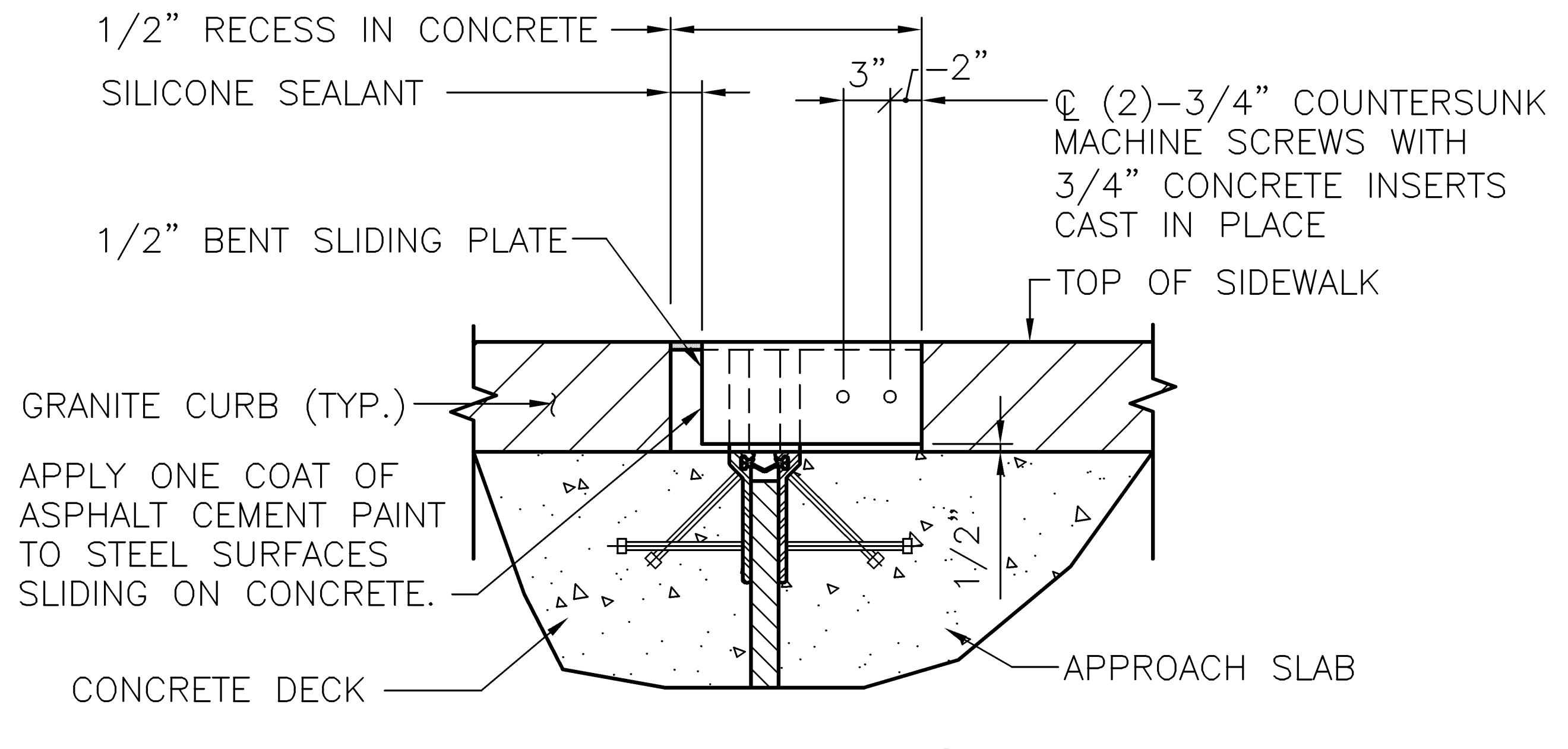
P:\10000\10027.00 On-Call Bridge Design\10027.20 Bridge Design Std Details_Drawings\Structural_Current_Drawings\Ris4-20.dwg, 7/22/2015 1:25:07 PM, JTA



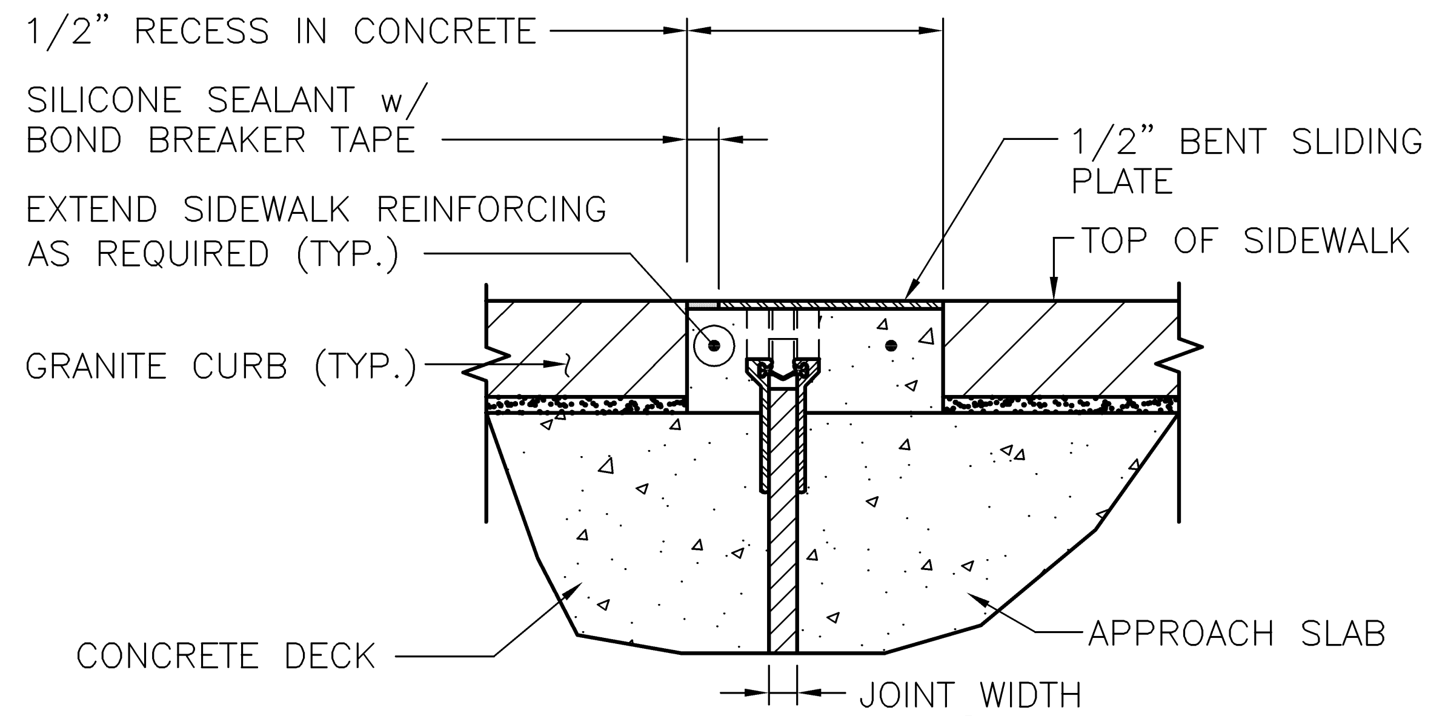
PLAN AT BARRIER


SIDEWALK
℄ BEAM
FACE OF CURB
FILL WITH SILICONE SEALANT (SEE DETAIL 2/4.30)
PARAPET
OPEN JOINT
9" (TYP.)
3/8"x1/2" SILICONE SEALANT
END POST
3/4" COUNTERSUNK MACHINE SCREWS (TYP.)

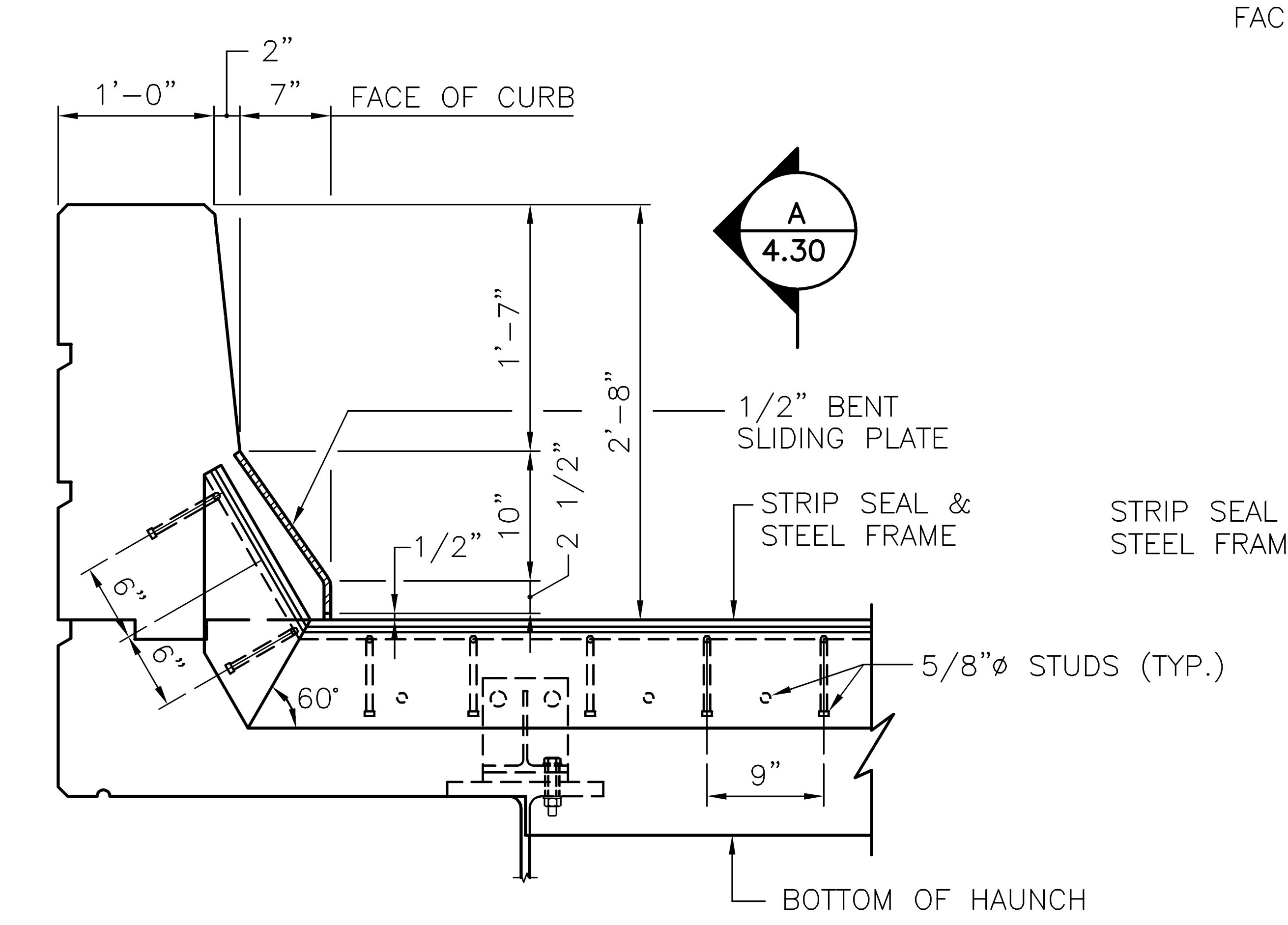
PLAN AT SIDEWALK


1/2" RECESS IN CONCRETE
SILICONE SEALANT
3"
2"
℄ (2)-3/4" COUNTERSUNK MACHINE SCREWS WITH 3/4" CONCRETE INSERTS CAST IN PLACE
1/2" BENT SLIDING PLATE
TOP OF SIDEWALK
GRANITE CURB (TYP.)
APPLY ONE COAT OF ASPHALT CEMENT PAINT TO STEEL SURFACES SLIDING ON CONCRETE.
1/2"
CONCRETE DECK
APPROACH SLAB

SECTION B 4.30

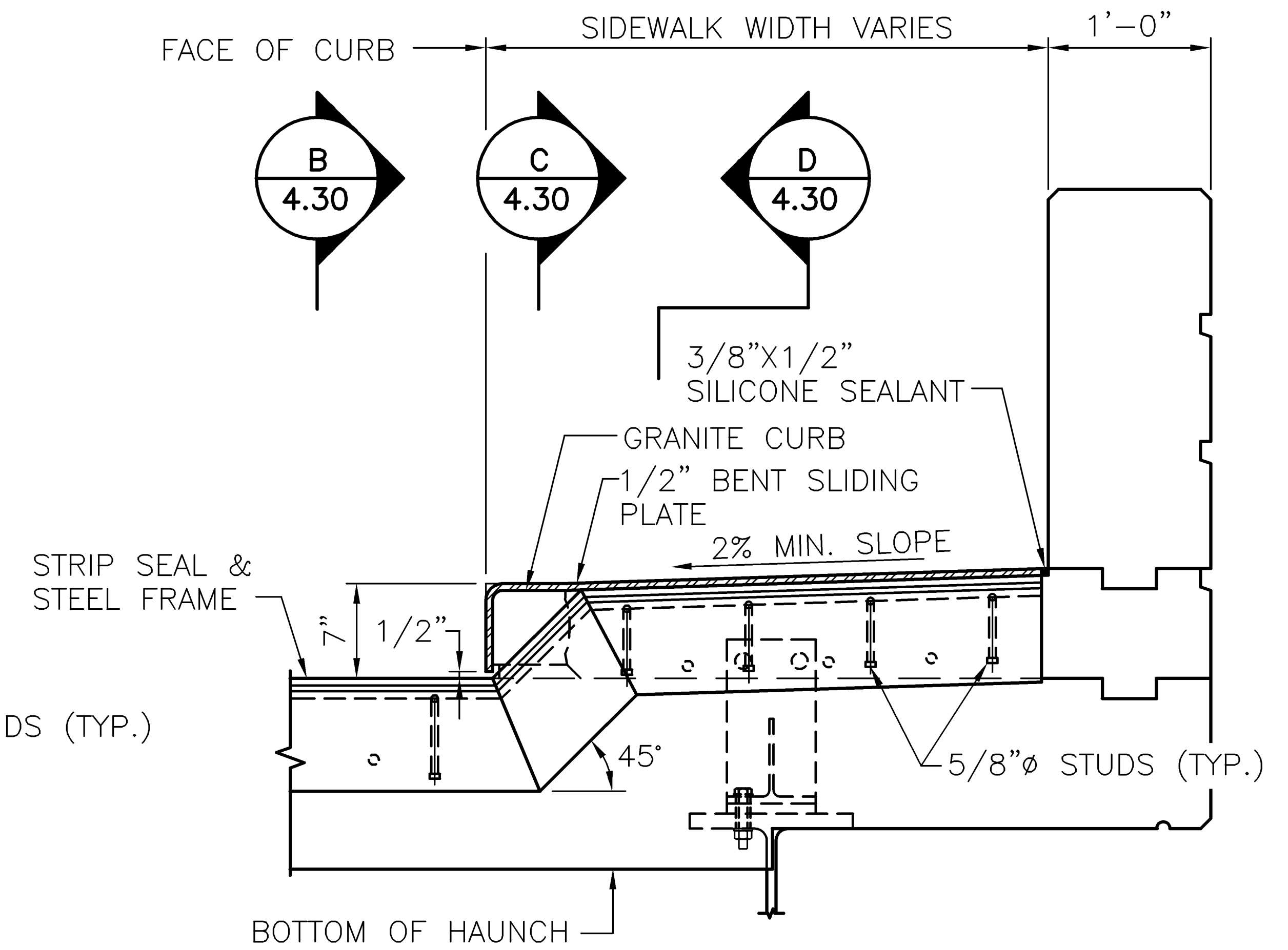


SECTION C 4.30



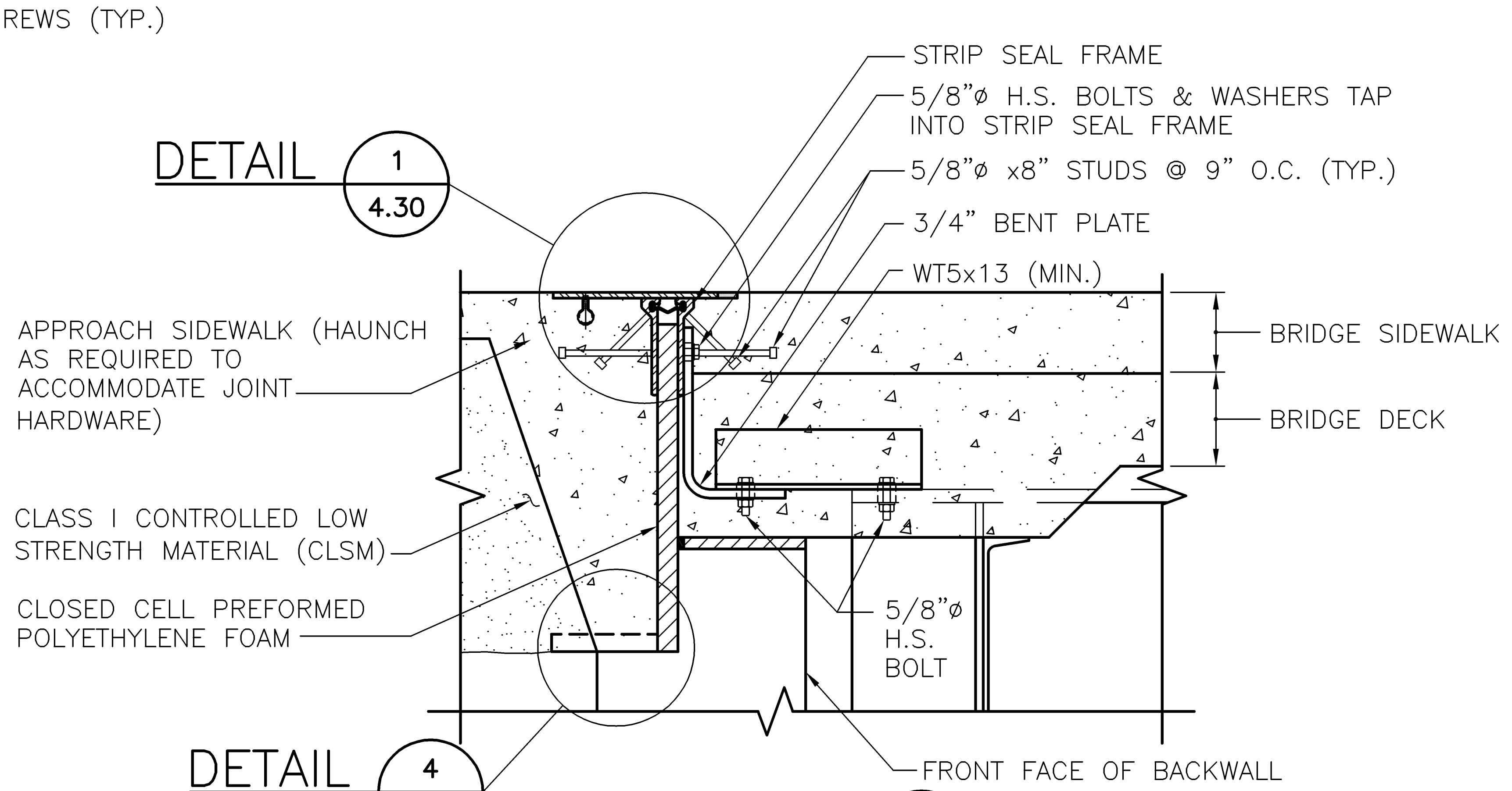
SECTION AT BARRIER

(SUPERSTRUCTURE)



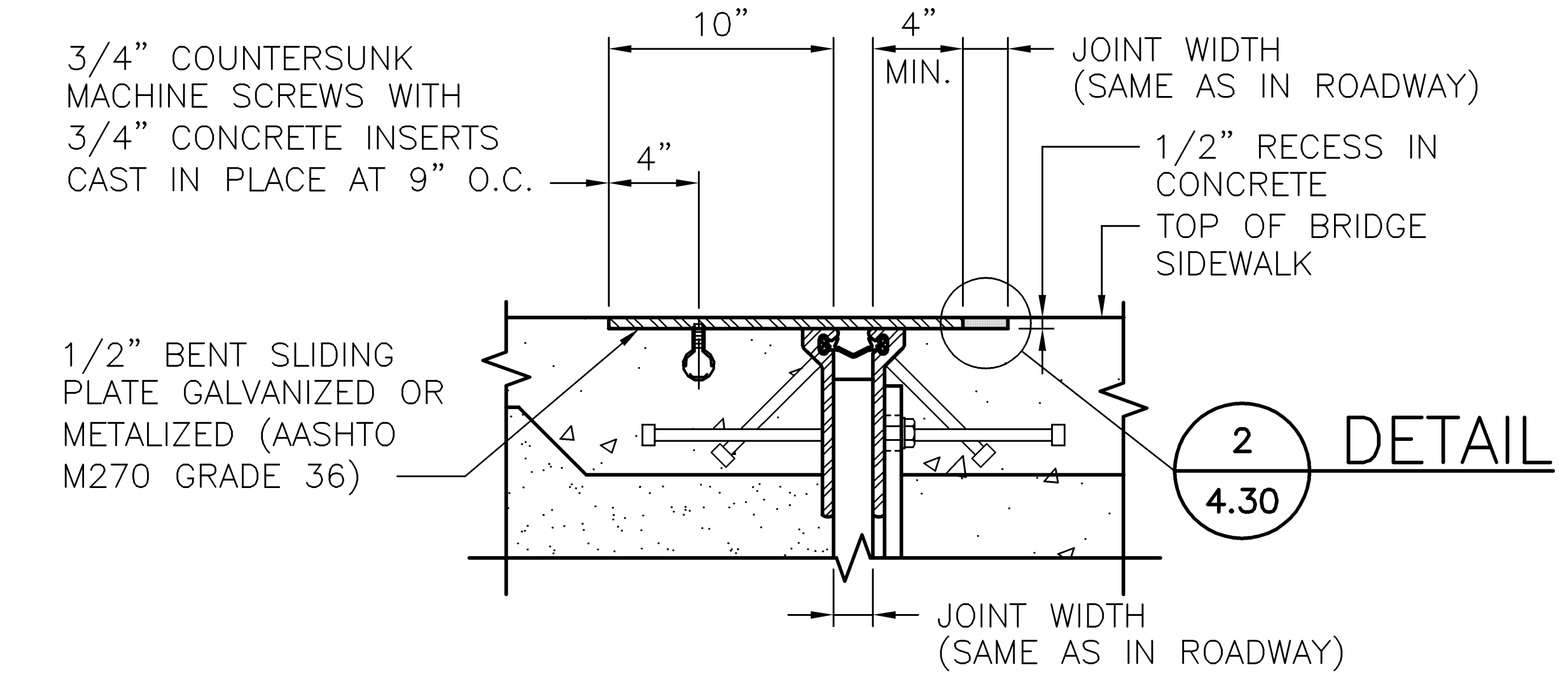
SECTION AT SIDEWALK

(SUPERSTRUCTURE)


DETAIL 1 4.30
STRIP SEAL FRAME
5/8"ø H.S. BOLTS & WASHERS TAP INTO STRIP SEAL FRAME
5/8"ø x8" STUDS @ 9" O.C. (TYP.)
3/4" BENT PLATE
WT5x13 (MIN.)
BRIDGE SIDEWALK
BRIDGE DECK
APPROACH SIDEWALK (HAUNCH AS REQUIRED TO ACCOMMODATE JOINT HARDWARE)
CLASS I CONTROLLED LOW STRENGTH MATERIAL (CLSM)
CLOSED CELL PREFORMED POLYETHYLENE FOAM
5/8"ø H.S. BOLT
DETAIL 4 2.40
FRONT FACE OF BACKWALL

SECTION D 4.30

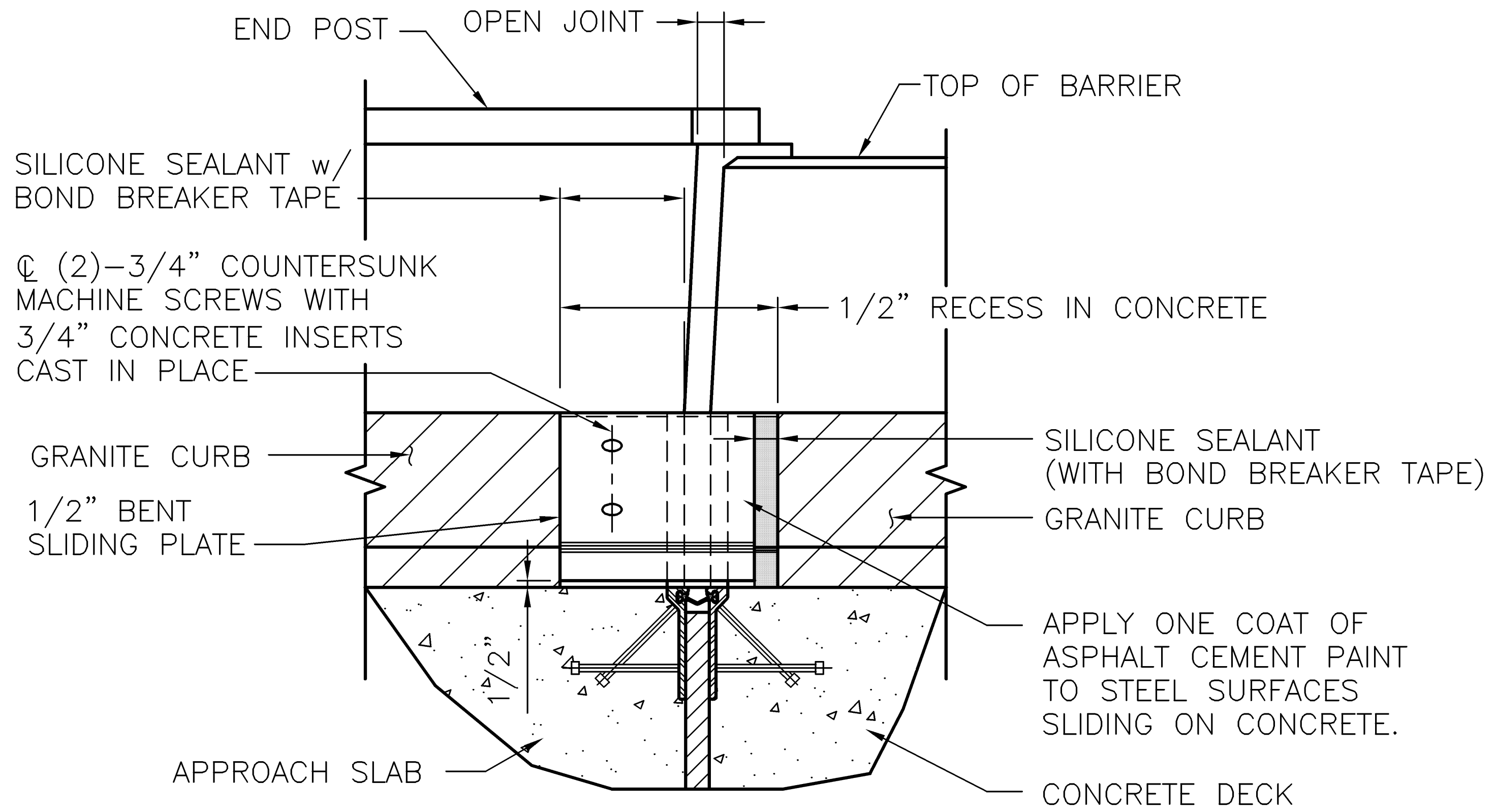
NOT TO SCALE


3/4" COUNTERSUNK MACHINE SCREWS WITH 3/4" CONCRETE INSERTS CAST IN PLACE AT 9" O.C.
10"
4"
4" MIN.
JOINT WIDTH (SAME AS IN ROADWAY)
1/2" RECESS IN CONCRETE
TOP OF BRIDGE SIDEWALK
1/2" BENT SLIDING PLATE GALVANIZED OR METALIZED (AASHTO M270 GRADE 36)
2 4.30 DETAIL
JOINT WIDTH (SAME AS IN ROADWAY)

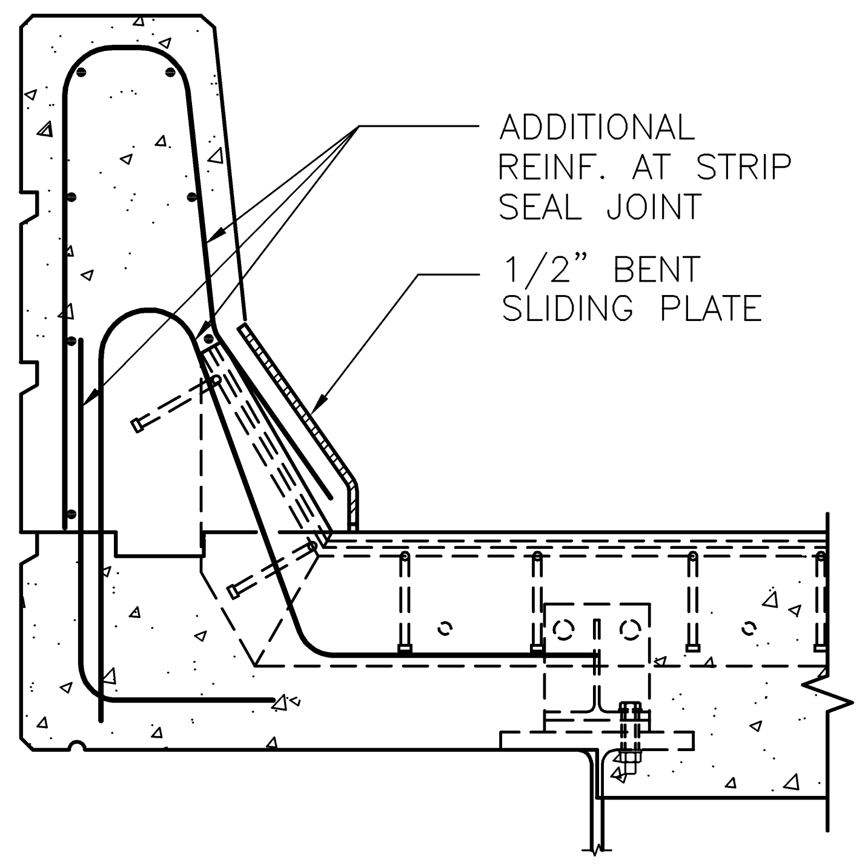
DETAIL 1 4.30

DESIGNER NOTES:

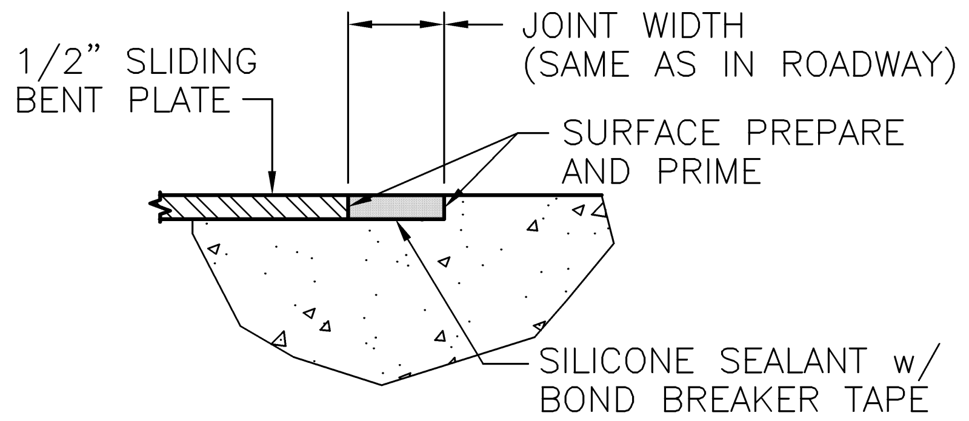
1. *THE DETAILS SHOWN ON THIS SHEET APPLY TO STRIP SEAL EXPANSION JOINT WITH EXPOSED CONCRETE DECK.*
2. *FOR APPLICABLE NOTES REFER TO DRAWING 4.20.*


END POST
OPEN JOINT
TOP OF BARRIER
SILICONE SEALANT w/ BOND BREAKER TAPE
℄ (2)-3/4" COUNTERSUNK MACHINE SCREWS WITH 3/4" CONCRETE INSERTS CAST IN PLACE
1/2" RECESS IN CONCRETE
GRANITE CURB
1/2" BENT SLIDING PLATE
SILICONE SEALANT (WITH BOND BREAKER TAPE)
GRANITE CURB
APPLY ONE COAT OF ASPHALT CEMENT PAINT TO STEEL SURFACES SLIDING ON CONCRETE.
1/2"
APPROACH SLAB
CONCRETE DECK

SECTION A 4.30



SECTION E 4.30


1/2" SLIDING BENT PLATE
JOINT WIDTH (SAME AS IN ROADWAY)
SURFACE PREPARE AND PRIME
SILICONE SEALANT w/ BOND BREAKER TAPE

DETAIL 2 4.30

THIS SHEET IS NOT TO SCALE

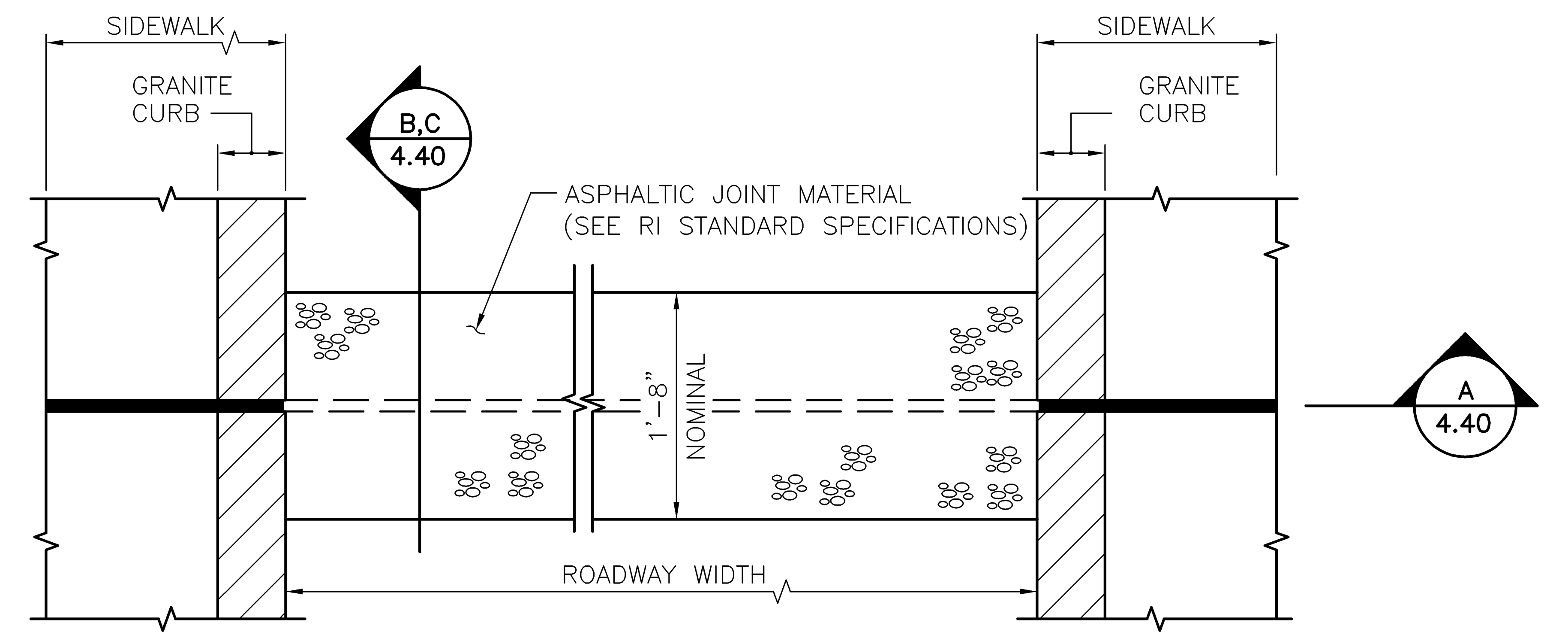
REVISIONS	
No.	DATE

RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

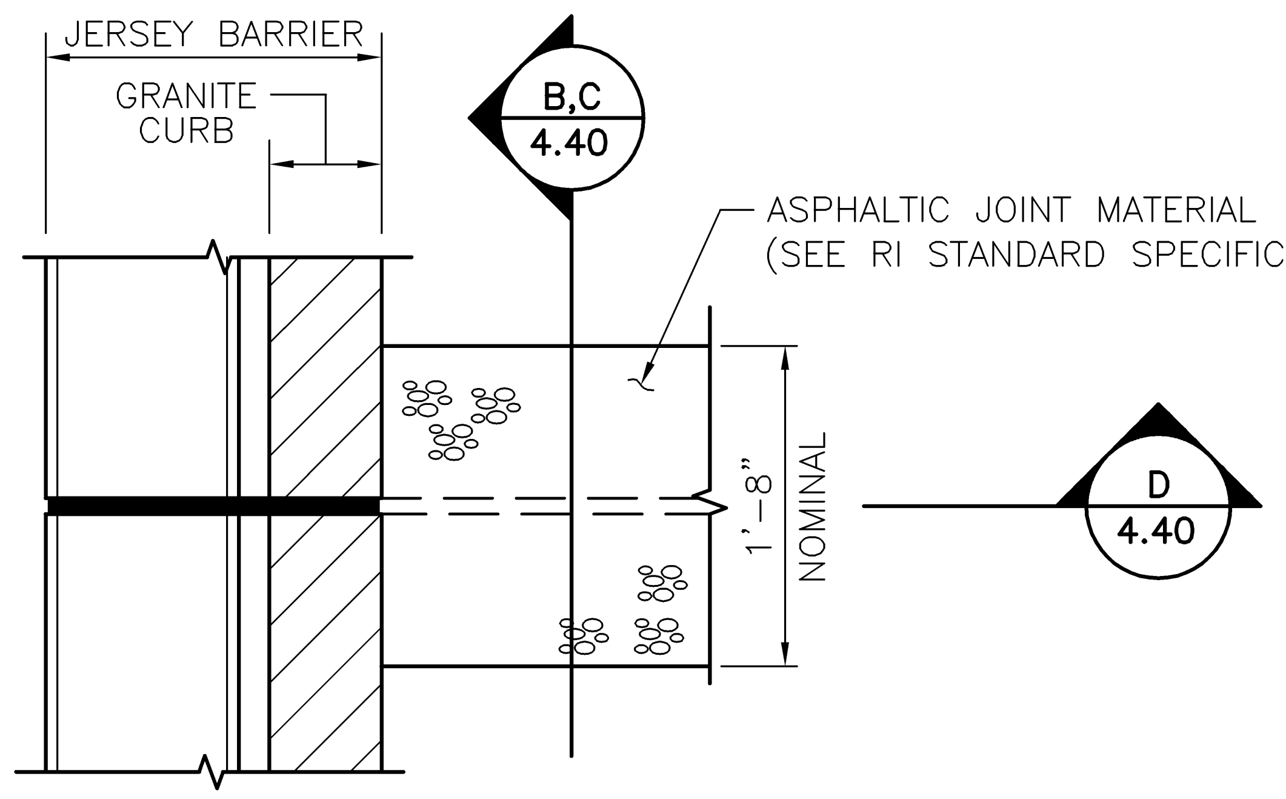
BRIDGE STANDARDS

STRIP SEAL EXPANSION JOINTS
SHEET 2

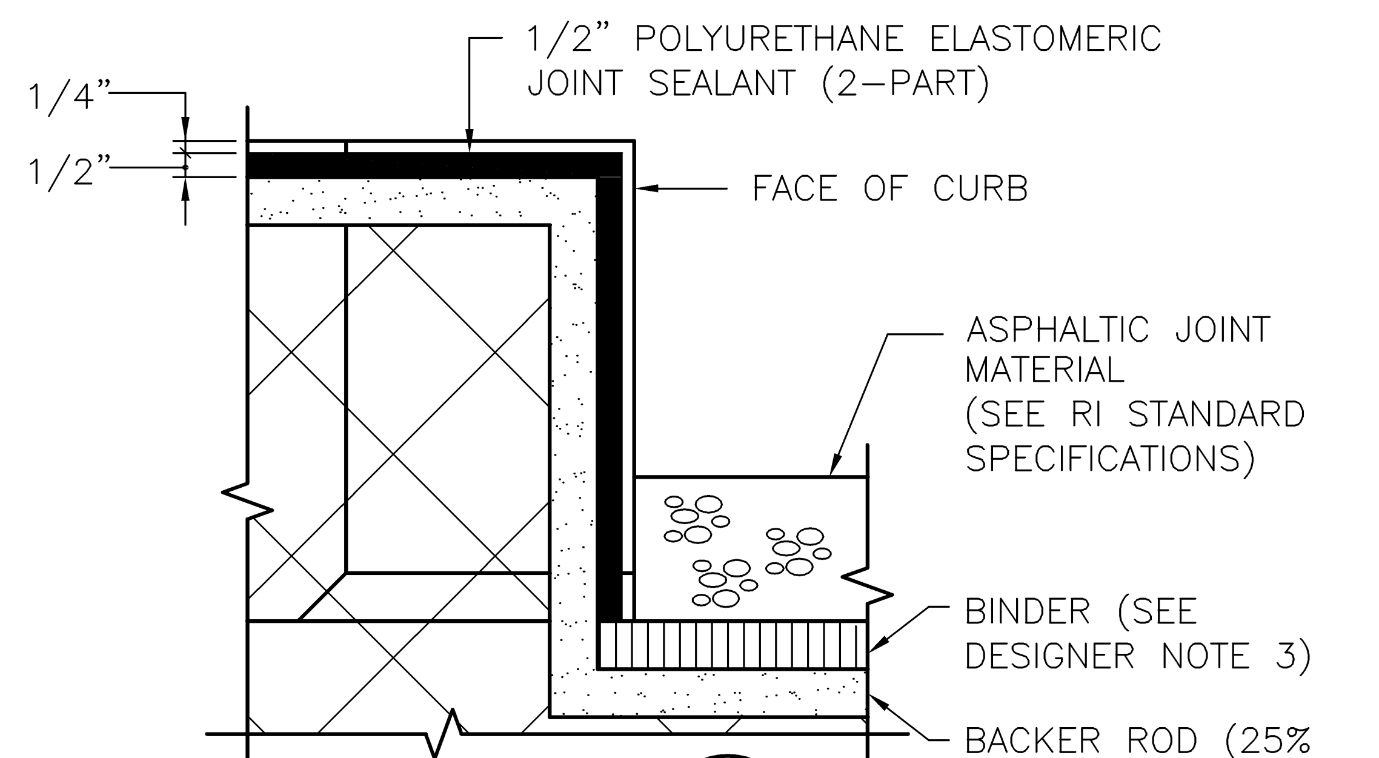
DRAWING NUMBER: 4.30



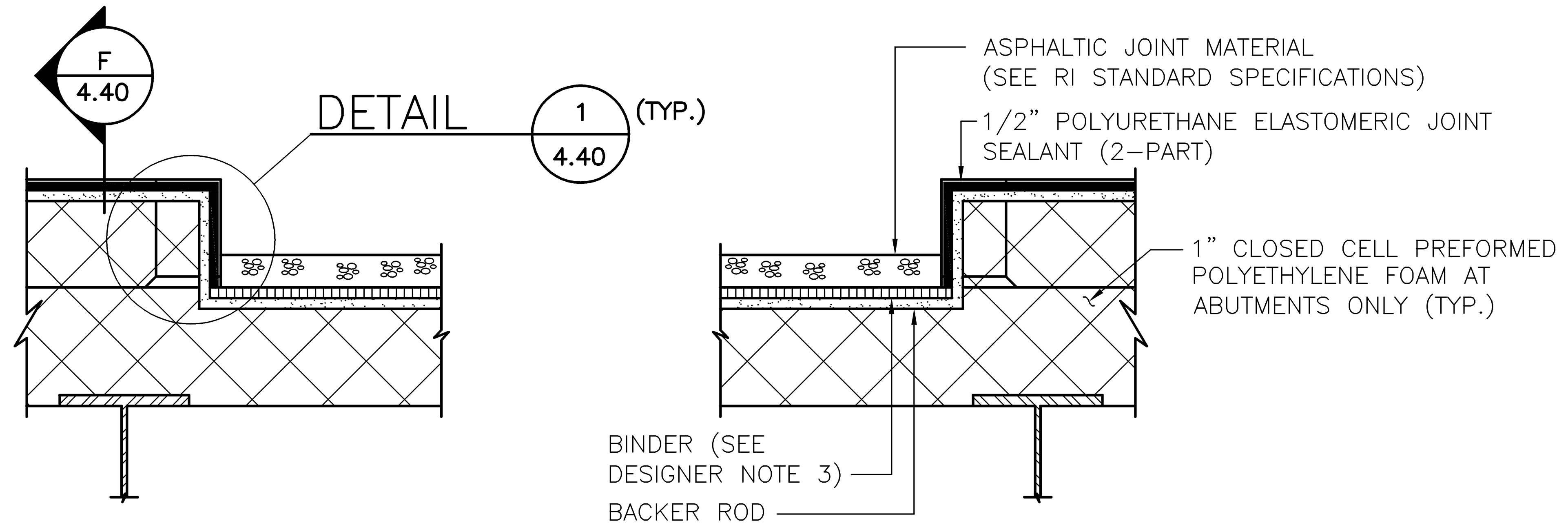
PLAN AT ROADWAY WITH SIDEWALKS



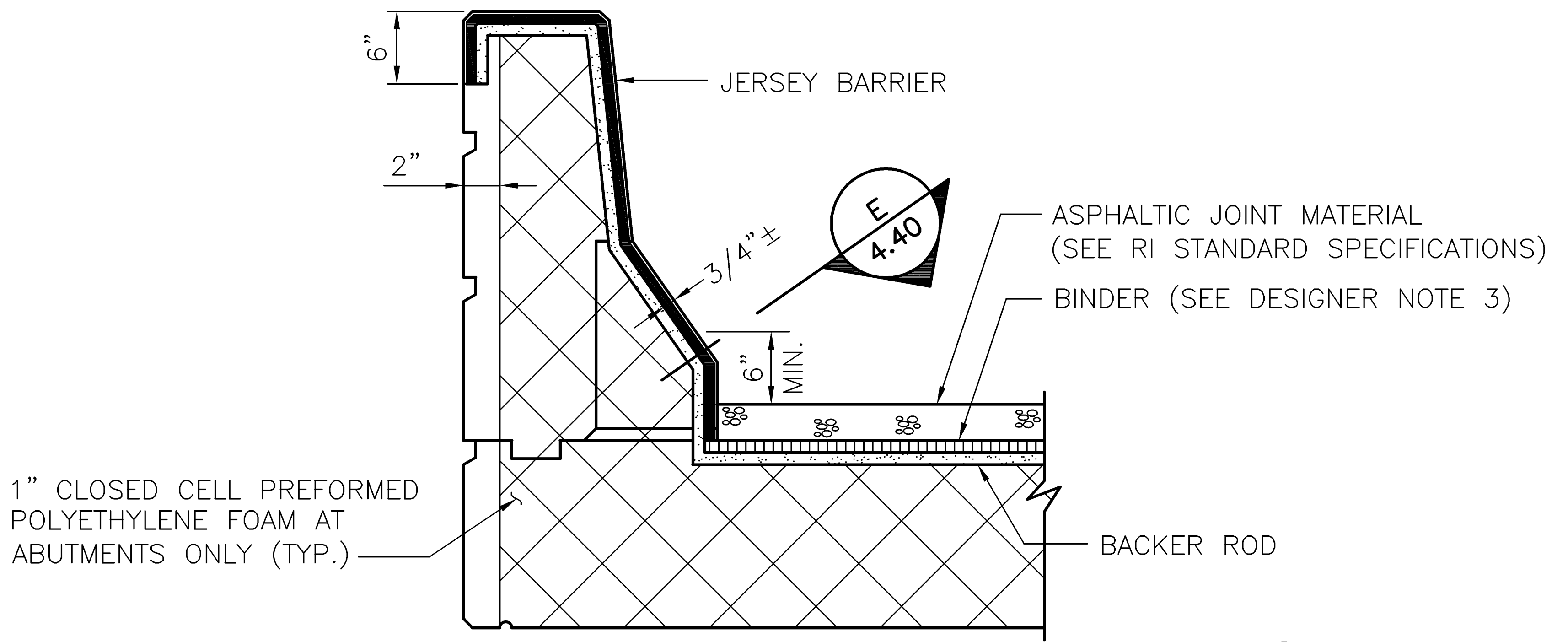
PLAN AT BARRIER


1/4"
1/2"
1/2" POLYURETHANE ELASTOMERIC JOINT SEALANT (2-PART)
FACE OF CURB
ASPHALTIC JOINT MATERIAL (SEE RI STANDARD SPECIFICATIONS)
BINDER (SEE DESIGNER NOTE 3)
BACKER ROD (25% LARGER DIAMETER THAN JOINT OPENING)

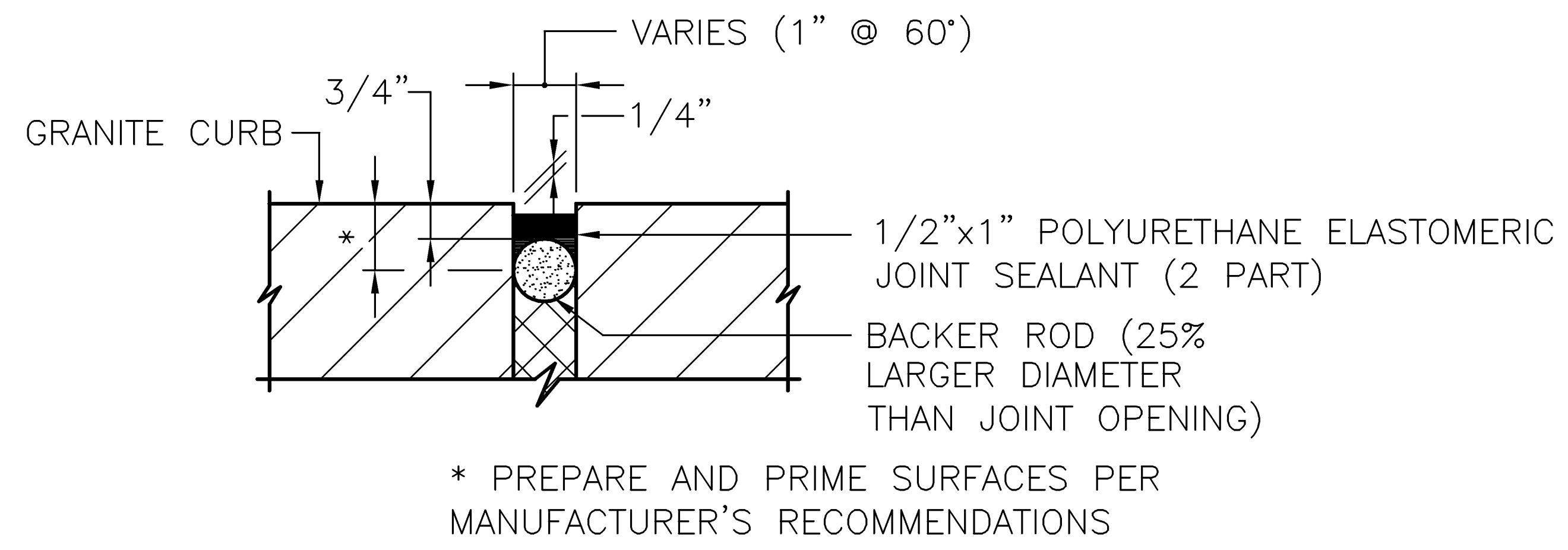
DETAIL 1/4.40
SCALE: 3"=1'-0"


F 4.40
DETAIL 1/4.40 (TYP.)
ASPHALTIC JOINT MATERIAL (SEE RI STANDARD SPECIFICATIONS)
1/2" POLYURETHANE ELASTOMERIC JOINT SEALANT (2-PART)
1" CLOSED CELL PREFORMED POLYETHYLENE FOAM AT ABUTMENTS ONLY (TYP.)
BINDER (SEE DESIGNER NOTE 3)
BACKER ROD

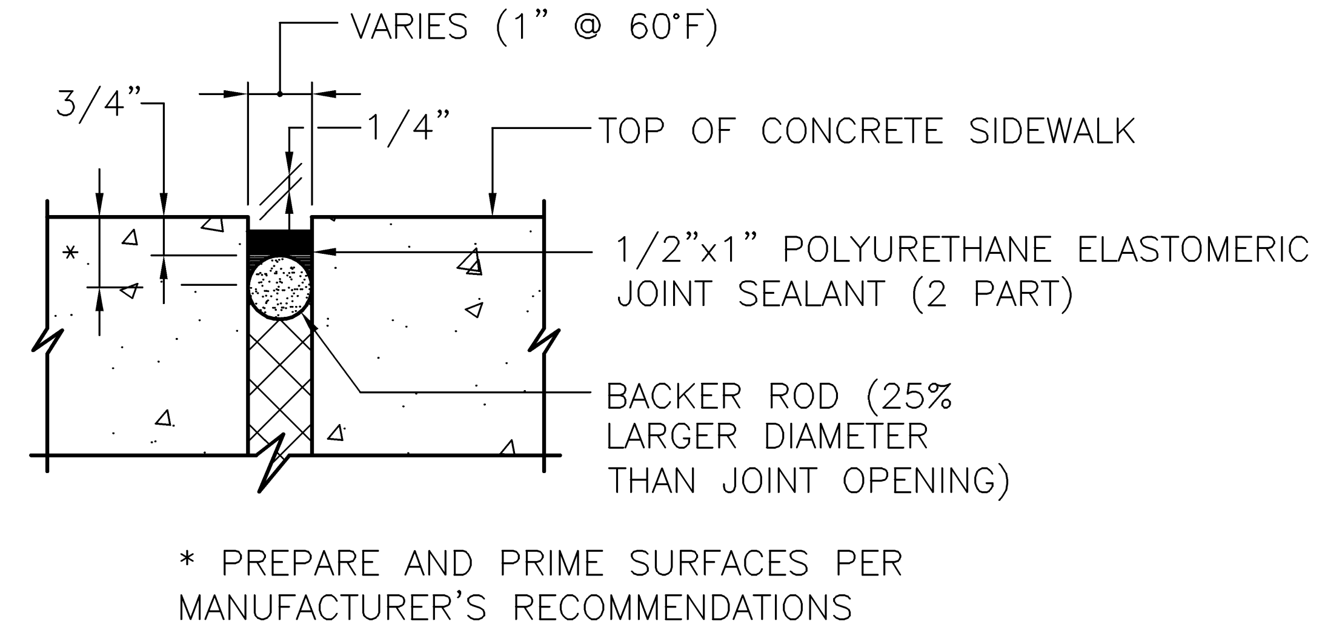
SECTION THRU ROADWAY WITH SIDEWALKS A/4.40
SCALE: 1" = 1'-0"


6"
2"
JERSEY BARRIER
3/4"±
E 4.40
6" MIN.
ASPHALTIC JOINT MATERIAL (SEE RI STANDARD SPECIFICATIONS)
BINDER (SEE DESIGNER NOTE 3)
1" CLOSED CELL PREFORMED POLYETHYLENE FOAM AT ABUTMENTS ONLY (TYP.)
BACKER ROD

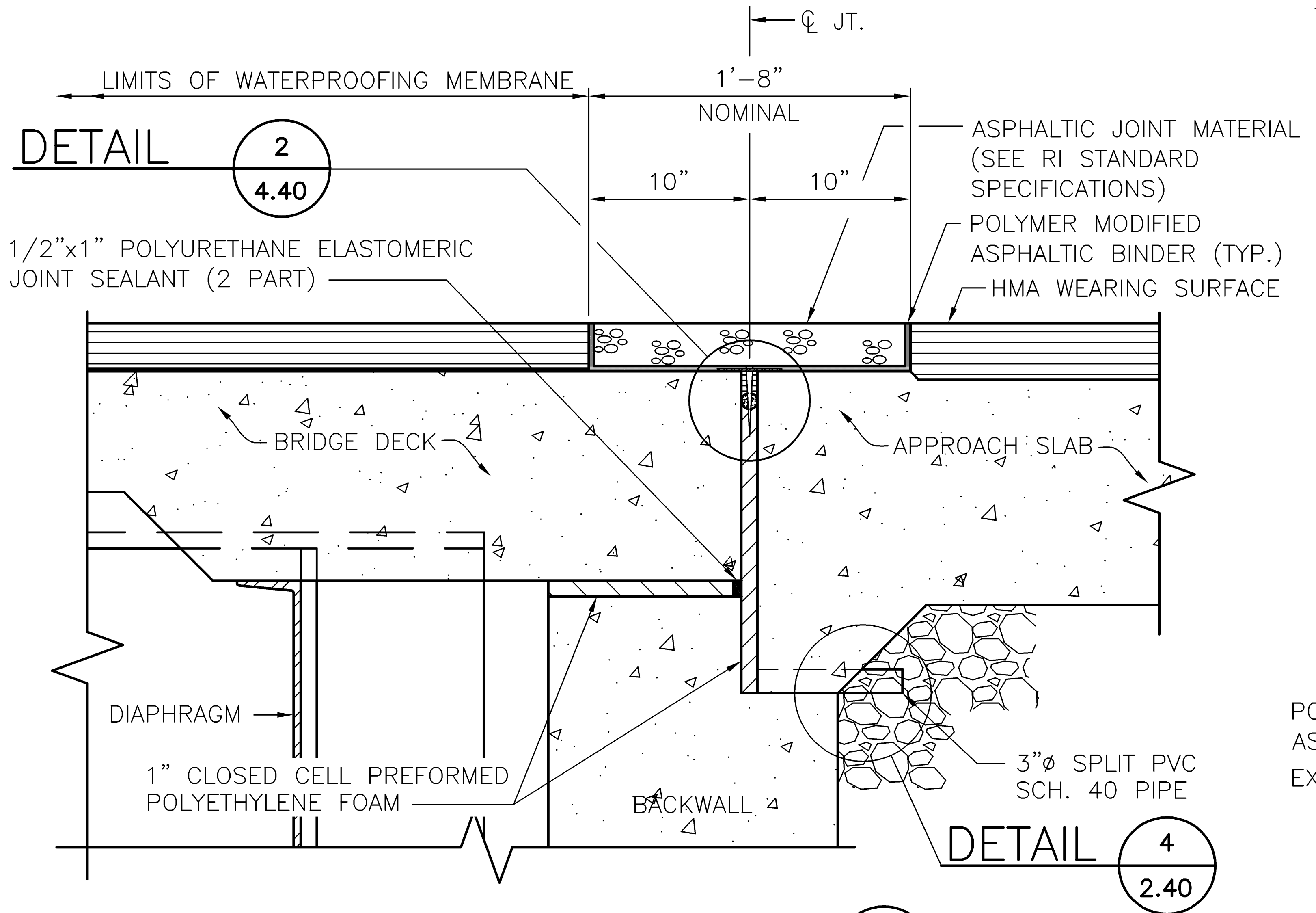
SECTION AT JERSEY BARRIER D/4.40
SCALE: 1" = 1'-0"


VARIES (1" @ 60°)
3/4"
1/4"
GRANITE CURB
*
1/2"x1" POLYURETHANE ELASTOMERIC JOINT SEALANT (2 PART)
BACKER ROD (25% LARGER DIAMETER THAN JOINT OPENING)
* PREPARE AND PRIME SURFACES PER MANUFACTURER'S RECOMMENDATIONS

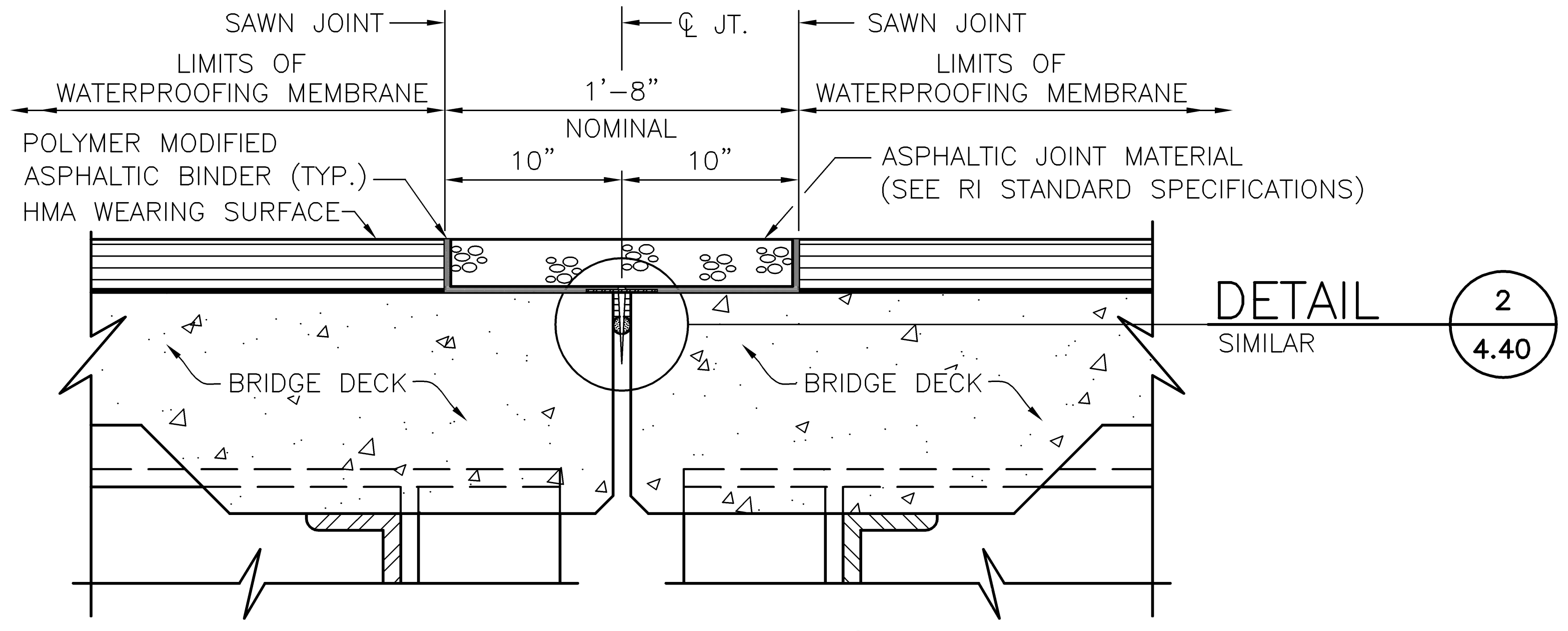
SECTION E/4.40
SCALE: 3"=1'-0"


VARIES (1" @ 60°F)
3/4"
1/4"
TOP OF CONCRETE SIDEWALK
*
1/2"x1" POLYURETHANE ELASTOMERIC JOINT SEALANT (2 PART)
BACKER ROD (25% LARGER DIAMETER THAN JOINT OPENING)
* PREPARE AND PRIME SURFACES PER MANUFACTURER'S RECOMMENDATIONS

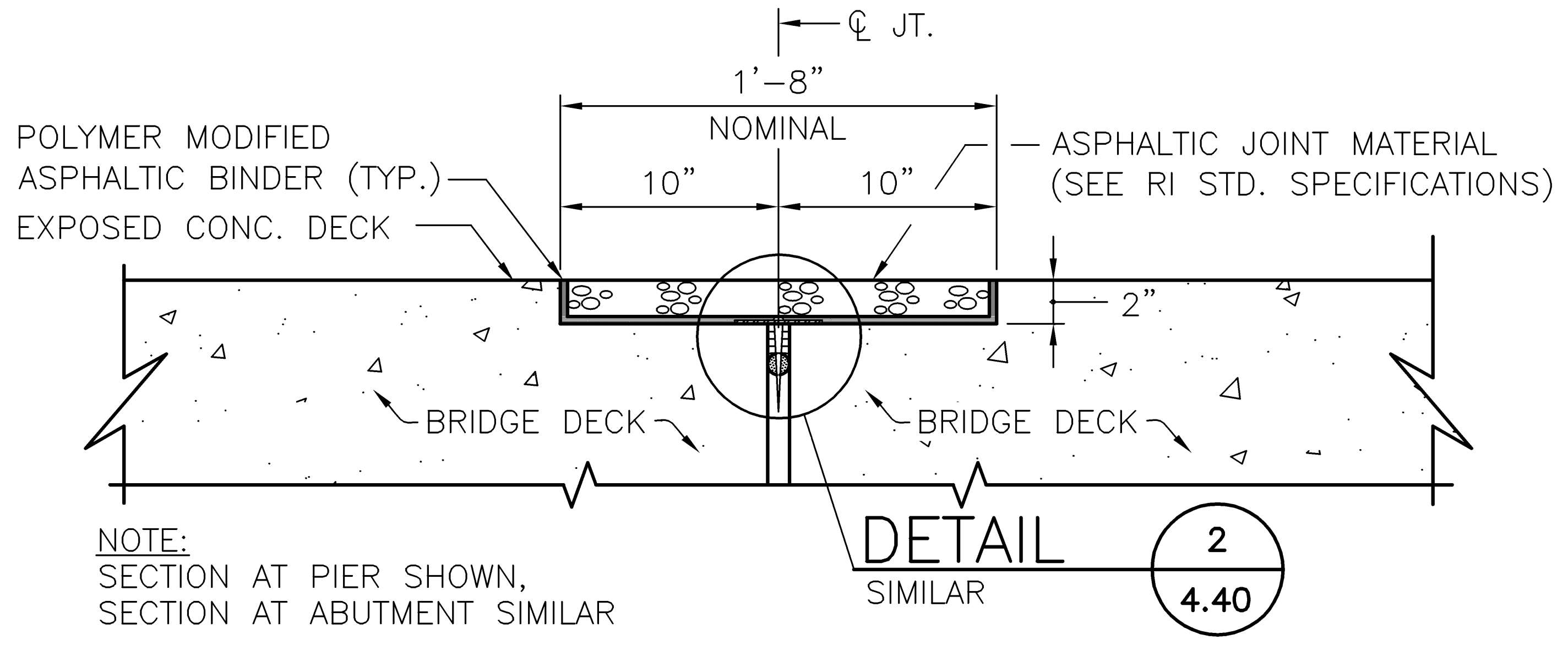
SECTION F/4.40
SCALE: 3"=1'-0"


℄ JT.
LIMITS OF WATERPROOFING MEMBRANE
1'-8" NOMINAL
DETAIL 2/4.40
10"
10"
ASPHALTIC JOINT MATERIAL (SEE RI STANDARD SPECIFICATIONS)
POLYMER MODIFIED ASPHALTIC BINDER (TYP.)
HMA WEARING SURFACE
1/2"x1" POLYURETHANE ELASTOMERIC JOINT SEALANT (2 PART)
BRIDGE DECK
APPROACH SLAB
DIAPHRAGM
1" CLOSED CELL PREFORMED POLYETHYLENE FOAM
BACKWALL
3"Ø SPLIT PVC SCH. 40 PIPE
DETAIL 4/2.40

SECTION AT ABUTMENT B/4.40
SCALE: 1 1/2"=1'-0"

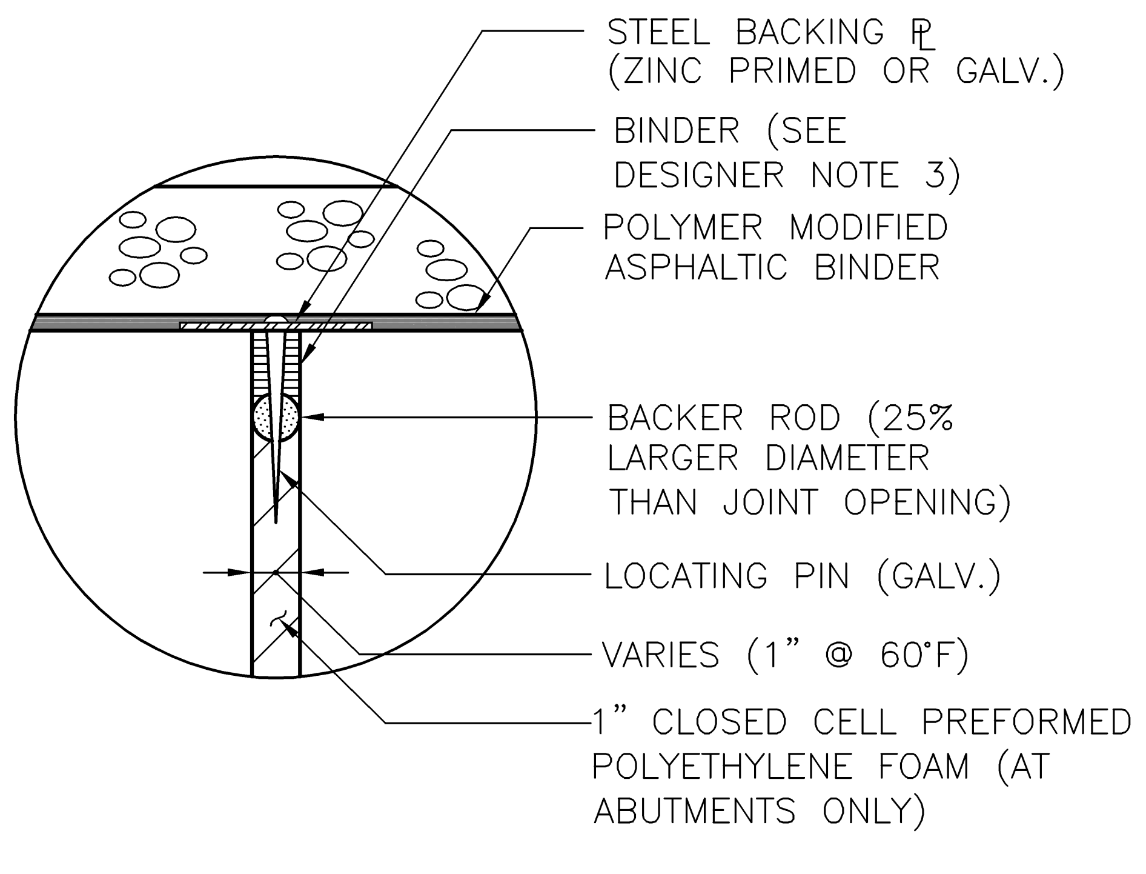

SAWN JOINT
℄ JT.
SAWN JOINT
LIMITS OF WATERPROOFING MEMBRANE
1'-8" NOMINAL
LIMITS OF WATERPROOFING MEMBRANE
POLYMER MODIFIED ASPHALTIC BINDER (TYP.)
HMA WEARING SURFACE
10"
10"
ASPHALTIC JOINT MATERIAL (SEE RI STANDARD SPECIFICATIONS)
DETAIL 2/4.40 SIMILAR
BRIDGE DECK
BRIDGE DECK

SECTION AT PIER C/4.40
SCALE: 1-1/2" = 1'-0"


℄ JT.
1'-8" NOMINAL
POLYMER MODIFIED ASPHALTIC BINDER (TYP.)
EXPOSED CONC. DECK
10"
10"
ASPHALTIC JOINT MATERIAL (SEE RI STD. SPECIFICATIONS)
2"
BRIDGE DECK
BRIDGE DECK
DETAIL 2/4.40 SIMILAR

NOTE:
SECTION AT PIER SHOWN, SECTION AT ABUTMENT SIMILAR

SECTION AT PIER WITH EXPOSED CONCRETE DECK
SCALE: 1 1/2" = 1'-0"


STEEL BACKING ℗ (ZINC PRIMED OR GALV.)
BINDER (SEE DESIGNER NOTE 3)
POLYMER MODIFIED ASPHALTIC BINDER
BACKER ROD (25% LARGER DIAMETER THAN JOINT OPENING)
LOCATING PIN (GALV.)
VARIES (1" @ 60°F)
1" CLOSED CELL PREFORMED POLYETHYLENE FOAM (AT ABUTMENTS ONLY)

DETAIL 2/4.40
SCALE: 3" = 1'-0"

DESIGNER NOTES:

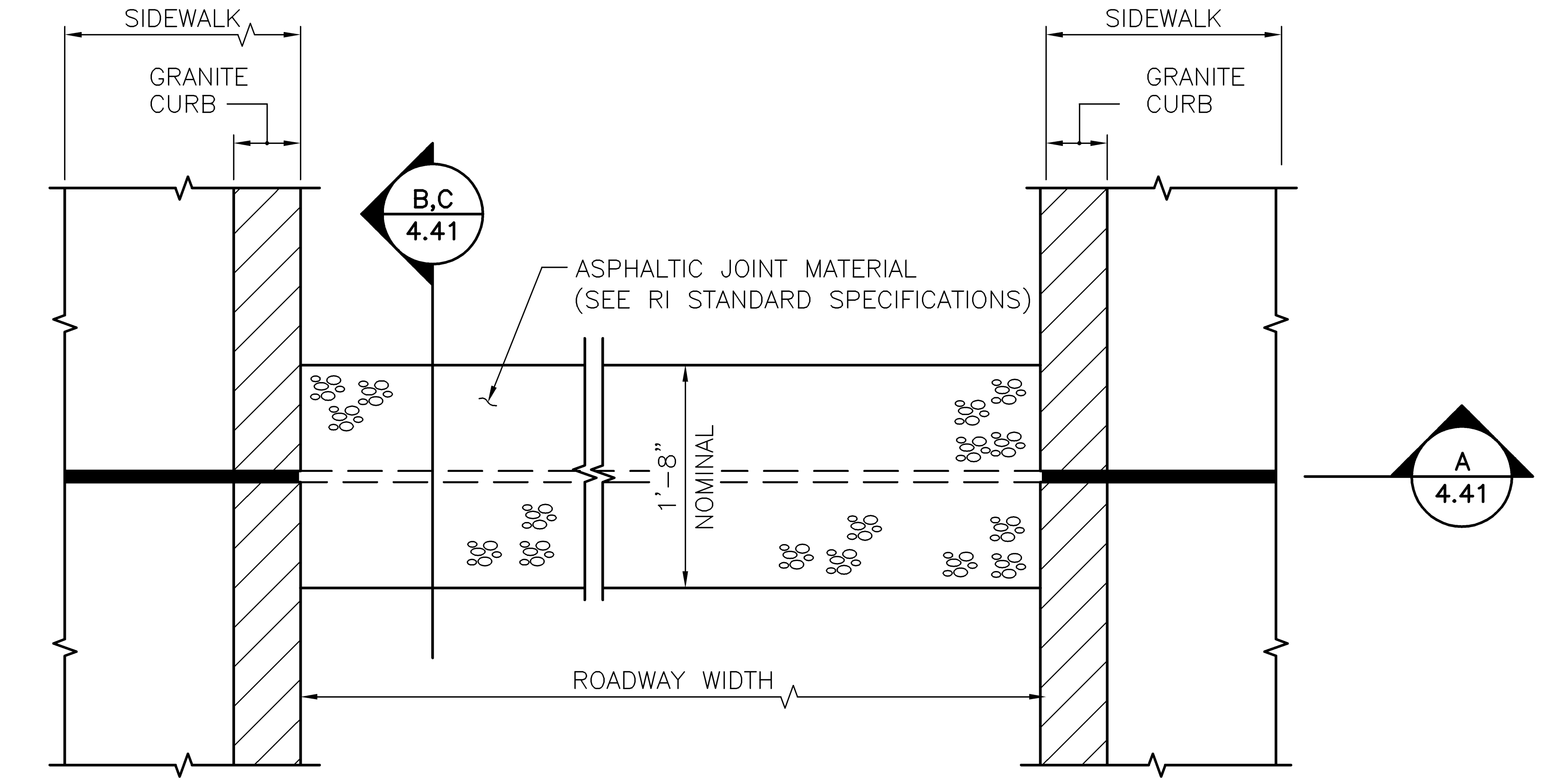
1. *THIS DETAIL MAY BE USED FOR A TOTAL ANTICIPATED JOINT MOVEMENT OF LESS THAN 1" AND AT A MAXIMUM SKEW ANGLE OF LESS THAN 20°. REFER TO RIDOT LRFD BRIDGE DESIGN MANUAL SECTION 14. THE USE OF THIS JOINT TYPE IS NOT PERMITTED ON HIGH VOLUME INTERSTATES AND EXPRESSWAY BRIDGES, UNLESS APPROVED BY MANAGING ENGINEER BRIDGE DESIGN.*
2. *SEE RHODE ISLAND SPECIFICATIONS FOR SPECIFICS ON MATERIALS AND CONSTRUCTION METHODS.*
3. *POLYURETHANE ELASTOMERIC JOINT SEALANT (2-PART) MAY BE SUBSTITUTED FOR BINDER MATERIAL. (1/2" THICK WITH A 3 DAY MINIMUM CURE).*
4. *AVOID USING THIS JOINT SYSTEM AT OR NEAR INTERSECTIONS WHERE BRAKING FORCES WILL SHOVE THE JOINT MATERIAL.*

REVISIONS	
No.	DATE

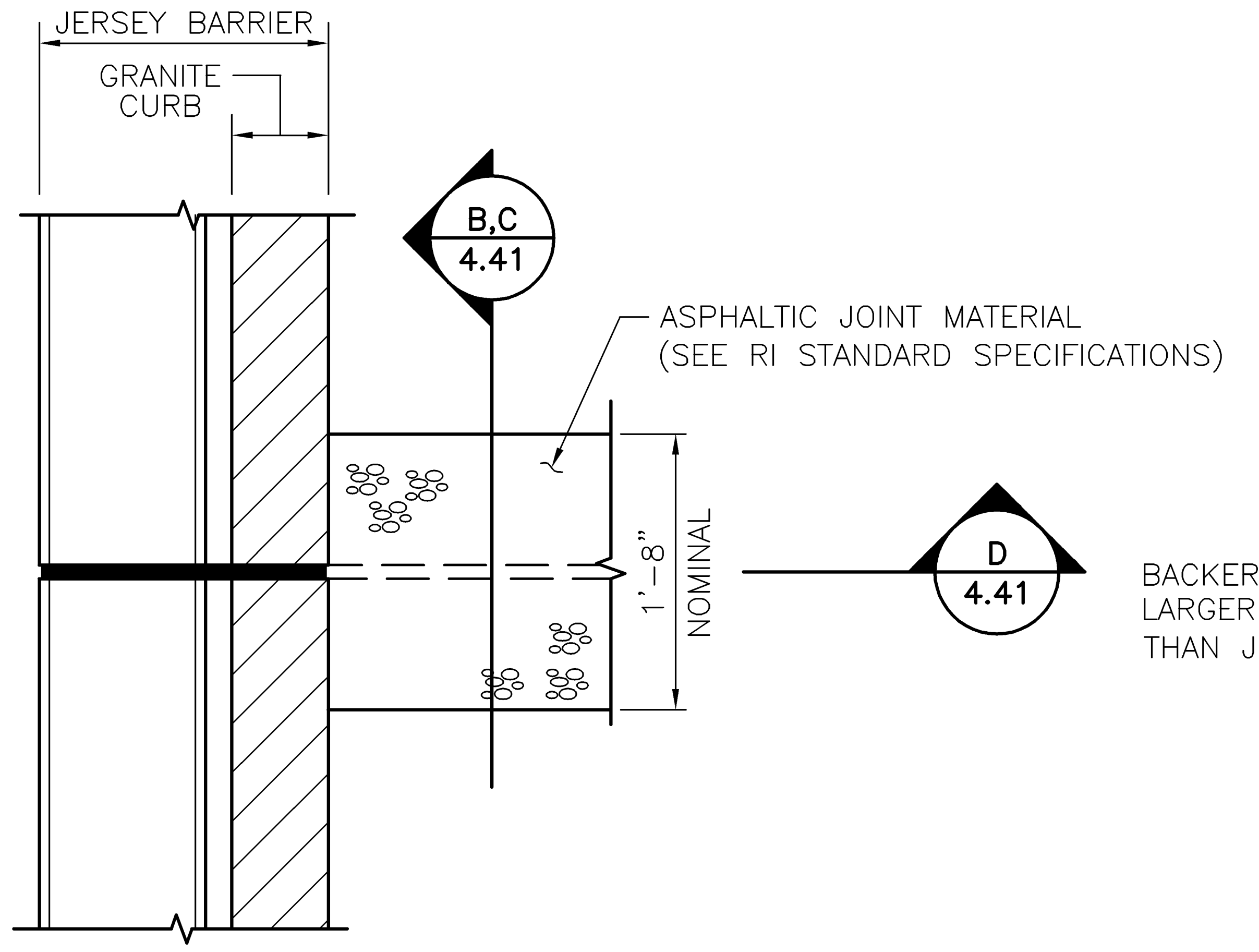
RHODE ISLAND
DEPARTMENT OF TRANSPORTATION
BRIDGE STANDARDS

ASPHALTIC EXPANSION
JOINT SYSTEM

DRAWING NUMBER: 4.40

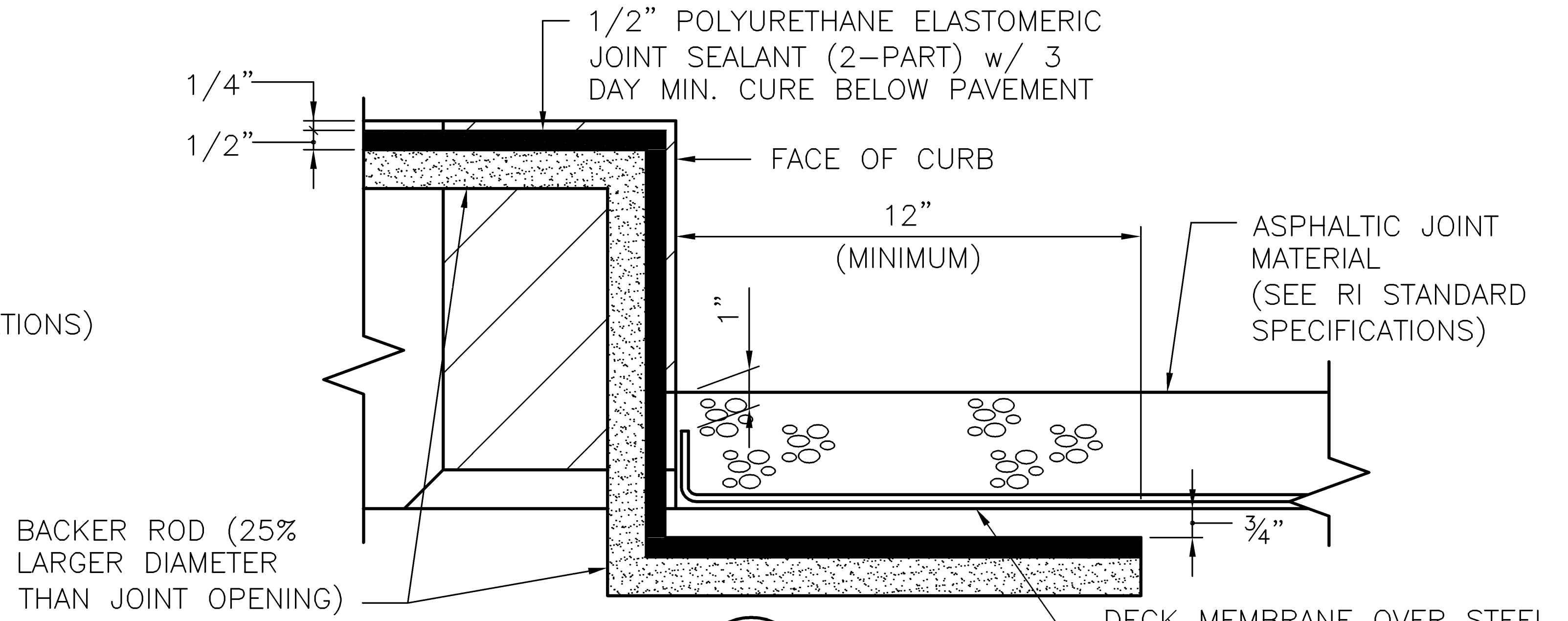


PLAN AT ROADWAY WITH SIDEWALKS



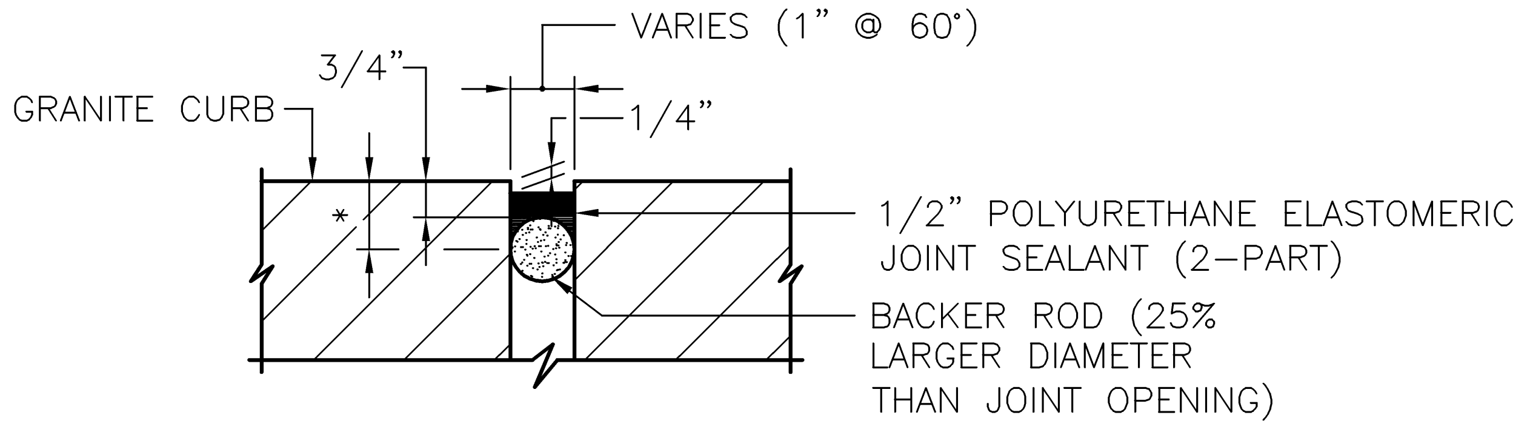
PLAN AT BARRIER

SCALE: 1" = 1'-0"


1/4"
1/2"
1/2" POLYURETHANE ELASTOMERIC JOINT SEALANT (2-PART) w/ 3 DAY MIN. CURE BELOW PAVEMENT
FACE OF CURB
12" (MINIMUM)
1"
ASPHALTIC JOINT MATERIAL (SEE RI STANDARD SPECIFICATIONS)
BACKER ROD (25% LARGER DIAMETER THAN JOINT OPENING)
¾"
DECK MEMBRANE OVER STEEL REINFORCED MEMBRANE OVER FLEXIBLE MEMBRANE

DETAIL 1/4.41

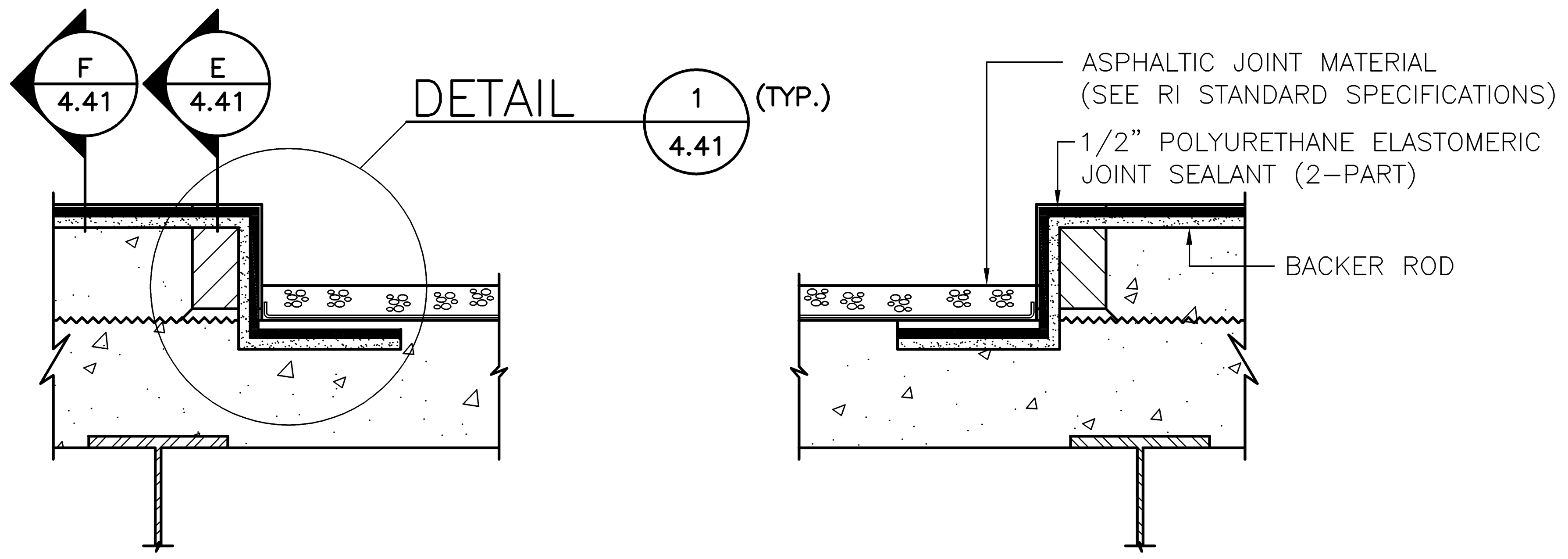
SCALE: 3"=1'-0"


GRANITE CURB
3/4"
VARIES (1" @ 60°)
1/4"
*
1/2" POLYURETHANE ELASTOMERIC JOINT SEALANT (2-PART)
BACKER ROD (25% LARGER DIAMETER THAN JOINT OPENING)

* PREPARE AND PRIME SURFACES PER MANUFACTURER'S RECOMMENDATIONS

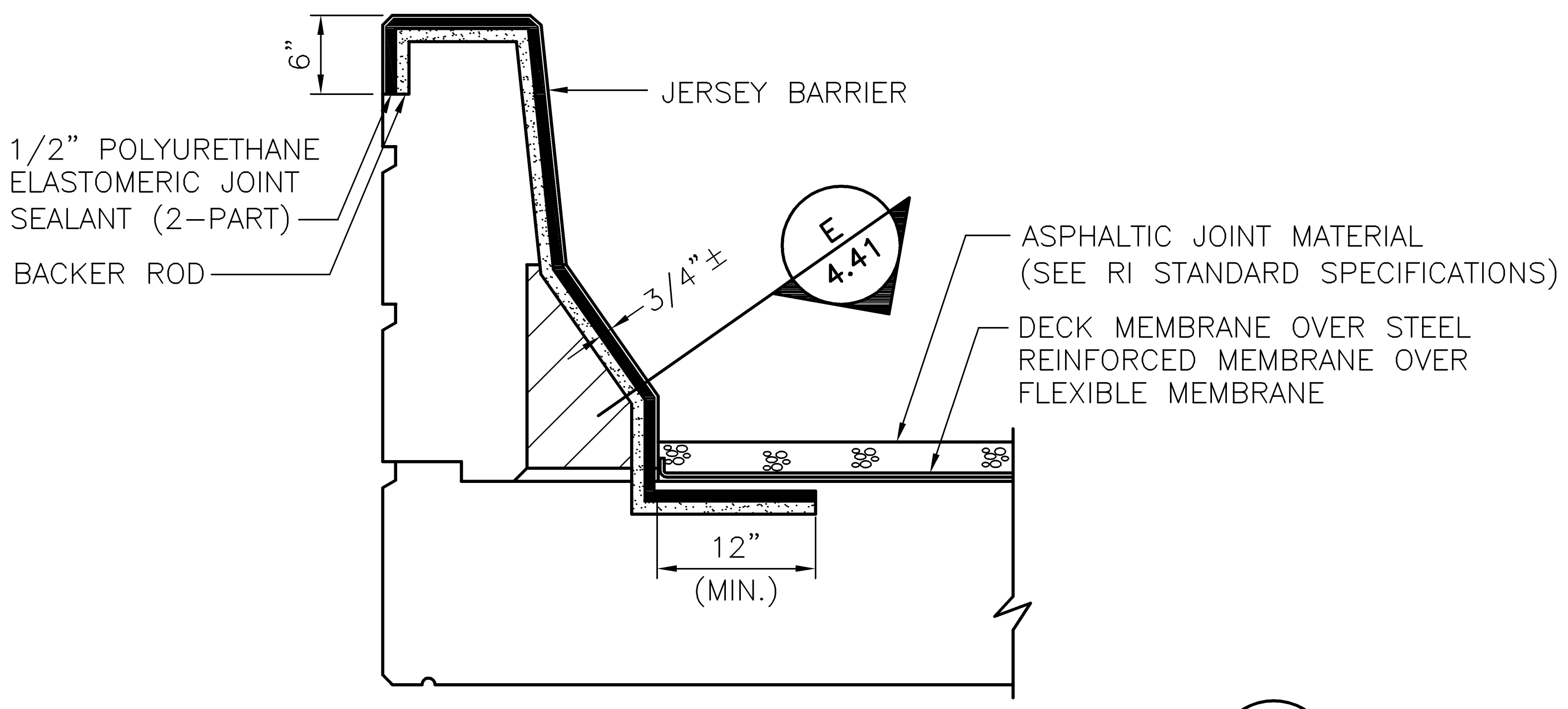
SECTION E/4.41

SCALE: 3"=1'-0"


F 4.41
E 4.41
DETAIL 1 4.41 (TYP.)
ASPHALTIC JOINT MATERIAL (SEE RI STANDARD SPECIFICATIONS)
1/2" POLYURETHANE ELASTOMERIC JOINT SEALANT (2-PART)
BACKER ROD

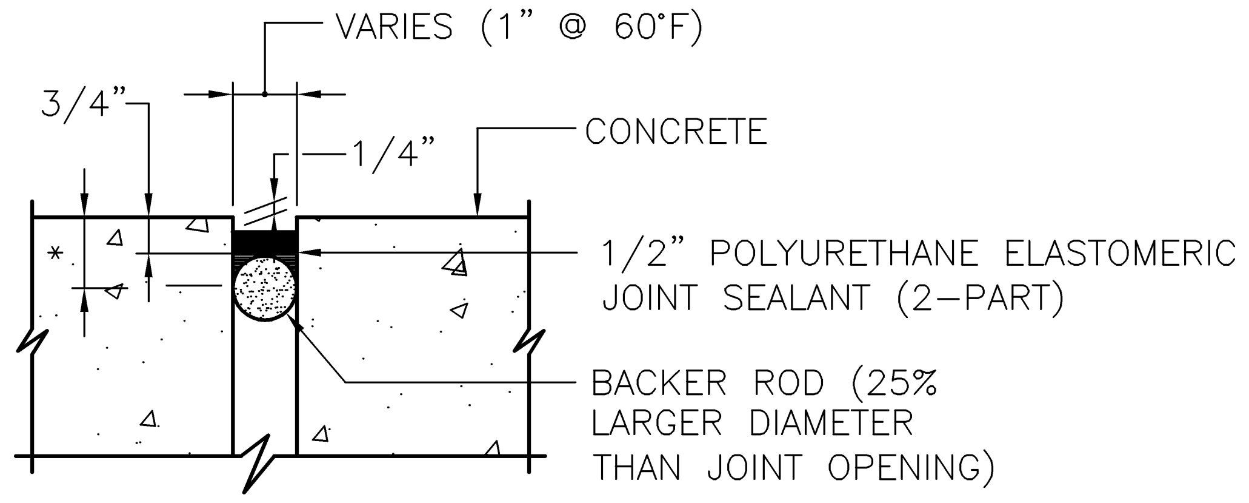
SECTION THRU ROADWAY WITH SIDEWALKS A/4.41

SCALE: 1" = 1'-0"


6"
JERSEY BARRIER
1/2" POLYURETHANE ELASTOMERIC JOINT SEALANT (2-PART)
BACKER ROD
3/4"±
E 4.41
ASPHALTIC JOINT MATERIAL (SEE RI STANDARD SPECIFICATIONS)
DECK MEMBRANE OVER STEEL REINFORCED MEMBRANE OVER FLEXIBLE MEMBRANE
12" (MIN.)

SECTION AT JERSEY BARRIER D/4.41

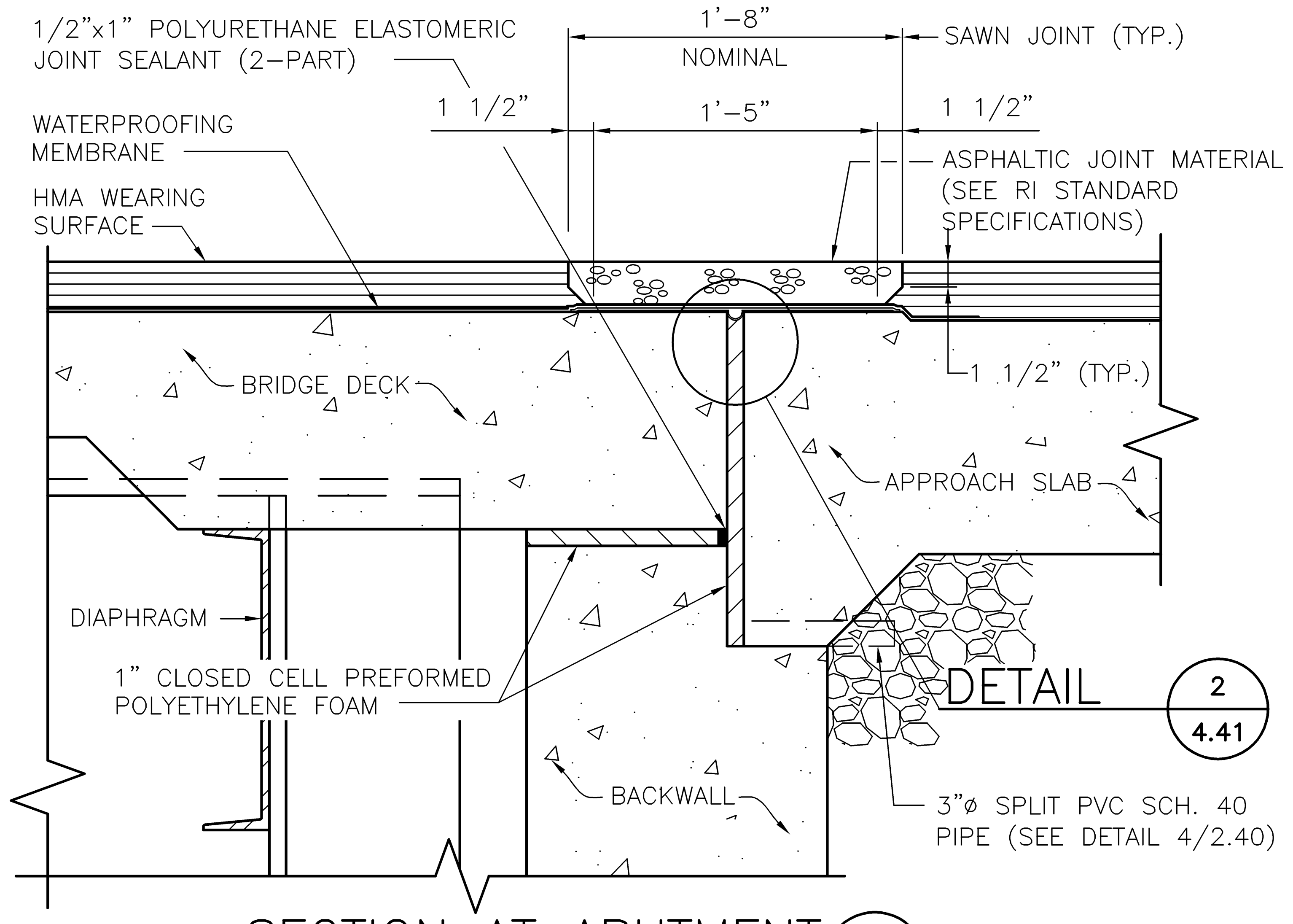
SCALE: 1" = 1'-0"


VARIES (1" @ 60°F)
3/4"
1/4"
CONCRETE
*
1/2" POLYURETHANE ELASTOMERIC JOINT SEALANT (2-PART)
BACKER ROD (25% LARGER DIAMETER THAN JOINT OPENING)

* PREPARE AND PRIME SURFACES PER MANUFACTURER'S RECOMMENDATIONS

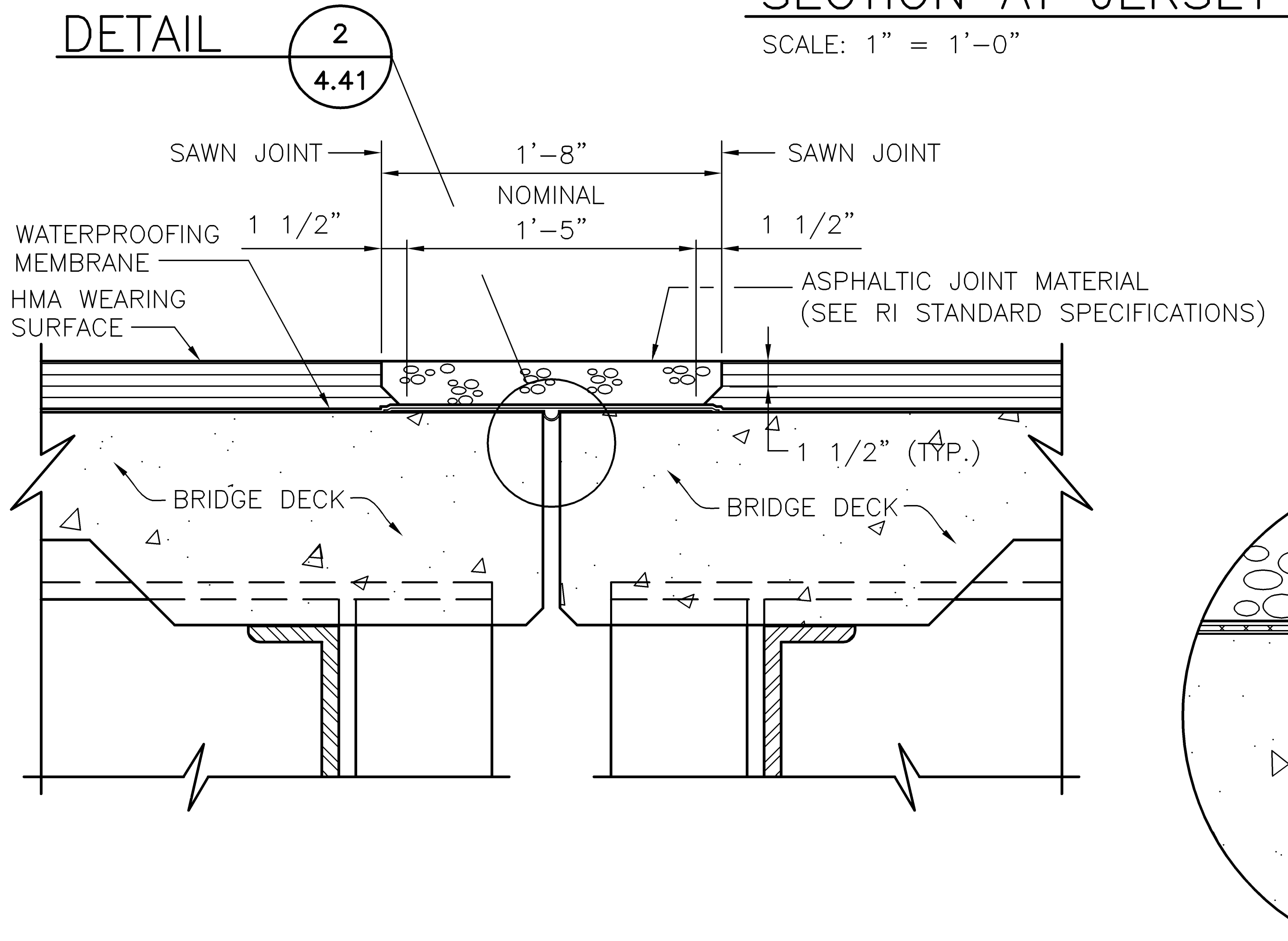
SECTION F/4.41

SCALE: 3"=1'-0"


1/2"x1" POLYURETHANE ELASTOMERIC JOINT SEALANT (2-PART)
1'-8" NOMINAL
SAWN JOINT (TYP.)
1 1/2"
1'-5"
1 1/2"
WATERPROOFING MEMBRANE
HMA WEARING SURFACE
ASPHALTIC JOINT MATERIAL (SEE RI STANDARD SPECIFICATIONS)
BRIDGE DECK
1 1/2" (TYP.)
APPROACH SLAB
DIAPHRAGM
1" CLOSED CELL PREFORMED POLYETHYLENE FOAM
DETAIL 2 4.41
BACKWALL
3"ø SPLIT PVC SCH. 40 PIPE (SEE DETAIL 4/2.40)

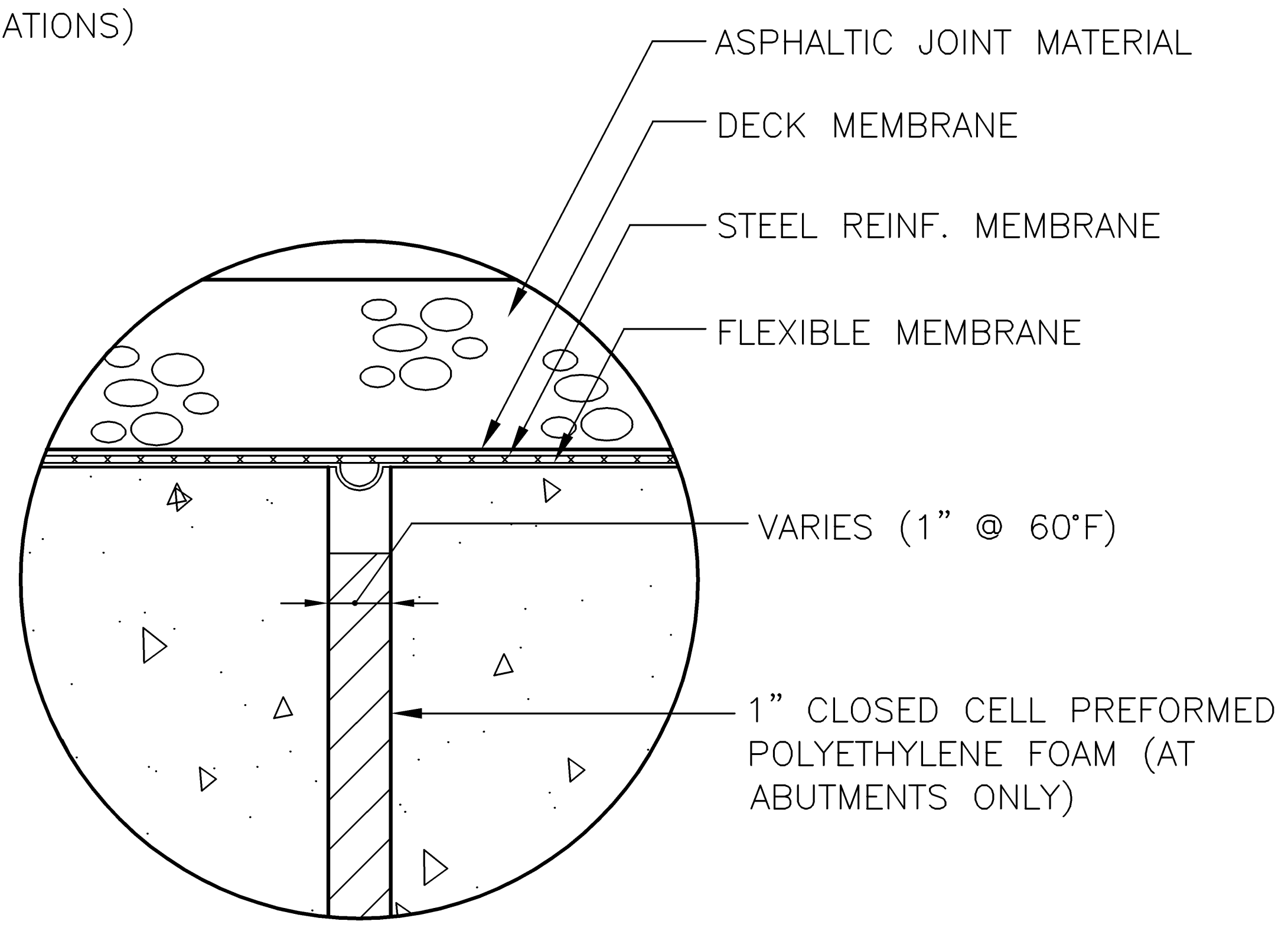
SECTION AT ABUTMENT B/4.41

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



SECTION AT PIER C/4.41

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



DETAIL 2/4.41

SCALE: 3" = 1'-0"

DESIGNER:

THIS DETAIL MAY BE USED FOR A TOTAL ANTICIPATED JOINT MOVEMENT OF LESS THAN 1" AND AT A MAXIMUM SKEW ANGLE OF LESS THAN 20°. REFER TO RIDOT LRFD. BRIDGE DESIGN MANUAL SECTION 14. THE USE OF THIS JOINT TYPE IS NOT PERMITTED ON HIGH VOLUME INTERSTATES AND EXPRESSWAY BRIDGES, UNLESS APPROVED BY MANAGING ENGINEER BRIDGE SECTION.

NOTE:

SEE SPECIAL PROVISIONS AND RHODE ISLAND SPECIFICATIONS FOR SPECIFICS ON MATERIALS AND CONSTRUCTION METHODS.

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RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

BRIDGE STANDARDS

ALTERNATE ASPHALTIC EXPANSION JOINT SYSTEM

DRAWING NUMBER: 4.41

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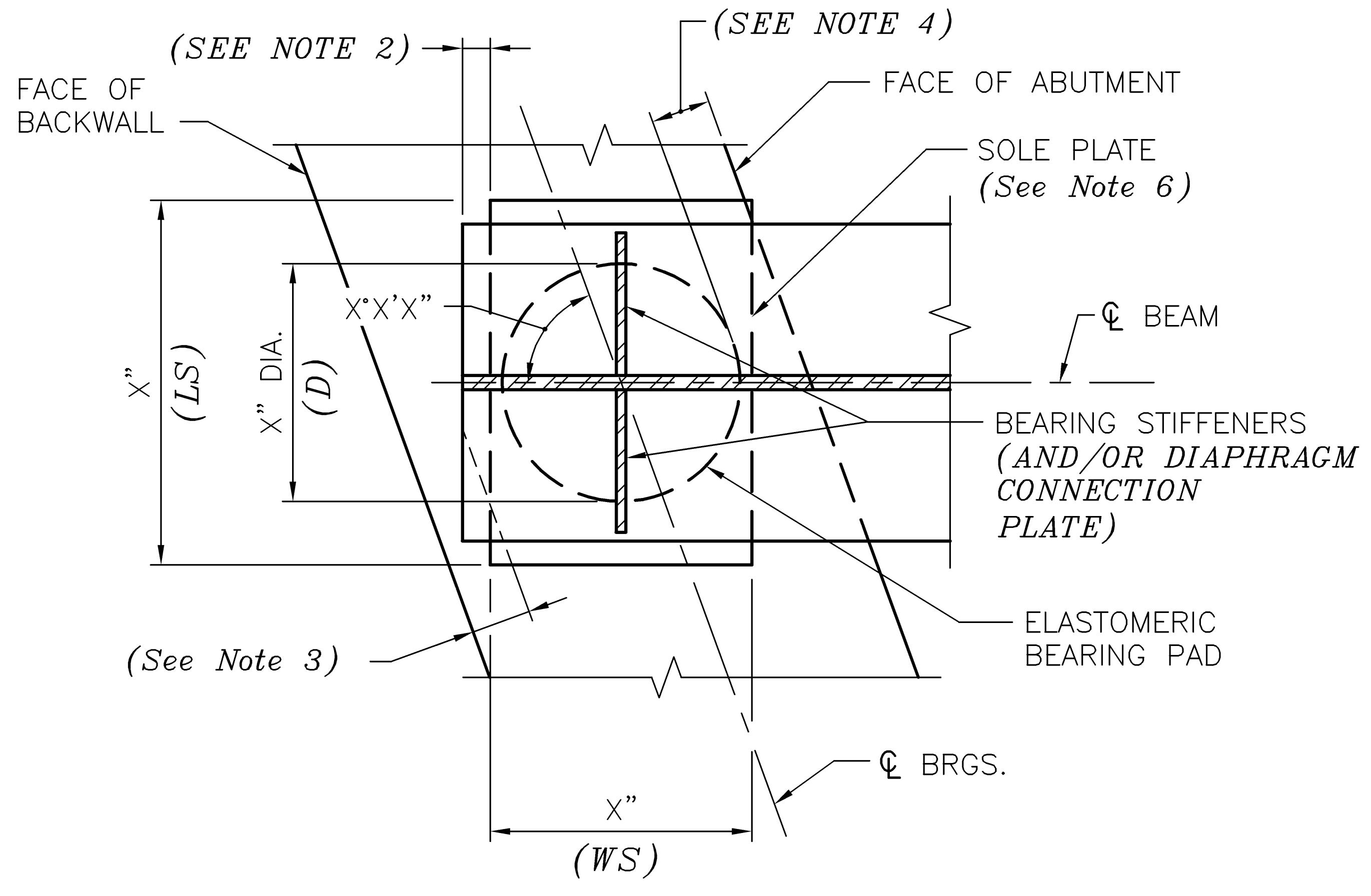
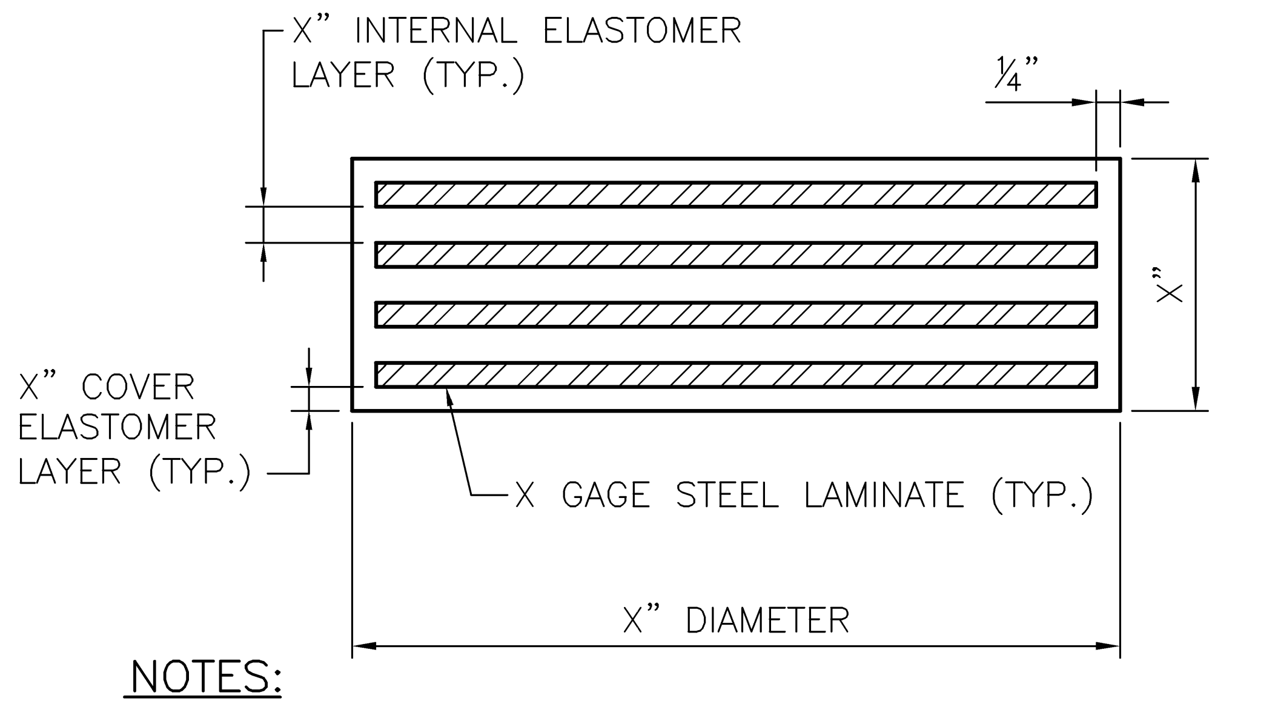


PLAN – STEEL BEAMS

SCALE: 1½"=1'-0"

DESIGNER NOTES:

1. *D = DIAMETER OF ELASTOMERIC BEARING PAD;*
   LS = LENGTH OF SOLE PLATE = THE GREATEST OF: (D + 2") OR (WIDTH OF BOTTOM FLANGE + 2");
   WS = WIDTH OF SOLE PLATE = D + 2".
2. *THE END OF THE BEAM AND SOLE PLATE MAY BE FLUSH, HOWEVER THE SOLE PLATE CANNOT EXTEND BEYOND THE BEAM END. IF REQUIRED, INCREASE THE LENGTH OF BEAM SO THAT IT STAYS FLUSH WITH THE SOLE PLATE.*
3. *IF NECESSARY, COPE SOLE PLATE AND BEAM BOTTOM FLANGE TO MAINTAIN A MINIMUM OF 3" CLEARANCE.*
4. *DEPENDING ON THE BEARING PAD SIZE, THE WIDTH OF THE BRIDGE SEAT MAY NEED TO BE INCREASED TO MAINTAIN A MINIMUM OF 3" CLEARANCE.*
5. *SOLE PLATE SHOULD BE TAPERED IF SLOPE OF BEAM BOTTOM FLANGE DUE TO ROADWAY GRADE AND CAMBER EXCEEDS 1%. PROVIDE DETAIL OF TAPERED SOLE PLATE.*
6. *MINIMUM THICKNESS OF SOLE PLATE AFTER BEVELING SHALL BE 1½" IF WELD MADE IN FIELD IS DIRECTLY OVER ELASTOMER. BEVELED PLATES MAY BE AS THIN AS ¾" IF THERE IS A LATERAL SEPARATION BETWEEN THE WELD AND ELASTOMER OF 1½" OR GREATER.*

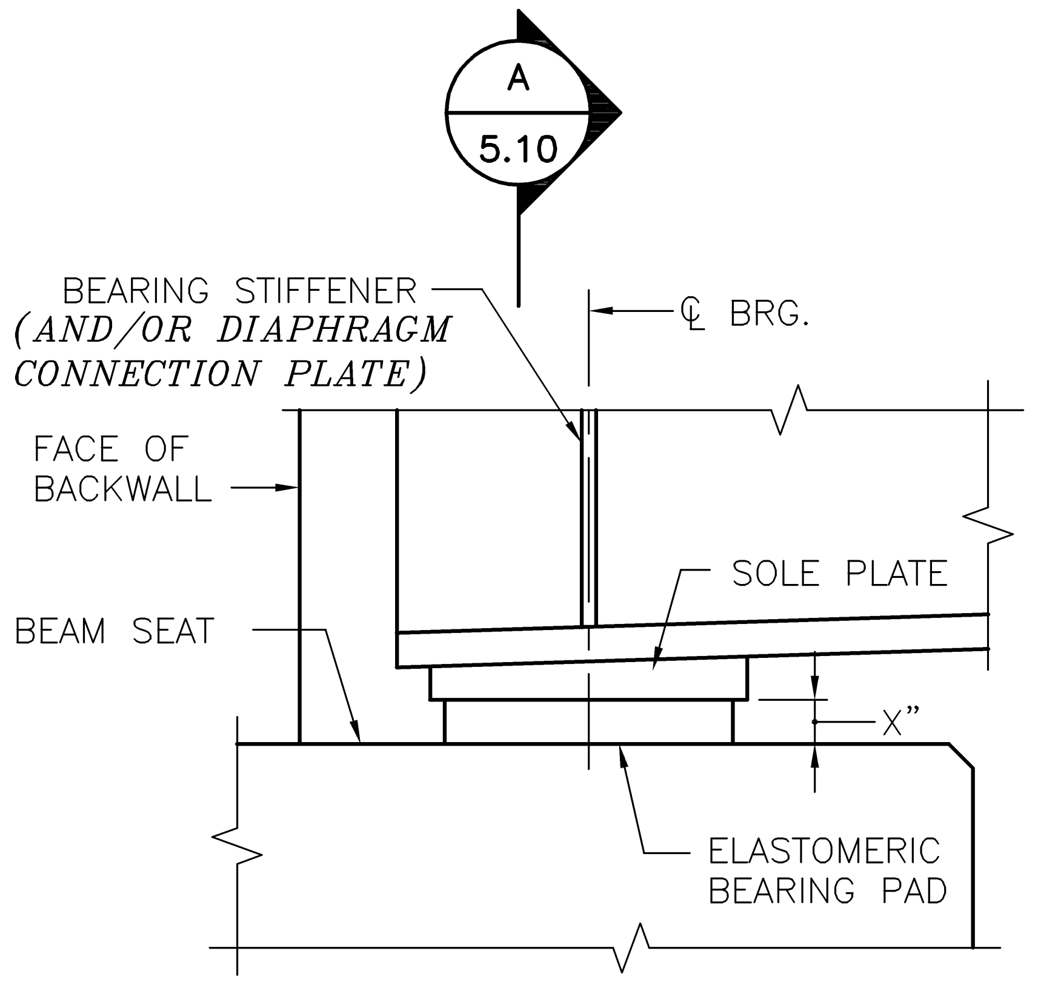

X" INTERNAL ELASTOMER LAYER (TYP.)
¼"
X"
X" COVER ELASTOMER LAYER (TYP.)
X GAGE STEEL LAMINATE (TYP.)
X" DIAMETER

NOTES:

1. ELASTOMER SHALL HAVE A SHEAR MODULUS OF 0.106 KSI.
2. STEEL LAMINATES SHALL CONFORM TO ASTM A 1011 GRADE 36.
3. THE COMPRESSIVE DESIGN LOAD ON THE BEARING PAD IS XXX KIPS. THE COMPRESSIVE DESIGN STRESS IS THE RESULT OF DIVIDING THE COMPRESSIVE DESIGN LOAD BY THE AREA OF THE PAD AND IS EQUAL TO XXX KSI.
4. ELASTOMERIC BEARING PAD SHALL NOT BE VULCANIZED TO THE SOLE PLATE.

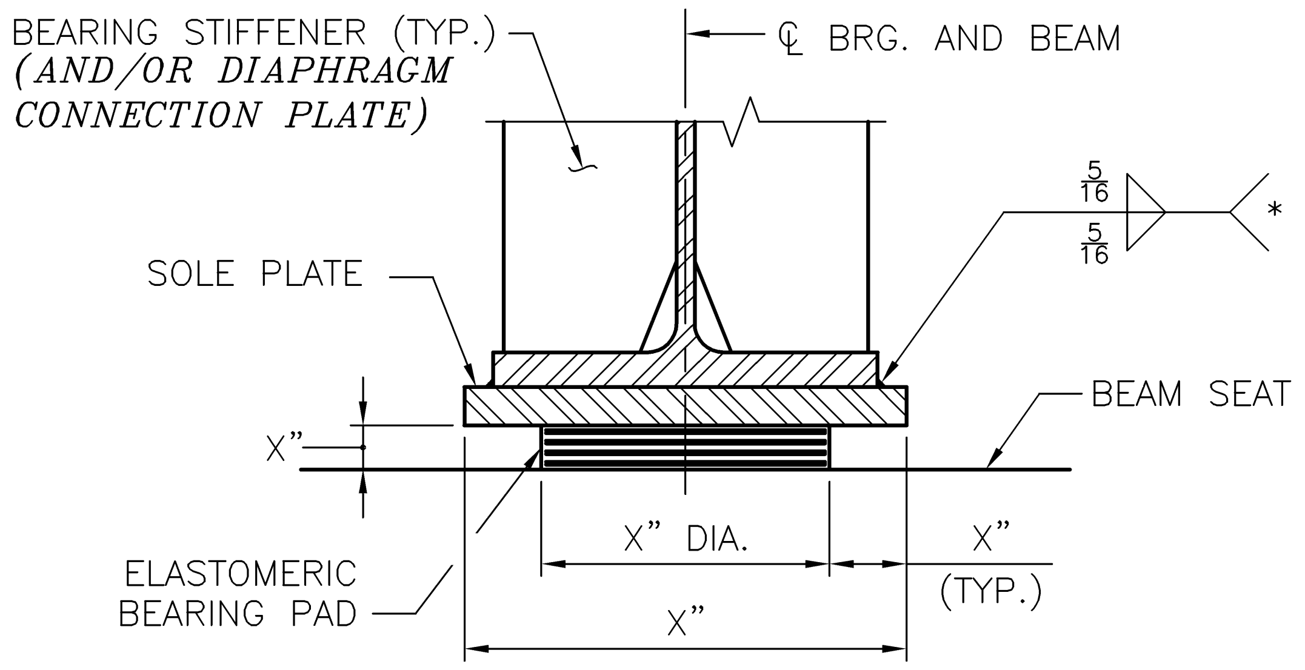
ELASTOMERIC BEARING PAD – STEEL BEAMS

NOT TO SCALE



ELEVATION – STEEL BEAMS

SCALE: 1½"=1'-0"



(*) – WELDS SHALL TERMINATE ¼" FROM EDGE OF PLATE.

SECTION (A 5.10)

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

DESIGNER NOTES:

1. *THE MINIMUM THICKNESS OF THE INDIVIDUAL INTERNAL ELASTOMER LAYERS SHALL BE ³⁄₈". TOP AND BOTTOM COVER LAYERS SHALL BE ¼" FOR BEARINGS WITH THICKNESS LESS OR EQUAL TO 5" AND ½" FOR THICKER BEARINGS. FURTHERMORE, COVER LAYERS SHALL BE NO THICKER THAN 70% OF THE INDIVIDUAL INTERNAL LAYER.*
2. *STEEL LAMINATES SHALL HAVE A MINIMUM THICKNESS OF 11 GAGE (0.1196"). ACTUAL DECIMAL THICKNESS OF STEEL LAMINATES IN INCHES SHALL BE USED TO CALCULATE TOTAL BEARING THICKNESS.*
3. *ALL ELASTOMERIC BEARING PADS FOR STEEL BEAMS FOR A GIVEN STRUCTURE SHALL HAVE A CONSTANT THICKNESS AND SHALL BE SET LEVEL.*
4. *ALL ELASTOMERIC BEARING PADS ON ANY SUBSTRUCTURE UNIT SHALL HAVE THE SAME NOMINAL COMPRESSIVE STIFFNESS.*
5. *ELASTOMERIC BEARING ASSEMBLIES SHALL BE USED FOR BOTH PRESTRESSED CONCRETE AND STEEL BEAM BRIDGES AND SHALL BE DESIGNED AND FABRICATED IN ACCORDANCE WITH SECTION 14 OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS AND SECTION 18 OF THE RIDOT LRFD BRIDGE DESIGN MANUAL.*
6. *CHEEK WALLS SHALL BE PROVIDED AT SUBSTRUCTURE ELEMENTS TO RESTRICT TRANSVERSE MOVEMENT. FOR ADDITIONAL INFORMATION REFER TO DRAWING Nos. 2.10 AND 7.80.*

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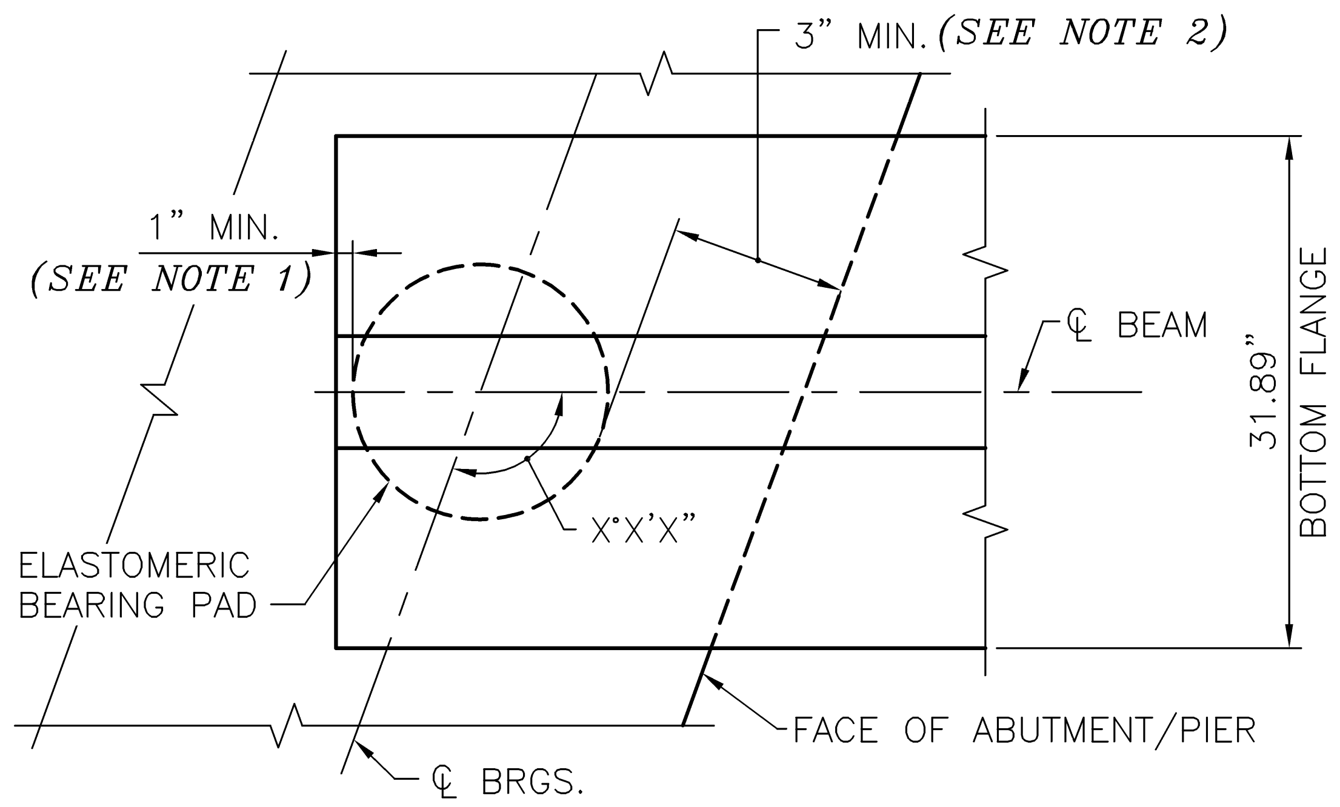
DEPARTMENT OF TRANSPORTATION

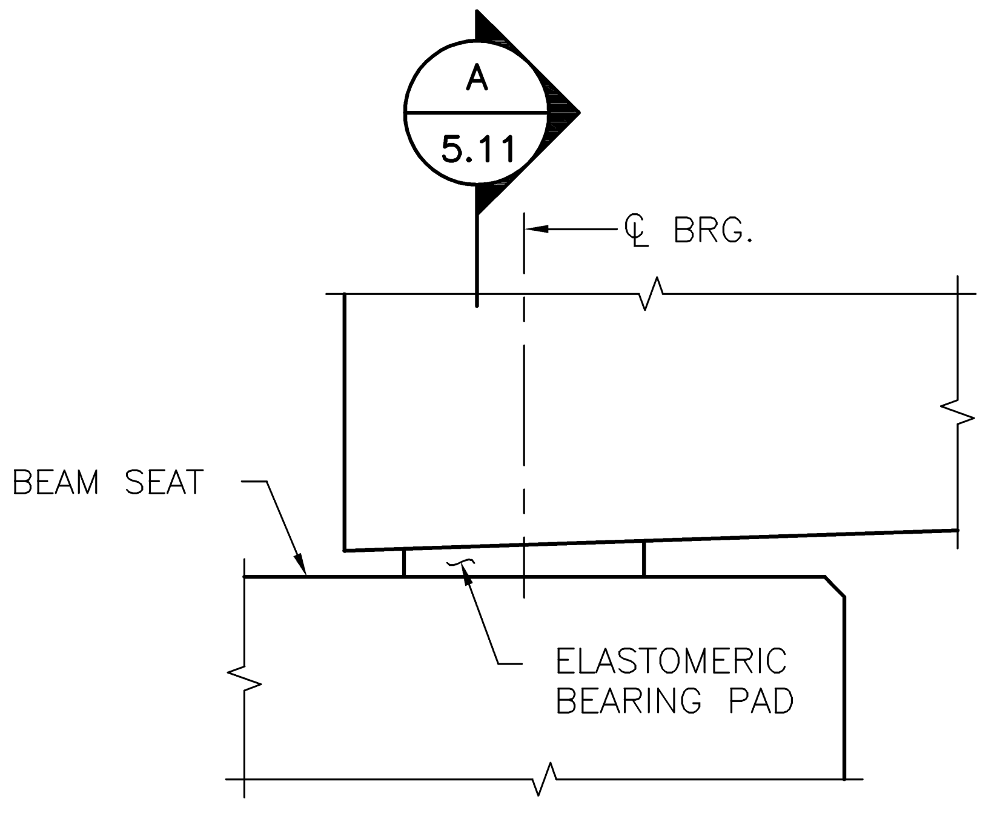
BRIDGE STANDARDS

ELASTOMERIC BEARINGS STEEL BEAMS

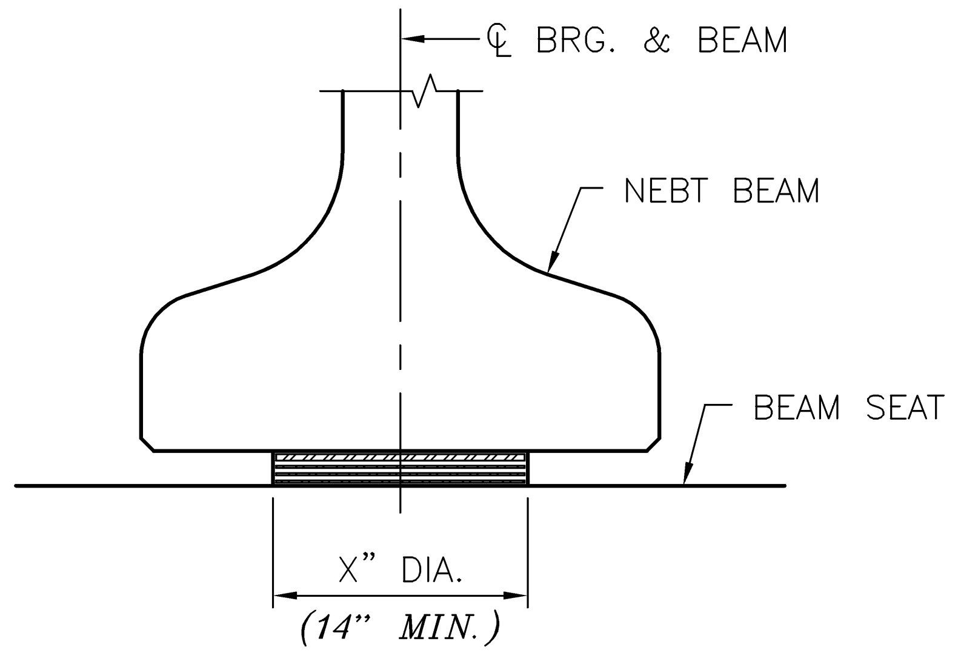
DRAWING NUMBER: 5.10



PLAN
NOT TO SCALE



ELEVATION
NOT TO SCALE

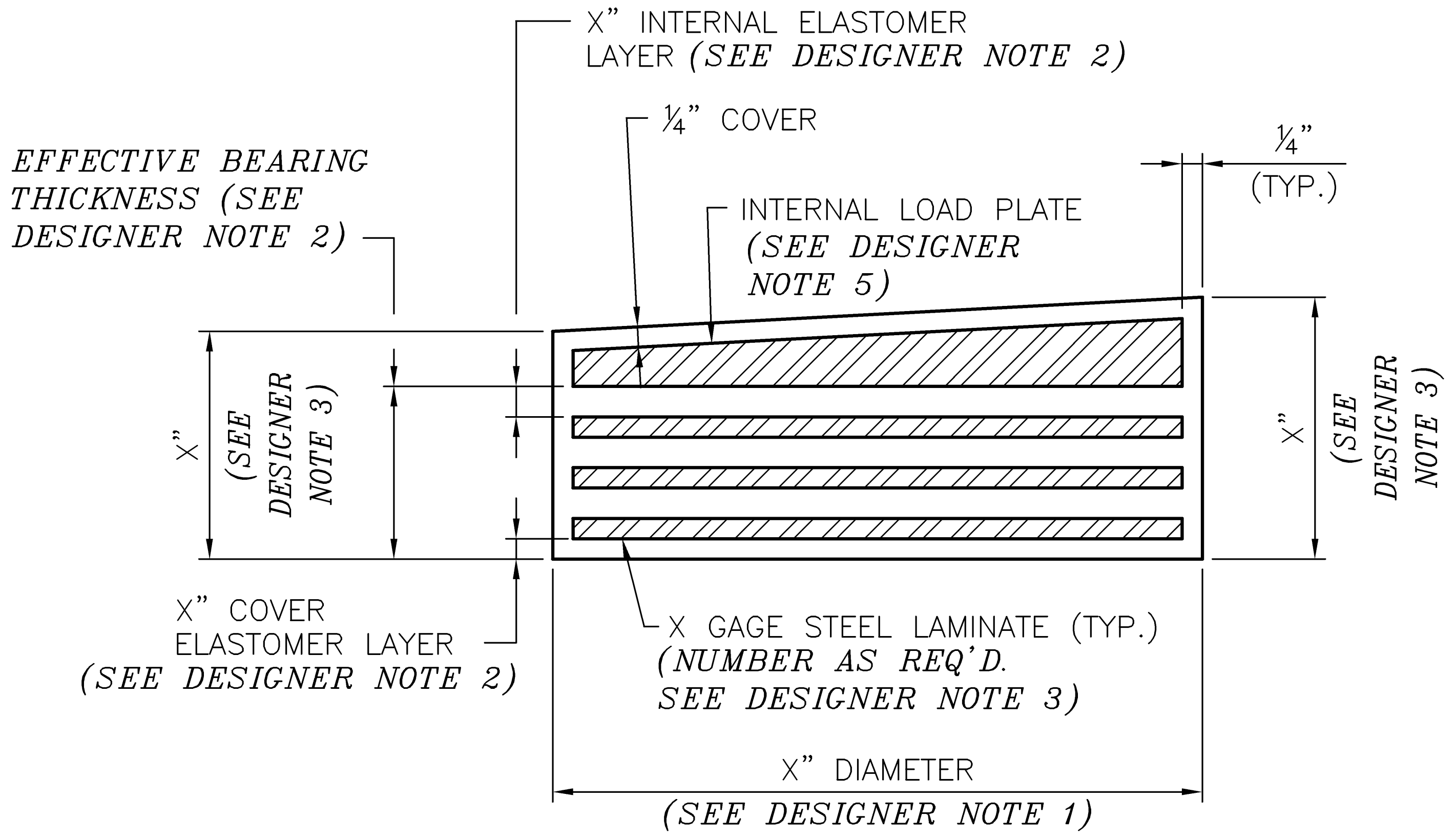


SECTION
SCALE: 1" = 1'–0"

A
5.11

DESIGNER NOTES:

1. *THE END OF THE BEAM AND SOLE PLATE MAY BE FLUSH, HOWEVER THE SOLE PLATE CANNOT EXTEND BEYOND THE BEAM END. IF REQUIRED, INCREASE THE LENGTH OF BEAM SO THAT IT STAYS FLUSH WITH THE SOLE PLATE.*
2. *DEPENDING ON THE BEARING PAD SIZE, THE WIDTH OF THE BRIDGE SEAT MAY NEED TO BE INCREASED TO MAINTAIN A MINIMUM OF 3" CLEARANCE.*



NOTES:

1. ELASTOMER SHALL HAVE A SHEAR MODULUS OF 0.160 KSI.
2. STEEL LAMINATES SHALL CONFORM TO ASTM A 1011 GRADE 36 OR HIGHER.
3. THE COMPRESSIVE DESIGN LOAD ON THE BEARING PAD IS XXX KIPS. THE COMPRESSIVE DESIGN STRESS IS THE RESULT OF DIVIDING THE COMPRESSIVE DESIGN LOAD BY THE AREA OF THE PAD AND IS EQUAL TO XXX KSI.
4. TAPERED INTERNAL LOAD PLATE SHALL CONFORM TO AASHTO M 270 GRADE 36.
5. ALL BEARINGS SHALL BE MARKED PRIOR TO SHIPPING. THE MARKS SHALL INCLUDE THE BEARING LOCATION ON THE BRIDGE, AND A 1/32" DEEP DIRECTION ARROW THAT POINTS UP–STATION. ALL MARKS SHALL BE PERMANENT AND BE VISIBLE AFTER BEARING IS INSTALLED.

ELASTOMERIC BEARING PAD
NOT TO SCALE

DESIGNER NOTES:

1. *BEARING DIAMETER SHALL BE SET TO WHOLE NUMBER INCREMENTS OF 1", FOR EXAMPLE: 6", 7", ETC. FOR NEBT BEAMS, MINIMUM BEARING DIAMETER SHALL BE SET AT 14" TO AID BEAM STABILITY DURING ERECTION.*
2. *A MINIMUM THICKNESS OF A SINGLE ELASTOMER LAYER SHALL BE ¼". BOTTOM COVER LAYER SHALL BE ¼" FOR BEARING WITH THICKNESS LESS OR EQUAL TO 5" AND ½" FOR THICKER BEARINGS. FURTHERMORE, IT SHALL BE NO THICKER THAN 70% OF THE INDIVIDUAL INTERNAL LAYER.*
3. *STEEL LAMINATES SHALL HAVE A MINIMUM THICKNESS OF 11 GAGE (⅛"). THICKNESS OF STEEL LAMINATES IN INCHES SHALL BE USED TO CALCULATE TOTAL BEARING THICKNESS.*
4. *ALL BEARINGS ON ANY SUBSTRUCTURE UNIT SHALL HAVE THE SAME NOMINAL COMPRESSIVE STIFFNESS AND SHALL BE SET LEVEL , EXCEPT FOR ADJACENT BEAM BRIDGES.*
5. *PROVIDE TAPERED INTERNAL LOAD PLATE IF SLOPE OF BEAM BOTTOM FLANGE DUE TO ROADWAY GRADE AND CAMBER EXCEEDS 1%.*

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BRIDGE STANDARDS

ELASTOMERIC BEARINGS
NEBT BEAMS

DRAWING NUMBER: 5.11

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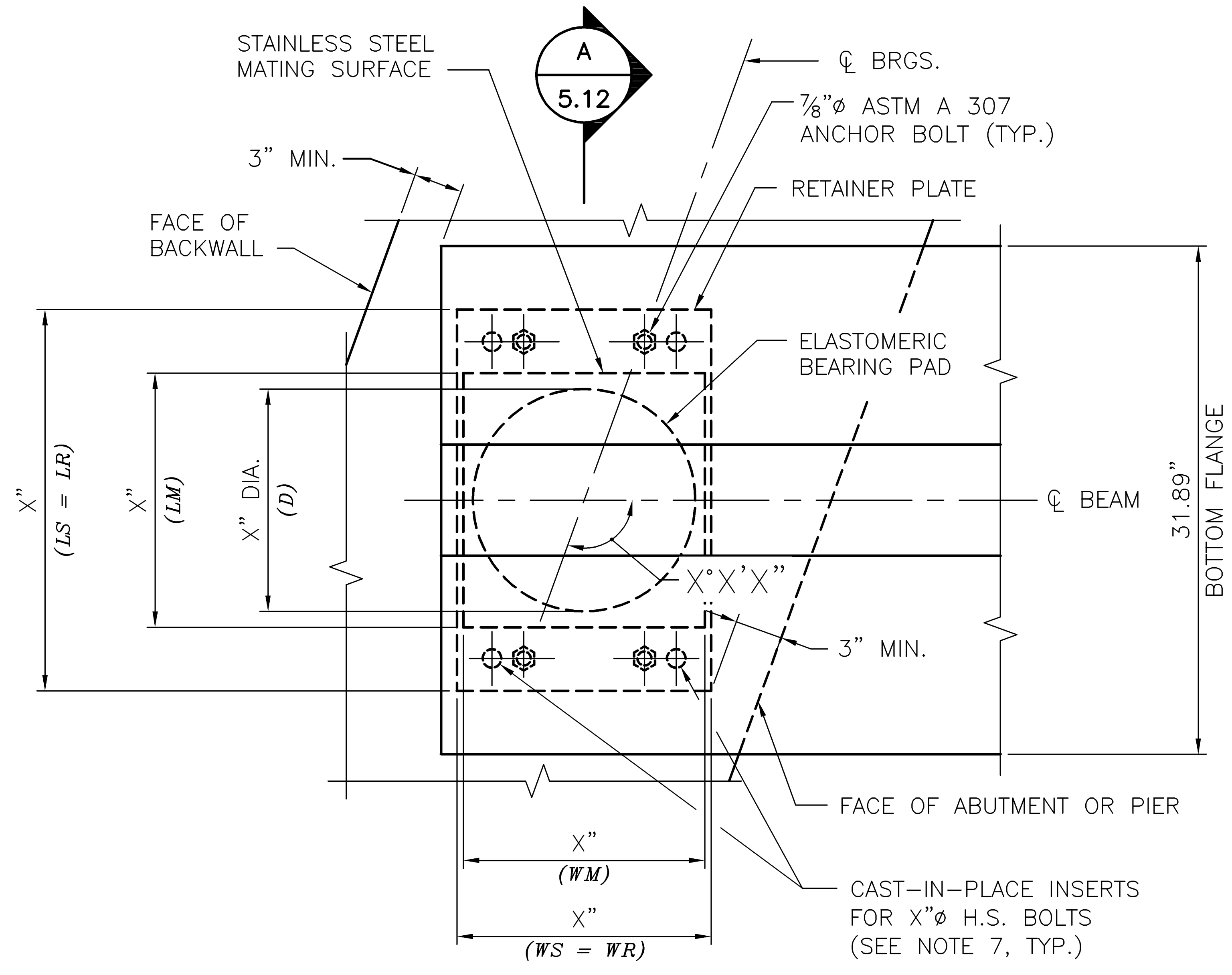
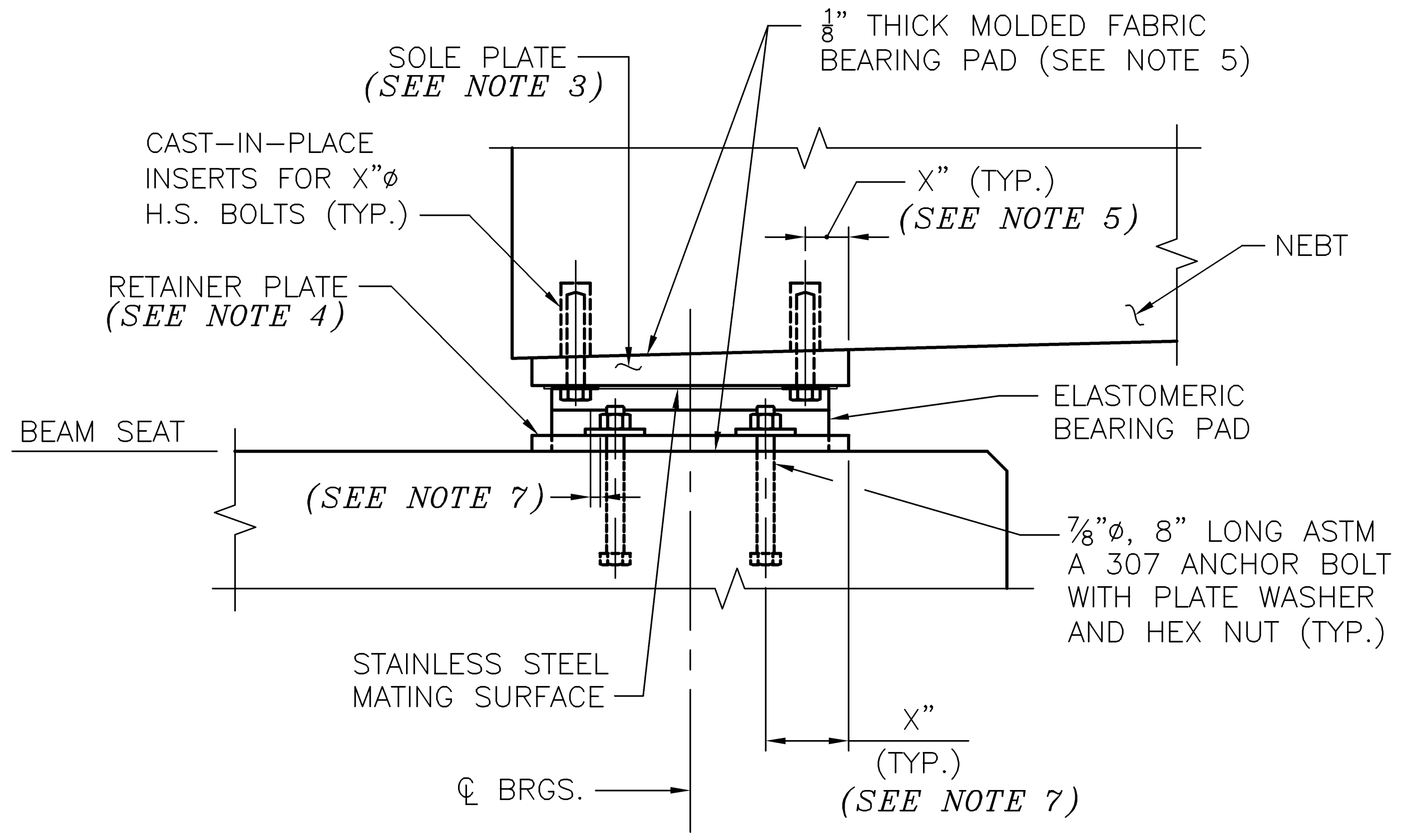
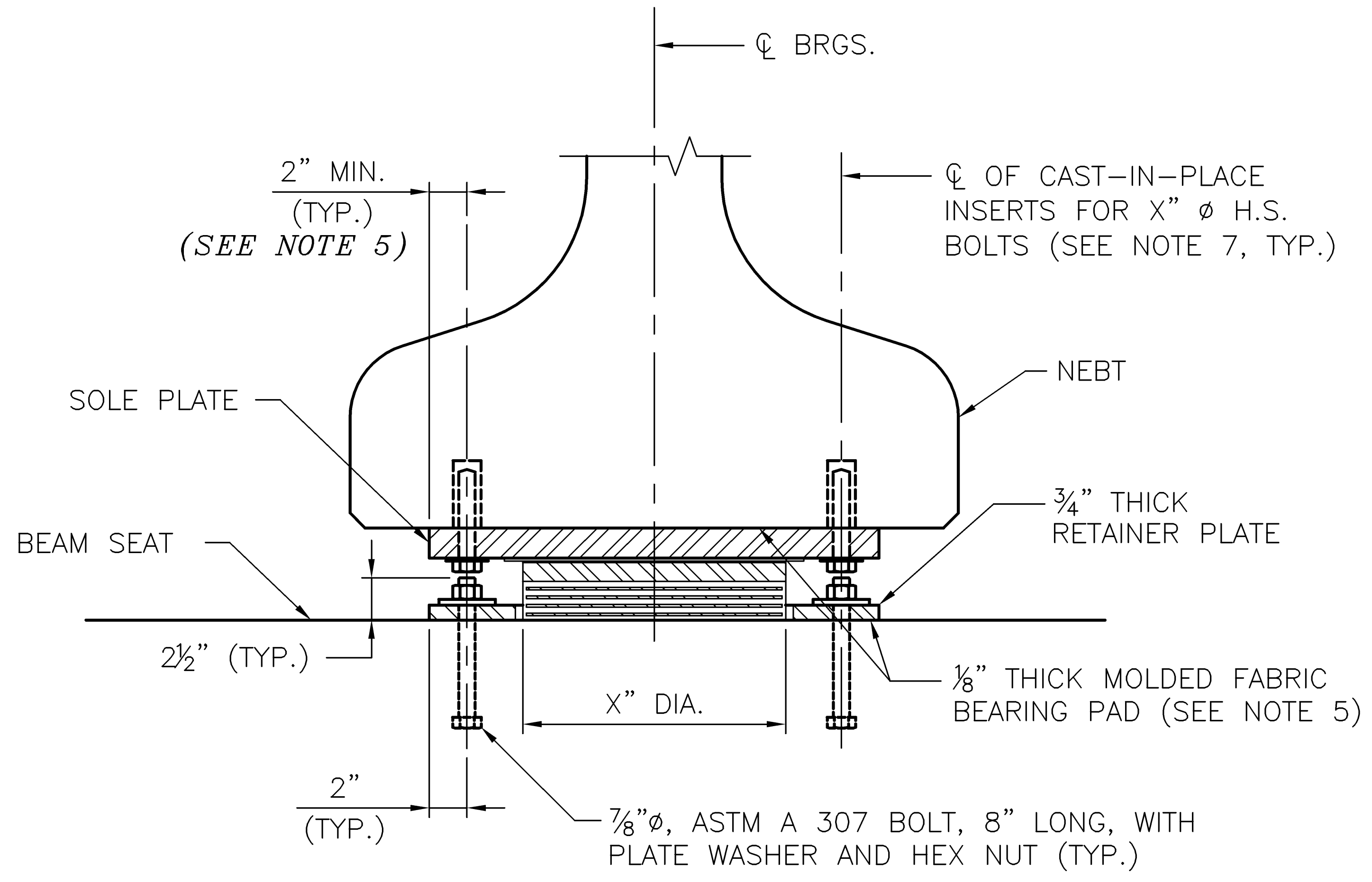


PLAN
SCALE: 1 1/2"=1'–0"

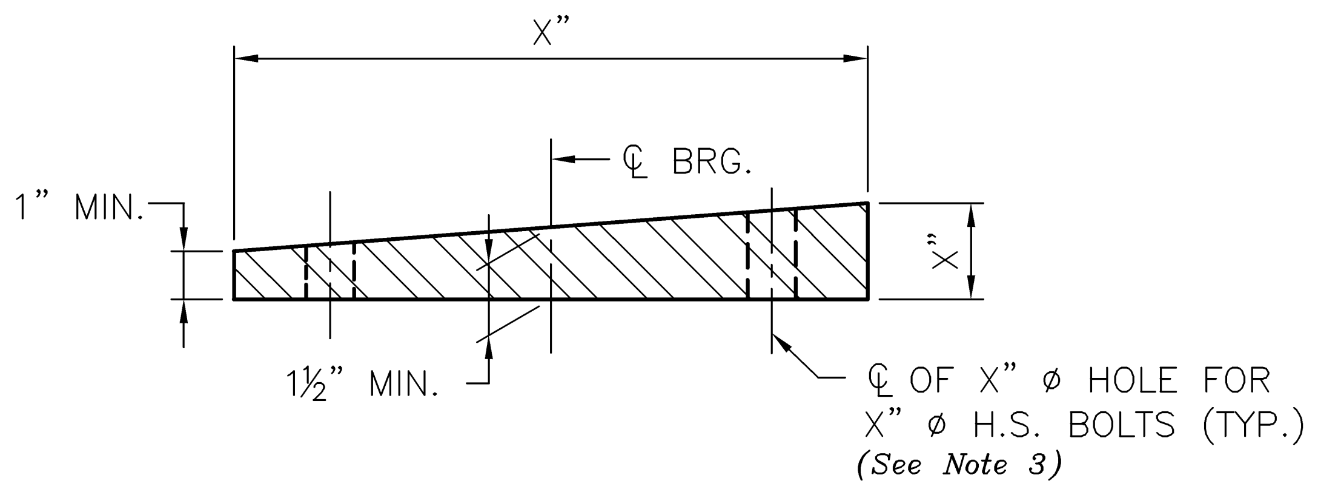

SOLE PLATE (SEE NOTE 3)
⅛" THICK MOLDED FABRIC BEARING PAD (SEE NOTE 5)
CAST–IN–PLACE INSERTS FOR X"ø H.S. BOLTS (TYP.)
X" (TYP.) (SEE NOTE 5)
NEBT
RETAINER PLATE (SEE NOTE 4)
ELASTOMERIC BEARING PAD
BEAM SEAT
(SEE NOTE 7)
⅞"ø, 8" LONG ASTM A 307 ANCHOR BOLT WITH PLATE WASHER AND HEX NUT (TYP.)
STAINLESS STEEL MATING SURFACE
X" (TYP.) (SEE NOTE 7)
℄ BRGS.

ELEVATION
SCALE: 1"=1'–0"


℄ BRGS.
2" MIN. (TYP.) (SEE NOTE 5)
℄ OF CAST–IN–PLACE INSERTS FOR X" ø H.S. BOLTS (SEE NOTE 7, TYP.)
NEBT
SOLE PLATE
¾" THICK RETAINER PLATE
BEAM SEAT
2½" (TYP.)
⅛" THICK MOLDED FABRIC BEARING PAD (SEE NOTE 5)
X" DIA.
2" (TYP.)
⅞"ø, ASTM A 307 BOLT, 8" LONG, WITH PLATE WASHER AND HEX NUT (TYP.)

NOTES:
1. STAINLESS STEEL MATING SURFACE SHALL BE TYPE 304 CONFORMING TO ASTM A 167/A 240 WITH A SURFACE FINISH OF 8 MICRO–INCHES RMS OR BETTER. IT SHALL BE WELDED WITH AN ALL–AROUND WELD TO THE SOLE PLATE SO THAT IT REMAINS FLAT AND IN FULL CONTACT WITH THE SOLE PLATE.
2. STAINLESS STEEL MATING SURFACE SHALL BE PROTECTED FROM SCRATCHES, GOUGES OR OTHER DAMAGE DURING SHIPMENT AND STORAGE.
3. THE SOLE PLATE ASSEMBLY SHALL BE METALIZED, EXCEPT FOR THE STAINLESS STEEL MATING SURFACE. THE RETAINER PLATE SHALL BE HOT–DIP GALVANIZED IN ACCORDANCE WITH AASHTO M 111.
4. STEEL SOLE AND RETAINER PLATES SHALL CONFORM TO AASHTO M 270 GRADE 36.
5. MOLDED FABRIC BEARING PAD SHALL CONFORM TO M.13.03.4.a. THE BEARING PAD UNDERNEATH THE RETAINER PLATE SHALL BE CUT TO MATCH ITS SILHOUETTE. THE BEARING PAD MUST SIT ON CONCRETE AND NOT ON FABRIC PAD.
6. BOLTS, PLATE WASHERS AND NUTS SHALL BE HOT–DIP GALVANIZED IN ACCORDANCE WITH AASHTO M 232.
7. CAST–IN–PLACE INSERTS SHALL HAVE AN ULTIMATE SHEAR CAPACITY OF XX KIPS.

SECTION A 5.12
SCALE: 1 1/2" = 1'–0"



SOLE PLATE DETAIL
SCALE: 3"=1'–0"

DESIGNER NOTES:

1. *D = DIAMETER OF ELASTOMERIC BEARING PAD;*
   LM = LENGTH OF STAINLESS STEEL MATING SURFACE = D + 2";
   WM = WIDTH OF STAINLESS STEEL MATING SURFACE = D + (CALCULATED TOTAL THERMAL MOVEMENT RANGE X 1.5), ROUNDED UP TO THE NEAREST ½";
   LS = LENGTH OF SOLE PLATE = LM + 8";
   WS = WIDTH OF SOLE PLATE = WM + 1";
   LR = LENGTH OF RETAINER PLATE = LS;
   WR = WIDTH OF RETAINER PLATE = WS.
2. *THE END OF THE BEAM AND SOLE PLATE MAY BE FLUSH, HOWEVER THE SOLE PLATE CANNOT EXTEND BEYOND THE BEAM END. IF REQUIRED, INCREASE THE LENGTH OF BEAM SO THAT IT ALWAYS STAYS FLUSH WITH SOLE PLATE.*
3. *SOLE PLATE MUST BE TAPERED IF SLOPE OF BEAM BOTTOM FLANGE DUE TO ROADWAY GRADE AND CAMBER EXCEEDS 1%. PROVIDE DETAIL OF TAPERED SOLE PLATE AS SHOWN ON THIS SHEET. DIAMETER OF HOLE = (BOLT DIAMETER X 1.25), ROUNDED UP TO NEAREST ¼".*
4. *MODIFY RETAINER PLATE AS REQUIRED AND PROVIDE DETAIL.*
5. *SET CENTERLINE OF CAST–IN–PLACE INSERTS ON STRAND LOCATION AND OMIT THOSE COLUMNS OF STRANDS FOR THE SPECIFIC STRAND PATTERN.*
6. *DESIGNER MUST PROVIDE SUFFICIENT VERTICAL CLEARANCE, WHICH IS BASED ON THE TOTAL HEIGHT OF THE BEARING ASSEMBLY, FOR THE BOLTS SECURING SOLE PLATE, TO ALLOW FOR THEIR COMPLETED UNSCREWING AND SUBSEQUENT REMOVAL OF THE RETAINER PLATE AND THE BEARING PAD.*
7. *DESIGNER MUST ALSO PROVIDE SUFFICIENT HORIZONTAL CLEARANCE AFTER MAXIMUM THERMAL MOVEMENTS BETWEEN THE CENTERLINES OF THE CAST–IN–PLACE INSERTS AND THE NUTS SECURING RETAINER PLATE TO AVOID THEIR INTERFERENCE DURING POSSIBLE REMOVAL OF THE RETAINER PLATE AND THE BEARING PAD.*

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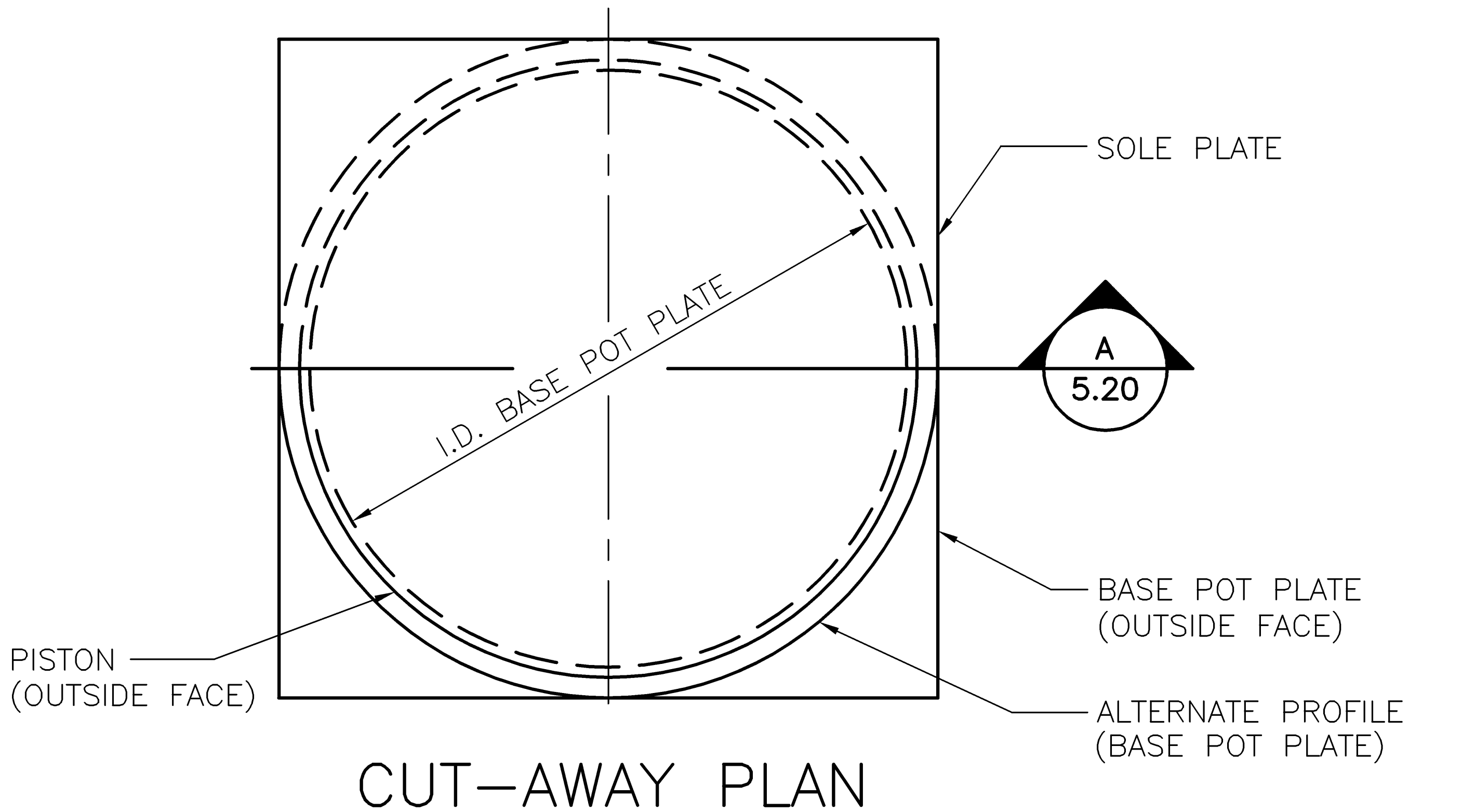
BRIDGE STANDARDS

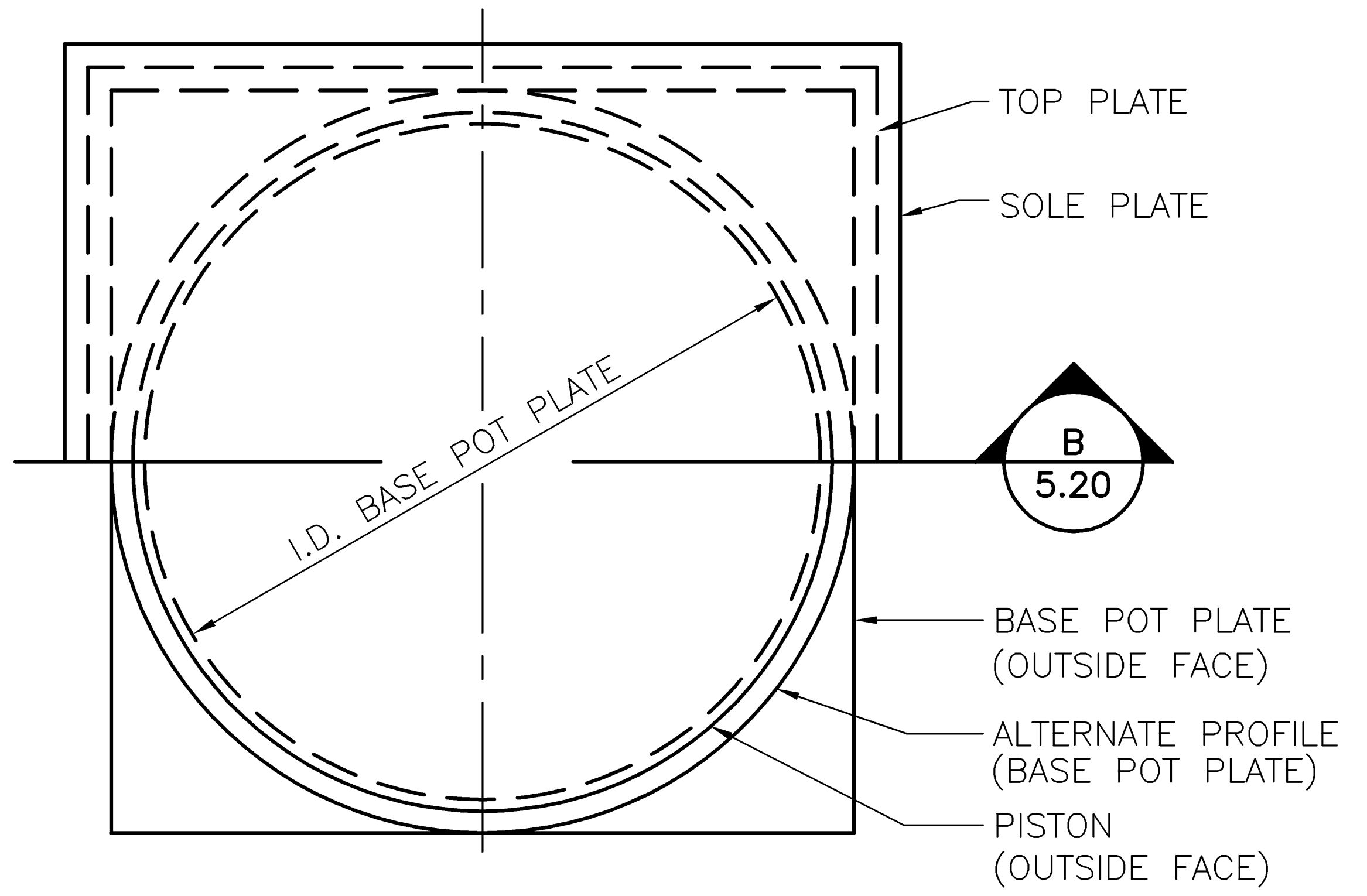
ELASTOMERIC BEARINGS
SLIDING BEARINGS

DRAWING NUMBER: 5.12


SOLE PLATE
I.D. BASE POT PLATE
A
5.20
BASE POT PLATE (OUTSIDE FACE)
ALTERNATE PROFILE (BASE POT PLATE)
PISTON (OUTSIDE FACE)

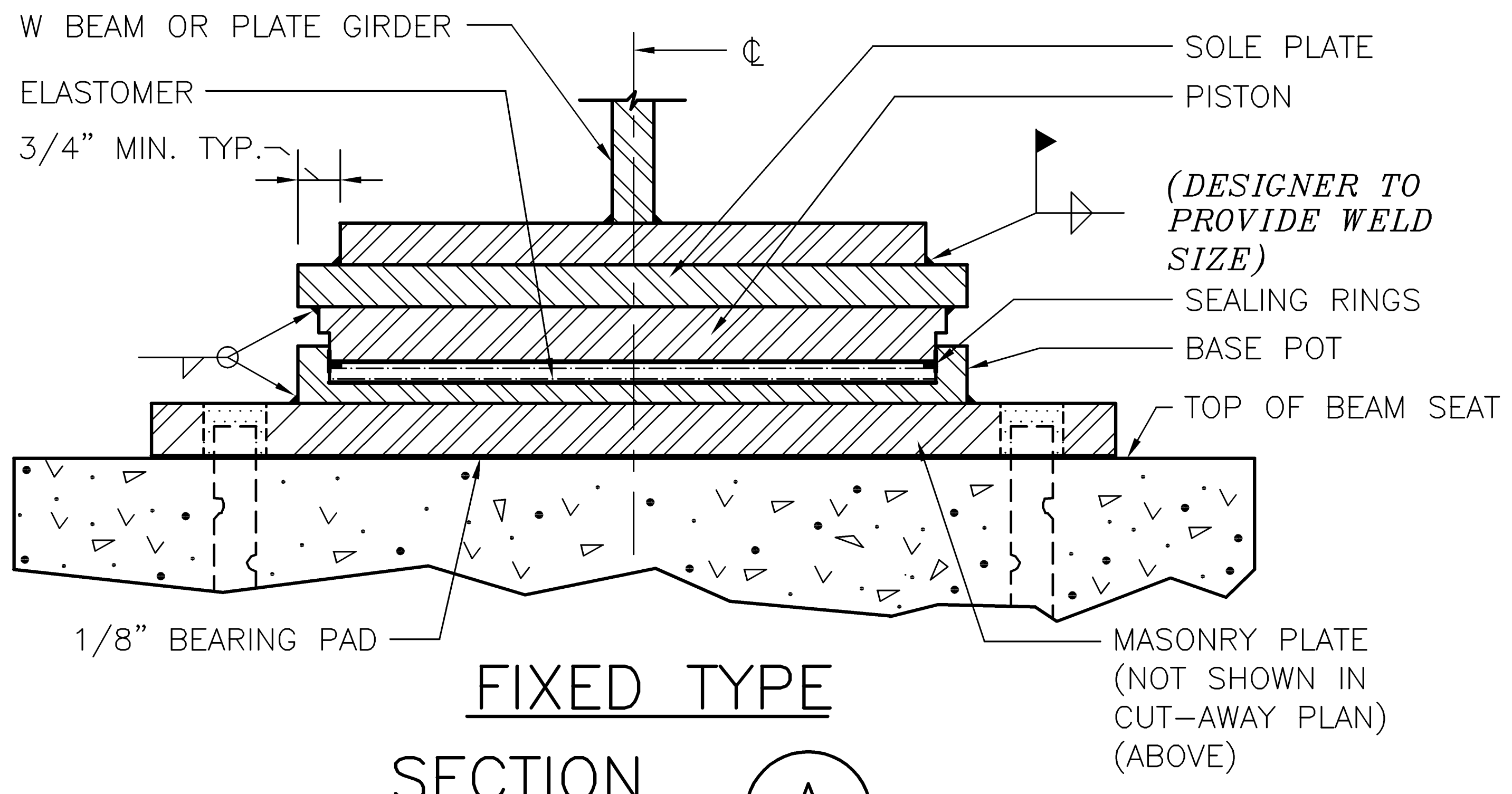
CUT–AWAY PLAN

(HALF OF SOLE PLATE SHOWN)



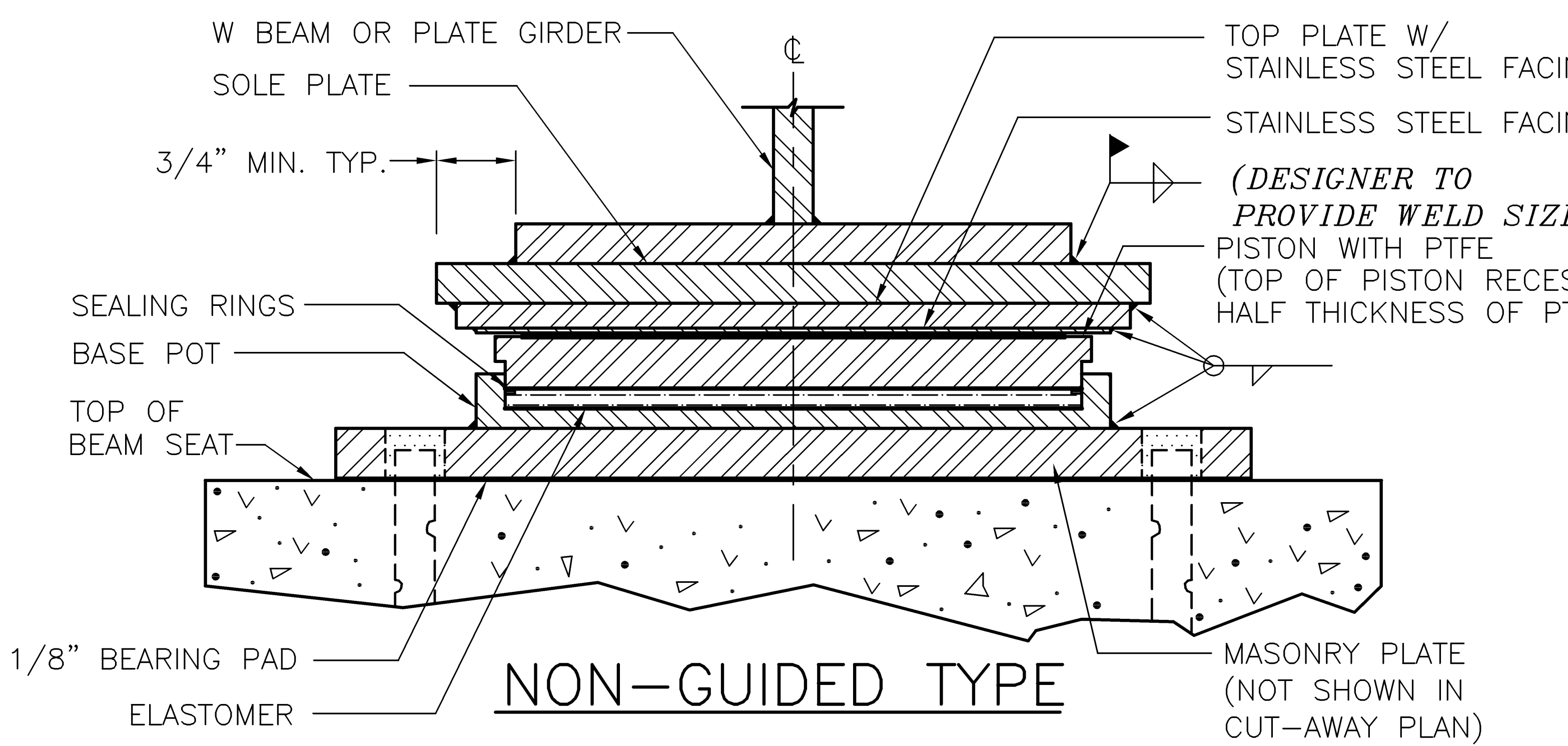
CUT–AWAY PLAN

(HALF OF SOLE AND TOP PLATES SHOWN)



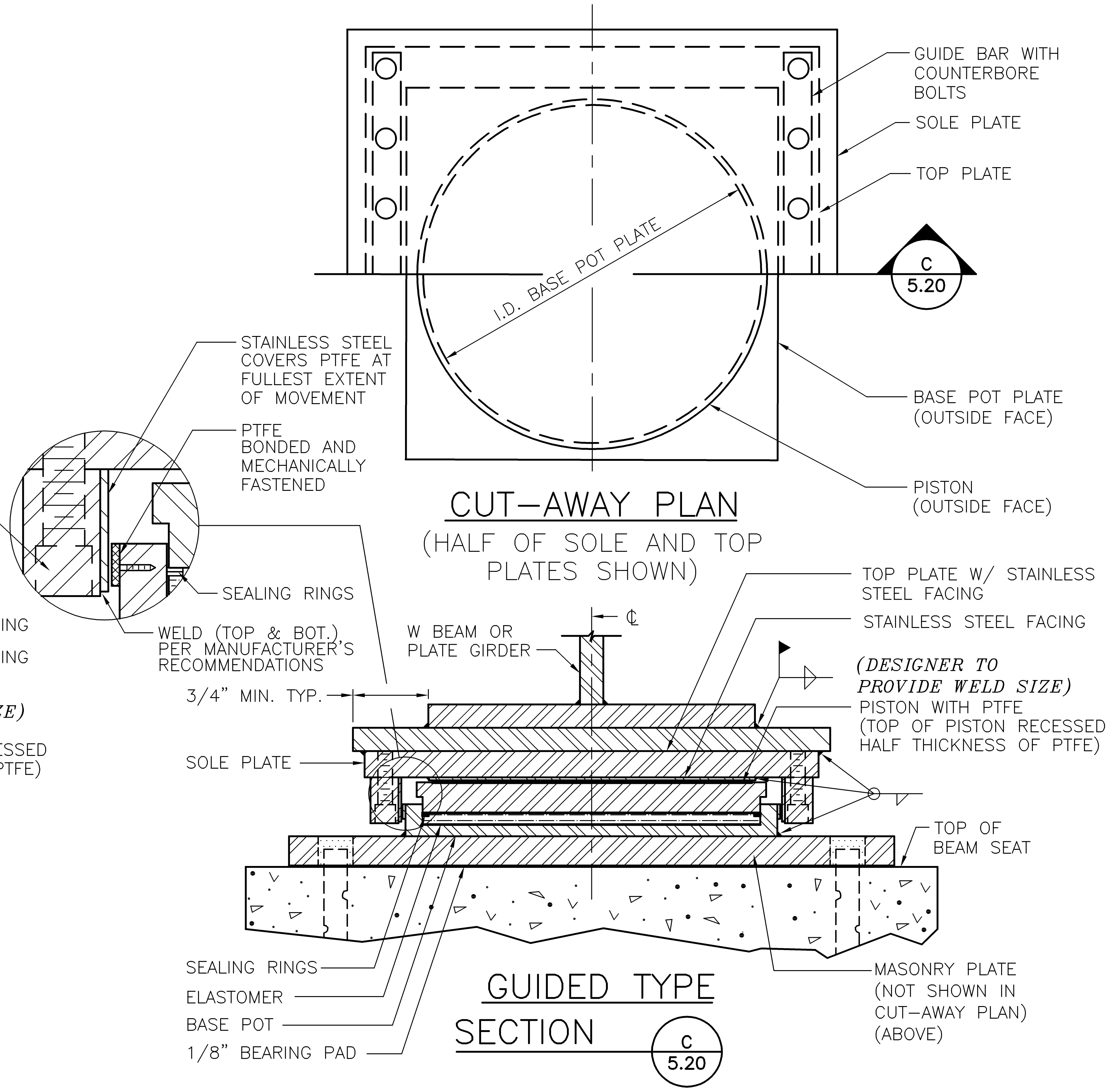
FIXED TYPE

SECTION A 5.20


W BEAM OR PLATE GIRDER
SOLE PLATE
3/4" MIN. TYP.
℄
TOP PLATE W/ STAINLESS STEEL FACING
STAINLESS STEEL FACING
(DESIGNER TO PROVIDE WELD SIZE)
PISTON WITH PTFE (TOP OF PISTON RECESSED HALF THICKNESS OF PTFE)
SEALING RINGS
BASE POT
TOP OF BEAM SEAT
1/8" BEARING PAD
ELASTOMER
MASONRY PLATE (NOT SHOWN IN CUT–AWAY PLAN) (ABOVE)

NON–GUIDED TYPE

SECTION B 5.20

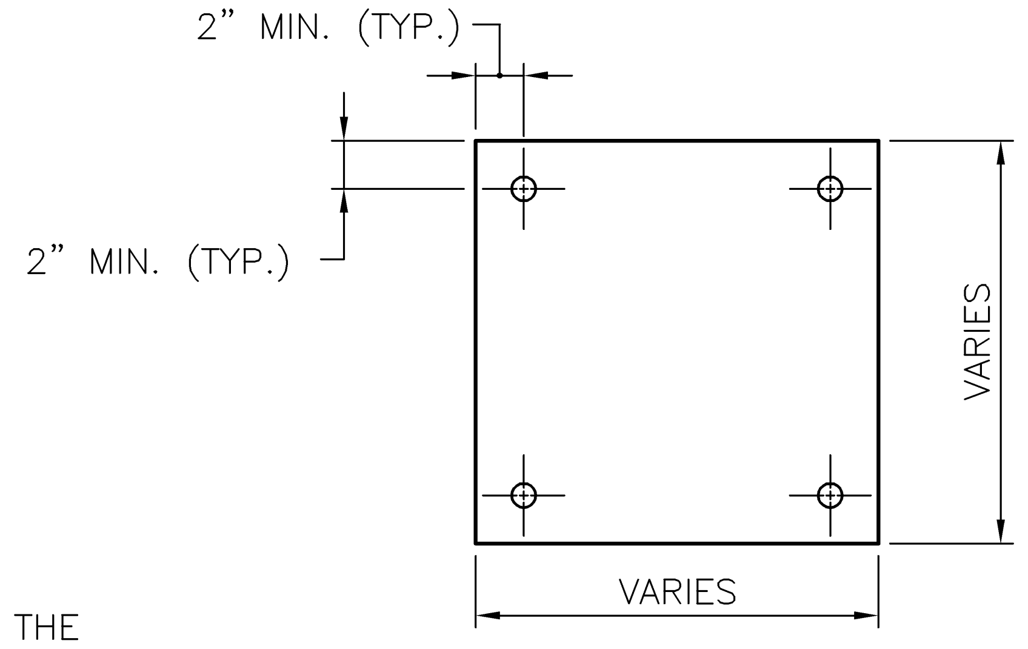

GUIDE BAR WITH COUNTERBORE BOLTS
SOLE PLATE
TOP PLATE
I.D. BASE POT PLATE
C
5.20
BASE POT PLATE (OUTSIDE FACE)
PISTON (OUTSIDE FACE)
STAINLESS STEEL COVERS PTFE AT FULLEST EXTENT OF MOVEMENT
PTFE BONDED AND MECHANICALLY FASTENED
COUNTERBORE BOLT
SEALING RINGS
WELD (TOP & BOT.) PER MANUFACTURER'S RECOMMENDATIONS
W BEAM OR PLATE GIRDER
3/4" MIN. TYP.
℄
TOP PLATE W/ STAINLESS STEEL FACING
STAINLESS STEEL FACING
(DESIGNER TO PROVIDE WELD SIZE)
PISTON WITH PTFE (TOP OF PISTON RECESSED HALF THICKNESS OF PTFE)
SOLE PLATE
TOP OF BEAM SEAT
SEALING RINGS
ELASTOMER
BASE POT
1/8" BEARING PAD
MASONRY PLATE (NOT SHOWN IN CUT–AWAY PLAN) (ABOVE)

CUT–AWAY PLAN

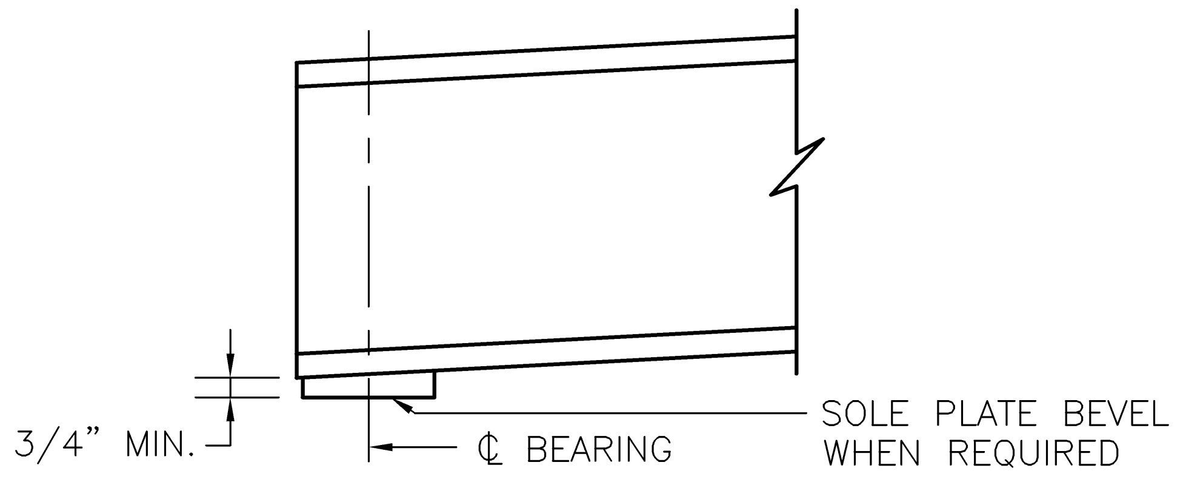
(HALF OF SOLE AND TOP PLATES SHOWN)

GUIDED TYPE

SECTION C 5.20

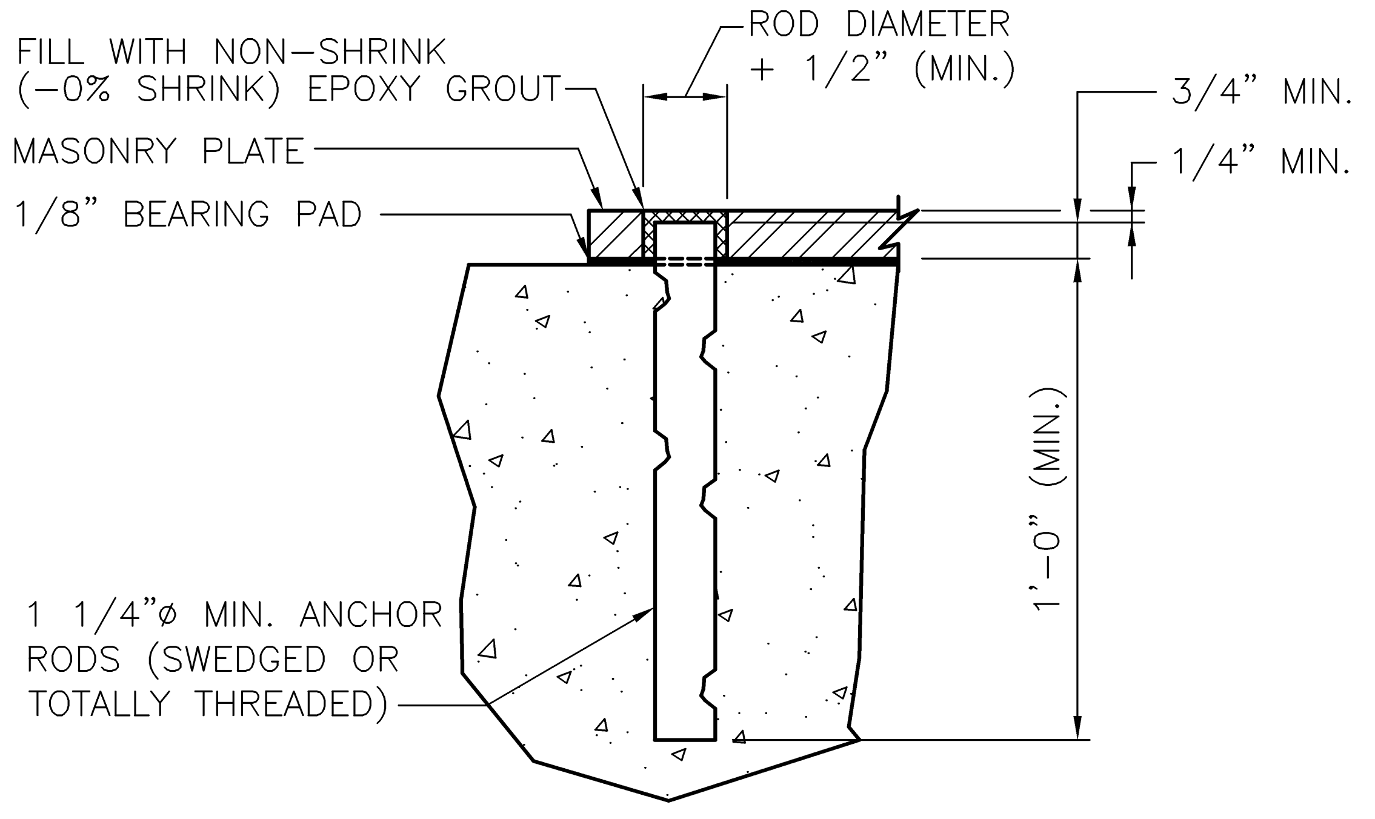


MASONRY PLATE



BEVEL SOLE PLATES

(STEEL BEAMS ONLY)


FILL WITH NON–SHRINK (–0% SHRINK) EPOXY GROUT
ROD DIAMETER + 1/2" (MIN.)
MASONRY PLATE
1/8" BEARING PAD
3/4" MIN.
1/4" MIN.
1'–0" (MIN.)
1 1/4"ø MIN. ANCHOR RODS (SWEDGED OR TOTALLY THREADED)

ANCHOR ROD DETAIL

THIS SHEET IS NOT TO SCALE

NOTES:

1. FOR DESIGN, MATERIAL, FABRICATION AND GENERAL CONSTRUCTION REQUIREMENTS, REFER TO THE R.I. STD. SPECIFICATIONS AND ANY APPLICABLE SPECIAL PROVISIONS OF THE SPECIFICATIONS. THE ENTIRE BEARING ASSEMBLY EXCEPT FOR THE PTFE (POLYTETRAFLUOROETHYLENE) AND STAINLESS STEEL PLATE SHALL BE ZINC METALLIZED OR GALVANIZED.
2. THE OVERALL HEIGHT OF THE BEARINGS, WHICH VARIES WITH TYPE, CAPACITY AND MANUFACTURER, MUST BE KNOWN BEFORE THE EXACT BEAM SEAT ELEVATIONS CAN BE DETERMINED. SEE SECTION 828. OF THE R.I. STD. SPECIFICATIONS.
3. MASONRY BASE PLATES SHALL BE PLACED ON 1/8" PREFORMED FABRIC PAD AS SPECIFIED IN SECTION M.13.04 OF THE RIDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION.
4. ANCHOR ROD SPACING SHALL BE COORDINATED WITH THE BEARING MANUFACTURER.
5. ANCHOR RODS SHALL BE GALVANIZED AASHTO DESIGNATION M 270 (GRADE 36).
6. BEARING INSTALLATION SHALL BE IN STRICT CONFORMANCE WITH THE R.I. STD. SPECIFICATIONS OR ANY APPLICABLE SPECIAL PROVISIONS OF THE SPECIFICATIONS AND THE MANUFACTURER'S RECOMMENDATIONS.
7. AFTER SETTING MASONRY PLATES, ANCHOR ROD HOLES SHALL BE FILLED WITH NON–SHRINK (–0% SHRINK) EPOXY GROUT.
8. PTFE INDICATES POLYTETRAFLUOROETHYLENE.
9. SOLE PLATES MUST BE TAPERED IF SLOPE OF BEAM BOTTOM FLANGE DUE TO ROADWAY GRADE AND CAMBER EXCEEDS 1%.

DESIGNER NOTES:

1. *CONSTRUCTION DRAWINGS SHALL CONTAIN ALL THE REQUIRED INFORMATION PER THE RIDOT LRFD BRIDGE DESIGN MANUAL – SECTION 14 (INCLUDING REQUIREMENTS RELATED TO THE BEARING INSTALLATION SETTING TABLE).*
2. *PROVISIONS FOR UPLIFT SHALL BE MADE WHEN UPLIFT RESTRAINT IS REQUIRED BY DESIGN. DETAILS OF THE UPLIFT BEARING SHALL BE COORDINATED WITH THE BEARING MANUFACTURER. ANCHOR ROD DETAIL SHALL BE APPROPRIATELY REDESIGNED.*
3. *ANCHOR ROD DIAMETER SHALL BE DETERMINED IN ACCORDANCE WITH THE GROUP LOADING REQUIREMENTS SPECIFIED IN THE AASHTO SPECIFICATION, (INCLUDING SEISMIC REQUIREMENTS)*
4. *DIMENSIONS, SIZES OF PLATES, AND WELDS NOT SHOWN ARE DEPENDENT UPON DESIGN LOADS, BEARING TYPE AND CAPACITY, AND THE MANUFACTURER. THE SHOP DRAWINGS, PREPARED BY THE MANUFACTURER, SHALL PROVIDE ALL PERTINENT BEARING INFORMATION. THE FINAL BEAM SEAT ELEVATIONS WILL BE DETERMINED AFTER APPROVAL OF THE SHOP DRAWINGS.*
5. *THE NOTES SHOWN ON THIS DRAWING SHALL BE PROVIDED ON THE CONTRACT DRAWINGS, WHERE APPLICABLE.*

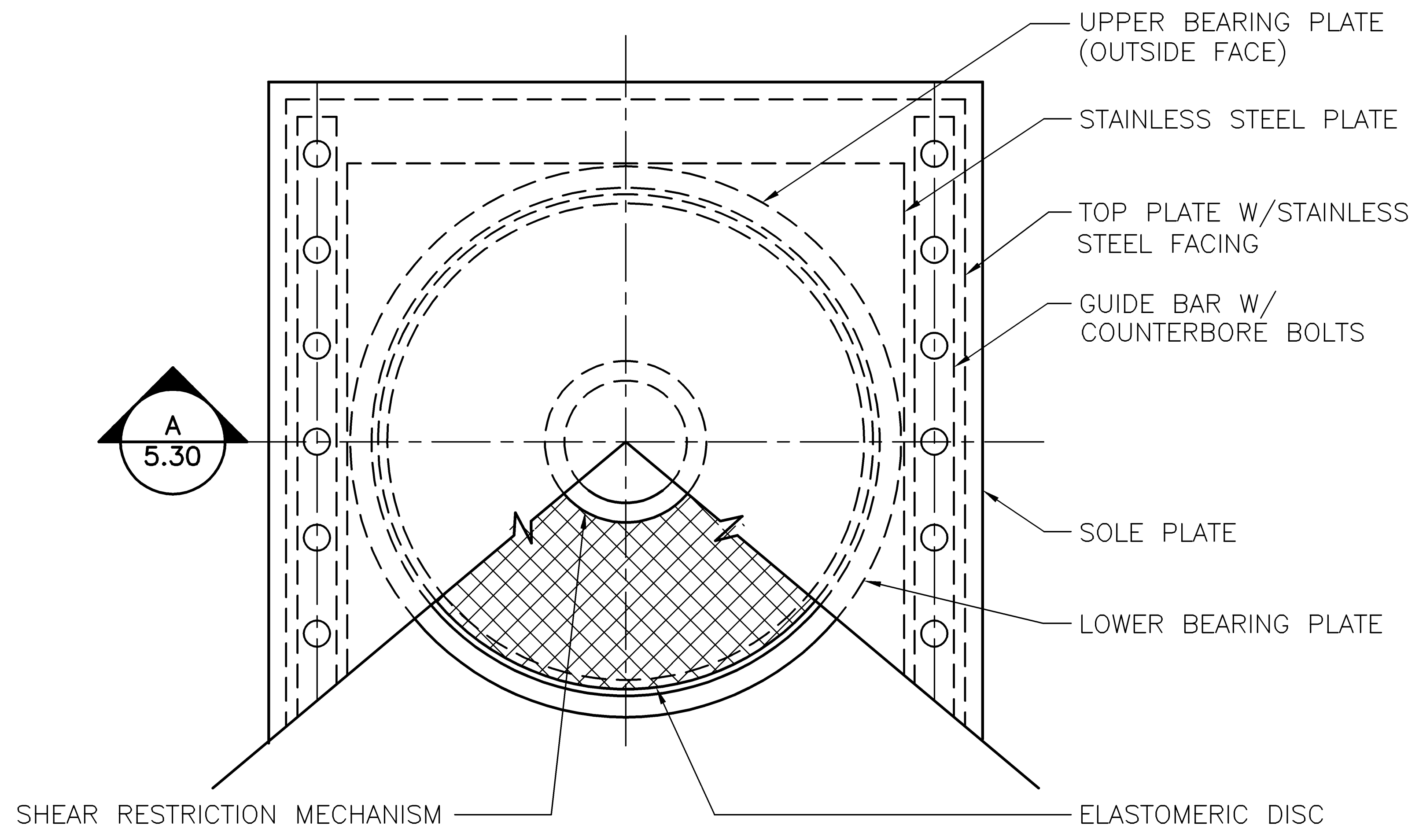
REVISIONS	
No.	DATE

RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

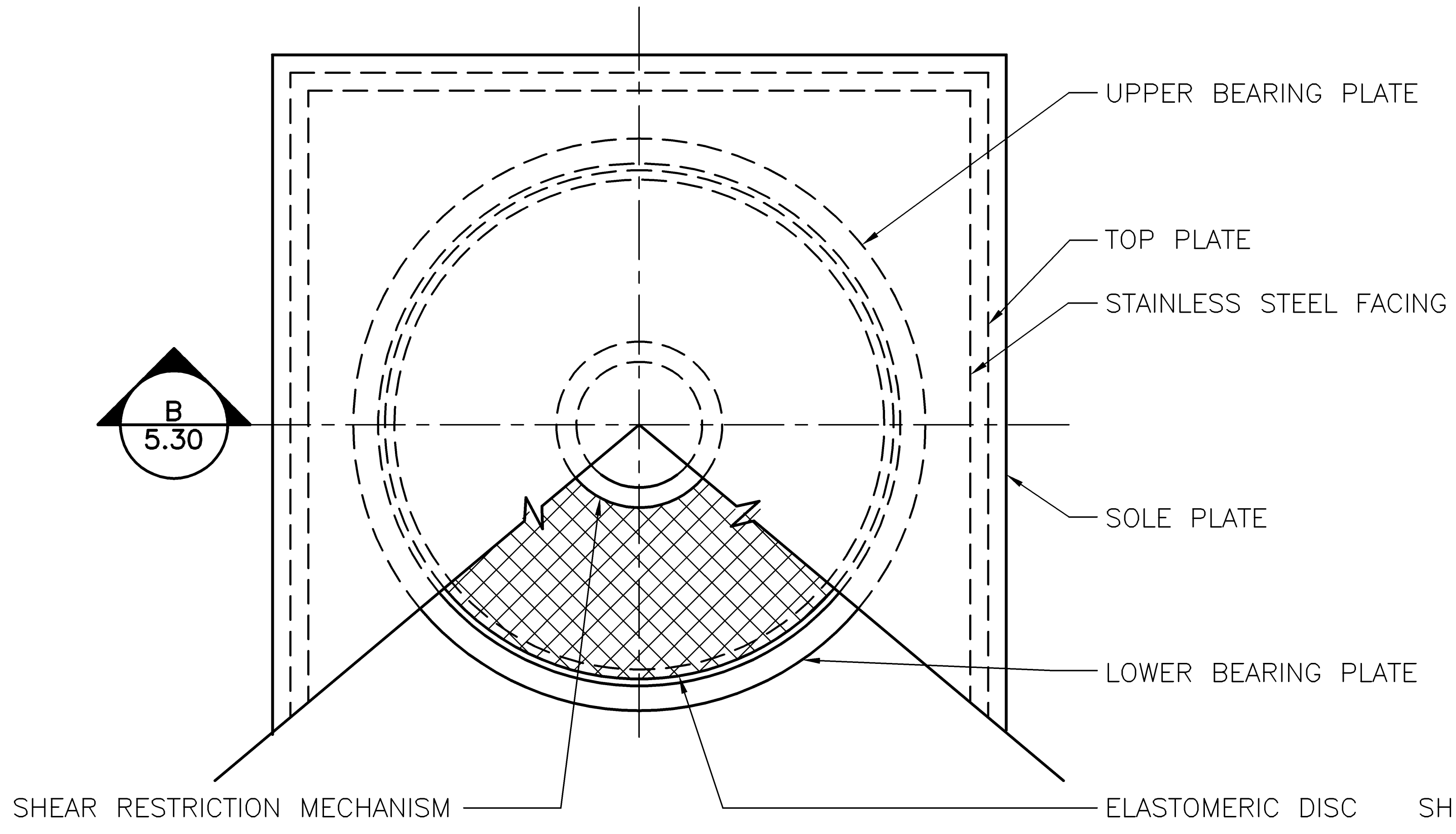
BRIDGE STANDARDS

MULTI–ROTATIONAL BEARING
POT BEARINGS

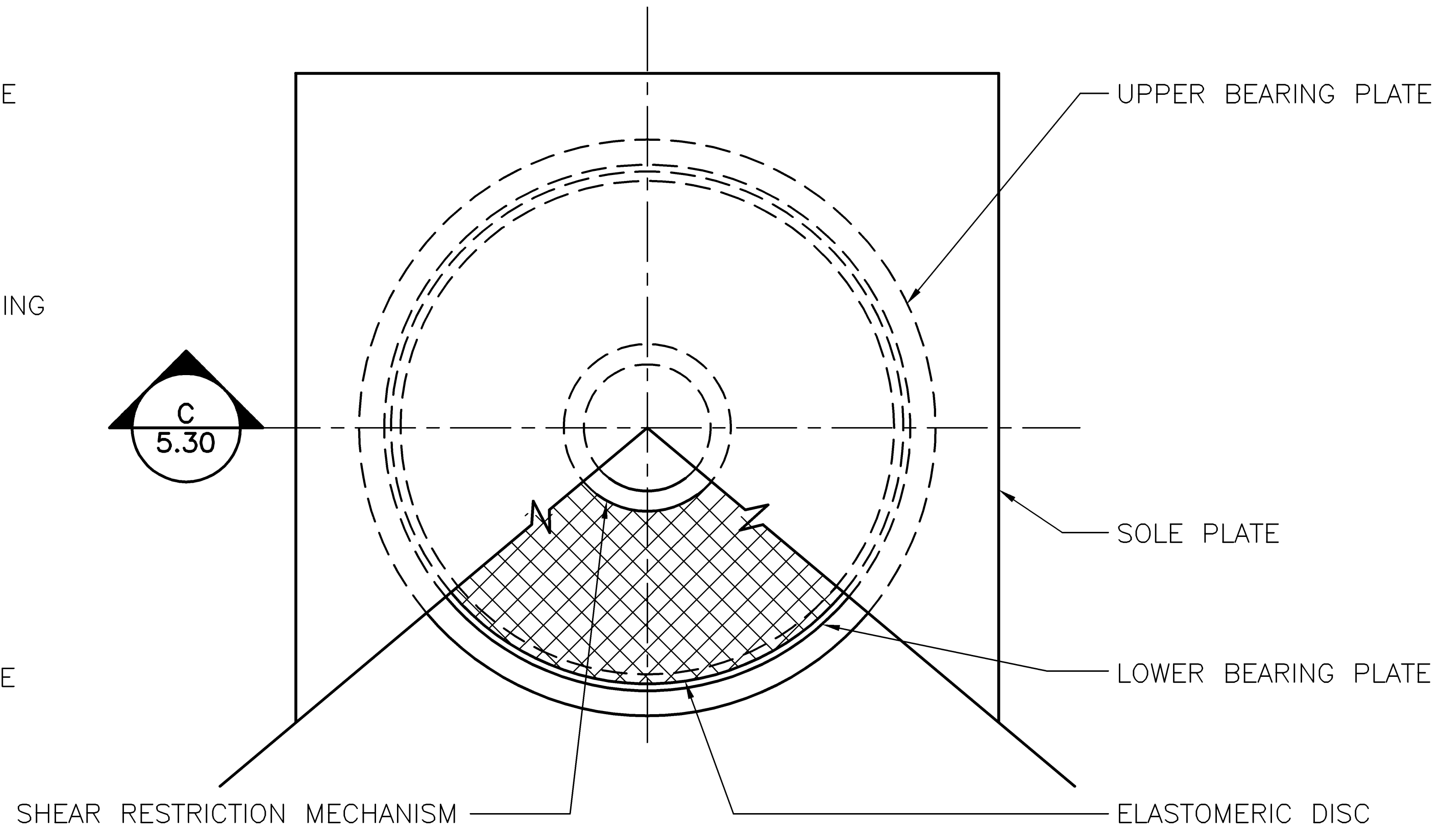
DRAWING NUMBER: 5.20


UPPER BEARING PLATE (OUTSIDE FACE)
STAINLESS STEEL PLATE
TOP PLATE W/STAINLESS STEEL FACING
GUIDE BAR W/ COUNTERBORE BOLTS
A
5.30
N
N
SOLE PLATE
LOWER BEARING PLATE
SHEAR RESTRICTION MECHANISM
ELASTOMERIC DISC

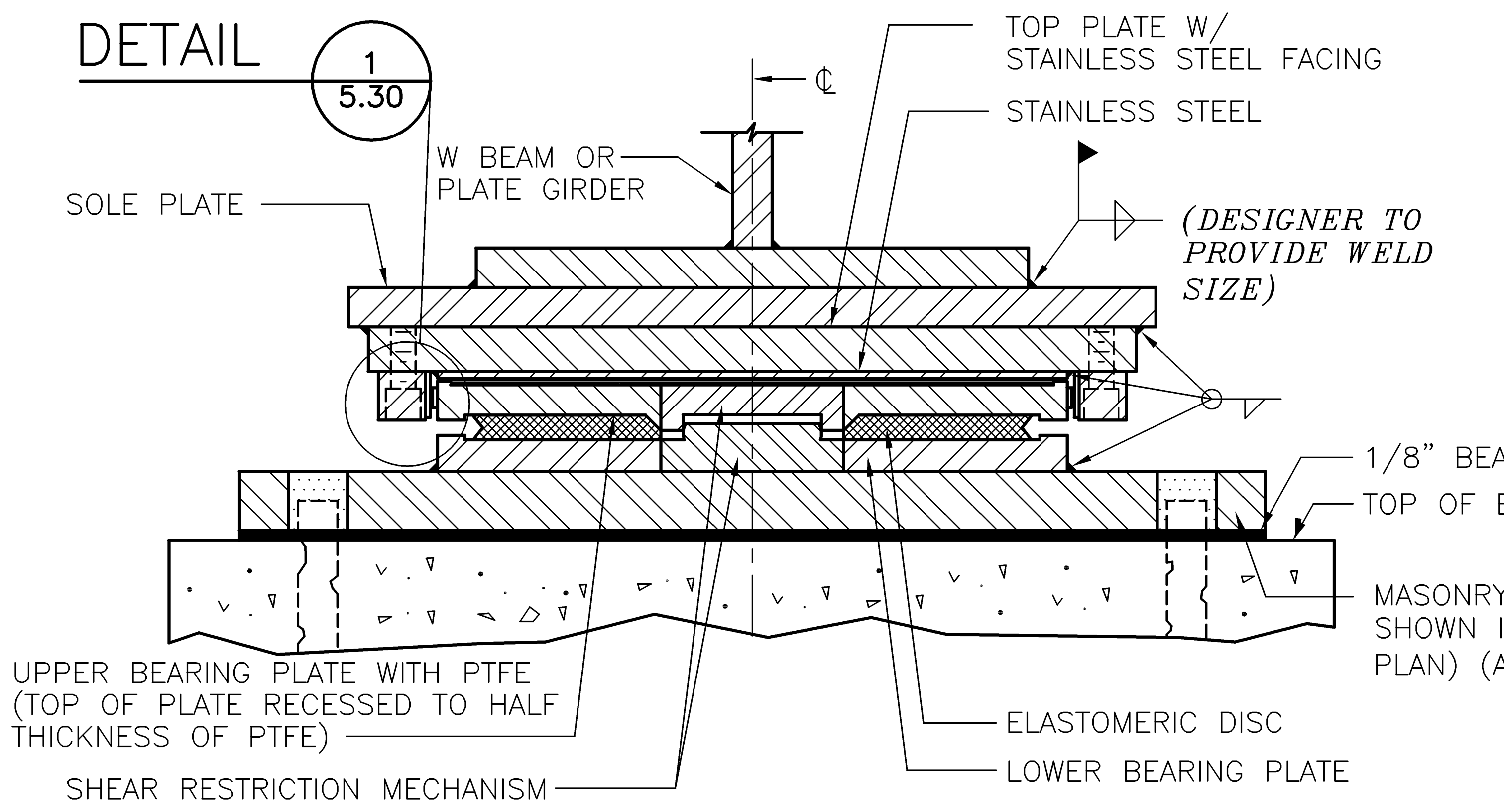
CUT–AWAY PLAN



CUT–AWAY PLAN

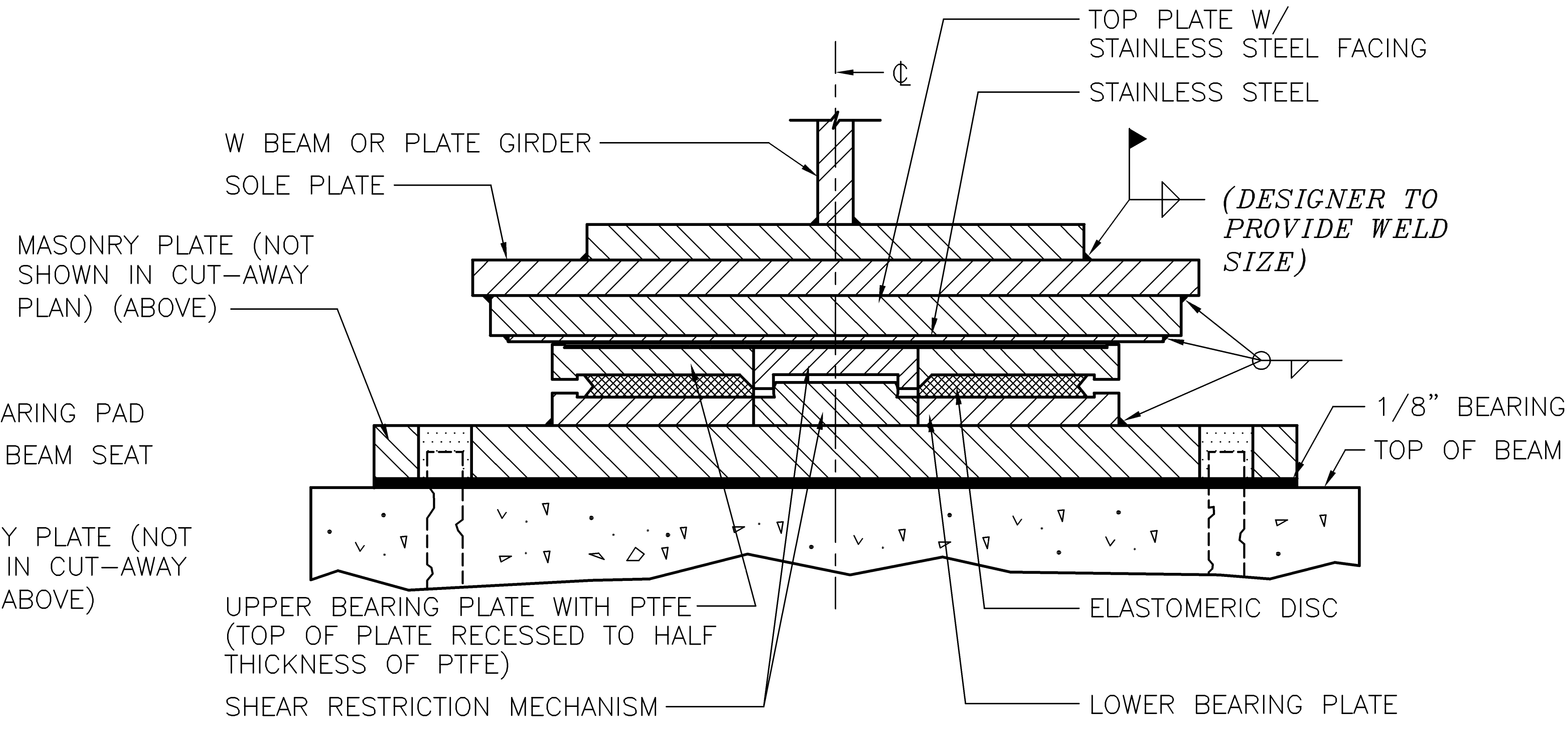


CUT–AWAY PLAN


DETAIL 1/5.30
℄
TOP PLATE W/ STAINLESS STEEL FACING
STAINLESS STEEL
W BEAM OR PLATE GIRDER
SOLE PLATE
(DESIGNER TO PROVIDE WELD SIZE)
1/8" BEARING PAD
TOP OF BEAM SEAT
MASONRY PLATE (NOT SHOWN IN CUT–AWAY PLAN) (ABOVE)
UPPER BEARING PLATE WITH PTFE (TOP OF PLATE RECESSED TO HALF THICKNESS OF PTFE)
ELASTOMERIC DISC
LOWER BEARING PLATE
SHEAR RESTRICTION MECHANISM

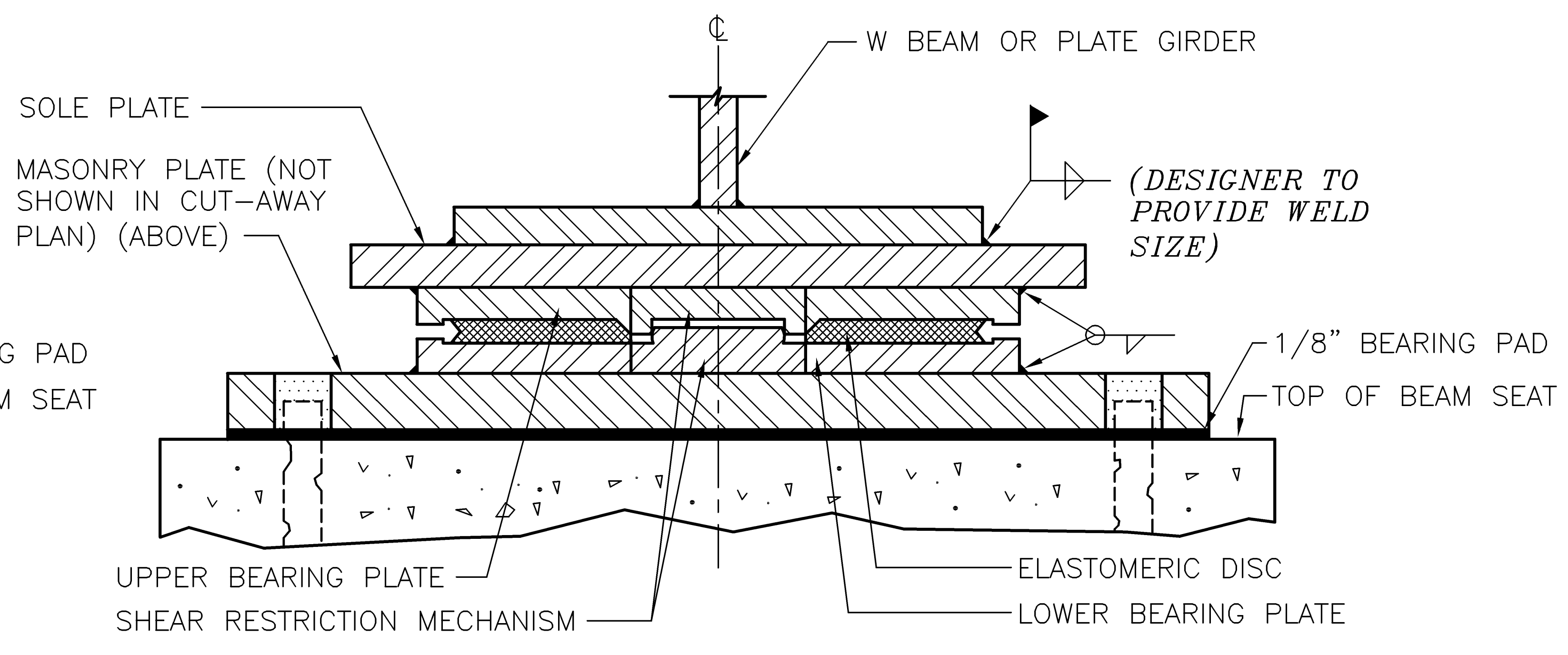
GUIDED TYPE

SECTION A/5.30


℄
TOP PLATE W/ STAINLESS STEEL FACING
STAINLESS STEEL
W BEAM OR PLATE GIRDER
SOLE PLATE
(DESIGNER TO PROVIDE WELD SIZE)
MASONRY PLATE (NOT SHOWN IN CUT–AWAY PLAN) (ABOVE)
1/8" BEARING PAD
TOP OF BEAM SEAT
UPPER BEARING PLATE WITH PTFE (TOP OF PLATE RECESSED TO HALF THICKNESS OF PTFE)
ELASTOMERIC DISC
SHEAR RESTRICTION MECHANISM
LOWER BEARING PLATE

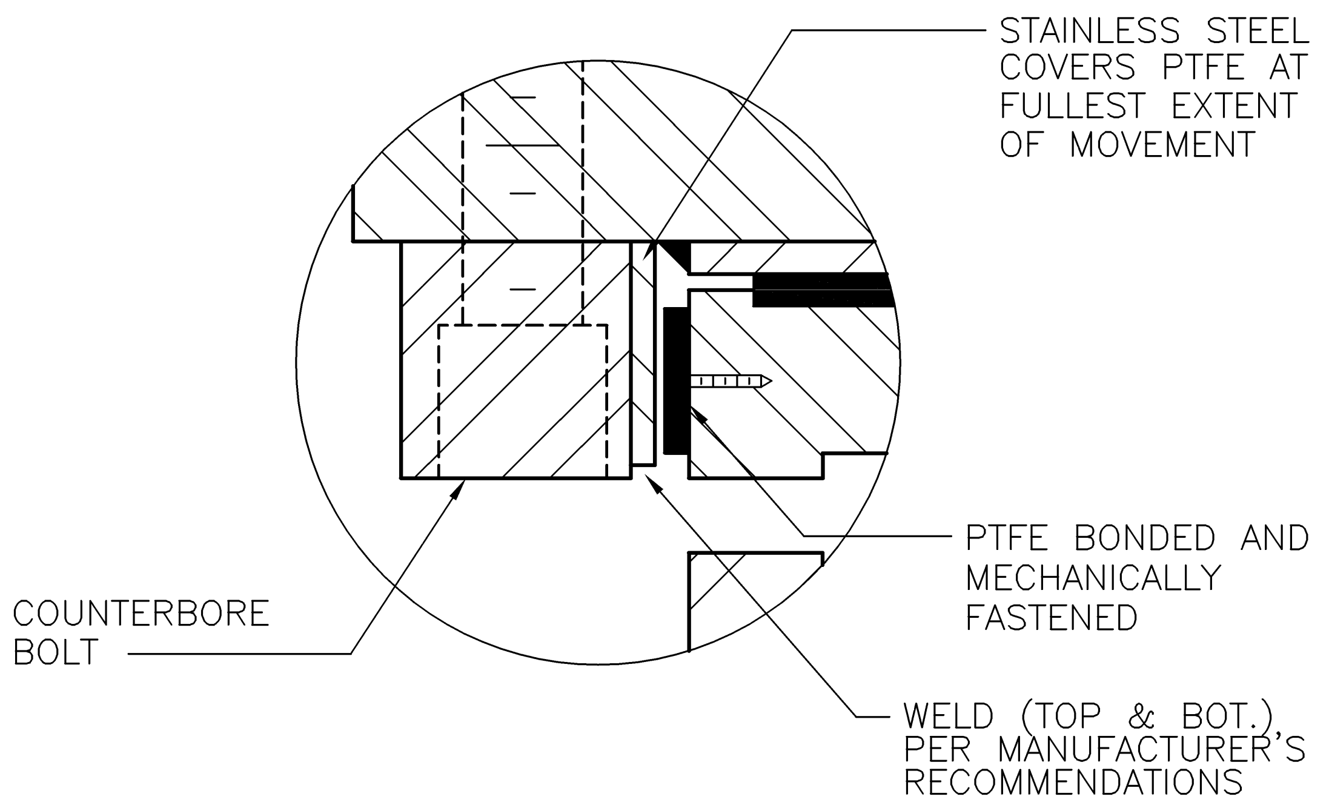
NON–GUIDED TYPE

SECTION B/5.30



FIXED TYPE

SECTION C/5.30


STAINLESS STEEL COVERS PTFE AT FULLEST EXTENT OF MOVEMENT
PTFE BONDED AND MECHANICALLY FASTENED
COUNTERBORE BOLT
WELD (TOP & BOT.) PER MANUFACTURER'S RECOMMENDATIONS

DETAIL 1/5.30

NOTES:

1 FOR DESIGN, MATERIAL, FABRICATION AND GENERAL CONSTRUCTION REQUIREMENTS, REFER TO THE RI STANDARD SPECIFICATIONS OR THE SPECIAL PROVISIONS. ENTIRE BEARING ASSEMBLY EXCEPT FOR THE PTFE AND STAINLESS STEEL PLATE SHALL BE ZINC METALLIZED OR GALVANIZED.

2 THE OVERALL HEIGHT OF THE BEARINGS, WHICH VARIES WITH TYPE, CAPACITY AND MANUFACTURER, MUST BE KNOWN BEFORE THE EXACT BEAM SEAT ELEVATIONS CAN BE DETERMINED. SEE RI STANDARD SPECIFICATIONS OR SPECIAL PROVISIONS.

3 MASONRY BASE PLATES SHALL BE PLACED ON 1/8" PREFORMED FABRIC PADS AS SPECIFIED IN SECTION M.13.04 OF THE RIDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION.

4 ANCHOR ROD SPACING SHALL BE COORDINATED WITH THE BEARING MANUFACTURER.

5 ANCHOR RODS SHALL BE GALVANIZED AASHTO DESIGNATION M 270 (GRADE 36).

6 BEARING INSTALLATION SHALL BE IN STRICT CONFORMANCE WITH SPECIAL PROVISIONS OF THE SPECIFICATION AND THE MANUFACTURER'S RECOMMENDATIONS.

7 AFTER SETTING MASONRY PLATES, ANCHOR ROD HOLES SHALL BE FILLED WITH NON–SHRINK (–0% SHRINK) EPOXY GROUT.

8 PTFE INDICATES POLYTETRAFLUOROETHYLENE.

DESIGNER NOTES:

1. *CONSTRUCTION DRAWINGS SHALL CONTAIN ALL THE REQUIRED INFORMATION PER THE RIDOT LRFD BRIDGE DESIGN MANUAL – SECTION 14 (INCLUDING REQUIREMENTS RELATED TO THE BEARING INSTALLATION SETTING TABLE).*

2. *PROVISIONS FOR UPLIFT SHALL BE MADE FOR WHEN UPLIFT RESTRAINT IS REQUIRED BY DESIGN. DETAILS OF THE UPLIFT BEARING SHALL BE COORDINATED WITH BEARING MANUFACTURERS. ANCHOR ROD DETAIL SHALL BE APPROPRIATELY REDESIGNED.*

3. *ANCHOR ROD DIAMETER SHALL BE DETERMINED IN ACCORDANCE WITH THE GROUP LOADING REQUIREMENTS SPECIFIED IN THE AASHTO LRFD BRIDGE SPECIFICATION, (INCLUDING SEISMIC REQUIREMENTS)*

4. *DIMENSIONS, SIZES OF PLATES, AND WELDS NOT SHOWN ARE DEPENDENT UPON DESIGN LOADS, BEARING TYPE AND CAPACITY, AND THE MANUFACTURER. THE SHOP DRAWINGS, PREPARED BY THE MANUFACTURER, SHALL PROVIDE ALL PERTINENT BEARING INFORMATION. THE FINAL BEAM SEAT ELEVATIONS WILL BE DETERMINED AFTER APPROVAL OF THE SHOP DRAWINGS.*

5. *THE NOTES SHOWN ON THIS DRAWING SHALL BE PROVIDED ON THE CONTRACT DRAWINGS, WHERE APPLICABLE.*

6. *FOR DETAILS OF SOLE PLATE ATTACHMENTS TO STEEL BEAMS AND FOR ANCHOR ROD AND MASONRY PLATE, DETAILS REFER TO DRAWING NO. 5.20.*

THIS SHEET IS NOT TO SCALE

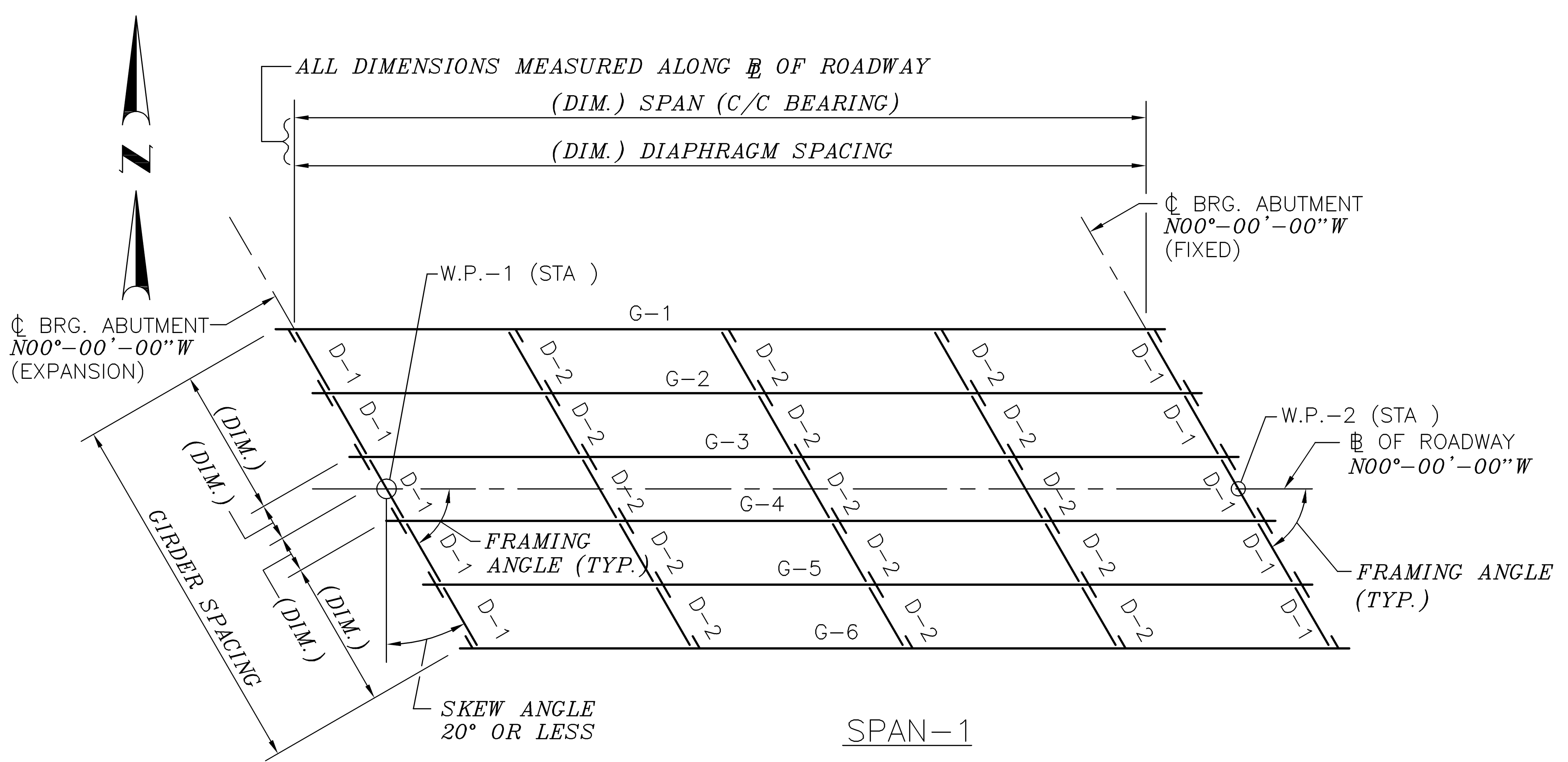
REVISIONS	
No.	DATE

RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

BRIDGE STANDARDS

MULTI–ROTATIONAL BEARING
DISC BEARINGS

DRAWING NUMBER: 5.30



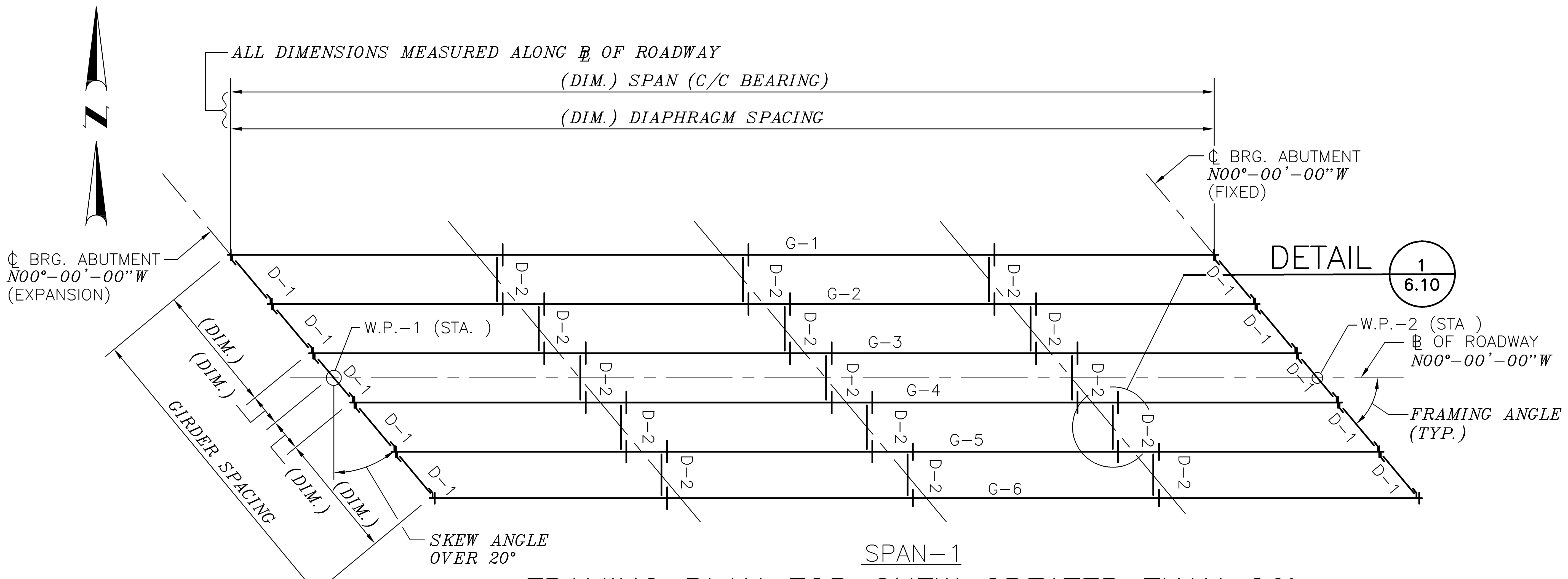
ALL DIMENSIONS MEASURED ALONG ℄ OF ROADWAY
(DIM.) SPAN (C/C BEARING)
(DIM.) DIAPHRAGM SPACING
N
℄ BRG. ABUTMENT N00°-00'-00"W (FIXED)
℄ BRG. ABUTMENT N00°-00'-00"W (EXPANSION)
W.P.-1 (STA)
W.P.-2 (STA)
℄ OF ROADWAY N00°-00'-00"W
G-1
G-2
G-3
G-4
G-5
G-6
D-1
D-2
FRAMING ANGLE (TYP.)
FRAMING ANGLE (TYP.)
(DIM.)
GIRDER SPACING
SKEW ANGLE 20° OR LESS

SPAN-1

FRAMING PLAN FOR SKEW 20° OR LESS

(SIMPLE SPAN)

PLATE GIRDER (G) OR ROLLED SECTIONS (S)



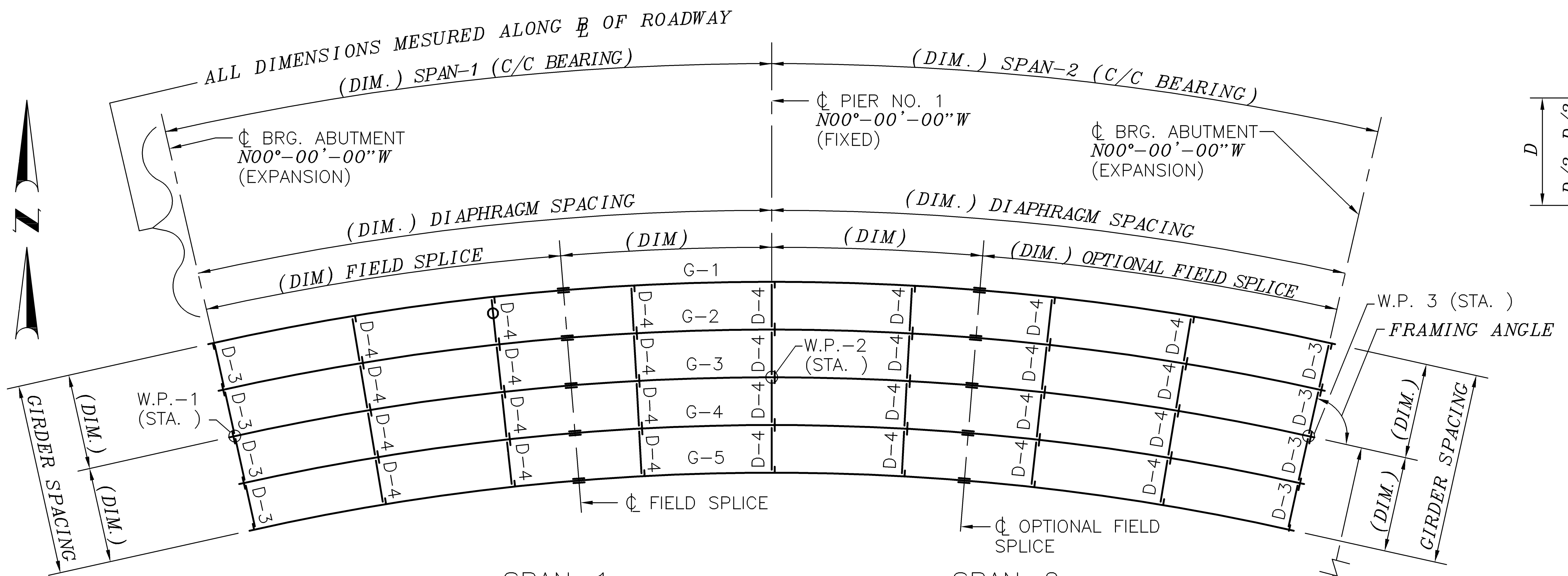
ALL DIMENSIONS MEASURED ALONG ℄ OF ROADWAY
(DIM.) SPAN (C/C BEARING)
(DIM.) DIAPHRAGM SPACING
N
℄ BRG. ABUTMENT N00°-00'-00"W (FIXED)
℄ BRG. ABUTMENT N00°-00'-00"W (EXPANSION)
DETAIL 1 6.10
W.P.-1 (STA.)
W.P.-2 (STA)
℄ OF ROADWAY N00°-00'-00"W
FRAMING ANGLE (TYP.)
G-1
G-2
G-3
G-4
G-5
G-6
D-1
D-2
(DIM.)
GIRDER SPACING
SKEW ANGLE OVER 20°

SPAN-1

FRAMING PLAN FOR SKEW GREATER THAN 20°

(SIMPLE SPAN)

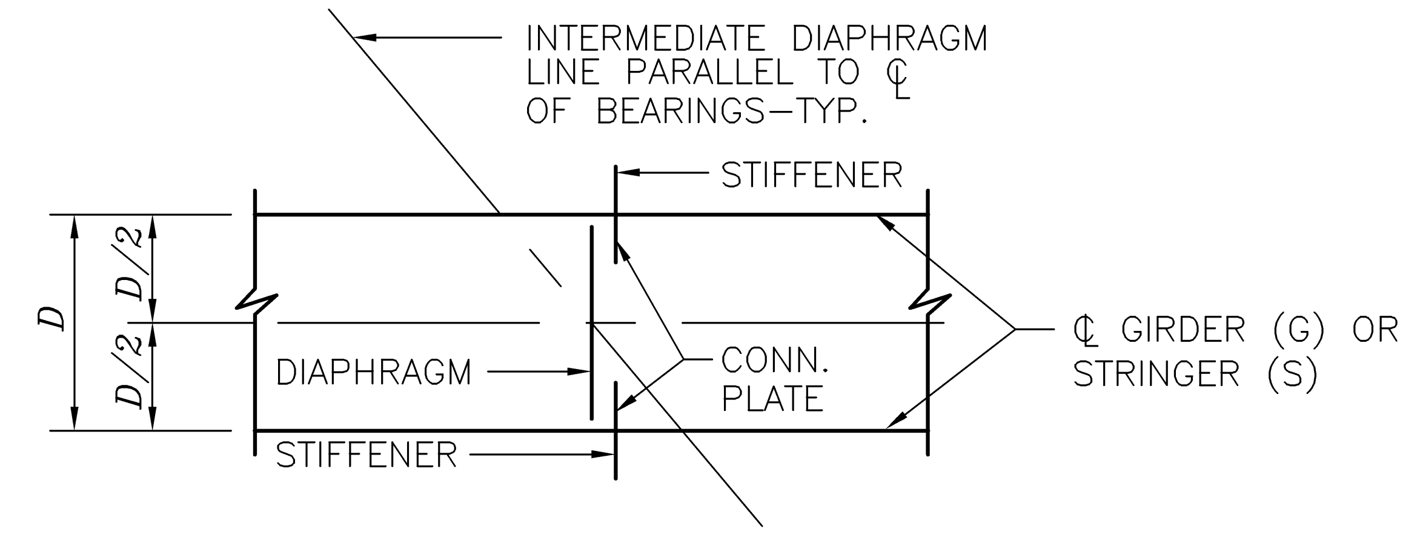
PLATE GIRDER (G) OR ROLLED SECTIONS (S)



ALL DIMENSIONS MESURED ALONG ℄ OF ROADWAY
(DIM.) SPAN-1 (C/C BEARING)
(DIM.) SPAN-2 (C/C BEARING)
N
℄ BRG. ABUTMENT N00°-00'-00"W (EXPANSION)
℄ PIER NO. 1 N00°-00'-00"W (FIXED)
℄ BRG. ABUTMENT N00°-00'-00"W (EXPANSION)
(DIM.) DIAPHRAGM SPACING
(DIM.) DIAPHRAGM SPACING
(DIM)
(DIM)
(DIM) FIELD SPLICE
(DIM.) OPTIONAL FIELD SPLICE
W.P. 3 (STA.)
FRAMING ANGLE
W.P.-2 (STA.)
W.P.-1 (STA.)
G-1
G-2
G-3
G-4
G-5
D-3
D-4
(DIM.)
GIRDER SPACING
℄ FIELD SPLICE
℄ OPTIONAL FIELD SPLICE
PROVIDE BASELINE RADIUS

SPAN-1 FRAMING PLAN SPAN-2

(CONTINUOUS CURVED GIRDERS)

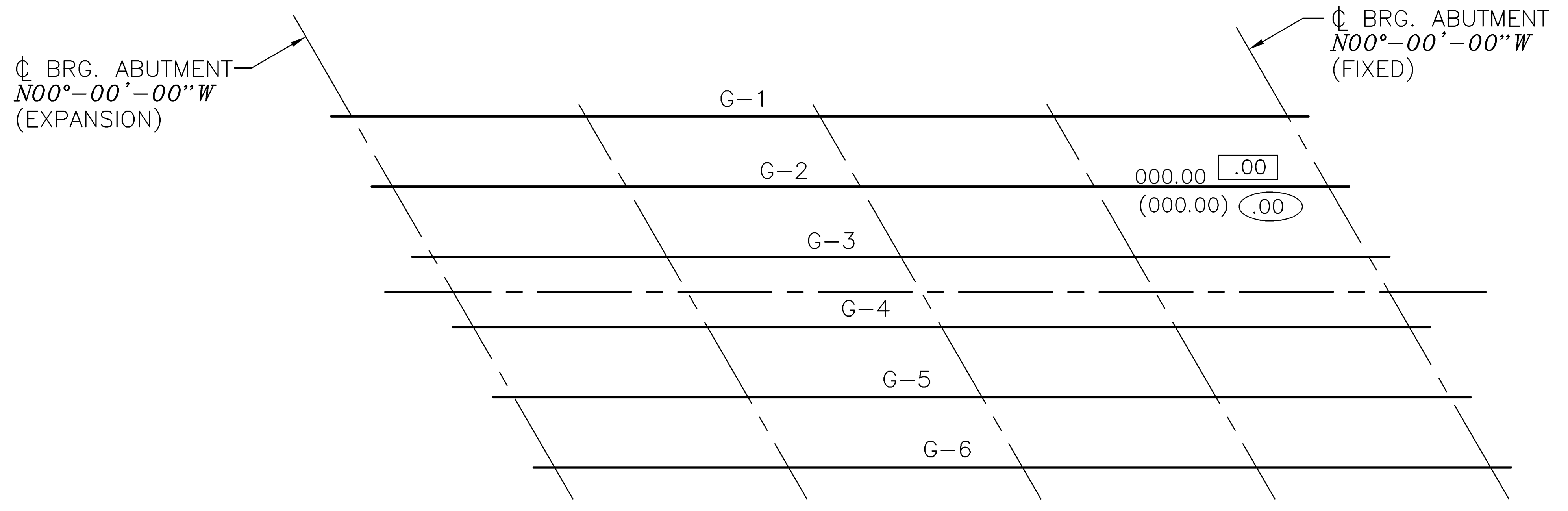


INTERMEDIATE DIAPHRAGM LINE PARALLEL TO ℄ OF BEARINGS-TYP.
STIFFENER
D
D/2
D/2
DIAPHRAGM
CONN. PLATE
STIFFENER
℄ GIRDER (G) OR STRINGER (S)

DETAIL 1/6.10

DESIGNER NOTES:

1. FOR SKEWS 20 DEGREES OR LESS, PLACE INTERMEDIATE DIAPHRAGMS PARALLEL TO CENTERLINE OF BEARING.
2. FOR SKEWS GREATER THAN 20 DEGREES, PLACE INTERMEDIATE DIAPHRAGMS PERPENDICULAR TO GIRDER.
3. FOR HORIZONTALLY CURVED GIRDER BRIDGES, DIAPHRAGMS SHALL BE PROVIDED AT EACH SUPPORT AND AT INTERMEDIATE INTERVALS BETWEEN SUPPORTS WITH SPACING AS DETERMINED BY DESIGN CONSIDERATION. MINIMUM DIAPHRAGM SPACING SHALL BE IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS. DIAPHRAGMS SHOULD BE PLACED RADIALLY.
4. WHEN USING ROLLED SECTIONS, MARK FRAMING PLAN WITH PREFIX S-1, S-2, ETC.
5. LAYOUT IS SIMILAR FOR CONTINUOUS GIRDERS.
6. FRAMING PLAN SHOULD CONTAIN BEARING TYPE AND APPLICABLE LEGENDS.



℄ BRG. ABUTMENT N00°-00'-00"W (EXPANSION)
℄ BRG. ABUTMENT N00°-00'-00"W (FIXED)
G-1
G-2
000.00 .00
(000.00) .00
G-3
G-4
G-5
G-6

DECK GRADES

DECK GRADE NOTES:

1. ELEVATIONS OF BEAMS ARE GIVEN AT THE CENTERLINE OF BEARING OF EACH BEAM AND AT THE QUARTER POINTS OF EACH SPAN.
2. 000.00 ELEVATIONS GIVEN ARE THEORETICAL FINAL GRADES ON TOP OF CONCRETE DECK AT CENTERLINE OF BEAM.
3. (000.00) ELEVATIONS GIVEN IN PARENTHESES ARE THEORETICAL GRADES ON TOP OF BEAMS BEFORE PLACING CONCRETE.
4. .00 FIGURES IN RECTANGLES ARE DEAD LOAD DEFLECTIONS IN INCHES CAUSED BY THE WEIGHT OF THE CONCRETE DECK.
5. (.00) FIGURES ARE DEFLECTIONS IN INCHES CAUSED BY SUPERIMPOSED DEAD LOADS (WEIGHT OF RAILINGS, RAIL BASE AND CURBS).

THIS SHEET IS NOT TO SCALE

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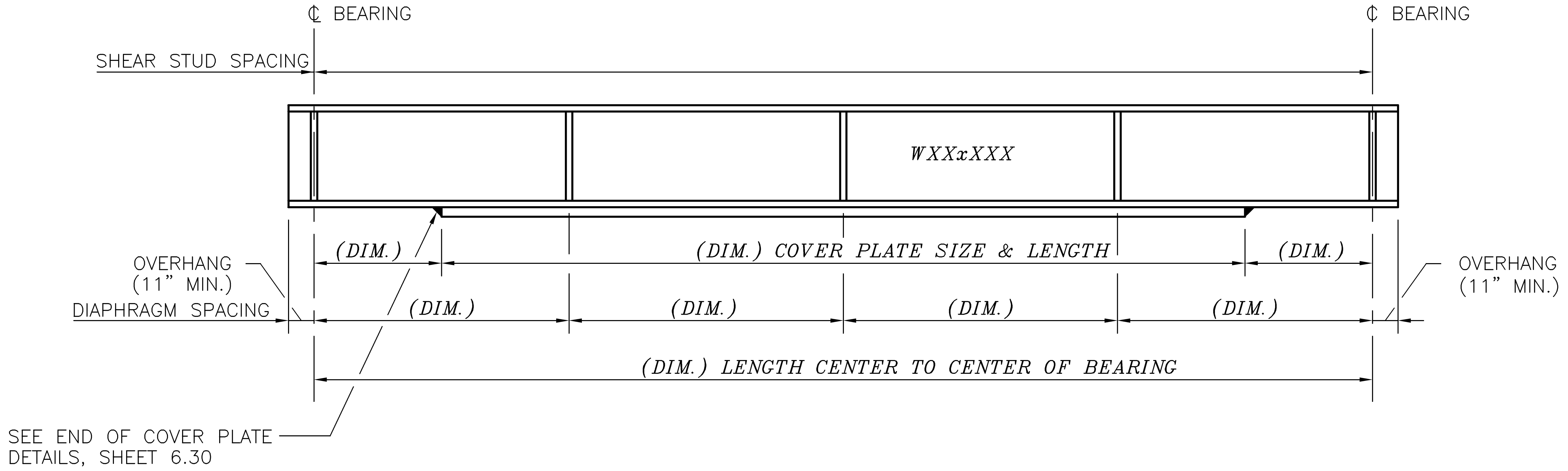
RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

BRIDGE STANDARDS

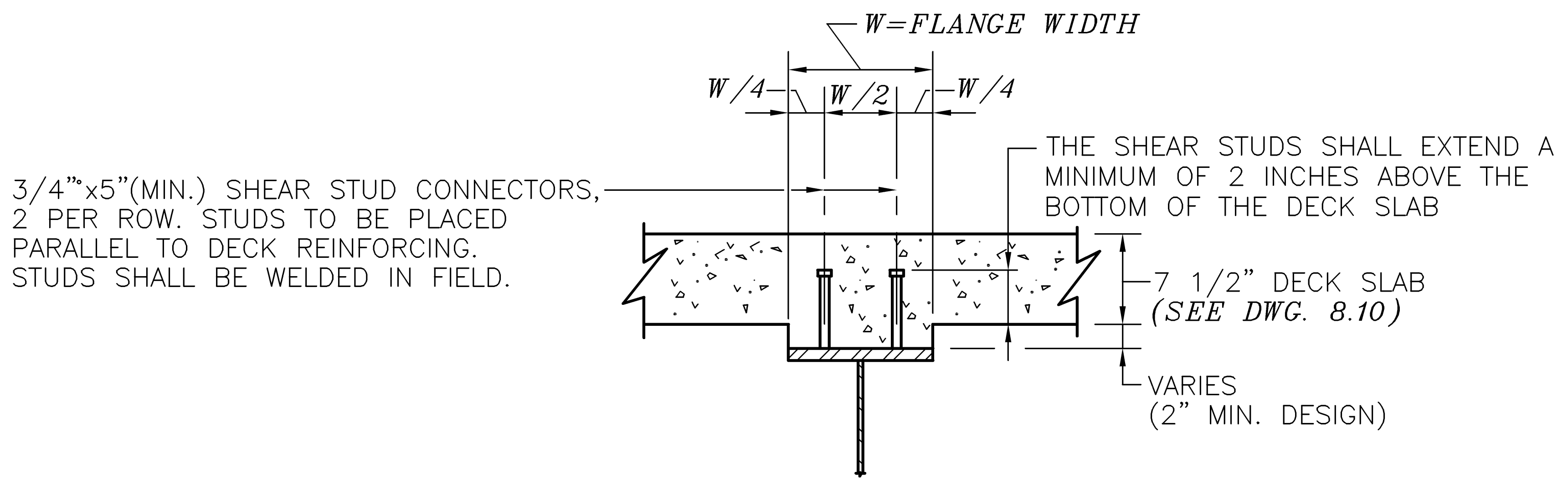
TYPICAL FRAMING PLAN LAYOUTS

DRAWING NUMBER: 6.10



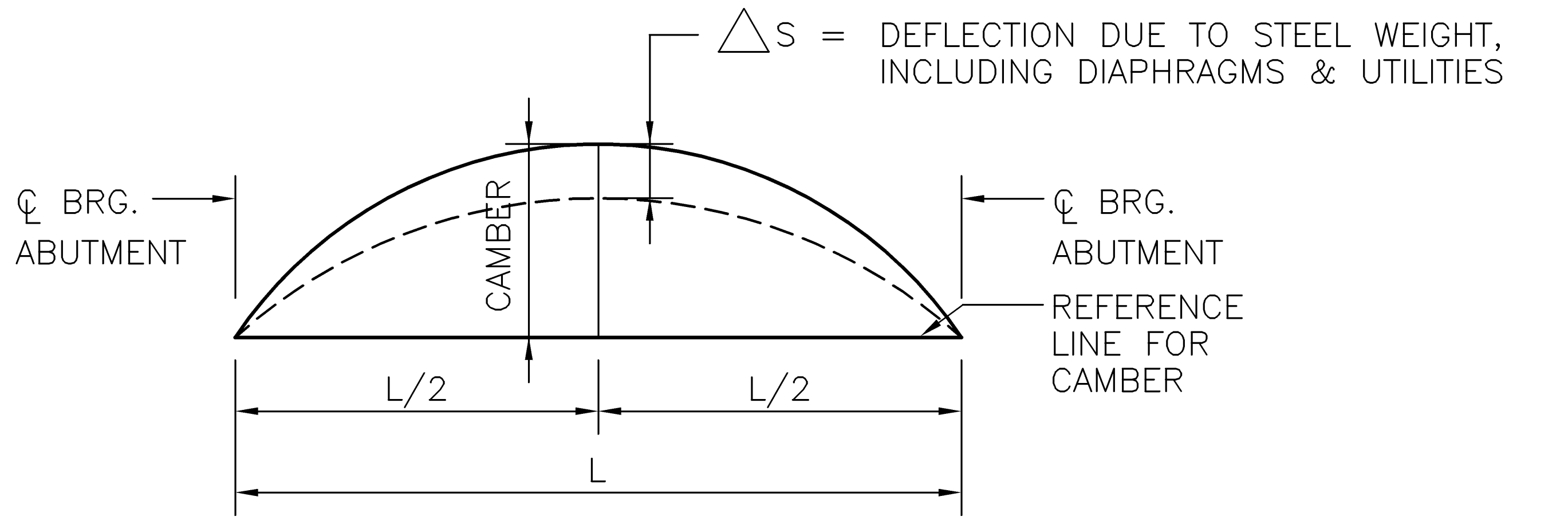
STRINGER ELEVATION
SIMPLE SPAN

(ROLLED SECTION SHOWN)



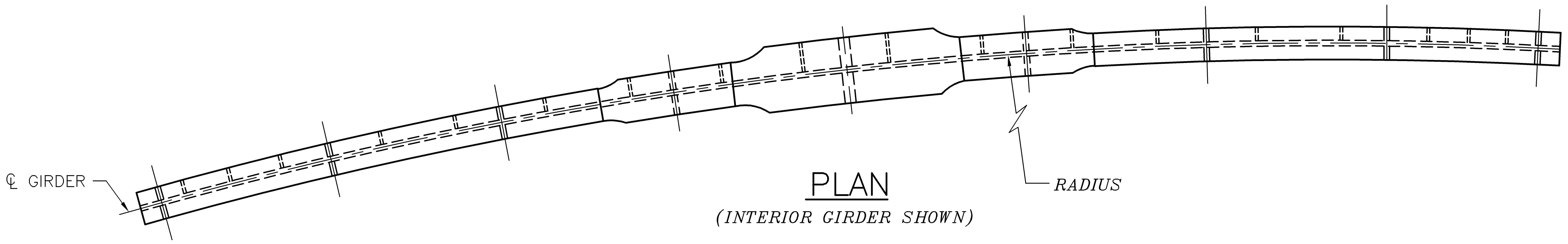
W=FLANGE WIDTH
W/4
W/2
W/4
3/4"x5"(MIN.) SHEAR STUD CONNECTORS, 2 PER ROW. STUDS TO BE PLACED PARALLEL TO DECK REINFORCING. STUDS SHALL BE WELDED IN FIELD.
THE SHEAR STUDS SHALL EXTEND A MINIMUM OF 2 INCHES ABOVE THE BOTTOM OF THE DECK SLAB
7 1/2" DECK SLAB (SEE DWG. 8.10)
VARIES (2" MIN. DESIGN)

SHEAR CONNECTOR DETAIL



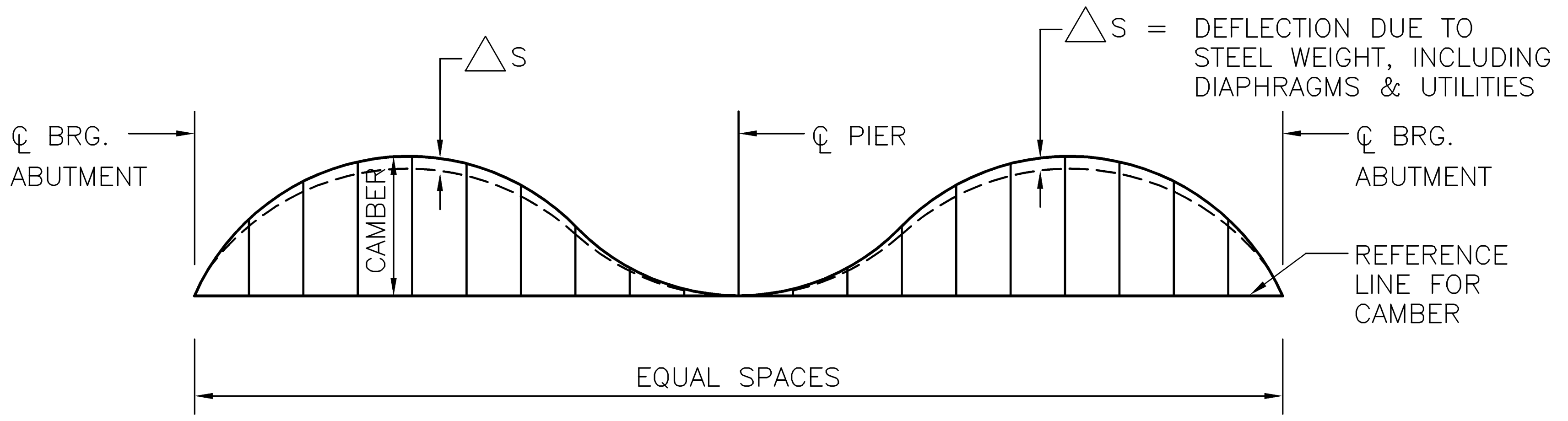
△S = DEFLECTION DUE TO STEEL WEIGHT, INCLUDING DIAPHRAGMS & UTILITIES
℄ BRG. ABUTMENT
℄ BRG. ABUTMENT
CAMBER
REFERENCE LINE FOR CAMBER
L/2
L/2
L

SIMPLE SPAN CAMBER DIAGRAM



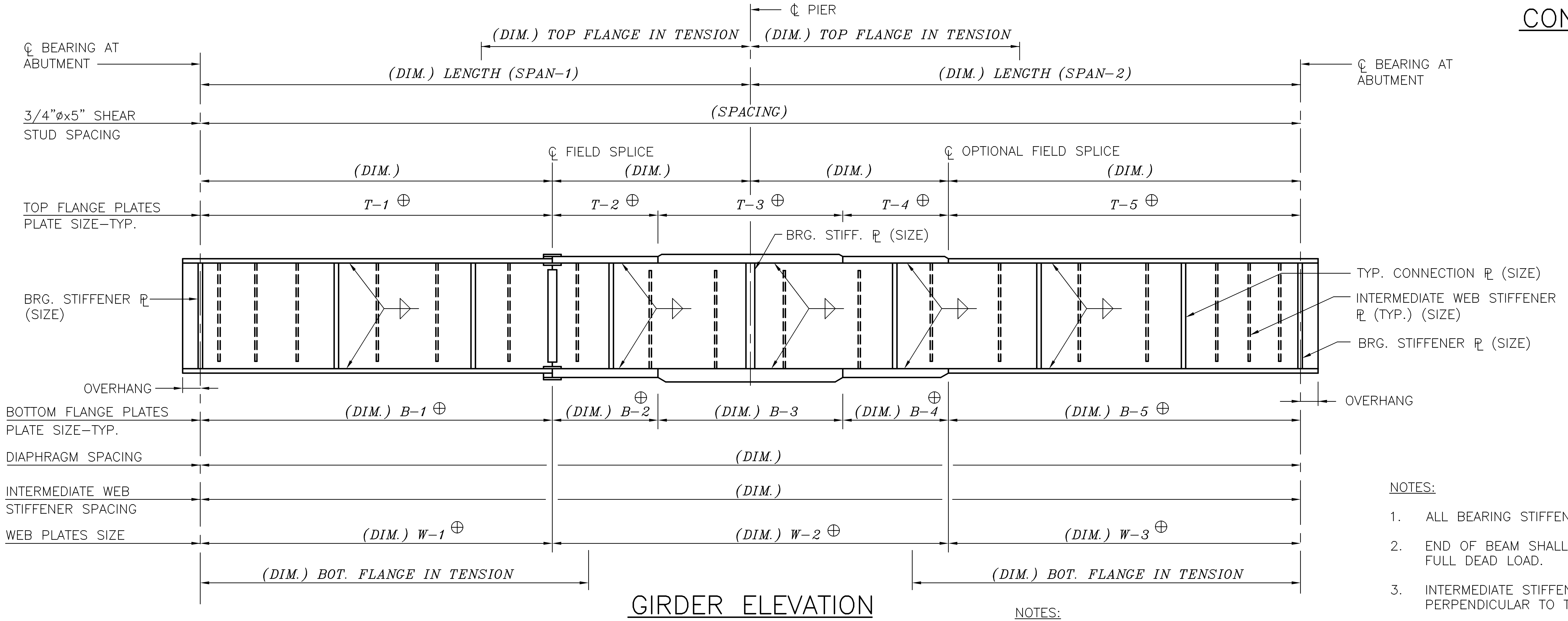
PLAN

(INTERIOR GIRDER SHOWN)



△S
△S = DEFLECTION DUE TO STEEL WEIGHT, INCLUDING DIAPHRAGMS & UTILITIES
℄ BRG. ABUTMENT
℄ PIER
℄ BRG. ABUTMENT
CAMBER
REFERENCE LINE FOR CAMBER
EQUAL SPACES

CONTINUOUS SPAN CAMBER DIAGRAM



GIRDER ELEVATION
CONTINUOUS SPAN

NOTE: CURVED PLATE GIRDER SHOWN
(STRAIGHT GIRDER DETAILS AND
DIMENSIONS SIMILAR)

NOTES:

1. ⊕ INDICATES CHARPY V–NOTCH TEST REQUIREMENT (ON TENSION MEMBERS)
2. ALL DIMENSIONS SHOWN ARE ALONG ℄ OF GIRDER.

NOTES:

1. ALL BEARING STIFFENERS SHALL BE PLUMB.
2. END OF BEAM SHALL BE PLUMB UNDER FULL DEAD LOAD.
3. INTERMEDIATE STIFFENERS SHALL BE PERPENDICULAR TO THE WEB AND FLANGES.

DESIGNER NOTES:

1. *THE REQUIRED DESIGN CAMBERS (IN ACCORDANCE WITH THE RIDOT LRFD BRIDGE DESIGN MANUAL) SHALL BE SHOWN ON THE CONTRACT DRAWINGS. CAMBER INFORMATION SHALL INCLUDE A CAMBER DIAGRAM AND A TABLE WITH THE COMPUTED CAMBER VALUES.*
2. *WHEN SPECIFIED, GIRDER FIELD SPLICE(S) SHALL BE DESIGNED AND DETAILED ON THE CONTRACT DRAWINGS. THE LOCATION OF THE FIELD SPLICES SHALL BE INDICATED ON THE GIRDER ELEVATIONS. GIRDER FIELD SPLICE DETAILS SHALL ALSO CONTAIN THE FOLLOWING INFORMATION:*
    - **BOLT DIAMETER AND TYPE.*
    - **SPLICE PLATE TYPE (AASHTO MATERIAL DESIGNATION).*
    - **CONTACT SURFACE CLASS AND REQUIREMENTS.*
    - **THE HOLE DIAMETER FOR THE SPLICE PLATES.*
3. *IF STUD SPACING VARIES FOR EACH GIRDER, A TABLE MAY BE USED. IF THE STUD SPACING IS SIMILAR FOR ALL GIRDERS THE SPACING MAY BE SHOWN ON THE GIRDER ELEVATIONS.*

THIS SHEET IS NOT TO SCALE

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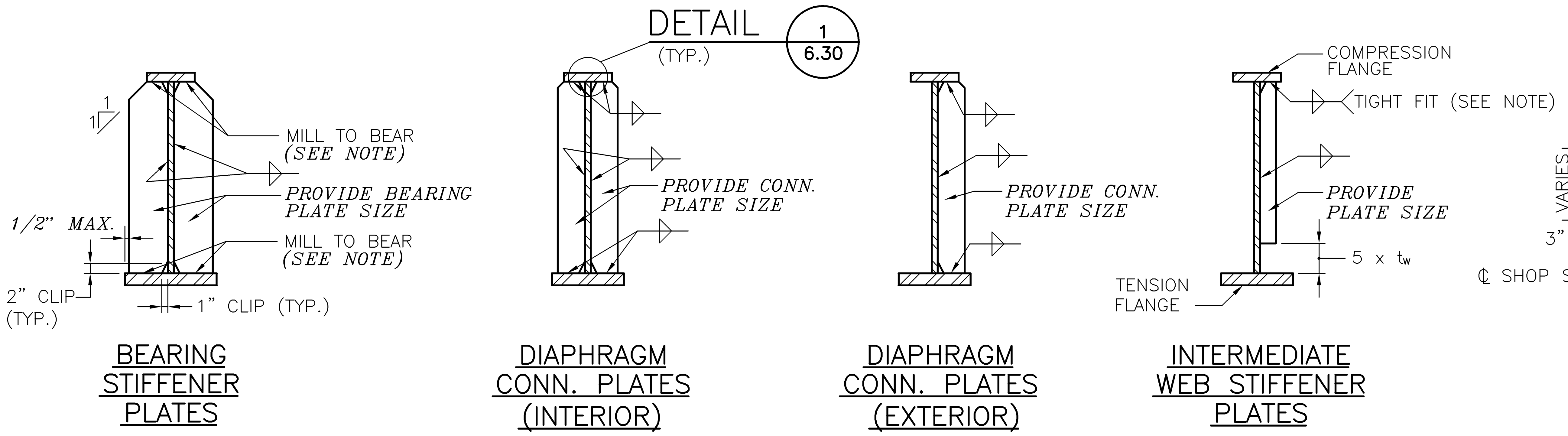
RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

BRIDGE STANDARDS

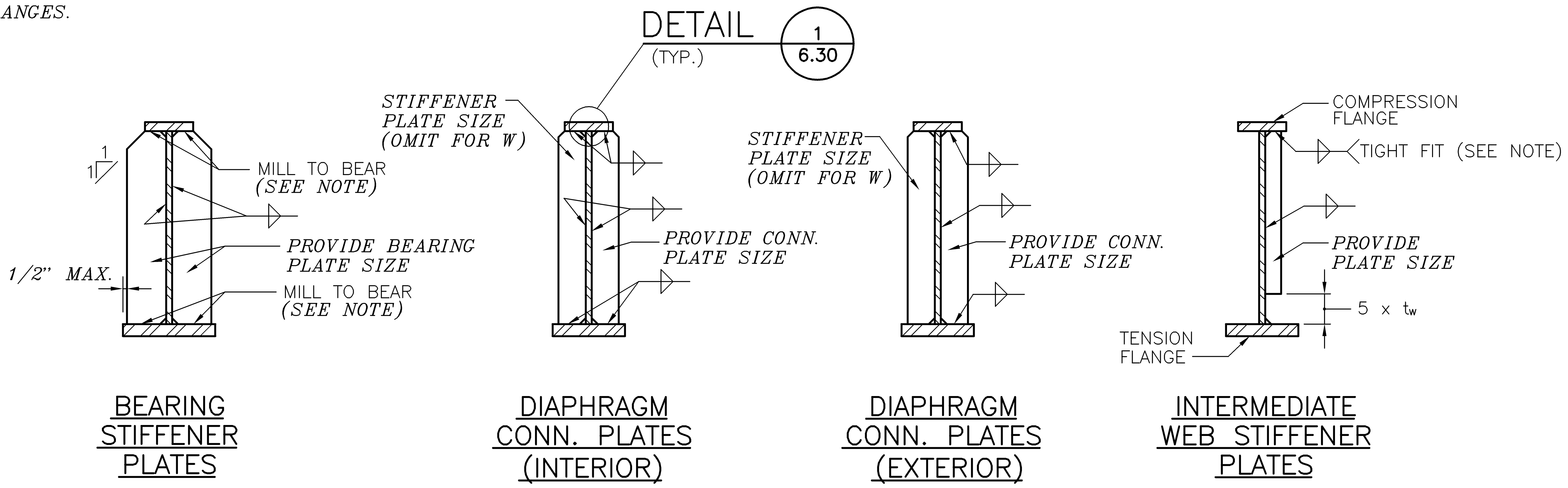
SIMPLE SPAN & CONTINUOUS GIRDER ELEVATIONS

DRAWING NUMBER: 6.20



NOTE:
BEARING STIFFENERS USED AS DIAPHRAGM CONNECTION PLATES SHALL BE WELDED TO TOP AND BOTTOM FLANGES.

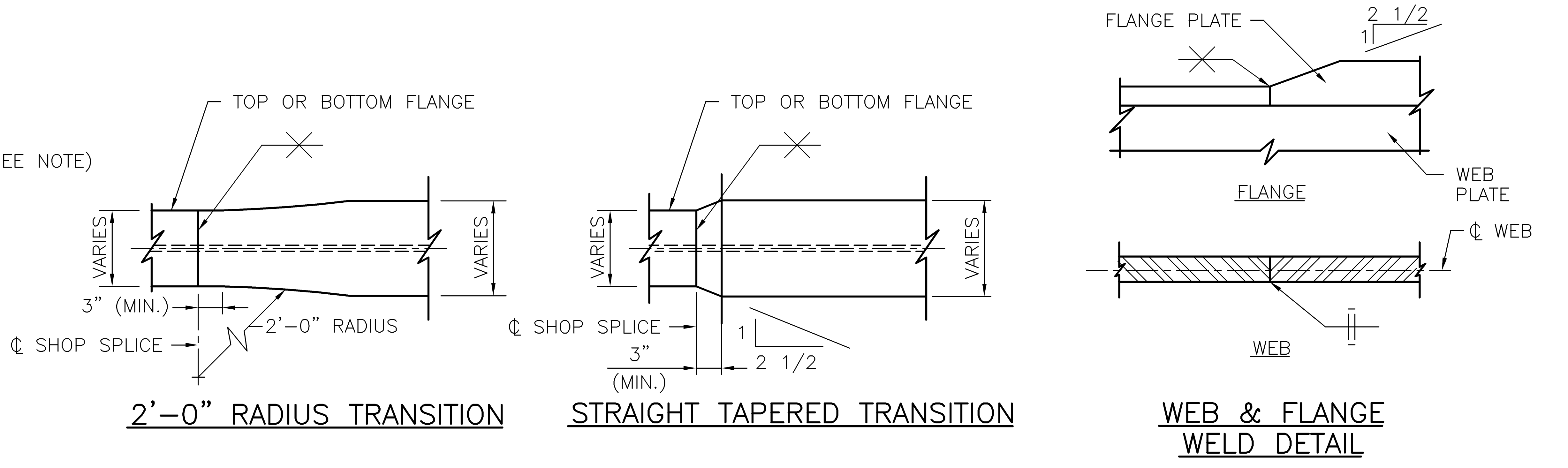
SKEW 20° OR LESS



NOTE:
INTERMEDIATE WEB STIFFENER PLATES IN STRAIGHT GIRDERS SHALL BE TIGHT FIT OR ATTACHED AT THE COMPRESSIVE FLANGE. SINGLE-SIDED INTERMEDIATE WEB STIFFENERS ON HORIZONTALLY CURVED GIRDERS SHALL BE ATTACHED TO BOTH FLANGES.

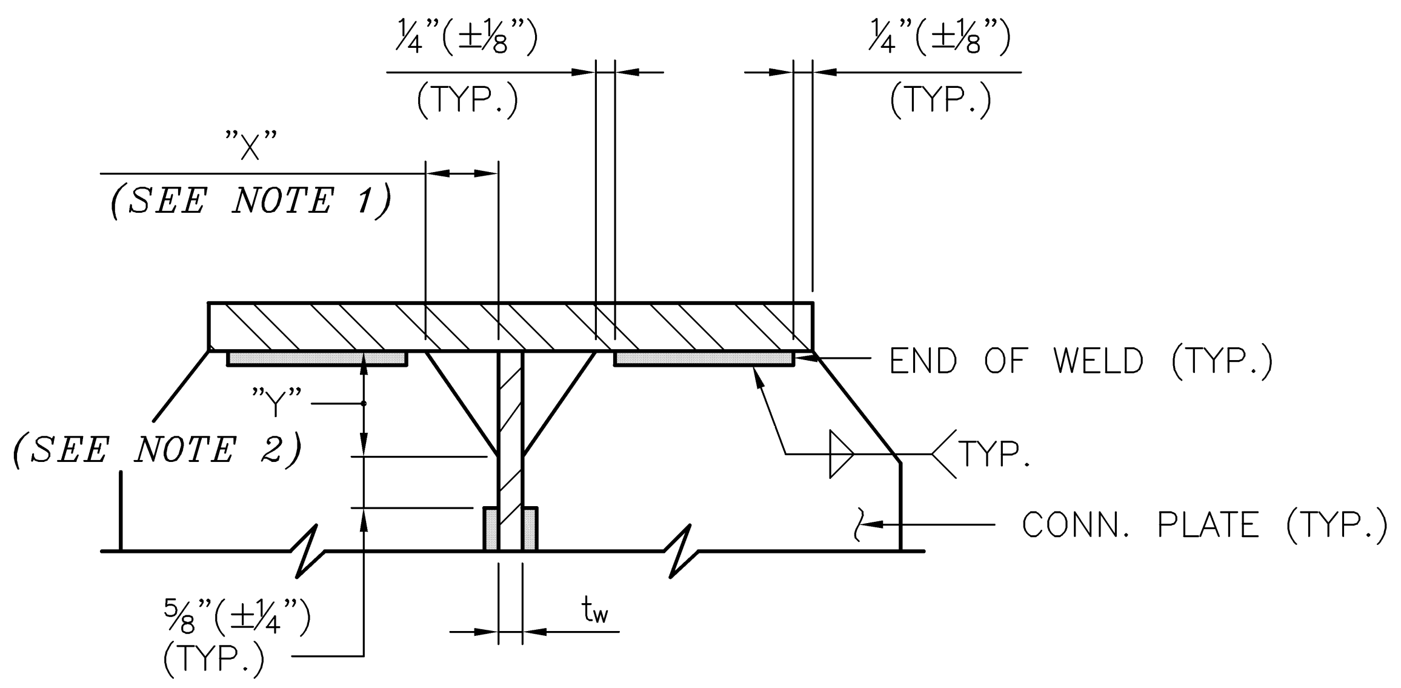
SKEW GREATER THAN 20°

STIFFENER AND CONNECTION PLATE DETAILS



SPLICE TRANSITION DETAILS

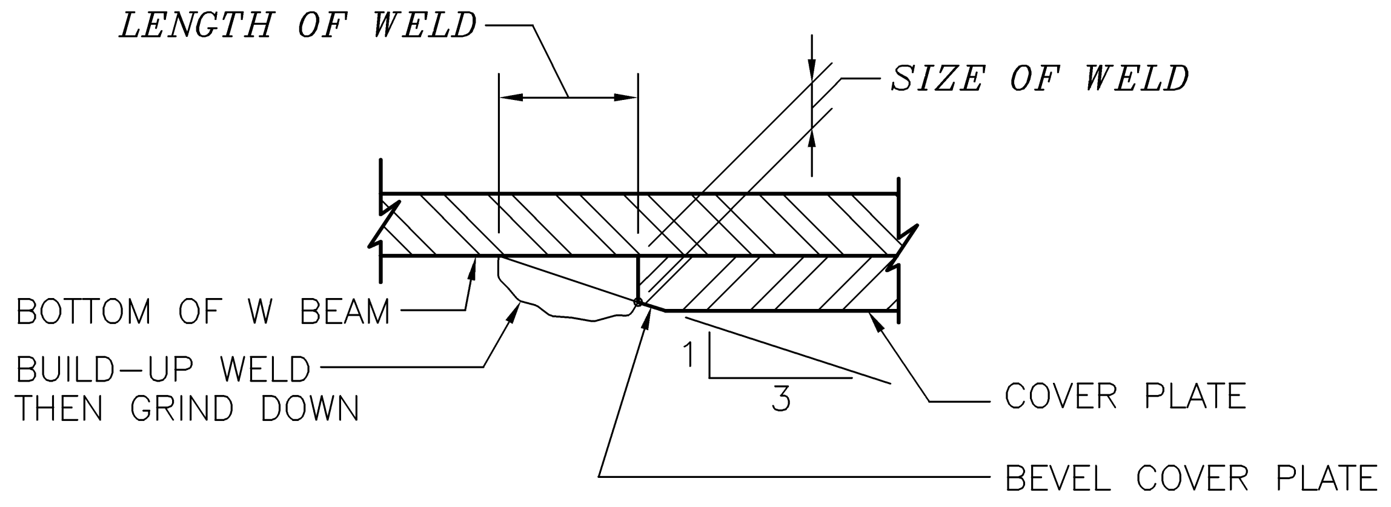
(BUILT-UP SECTIONS)



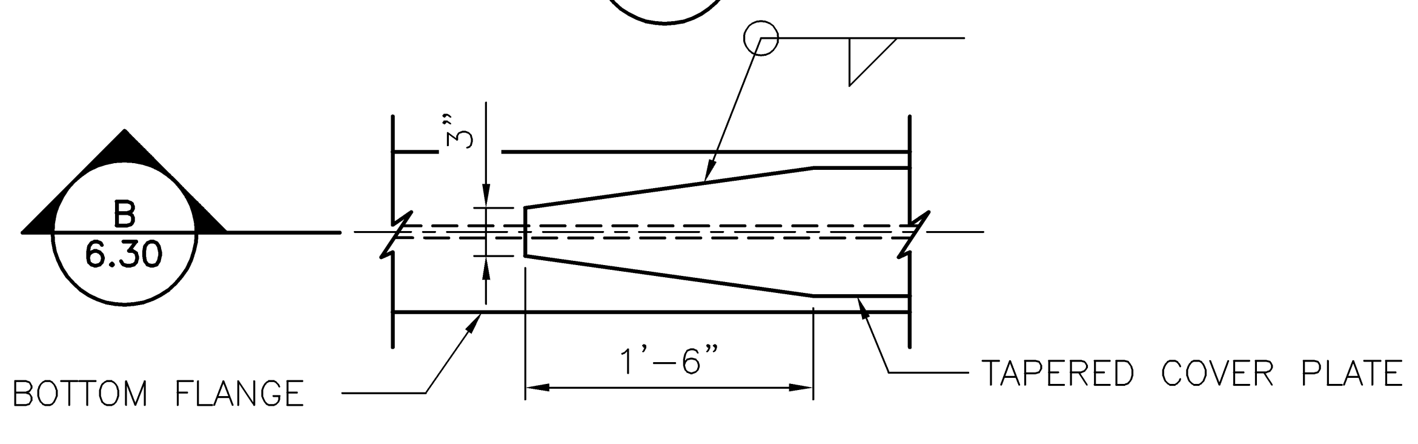
DETAIL 1 / 6.30

DESIGNER:
CONNECTION PLATE NOTES:

1. *WIDTH OF CLIP SHALL BE 2 x t_w.*
2. *HEIGHT OF CLIP SHALL BE 5 x t_w.*



SECTION B / 6.30

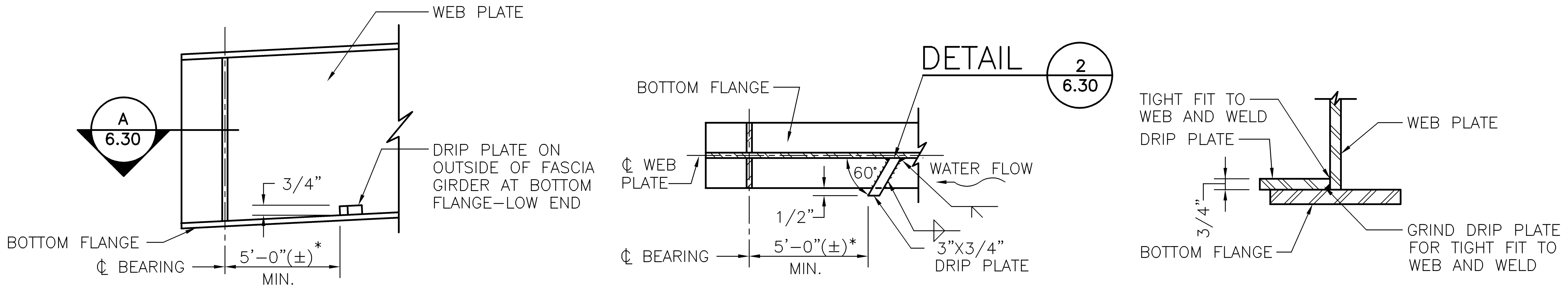


PLAN AT BOTTOM FLANGE

END OF COVER PLATE DETAIL

DESIGNER:
COVER PLATE NOTES:

1. *COVER PLATES ARE TO BE IN ONE PIECE AND SHALL BE LIMITED TO ONE AT ANY FLANGE.*
2. *THICKNESS OF COVER PLATES SHALL NOT EXCEED 1.5 TIMES FLANGE THICKNESS.*



* *REFER TO RHODE ISLAND BRIDGE DESIGN MANUAL FOR WEATHERING STEEL REQUIREMENTS*

DRIP PLATE DETAILS

DESIGNER:
DRIP PLATES SHALL BE USED ON ALL WEATHERING STEEL AND ON ALL PROFILE GRADES GREATER THAN 4%. (OPTIONAL AT GRADES LESS THAN 4% ON NON-WEATHERING STEEL)

THIS SHEET IS NOT TO SCALE

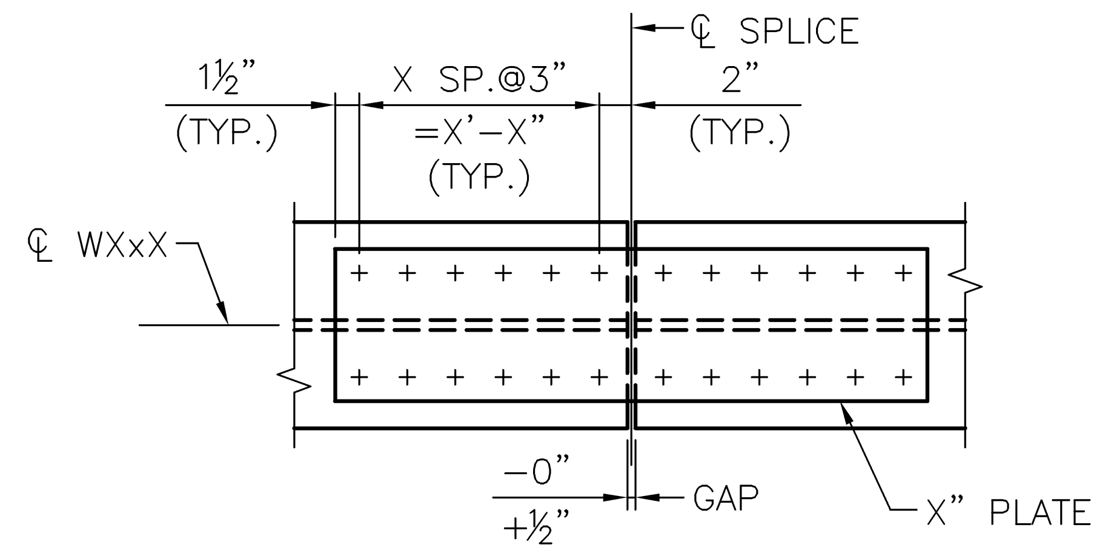
REVISIONS	
No.	DATE

RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

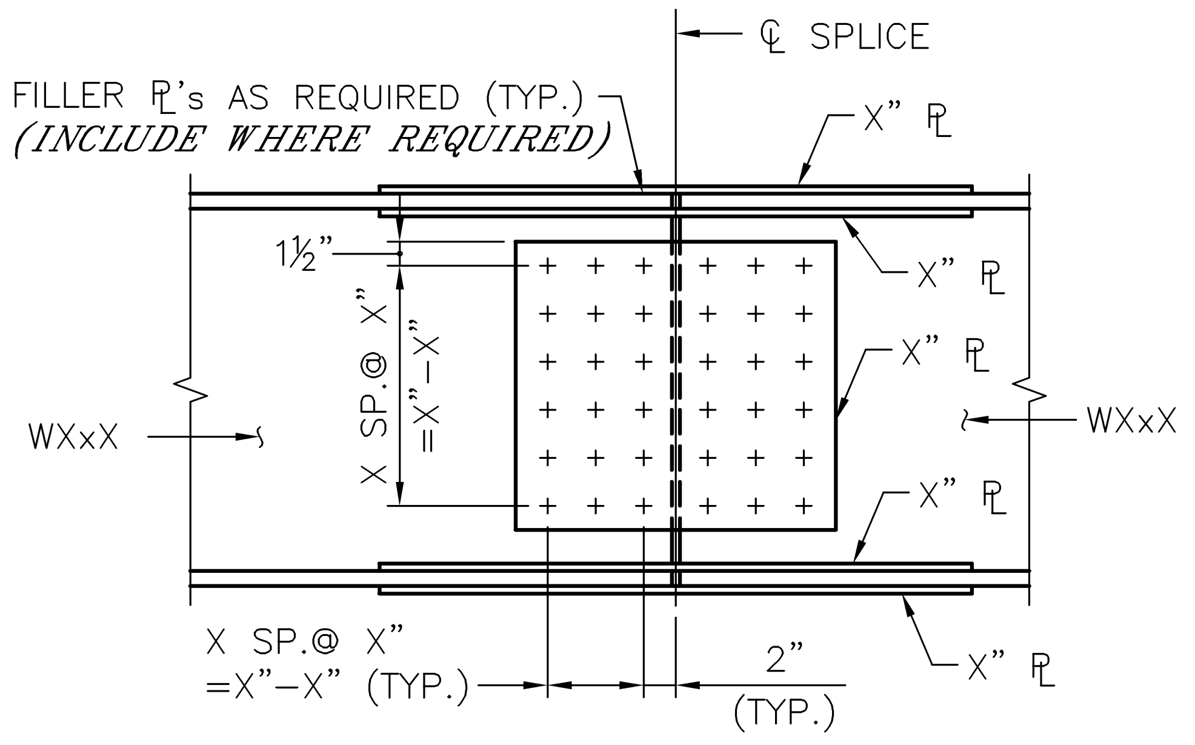
BRIDGE STANDARDS

STEEL DETAILS
SHEET 1

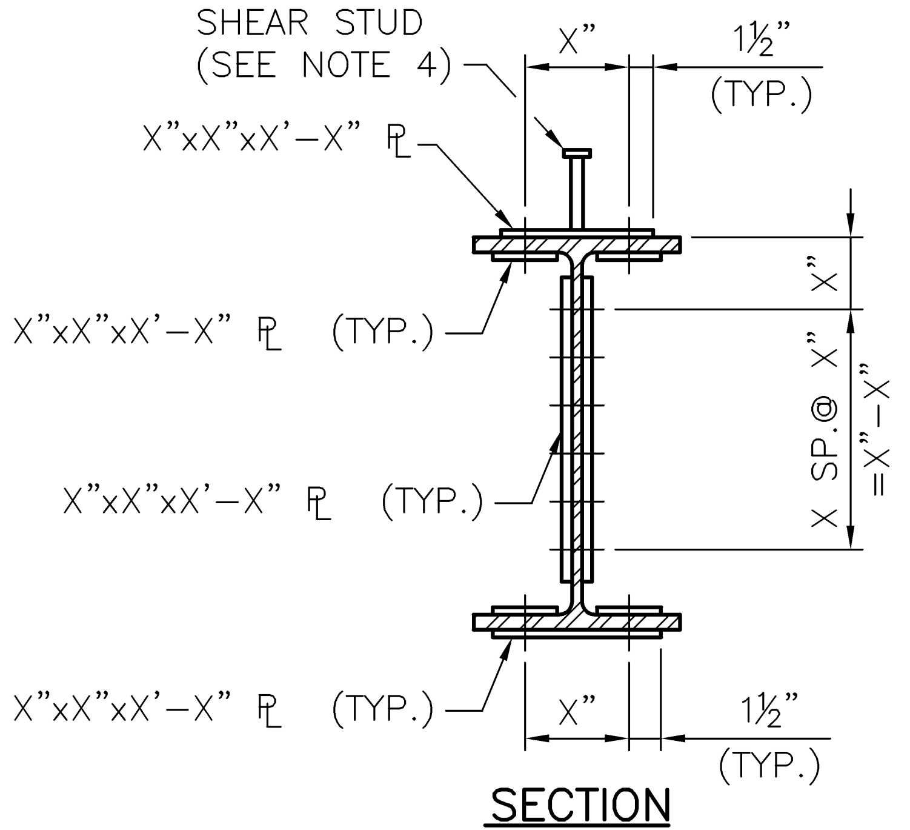
DRAWING NUMBER: 6.30



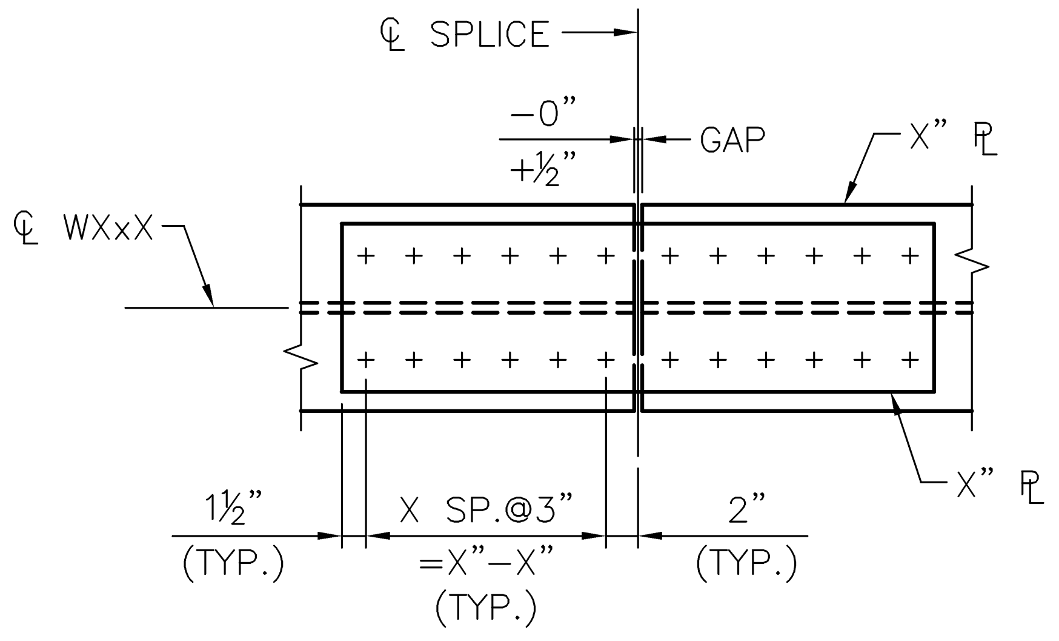
TOP FLANGE



ELEVATION



SECTION



BOTTOM FLANGE

NOTES:

1. BOLTED FIELD SPLICES SHALL BE CONSIDERED SLIP–CRITICAL CONNECTIONS WITH CLASS B FAYING SURFACES.
2. + DENOTES $\frac{7}{8}$" ø ASTM A325 HIGH STRENGTH BOLT IN $\frac{15}{16}$" ø HOLE.
3. THICKNESS DIFFERENCES OF $\frac{1}{16}$" OR LESS DO NOT REQUIRE FILLER PLATES. FILLER PLATES SHALL CONFORM TO AASHTO M 270 GRADE 36 OR 50.
4. ONE ROW OF STUD SHEAR CONNECTORS SHALL BE PLACED ALONG THE CENTERLINE OF THE TOP FLANGE SPLICE PLATES.

BOLTED FIELD SPLICE DETAILS

SCALE: 1"=1'–0"

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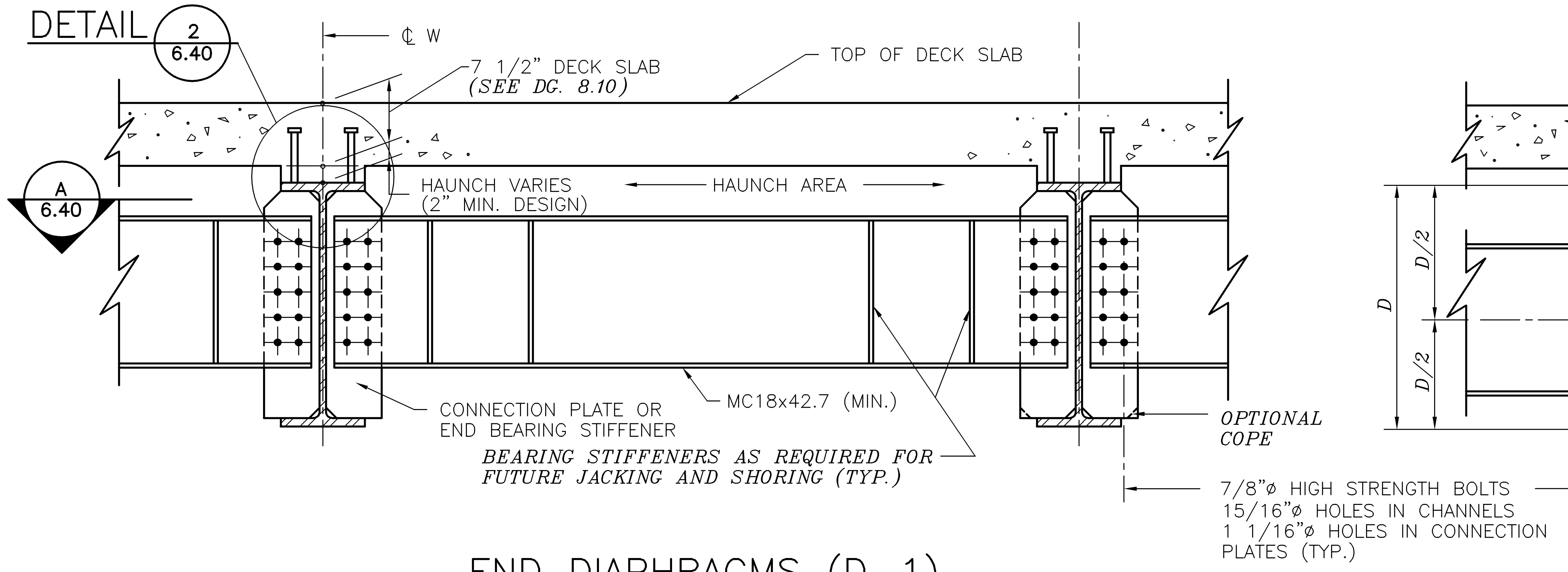
RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

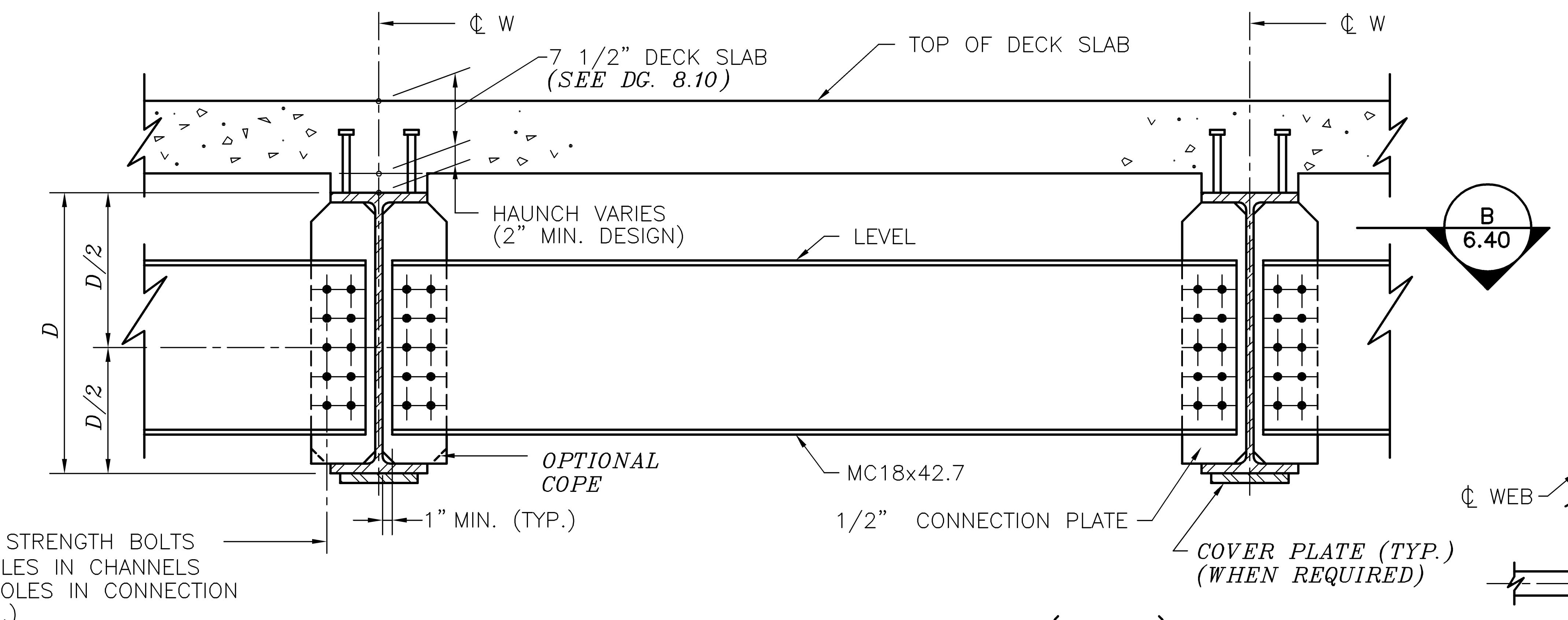
BRIDGE STANDARDS

STEEL DETAILS
SHEET 2

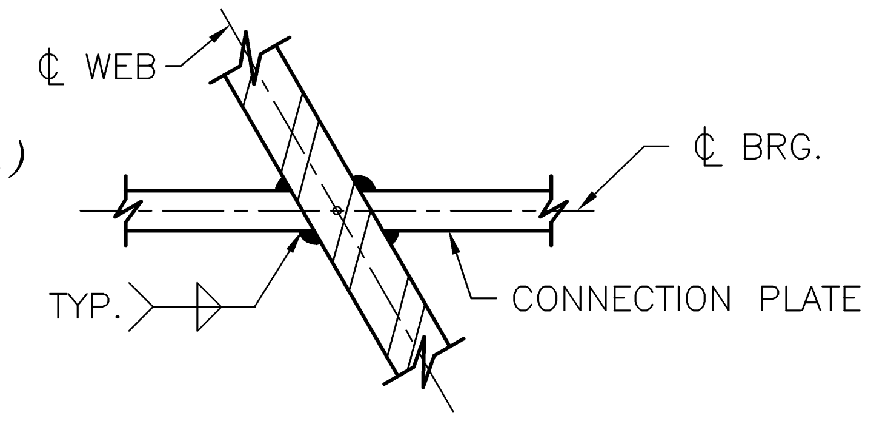
DRAWING NUMBER: 6.31



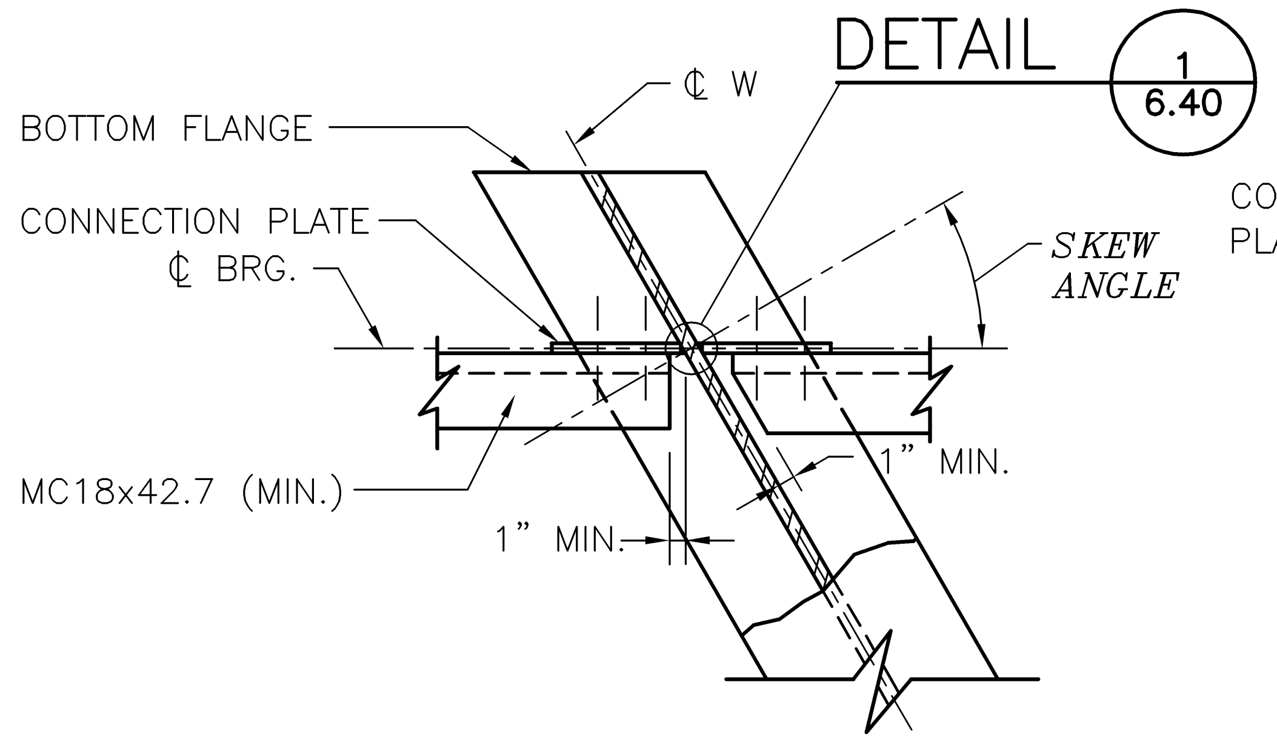
END DIAPHRAGMS (D–1)



INTERMEDIATE DIAPHRAGMS (D–2)

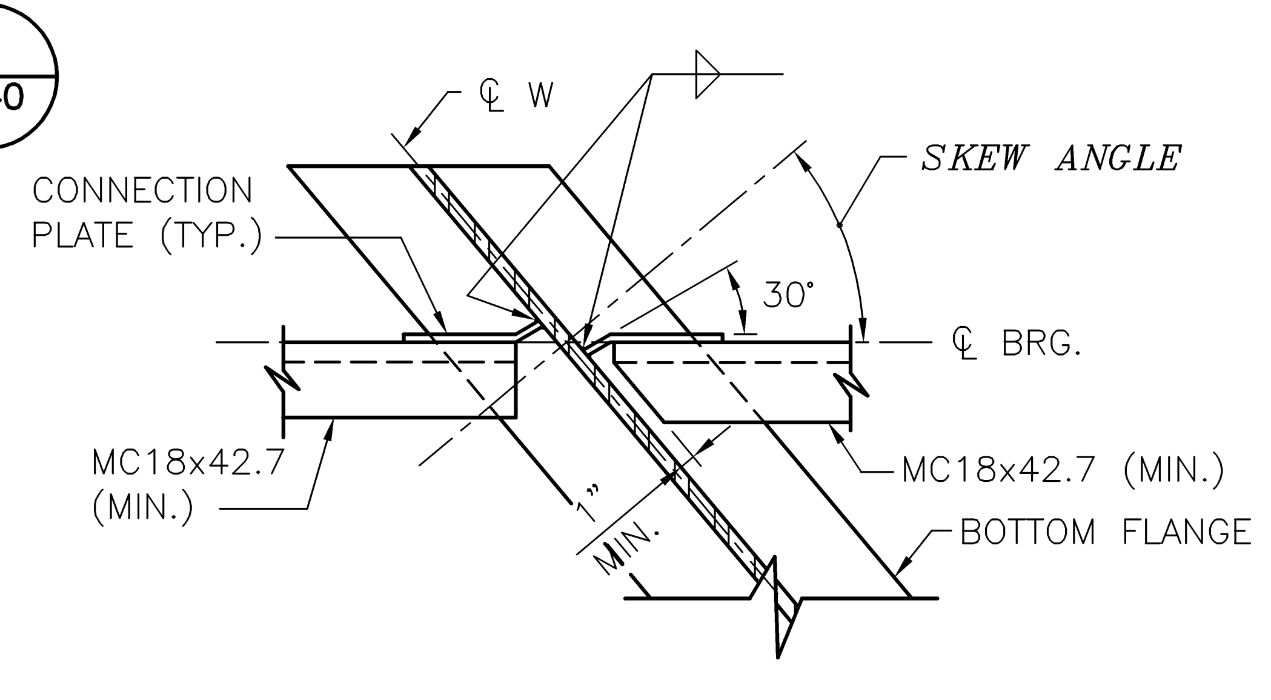


DETAIL 1/6.40



SKEW ANGLE 0°–20°

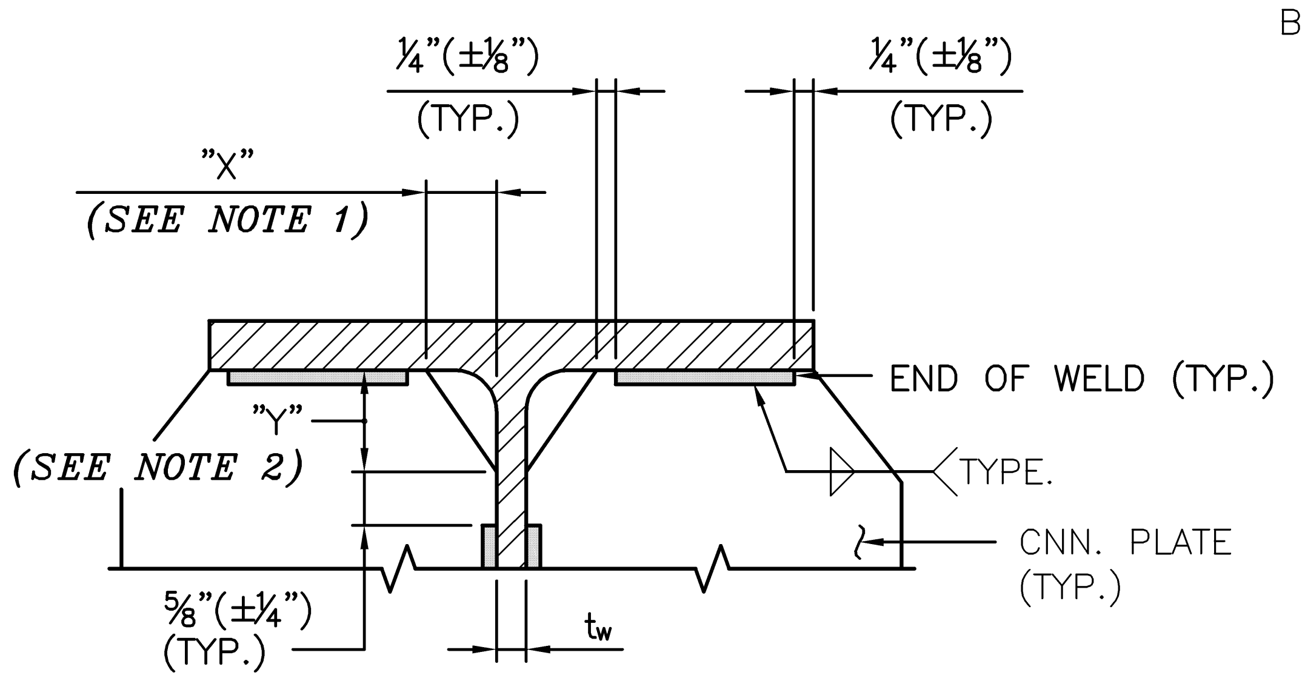
SECTION A/6.40



SKEW ANGLE GREATER THAN 20°

SECTION A/6.40

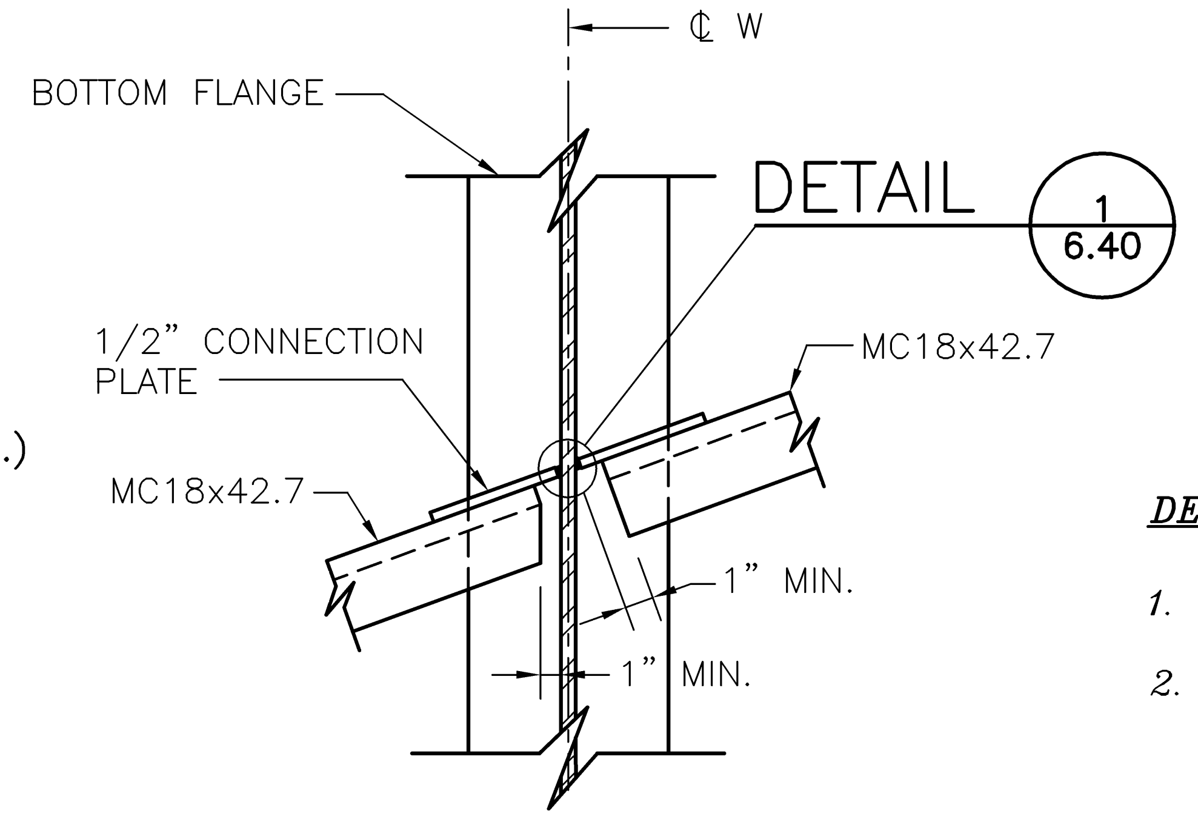
END DIAPHRAGM CONNECTIONS WITHOUT BEARING STIFFENERS



DESIGNER:

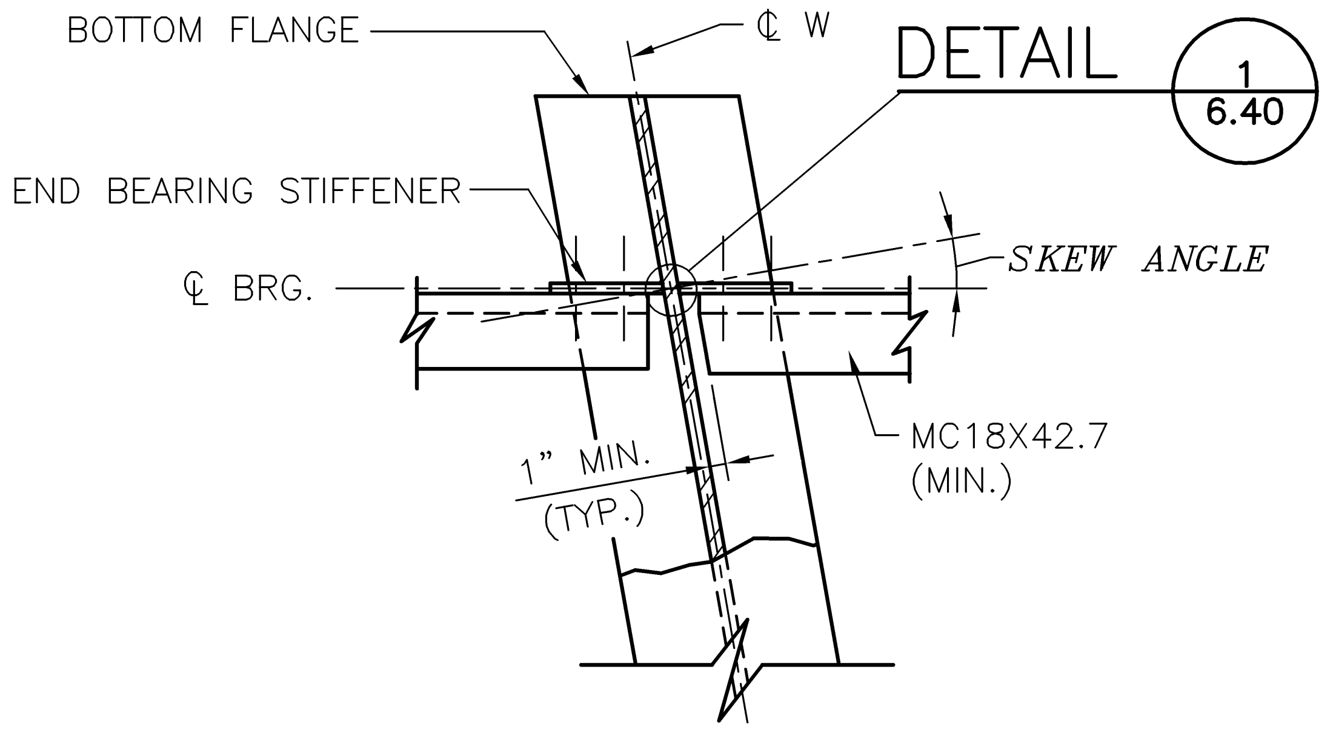
1. ***WIDTH OF CLIP SHALL BE 2 x t_w.***
2. ***HEIGHT OF CLIP SHALL BE 5 x t_w.***

DETAIL 2/6.40



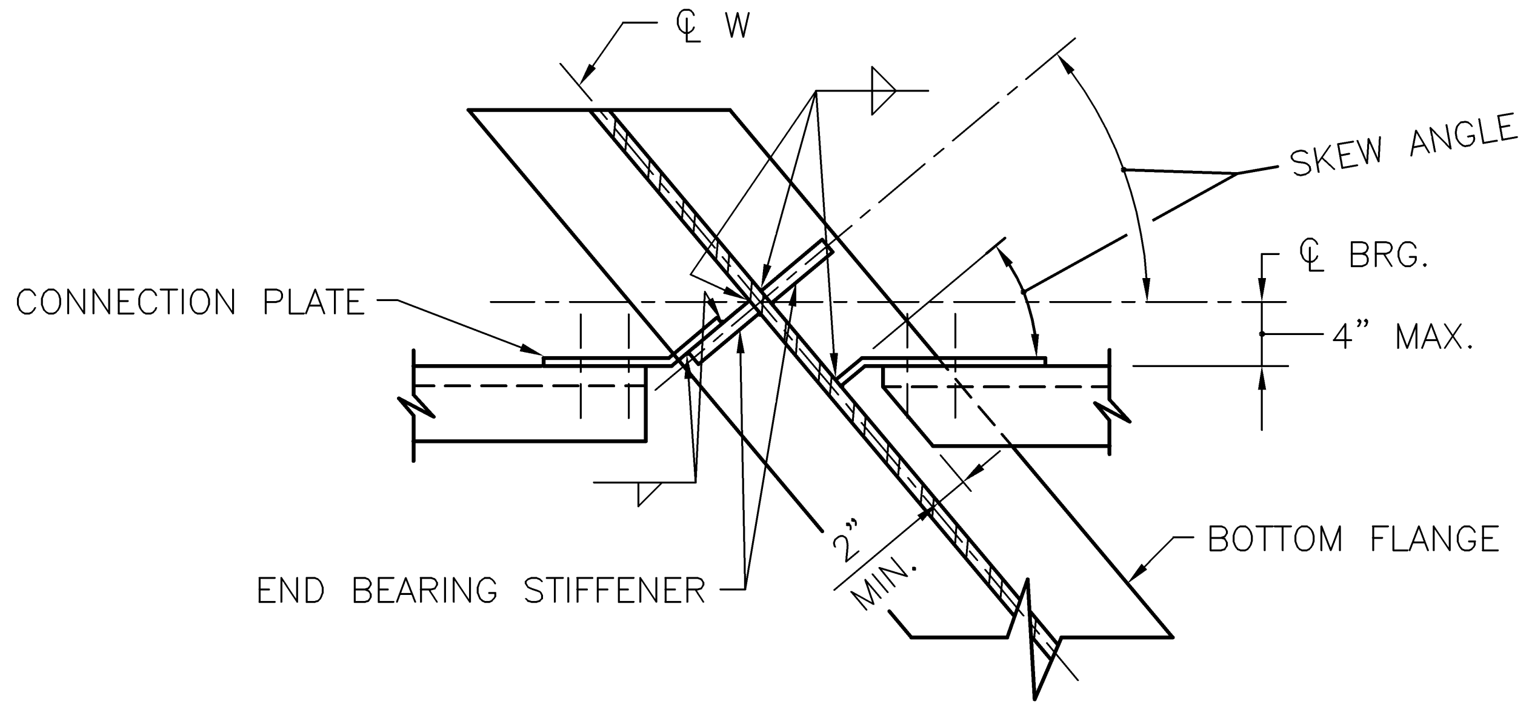
INTERMEDIATE DIAPHRAGM
(FOR SKEW 20° OR LESS)

SECTION B/6.40



SKEW ANGLE 0° TO 20°

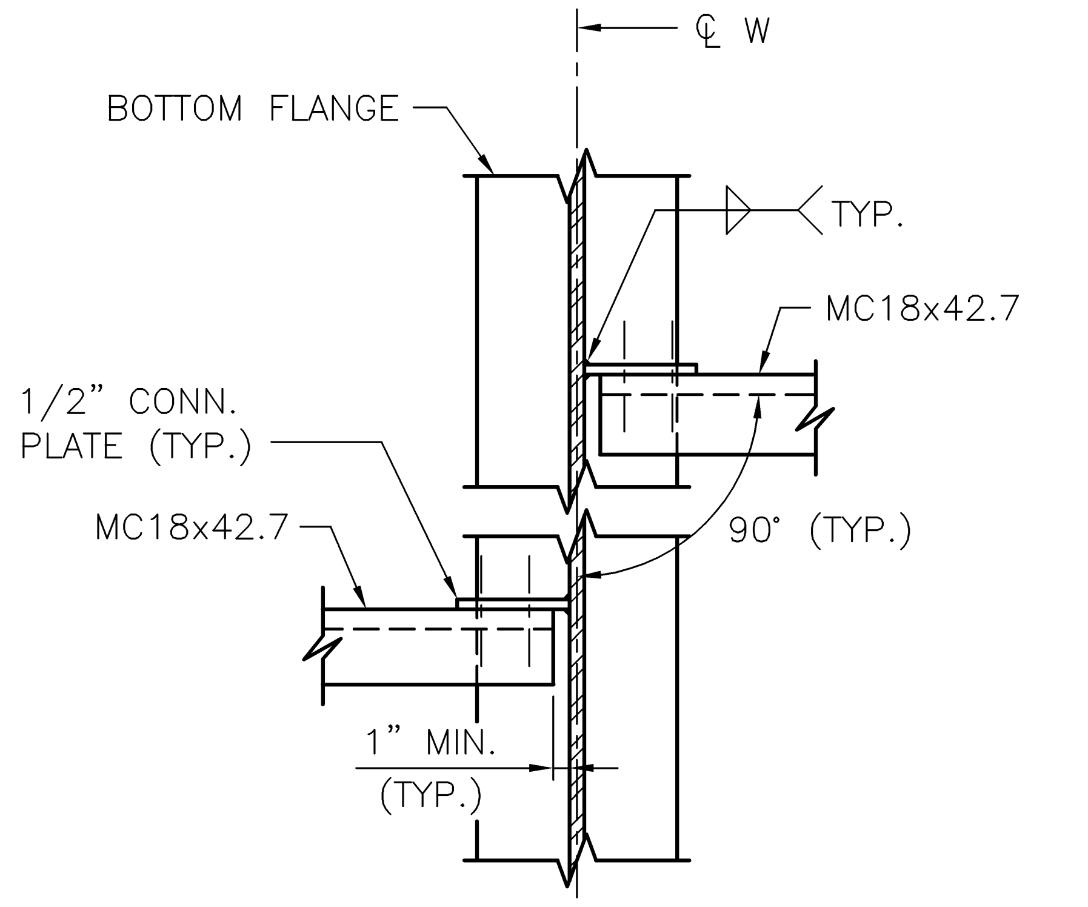
SECTION A/6.40



SKEW ANGLE GREATER THAN 20°

SECTION A/6.40

END DIAPHRAGM CONNECTIONS WITH BEARING STIFFENERS



INTERMEDIATE DIAPHRAGM
(FOR SKEW ANGLE GREATER THAN 20°)

SECTION B/6.40

DESIGNER NOTES:

1. *FOR SHEAR CONNECTOR DETAIL SEE DRAWING 6.20.*
2. *THE END DIAPHRAGM AND CONNECTION DETAILS SHOWN ARE MINIMUM REQUIRED (EXCEPT FOR VERY SHALLOW SECTIONS). ACTUAL DIAPHRAGM SIZE AND CONNECTION DETAILS SHALL BE DETERMINED BASED ON FUTURE JACKING LOAD REQUIREMENTS (REFER TO RIDOT LRFD BRIDGE DESIGN MANUAL) AND/OR THE REQUIREMENTS OF AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.*
3. *THE CLASS OF THE CONTACT SURFACE OF BOLTED PARTS AS REQUIRED BASED ON DESIGN CONSIDERATIONS, SHALL BE INDICATED ON THE CONTRACT DRAWINGS.*

NOTES:

1. THE END DIAPHRAGMS ARE TO FOLLOW THE CROSS PITCH OF THE ROADWAY.
2. LOCATIONS OF HOLES IN CONNECTION PLATES SHALL BE DETERMINED BY THE FABRICATOR.

THIS SHEET IS NOT TO SCALE

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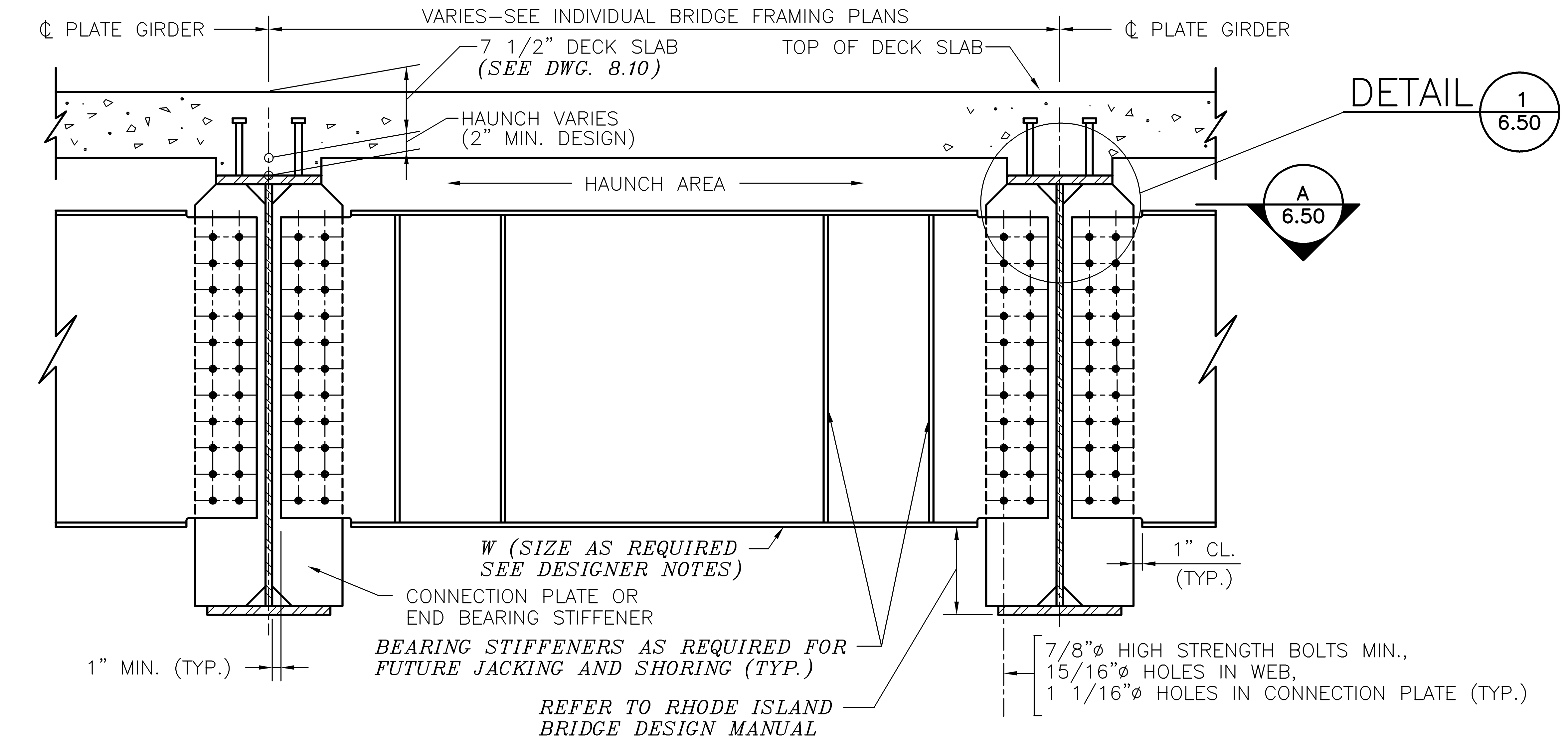
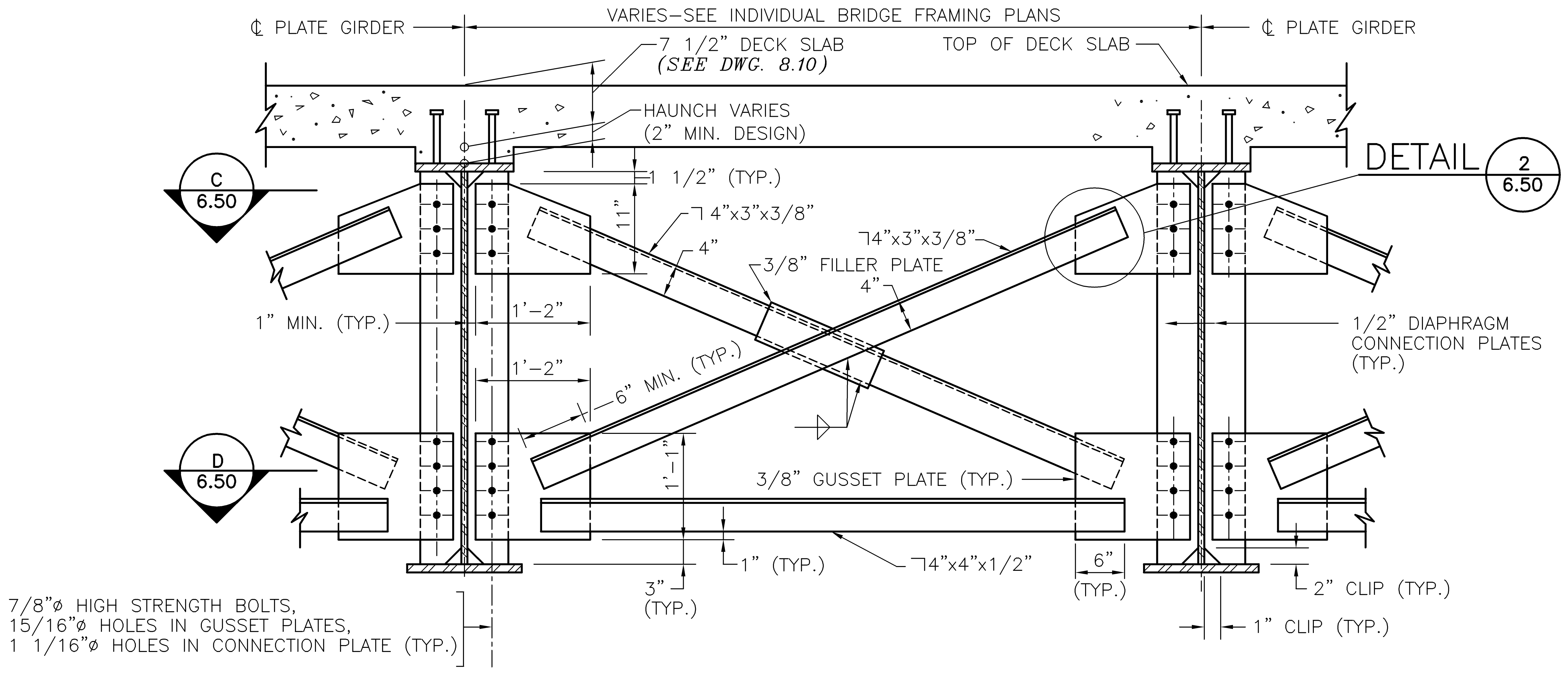
BRIDGE STANDARDS

DIAPHRAGM DETAILS
FOR ROLLED SECTIONS

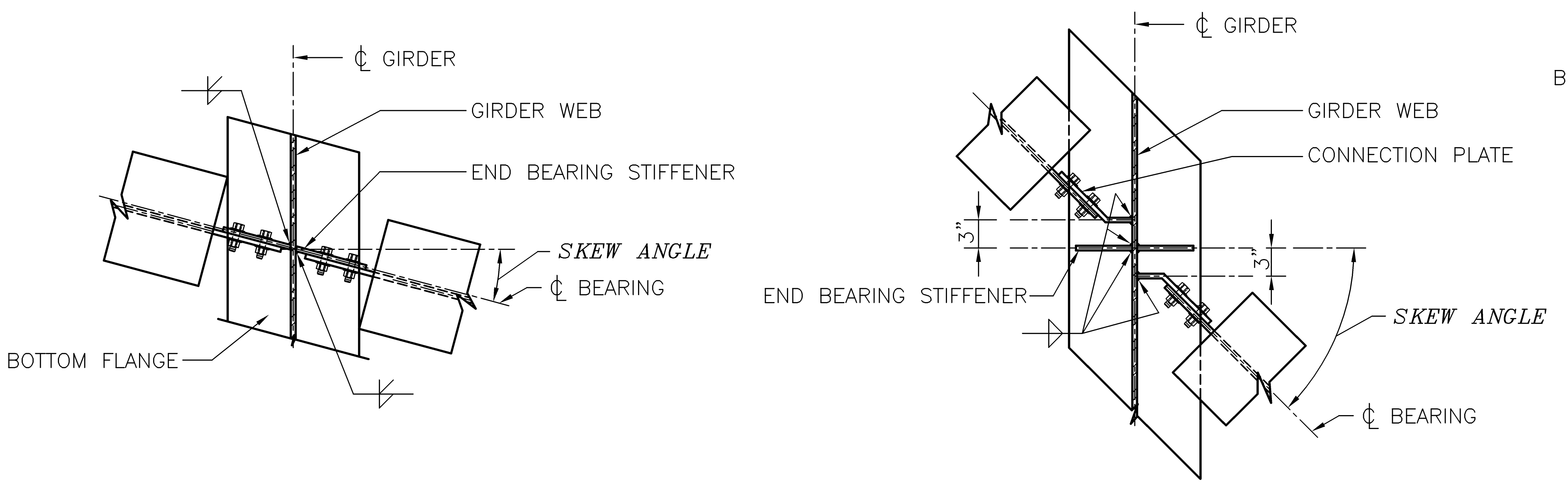
DRAWING NUMBER: 6.40


℄ PLATE GIRDER
VARIES–SEE INDIVIDUAL BRIDGE FRAMING PLANS
℄ PLATE GIRDER
7 1/2" DECK SLAB (SEE DWG. 8.10)
TOP OF DECK SLAB
HAUNCH VARIES (2" MIN. DESIGN)
HAUNCH AREA
DETAIL 1 6.50
A 6.50
W (SIZE AS REQUIRED SEE DESIGNER NOTES)
CONNECTION PLATE OR END BEARING STIFFENER
1" CL. (TYP.)
1" MIN. (TYP.)
BEARING STIFFENERS AS REQUIRED FOR FUTURE JACKING AND SHORING (TYP.)
REFER TO RHODE ISLAND BRIDGE DESIGN MANUAL
7/8"ø HIGH STRENGTH BOLTS MIN., 15/16"ø HOLES IN WEB, 1 1/16"ø HOLES IN CONNECTION PLATE (TYP.)

END DIAPHRAGM (D–1)



INTERMEDIATE CROSS FRAME (D–2)

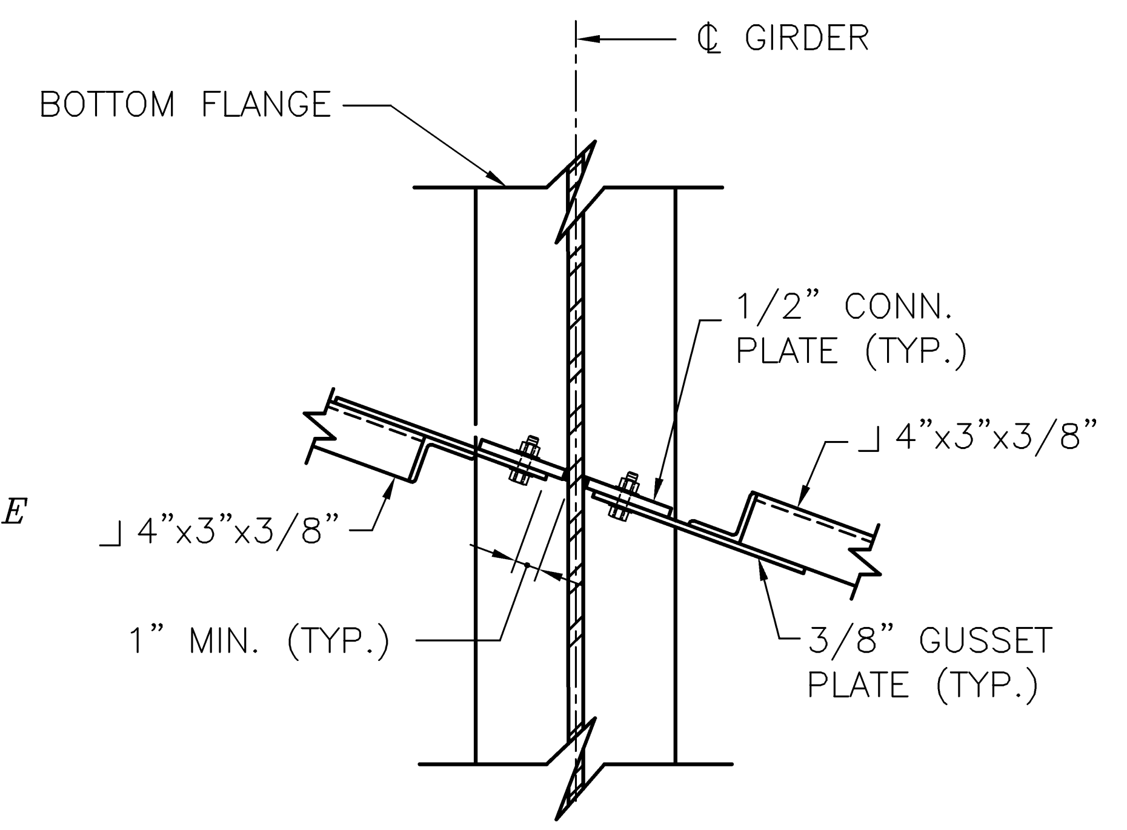


SKEW ANGLE 0°–20°

SKEW ANGLE GREATER THAN 20°

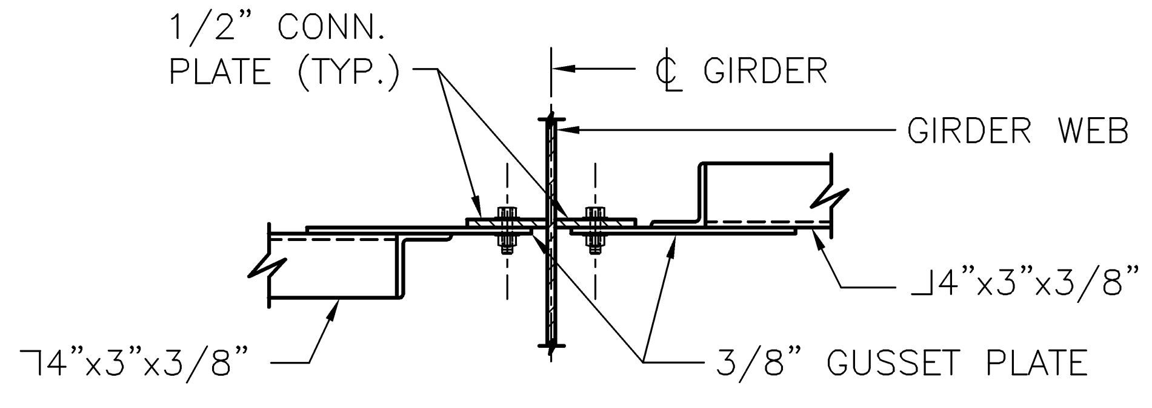
DESIGNER NOTE:
THIS DETAIL SHALL NOT BE USED FOR END DIAPHRAGMS IF UTILIZED FOR FUTURE JACKING. THE DESIGNER SHALL BE RESPONSIBLE FOR THE DESIGN AND DETAIL OF THIS CONNECTION, IF PROPOSED FOR FUTURE JACKING REQUIREMENTS.

SECTION A 6.50



INTERMEDIATE DIAPHRAGM
(FOR SKEW 20° OR LESS)

SECTION C 6.50



INTERMEDIATE DIAPHRAGM
(SKEW ANGLE GREATER THAN 20°)

SECTION C 6.50

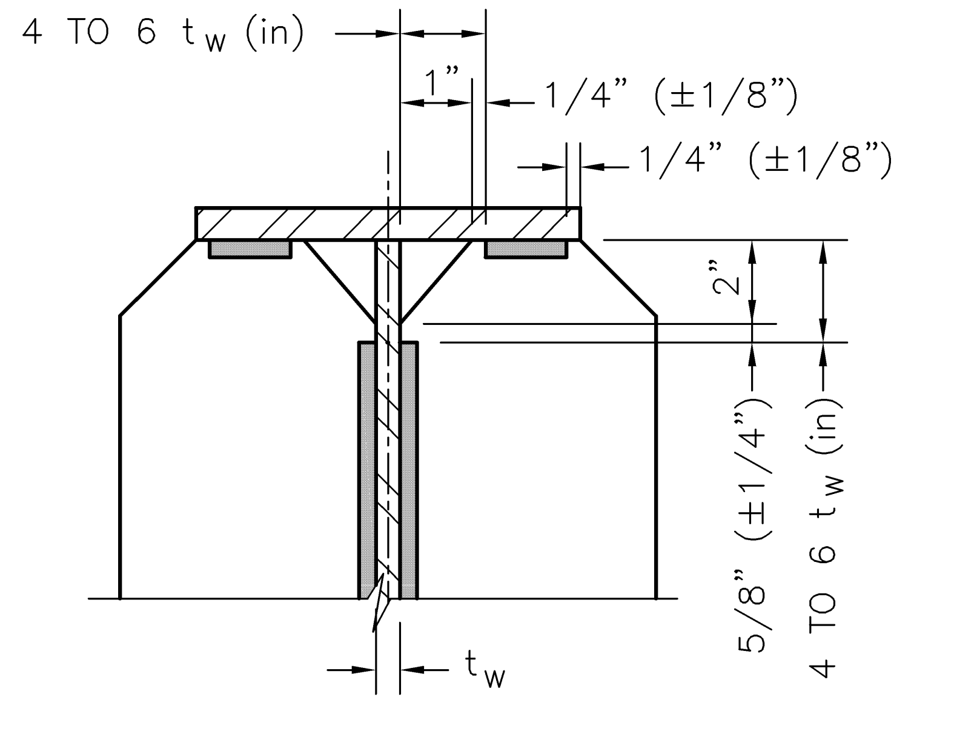
DESIGNER NOTES:

1. *THE SIZE OF THE END DIAPHRAGM AND CONNECTION DETAILS SHALL BE DETERMINED BASED ON FUTURE JACKING LOAD REQUIREMENTS (REFER TO RIDOT LRFD BRIDGE DESIGN MANUAL) AND/OR THE REQUIREMENTS OF AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.*
2. *THE CLASS OF THE CONTACT SURFACE OF BOLTED PARTS AS REQUIRED BASED ON DESIGN CONSIDERATIONS, SHALL BE INDICATED ON THE CONTRACT DRAWINGS.*

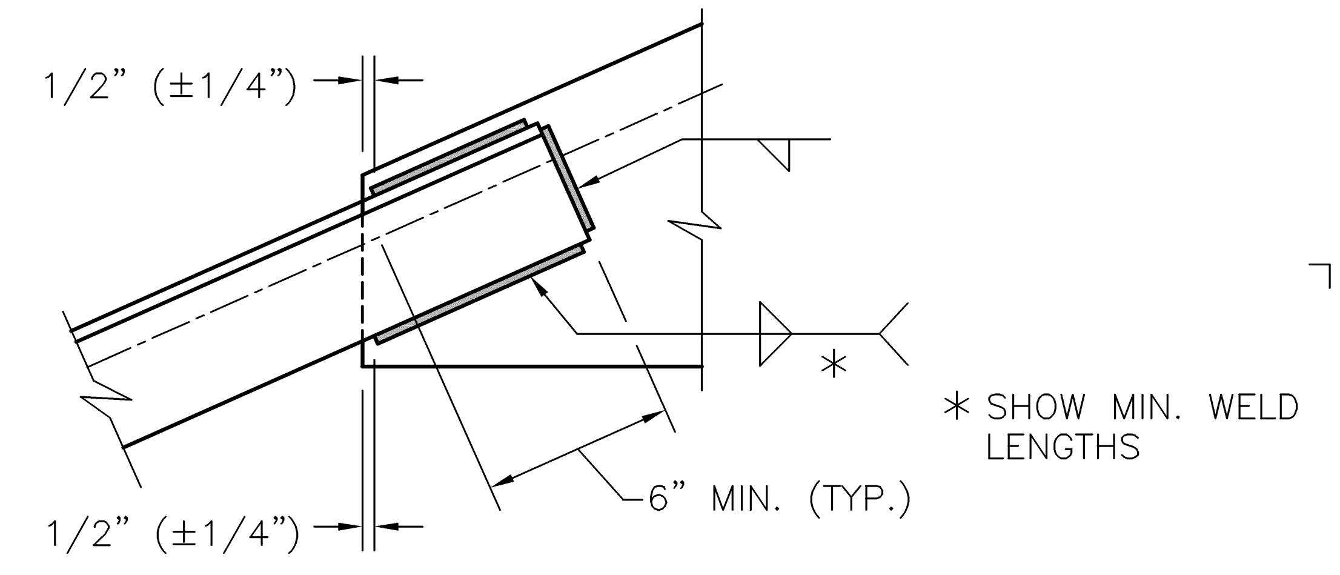
NOTES:

1 THE END DIAPHRAGMS ARE TO FOLLOW THE CROSS PITCH OF THE ROADWAY.

2 LOCATIONS OF HOLES IN CONNECTION PLATES SHALL BE DETERMINED BY THE FABRICATOR.

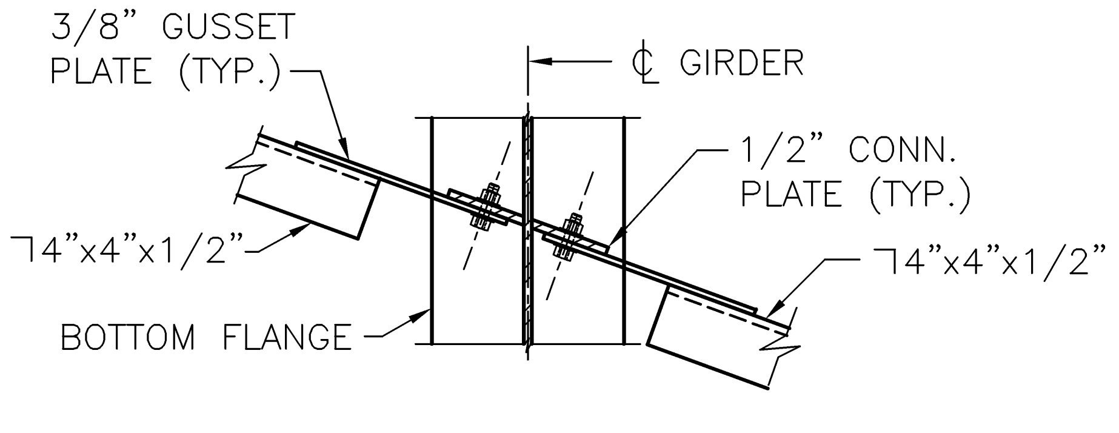


DETAIL 1 6.50



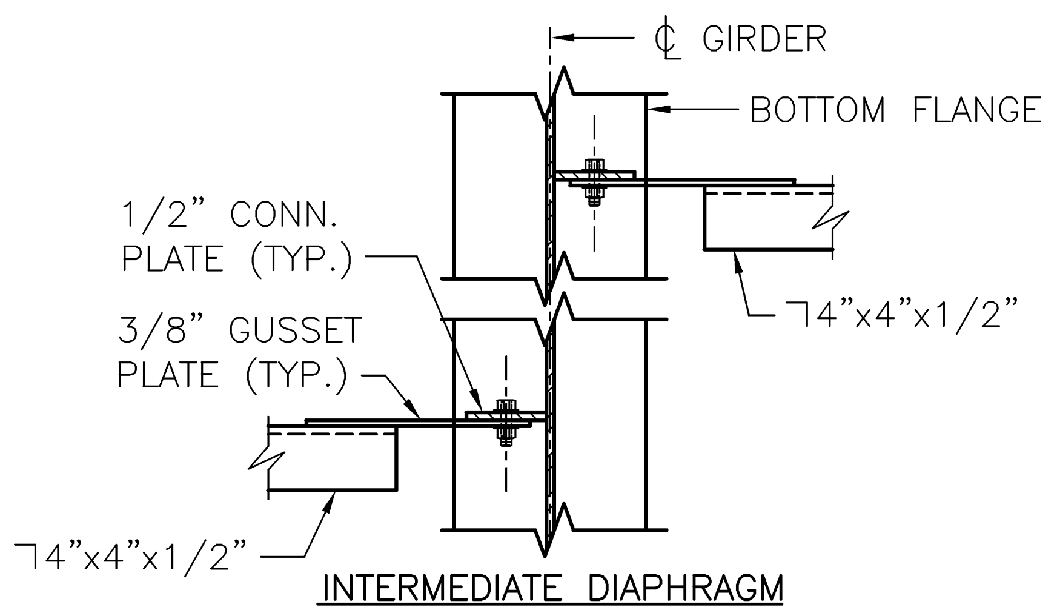
DETAIL 2 6.50

(TYPICAL WELD DETAIL FOR CROSS FRAME CONNECTIONS)



INTERMEDIATE DIAPHRAGM
(FOR SKEW 20° OR LESS)

SECTION D 6.50



INTERMEDIATE DIAPHRAGM
(SKEW ANGLE GREATER THAN 20°)

SECTION D 6.50

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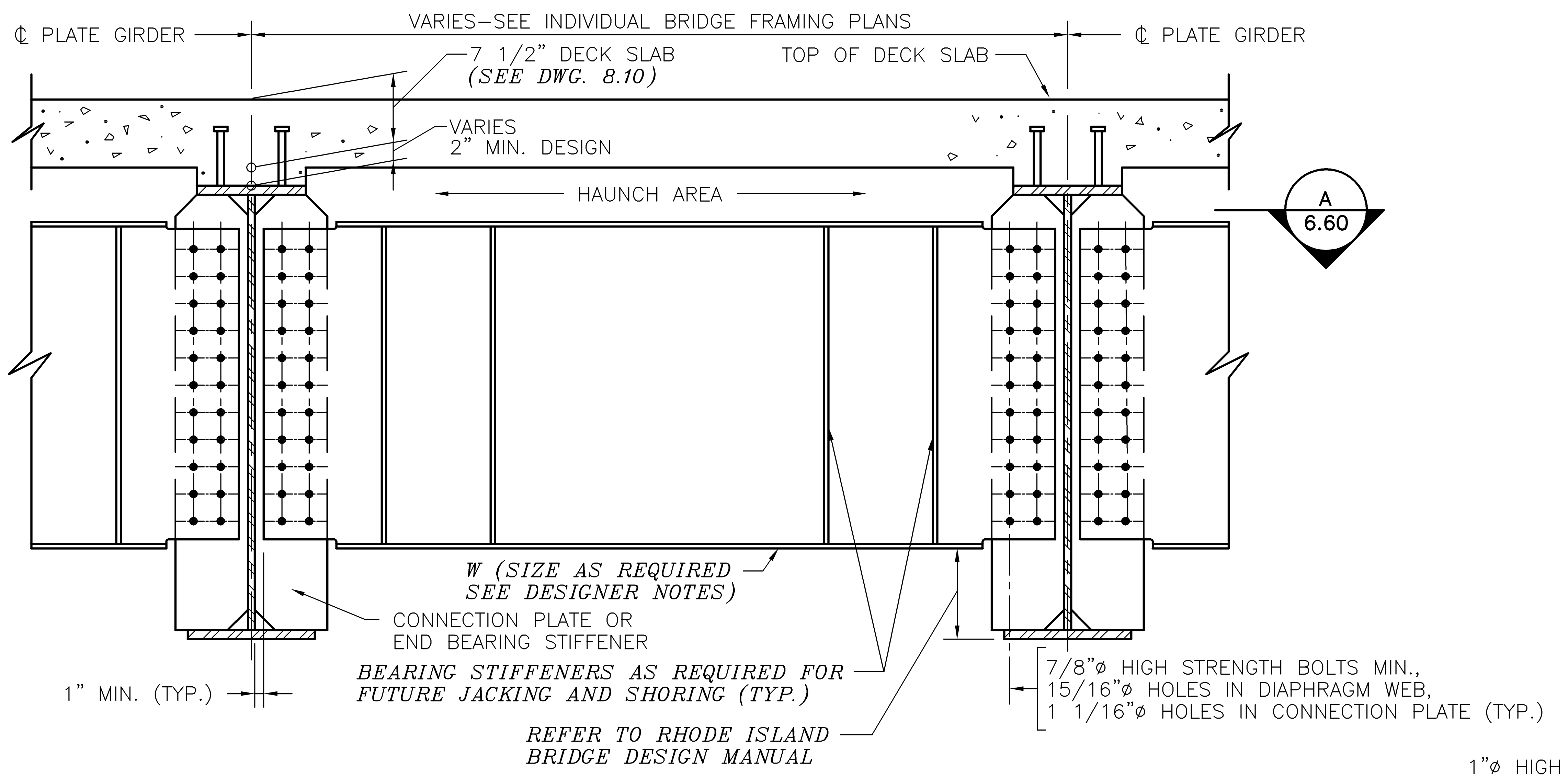
DEPARTMENT OF TRANSPORTATION

BRIDGE STANDARDS

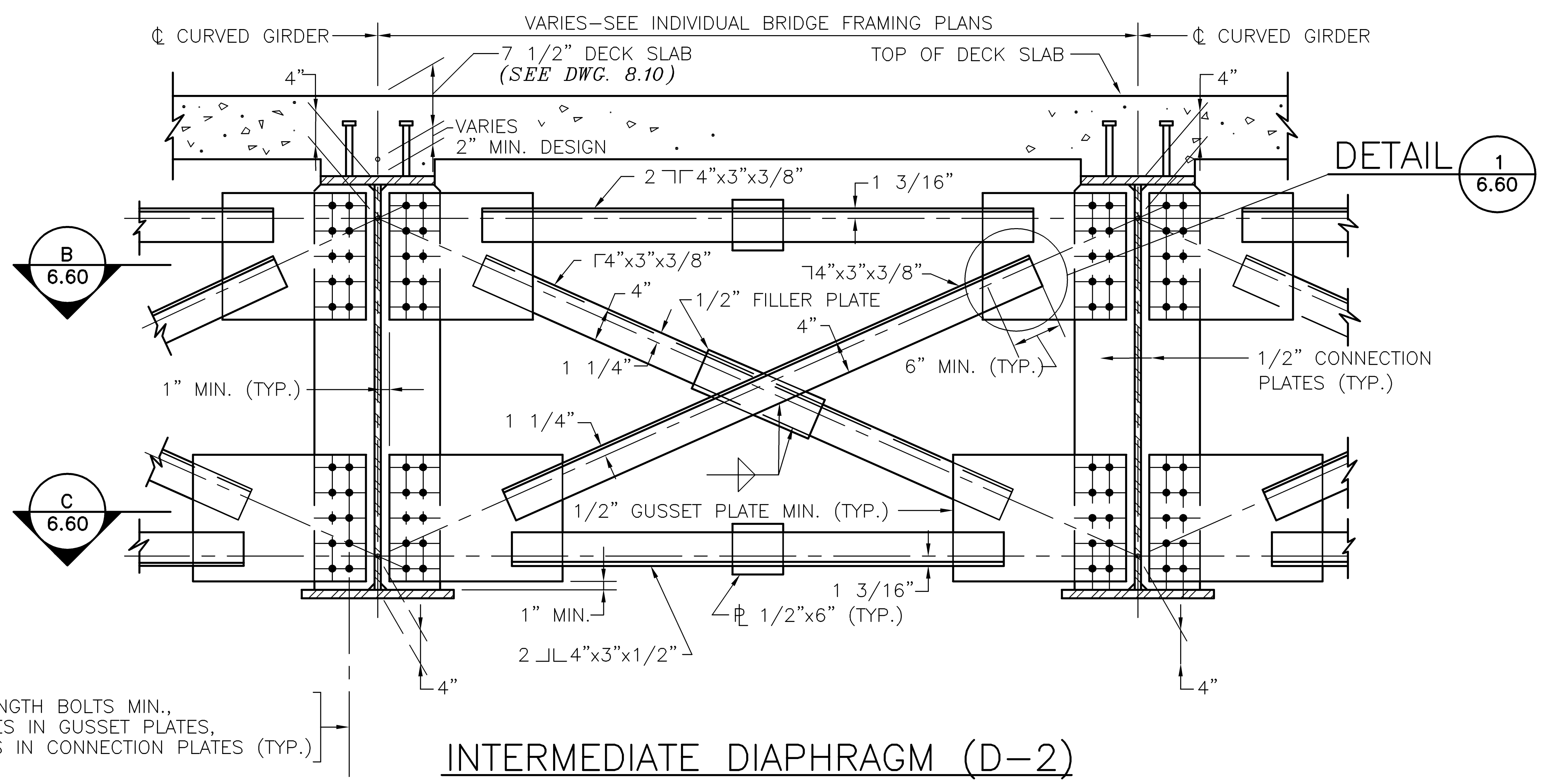
DIAPHRAGM DETAILS FOR
PLATE GIRDERS–STRAIGHT

DRAWING NUMBER: 6.50

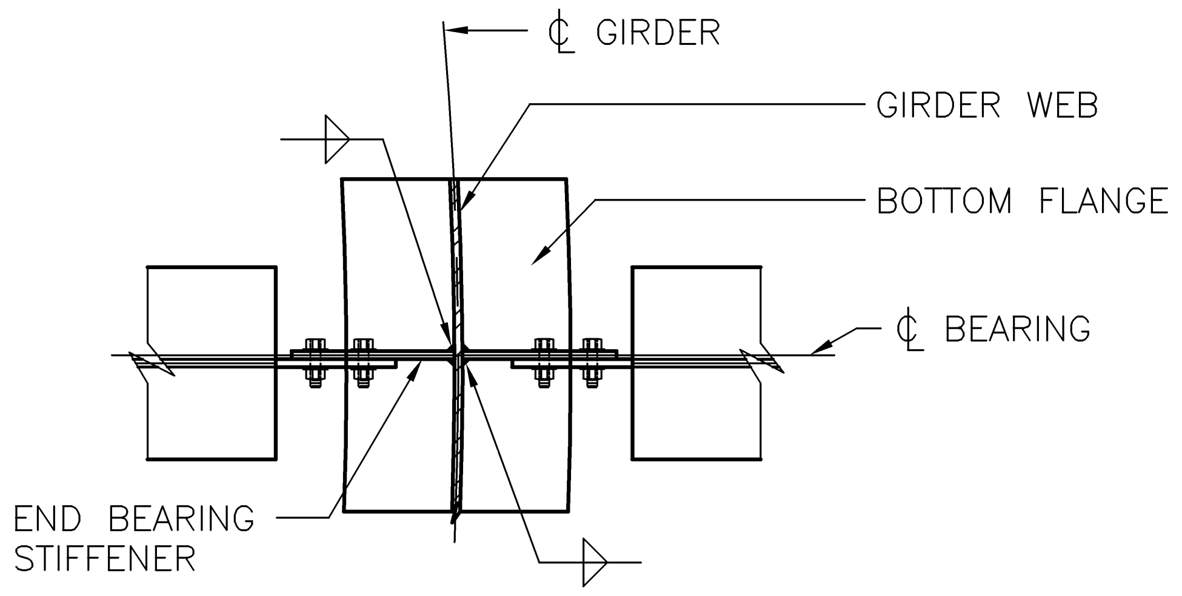


END DIAPHRAGM (D–1)

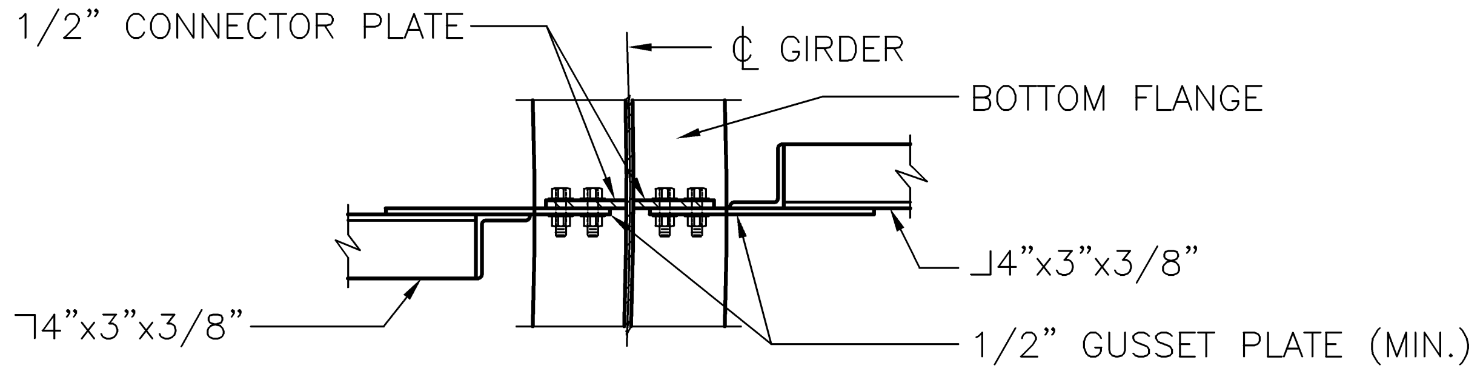
1"ø HIGH STRENGTH BOLTS MIN.,
1 1/16"ø HOLES IN GUSSET PLATES,
1 1/4"ø HOLES IN CONNECTION PLATES (TYP.)



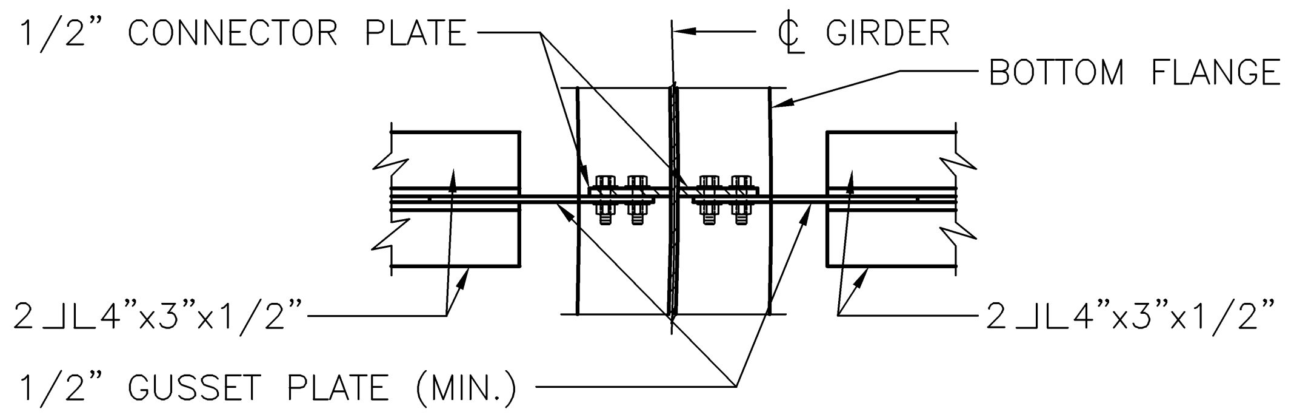
INTERMEDIATE DIAPHRAGM (D–2)



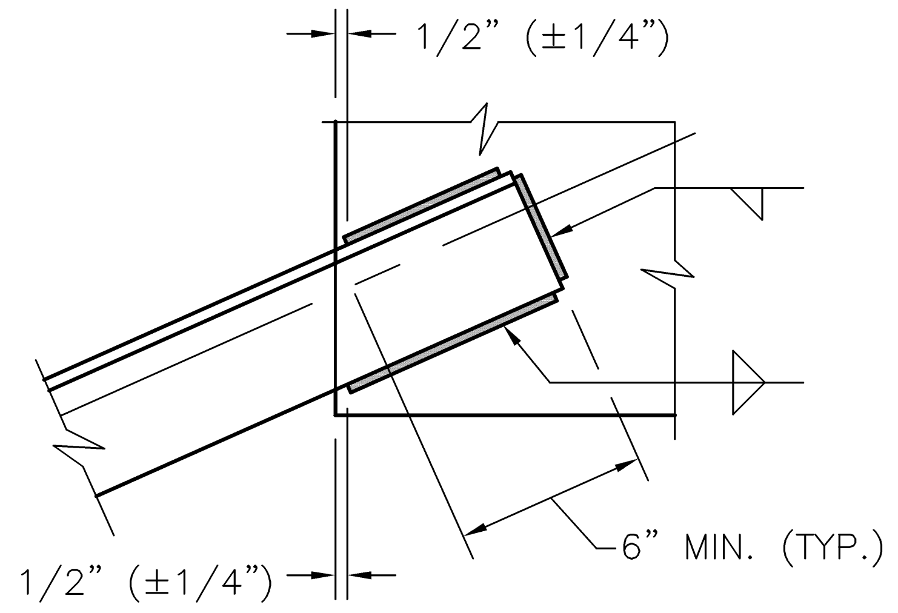
SECTION A 6.60



SECTION B 6.60



SECTION C 6.60



DETAIL 1 6.60

DESIGNER NOTES:

1. *THE SIZE OF THE END DIAPHRAGM AND CONNECTION DETAILS SHALL ALSO BE DETERMINED BASED ON FUTURE JACKING LOAD REQUIREMENTS (REFER TO THE RIDOT LRFD BRIDGE DESIGN MANUAL)*
2. *THE CLASS OF THE CONTACT SURFACE OF BOLTED PARTS AS REQUIRED BASED ON DESIGN CONSIDERATIONS, SHALL BE INDICATED ON THE CONTRACT DRAWINGS.*

NOTES:

1. THE END DIAPHRAGMS ARE TO FOLLOW THE CROSS PITCH OF THE ROADWAY.
2. LOCATIONS OF HOLES IN CONNECTION PLATES SHALL BE DETERMINED BY THE FABRICATOR.

DIAPHRAGMS ARE SHOWN STRAIGHT FOR STANDARDIZATION PURPOSES ONLY.

THIS SHEET IS NOT TO SCALE

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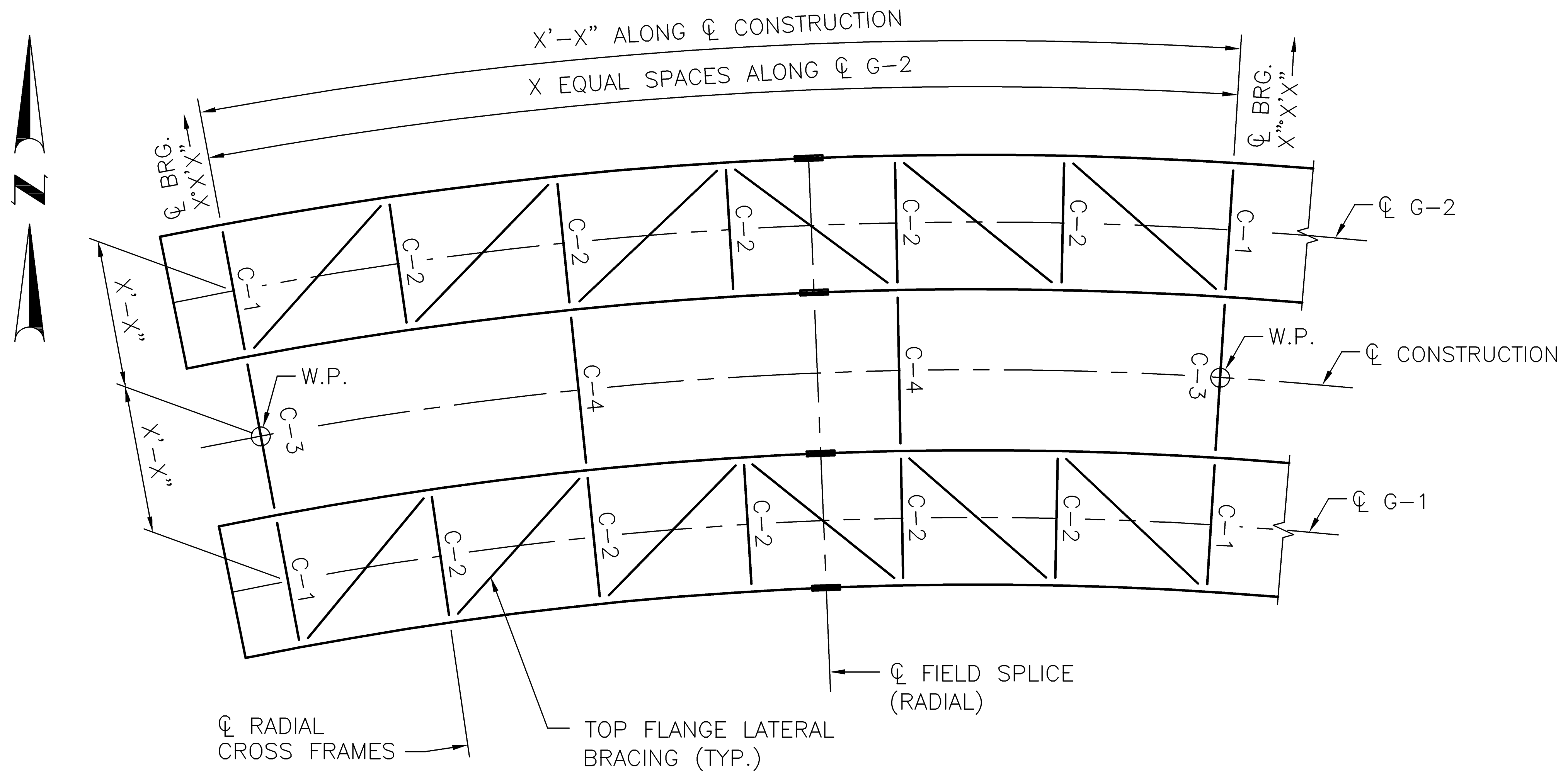
BRIDGE STANDARDS

DIAPHRAGM DETAILS FOR
PLATE GIRDERS–CURVED

DRAWING NUMBER: 6.60



NOTE:

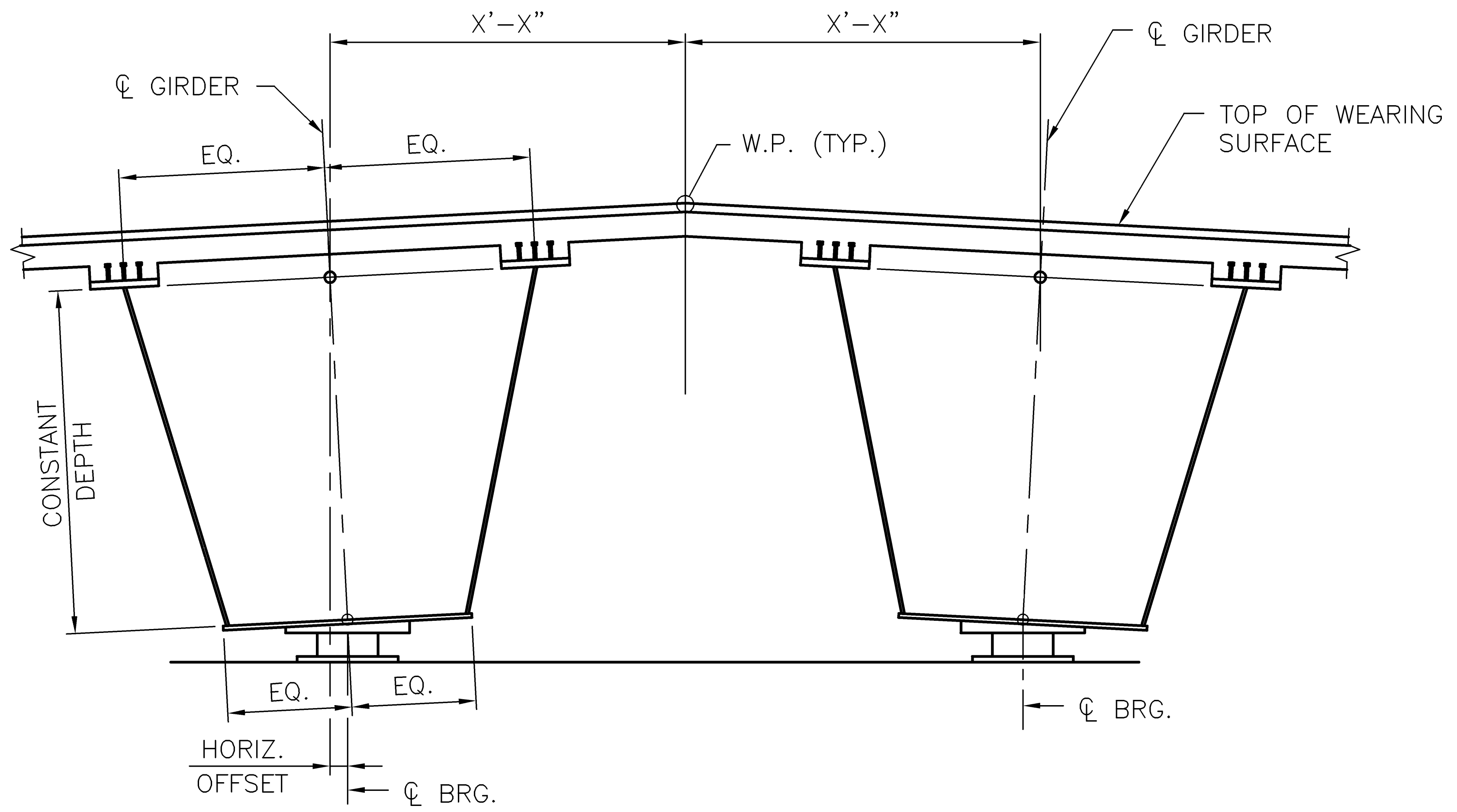
C1 = TYPICAL INTERIOR END CROSS FRAME
C2 = TYPICAL INTERIOR INTERMEDIATE CROSS FRAME
C3 = TYPICAL EXTERIOR END CROSS FRAME
C4 = TYPICAL EXTERIOR INTERMEDIATE CROSS FRAME

FRAMING PLAN

NOT TO SCALE

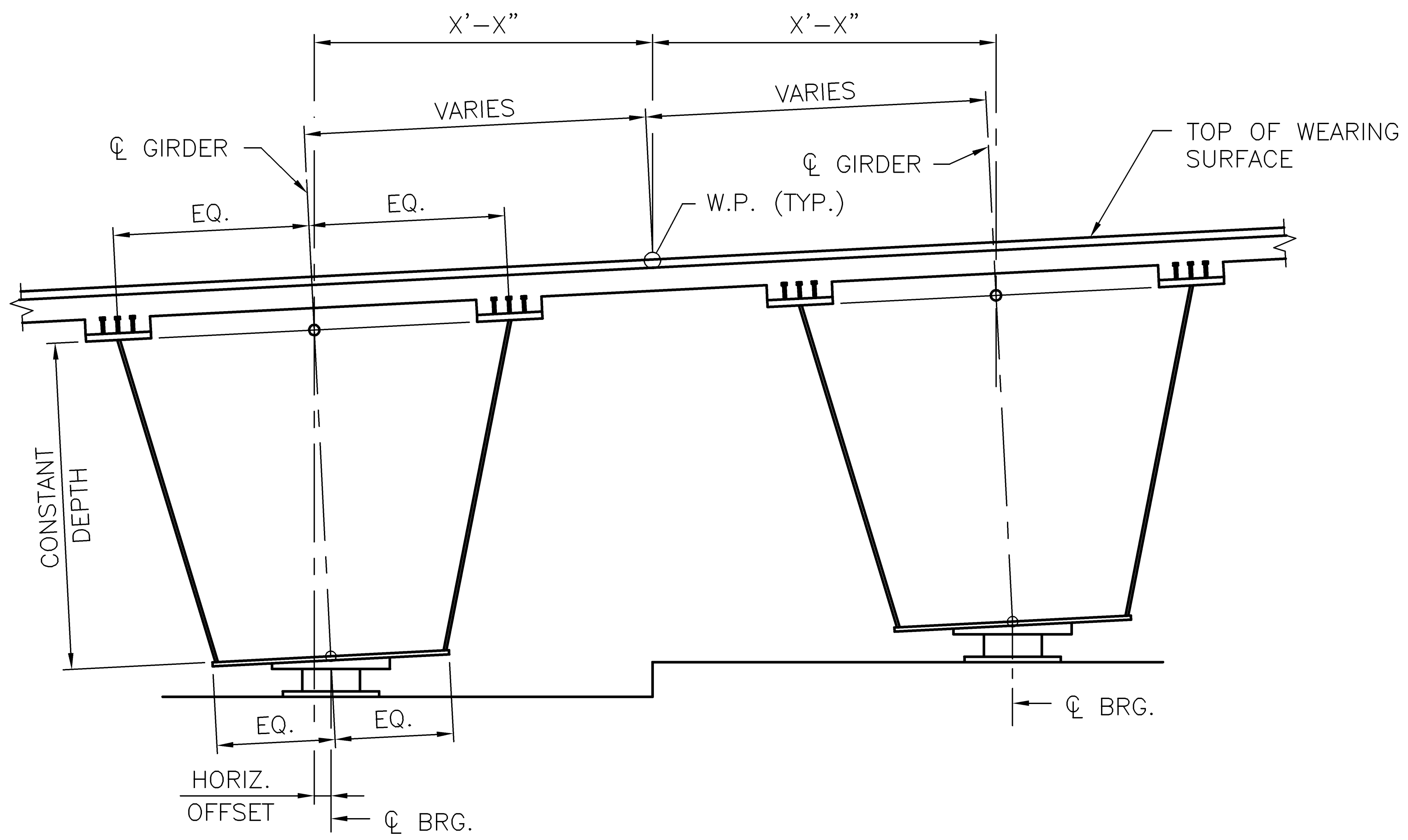
DESIGNER NOTES:

1. *EXTERIOR CROSS FRAME SPACING SHALL BE GOVERNED BY DESIGN REQUIREMENTS.*
2. *FRAMING PLAN SHOWS PREFERRED TOP FLANGE INTERNAL BRACING CONFIGURATION.*
3. *DIMENSION CROSS FRAME SPACING ALONG CENTER LINE OF CONSTRUCTION.*
4. *RADIAL LAYOUT PREFERRED.*
5. *DIMENSION LOCATIONS OF INSPECTION ACCESS HATCHES IN BOTTOM FLANGES. PROVIDE 1 HATCH PER STEEL BOX GIRDER PER SUBSTRUCTURE.*



CROWNED ROADWAY SECTION

NOT TO SCALE



SUPERELEVATED ROADWAY SECTION

NOT TO SCALE

DESIGNER NOTES:

1. *ROTATE BOXES TO FOLLOW CROSS SLOPE.*
2. *MAINTAIN CONSTANT TRAPEZOIDAL SHAPE.*
3. *W.P. INDICATES WORKING POINT. WORKING POINTS SHALL BE DEFINED ON CONSTRUCTION PLANS.*

THIS SHEET IS NOT TO SCALE

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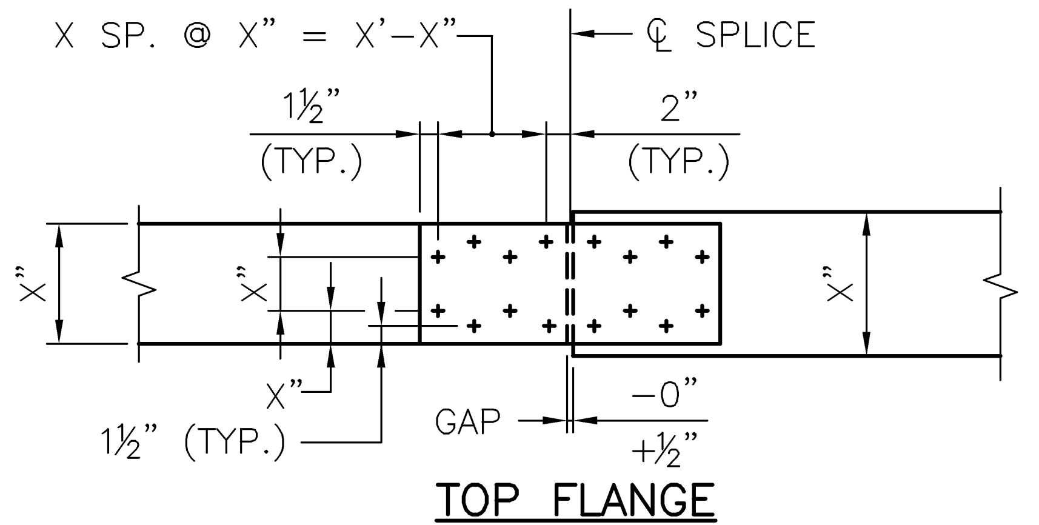
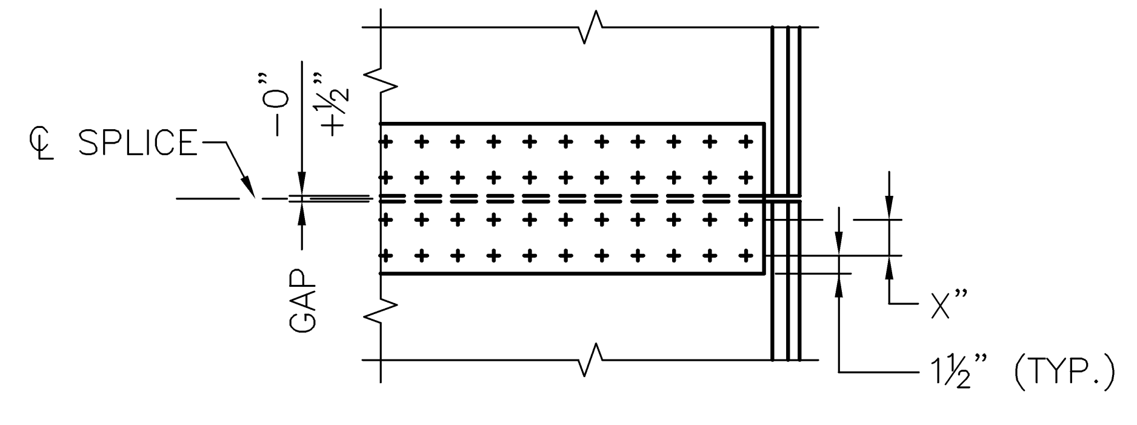
STEEL BOX GIRDER DETAILS
SHEET 1

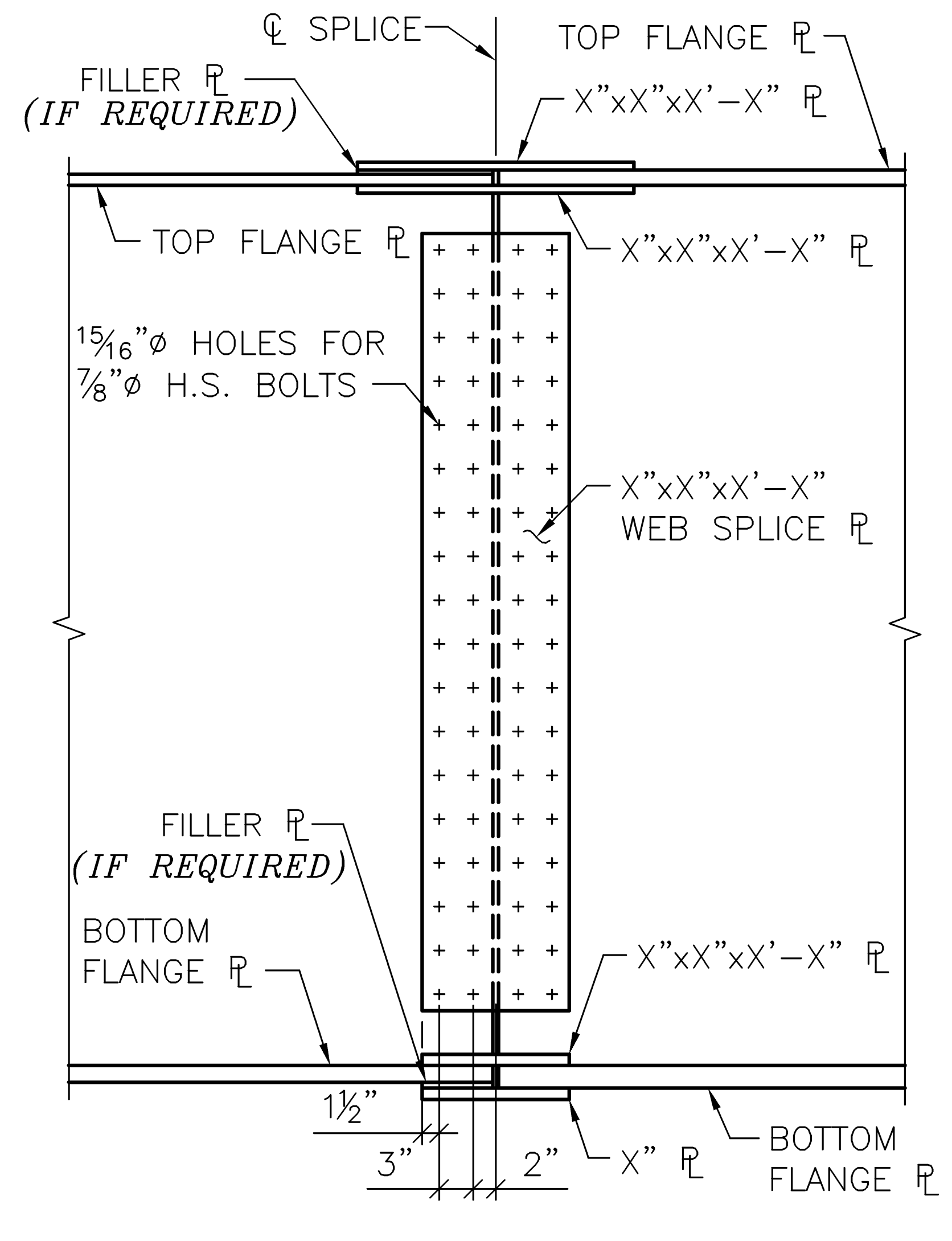
DRAWING NUMBER: 6.70



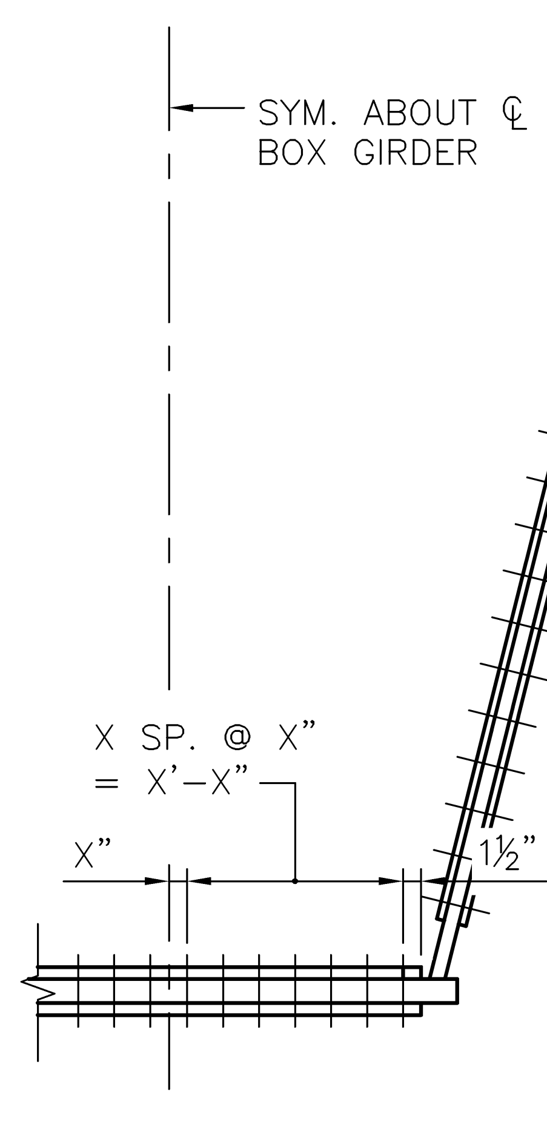
TOP FLANGE



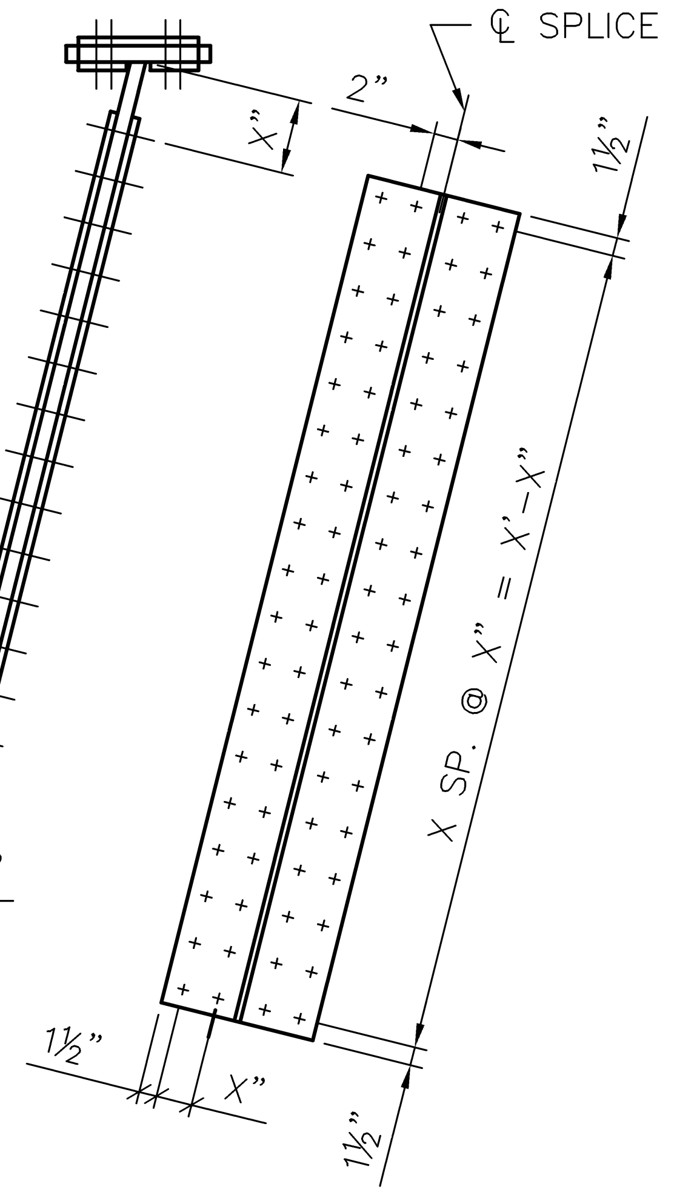
BOTTOM FLANGE



ELEVATION



SECTION

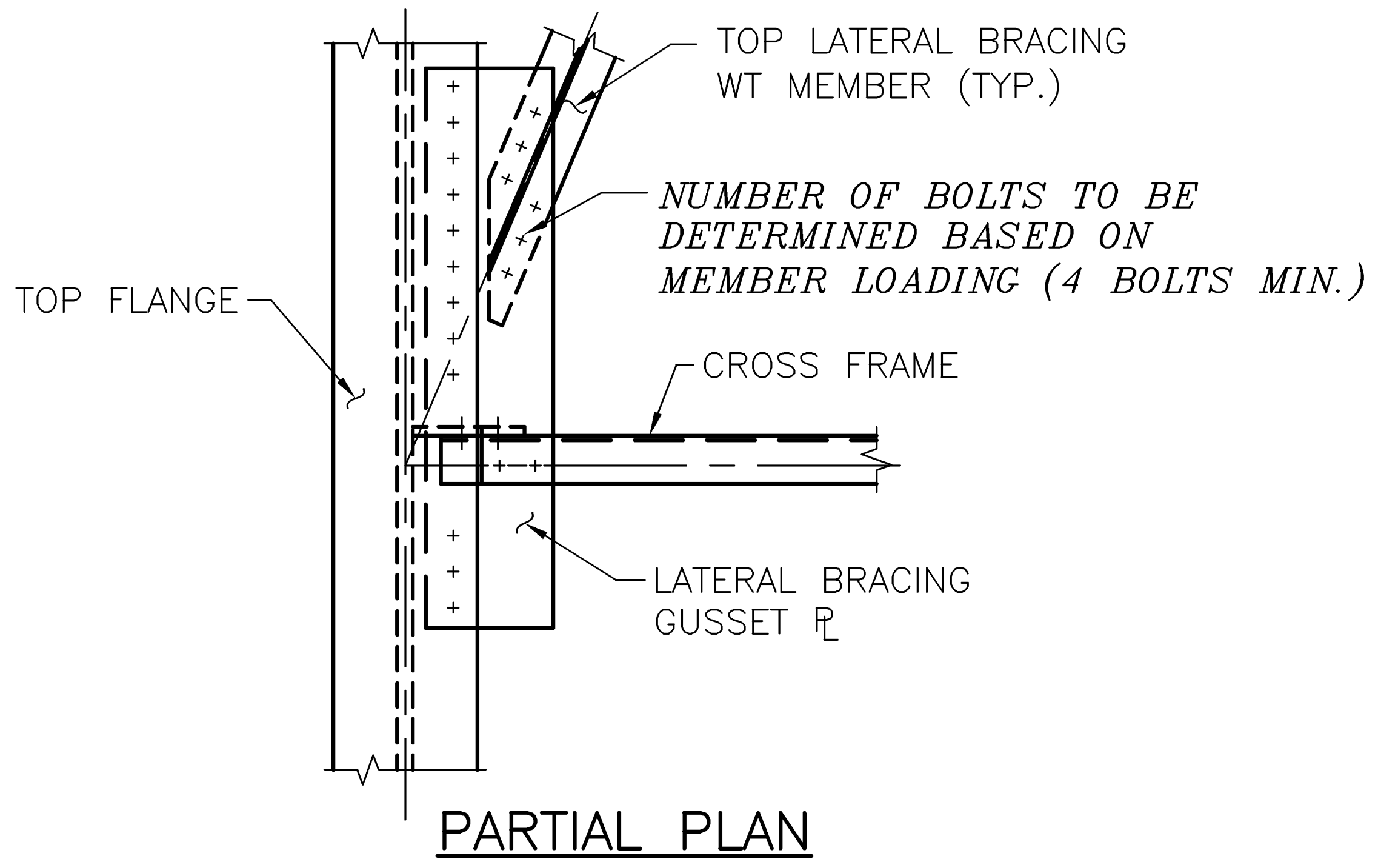


WEB SPLICE PLATE

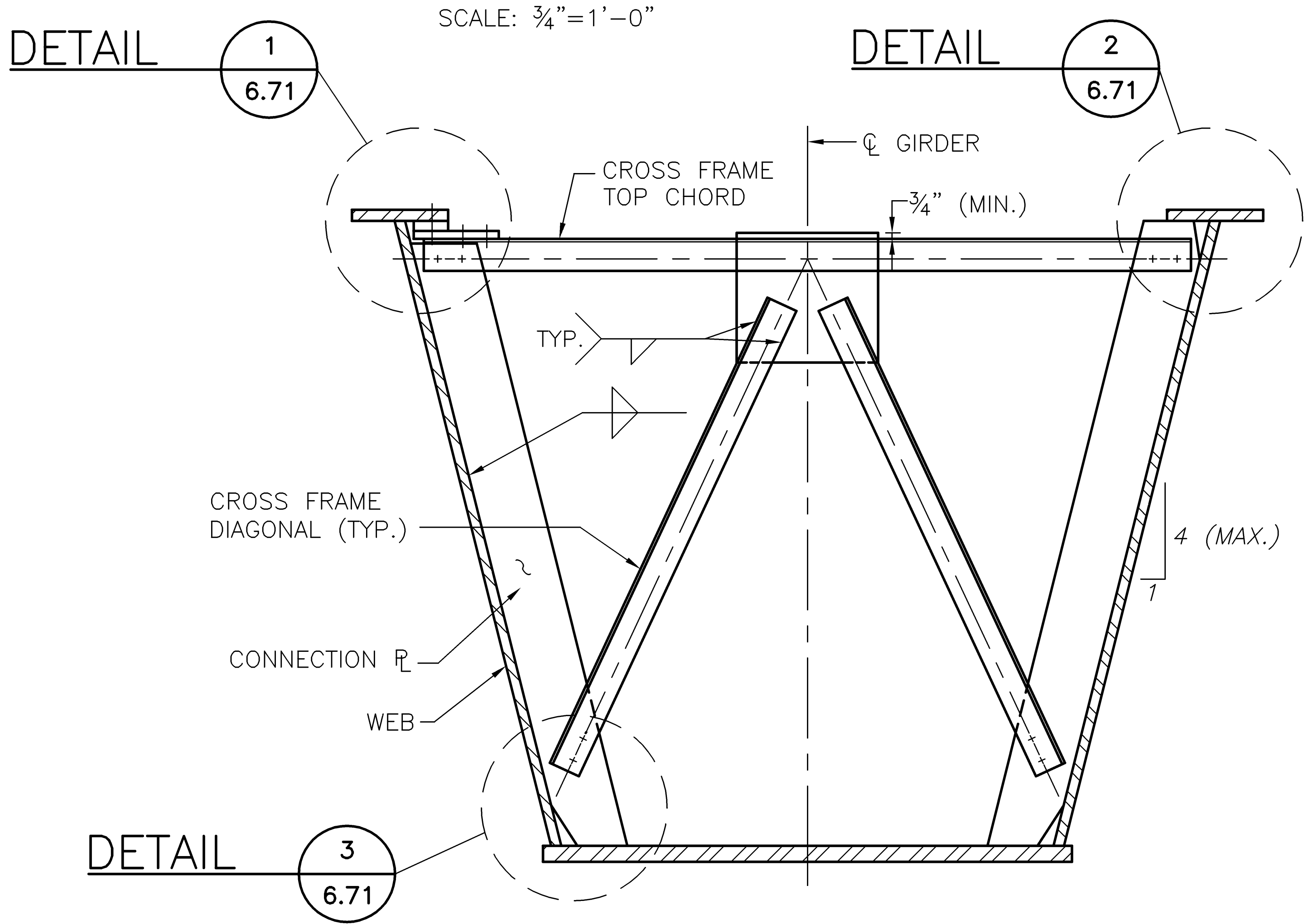
NOTES:
1. BOLTED FIELD SPLICES SHALL BE CONSIDERED SLIP–CRITICAL CONNECTIONS WITH CLASS B FAYING SURFACES.
2. + DENOTES 7/8" ø ASTM A325 HIGH STRENGTH BOLT IN 15/16" ø HOLE.
3. THICKNESS DIFFERENCES OF 1/16" OR LESS DO NOT REQUIRE FILLER PLATES. FILLER PLATES SHALL CONFORM TO AASHTO M 270 GRADE 36 OR 50.
4. ONE ROW OF STUD SHEAR CONNECTORS SHALL BE PLACED ALONG THE CENTERLINE OF THE TOP FLANGE SPLICE PLATES.

BOLTED FIELD SPLICE DETAILS

SCALE: ¾"=1'–0"


TOP LATERAL BRACING WT MEMBER (TYP.)
NUMBER OF BOLTS TO BE DETERMINED BASED ON MEMBER LOADING (4 BOLTS MIN.)
TOP FLANGE
CROSS FRAME
LATERAL BRACING GUSSET ℄
PARTIAL PLAN

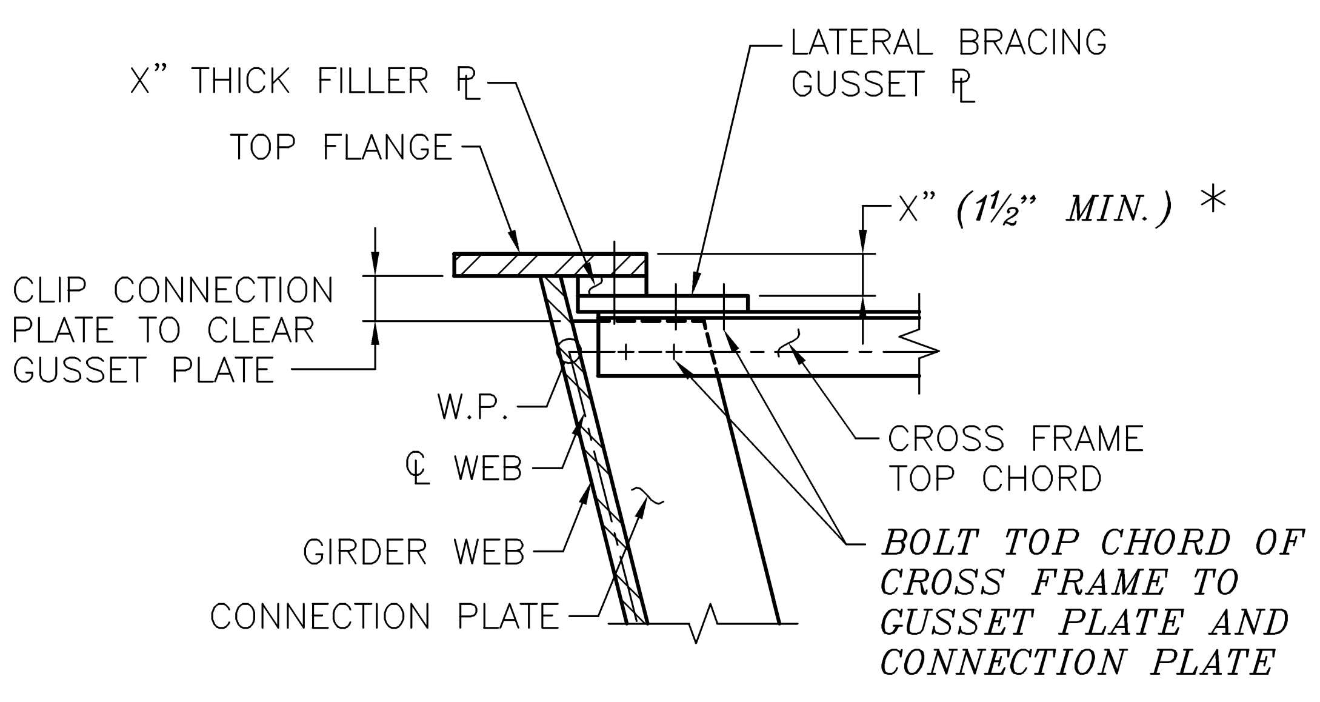
SCALE: ¾"=1'–0"



INTERIOR INTERMEDIATE CROSS FRAME DETAILS

SCALE: ¾"=1'–0"

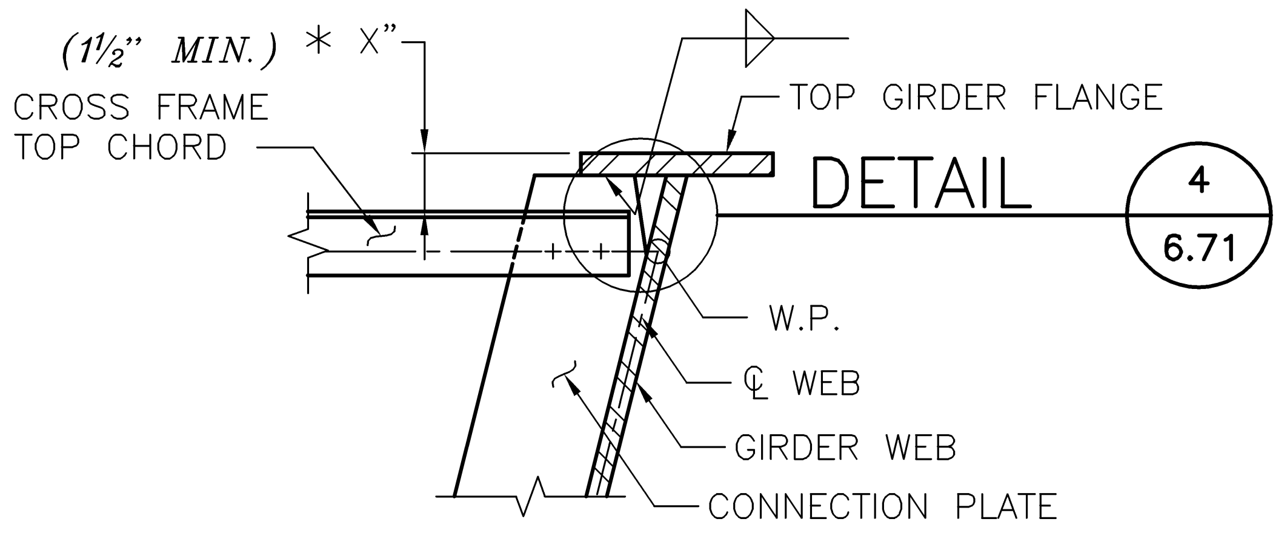
DESIGNER NOTES:
1. *THE TOP LATERAL BRACING MAY BE BOLTED DIRECTLY TO THE FLANGE WITHOUT A GUSSET PLATE WHERE THE FLANGE WIDTH PERMITS.*
2. *SINGLE ANGLES ARE PREFERRED FOR INTERMEDIATE CROSS FRAMES. DOUBLE ANGLES MAY BE REQUIRED AS THE DESIGN DICTATES.*
3. *RECTANGULAR GUSSET PLATES ARE PREFERRED.*



WITH LATERAL BRACING

DETAIL 1 6.71

SCALE: 1" = 1'–0"

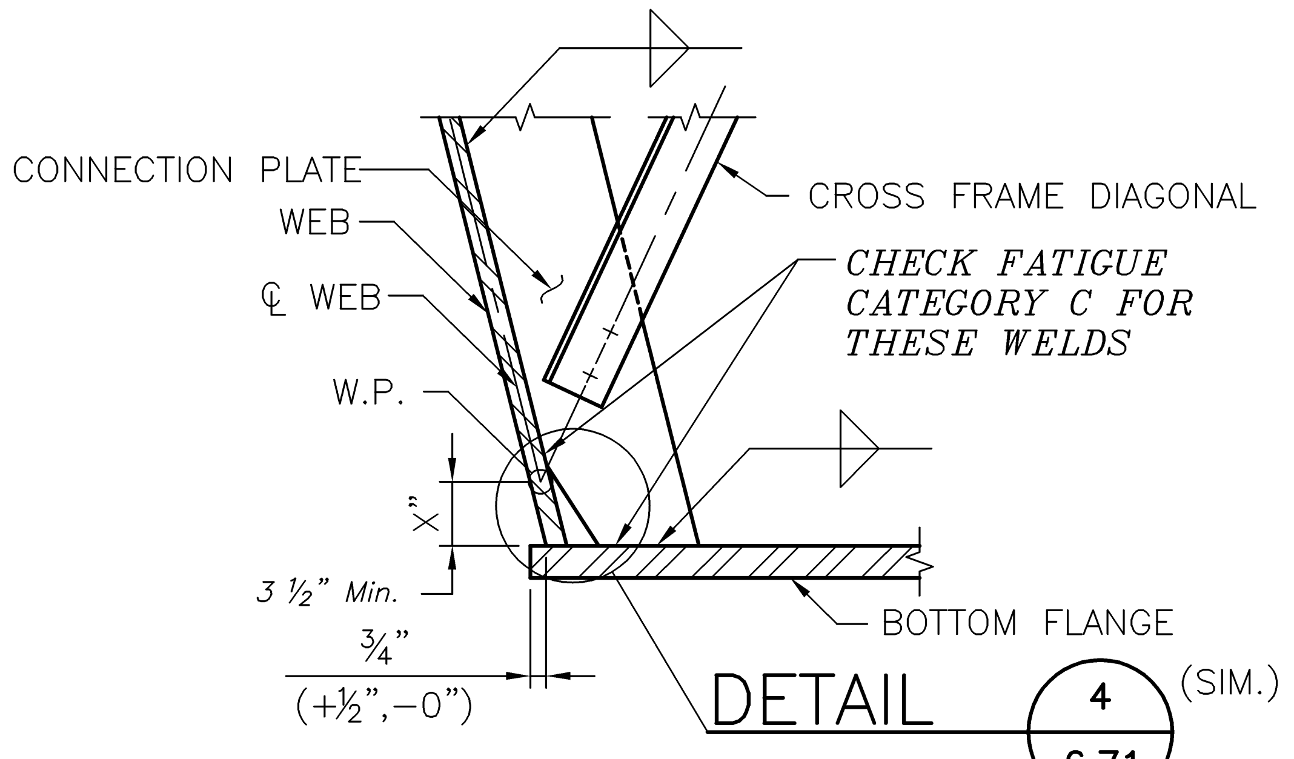


WITHOUT LATERAL BRACING

DETAIL 2 6.71

SCALE: 1" = 1'–0"

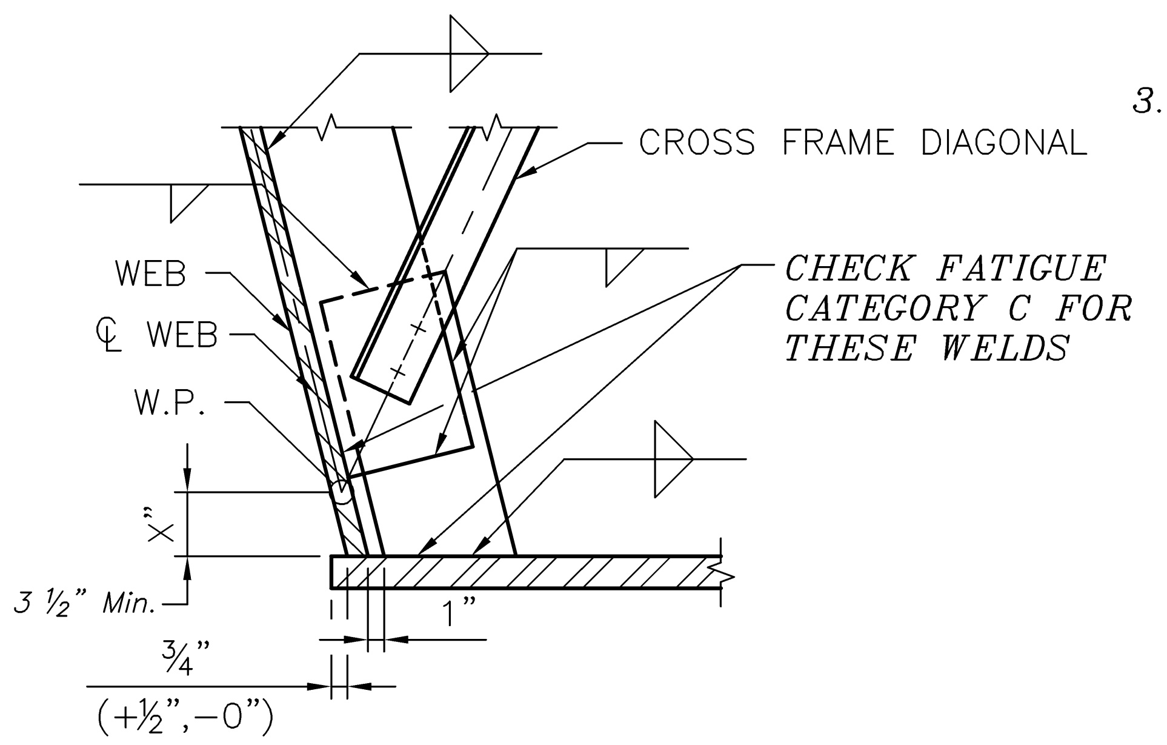
* *LEAVE GAP TO FACILITATE DECK FORMING. ALWAYS KEEP DIMENSION CONSISTENT BETWEEN CROSS FRAMES.*



CONNECTION DETAIL

DETAIL 3 6.71

SCALE: 1" = 1'–0"

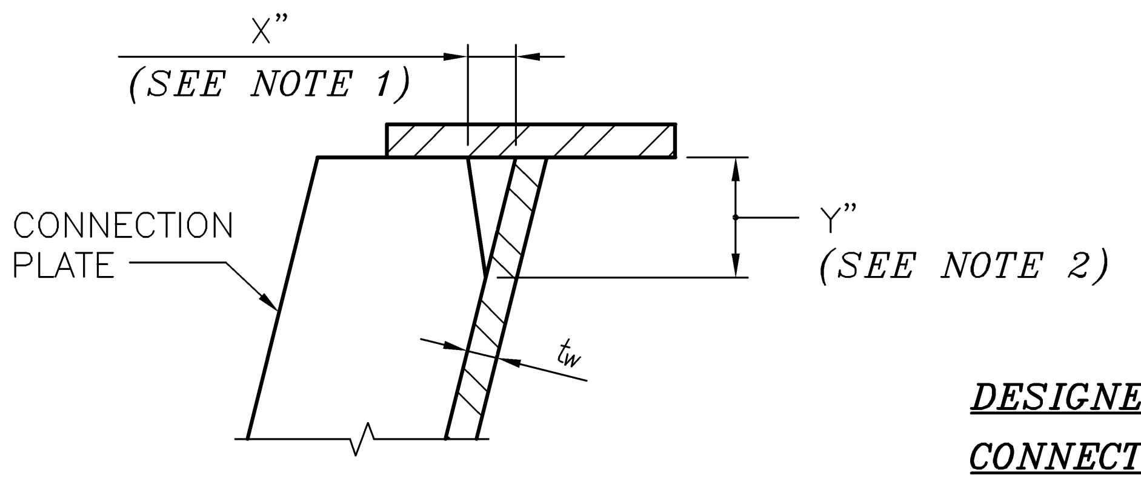


CONNECTION DETAIL (ALTERNATE)

DETAIL 3 6.71

SCALE: 1" = 1'–0"

NOTE:
TERMINATE FILLET WELDS ½" SHORT OF ALL PLATE EDGES



DETAIL 4 6.71

NOT TO SCALE

DESIGNER:

CONNECTION PLATE NOTES:
1. *WIDTH OF CLIP SHALL BE 2 x t_w.*
2. *HEIGHT OF CLIP SHALL BE 5 x t_w.*

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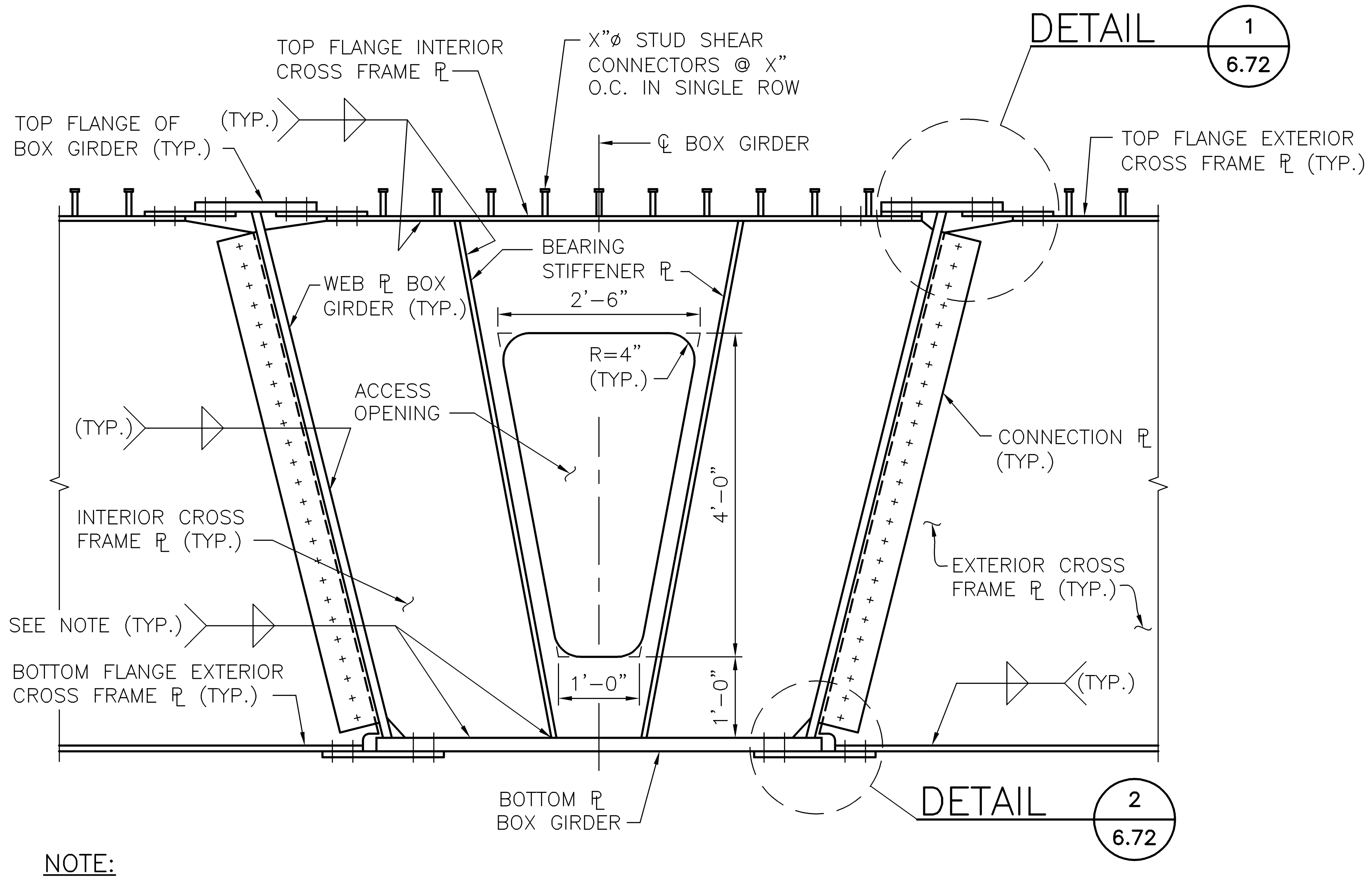
STEEL BOX GIRDER DETAILS
SHEET 2

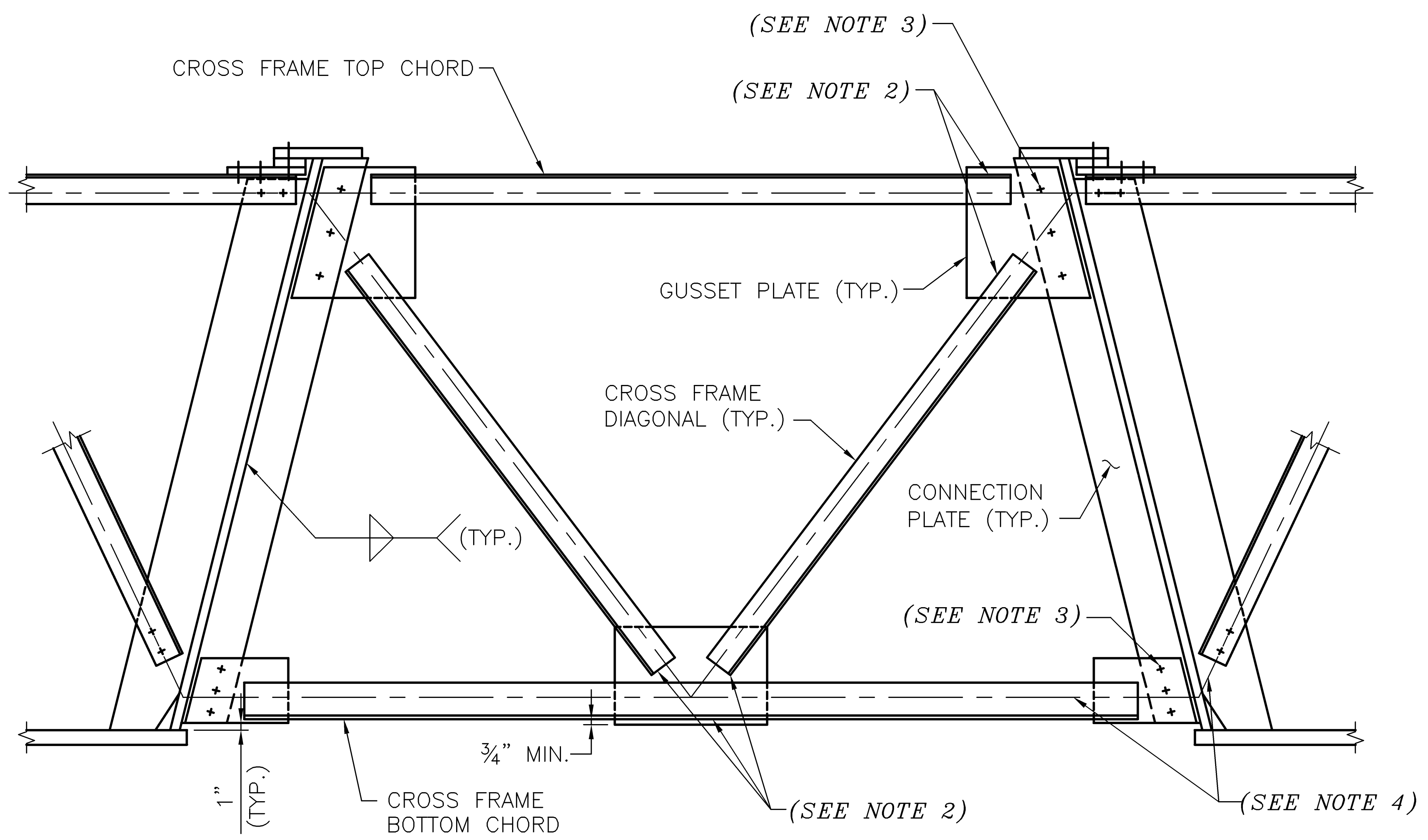
DRAWING NUMBER: 6.71


TOP FLANGE INTERIOR CROSS FRAME ℙ
X"ø STUD SHEAR CONNECTORS @ X" O.C. IN SINGLE ROW
DETAIL 1 / 6.72
TOP FLANGE OF BOX GIRDER (TYP.)
(TYP.)
℄ BOX GIRDER
TOP FLANGE EXTERIOR CROSS FRAME ℙ (TYP.)
BEARING STIFFENER ℙ
WEB ℙ BOX GIRDER (TYP.)
2'–6"
R=4" (TYP.)
ACCESS OPENING
(TYP.)
CONNECTION ℙ (TYP.)
4'–0"
INTERIOR CROSS FRAME ℙ (TYP.)
EXTERIOR CROSS FRAME ℙ (TYP.)
SEE NOTE (TYP.)
BOTTOM FLANGE EXTERIOR CROSS FRAME ℙ (TYP.)
1'–0"
1'–0"
(TYP.)
BOTTOM ℙ BOX GIRDER
DETAIL 2 / 6.72

NOTE:
ALL CROSS FRAME AND STIFFENER PLATE CONNECTIONS TO BOX GIRDER BOTTOM FLANGE ARE MILLED TO BEAR.

END CROSS FRAME

SCALE: ¾"=1'–0"

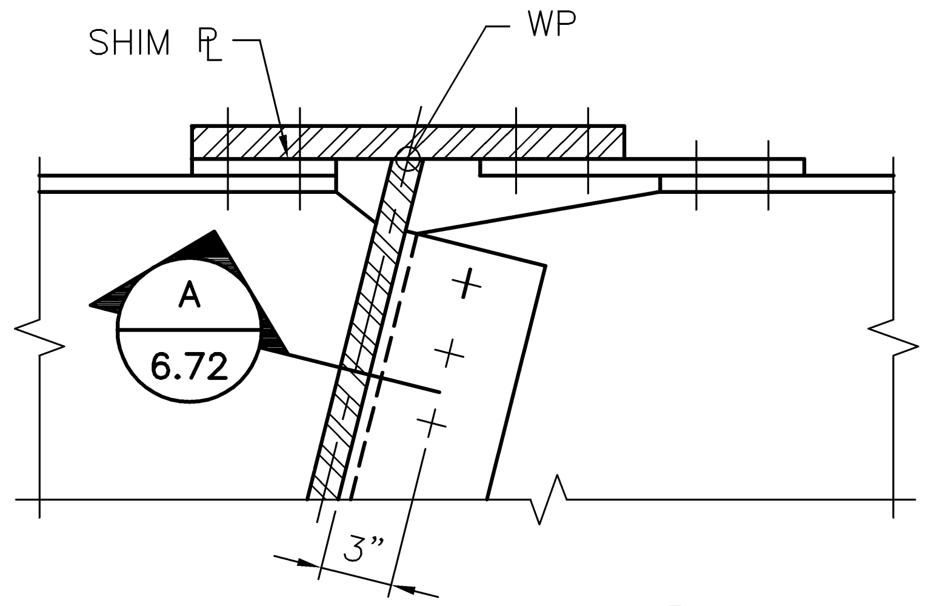


EXTERIOR INTERMEDIATE CROSS FRAME

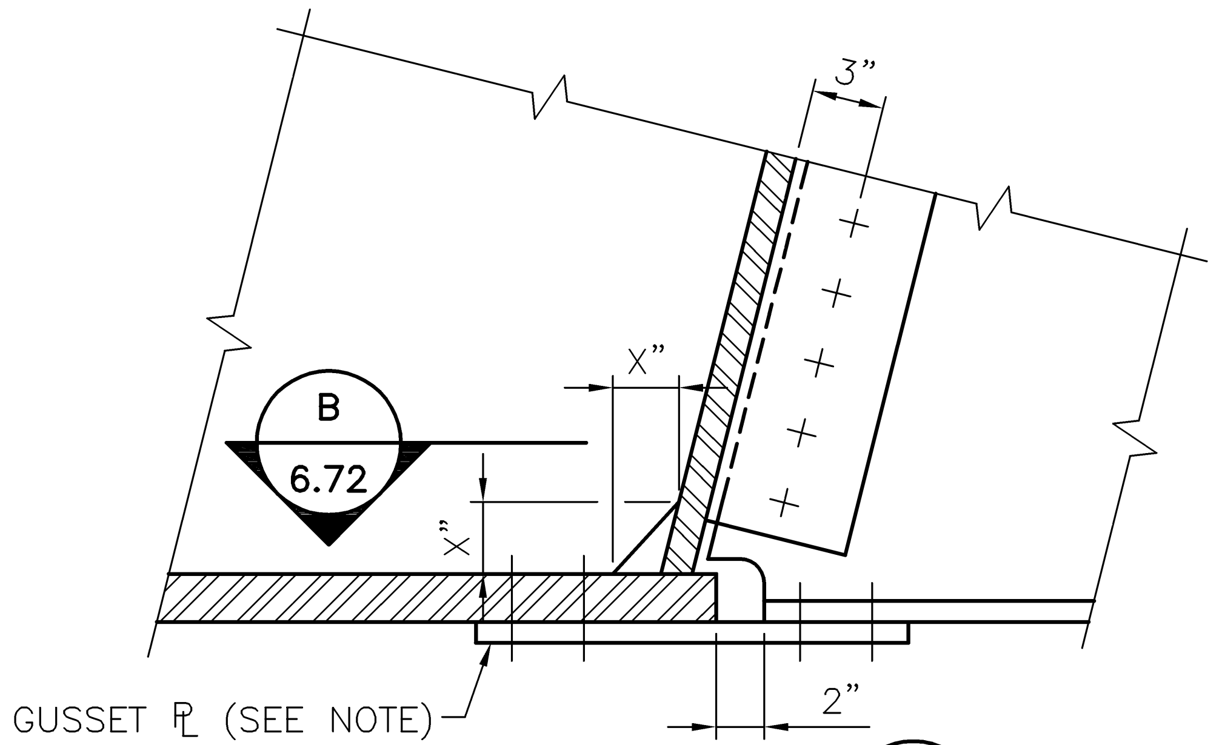
SCALE: ¾"=1'–0"

DESIGNER NOTES:

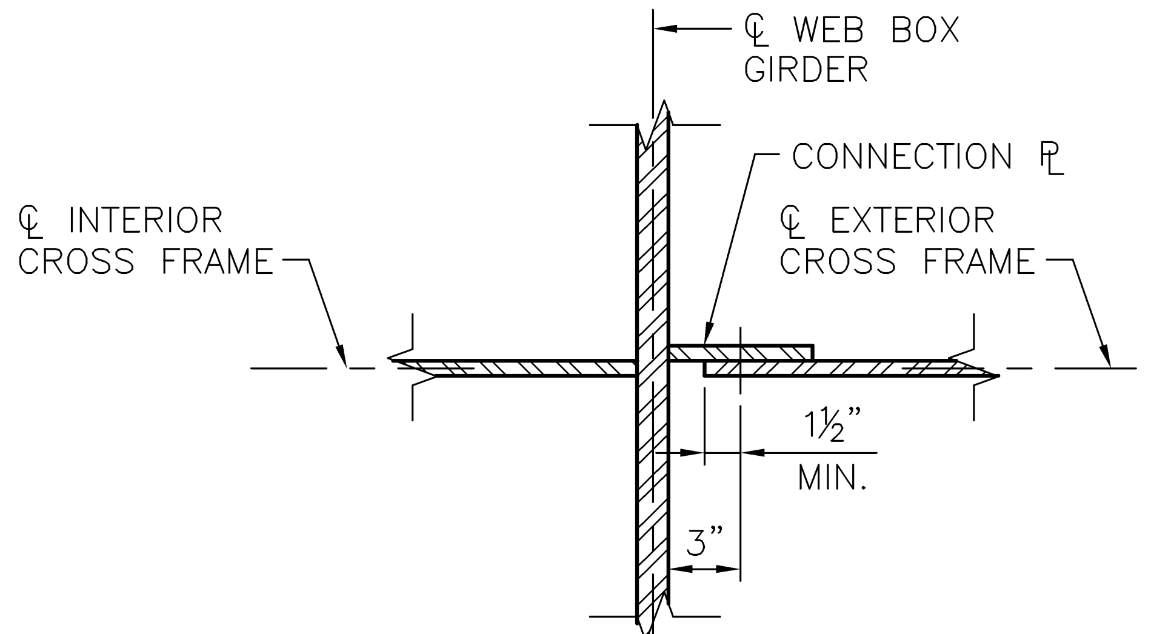
1. *THE INTERIOR CROSS FRAME MEMBERS SHALL BE DESIGNED TO ACCOMMODATE THE FORCES FROM THE EXTERIOR CROSS FRAMES.*
2. *WELD ALL ANGLES TO GUSSET PLATES WITH FILLET WELDS ON NEAR SIDE ONLY.*
3. *MINIMUM NUMBER OF BOLTS SHOWN. ACTUAL NUMBER OF BOLTS SHALL BE DETERMINED BY DESIGN.*
4. *LINE OF ACTION FOR INTERIOR AND EXTERIOR CROSS FRAME MEMBERS SHALL BE COINCIDENT TO THE CENTERLINE OF WEB.*



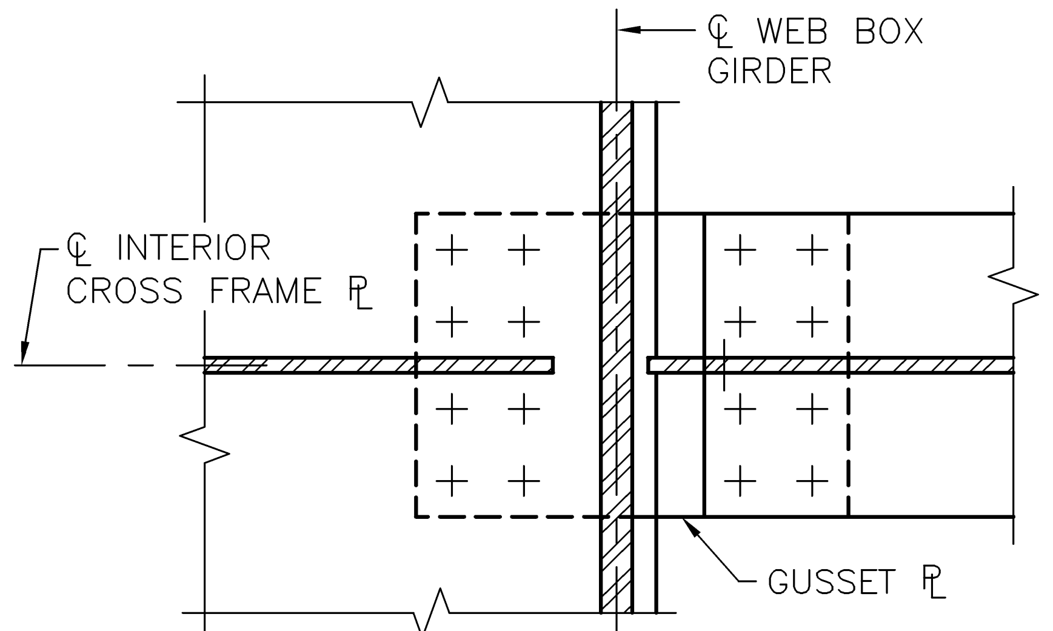
DETAIL 1 / 6.72



DETAIL 2 / 6.72



DETAIL A / 6.72



DETAIL B / 6.72

NOTE:
BEND PLATE AS REQUIRED WHEN CONNECTION CROSS FRAME BETWEEN BOXED WITH VARYING CROSS SLOPE.

END CROSS FRAME CONNECTION DETAILS

SCALE: 1½"=1'–0"

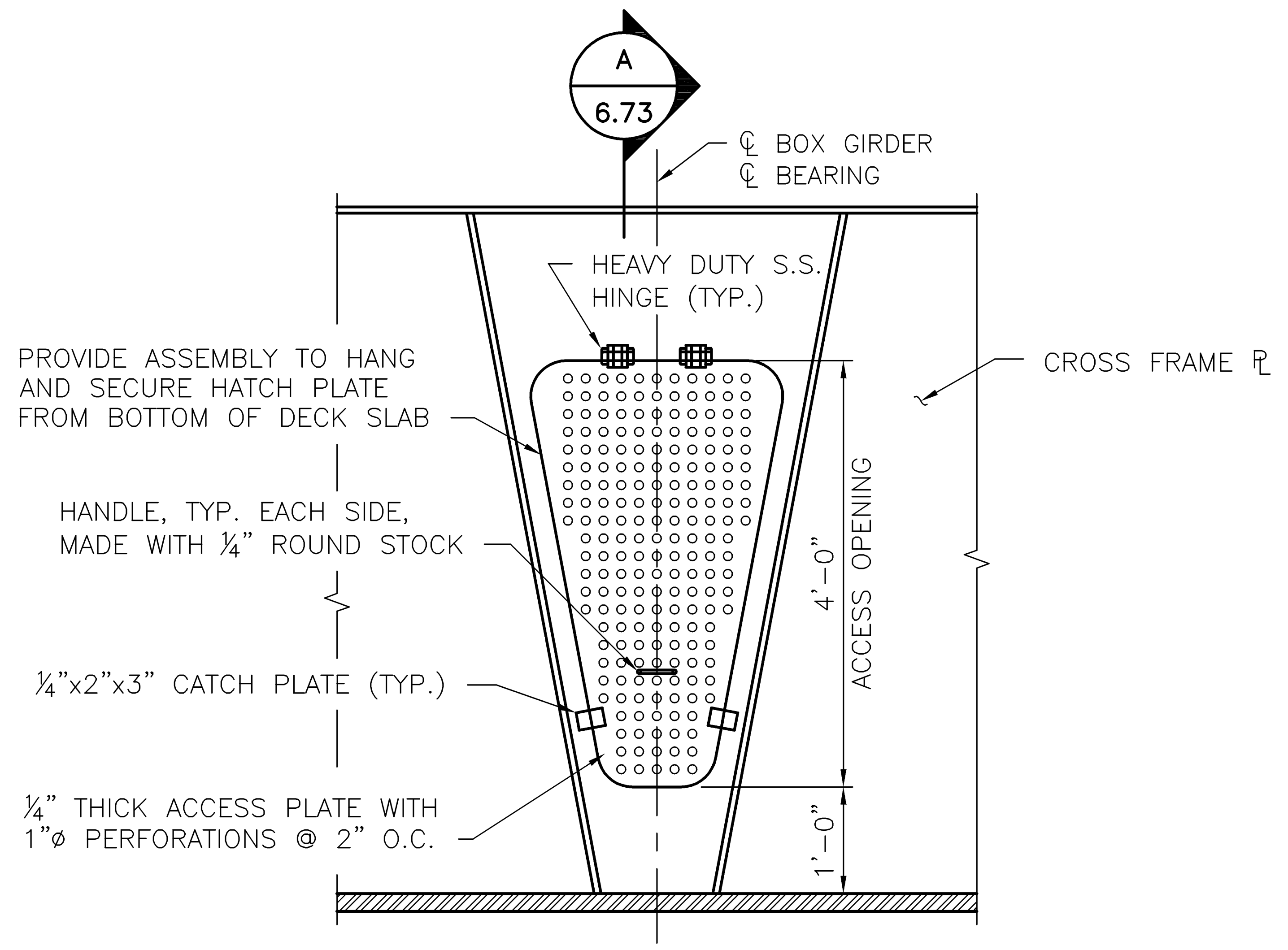
REVISIONS	
No.	DATE

RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

BRIDGE STANDARDS

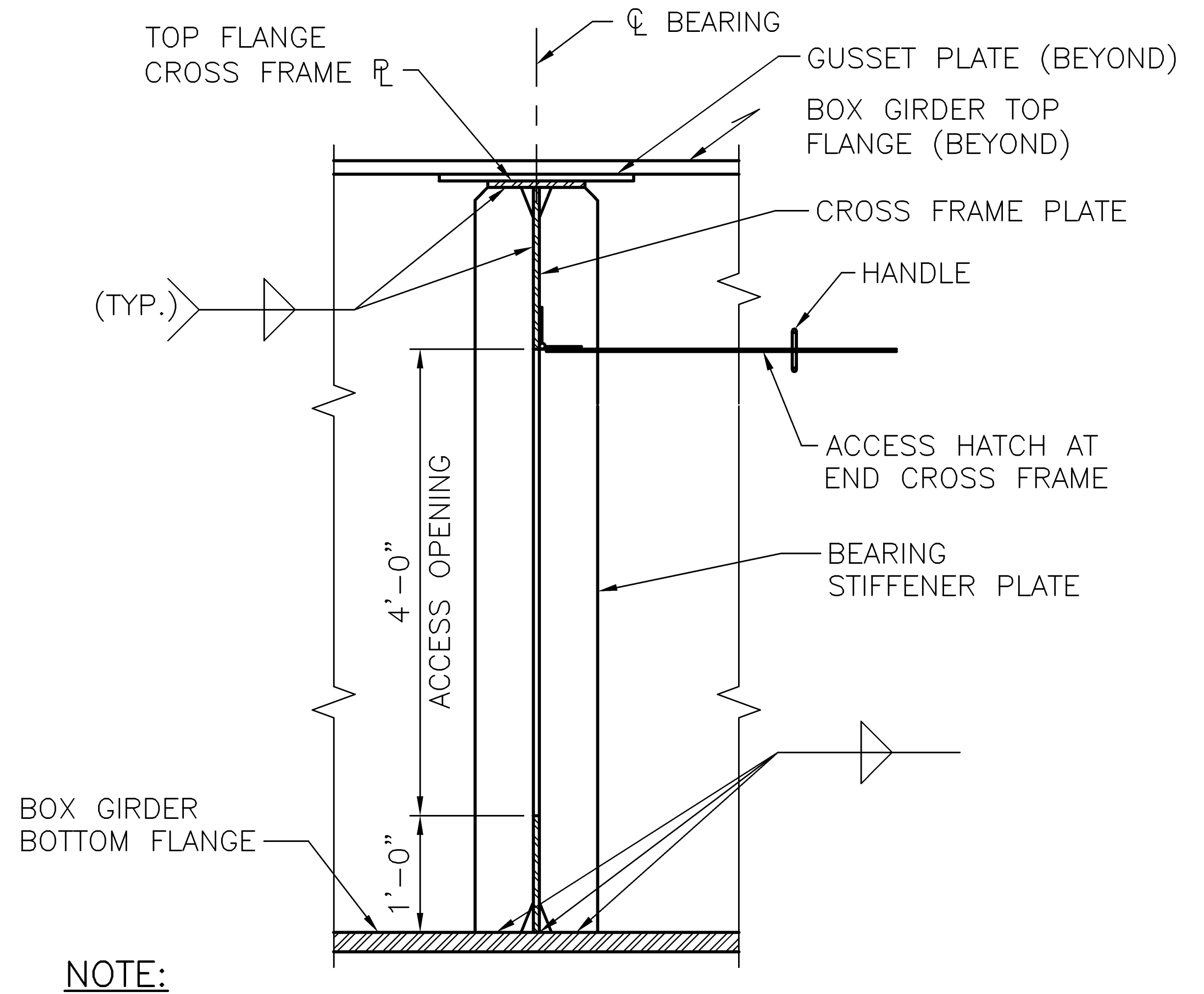
STEEL BOX GIRDER DETAILS
SHEET 3

DRAWING NUMBER: 6.72


A
6.73
℄ BOX GIRDER
℄ BEARING
HEAVY DUTY S.S. HINGE (TYP.)
PROVIDE ASSEMBLY TO HANG AND SECURE HATCH PLATE FROM BOTTOM OF DECK SLAB
CROSS FRAME PL
HANDLE, TYP. EACH SIDE, MADE WITH ¼" ROUND STOCK
4'-0" ACCESS OPENING
¼"x2"x3" CATCH PLATE (TYP.)
¼" THICK ACCESS PLATE WITH 1"ø PERFORATIONS @ 2" O.C.
1'-0"

ACCESS HATCH AT INTERIOR END CROSS FRAME

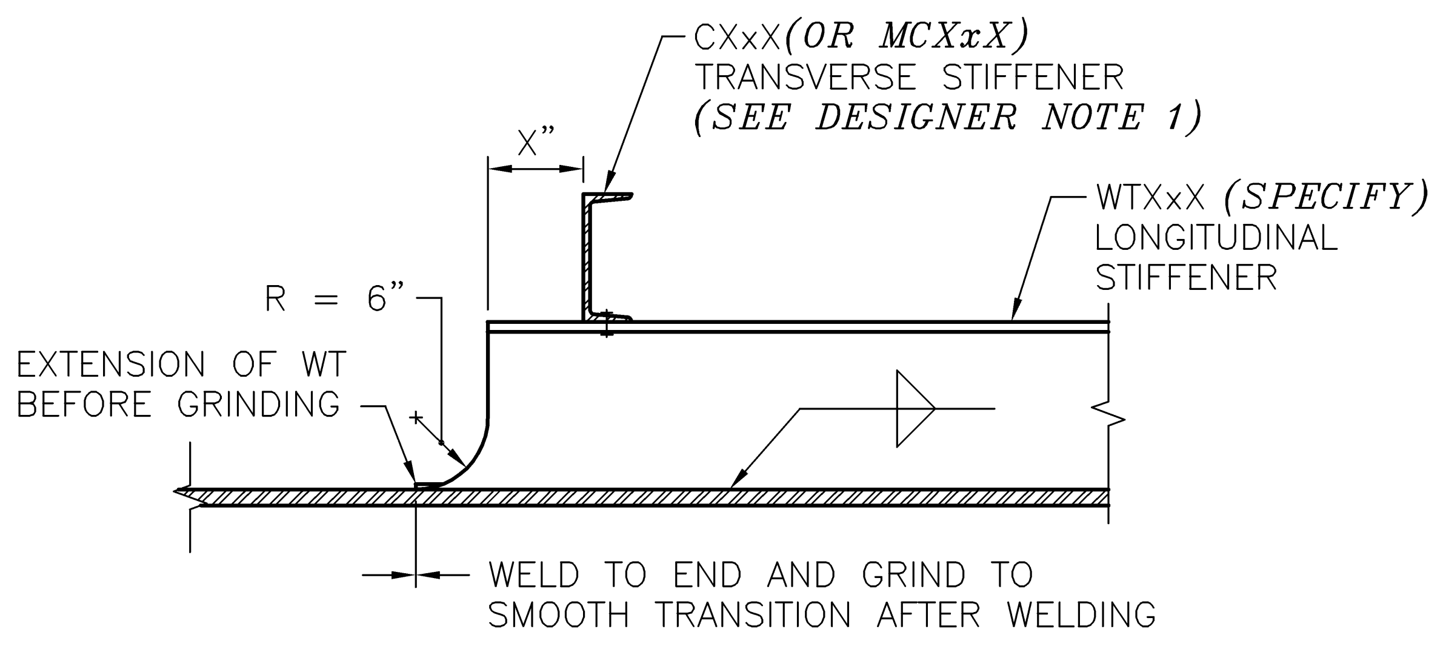
SCALE: ¾"=1'-0"



NOTE:
ABUTMENT END CROSS FRAME SHOWN. PIER END CROSS FRAME SIMILAR.
(INCLUDE THIS NOTE FOR MULTIPLE SPAN BRIDGES)

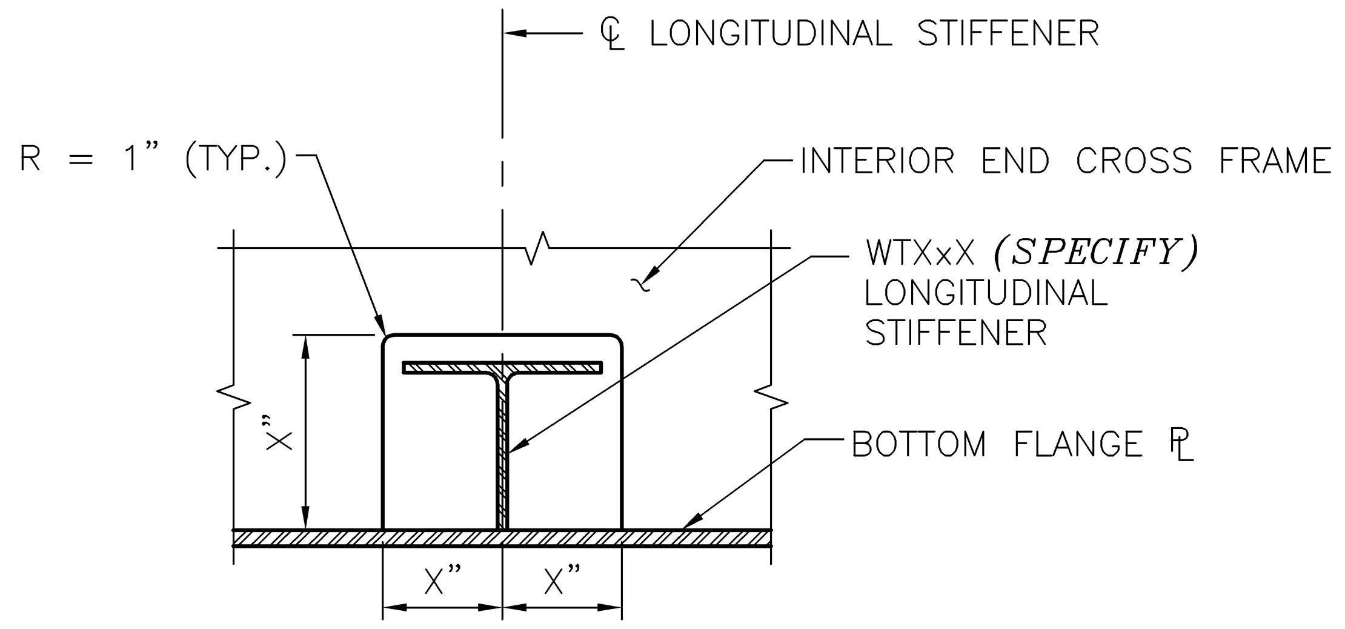
SECTION A 6.73

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



BOTTOM FLANGE LONGITUDINAL STIFFENER TERMINUS DETAIL

NOT TO SCALE

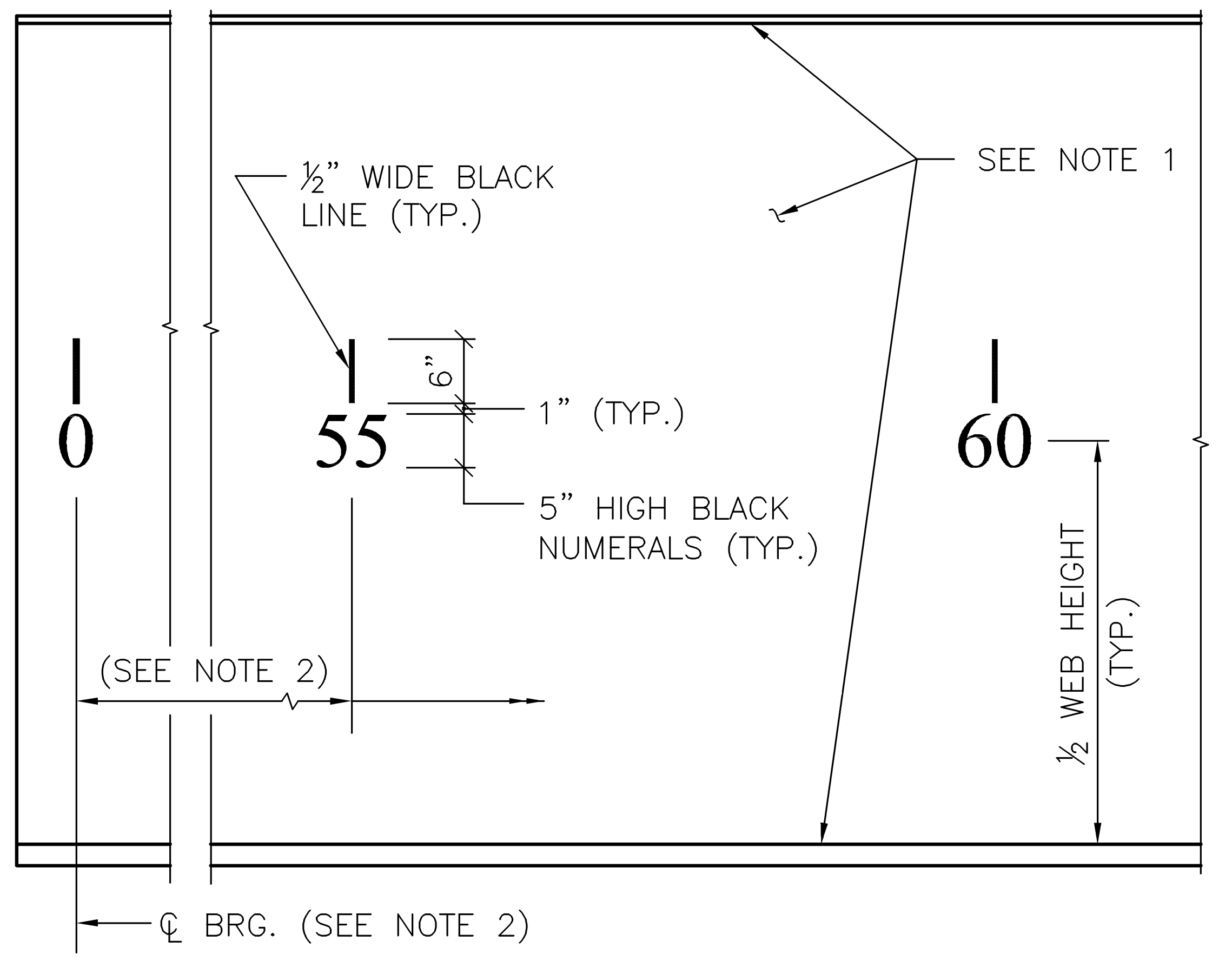


BOTTOM FLANGE LONGITUDINAL STIFFENER/PIER CROSS FRAME INTERFACE

NOT TO SCALE

DESIGNER NOTES:

1. *REFER TO AASHTO-LRFD FOR ADDITIONAL INFORMATION REGARDING SIZE AND LOCATION OF THE TRANSVERSE STIFFENER AND IT'S CONNECTION TO THE LONGITUDINAL STIFFENER. SHOW LOCATION OF TRANSVERSE STIFFENER ON FRAMING PLAN.*
2. *LONGITUDINAL STIFFENERS ARE TYPICALLY ONLY REQUIRED FOR WIDER THAN NORMAL BOX GIRDERS. THE BEARING STIFFENER DETAILS SHOWN ON DWG. NO. 6.72 MAY NEED TO BE MODIFIED TO ACCOMMODATE THE LONGITUDINAL STIFFENER.*



NOTES:

1. THE INTERIOR OF ALL BOX GIRDERS, INCLUDING ALL STRUCTURAL STEEL COMPONENTS WITHIN EACH BOX GIRDER (SUCH AS DIAPHRAGMS, CROSS-FRAMES, CONNECTION PLATES, ETC.) SHALL BE PAINTED GLOSS WHITE (FEDERAL STANDARD 595B, COLOR NO. 17925).
2. INDICATE DISTANCES SEQUENTIALLY AT FIVE (5) FOOT INTERVALS WITHOUT INTERRUPTION FULL LENGTH WITHIN EACH BOX GIRDER WITH BLACK LINES AND NUMERALS ON LEFT WEB, GOING UPSTATION.
3. DO NOT CARRY OVER THE MEASURED DISTANCE SEQUENCE BETWEEN SEPARATE BOX GIRDERS WITHIN THE SAME GIRDER LINE OVER PIER(S).

INTERIOR PAINTING REQUIREMENTS

SCALE: ¾"=1'-0"

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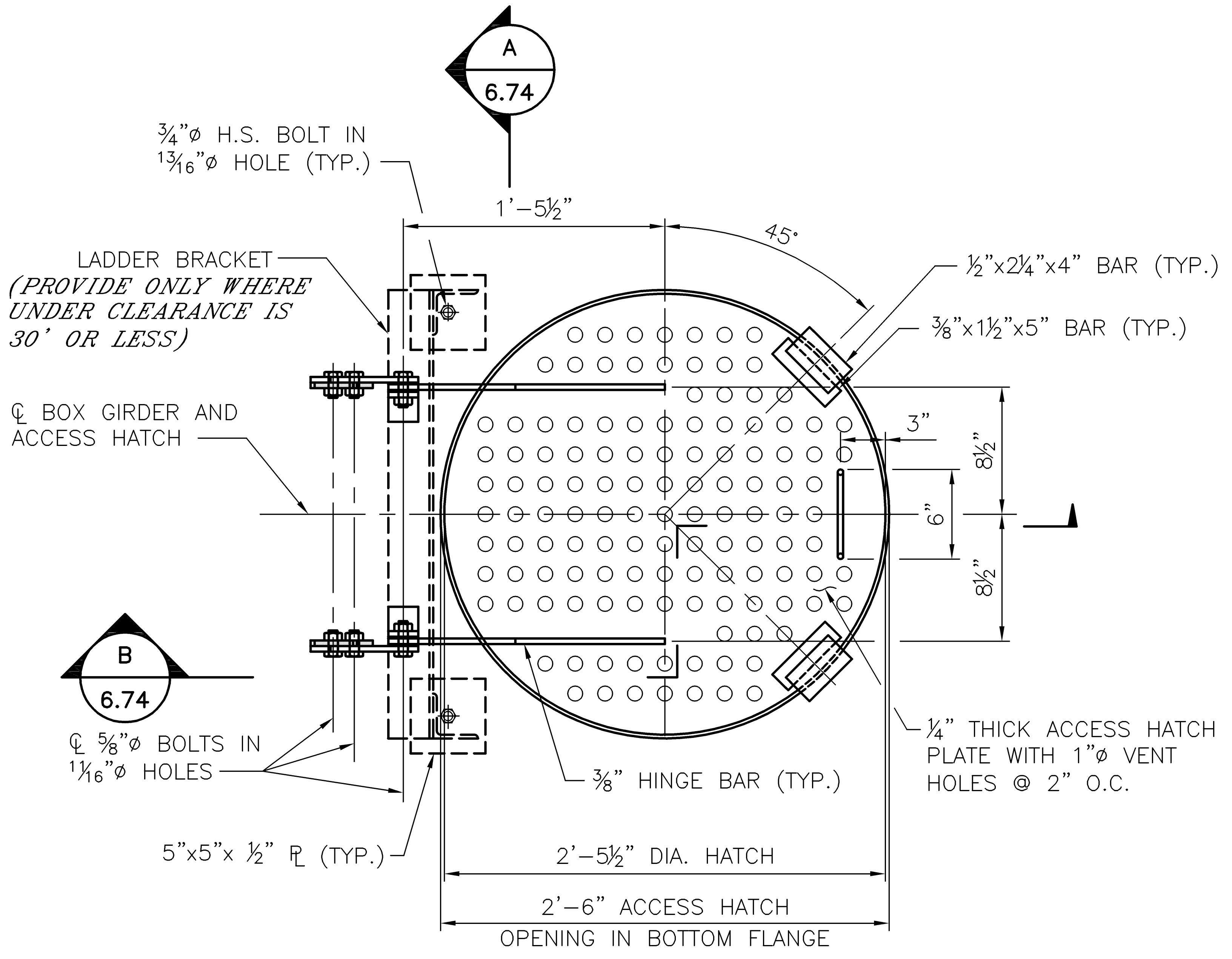
RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

BRIDGE STANDARDS

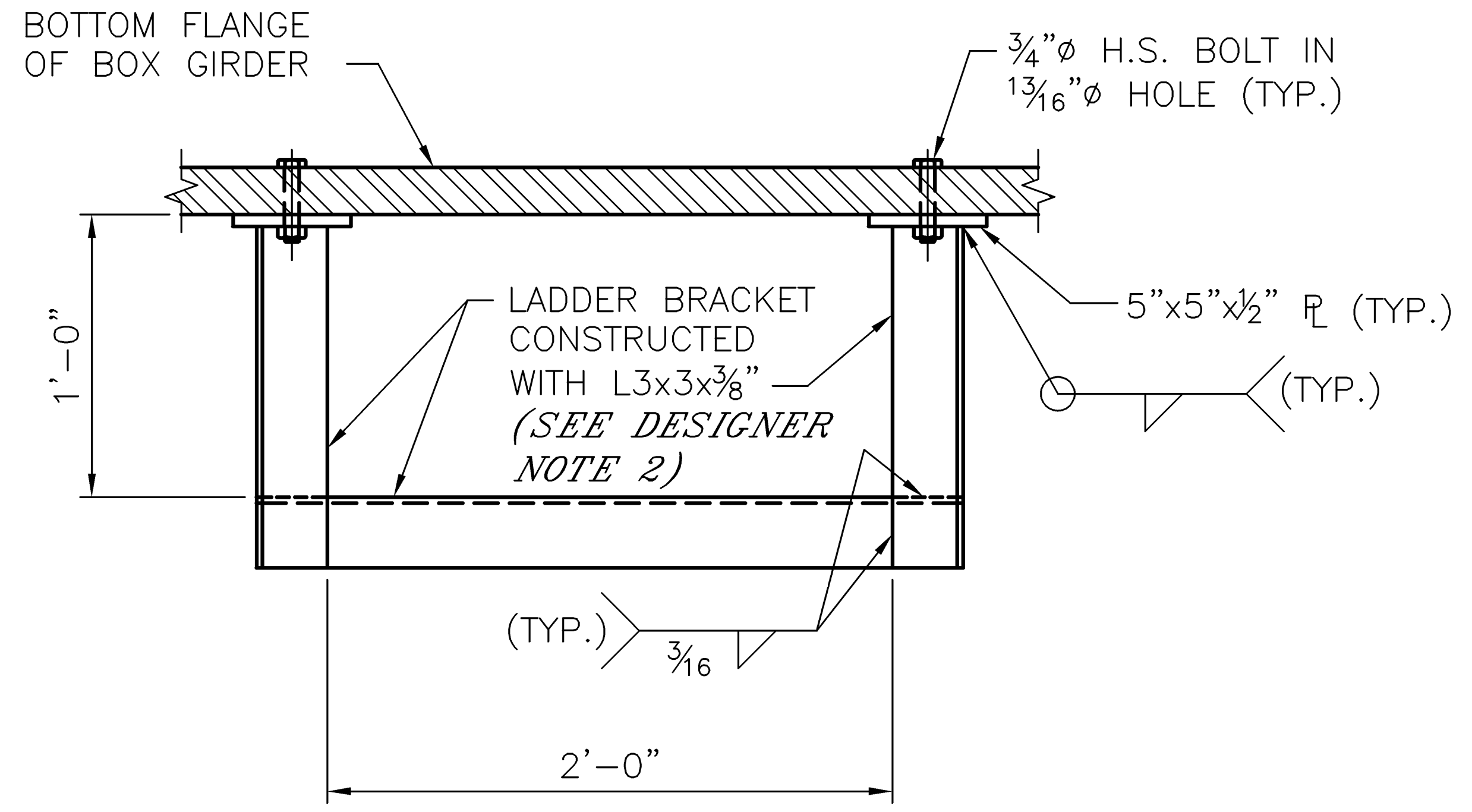
STEEL BOX GIRDER DETAILS
SHEET 4

DRAWING NUMBER: 6.73



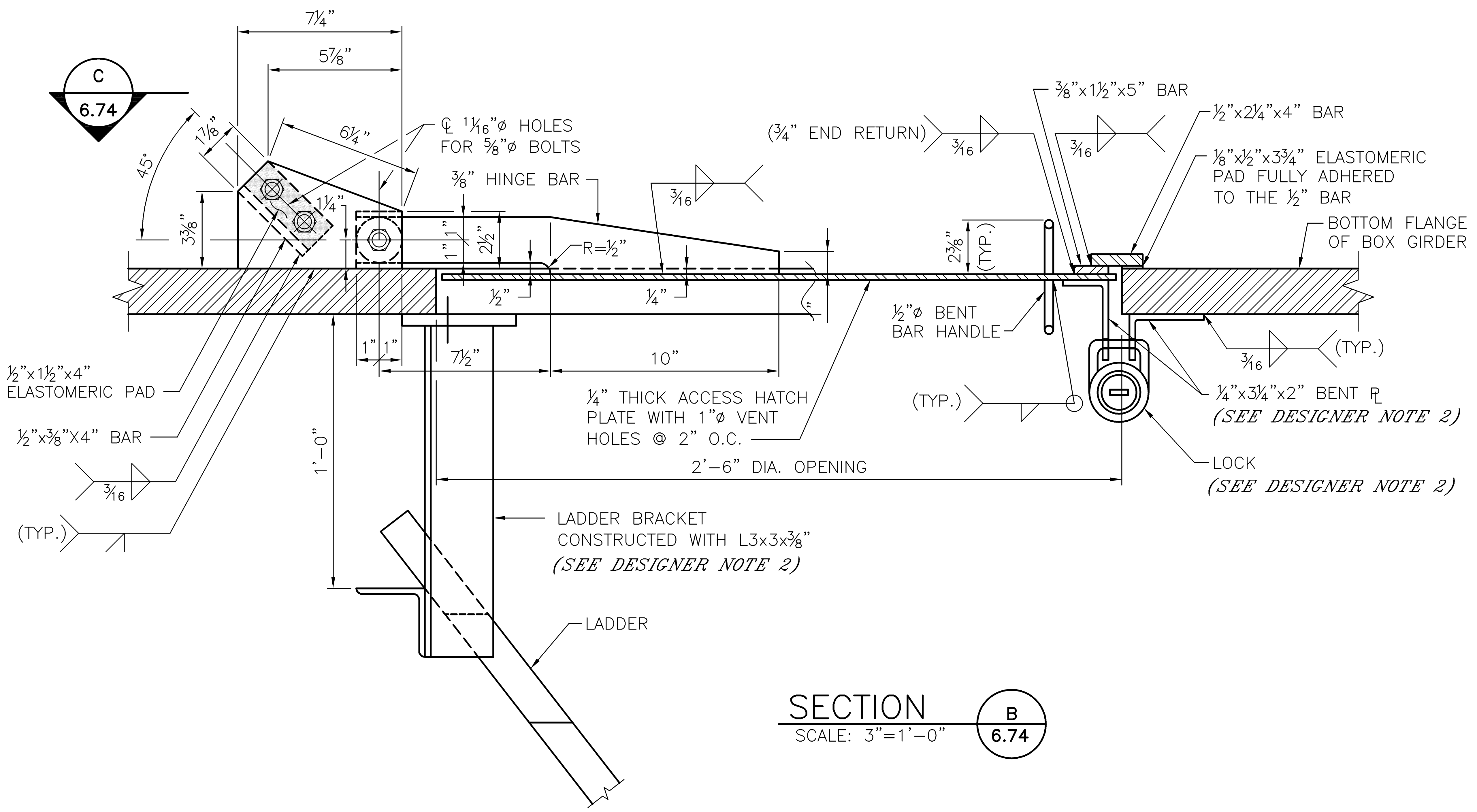
INSPECTION ACCESS HATCH PLAN

SCALE: 1½"=1'-0"


BOTTOM FLANGE OF BOX GIRDER
¾"ø H.S. BOLT IN 13/16"ø HOLE (TYP.)
1'-0"
LADDER BRACKET CONSTRUCTED WITH L3x3x⅜"
(SEE DESIGNER NOTE 2)
5"x5"x½" ℙ (TYP.)
(TYP.)
(TYP.)
3/16
2'-0"

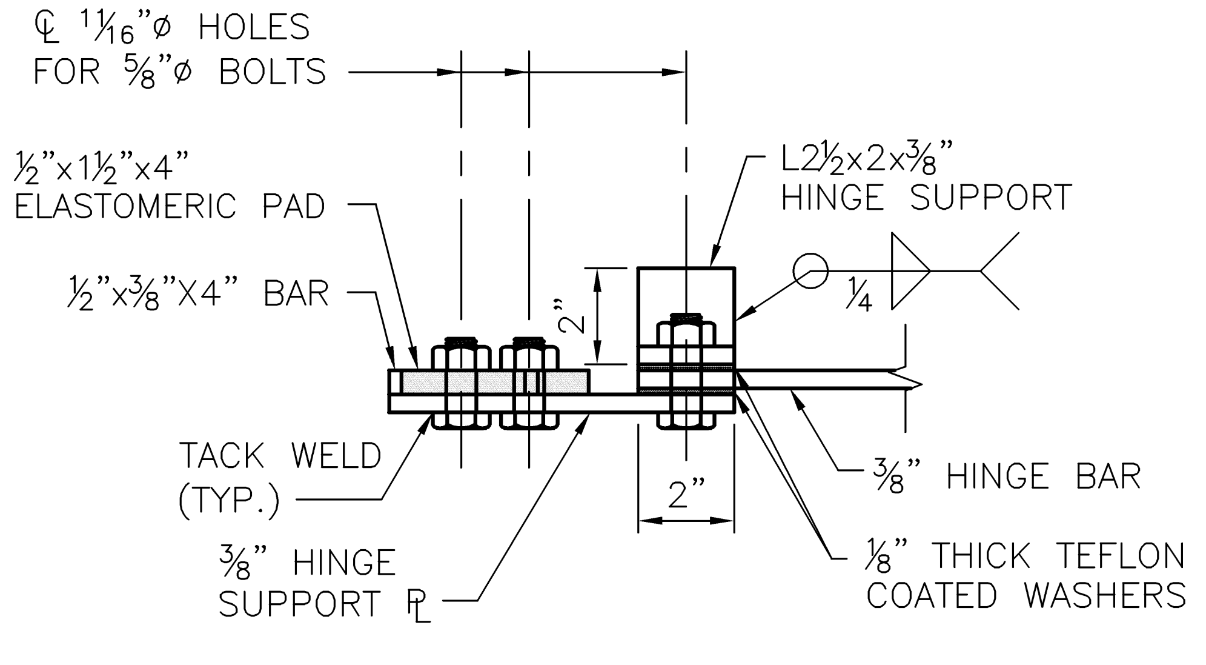
SECTION A 6.74

SCALE: 1½"=1'-0"



SECTION B 6.74

SCALE: 3"=1'-0"


℄ 1 1/16"ø HOLES FOR ⅝"ø BOLTS
½"x1½"x4" ELASTOMERIC PAD
½"x⅜"X4" BAR
L2½x2x⅜" HINGE SUPPORT
¼
2"
TACK WELD (TYP.)
⅜" HINGE SUPPORT ℙ
2"
⅜" HINGE BAR
⅛" THICK TEFLON COATED WASHERS

SECTION C 6.74

SCALE: 3"=1'-0"

INSPECTION ACCESS HATCH NOTES:

1. INTERIOR OF ALL BOX BEAMS SHALL BE LEFT IN A BROOM CLEAN CONDITION, FREE FROM ALL DEBRIS. THE ENGINEER SHALL BE PROVIDED ACCESS TO BOX INTERIORS FOR CLEAN-OUT ACCEPTANCE.

2. ALL STEEL COMPONENTS SHALL CONFORM TO AASHTO M 270 GRADE 36 AND SHALL BE GALVANIZED AFTER ASSEMBLY IN ACCORDANCE WITH THE REQUIREMENTS OF AASHTO M 111. ALL FASTENERS SHALL BE GALVANIZED IN ACCORDANCE WITH THE REQUIREMENTS OF AASHTO M 232.

3. ACCESS HATCH SHALL BE PAINTED ON BOTH SIDES AND EDGES WITH THE SAME COATING AS USED ON THE OUTSIDE/INSIDE OF THE BOX GIRDER.

4. ALL LOCKS ON A BRIDGE SHALL BE KEYED THE SAME.
(ELIMINATE THIS NOTE IF LOCKS ARE NOT NEEDED)

DESIGNER NOTES:

1. THE DESIGNER SHALL COORDINATE THE LOCATION OF THE INSPECTION HATCH WITH THE RIDOT BRIDGE SECTION.

2. LOCKS AND ¼"X3½"X2" BENT PLATES SHALL BE PROVIDED ON A BRIDGE ONLY IF THE INSPECTION ACCESS HATCH IS LOCATED LESS THAN 20' FROM THE GROUND.

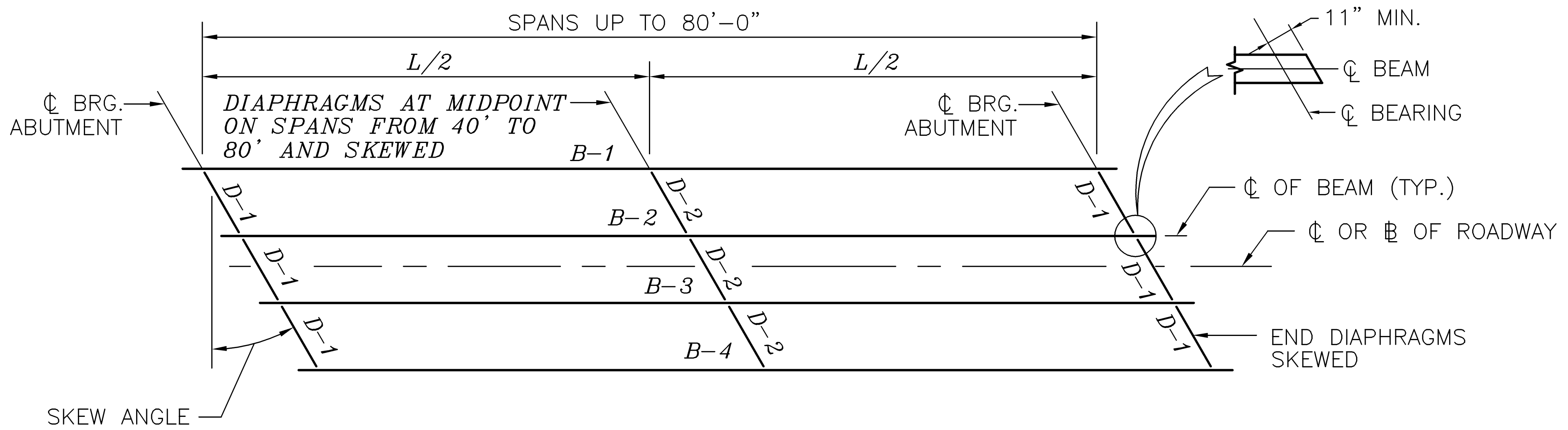
REVISIONS	
No.	DATE

RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

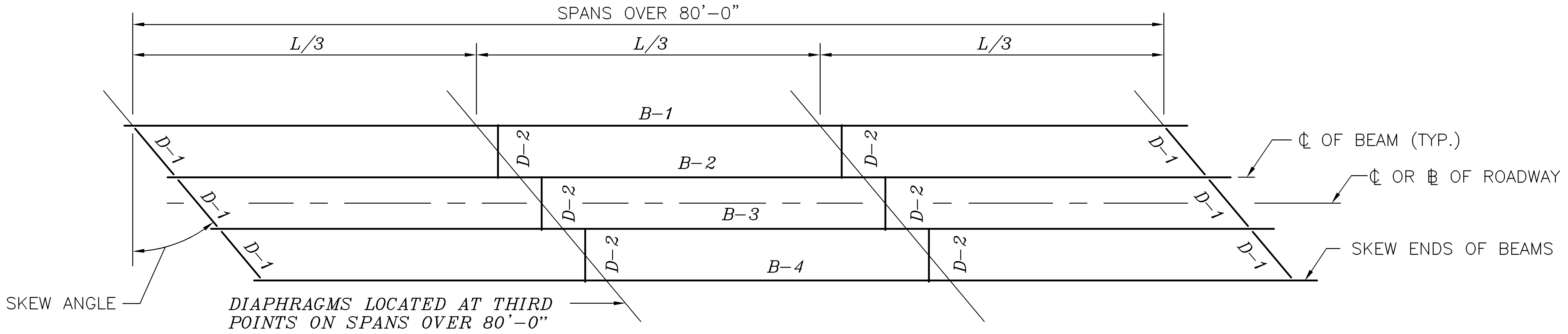
BRIDGE STANDARDS

STEEL BOX GIRDER DETAILS
SHEET 5

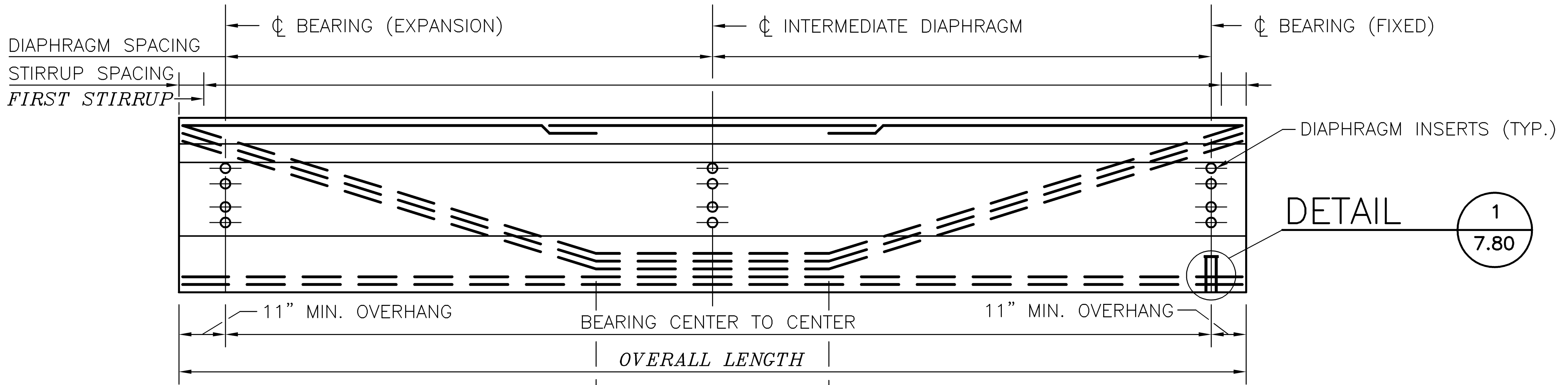
DRAWING NUMBER: 6.74



FRAMING PLAN
PRESTRESSED CONCRETE BEAMS
(SKEW ANGLE 30° AND UNDER)

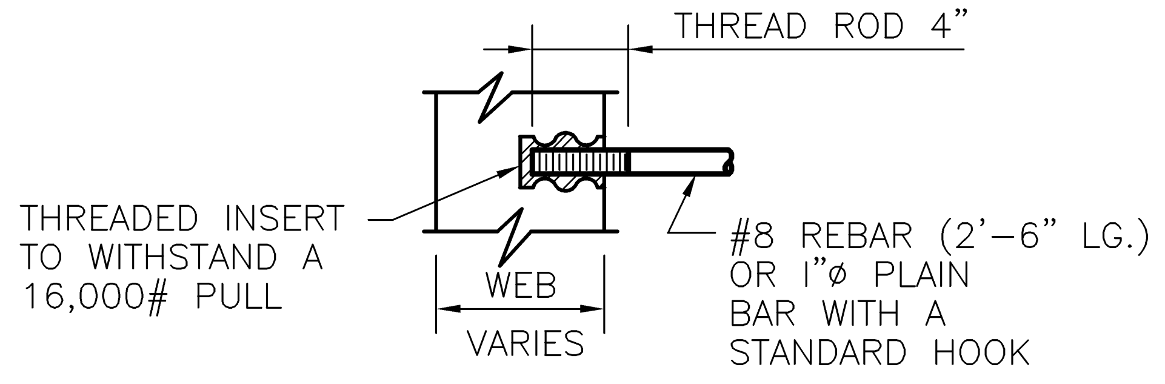


FRAMING PLAN
PRESTRESSED CONCRETE BEAMS
(SKEW ANGLE OVER 30°)



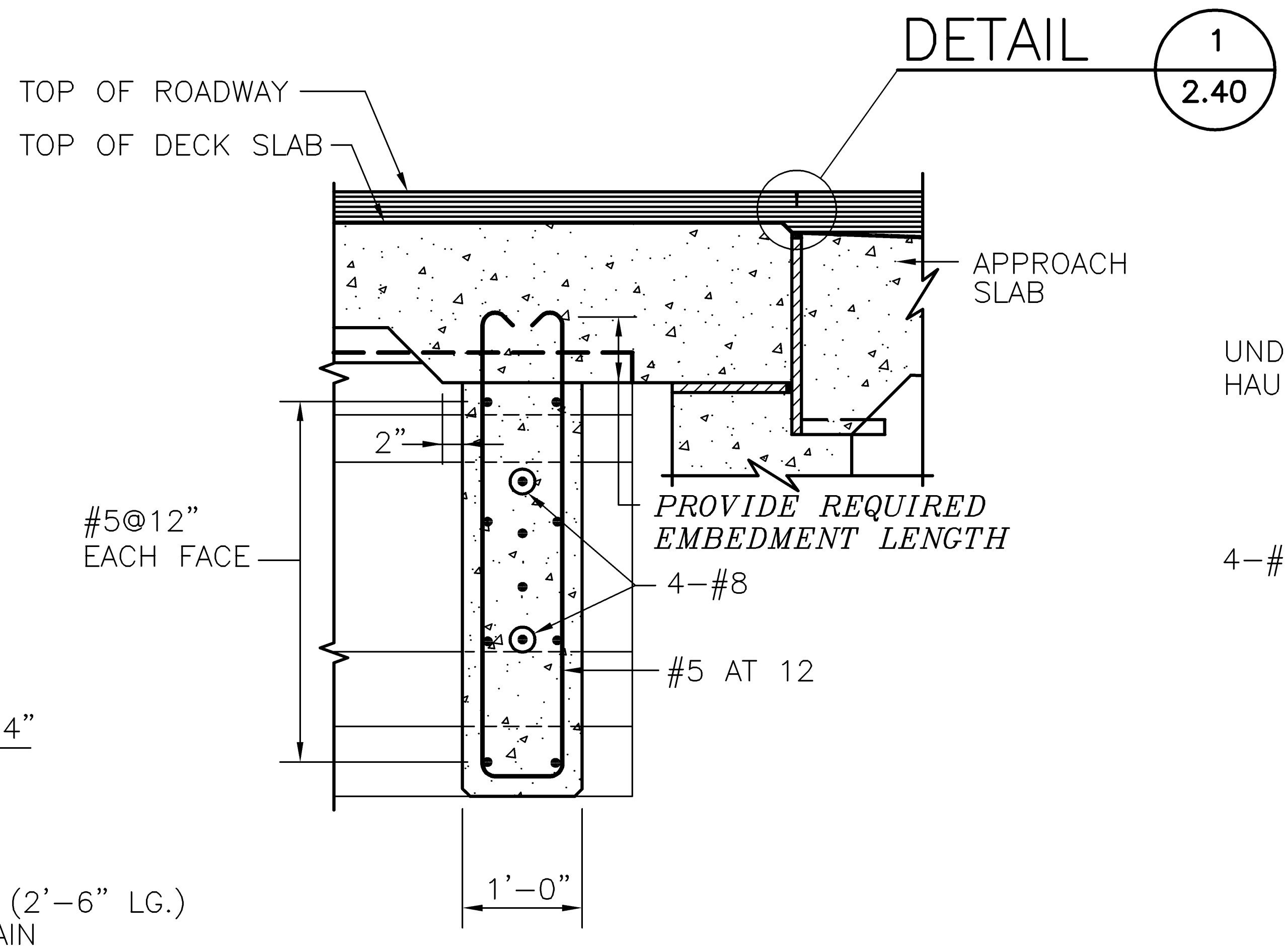
ELEVATION

(FOR ILLUSTRATIVE PURPOSES ONLY)

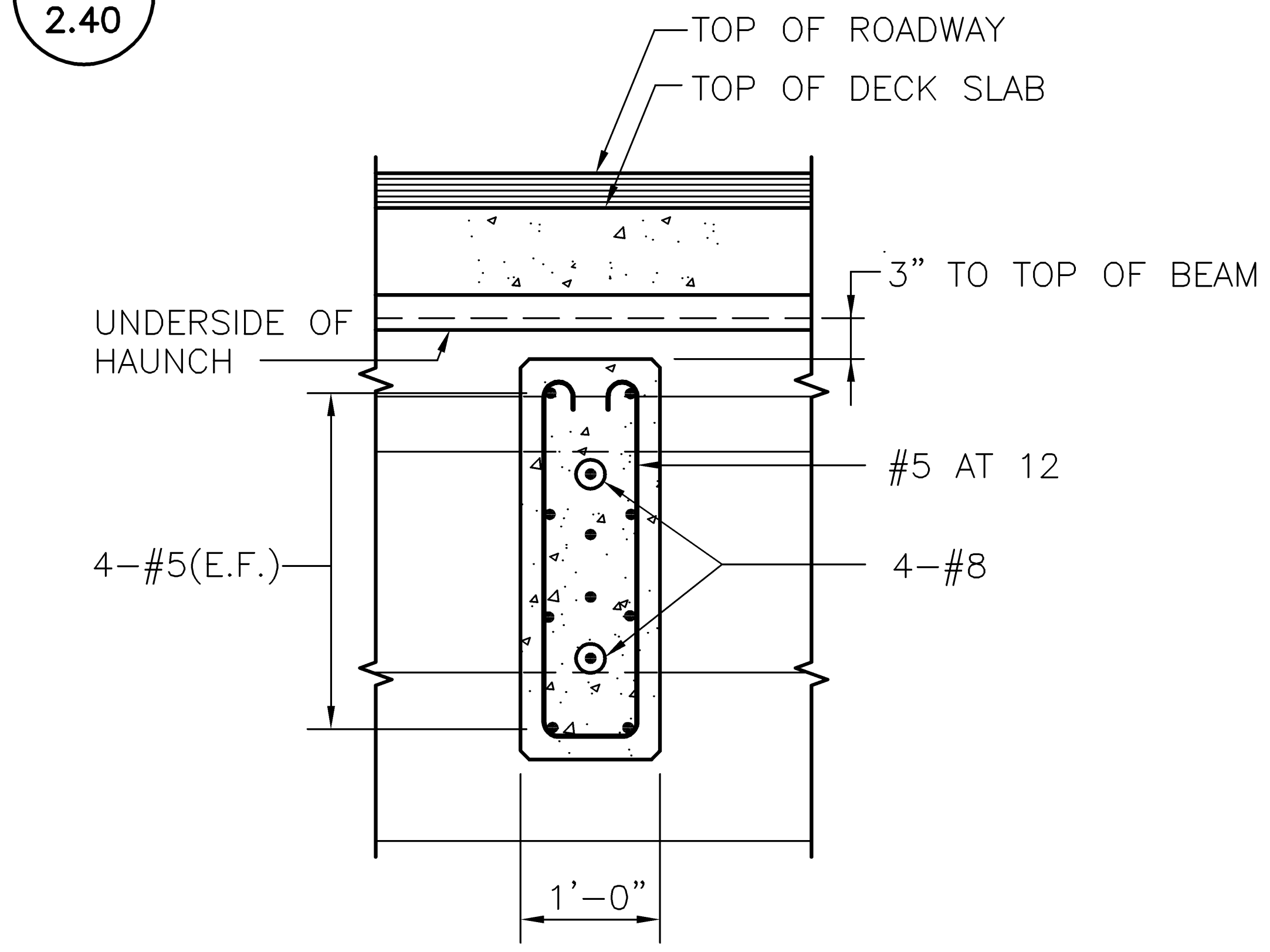

THREAD ROD 4"
THREADED INSERT TO WITHSTAND A 16,000# PULL
WEB
VARIES
#8 REBAR (2'-6" LG.) OR 1"ø PLAIN BAR WITH A STANDARD HOOK

TRANSVERSE RODS AT EXTERIOR BEAMS

(SIMILAR AT INTERIOR BEAMS)



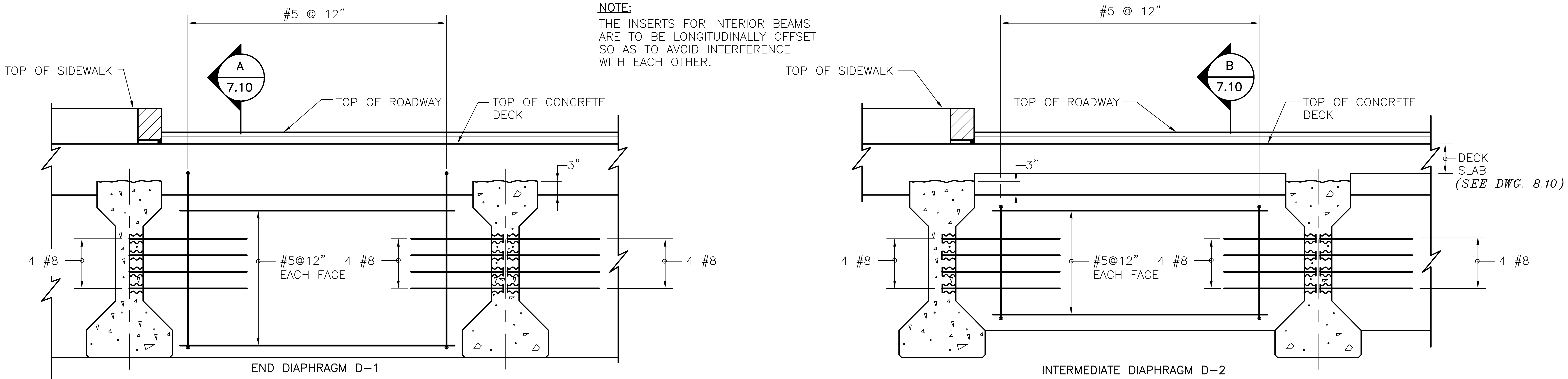
SECTION A 7.10



SECTION B 7.10

NOTE:

THE INSERTS FOR INTERIOR BEAMS ARE TO BE LONGITUDINALLY OFFSET SO AS TO AVOID INTERFERENCE WITH EACH OTHER.



DIAPHRAGM ELEVATIONS

DESIGNER NOTES:

1. *FOR BEARING DETAILS AND REQUIREMENTS, AND EXPANSION JOINT DETAILS, REFER TO DRAWING 7.30.*
2. *TO AVOID CRACKING OF THE GIRDERS, THE DESIGNER SHALL LIMIT THE TOTAL HOLD DOWN FORCE TO 3/4 OF THE BEAM WEIGHT.*
3. *THE DESIGNER SHALL REFER TO THE RHODE ISLAND LRFD BRIDGE DESIGN MANUAL FOR FUTURE JACKING REQUIREMENTS.*
4. *REFER TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS FOR VERTICAL STIRRUP REQUIREMENTS AT ENDS OF BEAMS.*

THIS SHEET IS NOT TO SCALE

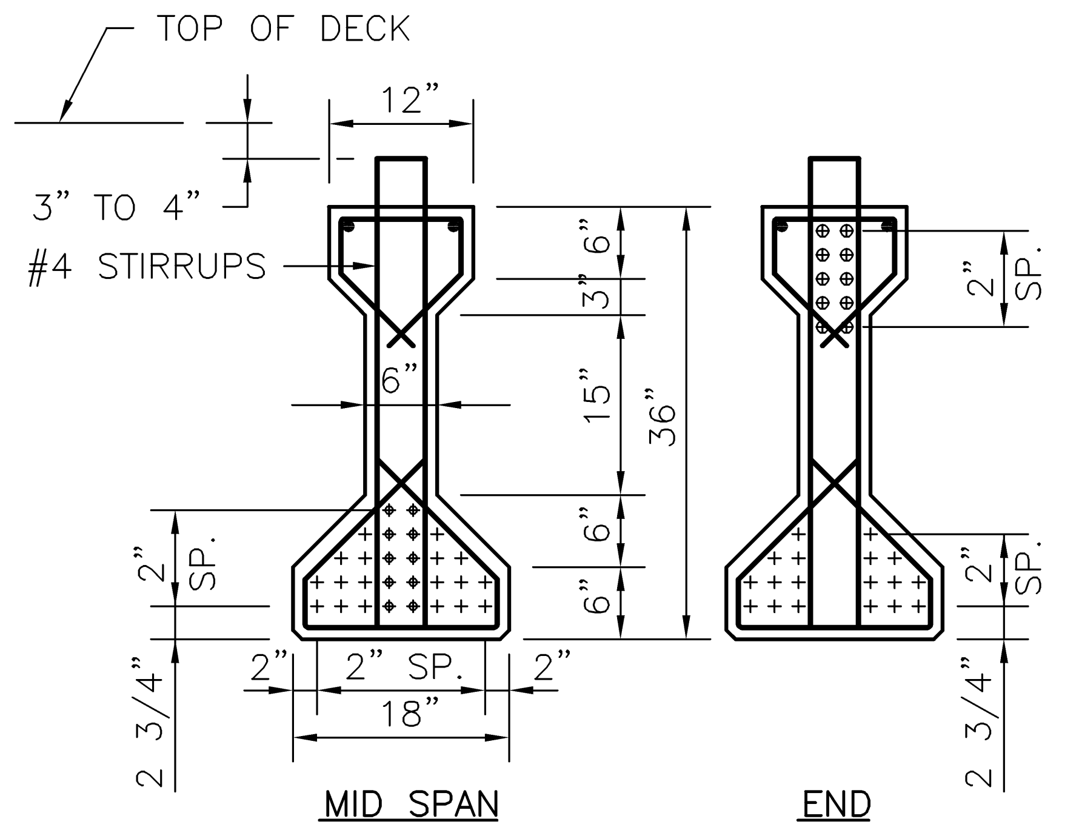
REVISIONS	
No.	DATE

RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

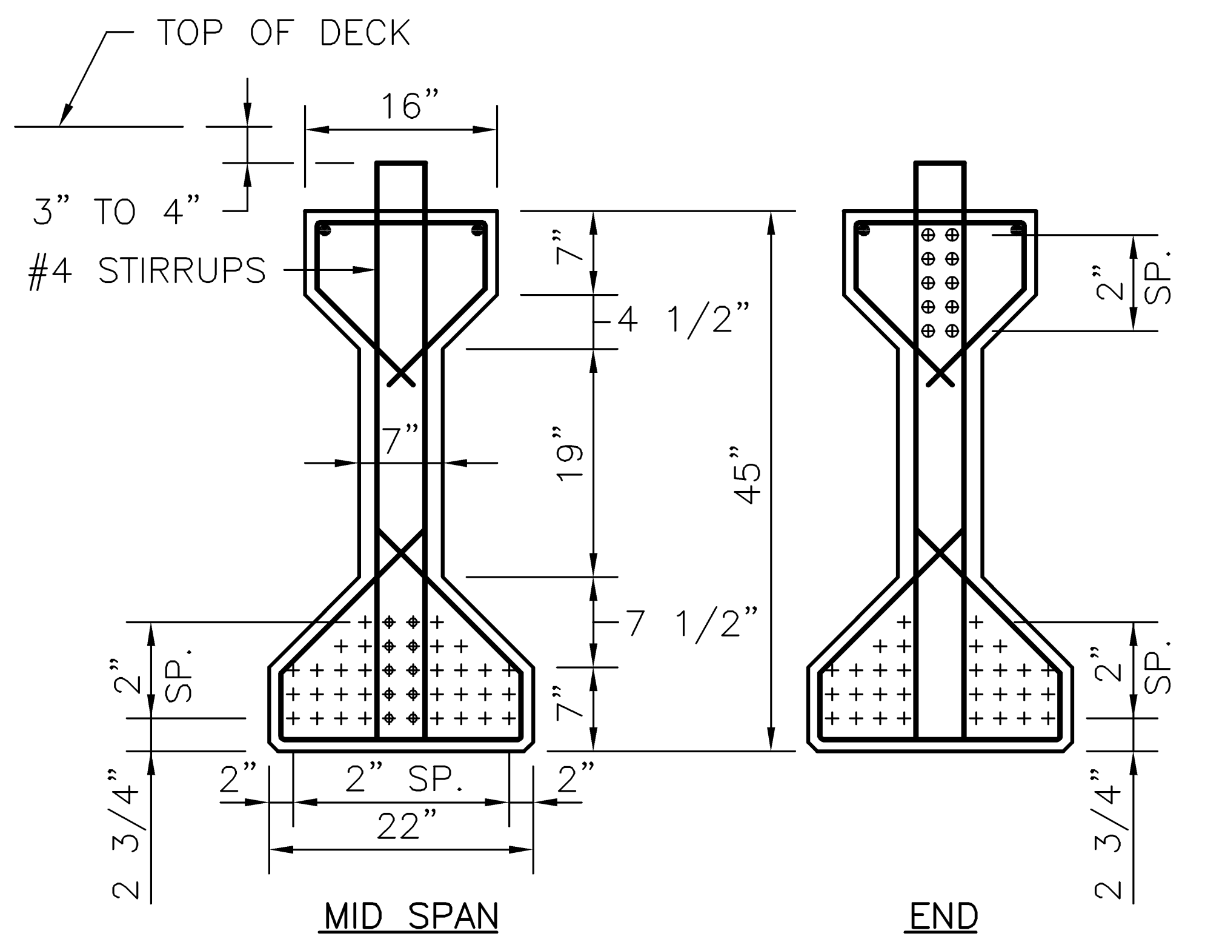
BRIDGE STANDARDS

PRESTRESSED BEAM DETAILS AND FRAMING LAYOUT

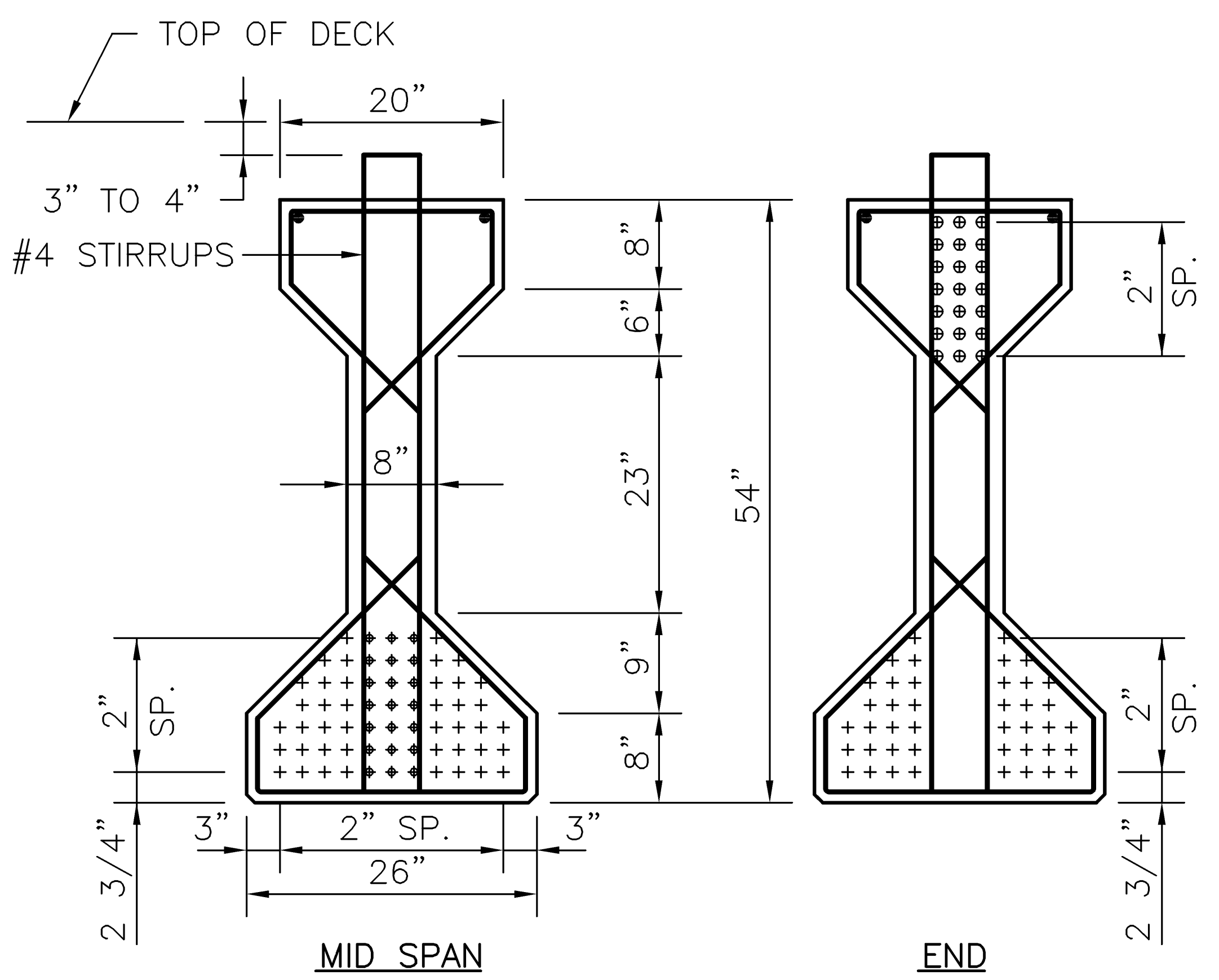
DRAWING NUMBER: 7.10



TYPE II



TYPE III



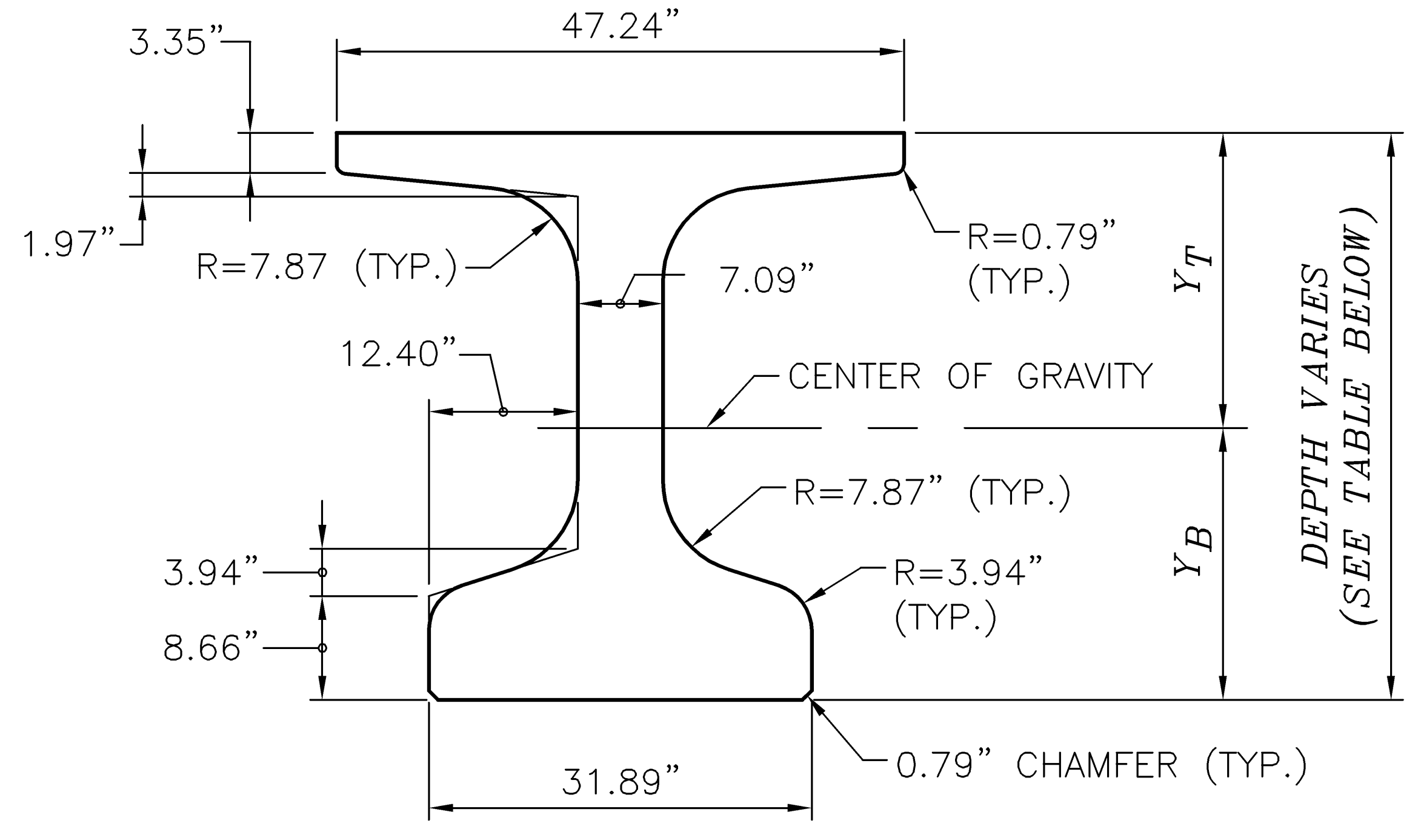
TYPE IV

TYPE	W(LB/FT)	A (IN^2)	Y_T (IN)	Y_B (IN)	S_T (IN^3)	S_B (IN^3)	I (IN^4)	SPAN RANGE
II	384	369	20.17	15.83	2,530	3,220	51,000	35' – 55'
III	583	560	24.73	20.27	5,070	6,190	125,000	50' – 75'
IV	822	789	29.27	24.73	8,910	10,550	261,000	65' – 95'

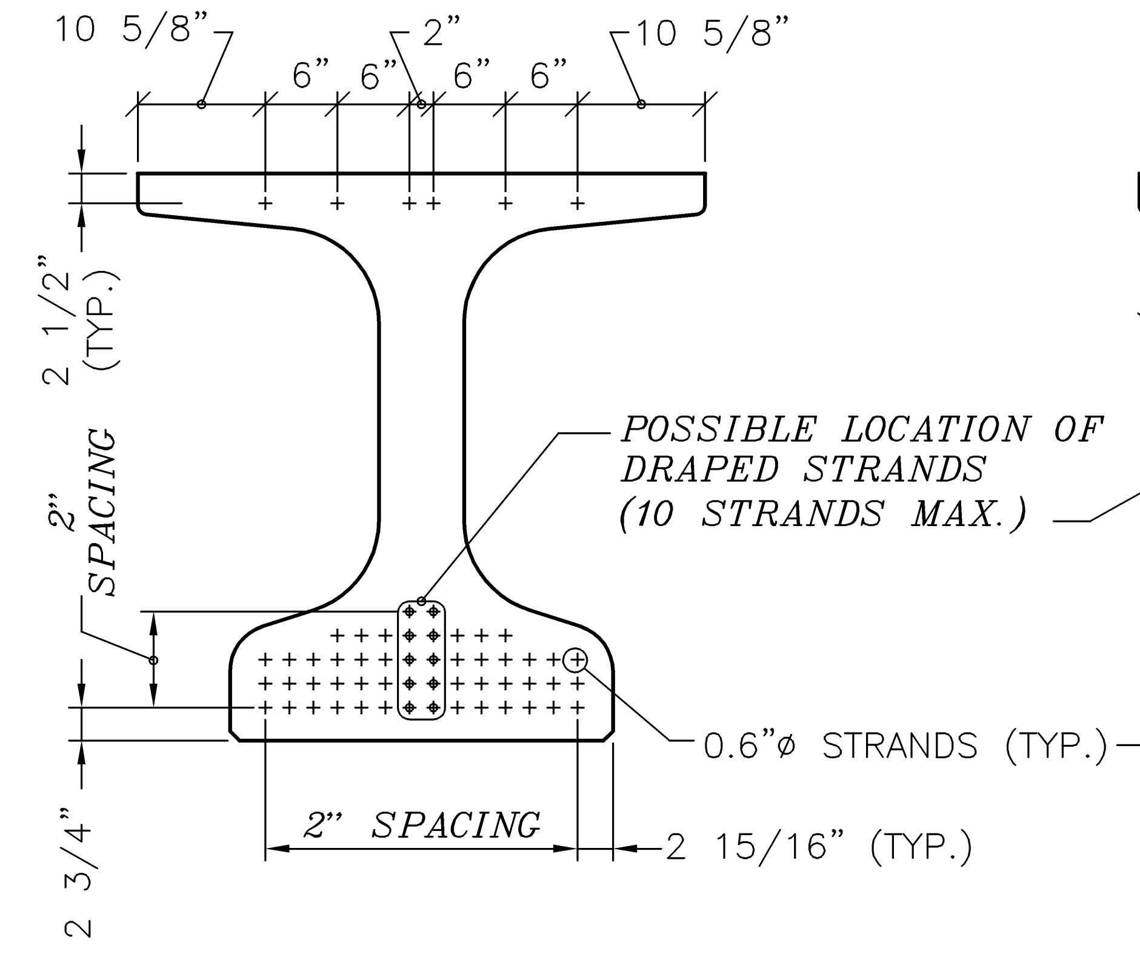
AASHTO BEAM PROPERTIES

DESIGNER NOTES:

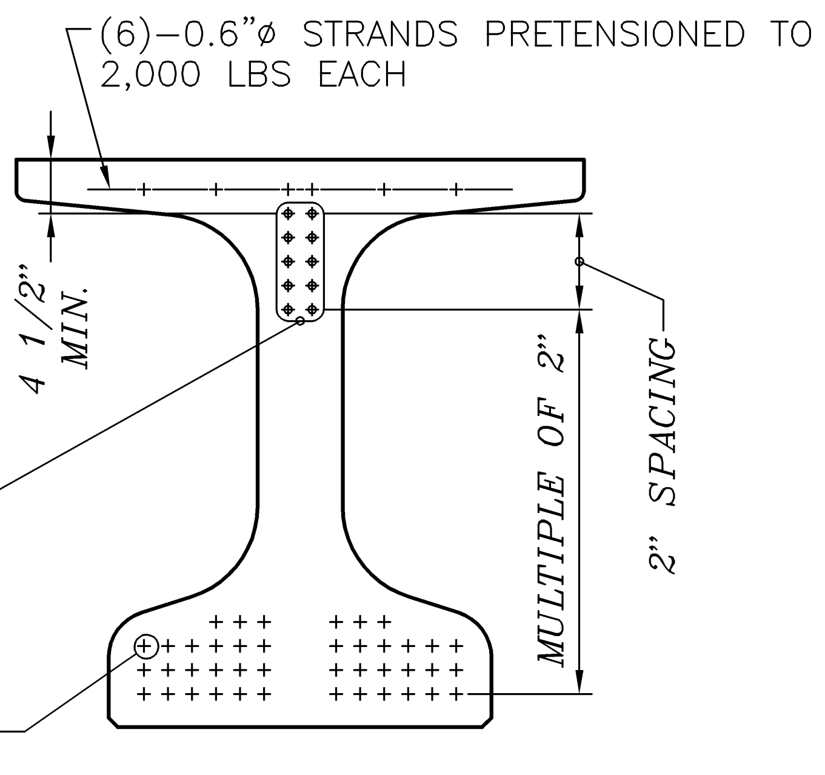
1. *THIS SHEET CONTAINS STANDARD AASHTO AND NEW ENGLAND BULB TEE BEAM SECTIONS. APPLICABLE DETAILS, INCLUDING BEAM DIMENSIONS, ELEVATIONS, SIZE AND NUMBER OF STRAIGHT, DRAPED AND/OR DEBONDED STRANDS, AND SIZE AND NUMBER OF REINFORCING BARS SHALL BE SHOWN ON THE CONTRACT DRAWINGS.*
2. *THE AMOUNT OF REINFORCEMENT AND STRAND ARRANGEMENT ARE ILLUSTRATIVE ONLY. THE ACTUAL NUMBER AND SIZE OF STRANDS AND REINFORCEMENT SHALL BE DETERMINED BASED UPON DESIGN REQUIREMENTS.*
3. *THE MAXIMUM SPAN LENGTHS SHOWN BELOW ARE APPROXIMATE AND ARE PROVIDED AS A GUIDE ONLY. SUCH FACTORS AS STRENGTH OF CONCRETE, NUMBER OF STRANDS, TYPE OF LIVE LOAD AND BEAM SPACING WILL AFFECT THESE LIMITS.*
4. *TO AVOID CRACKING OF THE GIRDERS, THE DESIGNER SHALL LIMIT THE TOTAL HOLD DOWN FORCE TO 3/4 OF THE BEAM WEIGHT.*
5. *STIRRUP SIZE & SPACING SHALL BE AS REQUIRED BY DESIGN. MAXIMUM STIRRUP SPACING SHALL BE 24 INCHES FOR AASHTO SECTIONS, 18 INCHES FOR NEBT SECTIONS.*
6. *STRANDS SHALL BE DETAILED SO AS NOT TO BE IN CONFLICT WITH THE INSERTS PROVIDED FOR THE DIAPHRAGM OR WITH THE FIXED BEARING ANCHOR RODS.*
7. *FOR BEARING DETAILS AND REQUIREMENTS, REFER TO DRAWING 7.80.*
8. *FOR PRESTRESSED DESIGN & DETAILING REQUIREMENTS ALSO REFER TO THE RIDOT LRFD BRIDGE DESIGN MANUAL.*
9. *EMBEDMENT LENGTHS OF THE HORIZONTAL SHEAR REINFORCING INTO THE DECK MAY NEED TO BE INCREASED IN CASES OF LARGE HAUNCH DEPTHS. THE DESIGNER SHALL ENSURE THAT AT LEAST 2" CLEAR COVER IS MAINTAINED TO THE TOP OF THE DECK AT ALL LOCATIONS. THE EMBEDMENT LENGTH SHOWN DOES NOT PRODUCE FULL DEVELOPMENT.*
10. *THE MAXIMUM SPAN LENGTHS LISTED BELOW ARE APPROXIMATE AND ARE PROVIDED AS A GUIDE ONLY. THEY ARE BASED ON AN HL93 LIVE LOAD, BUT THEY WILL VARY DEPENDING ON SUCH FACTORS AS STRENGTH OF CONCRETE, NUMBER OF STRANDS, SPACING OF BEAMS, AND DEAD (AND SUPERIMPOSED DEAD) LOADINGS.*



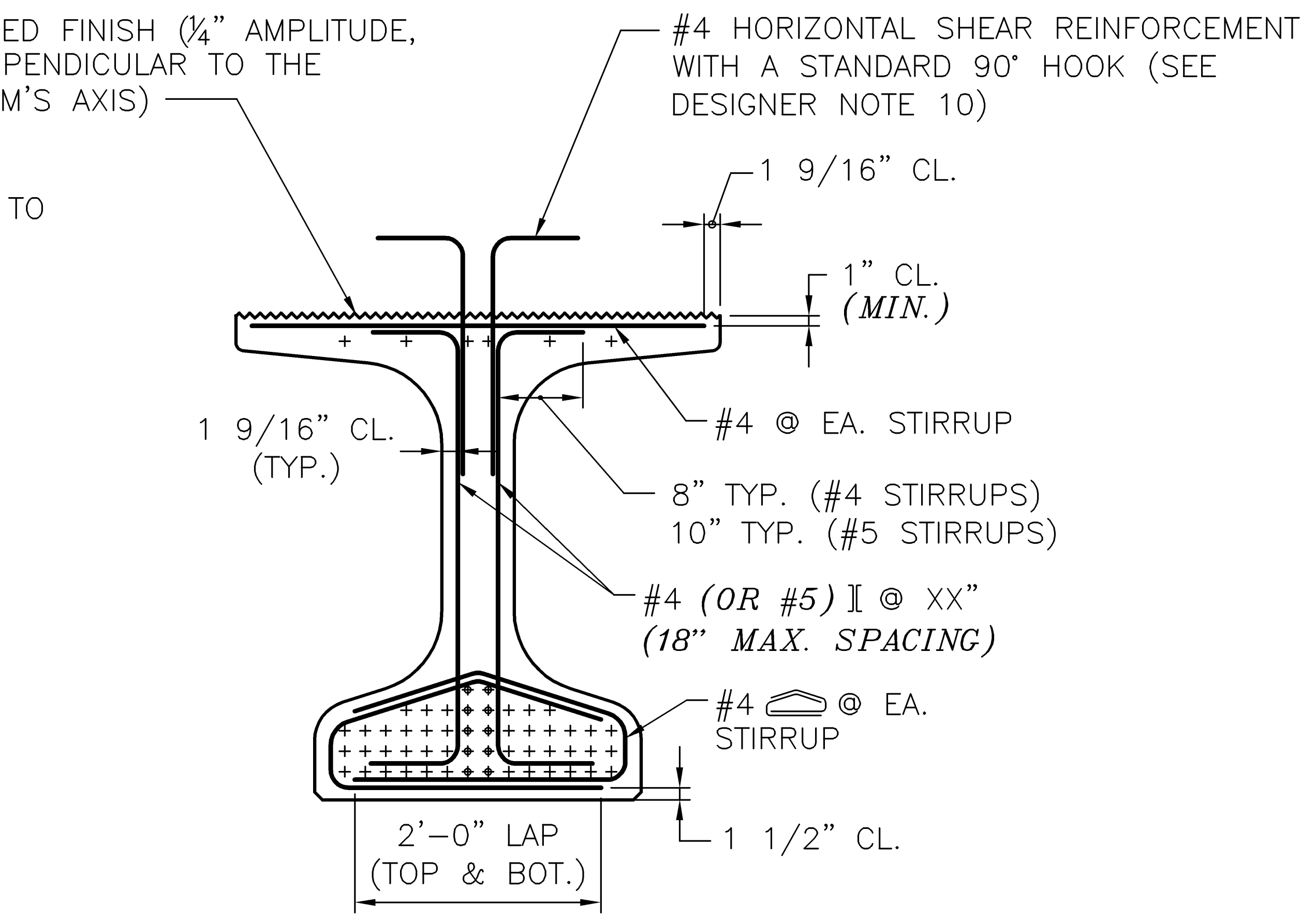
TYPICAL NEBT SECTION



NEBT STRAND LOCATIONS MIDSPAN



NEBT STRAND LOCATIONS END OF BEAM


RAKED FINISH (¼" AMPLITUDE, PERPENDICULAR TO THE BEAM'S AXIS)
#4 HORIZONTAL SHEAR REINFORCEMENT WITH A STANDARD 90° HOOK (SEE DESIGNER NOTE 10)
1 9/16" CL.
1" CL. (MIN.)
#4 @ EA. STIRRUP
1 9/16" CL. (TYP.)
8" TYP. (#4 STIRRUPS)
10" TYP. (#5 STIRRUPS)
#4 (OR #5)][@ XX" (18" MAX. SPACING)
#4 @ EA. STIRRUP
2'–0" LAP (TOP & BOT.)
1 1/2" CL.

NEBT TYPICAL SECTION

TYPE	DEPTH (IN)	W(LB/FT)	A (IN^2)	Y_T (IN)	Y_B (IN)	S_T (IN^3)	S_B (IN^3)	I_X (IN^4)	I_Y (IN^4)	MAXIMUM SPAN (FT)
NEBT 1000	39.37	778	746	20.35	19.02	7,332	7,844	149,196	61,745	70
NEBT 1200	47.24	835	801	24.61	22.63	9,675	10,516	238,089	61,985	81
NEBT 1400	55.12	894	857	28.86	26.26	12,237	13,449	353,169	62,225	94
NEBT 1600	62.99	952	913	33.03	29.96	14,911	16,439	492,515	62,465	105
NEBT 1800	70.87	1,010	969	37.20	33.66	17,761	19,663	660,691	62,706	115

NEW ENGLAND BULB TEE (NEBT) BEAM PROPERTIES

LEGEND

- + STRAIGHT STRANDS
- ⌖ DRAPED STRANDS
- • REINFORCING STEEL

THIS SHEET IS NOT TO SCALE

REVISIONS	
No.	DATE

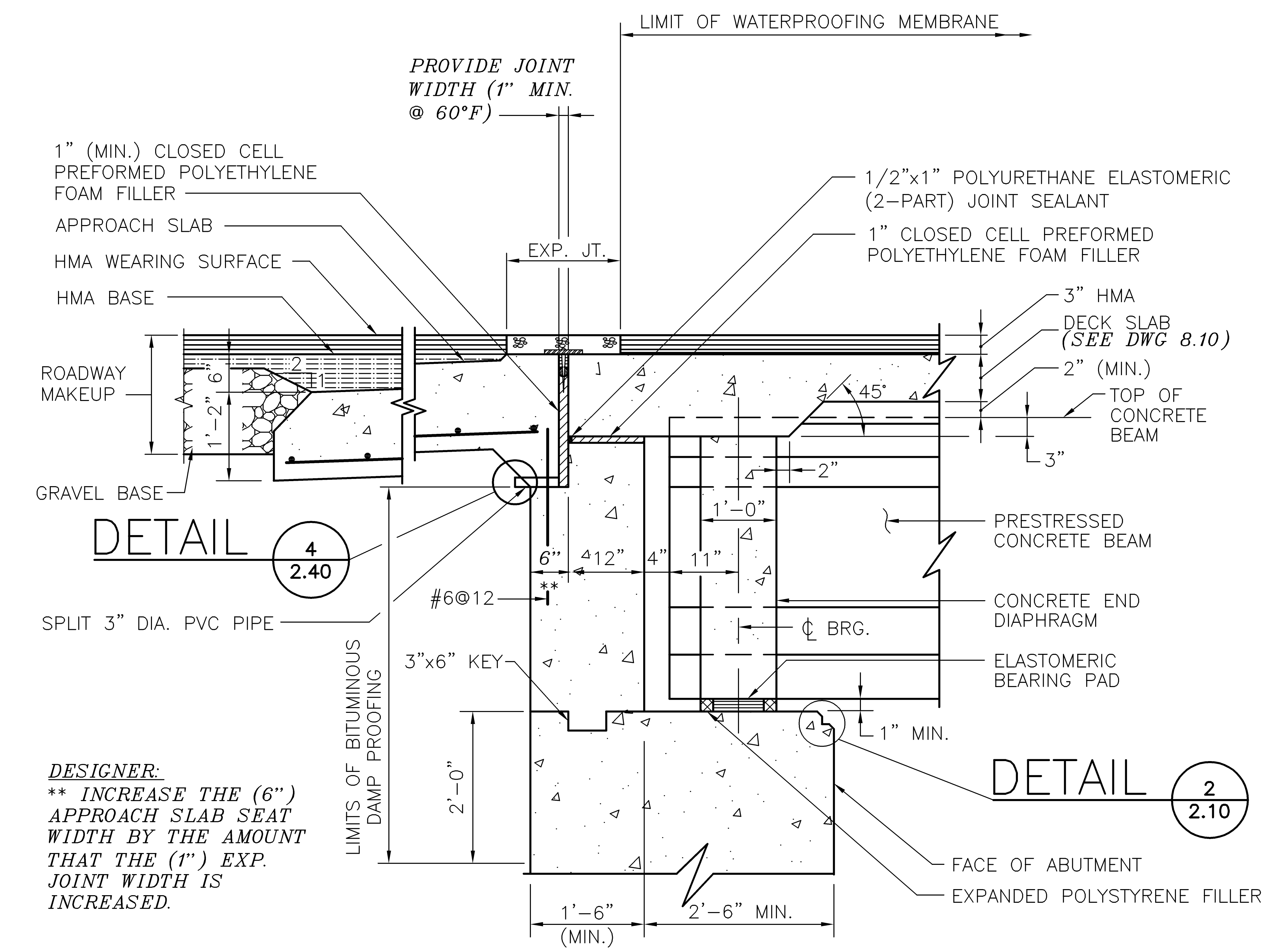
RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

BRIDGE STANDARDS

STANDARD AASHTO AND NEBT PRESTRESSED BEAMS

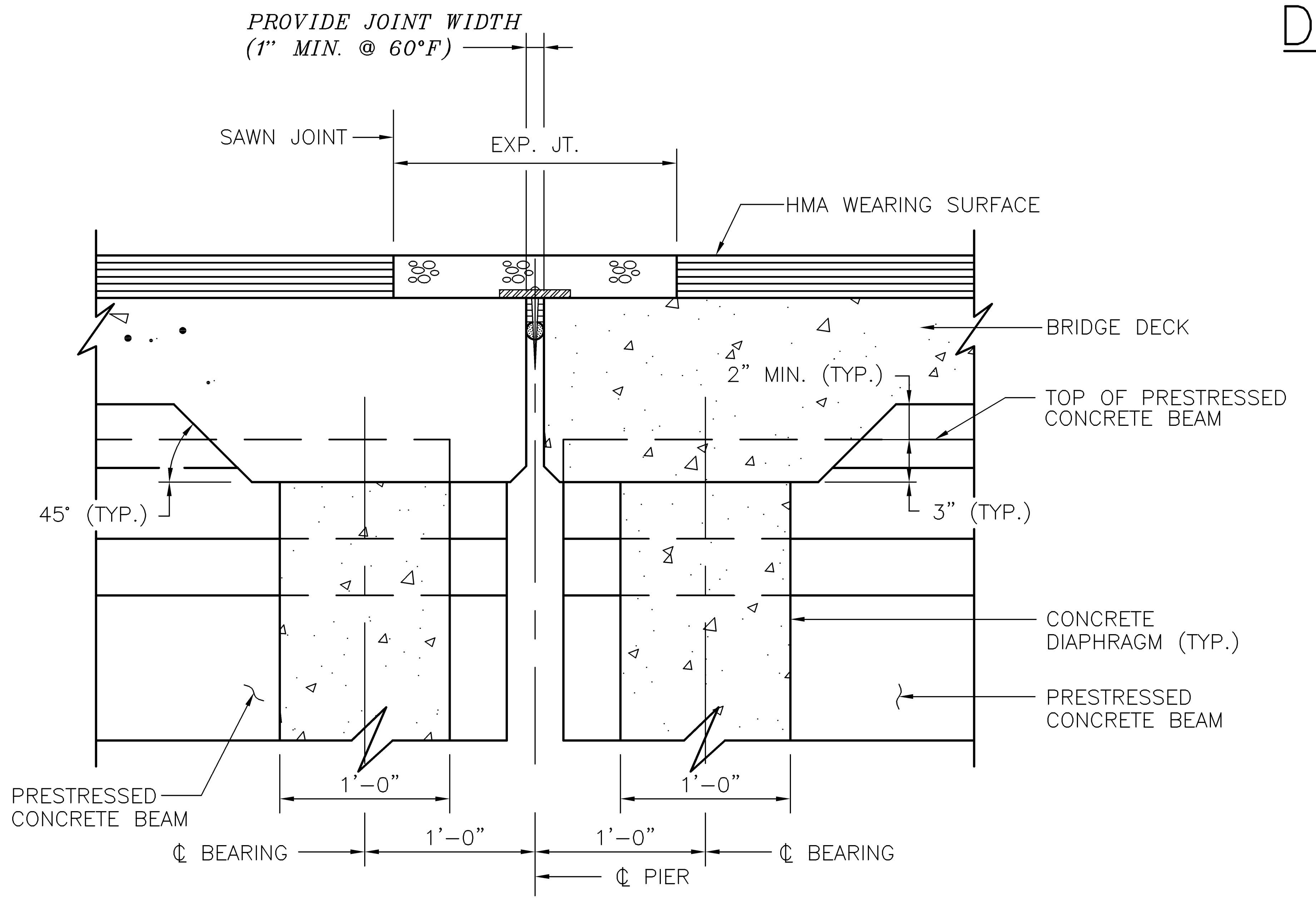
DRAWING NUMBER: 7.20

P:\10000\10027.00 On-Call Bridge Design\10027.20 Bridge Design Std Details_Drawings\Structural_Current_Drawings\Ris7-20.dwg, 7/22/2015 1:26:57 PM, JTA


LIMIT OF WATERPROOFING MEMBRANE
PROVIDE JOINT WIDTH (1" MIN. @ 60°F)
1" (MIN.) CLOSED CELL PREFORMED POLYETHYLENE FOAM FILLER
APPROACH SLAB
HMA WEARING SURFACE
HMA BASE
ROADWAY MAKEUP
GRAVEL BASE
1/2"x1" POLYURETHANE ELASTOMERIC (2-PART) JOINT SEALANT
1" CLOSED CELL PREFORMED POLYETHYLENE FOAM FILLER
EXP. JT.
3" HMA
DECK SLAB (SEE DWG 8.10)
2" (MIN.)
TOP OF CONCRETE BEAM
45°
2"
3"
1'-2" ±
1'-0"
DETAIL 4 / 2.40
SPLIT 3" DIA. PVC PIPE
6"
12"
4"
11"
#6@12
**
3"x6" KEY
PRESTRESSED CONCRETE BEAM
CONCRETE END DIAPHRAGM
℄ BRG.
ELASTOMERIC BEARING PAD
1" MIN.
LIMITS OF BITUMINOUS DAMP PROOFING
2'-0"
DETAIL 2 / 2.10
FACE OF ABUTMENT
EXPANDED POLYSTYRENE FILLER
1'-6" (MIN.)
2'-6" MIN.
DESIGNER:
** INCREASE THE (6") APPROACH SLAB SEAT WIDTH BY THE AMOUNT THAT THE (1") EXP. JOINT WIDTH IS INCREASED.

EXPANSION JOINT AT ABUTMENT

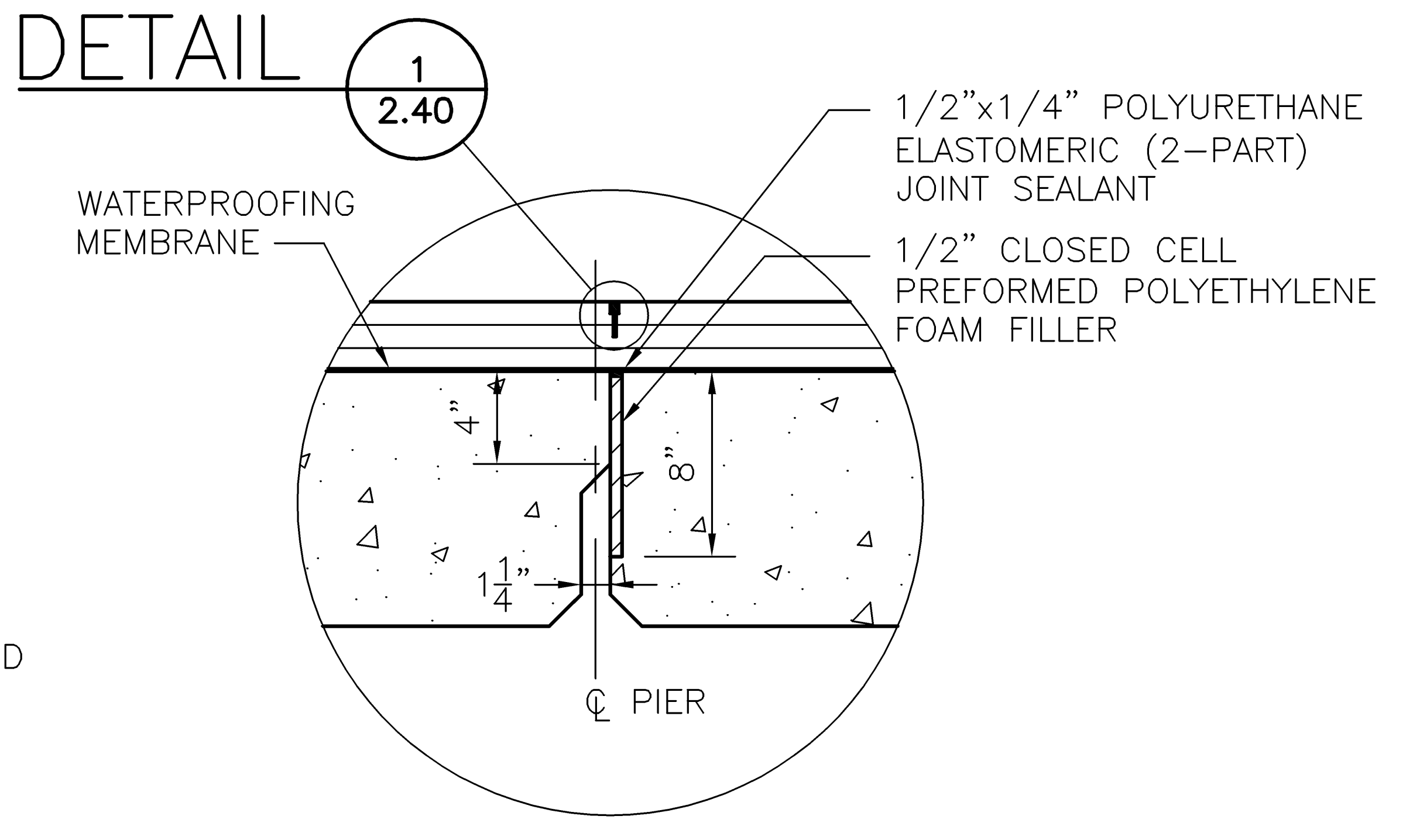
SCALE:3/4"=1'-0"

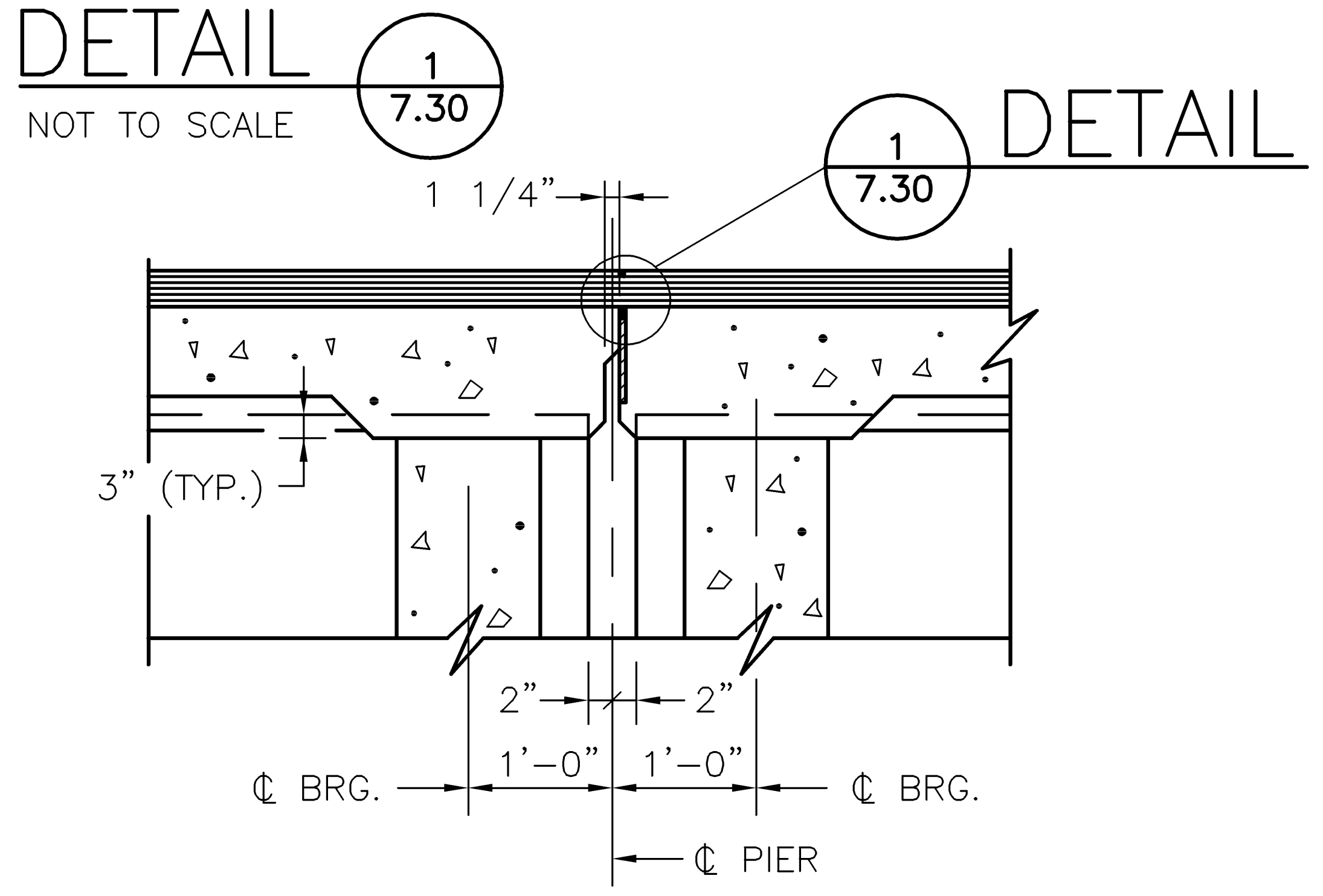

PROVIDE JOINT WIDTH (1" MIN. @ 60°F)
SAWN JOINT
EXP. JT.
HMA WEARING SURFACE
BRIDGE DECK
2" MIN. (TYP.)
TOP OF PRESTRESSED CONCRETE BEAM
45° (TYP.)
3" (TYP.)
CONCRETE DIAPHRAGM (TYP.)
PRESTRESSED CONCRETE BEAM
PRESTRESSED CONCRETE BEAM
1'-0"
1'-0"
℄ BEARING
1'-0"
1'-0"
℄ BEARING
℄ PIER

EXPANSION JOINT AT PIER

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

*SEE DESIGNER NOTE 8

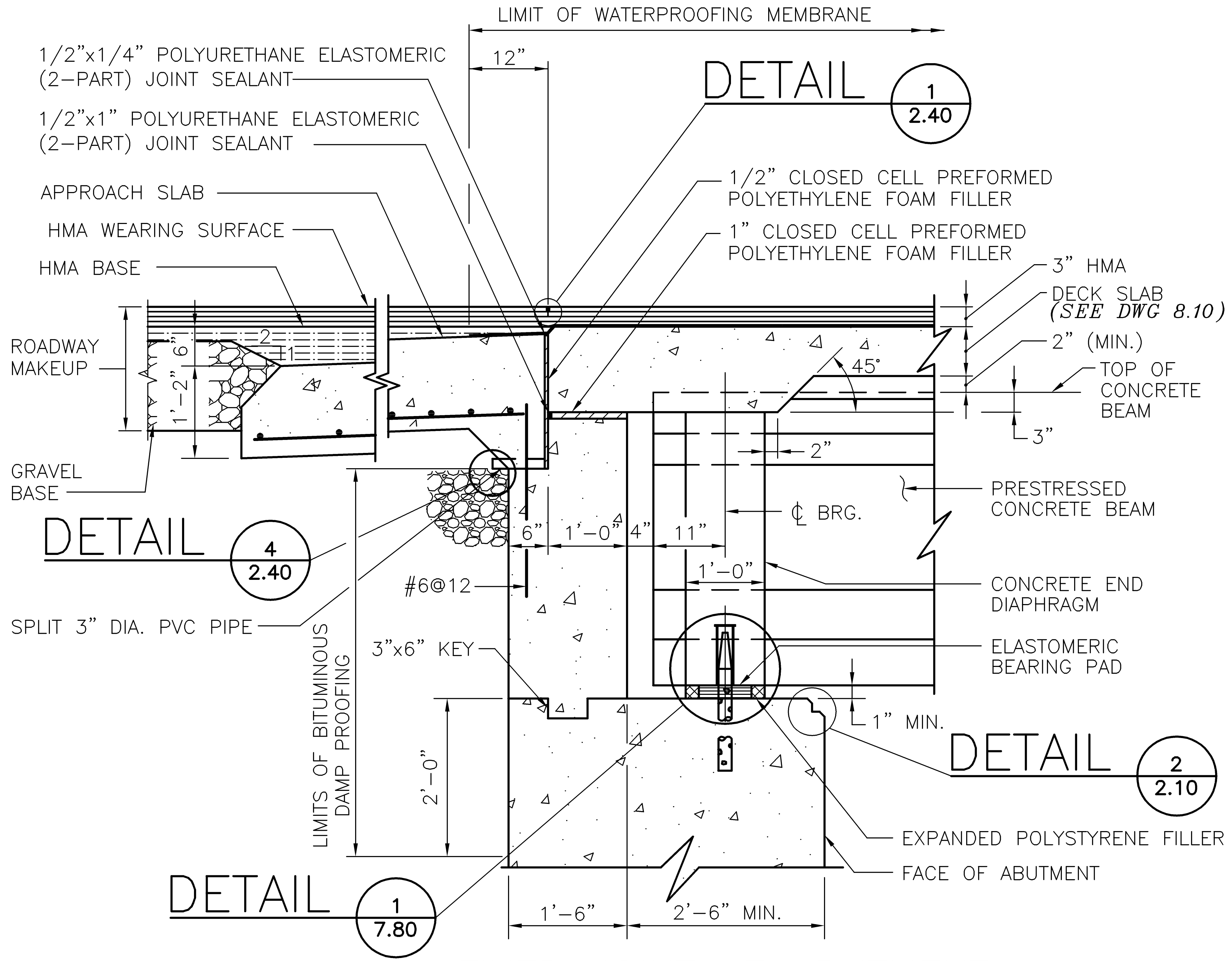

DETAIL 1 / 2.40
WATERPROOFING MEMBRANE
1/2"x1/4" POLYURETHANE ELASTOMERIC (2-PART) JOINT SEALANT
1/2" CLOSED CELL PREFORMED POLYETHYLENE FOAM FILLER
4"
8"
1 1/4"
℄ PIER



*FIXED JOINT AT PIER

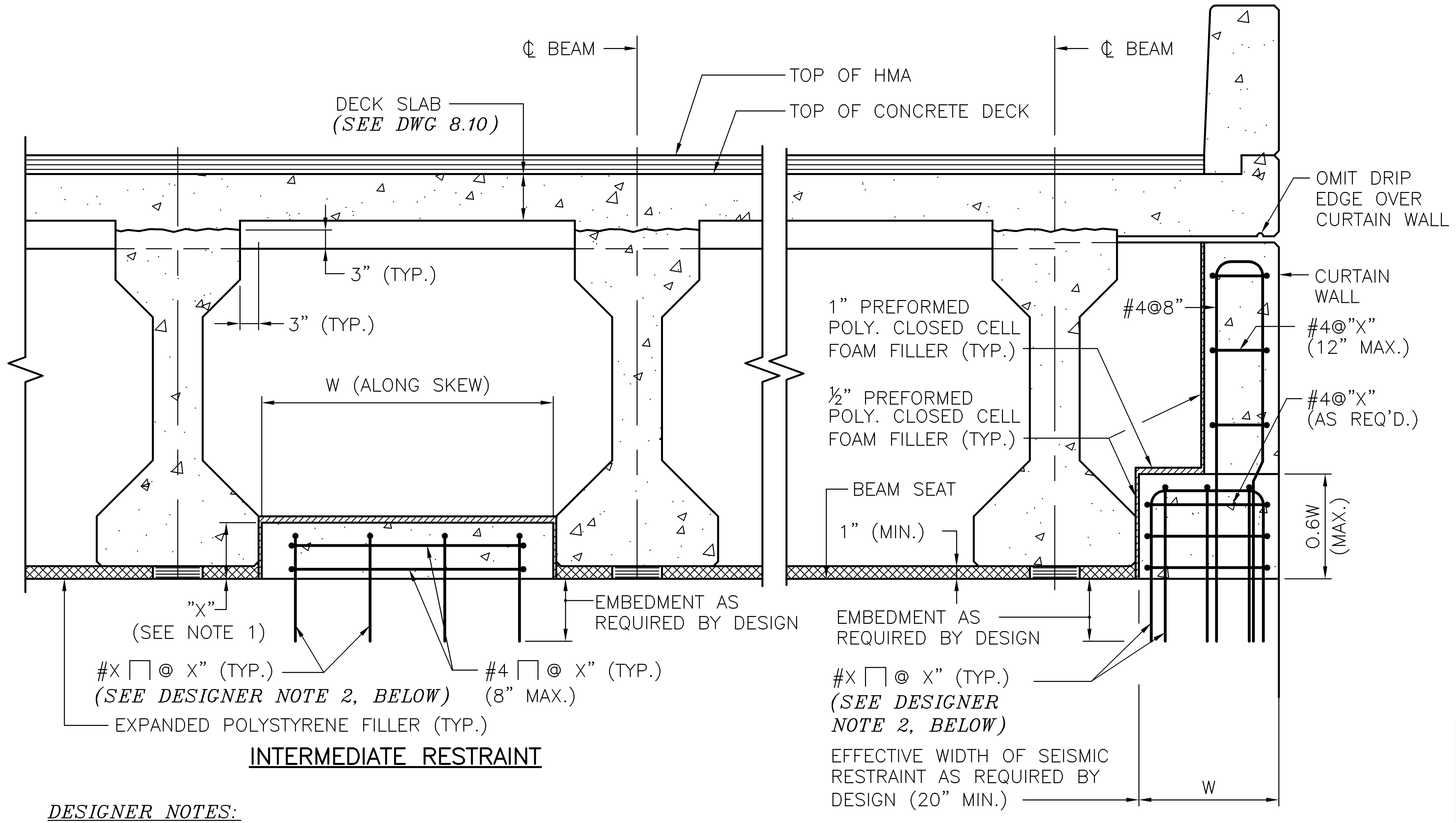
NOT TO SCALE

*SEE DESIGNER NOTE 8



FIXED JOINT AT ABUTMENT

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


℄ BEAM
℄ BEAM
TOP OF HMA
TOP OF CONCRETE DECK
DECK SLAB (SEE DWG 8.10)
OMIT DRIP EDGE OVER CURTAIN WALL
3" (TYP.)
3" (TYP.)
CURTAIN WALL
#4@8"
#4@"X" (12" MAX.)
#4@"X" (AS REQ'D.)
W (ALONG SKEW)
1" PREFORMED POLY. CLOSED CELL FOAM FILLER (TYP.)
½" PREFORMED POLY. CLOSED CELL FOAM FILLER (TYP.)
BEAM SEAT
1" (MIN.)
0.6W (MAX.)
"X" (SEE NOTE 1)
EMBEDMENT AS REQUIRED BY DESIGN
EMBEDMENT AS REQUIRED BY DESIGN
#X ⊓ @ X" (TYP.) (SEE DESIGNER NOTE 2, BELOW)
#4 ⊓ @ X" (TYP.) (8" MAX.)
EXPANDED POLYSTYRENE FILLER (TYP.)
INTERMEDIATE RESTRAINT
#X ⊓ @ X" (TYP.) (SEE DESIGNER NOTE 2, BELOW)
EFFECTIVE WIDTH OF SEISMIC RESTRAINT AS REQUIRED BY DESIGN (20" MIN.)
W
CURTAIN WALL RESTRAINT

DESIGNER NOTES:

1. *HEIGHT OF LATERAL RESTRAINT BLOCK: HEIGHT ≤ W/3.*
2. *DESIGN AS SHEAR FRICTION REINFORCEMENT TO RESIST TRANSVERSE SEISMIC LOADS. REINFORCEMENT CONFIGURATION IS CONCEPTUAL. THE DESIGNER SHALL MODIFY THE ARRANGEMENT AS REQUIRED.*
3. *INTERMEDIATE RESTRAINTS ARE ONLY USED WHEN CURTAIN WALL RESTRAINTS ARE INSUFFICIENT. AVOID LOCATING INTERMEDIATE RESTRAINTS IN UTILITY BAYS.*

TYPICAL PLACEMENT OF LATERAL RESTRAINTS AT EXPANSION JOINTS

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

DESIGNER NOTES:

1. *DIMENSIONS SHOWN ARE SQUARE DIMENSIONS.*
2. *FOR APPROACH SLAB DETAILS REFER TO DRAWING 2.40.*
3. *THE DESIGNER SHALL PROVIDE THE APPROPRIATE EXPANSION JOINT DETAIL FOR THE ANTICIPATED AMOUNT OF JOINT MOVEMENT. REFER TO RIDOT LRFD BRIDGE DESIGN MANUAL (SECTION 14).*
4. *FOR DETAILS OF ASPHALTIC EXPANSION JOINT SYSTEMS, REFER TO DRAWINGS 4.40 AND 4.41.*
5. *FOR DETAILS OF THE STRIP SEAL EXPANSION JOINT, REFER TO DRAWINGS 4.20 AND 4.30.*
6. *FOR DETAILS OF ALTERNATE FIXED JOINTS REFER TO DRAWINGS 2.40 AND 2.50.*
7. *FOR DETAILS OF BEARING ANCHOR RODS REFER TO DRAWING 7.80.*
8. *ELIMINATION OF EXPANSION AND FIXED JOINTS AT PIER IS PREFERRED. SEE DRAWING 3.20.*
9. *THE DESIGN OF THE ELASTOMERIC BEARINGS SHALL BE IN ACCORDANCE WITH AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.*

REVISIONS	
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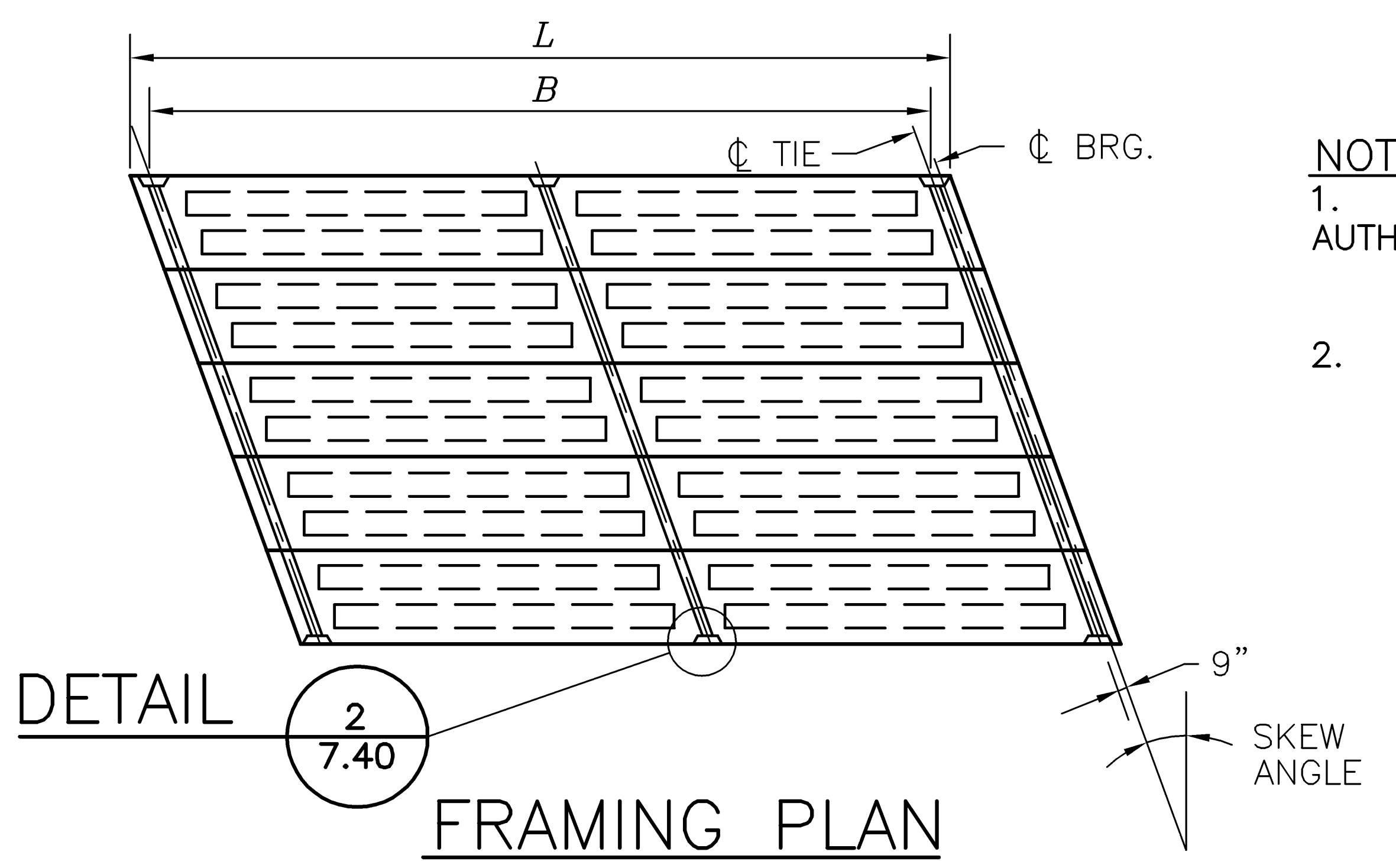
RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

BRIDGE STANDARDS

JOINT DETAILS FOR
PRESTRESSED BEAMS

DRAWING NUMBER: 7.30



FRAMING PLAN

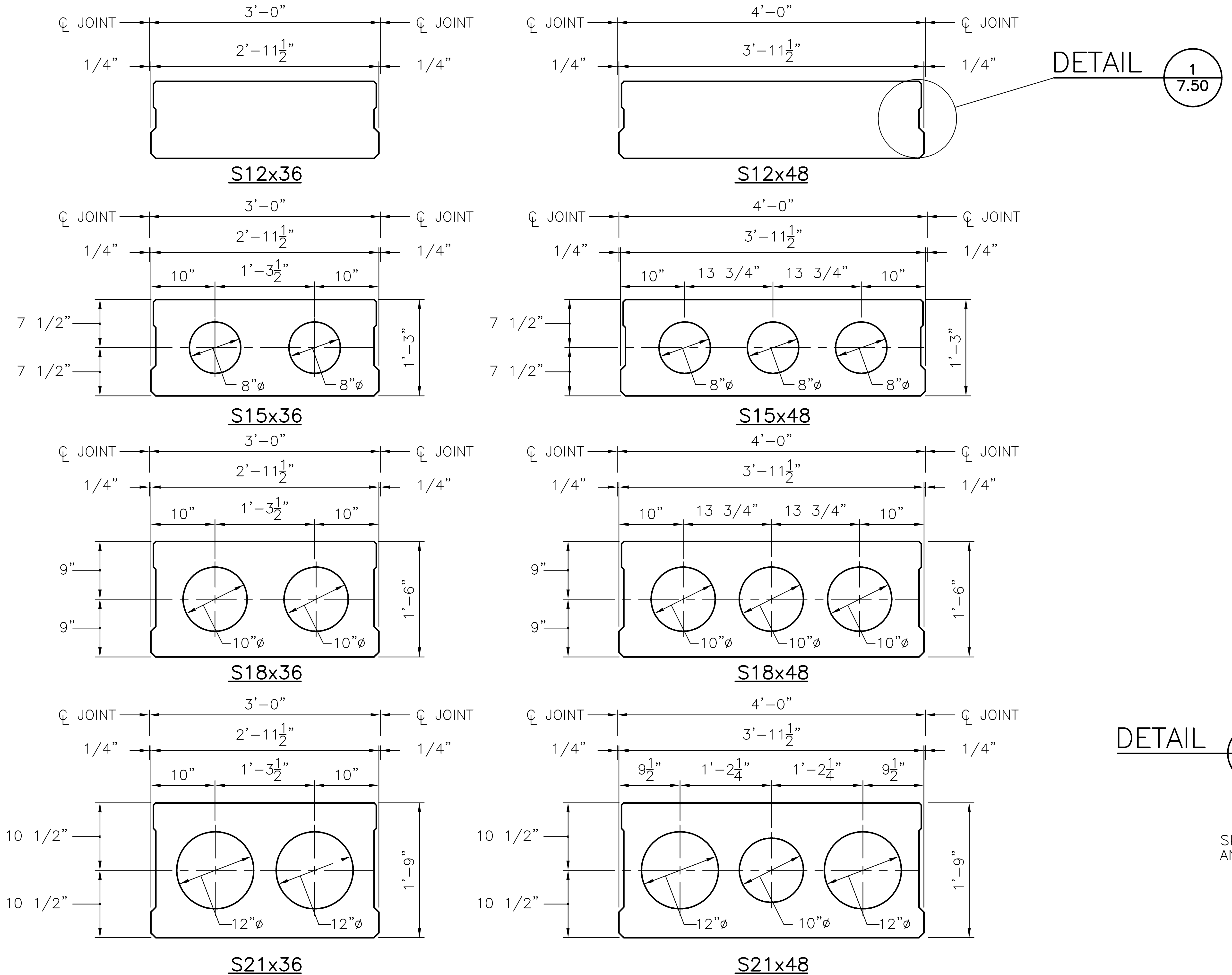
NOTE:

1. SKEW ANGLE IS NOT TO EXCEED 30° EXCEPT AS AUTHORIZED BY THE ENGINEER.
(SEE DESIGNER NOTE 5)

2. PROVIDE LATERAL TIES AT MIDPOINT AND AT END POINTS.

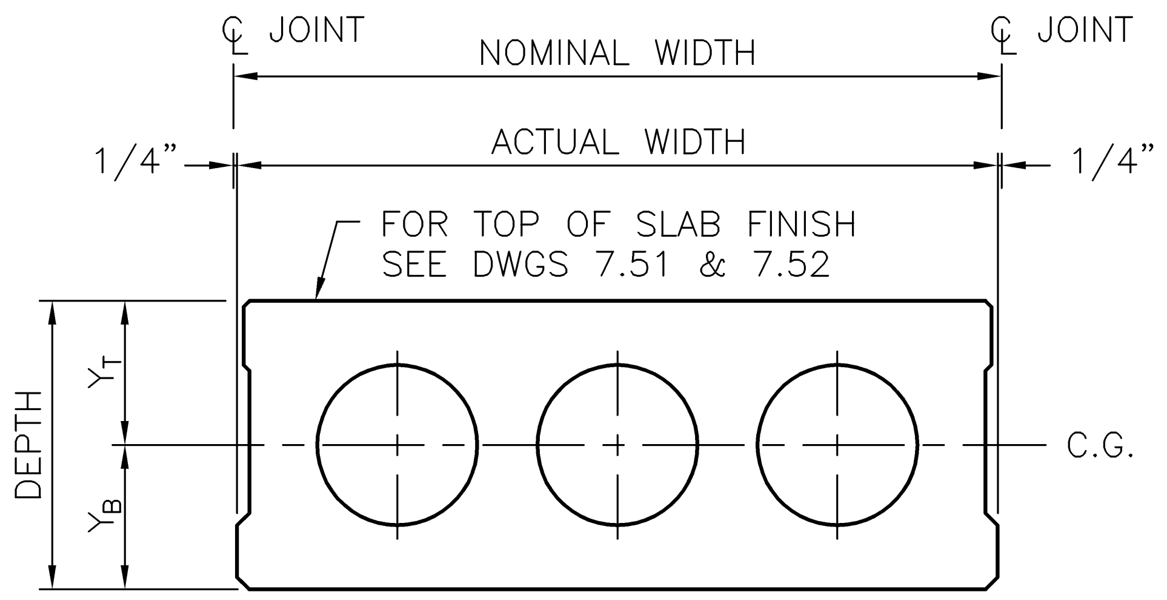
SECTION PROPERTIES											
BEAM TYPE	DEPTH (IN.)	WIDTH (IN.)		$A (IN.^2)$	$I (IN.^4)$	Y_B (IN.)	Y_T (IN.)	$S_B (IN.^3)$	$S_T (IN.^3)$	WT. LBS./FT.	* MAX. SPAN/FT.
		NOMINAL	ACTUAL								
S12x36	12.0	36.0	35.5	417.0	5033.0	5.98	6.02	842.0	836.0	434	30
S15x36	15.0	36.0	35.5	419.0	9419.0	7.47	7.53	1261.0	1251.0	436	40
S18x36	18.0	36.0	35.5	464.0	15963.0	8.96	9.04	1782.0	1766.0	483	46
S21x36	21.0	36.0	35.5	497.0	24827.0	10.45	10.55	2376.0	2353.0	518	54
S12x48	12.0	48.0	47.5	561.0	6761.0	5.98	6.02	1131.0	1123.0	584	34
S15x48	15.0	48.0	47.5	548.0	12593.0	7.47	7.53	1686.0	1672.0	571	39
S18x48	18.0	48.0	47.5	601.0	21303.0	8.97	9.03	2375.0	2359.0	626	47
S21x48	21.0	48.0	47.5	670.0	33597.0	10.47	10.53	3209.0	3191.0	698	58

** SEE DESIGNER NOTE 3*



SLAB SECTIONS

SCALE: 1" = 1'-0"



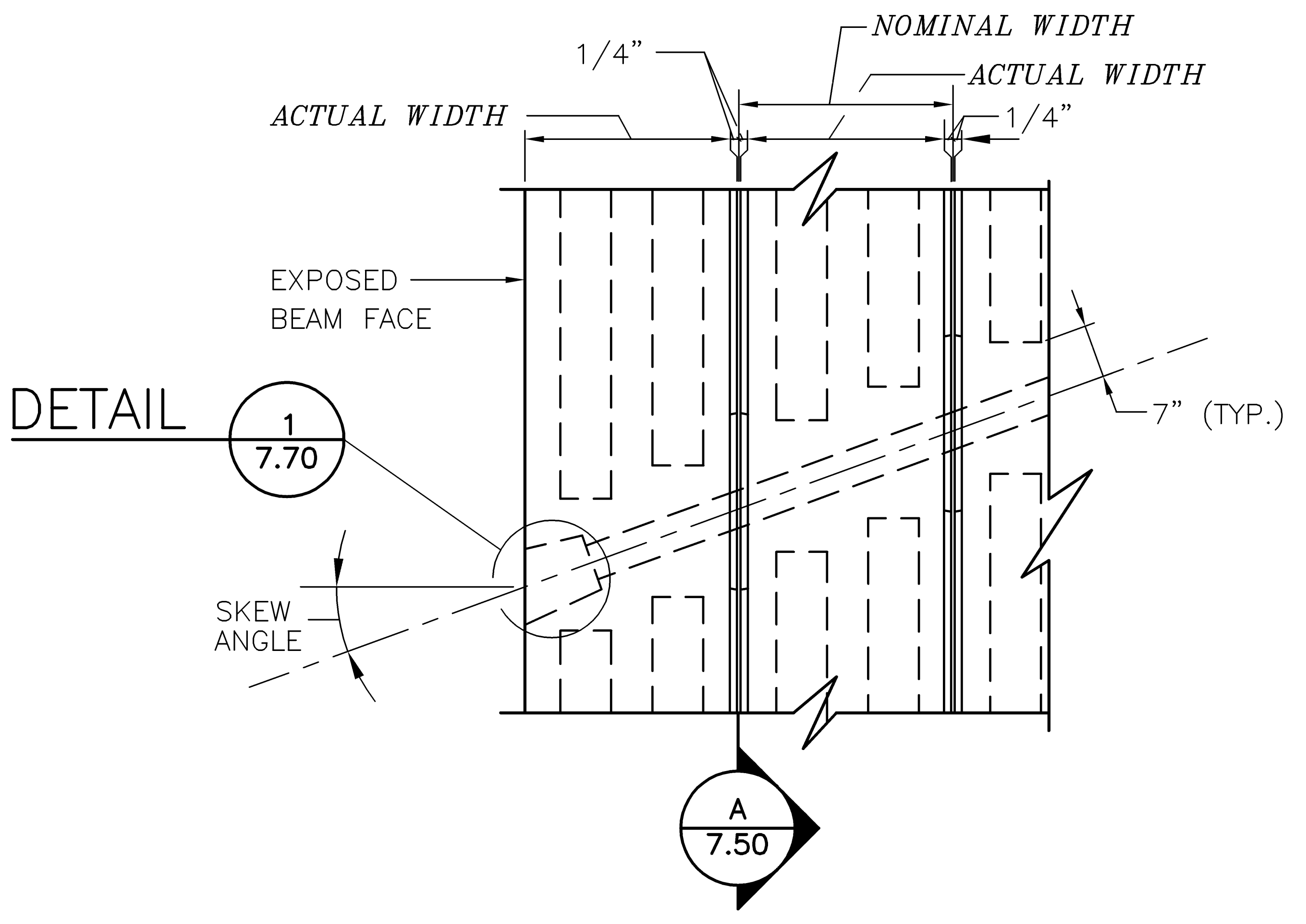
SLAB SECTION

NOTE:

1. FABRICATOR SHALL FURNISH ACCESS HANDHOLES AS REQUIRED FOR LATERAL TIE INSTALLATION.

DESIGNER NOTES:

1. *DESIGNER SHALL INVESTIGATE EXTERIOR BEAM GROUP FOR TORSIONAL LOADS DUE TO SLAB OVERHANG OR UTILITY PLACEMENT. CONSIDERATION SHOULD BE GIVEN TO INCREASING THE NUMBER OF LATERAL TIES, AMOUNT OF POST TENSIONING AND/OR PROVIDING ADDITIONAL SHEAR BLOCKS.*
2. *STIRRUP SIZE AND SPACING SHALL BE AS REQUIRED BY DESIGN. STIRRUP SPACING AND SIZE SHOWN ARE MINIMUM REQUIREMENTS.*
3. *THE MAXIMUM SPAN LENGTHS LISTED ABOVE ARE APPROXIMATE AND ARE PROVIDED AS A GUIDE ONLY. THEY ARE BASED ON AN HL93 LIVE LOAD, BUT THEY WILL VARY DEPENDING ON SUCH FACTORS AS STRENGTH OF CONCRETE, SIZE AND NUMBER OF STRANDS, AND WHETHER OR NOT A 5" MIN. REINFORCED CONCRETE DECK OVERLAY IS USED.*
4. *THIS SHEET CONTAINS STANDARD PRESTRESSED CONCRETE SLAB SECTIONS. SPECIFIC APPLICATIONS, DETAILS (INCLUDING SLAB DIMENSIONS, ELEVATIONS, SIZES AND NUMBERS OF STRANDS OF BAR REINFORCEMENT) SHALL BE SHOWN ON THE CONTRACT DRAWINGS.*
5. *FOR ANY AUTHORIZED SKEW ANGLE GREATER THAN 30 DEGREES, THE DESIGNER MUST CONSIDER THE RESULTING EFFECTS OF THE LARGER SKEW ANGLE AND CONSIDER DETAILING ADDITIONAL LATERAL TIE STRANDS TO COMPENSATE FOR THE REDUCED LATERAL FORCES.*



SKEW ANGLE ≦ 30°

DETAIL 2/7.40

NOT TO SCALE

REVISIONS	
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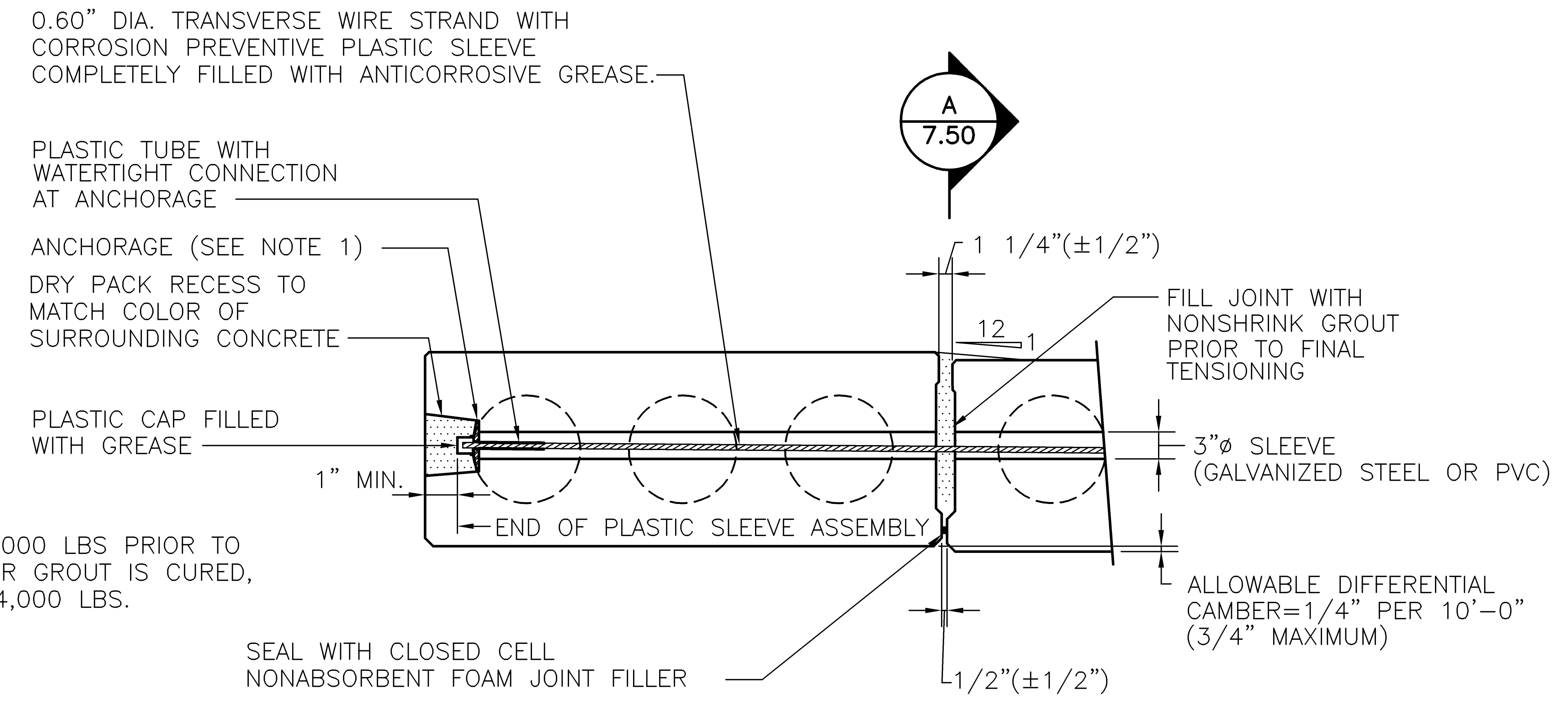
RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

BRIDGE STANDARDS

PRESTRESSED CONCRETE SLABS
SHEET 1

DRAWING NUMBER: 7.40

P:\10000\10027.00 On-Call Bridge Design\10027.20 Bridge Design Std Details_Drawings\Structural_Current_Drawings\Ris7-40.dwg, 7/22/2015 1:27:07 PM, JTA

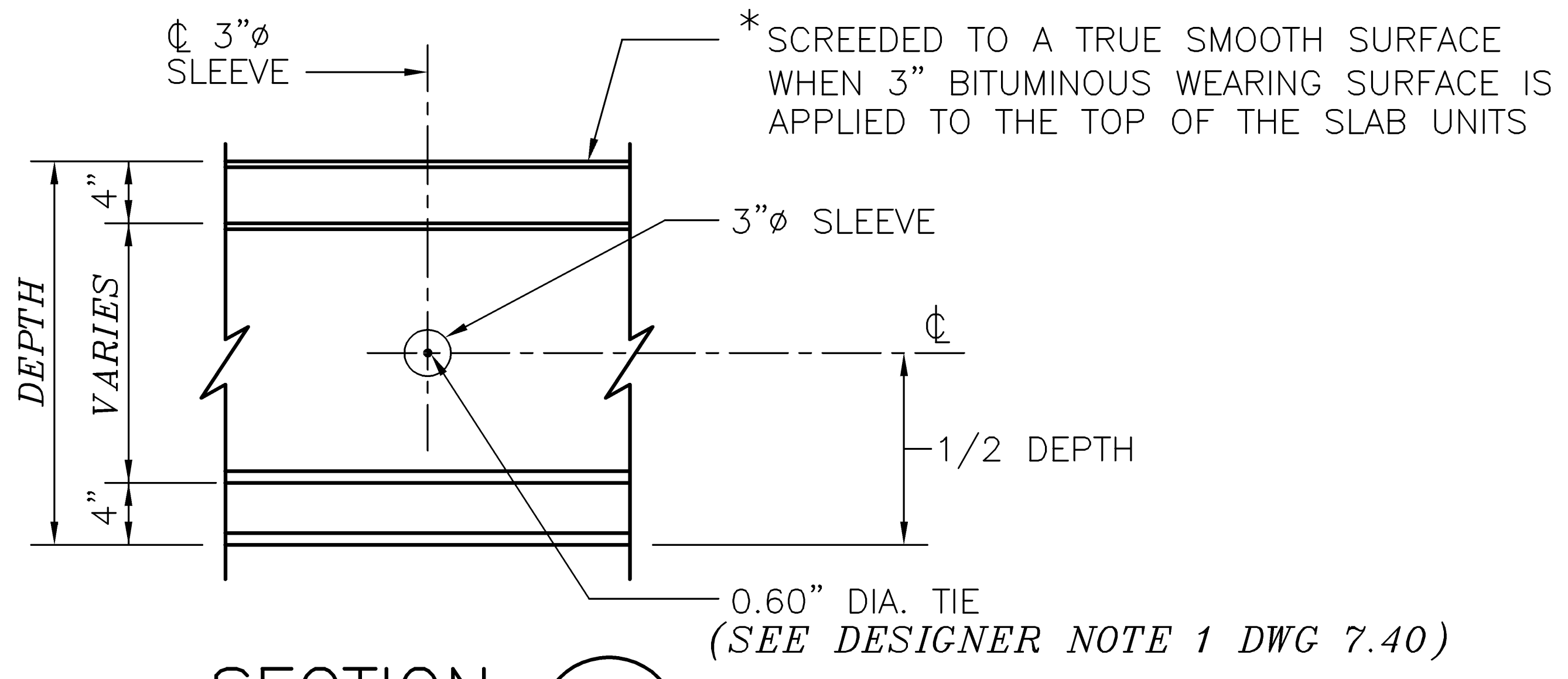


A
7.50
0.60" DIA. TRANSVERSE WIRE STRAND WITH CORROSION PREVENTIVE PLASTIC SLEEVE COMPLETELY FILLED WITH ANTICORROSIVE GREASE.
PLASTIC TUBE WITH WATERTIGHT CONNECTION AT ANCHORAGE
ANCHORAGE (SEE NOTE 1)
DRY PACK RECESS TO MATCH COLOR OF SURROUNDING CONCRETE
PLASTIC CAP FILLED WITH GREASE
1" MIN.
END OF PLASTIC SLEEVE ASSEMBLY
SEAL WITH CLOSED CELL NONABSORBENT FOAM JOINT FILLER
1 1/4"(±1/2")
12
1
FILL JOINT WITH NONSHRINK GROUT PRIOR TO FINAL TENSIONING
3"ø SLEEVE (GALVANIZED STEEL OR PVC)
ALLOWABLE DIFFERENTIAL CAMBER=1/4" PER 10'-0" (3/4" MAXIMUM)
1/2"(±1/2")

NOTE:
TENSION STRAND TO 5,000 LBS PRIOR TO GROUTING JOINTS. AFTER GROUT IS CURED, TENSION STRAND TO 44,000 LBS.

LATERAL TIE DETAILS

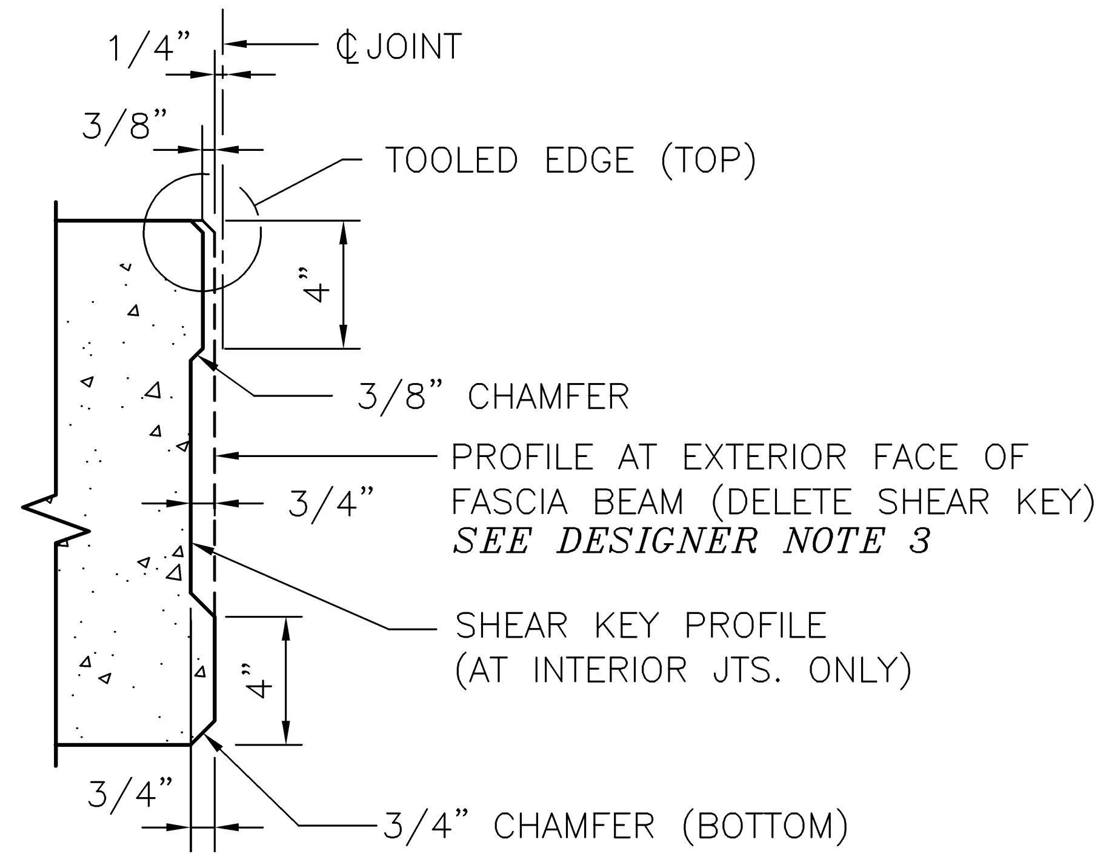
SCALE:1"=1'-0"



℄ 3"ø SLEEVE
*SCREEDED TO A TRUE SMOOTH SURFACE WHEN 3" BITUMINOUS WEARING SURFACE IS APPLIED TO THE TOP OF THE SLAB UNITS
3"ø SLEEVE
℄
1/2 DEPTH
DEPTH VARIES
4"
4"
0.60" DIA. TIE
(SEE DESIGNER NOTE 1 DWG 7.40)

SECTION A
7.50

* RAKED SURFACE WHEN 5" (MIN.) REINFORCED CONCRETE DECK OVERLAY IS APPLIED TO THE TOP OF THE SLAB UNITS

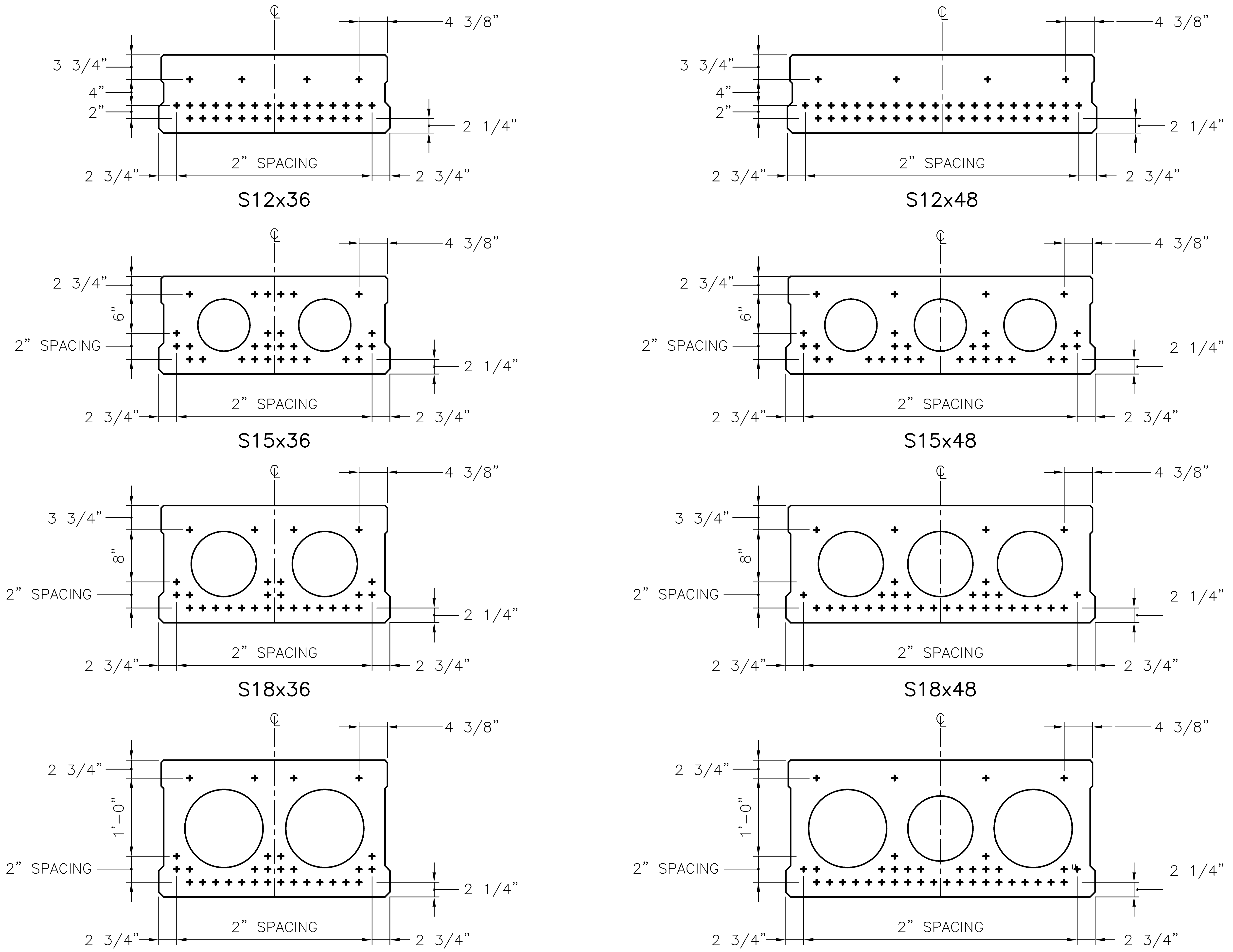


1/4"
℄ JOINT
3/8"
TOOLED EDGE (TOP)
4"
3/8" CHAMFER
PROFILE AT EXTERIOR FACE OF FASCIA BEAM (DELETE SHEAR KEY)
SEE DESIGNER NOTE 3
3/4"
SHEAR KEY PROFILE (AT INTERIOR JTS. ONLY)
4"
3/4"
3/4" CHAMFER (BOTTOM)

DETAIL 1
7.50

SHEAR KEY DETAILS

NOT TO SCALE



S12x36

S12x48

S15x36

S15x48

S18x36

S18x48

S21x36

S21x48

STRAND LOCATIONS

SCALE:1"=1'-0"

LEGEND

+ STRAIGHT STRAND
(SEE DESIGNER NOTE 2)

DESIGNER NOTES:

1. *THE STANDARD STRAND PATTERNS SHOWN HERE DEPICT THE MAXIMUM NUMBER OF STRANDS POSSIBLE FOR A GIVEN BEAM SECTION WHILE STILL MEETING APPLICABLE FABRICATION CLEARANCES.*
2. *PRESTRESSED WIRE STRANDS SHALL BE 0.50"DIA. OR 0.60"DIA.*
3. *THE EXTERIOR FACE OF THE FASCIA BEAMS SHALL RECEIVE A SELECTED FORMLINER OR RUBBED FINISH.*

NOTES:

1. DETAILS OF THE ANCHORAGE ASSEMBLY ARE TO BE SUBMITTED FOR REVIEW AND APPROVAL BY THE ENGINEER.
2. ALL PRESTRESSED CONCRETE SLABS SHALL BE ERECTED AS INDICATED ON THE CONTRACT DRAWINGS. THEY SHALL BE SET TO THE SPECIFIED (NOMINAL) DIMENSIONS AND WITH THE SPECIFIED (NOMINAL) 1 INCH SPACING BETWEEN UNITS. THE LATERAL POST-TENSIONING STRANDS SHALL BE TENSIONED INITIALLY TO 5,000 POUNDS. SAID LATERAL POST-TENSIONING IS NOT EXPECTED TO DRAW THE UNITS TOGETHER. AFTER THE UNITS ARE IN PLACE, THE FOAM JOINT FILLER SHALL BE PLACED AT THE BOTTOM OF THE SHEAR KEYS. APPROVED NON-SHRINK GROUT SHALL THEN BE PLACED INTO THE SHEAR KEYS (PENCIL VIBRATE THE GROUT IN THE KEY TO CONSOLIDATE MATERIAL) AND ALLOWED TO CURE, FOR A MINIMUM OF 72 HOURS, AFTER WHICH THE STRANDS SHALL BE STRESSED TO THE FULL 44,000 POUNDS.
3. THE CONTRACTOR SHALL FURNISH THE STATE WITH CALCULATIONS FOR THE THEORETICAL ELONGATION OF THE LATERAL POST-TENSIONING STRANDS SO THAT THE STRAND TENSION INDICATED ON THE CALIBRATED METER CAN BE VERIFIED. THE CONTRACTOR SHALL FURNISH RECORDS TO THE STATE OF THE GAUGE READINGS VERSUS THE MEASURED ELONGATIONS.
4. NO TRAFFIC OR HEAVY EQUIPMENT SHALL BE PERMITTED ON THE STRUCTURE UNTIL ALL TRANSVERSE TIES HAVE BEEN PROPERLY TENSIONED AND THE GROUT HAS ATTAINED THE 28 DAY COMPRESSIVE STRENGTH.

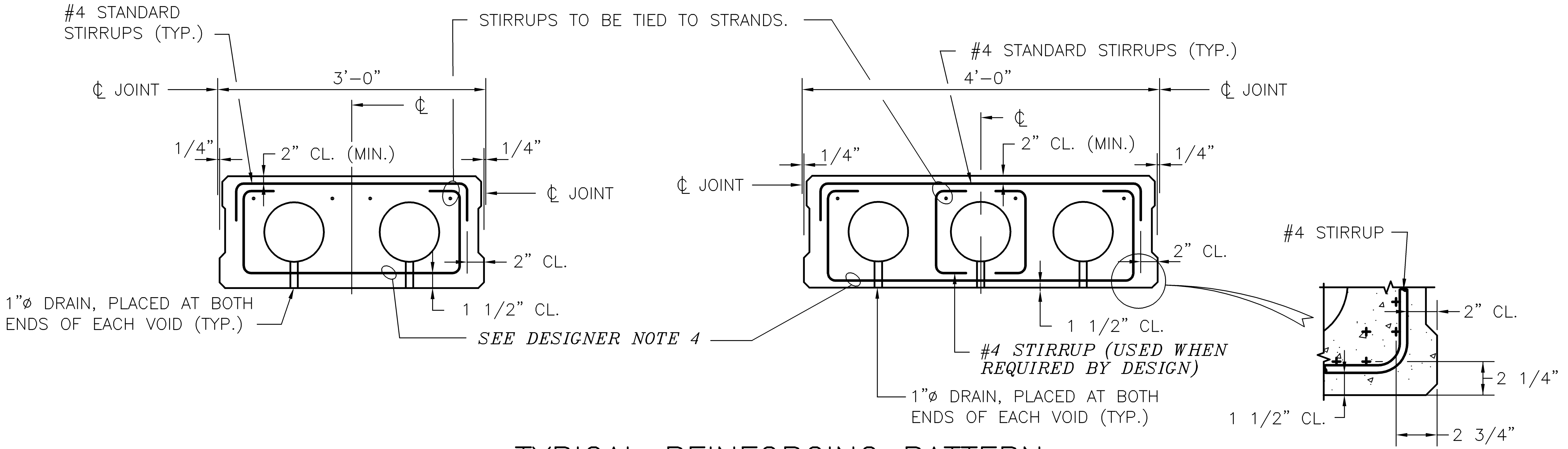
REVISIONS	
No.	DATE

RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

BRIDGE STANDARDS

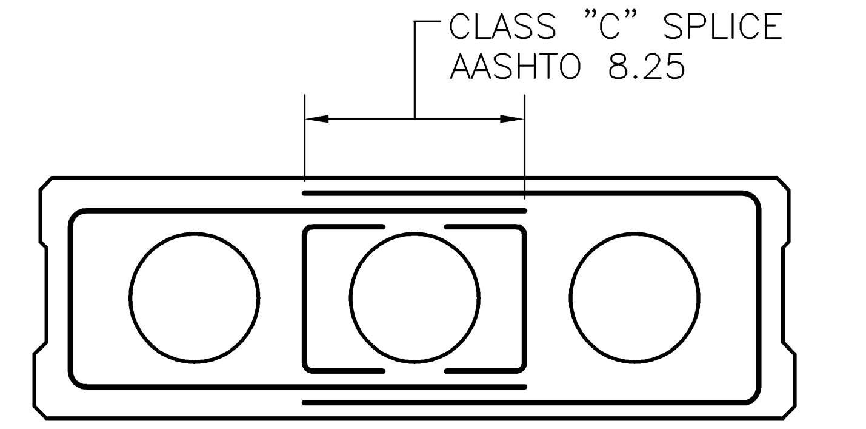
PRESTRESSED CONCRETE SLABS
SHEET 2

DRAWING NUMBER: 7.50


#4 STANDARD STIRRUPS (TYP.)
STIRRUPS TO BE TIED TO STRANDS.
#4 STANDARD STIRRUPS (TYP.)
℄ JOINT
3'–0"
℄
1/4"
2" CL. (MIN.)
1/4"
℄ JOINT
2" CL.
1 1/2" CL.
1"ø DRAIN, PLACED AT BOTH ENDS OF EACH VOID (TYP.)
SEE DESIGNER NOTE 4
4'–0"
℄
2" CL. (MIN.)
℄ JOINT
1/4"
1/4"
2" CL.
1 1/2" CL.
#4 STIRRUP (USED WHEN REQUIRED BY DESIGN)
1"ø DRAIN, PLACED AT BOTH ENDS OF EACH VOID (TYP.)
#4 STIRRUP
2" CL.
2 1/4"
1 1/2" CL.
2 3/4"

TYPICAL REINFORCING PATTERN

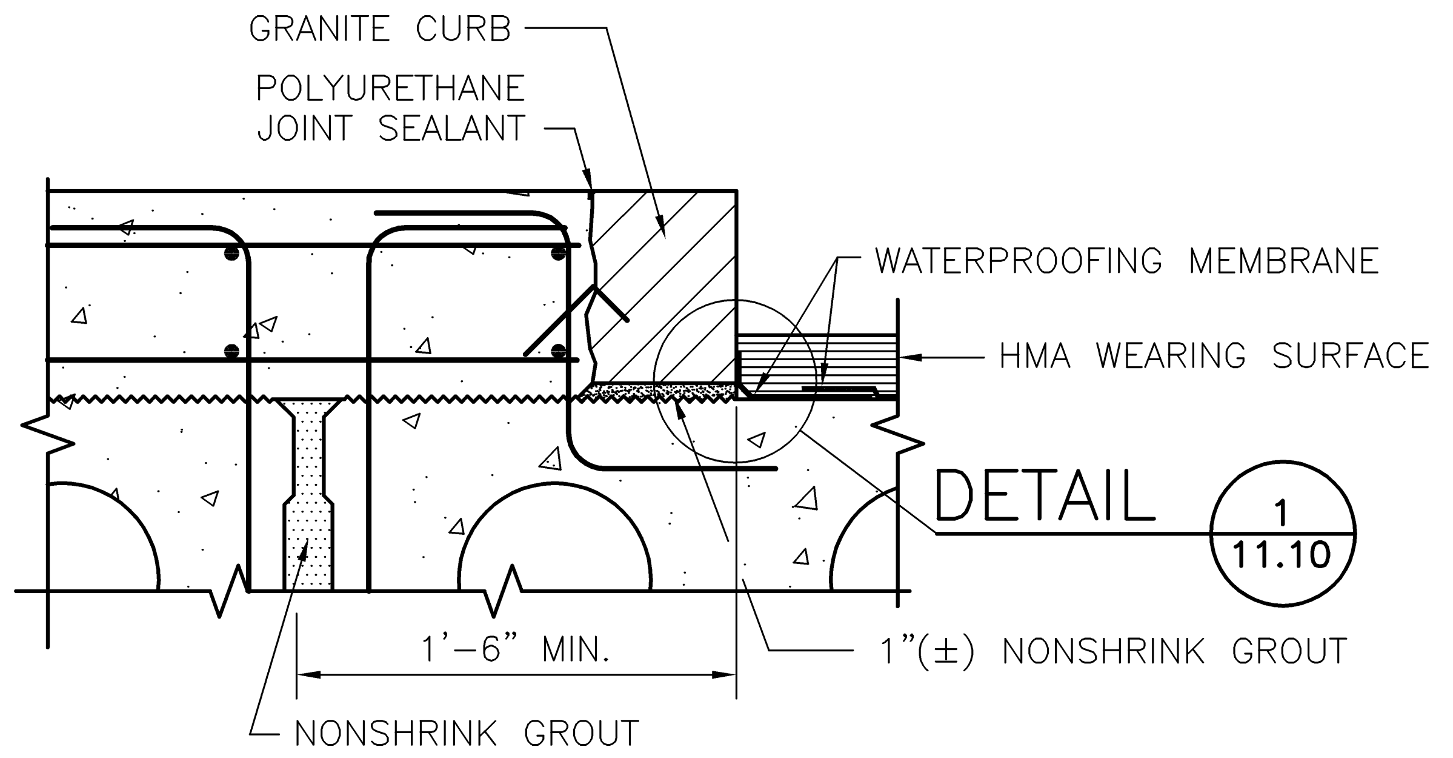
SCALE:1"=1'–0"



NOTE:
FOR S12x36 AND S12x48 BEAMS USE THIS ALTERNATIVE PATTERN EXCLUSIVELY

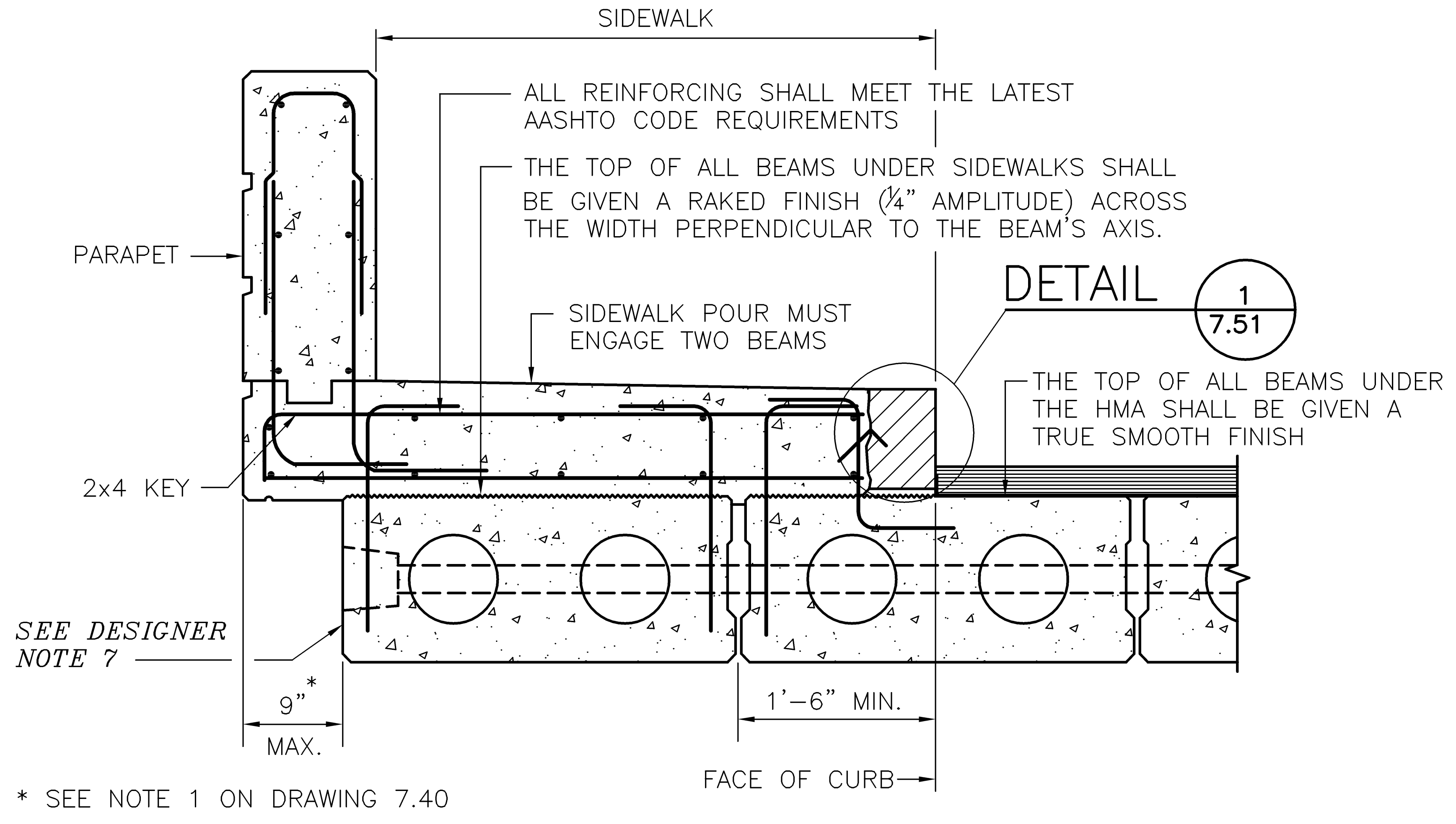
ALTERNATE STIRRUP PATTERN

SCALE:1"=1'–0"



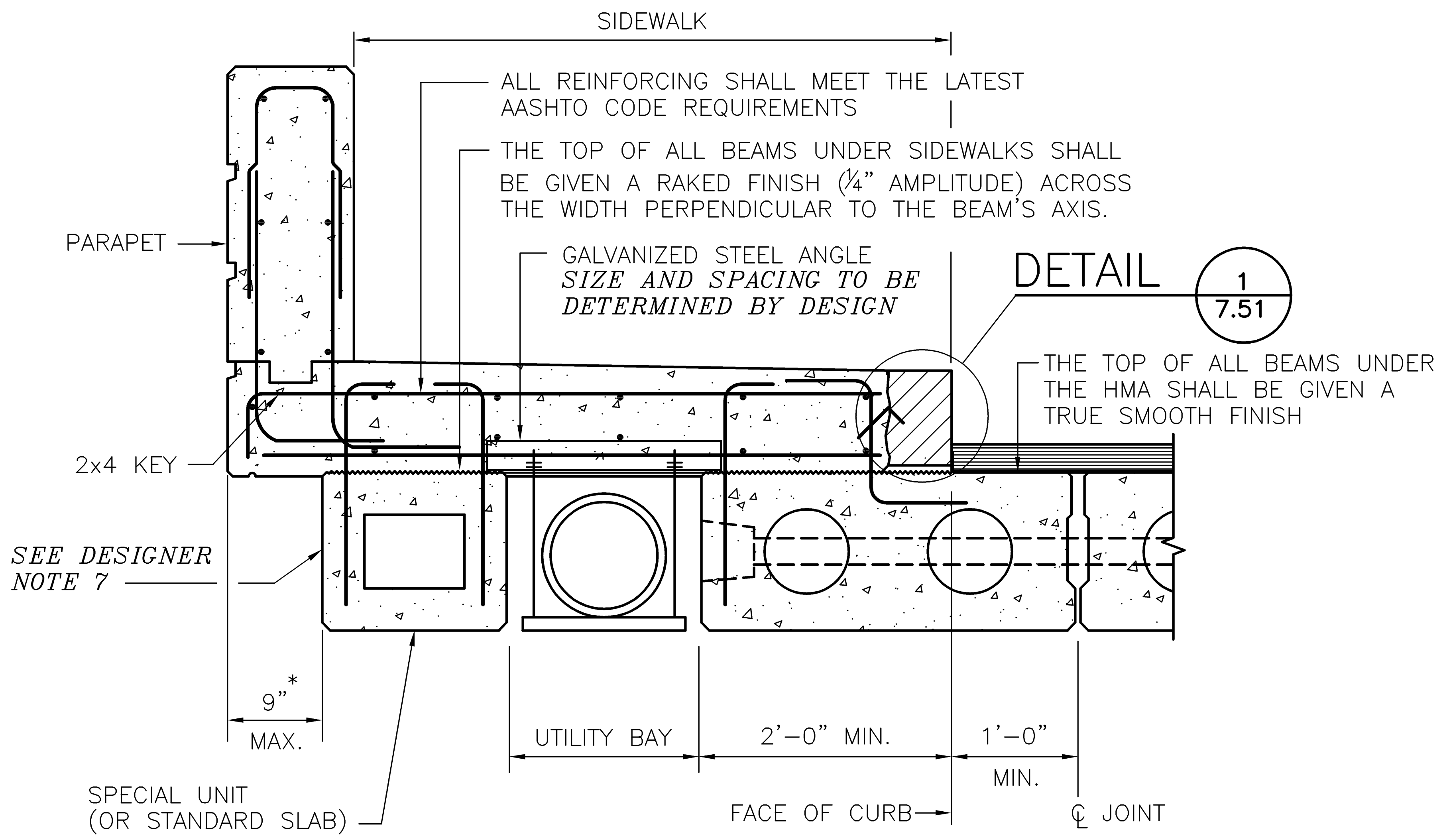
CURB DETAIL

DETAIL 1/7.51


SIDEWALK
ALL REINFORCING SHALL MEET THE LATEST AASHTO CODE REQUIREMENTS
THE TOP OF ALL BEAMS UNDER SIDEWALKS SHALL BE GIVEN A RAKED FINISH (¼" AMPLITUDE) ACROSS THE WIDTH PERPENDICULAR TO THE BEAM'S AXIS.
PARAPET
SIDEWALK POUR MUST ENGAGE TWO BEAMS
DETAIL 1 7.51
THE TOP OF ALL BEAMS UNDER THE HMA SHALL BE GIVEN A TRUE SMOOTH FINISH
2x4 KEY
SEE DESIGNER NOTE 7
9"* MAX.
1'–6" MIN.
FACE OF CURB

* SEE NOTE 1 ON DRAWING 7.40

SIDEWALK OVERHANG WITHOUT UTILITIES

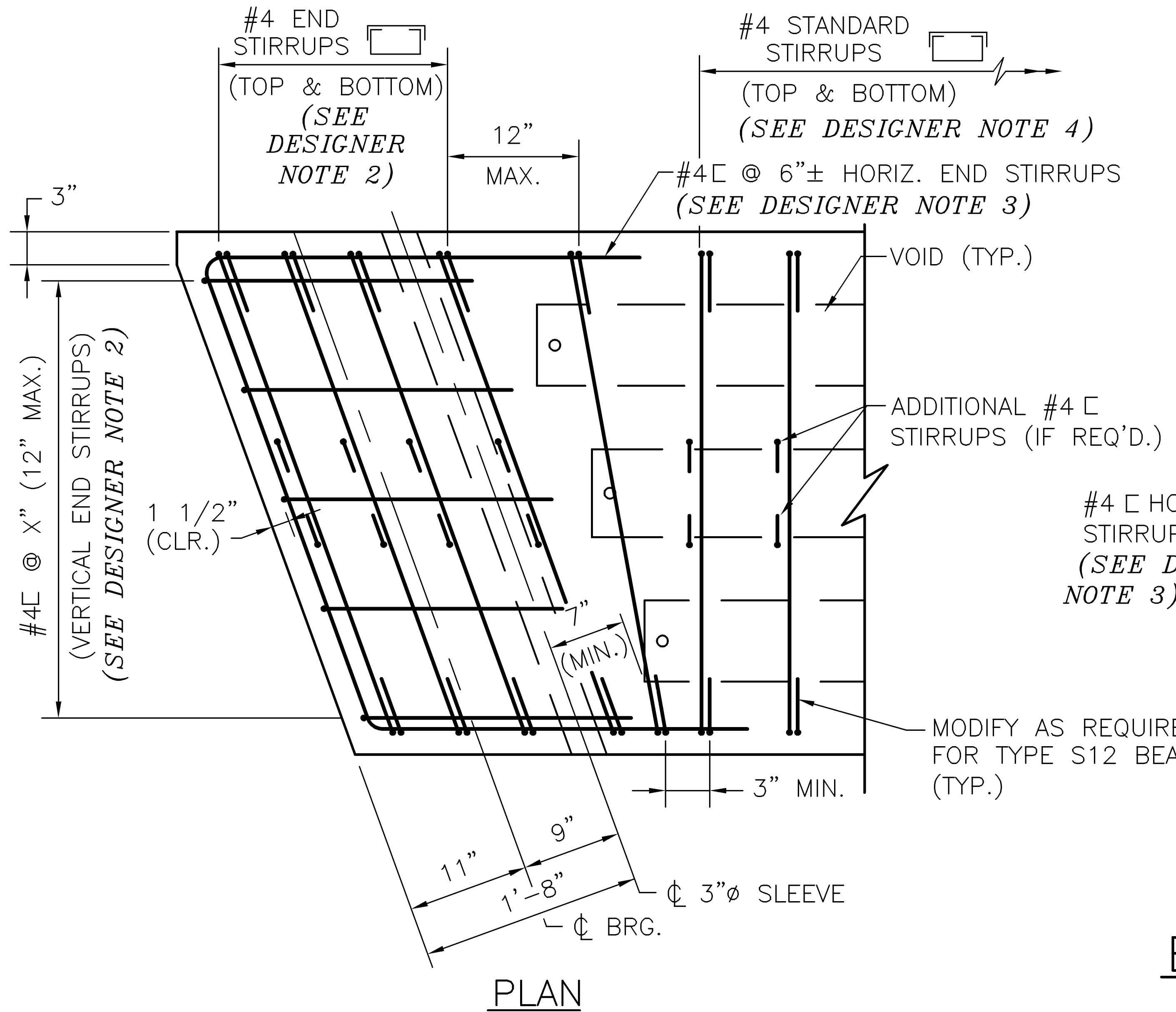

SIDEWALK
ALL REINFORCING SHALL MEET THE LATEST AASHTO CODE REQUIREMENTS
THE TOP OF ALL BEAMS UNDER SIDEWALKS SHALL BE GIVEN A RAKED FINISH (¼" AMPLITUDE) ACROSS THE WIDTH PERPENDICULAR TO THE BEAM'S AXIS.
GALVANIZED STEEL ANGLE SIZE AND SPACING TO BE DETERMINED BY DESIGN
PARAPET
DETAIL 1 7.51
THE TOP OF ALL BEAMS UNDER THE HMA SHALL BE GIVEN A TRUE SMOOTH FINISH
2x4 KEY
SEE DESIGNER NOTE 7
9"* MAX.
UTILITY BAY
2'–0" MIN.
1'–0" MIN.
SPECIAL UNIT (OR STANDARD SLAB)
FACE OF CURB
℄ JOINT

NOTE:
POST TENSIONING REQUIREMENT NOT APPLICABLE TO SPECIAL UNIT

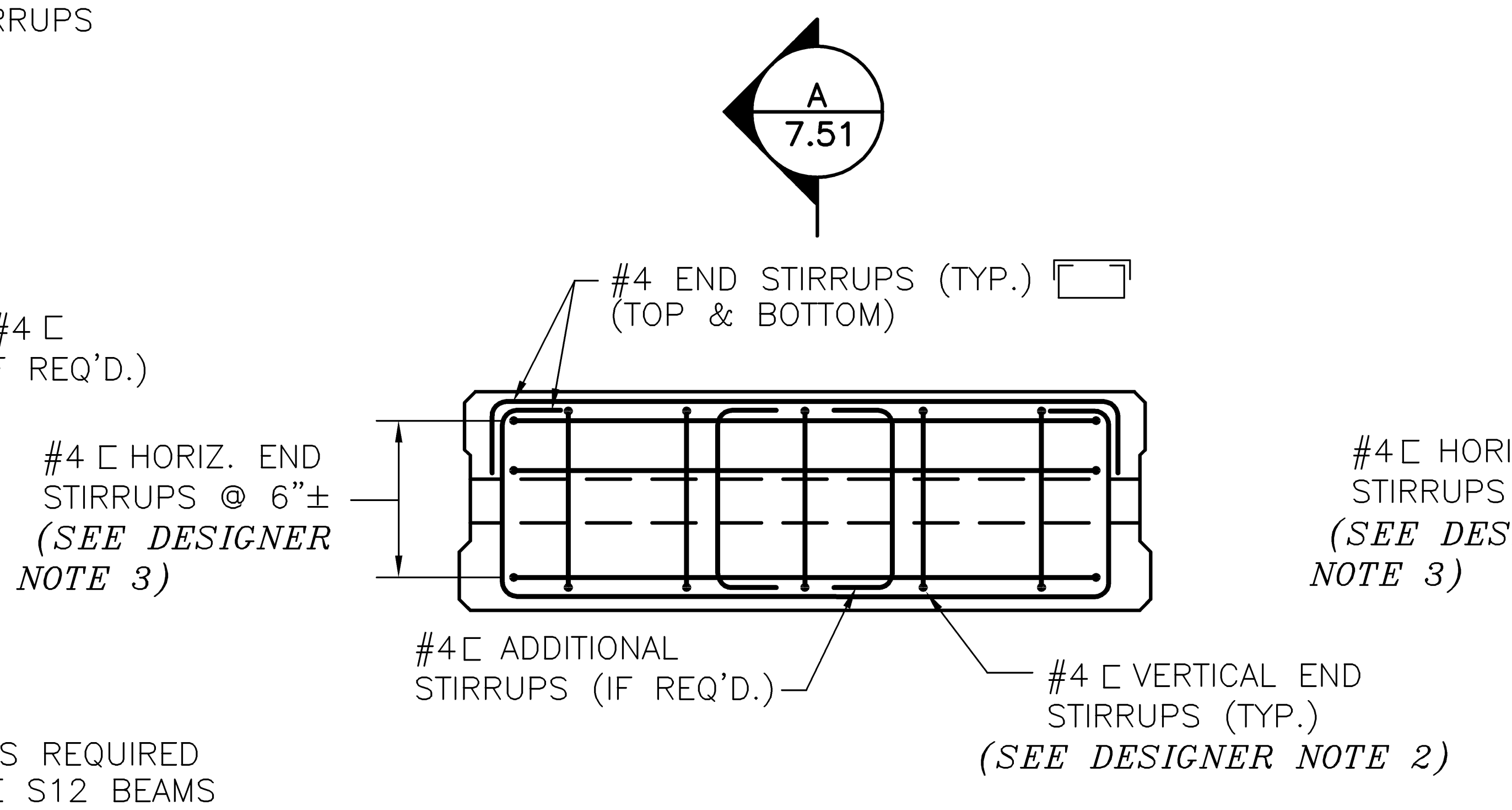
SIDEWALK OVERHANG WITH UTILITIES

DESIGNER NOTES:

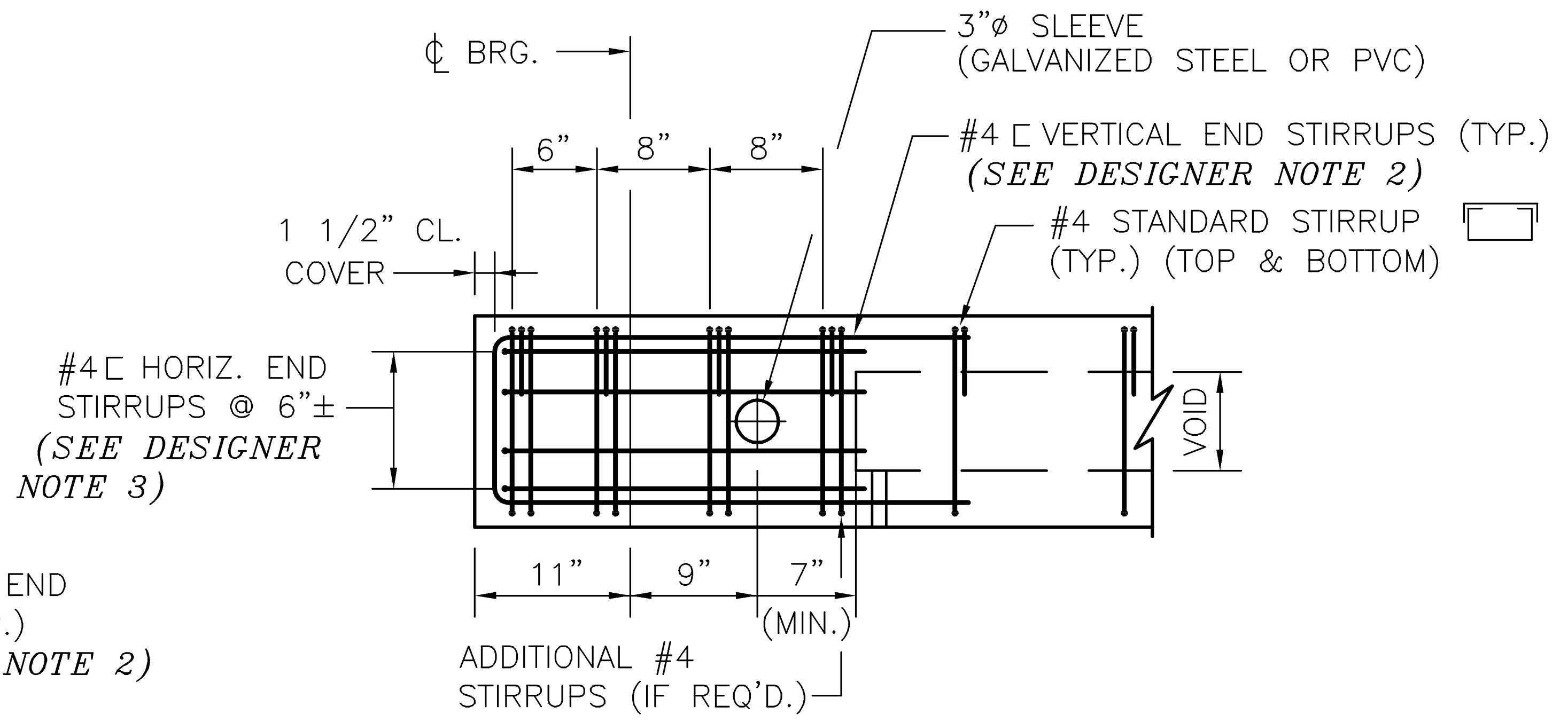
1. *THIS DRAWING IS INTENDED TO APPLY TO PRESTRESSED CONCRETE SLAB UNITS WITH AN ASPHALTIC WEARING SURFACE ONLY. SEE DRAWING 7.52 FOR PRESTRESSED CONCRETE SLAB UNITS WITH A 5" MIN. COMPOSITE REINFORCED CONCRETE DECK OVERLAY.*
2. *DESIGN END STIRRUPS IN ACCORDANCE WITH AASHTO LRFD BRIDGE DESIGN REQUIREMENTS FOR ANCHORAGE ZONES. THE HORIZONTAL LEG LENGTHS OF THE VERTICAL END STIRRUPS ARE EQUAL TO THE DEPTH OF THE BEAM AND SHALL BE DIMENSIONED ON THE PLAN VIEW.*
3. *HORIZONTAL END STIRRUPS SHALL BE EMBEDDED A MINIMUM DISTANCE EQUAL TO THE DEPTH OF BEAM INTO THE WEB OF THE VOIDED SECTION. LENGTH OF EMBEDMENT SHALL BE NOTED ON THE PLAN.*
4. *STANDARD STIRRUP SPACING SHALL NOT EXCEED 12".*
5. *PROPERLY NOTE AND SHOW THE LOCATION AND SPACING OF ANY DOWELS WHICH EXTEND INTO SLABS, SIDEWALKS, CURB, OR BARRIERS ON THE CROSS SECTION AND PLAN VIEWS OF THE BEAMS.*
6. *THE MAXIMUM ALLOWABLE DEPTH OF PAVEMENT BUILD UP (TO ACCOMMODATE ROADWAY PROFILE AND CROSS SLOPE) SHALL BE 7 INCHES UNLESS OTHERWISE AUTHORIZED BY THE MANAGING BRIDGE ENGINEER.*
7. *THE EXTERIOR FACE OF THE FASCIA BEAMS SHALL RECEIVE A SELECTED FORMLINER OR RUBBED FINISH.*


#4 END STIRRUPS (TOP & BOTTOM) (SEE DESIGNER NOTE 2)
#4 STANDARD STIRRUPS (TOP & BOTTOM) (SEE DESIGNER NOTE 4)
12" MAX.
#4⊏ @ 6"± HORIZ. END STIRRUPS (SEE DESIGNER NOTE 3)
3"
VOID (TYP.)
ADDITIONAL #4 ⊏ STIRRUPS (IF REQ'D.)
#4⊏ @ X" (12" MAX.) (VERTICAL END STIRRUPS) (SEE DESIGNER NOTE 2)
1 1/2" (CLR.)
7" (MIN.)
MODIFY AS REQUIRED FOR TYPE S12 BEAMS (TYP.)
3" MIN.
11"
9"
1'–8"
℄ 3"ø SLEEVE
℄ BRG.

PLAN


A 7.51
#4 END STIRRUPS (TYP.) (TOP & BOTTOM)
#4 ⊏ HORIZ. END STIRRUPS @ 6"± (SEE DESIGNER NOTE 3)
#4⊏ ADDITIONAL STIRRUPS (IF REQ'D.)
#4 ⊏ VERTICAL END STIRRUPS (TYP.) (SEE DESIGNER NOTE 2)

END OF BEAM SECTION


℄ BRG.
3"ø SLEEVE (GALVANIZED STEEL OR PVC)
6"
8"
8"
#4 ⊏ VERTICAL END STIRRUPS (TYP.) (SEE DESIGNER NOTE 2)
#4 STANDARD STIRRUP (TYP.) (TOP & BOTTOM)
1 1/2" CL. COVER
#4⊏ HORIZ. END STIRRUPS @ 6"± (SEE DESIGNER NOTE 3)
VOID
11"
9"
7" (MIN.)
ADDITIONAL #4 STIRRUPS (IF REQ'D.)

LONGITUDINAL SECTION

SECTION A/7.51

END REINFORCING PATTERN

SCALE:1"=1'–0"

REVISIONS	
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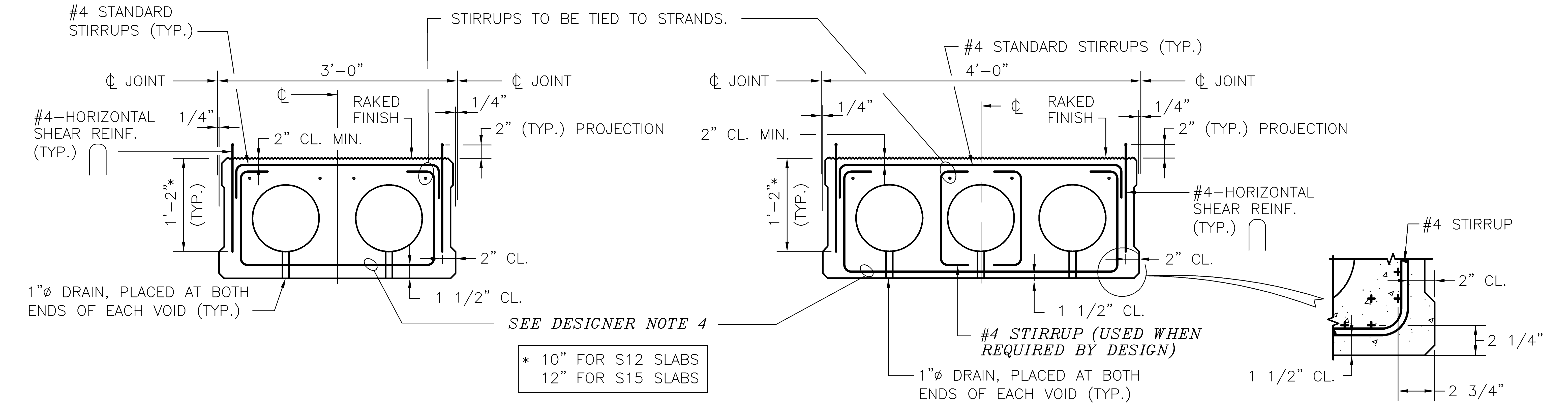
RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

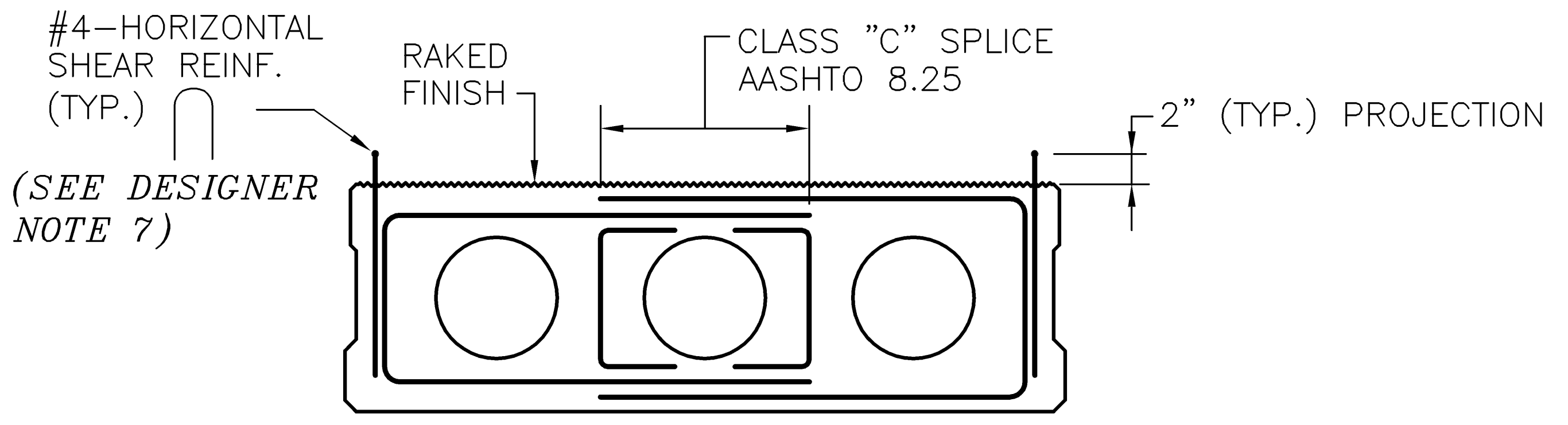
BRIDGE STANDARDS

PRESTRESSED CONCRETE SLABS
SHEET 3

DRAWING NUMBER: 7.51

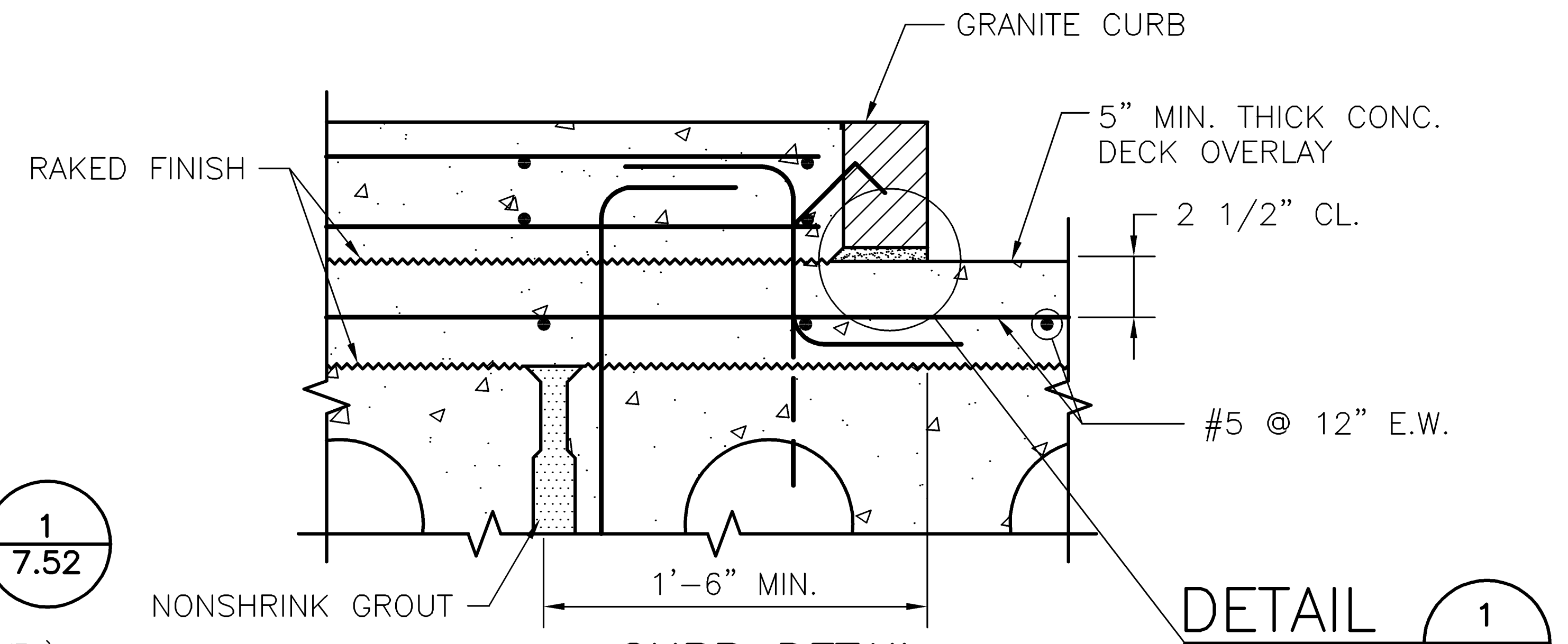

#4 STANDARD STIRRUPS (TYP.)
STIRRUPS TO BE TIED TO STRANDS.
℄ JOINT
3'-0"
℄
℄ JOINT
#4-HORIZONTAL SHEAR REINF. (TYP.) ⋂
1/4"
RAKED FINISH
1/4"
2" CL. MIN.
2" (TYP.) PROJECTION
1'-2"* (TYP.)
2" CL.
1"ø DRAIN, PLACED AT BOTH ENDS OF EACH VOID (TYP.)
1 1/2" CL.
SEE DESIGNER NOTE 4
* 10" FOR S12 SLABS
12" FOR S15 SLABS
#4 STANDARD STIRRUPS (TYP.)
4'-0"
℄ JOINT
1/4"
℄
RAKED FINISH
1/4"
℄ JOINT
2" CL. MIN.
2" (TYP.) PROJECTION
1'-2"* (TYP.)
#4-HORIZONTAL SHEAR REINF. (TYP.) ⋂
#4 STIRRUP
2" CL.
2" CL.
1 1/2" CL.
#4 STIRRUP (USED WHEN REQUIRED BY DESIGN)
1"ø DRAIN, PLACED AT BOTH ENDS OF EACH VOID (TYP.)
2 1/4"
1 1/2" CL.
2 3/4"

TYPICAL REINFORCING PATTERN


#4-HORIZONTAL SHEAR REINF. (TYP.) ⋂
(SEE DESIGNER NOTE 7)
RAKED FINISH
CLASS "C" SPLICE AASHTO 8.25
2" (TYP.) PROJECTION

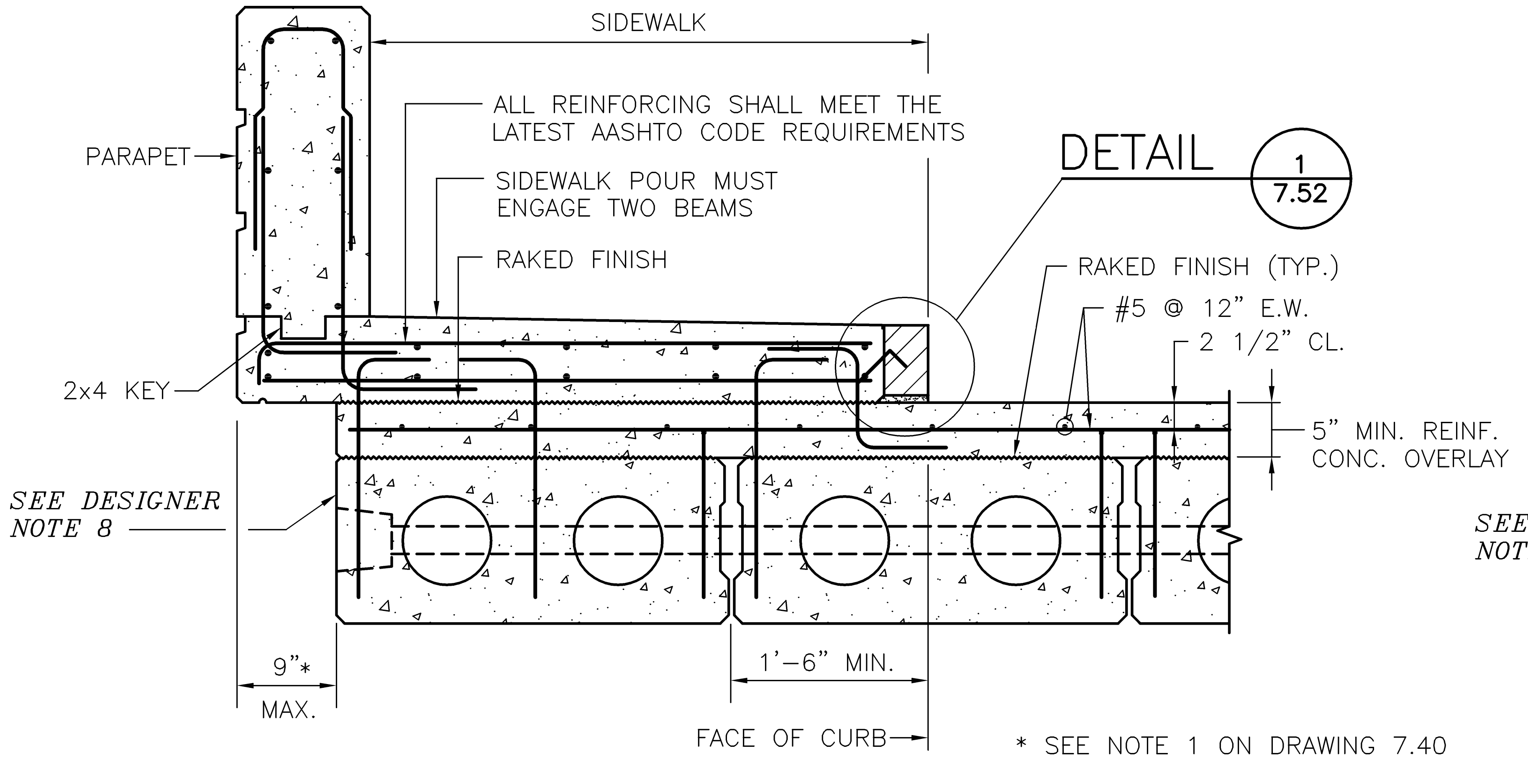
NOTE:
FOR S12x36 AND S12x48 BEAMS USE THIS ALTERNATIVE PATTERN EXCLUSIVELY

ALTERNATE STIRRUP PATTERN

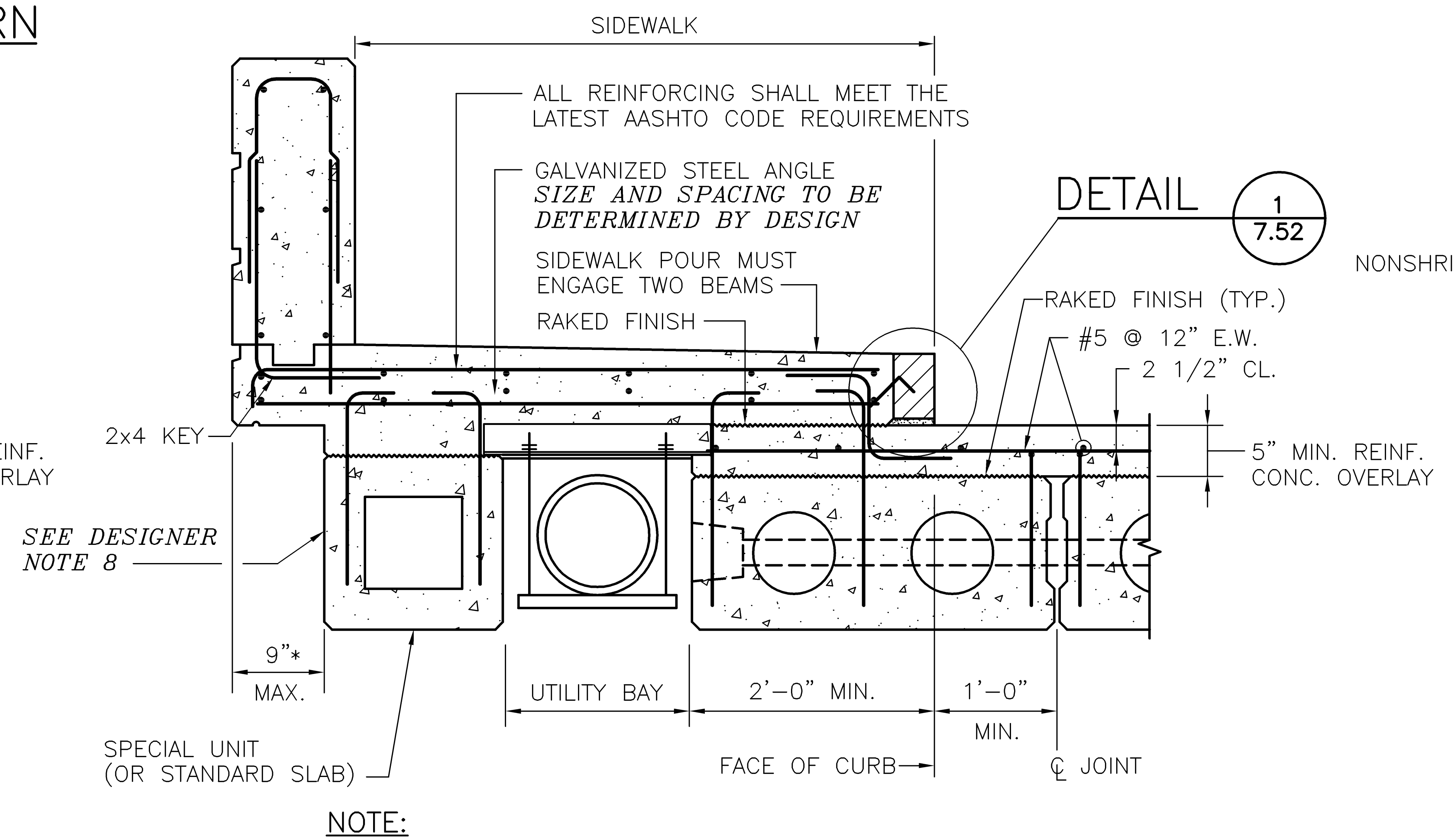


CURB DETAIL

DETAIL 1/7.52

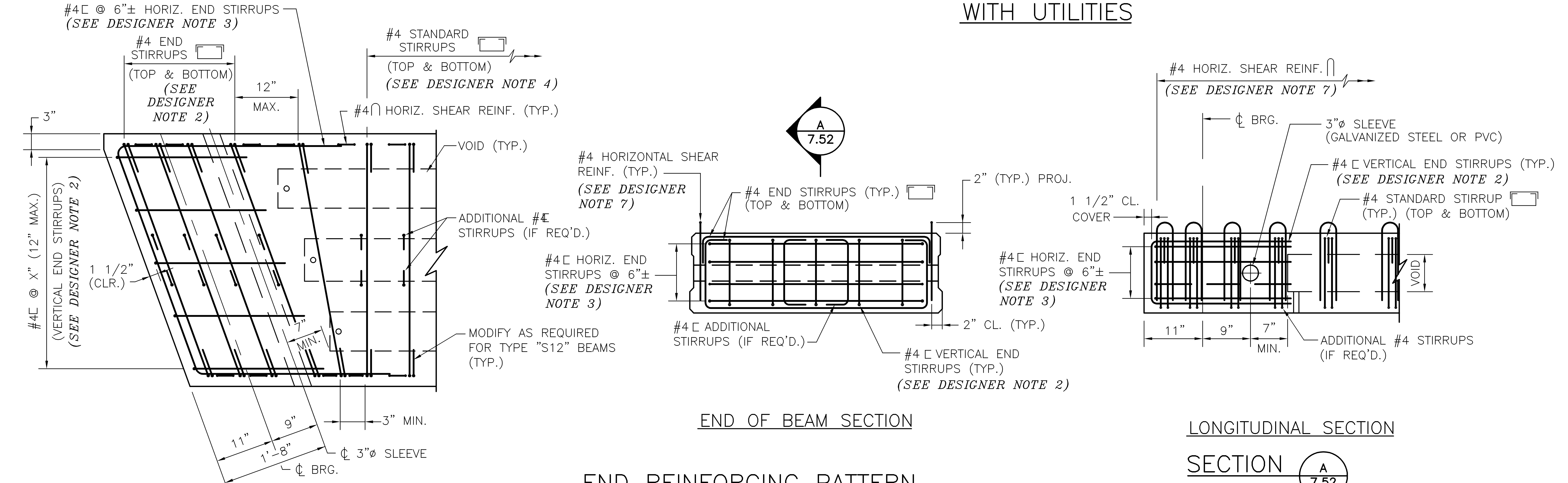

SIDEWALK
PARAPET
ALL REINFORCING SHALL MEET THE LATEST AASHTO CODE REQUIREMENTS
SIDEWALK POUR MUST ENGAGE TWO BEAMS
RAKED FINISH
DETAIL 1/7.52
RAKED FINISH (TYP.)
#5 @ 12" E.W.
2 1/2" CL.
2x4 KEY
5" MIN. REINF. CONC. OVERLAY
SEE DESIGNER NOTE 8
9"* MAX.
1'-6" MIN.
FACE OF CURB
* SEE NOTE 1 ON DRAWING 7.40

SIDEWALK OVERHANG WITHOUT UTILITIES


SIDEWALK
ALL REINFORCING SHALL MEET THE LATEST AASHTO CODE REQUIREMENTS
GALVANIZED STEEL ANGLE
SIZE AND SPACING TO BE DETERMINED BY DESIGN
SIDEWALK POUR MUST ENGAGE TWO BEAMS
RAKED FINISH
DETAIL 1/7.52
RAKED FINISH (TYP.)
#5 @ 12" E.W.
2 1/2" CL.
2x4 KEY
5" MIN. REINF. CONC. OVERLAY
SEE DESIGNER NOTE 8
9"* MAX.
UTILITY BAY
2'-0" MIN.
1'-0" MIN.
SPECIAL UNIT (OR STANDARD SLAB)
FACE OF CURB
℄ JOINT

NOTE:
POST TENSIONING REQUIREMENT NOT APPLICABLE TO SPECIAL UNIT

SIDEWALK OVERHANG WITH UTILITIES


#4⊏ @ 6"± HORIZ. END STIRRUPS
(SEE DESIGNER NOTE 3)
#4 END STIRRUPS (TOP & BOTTOM)
(SEE DESIGNER NOTE 2)
12" MAX.
#4 STANDARD STIRRUPS (TOP & BOTTOM)
(SEE DESIGNER NOTE 4)
#4⋂ HORIZ. SHEAR REINF. (TYP.)
3"
VOID (TYP.)
ADDITIONAL #4⊏ STIRRUPS (IF REQ'D.)
#4⊏ @ X" (12" MAX.)
(VERTICAL END STIRRUPS) (SEE DESIGNER NOTE 2)
1 1/2" (CLR.)
7" MIN.
MODIFY AS REQUIRED FOR TYPE "S12" BEAMS (TYP.)
3" MIN.
11"
9"
1'-8"
℄ 3"ø SLEEVE
℄ BRG.
A 7.52
#4 HORIZONTAL SHEAR REINF. (TYP.)
(SEE DESIGNER NOTE 7)
#4 END STIRRUPS (TYP.) (TOP & BOTTOM)
2" (TYP.) PROJ.
#4⊏ HORIZ. END STIRRUPS @ 6"±
(SEE DESIGNER NOTE 3)
#4⊏ ADDITIONAL STIRRUPS (IF REQ'D.)
2" CL. (TYP.)
#4 ⊏ VERTICAL END STIRRUPS (TYP.)
(SEE DESIGNER NOTE 2)
#4 HORIZ. SHEAR REINF. ⋂
(SEE DESIGNER NOTE 7)
℄ BRG.
3"ø SLEEVE (GALVANIZED STEEL OR PVC)
#4 ⊏ VERTICAL END STIRRUPS (TYP.)
(SEE DESIGNER NOTE 2)
#4 STANDARD STIRRUP (TYP.) (TOP & BOTTOM)
1 1/2" CL. COVER
#4⊏ HORIZ. END STIRRUPS @ 6"±
(SEE DESIGNER NOTE 3)
VOID
11"
9"
7" MIN.
ADDITIONAL #4 STIRRUPS (IF REQ'D.)

PLAN

END OF BEAM SECTION

LONGITUDINAL SECTION

SECTION A/7.52

END REINFORCING PATTERN

DESIGNER NOTES:

1. *THIS DRAWING IS INTENDED TO APPLY TO PRESTRESSED CONCRETE SLAB UNITS WITH A 5" MINIMUM COMPOSITE REINFORCED CONCRETE OVERLAY ONLY. SEE DRAWING 7.51 FOR PRESTRESSED CONCRETE SLAB UNITS WITH AN ASPHALTIC WEARING SURFACE.*
2. *DESIGN END STIRRUPS IN ACCORDANCE WITH AASHTO LRFD BRIDGE DESIGN REQUIREMENTS FOR ANCHORAGE ZONES. THE HORIZONTAL LEG LENGTHS OF THE VERTICAL END STIRRUPS ARE EQUAL TO THE DEPTH OF THE BEAM AND SHALL BE DIMENSIONED ON THE PLAN VIEW.*
3. *HORIZONTAL END STIRRUPS SHALL BE EMBEDDED A MINIMUM DISTANCE EQUAL TO THE DEPTH OF BEAM INTO THE WEB OF THE VOIDED SECTION. LENGTH OF EMBEDMENT SHALL BE NOTED ON THE PLAN.*
4. *STANDARD STIRRUP SPACING SHALL NOT EXCEED 12".*
5. *PROPERLY NOTE AND SHOW THE LOCATION AND SPACING OF ANY DOWELS WHICH EXTEND INTO SLABS, SIDEWALKS, CURB, OR BARRIERS ON THE CROSS SECTION AND PLAN VIEWS OF THE BEAMS.*
6. *THE TOP OF ALL BEAMS SHALL BE GIVEN A RAKED FINISH (¼" AMPLITUDE) ACROSS THE WIDTH (PERPENDICULAR TO THE BEAM'S AXIS).*
7. *HORIZONTAL SHEAR REINFORCEMENT SHALL BE DESIGNED IN ACCORDANCE WITH AASHTO AND SHALL BE SPACED AT A MULTIPLE OF THE STANDARD STIRRUP SPACING. PROVIDE ADDITIONAL PROJECTION FOR USE WITH SPREAD SLAB UNITS.*
8. *THE EXTERIOR FACE OF THE FASCIA BEAMS SHALL RECEIVE A SELECTED FORMLINER OR RUBBED FINISH.*
9. *CONCRETE FOR DECK SLAB SHALL BE PLACED AFTER THE TIES HAVE BEEN FULLY TENSIONED.*

REVISIONS	
No.	DATE

RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

BRIDGE STANDARDS

PRESTRESSED CONCRETE SLABS
SHEET 4

DRAWING NUMBER: 7.52

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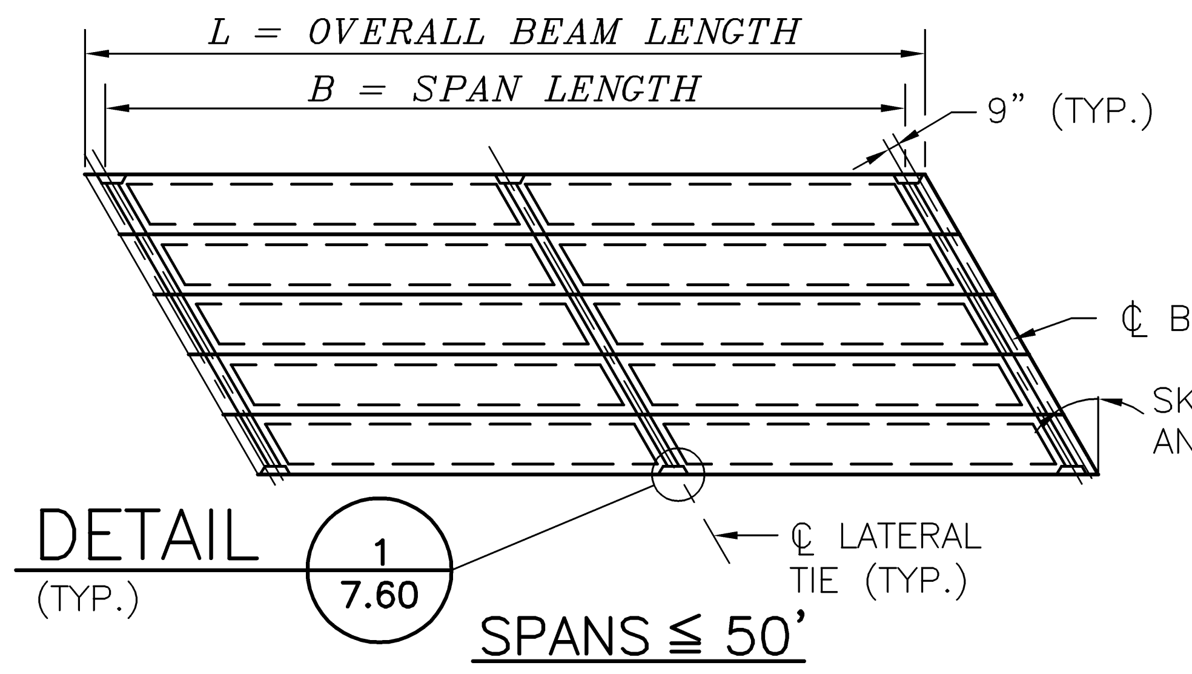
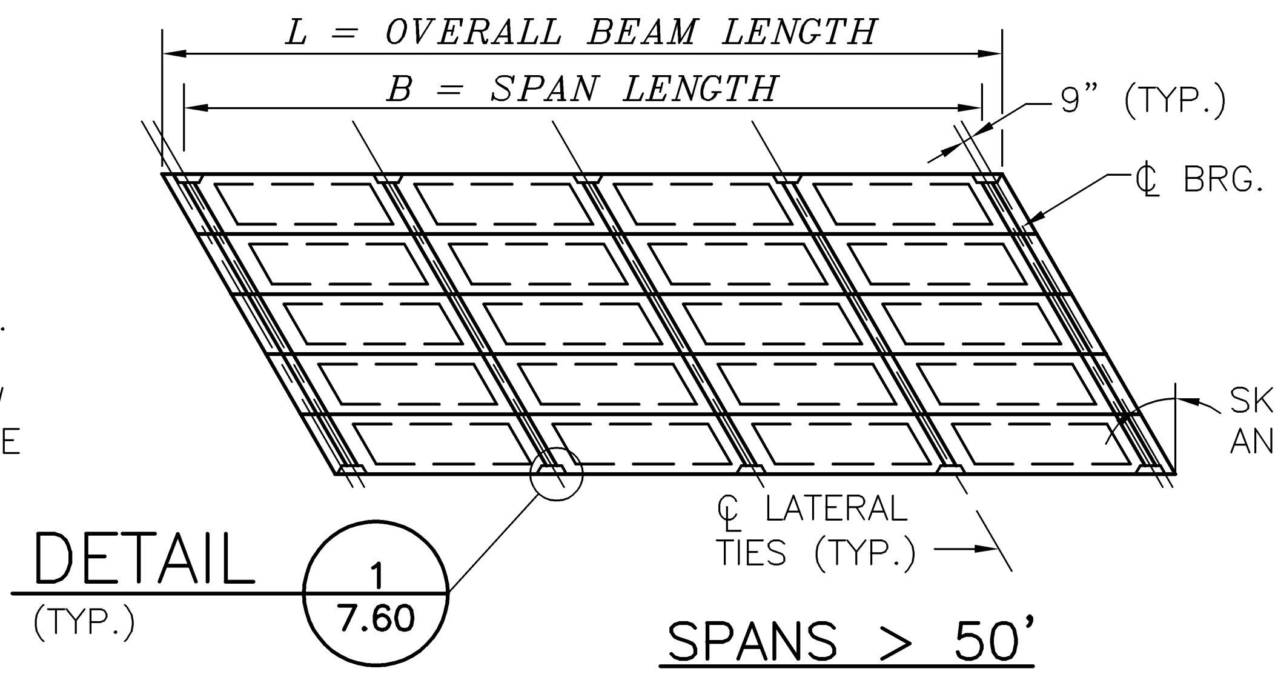


SPANS ≤ 50'

NOTE:
FABRICATOR SHALL FURNISH ACCESS HANDHOLES AS REQUIRED FOR LATERAL TIE INSTALLATION.

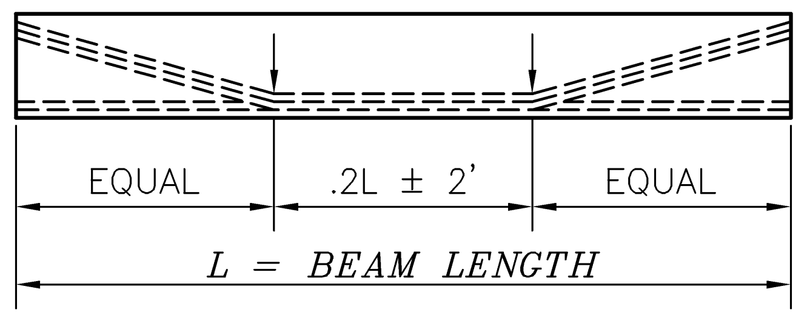


SPANS > 50'

LATERAL TIES AT SUPPORTS AND MIDPOINT WHEN B ≤ 50'-0", AND AT QUARTER POINTS WHEN B > 50'-0"

FRAMING PLANS

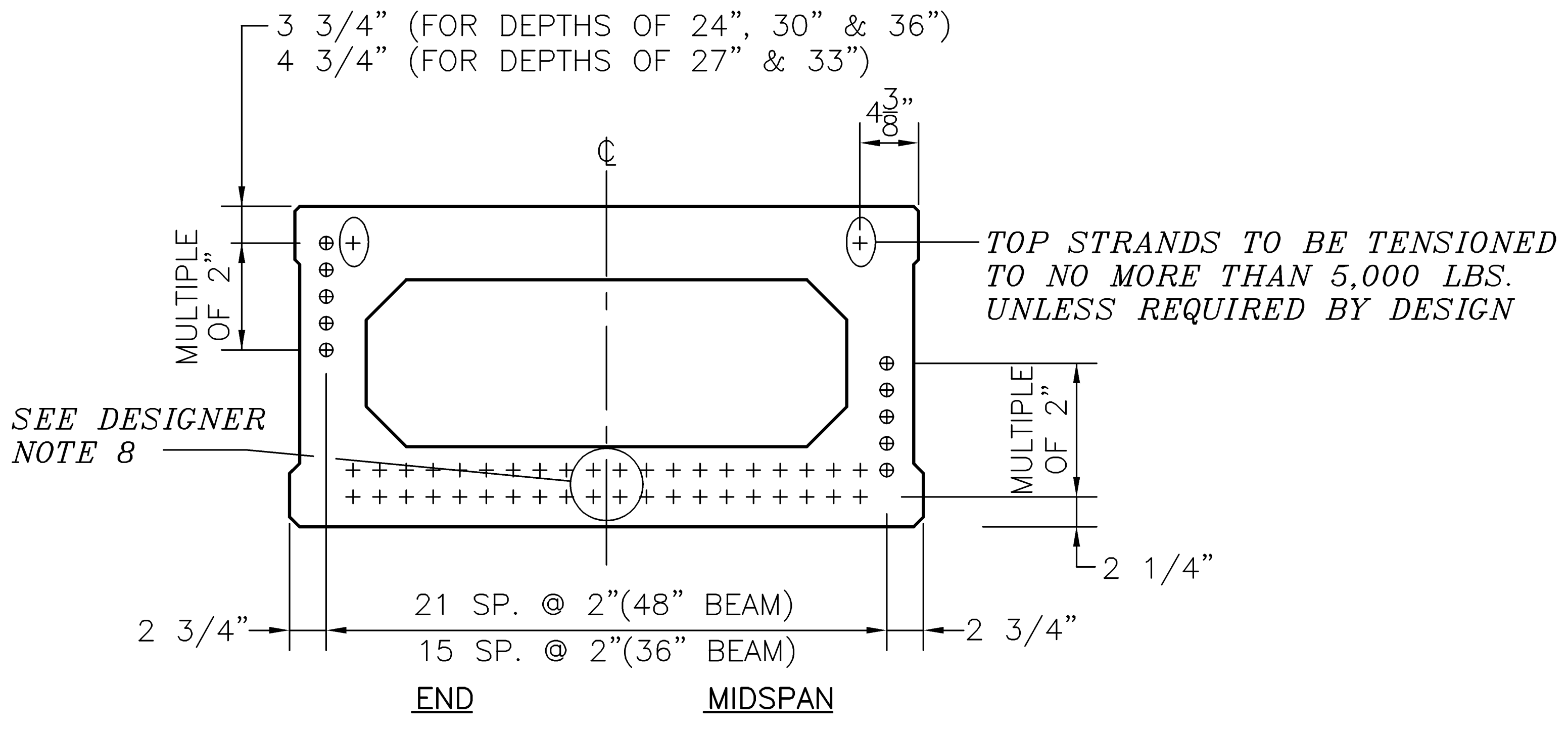
SKEW < 30° (SEE DESIGNER NOTE 7)



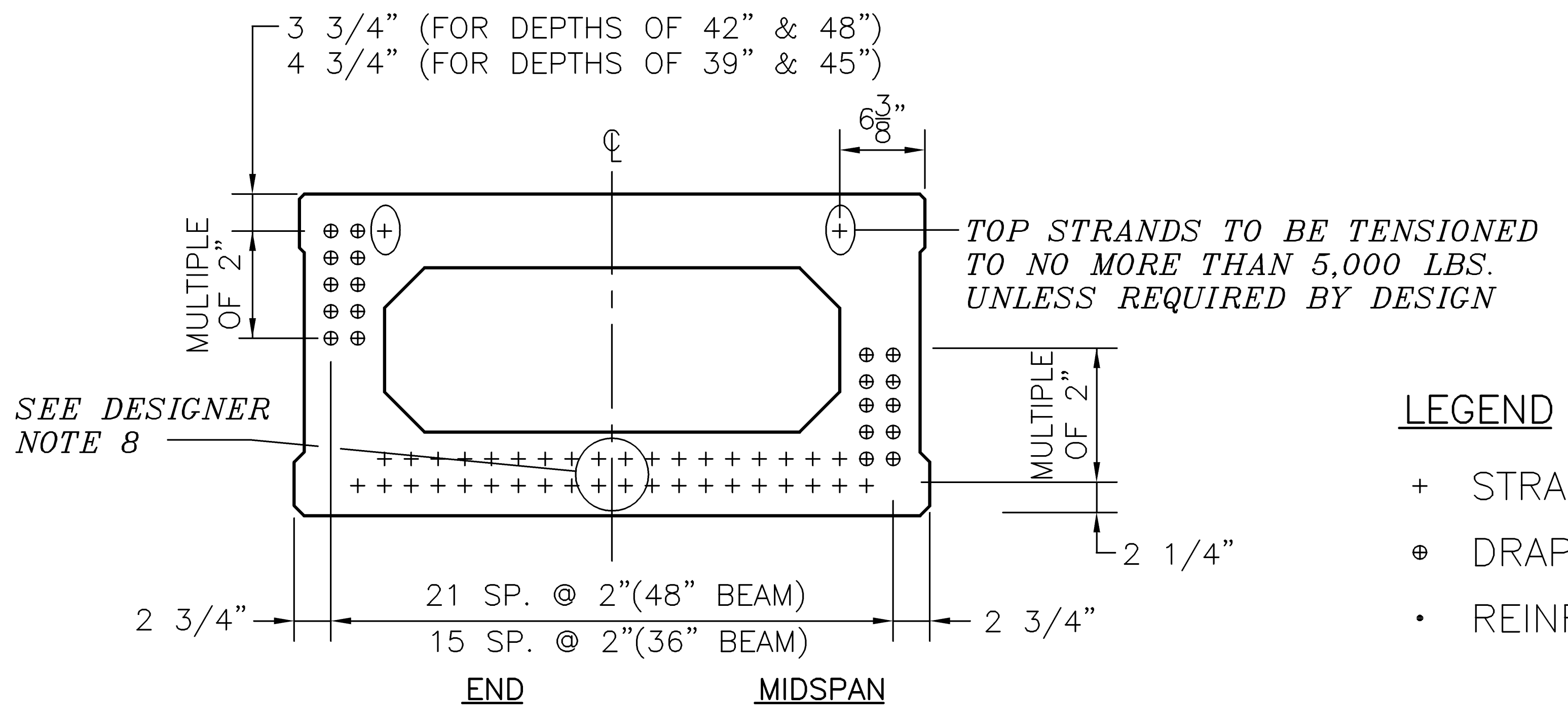
HOLD DOWN POINTS FOR DRAPED STRANDS

DESIGNER NOTES:

1. THIS SHEET CONTAINS STANDARD BOX BEAM SECTIONS. SPECIFIC APPLICABLE DETAILS, (INCLUDING BEAM DIMENSIONS, ELEVATIONS, SIZES AND NUMBERS OF STRAIGHT, DRAPED AND/OR DEBONDED STRANDS AND SIZES AND NUMBERS OF BAR REINFORCEMENT) SHALL BE SHOWN ON THE CONTRACT DRAWINGS.
2. DESIGNER SHALL INVESTIGATE EXTERIOR BEAM GROUP FOR TORSIONAL LOADS DUE TO SLAB OVERHANG OR UTILITY PLACEMENT. CONSIDERATION SHOULD BE GIVEN TO INCREASING THE NUMBER OF LATERAL TIES, THE AMOUNT OF POST TENSIONING AND/OR PROVIDING ADDITIONAL SHEAR BLOCKS
3. TO AVOID CRACKING IN THE BEAMS, THE DESIGNER SHALL LIMIT THE TOTAL HOLD DOWN FORCE TO 3/4 OF THE BEAM WEIGHT.
4. FOR BEARING DETAILS AND REQUIREMENTS AND FOR JOINT DETAILS REFER TO DRAWING 7.80.
5. ALL THE APPLICABLE NOTES SHOWN ON SHEET A2 & A3, SHOULD BE INCLUDED ON THE CONTRACT DRAWINGS.
6. TOP AND BOTTOM TRANSVERSE STIRRUP SIZE AND SPACING SHALL BE AS REQUIRED BY DESIGN, WITH THE ADDITIONAL REQUIREMENT THAT SPACING DOES NOT EXCEED 16".
7. SKEW ANGLES > 30° MUST BE APPROVED BY THE BRIDGE ENGINEER. CONSULTANT SHOULD CONSIDER SPREAD BOX BEAMS FOR SKEW ANGLES > 30°.
8. OMIT 4 CENTER BOTTOM STRANDS IF BOX BEAM ANCHOR BOLTS ARE USED.
9. THE MAXIMUM SPAN LENGTHS LISTED BELOW ARE APPROXIMATE AND ARE PROVIDED AS A GUIDE ONLY. THEY ARE BASED ON AN HL93 LIVE LOAD, BUT THEY WILL VARY DEPENDING ON SUCH FACTORS AS STRENGTH OF CONCRETE, SIZE AND NUMBER OF STRANDS, AND WHETHER OR NOT A 5" MIN. COMPOSITE REINFORCED CONCRETE DECK OVERLAY IS USED.


3 3/4" (FOR DEPTHS OF 24", 30" & 36")
4 3/4" (FOR DEPTHS OF 27" & 33")
4 3/4"
℄
MULTIPLE OF 2"
TOP STRANDS TO BE TENSIONED TO NO MORE THAN 5,000 LBS. UNLESS REQUIRED BY DESIGN
SEE DESIGNER NOTE 8
MULTIPLE OF 2"
2 1/4"
2 3/4"
21 SP. @ 2"(48" BEAM)
15 SP. @ 2"(36" BEAM)
2 3/4"
END
MIDSPAN

STRAND LOCATION–(B24x36 THRU B36x36) & (B24x48 THRU B36x48)

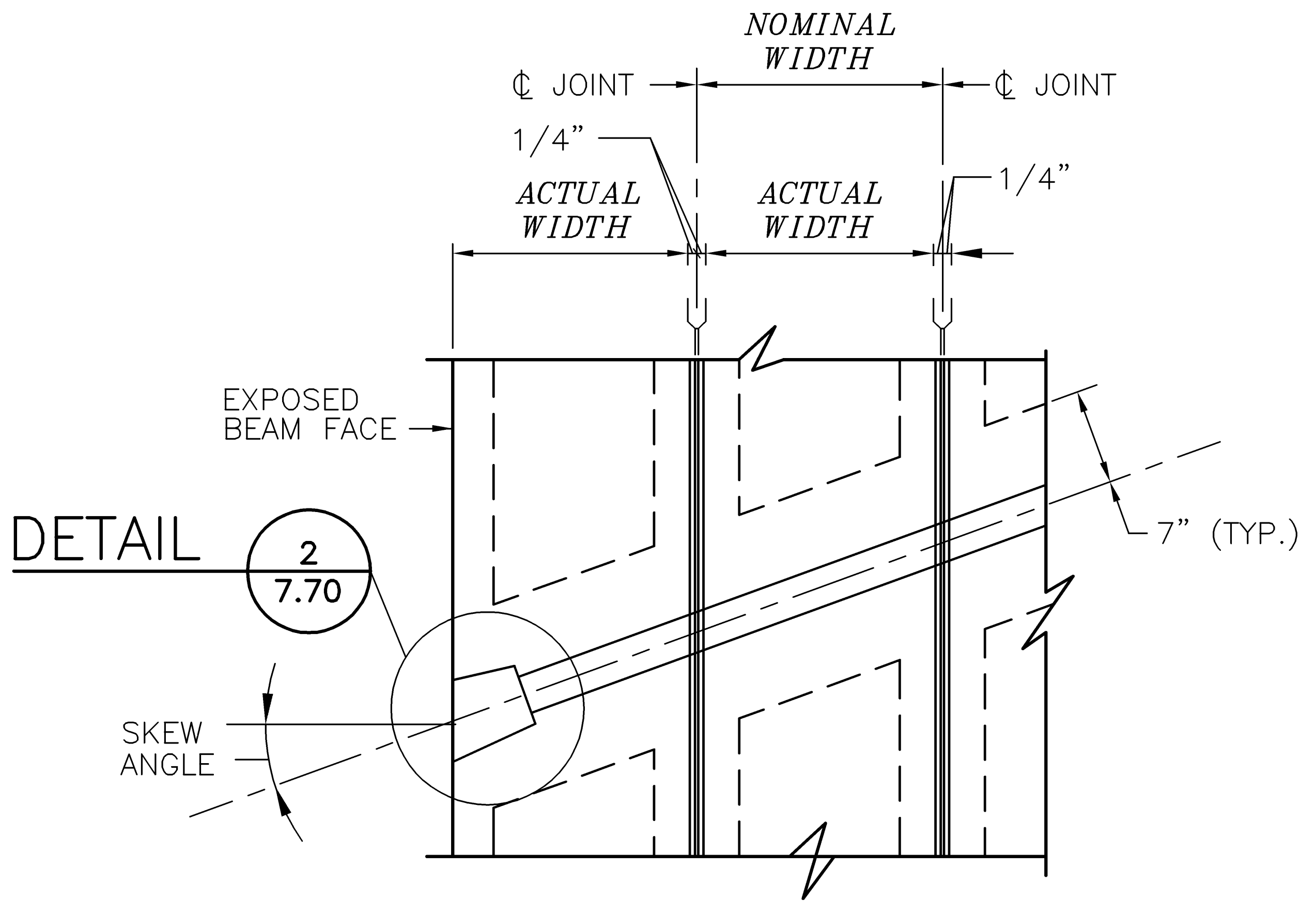

3 3/4" (FOR DEPTHS OF 42" & 48")
4 3/4" (FOR DEPTHS OF 39" & 45")
6 3/4"
℄
MULTIPLE OF 2"
TOP STRANDS TO BE TENSIONED TO NO MORE THAN 5,000 LBS. UNLESS REQUIRED BY DESIGN
SEE DESIGNER NOTE 8
MULTIPLE OF 2"
2 1/4"
2 3/4"
21 SP. @ 2"(48" BEAM)
15 SP. @ 2"(36" BEAM)
2 3/4"
END
MIDSPAN

STRAND LOCATION–(B39x36 THRU B48x36) & (B39x48 THRU B48x48)

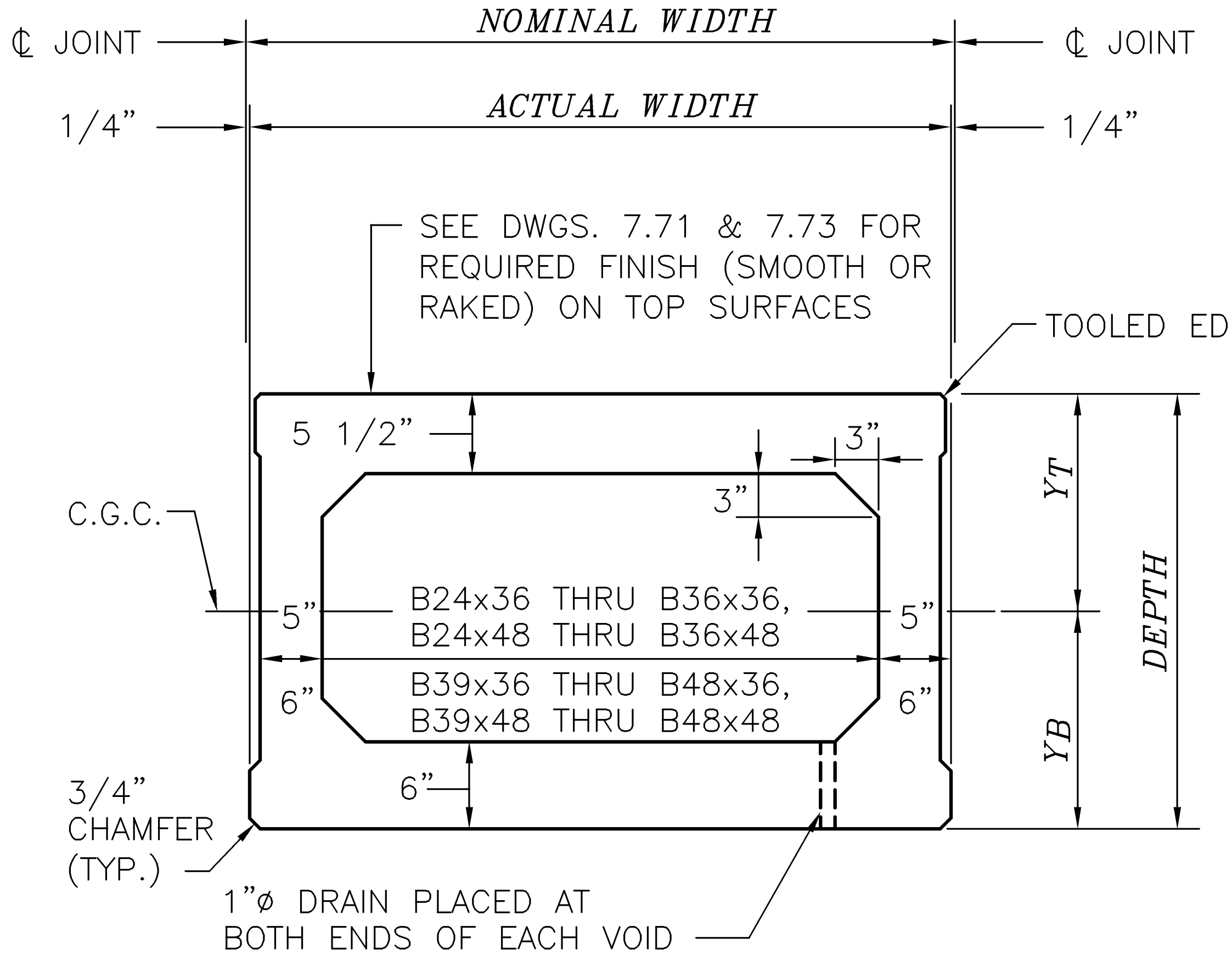
LEGEND

- + STRAIGHT STRAND
- ⊕ DRAPED STRAND
- • REINFORCING STEEL

STRAND PATTERNS SHOWN ARE MAXIMUM NUMBER TYPICALLY ALLOWED. DEVIATIONS MAY BE PERMITTED WITH PRIOR CONSULTATION WITH LOCAL FABRICATORS. PRESTRESSED WIRE STRANDS SHALL BE .50" DIA. OR .60" DIA. AS REQUIRED BY DESIGN



DETAIL 1 7.60


℄ JOINT
NOMINAL WIDTH
℄ JOINT
1/4"
ACTUAL WIDTH
1/4"
SEE DWGS. 7.71 & 7.73 FOR REQUIRED FINISH (SMOOTH OR RAKED) ON TOP SURFACES
TOOLED EDGE (TYP.)
5 1/2"
3"
3"
C.G.C.
5"
B24x36 THRU B36x36, B24x48 THRU B36x48
5"
6"
B39x36 THRU B48x36, B39x48 THRU B48x48
6"
6"
YT
YB
DEPTH
3/4" CHAMFER (TYP.)
1"ø DRAIN PLACED AT BOTH ENDS OF EACH VOID

BOX BEAM SECTION

BOX BEAM PROPERTIES

TYPE	DEPTH (IN.)	WIDTH (IN.)		A (IN.^{2})	I (IN.^{4})	Y_B (IN.)	Y_T (IN.)	S_B (IN.^{3})	S_T (IN.^{3})	WT. LBS./FT.	* MAX. SPAN
		NOMINAL	ACTUAL								
B24x36	24.0	36.0	35.5	543	36609	11.82	12.18	3097	3006	566	64'–0"
B27x36	27.0	36.0	35.5	573	50267	13.29	13.71	3782	3666	597	71'–0"
B30x36	30.0	36.0	35.5	603	66503	14.77	15.23	4503	4367	628	78'–0"
B33x36	33.0	36.0	35.5	633	85453	16.24	16.76	5262	5099	659	84'–0"
B36x36	36.0	36.0	35.5	663	107251	17.72	18.28	6053	5867	691	92'–0"
B39x36	39.0	36.0	35.5	748	135514	19.24	19.76	7043	6858	779	99'–0"
B42x36	42.0	36.0	35.5	784	164680	20.73	21.27	7944	7742	817	107'–0"
B45x36	45.0	36.0	35.5	820	197374	22.21	22.79	8887	8661	854	113'–0"
B48x36	48.0	36.0	35.5	856	233759	23.70	24.30	9863	9620	892	117'–0"
B24x48	24.0	48.0	47.5	681	48461	11.80	12.20	4107	3972	709	64'–0"
B27x48	27.0	48.0	47.5	711	66201	13.27	13.73	4989	4822	741	70'–0"
B30x48	30.0	48.0	47.5	741	87139	14.73	15.27	5916	5707	772	79'–0"
B33x48	33.0	48.0	47.5	771	111410	16.20	16.80	6877	6632	803	85'–0"
B36x48	36.0	48.0	47.5	801	139151	17.68	18.32	7871	7596	834	92'–0"
B39x48	39.0	48.0	47.5	886	173980	19.19	19.81	9066	8782	923	103'–0"
B42x48	42.0	48.0	47.5	922	210330	20.67	21.33	10176	9861	960	111'–0"
B45x48	45.0	48.0	47.5	958	250828	22.15	22.85	11324	10977	998	115'–0"
B48x48	48.0	48.0	47.5	994	295638	23.63	24.37	12511	12131	1035	122'–0"

** SEE DESIGNER NOTE 9*

THIS SHEET IS NOT TO SCALE

REVISIONS	
No.	DATE

RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

BRIDGE STANDARDS

PRECAST CONCRETE
BUTTED BOX BEAMS
SHEET 1

DRAWING NUMBER: 7.60

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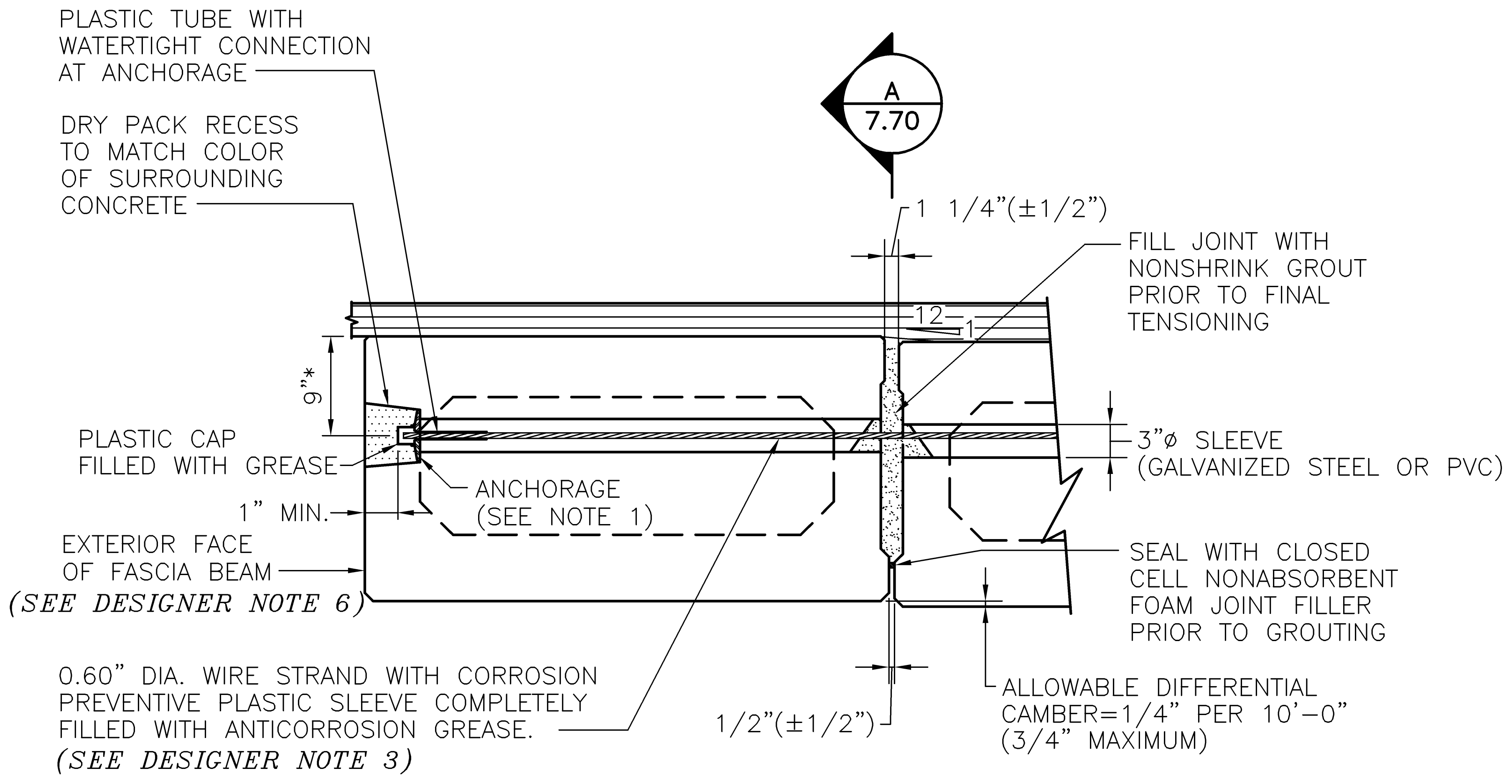
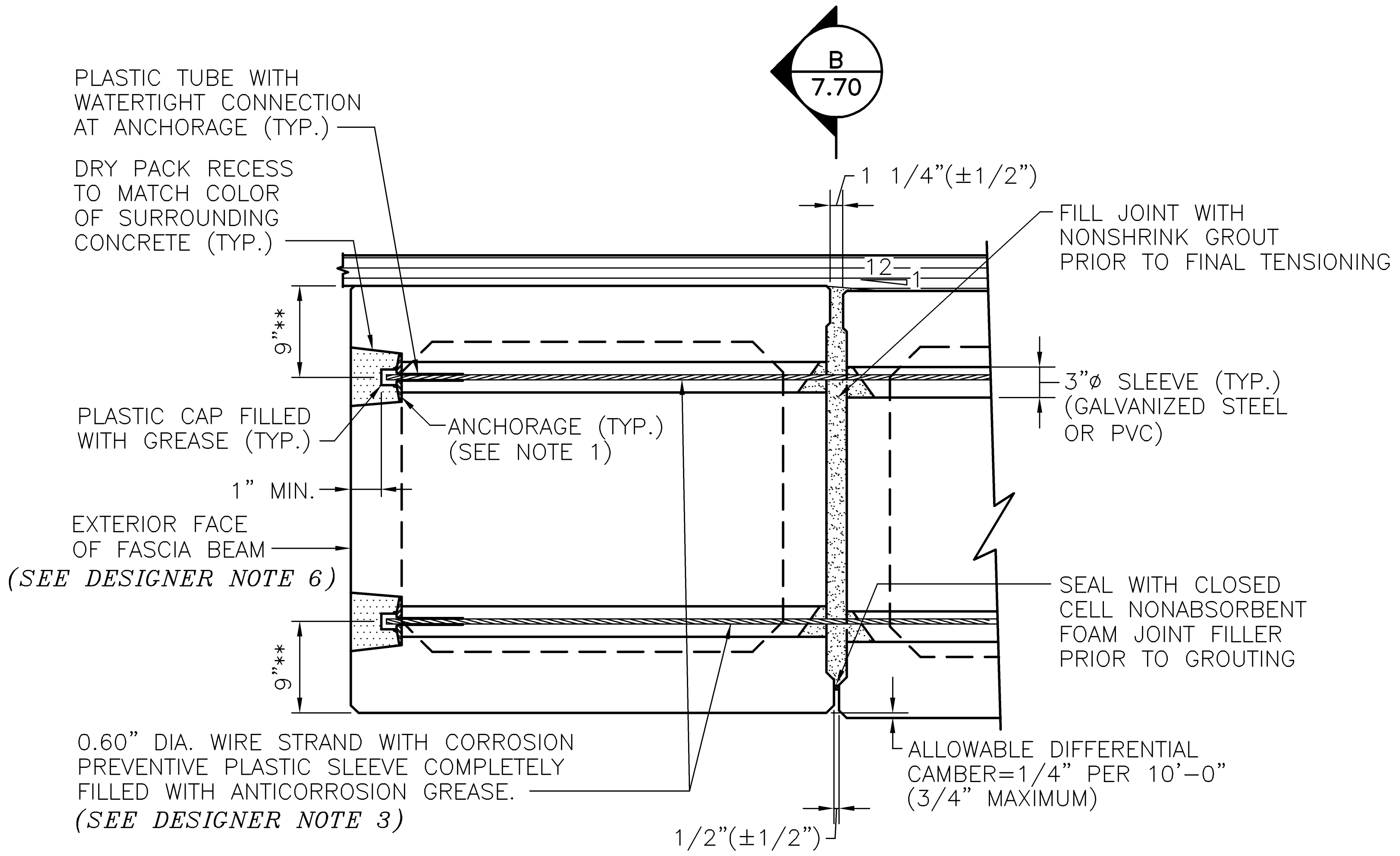
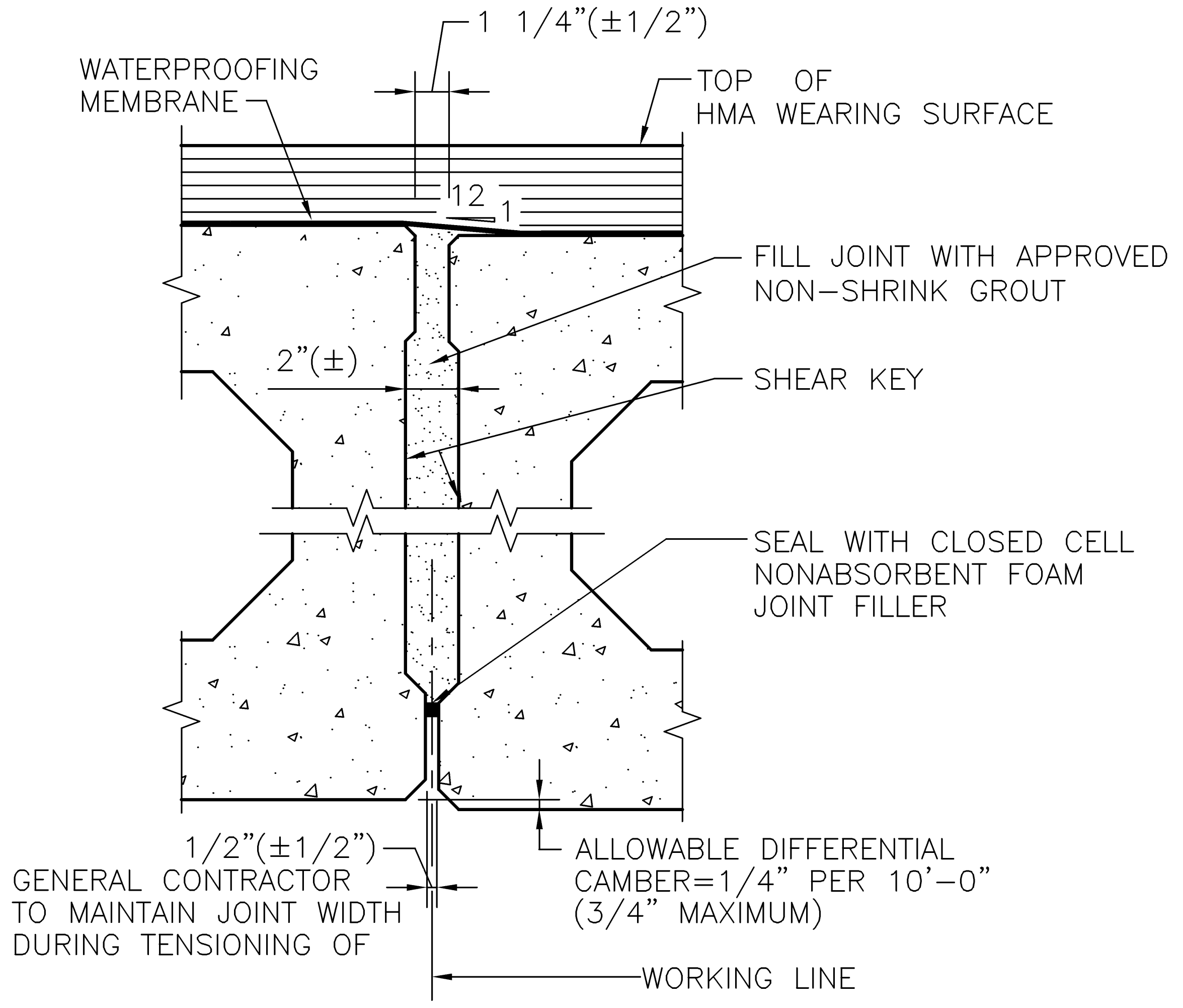

A
7.70
PLASTIC TUBE WITH WATERTIGHT CONNECTION AT ANCHORAGE
DRY PACK RECESS TO MATCH COLOR OF SURROUNDING CONCRETE
1 1/4"(±1/2")
FILL JOINT WITH NONSHRINK GROUT PRIOR TO FINAL TENSIONING
12
1
9"*
PLASTIC CAP FILLED WITH GREASE
3"ø SLEEVE (GALVANIZED STEEL OR PVC)
ANCHORAGE (SEE NOTE 1)
1" MIN.
EXTERIOR FACE OF FASCIA BEAM
(SEE DESIGNER NOTE 6)
SEAL WITH CLOSED CELL NONABSORBENT FOAM JOINT FILLER PRIOR TO GROUTING
0.60" DIA. WIRE STRAND WITH CORROSION PREVENTIVE PLASTIC SLEEVE COMPLETELY FILLED WITH ANTICORROSION GREASE.
(SEE DESIGNER NOTE 3)
1/2"(±1/2")
ALLOWABLE DIFFERENTIAL CAMBER=1/4" PER 10'-0" (3/4" MAXIMUM)

* *(SEE DESIGNER NOTE 4)*

DETAIL I
(APPLIES TO BOX BEAMS B24 THRU B33)


B
7.70
PLASTIC TUBE WITH WATERTIGHT CONNECTION AT ANCHORAGE (TYP.)
DRY PACK RECESS TO MATCH COLOR OF SURROUNDING CONCRETE (TYP.)
1 1/4"(±1/2")
FILL JOINT WITH NONSHRINK GROUT PRIOR TO FINAL TENSIONING
12
1
9"**
3"ø SLEEVE (TYP.) (GALVANIZED STEEL OR PVC)
PLASTIC CAP FILLED WITH GREASE (TYP.)
ANCHORAGE (TYP.) (SEE NOTE 1)
1" MIN.
EXTERIOR FACE OF FASCIA BEAM
(SEE DESIGNER NOTE 6)
SEAL WITH CLOSED CELL NONABSORBENT FOAM JOINT FILLER PRIOR TO GROUTING
9"**
0.60" DIA. WIRE STRAND WITH CORROSION PREVENTIVE PLASTIC SLEEVE COMPLETELY FILLED WITH ANTICORROSION GREASE.
(SEE DESIGNER NOTE 3)
ALLOWABLE DIFFERENTIAL CAMBER=1/4" PER 10'-0" (3/4" MAXIMUM)
1/2"(±1/2")

DETAIL II
(APPLIES TO BOX BEAMS B36 THRU B48)

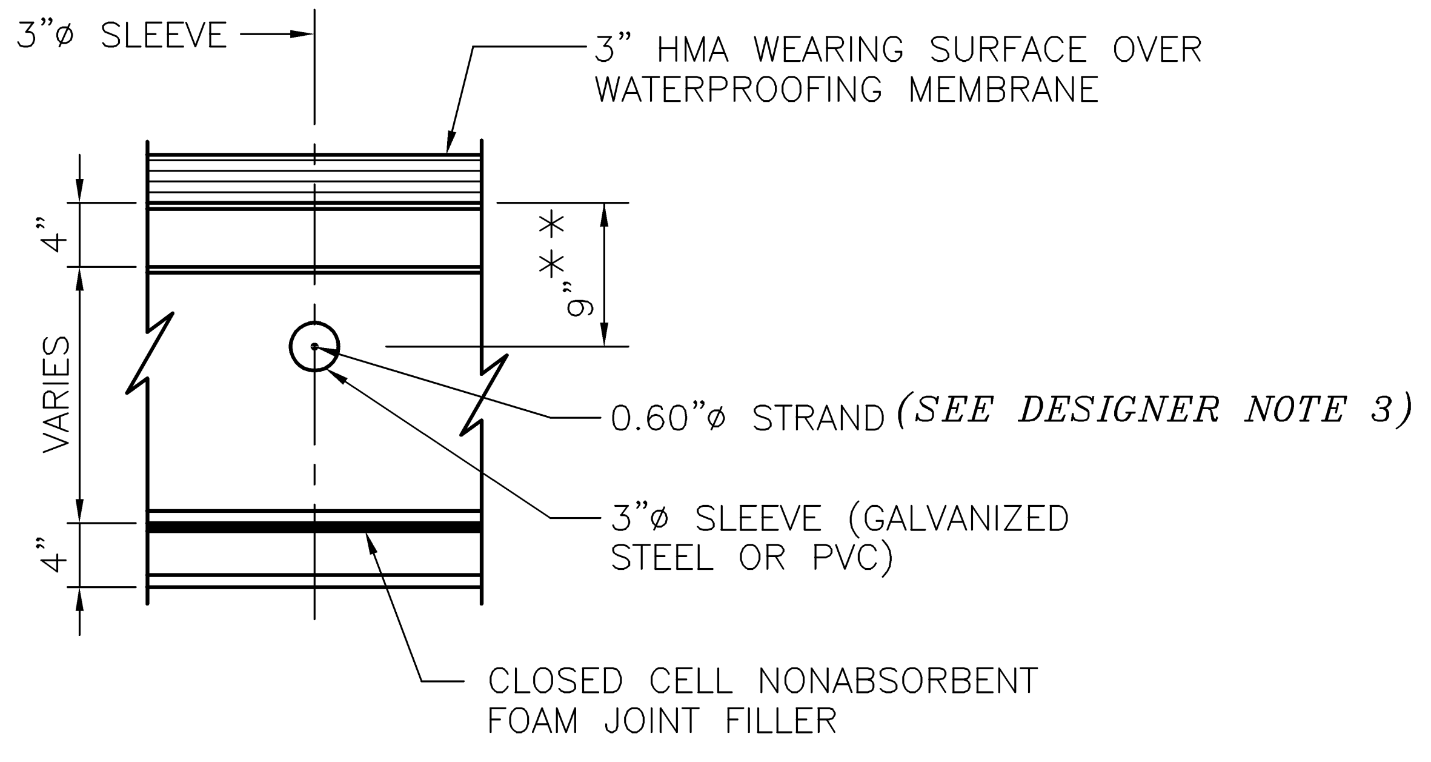

1 1/4"(±1/2")
WATERPROOFING MEMBRANE
TOP OF HMA WEARING SURFACE
12
1
FILL JOINT WITH APPROVED NON-SHRINK GROUT
2"(±)
SHEAR KEY
SEAL WITH CLOSED CELL NONABSORBENT FOAM JOINT FILLER
1/2"(±1/2")
GENERAL CONTRACTOR TO MAINTAIN JOINT WIDTH DURING TENSIONING OF
ALLOWABLE DIFFERENTIAL CAMBER=1/4" PER 10'-0" (3/4" MAXIMUM)
WORKING LINE

JOINT DETAIL

LATERAL TIE DETAILS

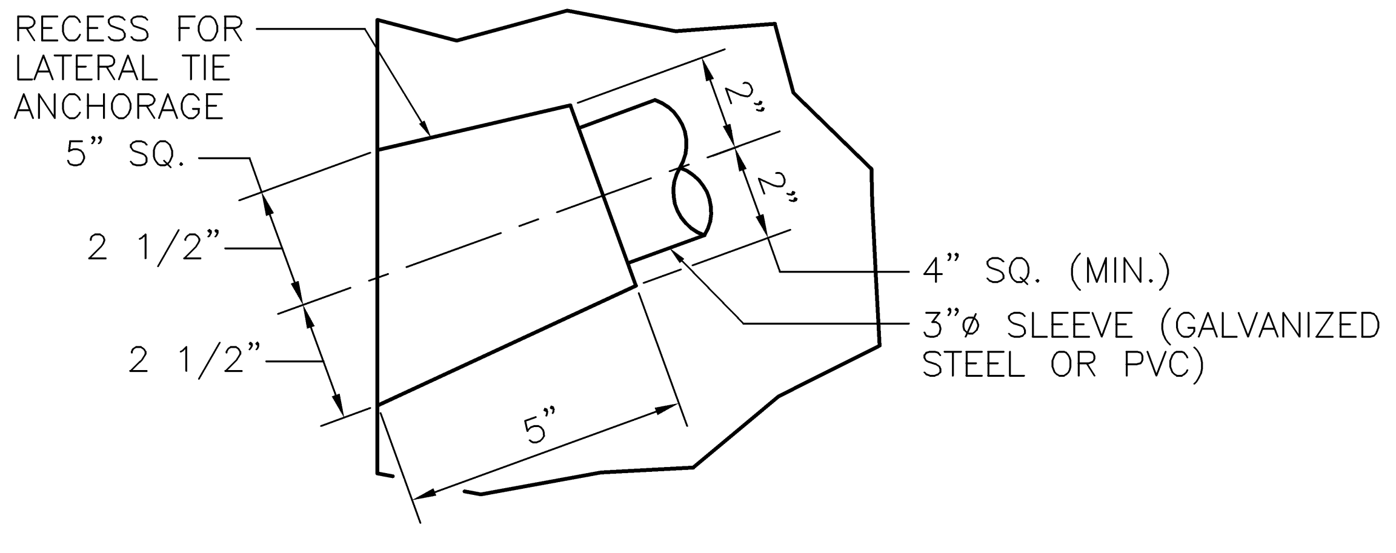
NOTES:

1. TENSION STRAND TO 5,000 LBS PRIOR TO GROUTING JOINTS. AFTER GROUT IS CURED, TENSION STRAND TO 44,000 LBS.
2. PLACE SHIMS IN JOINT, TENSION STRANDS TO 5,000 LBS AND FILL WITH NONSHRINK GROUT.

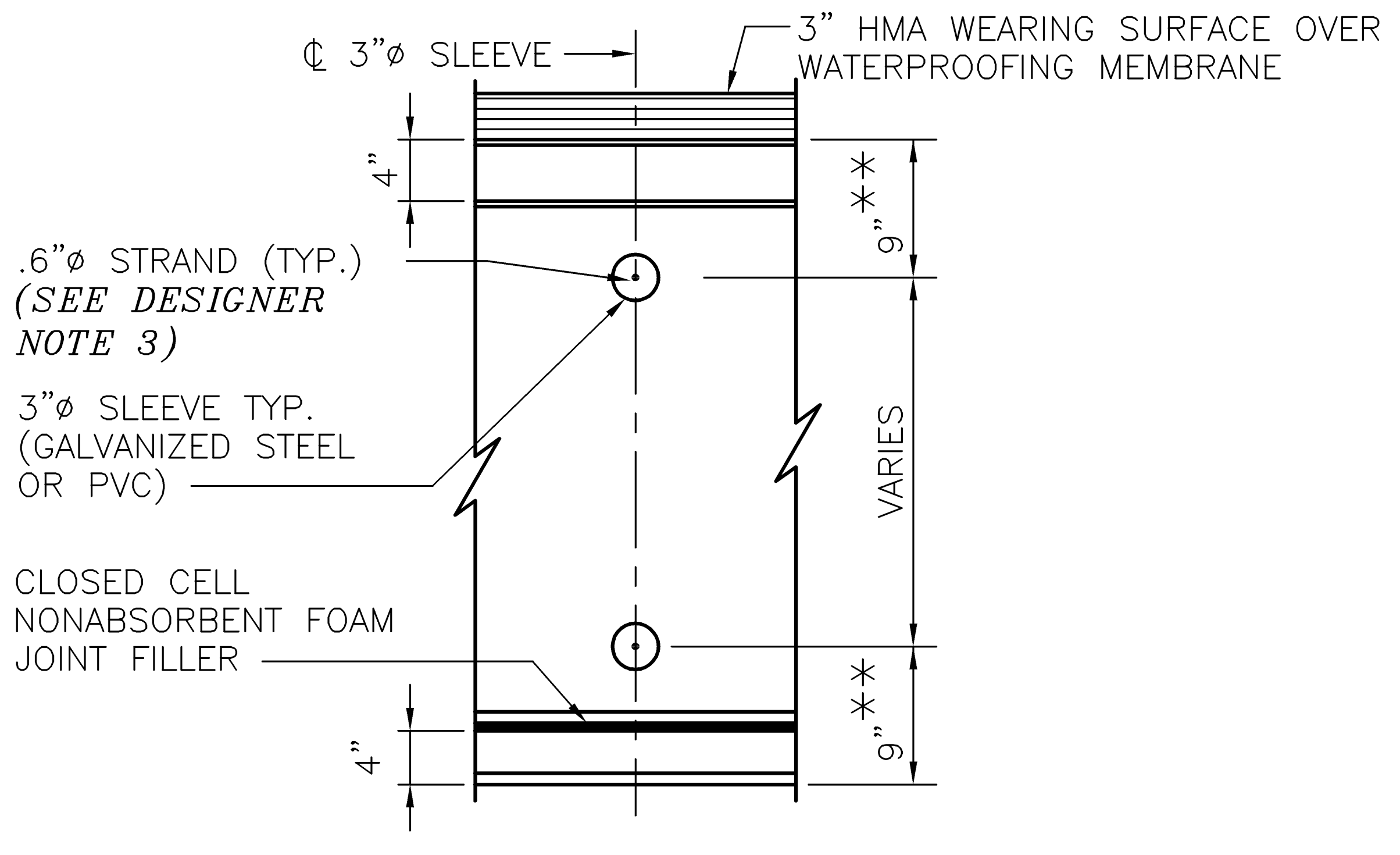

℄ 3"ø SLEEVE
3" HMA WEARING SURFACE OVER WATERPROOFING MEMBRANE
4"
9"**
VARIES
0.60"ø STRAND (SEE DESIGNER NOTE 3)
3"ø SLEEVE (GALVANIZED STEEL OR PVC)
4"
CLOSED CELL NONABSORBENT FOAM JOINT FILLER

SECTION A 7.70

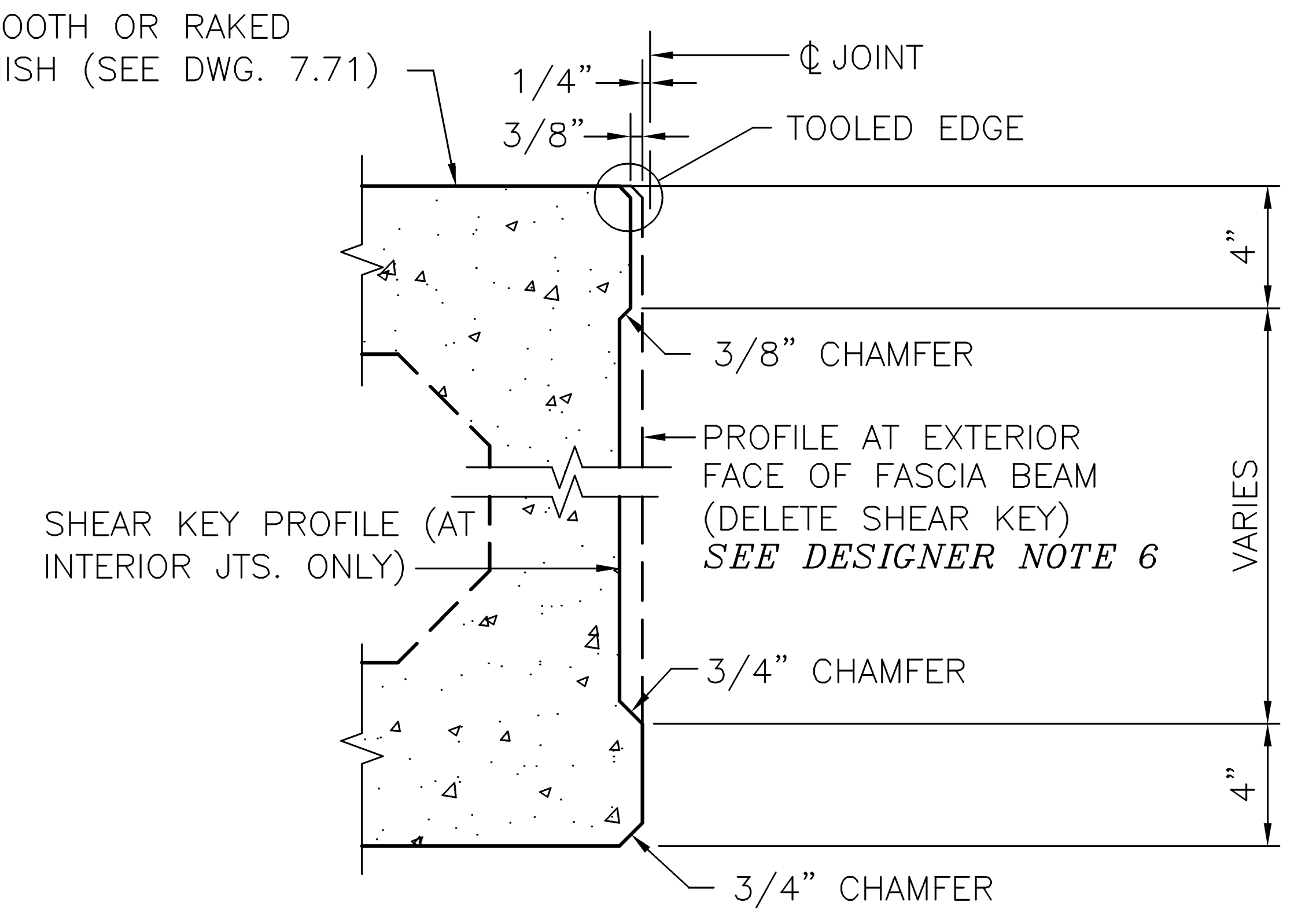
** LATERAL TIES MAY BE MOVED TO AVOID CONFLICT WITH PRESTRESSING STRANDS.


RECESS FOR LATERAL TIE ANCHORAGE
5" SQ.
2 1/2"
2 1/2"
2"
2"
4" SQ. (MIN.)
3"ø SLEEVE (GALVANIZED STEEL OR PVC)
5"

DETAIL 2 7.70


℄ 3"ø SLEEVE
3" HMA WEARING SURFACE OVER WATERPROOFING MEMBRANE
4"
.6"ø STRAND (TYP.) (SEE DESIGNER NOTE 3)
9"**
3"ø SLEEVE TYP. (GALVANIZED STEEL OR PVC)
VARIES
CLOSED CELL NONABSORBENT FOAM JOINT FILLER
9"**
4"

SECTION B 7.70


SMOOTH OR RAKED FINISH (SEE DWG. 7.71)
1/4"
3/8"
℄ JOINT
TOOLED EDGE
4"
3/8" CHAMFER
PROFILE AT EXTERIOR FACE OF FASCIA BEAM (DELETE SHEAR KEY) SEE DESIGNER NOTE 6
SHEAR KEY PROFILE (AT INTERIOR JTS. ONLY)
VARIES
3/4" CHAMFER
4"
3/4" CHAMFER

SHEAR KEY PROFILE DETAIL

NOTES:

1. DETAILS OF THE ANCHORAGE ASSEMBLY ARE TO BE SUBMITTED FOR REVIEW AND APPROVAL BY THE ENGINEER.
2. ALL PRESTRESSED CONCRETE SLABS SHALL BE ERECTED AS INDICATED ON THE CONTRACT DRAWINGS. THEY SHALL BE SET TO THE SPECIFIED (NOMINAL) DIMENSIONS AND WITH THE SPECIFIED (NOMINAL) 1 INCH SPACING BETWEEN UNITS. THE LATERAL POST-TENSIONING STRANDS SHALL BE TENSIONED INITIALLY TO 5,000 POUNDS. SAID LATERAL POST-TENSIONING IS NOT EXPECTED TO DRAW THE UNITS TOGETHER. AFTER THE UNITS ARE IN PLACE, THE FOAM JOINT FILLER SHALL BE PLACED AT THE BOTTOM OF THE SHEAR KEYS (PENCIL VIBRATE THE GROUT IN THE KEY TO CONSOLIDATE MATERIAL) AND ALLOWED TO CURE, FOR A MINIMUM OF 72 HOURS, AFTER WHICH THE STRANDS SHALL BE STRESSED TO THE FULL 44,000 POUNDS.
3. THE CONTRACTOR SHALL FURNISH THE STATE WITH CALCULATIONS FOR THE THEORETICAL ELONGATION OF THE LATERAL POST-TENSIONING STRANDS SO THAT THE STRAND TENSION INDICATED ON THE CALIBRATED METER CAN BE VERIFIED. THE CONTRACTOR SHALL FURNISH RECORDS TO THE STATE OF THE GAUGE READINGS VERSUS THE MEASURED ELONGATIONS.
4. NO TRAFFIC OR HEAVY EQUIPMENT SHALL BE PERMITTED ON THE STRUCTURE UNTIL ALL TRANSVERSE TIES HAVE BEEN PROPERLY TENSIONED AND THE GROUT HAS ATTAINED THE 28 DAY COMPRESSIVE STRENGTH.

DESIGNER NOTES:

1. *THIS DRAWING APPLIES TO PRESTRESSED CONCRETE BOX BEAMS WITH AN ASPHALT WEARING SURFACE ONLY.*
2. *REFER TO DWG No. 7.72 & No. 7.73 FOR PRESTRESSED CONCRETE BOX BEAMS WITH A 5" MIN. COMPOSITE REINFORCED CONCRETE DECK OVERLAY.*
3. *FOR LOCATION OF LATERAL TIES (LONGITUDINALLY ALONG THE BEAM) SEE DWG. No. 7.60.*
4. *IN LATERAL TIE DETAILS (DETAIL I) THE DEPTH TO THE LATERAL TIE MAY BE INCREASED UP TO D/2 FOR WIDE BRIDGES TO MINIMIZE THE "DISHING EFFECT" ACROSS THE WIDTH OF THE DECK, PROVIDED THAT THERE ARE NO DESIGN CONCERNS FOR TORSIONAL LOADS ON EXTERIOR BEAMS. (SEE DESIGNER NOTE 1 ON DWG No. 7.40)*
5. *THE MAXIMUM ALLOWABLE DEPTH OF PAVEMENT BUILDUP (TO ACCOMMODATE ROADWAY PROFILE AND CROSS SLOPE) SHALL BE 7 INCHES UNLESS OTHERWISE AUTHORIZED BY THE MANAGING BRIDGE ENGINEER.*
6. *THE EXTERIOR FACE OF THE FASCIA BEAMS SHALL RECEIVE A SELECTED FORMLINER OR RUBBED FINISH.*

THIS SHEET IS NOT TO SCALE

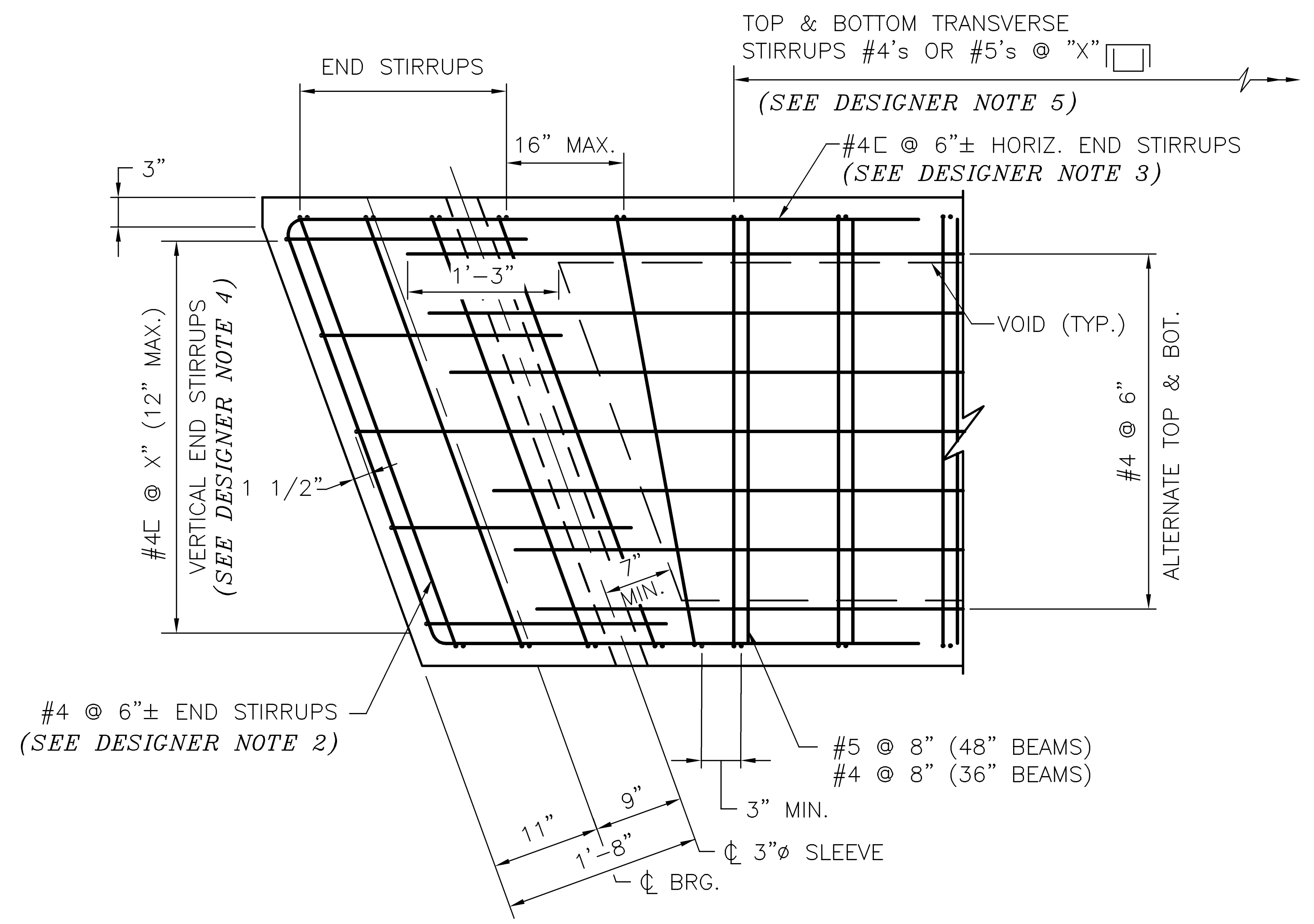
REVISIONS	
No.	DATE

RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

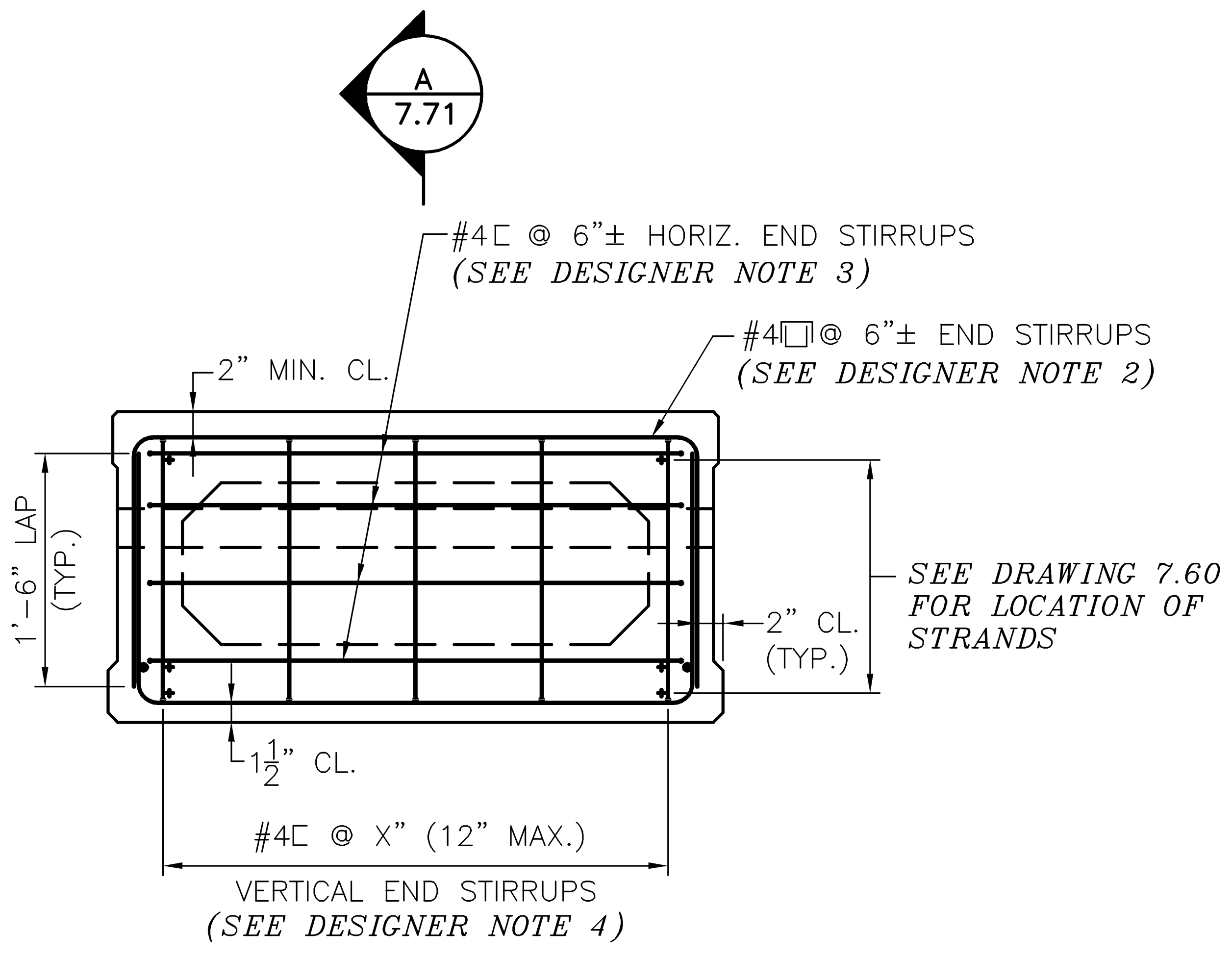
BRIDGE STANDARDS

PRECAST CONCRETE
BUTTED BOX BEAMS
SHEET 2

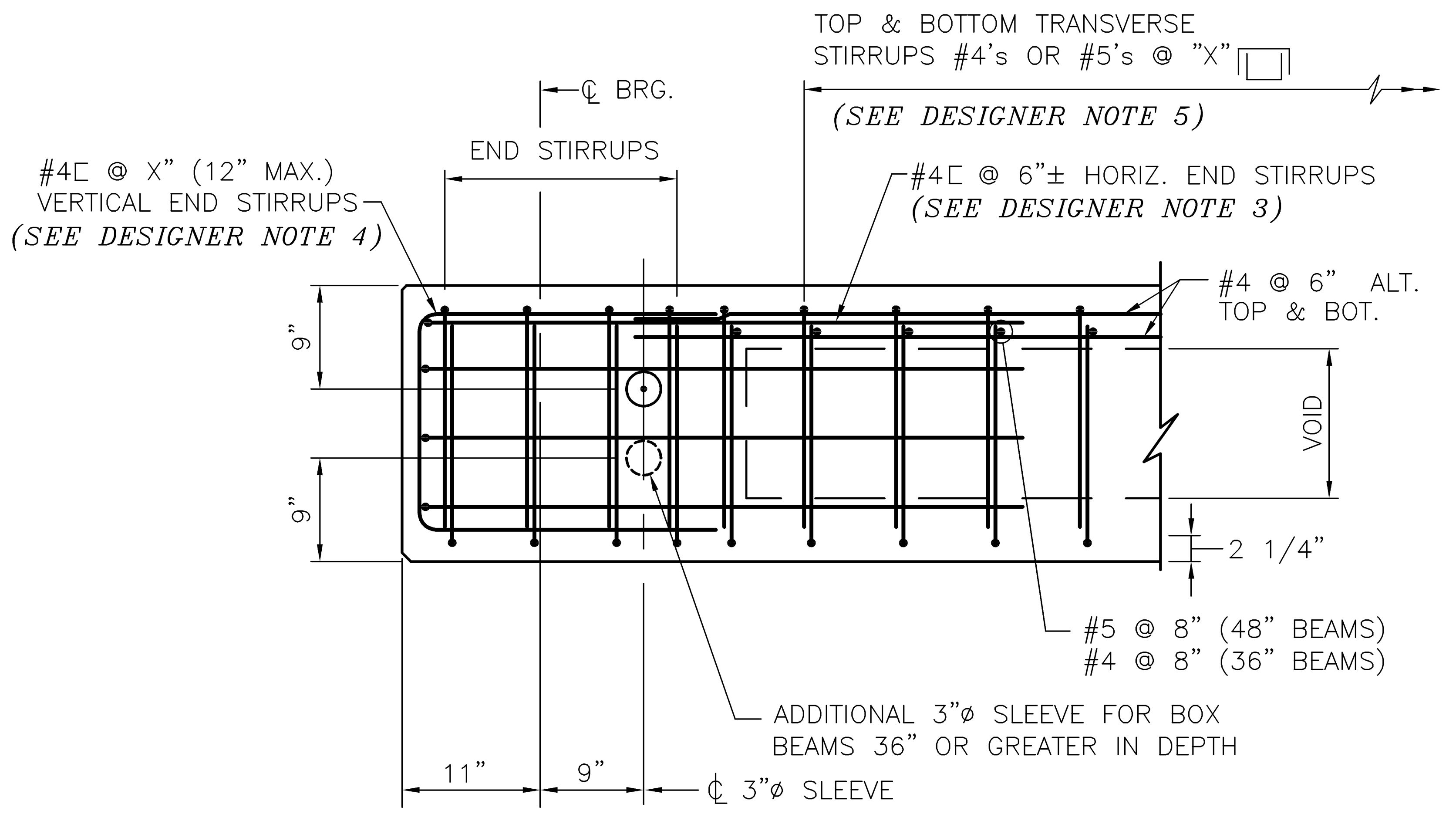
DRAWING NUMBER: 7.70



PLAN



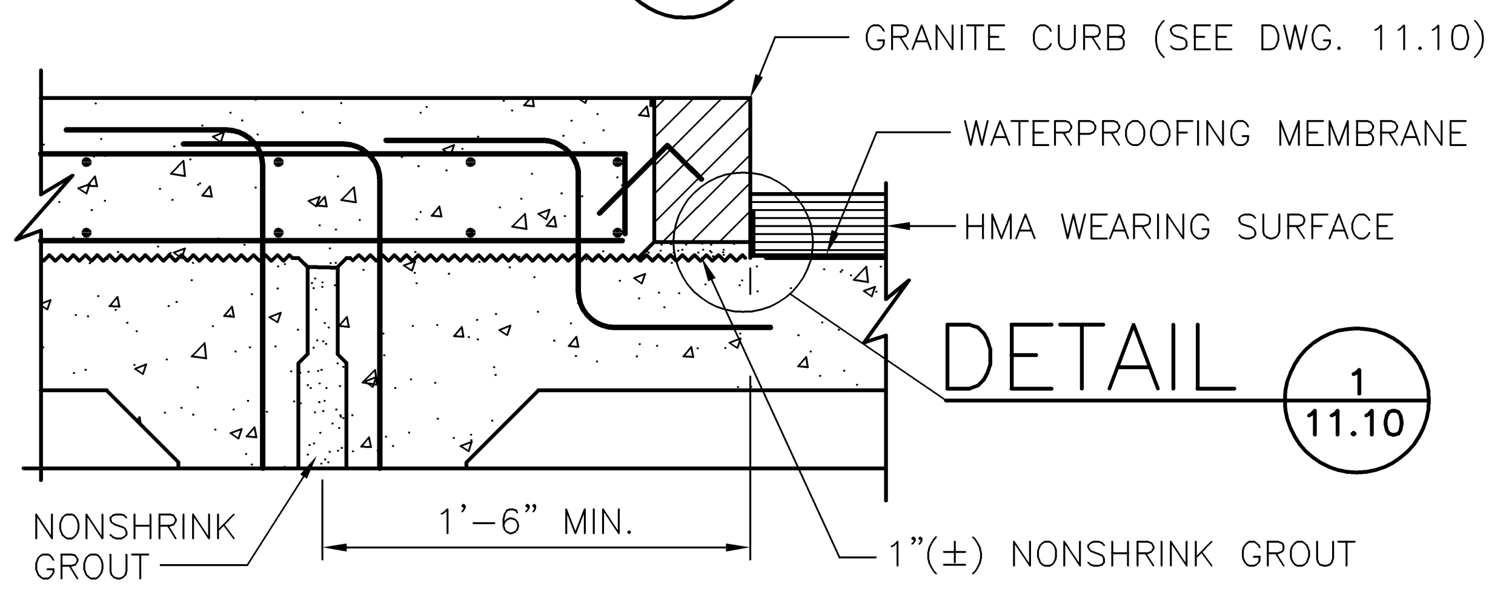
END OF BEAM SECTION



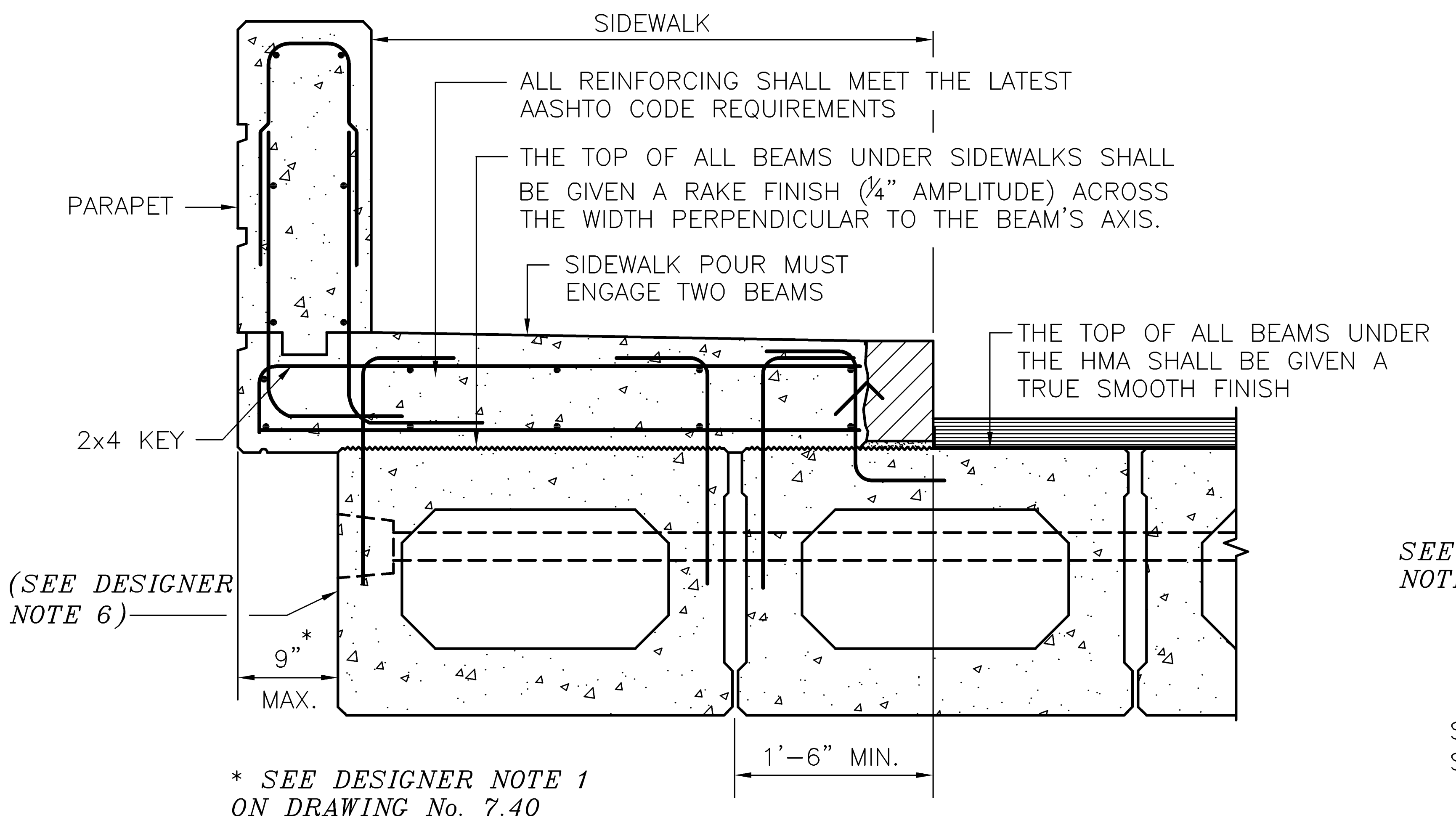
LONGITUDINAL SECTION

END REINFORCING PATTERN

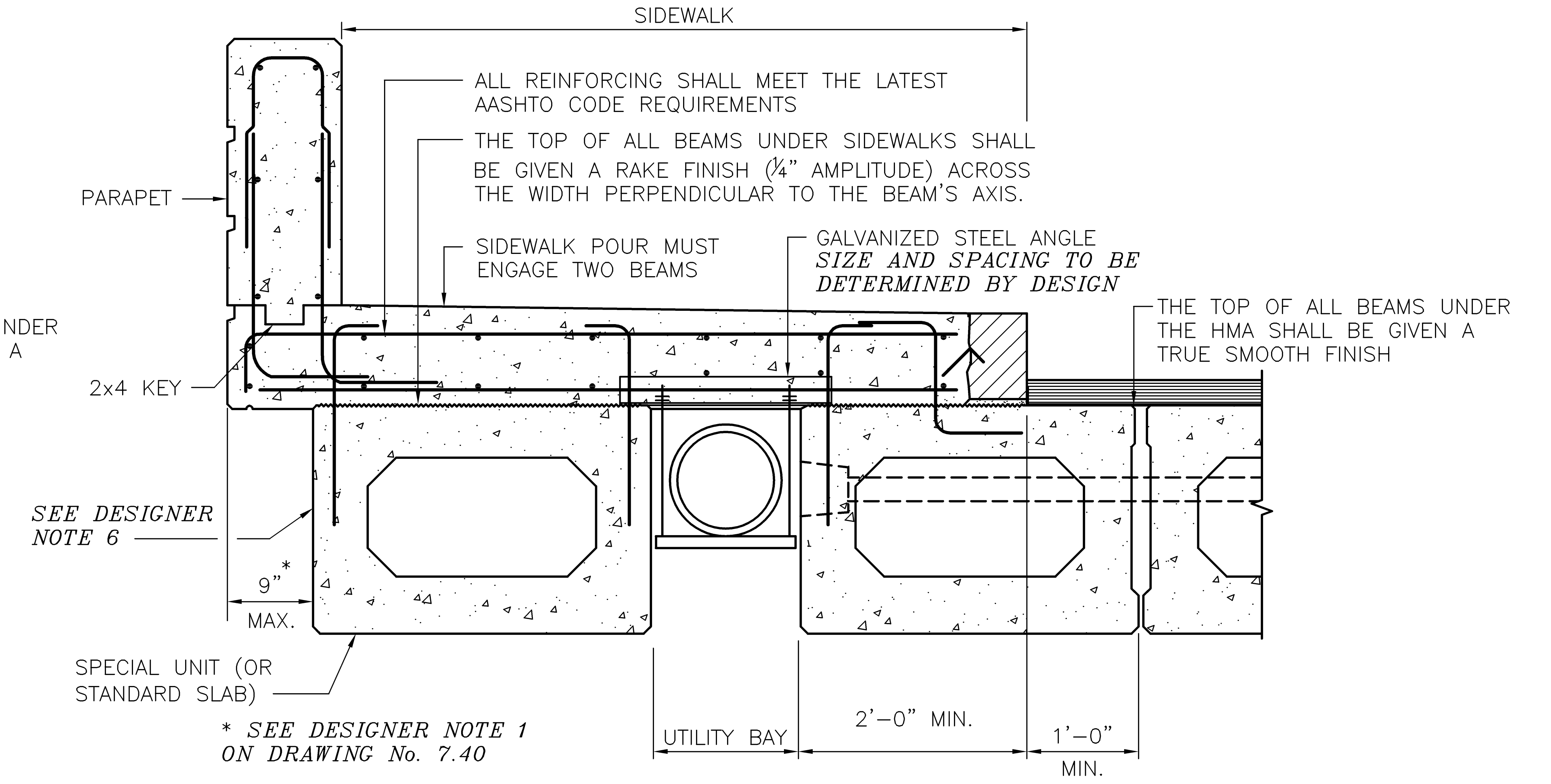
SECTION A/7.71



CURB DETAIL

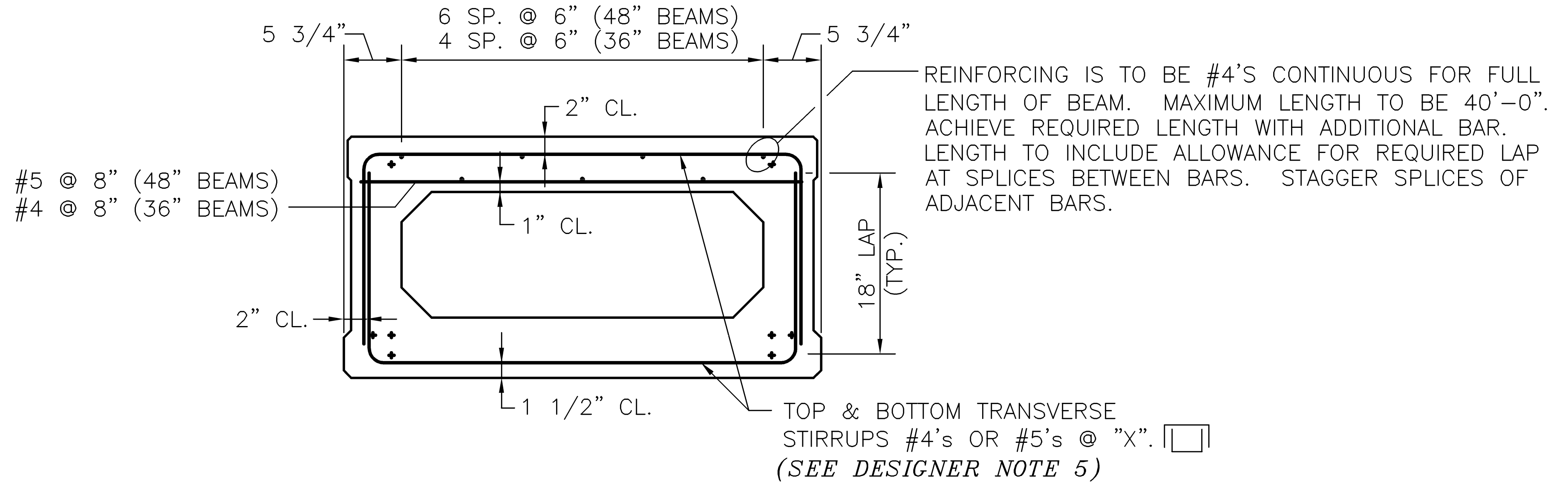

SIDEWALK
ALL REINFORCING SHALL MEET THE LATEST AASHTO CODE REQUIREMENTS
THE TOP OF ALL BEAMS UNDER SIDEWALKS SHALL BE GIVEN A RAKE FINISH (¼" AMPLITUDE) ACROSS THE WIDTH PERPENDICULAR TO THE BEAM'S AXIS.
SIDEWALK POUR MUST ENGAGE TWO BEAMS
PARAPET
THE TOP OF ALL BEAMS UNDER THE HMA SHALL BE GIVEN A TRUE SMOOTH FINISH
2x4 KEY
(SEE DESIGNER NOTE 6)
9"*
MAX.
1'-6" MIN.
* SEE DESIGNER NOTE 1 ON DRAWING No. 7.40

SIDEWALK OVERHANG WITHOUT UTILITIES


SIDEWALK
ALL REINFORCING SHALL MEET THE LATEST AASHTO CODE REQUIREMENTS
THE TOP OF ALL BEAMS UNDER SIDEWALKS SHALL BE GIVEN A RAKE FINISH (¼" AMPLITUDE) ACROSS THE WIDTH PERPENDICULAR TO THE BEAM'S AXIS.
PARAPET
SIDEWALK POUR MUST ENGAGE TWO BEAMS
GALVANIZED STEEL ANGLE
SIZE AND SPACING TO BE DETERMINED BY DESIGN
THE TOP OF ALL BEAMS UNDER THE HMA SHALL BE GIVEN A TRUE SMOOTH FINISH
2x4 KEY
SEE DESIGNER NOTE 6
9"*
MAX.
SPECIAL UNIT (OR STANDARD SLAB)
* SEE DESIGNER NOTE 1 ON DRAWING No. 7.40
UTILITY BAY
2'-0" MIN.
1'-0" MIN.

SIDEWALK OVERHANG WITH UTILITIES

NOTE:
POST TENSIONING REQUIREMENT NOT APPLICABLE TO SPECIAL UNIT.


5 3/4"
6 SP. @ 6" (48" BEAMS)
4 SP. @ 6" (36" BEAMS)
5 3/4"
2" CL.
REINFORCING IS TO BE #4'S CONTINUOUS FOR FULL LENGTH OF BEAM. MAXIMUM LENGTH TO BE 40'-0". ACHIEVE REQUIRED LENGTH WITH ADDITIONAL BAR. LENGTH TO INCLUDE ALLOWANCE FOR REQUIRED LAP AT SPLICES BETWEEN BARS. STAGGER SPLICES OF ADJACENT BARS.
#5 @ 8" (48" BEAMS)
#4 @ 8" (36" BEAMS)
1" CL.
18" LAP (TYP.)
2" CL.
1 1/2" CL.
TOP & BOTTOM TRANSVERSE STIRRUPS #4's OR #5's @ "X".
(SEE DESIGNER NOTE 5)

MIDSPAN REINFORCING PATTERN

DESIGNER NOTES:

1. *THIS DRAWING APPLIES TO PRESTRESSED CONCRETE BOX BEAMS WITH AN ASPHALT WEARING SURFACE ONLY.* *FOR PRESTRESSED CONCRETE BOX BEAMS WITH A 5" MINIMUM REINFORCED COMPOSITE CONCRETE DECK OVERLAY REFER TO DWG No. 7.72 & No. 7.73*
2. *DESIGN END STIRRUPS IN ACCORDANCE WITH AASHTO LRFD BRIDGE DESIGN REQUIREMENTS FOR ANCHORAGE ZONES.*
3. *HORIZONTAL END STIRRUPS SHALL BE EMBEDDED A MINIMUM DISTANCE EQUAL TO DEPTH OF BEAM INTO THE WEB OF THE VOIDED SECTION. LENGTH OF EMBEDMENT SHALL BE NOTED ON THE PLAN.*
4. *THE HORIZONTAL LEG OF VERTICAL END STIRRUPS SHALL EQUAL THE DEPTH OF THE BEAM AND SHALL BE DIMENSIONED ON THE PLAN VIEW.*
5. *TOP AND BOTTOM TRANSVERSE STIRRUP SIZE AND SPACING SHALL BE AS REQUIRED BY DESIGN, WITH THE ADDITIONAL REQUIREMENT THAT SPACING DOES NOT EXCEED 16"*
6. *THE EXTERIOR FACE OF THE FASCIA BEAMS SHALL RECEIVE A SELECTED FORMLINER OR RUBBED FINISH.*

THIS SHEET IS NOT TO SCALE

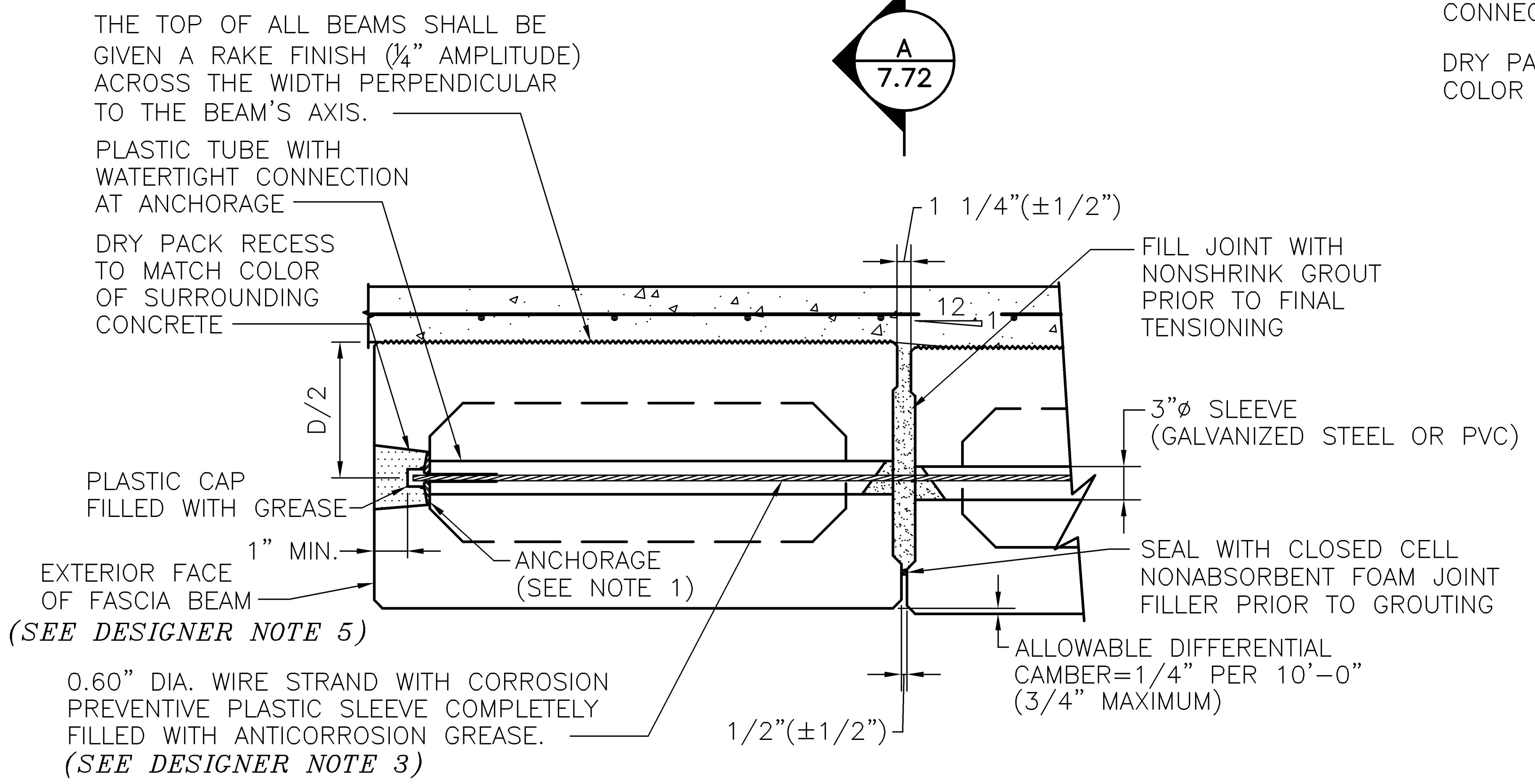
REVISIONS	
No.	DATE

RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

BRIDGE STANDARDS

PRECAST CONCRETE
BUTTED BOX BEAMS
SHEET 3

DRAWING NUMBER: 7.71

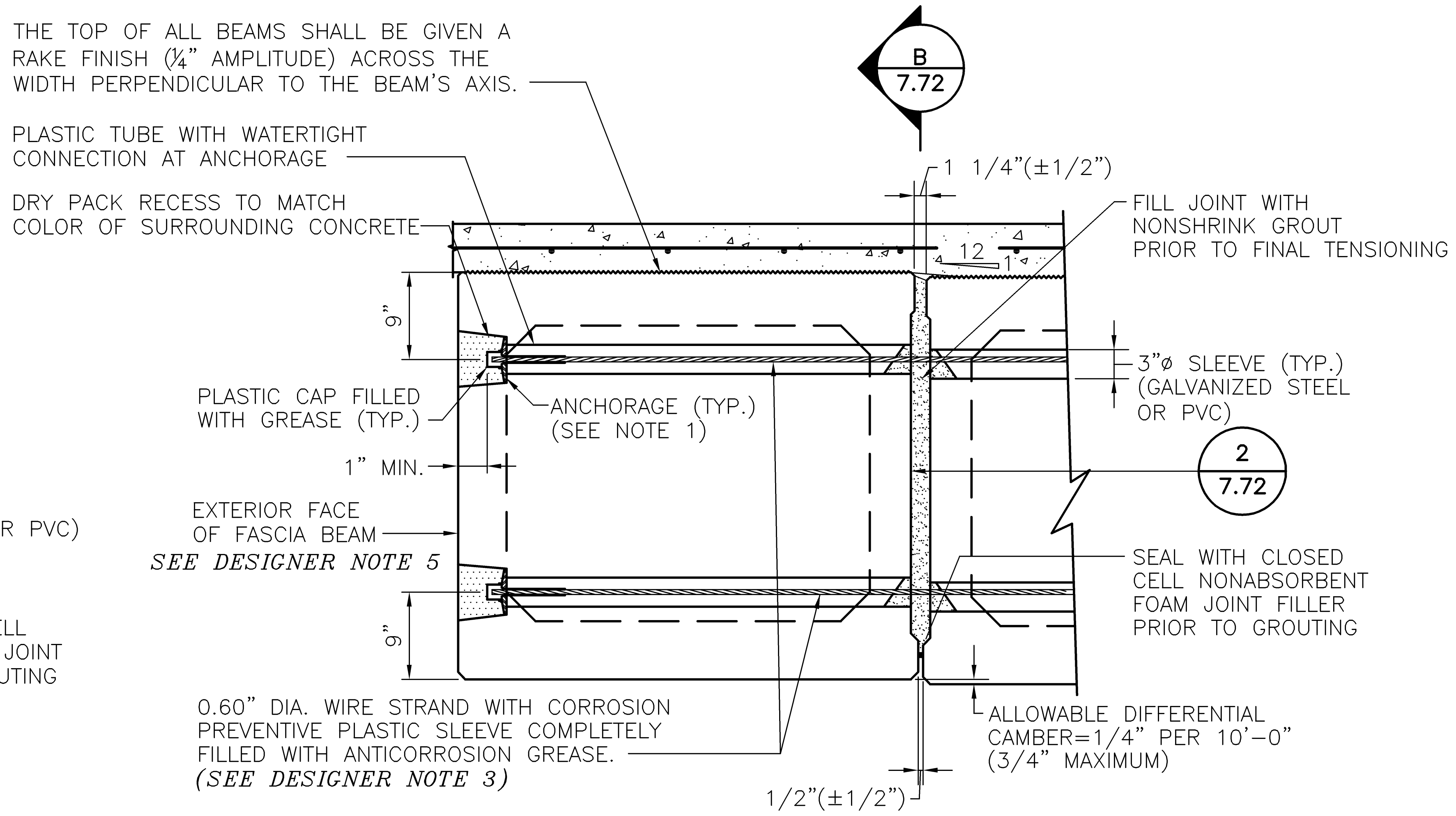

A
7.72
THE TOP OF ALL BEAMS SHALL BE GIVEN A RAKE FINISH (¼" AMPLITUDE) ACROSS THE WIDTH PERPENDICULAR TO THE BEAM'S AXIS.
PLASTIC TUBE WITH WATERTIGHT CONNECTION AT ANCHORAGE
DRY PACK RECESS TO MATCH COLOR OF SURROUNDING CONCRETE
1 1/4"(±1/2")
FILL JOINT WITH NONSHRINK GROUT PRIOR TO FINAL TENSIONING
12
1
D/2
3"ø SLEEVE (GALVANIZED STEEL OR PVC)
PLASTIC CAP FILLED WITH GREASE
1" MIN.
ANCHORAGE (SEE NOTE 1)
SEAL WITH CLOSED CELL NONABSORBENT FOAM JOINT FILLER PRIOR TO GROUTING
EXTERIOR FACE OF FASCIA BEAM
(SEE DESIGNER NOTE 5)
ALLOWABLE DIFFERENTIAL CAMBER=1/4" PER 10'-0" (3/4" MAXIMUM)
0.60" DIA. WIRE STRAND WITH CORROSION PREVENTIVE PLASTIC SLEEVE COMPLETELY FILLED WITH ANTICORROSION GREASE.
(SEE DESIGNER NOTE 3)
1/2"(±1/2")

DETAIL I

(APPLIES TO BOX BEAMS
B24 THRU B33)

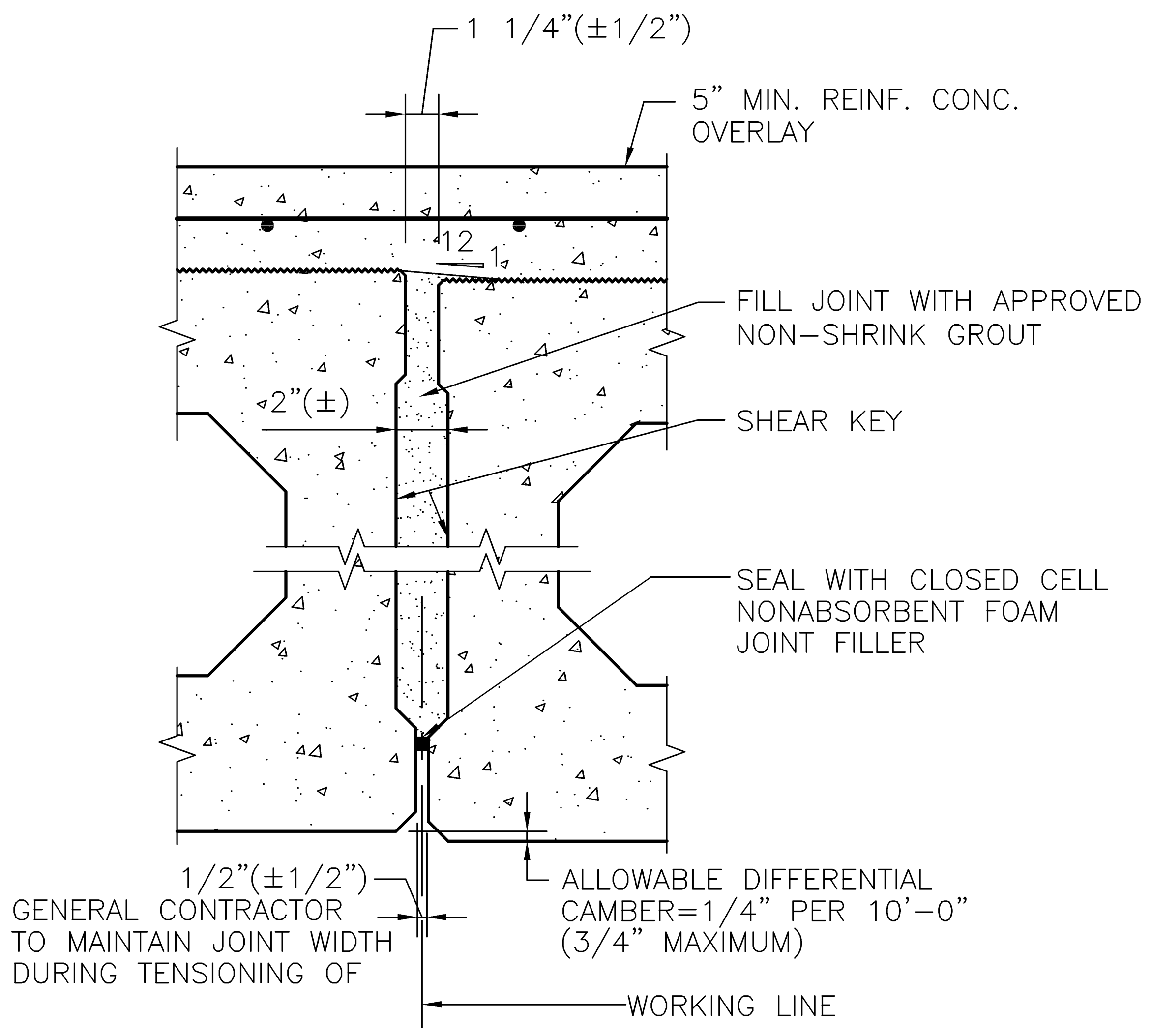
NOTES:

1. TENSION STRAND TO 5,000 LBS PRIOR TO GROUTING JOINTS. AFTER GROUT IS CURED, TENSION STRAND TO 44,000 LBS.
2. PLACE SHIMS IN JOINT, TENSION STRANDS TO 5,000 LBS AND FILL WITH NONSHRINK GROUT.


THE TOP OF ALL BEAMS SHALL BE GIVEN A RAKE FINISH (¼" AMPLITUDE) ACROSS THE WIDTH PERPENDICULAR TO THE BEAM'S AXIS.
B
7.72
PLASTIC TUBE WITH WATERTIGHT CONNECTION AT ANCHORAGE
DRY PACK RECESS TO MATCH COLOR OF SURROUNDING CONCRETE
1 1/4"(±1/2")
FILL JOINT WITH NONSHRINK GROUT PRIOR TO FINAL TENSIONING
12
1
9"
PLASTIC CAP FILLED WITH GREASE (TYP.)
ANCHORAGE (TYP.) (SEE NOTE 1)
3"ø SLEEVE (TYP.) (GALVANIZED STEEL OR PVC)
1" MIN.
2
7.72
EXTERIOR FACE OF FASCIA BEAM
SEE DESIGNER NOTE 5
SEAL WITH CLOSED CELL NONABSORBENT FOAM JOINT FILLER PRIOR TO GROUTING
9"
0.60" DIA. WIRE STRAND WITH CORROSION PREVENTIVE PLASTIC SLEEVE COMPLETELY FILLED WITH ANTICORROSION GREASE.
(SEE DESIGNER NOTE 3)
ALLOWABLE DIFFERENTIAL CAMBER=1/4" PER 10'-0" (3/4" MAXIMUM)
1/2"(±1/2")

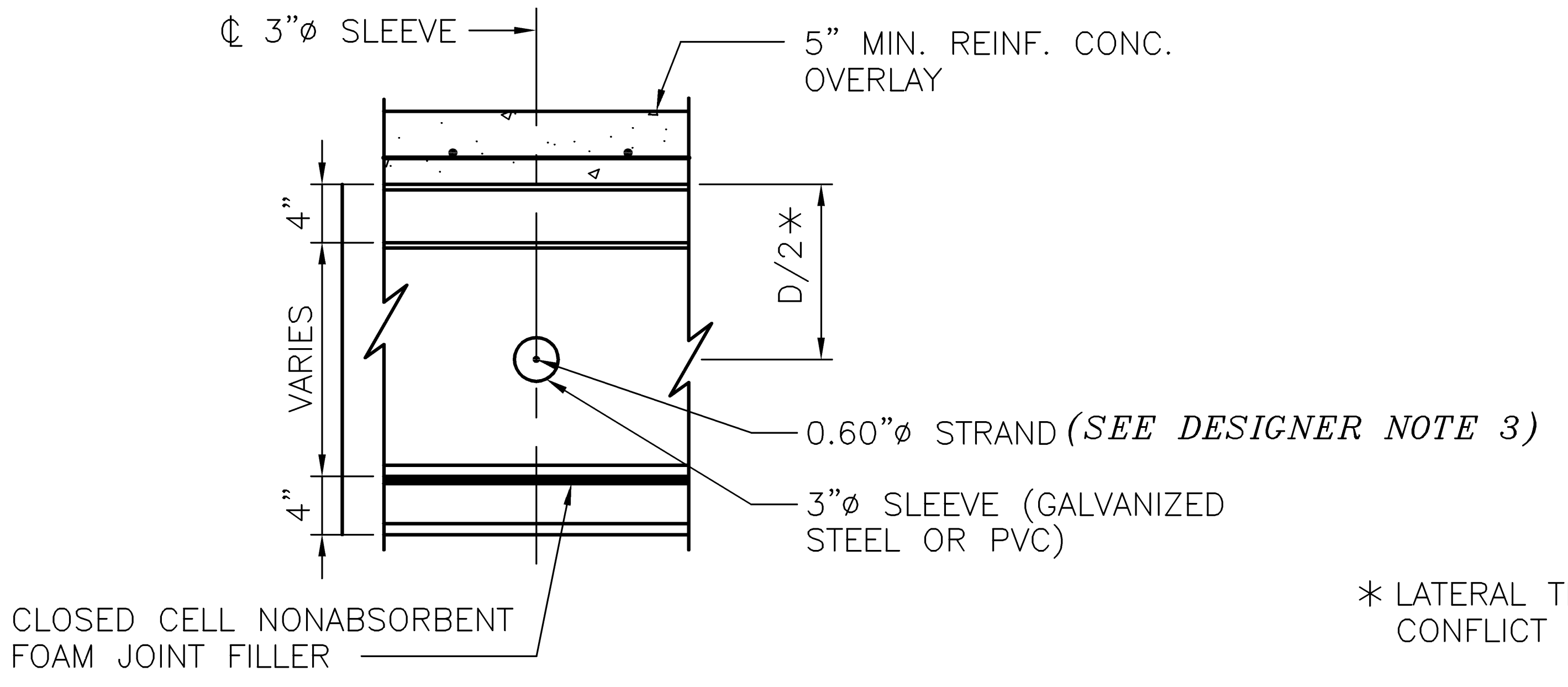
DETAIL II

(APPLIES TO BOX BEAMS
B36 THRU B48)

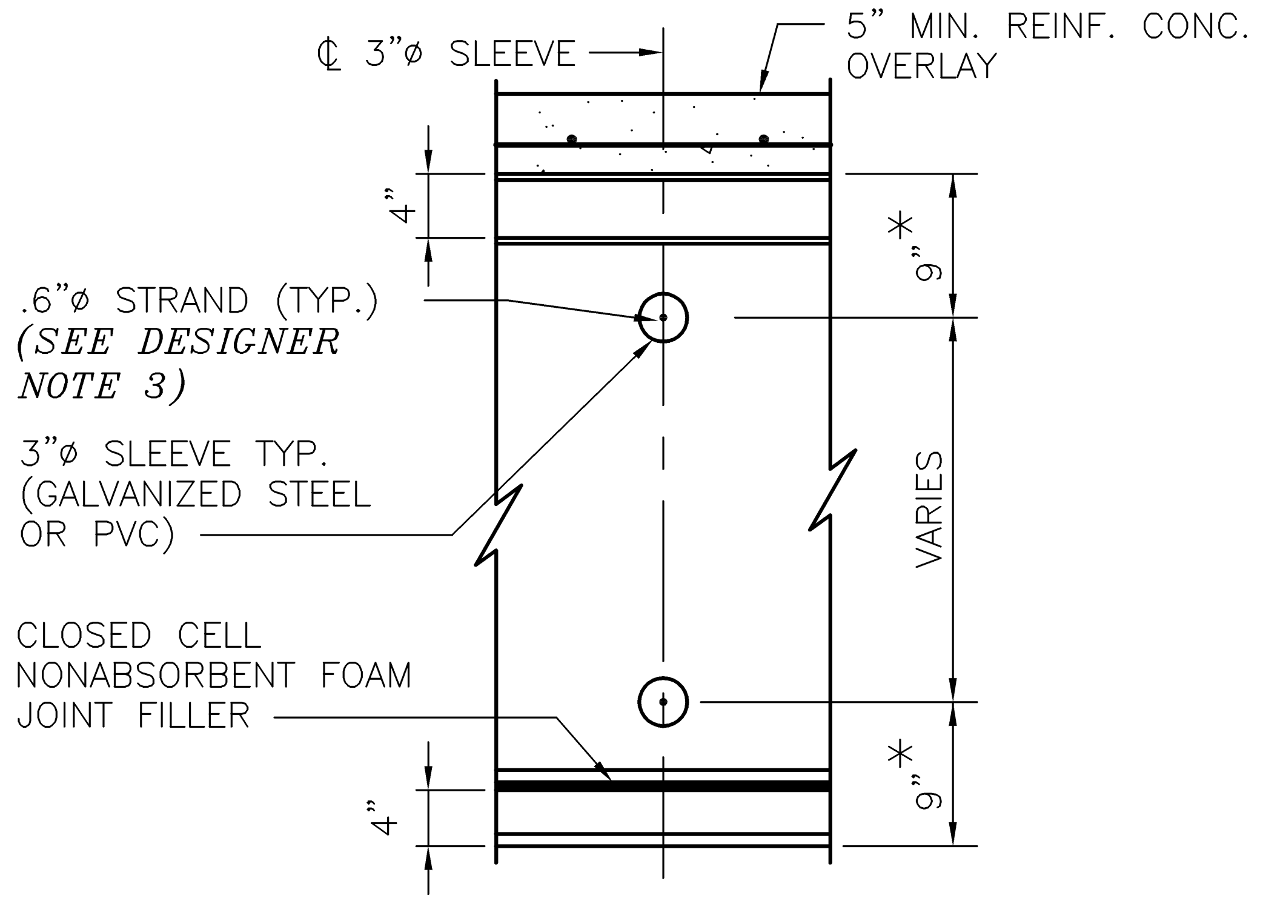

1 1/4"(±1/2")
5" MIN. REINF. CONC. OVERLAY
12
1
FILL JOINT WITH APPROVED NON-SHRINK GROUT
2"(±)
SHEAR KEY
SEAL WITH CLOSED CELL NONABSORBENT FOAM JOINT FILLER
1/2"(±1/2")
GENERAL CONTRACTOR TO MAINTAIN JOINT WIDTH DURING TENSIONING OF
ALLOWABLE DIFFERENTIAL CAMBER=1/4" PER 10'-0" (3/4" MAXIMUM)
WORKING LINE

JOINT DETAIL

LATERAL TIE DETAILS

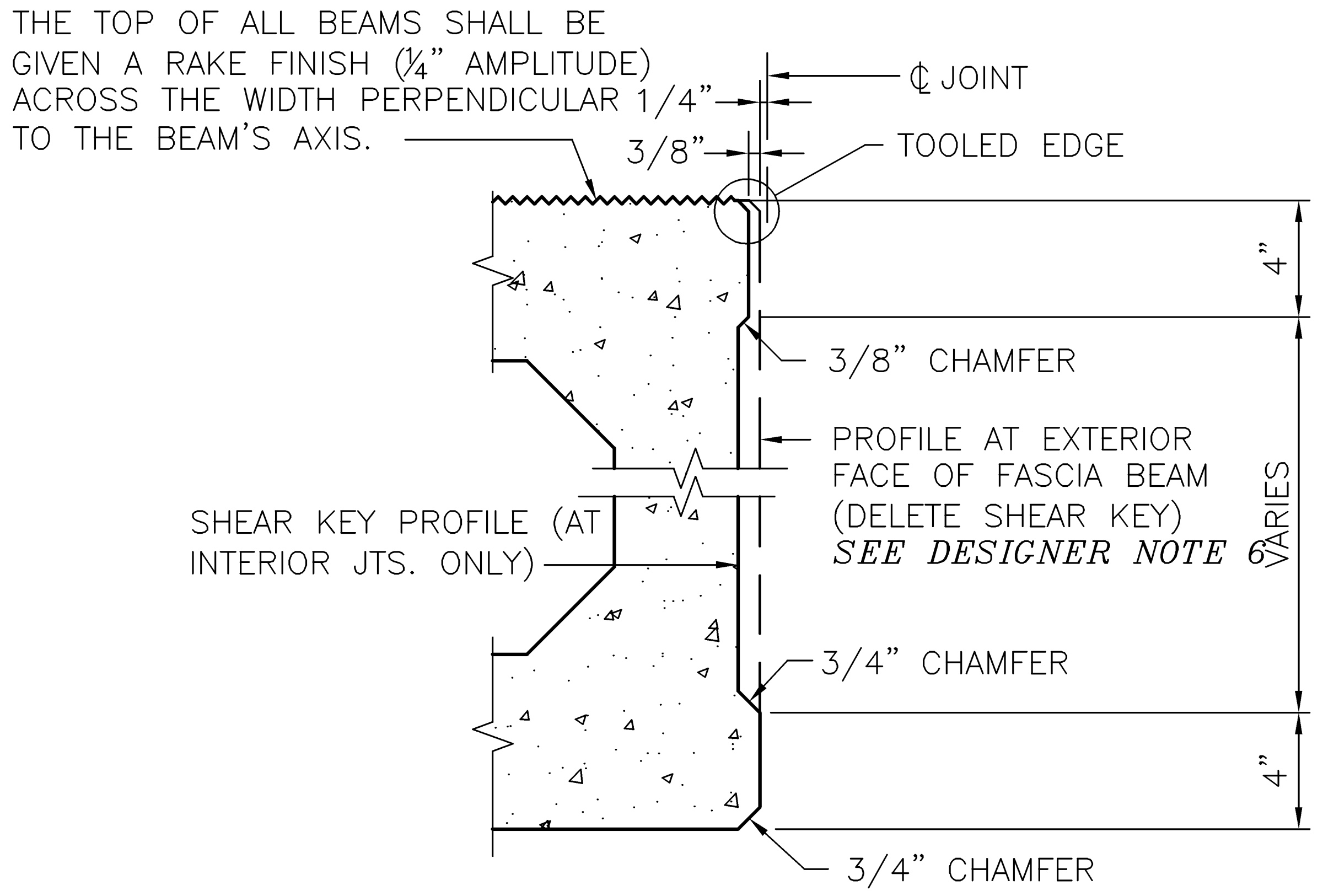

℄ 3"ø SLEEVE
5" MIN. REINF. CONC. OVERLAY
4"
VARIES
4"
D/2*
0.60"ø STRAND (SEE DESIGNER NOTE 3)
3"ø SLEEVE (GALVANIZED STEEL OR PVC)
CLOSED CELL NONABSORBENT FOAM JOINT FILLER

SECTION A/7.72


℄ 3"ø SLEEVE
5" MIN. REINF. CONC. OVERLAY
4"
9"*
.6"ø STRAND (TYP.)
(SEE DESIGNER NOTE 3)
3"ø SLEEVE TYP. (GALVANIZED STEEL OR PVC)
VARIES
CLOSED CELL NONABSORBENT FOAM JOINT FILLER
4"
9"*

* LATERAL TIES MAY BE MOVED TO AVOID CONFLICT WITH PRESTRESSING STRANDS.

SECTION B/7.72


THE TOP OF ALL BEAMS SHALL BE GIVEN A RAKE FINISH (¼" AMPLITUDE) ACROSS THE WIDTH PERPENDICULAR TO THE BEAM'S AXIS.
1/4"
3/8"
℄ JOINT
TOOLED EDGE
4"
3/8" CHAMFER
PROFILE AT EXTERIOR FACE OF FASCIA BEAM (DELETE SHEAR KEY)
SEE DESIGNER NOTE 6
VARIES
SHEAR KEY PROFILE (AT INTERIOR JTS. ONLY)
3/4" CHAMFER
4"
3/4" CHAMFER

SHEAR KEY PROFILE DETAIL

NOTES:

1. DETAILS OF THE ANCHORAGE ASSEMBLY ARE TO BE SUBMITTED FOR REVIEW AND APPROVAL BY THE ENGINEER.
2. ALL PRESTRESSED CONCRETE SLABS SHALL BE ERECTED AS INDICATED ON THE CONTRACT DRAWINGS. THEY SHALL BE SET TO THE SPECIFIED (NOMINAL) DIMENSIONS AND WITH THE SPECIFIED (NOMINAL) 1 INCH SPACING BETWEEN UNITS. THE LATERAL POST-TENSIONING STRANDS SHALL BE TENSIONED INITIALLY TO 5,000 POUNDS. SAID LATERAL POST-TENSIONING IS NOT EXPECTED TO DRAW THE UNITS TOGETHER. AFTER THE UNITS ARE IN PLACE, THE FOAM JOINT FILLER SHALL BE PLACED AT THE BOTTOM OF THE SHEAR KEYS (PENCIL VIBRATE THE GROUT IN THE KEY TO CONSOLIDATE MATERIAL) AND ALLOWED TO CURE, FOR A MINIMUM OF 72 HOURS, AFTER WHICH THE STRANDS SHALL BE STRESSED TO THE FULL 44,000 POUNDS.
3. THE CONTRACTOR SHALL FURNISH THE STATE WITH CALCULATIONS FOR THE THEORETICAL ELONGATION OF THE LATERAL POST-TENSIONING STRANDS SO THAT THE STRAND TENSION INDICATED ON THE CALIBRATED METER CAN BE VERIFIED. THE CONTRACTOR SHALL FURNISH RECORDS TO THE STATE OF THE GAUGE READINGS VERSUS THE MEASURED ELONGATIONS.

DESIGNER NOTES:

1. *THIS DRAWING APPLIES TO PRESTRESSED CONCRETE BOX BEAMS WITH A 5" MINIMUM REINFORCED CONCRETE COMPOSITE DECK OVERLAY ONLY.*
2. *REFER TO DWG 7.70 & 7.71 FOR PRESTRESSED CONCRETE BOX BEAMS WITH AN ASPHALTIC WEARING SURFACE.*
3. *FOR LOCATIONS OF LATERAL TIES (LONGITUDINAL ALONG THE BEAM) SEE DWG 7.6.*
4. *DESIGNER SHALL SPECIFY THAT THE TOP OF ALL BEAMS WITH A CONCRETE OVERLAY BE GIVEN A RAKED FINISH (¼" AMPLITUDE) ACROSS THE WIDTH(PERPENDICULAR TO THE BEAM'S AXIS)*
5. *THE EXTERIOR FACE OF THE FASCIA BEAMS SHALL RECEIVE A SELECTED FORMLINER OR RUBBED FINISH.*
6. *CONCRETE FOR DECK SLAB SHALL BE PLACED AFTER THE TIES HAVE BEEN FULLY TENSIONED.*

REVISIONS	
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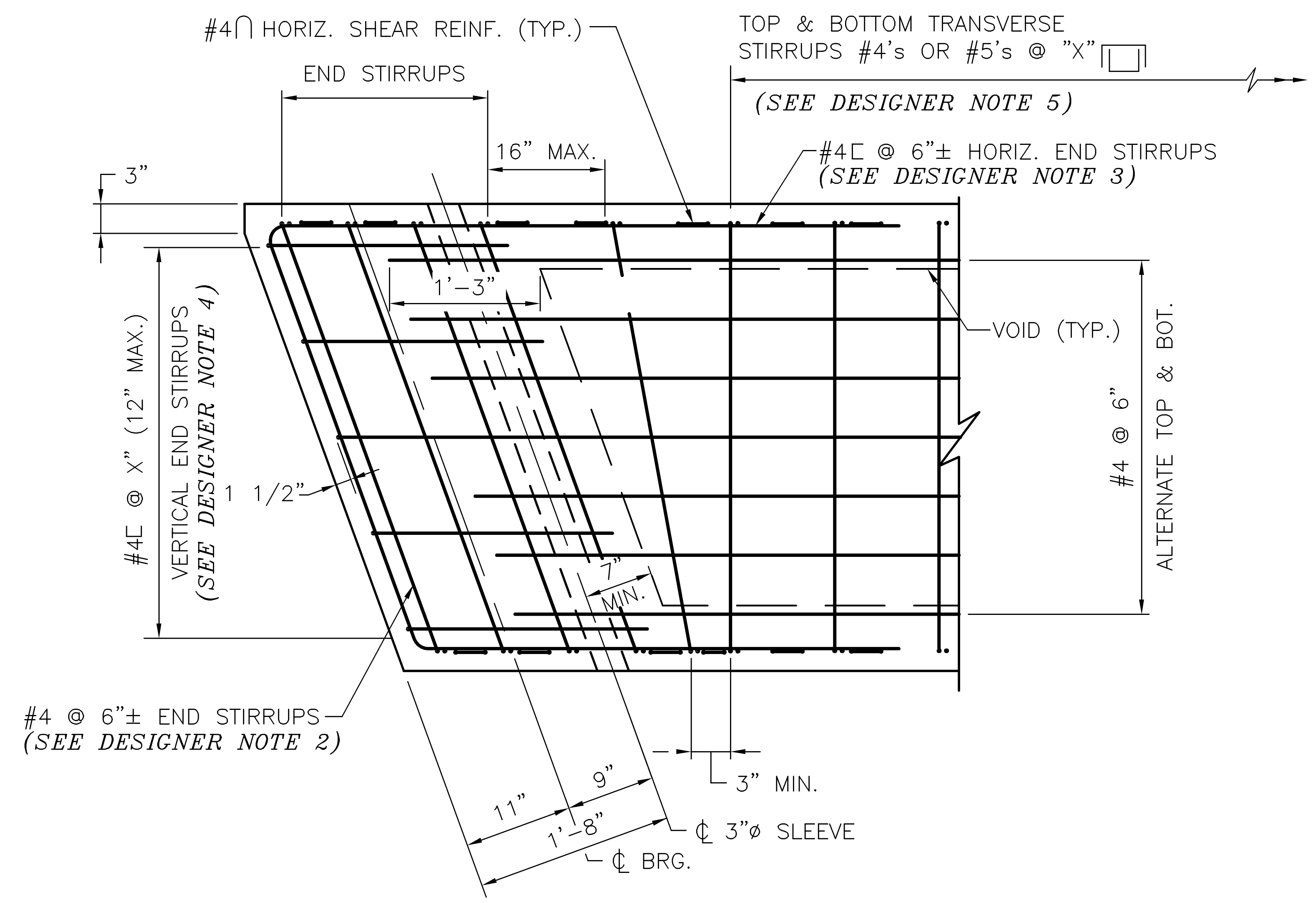
RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

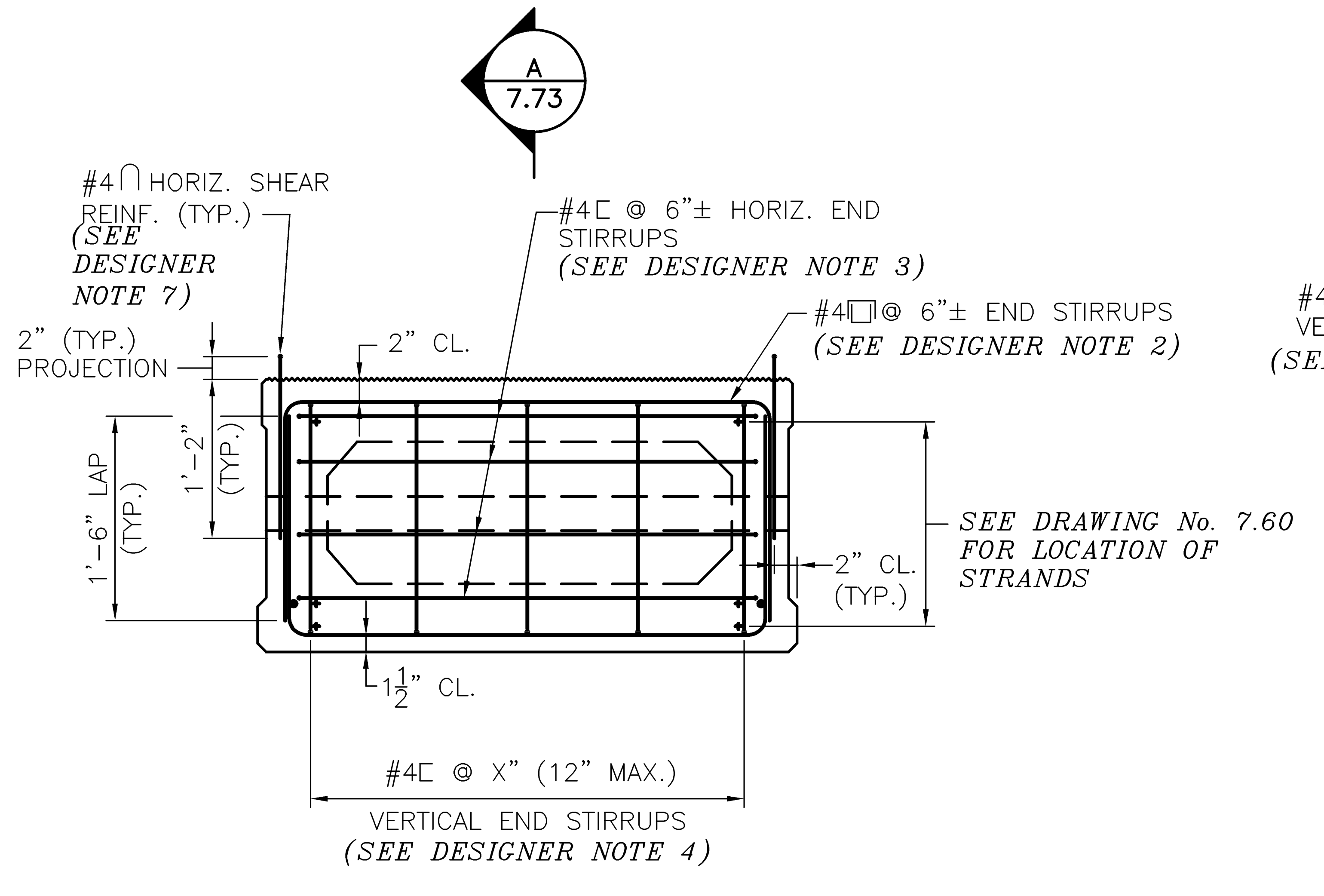
BRIDGE STANDARDS

PRECAST CONCRETE
BUTTED BOX BEAMS
SHEET 4

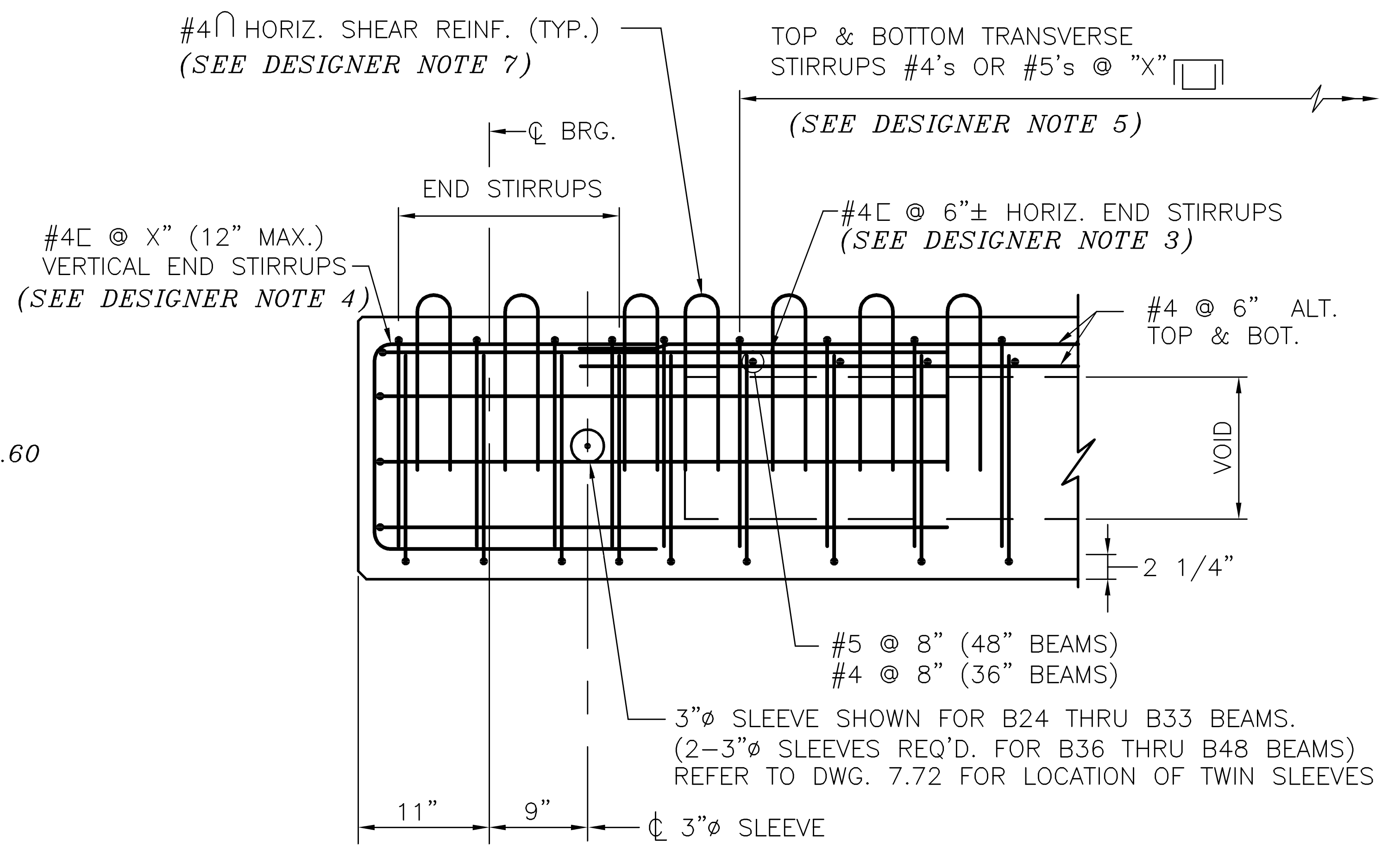
DRAWING NUMBER: 7.72



PLAN



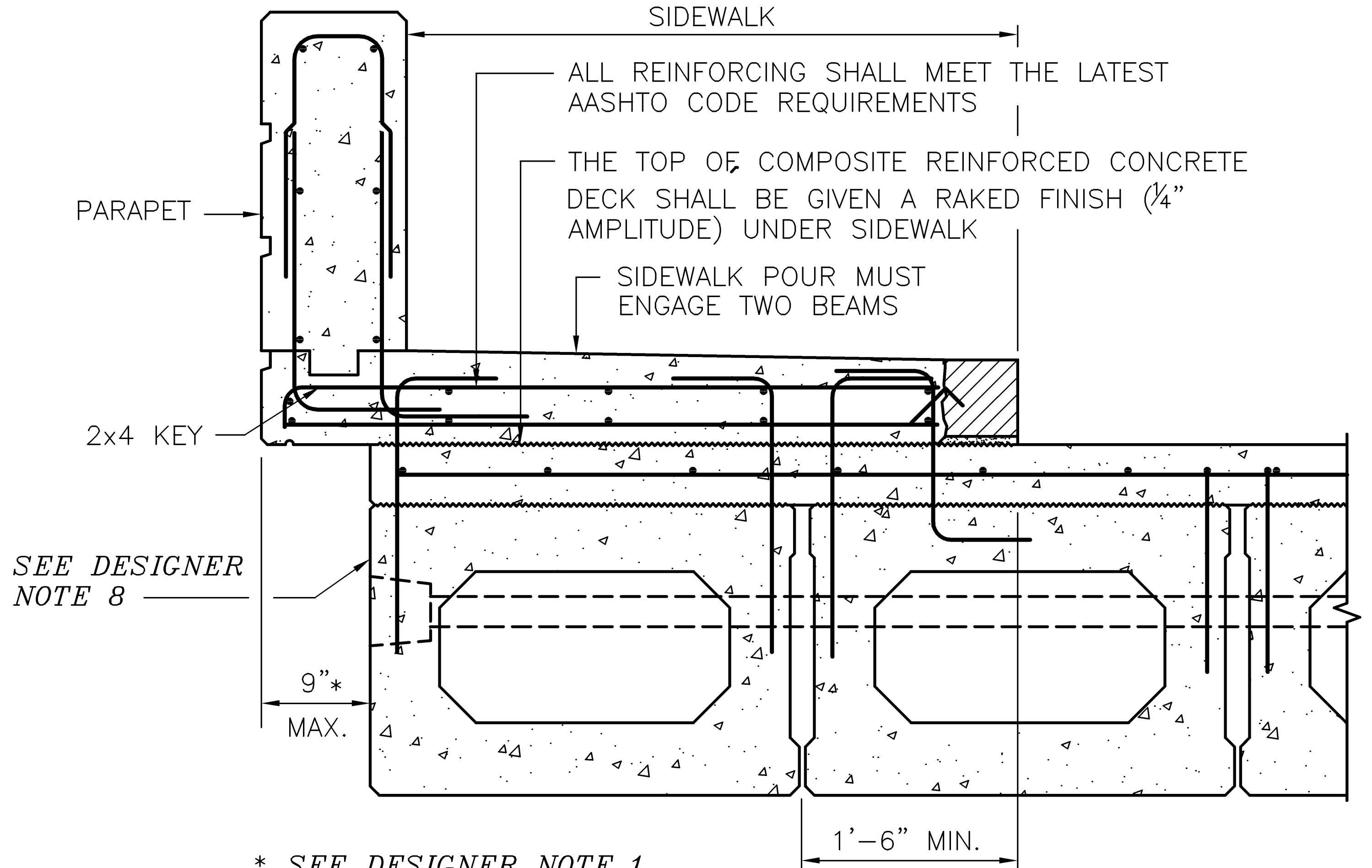
END OF BEAM SECTION


#4∩ HORIZ. SHEAR REINF. (TYP.)
(SEE DESIGNER NOTE 7)
TOP & BOTTOM TRANSVERSE STIRRUPS #4's OR #5's @ "X"
(SEE DESIGNER NOTE 5)
℄ BRG.
END STIRRUPS
#4⊏ @ 6"± HORIZ. END STIRRUPS
(SEE DESIGNER NOTE 3)
#4⊏ @ X" (12" MAX.)
VERTICAL END STIRRUPS
(SEE DESIGNER NOTE 4)
#4 @ 6" ALT. TOP & BOT.
VOID
2 1/4"
#5 @ 8" (48" BEAMS)
#4 @ 8" (36" BEAMS)
3"ø SLEEVE SHOWN FOR B24 THRU B33 BEAMS.
(2–3"ø SLEEVES REQ'D. FOR B36 THRU B48 BEAMS)
REFER TO DWG. 7.72 FOR LOCATION OF TWIN SLEEVES
11"
9"
℄ 3"ø SLEEVE

LONGITUDINAL SECTION

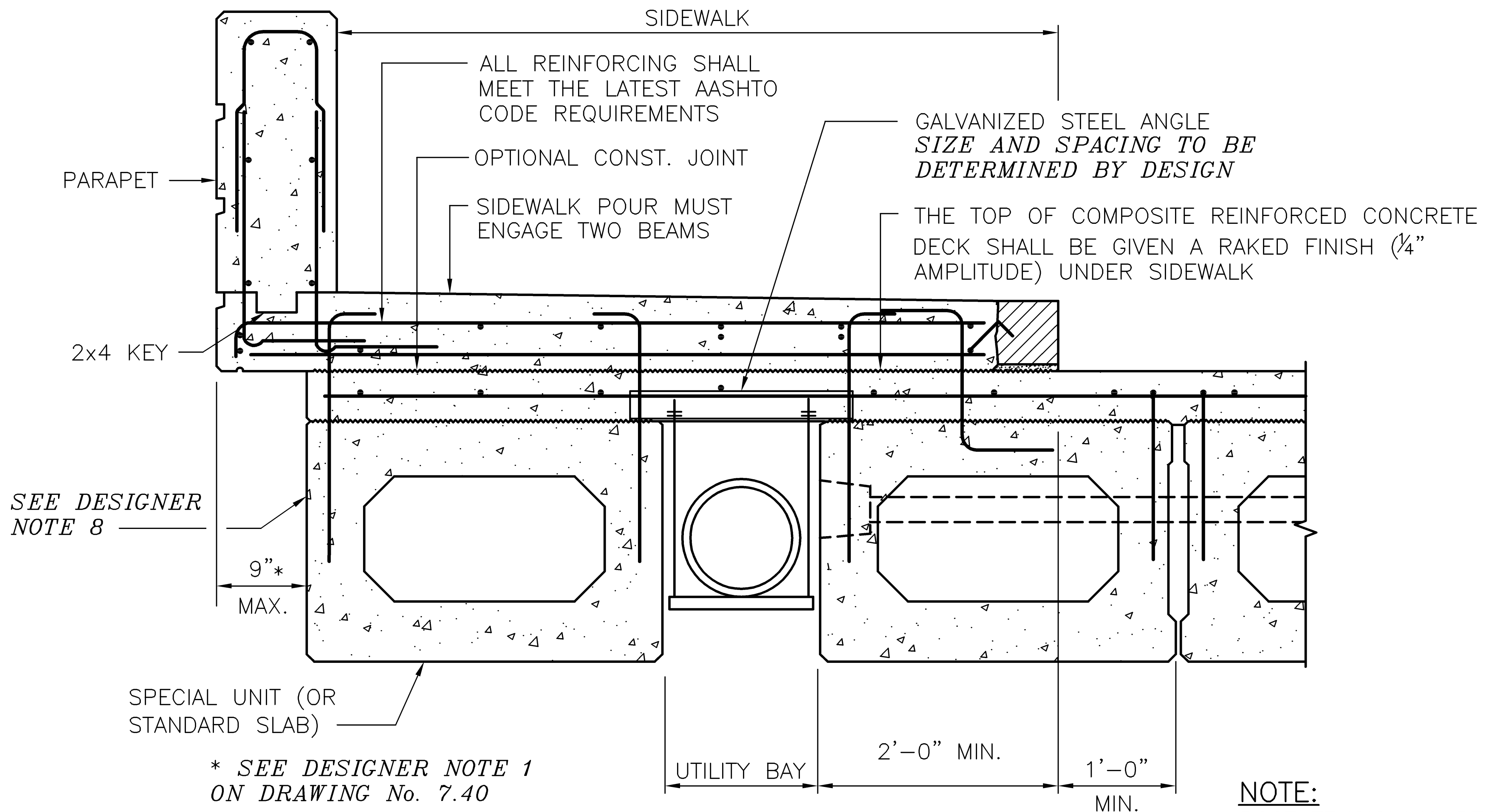
END REINFORCING PATTERN

SECTION A 7.73


SIDEWALK
ALL REINFORCING SHALL MEET THE LATEST AASHTO CODE REQUIREMENTS
THE TOP OF COMPOSITE REINFORCED CONCRETE DECK SHALL BE GIVEN A RAKED FINISH (¼" AMPLITUDE) UNDER SIDEWALK
SIDEWALK POUR MUST ENGAGE TWO BEAMS
PARAPET
2x4 KEY
SEE DESIGNER NOTE 8
9"* MAX.
1'-6" MIN.

* SEE DESIGNER NOTE 1 ON DRAWING No. 7.40

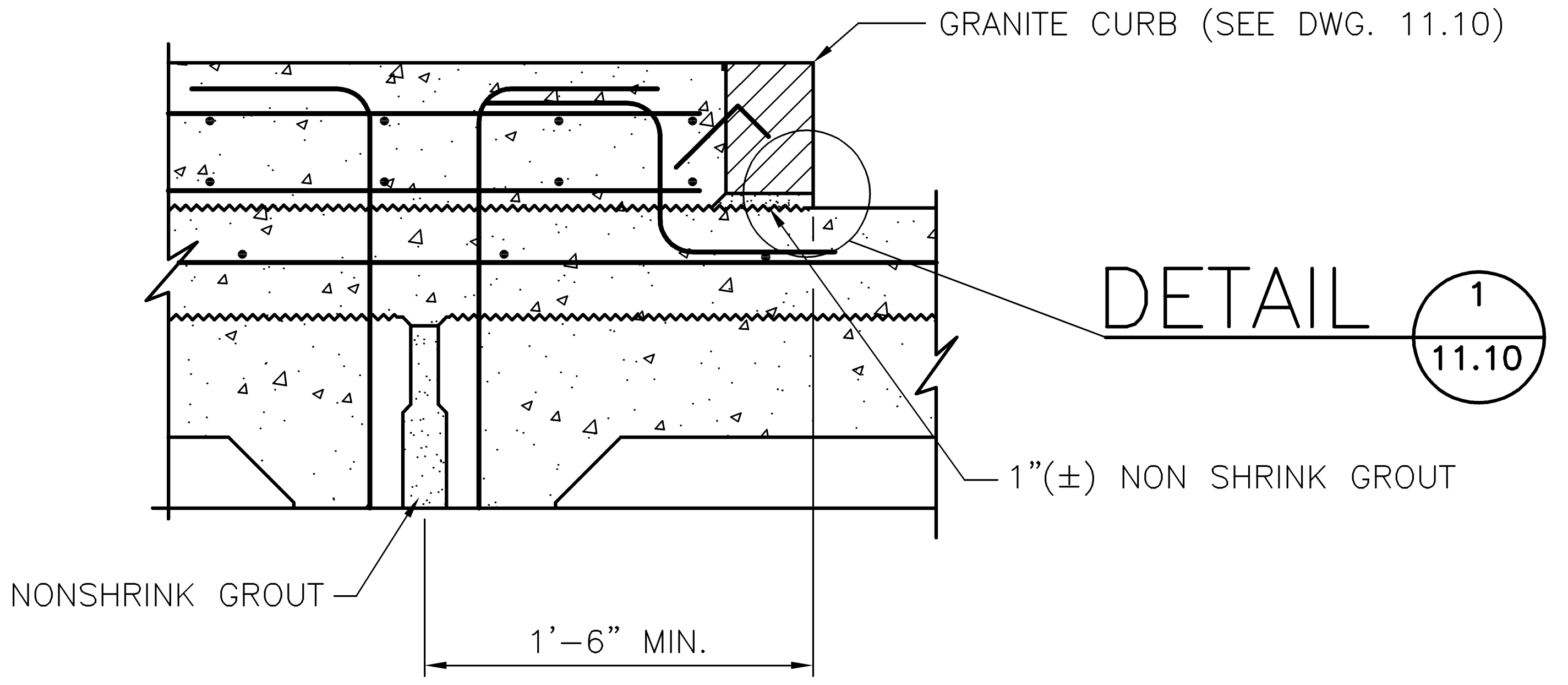
SIDEWALK OVERHANG WITHOUT UTILITIES


SIDEWALK
ALL REINFORCING SHALL MEET THE LATEST AASHTO CODE REQUIREMENTS
OPTIONAL CONST. JOINT
SIDEWALK POUR MUST ENGAGE TWO BEAMS
GALVANIZED STEEL ANGLE SIZE AND SPACING TO BE DETERMINED BY DESIGN
THE TOP OF COMPOSITE REINFORCED CONCRETE DECK SHALL BE GIVEN A RAKED FINISH (¼" AMPLITUDE) UNDER SIDEWALK
PARAPET
2x4 KEY
SEE DESIGNER NOTE 8
9"* MAX.
SPECIAL UNIT (OR STANDARD SLAB)
UTILITY BAY
2'-0" MIN.
1'-0" MIN.

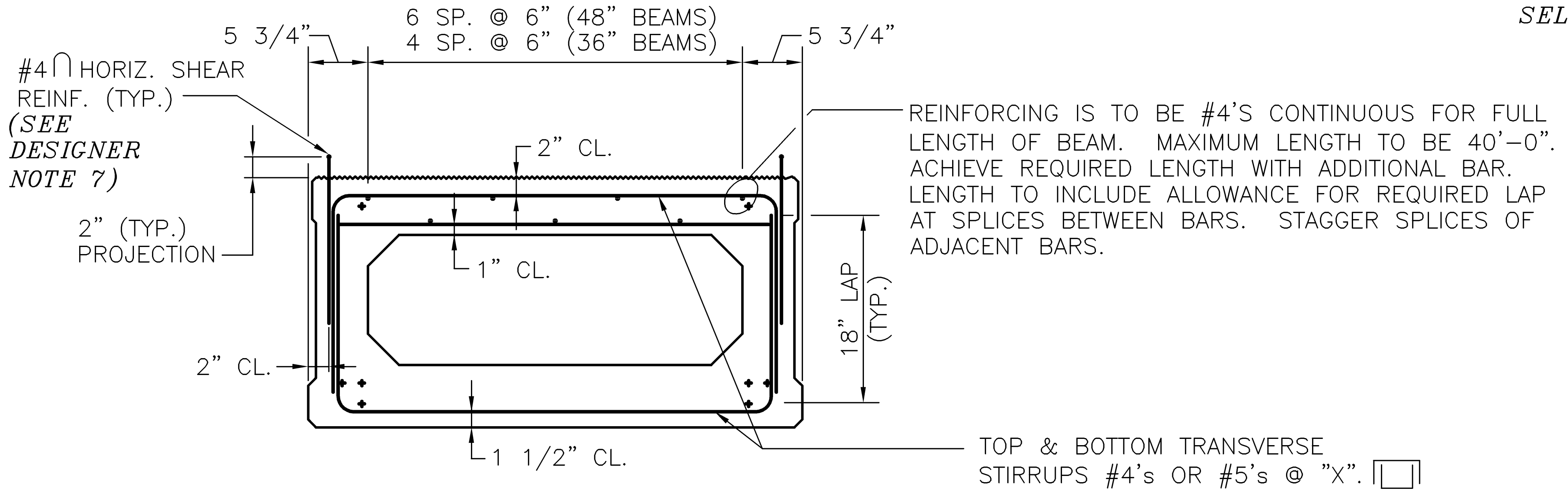
* SEE DESIGNER NOTE 1 ON DRAWING No. 7.40

SIDEWALK OVERHANG WITH UTILITIES

NOTE:
POST TENSIONING REQUIREMENT NOT APPLICABLE TO SPECIAL UNIT



CURB DETAIL


5 3/4"
6 SP. @ 6" (48" BEAMS)
4 SP. @ 6" (36" BEAMS)
5 3/4"
#4∩ HORIZ. SHEAR REINF. (TYP.)
(SEE DESIGNER NOTE 7)
2" (TYP.) PROJECTION
2" CL.
1" CL.
2" CL.
1 1/2" CL.
18" LAP (TYP.)
REINFORCING IS TO BE #4'S CONTINUOUS FOR FULL LENGTH OF BEAM. MAXIMUM LENGTH TO BE 40'-0". ACHIEVE REQUIRED LENGTH WITH ADDITIONAL BAR. LENGTH TO INCLUDE ALLOWANCE FOR REQUIRED LAP AT SPLICES BETWEEN BARS. STAGGER SPLICES OF ADJACENT BARS.
TOP & BOTTOM TRANSVERSE STIRRUPS #4's OR #5's @ "X".
(SEE DESIGNER NOTE 5)

MID SPAN REINFORCING PATTERN

DESIGNER NOTES:

1. *THIS DRAWING APPLIES TO PRESTRESSED CONCRETE BOX BEAMS WITH A 5" MINIMUM COMPOSITE REINFORCED CONCRETE DECK OVERLAY ONLY. FOR PRESTRESSED CONCRETE BOX BEAMS WITH AN ASPHALT WEARING SURFACE REFER TO DWG No. 7.70 & No. 7.71.*
2. *DESIGN END STIRRUPS IN ACCORDANCE WITH AASHTO LRFD BRIDGE DESIGN SPECIFICATION REQUIREMENTS FOR ANCHORAGE ZONES.*
3. *HORIZONTAL END STIRRUPS SHALL BE EMBEDDED A MINIMUM DISTANCE EQUAL TO DEPTH OF BEAM INTO THE WEB OF THE VOIDED SECTION. LENGTH OF EMBEDMENT SHALL BE NOTED ON THE PLAN.*
4. *THE HORIZONTAL LEG OF VERTICAL END STIRRUPS SHALL EQUAL THE DEPTH OF THE BEAM AND SHALL BE DIMENSIONED ON THE PLAN VIEW.*
5. *TOP AND BOTTOM TRANSVERSE STIRRUP SIZE AND SPACING SHALL BE AS REQUIRED BY DESIGN, WITH THE ADDITIONAL REQUIREMENT THAT SPACING DOES NOT EXCEED 16".*
6. *PROPERLY NOTE AND SHOW THE LOCATION AND SPACING OF ANY DOWELS WHICH EXTEND INTO SLABS, SIDEWALKS, CURB OR BARRIERS IN THE CROSS SECTION AND PLAN VIEWS OF THE BEAMS.*
7. *HORIZONTAL SHEAR REINFORCEMENT SHALL BE DESIGNED IN ACCORDANCE WITH AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS AND SHALL BE SPACED AT A MULTIPLE OF THE STANDARD STIRRUP SPACING. PROVIDE ADDITIONAL PROJECTION FOR USE WITH SPREAD BOX BEAM UNITS.*
8. *THE EXTERIOR FACE OF THE FASCIA BEAMS SHALL RECEIVE A SELECTED FORMLINER OR RUBBED FINISH.*

THIS SHEET IS NOT TO SCALE

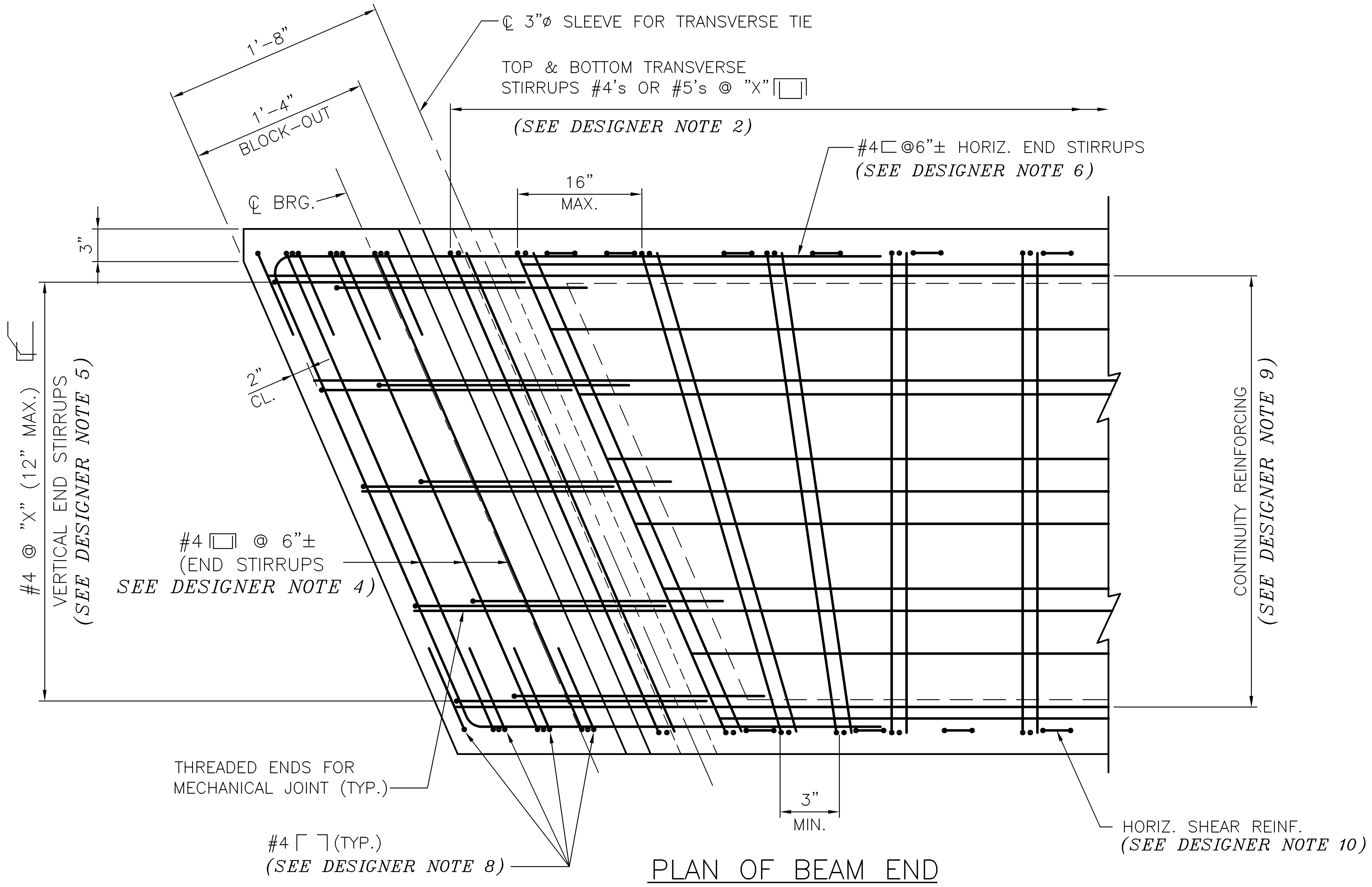
REVISIONS	
No.	DATE

RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

BRIDGE STANDARDS

PRECAST CONCRETE
BUTTED BOX BEAMS
SHEET 5

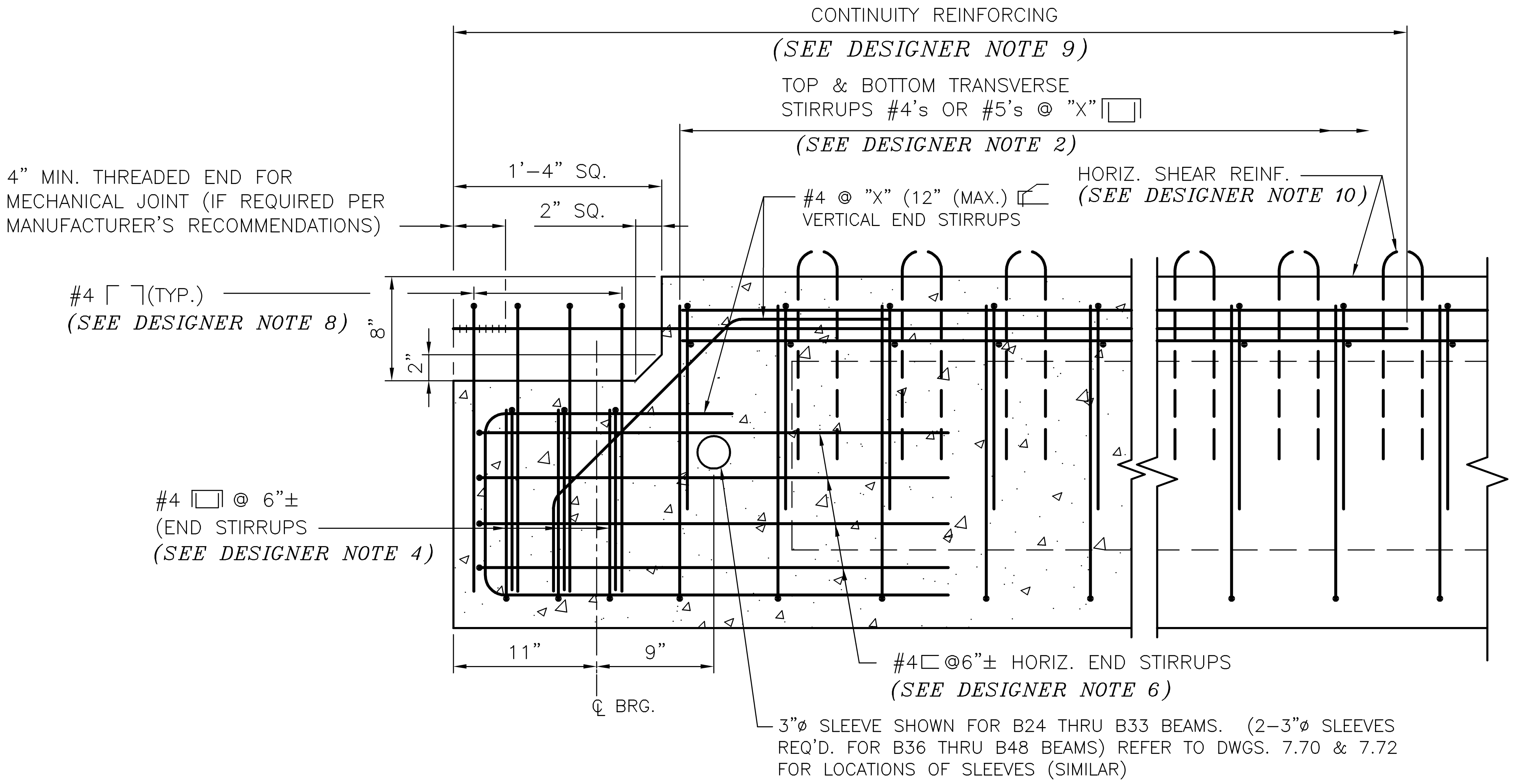
DRAWING NUMBER: 7.73



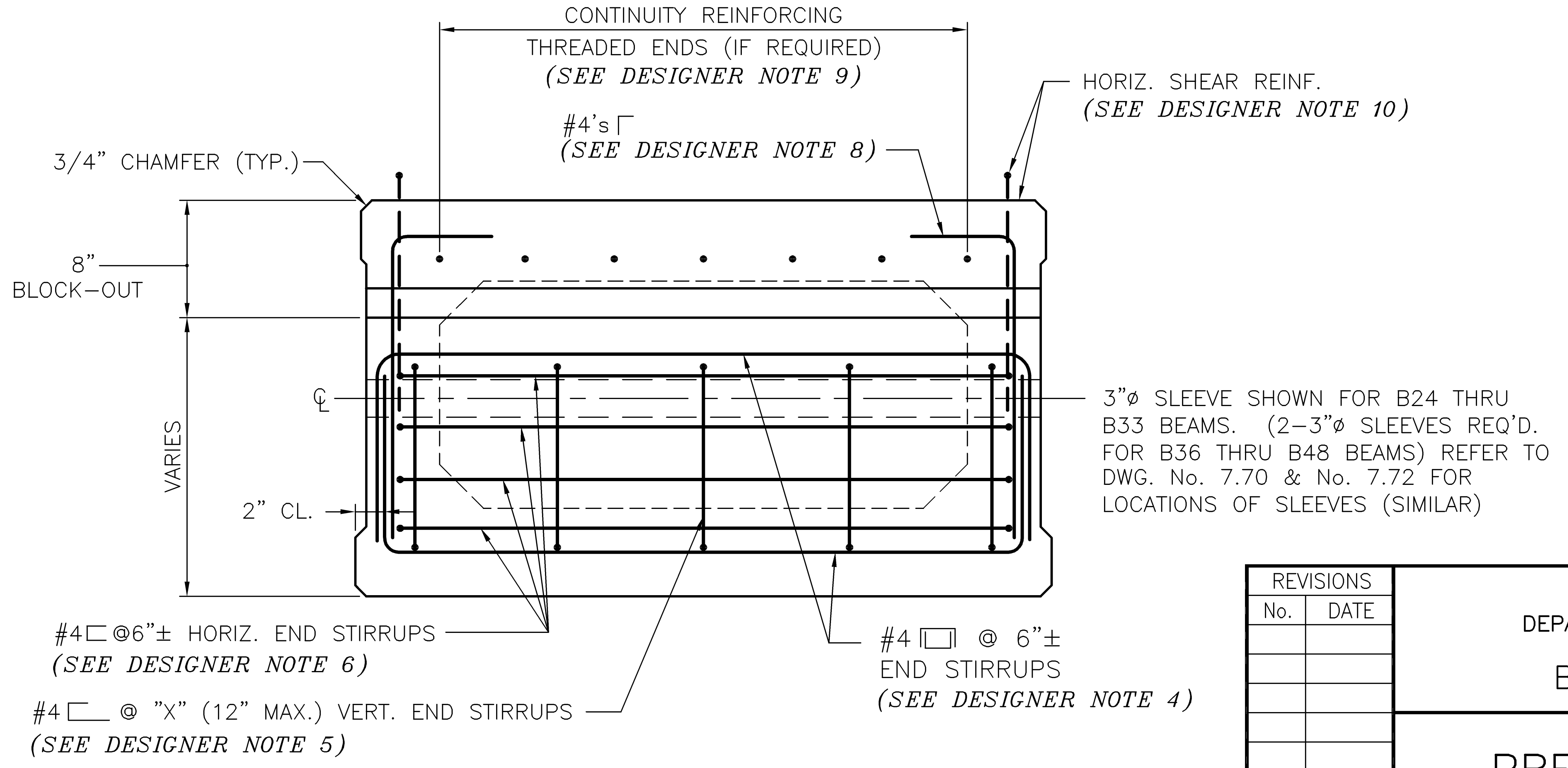
PLAN OF BEAM END

DESIGNER NOTES:

1. ALL PRESTRESSED BEAMS WILL BE DESIGNED ACCORDING TO THE LATEST AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS FOR HIGHWAY BRIDGES
2. TOP AND BOTTOM TRANSVERSE STIRRUP SIZE AND SPACING SHALL BE AS REQUIRED BY DESIGN, WITH THE ADDITIONAL REQUIREMENT THAT SPACING DOES NOT EXCEED 16"
3. THE ACTUAL NUMBER AND LOCATION OF THE PRESTRESSED STRANDS SHALL BE DESIGNED AND SHALL CONFORM TO THE SPACINGS SHOWN ON DRAWING No. 7.60.
4. END STIRRUPS LOCATED ¼ OF THE BEAM DEPTH FROM THE END SHALL BE DESIGNED TO MEET THE AASHTO LRFD BRIDGE REQUIREMENTS FOR ANCHORAGE ZONES OF PRESTRESSED CONCRETE BEAMS. ALL OTHER STIRRUPS IN THE BLOCK-OUT SECTION SHALL BE DESIGNED AS TRANSVERSE STIRRUPS.
5. THE HORIZONTAL LEGS OF THE VERTICAL END STIRRUPS ARE EQUAL TO THE DEPTH OF THE BEAM AND SHALL BE DIMENSIONED ON THE PLAN.
6. HORIZONTAL END STIRRUPS SHALL BE EMBEDDED A MINIMUM DISTANCE EQUAL TO THE DEPTH OF THE BEAM (OR 12") INTO THE WEB OF THE VOIDED SECTION, WHICHEVER IS LONGER. LENGTH OF EMBEDMENT SHALL BE NOTED ON THE PLAN VIEW.
7. PROPERLY NOTE OR SHOW THE LOCATION AND SPACING OF ANY DOWELS WHICH EXTEND INTO SIDEWALKS, CURBS, OR BARRIERS ON THE CROSS-SECTION AND PLAN VIEWS OF THE BEAMS.
8. IF BLOCK-OUT SECTION IS FOR CONTINUITY , PROVIDE #4 BARS TO MEET SHEAR REQUIREMENTS. IF BLOCK-OUT SECTION IS FOR A JOINT SYSTEM, PROVIDE A MINIMUM OF 4-#4 BARS. (TYP.)
9. THE LENGTH, SIZE AND QUANTITY OF CONTINUITY REINFORCEMENT SHALL BE DETERMINED BY THE DESIGNER. CONTINUITY REINFORCEMENT WILL NOT BE REQUIRED IF BLOCK OUT IS FOR PLACING A JOINT SYSTEM.
10. THE DESIGNER SHALL COORDINATE THIS DRAWING WITH DRAWING Nos. 7.60, 7.70, 7.71, 7.72 & 7.73. HORIZONTAL SHEAR REINFORCING AND RAKED TOP SURFACES SHALL BE REQUIRED FOR BUTTED BOX BEAMS UTILIZING A 5" MIN. COMPOSITE REINFORCED CONCRETE DECK OVERLAY.


CONTINUITY REINFORCING
(SEE DESIGNER NOTE 9)
TOP & BOTTOM TRANSVERSE STIRRUPS #4's OR #5's @ "X"
(SEE DESIGNER NOTE 2)
4" MIN. THREADED END FOR MECHANICAL JOINT (IF REQUIRED PER MANUFACTURER'S RECOMMENDATIONS)
1'-4" SQ.
2" SQ.
#4 @ "X" (12" (MAX.)
VERTICAL END STIRRUPS
HORIZ. SHEAR REINF.
(SEE DESIGNER NOTE 10)
#4 (TYP.)
(SEE DESIGNER NOTE 8)
8"
2"
#4 @ 6"±
(END STIRRUPS
(SEE DESIGNER NOTE 4)
11"
9"
℄ BRG.
#4 @6"± HORIZ. END STIRRUPS
(SEE DESIGNER NOTE 6)
3"ø SLEEVE SHOWN FOR B24 THRU B33 BEAMS. (2-3"ø SLEEVES REQ'D. FOR B36 THRU B48 BEAMS) REFER TO DWGS. 7.70 & 7.72 FOR LOCATIONS OF SLEEVES (SIMILAR)

LONGITUDINAL SECTION


CONTINUITY REINFORCING
THREADED ENDS (IF REQUIRED)
(SEE DESIGNER NOTE 9)
#4's
(SEE DESIGNER NOTE 8)
HORIZ. SHEAR REINF.
(SEE DESIGNER NOTE 10)
3/4" CHAMFER (TYP.)
8" BLOCK-OUT
℄
VARIES
2" CL.
3"ø SLEEVE SHOWN FOR B24 THRU B33 BEAMS. (2-3"ø SLEEVES REQ'D. FOR B36 THRU B48 BEAMS) REFER TO DWG. No. 7.70 & No. 7.72 FOR LOCATIONS OF SLEEVES (SIMILAR)
#4 @6"± HORIZ. END STIRRUPS
(SEE DESIGNER NOTE 6)
#4 @ "X" (12" MAX.) VERT. END STIRRUPS
(SEE DESIGNER NOTE 5)
#4 @ 6"±
END STIRRUPS
(SEE DESIGNER NOTE 4)

END OF BEAM SECTION

END REINFORCING PATTERN (WITH BLOCK-OUT)

REVISIONS	
No.	DATE

RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

BRIDGE STANDARDS

PRECAST CONCRETE
BUTTED BOX BEAMS
SHEET 6

DRAWING NUMBER: 7.74

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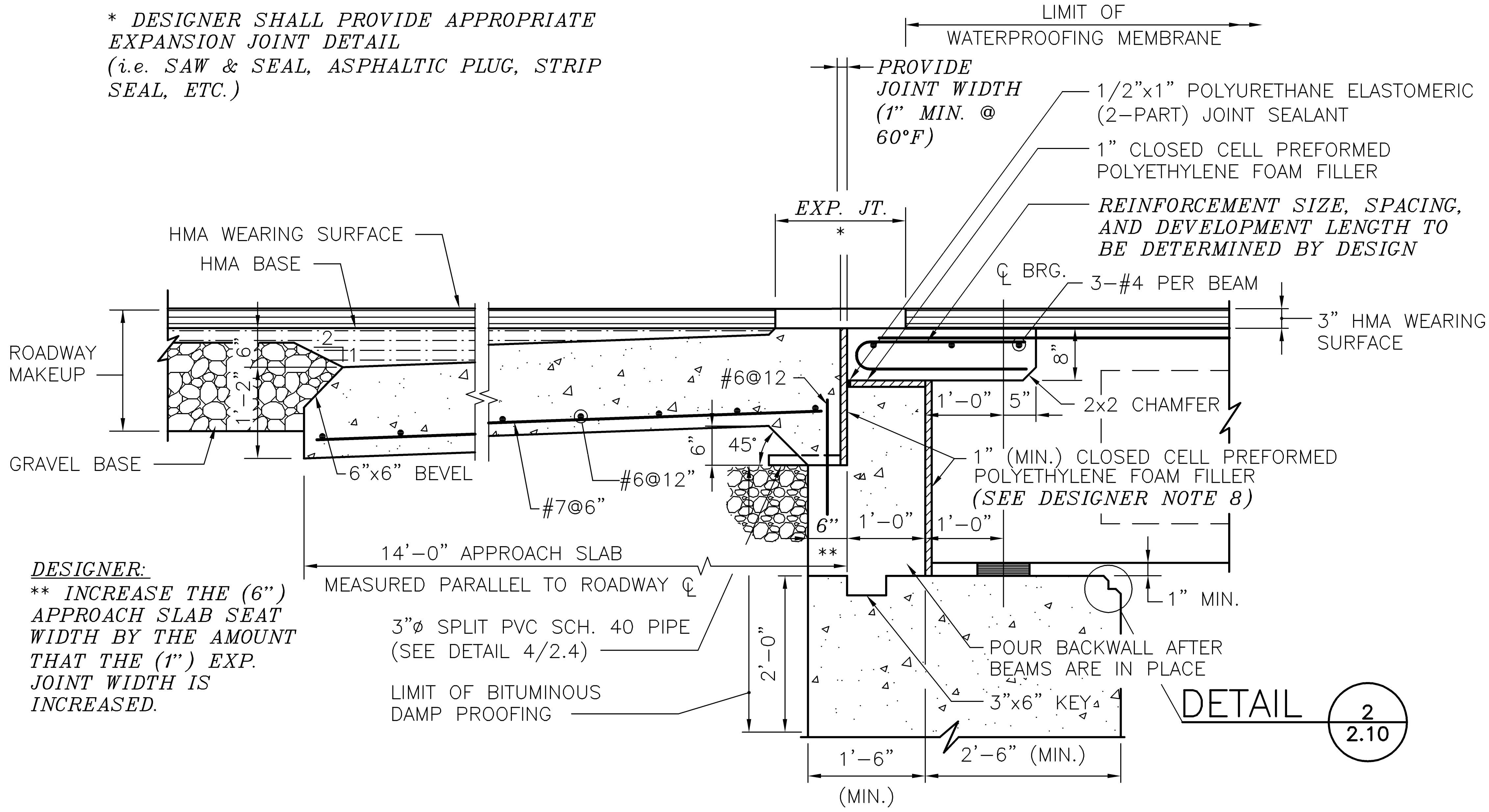
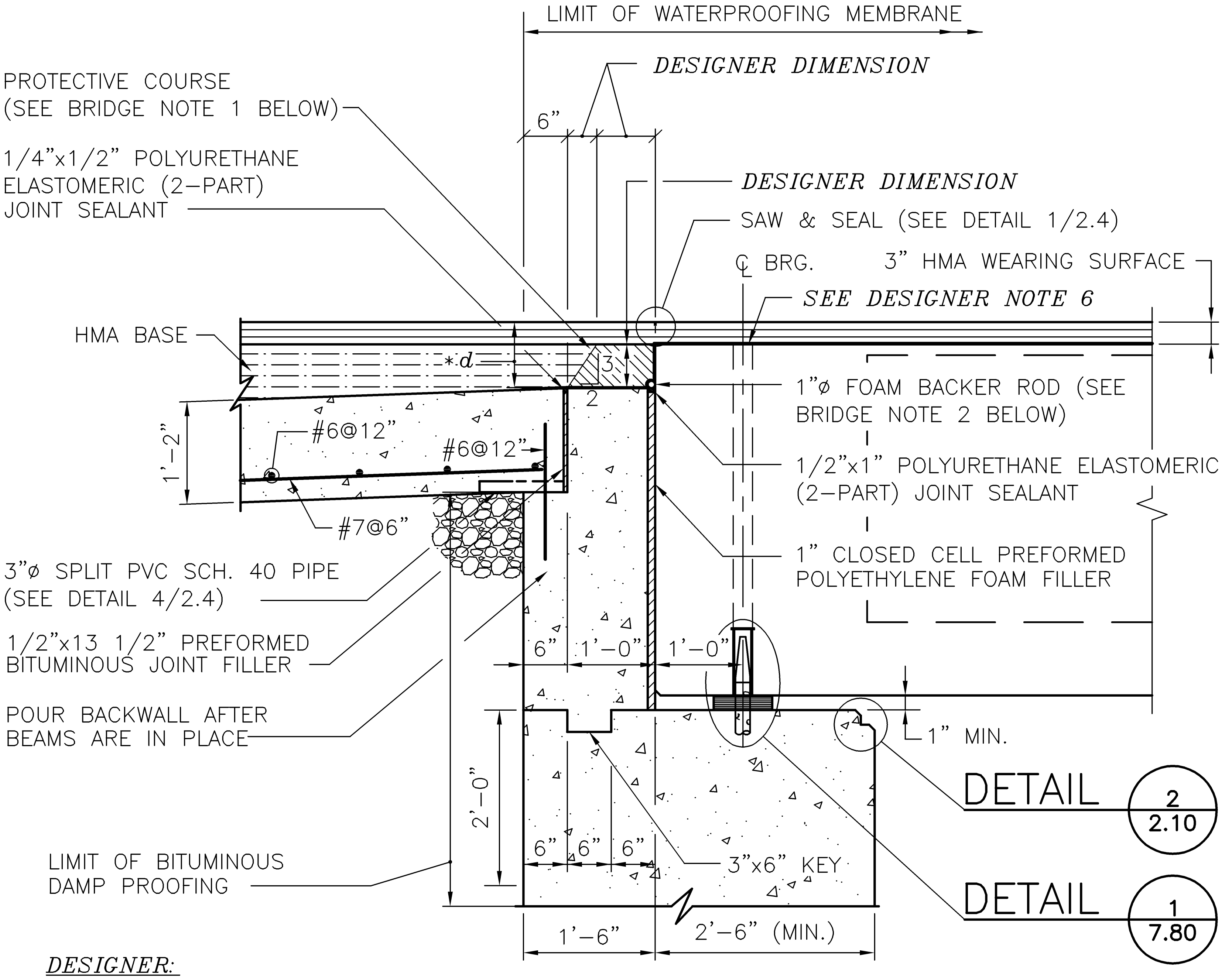

LIMIT OF WATERPROOFING MEMBRANE
PROVIDE JOINT WIDTH (1" MIN. @ 60°F)
1/2"x1" POLYURETHANE ELASTOMERIC (2-PART) JOINT SEALANT
1" CLOSED CELL PREFORMED POLYETHYLENE FOAM FILLER
REINFORCEMENT SIZE, SPACING, AND DEVELOPMENT LENGTH TO BE DETERMINED BY DESIGN
EXP. JT.
*
HMA WEARING SURFACE
HMA BASE
℄ BRG.
3-#4 PER BEAM
3" HMA WEARING SURFACE
ROADWAY MAKEUP
2
1
1'-2"
6"
#6@12
8"
1'-0"
5"
2x2 CHAMFER
GRAVEL BASE
6"x6" BEVEL
#6@12"
45°
6"
1" (MIN.) CLOSED CELL PREFORMED POLYETHYLENE FOAM FILLER (SEE DESIGNER NOTE 8)
#7@6"
6"
1'-0"
1'-0"
14'-0" APPROACH SLAB
MEASURED PARALLEL TO ROADWAY ℄
**
1" MIN.
3"ø SPLIT PVC SCH. 40 PIPE (SEE DETAIL 4/2.4)
2'-0"
POUR BACKWALL AFTER BEAMS ARE IN PLACE
LIMIT OF BITUMINOUS DAMP PROOFING
3"x6" KEY
DETAIL 2 / 2.10
1'-6"
2'-6" (MIN.)
(MIN.)

* DESIGNER SHALL PROVIDE APPROPRIATE EXPANSION JOINT DETAIL (i.e. SAW & SEAL, ASPHALTIC PLUG, STRIP SEAL, ETC.)

DESIGNER:

*** INCREASE THE (6") APPROACH SLAB SEAT WIDTH BY THE AMOUNT THAT THE (1") EXP. JOINT WIDTH IS INCREASED.*

AT EXPANSION JOINT

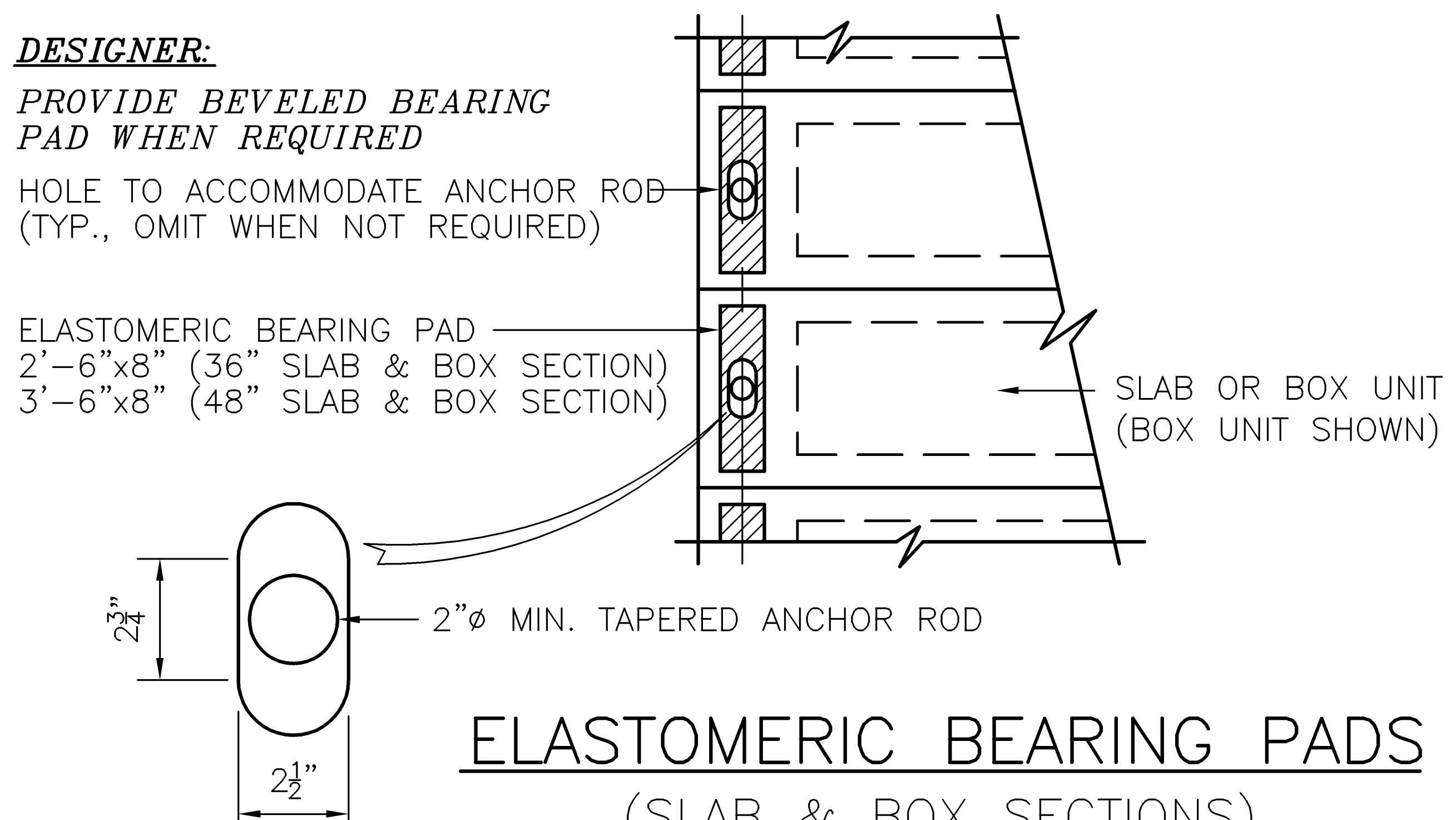

LIMIT OF WATERPROOFING MEMBRANE
DESIGNER DIMENSION
PROTECTIVE COURSE (SEE BRIDGE NOTE 1 BELOW)
6"
1/4"x1/2" POLYURETHANE ELASTOMERIC (2-PART) JOINT SEALANT
DESIGNER DIMENSION
SAW & SEAL (SEE DETAIL 1/2.4)
℄ BRG.
3" HMA WEARING SURFACE
SEE DESIGNER NOTE 6
HMA BASE
*d
3
2
1'-2"
#6@12"
#6@12"
1"ø FOAM BACKER ROD (SEE BRIDGE NOTE 2 BELOW)
#7@6"
1/2"x1" POLYURETHANE ELASTOMERIC (2-PART) JOINT SEALANT
1" CLOSED CELL PREFORMED POLYETHYLENE FOAM FILLER
3"ø SPLIT PVC SCH. 40 PIPE (SEE DETAIL 4/2.4)
1/2"x13 1/2" PREFORMED BITUMINOUS JOINT FILLER
6"
1'-0"
1'-0"
POUR BACKWALL AFTER BEAMS ARE IN PLACE
1" MIN.
DETAIL 2 / 2.10
2'-0"
6"
6"
6"
3"x6" KEY
LIMIT OF BITUMINOUS DAMP PROOFING
DETAIL 1 / 7.80
1'-6"
2'-6" (MIN.)

DESIGNER:
**d=DESIGN DEPTH OF APPROACH PAVEMENT*

AT FIXED JOINT

PRESTRESSED BUTTED BOX BEAM – SPANS OVER 65 FEET

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


DESIGNER:
PROVIDE BEVELED BEARING PAD WHEN REQUIRED
HOLE TO ACCOMMODATE ANCHOR ROD (TYP., OMIT WHEN NOT REQUIRED)
ELASTOMERIC BEARING PAD 2'-6"x8" (36" SLAB & BOX SECTION) 3'-6"x8" (48" SLAB & BOX SECTION)
SLAB OR BOX UNIT (BOX UNIT SHOWN)
2¾"
2"ø MIN. TAPERED ANCHOR ROD
2½"

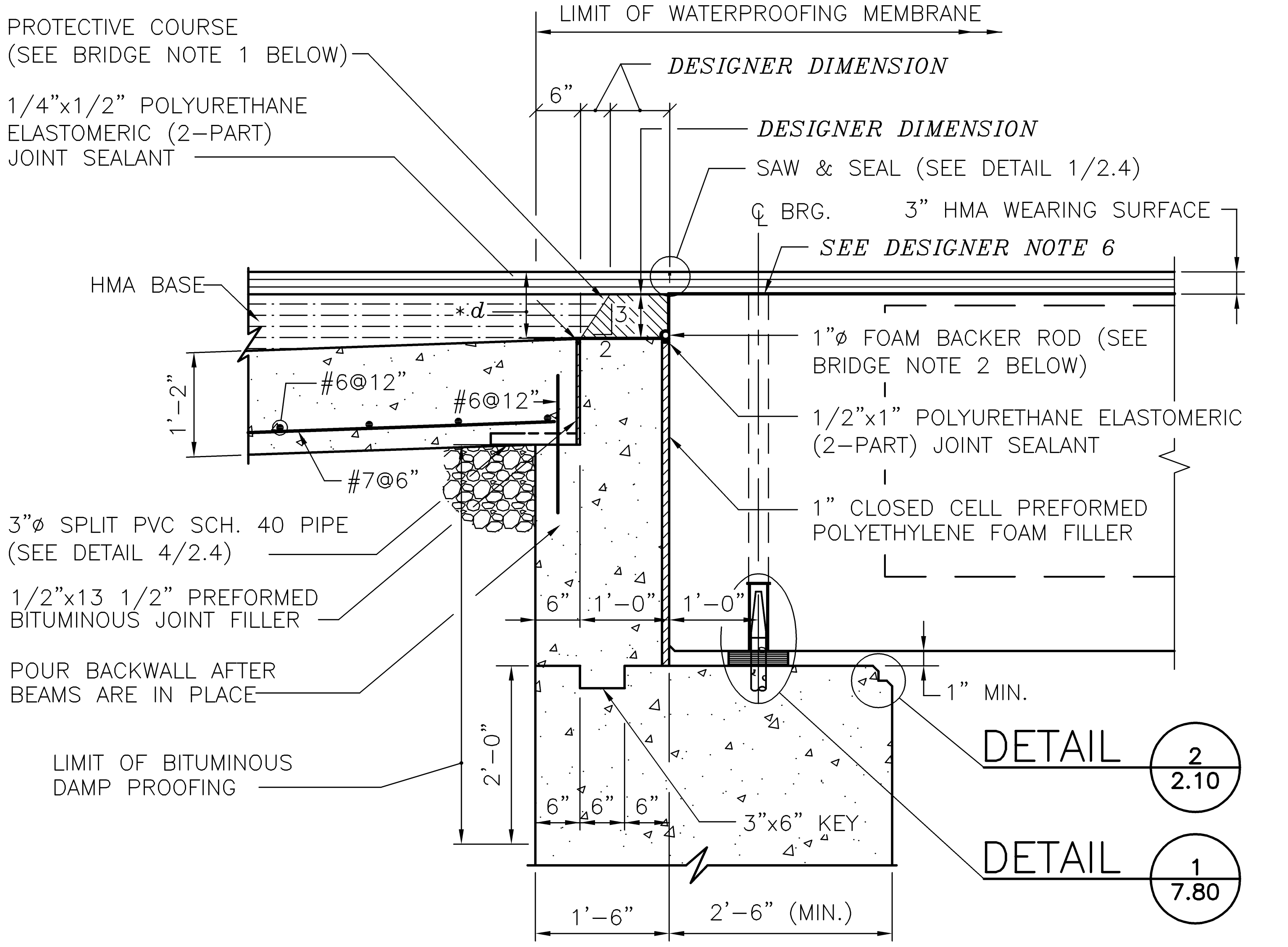
ELASTOMERIC BEARING PADS

(SLAB & BOX SECTIONS)

SCALE:3/8"=1'-0"

DESIGNER NOTES:

1. *IN GENERAL, THE USE OF CHEEK WALLS TO RESTRICT TRANSVERSE MOVEMENT IS ENCOURAGED; HOWEVER, ANCHOR RODS ARE TO BE PROVIDED AT FIXED JOINTS OF SPANS EXCEEDING 65 FEET, WHERE CHEEK WALLS CANNOT BE PROVIDED FOR TRANSVERSE RESTRAINT, OR WHERE THEY ARE REQUIRED TO PREVENT STRUCTURE MOVEMENT DUE TO EXCESSIVE PROFILE GRADE.*
2. *ANCHOR ROD DIAMETERS SHOWN ARE MINIMUM REQUIRED. DESIGNER SHALL DETERMINE IF A LARGER SIZE, BASED ON SEISMIC AND OTHER AASHTO LOADING REQUIREMENTS, IS REQUIRED.*
3. *AT THE FIXED BEARINGS, ANCHOR RODS SHALL BE PROVIDED FOR APPROXIMATELY 1/3 OF ALL GIRDERS OR BEAMS. THIS SHALL PREFERABLY OCCUR AT THE INTERIOR GIRDERS OR BEAMS.*
4. *THE DESIGNER SHALL PROVIDE THE APPROPRIATE EXPANSION JOINT DETAIL FOR THE AMOUNT OF ANTICIPATED EXPANSION. REFER TO RIDOT BRIDGE DESIGN MANUAL (SECTION 14).*
5. *FOR DETAILS OF THE STRIP SEAL EXPANSION JOINT, REFER TO DRAWINGS No. 4.20 AND No. 4.30.*
6. *FOR SHALLOW BEAMS, AN ALTERNATE ANCHOR BOLT DETAIL MAY BE SHOWN USING A DRILLING AND GROUTING TECHNIQUE AT THE APPROVAL OF THE ENGINEER. AN ALTERNATIVE TO USING ANCHOR RODS AT EXPANSION JOINTS WOULD BE TO DETAIL SHEAR BLOCKS (OR CHEEK WALLS AT ALL FOUR CORNERS) TO RESTRICT TRANSVERSE MOVEMENT OF THE DECK.*
7. *THE DESIGN OF THE ELASTOMERIC BEARINGS SHALL BE IN ACCORDANCE WITH AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.*
8. *THICKNESS OF CLOSED CELL PREFORMED POLYETHYLENE FOAM BETWEEN APPROACH SLAB AND BACKWALL SHALL BE DETERMINED BASED ON ANTICIPATED THERMAL MOVEMENT OF THE BRIDGE SUPERSTRUCTURE. THICKNESS OF CLOSED CELL PREFORMED POLYETHYLENE FOAM BETWEEN THE BACKWALL AND PRESTRESSED BEAM SHALL BE THE BASED ON ANTICIPATED THERMAL MOVEMENT PLUS 1/2".*
9. *APPROACH SLAB IS PITCHED (6") TO DRAIN AWAY FROM THE ABUTMENT. THE PITCH MAY NEED TO BE INCREASED (BASED ON BASELINE PROFILE) TO PROVIDE FOR THE MINIMUM DESIGN DEPTH OF APPROACH PAVEMENT AT THE (APPROACH) END OF THE SLAB.*


LIMIT OF WATERPROOFING MEMBRANE
PROTECTIVE COURSE (SEE BRIDGE NOTE 1 BELOW)
DESIGNER DIMENSION
6"
1/4"x1/2" POLYURETHANE ELASTOMERIC (2-PART) JOINT SEALANT
DESIGNER DIMENSION
SAW & SEAL (SEE DETAIL 1/2.4)
℄ BRG.
3" HMA WEARING SURFACE
SEE DESIGNER NOTE 6
HMA BASE
*d
3
2
1'-2"
#6@12"
#6@12"
1"ø FOAM BACKER ROD (SEE BRIDGE NOTE 2 BELOW)
#7@6"
1/2"x1" POLYURETHANE ELASTOMERIC (2-PART) JOINT SEALANT
1" CLOSED CELL PREFORMED POLYETHYLENE FOAM FILLER
3"ø SPLIT PVC SCH. 40 PIPE (SEE DETAIL 4/2.4)
1/2"x13 1/2" PREFORMED BITUMINOUS JOINT FILLER
6"
1'-0"
1'-0"
POUR BACKWALL AFTER BEAMS ARE IN PLACE
1" MIN.
DETAIL 2 / 2.10
LIMIT OF BITUMINOUS DAMP PROOFING
2'-0"
6"
6"
6"
3"x6" KEY
DETAIL 1 / 7.80
1'-6"
2'-6" (MIN.)

AT JOINTS

PRESTRESSED BUTTED BOX BEAM – SPANS UP TO 65 FEET

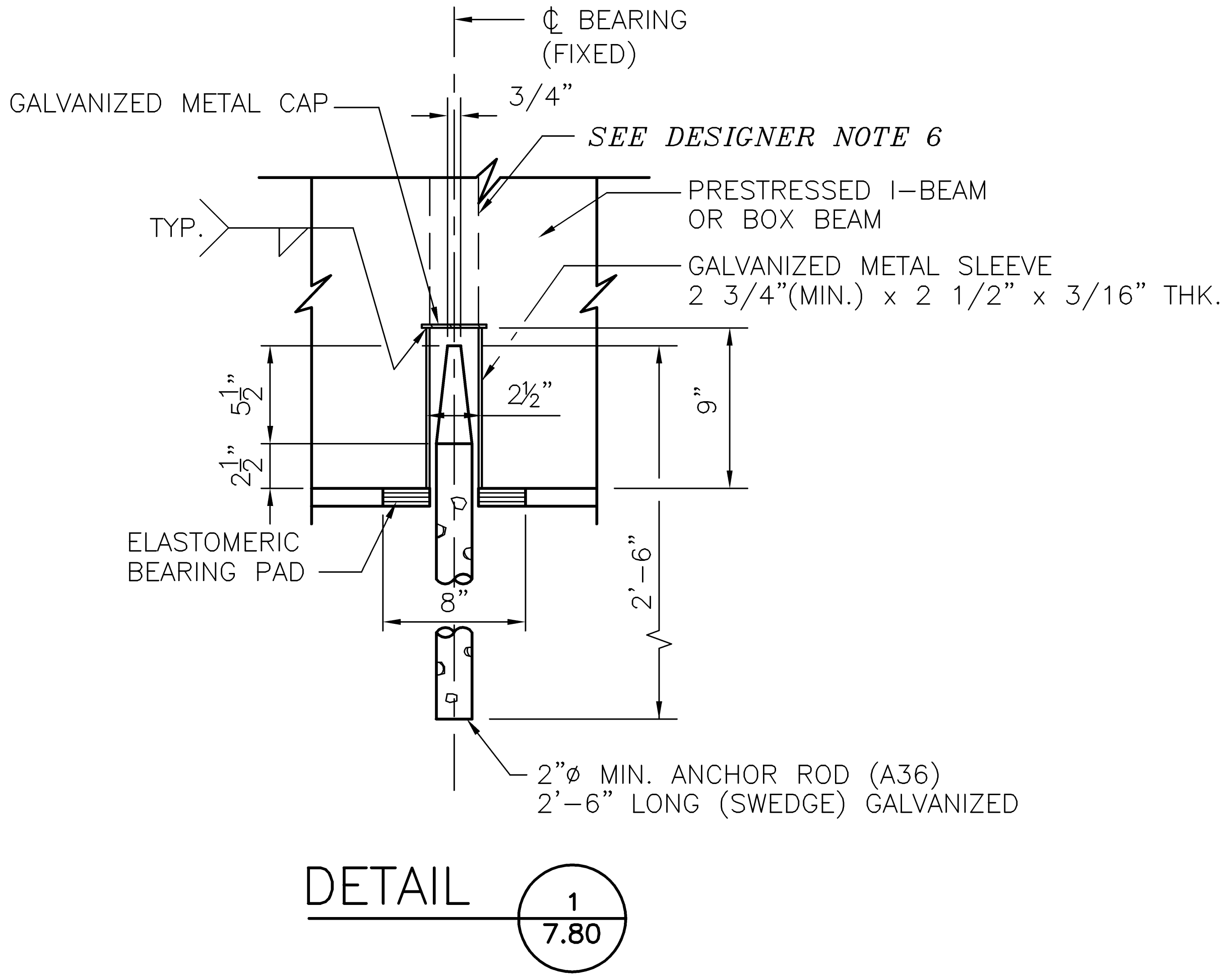
SCALE: 3/4"=1'-0"

BRIDGE NOTES:

TO BE INCLUDED WITH TYPICAL PRESTRESSED BUTTED BOX BEAMS FOR SPANS UP TO 65 FEET (AT EXPANSION & FIXED JOINTS)

1. BRIDGE BINDER TO BE PLACED IN 1 1/2" INCH LAYERS AND COMPACTED WITH MECHANICAL HAND-GUIDED TAMPER WITHIN 12 HOURS AFTER PLACING MEMBRANE WATERPROOFING.
2. DRAPE MEMBRANE WATERPROOFING OVER CLOSED CELL FOAM BACKER ROD.
3. ATTACH CLOSED CELL POLYETHYLENE FOAM TO BACK OF PRECAST BEAM WITH ADHESIVE.

DESIGNER:
**d=DESIGN DEPTH OF APPROACH PAVEMENT*


℄ BEARING (FIXED)
GALVANIZED METAL CAP
3/4"
SEE DESIGNER NOTE 6
TYP.
PRESTRESSED I-BEAM OR BOX BEAM
GALVANIZED METAL SLEEVE 2 3/4"(MIN.) x 2 1/2" x 3/16" THK.
5½"
2½"
2½"
9"
ELASTOMERIC BEARING PAD
8"
2'-6"
2"ø MIN. ANCHOR ROD (A36) 2'-6" LONG (SWEDGE) GALVANIZED
DETAIL 1 / 7.80

ANCHOR ROD DETAILS – AT FIXED BEARINGS

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

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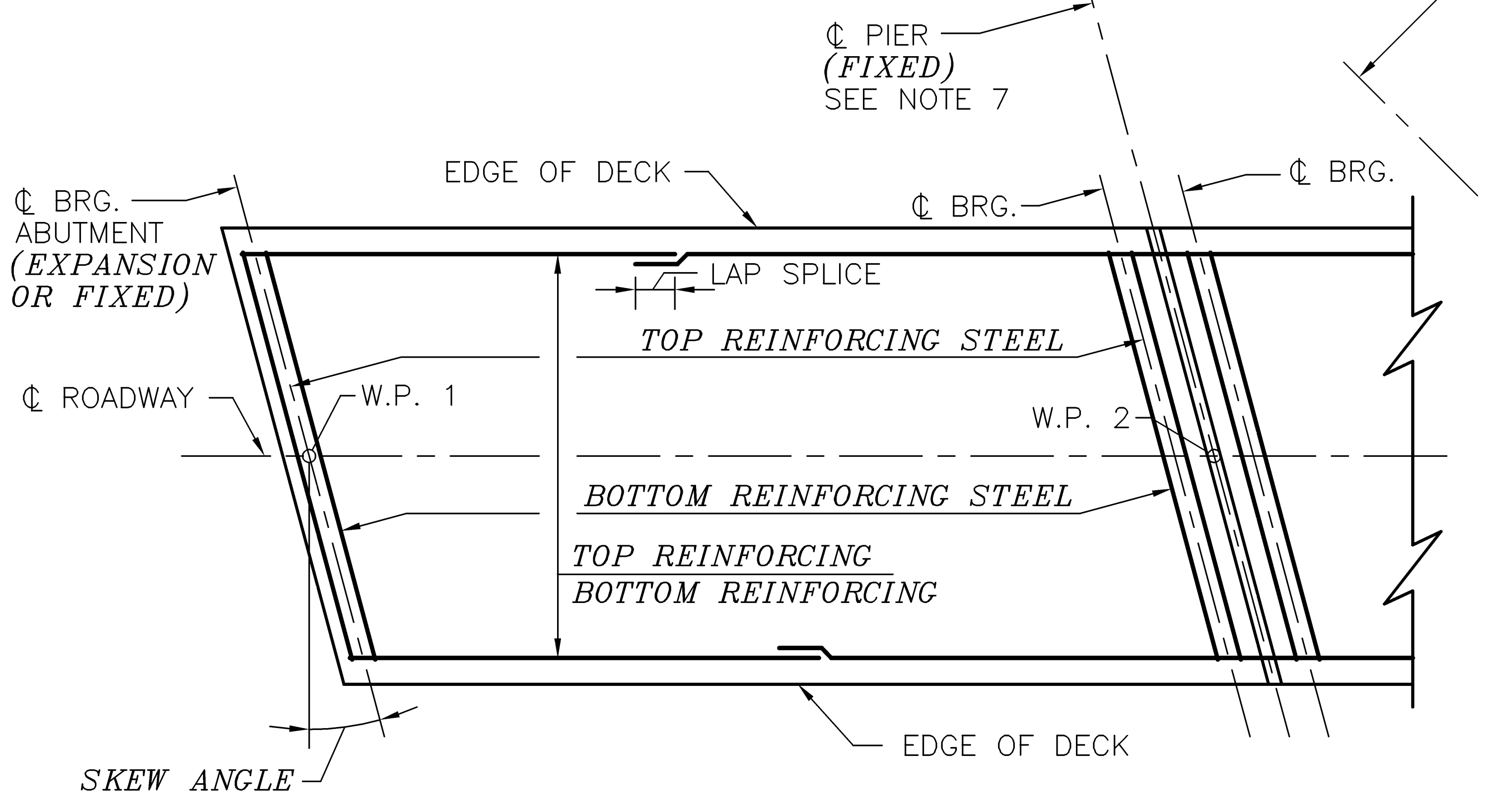
RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

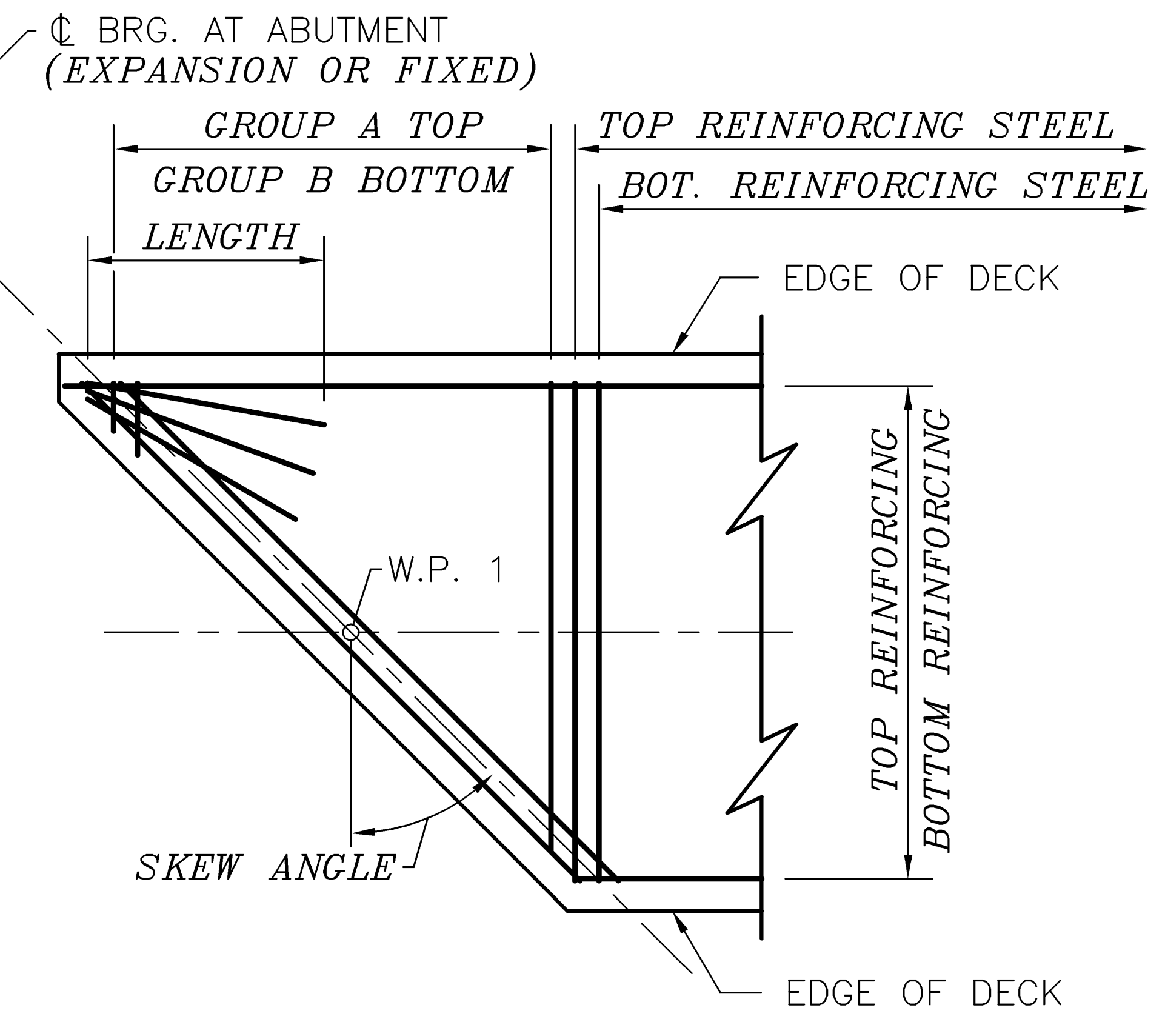
BRIDGE STANDARDS

PRESTRESSED CONCRETE
ANCHOR ROD AND
JOINT DETAILS

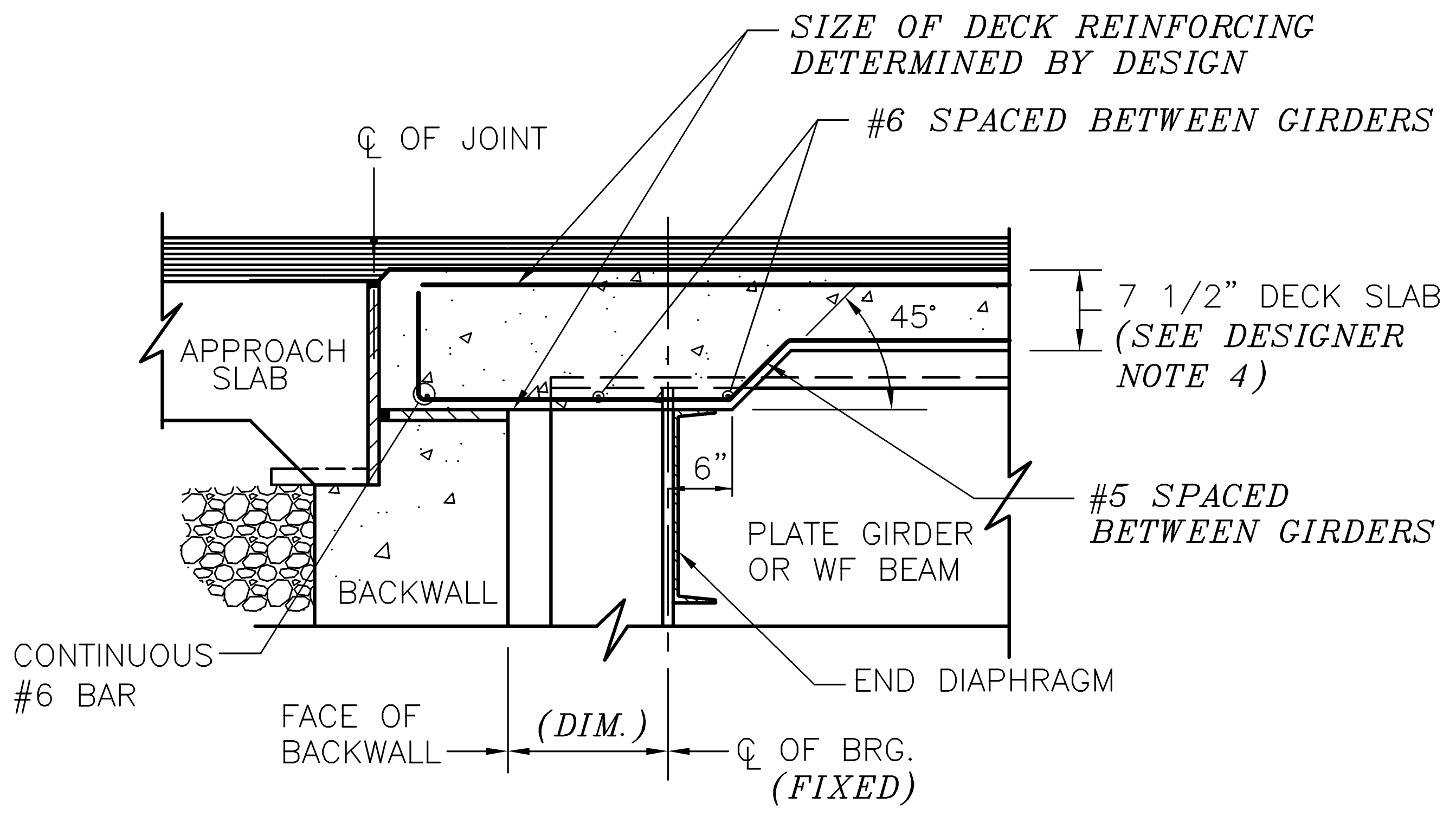
DRAWING NUMBER: 7.80



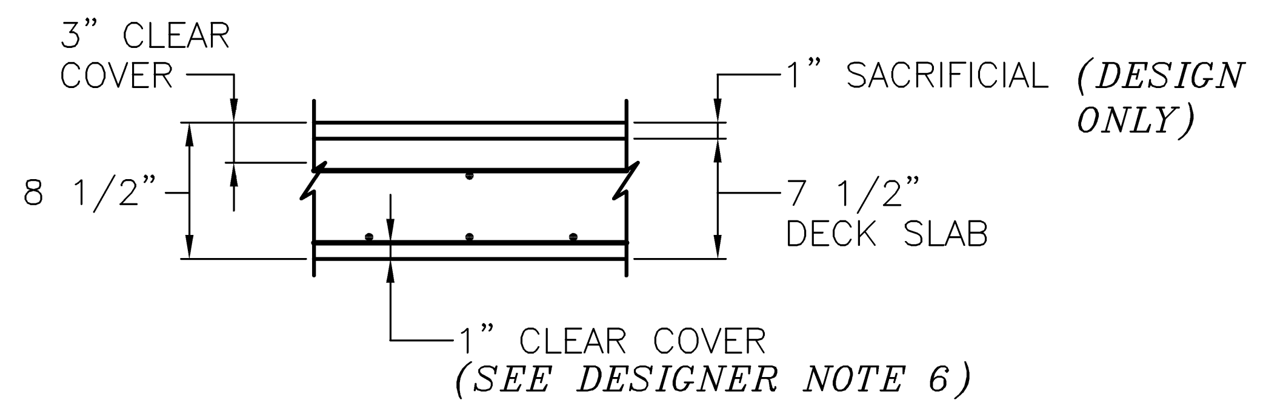
DECK SLAB WITH A SKEW ANGLE OF 30° AND UNDER



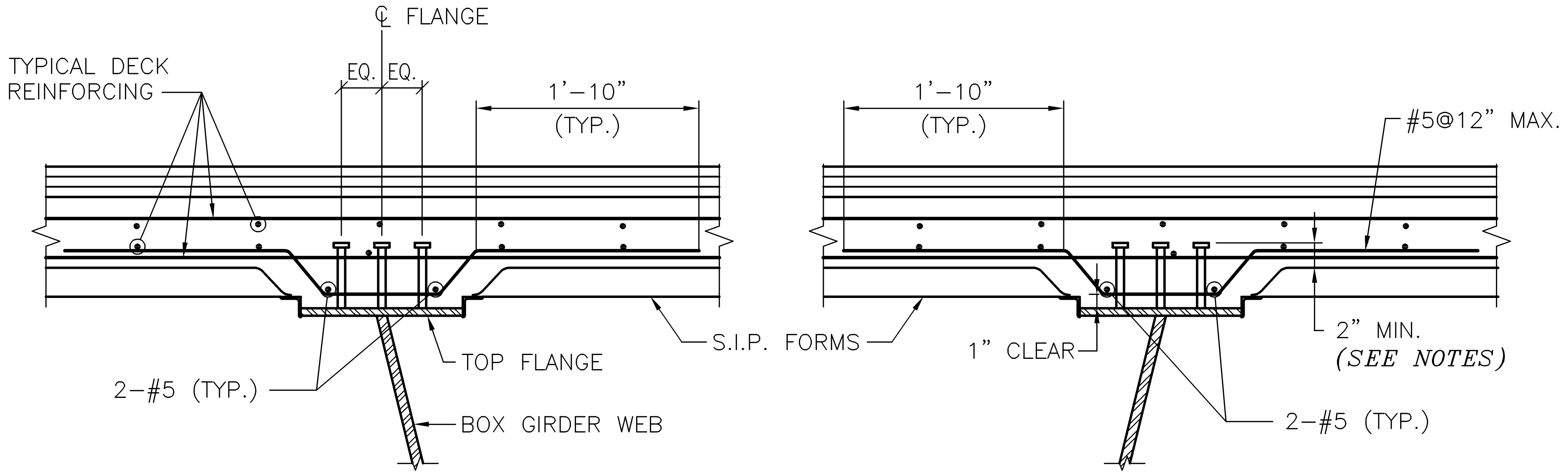
PARTIAL DECK SLAB WITH SKEW ANGLE OVER 30°



DECK HAUNCH DETAIL AT ABUTMENT



EXPOSED CONC. DECK SLAB

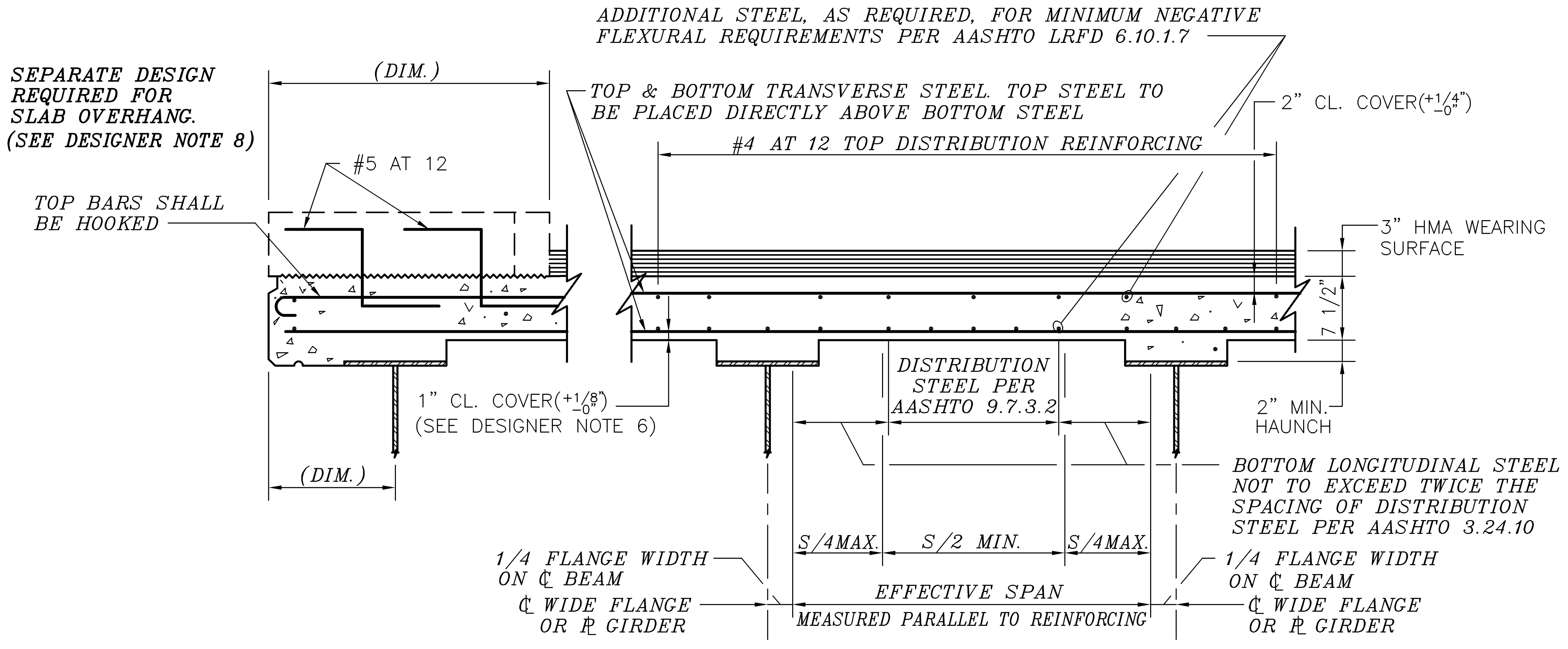


SPECIAL HAUNCH REINFORCING & SHEAR STUD DETAIL

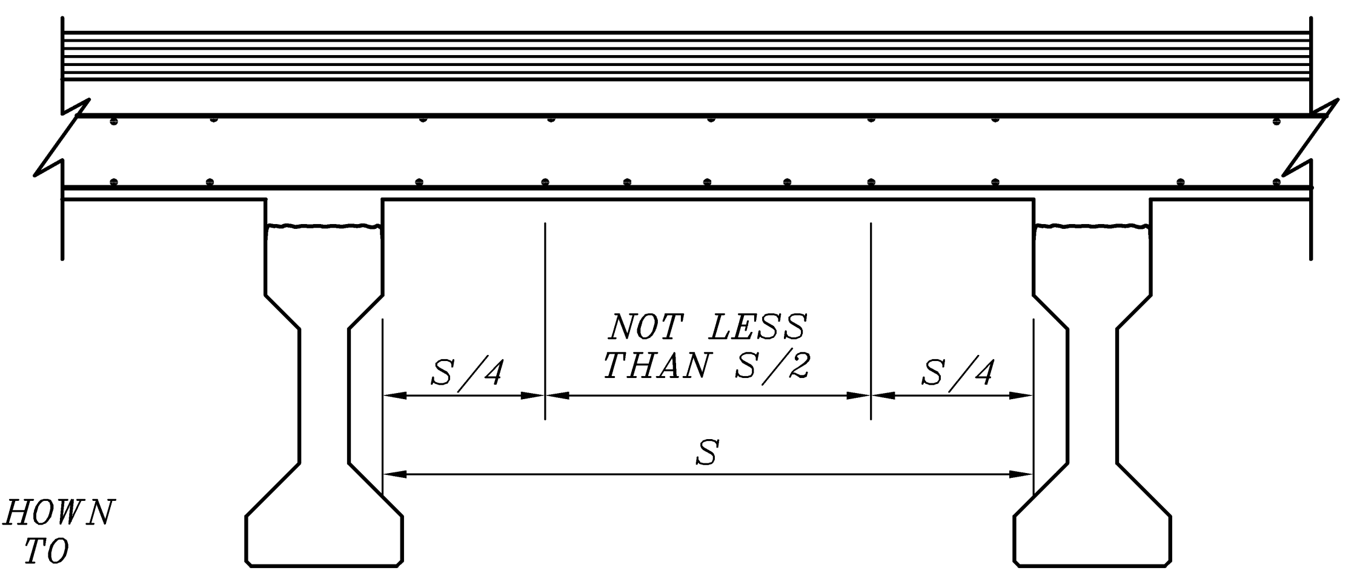
FOR HAUNCHES 4" AND HIGHER

DESIGNER:
SHEAR STUDS SHALL BE PLACED PARALLEL TO THE TRANSVERSE DECK REINFORCING.

THE SHEAR STUDS SHALL EXTEND A MINIMUM OF 2 INCHES ABOVE THE BOTTOM OF THE DECK SLAB


ADDITIONAL STEEL, AS REQUIRED, FOR MINIMUM NEGATIVE FLEXURAL REQUIREMENTS PER AASHTO LRFD 6.10.1.7
SEPARATE DESIGN REQUIRED FOR SLAB OVERHANG. (SEE DESIGNER NOTE 8)
(DIM.)
TOP & BOTTOM TRANSVERSE STEEL. TOP STEEL TO BE PLACED DIRECTLY ABOVE BOTTOM STEEL
2" CL. COVER(+1/4, -0")
#4 AT 12 TOP DISTRIBUTION REINFORCING
#5 AT 12
TOP BARS SHALL BE HOOKED
3" HMA WEARING SURFACE
7 1/2"
DISTRIBUTION STEEL PER AASHTO 9.7.3.2
1" CL. COVER(+1/8, -0")
(SEE DESIGNER NOTE 6)
2" MIN. HAUNCH
(DIM.)
BOTTOM LONGITUDINAL STEEL NOT TO EXCEED TWICE THE SPACING OF DISTRIBUTION STEEL PER AASHTO 3.24.10
S/4MAX.
S/2 MIN.
S/4MAX.
1/4 FLANGE WIDTH ON ℄ BEAM
℄ WIDE FLANGE OR ℙ GIRDER
EFFECTIVE SPAN
MEASURED PARALLEL TO REINFORCING
1/4 FLANGE WIDTH ON ℄ BEAM
℄ WIDE FLANGE OR ℙ GIRDER

SLAB ON STEEL BEAMS



NOTE:
FOR INFORMATION NOT SHOWN ON THIS SECTION REFER TO THE STEEL BEAM SECTION.

SLAB ON PRESTRESSED BEAMS

NOTES:

1. SPACE HAUNCH REINFORCING BETWEEN GIRDERS OR BEAMS AND TIE TO BOTTOM REINFORCING OF DECK.
2. TRANSVERSE REINFORCEMENT LISTED AS STRAIGHT SHALL BE SHOP OR FIELD BENT AS REQUIRED TO PROVIDE MINIMUM COVER.
3. DECK SLAB REINFORCING COVER SHALL HAVE TOLERANCE OF (+)1/4", (-)0" FOR TOP BARS AND (+)1/8", (-)0" FOR BOTTOM BARS.
4. CHAIRS SHALL BE SPACED TO PROVIDE THE REQUIRED CONCRETE COVER WITH THE SPECIFIED TOLERANCES. MAXIMUM SPACING OF CHAIRS SHALL BE 5'-0" ON CENTER, PREFERABLY LOCATED AT THE INTERSECTION OF REINFORCEMENT. CHAIRS SHALL HAVE APPROVED CORROSION PROTECTION (i.e. EPOXY COATED, PLASTIC COATED, ETC.)
5. DECK CONCRETE PLACEMENT SHALL BE IN ACCORDANCE WITH THE RI STANDARD SPECIFICATIONS.
6. SHOULD ADDITIONAL HAUNCH REINFORCING OR ADJUSTMENTS TO THE SHEAR STUD LENGTHS BE NECESSARY DUE TO DEVIATIONS IN THE AS BUILT CAMBER OF THE SUPERSTRUCTURE STEEL IT SHALL BE CONSIDERED AS INCIDENTAL TO THE APPROPRIATE BID ITEMS FOR REINFORCING STEEL AND/OR SHEAR STUDS. THE ADJUSTED LENGTHS OF SHEAR STUDS SHALL BE DETERMINED BY THE ENGINEER. THE REQUIREMENTS FOR REINFORCING HAUNCHES GREATER THAN 4" HIGH SHALL BE AS SHOWN ON THIS SHEET.

DESIGNER NOTES:

1. *TOP BARS SHALL BE LAPPED MIDWAY BETWEEN GIRDERS.*
2. *MAXIMUM LENGTH OF REINFORCING BARS SHALL PREFERABLY BE LIMITED TO 35'-0".*
3. *THE EXACT POURING SEQUENCE SHALL BE PROVIDED BY THE DESIGNER/ENGINEER AND SHOWN ON THE DRAWINGS.*
4. *STANDARD MINIMUM SLAB THICKNESS SHALL BE 7 1/2" UNLESS UNUSUAL DESIGN OR LONGER EFFECTIVE SPAN DICTATES THAT A THICKER SLAB IS REQUIRED.*
5. *THE APPLICABLE NOTES PROVIDED BELOW SHALL BE INCLUDED ON THE CONTRACT DRAWINGS.*
6. *INCREASE THE BOTTOM REINFORCING COVER TO 1 1/2" (AND MINIMUM DECK THICKNESS TO 8") FOR BRIDGES OVER SALT OR BRACKISH WATER. SEE RIDOT LRFD BRIDGE MANUAL SECTION 9.*
7. *WHENEVER POSSIBLE BRIDGE SUPERSTRUCTURES (INCLUDING DECKS) SHALL BE MADE CONTINUOUS AT PIERS.*
8. *THE FASCIA SLAB OVERHANG SHALL BE DESIGNED TO INCLUDE THE AASHTO LRFD BRIDGE DESIGN SPECIFICATION FOR RAIL IMPACT LOADING.*

THIS SHEET NOT TO SCALE.

REVISIONS	
No.	DATE

RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

BRIDGE STANDARDS

DECK SLAB DETAILS

DRAWING NUMBER: 8.10

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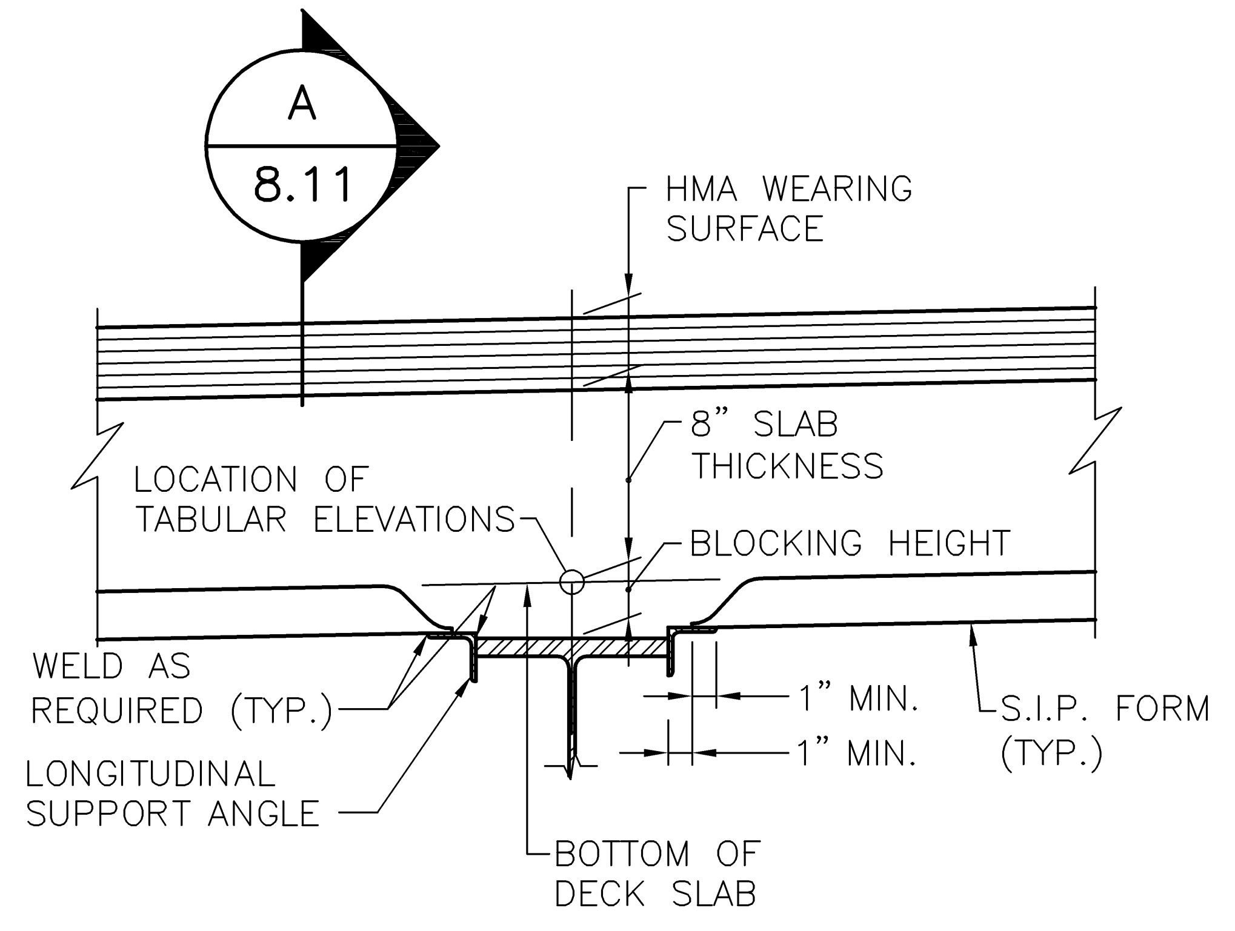
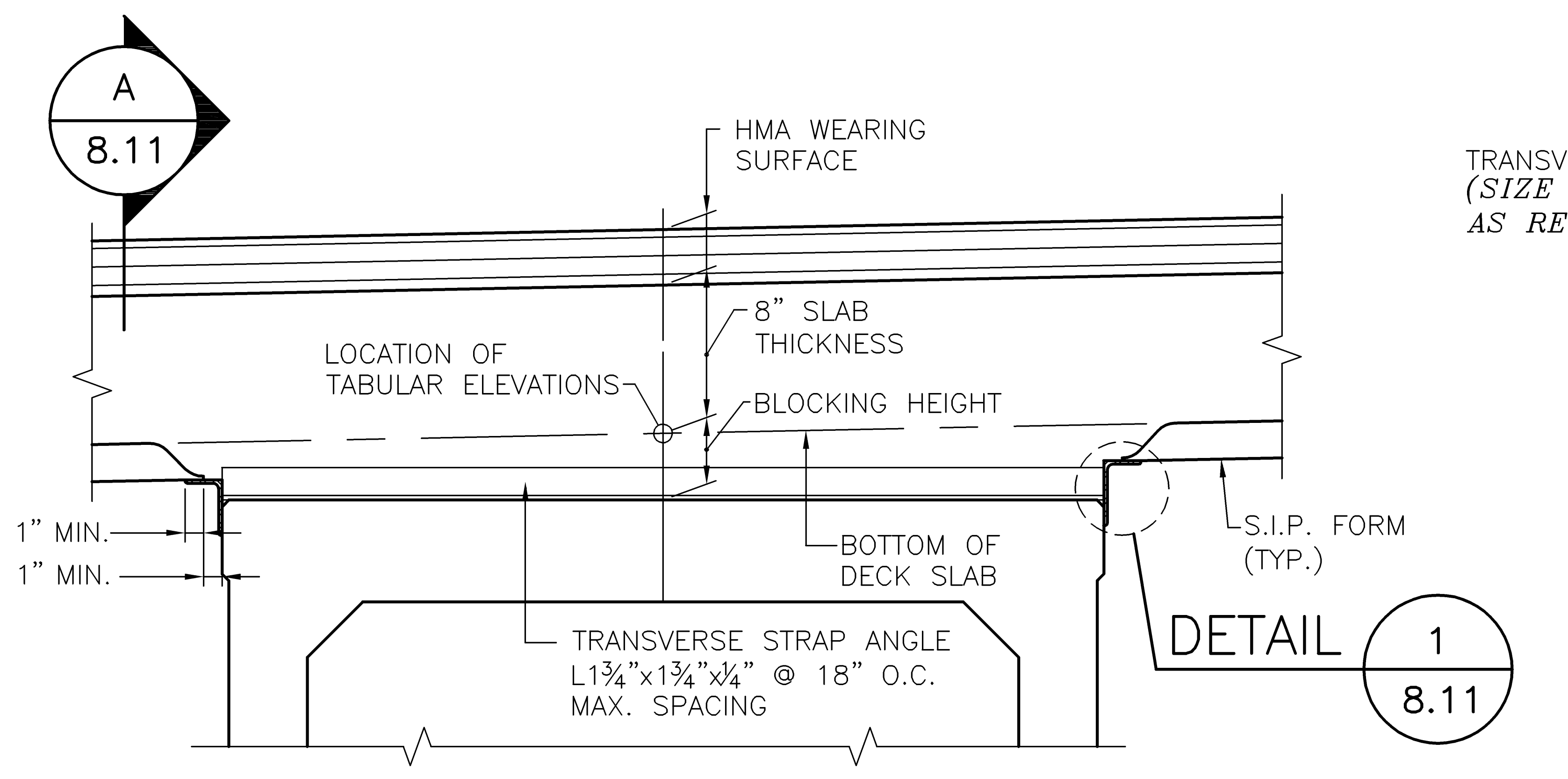


HAUNCH DETAIL – STEEL BEAM

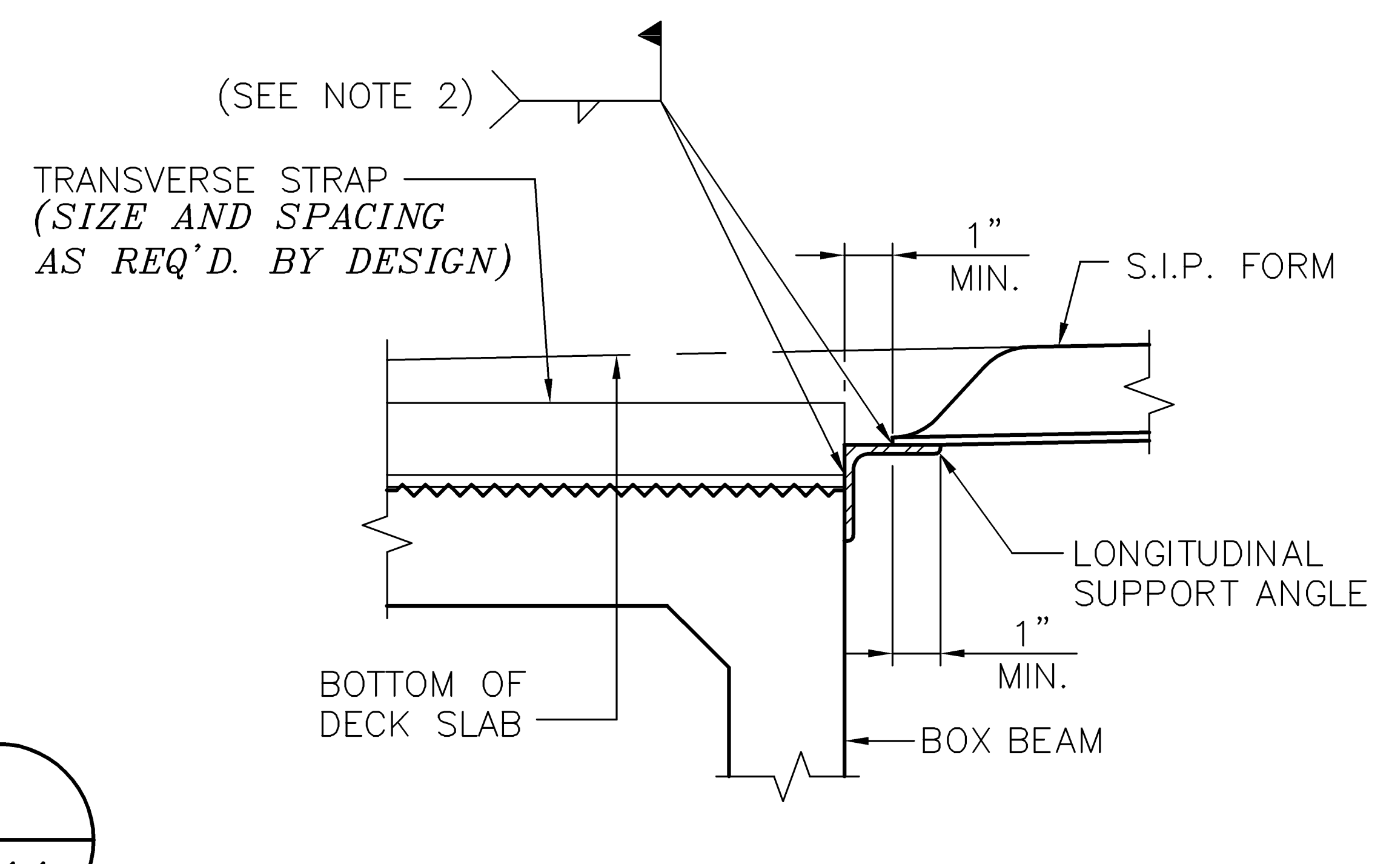
SCALE: 1 1/2"=1'–0"

NOTE:
AFTER THE BEAMS ARE ERECTED, BUT BEFORE THE FORMS ARE BUILT, ELEVATIONS ON THE TOP OF FLANGE OF THE BEAMS ARE TO BE OBTAINED AT THE POINTS INDICATED IN THE ELEVATION TABLE. THE DIFFERENCE BETWEEN THE ELEVATIONS OBTAINED AND THOSE SHOWN IN THE TABLE GIVES THE ACTUAL BLOCKING DISTANCE FROM THE TOP OF FLANGE TO THE BOTTOM OF SLAB AT CENTER LINE OF WEB.



HAUNCH DETAIL – PRESTRESSED BEAMS

SCALE: 1 1/2"=1'–0"



DETAIL 1 8.11

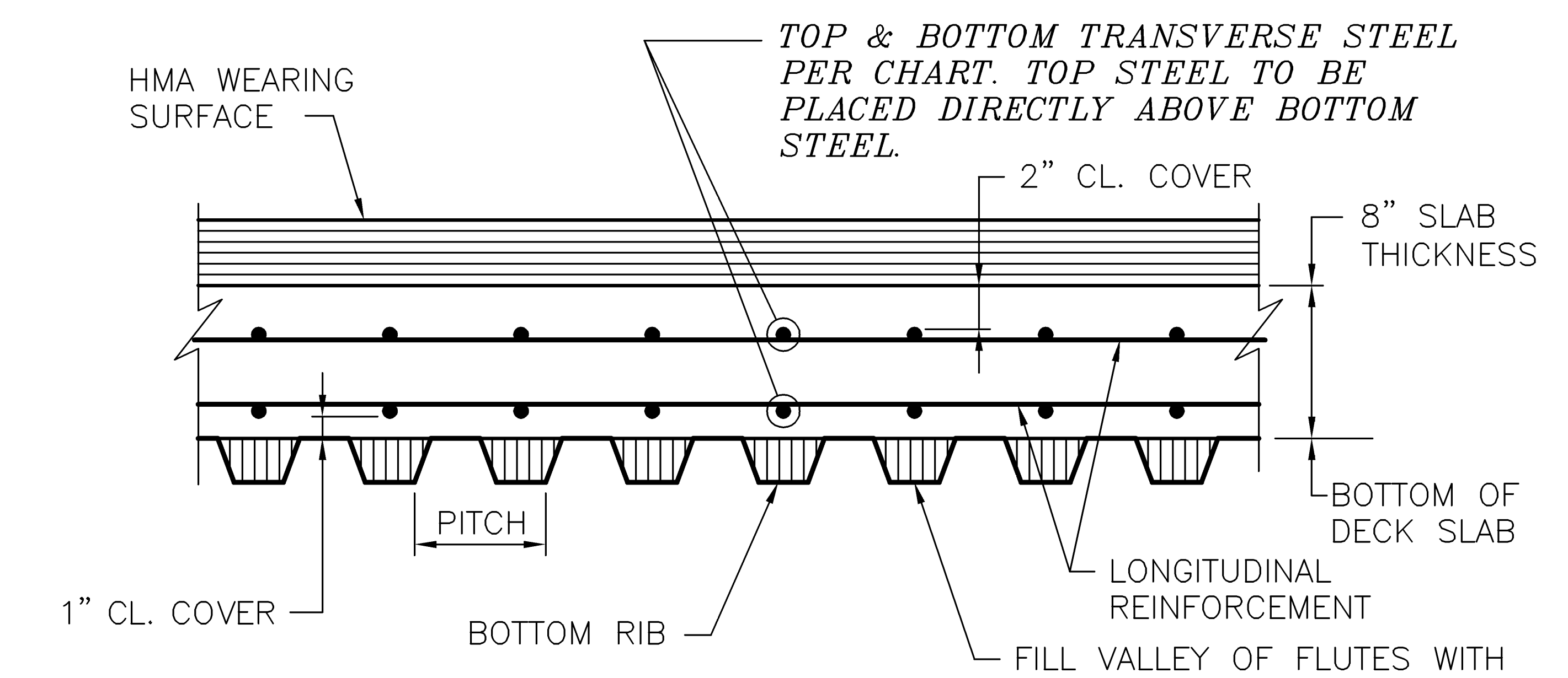
NOT TO SCALE

NOTES:

1. ATTACHMENT ANGLES SHALL BE HOT–DIP GALVANIZED AFTER FABRICATION.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN OF THE SUPPORTING ANGLE AND ITS ATTACHMENTS.

DESIGNER:

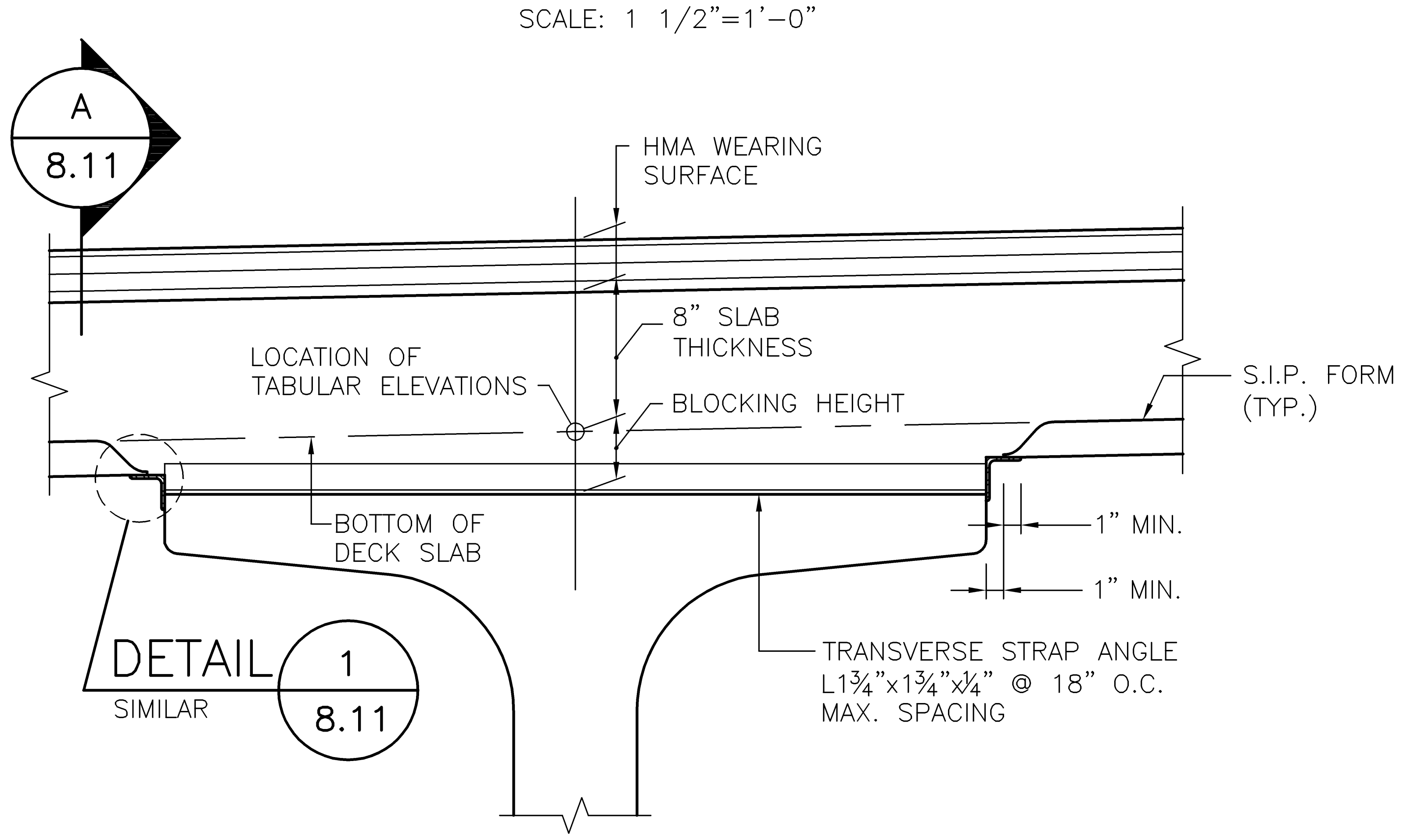
BOX BEAM SHOWN, DETAILS ARE SIMILAR FOR OTHER BEAM TYPES.


HMA WEARING SURFACE
TOP & BOTTOM TRANSVERSE STEEL PER CHART. TOP STEEL TO BE PLACED DIRECTLY ABOVE BOTTOM STEEL.
2" CL. COVER
8" SLAB THICKNESS
BOTTOM OF DECK SLAB
PITCH
1" CL. COVER
BOTTOM RIB
LONGITUDINAL REINFORCEMENT
FILL VALLEY OF FLUTES WITH POLYSTYRENE FOAM FILLER

NOTE: ADJUST THE ABOVE SECTION TO SUIT WEARING SURFACE TYPE.

SECTION A 8.11

SCALE: 3"=1'–0"



HAUNCH DETAIL – PRESTRESSED BULB TEES

SCALE: 1 1/2"=1'–0"

DESIGNER NOTES:

1. *FOR SPANS OF 50 FEET AND LESS, ELEVATIONS ARE TO BE SHOWN AT 1/4 POINTS.*
2. *THE TABULAR ELEVATIONS SHALL BE CALCULATED BY TAKING THE PROPOSED FINISHED GRADE OF THE CENTERLINE OF BEAMS AND:*
   - *A. SUBTRACTING THE SURFACING AND CONCRETE SLAB THICKNESS AND*
   - *B. ADDING THE THEORETICAL DEFLECTION OF THE BEAMS DUE TO THE WEIGHT OF THE SLAB, SURFACING, AND ALL OTHER SUPERIMPOSED DEAD LOADS.*
3. *AT THE POINT OF MAXIMUM CAMBER, BLOCKING HEIGHTS SHALL BE 1 INCH FOR SPANS UP TO 50 FEET AND 1½ INCHES FOR SPANS OVER 50 FEET. USE THE BLOCKING HEIGHTS FOR THE COMPUTATION OF BRIDGE SEAT ELEVATIONS BUT DO NOT SHOW ON THE CONSTRUCTION PLANS. BLOCKING HEIGHT SHALL BE CONSIDERED AS 0 INCHES WHEN CALCULATING THE PHYSICAL PROPERTIES OF COMPOSITE BEAMS, HOWEVER, THE WEIGHT OF THE HAUNCH SHALL BE INCLUDED IN THE DESIGN CALCULATIONS.*
4. *FOR PLATE GIRDERS WITH VARYING TOP FLANGE THICKNESSES OR FOR ROLLED BEAMS WITH TOP FLANGE COVER PLATES, BLOCKING HEIGHTS SHALL BE MEASURED FROM THE TOP OF THE THICKEST FLANGE PLATE OR THE TOP OF THE COVER PLATE.*
5. *THE DESIGNER SHALL REFER TO RIDOT LRFD BRIDGE DESIGN MANUAL (SECTION 9.6.9) FOR SPECIFICATIONS.*
6. *THE TABULAR ELEVATIONS SHALL BE INCREASED FOR STRUCTURES USING TRAPEZOIDAL STEEL BOX GIRDERS TO SUFFICIENTLY ACCOMMODATE THE INTERNAL CROSS FRAME AND DIAGONAL BRACING CONNECTIONS AND ELIMINATE ANY INTERFERENCE BETWEEN THE BOTTOM OF THE S.I.P. FORMS; THE GIRDER FLANGES; AND THE BRACING, CROSS FRAMES, AND THEIR CONNECTION HARDWARE. THE DESIGNER SHALL ALSO ACCOUNT FOR THE DEPTH OF S.I.P. FORM PANS IN THE HAUNCH VOLUME COMPUTATIONS.*

TOP OF FORM ELEVATIONS FOR DECK SLAB PRIOR TO PLACEMENT OF CONCRETE

BEAM #	℄ BRG.	1/10 PT.	2/10 PT.	3/10 PT.	4/10 PT.	5/10 PT.	6/10 PT.	7/10 PT.	8/10 PT.	9/10 PT.	℄ BRG.

NOTES:

1. FORM ENDS SHALL BE CRIMPED CLOSED IN A TAPERED MANNER. SEPARATE END CLOSURE PIECES WILL NOT BE ALLOWED.
2. SUPPORT ANGLES SHALL BE PLACED IN THE "LEG DOWN" POSITION WHERE POSSIBLE. HOWEVER, WHERE THE "LEG UP" POSITION IS NECESSARY, THE UPPER MOST PORTION OF THE ANGLE SHALL NOT PROJECT MORE THAN 1 INCH ABOVE THE TOP OF THE BEAM. THE CONTRACTOR SHALL HAVE AN ASSORTMENT OF ANGLES OF VARIOUS SIZES AVAILABLE ON THE SITE TO CONFORM TO THIS REQUIREMENT.
3. S.I.P. FORMS SHALL BE DESIGNED FOR THE DEAD LOAD OF THE FORM AND THE CONCRETE PLUS A MINIMUM 50 POUNDS PER SQUARE FOOT FOR CONSTRUCTION LOADS.
4. MAXIMUM DEFLECTION UNDER THE WEIGHT OF FORMS, REINFORCEMENT AND CONCRETE, OR A MINIMUM OF 120 POUNDS PER SQUARE FOOT SHALL NOT EXCEED THE LESSER OF 1/180 OF THE FORM SPAN OR 1/2 INCH. THE DESIGN SPAN FOR FORMS SHALL BE THE CLEAR DISTANCE BETWEEN BEAM FLANGES MEASURED PARALLEL TO THE FORM FLUTES MINUS 2 INCHES.

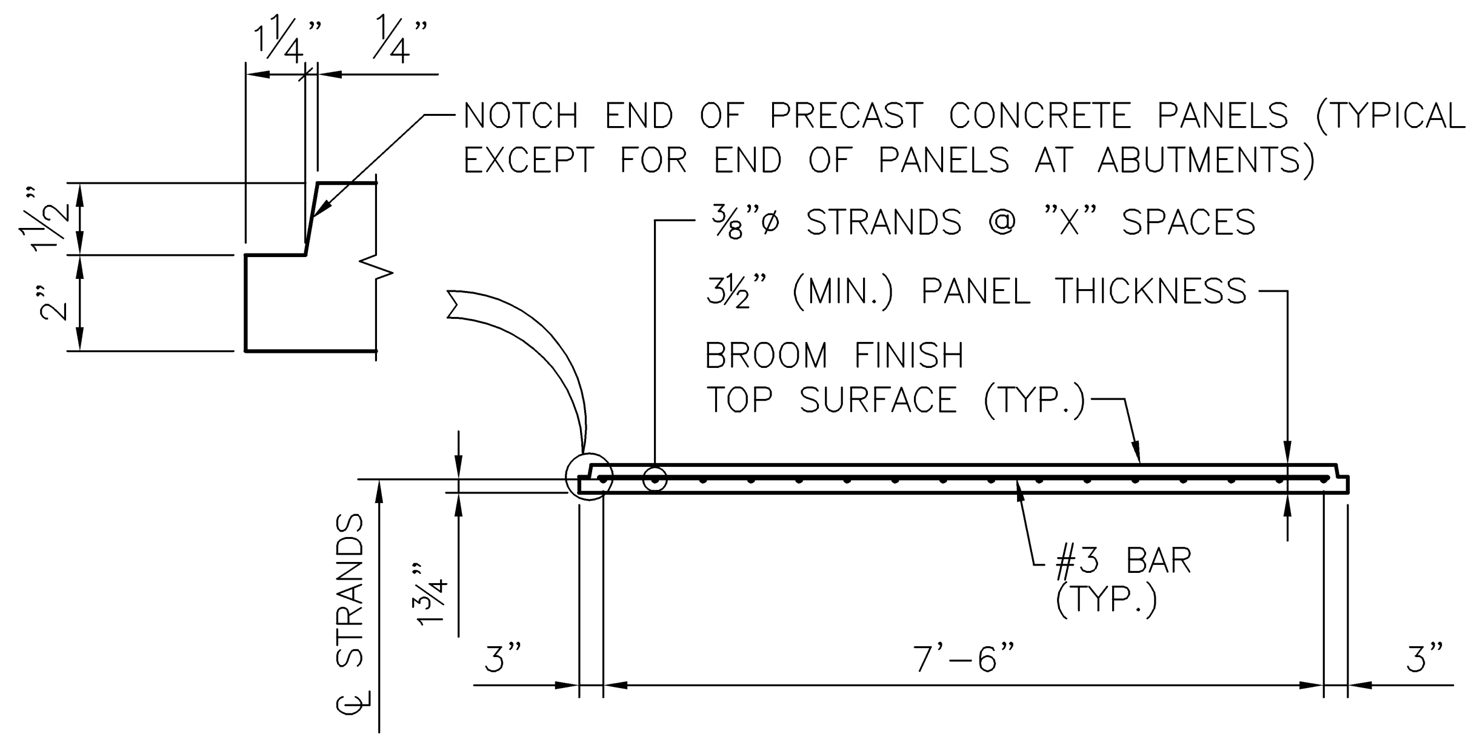
REVISIONS	
No.	DATE

RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

BRIDGE STANDARDS

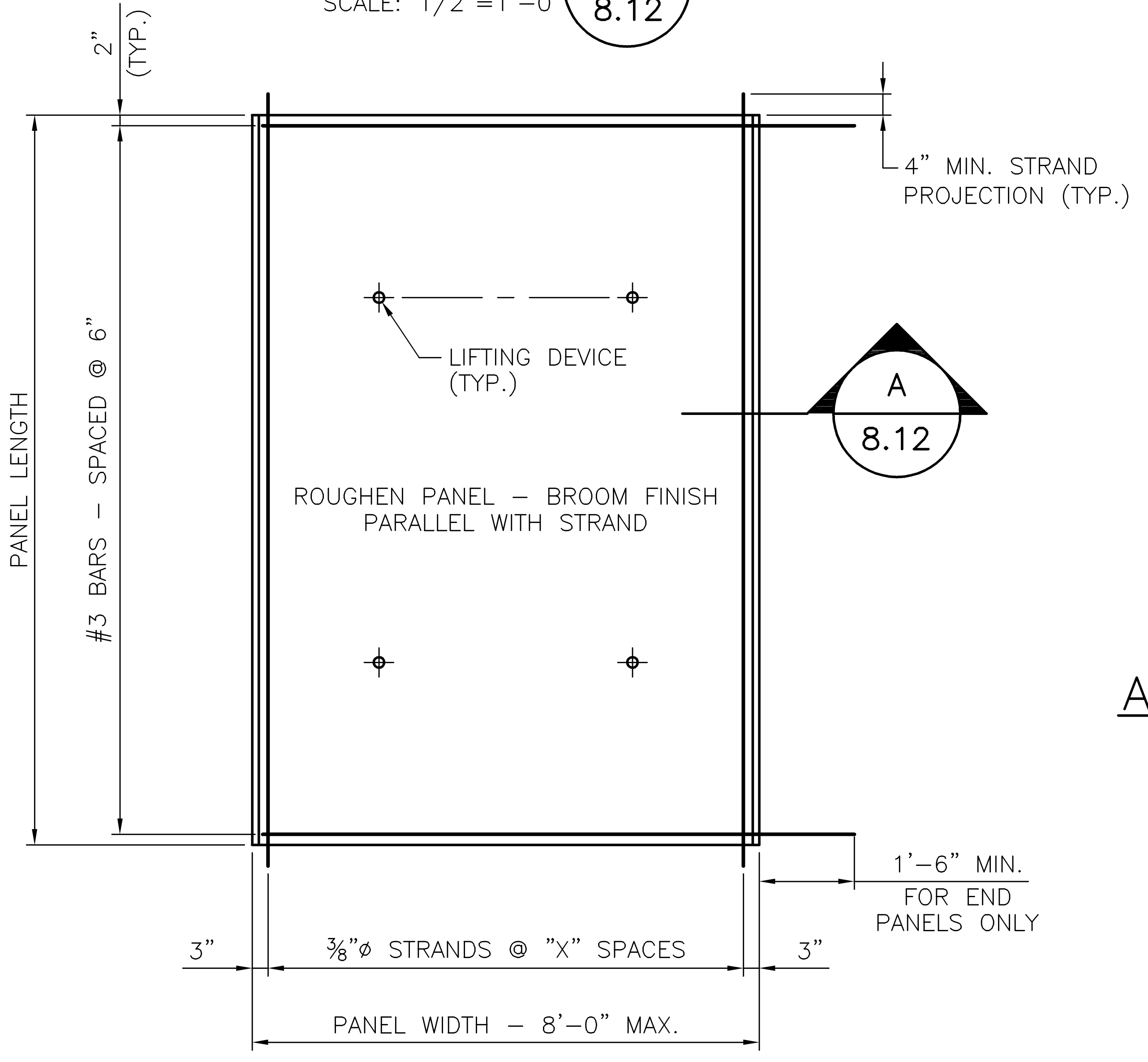
STAY–IN–PLACE
STEEL FORM DETAILS

DRAWING NUMBER: 8.11


1¼"
¼"
NOTCH END OF PRECAST CONCRETE PANELS (TYPICAL EXCEPT FOR END OF PANELS AT ABUTMENTS)
1½"
2"
⅜"ø STRANDS @ "X" SPACES
3½" (MIN.) PANEL THICKNESS
BROOM FINISH TOP SURFACE (TYP.)
#3 BAR (TYP.)
℄ STRANDS
1¾"
3"
7'-6"
3"

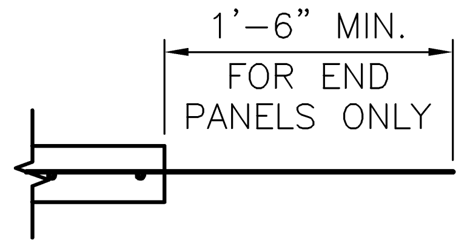
SECTION A 8.12

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



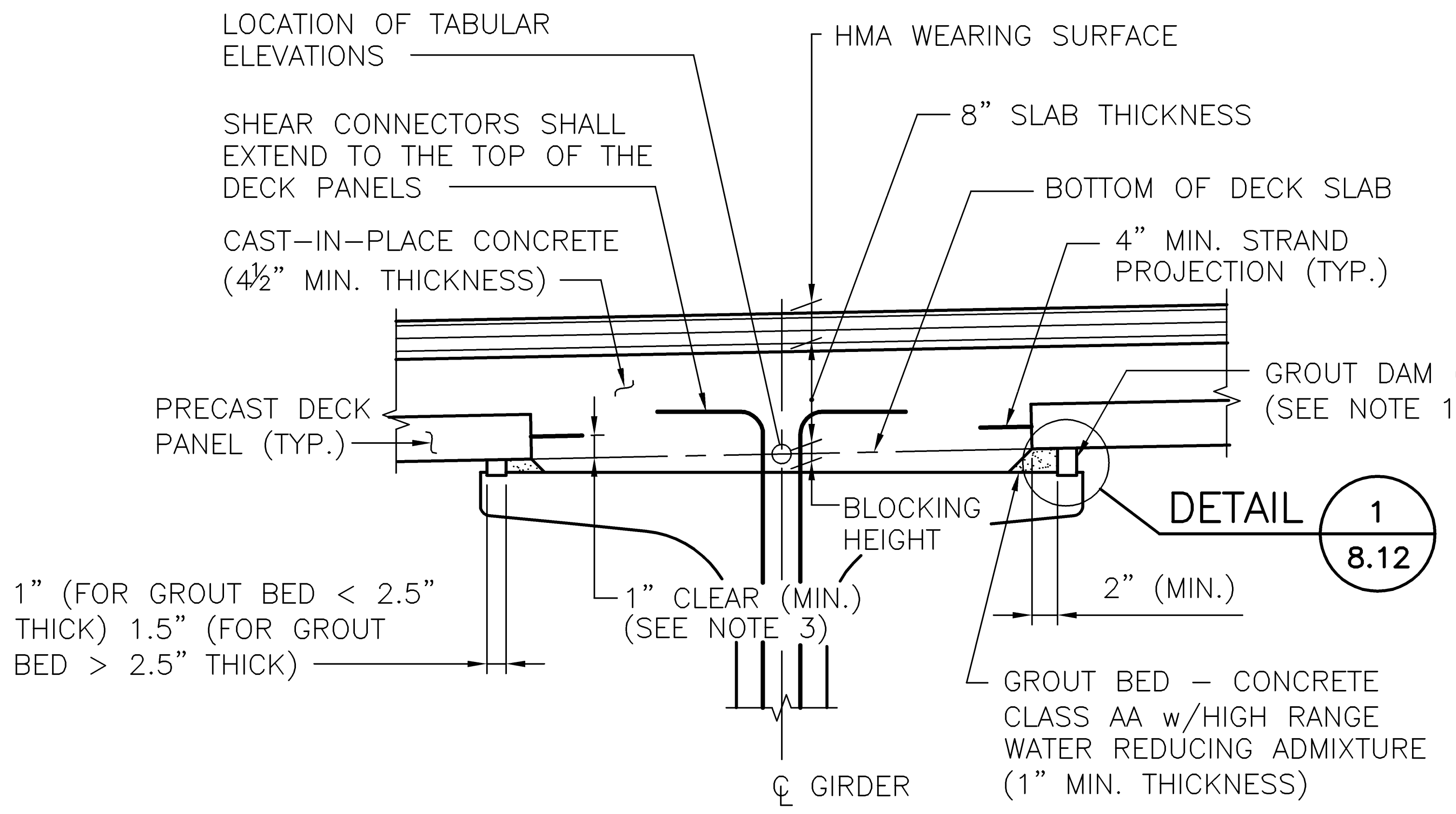
DECK PANEL DETAIL

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



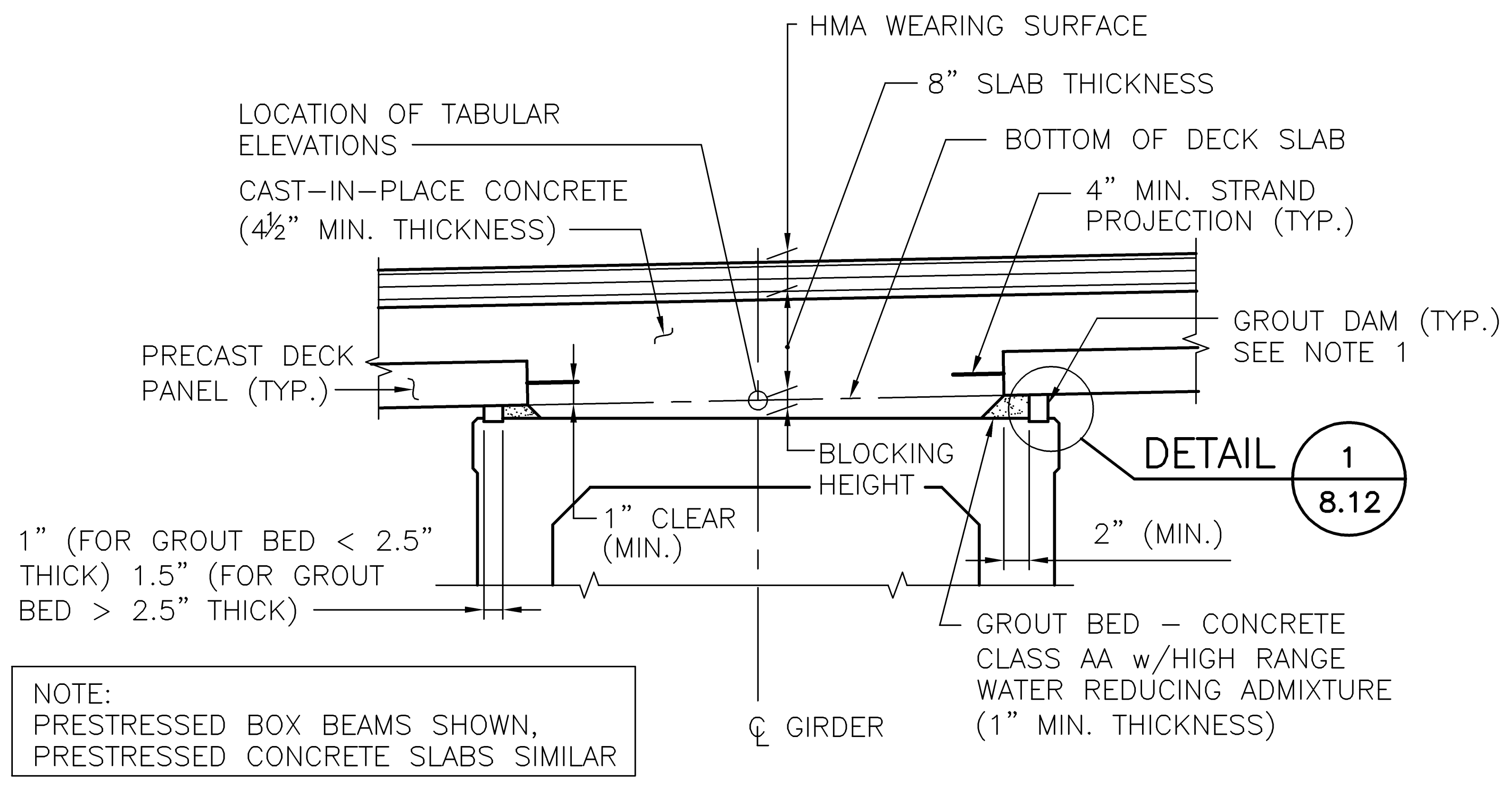
DECK PANEL END AT ABUTMENT DETAIL

SCALE: 1"=1'-0"


LOCATION OF TABULAR ELEVATIONS
HMA WEARING SURFACE
SHEAR CONNECTORS SHALL EXTEND TO THE TOP OF THE DECK PANELS
8" SLAB THICKNESS
BOTTOM OF DECK SLAB
CAST-IN-PLACE CONCRETE (4½" MIN. THICKNESS)
4" MIN. STRAND PROJECTION (TYP.)
GROUT DAM (TYP.) (SEE NOTE 1)
PRECAST DECK PANEL (TYP.)
BLOCKING HEIGHT
DETAIL 1 8.12
1" (FOR GROUT BED < 2.5" THICK) 1.5" (FOR GROUT BED > 2.5" THICK)
1" CLEAR (MIN.) (SEE NOTE 3)
2" (MIN.)
GROUT BED - CONCRETE CLASS AA w/HIGH RANGE WATER REDUCING ADMIXTURE (1" MIN. THICKNESS)
℄ GIRDER

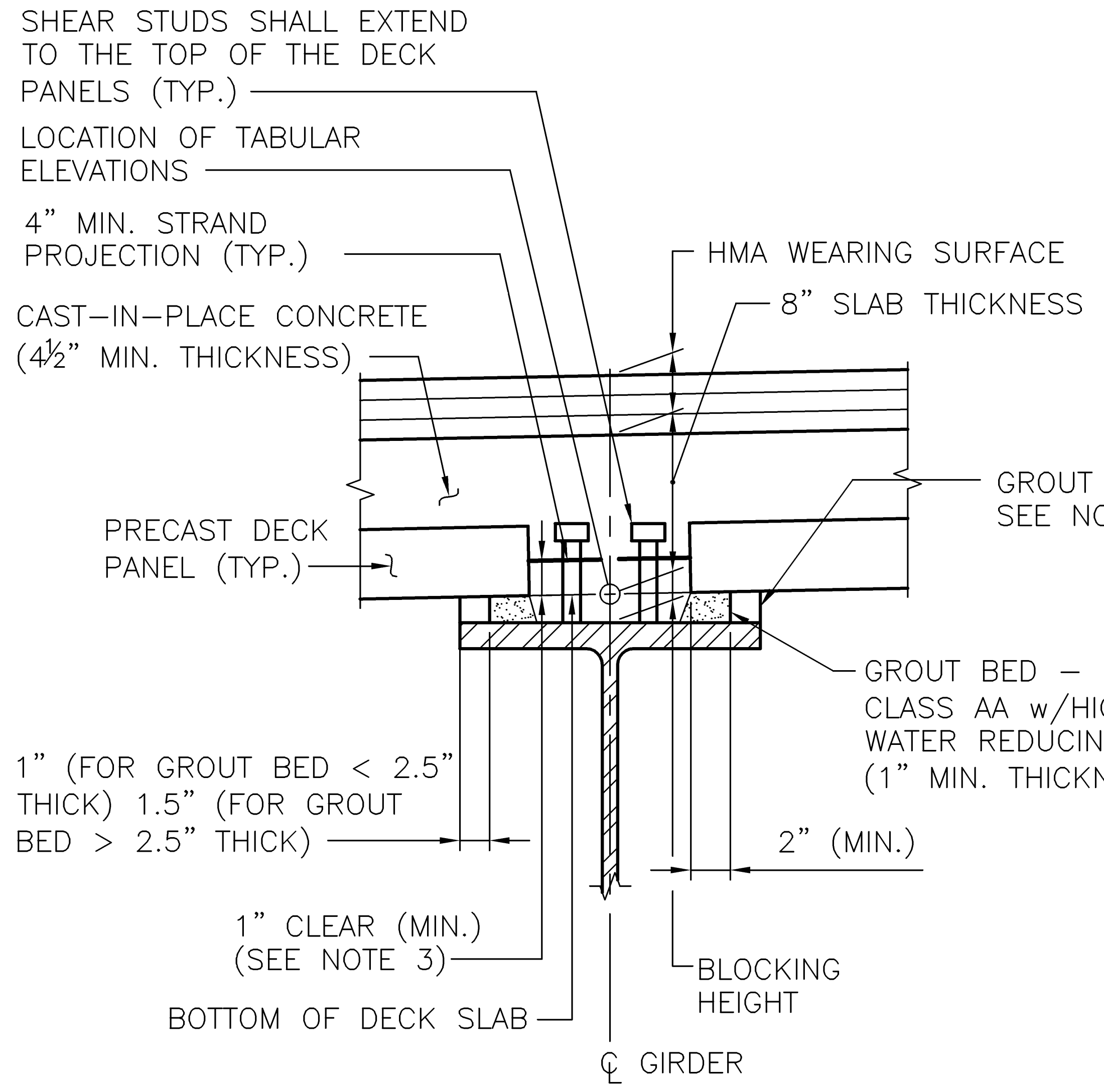
HAUNCH DETAIL - PRESTRESSED BULB TEES

SCALE: 1"=1'-0"


HMA WEARING SURFACE
8" SLAB THICKNESS
LOCATION OF TABULAR ELEVATIONS
BOTTOM OF DECK SLAB
CAST-IN-PLACE CONCRETE (4½" MIN. THICKNESS)
4" MIN. STRAND PROJECTION (TYP.)
GROUT DAM (TYP.) SEE NOTE 1
PRECAST DECK PANEL (TYP.)
BLOCKING HEIGHT
DETAIL 1 8.12
1" CLEAR (MIN.)
1" (FOR GROUT BED < 2.5" THICK) 1.5" (FOR GROUT BED > 2.5" THICK)
2" (MIN.)
GROUT BED - CONCRETE CLASS AA w/HIGH RANGE WATER REDUCING ADMIXTURE (1" MIN. THICKNESS)
NOTE: PRESTRESSED BOX BEAMS SHOWN, PRESTRESSED CONCRETE SLABS SIMILAR
℄ GIRDER

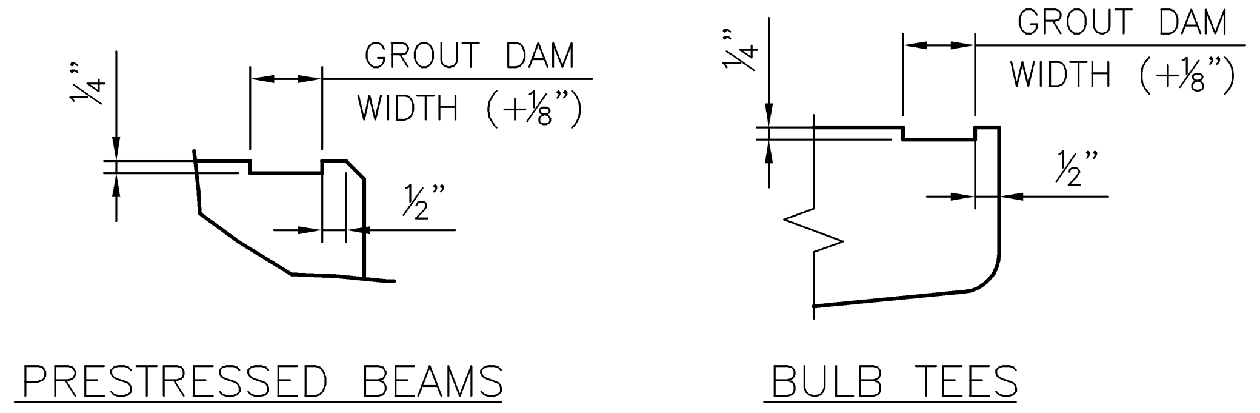
HAUNCH DETAIL - PRESTRESSED BOX BEAMS

SCALE: 1"=1'-0"


SHEAR STUDS SHALL EXTEND TO THE TOP OF THE DECK PANELS (TYP.)
LOCATION OF TABULAR ELEVATIONS
4" MIN. STRAND PROJECTION (TYP.)
HMA WEARING SURFACE
8" SLAB THICKNESS
CAST-IN-PLACE CONCRETE (4½" MIN. THICKNESS)
GROUT DAM (TYP.) SEE NOTE 1
PRECAST DECK PANEL (TYP.)
GROUT BED - CONCRETE CLASS AA w/HIGH RANGE WATER REDUCING ADMIXTURE (1" MIN. THICKNESS)
1" (FOR GROUT BED < 2.5" THICK) 1.5" (FOR GROUT BED > 2.5" THICK)
2" (MIN.)
1" CLEAR (MIN.) (SEE NOTE 3)
BLOCKING HEIGHT
BOTTOM OF DECK SLAB
℄ GIRDER

HAUNCH DETAIL - STEEL GIRDER

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



DETAIL 1 8.12

NOT TO SCALE

NOTES:

1. TEMPORARY SUPPORTS FOR PRECAST DECK PANELS SHALL CONSIST OF CONTINUOUS, HIGH-DENSITY, EXPANDED POLYSTYRENE STRIPS (GROUT DAM) WITH A MINIMUM COMPRESSIVE STRENGTH OF (55 PSI). IF LEVELING SCREWS ARE USED, A 1.7 POUND PER CUBIC FOOT POLYETHYLENE FOAM SEAL (WITH AN APPROVED ADHESIVE) SHALL BE USED AS A GROUT DAM FOR THE GIRDER AND DECK PANEL.

2. IF LEVELING SCREWS ARE USED, TEMPORARY BRACING BETWEEN THE ENDS OF PANELS SHALL BE INSTALLED AS REQUIRED TO PREVENT TRANSVERSE PANEL MOVEMENT THAT COULD LEAD TO LOSS OF BEARING ON THE LEVELING SCREWS.

3. DECK PANELS ARE REQUIRED TO BE GROUTED IN PLACE PRIOR TO PLACEMENT OF THE CAST-IN-PLACE CONCRETE DECK. THE GROUT BED SHOULD EXTEND FOR THE FULL WIDTH OF THE GIRDER FLANGE COMPLETELY FILLING THE AREA BETWEEN THE GROUT DAMS. THE TOP OF THE GROUT BED SHOULD BE 1 INCH CLEAR BELOW THE STRAND EXTENSIONS.

4. IF LEVELING SCREWS ARE USED THEY SHALL BE COMPLETELY REMOVED AFTER THE GROUTING OPERATION AND PRIOR TO DECK PLACEMENT.

TOP OF FORM ELEVATIONS FOR DECK
SLAB PRIOR TO PLACEMENT OF CONCRETE

BEAM #	℄ BRG.	1/10 PT.	2/10 PT.	3/10 PT.	4/10 PT.	5/10 PT.	6/10 PT.	7/10 PT.	8/10 PT.	9/10 PT.	℄ BRG.

DESIGNER NOTES:

1. *FOR SPANS OF 50 FEET AND LESS, ELEVATIONS ARE TO BE SHOWN AT 1/4 POINTS.*

2. *THE TABULAR ELEVATIONS SHALL BE CALCULATED BY TAKING THE PROPOSED FINISHED GRADE OF THE CENTERLINE OF BEAMS AND:*
   A. *SUBTRACTING THE SURFACING AND CONCRETE SLAB THICKNESS AND*
   B. *ADDING THE THEORETICAL DEFLECTION OF THE BEAMS DUE TO THE WEIGHT OF THE SLAB, SURFACING, AND ALL OTHER SUPERIMPOSED DEAD LOADS.*

3. *AT THE POINT OF MAXIMUM CAMBER, MINIMUM BLOCKING HEIGHTS SHALL BE 1 INCH FOR SPANS UP TO 50 FEET AND 1 1/2 FOR SPANS OVER 50 FEET. USE THE BLOCKING HEIGHTS FOR THE COMPUTATION OF BRIDGE SEAT ELEVATIONS BUT DO NOT SHOW ON THE CONSTRUCTION PLANS. BLOCKING HEIGHTS SHALL BE CONSIDERED AS 0 INCHES WHEN CALCULATING THE PHYSICAL PROPERTIES OF COMPOSITE BEAMS, HOWEVER, THE WEIGHT OF THE HAUNCH SHALL BE INCLUDED IN THE DESIGN CALCULATIONS.*

4. *FOR PLATE GIRDERS WITH DIFFERENT TOP FLANGE THICKNESSES OR ROLLED BEAMS WITH TOP FLANGE COVER PLATE, BLOCKING HEIGHTS SHALL BE MEASURED FROM THE TOP OF THE THICKEST PLATE OR THE TOP OF THE COVER PLATE.*

5. *THE DESIGNER SHALL REFER TO RIDOT LRFD BRIDGE DESIGN MANUAL (SECTION 9.6.9) FOR DESIGN REQUIREMENTS.*

6. *THE TABULAR ELEVATIONS SHALL BE INCREASED FOR STRUCTURES USING TRAPEZOIDAL STEEL BOX GIRDERS TO SUFFICIENTLY ACCOMMODATE THE INTERNAL CROSS FRAME AND DIAGONAL BRACING CONNECTIONS AND ELIMINATE ANY INTERFERENCE BETWEEN THE BOTTOM OF THE S.I.P. FORMS; THE GIRDER FLANGES; AND THE BRACING, CROSS FRAMES, AND THEIR CONNECTION HARDWARE. THE DESIGNER SHALL ALSO ACCOUNT FOR THE DEPTH OF THE S.I.P. FORMS IN THE HAUNCH VOLUME COMPUTATIONS.*

REVISIONS	
No.	DATE

RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

BRIDGE STANDARDS

STAY-IN-PLACE
PRECAST CONCRETE
DECK PANELS

DRAWING NUMBER: 8.12

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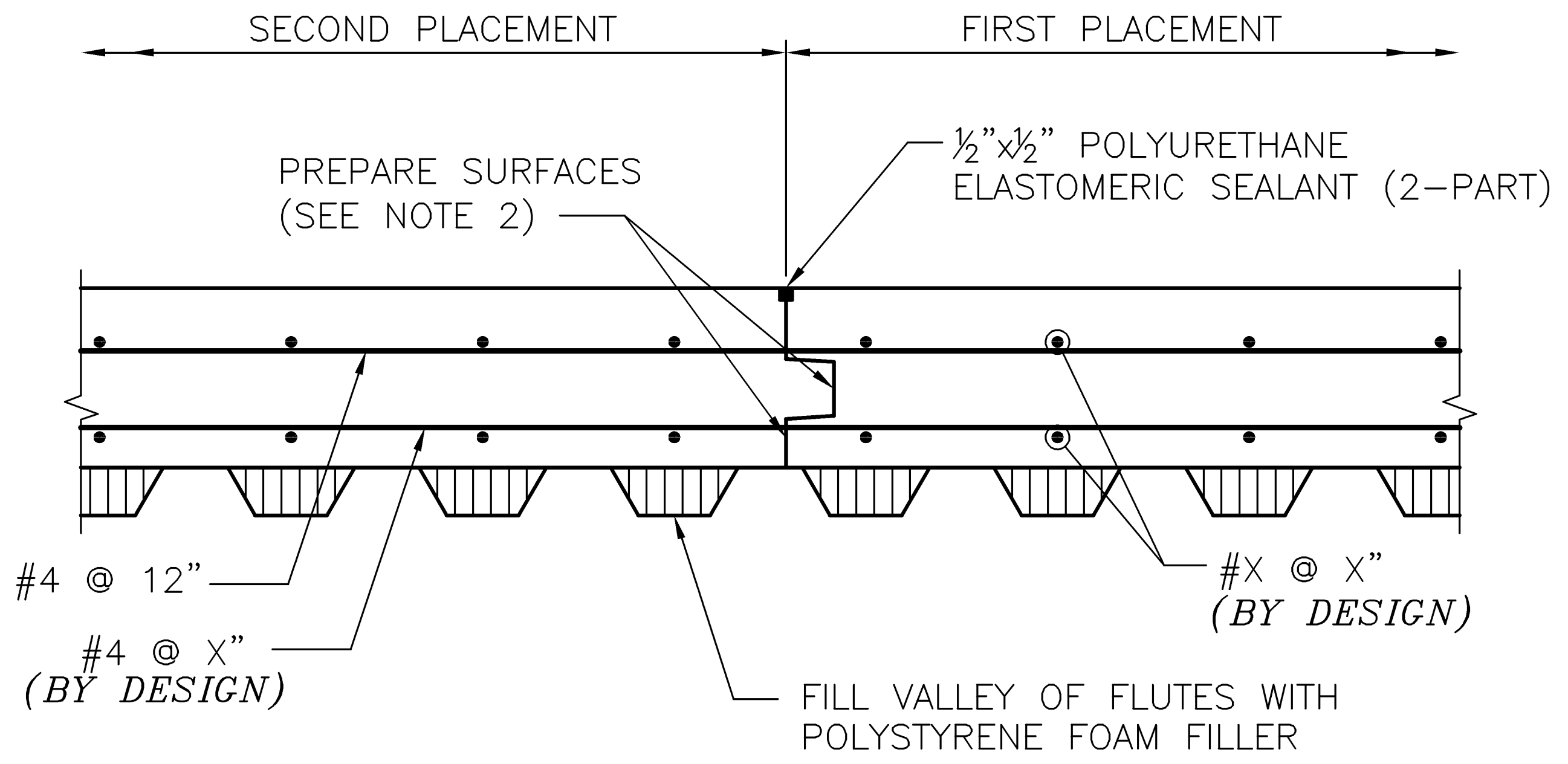
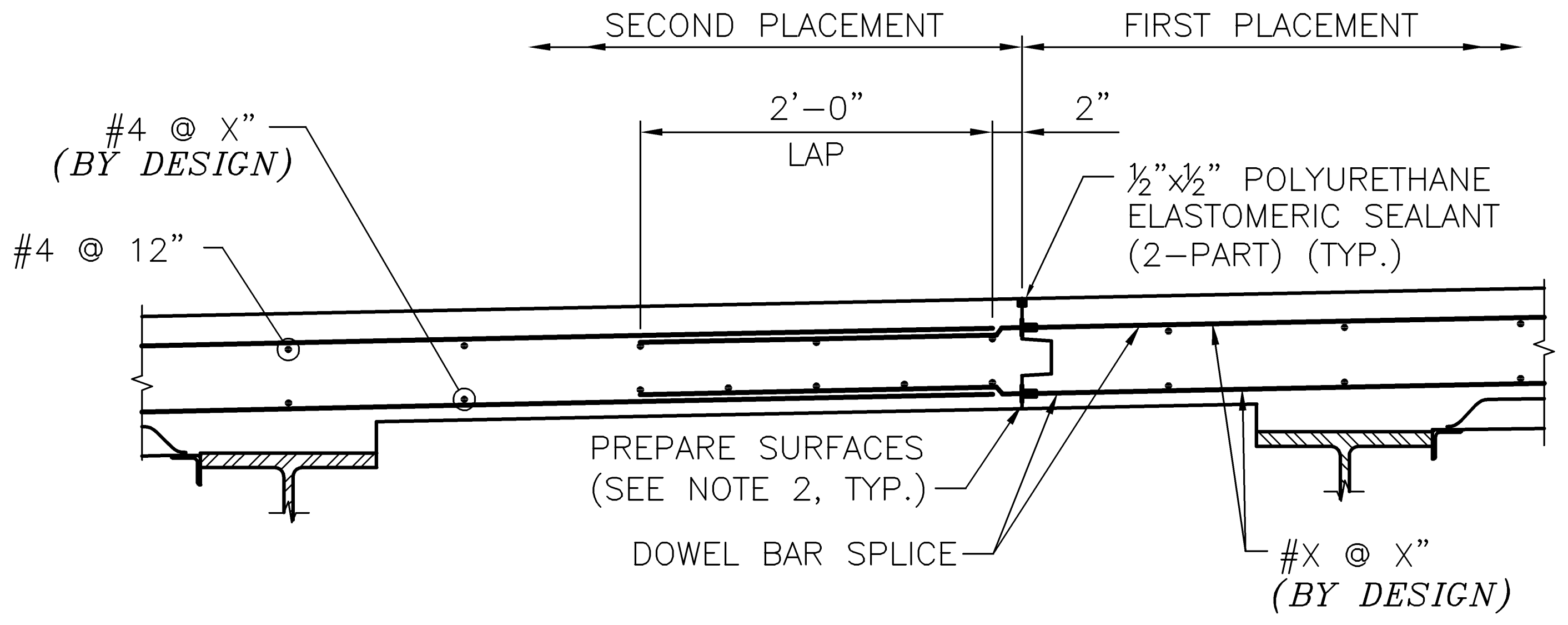


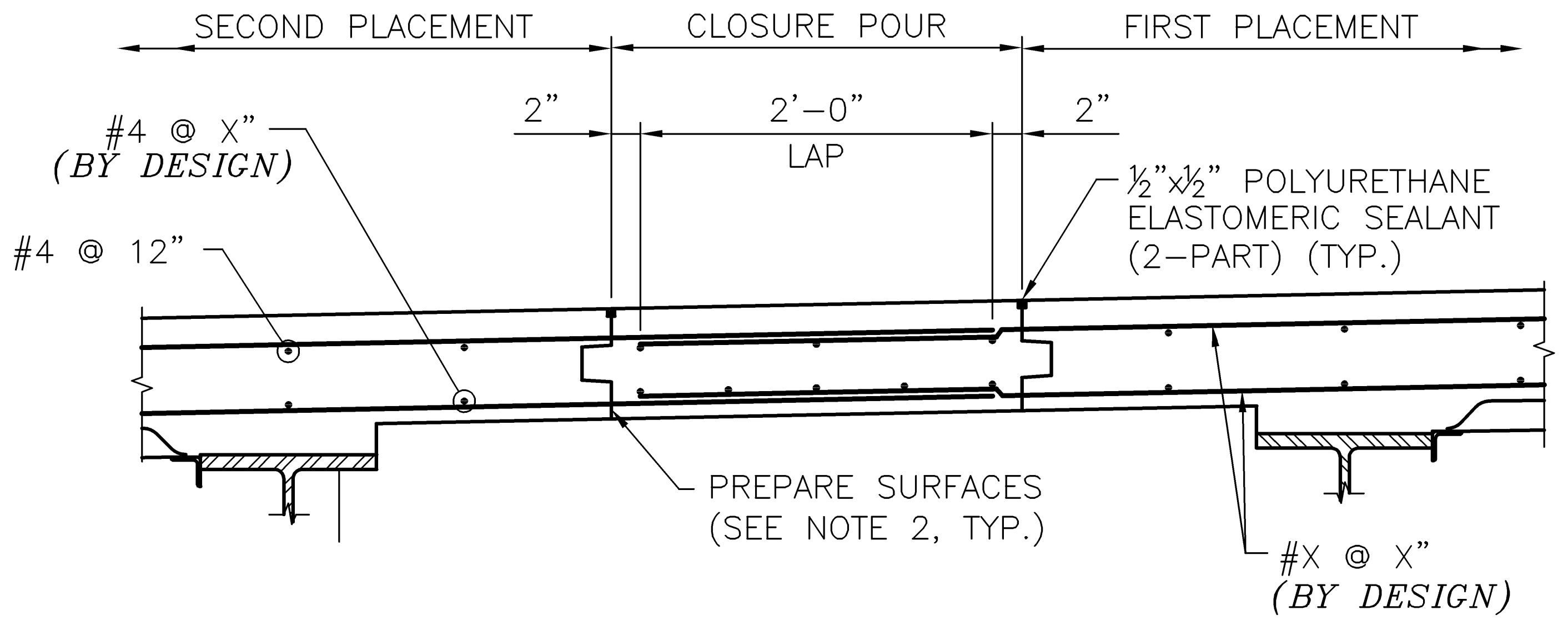
TRANSVERSE CONSTRUCTION
JOINT DETAIL IN DECK SLAB

SCALE: 1 1/2"=1'–0"



LONGITUDINAL CONSTRUCTION JOINT DETAIL
IN DECK SLAB WITH DOWEL SPLICERS

SCALE: 1 1/2"=1'–0"



LONGITUDINAL CONSTRUCTION JOINT DETAIL
IN DECK SLAB WITH CLOSURE POUR

SCALE: 1 1/2"=1'–0"

NOTES:

1. BRIDE DECK SHALL BE PLACED IN ACCORDANCE WITH THE PLACEMENT SEQUENCE SHOWN ON THE PLANS.
2. THE SURFACE OF THE PREVIOUSLY CAST CONCRETE SHALL BE BLAST CLEANED, ROUGHENED, WETTED WITH CLEAN WATER, AND THEN FLUSHED WITH A MORTAR COMPOSED OF EQUAL PARTS OF THE CEMENT AND SAND SPECIFIED FOR THE NEW CONCRETE, BEFORE NEW CONCRETE IS PLACED ADJACENT THERETO. NEW CONCRETE SHALL BE PLACED BEFORE MORTAR HAS TAKEN INITIAL SET.
3. THE CONTRACTOR MAY SUBMIT A PROPOSAL DETAILING THE ELIMINATION OF THE CLOSURE POUR FOR THE APPROVAL OF THE ENGINEER. THE PROPOSAL SHALL DETAIL THE CONTRACTOR'S MEANS AND METHODS FOR ACCURATELY CONSTRUCTING THE DECK SLAB TO THE LINES, GRADES, AND THICKNESS SHOWN ON THE PLANS WITHOUT LEAKAGE OF CONCRETE.
4. DOWEL BAR SPLICERS SHALL BE USED WHERE USE OF LAP SPLICES IS NOT FEASIBLE.

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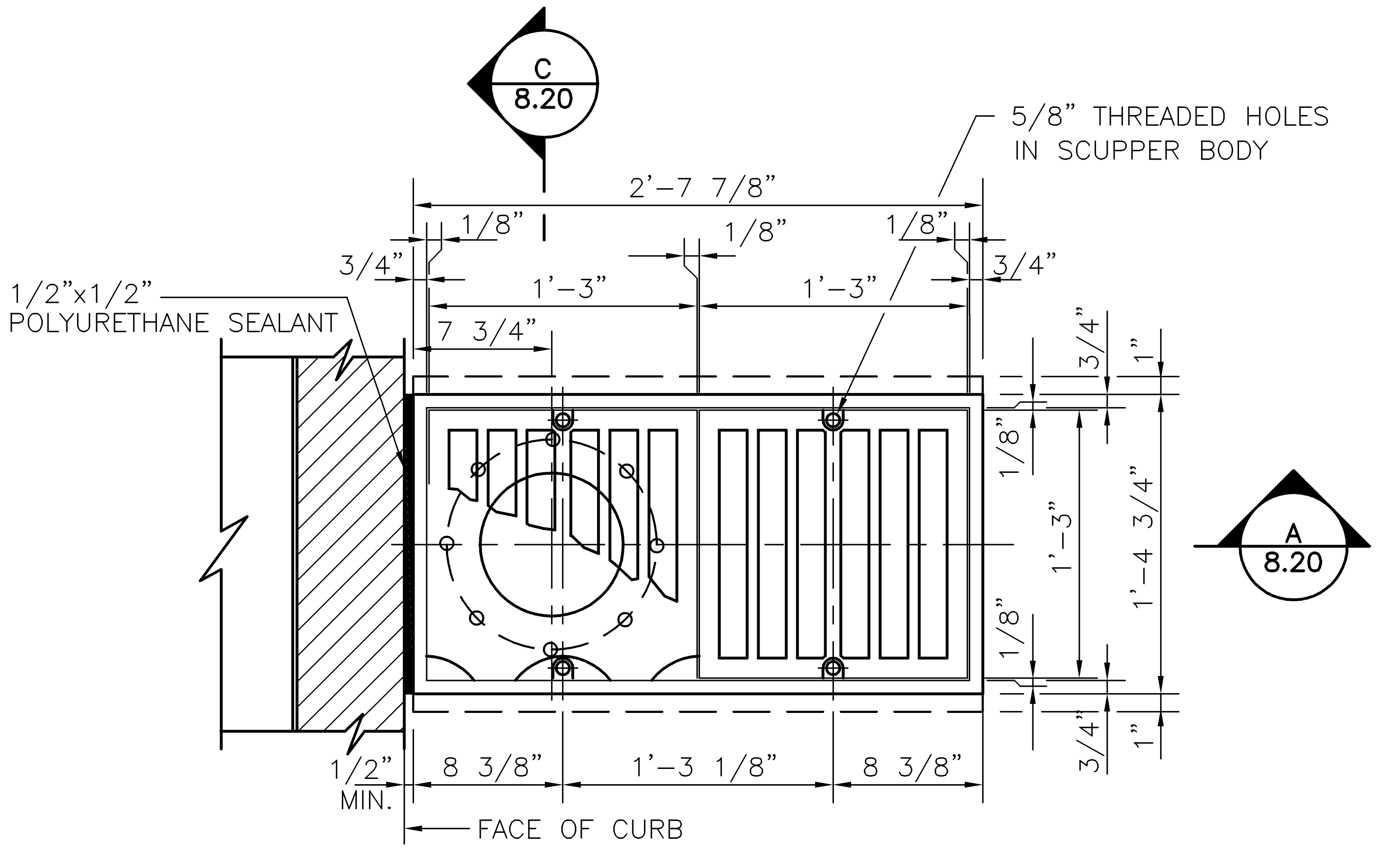
RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

BRIDGE STANDARDS

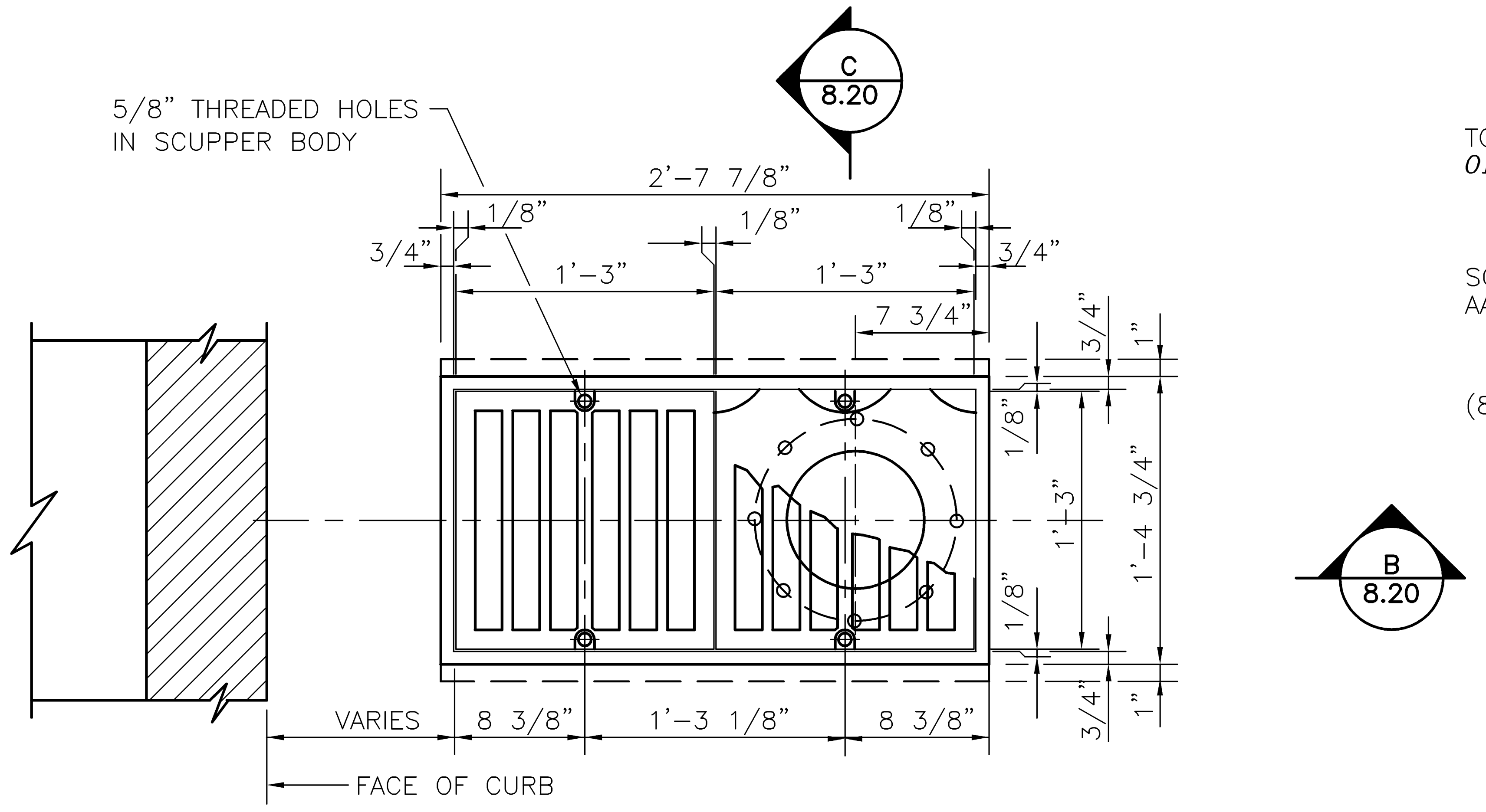
CONSTRUCTION JOINTS
IN DECK

DRAWING NUMBER: 8.13



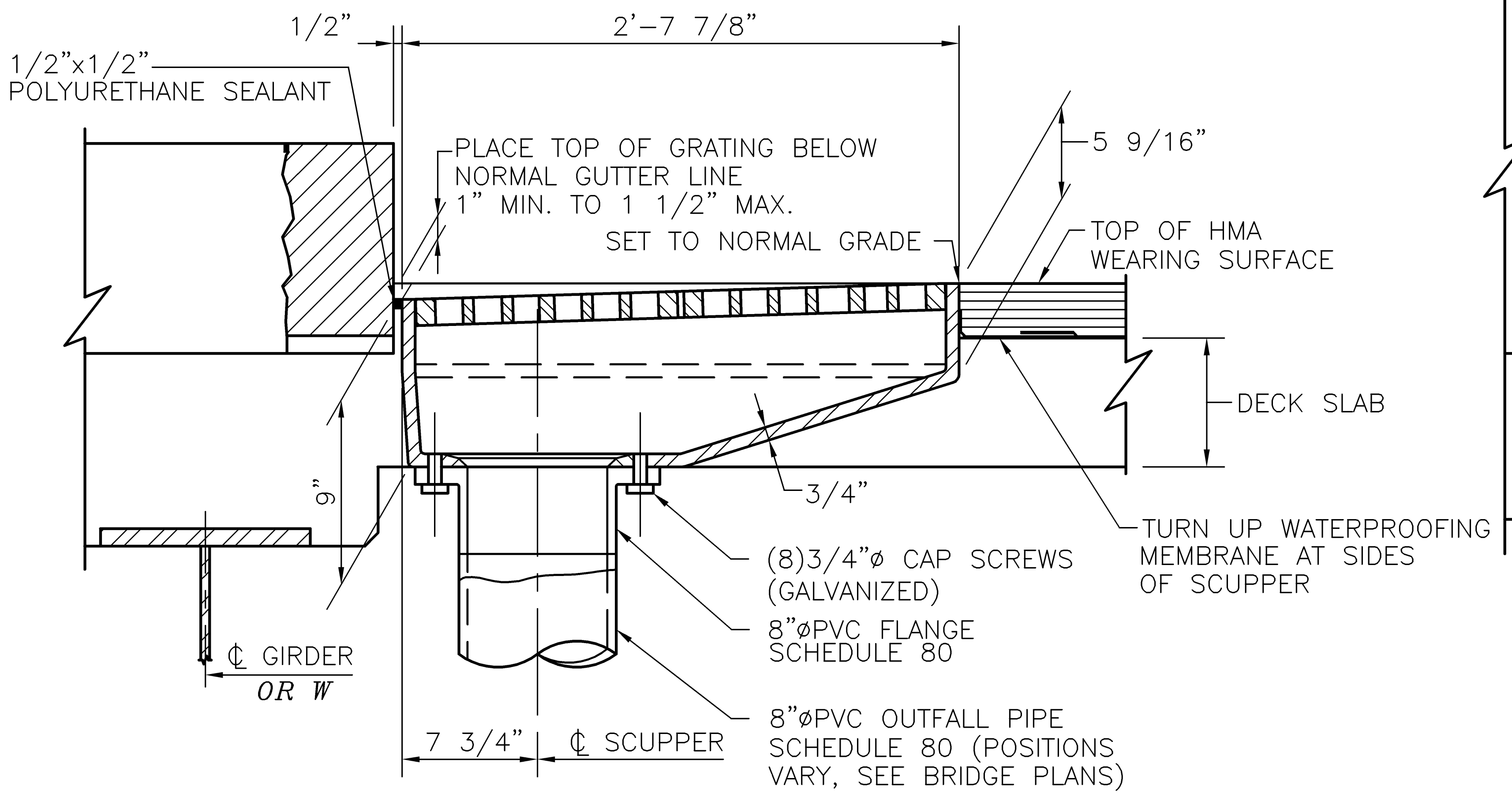
PLAN

2 SECTION SCUPPER



PLAN

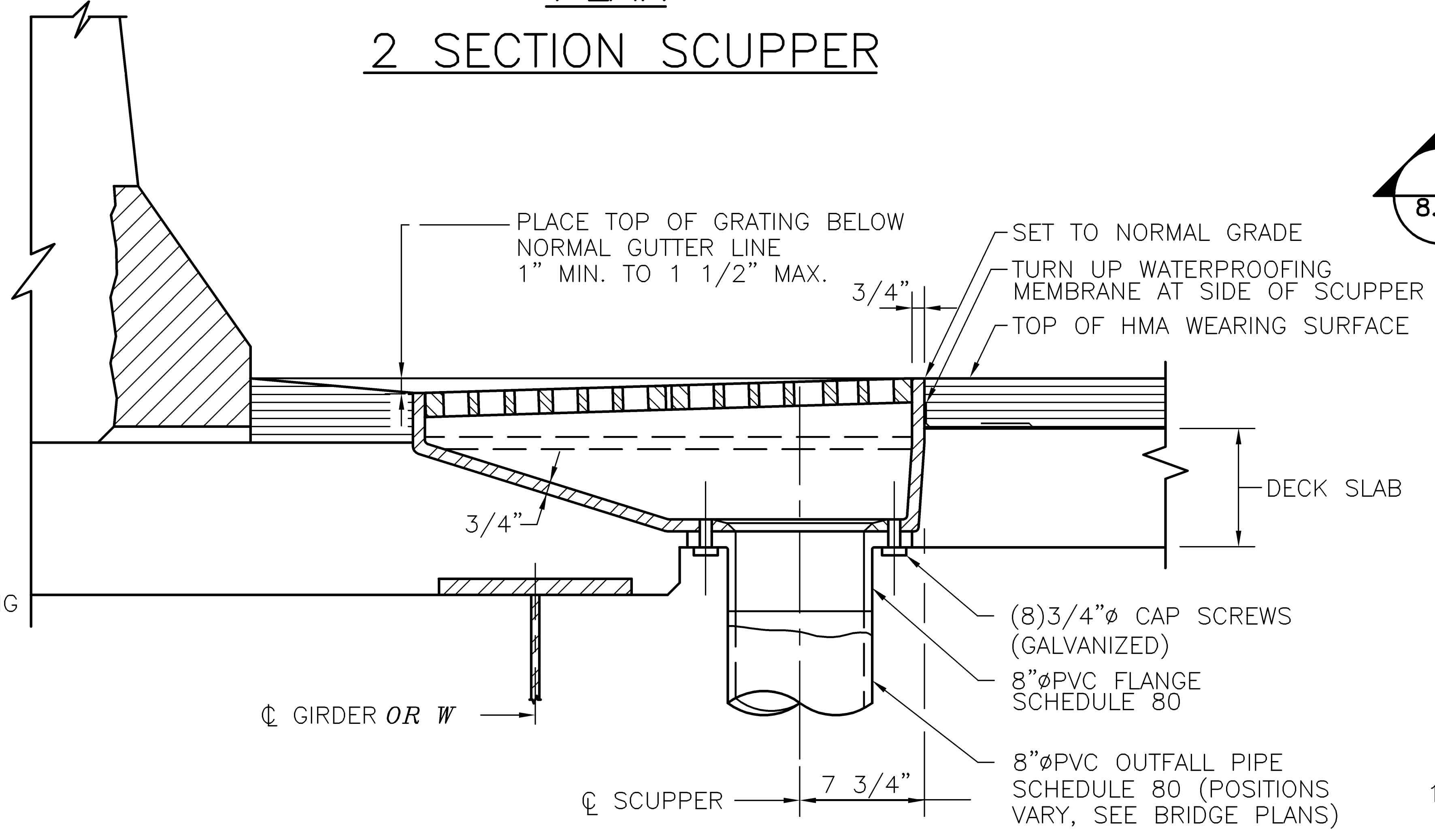
2 SECTION SCUPPER


1/2"
2'-7 7/8"
1/2"x1/2" POLYURETHANE SEALANT
PLACE TOP OF GRATING BELOW NORMAL GUTTER LINE 1" MIN. TO 1 1/2" MAX.
SET TO NORMAL GRADE
5 9/16"
TOP OF HMA WEARING SURFACE
DECK SLAB
9"
3/4"
(8)3/4"ø CAP SCREWS (GALVANIZED)
8"øPVC FLANGE SCHEDULE 80
TURN UP WATERPROOFING MEMBRANE AT SIDES OF SCUPPER
℄ GIRDER OR W
8"øPVC OUTFALL PIPE SCHEDULE 80 (POSITIONS VARY, SEE BRIDGE PLANS)
7 3/4"
℄ SCUPPER

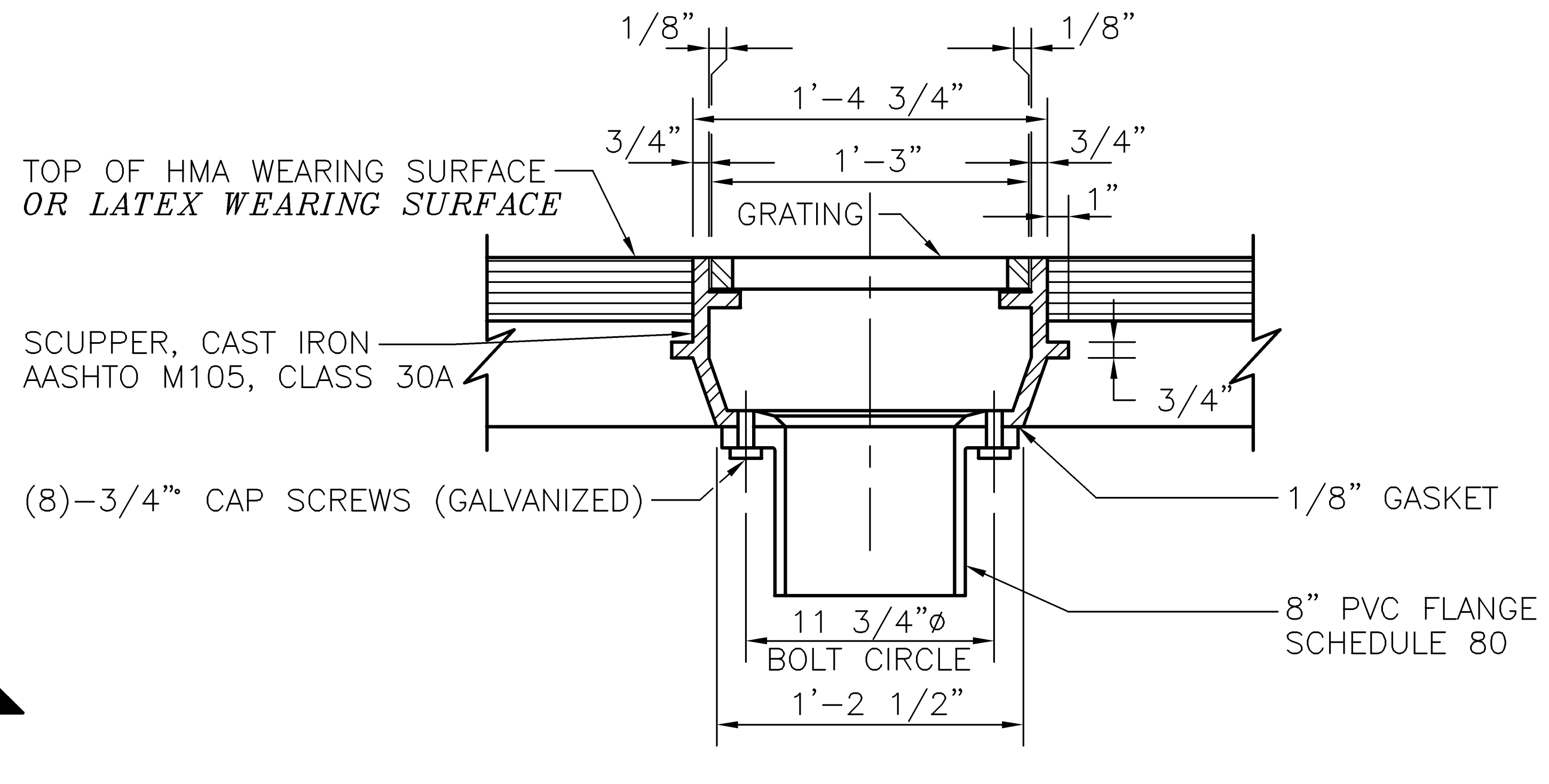
SECTION A/8.20

SCUPPER DETAILS

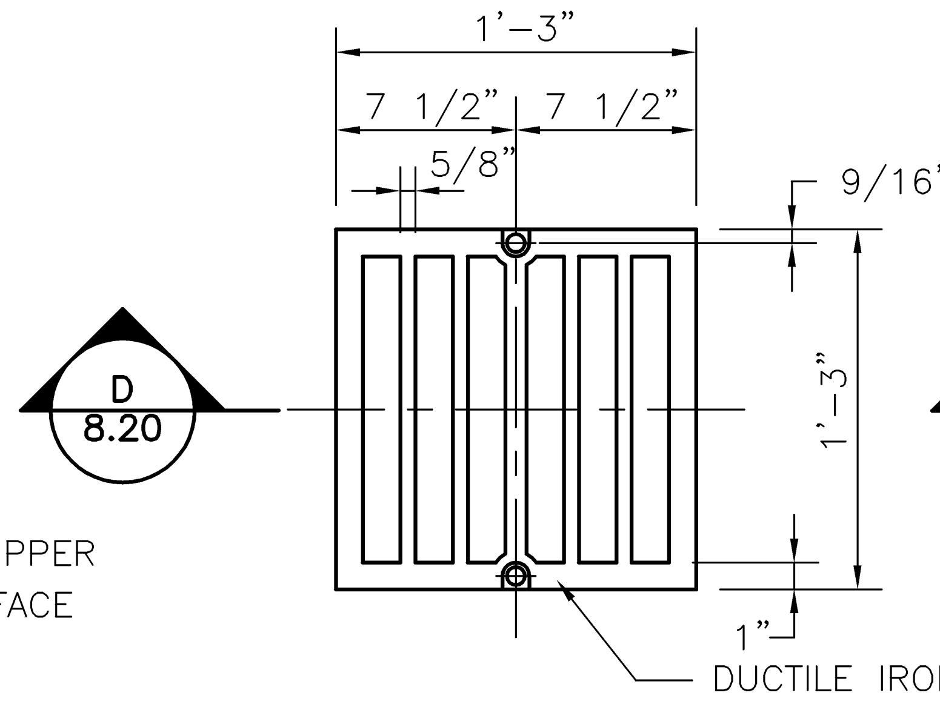
SCALE:1 1/2"=1'-0"


PLACE TOP OF GRATING BELOW NORMAL GUTTER LINE 1" MIN. TO 1 1/2" MAX.
3/4"
SET TO NORMAL GRADE
TURN UP WATERPROOFING MEMBRANE AT SIDE OF SCUPPER
TOP OF HMA WEARING SURFACE
DECK SLAB
3/4"
℄ GIRDER OR W
(8)3/4"ø CAP SCREWS (GALVANIZED)
8"øPVC FLANGE SCHEDULE 80
8"øPVC OUTFALL PIPE SCHEDULE 80 (POSITIONS VARY, SEE BRIDGE PLANS)
℄ SCUPPER
7 3/4"

SECTION B/8.20


1/8"
1/8"
1'-4 3/4"
3/4"
3/4"
1'-3"
1"
TOP OF HMA WEARING SURFACE OR LATEX WEARING SURFACE
GRATING
SCUPPER, CAST IRON AASHTO M105, CLASS 30A
3/4"
(8)-3/4"ᶲ CAP SCREWS (GALVANIZED)
1/8" GASKET
8" PVC FLANGE SCHEDULE 80
11 3/4"ø BOLT CIRCLE
1'-2 1/2"

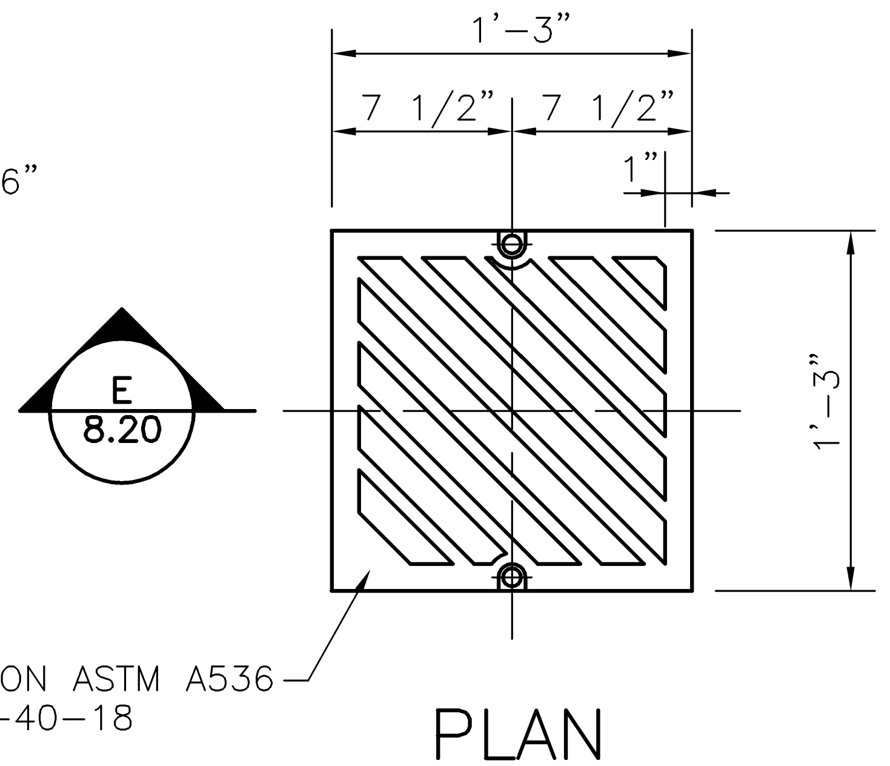
SECTION C/8.20



PLAN

TYPE A GRATING

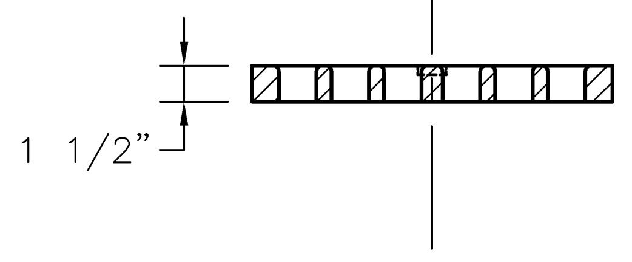
WHEN BICYCLES ARE PROHIBITED FROM BRIDGE



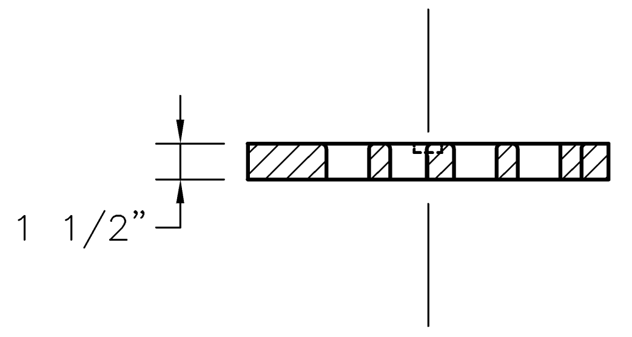
PLAN

TYPE B GRATING

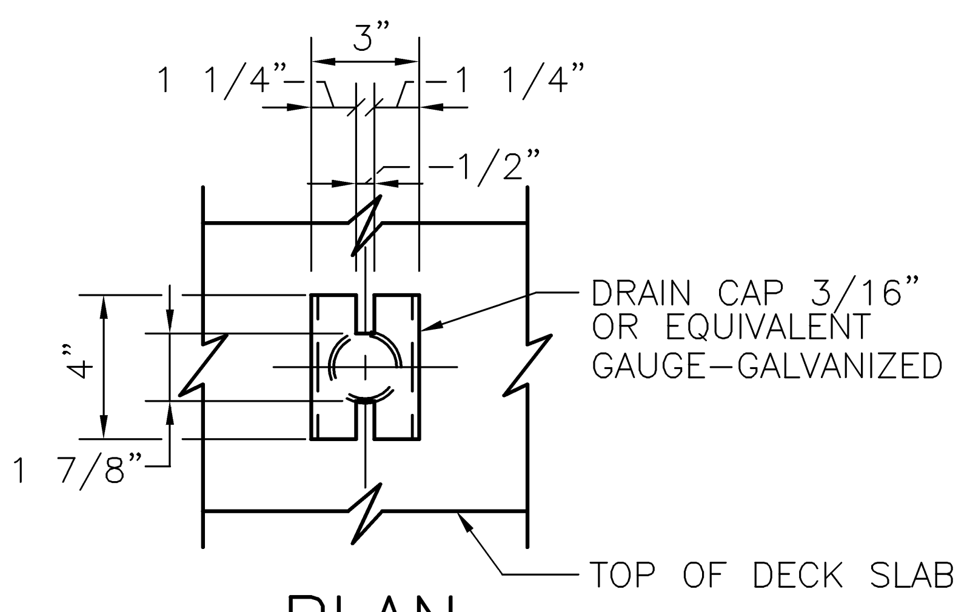
WHEN BICYCLES ARE NOT PROHIBITED FROM BRIDGE



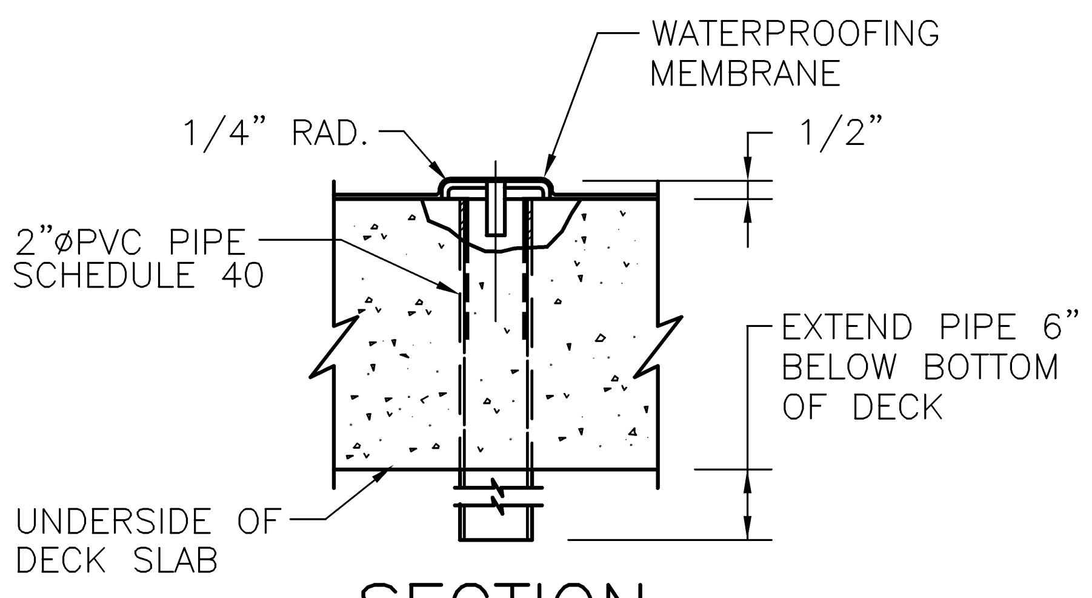
SECTION D/8.20



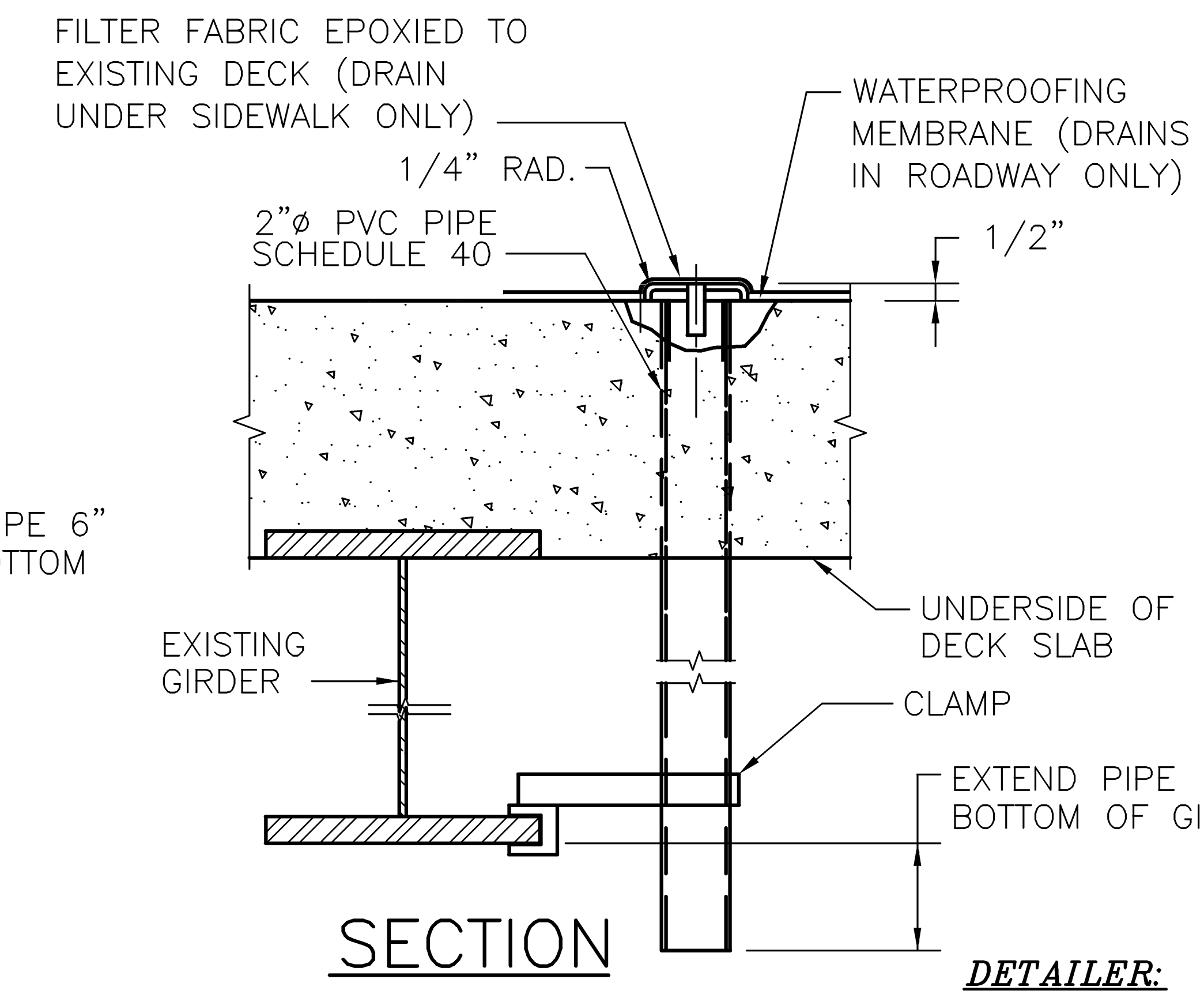
SECTION E/8.20



PLAN



SECTION


FILTER FABRIC EPOXIED TO EXISTING DECK (DRAIN UNDER SIDEWALK ONLY)
WATERPROOFING MEMBRANE (DRAINS IN ROADWAY ONLY)
1/4" RAD.
2"ø PVC PIPE SCHEDULE 40
1/2"
UNDERSIDE OF DECK SLAB
EXISTING GIRDER
CLAMP
EXTEND PIPE 12" BELOW BOTTOM OF GIRDER

SECTION

SUBPAVEMENT DRAIN

NO TO SCALE

DETAILER:
EXTEND PIPE 12" BELOW BOTTOM OF GIRDER IF WATER IS LIKELY TO DISCHARGE ON TO GIRDER.

DESIGNER NOTES:

1. *THE SECTION B/8.20 SCUPPER SHOULD BE USED WHEN GIRDERS, STRINGERS OR PRESTRESSED BEAMS INTERFERE WITH THE OUTFALL PIPE.*
2. *REFER TO THE RIDOT LRFD BRIDGE DESIGN MANUAL FOR SCUPPER DESIGN AND DETAILING REQUIREMENTS.*
3. *WHEN THE SCUPPER IS PLACED AT A LOCATION WHERE EXPANSION BETWEEN IT AND THE SCUPPER DISCHARGE PIPING SYSTEM ATTACHED TO THE SUBSTRUCTURE UNIT MAY OCCUR, PROVISIONS SHALL BE MADE TO ACCOMMODATE THE MOVEMENT.*
4. *DETAILS ARE SIMILAR FOR FINISHED CONCRETE DECK.*

NOTE:

1. AN ALTERNATE DETAIL OF SIMILAR DIMENSIONS AND EQUAL CAPACITY MAY BE SUBMITTED FOR APPROVAL OF THE ENGINEER.

REVISIONS	
No.	DATE

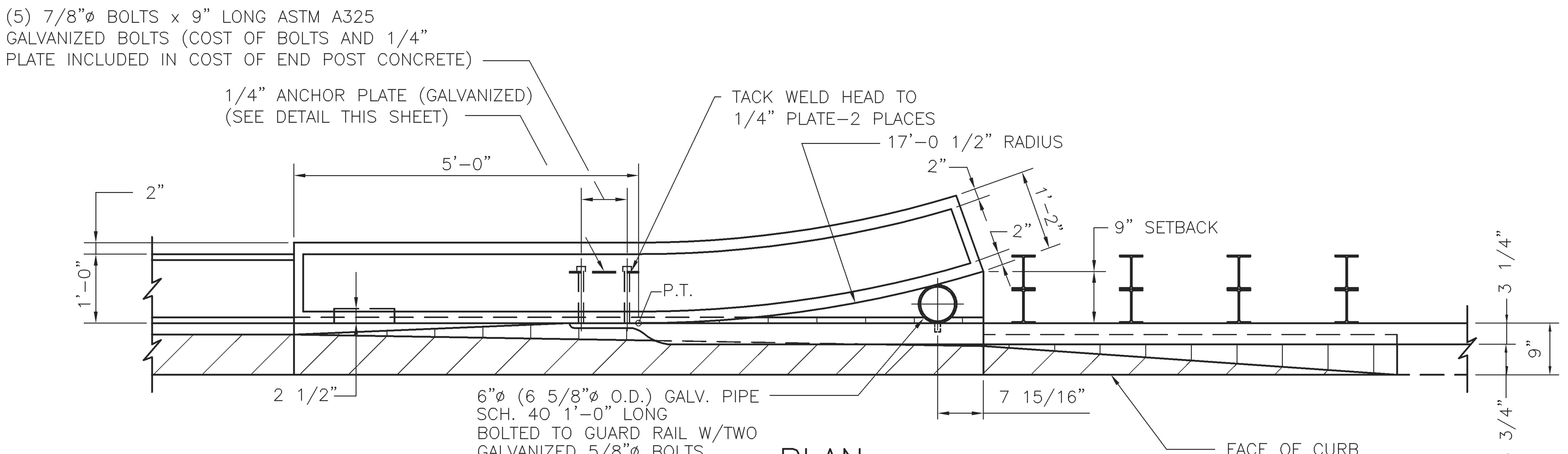
RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

BRIDGE STANDARDS

DRAINAGE DETAILS

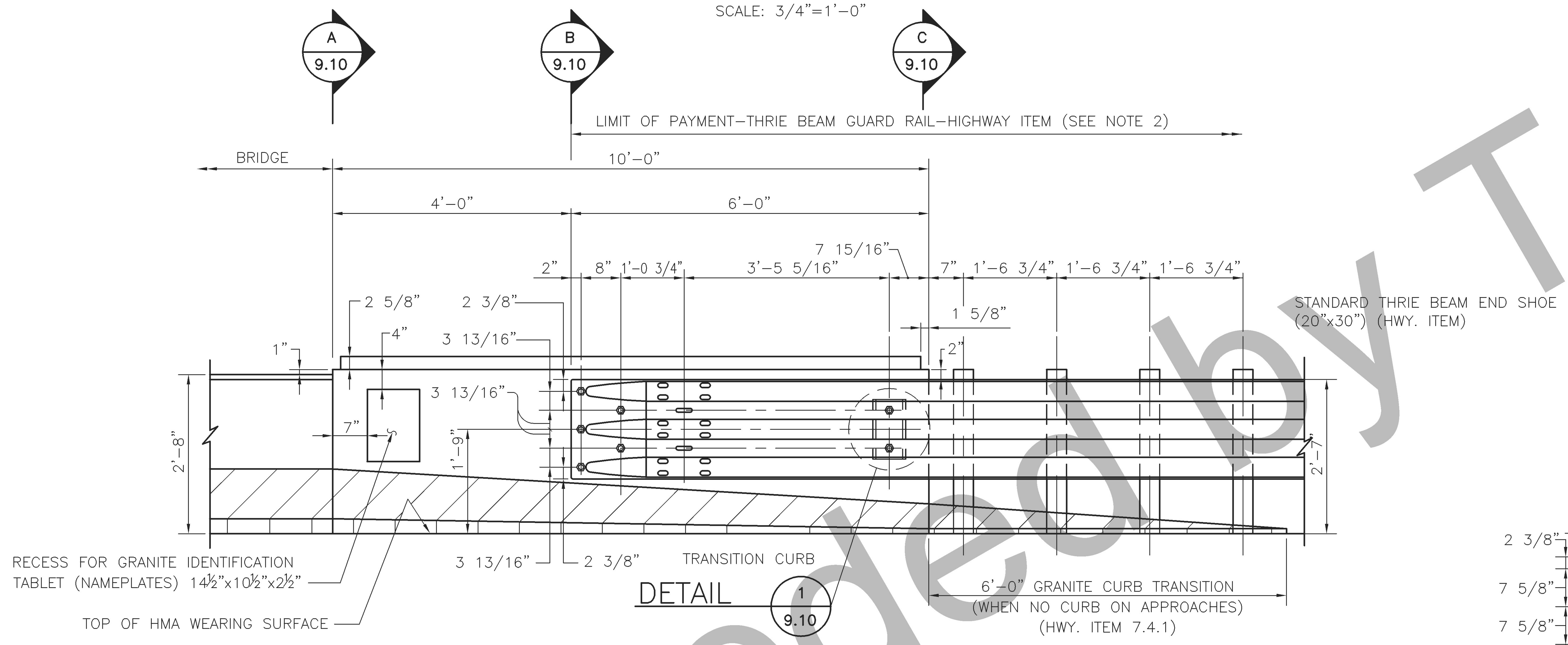
DRAWING NUMBER: 8.20

Superseded by TAC 0405


(5) 7/8"ø BOLTS x 9" LONG ASTM A325
GALVANIZED BOLTS (COST OF BOLTS AND 1/4"
PLATE INCLUDED IN COST OF END POST CONCRETE)
1/4" ANCHOR PLATE (GALVANIZED)
(SEE DETAIL THIS SHEET)
TACK WELD HEAD TO
1/4" PLATE-2 PLACES
17'-0 1/2" RADIUS
5'-0"
2"
1'-2"
2"
9" SETBACK
1'-0"
P.T.
3 1/4"
9"
5 3/4"
2 1/2"
6"ø (6 5/8"ø O.D.) GALV. PIPE
SCH. 40 1'-0" LONG
BOLTED TO GUARD RAIL W/TWO
GALVANIZED 5/8"ø BOLTS
7 15/16"
FACE OF CURB

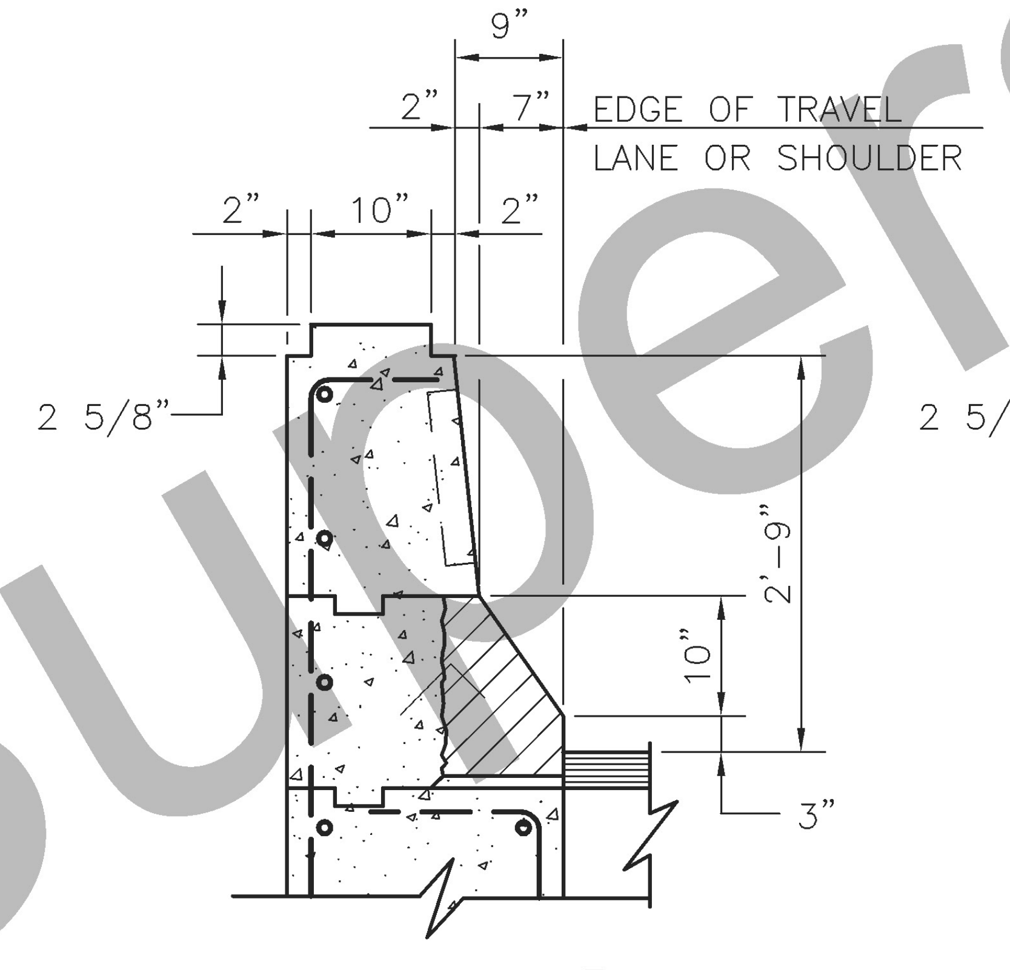
PLAN

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

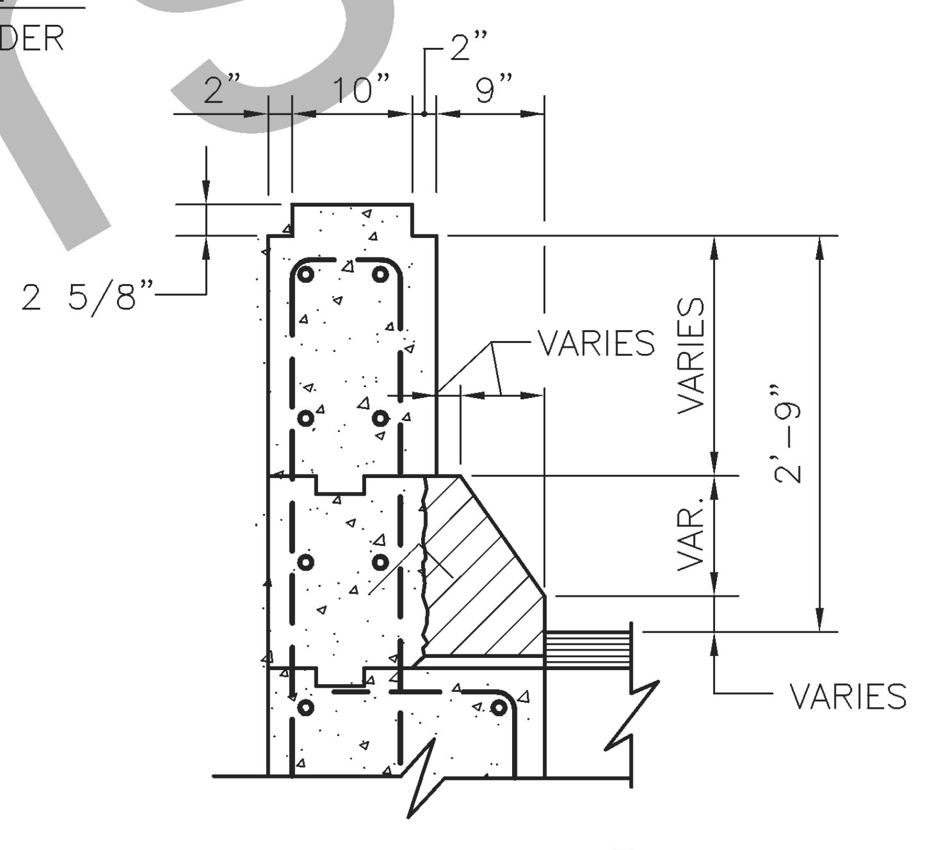

A 9.10
B 9.10
C 9.10
LIMIT OF PAYMENT-THRIE BEAM GUARD RAIL-HIGHWAY ITEM (SEE NOTE 2)
BRIDGE
10'-0"
4'-0"
6'-0"
7 15/16"
2"
8"
1'-0 3/4"
3'-5 5/16"
7"
1'-6 3/4"
1'-6 3/4"
1'-6 3/4"
2 5/8"
2 3/8"
4"
3 13/16"
3 13/16"
1 5/8"
2"
1"
7"
2'-8"
1'-9"
2'-7"
STANDARD THRIE BEAM END SHOE
(20"x30") (HWY. ITEM)
RECESS FOR GRANITE IDENTIFICATION
TABLET (NAMEPLATES) 14½"x10½"x2½"
TOP OF HMA WEARING SURFACE
3 13/16"
2 3/8"
TRANSITION CURB
DETAIL 1 9.10
6'-0" GRANITE CURB TRANSITION
(WHEN NO CURB ON APPROACHES)
(HWY. ITEM 7.4.1)

ELEVATION

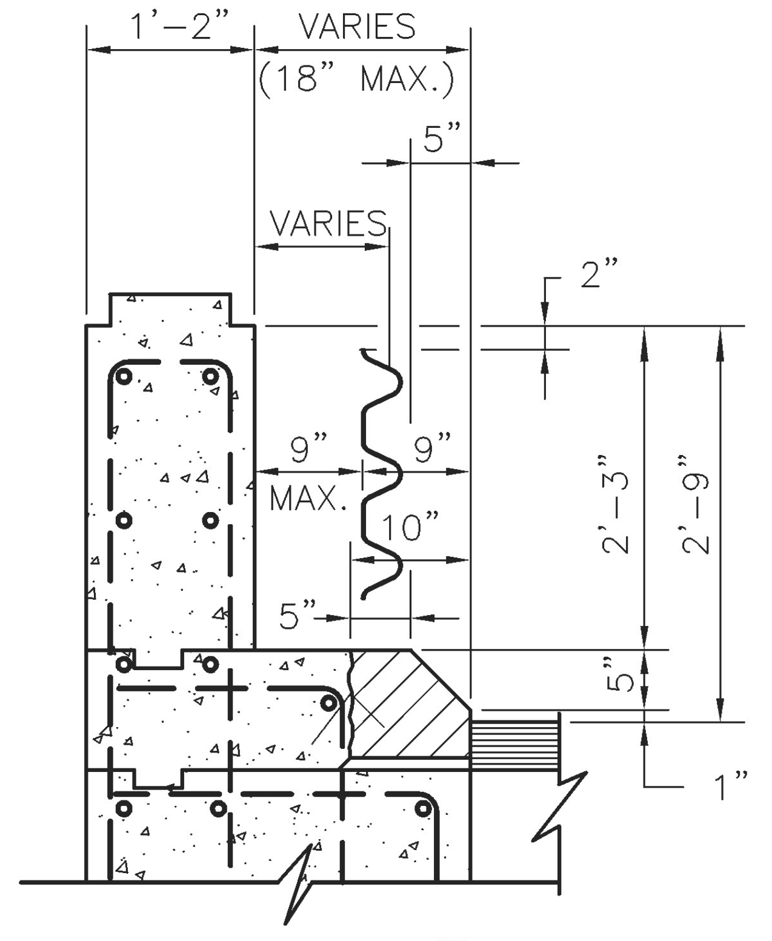
SCALE: 3/4"=1'-0"



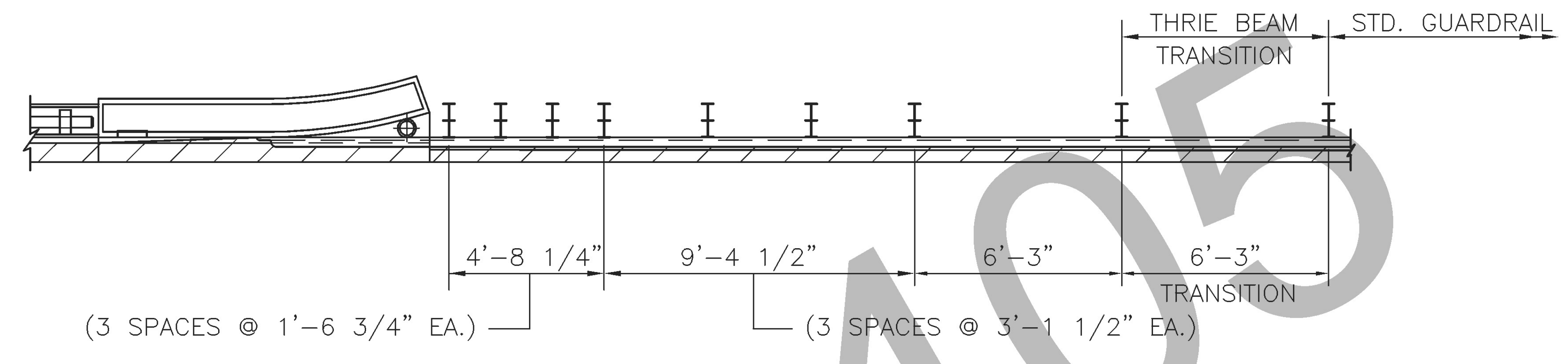
SECTION A 9.10
SCALE: 3/4"=1'-0"



SECTION B 9.10
SCALE: 3/4"=1'-0"

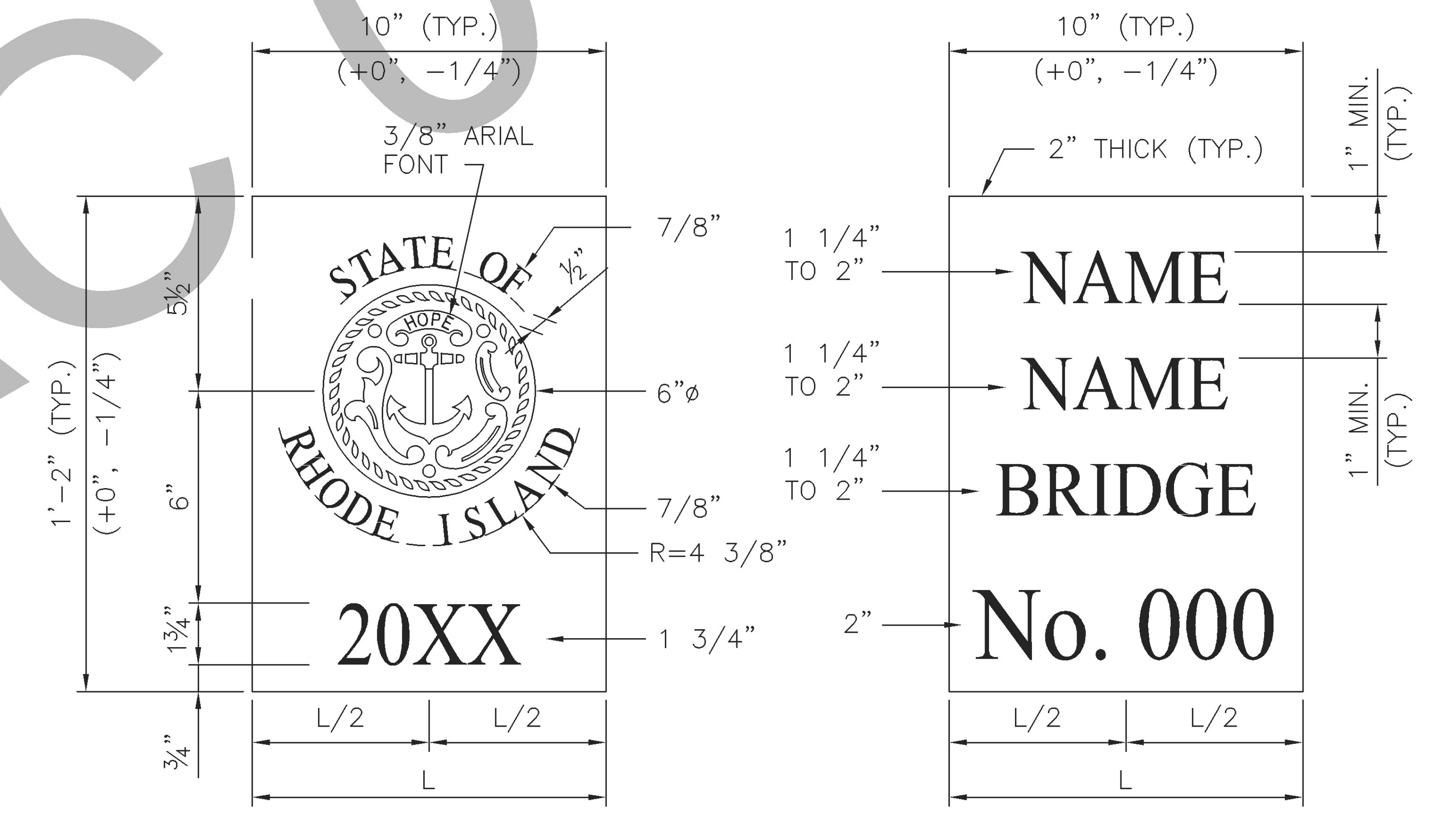


SECTION C 9.10
SCALE: 3/4"=1'-0"



PLAN VIEW OF GUARDRAIL TRANSITION

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



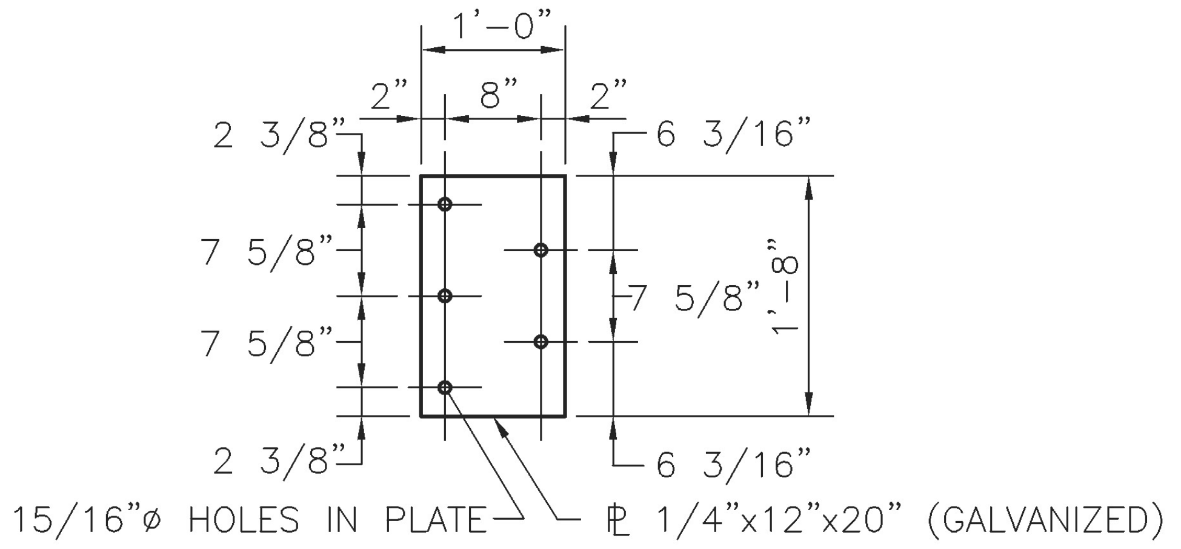
STATE SEAL TABLET

BRIDGE NAME TABLET

NOTE:
ALL FONT STYLES ARE TO BE TIMES NEW ROMAN,
UNLESS NOTED OTHERWISE.

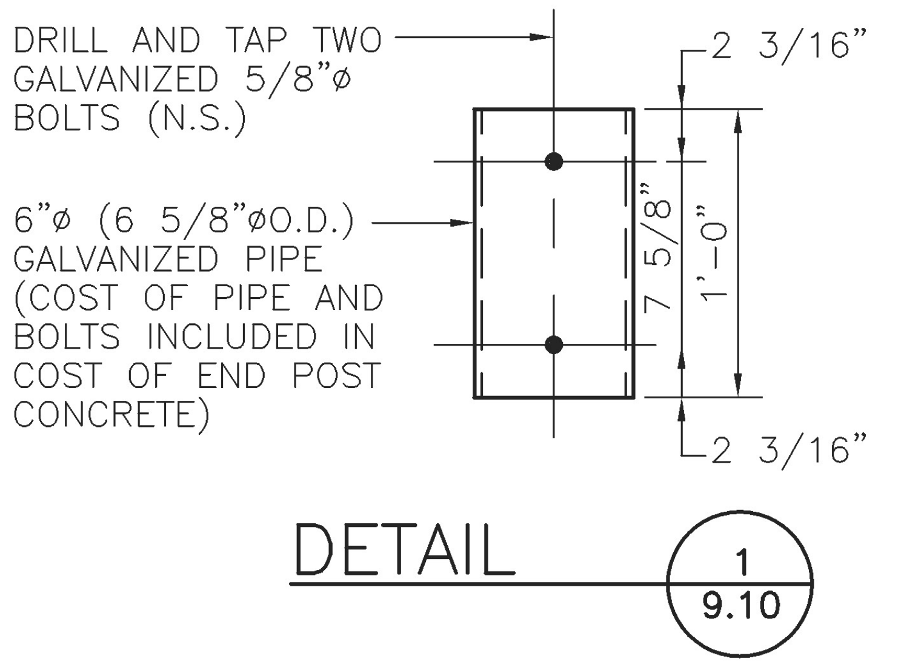
GRANITE IDENTIFICATION TABLETS (NAMEPLATES)

SCALE: 3"=1'-0"



DETAIL OF ANCHOR PLATE FOR THRIE BEAM

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



PIPE SEPARATOR DETAIL

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

DESIGNER:

1. *THE HIGH VOLUME-HIGH SPEED END POST DETAIL IS TO BE USED ON INTERSTATES OR PRIMARY ROUTES UNLESS OTHERWISE DIRECTED BY THE BRIDGE ENGINEER.*

NOTES:

1. TO INSURE PROPER GUARD RAIL ANCHORAGE, THE GUARD RAIL INSTALLATION SHALL BEGIN AT EACH END OF THE BRIDGE.
2. THE COST OF THE GUARD RAIL TRANSITION TO BRIDGE END POSTS ARE HIGHWAY ITEMS. APPROACH SECTIONS AND TRAILING SECTIONS ARE SEPARATE ITEMS IN THE PROPOSAL.

HIGH VOLUME-HIGH SPEED

REVISIONS	
No.	DATE

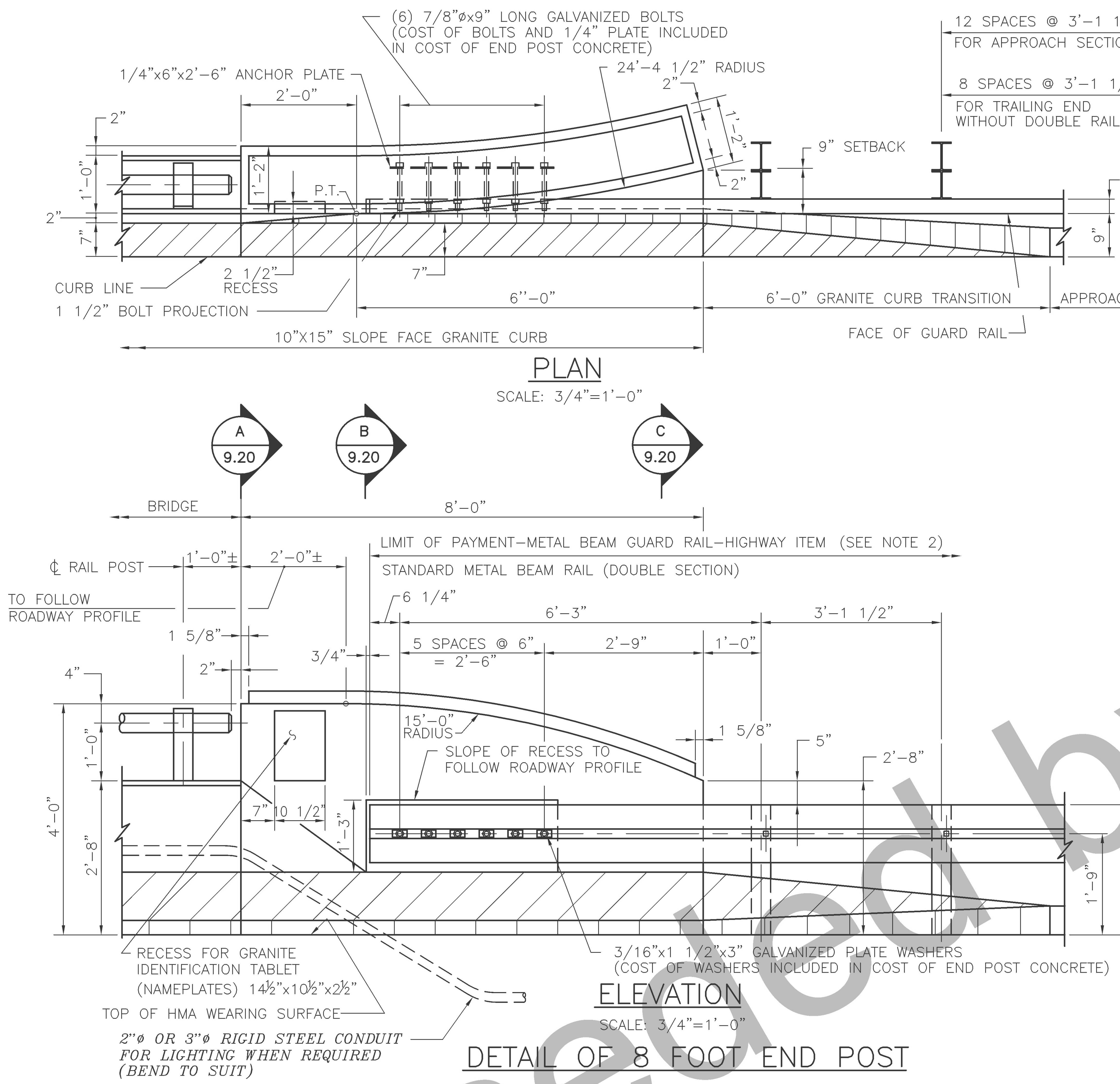
RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

BRIDGE STANDARDS

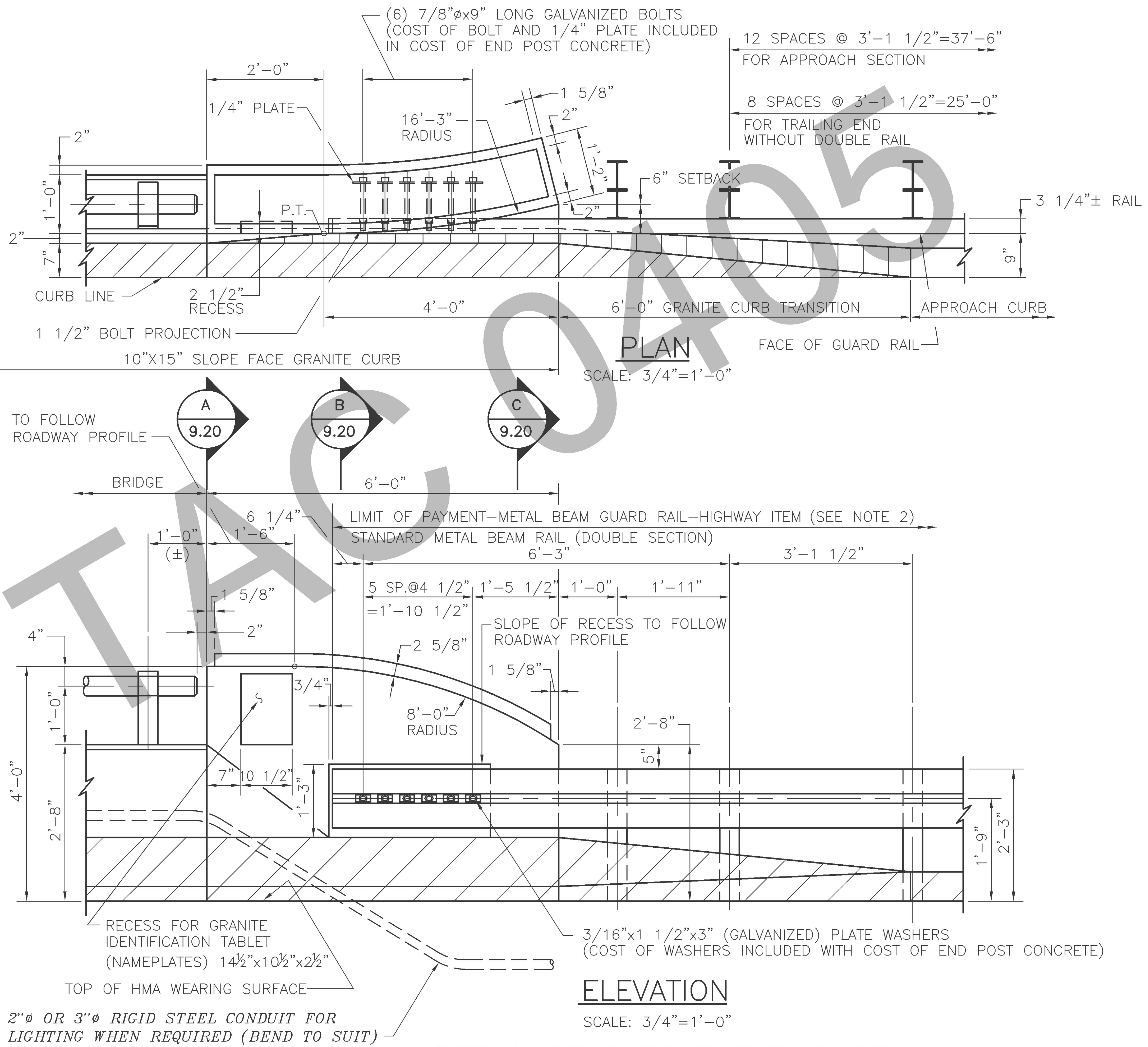
END POST DETAILS
FOR SAFETY BARRIER PARAPET

DRAWING NUMBER: 9.10

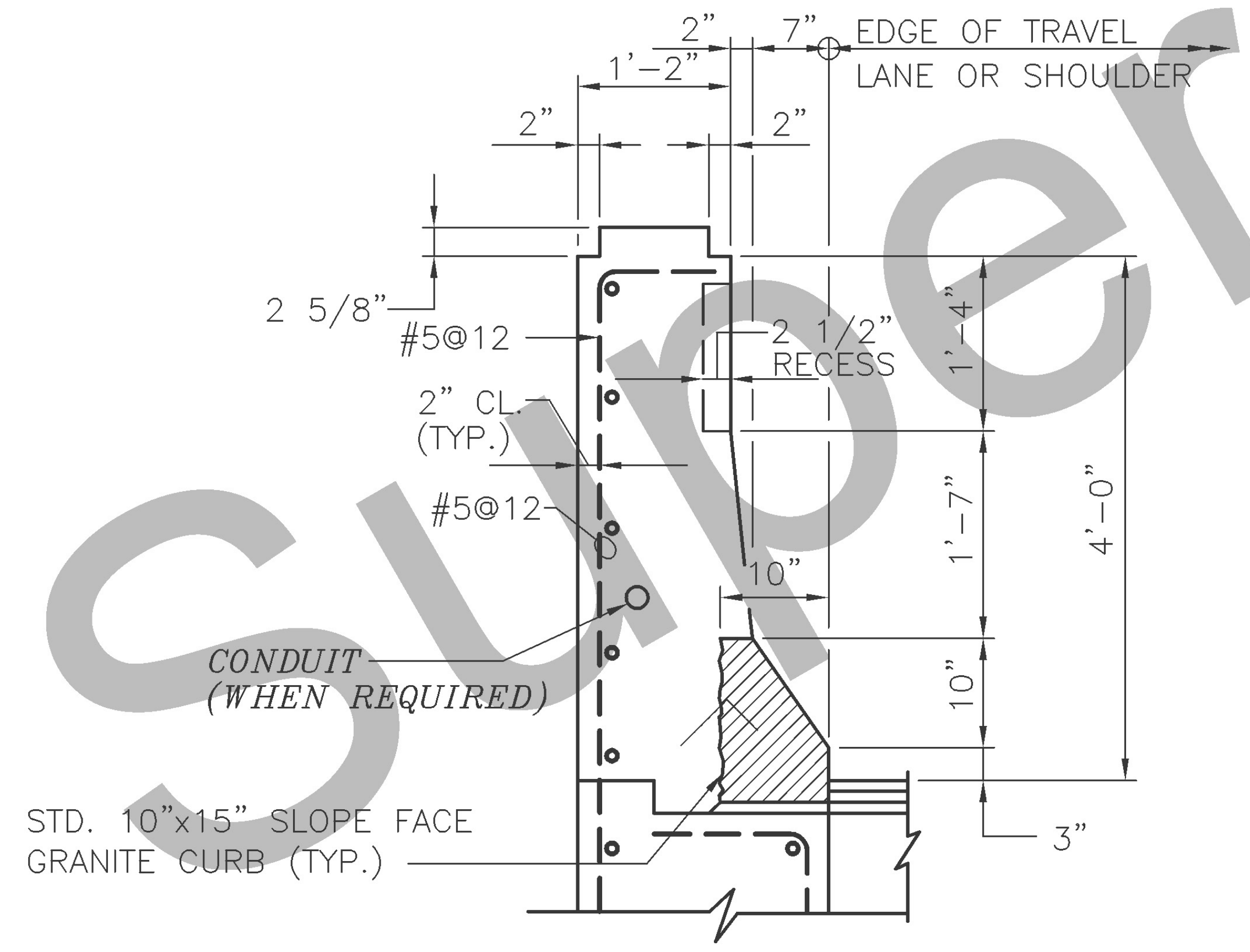
Superseded by TAC 0405


(6) 7/8"øx9" LONG GALVANIZED BOLTS (COST OF BOLTS AND 1/4" PLATE INCLUDED IN COST OF END POST CONCRETE)
1/4"x6"x2'-6" ANCHOR PLATE
2'-0"
24'-4 1/2" RADIUS
12 SPACES @ 3'-1 1/2"=37'-6" FOR APPROACH SECTION
8 SPACES @ 3'-1 1/2"=25'-0" FOR TRAILING END WITHOUT DOUBLE RAIL
9" SETBACK
3 1/4"± RAIL
P.T.
CURB LINE
2 1/2" RECESS
1 1/2" BOLT PROJECTION
6'-0"
6'-0" GRANITE CURB TRANSITION
APPROACH CURB
FACE OF GUARD RAIL
10"X15" SLOPE FACE GRANITE CURB
PLAN
SCALE: 3/4"=1'-0"
A 9.20
B 9.20
C 9.20
BRIDGE
8'-0"
LIMIT OF PAYMENT–METAL BEAM GUARD RAIL–HIGHWAY ITEM (SEE NOTE 2)
STANDARD METAL BEAM RAIL (DOUBLE SECTION)
℄ RAIL POST
TO FOLLOW ROADWAY PROFILE
1'-0"±
2'-0"±
6 1/4"
6'-3"
3'-1 1/2"
5 SPACES @ 6" = 2'-6"
2'-9"
1'-0"
15'-0" RADIUS
SLOPE OF RECESS TO FOLLOW ROADWAY PROFILE
1 5/8"
5"
2'-8"
7" 10 1/2"
4'-0"
2'-8"
1'-9"
2'-3"
RECESS FOR GRANITE IDENTIFICATION TABLET (NAMEPLATES) 14½"x10½"x2½"
TOP OF HMA WEARING SURFACE
2"ø OR 3"ø RIGID STEEL CONDUIT FOR LIGHTING WHEN REQUIRED (BEND TO SUIT)
3/16"x1 1/2"x3" GALVANIZED PLATE WASHERS (COST OF WASHERS INCLUDED IN COST OF END POST CONCRETE)
ELEVATION
SCALE: 3/4"=1'-0"

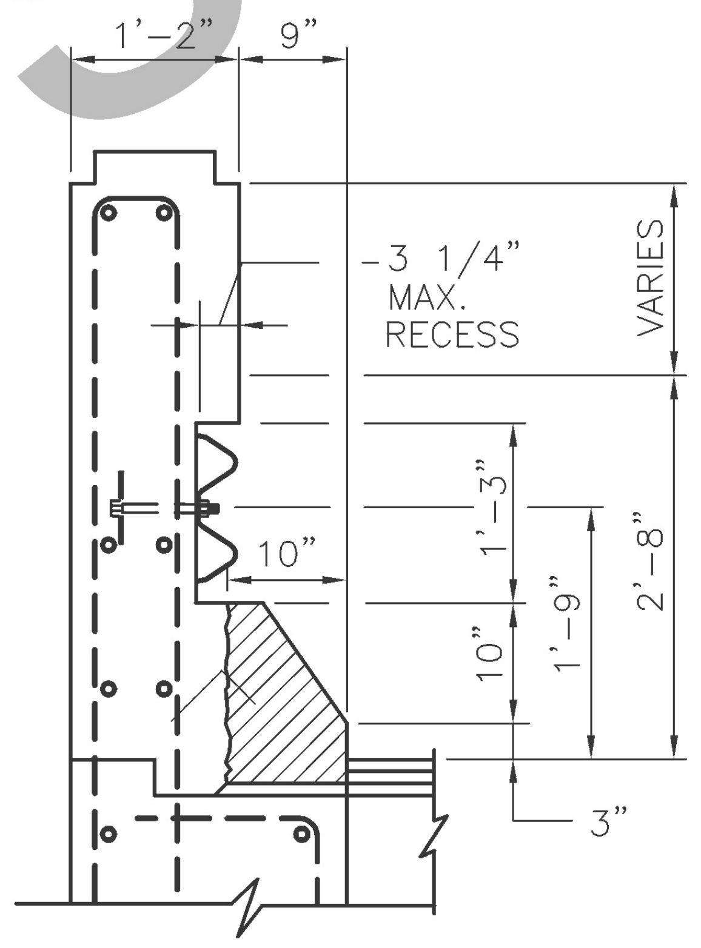
DETAIL OF 8 FOOT END POST


(6) 7/8"øx9" LONG GALVANIZED BOLTS (COST OF BOLT AND 1/4" PLATE INCLUDED IN COST OF END POST CONCRETE)
2'-0"
1/4" PLATE
16'-3" RADIUS
12 SPACES @ 3'-1 1/2"=37'-6" FOR APPROACH SECTION
8 SPACES @ 3'-1 1/2"=25'-0" FOR TRAILING END WITHOUT DOUBLE RAIL
6" SETBACK
3 1/4"± RAIL
P.T.
CURB LINE
2 1/2" RECESS
1 1/2" BOLT PROJECTION
4'-0"
6'-0" GRANITE CURB TRANSITION
APPROACH CURB
FACE OF GUARD RAIL
10"X15" SLOPE FACE GRANITE CURB
PLAN
SCALE: 3/4"=1'-0"
TO FOLLOW ROADWAY PROFILE
A 9.20
B 9.20
C 9.20
BRIDGE
6'-0"
LIMIT OF PAYMENT–METAL BEAM GUARD RAIL–HIGHWAY ITEM (SEE NOTE 2)
STANDARD METAL BEAM RAIL (DOUBLE SECTION)
6'-3"
3'-1 1/2"
5 SP.@4 1/2" =1'-10 1/2"
1'-5 1/2"
1'-0"
1'-11"
SLOPE OF RECESS TO FOLLOW ROADWAY PROFILE
8'-0" RADIUS
2'-8"
4'-0"
2'-8"
1'-9"
2'-3"
RECESS FOR GRANITE IDENTIFICATION TABLET (NAMEPLATES) 14½"x10½"x2½"
TOP OF HMA WEARING SURFACE
2"ø OR 3"ø RIGID STEEL CONDUIT FOR LIGHTING WHEN REQUIRED (BEND TO SUIT)
3/16"x1 1/2"x3" (GALVANIZED) PLATE WASHERS (COST OF WASHERS INCLUDED WITH COST OF END POST CONCRETE)
ELEVATION
SCALE: 3/4"=1'-0"

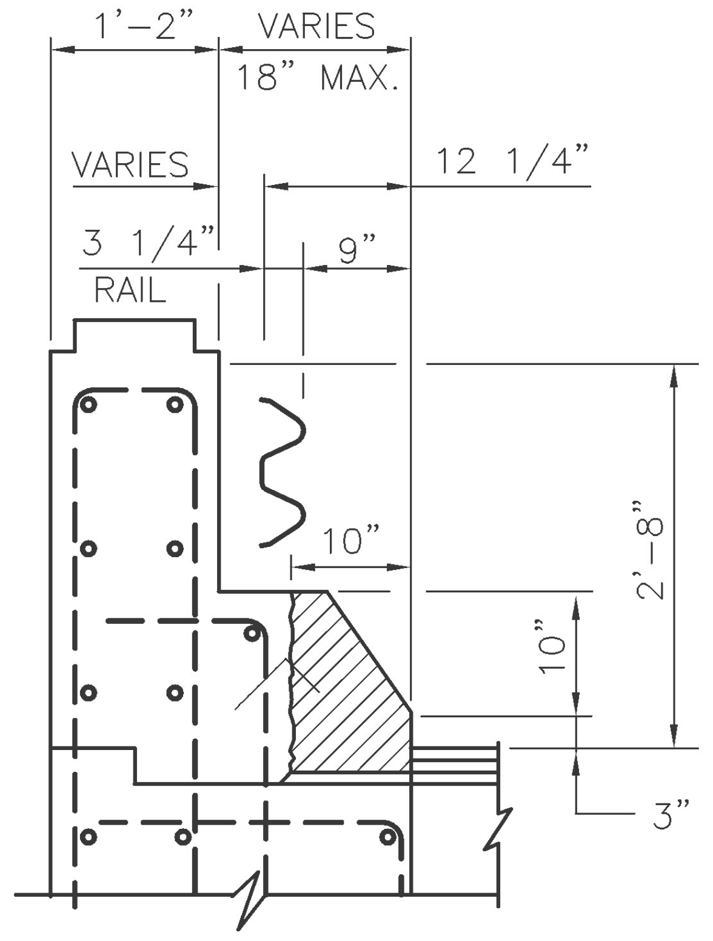
DETAIL OF 6 FOOT END POST



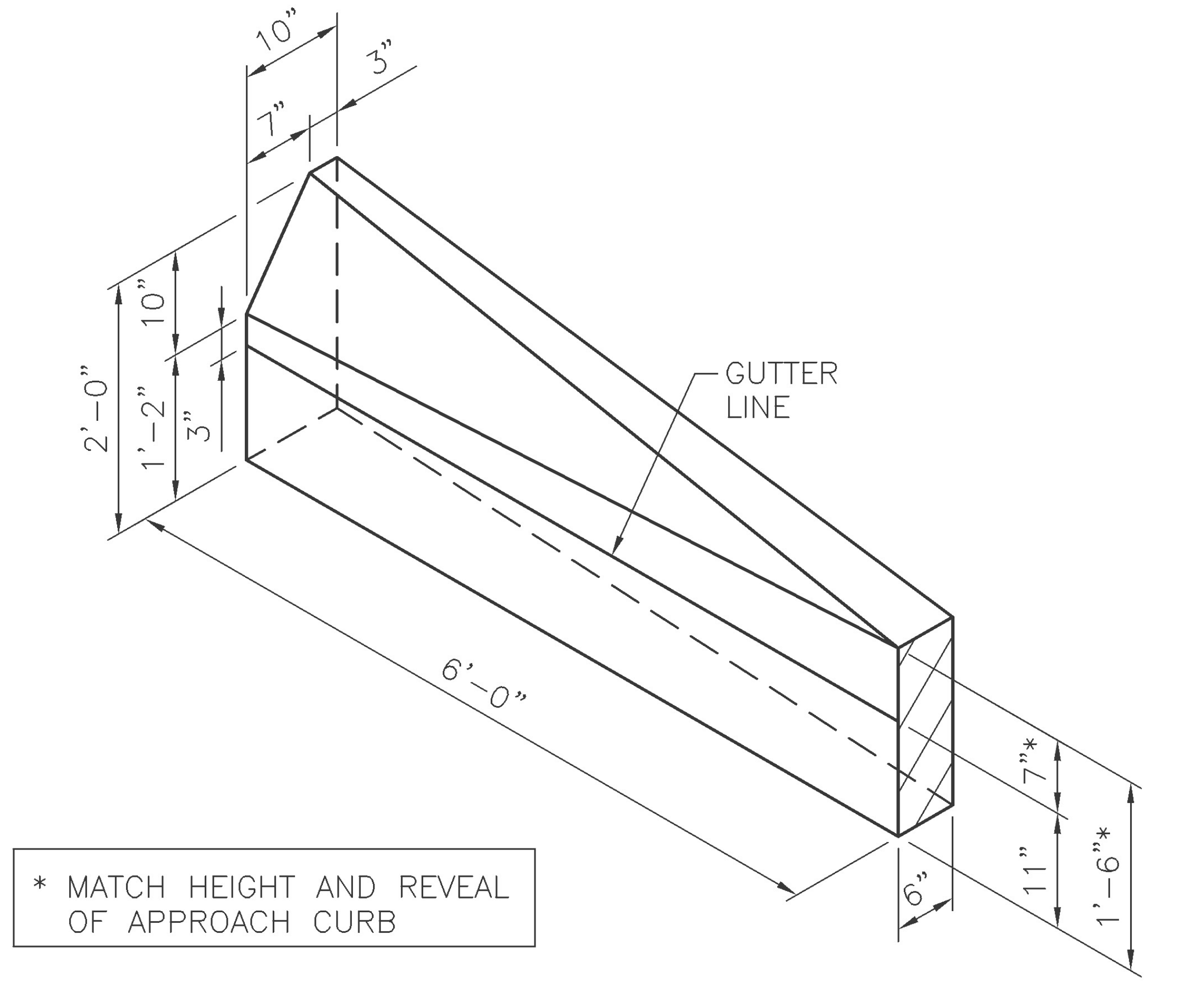
SECTION A 9.20
SCALE: 3/4"=1'-0"



SECTION B 9.20
SCALE: 3/4"=1'-0"



SECTION C 9.20
SCALE: 3/4"=1'-0"



6'-0" GRANITE CURB TRANSITION

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

NOTES:

1. TO INSURE PROPER GUARD RAIL ANCHORAGE, THE GUARD RAIL INSTALLATION SHALL BEGIN AT EACH END OF THE BRIDGE.
2. THE COST OF THE GUARD RAIL TRANSITION TO BRIDGE END POSTS ARE HIGHWAY ITEMS. APPROACH SECTIONS AND TRAILING SECTIONS ARE SEPARATE ITEMS IN THE PROPOSAL.
3. SEE DRAWING (18.20) FOR 1-BAR ORNAMENTAL RAIL DETAILS.
4. REFER TO DRAWING (9.10) TO FOR NAMEPLATE TABLET DETAILS

LOW VOLUME–LOW SPEED

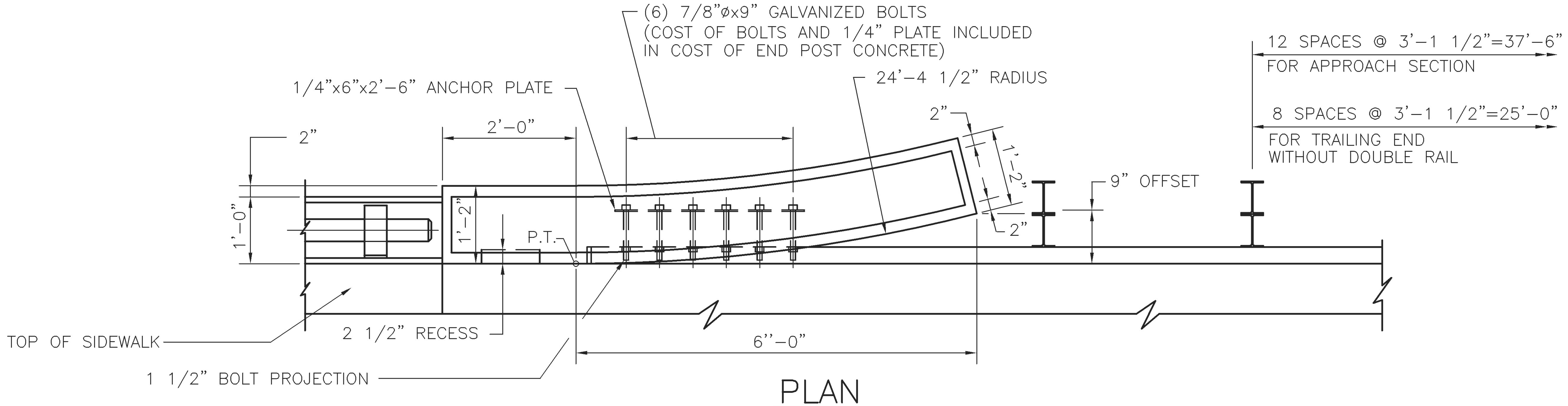
REVISIONS	
No.	DATE

RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

BRIDGE STANDARDS

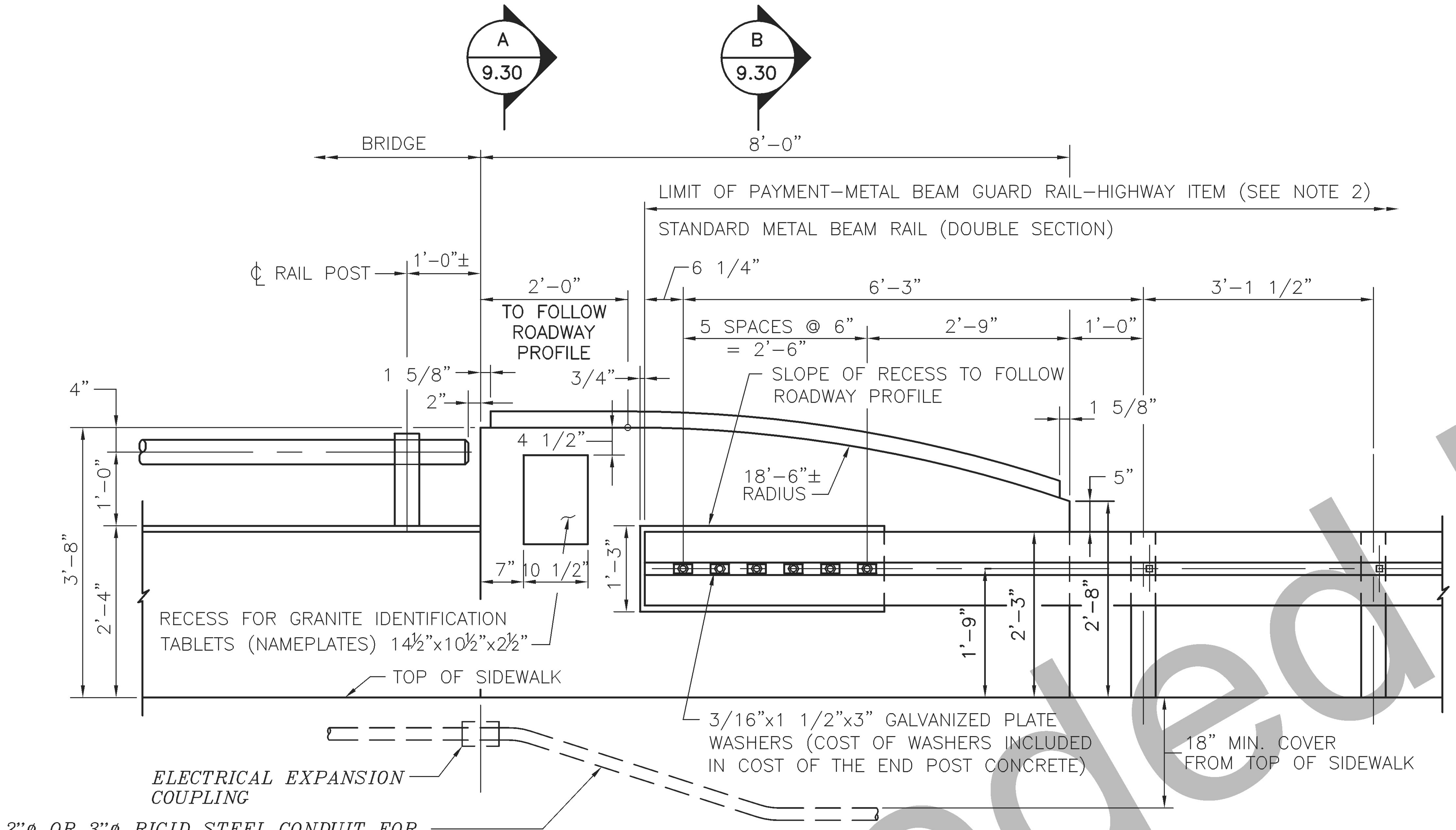
END POST DETAILS FOR
SAFETY BARRIER PARAPET

DRAWING NUMBER: 9.20


(6) 7/8"øx9" GALVANIZED BOLTS (COST OF BOLTS AND 1/4" PLATE INCLUDED IN COST OF END POST CONCRETE)
1/4"x6"x2'-6" ANCHOR PLATE
24'-4 1/2" RADIUS
12 SPACES @ 3'-1 1/2"=37'-6" FOR APPROACH SECTION
8 SPACES @ 3'-1 1/2"=25'-0" FOR TRAILING END WITHOUT DOUBLE RAIL
2'-0"
2"
1'-0"
1'-2"
P.T.
1'-2"
2"
9" OFFSET
TOP OF SIDEWALK
2 1/2" RECESS
6''-0"
1 1/2" BOLT PROJECTION

PLAN

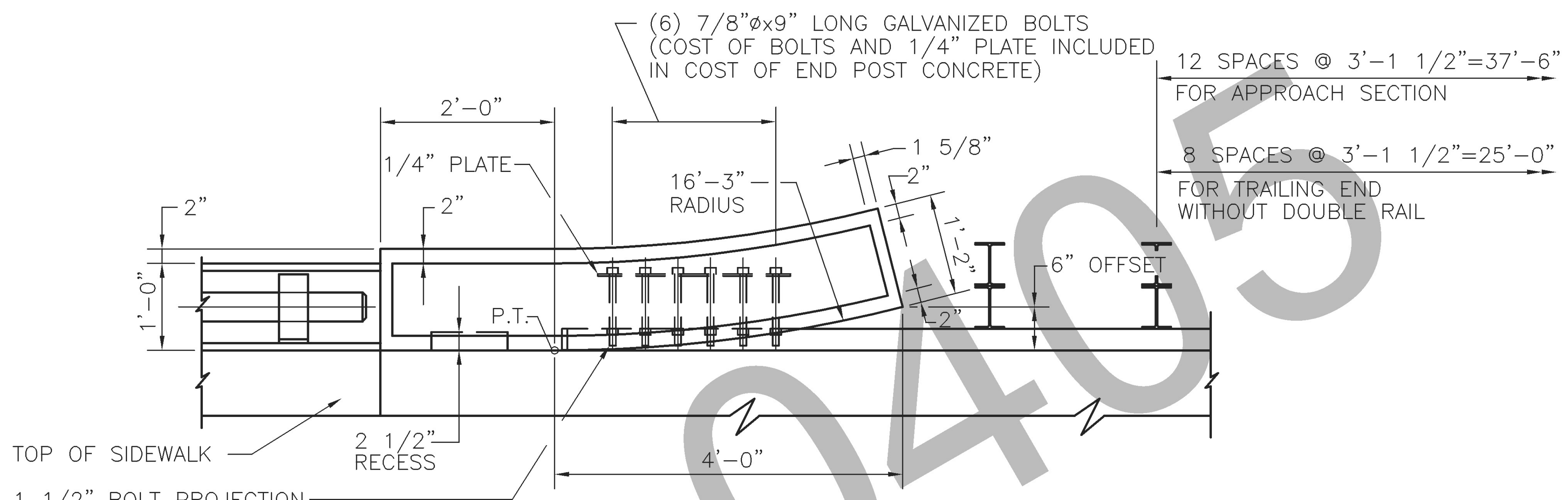
SCALE: 3/4"=1'-0"


A 9.30
B 9.30
BRIDGE
8'-0"
LIMIT OF PAYMENT-METAL BEAM GUARD RAIL-HIGHWAY ITEM (SEE NOTE 2)
STANDARD METAL BEAM RAIL (DOUBLE SECTION)
℄ RAIL POST
1'-0"±
2'-0"
6 1/4"
6'-3"
3'-1 1/2"
TO FOLLOW ROADWAY PROFILE
5 SPACES @ 6" = 2'-6"
2'-9"
1'-0"
1 5/8"
3/4"
2"
SLOPE OF RECESS TO FOLLOW ROADWAY PROFILE
1 5/8"
4"
4 1/2"
18'-6"± RADIUS
5"
1'-0"
3'-8"
2'-4"
7" 10 1/2"
1'-3"
1'-9"
2'-3"
2'-8"
RECESS FOR GRANITE IDENTIFICATION TABLETS (NAMEPLATES) 14½"x10½"x2½"
TOP OF SIDEWALK
3/16"x1 1/2"x3" GALVANIZED PLATE WASHERS (COST OF WASHERS INCLUDED IN COST OF THE END POST CONCRETE)
18" MIN. COVER FROM TOP OF SIDEWALK
ELECTRICAL EXPANSION COUPLING
2"ø OR 3"ø RIGID STEEL CONDUIT FOR LIGHTING WHEN REQUIRED (BEND TO SUIT)

ELEVATION

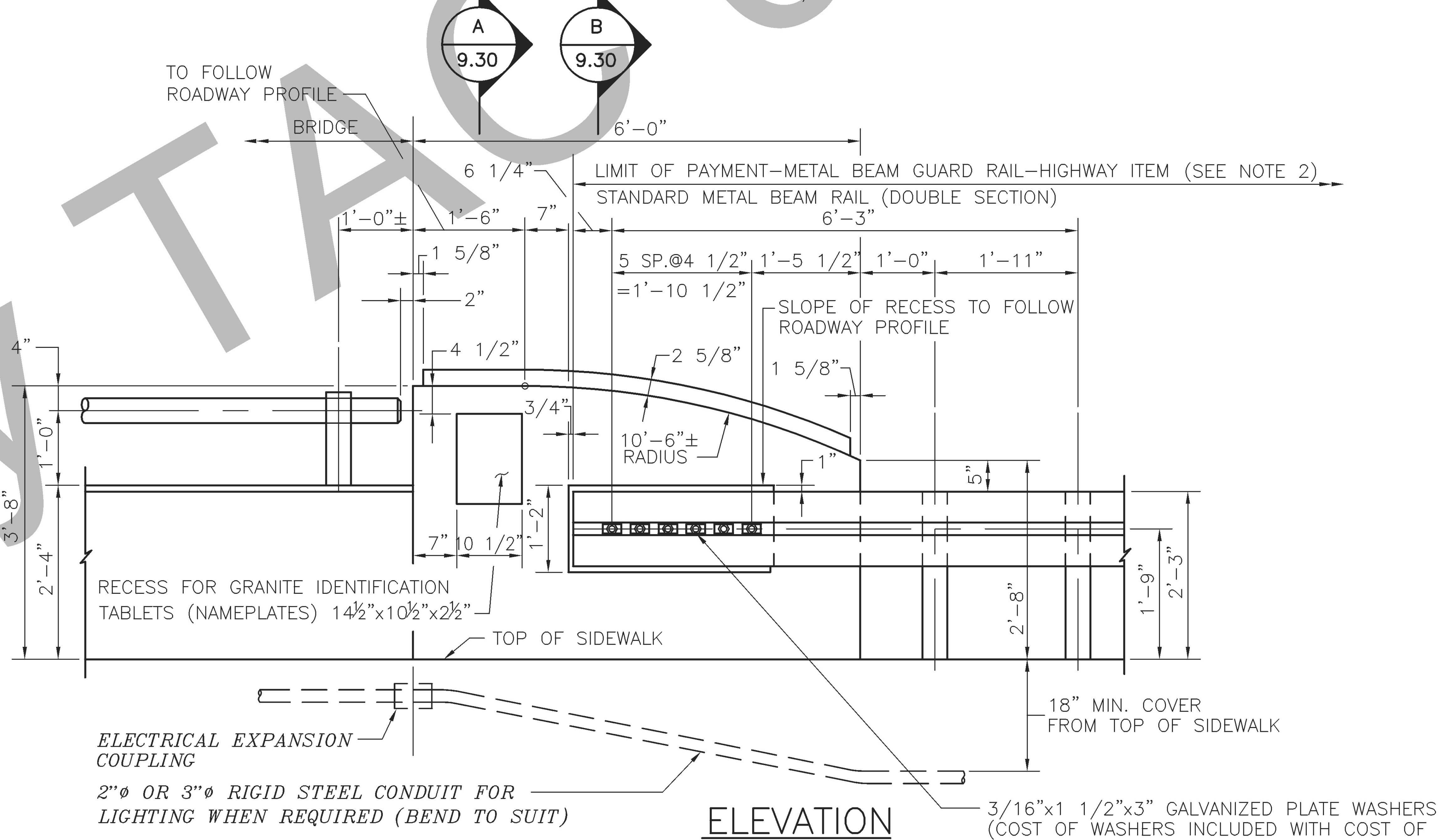
SCALE: 3/4"=1'-0"

DETAIL OF 8 FOOT END POST


(6) 7/8"øx9" LONG GALVANIZED BOLTS (COST OF BOLTS AND 1/4" PLATE INCLUDED IN COST OF END POST CONCRETE)
12 SPACES @ 3'-1 1/2"=37'-6" FOR APPROACH SECTION
8 SPACES @ 3'-1 1/2"=25'-0" FOR TRAILING END WITHOUT DOUBLE RAIL
2'-0"
1/4" PLATE
16'-3" RADIUS
1 5/8"
2"
2"
2"
1'-0"
1'-2"
6" OFFSET
P.T.
2"
TOP OF SIDEWALK
2 1/2" RECESS
4'-0"
1 1/2" BOLT PROJECTION

PLAN

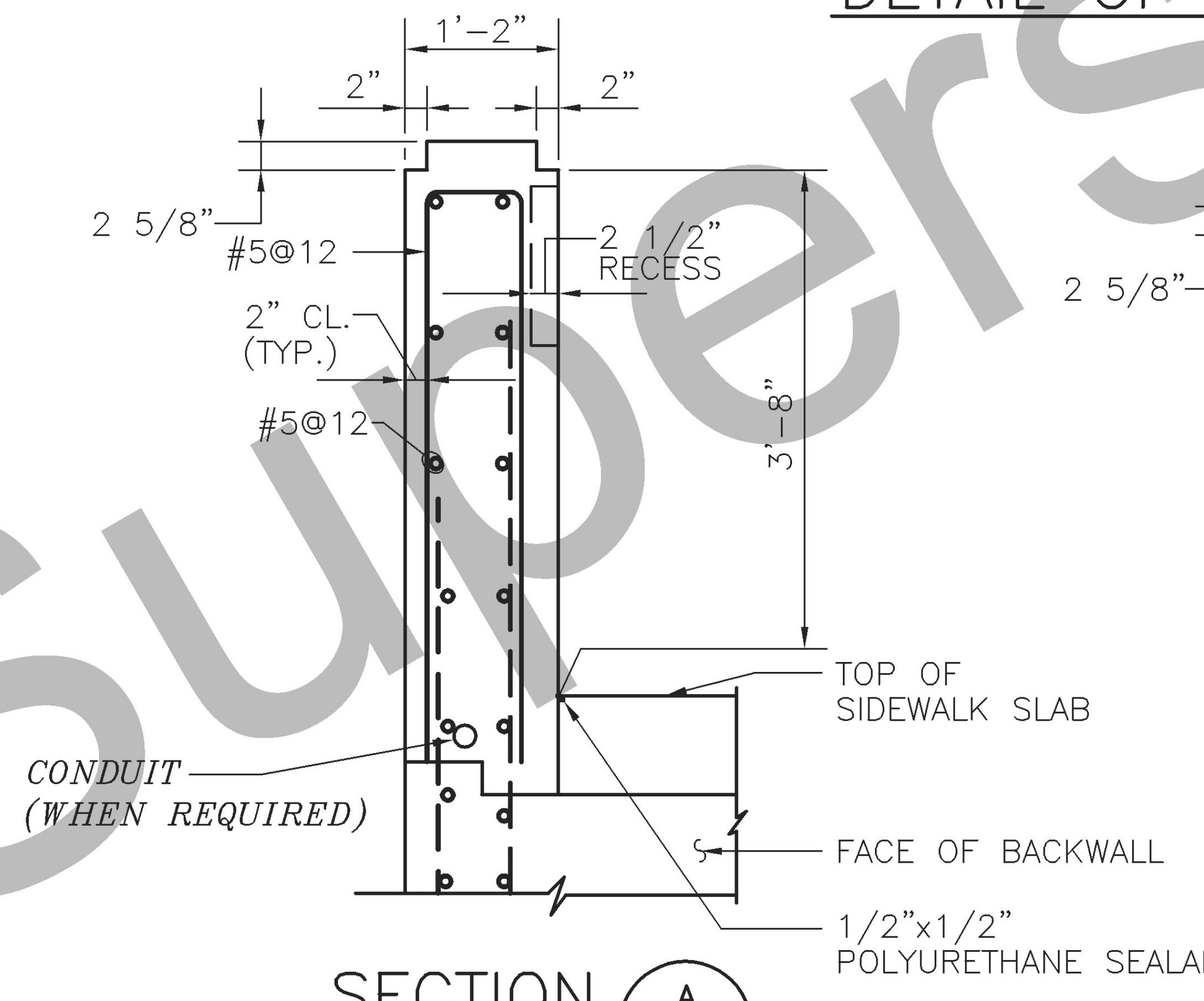
SCALE: 3/4"=1'-0"


A 9.30
B 9.30
TO FOLLOW ROADWAY PROFILE
BRIDGE
6'-0"
6 1/4"
LIMIT OF PAYMENT-METAL BEAM GUARD RAIL-HIGHWAY ITEM (SEE NOTE 2)
STANDARD METAL BEAM RAIL (DOUBLE SECTION)
1'-0"±
1'-6"
7"
6'-3"
1 5/8"
5 SP.@4 1/2" =1'-10 1/2"
1'-5 1/2"
1'-0"
1'-11"
2"
SLOPE OF RECESS TO FOLLOW ROADWAY PROFILE
4"
4 1/2"
2 5/8"
1 5/8"
3/4"
10'-6"± RADIUS
1"
5"
1'-0"
3'-8"
2'-4"
7" 10 1/2"
1'-2"
2'-8"
1'-9"
2'-3"
RECESS FOR GRANITE IDENTIFICATION TABLETS (NAMEPLATES) 14½"x10½"x2½"
TOP OF SIDEWALK
18" MIN. COVER FROM TOP OF SIDEWALK
ELECTRICAL EXPANSION COUPLING
2"ø OR 3"ø RIGID STEEL CONDUIT FOR LIGHTING WHEN REQUIRED (BEND TO SUIT)
3/16"x1 1/2"x3" GALVANIZED PLATE WASHERS (COST OF WASHERS INCLUDED WITH COST OF END POST CONCRETE)

ELEVATION

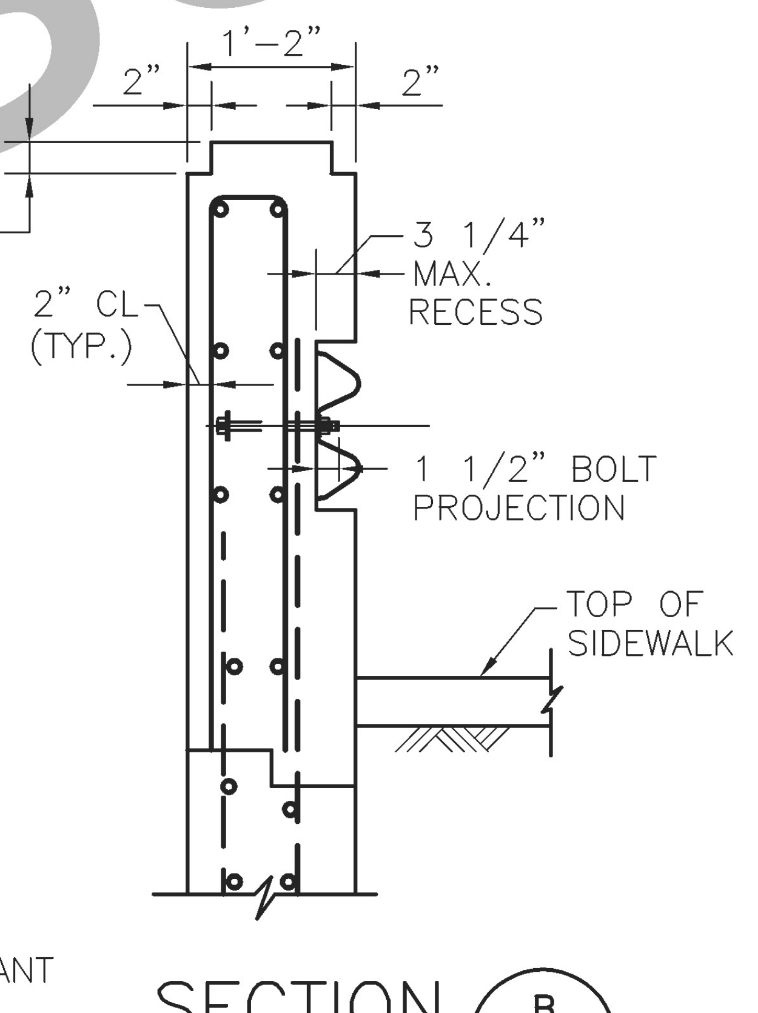
SCALE: 3/4"=1'-0"

DETAIL OF 6 FOOT END POST



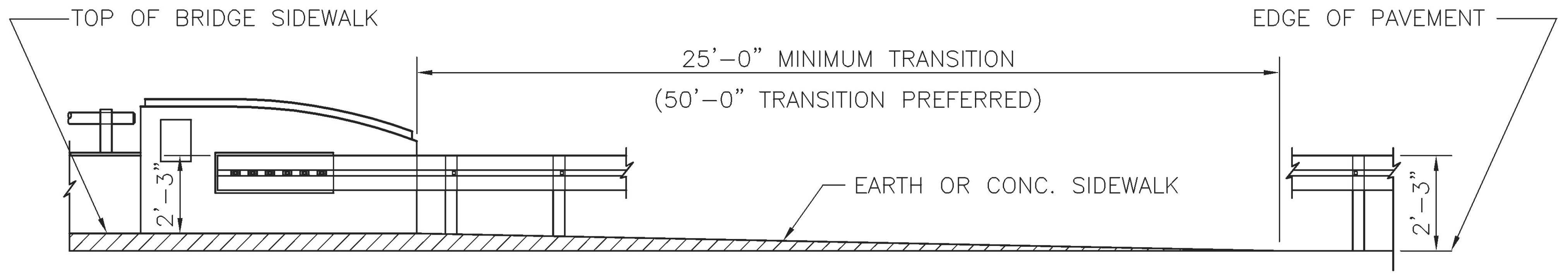
SECTION A 9.30

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



SECTION B 9.30

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



TRANSITION WHEN NO SIDEWALK IS ON APPROACHES

NOT TO SCALE

NOTES:

1. TO INSURE PROPER GUARD RAIL ANCHORAGE, THE GUARD RAIL INSTALLATION SHALL BEGIN AT EACH END OF THE BRIDGE.
2. THE COST OF THE GUARD RAIL TRANSITION TO BRIDGE END POSTS ARE HIGHWAY ITEMS. APPROACH SECTIONS AND TRAILING SECTIONS ARE SEPARATE ITEMS IN THE PROPOSAL.
3. REFER TO DRAWING (9.10) FOR NAMEPLATE TABLET DETAILS.

LOW VOLUME-LOW SPEED

REVISIONS	
No.	DATE

RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

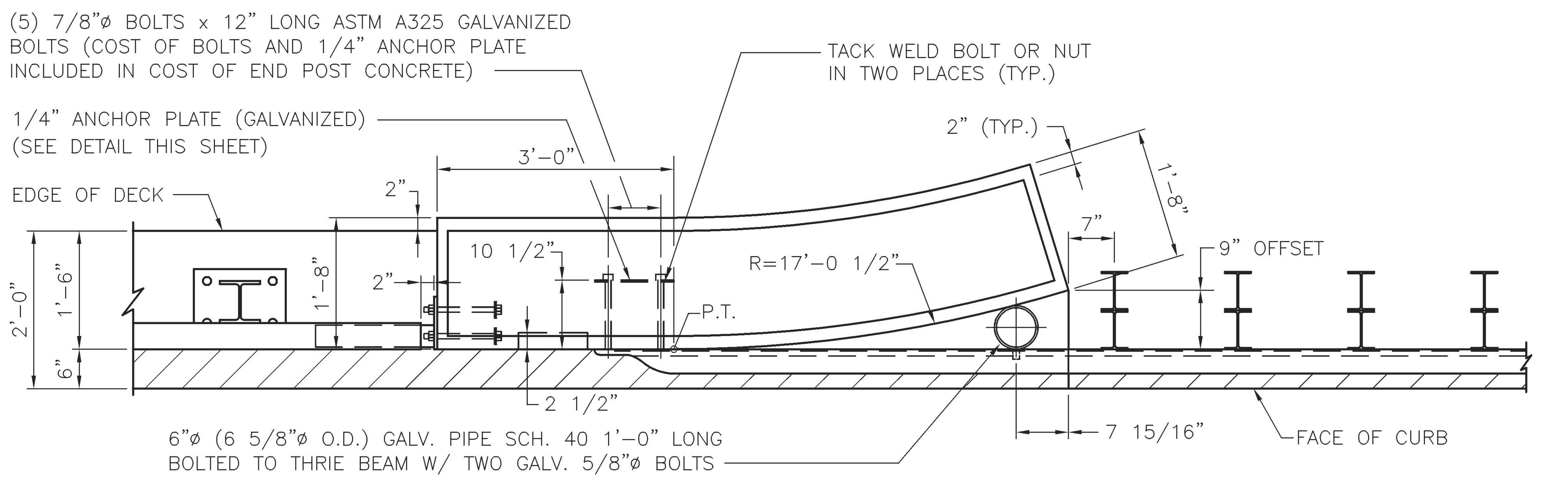
BRIDGE STANDARDS

END POST DETAILS FOR PARAPET WITH SIDEWALK

DRAWING NUMBER: 9.30

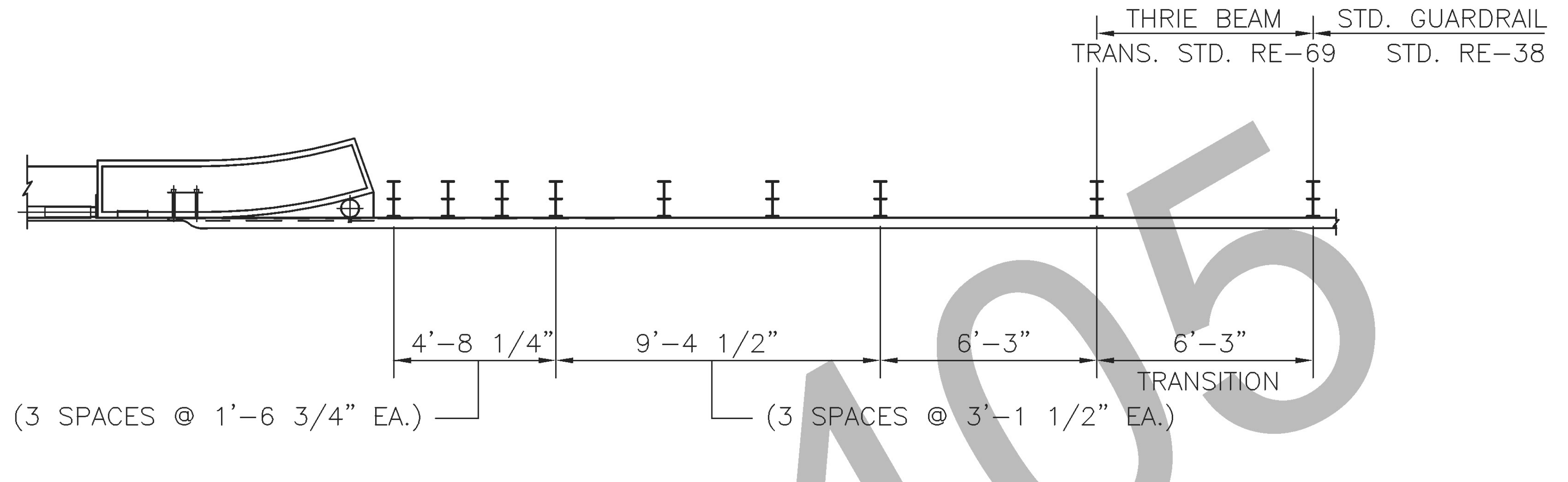
Superseded by TAC 0405

Superseded by TAC 0405


(5) 7/8"ø BOLTS x 12" LONG ASTM A325 GALVANIZED BOLTS (COST OF BOLTS AND 1/4" ANCHOR PLATE INCLUDED IN COST OF END POST CONCRETE)
TACK WELD BOLT OR NUT IN TWO PLACES (TYP.)
1/4" ANCHOR PLATE (GALVANIZED) (SEE DETAIL THIS SHEET)
EDGE OF DECK
3'-0"
2" (TYP.)
1'-8"
2"
10 1/2"
R=17'-0 1/2"
7"
9" OFFSET
2'-0"
1'-6"
1'-8"
2"
P.T.
6"
2 1/2"
7 15/16"
FACE OF CURB
6"ø (6 5/8"ø O.D.) GALV. PIPE SCH. 40 1'-0" LONG BOLTED TO THRIE BEAM W/ TWO GALV. 5/8"ø BOLTS

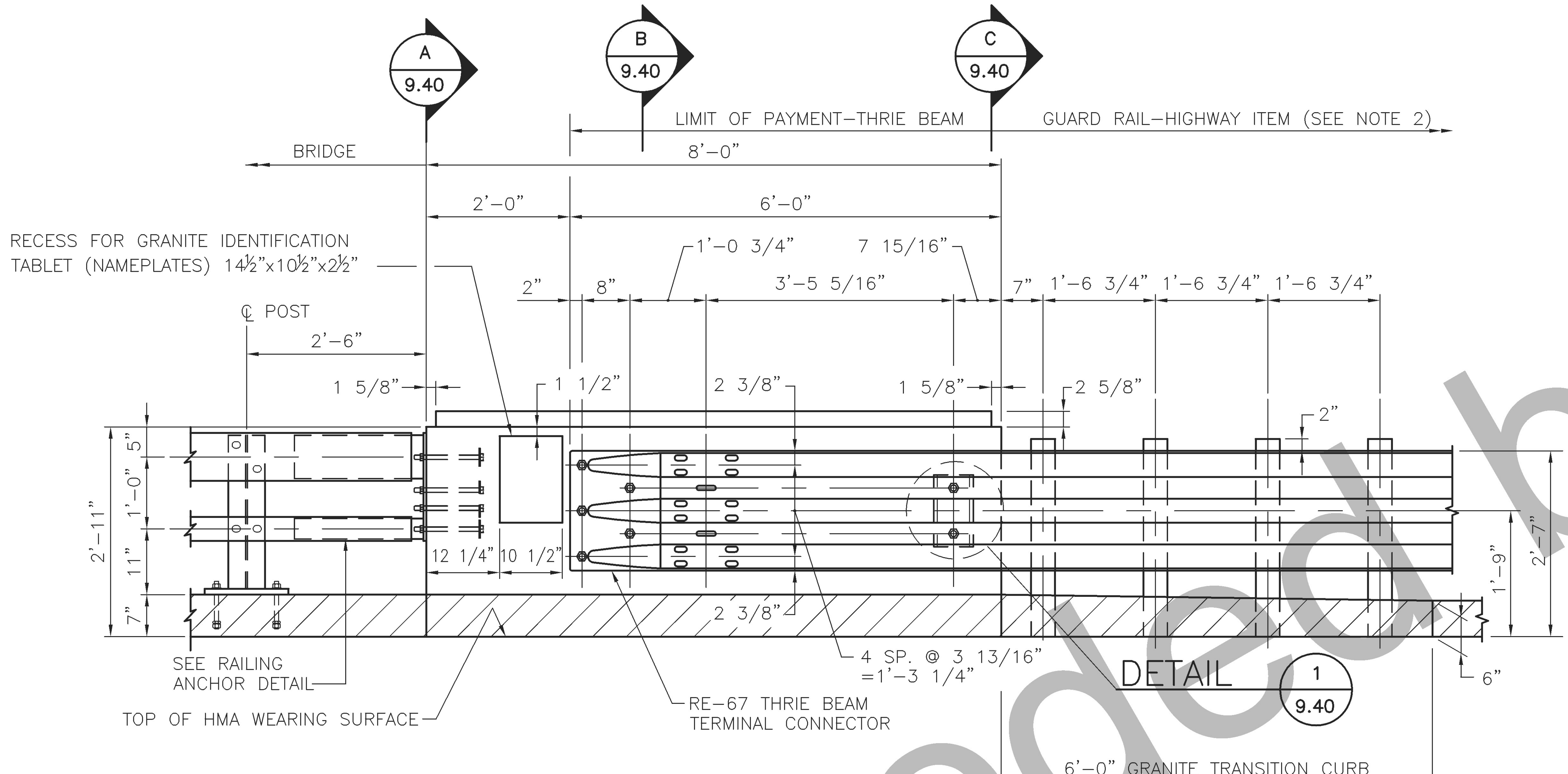
PLAN

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


THRIE BEAM TRANS. STD. RE-69
STD. GUARDRAIL STD. RE-38
4'-8 1/4"
9'-4 1/2"
6'-3"
6'-3"
TRANSITION
(3 SPACES @ 1'-6 3/4" EA.)
(3 SPACES @ 3'-1 1/2" EA.)

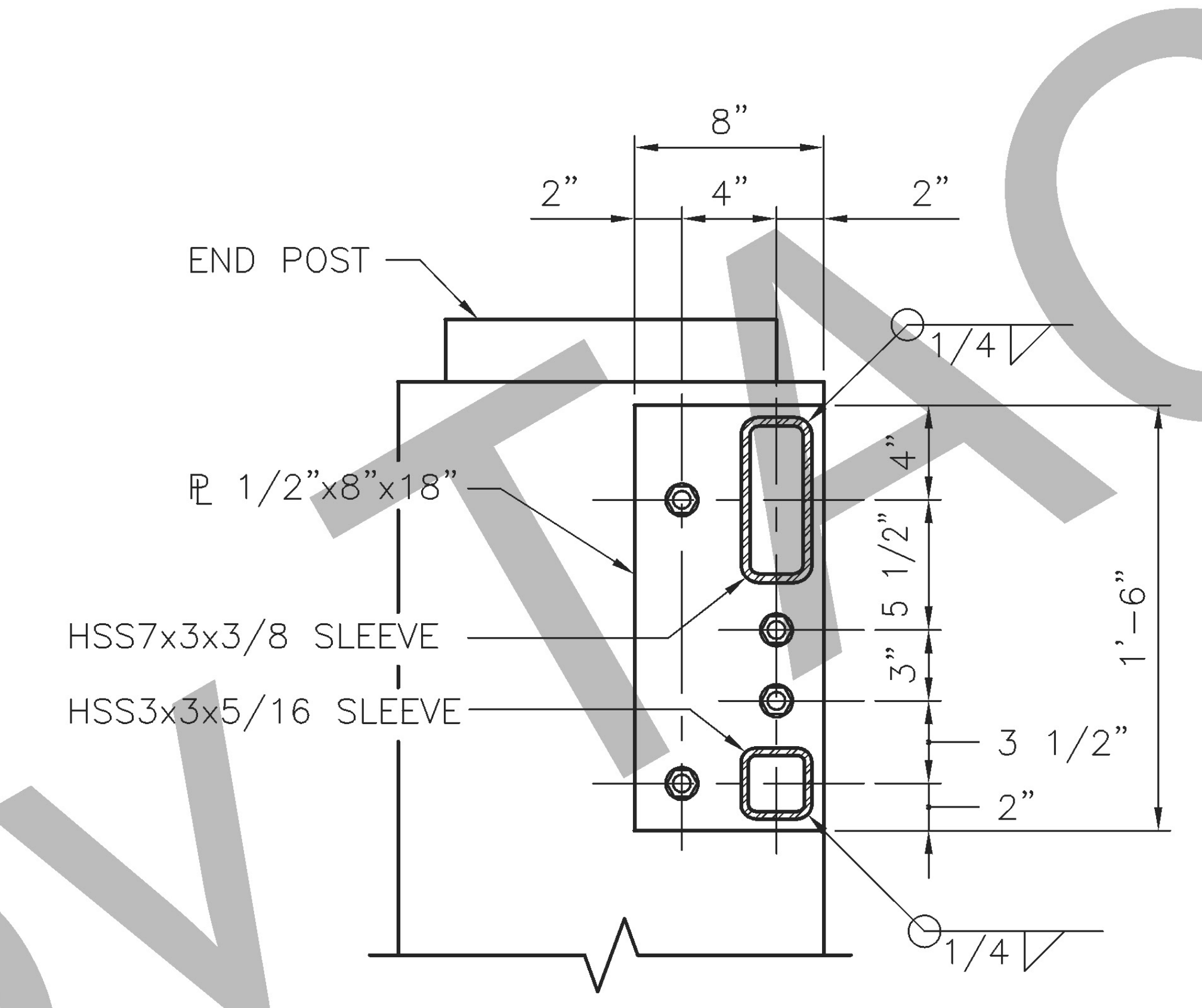
PLAN VIEW OF GUARDRAIL TRANSITION

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


A 9.40
B 9.40
C 9.40
LIMIT OF PAYMENT-THRIE BEAM
GUARD RAIL-HIGHWAY ITEM (SEE NOTE 2)
BRIDGE
8'-0"
2'-0"
6'-0"
RECESS FOR GRANITE IDENTIFICATION TABLET (NAMEPLATES) 14½"x10½"x2½"
1'-0 3/4"
7 15/16"
℄ POST
2"
8"
3'-5 5/16"
7"
1'-6 3/4"
1'-6 3/4"
1'-6 3/4"
2'-6"
1 5/8"
1 1/2"
2 3/8"
1 5/8"
2 5/8"
2"
5"
1'-0"
2'-11"
11"
7"
12 1/4"
10 1/2"
1'-9"
2'-7"
6"
2 3/8"
4 SP. @ 3 13/16" =1'-3 1/4"
SEE RAILING ANCHOR DETAIL
TOP OF HMA WEARING SURFACE
RE-67 THRIE BEAM TERMINAL CONNECTOR
DETAIL 1 9.40
6'-0" GRANITE TRANSITION CURB (HIGHWAY ITEM)

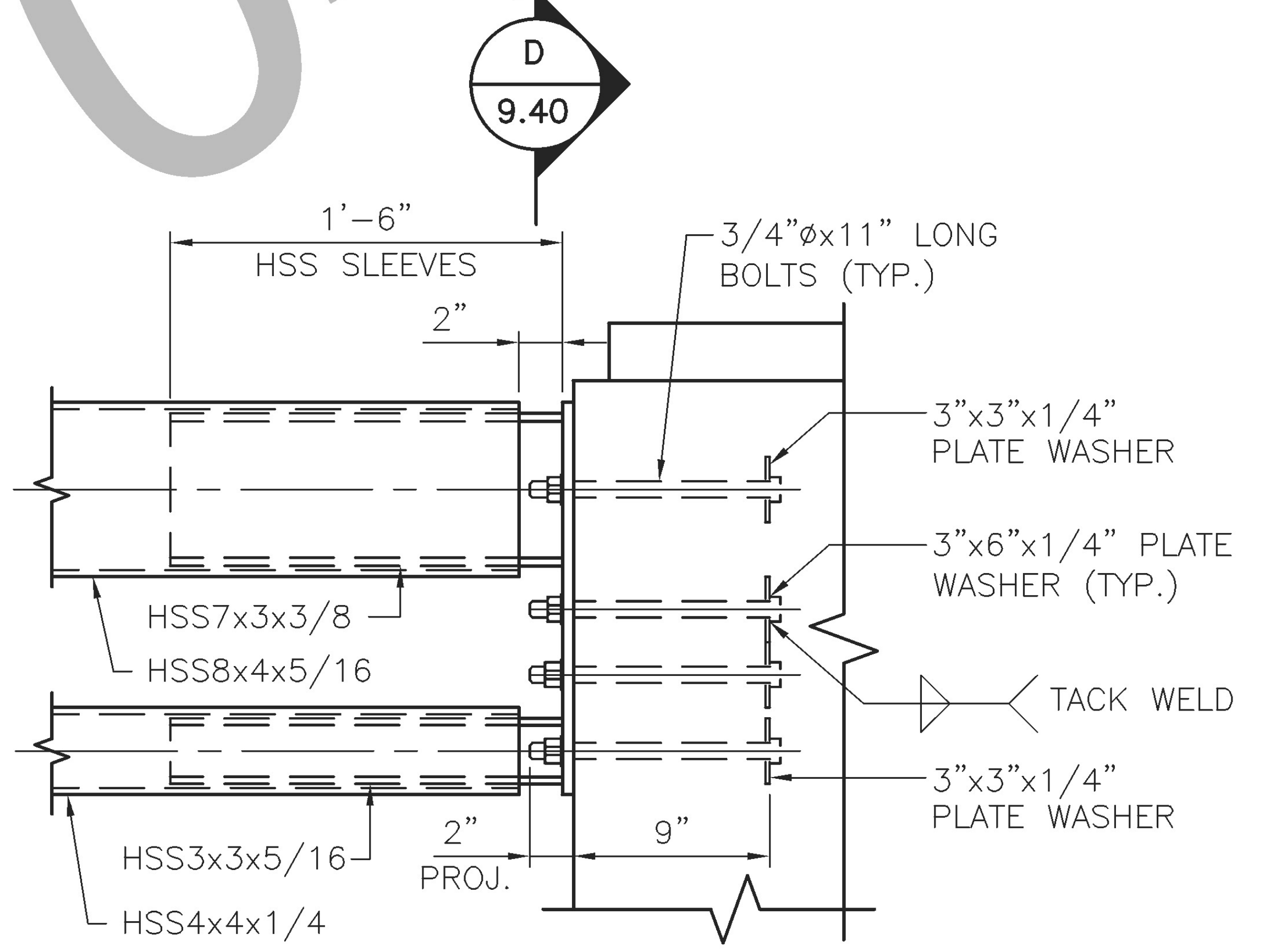
ELEVATION

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



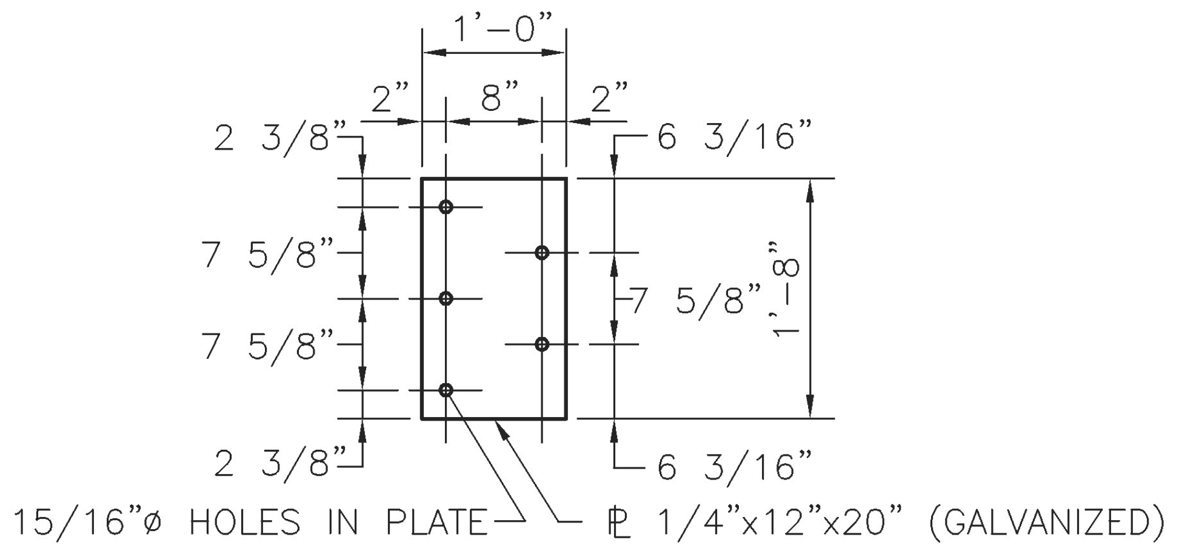
SECTION D 9.40

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



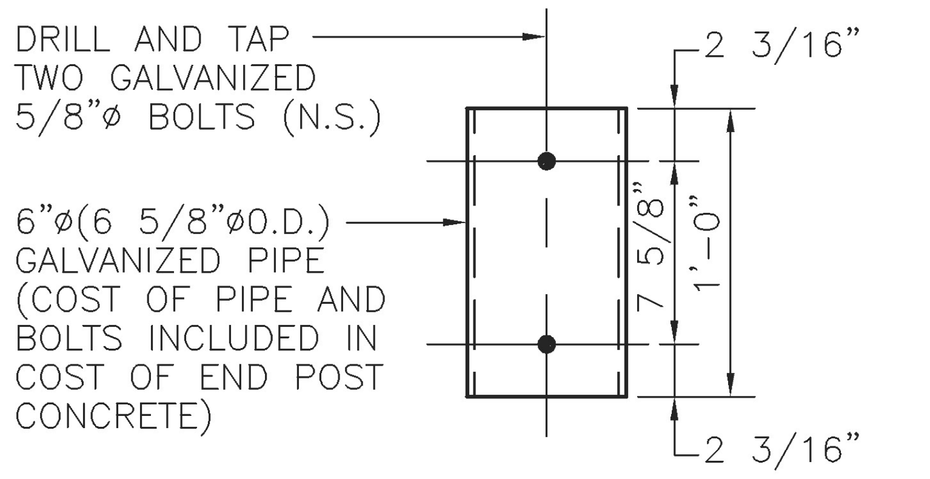
RAILING ANCHOR DETAIL

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



DETAIL OF ANCHOR PLATE FOR THRIE BEAM

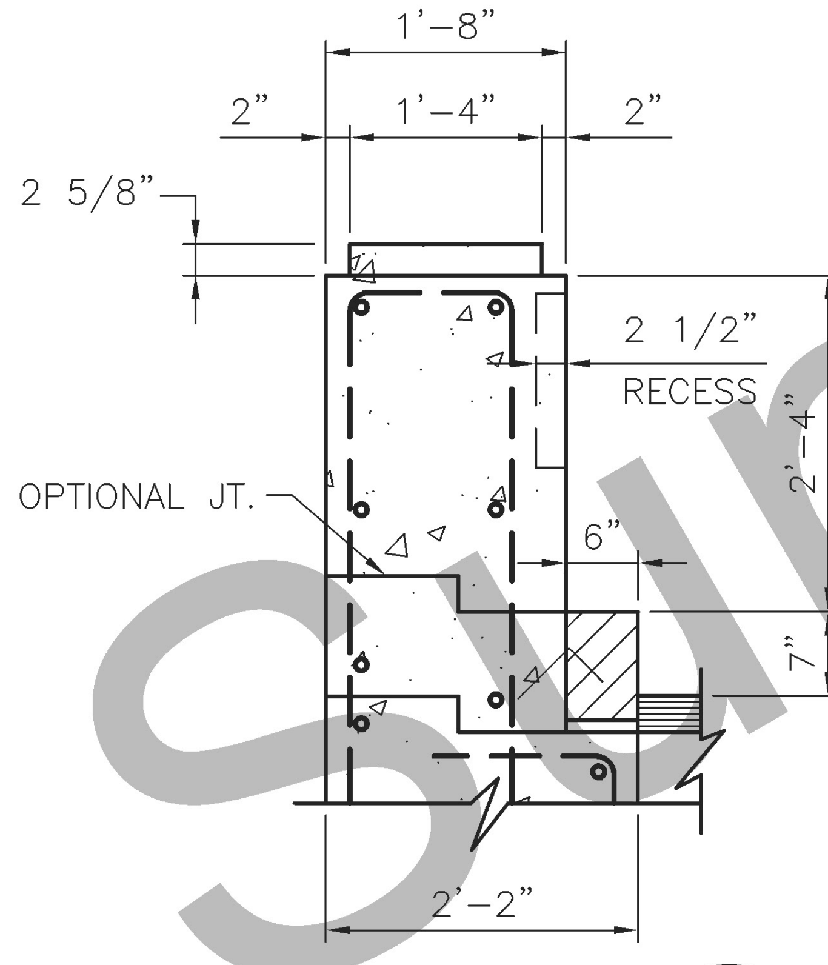
SCALE: 3/4"=1'-0"


DRILL AND TAP TWO GALVANIZED 5/8"ø BOLTS (N.S.)
2 3/16"
6"ø(6 5/8"øO.D.) GALVANIZED PIPE (COST OF PIPE AND BOLTS INCLUDED IN COST OF END POST CONCRETE)
7 5/8"
1'-0"
2 3/16"

DETAIL 1 9.40

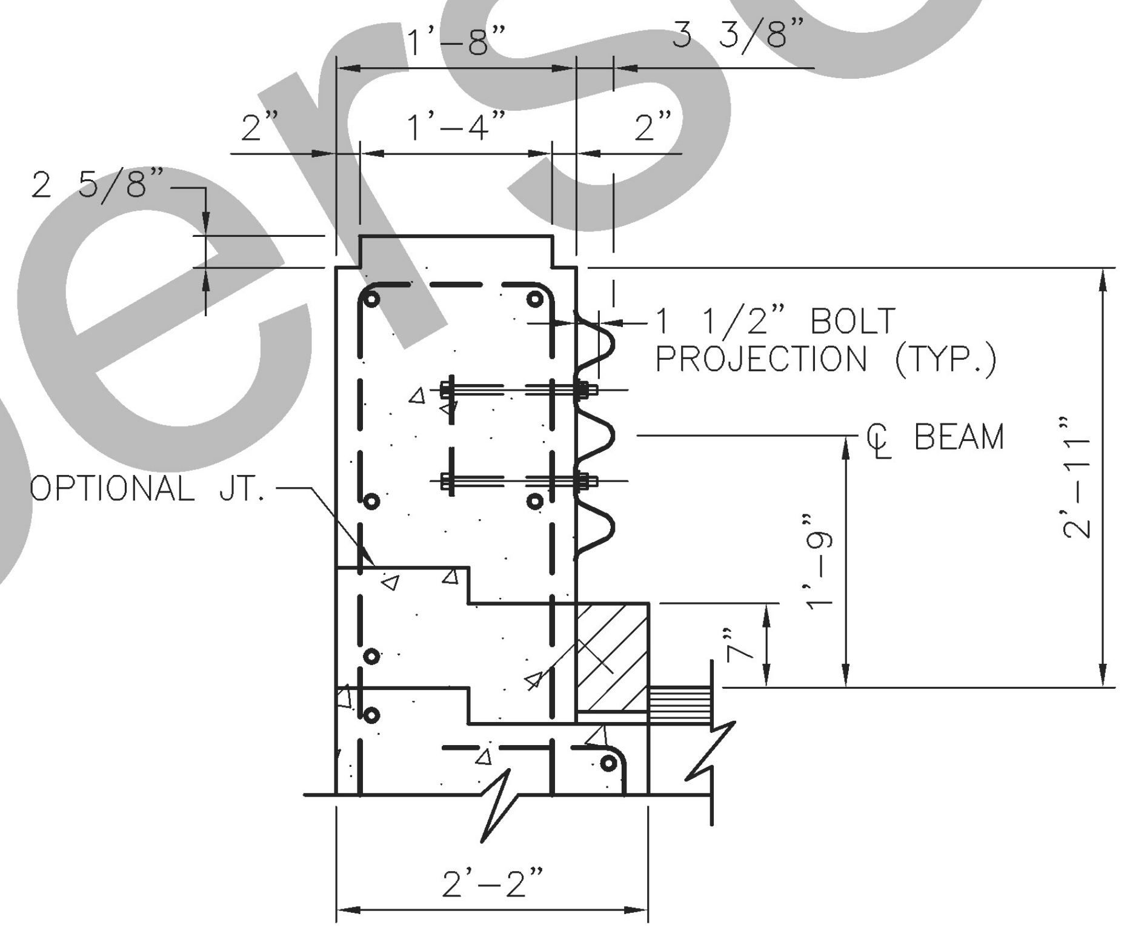
PIPE SEPARATOR DETAIL

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



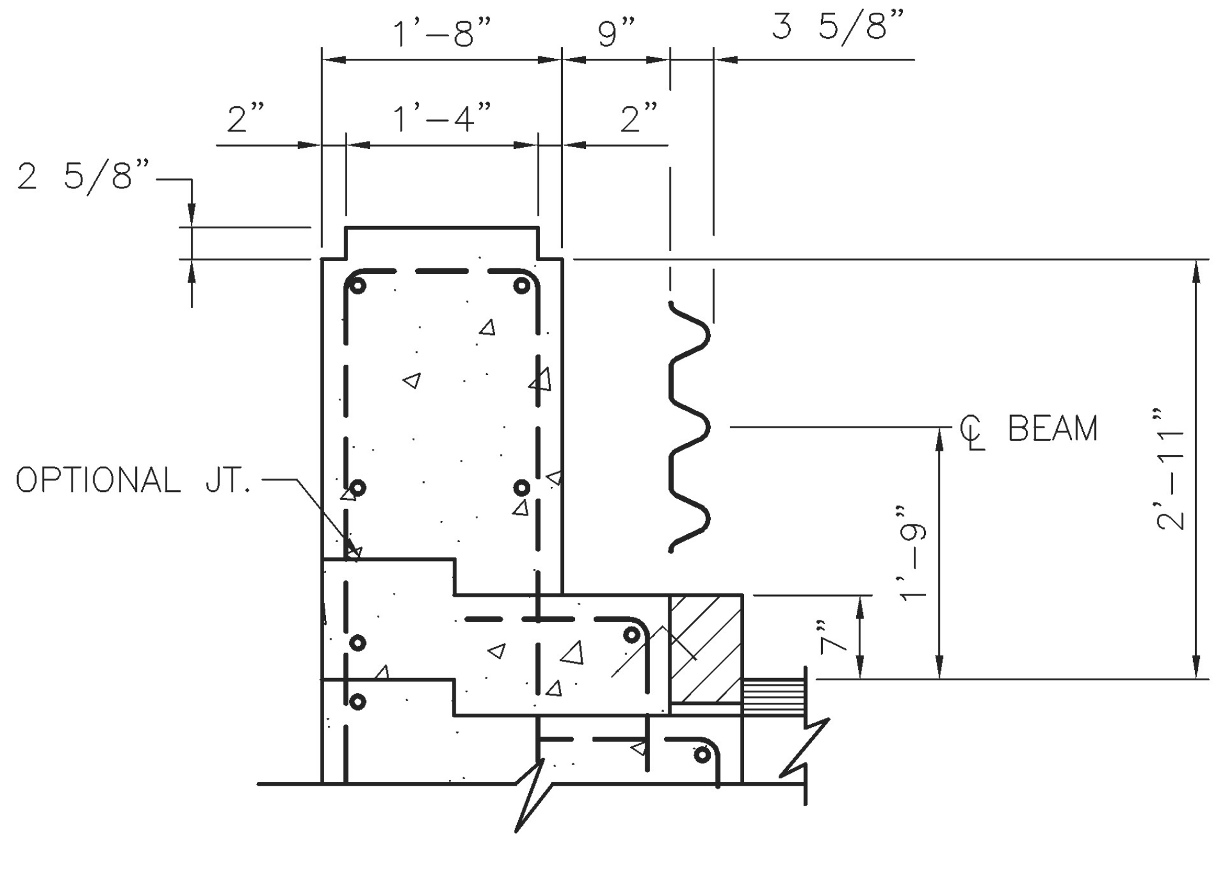
SECTION A 9.40

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



SECTION B 9.40

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



SECTION C 9.40

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

DESIGNER:

1. *COORDINATE THIS DRAWING WITH DRAWING 10.30*

NOTES:

1. TO INSURE PROPER GUARD RAIL ANCHORAGE, THE GUARD RAIL INSTALLATION SHALL BEGIN AT EACH END OF THE BRIDGE AND WORK INTO THE APPROACHES.
2. THE COST OF THE GUARD RAIL TRANSITIONS TO BRIDGE END POSTS ARE HIGHWAY ITEMS. APPROACH SECTIONS AND TRAILING SECTIONS ARE SEPARATE ITEMS IN THE PROPOSAL.
3. THE COST OF BRIDGE RAIL ANCHORAGE (PLATES, ANCHOR BOLTS AND PLATE SLEEVES) IS INCLUDED IN COST OF END POST CONCRETE.
4. REFER TO DRAWING (9.10) FOR NAMEPLATE TABLET DETAILS.

HIGH VOLUME-HIGH SPEED

REVISIONS	
No.	DATE

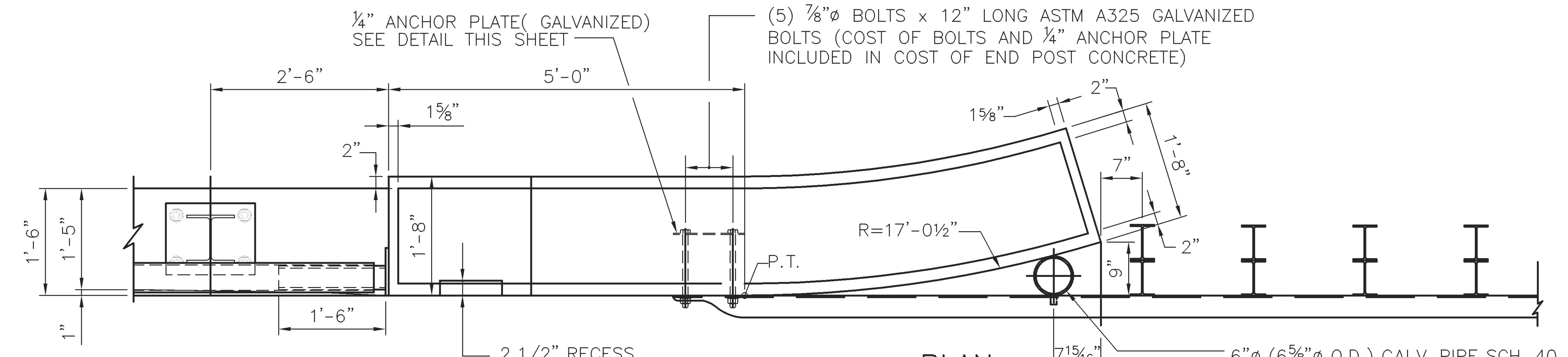
RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

BRIDGE STANDARDS

END POST DETAILS
FOR TWO BAR RAIL

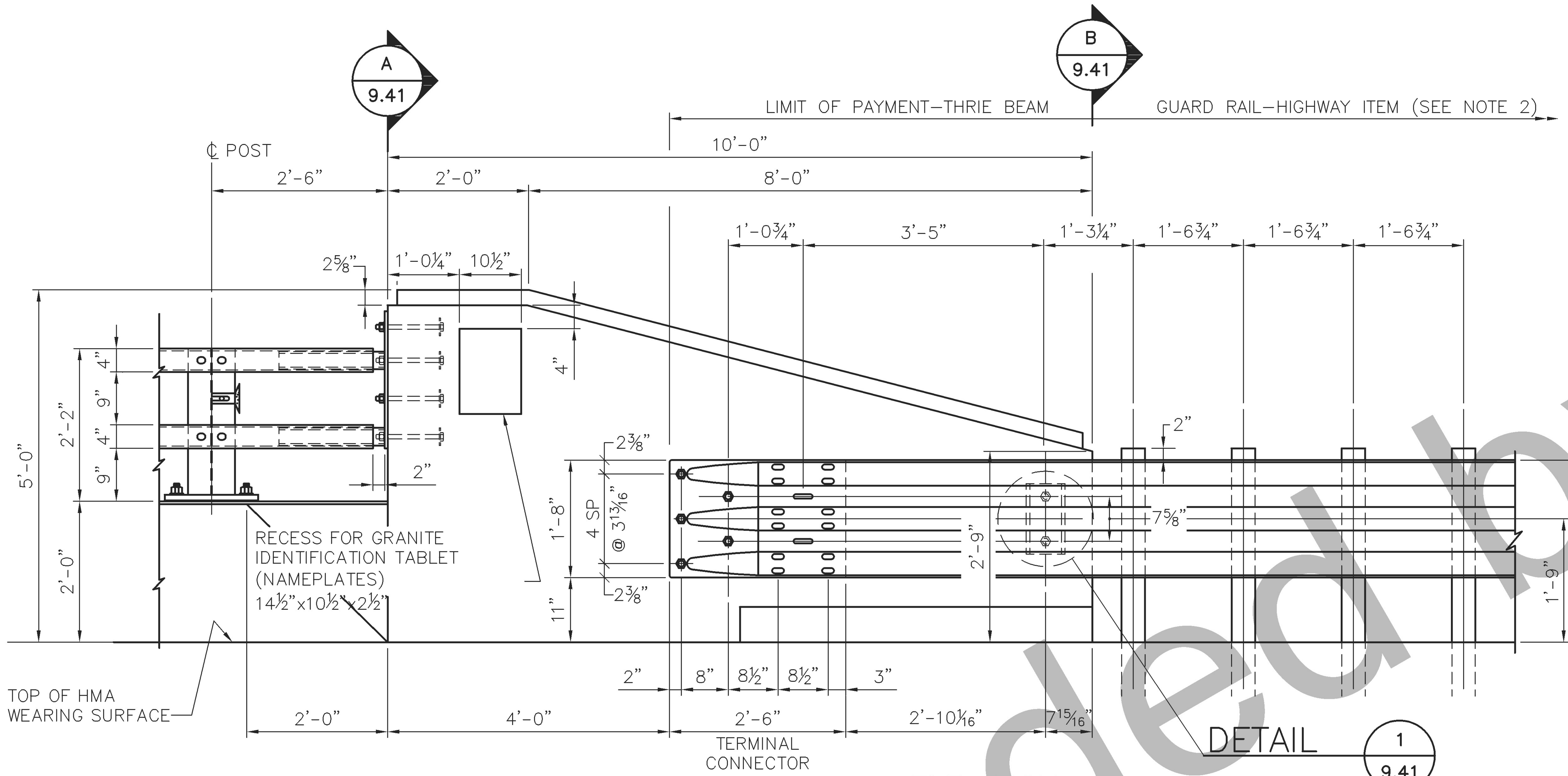
DRAWING NUMBER: 9.40

Superseded by TAC 0405


¼" ANCHOR PLATE(GALVANIZED) SEE DETAIL THIS SHEET
(5) ⅞"ø BOLTS x 12" LONG ASTM A325 GALVANIZED BOLTS (COST OF BOLTS AND ¼" ANCHOR PLATE INCLUDED IN COST OF END POST CONCRETE)
2'-6"
5'-0"
1⅝"
2"
1⅝"
2"
1'-8"
7"
R=17'-0½"
P.T.
2"
9"
1'-6"
1'-5"
1'-8"
1"
1'-6"
2 1/2" RECESS
7¹⁵⁄₁₆"
6"ø (6⅝"ø O.D.) GALV. PIPE SCH. 40 1'-0" LONG BOLTED TO THRIE BEAM w/ TWO GALV. ⅝"ø BOLTS

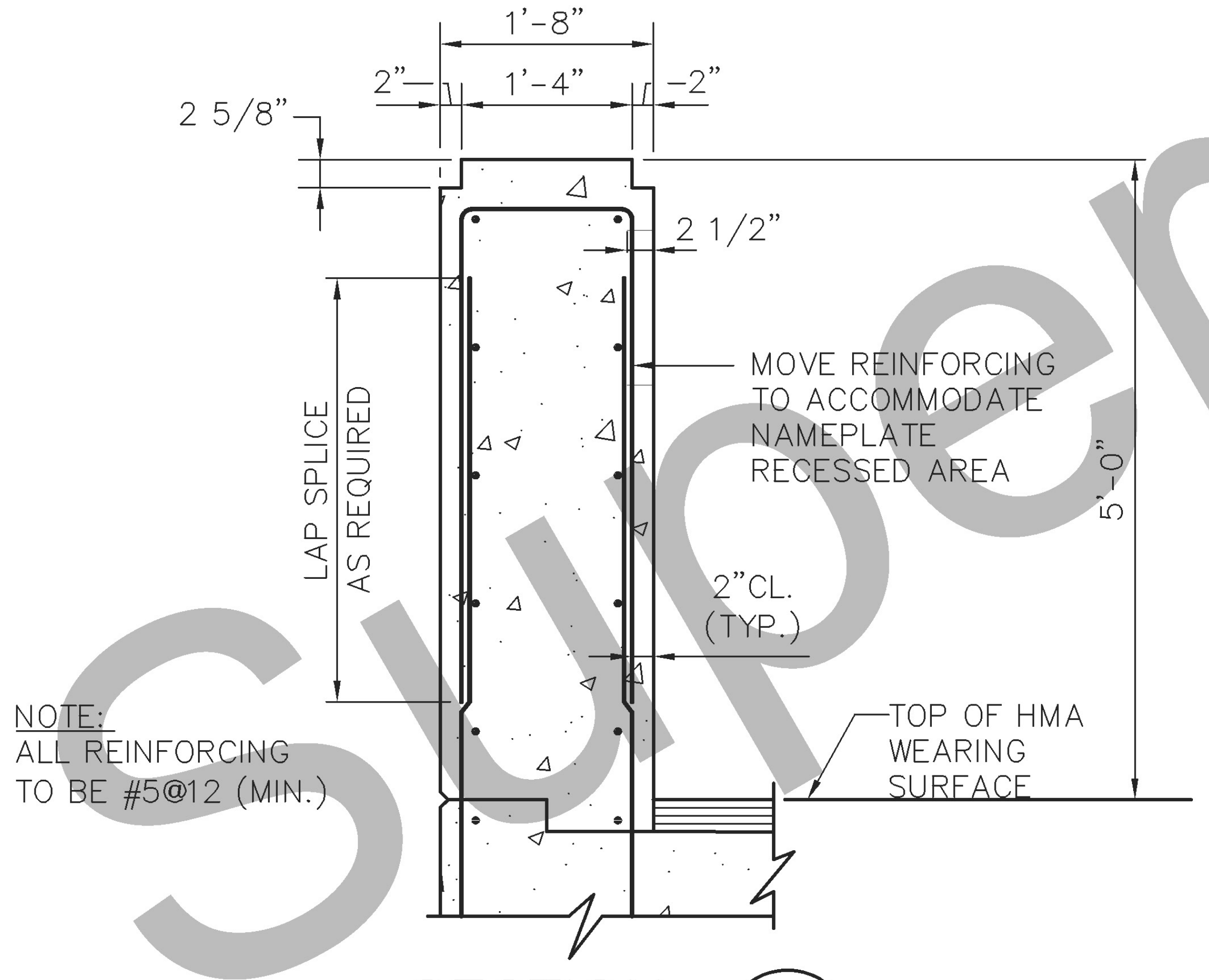
PLAN

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



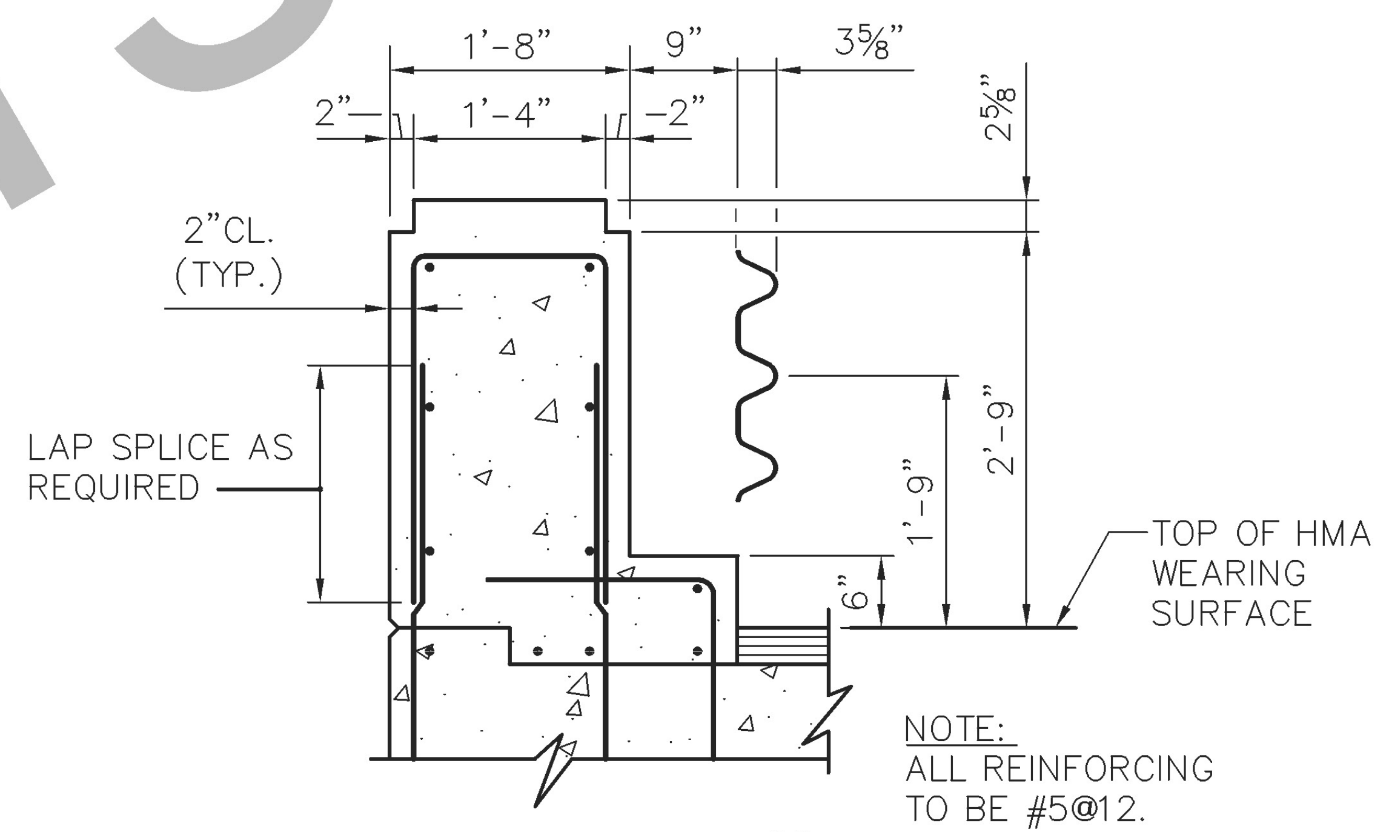
ELEVATION

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


1'-8"
2"
1'-4"
2"
2 5/8"
2 1/2"
LAP SPLICE AS REQUIRED
MOVE REINFORCING TO ACCOMMODATE NAMEPLATE RECESSED AREA
2"CL. (TYP.)
5'-0"
TOP OF HMA WEARING SURFACE
NOTE: ALL REINFORCING TO BE #5@12 (MIN.)

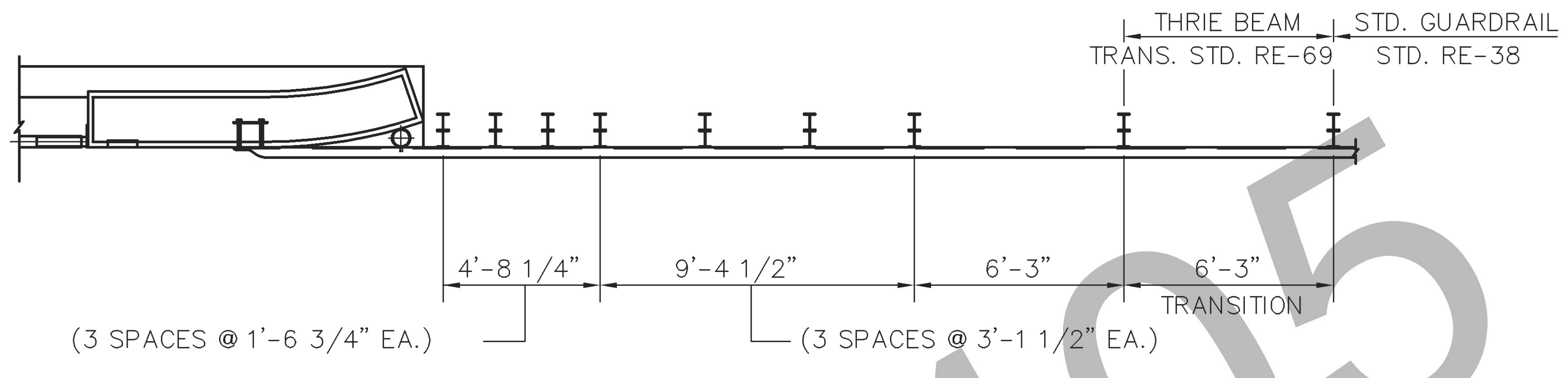
SECTION A

SCALE:3/4"=1'-0" 9.41



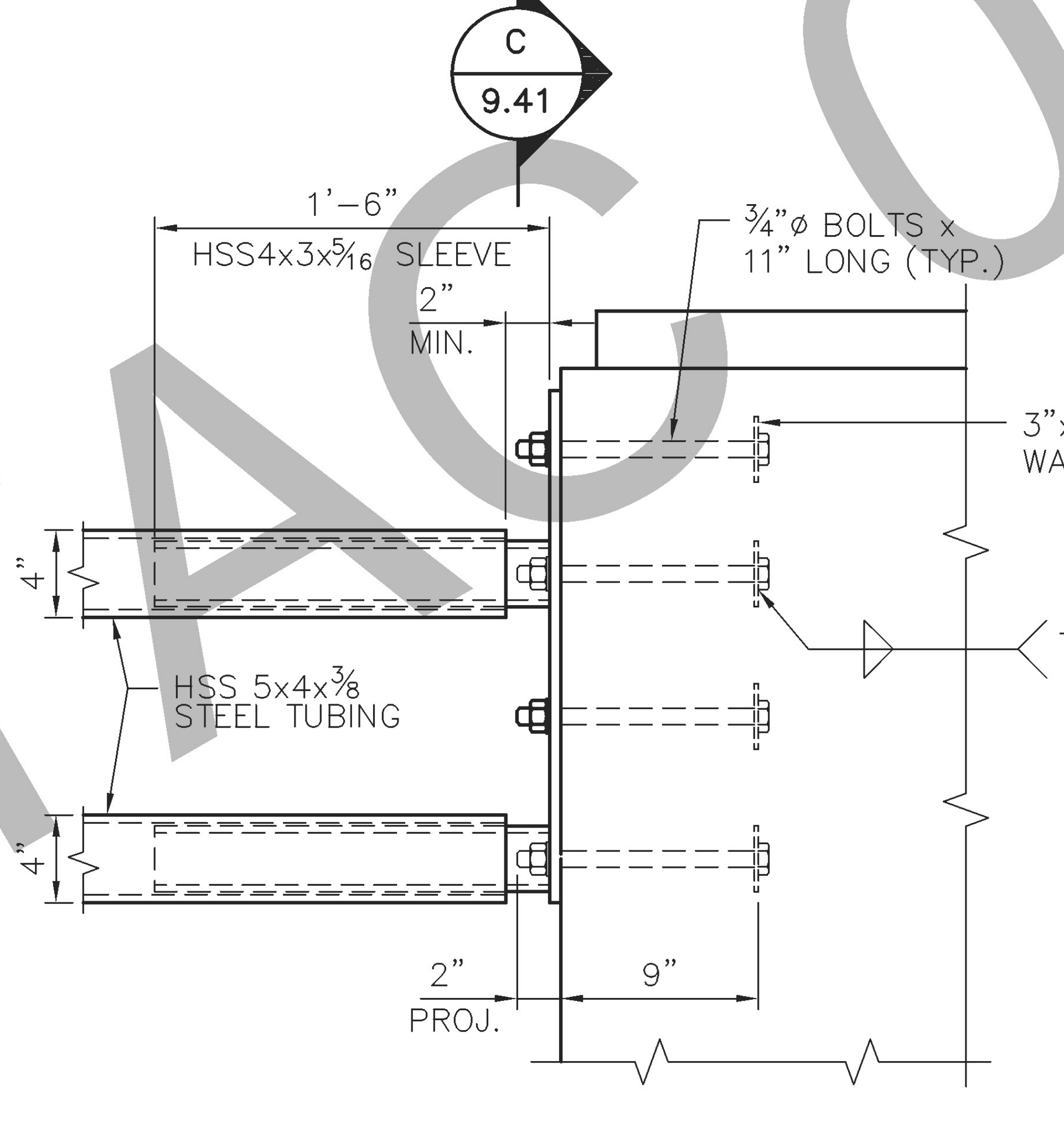
SECTION B

SCALE:3/4"=1'-0" 9.41


THRIE BEAM TRANS. STD. RE-69
STD. GUARDRAIL STD. RE-38
4'-8 1/4"
9'-4 1/2"
6'-3"
6'-3"
TRANSITION
(3 SPACES @ 1'-6 3/4" EA.)
(3 SPACES @ 3'-1 1/2" EA.)

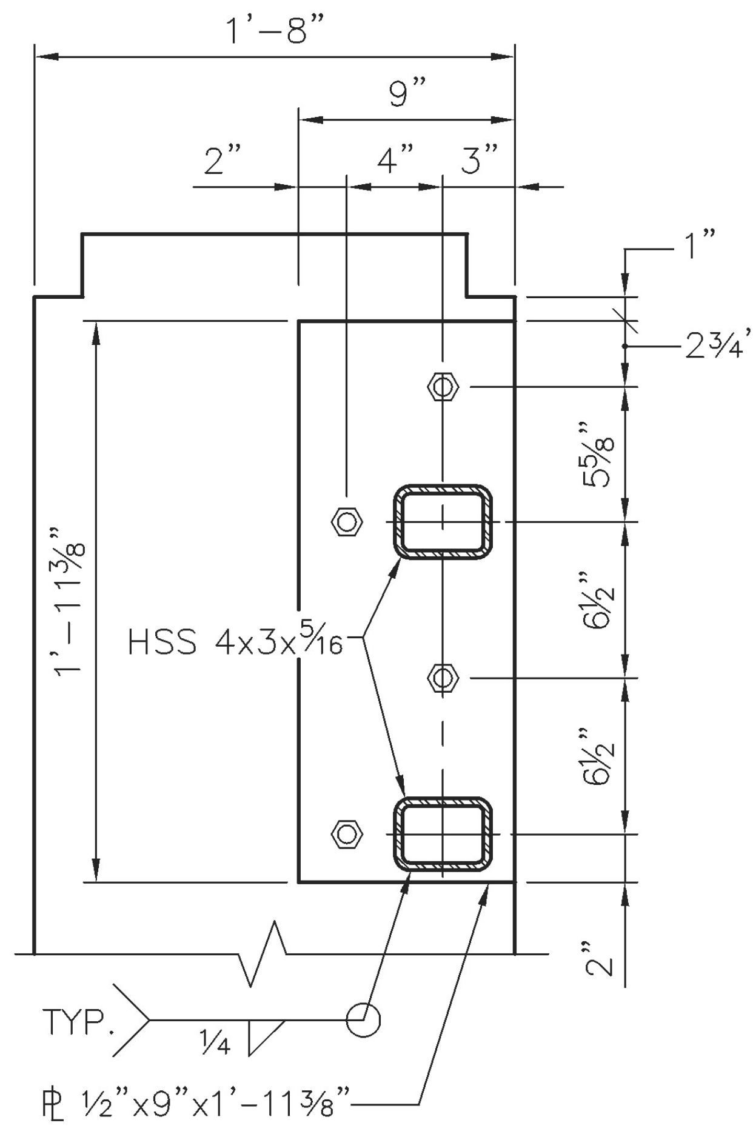
PLAN VIEW OF GUARDRAIL TRANSITION

NOT TO SCALE



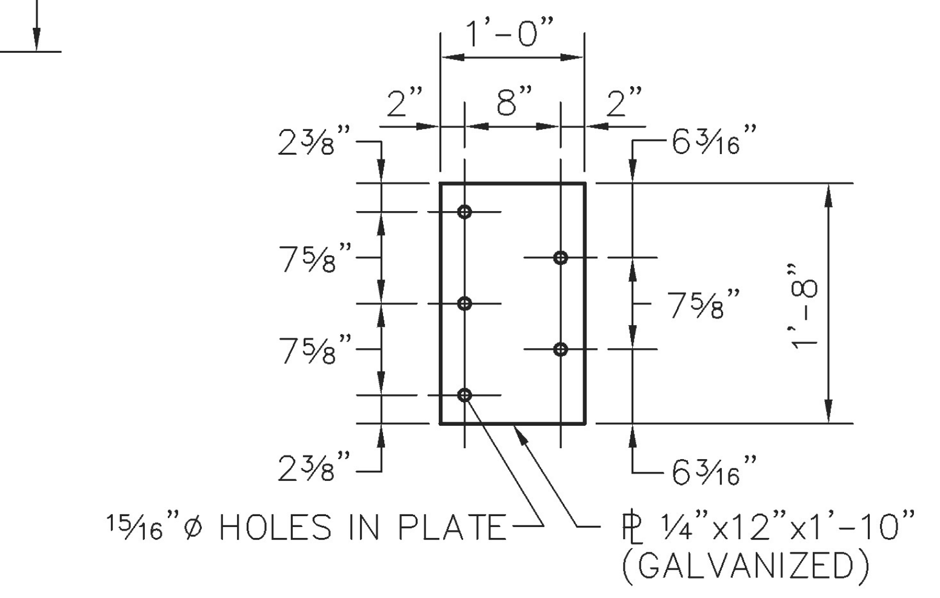
PARTIAL ELEVATION AT END POST

SCALE: 1½"=1'-0"



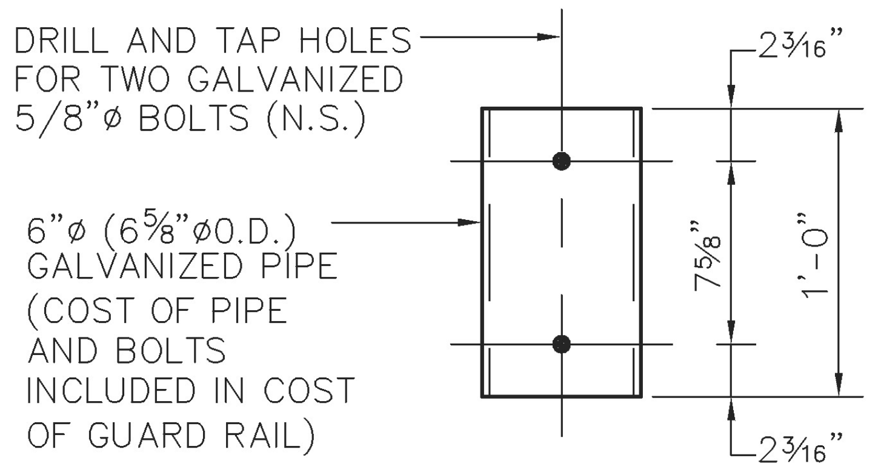
SECTION C

SCALE: 1½"=1'-0" 9.41



DETAIL OF ANCHOR PLATE FOR THRIE BEAM

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


DRILL AND TAP HOLES FOR TWO GALVANIZED 5/8"ø BOLTS (N.S.)
6"ø (6⅝"øO.D.) GALVANIZED PIPE (COST OF PIPE AND BOLTS INCLUDED IN COST OF GUARD RAIL)
2³⁄₁₆"
7⅝"
1'-0"
2³⁄₁₆"

DETAIL 1

9.41

PIPE SEPARATOR DETAIL

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

DESIGNER:

1. *COORDINATE THIS DRAWING WITH DRAWING 10.35*

NOTES:

1. TO INSURE PROPER GUARD RAIL ANCHORAGE, THE GUARD RAIL INSTALLATION SHALL BEGIN AT EACH END OF THE BRIDGE AND WORK INTO THE APPROACHES.
2. THE COST OF THE GUARD RAIL TRANSITIONS TO BRIDGE END POSTS ARE HIGHWAY ITEMS. APPROACH SECTIONS AND TRAILING SECTIONS ARE SEPARATE ITEMS IN THE PROPOSAL.
3. THE COST OF BRIDGE RAIL ANCHORAGE (PLATES, ANCHOR BOLTS, WASHERS AND PLATE SLEEVES) IS INCLUDED IN THE COST OF END POST CONCRETE.
4. ALL STEEL SHAPES AND PLATES SHALL CONFORM TO THE REQUIREMENTS OF AASHTO DESIGNATION M270, GRADE 36.
5. ANCHOR BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM DESIGNATION A 307.
6. REFER TO DRAWING (9.10) FOR NAMEPLATE TABLET DETAILS.

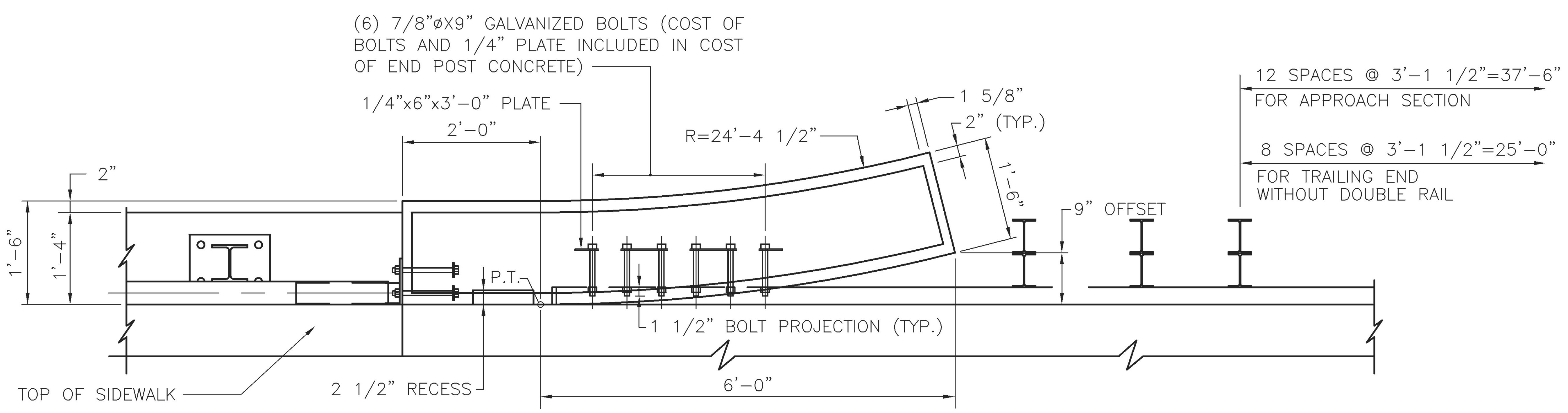
REVISIONS	
No.	DATE

RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

BRIDGE STANDARDS

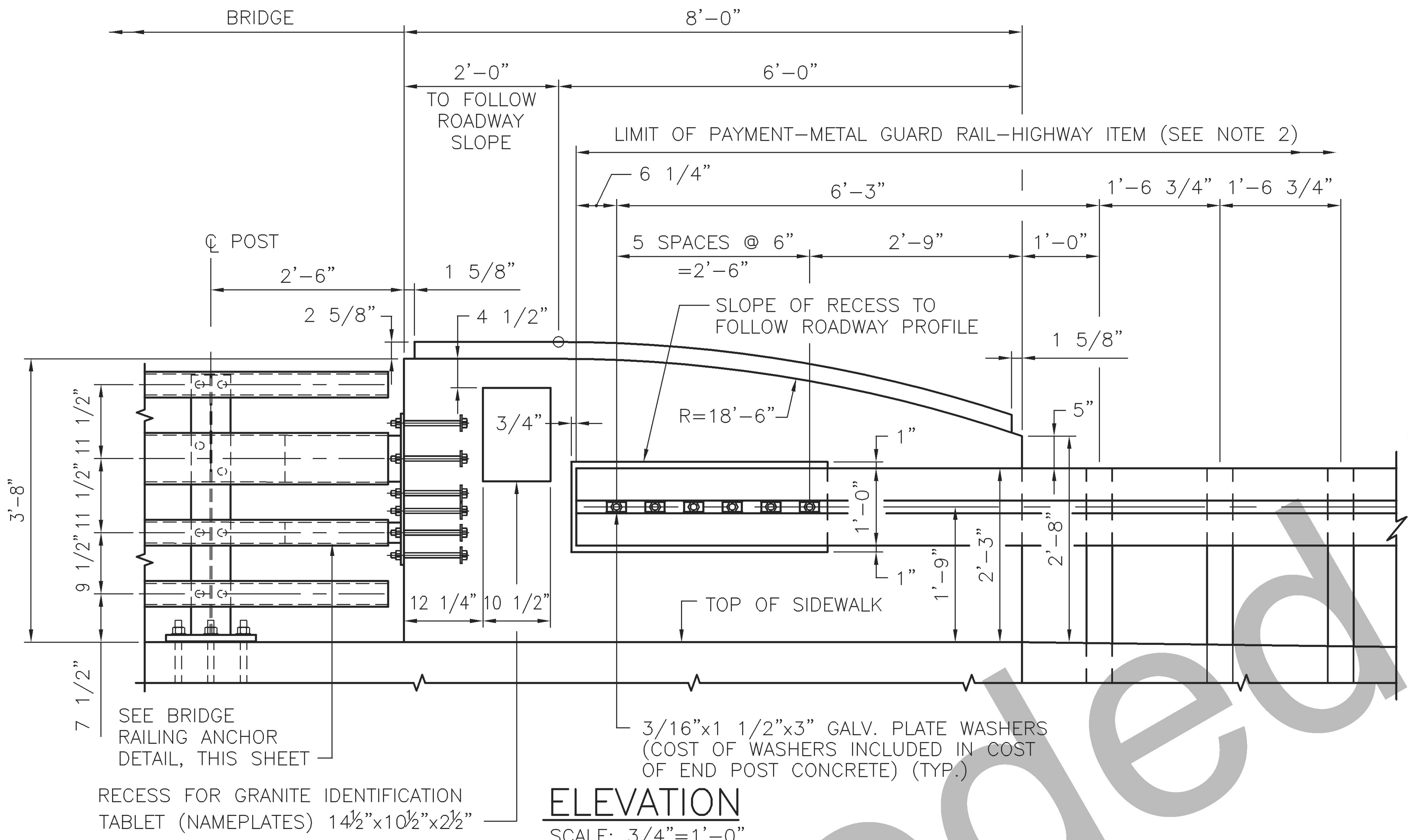
END POST DETAILS
FOR TL-5 RAIL

DRAWING NUMBER: 9.41


(6) 7/8"øX9" GALVANIZED BOLTS (COST OF BOLTS AND 1/4" PLATE INCLUDED IN COST OF END POST CONCRETE)
1/4"x6"x3'-0" PLATE
2'-0"
R=24'-4 1/2"
1 5/8"
2" (TYP.)
1'-6"
9" OFFSET
12 SPACES @ 3'-1 1/2"=37'-6" FOR APPROACH SECTION
8 SPACES @ 3'-1 1/2"=25'-0" FOR TRAILING END WITHOUT DOUBLE RAIL
2"
1'-6"
1'-4"
P.T.
1 1/2" BOLT PROJECTION (TYP.)
TOP OF SIDEWALK
2 1/2" RECESS
6'-0"

PLAN

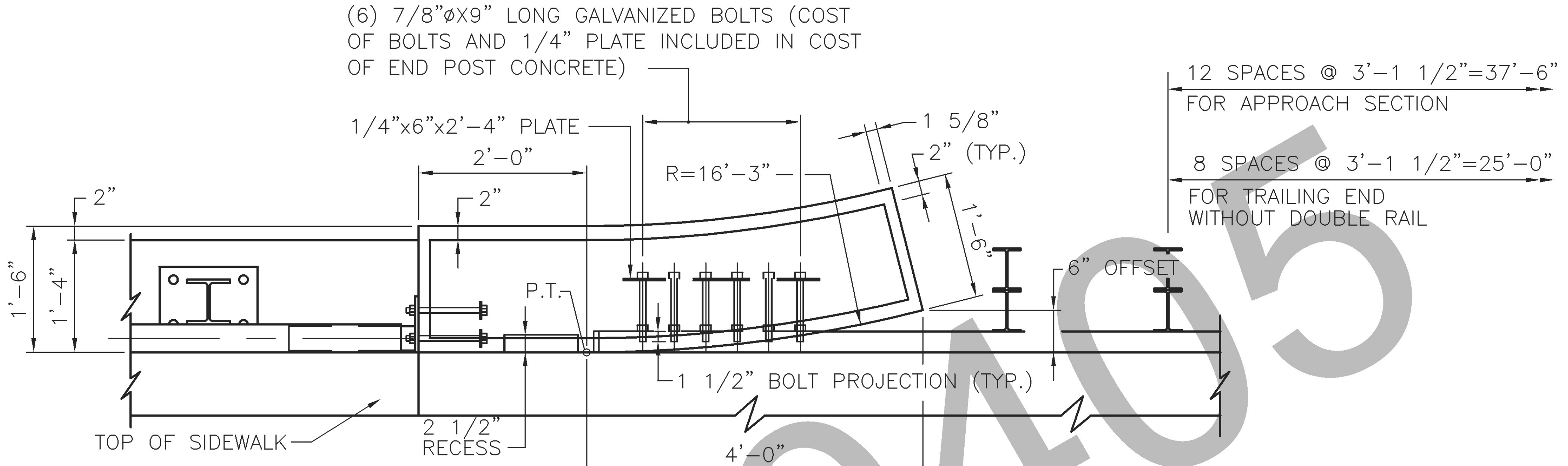
SCALE: 3/4"=1'-0"


BRIDGE
8'-0"
2'-0"
6'-0"
TO FOLLOW ROADWAY SLOPE
LIMIT OF PAYMENT-METAL GUARD RAIL-HIGHWAY ITEM (SEE NOTE 2)
6 1/4"
6'-3"
1'-6 3/4"
1'-6 3/4"
℄ POST
5 SPACES @ 6" =2'-6"
2'-9"
1'-0"
2'-6"
1 5/8"
2 5/8"
4 1/2"
SLOPE OF RECESS TO FOLLOW ROADWAY PROFILE
1 5/8"
3/4"
R=18'-6"
5"
1"
1'-0"
1"
3'-8"
11 1/2"
11 1/2"
11 1/2"
9 1/2"
7 1/2"
1'-9"
2'-3"
2'-8"
12 1/4"
10 1/2"
TOP OF SIDEWALK
SEE BRIDGE RAILING ANCHOR DETAIL, THIS SHEET
3/16"x1 1/2"x3" GALV. PLATE WASHERS (COST OF WASHERS INCLUDED IN COST OF END POST CONCRETE) (TYP.)
RECESS FOR GRANITE IDENTIFICATION TABLET (NAMEPLATES) 14½"x10½"x2½"

ELEVATION

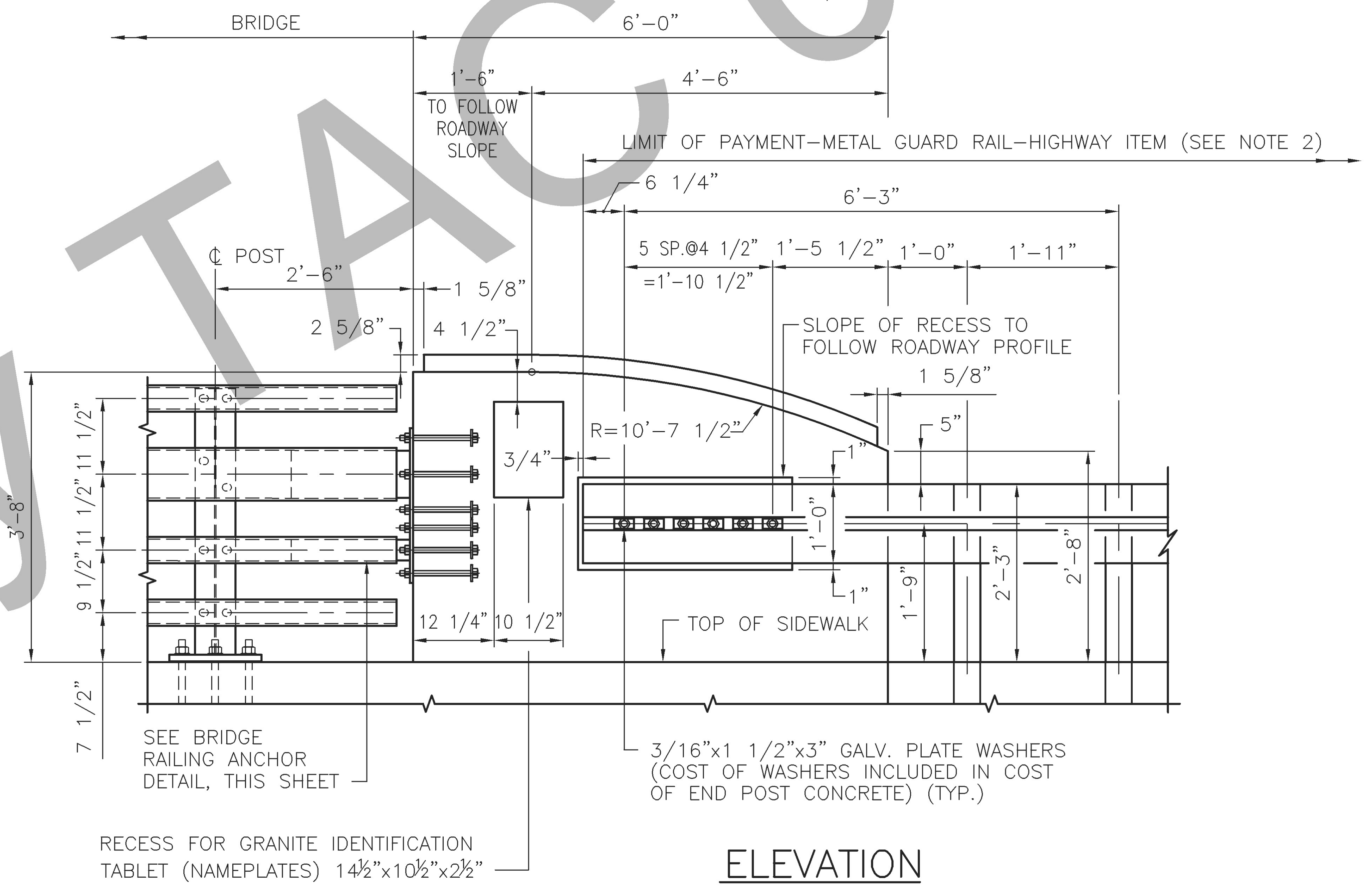
SCALE: 3/4"=1'-0"

DETAIL OF 8 FOOT END POST


(6) 7/8"øX9" LONG GALVANIZED BOLTS (COST OF BOLTS AND 1/4" PLATE INCLUDED IN COST OF END POST CONCRETE)
1/4"x6"x2'-4" PLATE
2'-0"
R=16'-3"
1 5/8"
2" (TYP.)
1'-6"
6" OFFSET
12 SPACES @ 3'-1 1/2"=37'-6" FOR APPROACH SECTION
8 SPACES @ 3'-1 1/2"=25'-0" FOR TRAILING END WITHOUT DOUBLE RAIL
2"
2"
1'-6"
1'-4"
P.T.
1 1/2" BOLT PROJECTION (TYP.)
TOP OF SIDEWALK
2 1/2" RECESS
4'-0"

PLAN

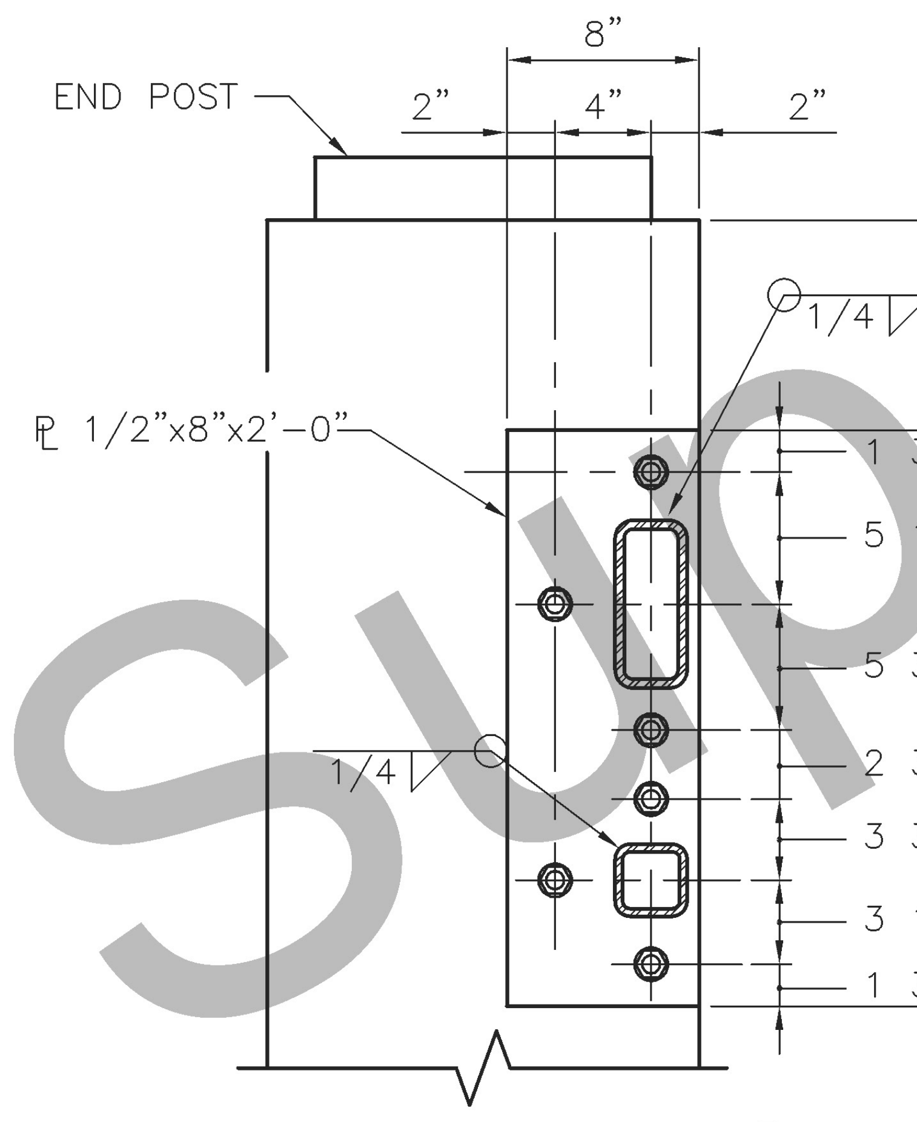
SCALE: 3/4"=1'-0"


BRIDGE
6'-0"
1'-6"
4'-6"
TO FOLLOW ROADWAY SLOPE
LIMIT OF PAYMENT-METAL GUARD RAIL-HIGHWAY ITEM (SEE NOTE 2)
6 1/4"
6'-3"
℄ POST
2'-6"
5 SP.@4 1/2" =1'-10 1/2"
1'-5 1/2"
1'-0"
1'-11"
1 5/8"
2 5/8"
4 1/2"
SLOPE OF RECESS TO FOLLOW ROADWAY PROFILE
1 5/8"
3/4"
R=10'-7 1/2"
5"
1"
1'-0"
1"
3'-8"
11 1/2"
11 1/2"
11 1/2"
9 1/2"
7 1/2"
1'-9"
2'-3"
2'-8"
12 1/4"
10 1/2"
TOP OF SIDEWALK
SEE BRIDGE RAILING ANCHOR DETAIL, THIS SHEET
3/16"x1 1/2"x3" GALV. PLATE WASHERS (COST OF WASHERS INCLUDED IN COST OF END POST CONCRETE) (TYP.)
RECESS FOR GRANITE IDENTIFICATION TABLET (NAMEPLATES) 14½"x10½"x2½"

ELEVATION

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

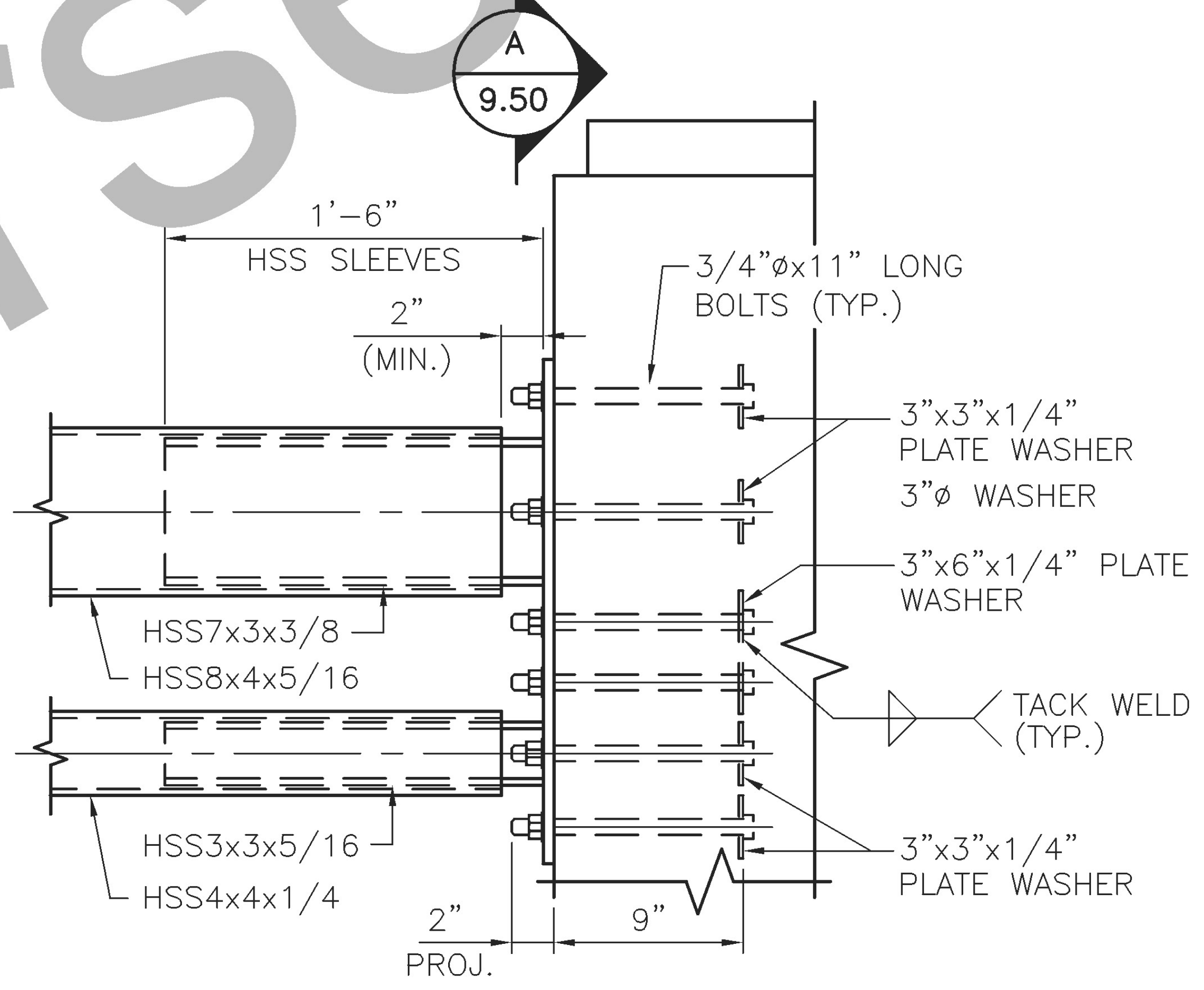
DETAIL OF 6 FOOT END POST



SECTION

A
9.50

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



BRIDGE RAILING ANCHOR DETAIL

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

DESIGNER:

1. *COORDINATE THIS DRAWING WITH DRAWING 10.22*

NOTES:

1. TO INSURE PROPER GUARD RAIL ANCHORAGE, THE GUARD RAIL INSTALLATION SHALL BEGIN AT EACH END OF THE BRIDGE AND WORK INTO THE APPROACHES.
2. THE COST OF THE GUARD RAIL TRANSITION TO BRIDGE END POSTS ARE HIGHWAY ITEMS. APPROACH SECTIONS AND TRAILING SECTIONS ARE SEPARATE ITEMS IN THE PROPOSAL.
3. THE COST OF BRIDGE RAIL ANCHORAGE (PLATES, ANCHOR BOLTS, WASHERS AND PLATE SLEEVES) IS INCLUDED IN COST OF POST CONCRETE.
4. REFER TO DRAWING (9.10) FOR NAMEPLATE TABLET DETAILS.

LOW VOLUME-LOW SPEED

REVISIONS	
No.	DATE

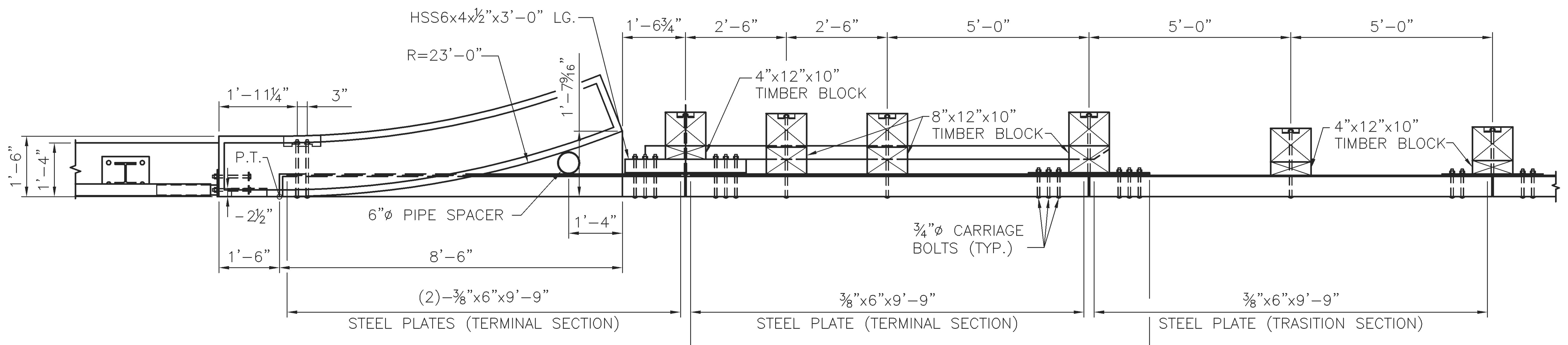
RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

BRIDGE STANDARDS

END POST DETAILS FOR FOUR BAR RAIL

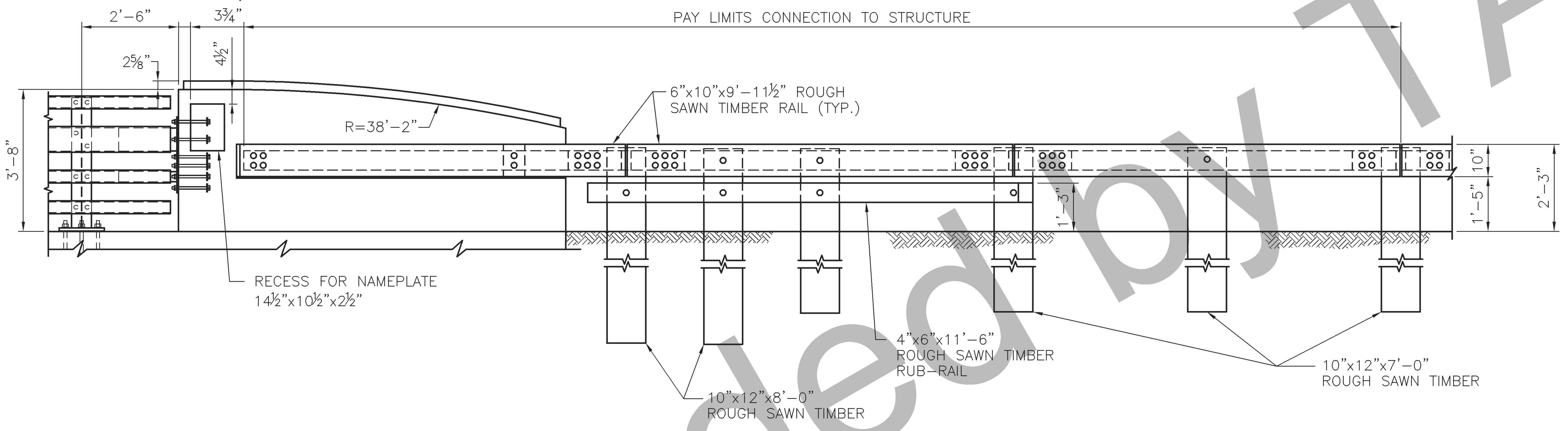
DRAWING NUMBER: 9.50

Superseded by TAC 0405



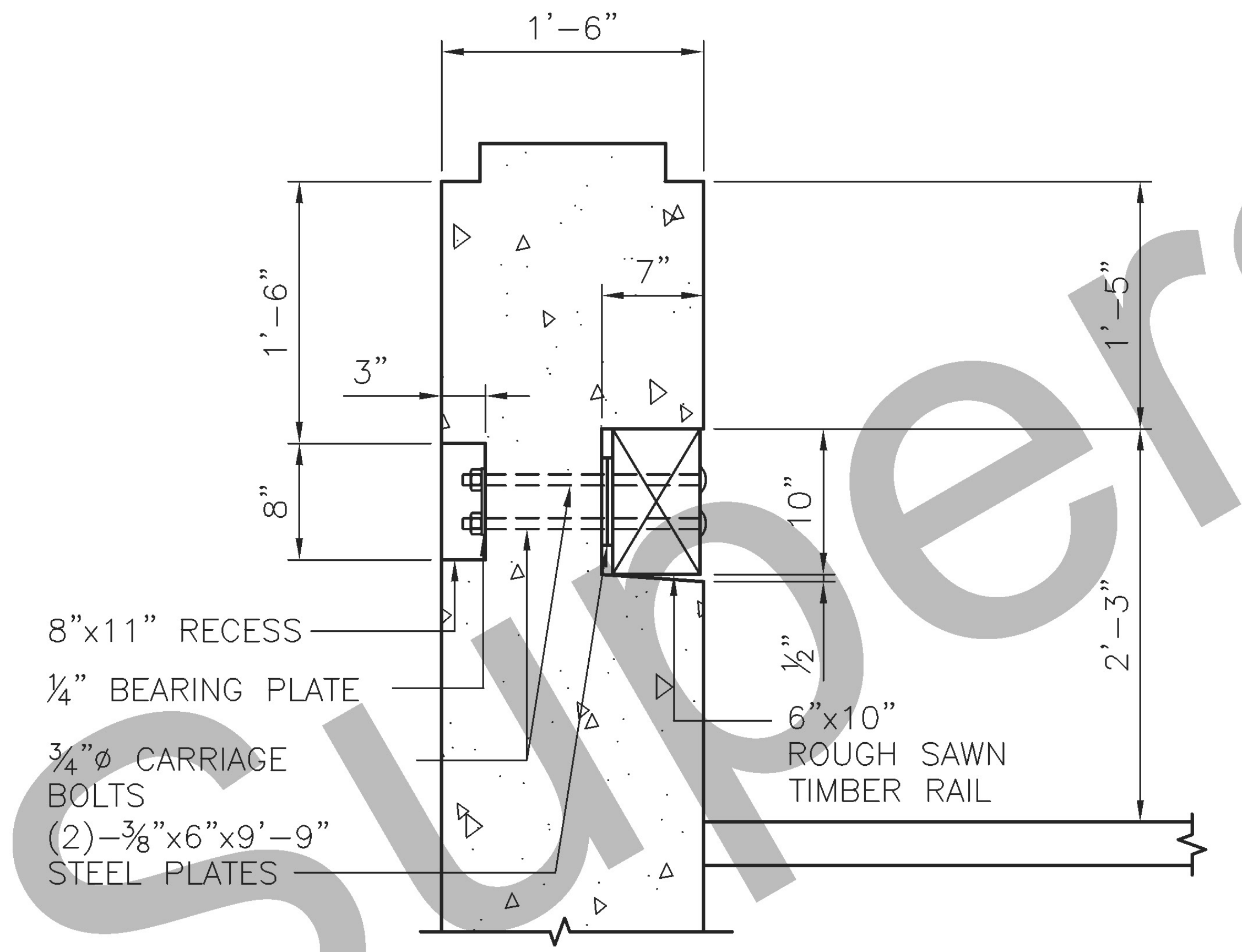
PLAN

SCALE: 1/2"=1'–0"



ELEVATION

SCALE: 1/2"=1'–0"



SECTION A 9.51

SCALE:1"=1'–0"

LOW VOLUME – LOW SPEED

REVISIONS	
No.	DATE

RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

BRIDGE STANDARDS

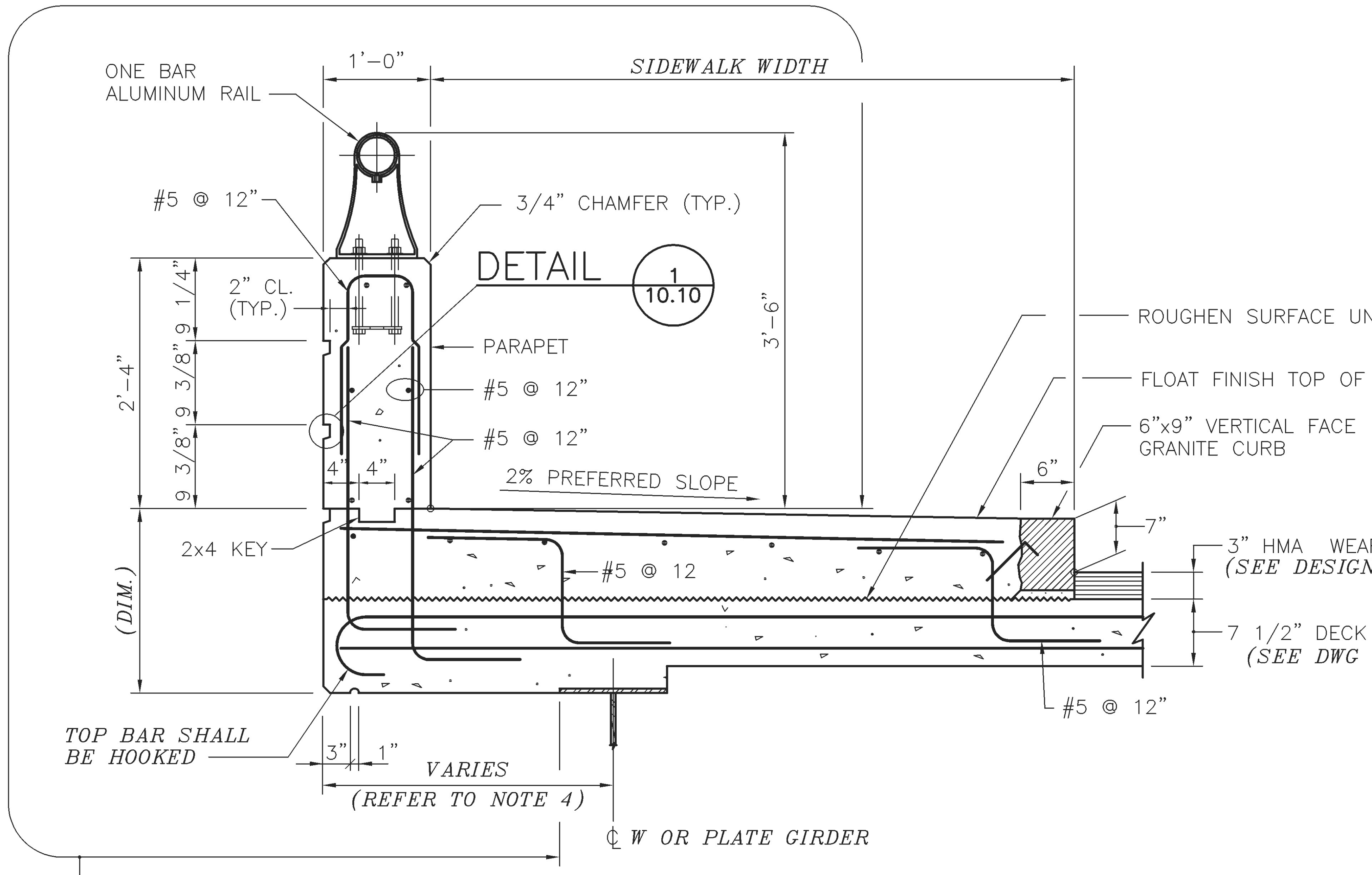
END POST DETAILS FOR STEEL BACKED TIMBER GUARDRAIL

DRAWING NUMBER: 9.51

Superseded by TAC 0405

P:\1000\10027.00 On-Call Bridge Design\10027.20 Bridge Design Std Details_Drawings\Structural_Current_Drawings\RIS9-51.dwg, 7/22/2015 1:28:57 PM, JTA

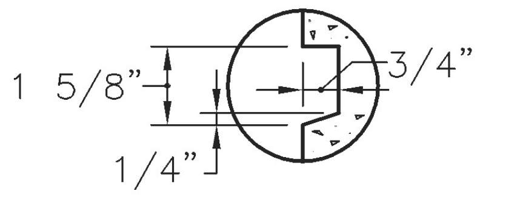
Superseded by TAC 0405



SECTION THRU SIDEWALK

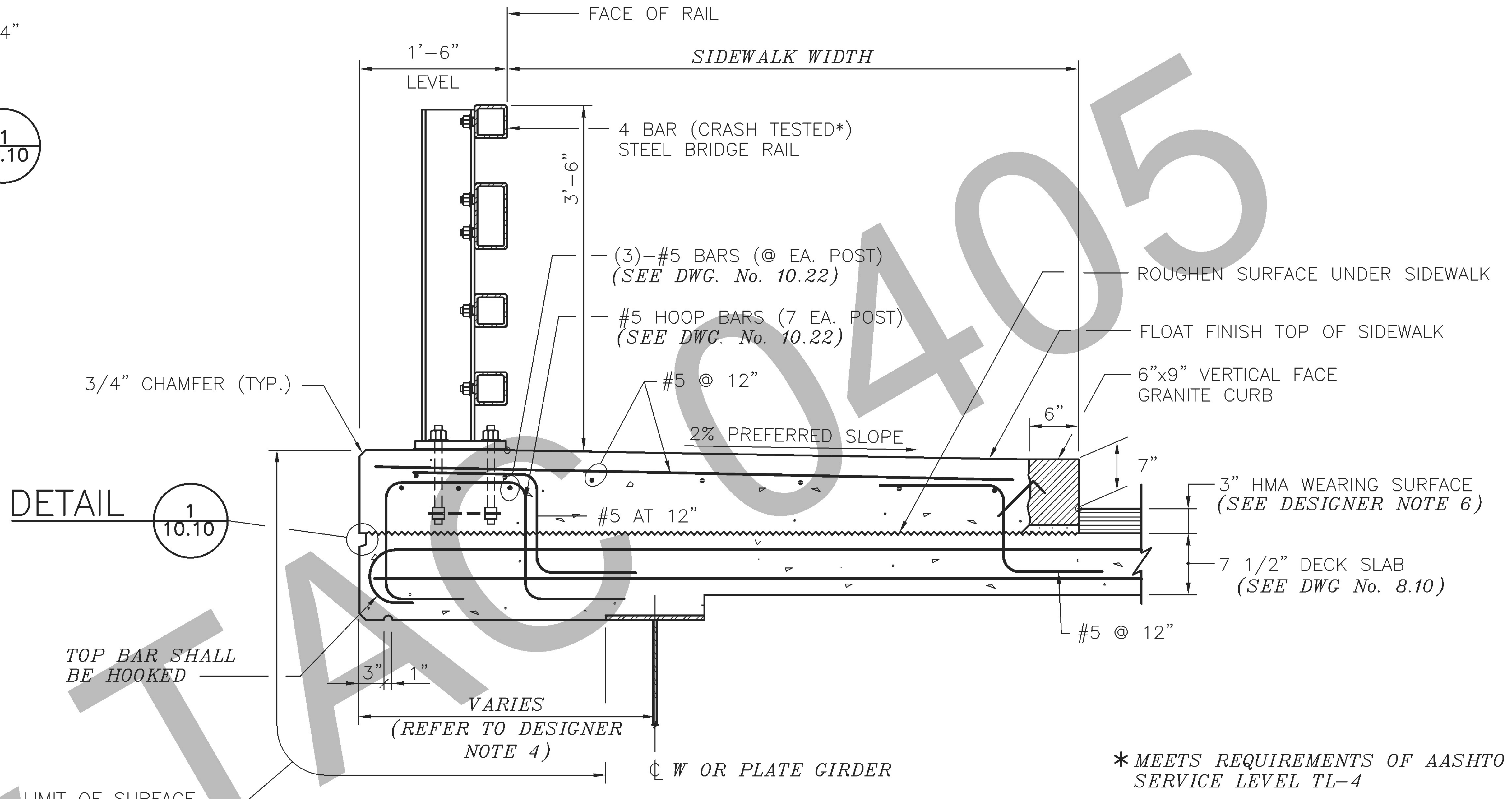
(WITH A PARAPET & HMA WEARING SURFACE)

SCALE 1"=1'-0"



DETAIL 1/10.10

SCALE 3"= 1'-0"

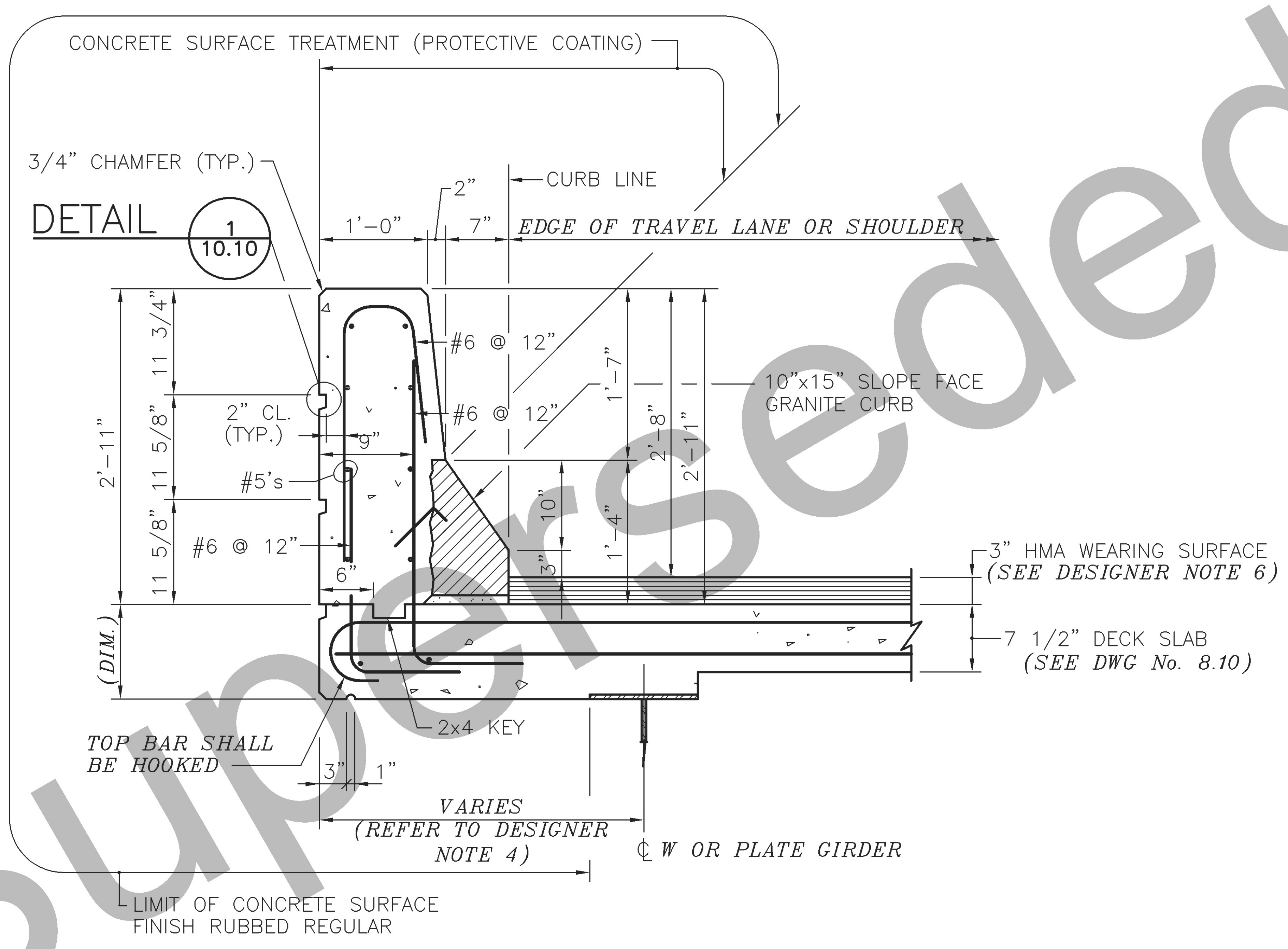

FACE OF RAIL
1'-6"
LEVEL
SIDEWALK WIDTH
4 BAR (CRASH TESTED*) STEEL BRIDGE RAIL
3'-6"
(3)-#5 BARS (@ EA. POST) (SEE DWG. No. 10.22)
#5 HOOP BARS (7 EA. POST) (SEE DWG. No. 10.22)
3/4" CHAMFER (TYP.)
#5 @ 12"
2% PREFERRED SLOPE
ROUGHEN SURFACE UNDER SIDEWALK
FLOAT FINISH TOP OF SIDEWALK
6"x9" VERTICAL FACE GRANITE CURB
6"
7"
DETAIL 1 10.10
#5 AT 12"
3" HMA WEARING SURFACE (SEE DESIGNER NOTE 6)
7 1/2" DECK SLAB (SEE DWG No. 8.10)
#5 @ 12"
TOP BAR SHALL BE HOOKED
3" 1"
VARIES (REFER TO DESIGNER NOTE 4)
℄ W OR PLATE GIRDER
LIMIT OF SURFACE FINISH RUBBED

*MEETS REQUIREMENTS OF AASHTO SERVICE LEVEL TL-4

SECTION THRU SIDEWALK

(WITH A 4-BAR RAIL & HMA WEARING SURFACE)

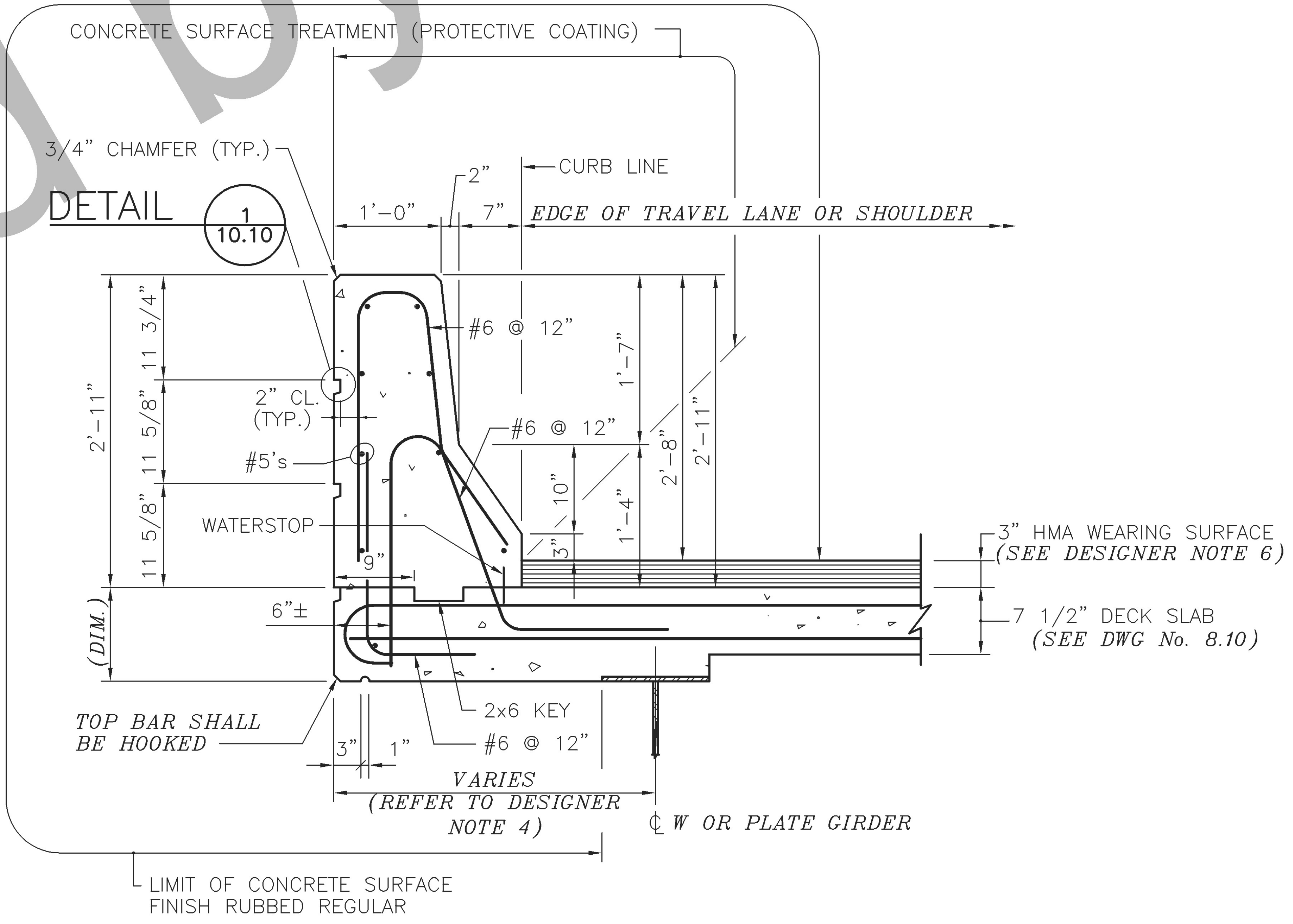
SCALE 1"=1'-0"


CONCRETE SURFACE TREATMENT (PROTECTIVE COATING)
3/4" CHAMFER (TYP.)
DETAIL 1 10.10
2"
CURB LINE
1'-0"
7"
EDGE OF TRAVEL LANE OR SHOULDER
#6 @ 12"
#6 @ 12"
10"x15" SLOPE FACE GRANITE CURB
2'-11"
11 3/4"
11 5/8"
11 5/8"
2" CL. (TYP.)
9"
#5's
#6 @ 12"
6"
1'-7"
2'-8"
2'-11"
10"
1'-4"
3"
3" HMA WEARING SURFACE (SEE DESIGNER NOTE 6)
(DIM.)
7 1/2" DECK SLAB (SEE DWG No. 8.10)
2x4 KEY
TOP BAR SHALL BE HOOKED
3" 1"
VARIES (REFER TO DESIGNER NOTE 4)
℄ W OR PLATE GIRDER
LIMIT OF CONCRETE SURFACE FINISH RUBBED REGULAR

SECTION THRU SAFETY BARRIER

(WITH GRANITE CURB & HMA WEARING SURFACE)

SCALE 1"=1'-0"


CONCRETE SURFACE TREATMENT (PROTECTIVE COATING)
3/4" CHAMFER (TYP.)
DETAIL 1 10.10
2"
CURB LINE
1'-0"
7"
EDGE OF TRAVEL LANE OR SHOULDER
#6 @ 12"
#6 @ 12"
2'-11"
11 3/4"
11 5/8"
11 5/8"
2" CL. (TYP.)
#5's
WATERSTOP
9"
1'-7"
2'-8"
2'-11"
10"
1'-4"
3"
3" HMA WEARING SURFACE (SEE DESIGNER NOTE 6)
6"±
(DIM.)
7 1/2" DECK SLAB (SEE DWG No. 8.10)
2x6 KEY
#6 @ 12"
TOP BAR SHALL BE HOOKED
3" 1"
VARIES (REFER TO DESIGNER NOTE 4)
℄ W OR PLATE GIRDER
LIMIT OF CONCRETE SURFACE FINISH RUBBED REGULAR

SECTION THRU (CRASH TESTED*) SAFETY BARRIER

(WITHOUT GRANITE CURB & HMA WEARING SURFACE)

SCALE 1"=1'-0"

*MEETS REQUIREMENTS OF AASHTO SERVICE LEVEL TL-4

DESIGNER NOTES:

1. *FOR DETAILS OF THE FOUR BAR (CRASH TESTED) STEEL BRIDGE RAIL, REFER TO DWG. No. 10.22.*
2. *FOR DETAILS OF THE ONE BAR (ORNAMENTAL) ALUMINUM RAILING, REFER TO DRAWING 10.20.*
3. *FOR CURB DETAILS, REFER TO DRAWING 11.10.*
4. *FOR DESIGN REQUIREMENTS OF THE DECK OVERHANG REFER TO THE RIDOT LRFD BRIDGE DESIGN MANUAL*
5. *SPECIFY CONCRETE SURFACE TREATMENT (PROTECTIVE COATING) IN ACCORDANCE WITH THE RIDOT LRFD BRIDGE DESIGN MANUAL.*
6. *SEE DWG. No. 10.11 FOR DETAILS WITH EXPOSED CONCRETE DECK SURFACE.*

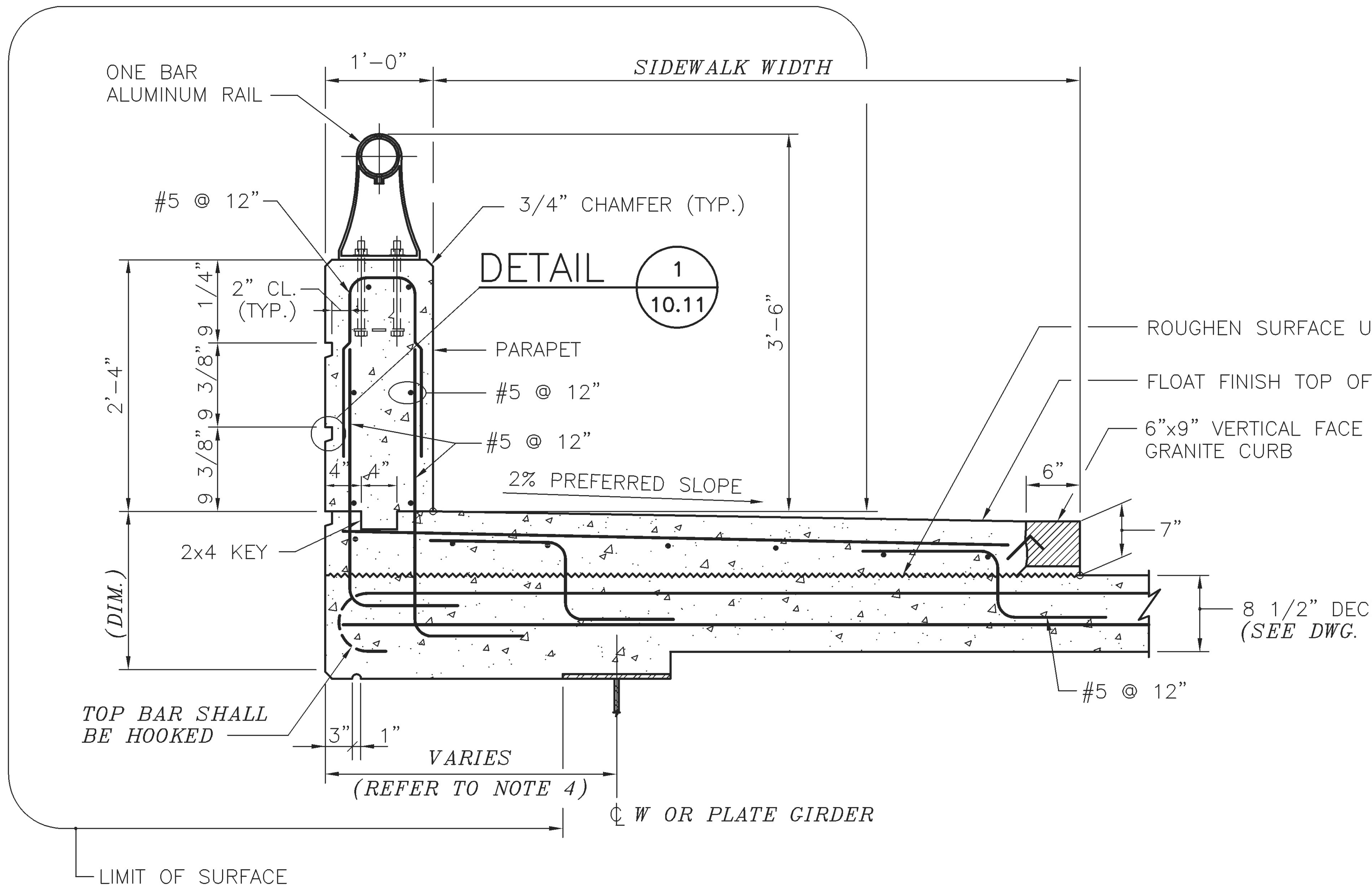
REVISIONS	
No.	DATE

RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

BRIDGE STANDARDS

SIDEWALK, SAFETY BARRIER AND PARAPET DETAILS-1 (WITH HMA WEARING SURFACE)

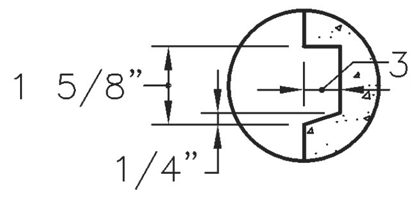
DRAWING NUMBER: 10.10



SECTION THRU SIDEWALK

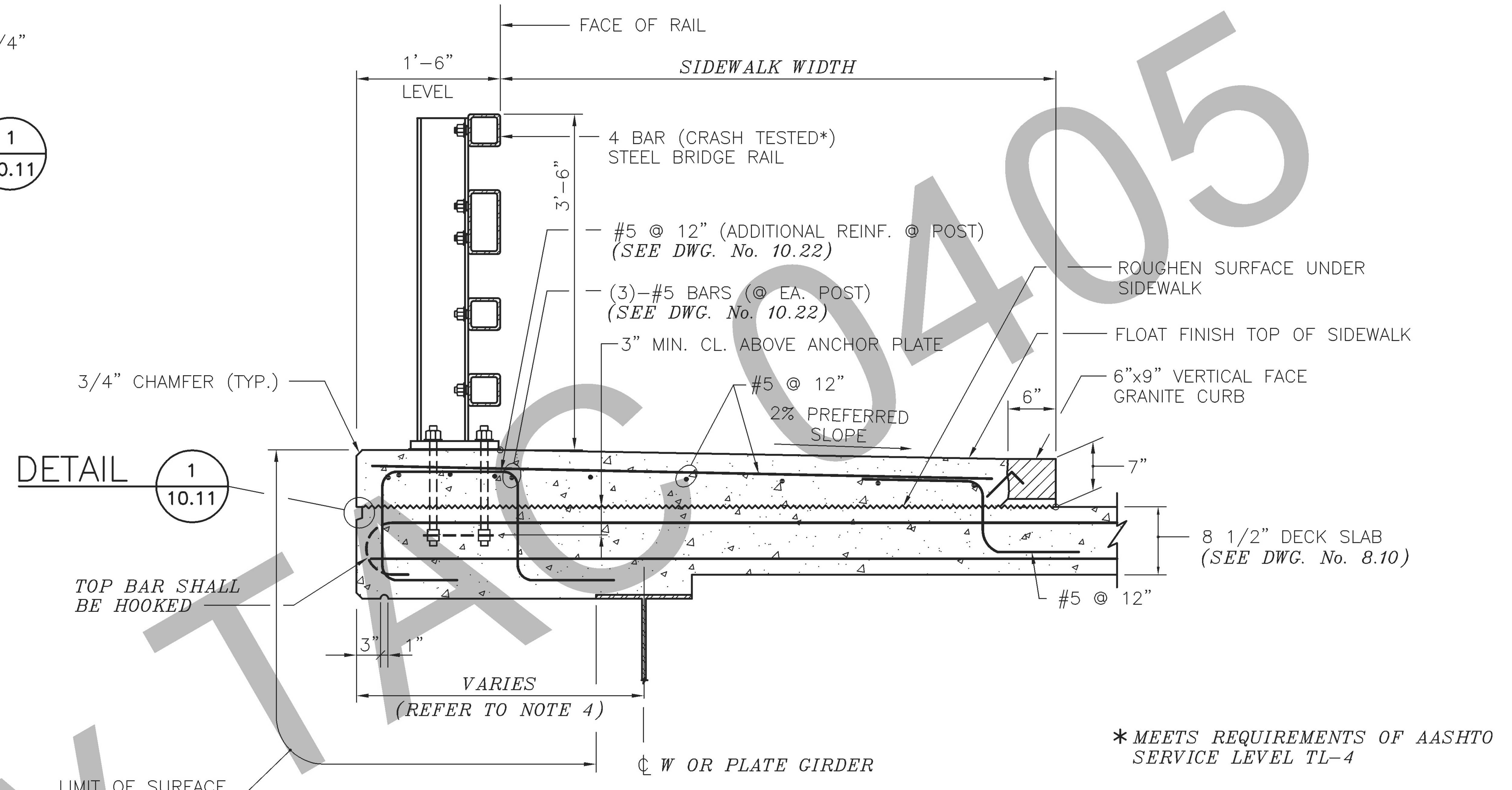
(WITH A PARAPET & CONCRETE WEARING SURFACE)

SCALE 1"=1'–0"



DETAIL 1 10.11

SCALE 3"= 1'–0"

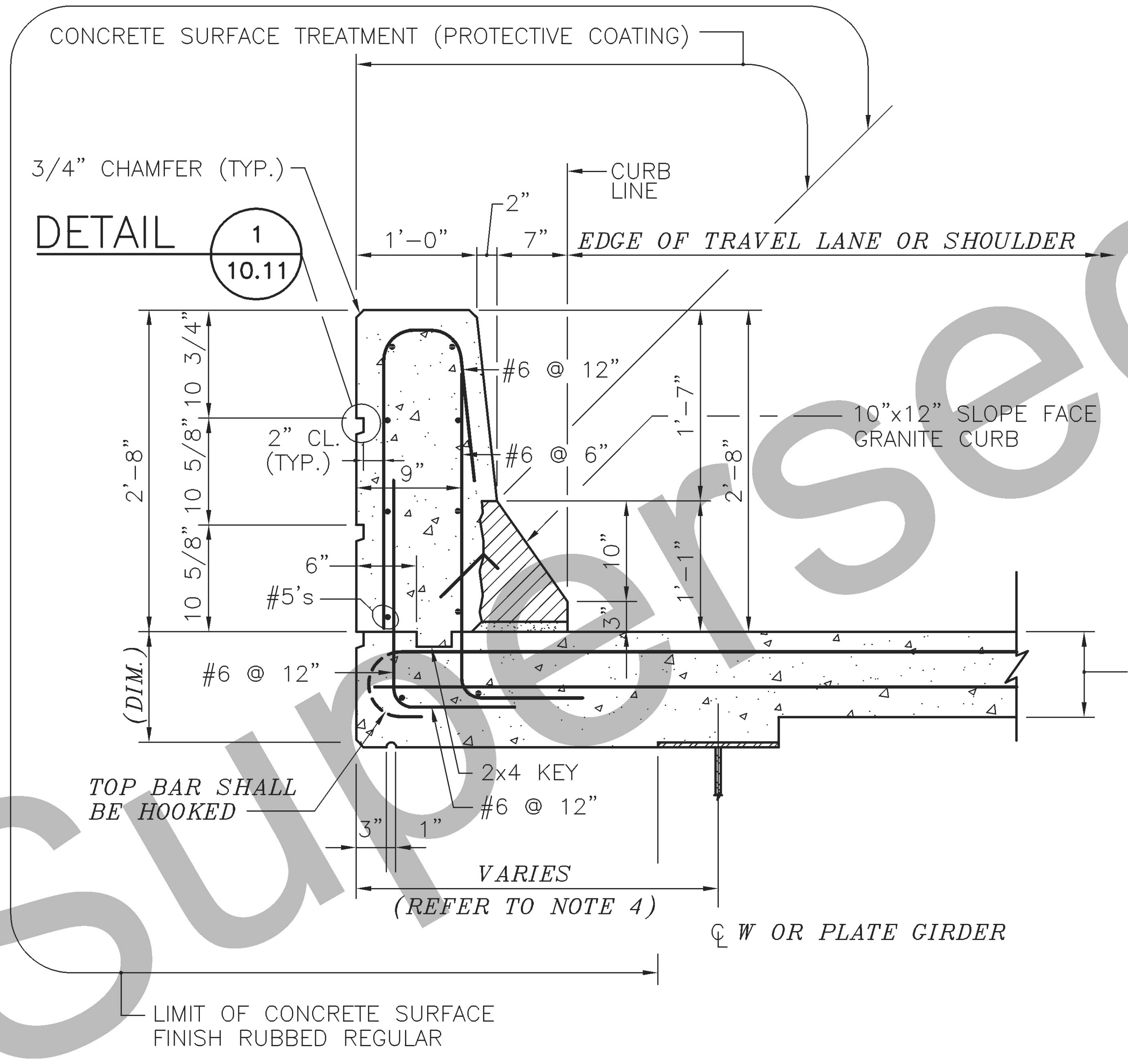

FACE OF RAIL
1'–6"
LEVEL
SIDEWALK WIDTH
4 BAR (CRASH TESTED*) STEEL BRIDGE RAIL
3'–6"
#5 @ 12" (ADDITIONAL REINF. @ POST) (SEE DWG. No. 10.22)
(3)–#5 BARS (@ EA. POST) (SEE DWG. No. 10.22)
3" MIN. CL. ABOVE ANCHOR PLATE
ROUGHEN SURFACE UNDER SIDEWALK
FLOAT FINISH TOP OF SIDEWALK
3/4" CHAMFER (TYP.)
#5 @ 12"
2% PREFERRED SLOPE
6"x9" VERTICAL FACE GRANITE CURB
6"
7"
DETAIL 1 10.11
8 1/2" DECK SLAB (SEE DWG. No. 8.10)
TOP BAR SHALL BE HOOKED
#5 @ 12"
3"
1"
VARIES
(REFER TO NOTE 4)
℄ W OR PLATE GIRDER
LIMIT OF SURFACE FINISH RUBBED

*MEETS REQUIREMENTS OF AASHTO SERVICE LEVEL TL–4

SECTION THRU SIDEWALK

(WITH A 4–BAR RAIL & CONCRETE WEARING SURFACE)

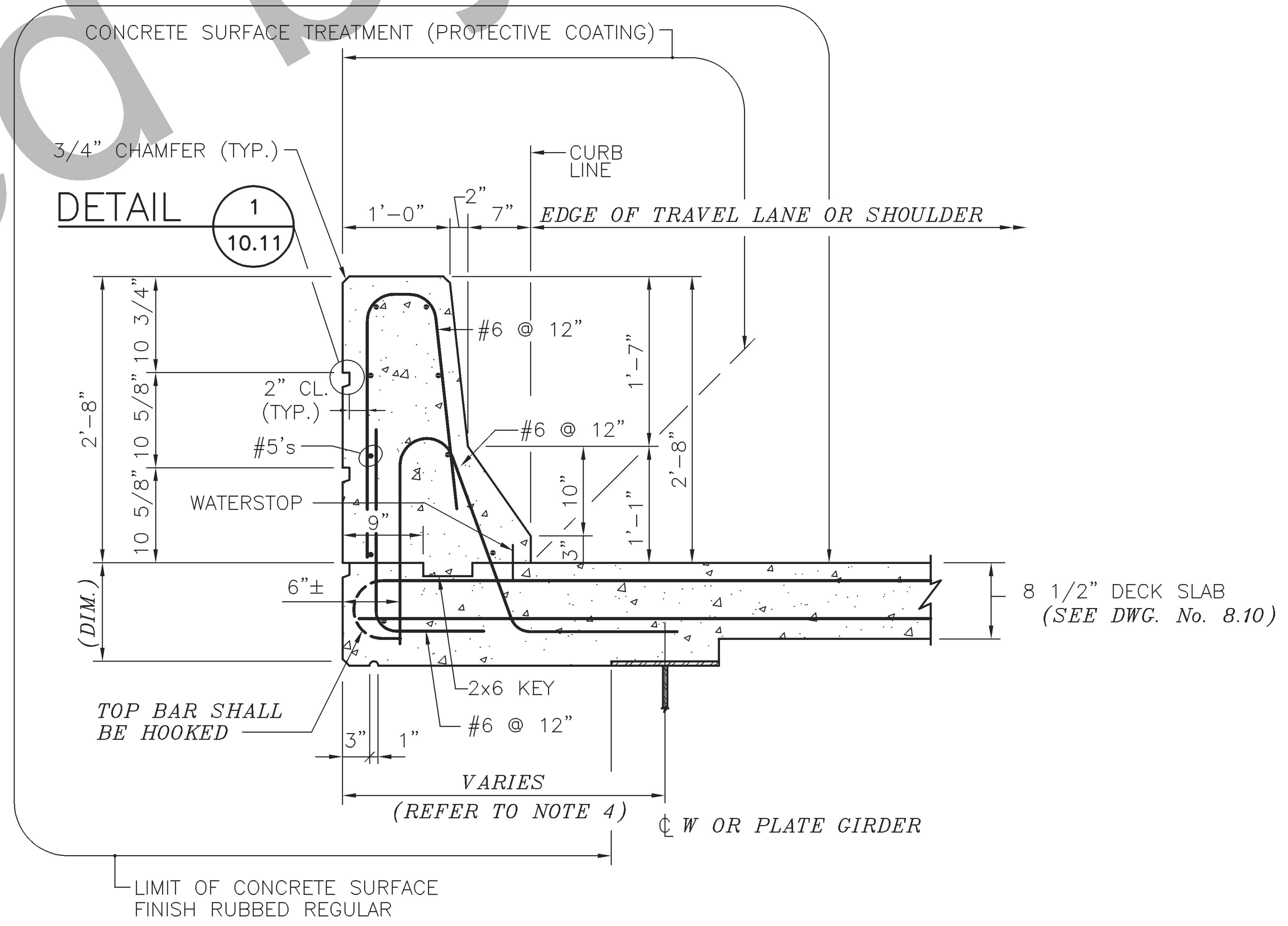
SCALE 1"=1'–0"



SECTION THRU SAFETY BARRIER

(WITH GRANITE CURB & WITH CONCRETE WEARING SURFACE)

SCALE 1"=1'–0"



SECTION THRU (CRASH TESTED*) SAFETY BARRIER

(WITHOUT GRANITE CURB & WITH CONCRETE WEARING SURFACE)

SCALE 1"=1'–0"

*MEETS REQUIREMENTS OF AASHTO SERVICE LEVEL TL–4

__DESIGNER NOTES:__

1. *FOR DETAILS OF THE FOUR BAR (CRASH TESTED) STEEL BRIDGE RAIL, REFER TO DWG. No. 10.22.*
2. *FOR DETAILS OF THE ONE BAR (ORNAMENTAL) ALUMINUM RAILING, REFER TO DRAWING 10.20.*
3. *FOR CURB DETAILS, REFER TO DRAWING 11.10.*
4. *FOR DESIGN REQUIREMENTS OF THE DECK OVERHANG REFER TO THE RIDOT LRFD BRIDGE DESIGN MANUAL*
5. *SPECIFY CONCRETE SURFACE TREATMENT (PROTECTIVE COATING) IN ACCORDANCE WITH THE RIDOT LRFD BRIDGE DESIGN MANUAL.*
6. *SEE DWG. No. 10.10 FOR DETAILS WITH HMA WEARING SURFACE.*

REVISIONS	
No.	DATE

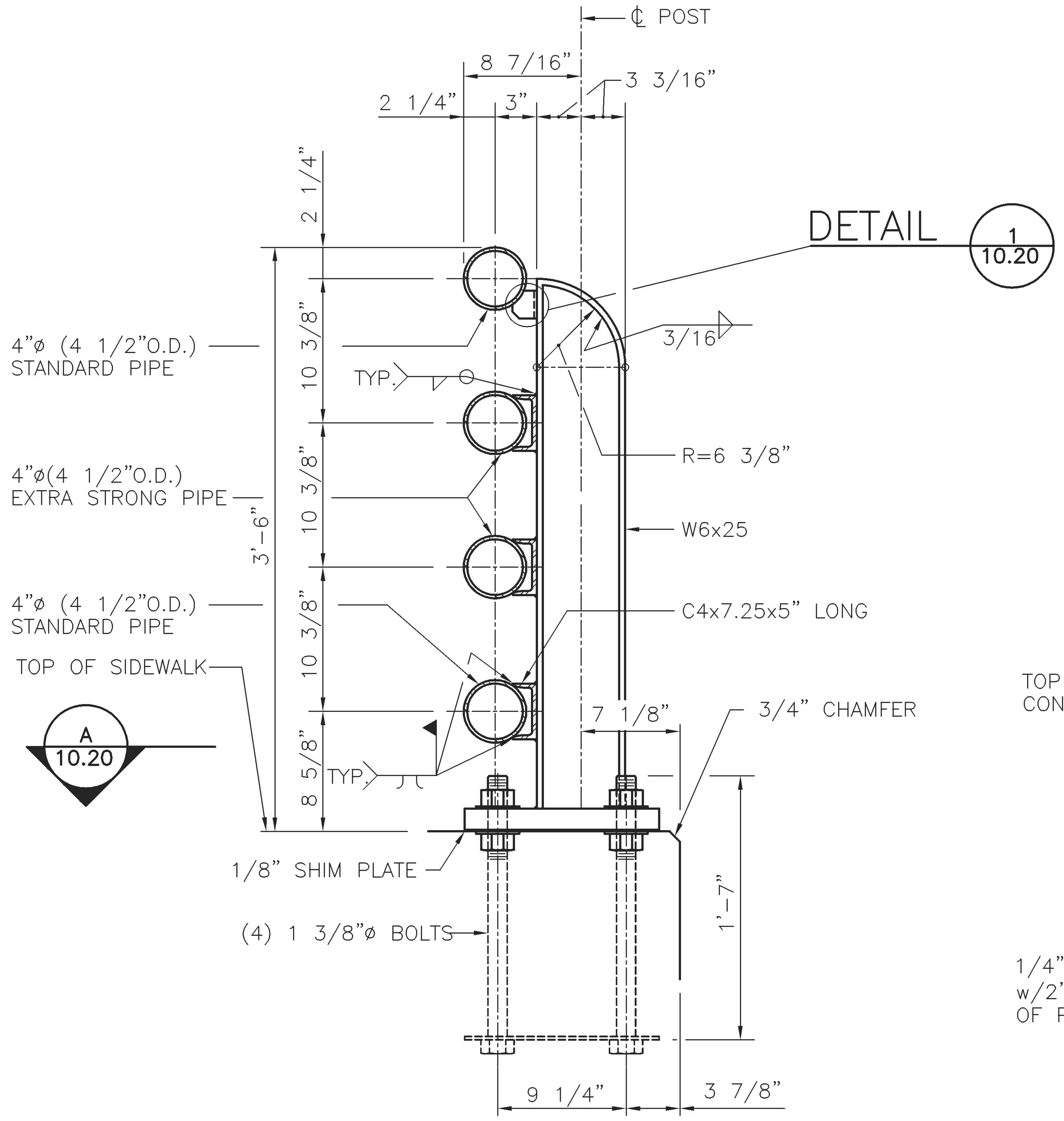
RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

BRIDGE STANDARDS

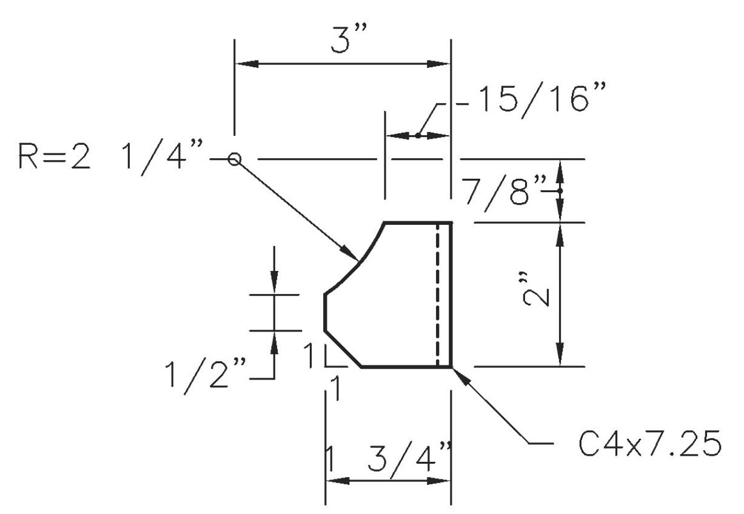
SIDEWALK, SAFETY BARRIER
AND PARAPET DETAILS–2
(WITH EXPOSED CONC. DECK SURFACE)

DRAWING NUMBER: 10.11

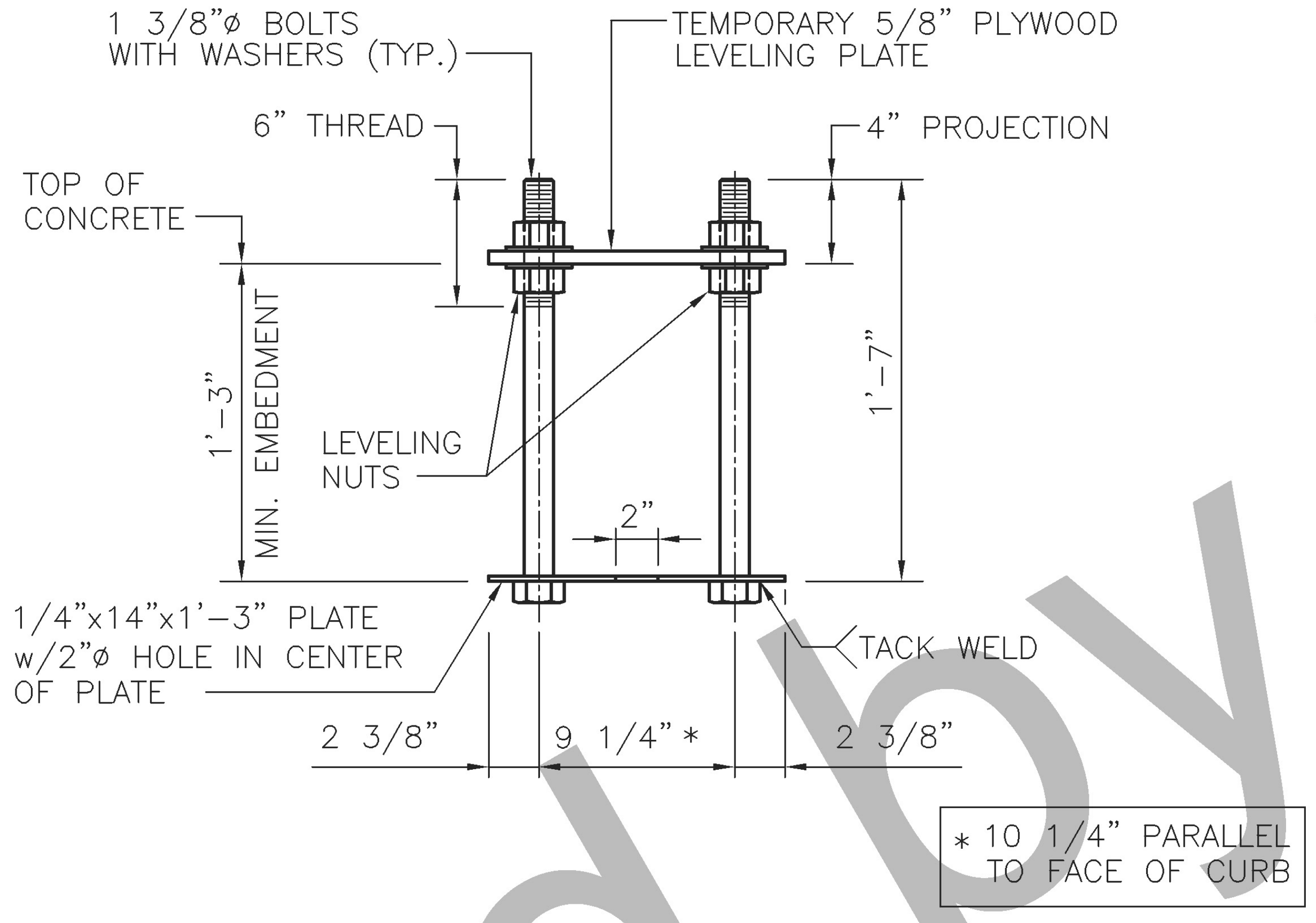
Superseded by TAC 0405



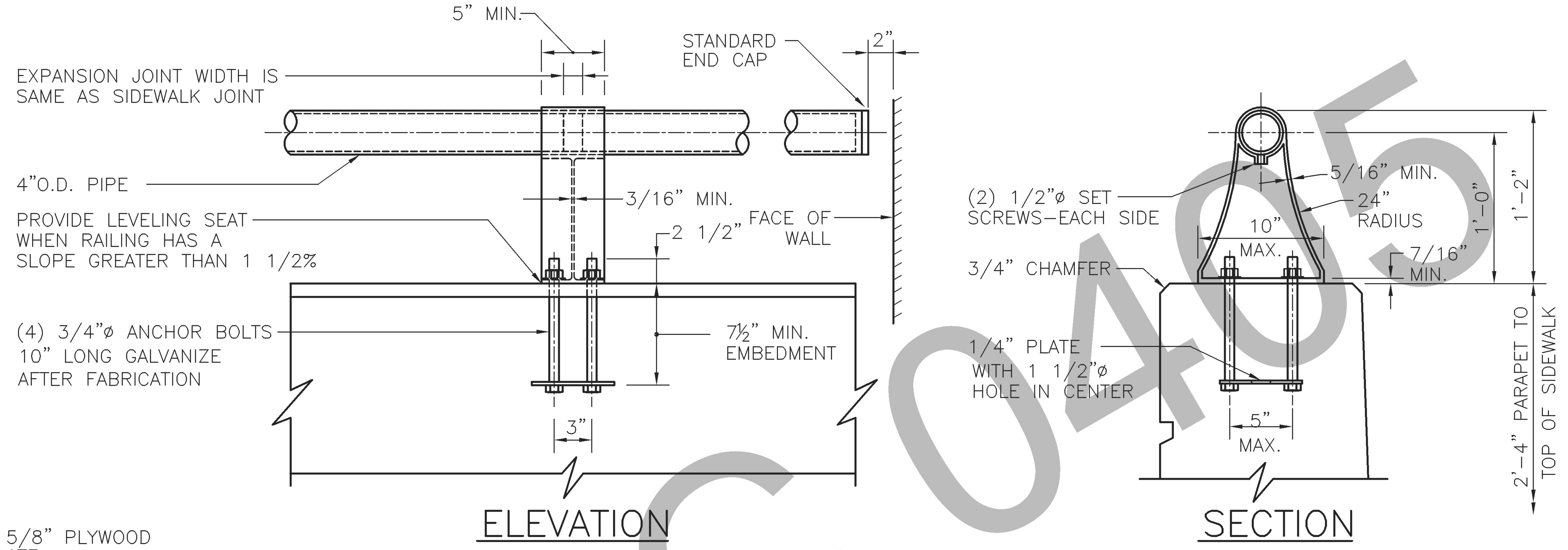
STEEL 4-BAR RAIL
SCALE:1 1/2"=1'-0"



DETAIL 1 10.20
N.T.S.


1 3/8"ø BOLTS WITH WASHERS (TYP.)
TEMPORARY 5/8" PLYWOOD LEVELING PLATE
6" THREAD
4" PROJECTION
TOP OF CONCRETE
1'-3" MIN. EMBEDMENT
LEVELING NUTS
2"
1'-7"
1/4"x14"x1'-3" PLATE w/2"ø HOLE IN CENTER OF PLATE
TACK WELD
2 3/8"
9 1/4" *
2 3/8"
* 10 1/4" PARALLEL TO FACE OF CURB

ANCHOR BOLT DETAIL FOR 4-BAR RAIL
SCALE:1 1/2"=1'-0"


5" MIN.
EXPANSION JOINT WIDTH IS SAME AS SIDEWALK JOINT
STANDARD END CAP
2"
4"O.D. PIPE
3/16" MIN.
PROVIDE LEVELING SEAT WHEN RAILING HAS A SLOPE GREATER THAN 1 1/2%
2 1/2"
FACE OF WALL
(4) 3/4"ø ANCHOR BOLTS 10" LONG GALVANIZE AFTER FABRICATION
7½" MIN. EMBEDMENT
3"
(2) 1/2"ø SET SCREWS-EACH SIDE
5/16" MIN.
24" RADIUS
10" MAX.
1'-0"
1'-2"
7/16" MIN.
3/4" CHAMFER
1/4" PLATE WITH 1 1/2"ø HOLE IN CENTER
5" MAX.
2'-4" PARAPET TO TOP OF SIDEWALK

ELEVATION

SECTION

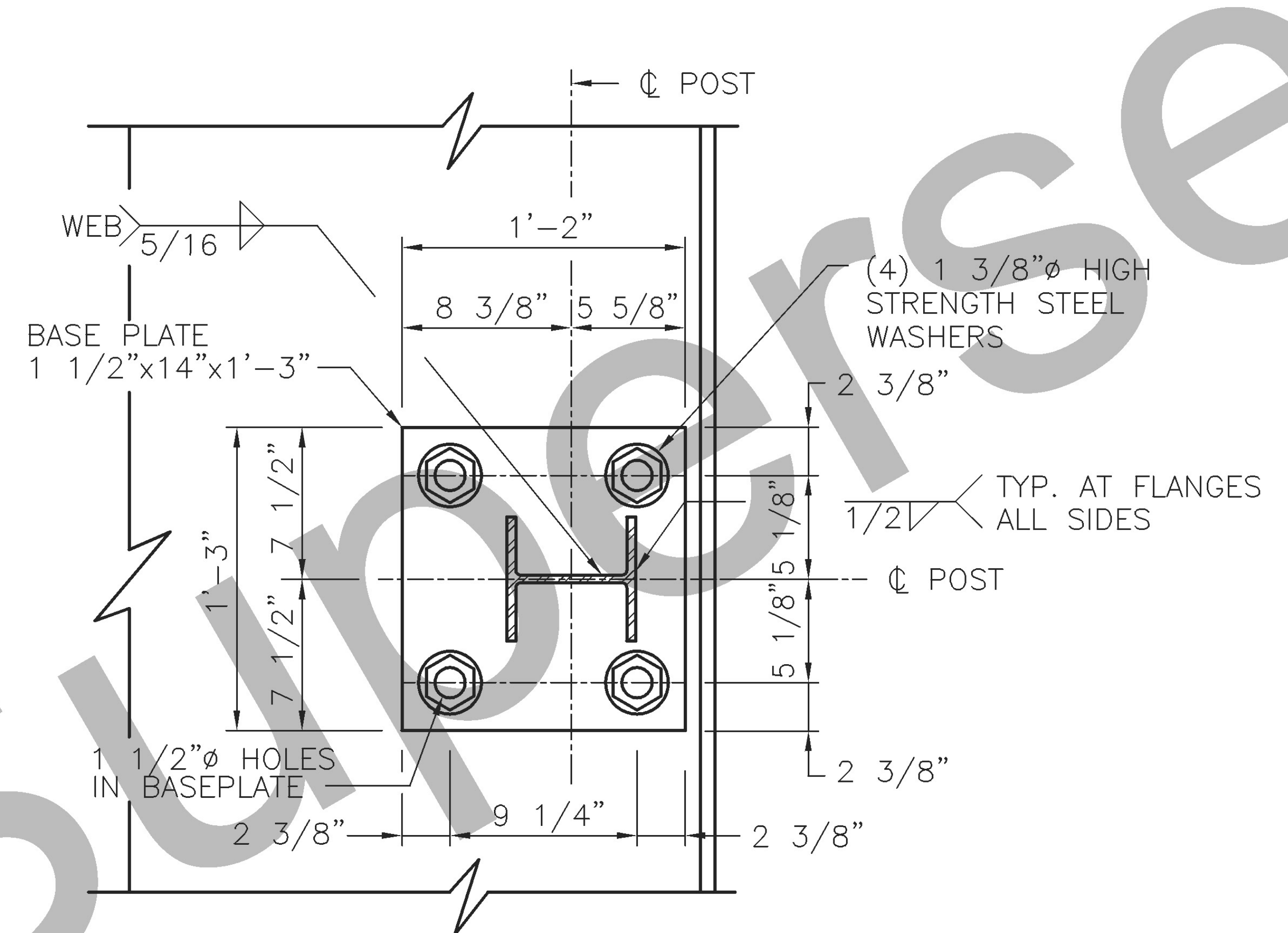
ALUMINUM 1-BAR RAIL
SCALE:1 1/2"=1'-0"

ALUMINUM RAILING NOTES

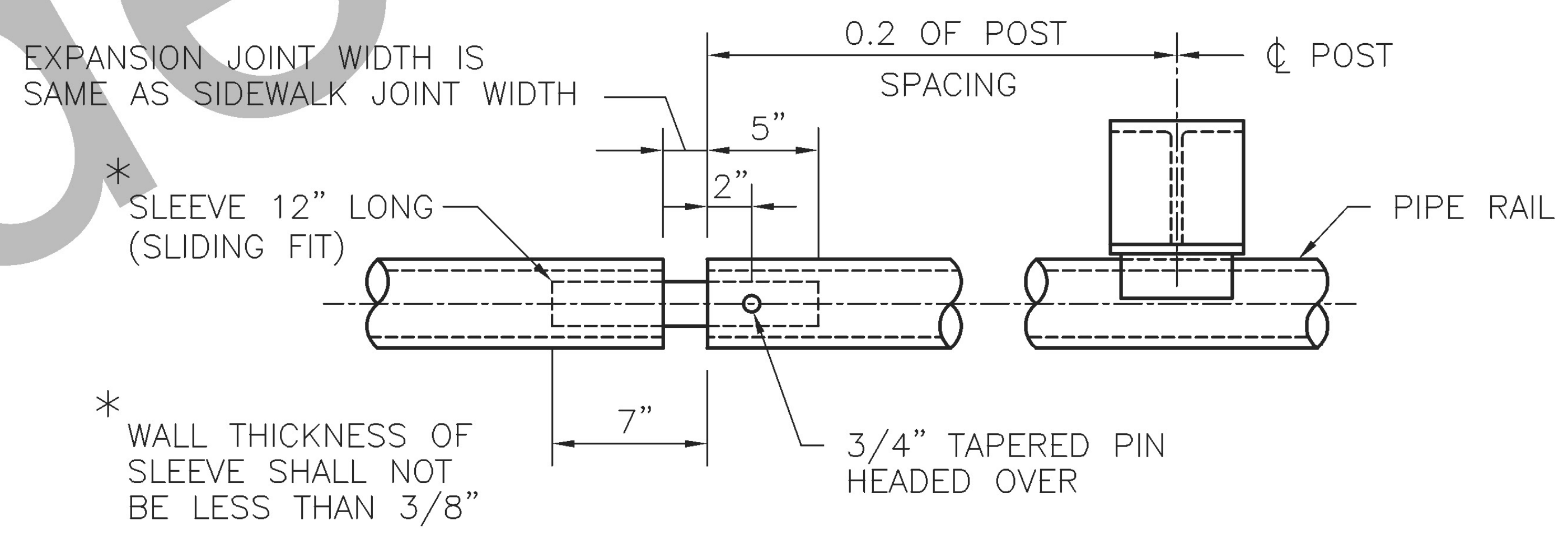
1. ALL ALUMINUM IN CONTACT WITH CONCRETE OR STEEL SURFACES SHALL BE THOROUGHLY COATED WITH APPROVED ALUMINUM IMPREGNATED CAULKING COMPOUND.
2. THE POSTS SHALL BE CAST ALUMINUM ALLOYS A 444.0–T4, A356.0–T61 OR A356.0–T6.
3. THE RAILS SHALL BE 4 INCH O.D. X 1/8 INCH WALL THICKNESS, ALUMINUM ALLOYS 6061–T6, 6063–T6 OR 6351–T5.

STEEL RAILING NOTES

1. THE ENTIRE RAILING SYSTEM SHALL BE METALIZED AND PAINTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE R.I. STANDARD SPECIFICATIONS.
2. STANDARD AND EXTRA STRONG STEEL PIPES SHALL CONFORM TO THE LATEST REQUIREMENTS OF ASTM DESIGNATION A 53, GRADE B.
3. STRUCTURAL STEEL SHAPES AND PLATES SHALL CONFORM TO THE REQUIREMENTS OF AASHTO DESIGNATION M 270 GRADE 36.
4. ANCHOR BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM DESIGNATION A 307.
5. THE ENTIRE ANCHOR BOLT ASSEMBLY SHALL BE GALVANIZED IN ACCORDANCE WITH THE REQUIREMENTS OF AASHTO DESIGNATION M 111.
6. RAIL POSTS SHALL BE SET VERTICAL IN THE FIELD. LEAD SHIMS SHALL BE PROVIDED UNDER THE BASE PLATES TO MAKE UP THE DIFFERENCE BETWEEN THE FABRICATED POST UNIT AND THE ACTUAL SLOPE OF THE SIDEWALK OR BRUSH CURB.
7. MAXIMUM POST SPACING SHALL BE 8'–0".
8. THE RAILS AND CHANNELS SHALL BE WELDED PARALLEL TO THE ACTUAL PROFILE OF THE SIDEWALK OR BRUSH CURB.
9. RAILINGS SHALL BE SPLICED OVER EXPANSION JOINTS.

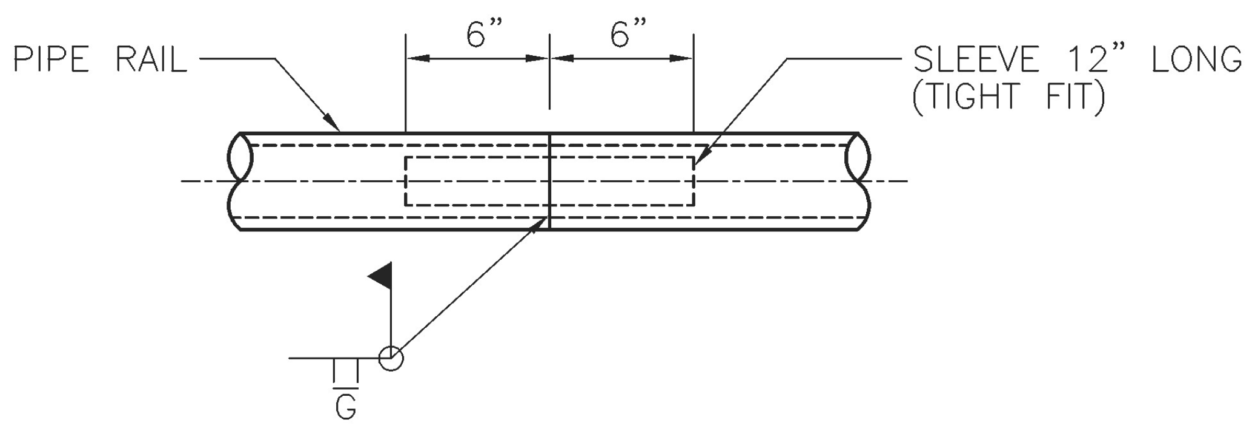

℄ POST
WEB 5/16
1'-2"
8 3/8"
5 5/8"
(4) 1 3/8"ø HIGH STRENGTH STEEL WASHERS
BASE PLATE 1 1/2"x14"x1'-3"
2 3/8"
7 1/2"
7 1/2"
1'-3"
1/8"
5 1/8"
5 1/8"
1/2
TYP. AT FLANGES ALL SIDES
℄ POST
1 1/2"ø HOLES IN BASEPLATE
2 3/8"
2 3/8"
9 1/4"
2 3/8"

SECTION A 10.20
SCALE:1 1/2"=1'-0"


EXPANSION JOINT WIDTH IS SAME AS SIDEWALK JOINT WIDTH
0.2 OF POST SPACING
℄ POST
5"
2"
* SLEEVE 12" LONG (SLIDING FIT)
PIPE RAIL
7"
3/4" TAPERED PIN HEADED OVER

* WALL THICKNESS OF SLEEVE SHALL NOT BE LESS THAN 3/8"

TYPICAL EXPANSION JOINT DETAIL
SCALE:1 1/2"=1'-0"



TYPICAL STEEL RAIL JOINT
SCALE:1 1/2"=1'-0"

DESIGNER NOTE:
PROVIDE PAINT COLOR
FOR RAILING SYSTEM

REVISIONS	
No.	DATE

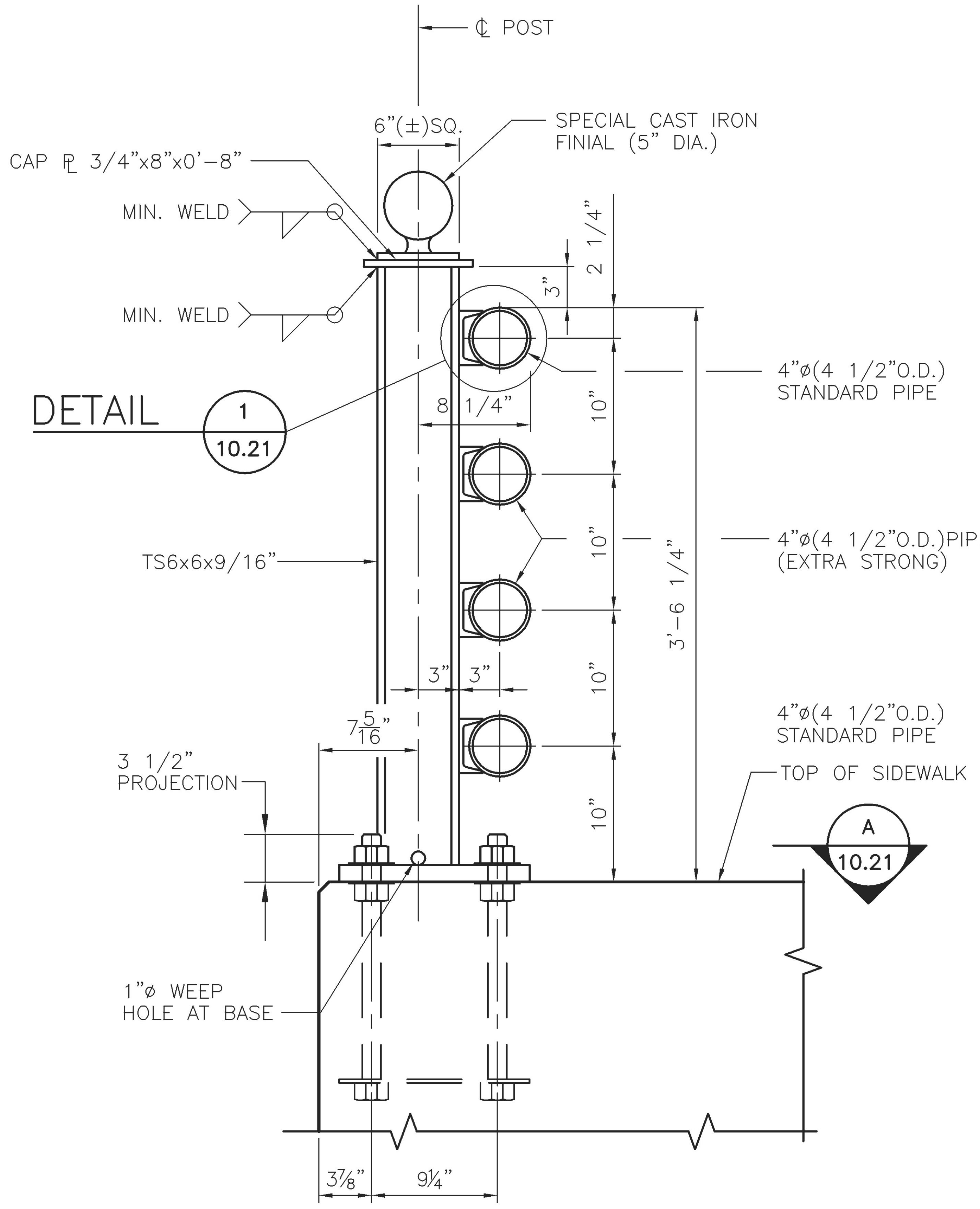
RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

BRIDGE STANDARDS

ONE AND FOUR BAR
RAIL AND POST DETAILS

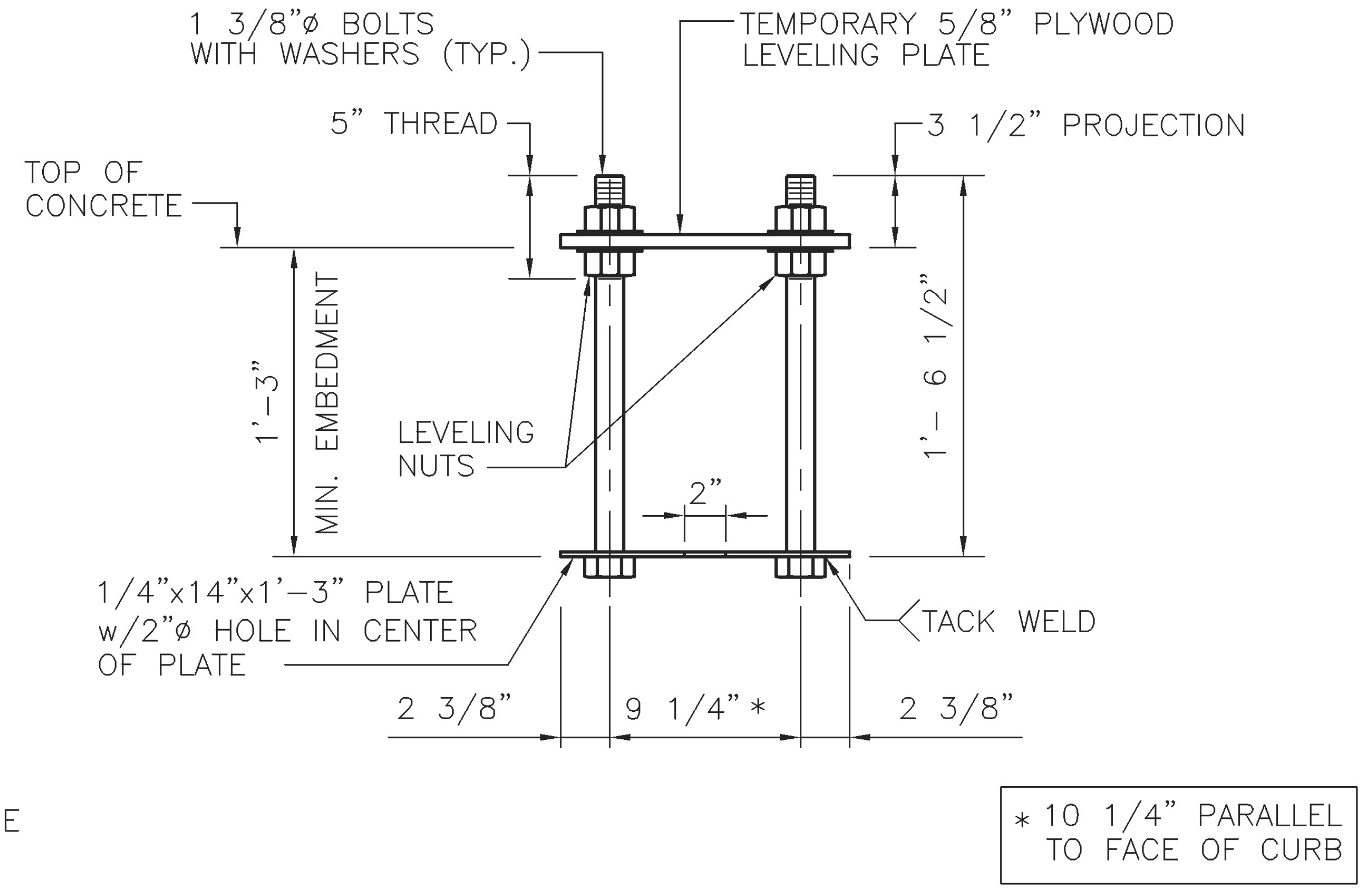
DRAWING NUMBER: 10.20

Superseded by TAC 0405



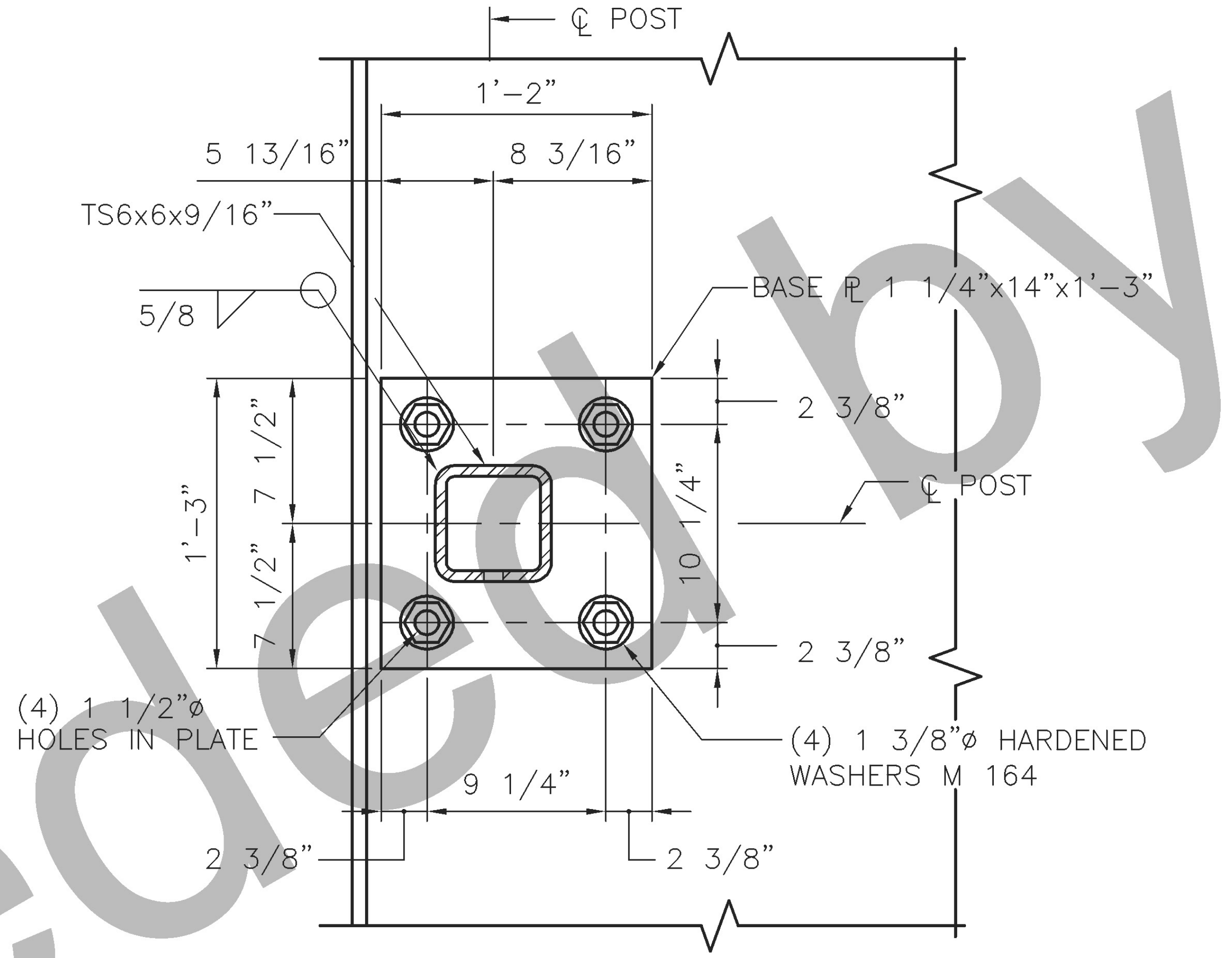
TYPICAL SECTION AT RAIL POST

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


1 3/8"ø BOLTS WITH WASHERS (TYP.)
TEMPORARY 5/8" PLYWOOD LEVELING PLATE
5" THREAD
3 1/2" PROJECTION
TOP OF CONCRETE
1'-3" MIN. EMBEDMENT
1'- 6 1/2"
LEVELING NUTS
2"
1/4"x14"x1'-3" PLATE w/2"ø HOLE IN CENTER OF PLATE
TACK WELD
2 3/8"
9 1/4" *
2 3/8"
* 10 1/4" PARALLEL TO FACE OF CURB

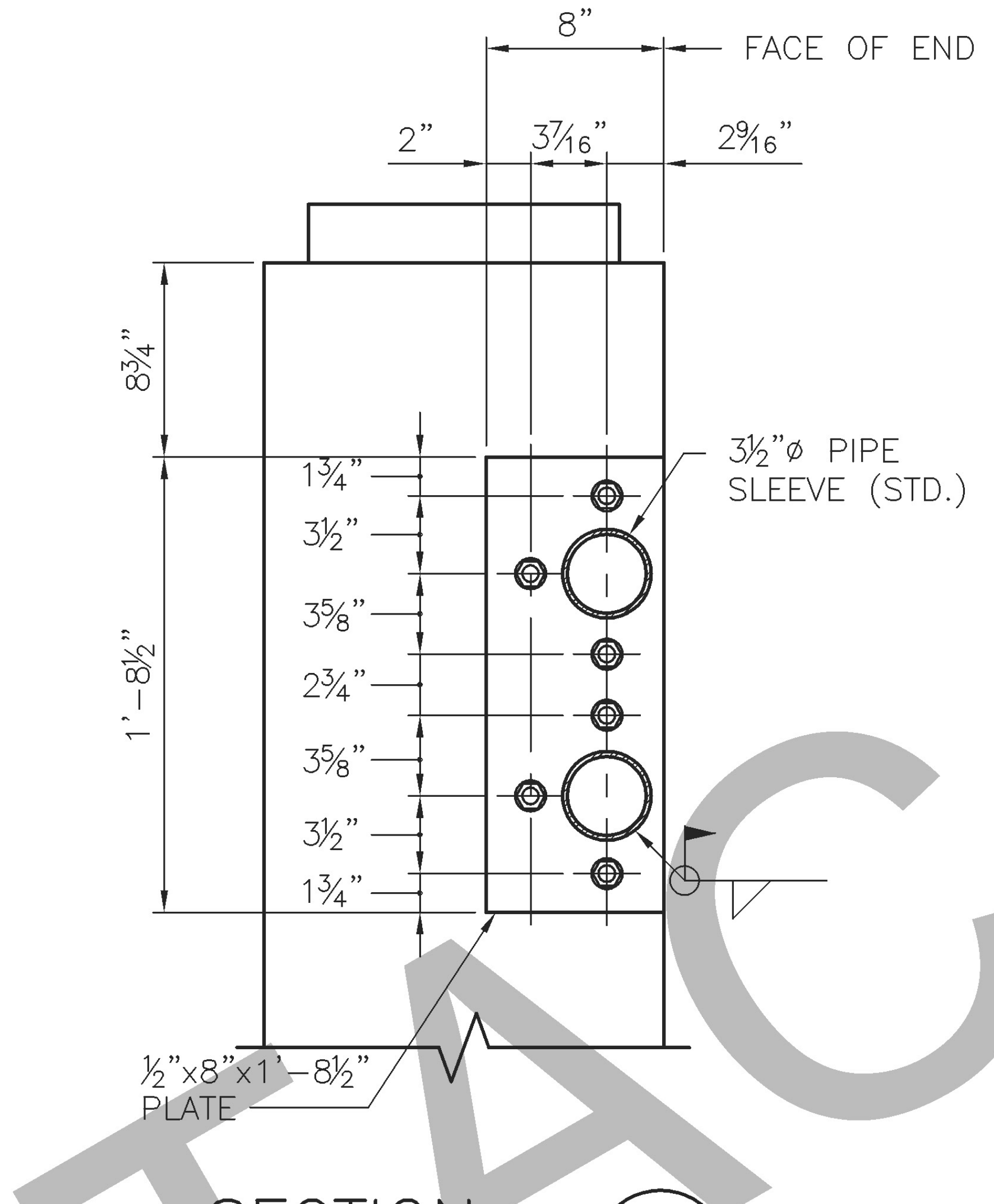
ANCHOR BOLT ASSEMBLY

SCALE:1"=1'-0"



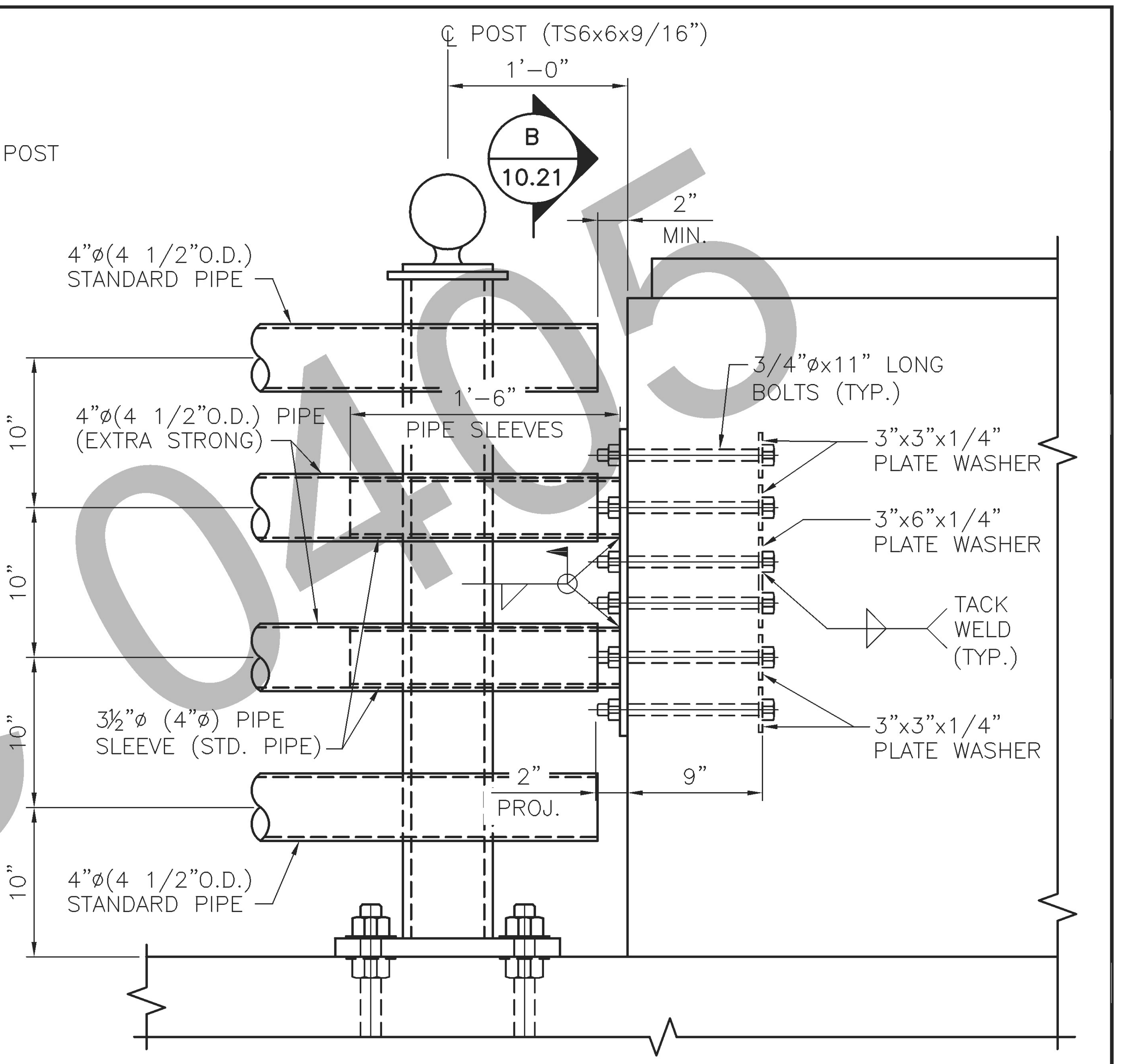
SECTION A / 10.21

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



SECTION B / 10.21

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



BRIDGE RAILING ANCHOR DETAIL

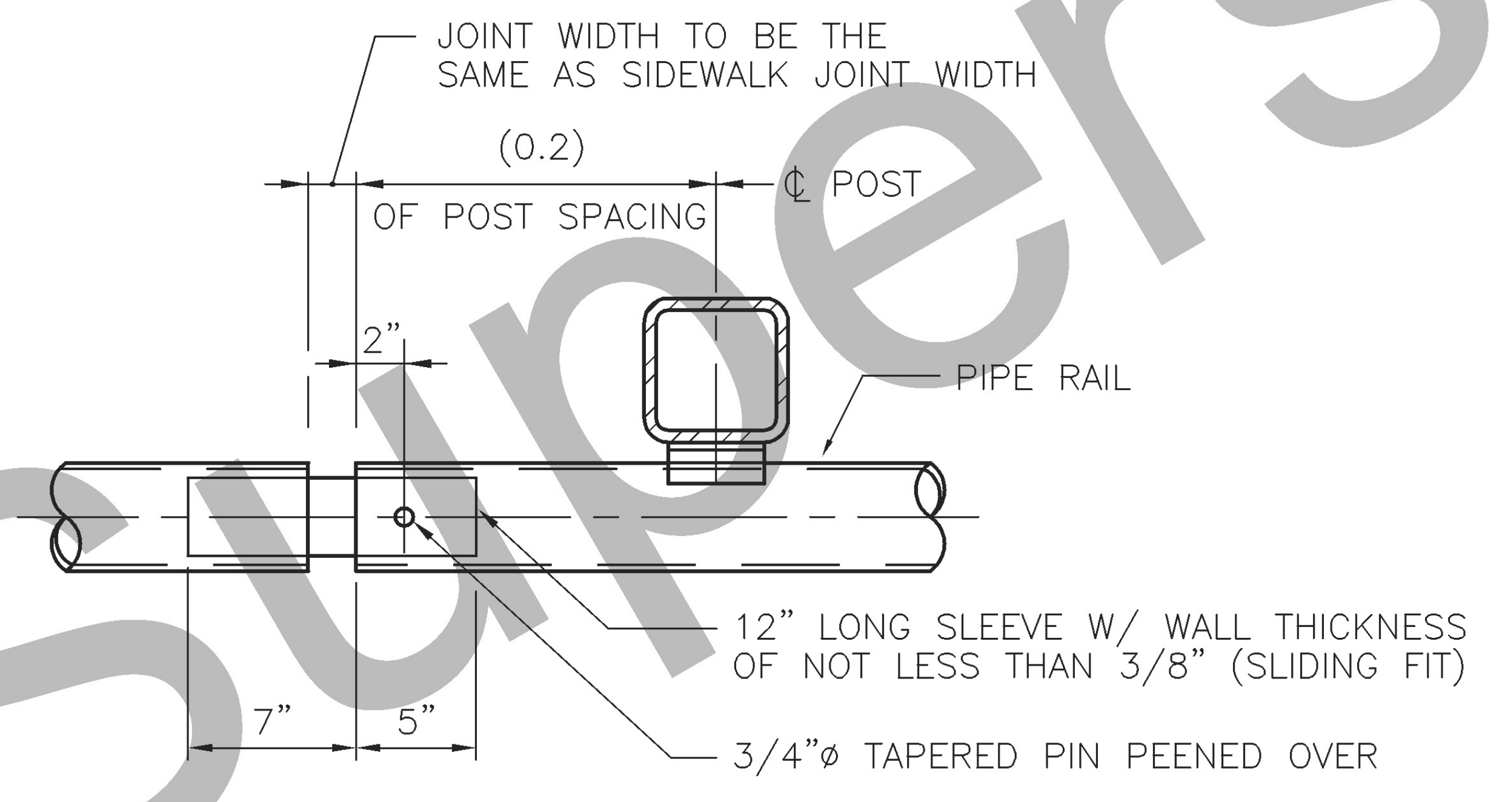
SCALE: 1 1/2"=1'-0"

DESIGNER NOTE:

PROVIDE PAINT COLOR FOR RAILING SYSTEM.

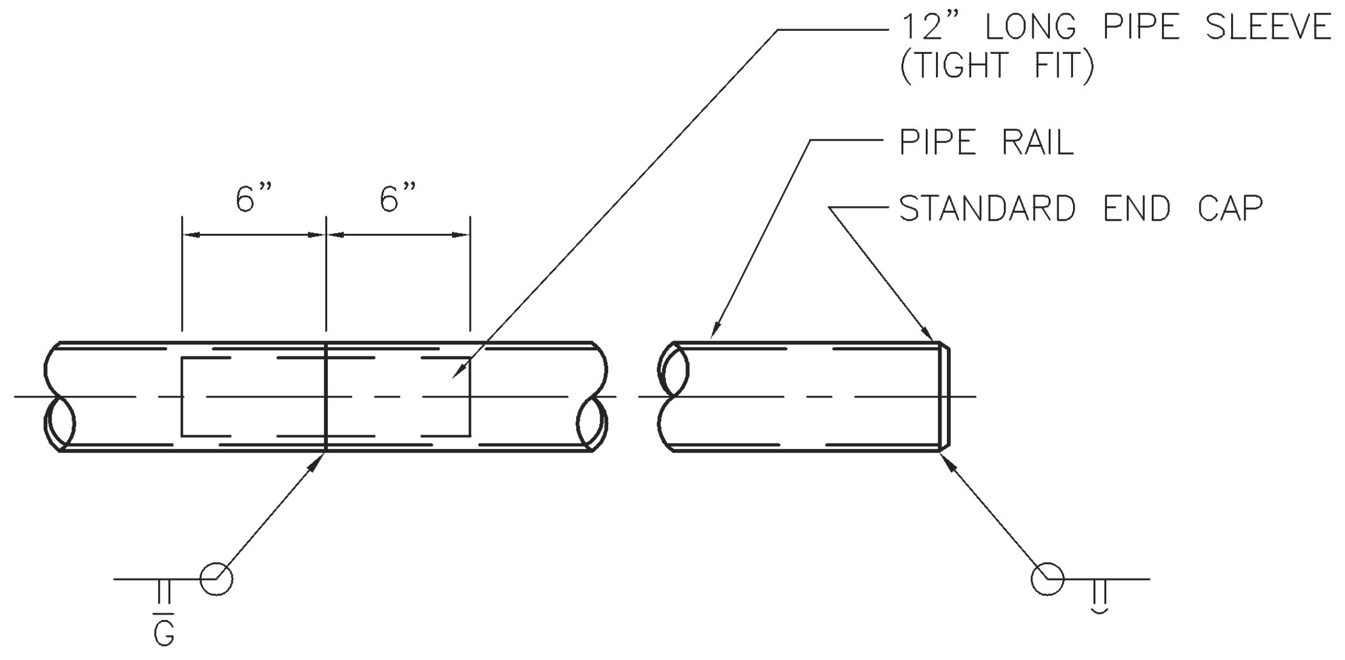
STEEL RAILING NOTES

1. THE ENTIRE RAILING SYSTEM SHALL BE METALIZED AND PAINTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE R.I. STANDARD SPECIFICATIONS.
2. STANDARD AND EXTRA STRONG STEEL PIPES SHALL CONFORM TO THE LATEST REQUIREMENTS OF ASTM DESIGNATION A 53, GRADE B.
3. STRUCTURAL STEEL SHAPES AND PLATES SHALL CONFORM TO THE REQUIREMENTS OF AASHTO DESIGNATION M 270 GRADE 36.
4. ANCHOR BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM DESIGNATION A 307.
5. THE ENTIRE ANCHOR BOLT ASSEMBLY SHALL BE GALVANIZED IN ACCORDANCE WITH THE REQUIREMENTS OF AASHTO DESIGNATION M 111.
6. RAIL POSTS SHALL BE SET VERTICAL IN THE FIELD. LEAD SHIMS SHALL BE PROVIDED UNDER THE BASE PLATES TO MAKE UP THE DIFFERENCE BETWEEN THE FABRICATED POST UNIT AND THE ACTUAL SLOPE OF THE SIDEWALK OR BRUSH CURB.
7. MAXIMUM POST SPACING SHALL BE 8'-0".
8. THE RAILS AND CHANNELS SHALL BE WELDED PARALLEL TO THE ACTUAL PROFILE OF THE SIDEWALK OR BRUSH CURB.
9. RAILINGS SHALL BE SPLICED OVER EXPANSION JOINTS.


JOINT WIDTH TO BE THE SAME AS SIDEWALK JOINT WIDTH
(0.2) OF POST SPACING
℄ POST
2"
PIPE RAIL
12" LONG SLEEVE W/ WALL THICKNESS OF NOT LESS THAN 3/8" (SLIDING FIT)
3/4"ø TAPERED PIN PEENED OVER
7"
5"

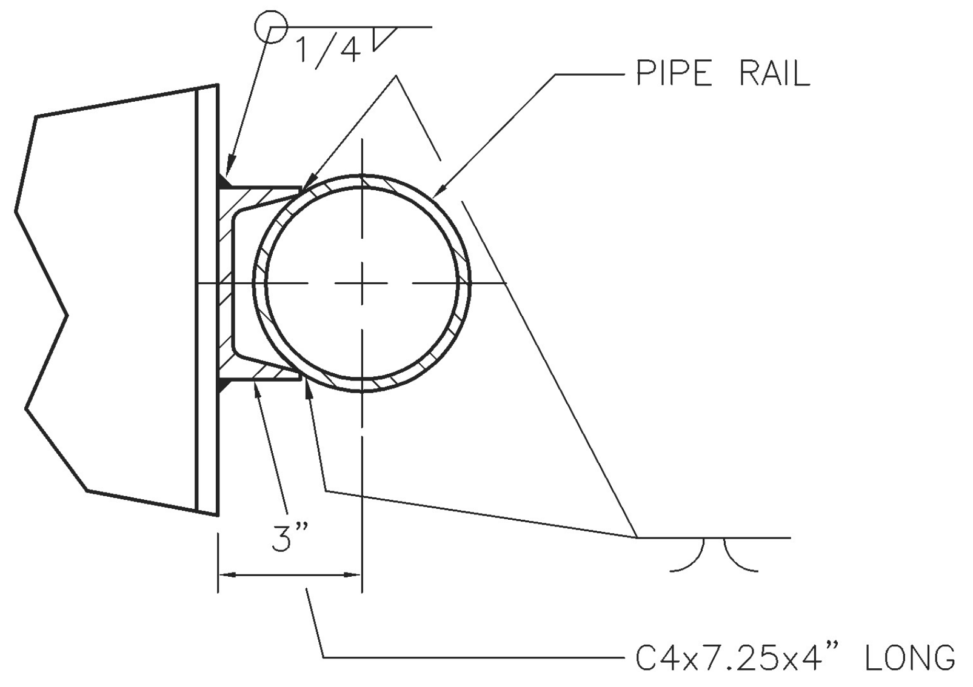
TYPICAL EXPANSION JOINT DETAIL

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



TYPICAL RAIL JOINT

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



DETAIL 1 / 10.21

REVISIONS	
No.	DATE

RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

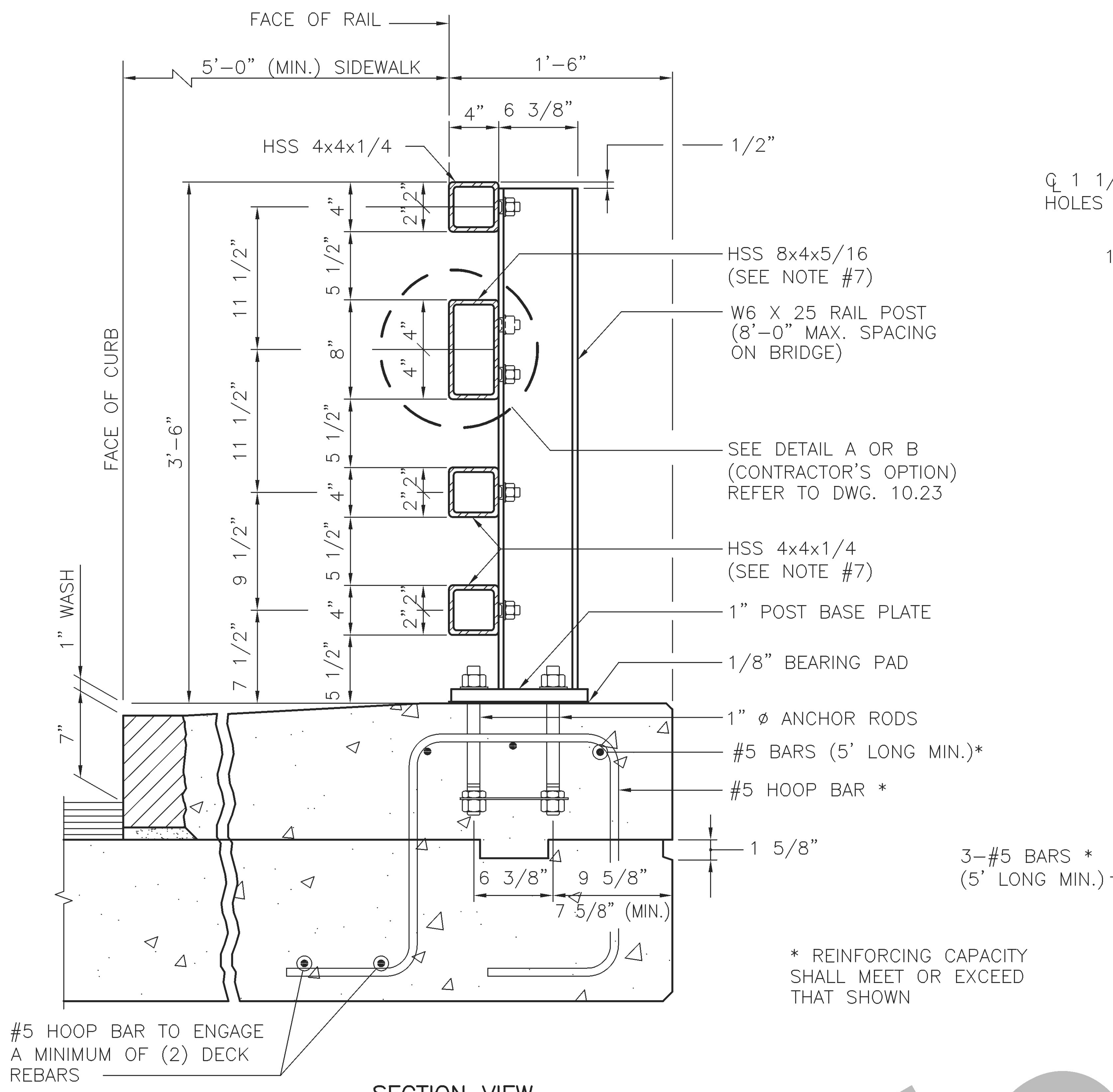
BRIDGE STANDARDS

BALDWIN FOUR BAR
ORNAMENTAL RAIL

DRAWING NUMBER: 10.21

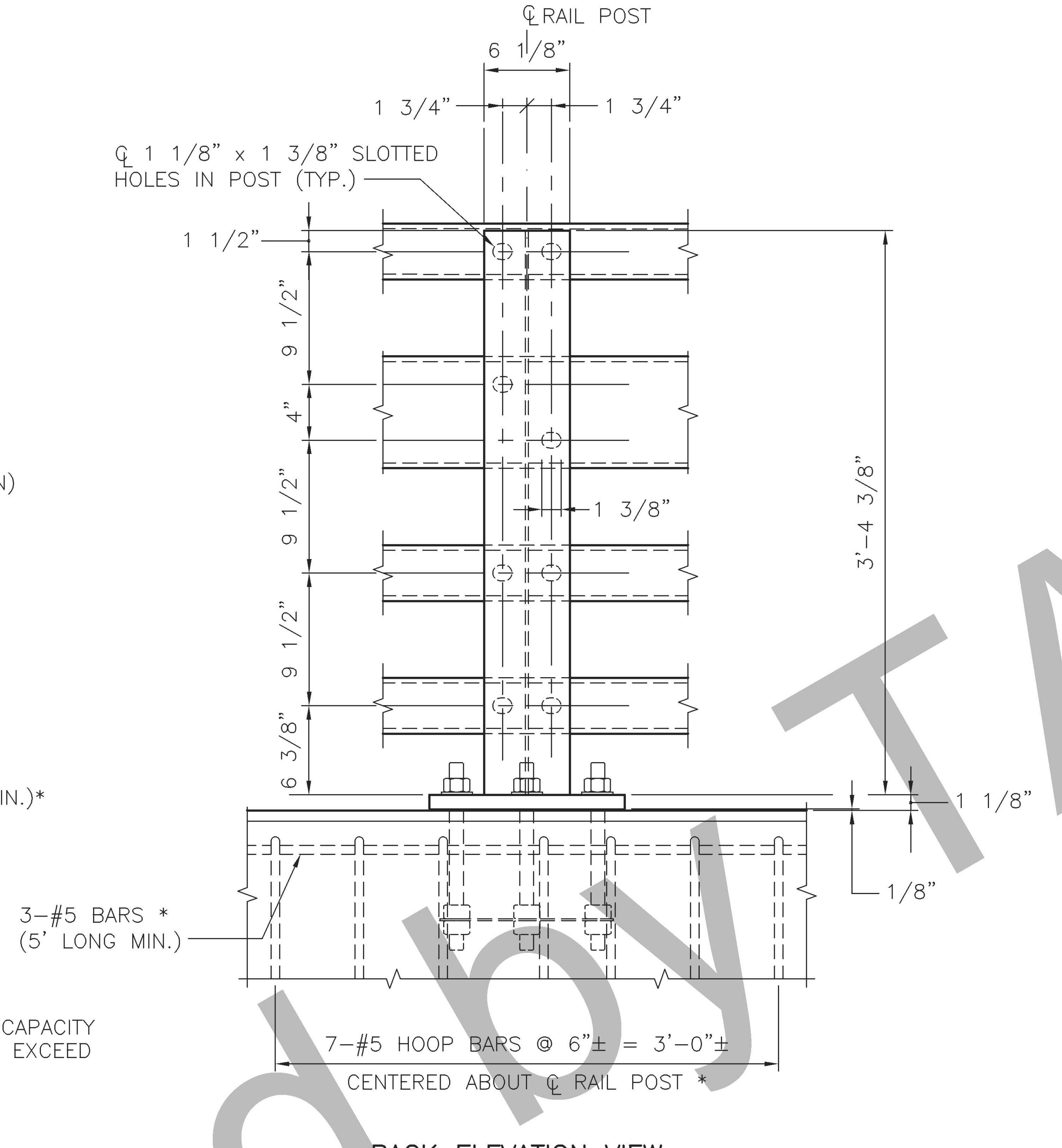
Superseded by TAC 0405

Superseded by TAC 0405



SECTION VIEW

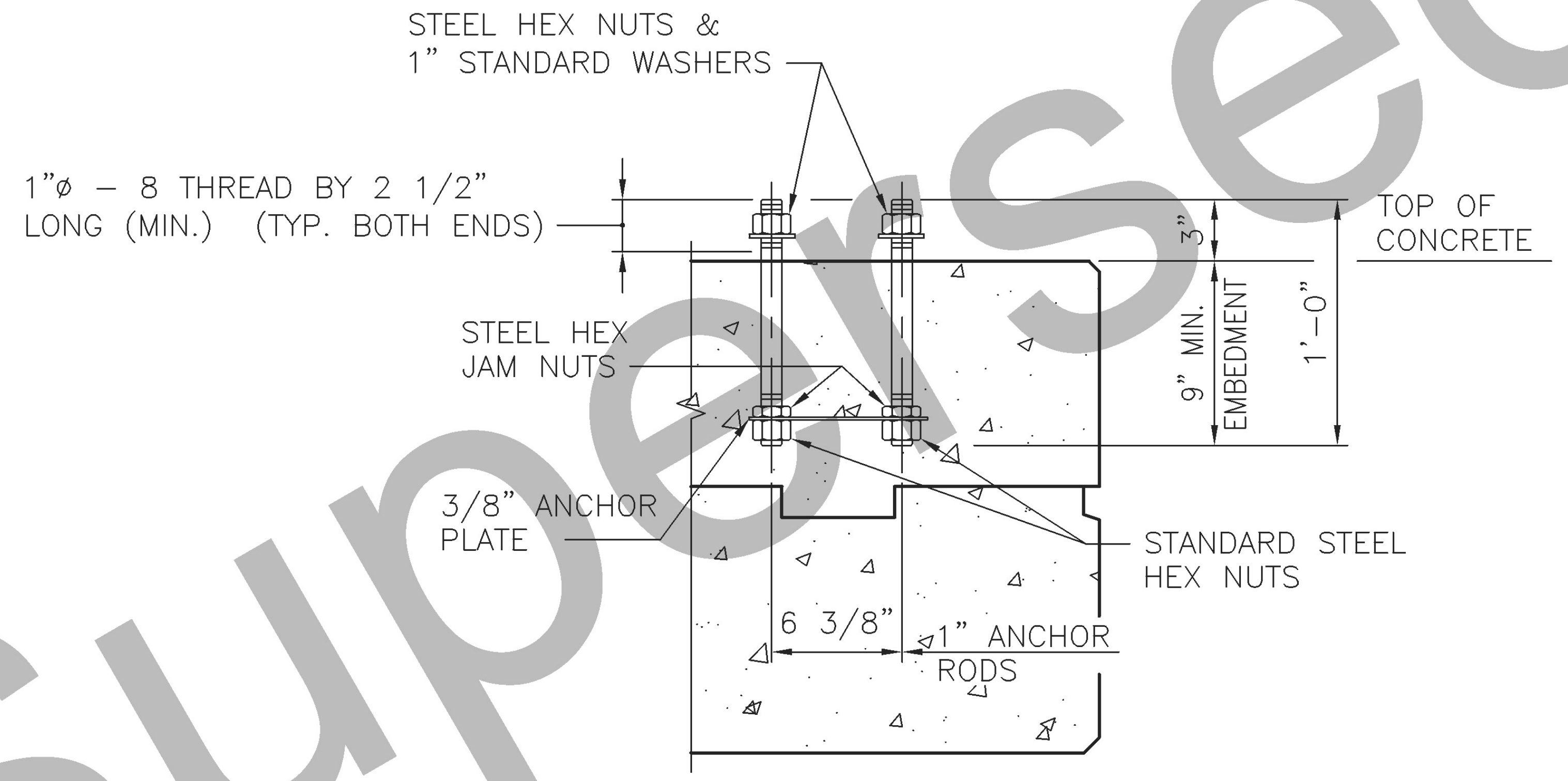
* REINFORCING CAPACITY SHALL MEET OR EXCEED THAT SHOWN



BACK ELEVATION VIEW

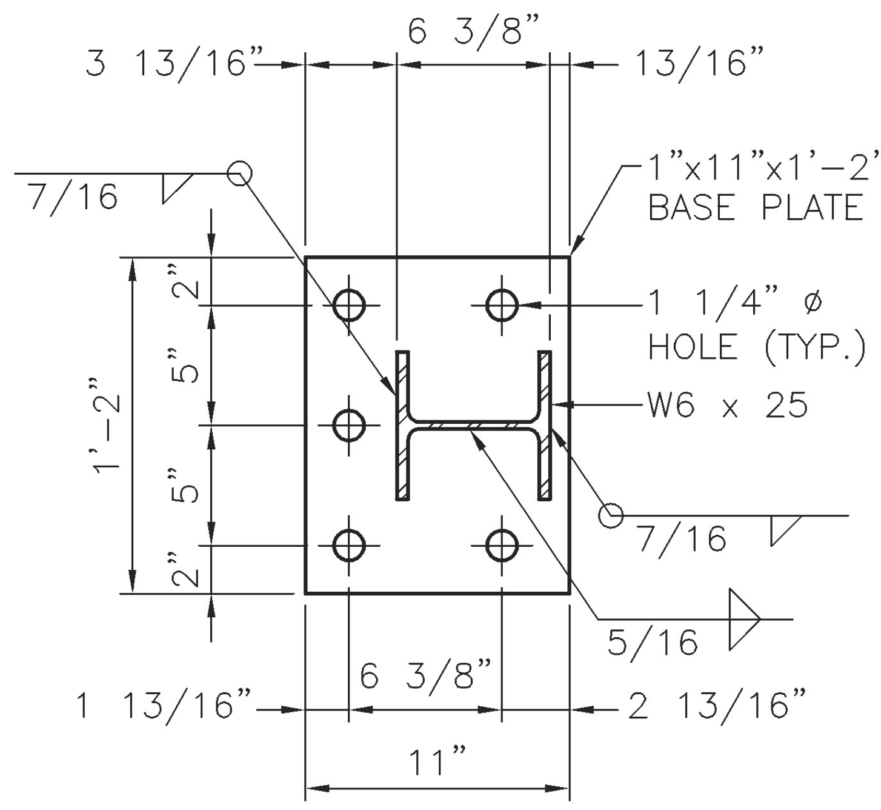
POST ASSEMBLY

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



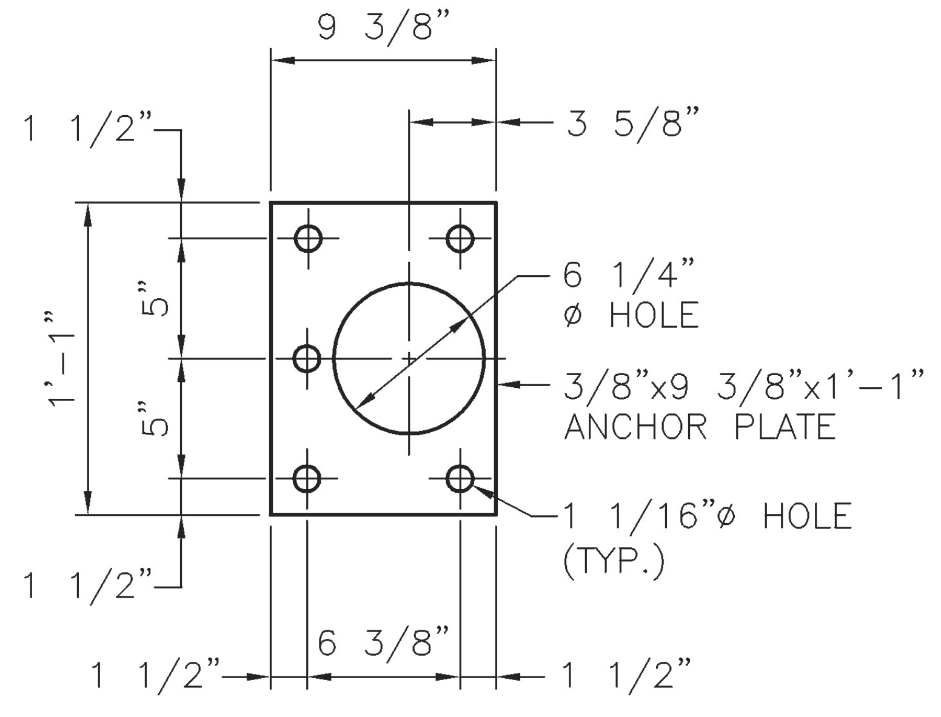
POST ANCHOR ASSEMBLY

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



POST BASE PLATE

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



ANCHOR PLATE

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

RAIL NOTES:

1. FOUR BAR (CRASH-TESTED) STEEL BRIDGE RAIL SHALL INCLUDE POSTS, BASE PLATES, ANCHOR RODS, PREFORMED PADS, RAIL ASSEMBLY BOLTS, NUTS, WASHERS, STUDS, STRUCTURAL TUBING, SPLICE BARS, PIPE SPACERS, RETRO REFLECTIVE DELINEATORS, ALL APPURTENANCES, METALIZING, AND PAINTING (IF SPECIFIED).

2. BRIDGE RAIL POSTS SHALL BE SET NORMAL (90 DEGREES) TO THE PROFILE GRADE, EXCEPT ON GRADES OVER 1.5% WHERE POSTS SHALL BE SET VERTICAL.

3. ENDS OF RAIL TUBE SECTIONS SHALL BE SAWED OR MILLED AND SHALL BE TRUE AND SMOOTH. ALL CUT EDGES OF ALL MATERIAL SHALL BE GROUND SMOOTH.

4. EACH PIECE OF RAIL TUBING SHALL BE ATTACHED TO A MINIMUM OF THREE (3) POSTS.

5. BOLT HOLES SHALL BE DRILLED OR PUNCHED. FLAME CUTTING MAY BE USED TO FINISH SLOTTED HOLES IF MECHANICALLY GUIDED.

6. AT INTERIOR SPLICES, PIPE SPACERS SHALL BE USED ON ONLY ONE SIDE OF THE SPLICE TO ALLOW MOVEMENT ON THAT SIDE. ALL 4 RAILS AT A SPLICE SHALL RECEIVE THE SAME TREATMENT. AT END SPLICES AND AT INTERIOR EXPANSION SPLICES PIPE SPACERS SHALL BE USED ON BOTH SIDES OF THE SPLICE TO ALLOW MOVEMENT ON BOTH SIDES.

7. MILL OR SHOP TRANSVERSE WELDS SHALL NOT BE PERMITTED ON ANY RAIL ELEMENT. RAIL ELEMENTS USED ON CURVES SHALL USE 3/8" WALL TUBES AND SHALL BE SHOP FORMED TO THE REQUIRED CURVATURE.

8. NO PUNCHING, DRILLING, CUTTING OR WELDING SHALL BE PERMITTED AFTER METALIZING, (EXCEPT FOR DETAIL "A"). DAMAGED AREAS OF METALIZING SHALL BE REPAIRED IN STRICT CONFORMANCE WITH THE MATERIAL SUPPLIER'S RECOMMENDATIONS AND SHALL BE APPROVED BY THE ENGINEER.

9. NUTS FOR 1"ø THREADED ANCHOR RODS CONNECTING THE BASE PLATE TO THE CONCRETE SHALL BE TIGHTENED TO A SNUG FIT AND GIVEN AN ADDITIONAL 1/8 TURN.

10 THREADS FOR ANCHOR RODS MAY BE ROLLED OR CUT. IF CUT THREADS ARE USED BOLT DIAMETER SHALL NOT BE LESS THAN NOMINAL DIAMETER. IF ROLLED THREADS ARE USED, ROD DIAMETER SHALL NOT BE LESS THAN ROOT DIAMETER OF THREADS.

MATERIAL NOTES:

11. STRUCTURAL TUBING SHALL CONFORM TO THE REQUIREMENTS OF ASTM A500, GRADE B, STRUCTURAL STEEL TUBING. RAIL TUBING SHALL MEET THE LONGITUDINAL CHARPY V-NOTCH REQUIREMENTS OF 15 LBS. AT 0°F FOR ASTM A500, GRADE B. THE TEST SAMPLES SHALL BE TAKEN AFTER FORMING THE TUBES. CHARPY V-NOTCH IS NOT REQUIRED FOR SPLICE TUBES.

12. RAIL POSTS AND BASE PLATES SHALL CONFORM TO THE REQUIREMENTS OF ASTM A572 GR. 50, EXCEPT ANCHOR PLATES MAY BE ASTM A36.

13. THREADED STUDS AND MATCHING NUTS FOR RAIL-TO-POST ATTACHMENT (DETAIL A) SHALL CONFORM TO ASTM A276 TYPE 304, STAINLESS STEEL, AND SHALL BE TORQUE TESTED PER AWS D1.5, 7.7.1. DETAIL B BOLTS SHALL BE ASTM A325 OR A449. ALL OTHER BOLTS AND NUTS SHALL CONFORM TO ASTM A307 AND ASTM 563 GRADE A RESPECTIVELY OR BETTER. ANCHOR RODS SHALL CONFORM TO ASTM A449 EXCEPT THAT ASTM A307 NUTS MAY BE USED ON THE BOTTOM OF ANCHOR ASSEMBLY. WASHERS SHALL BE HARDENED STEEL COMMERCIAL TYPE A PLAIN WIDE WASHERS AND SHALL MEET THE DIMENSIONAL REQUIREMENTS OF A.N.S.I. B18.22.

14. ALL STEEL COMPONENTS (EXCEPT STAINLESS) SHALL BE METALIZED AFTER FABRICATION IN CONFORMANCE WITH SECTION 827 "THERMAL SPRAYED ZINC COATING FOR NEW STRUCTURAL STEEL" OF THE RHODE ISLAND STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION. THE METALIZING SHALL HAVE A UNIFORM APPEARANCE, AND METALIZED MATERIAL SHALL BE PROPERLY STORED.

15. DETAIL "A" STUDS SHALL BE WELDED BEFORE TUBES ARE METALIZED.

16. PREFORMED BEARING PADS (1/8" THICK) SHALL CONFORM TO AASHTO M251.

DESIGNER NOTE:
PROVIDE PAINT COLOR FOR RAILING SYSTEM.

THIS BRIDGE RAIL SYSTEM WAS SUCCESSFULLY CRASH TESTED FOR AASHTO TL4 IN 1997 BY THE NEW ENGLAND TRANSPORTATION CONSORTIUM.

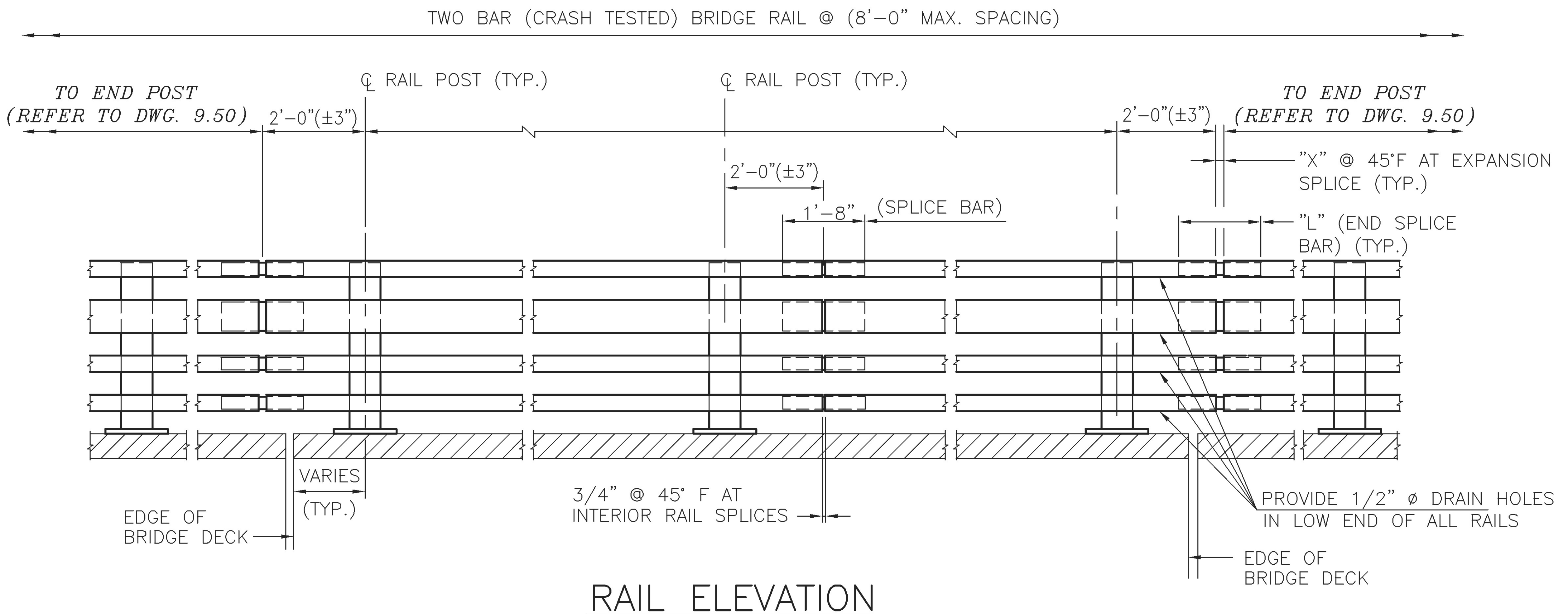
REVISIONS	
No.	DATE

RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

BRIDGE STANDARDS

FOUR BAR STEEL BRIDGE
RAIL (CRASH-TESTED TL-4)
SHEET 1

DRAWING NUMBER: 10.22

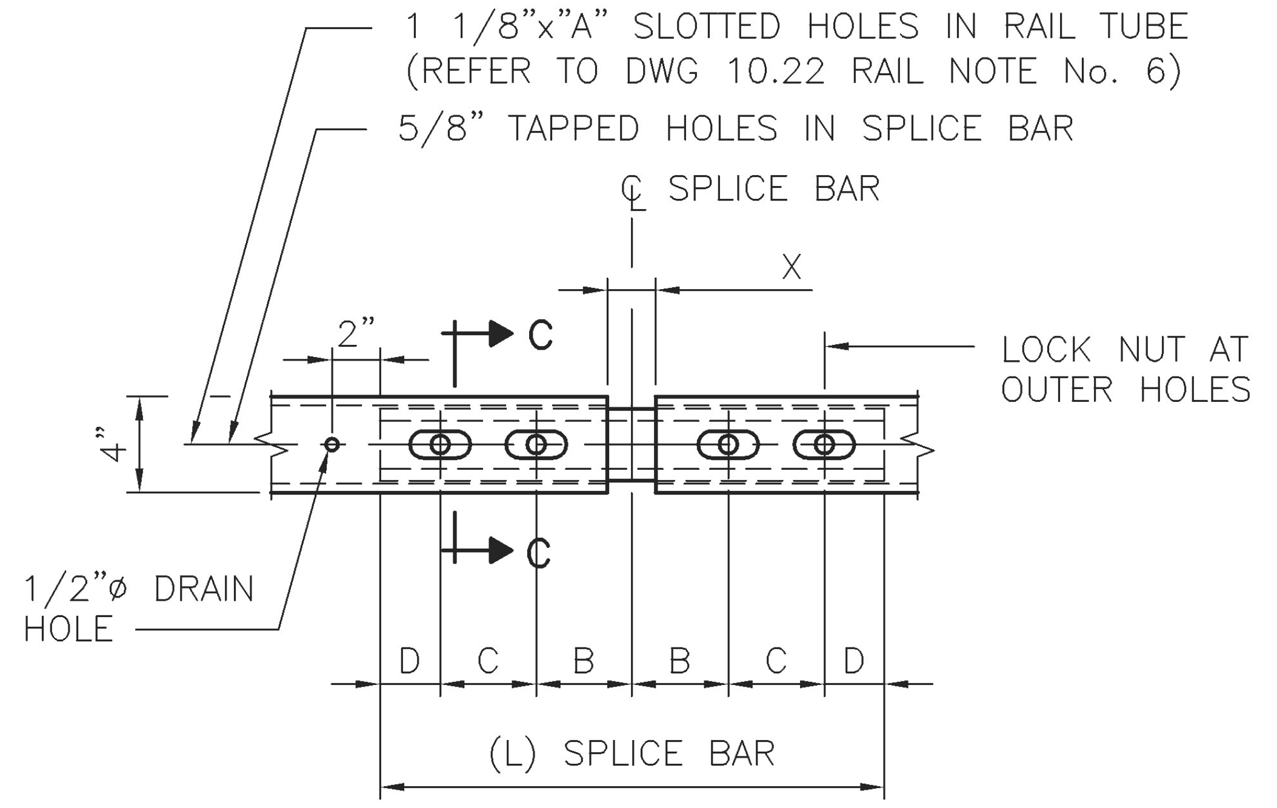

TWO BAR (CRASH TESTED) BRIDGE RAIL @ (8'–0" MAX. SPACING)
TO END POST (REFER TO DWG. 9.50)
2'–0"(±3")
℄ RAIL POST (TYP.)
℄ RAIL POST (TYP.)
2'–0"(±3")
TO END POST (REFER TO DWG. 9.50)
"X" @ 45°F AT EXPANSION SPLICE (TYP.)
2'–0"(±3")
1'–8" (SPLICE BAR)
"L" (END SPLICE BAR) (TYP.)
VARIES (TYP.)
EDGE OF BRIDGE DECK
3/4" @ 45° F AT INTERIOR RAIL SPLICES
PROVIDE 1/2" ø DRAIN HOLES IN LOW END OF ALL RAILS
EDGE OF BRIDGE DECK

RAIL ELEVATION

SCALE:1/2"=1'–0"

SPLICE BAR DIMENSION TABLE							
	T	A	B	C	D	X	L
	INTERIOR	2 1/2"	4"	4"	2"	3/4"	1'–8"
*	<3 1/4"	2 1/2"	4"	4"	2"	2"	1'–8"
*	3 1/4" TO 5 1/4"	3 1/2"	5"	5"	2 1/2"	3"	2'–1"

T = TOTAL MOVEMENT OF BRIDGE
* = END SPLICE BAR

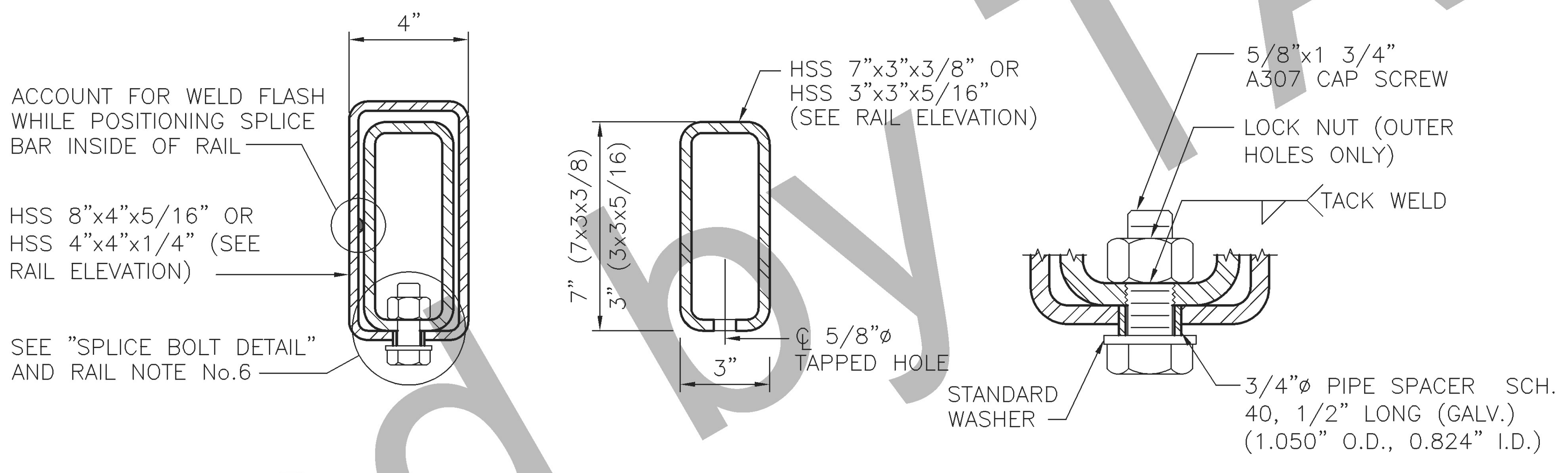

1 1/8"x"A" SLOTTED HOLES IN RAIL TUBE (REFER TO DWG 10.22 RAIL NOTE No. 6)
5/8" TAPPED HOLES IN SPLICE BAR
℄ SPLICE BAR
X
2"
C
C
LOCK NUT AT OUTER HOLES
4"
1/2"ø DRAIN HOLE
D
C
B
B
C
D
(L) SPLICE BAR

SEE SPLICE BAR DIMENSION TABLE THIS SHEET

(BOTTOM VIEW)

RAIL SPLICE

SCALE: 1 1/2"=1'–0"


4"
ACCOUNT FOR WELD FLASH WHILE POSITIONING SPLICE BAR INSIDE OF RAIL
HSS 8"x4"x5/16" OR HSS 4"x4"x1/4" (SEE RAIL ELEVATION)
SEE "SPLICE BOLT DETAIL" AND RAIL NOTE No.6
HSS 7"x3"x3/8" OR HSS 3"x3"x5/16" (SEE RAIL ELEVATION)
7" (7x3x3/8)
3" (3x3x5/16)
3"
℄ 5/8"ø TAPPED HOLE
5/8"x1 3/4" A307 CAP SCREW
LOCK NUT (OUTER HOLES ONLY)
TACK WELD
STANDARD WASHER
3/4"ø PIPE SPACER SCH. 40, 1/2" LONG (GALV.) (1.050" O.D., 0.824" I.D.)

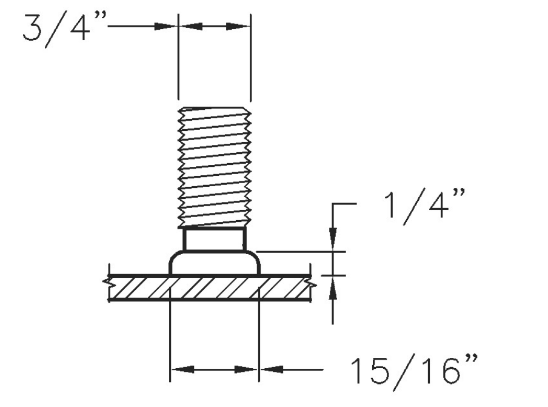
SECTION C–C

SPLICE BAR SECTION

SPLICE BOLT DETAIL

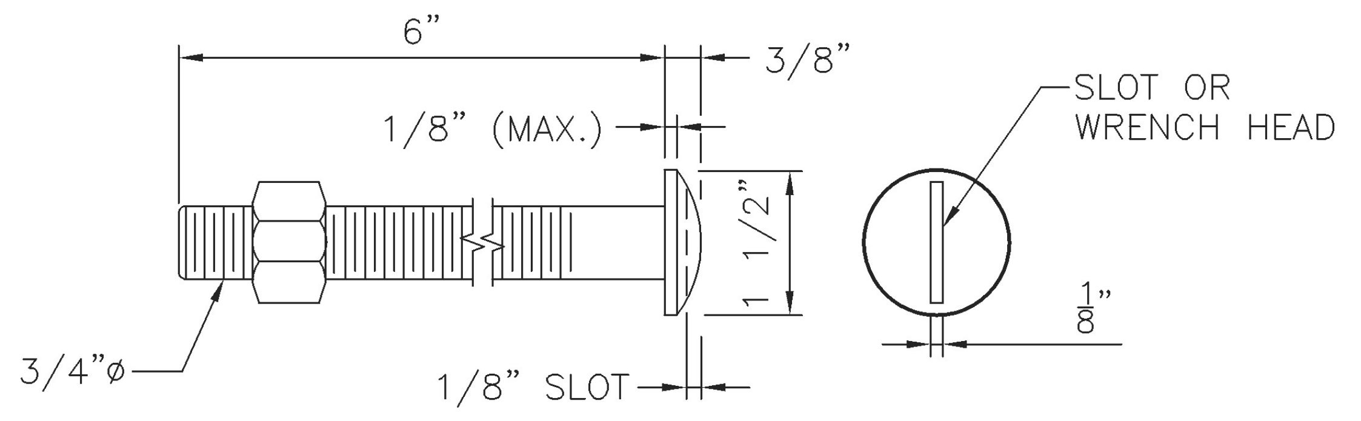
RAIL SPLICE DETAILS

SCALE: 3"=1'–0"



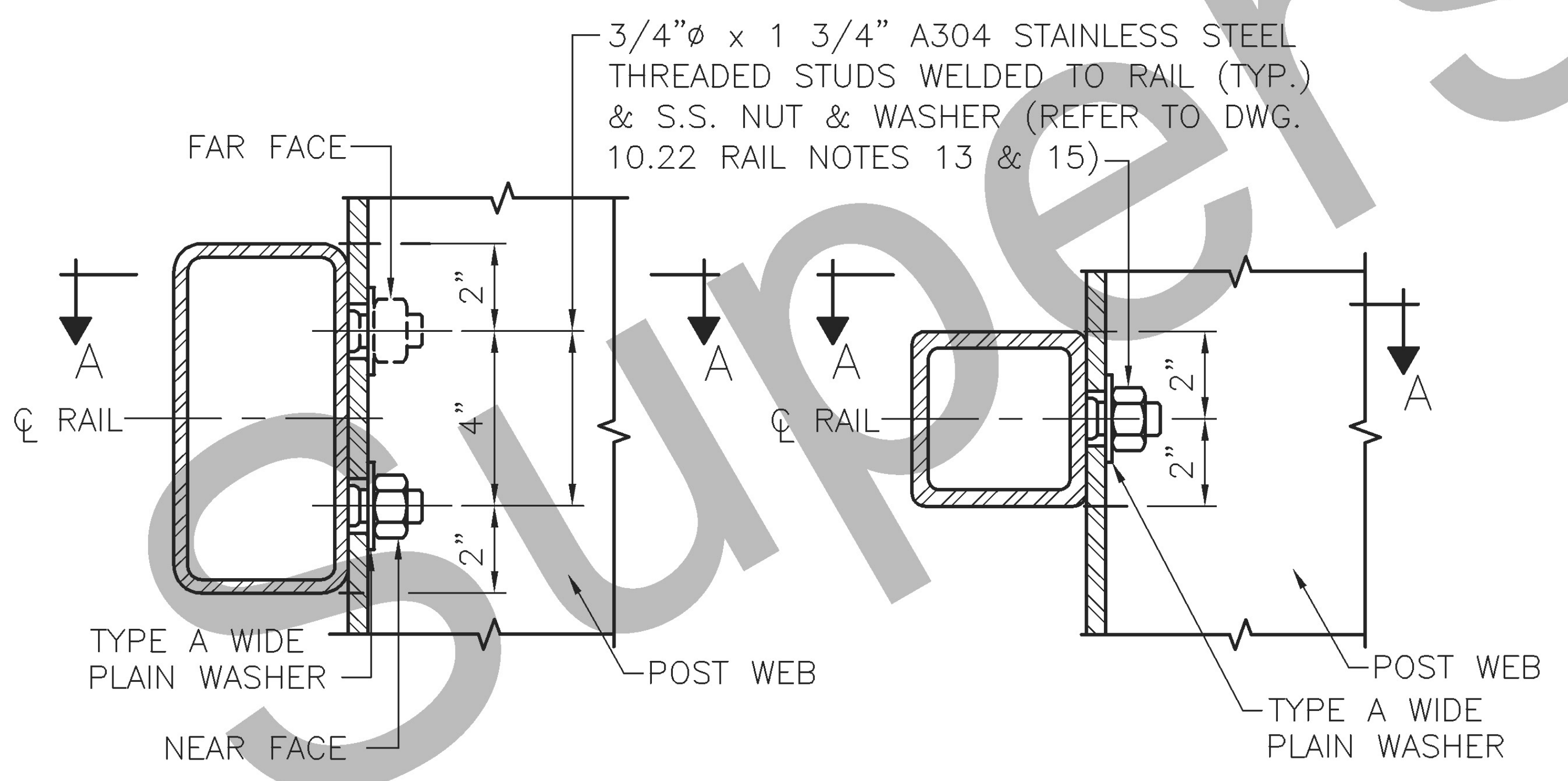
STUD WELD DETAIL

NOT TO SCALE



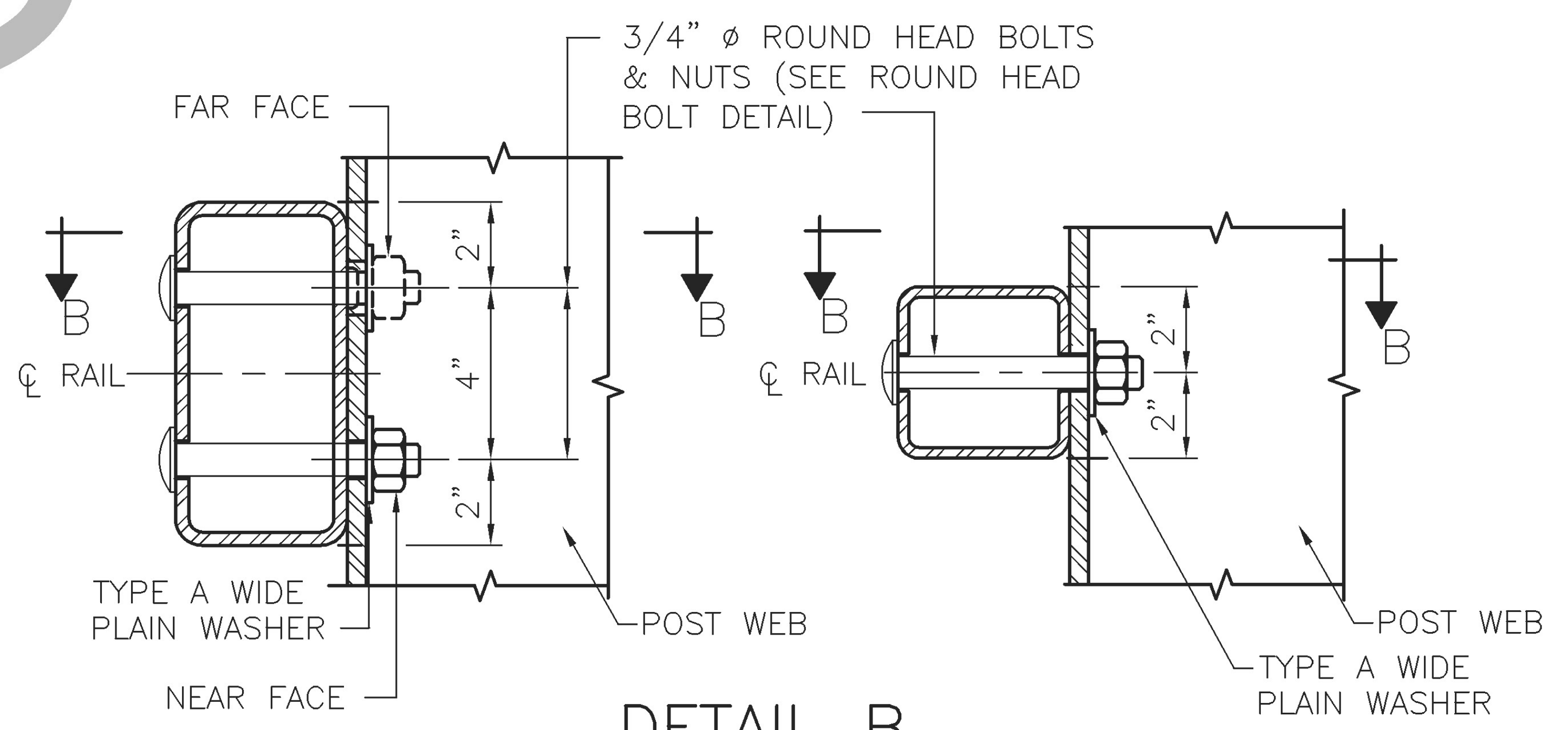
ROUND HEAD BOLT DETAIL

NOT TO SCALE


3/4"ø x 1 3/4" A304 STAINLESS STEEL THREADED STUDS WELDED TO RAIL (TYP.) & S.S. NUT & WASHER (REFER TO DWG. 10.22 RAIL NOTES 13 & 15)
FAR FACE
A
A
A
A
℄ RAIL
℄ RAIL
2"
4"
2"
2"
2"
TYPE A WIDE PLAIN WASHER
POST WEB
NEAR FACE
POST WEB
TYPE A WIDE PLAIN WASHER

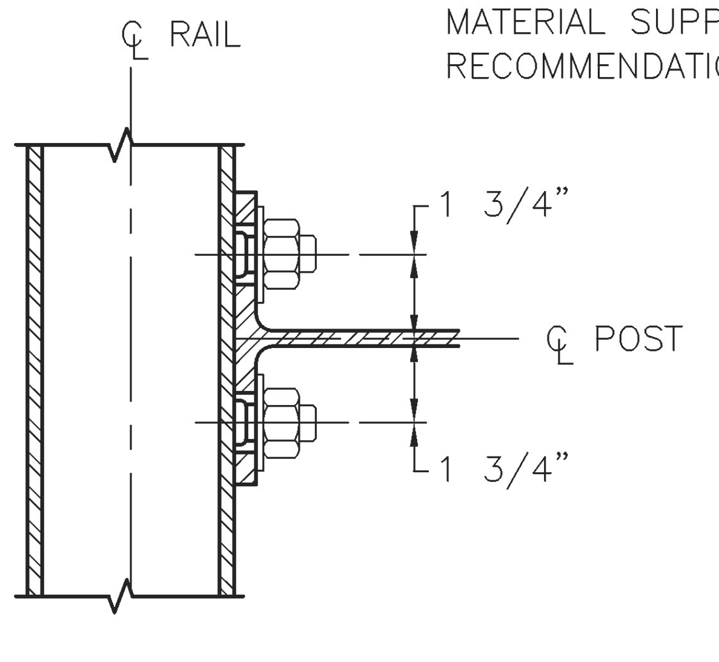
DETAIL A

SCALE: 3"=1'–0"



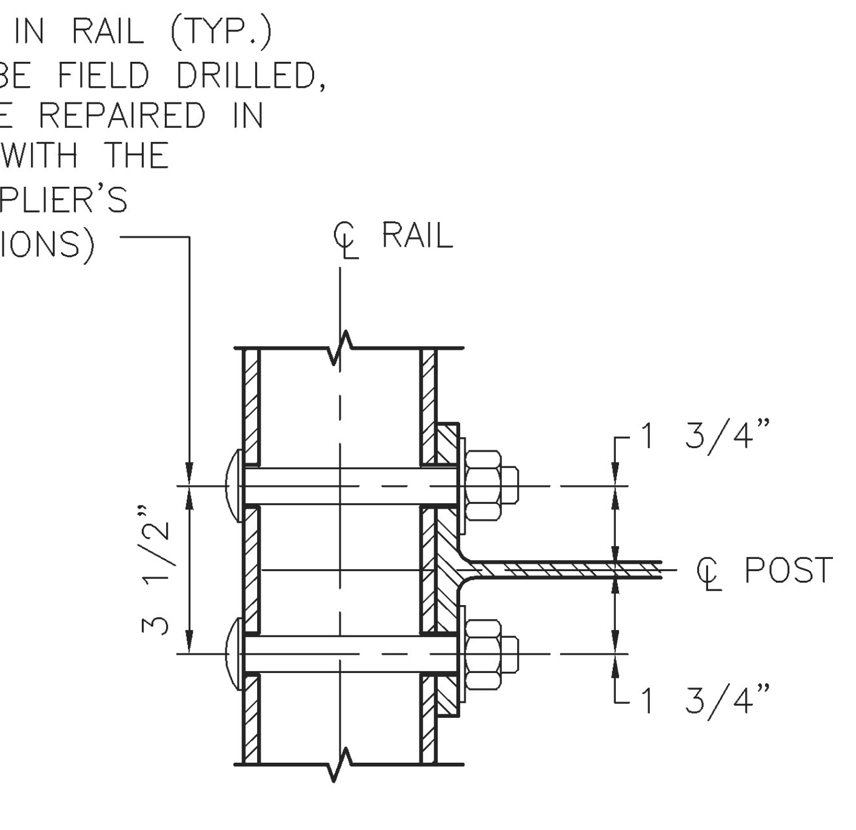
DETAIL B

SCALE: 3"=1'–0"



SECTION A–A

SCALE: 3"=1'–0"


7/8" ø HOLE IN RAIL (TYP.) (HOLES MAY BE FIELD DRILLED, AND SHALL BE REPAIRED IN ACCORDANCE WITH THE MATERIAL SUPPLIER'S RECOMMENDATIONS)
℄ RAIL
1 3/4"
3 1/2"
℄ POST
1 3/4"

SECTION B–B

SCALE: 3"=1'–0"

REVISIONS	
No.	DATE

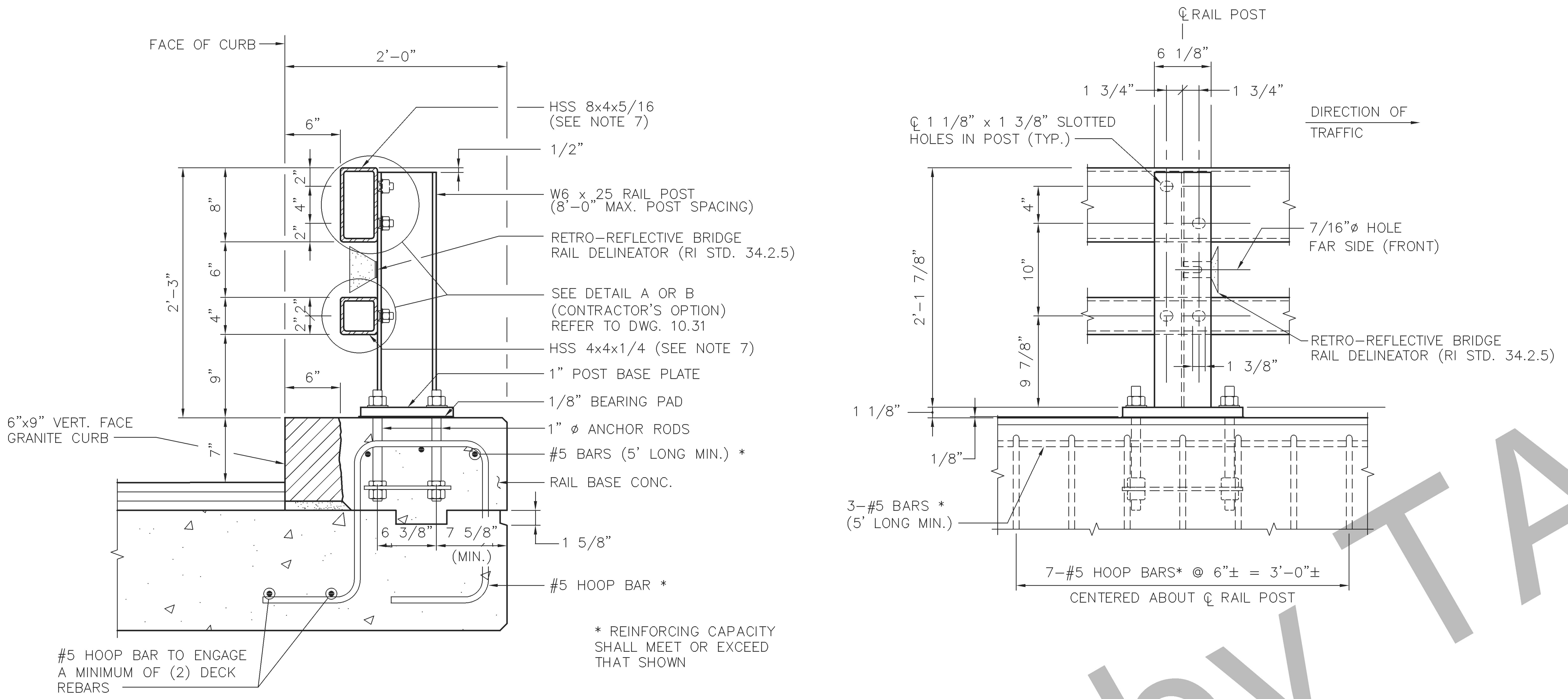
RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

BRIDGE STANDARDS

FOUR BAR STEEL BRIDGE RAIL (CRASH–TESTED TL–4) SHEET 2

DRAWING NUMBER: 10.23

Superseded by TAC 0405



SECTION VIEW

BACK ELEVATION VIEW

POST ASSEMBLY

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

RAIL NOTES:

1. TWO BAR (CRASH-TESTED) STEEL BRIDGE RAIL, SHALL INCLUDE POSTS, BASE PLATES, ANCHOR RODS, PREFORMED PADS, RAIL ASSEMBLY BOLTS, NUTS, WASHERS, STUDS, STRUCTURAL TUBING, SPLICE BARS, PIPE SPACERS, RETRO REFLECTIVE DELINEATORS, ALL APPURTENANCES, METALIZING, AND PAINTING (IF SPECIFIED).

2. BRIDGE RAIL POSTS SHALL BE SET NORMAL (90 DEGREES) TO THE PROFILE GRADE, EXCEPT ON GRADES OVER 1.5% WHERE POSTS SHALL BE SET VERTICAL.

3. ENDS OF RAIL TUBE SECTIONS SHALL BE SAWED OR MILLED AND SHALL BE TRUE AND SMOOTH. ALL CUT EDGES OF ALL MATERIAL SHALL BE GROUND SMOOTH.

4. EACH PIECE OF RAIL TUBING SHALL BE ATTACHED TO A MINIMUM OF THREE (3) POSTS.

5. BOLT HOLES SHALL BE DRILLED OR PUNCHED. FLAME CUTTING MAY BE USED TO FINISH SLOTTED HOLES IF MECHANICALLY GUIDED.

6. AT INTERIOR SPLICES, PIPE SPACERS SHALL BE USED ON ONLY ONE SIDE OF THE SPLICE TO ALLOW MOVEMENT ON THAT SIDE. BOTH RAILS AT A SPLICE SHALL RECEIVE THE SAME TREATMENT. AT INTERIOR EXPANSION JOINTS AND AT ALL END SPLICES, THE SLOTTED HOLES AND PIPE SPACERS SHALL BE USED ON BOTH SIDES OF THE SPLICE TO ALLOW MOVEMENT ON EACH SIDE.

7. MILL OR SHOP TRANSVERSE WELDS SHALL NOT BE PERMITTED ON ANY RAIL ELEMENT. RAIL ELEMENTS USED ON CURVES SHALL USE 3/8" WALL TUBES AND SHALL BE SHOP FORMED TO THE REQUIRED CURVATURE.

8. NO PUNCHING, DRILLING, CUTTING OR WELDING SHALL BE PERMITTED AFTER METALIZING, (EXCEPT FOR DETAIL "A"). DAMAGED AREAS OF METALIZING SHALL BE REPAIRED IN STRICT CONFORMANCE WITH THE MATERIAL SUPPLIER'S RECOMMENDATIONS AND SHALL BE APPROVED BY THE ENGINEER.

9. NUTS FOR 1"ø THREADED ANCHOR RODS CONNECTING THE BASE PLATE TO THE CONCRETE SHALL BE TIGHTENED TO A SNUG FIT AND GIVEN AN ADDITIONAL 1/8 TURN.

10. THREADS FOR ANCHOR RODS MAY BE ROLLED OR CUT. IF CUT THREADS ARE USED, BOLT DIAMETER SHALL NOT BE LESS THAN NOMINAL DIAMETER. IF ROLLED THREADS ARE USED, ROD DIAMETER SHALL NOT BE LESS THAN ROOT DIAMETER OF THREADS.

11. THE RAIL POST, BASE PLATE AND ANCHOR CAGE MUST BE INSTALLED PRECISELY TO THE LOCATION DIMENSIONED ON THESE PLANS. THE POSITION OF THE (3)-#5 LONGITUDINAL REBARS MAY BE ADJUSTED TO ACCOMMODATE THE ANCHOR CAGE, BUT MUST NOT BE CUT.

MATERIAL NOTES:

12. STRUCTURAL TUBING SHALL CONFORM TO THE REQUIREMENTS OF ASTM A500, GRADE B, STRUCTURAL STEEL TUBING. RAIL TUBING SHALL MEET THE LONGITUDINAL CHARPY V-NOTCH REQUIREMENTS OF 15 LBS. AT 0°F FOR ASTM A500, GRADE B. THE TEST SAMPLES SHALL BE TAKEN AFTER FORMING THE TUBES. CHARPY V-NOTCH IS NOT REQUIRED FOR SPLICE TUBES.

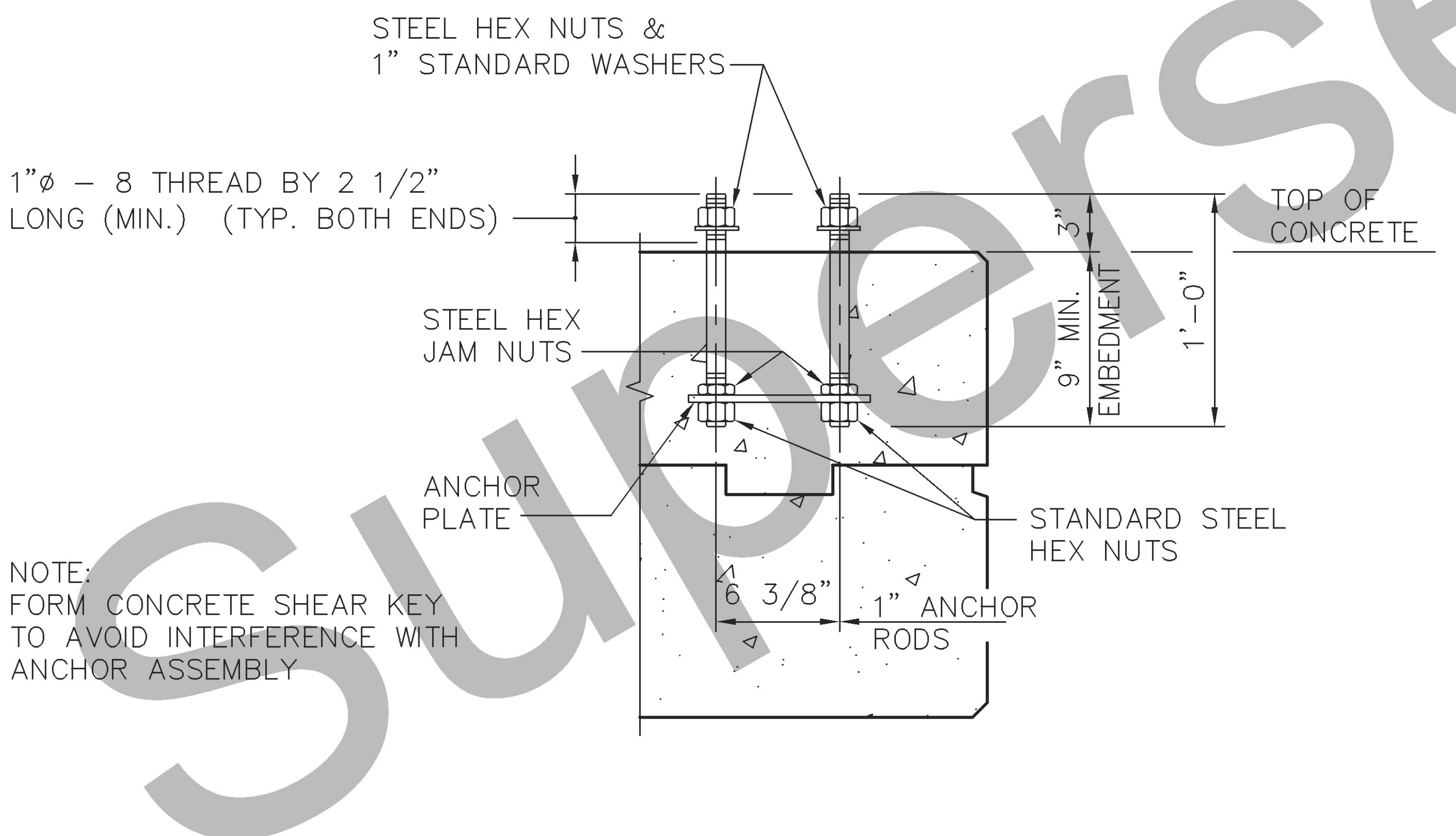
13. RAIL POSTS AND BASE PLATES SHALL CONFORM TO THE REQUIREMENTS OF ASTM A572 GR. 50, EXCEPT ANCHOR PLATES MAY BE ASTM A36.

14. THREADED STUDS AND MATCHING NUTS FOR RAIL-TO-POST ATTACHMENT (DETAIL A) SHALL CONFORM TO ASTM A276 TYPE 304, STAINLESS STEEL, AND SHALL BE TORQUE TESTED PER AWS D1.5, 7.7.1. DETAIL B BOLTS SHALL BE ASTM A325 OR A449. ALL OTHER BOLTS AND NUTS SHALL CONFORM TO ASTM A307 AND ASTM 563 GRADE A RESPECTIVELY OR BETTER. ANCHOR RODS SHALL CONFORM TO ASTM A449 EXCEPT THAT ASTM A307 NUTS MAY BE USED ON THE BOTTOM OF ANCHOR ASSEMBLY. WASHERS SHALL BE HARDENED STEEL COMMERCIAL TYPE A PLAIN WIDE WASHERS AND SHALL MEET THE DIMENSIONAL REQUIREMENTS OF A.N.S.I. B18.22.

15. ALL STEEL COMPONENTS (EXCEPT STAINLESS) SHALL BE METALIZED AFTER FABRICATION IN CONFORMANCE WITH SECTION 827 "THERMAL SPRAYED ZINC COATING FOR NEW STRUCTURAL STEEL" OF THE RHODE ISLAND STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION. THE METALIZING SHALL HAVE A UNIFORM APPEARANCE, AND METALIZED MATERIAL SHALL BE PROPERLY STORED.

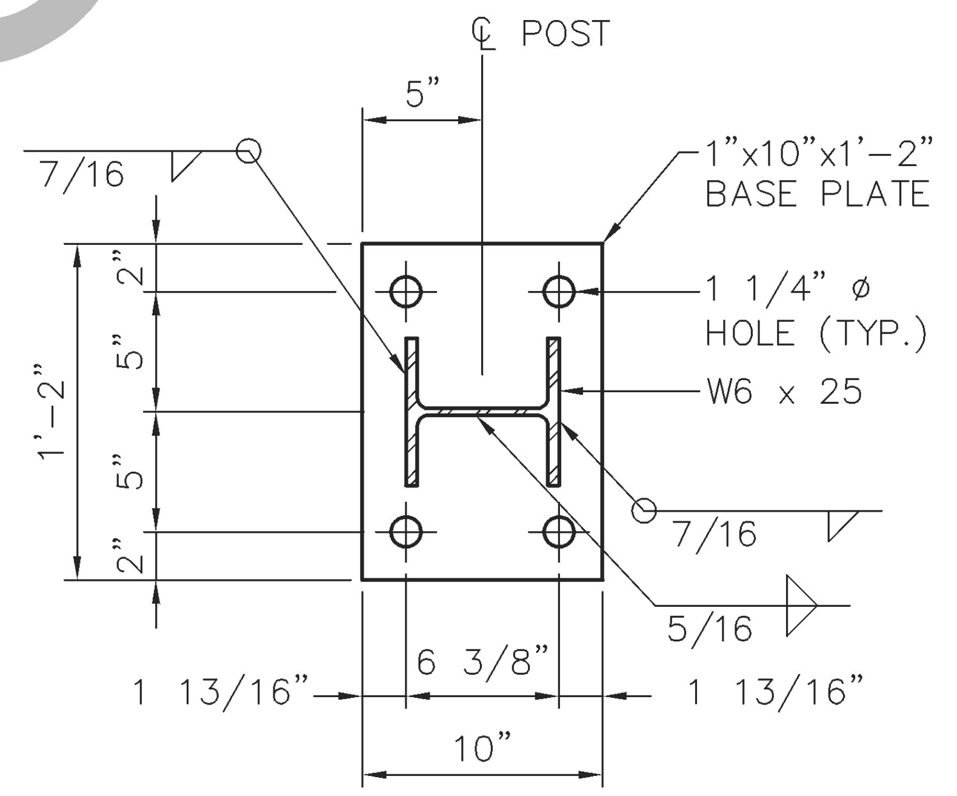
16. DETAIL "A" STUDS SHALL BE WELDED BEFORE TUBES ARE METALIZED.

17. PREFORMED BEARING PADS (1/8" THICK) SHALL CONFORM TO AASHTO M251.



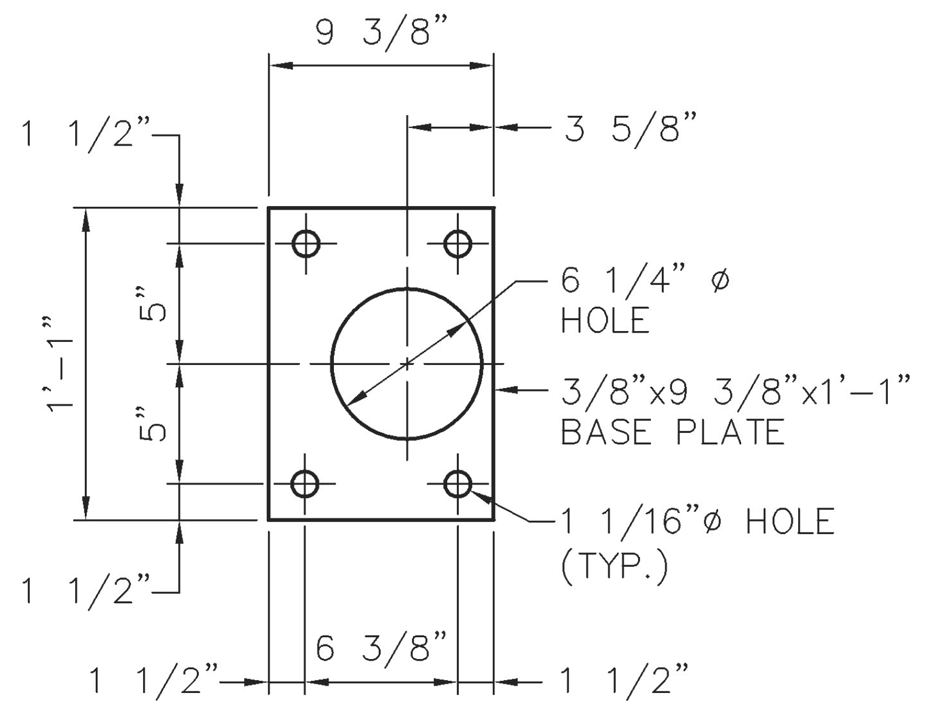
POST ANCHOR ASSEMBLY

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



POST BASE PLATE

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



ANCHOR PLATE

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

DESIGNER NOTE:
PROVIDE PAINT COLOR FOR RAILING SYSTEM.

THIS BRIDGE RAIL SYSTEM WAS SUCCESSFULLY CRASH TESTED FOR AASHTO TL4 IN 1994 BY THE NEW ENGLAND TRANSPORTATION CONSORTIUM.

REVISIONS	
No.	DATE

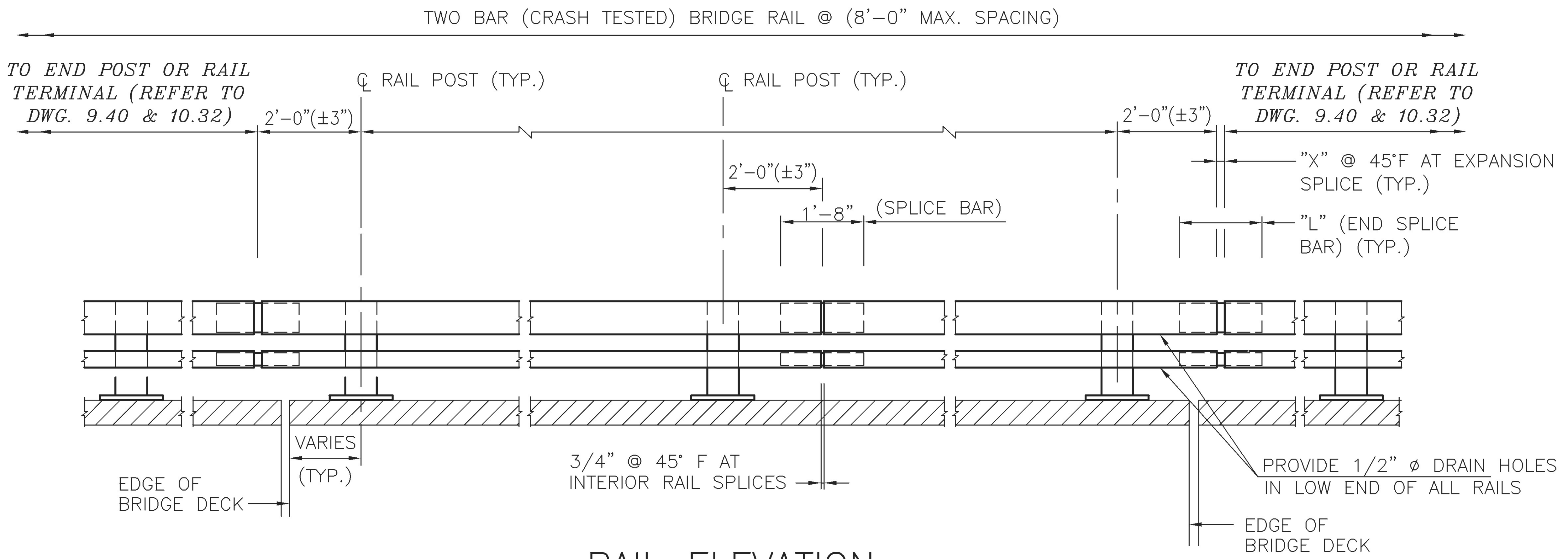
RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

BRIDGE STANDARDS

TWO BAR STEEL BRIDGE
RAIL (CRASH-TESTED TL-4)
SHEET 1

DRAWING NUMBER: 10.30

Superseded by TAC 0405

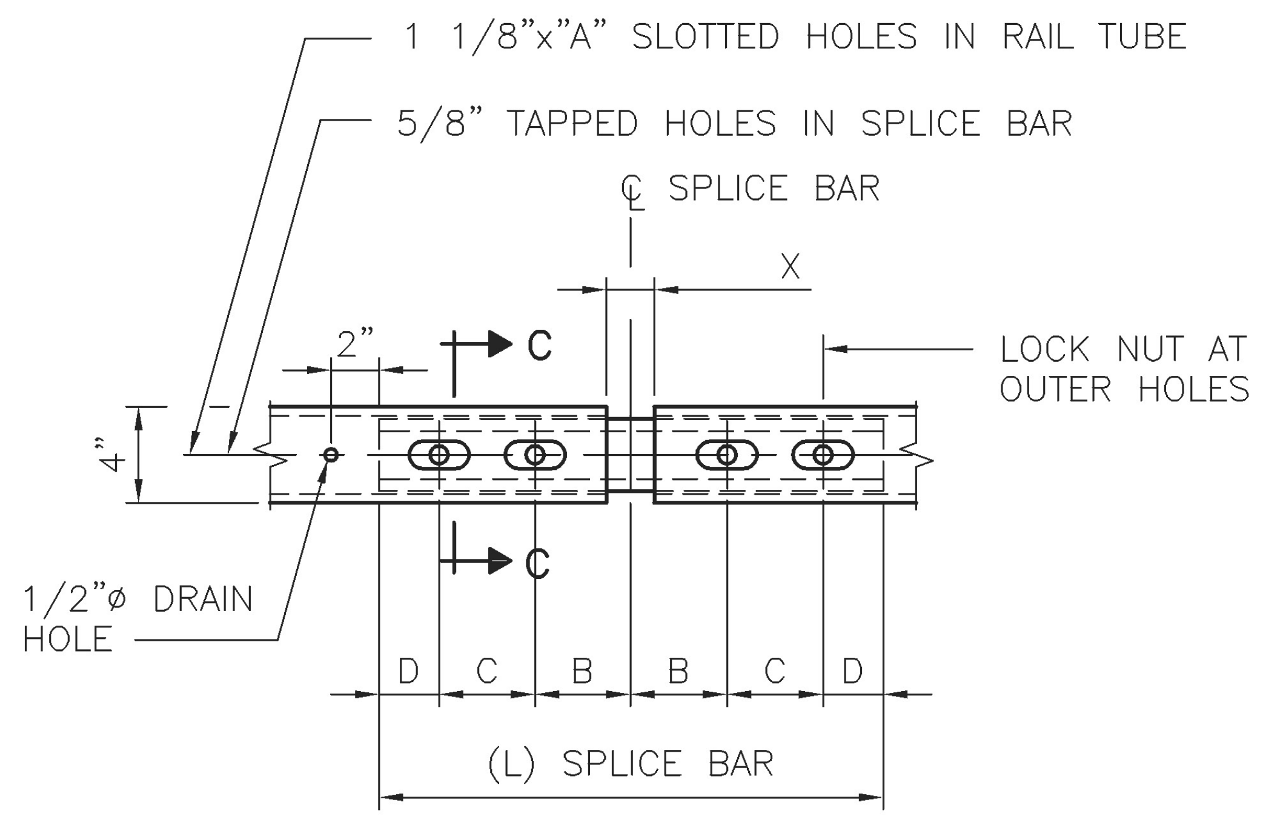

TWO BAR (CRASH TESTED) BRIDGE RAIL @ (8'-0" MAX. SPACING)
TO END POST OR RAIL TERMINAL (REFER TO DWG. 9.40 & 10.32)
℄ RAIL POST (TYP.)
℄ RAIL POST (TYP.)
TO END POST OR RAIL TERMINAL (REFER TO DWG. 9.40 & 10.32)
2'-0"(±3")
2'-0"(±3")
2'-0"(±3")
"X" @ 45°F AT EXPANSION SPLICE (TYP.)
1'-8" (SPLICE BAR)
"L" (END SPLICE BAR) (TYP.)
VARIES (TYP.)
EDGE OF BRIDGE DECK
3/4" @ 45° F AT INTERIOR RAIL SPLICES
PROVIDE 1/2" ø DRAIN HOLES IN LOW END OF ALL RAILS
EDGE OF BRIDGE DECK

RAIL ELEVATION

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

SPLICE BAR DIMENSION TABLE							
	T	A	B	C	D	X	L
	INTERIOR	2 1/2"	4"	4"	2"	3/4"	1'-8"
*	<3 1/4"	2 1/2"	4"	4"	2"	2"	1'-8"
*	3 1/4" TO 5 1/4"	3 1/2"	5"	5"	2 1/2"	3"	2'-1"

T = TOTAL MOVEMENT OF BRIDGE
* = END SPLICE BAR

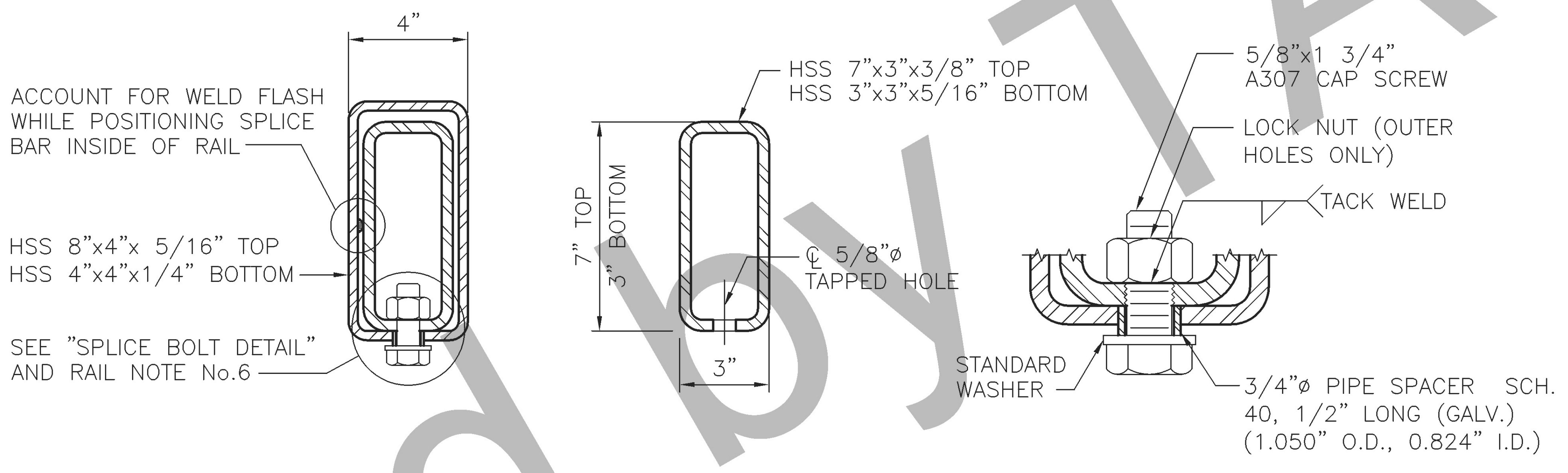


SEE SPLICE BAR DIMENSION TABLE THIS SHEET

(BOTTOM VIEW)

RAIL SPLICE

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


4"
ACCOUNT FOR WELD FLASH WHILE POSITIONING SPLICE BAR INSIDE OF RAIL
HSS 8"x4"x 5/16" TOP
HSS 4"x4"x1/4" BOTTOM
SEE "SPLICE BOLT DETAIL" AND RAIL NOTE No.6
HSS 7"x3"x3/8" TOP
HSS 3"x3"x5/16" BOTTOM
7" TOP
3" BOTTOM
℄ 5/8"ø TAPPED HOLE
3"
5/8"x1 3/4" A307 CAP SCREW
LOCK NUT (OUTER HOLES ONLY)
TACK WELD
STANDARD WASHER
3/4"ø PIPE SPACER SCH. 40, 1/2" LONG (GALV.) (1.050" O.D., 0.824" I.D.)

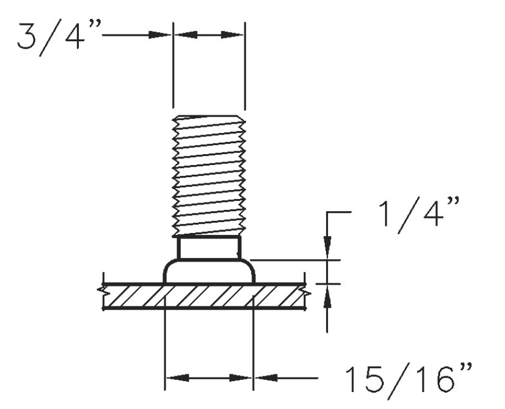
SECTION C-C

SPLICE BAR SECTION

SPLICE BOLT DETAIL

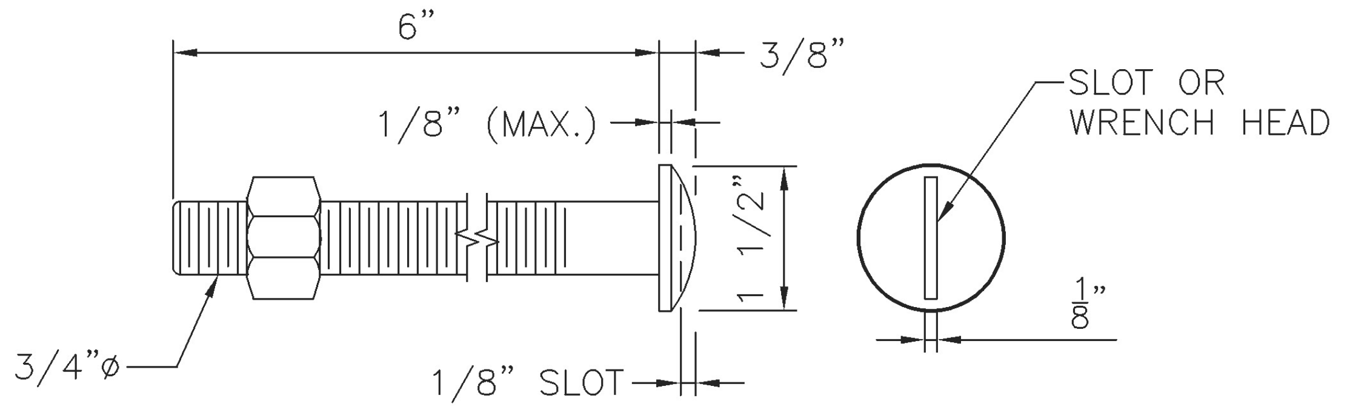
RAIL SPLICE DETAILS

SCALE: 3"=1'-0"



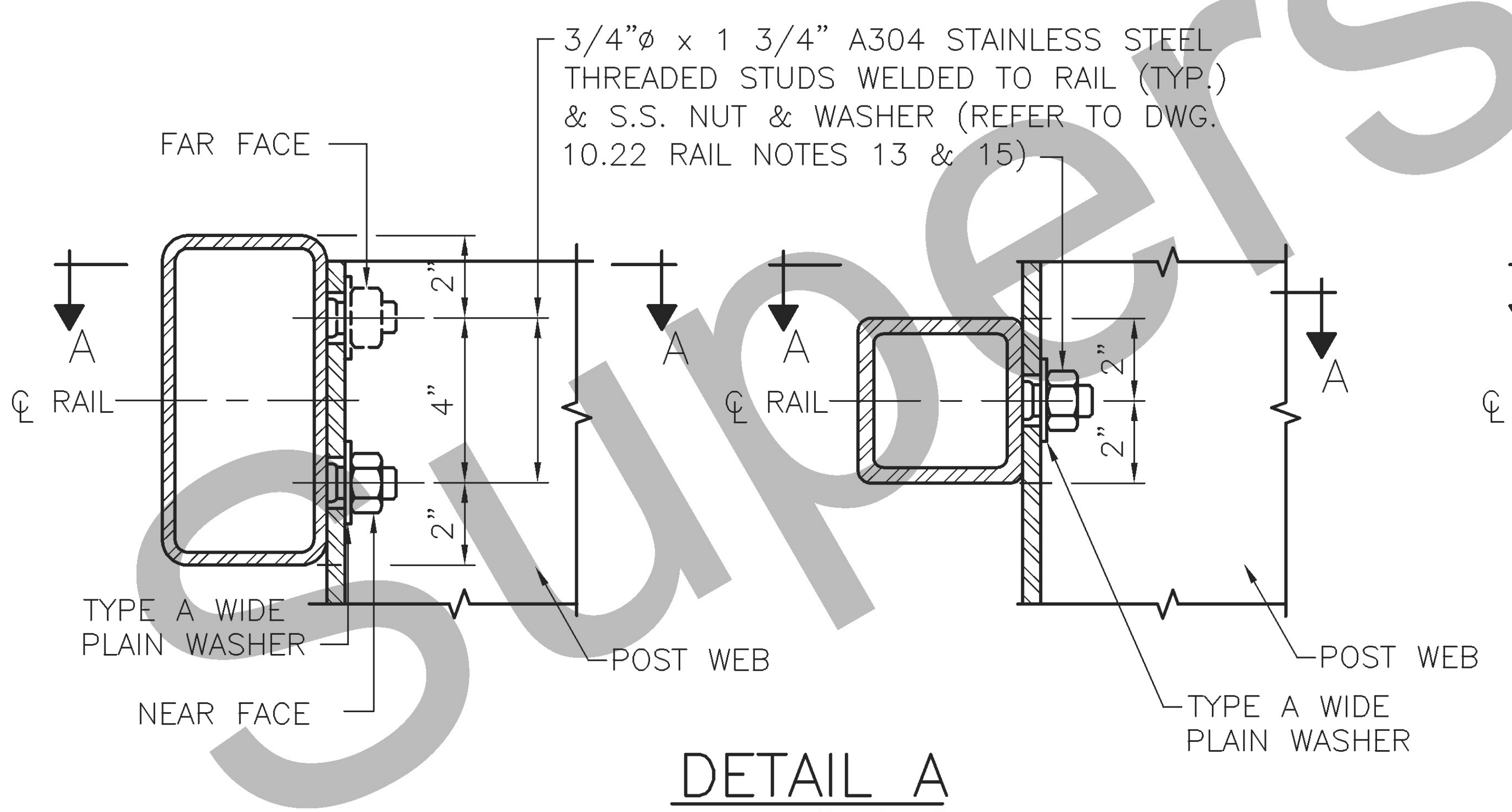
STUD WELD DETAIL

NOT TO SCALE



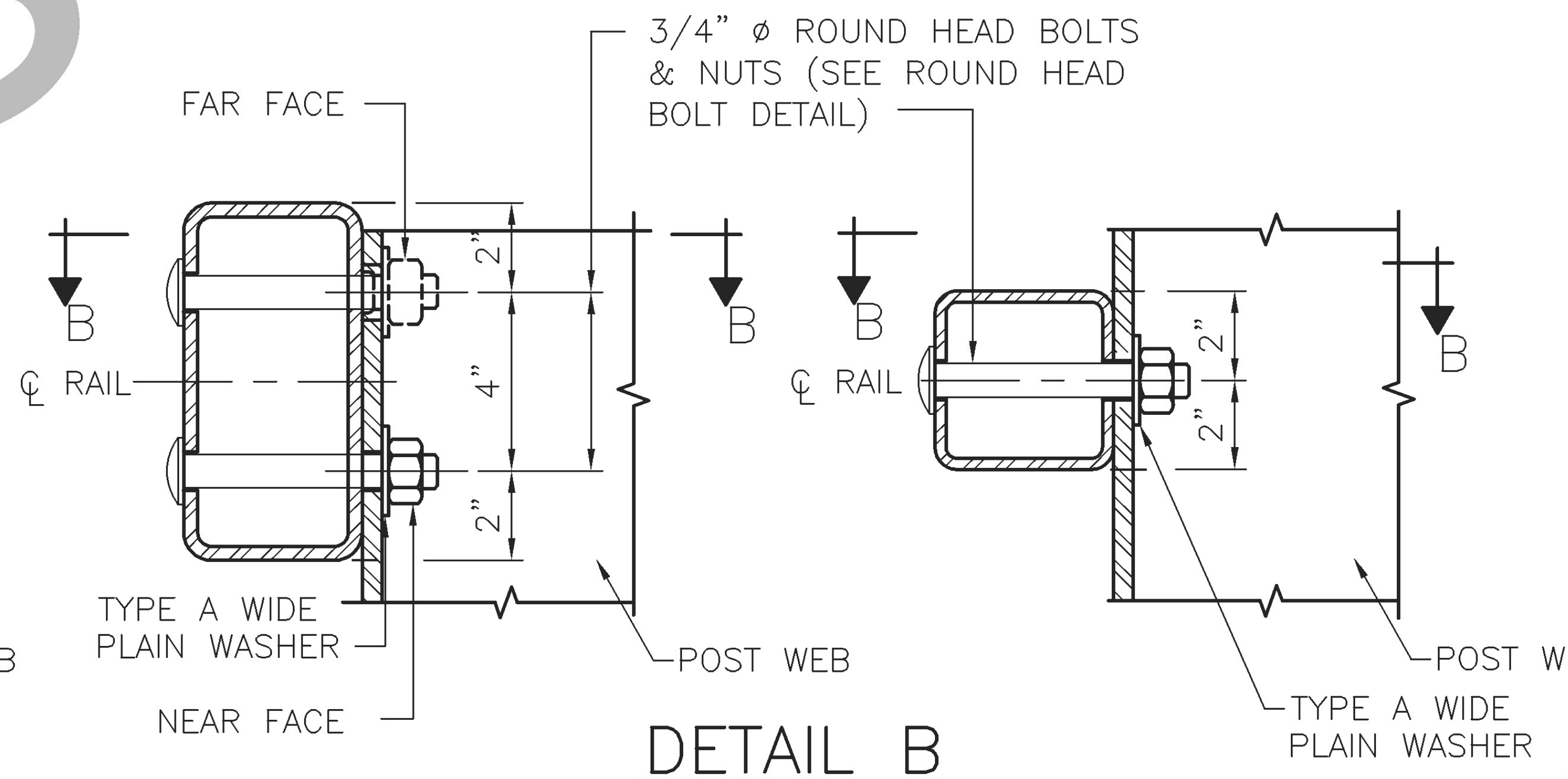
ROUND HEAD BOLT DETAIL

NOT TO SCALE


3/4"ø x 1 3/4" A304 STAINLESS STEEL THREADED STUDS WELDED TO RAIL (TYP.) & S.S. NUT & WASHER (REFER TO DWG. 10.22 RAIL NOTES 13 & 15)
FAR FACE
A
A
A
A
A
℄ RAIL
℄ RAIL
2"
4"
2"
2"
2"
TYPE A WIDE PLAIN WASHER
NEAR FACE
POST WEB
POST WEB
TYPE A WIDE PLAIN WASHER

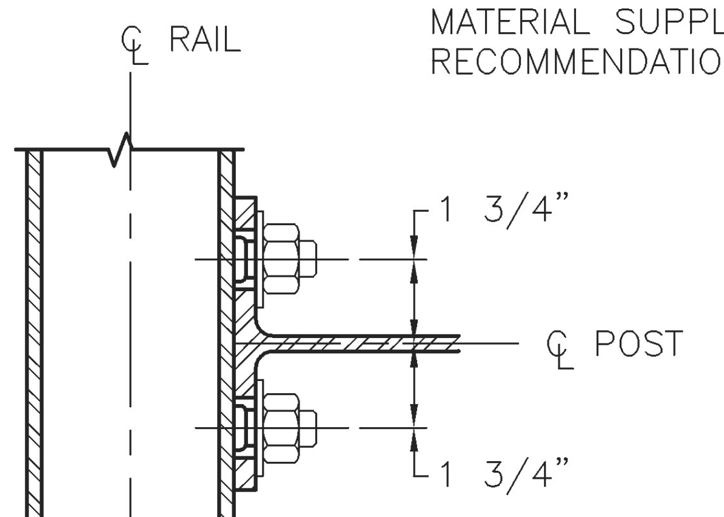
DETAIL A

SCALE: 3"=1'-0"



DETAIL B

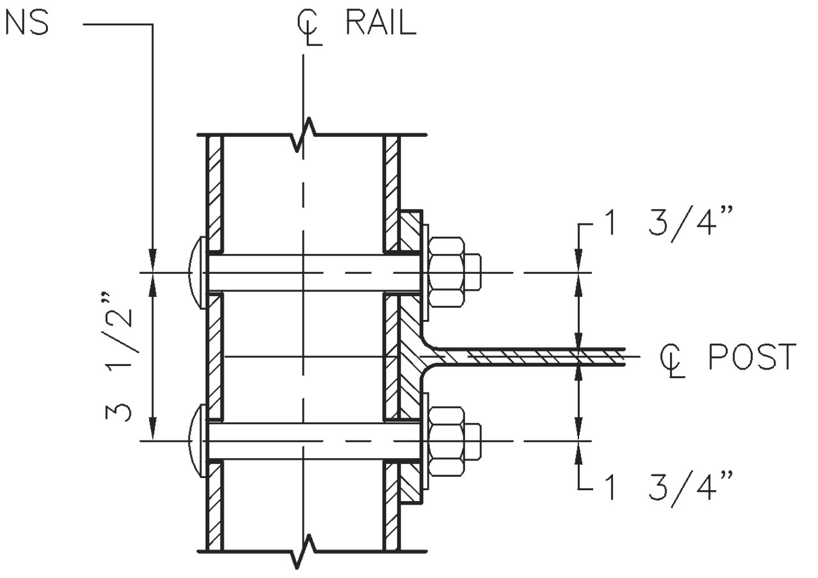
SCALE: 3"=1'-0"



SECTION A-A

SCALE: 3"=1'-0"

7/8" ø HOLE IN RAIL (TYP.)
(HOLES MAY BE FIELD DRILLED, AND SHALL BE REPAIRED IN ACCORDANCE WITH THE MATERIAL SUPPLIER'S RECOMMENDATIONS



SECTION B-B

SCALE: 3"=1'-0"

REVISIONS	
No.	DATE

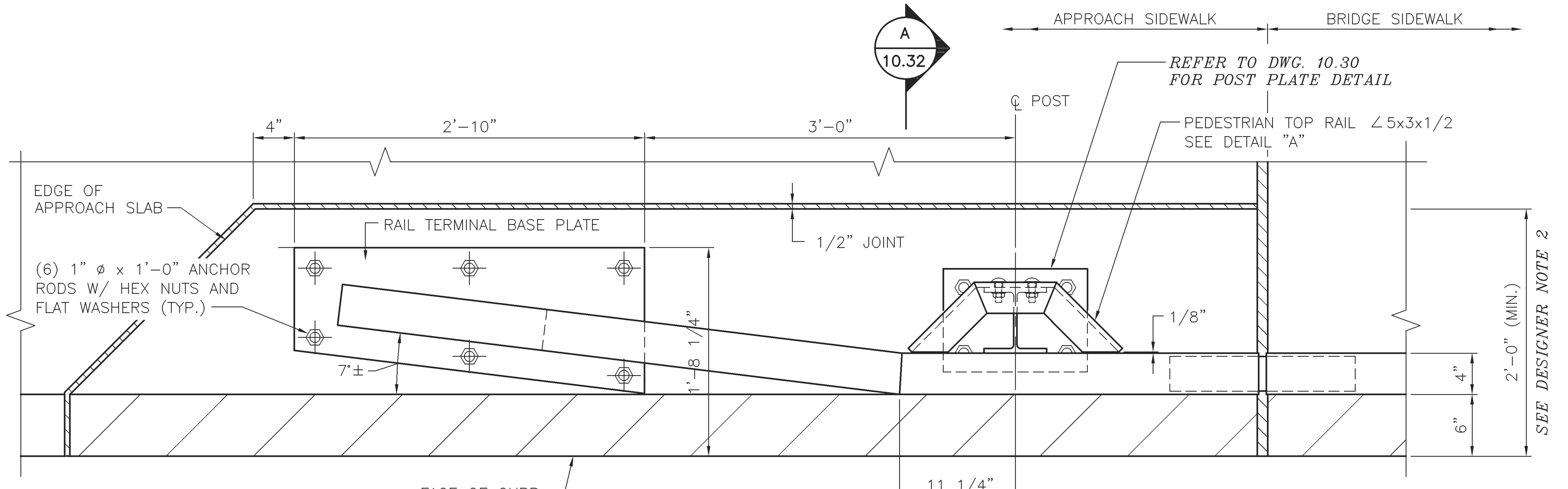
RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

BRIDGE STANDARDS

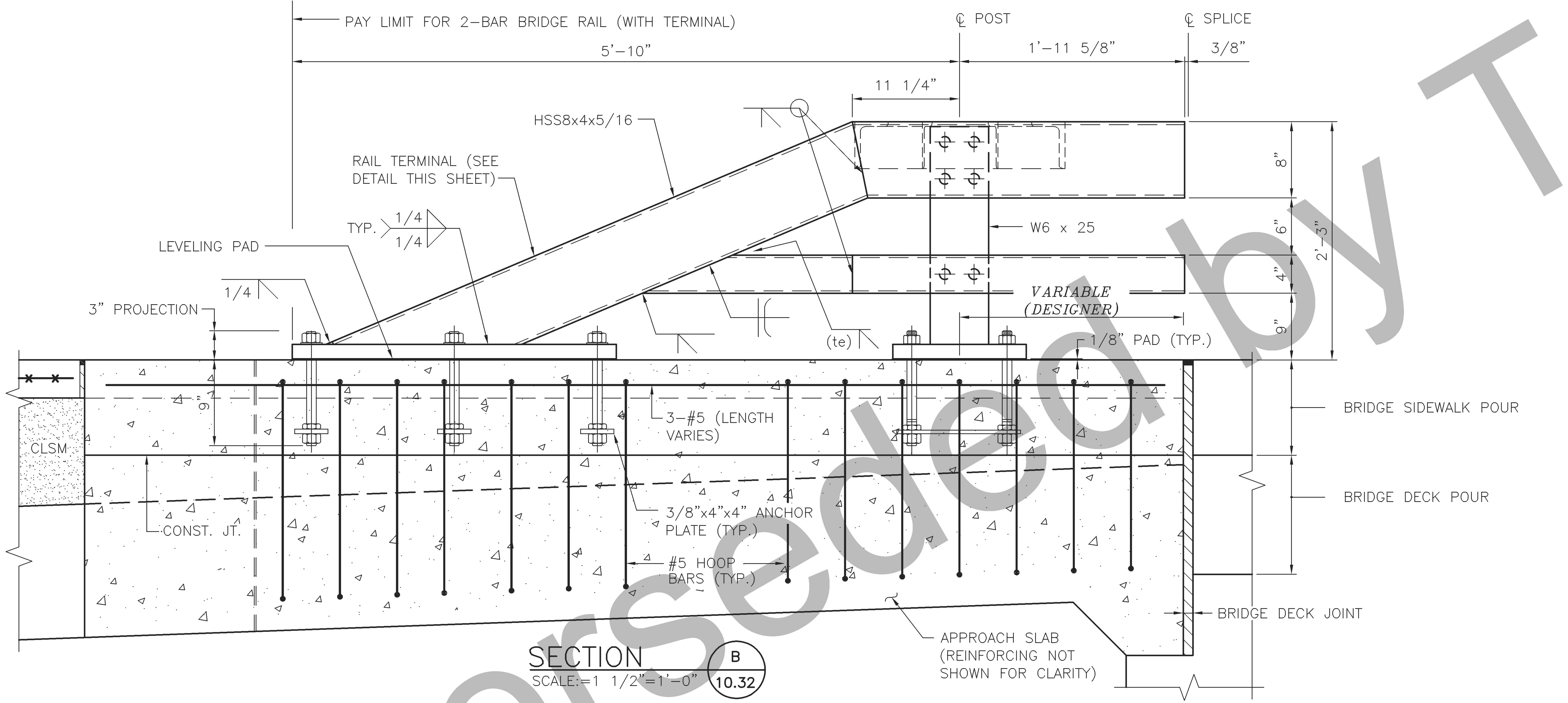
TWO BAR STEEL BRIDGE
RAIL (CRASH-TESTED TL-4)
SHEET 2

DRAWING NUMBER: 10.31

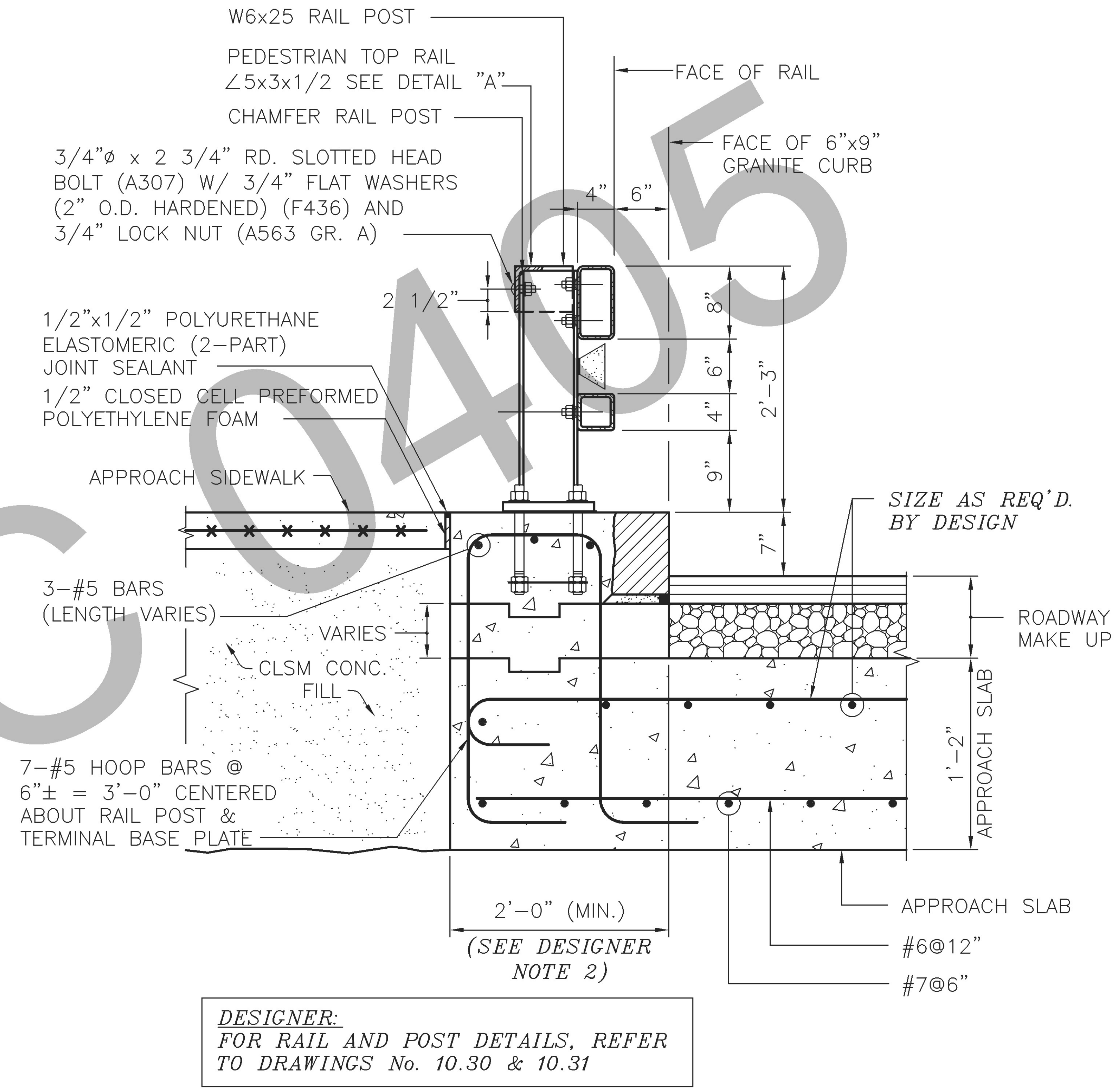
Superseded by TAC 0405



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



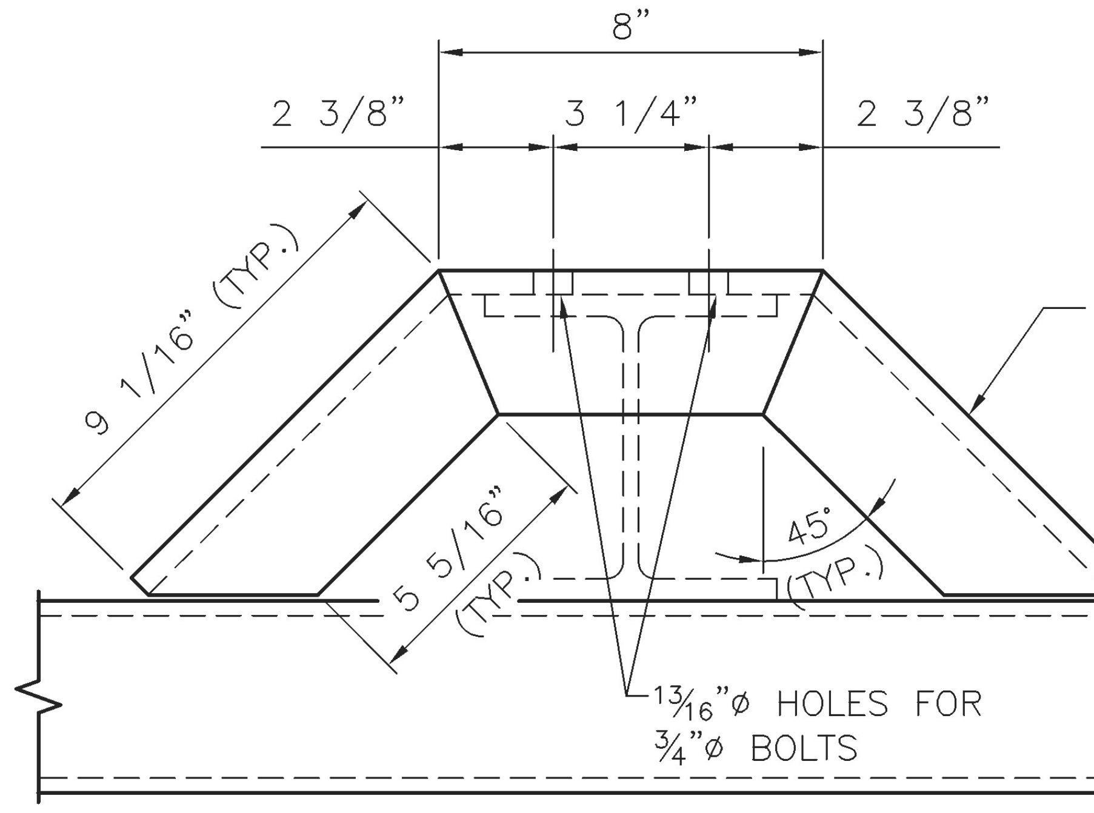
SECTION B
SCALE:=1 1/2"=1'-0" 10.32


W6x25 RAIL POST
PEDESTRIAN TOP RAIL ∠5x3x1/2 SEE DETAIL "A"
CHAMFER RAIL POST
FACE OF RAIL
FACE OF 6"x9" GRANITE CURB
3/4"ø x 2 3/4" RD. SLOTTED HEAD BOLT (A307) W/ 3/4" FLAT WASHERS (2" O.D. HARDENED) (F436) AND 3/4" LOCK NUT (A563 GR. A)
4"
6"
2 1/2"
8"
6"
4"
9"
2'-3"
7"
1/2"x1/2" POLYURETHANE ELASTOMERIC (2-PART) JOINT SEALANT
1/2" CLOSED CELL PREFORMED POLYETHYLENE FOAM
APPROACH SIDEWALK
SIZE AS REQ'D. BY DESIGN
3-#5 BARS (LENGTH VARIES)
VARIES
CLSM CONC. FILL
ROADWAY MAKE UP
1'-2" APPROACH SLAB
7-#5 HOOP BARS @ 6"± = 3'-0" CENTERED ABOUT RAIL POST & TERMINAL BASE PLATE
APPROACH SLAB
2'-0" (MIN.)
(SEE DESIGNER NOTE 2)
#6@12"
#7@6"

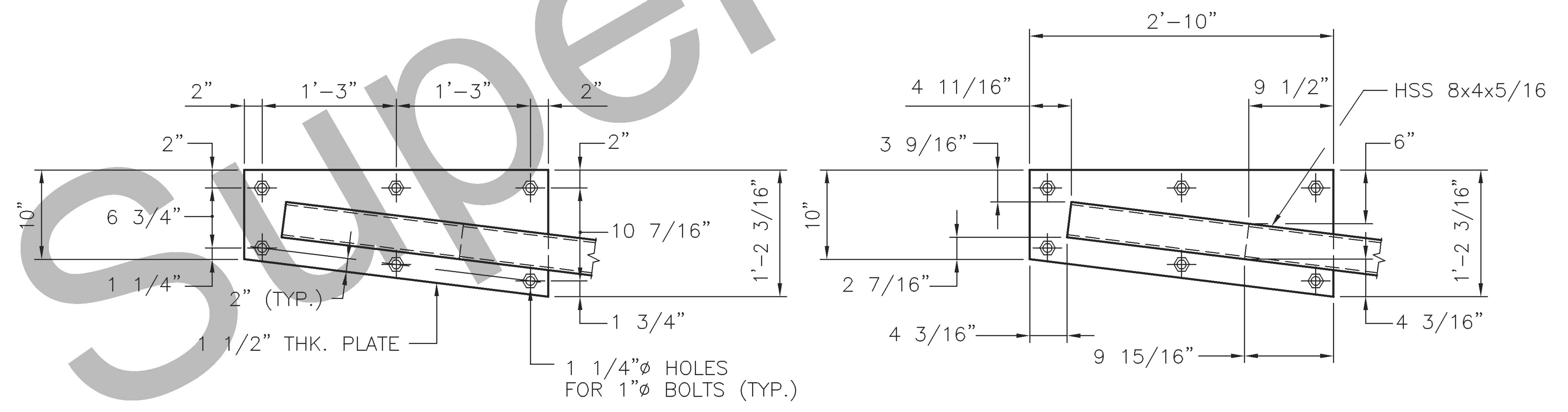
DESIGNER:
FOR RAIL AND POST DETAILS, REFER TO DRAWINGS No. 10.30 & 10.31

SECTION A
SCALE:=1"=1'-0" 10.32

DESIGNER:
PEDESTRIAN TOP RAIL IS TO BE INSTALLED ON ALL POSTS WHEN TWO BAR RAILING SYSTEM IS USED (AT THE FACE OF CURB) IN CONJUNCTION WITH A SIDEWALK



DETAIL-A
SCALE:3"=1'-0"



ANCHOR HOLE LAYOUT

RAIL TERMINAL LAYOUT

RAIL TERMINAL BASE PLATE
SCALE: 1"=1'-0"

DESIGNER NOTES:

1. *THE DETAILS SHOWN ARE FOR TWO BAR RAIL TERMINALS (AT THE FACE OF CURB) ENDING OFF OF THE BRIDGE DECK. RAIL TERMINALS ENDING ON THE BRIDGE DECK WOULD BE SIMILAR.*
2. *THE RAIL TERMINAL FOUNDATION SHALL BE AS REQUIRED TO ACCOMMODATE THE APPLICABLE AASHTO LRFD RAIL IMPACT LOADING.*
3. *ALTERNATE RAIL TERMINAL FOUNDATIONS (SUCH AS FOUNDATIONS CANTILEVERED FROM THE REAR FACES OF THE ABUTMENT STEMS/BACKWALLS OR FOUNDATIONS SET ON INDIVIDUAL WALL STEMS AND FOOTINGS AND CAST INTEGRALLY WITH THE ABUTMENT STEMS AND FOOTINGS) MAY BE CONSIDERED.*

REVISIONS	
No.	DATE

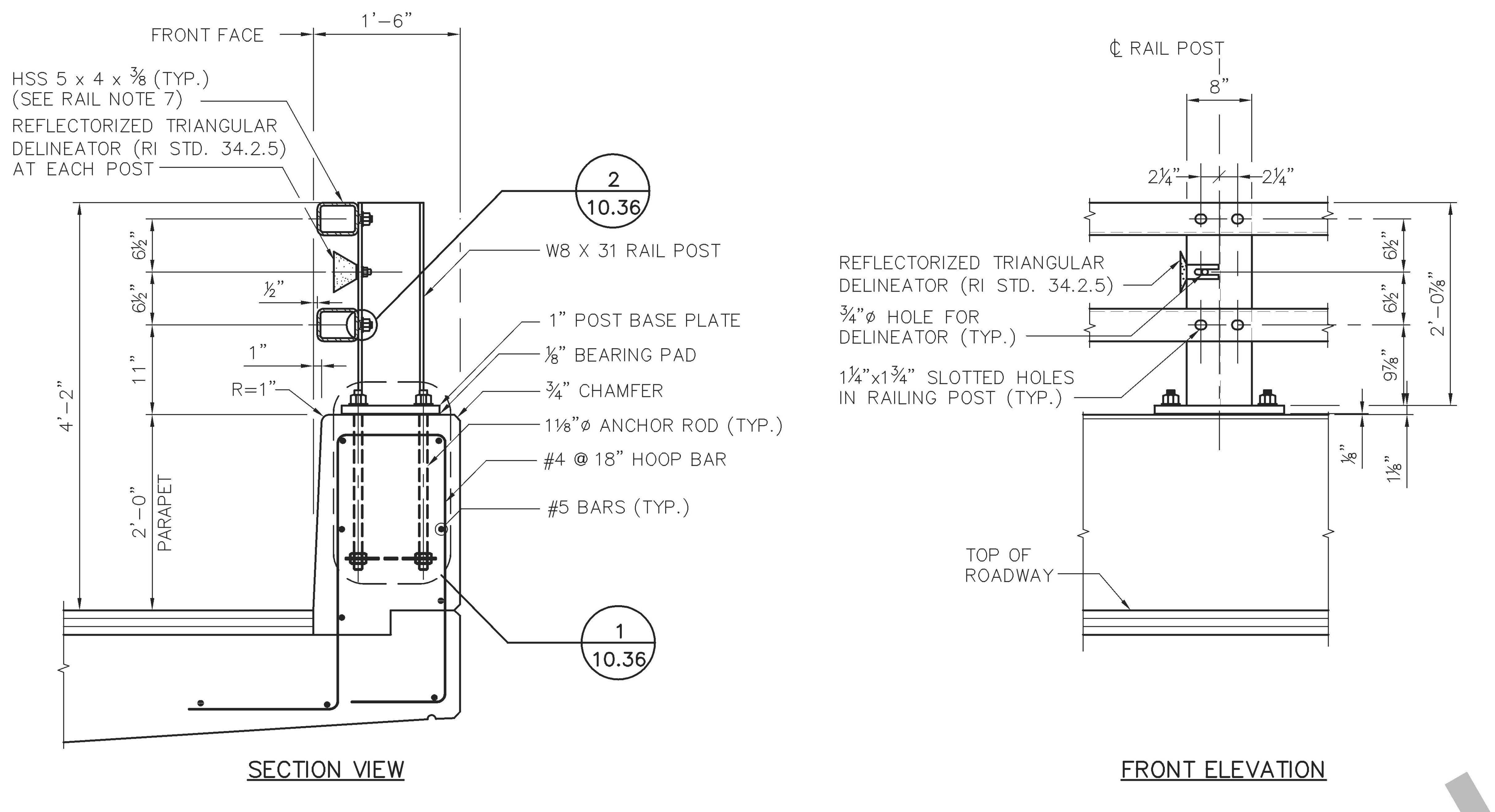
RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

BRIDGE STANDARDS

TWO BAR STEEL BRIDGE
RAIL (CRASH-TESTED TL-4)
SHEET 3

DRAWING NUMBER: 10.32

Superseded by TAC 0405



SECTION VIEW

FRONT ELEVATION

TL-5 TRAFFIC RAILING

SCALE: 1"= 1'-0"

RAIL NOTES

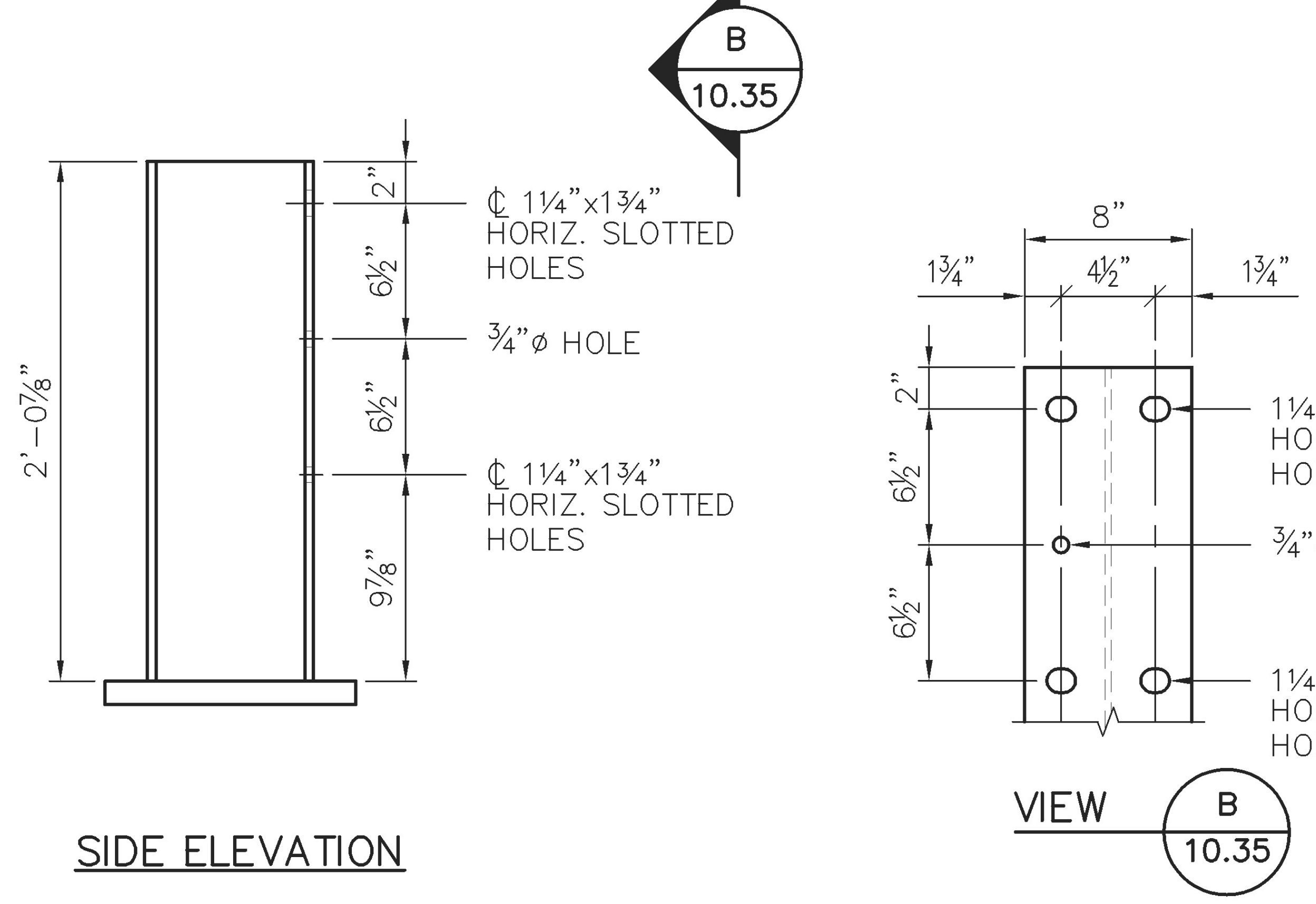
1. BRIDGE RAIL SHALL INCLUDE POSTS, BASE PLATES, ANCHOR RODS, PREFORMED PADS, RAIL ASSEMBLY BOLTS, NUTS, WASHERS, STUDS, STRUCTURAL TUBING, SPLICE BARS, PIPE SPACERS, ALL APPURTENANCES, METALIZING, AND PAINTING (IF SPECIFIED).
2. BRIDGE RAIL POSTS SHALL BE SET VERTICAL.
3. ENDS OF RAIL TUBE SECTIONS SHALL BE SAWED OR MILLED AND SHALL BE TRUE AND SMOOTH. ALL CUT EDGES OF ALL MATERIAL SHALL BE GROUND SMOOTH.
4. EACH PIECE OF RAIL TUBING SHALL BE CONTINUOUS OVER A MINIMUM OF THREE (3) POSTS BETWEEN SPLICES.
5. BOLT HOLES SHALL BE DRILLED OR PUNCHED.
6. AT INTERIOR SPLICES, PIPE SPACERS SHALL BE USED ON ONLY ONE SIDE OF THE SPLICE TO ALLOW MOVEMENT ON THAT SIDE. THE TOP AND BOTTOM RAIL SHALL RECEIVE THE SAME TREATMENT. AT END SPLICES PIPE SPACERS SHALL BE USED ON BOTH SIDES OF THE SPLICE TO ALLOW MOVEMENT ON EACH SIDE.
7. MILL OR SHOP TRANSVERSE WELDS SHALL NOT BE PERMITTED ON ANY RAIL ELEMENT. RAIL ELEMENTS USED ON CURVES SHALL BE SHOP FORMED TO THE REQUIRED CURVATURE.
8. NO PUNCHING, DRILLING, CUTTING OR WELDING SHALL BE PERMITTED AFTER METALIZING, (EXCEPT FOR DETAIL A). DAMAGED AREAS OF METALIZING SHALL BE REPAIRED IN STRICT CONFORMANCE WITH THE MATERIAL SUPPLIER'S RECOMMENDATIONS AND SHALL BE APPROVED BY THE ENGINEER.
9. NUTS FOR 1 1/8"ø THREADED ANCHOR RODS CONNECTING THE BASE PLATE TO THE CONCRETE SHALL BE TIGHTENED TO A SNUG FIT AND GIVEN AN ADDITIONAL 1/8 TURN.
10. THREADS FOR ANCHOR RODS MAY BE ROLLED OR CUT. IF CUT THREADS ARE USED, BOLT DIAMETER SHALL NOT BE LESS THAN NOMINAL DIAMETER. IF ROLLED THREADS ARE USED, ROD DIAMETER SHALL NOT BE LESS THAN ROOT DIAMETER OF THREADS.
11. FOR RAIL CONNECTION TO END POST, SEE "END POST DETAILS" SHEET.
12. DETAIL 2 IS REQUIRED AT THE POST ADJACENT TO THE END POST.

MATERIAL NOTES

1. STRUCTURAL TUBING SHALL CONFORM TO THE REQUIREMENTS OF ASTM A500, GRADE B, STRUCTURAL STEEL TUBING. RAIL TUBING SHALL MEET THE LONGITUDINAL CHARPY V-NOTCH REQUIREMENTS OF 15 FT. LBS. AT 0° F. FOR ASTM A500, GRADE B, THE TEST SAMPLES SHALL BE TAKEN AFTER FORMING THE TUBES. CHARPY V-NOTCH IS NOT REQUIRED FOR SPLICE TUBES.
2. RAIL POSTS AND BASE PLATES SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M270 GRADE 50 (ASTM A572 GR 50), EXCEPT ANCHOR PLATES MAY BE AASHTO M270 GRADE 36 (ASTM A36).
3. THREADED STUDS AND MATCHING NUTS FOR RAIL-TO-POST ATTACHMENT (DETAIL 2) SHALL CONFORM TO ASTM A276 TYPE 304, STAINLESS STEEL, AND SHALL BE TORQUE TESTED PER AWS D1.5, 7.7.1. ALL OTHER BOLTS AND NUTS SHALL CONFORM TO ASTM A307 AND ASTM 563 GRADE A RESPECTIVELY OR BETTER. ANCHOR RODS SHALL CONFORM TO ASTM A449 EXCEPT THAT ASTM A307 NUTS MAY BE USED ON THE BOTTOM OF ANCHOR ASSEMBLY. WASHERS SHALL BE HARDENED STEEL COMMERCIAL TYPE A PLAIN WIDE WASHERS AND SHALL MEET THE DIMENSIONAL REQUIREMENTS OF A.N.S.I. B18.22.
4. ALL STEEL COMPONENTS (EXCEPT STAINLESS STEEL COMPONENTS) SHALL BE METALIZED AFTER FABRICATION IN ACCORDANCE WITH THE APPLICABLE PROVISIONS OF SECTION 827 OF THE RI STANDARD SPECIFICATIONS. ALL OTHER FASTENERS, HARDWARE ITEMS, AND POST ANCHOR ASSEMBLY SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO M232 (ASTM A153) AND AASHTO M111 (ASTM A123). THE COST OF GALVANIZING AND METALIZING SHALL BE INCLUDED IN THE COST OF BRIDGE RAIL SYSTEM.
5. DETAIL 2 STUDS SHALL BE WELDED ON AFTER TUBES ARE METALIZED BY SPOT GRINDING OFF METALIZING, WELDING ON STUDS, THEN TOUCH UP METALIZING PER RAIL NOTE #8.
6. PREFORMED BEARING PADS (1/8" THICK) SHALL CONFORM TO AASHTO M251.

DESIGNER NOTES:

1. *THIS BRIDGE RAIL SYSTEM HAS BEEN ACCEPTED BY FHWA AS A TL-5 BARRIER.*
2. *PROVIDE PAINT COLOR FOR RAILING SYSTEM.*

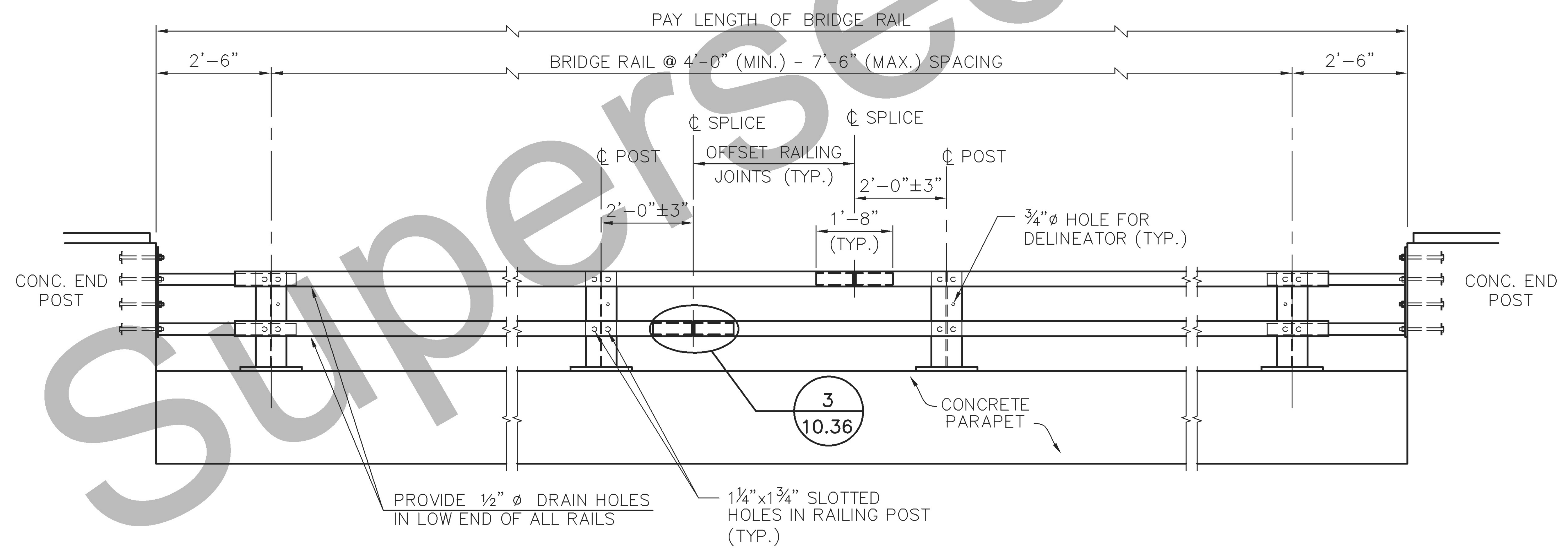


SIDE ELEVATION

VIEW B 10.35

RAIL POST DETAILS

SCALE: 1½"= 1'-0"



RAIL ELEVATION

NOT TO SCALE

REVISIONS	
No.	DATE

RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

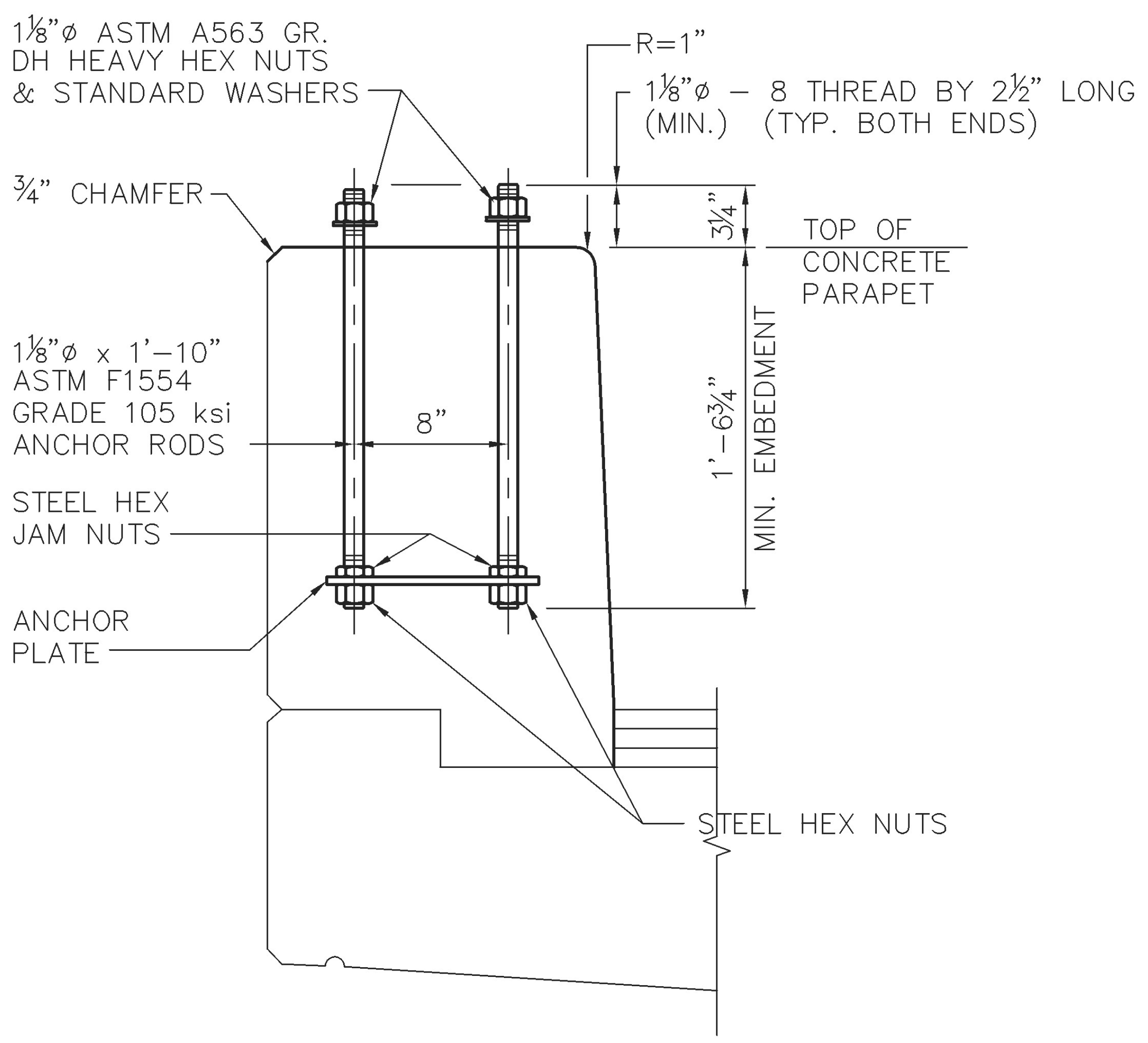
BRIDGE STANDARDS

TL-5 RAILING
SHEET 1

DRAWING NUMBER: 10.35

Superseded by TAC 0405

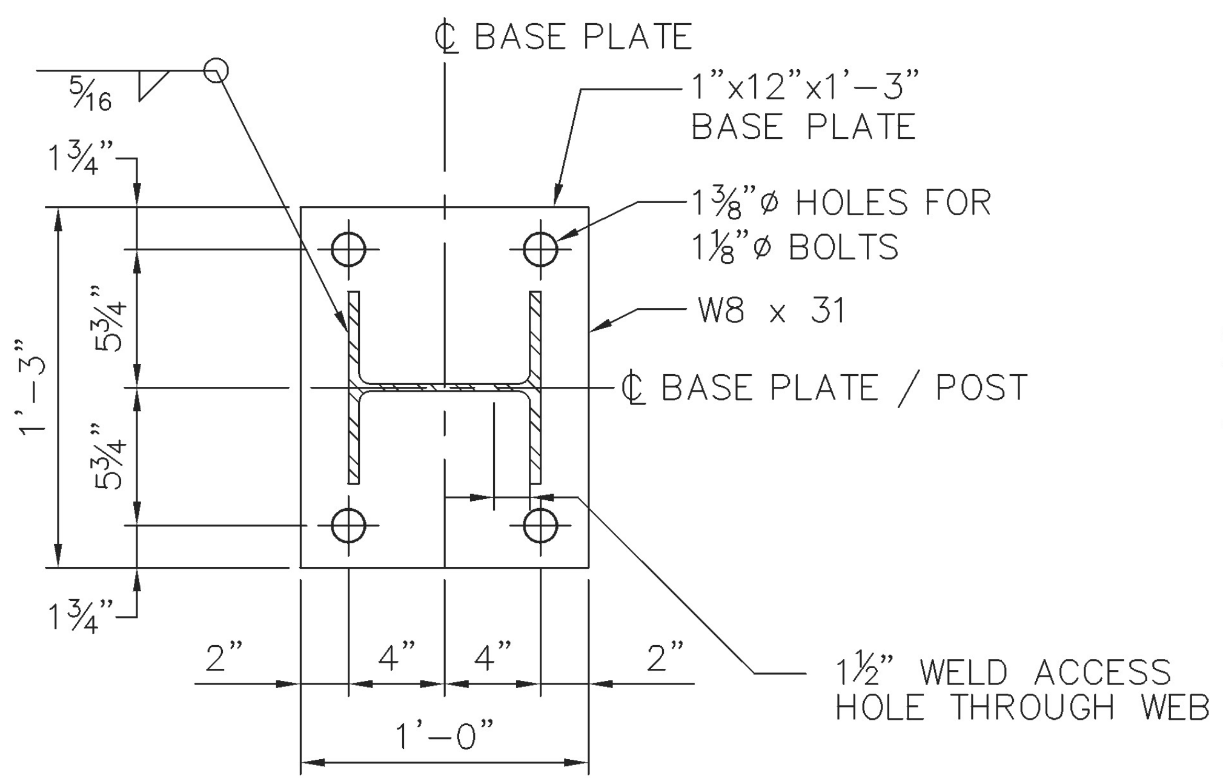
Superseded by TAC 0405


1⅛"ø ASTM A563 GR. DH HEAVY HEX NUTS & STANDARD WASHERS
R=1"
1⅛"ø – 8 THREAD BY 2½" LONG (MIN.) (TYP. BOTH ENDS)
¾" CHAMFER
3¼"
TOP OF CONCRETE PARAPET
1⅛"ø x 1'–10" ASTM F1554 GRADE 105 ksi ANCHOR RODS
8"
1'–6¾" MIN. EMBEDMENT
STEEL HEX JAM NUTS
ANCHOR PLATE
STEEL HEX NUTS

DETAIL 1/10.36

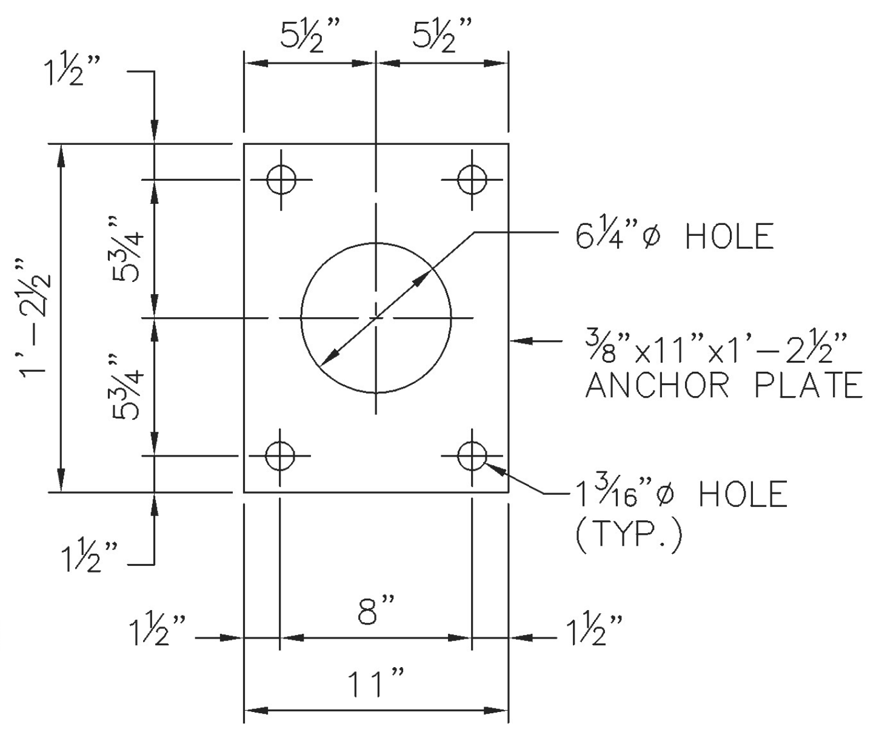
POST ANCHOR ASSEMBLY

SCALE:1 1/2"=1'–0"



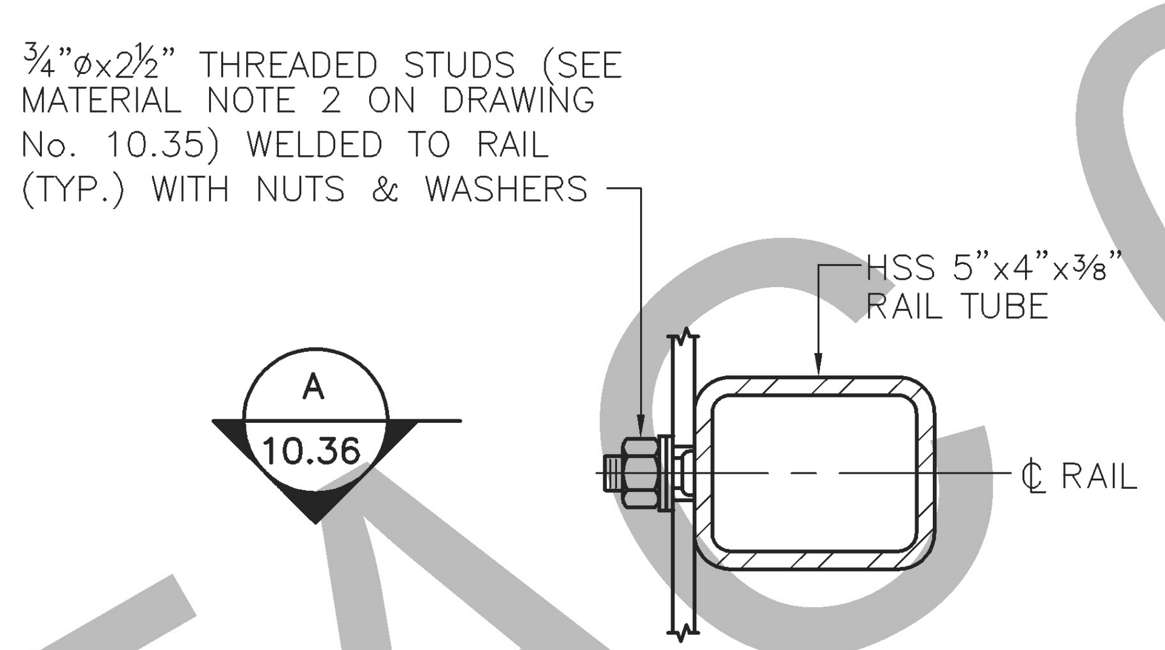
POST BASE PLATE

SCALE:1 1/2"=1'–0"



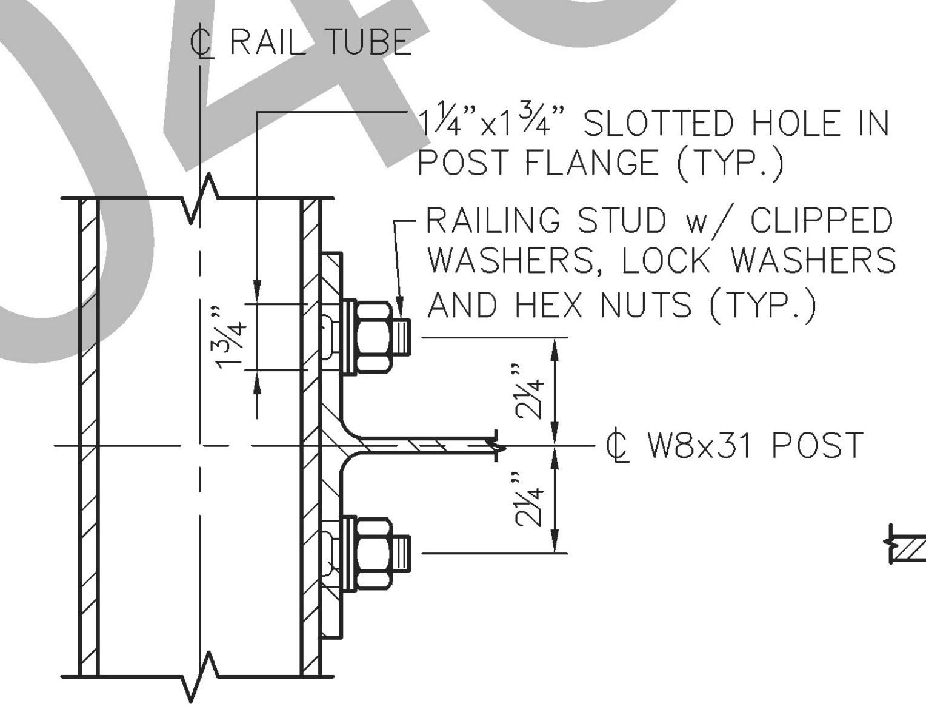
ANCHOR PLATE

SCALE:1 1/2"=1'–0"


¾"øx2½" THREADED STUDS (SEE MATERIAL NOTE 2 ON DRAWING No. 10.35) WELDED TO RAIL (TYP.) WITH NUTS & WASHERS
HSS 5"x4"x⅜" RAIL TUBE
℄ RAIL
A
10.36

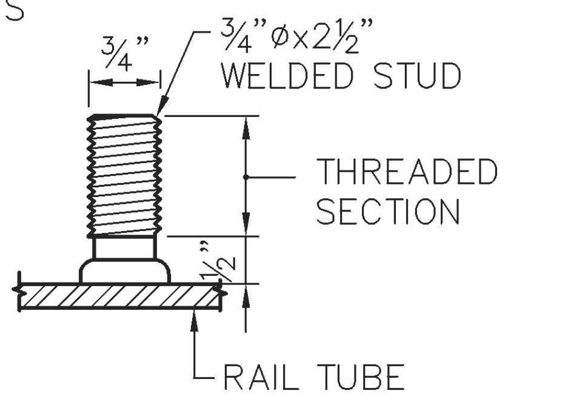
DETAIL 2/10.35

SCALE: 3"= 1'–0"


℄ RAIL TUBE
1¼"x1¾" SLOTTED HOLE IN POST FLANGE (TYP.)
RAILING STUD w/ CLIPPED WASHERS, LOCK WASHERS AND HEX NUTS (TYP.)
1¾"
2¼"
2¼"
℄ W8x31 POST

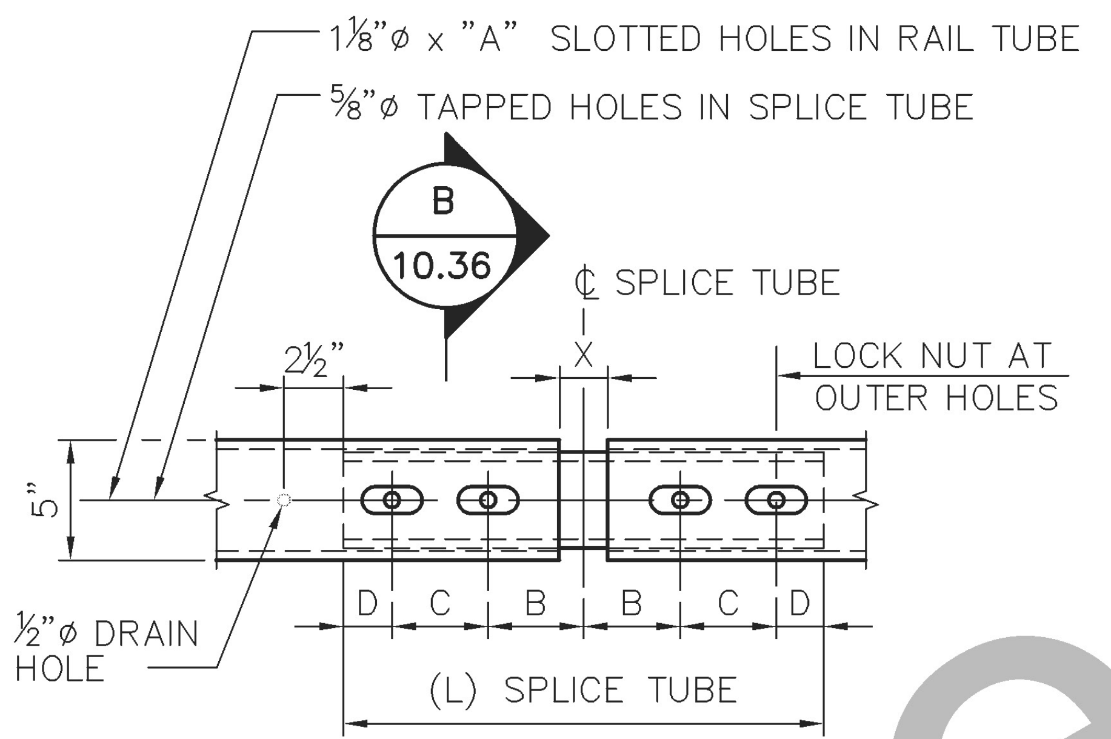
SECTION A/10.36

SCALE: 3"= 1'–0"



RAILING STUD DETAIL

NOT TO SCALE



RAIL SPLICE (BOTTOM VIEW)

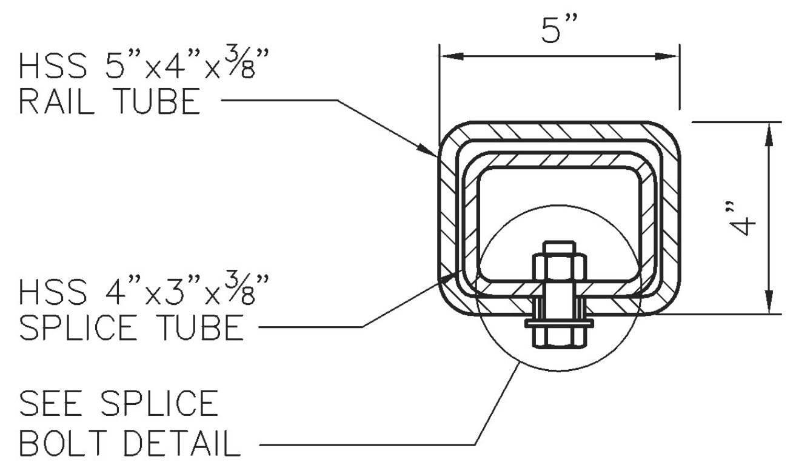
DETAIL 3/10.35

SCALE:1 1/2"=1'–0"

SPLICE TUBE DIMENSION TABLE							
	TOTAL MOVEMENT	A	B	C	D	X	L
	INTERIOR	2½"	4"	4"	2"	¾"	1'–8"
*	< 3¼"	2½"	4"	4"	2"	2"	1'–8"
*	3¼" TO 5 ¼"	3½"	5"	5"	2½"	3"	2'–1"

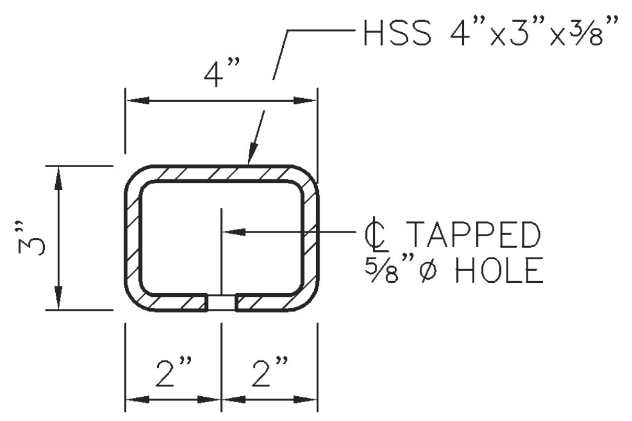
T = TOTAL MOVEMENT OF BRIDGE

* = END SPLICE BAR



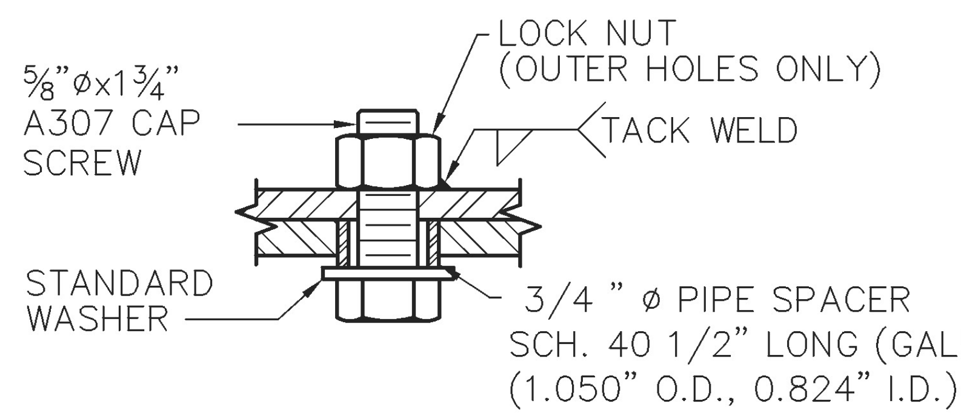
SECTION B/10.36

SCALE: 3"=1'–0"



SPLICE TUBE SECTION

SCALE: 3"= 1'–0"


⅝"øx1¾" A307 CAP SCREW
LOCK NUT (OUTER HOLES ONLY)
TACK WELD
STANDARD WASHER
3/4 " ø PIPE SPACER SCH. 40 1/2" LONG (GALV.) (1.050" O.D., 0.824" I.D.)

SPLICE BOLT DETAIL

NOT TO SCALE

RAIL SPLICE DETAILS

SCALE: 3"= 1'–0"

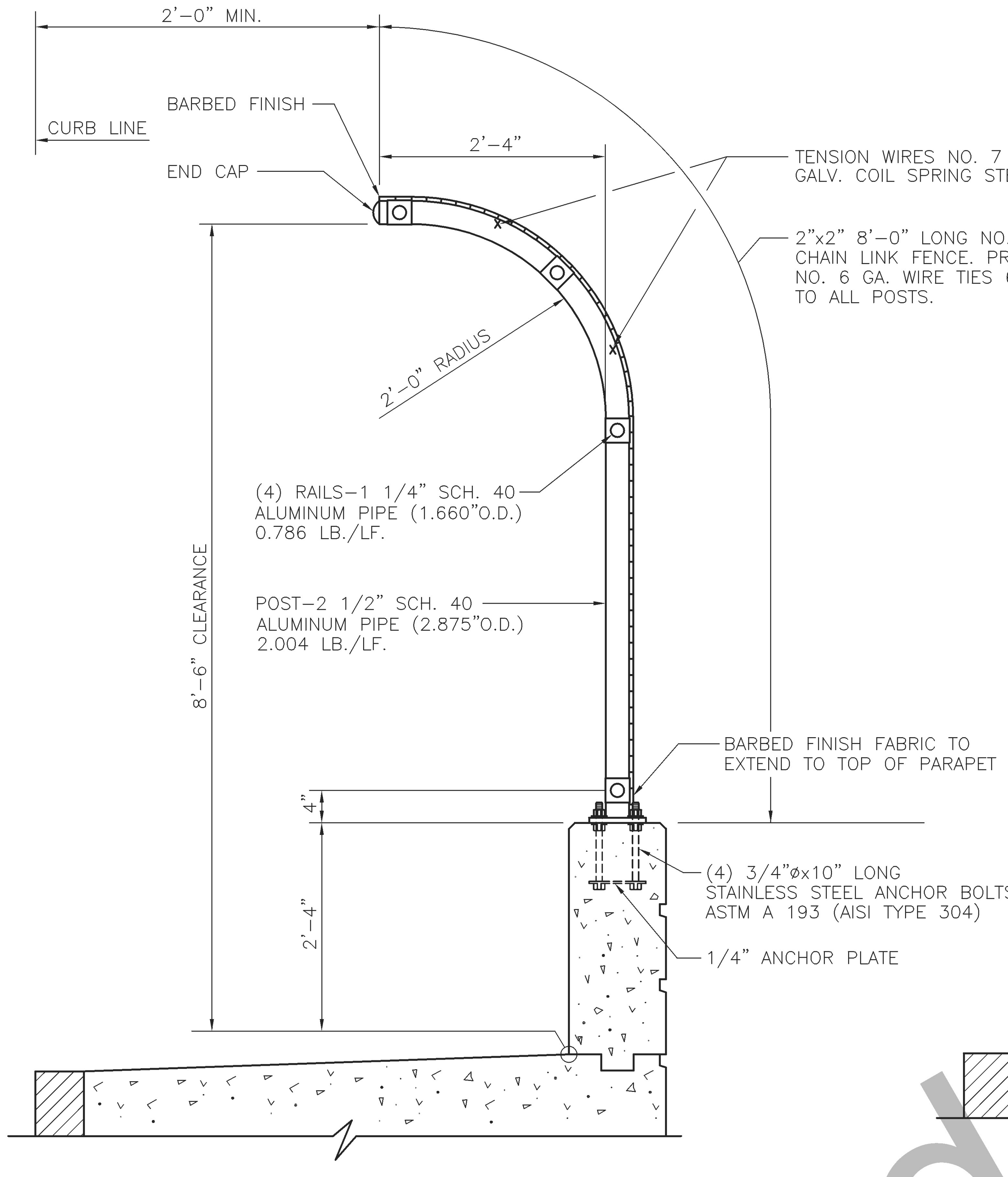
REVISIONS	
No.	DATE

RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

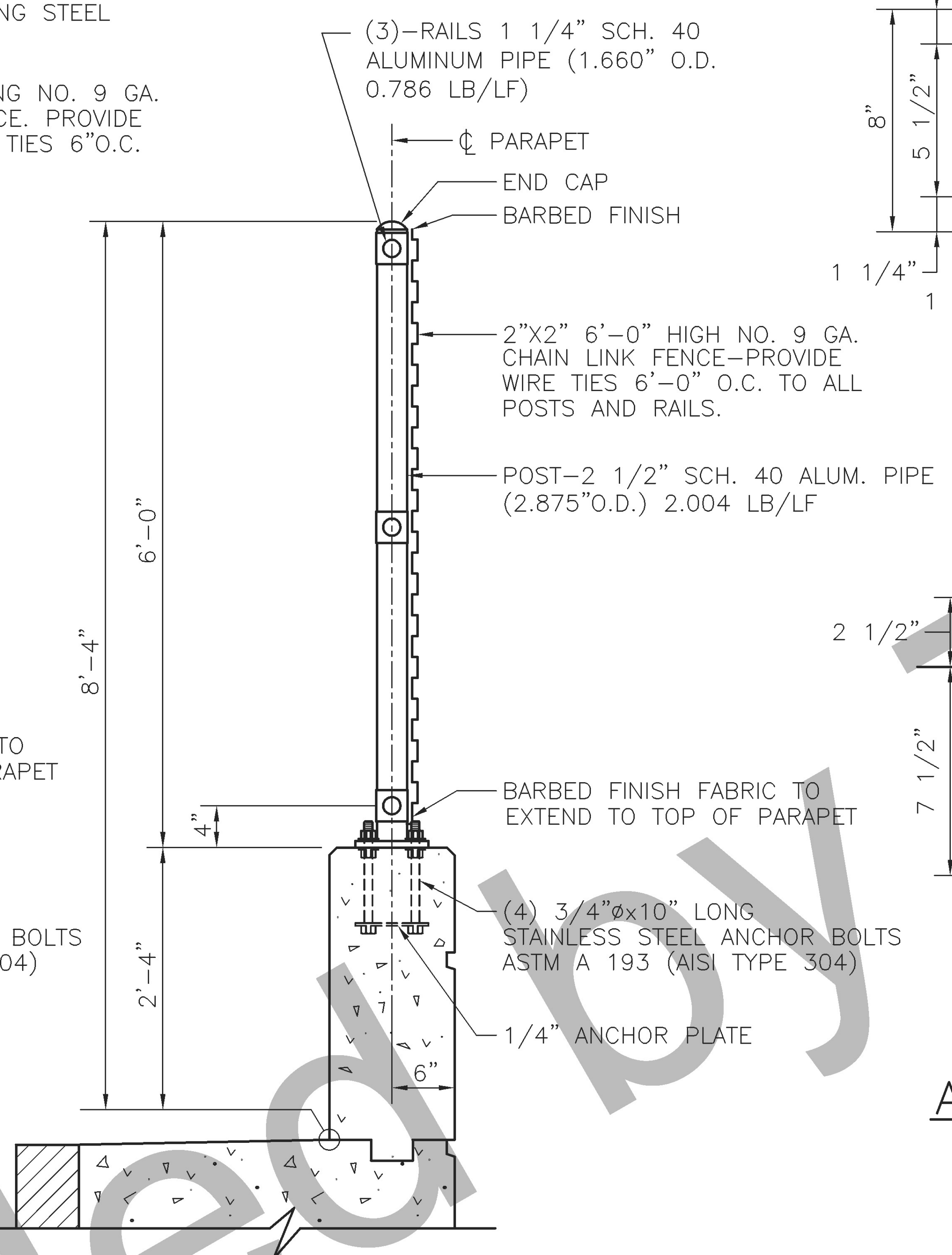
BRIDGE STANDARDS

TL–5 RAILING
SHEET 2

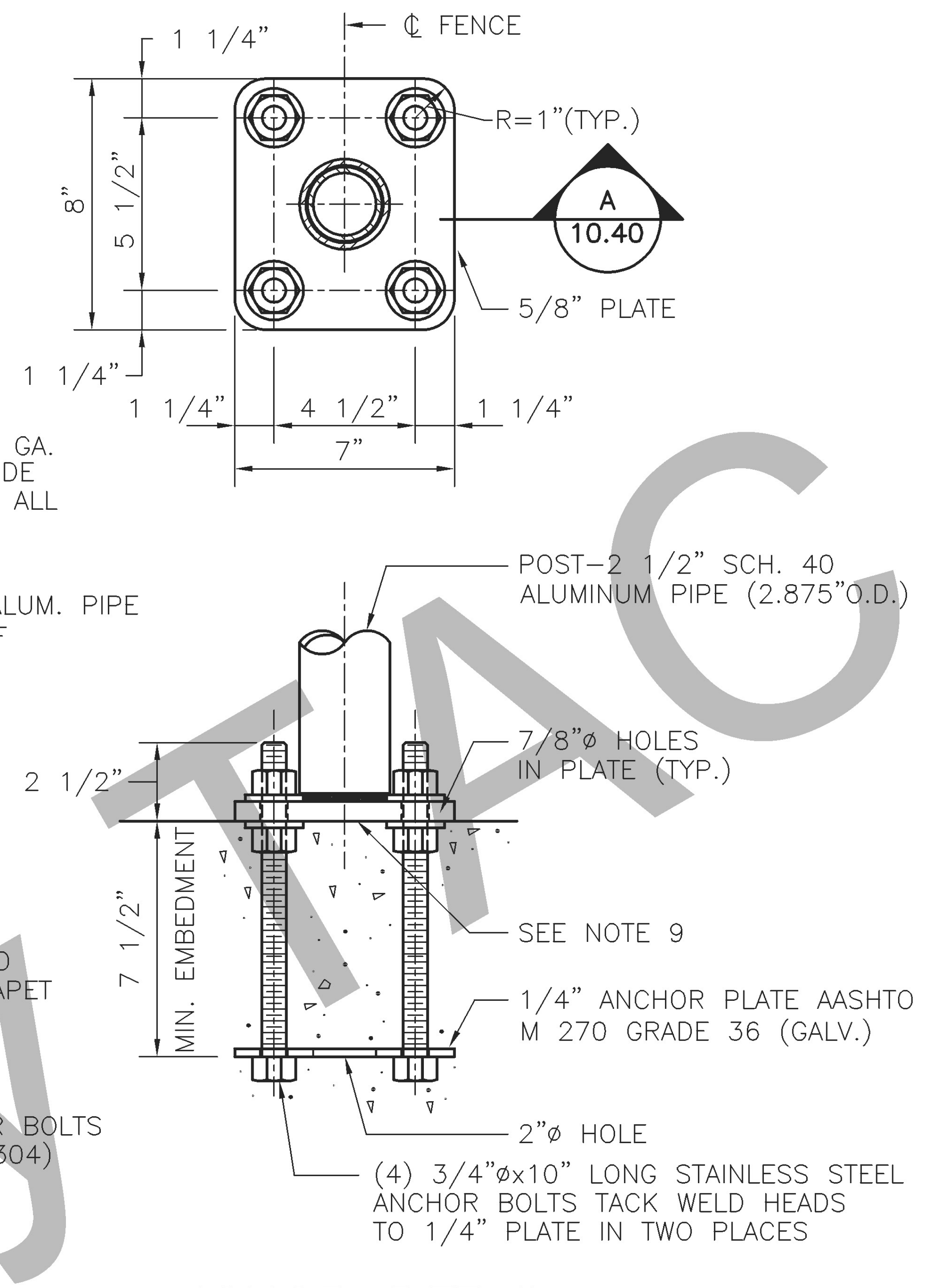
DRAWING NUMBER: 10.36


2'–0" MIN.
CURB LINE
BARBED FINISH
END CAP
2'–4"
TENSION WIRES NO. 7 GA. GALV. COIL SPRING STEEL
2"x2" 8'–0" LONG NO. 9 GA. CHAIN LINK FENCE. PROVIDE NO. 6 GA. WIRE TIES 6"O.C. TO ALL POSTS.
2'–0" RADIUS
(4) RAILS–1 1/4" SCH. 40 ALUMINUM PIPE (1.660"O.D.) 0.786 LB./LF.
POST–2 1/2" SCH. 40 ALUMINUM PIPE (2.875"O.D.) 2.004 LB./LF.
8'–6" CLEARANCE
BARBED FINISH FABRIC TO EXTEND TO TOP OF PARAPET
4"
2'–4"
(4) 3/4"ø x10" LONG STAINLESS STEEL ANCHOR BOLTS ASTM A 193 (AISI TYPE 304)
1/4" ANCHOR PLATE

TYPE I PROTECTIVE SCREEN (CHAIN LINK FENCE)


(3)–RAILS 1 1/4" SCH. 40 ALUMINUM PIPE (1.660" O.D. 0.786 LB/LF)
℄ PARAPET
END CAP
BARBED FINISH
2"X2" 6'–0" HIGH NO. 9 GA. CHAIN LINK FENCE–PROVIDE WIRE TIES 6'–0" O.C. TO ALL POSTS AND RAILS.
POST–2 1/2" SCH. 40 ALUM. PIPE (2.875"O.D.) 2.004 LB/LF
8'–4"
6'–0"
BARBED FINISH FABRIC TO EXTEND TO TOP OF PARAPET
4"
2'–4"
(4) 3/4"ø x10" LONG STAINLESS STEEL ANCHOR BOLTS ASTM A 193 (AISI TYPE 304)
1/4" ANCHOR PLATE
6"

TYPE II PROTECTIVE SCREEN (CHAIN LINK FENCE)


1 1/4"
℄ FENCE
R=1"(TYP.)
A
10.40
8"
5 1/2"
5/8" PLATE
1 1/4"
1 1/4"
4 1/2"
1 1/4"
7"
POST–2 1/2" SCH. 40 ALUMINUM PIPE (2.875"O.D.)
7/8"ø HOLES IN PLATE (TYP.)
2 1/2"
7 1/2" MIN. EMBEDMENT
SEE NOTE 9
1/4" ANCHOR PLATE AASHTO M 270 GRADE 36 (GALV.)
2"ø HOLE
(4) 3/4"ø x10" LONG STAINLESS STEEL ANCHOR BOLTS TACK WELD HEADS TO 1/4" PLATE IN TWO PLACES

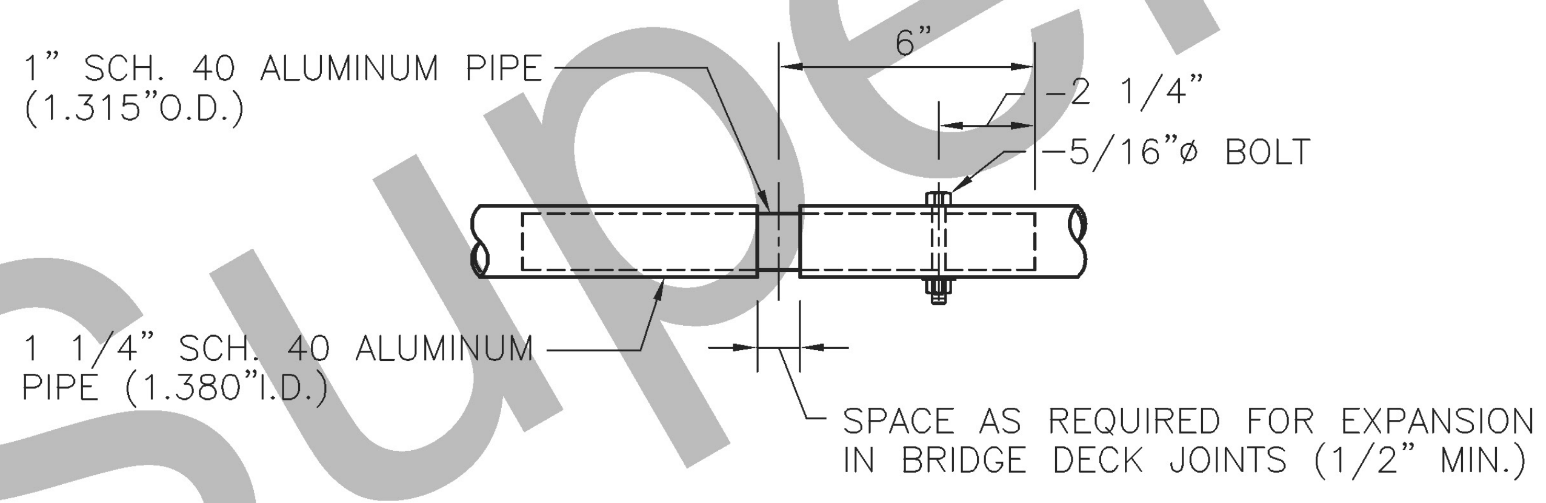
ANCHOR DETAIL

DESIGNER NOTES:

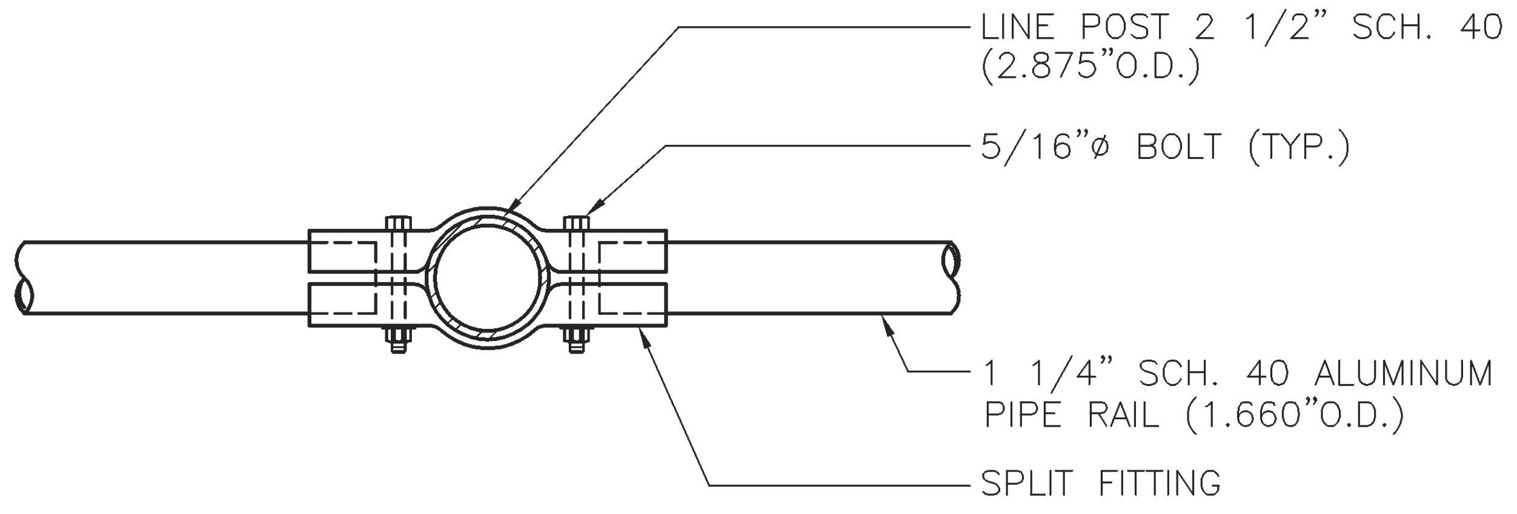
1. *IN GENERAL PROTECTIVE SCREENS SHOULD BE CONSIDERED ON OVERPASSES WITH HEAVY PEDESTRIAN TRAFFIC (SUCH AS NEAR SCHOOLS AND PLAYGROUNDS), OVERPASSES IN URBAN AREAS, OVERPASSES WHERE PRIVATE PROPERTIES ARE LOCATED BENEATH, AND OVERPASSES SPANNING RAILROAD TRACKS.*
2. *THE TYPE II PROTECTIVE SCREEN (CHAIN LINK FENCE) SHOULD ONLY BE CONSIDERED FOR BRIDGES SPANNING RAILROAD TRACKS OR WHEN THE SIDEWALK IS TOO NARROW TO ALLOW FOR TYPE I.*
3. *ALTERNATE PROTECTIVE SCREEN DETAILS MAY BE CONSIDERED, SHOULD SPECIFIC CONDITIONS WARRANT.*
4. *THE NOTES SHOWN BELOW, SHOULD BE INCLUDED ON THE CONTRACT DRAWINGS.*

NOTES:

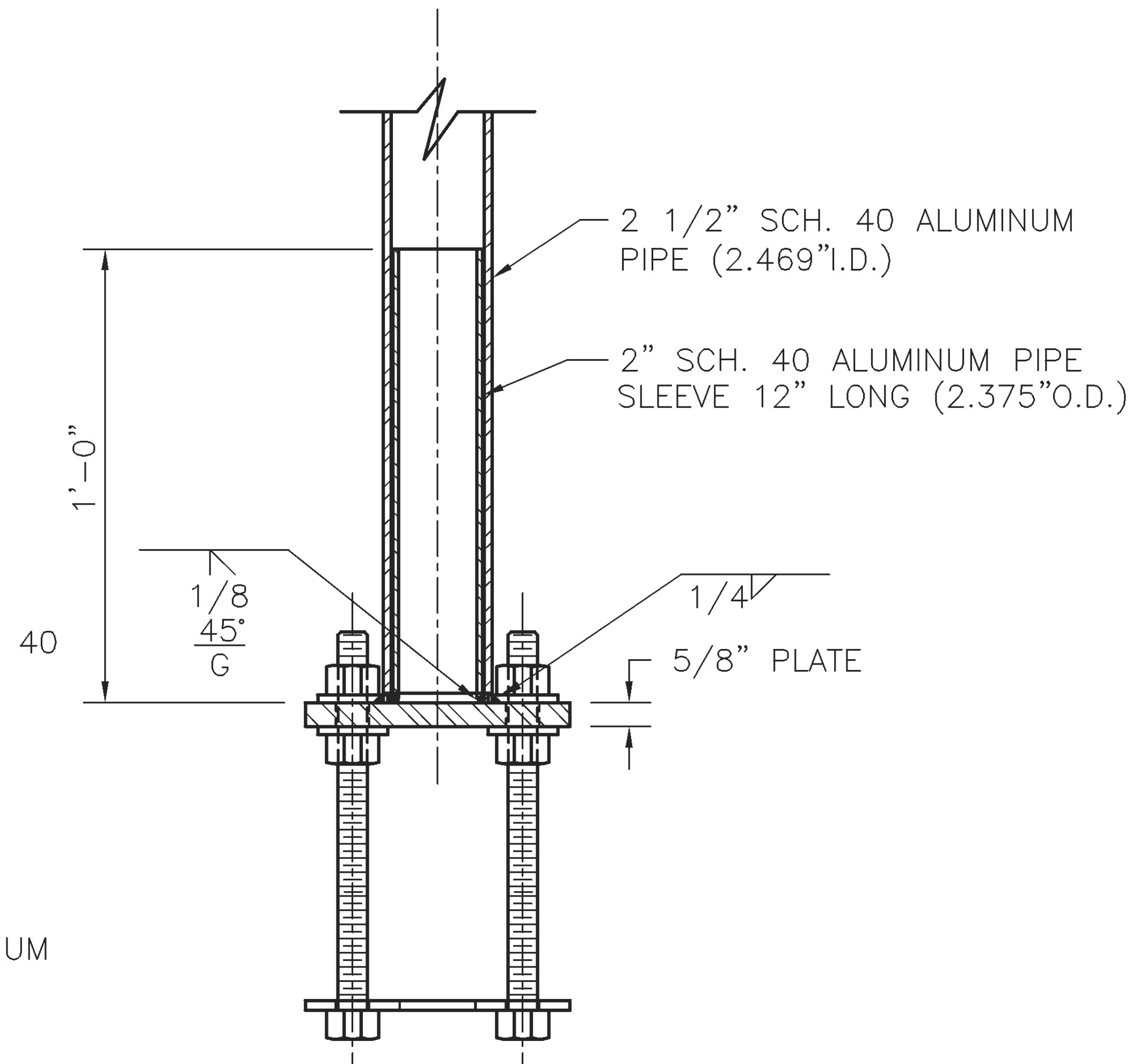
1. ALL POSTS SHALL BE SET VERTICAL UNLESS OTHERWISE SPECIFIED.
2. MAXIMUM POST SPACING SHALL BE 8'–0".
3. POSTS, RAILS, TENSION BARS, RAIL SPLICES, WASHERS AND POST CONNECTION CLAMPS SHALL BE ALUMINUM ALLOY 6061–T6 ASTM DESIGNATION B 221.
4. THE ALUMINUM FABRIC SHALL BE ALUMINUM ALLOY 6061–T89–94 ASTM DESIGNATION B 221, NO. 9 GAUGE (0.148" DIAMETER).
5. THE WIRE TIES SHALL BE ALUMINUM ALLOY 1100–H–18 NO. 6 GAUGE (0.194" DIAMETER).
6. THE TENSION BANDS SHALL BE ALUMINUM ALLOY 6063–T5 ASTM DESIGNATION B 221.
7. THE BOLTS SHALL BE STAINLESS STEEL ASTM DESIGNATION A 193 (AISI TYPE 304) Fy = 30 KSI.
8. THE NUTS SHALL BE STAINLESS STEEL ASTM DESIGNATION A 194.
9. THE PORTIONS OF THE ALUMINUM BASE PLATES TO BE IN CONTACT WITH THE CONCRETE PARAPET AND THE STEEL ANCHOR BOLTS SHALL BE THOROUGHLY COATED WITH AN APPROVED ALUMINUM IMPREGNATED CAULKING COMPOUND.
10. THE ALUMINUM BASE PLATES SHALL BE ALUMINUM ALLOY 6061–T6 ASTM DESIGNATION B 221.


1" SCH. 40 ALUMINUM PIPE (1.315"O.D.)
6"
2 1/4"
5/16"ø BOLT
1 1/4" SCH. 40 ALUMINUM PIPE (1.380"I.D.)
SPACE AS REQUIRED FOR EXPANSION IN BRIDGE DECK JOINTS (1/2" MIN.)

RAIL SPLICE DETAIL


LINE POST 2 1/2" SCH. 40 (2.875"O.D.)
5/16"ø BOLT (TYP.)
1 1/4" SCH. 40 ALUMINUM PIPE RAIL (1.660"O.D.)
SPLIT FITTING

DETAIL OF POST CONNECTION


2 1/2" SCH. 40 ALUMINUM PIPE (2.469"I.D.)
2" SCH. 40 ALUMINUM PIPE SLEEVE 12" LONG (2.375"O.D.)
1'–0"
1/8
45°
G
1/4
5/8" PLATE

SECTION A 10.40

THIS SHEET IS NOT TO SCALE

REVISIONS	
No.	DATE

RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

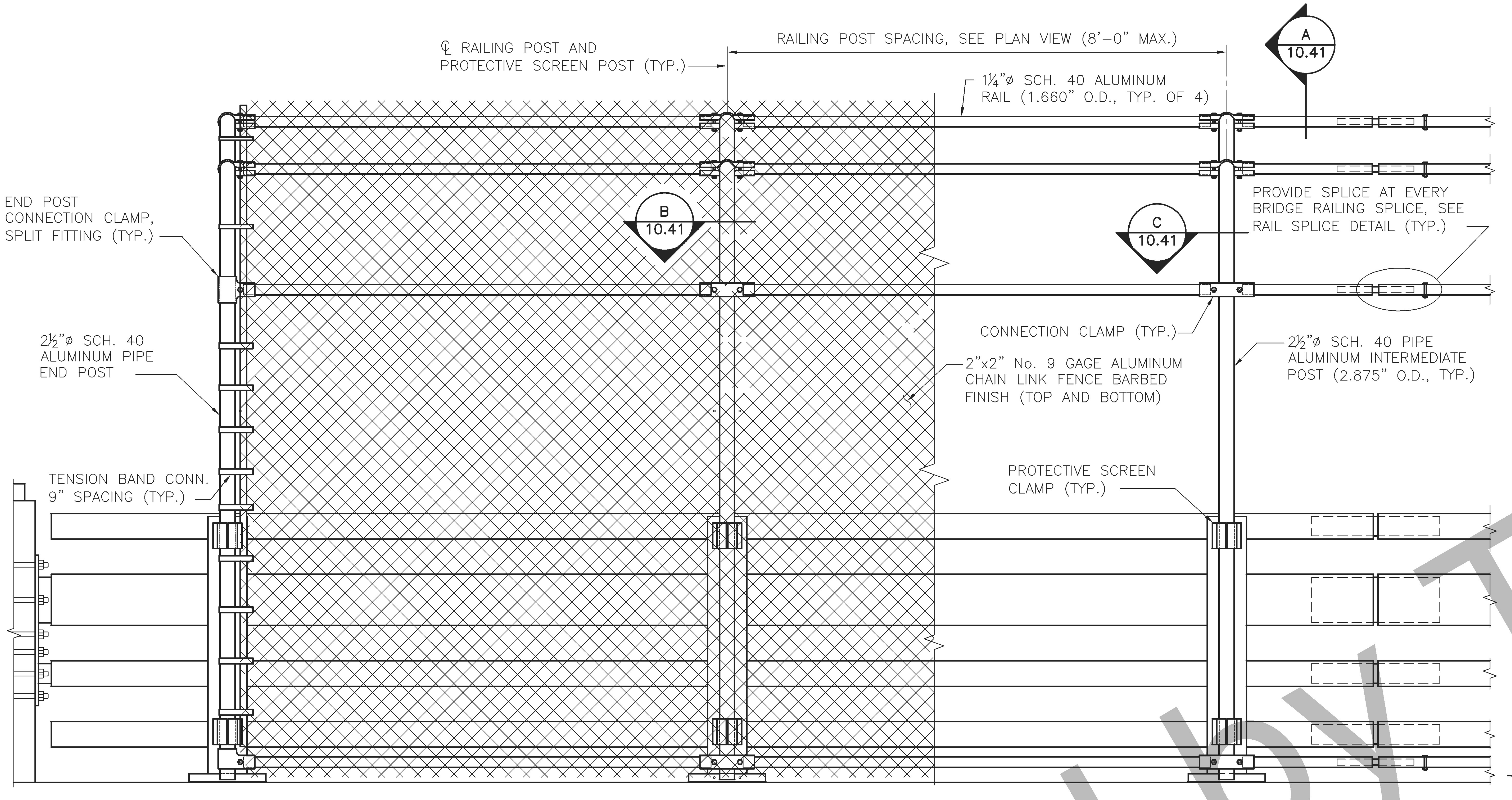
BRIDGE STANDARDS

PROTECTIVE SCREEN
(CHAIN LINK FENCE)
SHEET 1

DRAWING NUMBER: 10.40

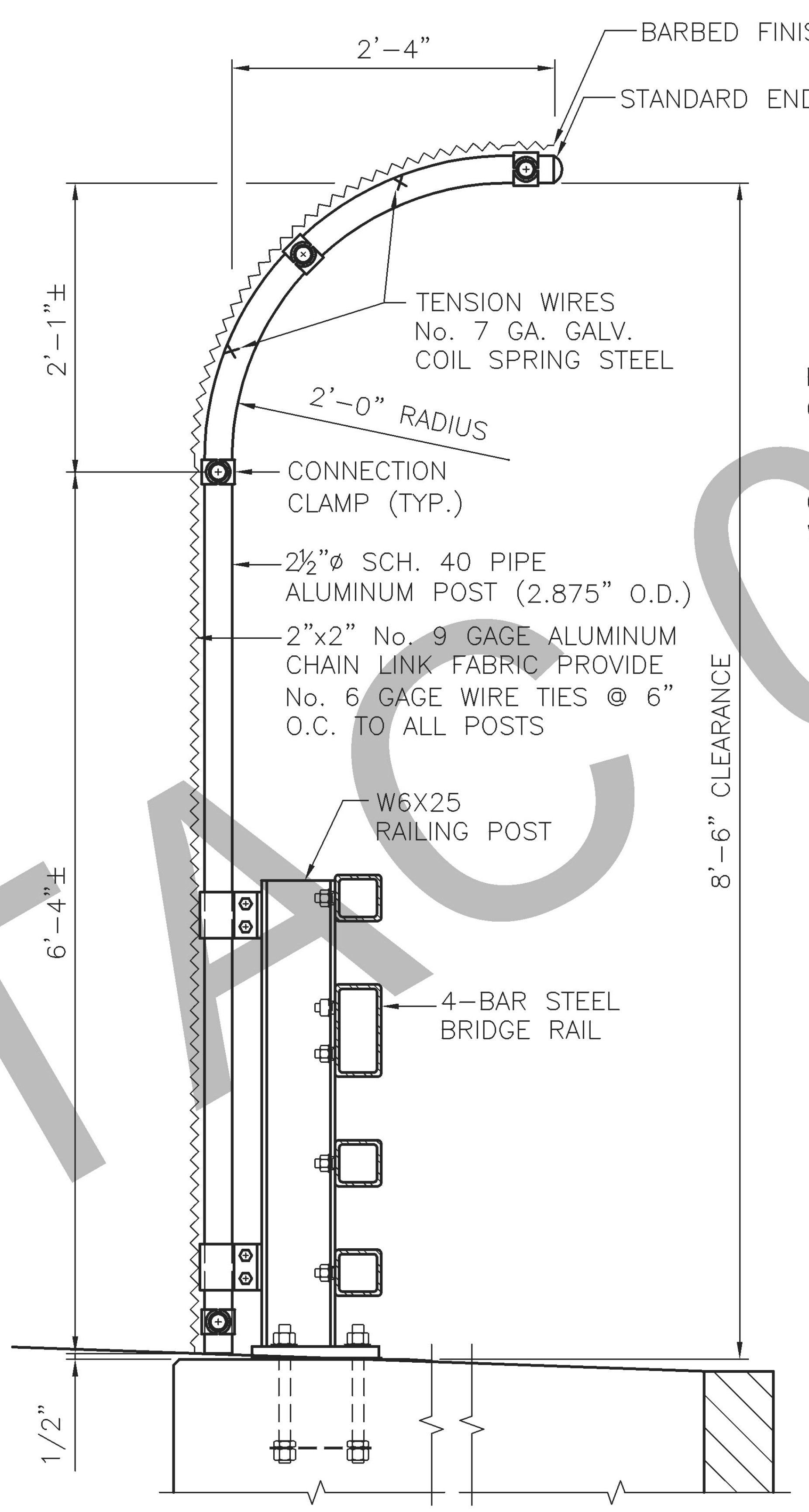
Superseded by TAC 0405

Superseded by TAC 0405

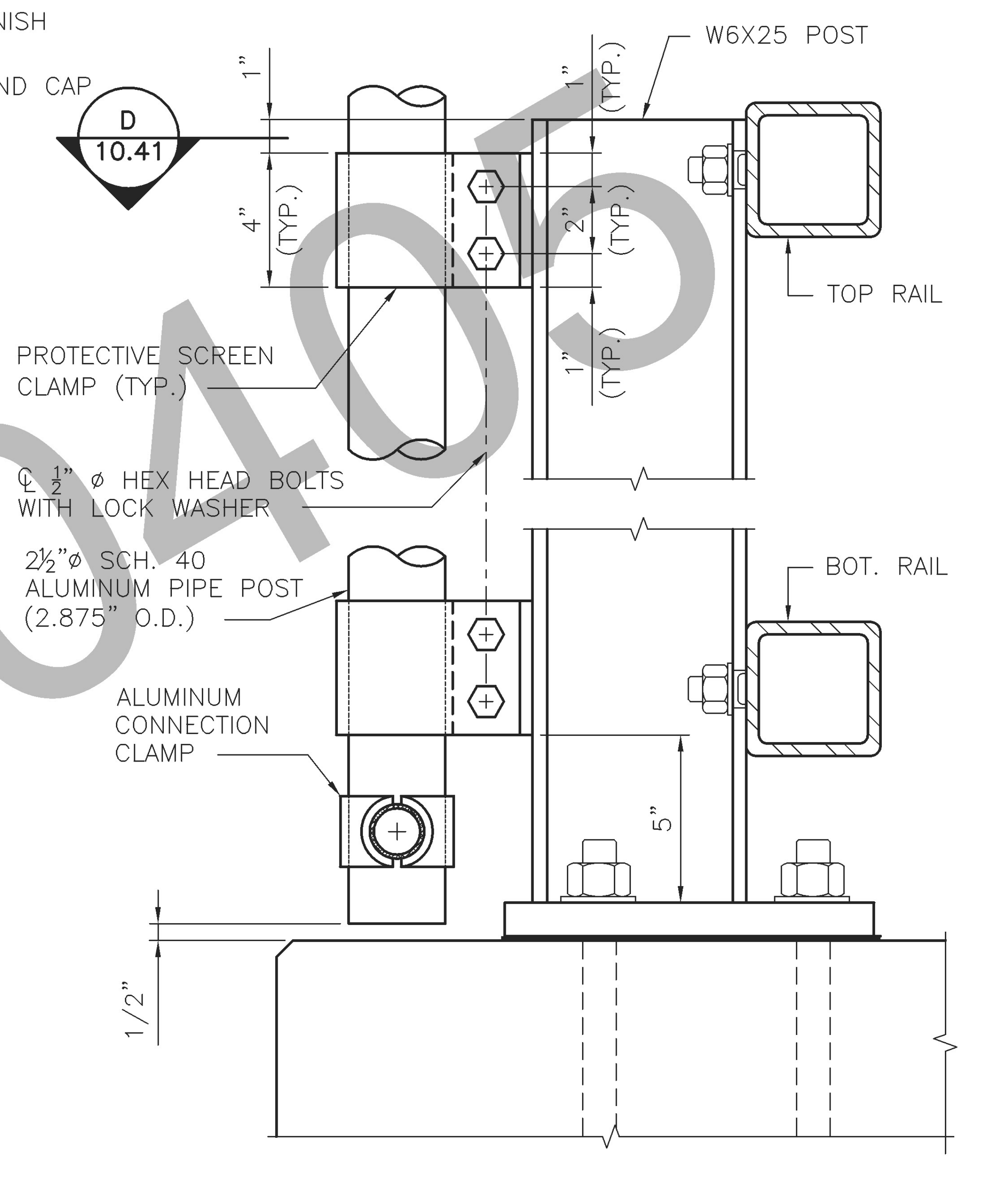

℄ RAILING POST AND PROTECTIVE SCREEN POST (TYP.)
RAILING POST SPACING, SEE PLAN VIEW (8'–0" MAX.)
A 10.41
1¼"ø SCH. 40 ALUMINUM RAIL (1.660" O.D., TYP. OF 4)
END POST CONNECTION CLAMP, SPLIT FITTING (TYP.)
B 10.41
C 10.41
PROVIDE SPLICE AT EVERY BRIDGE RAILING SPLICE, SEE RAIL SPLICE DETAIL (TYP.)
2½"ø SCH. 40 ALUMINUM PIPE END POST
CONNECTION CLAMP (TYP.)
2½"ø SCH. 40 PIPE ALUMINUM INTERMEDIATE POST (2.875" O.D., TYP.)
2"x2" No. 9 GAGE ALUMINUM CHAIN LINK FENCE BARBED FINISH (TOP AND BOTTOM)
TENSION BAND CONN. 9" SPACING (TYP.)
PROTECTIVE SCREEN CLAMP (TYP.)

BACK ELEVATION VIEW

SCALE: 1" = 1'–0"

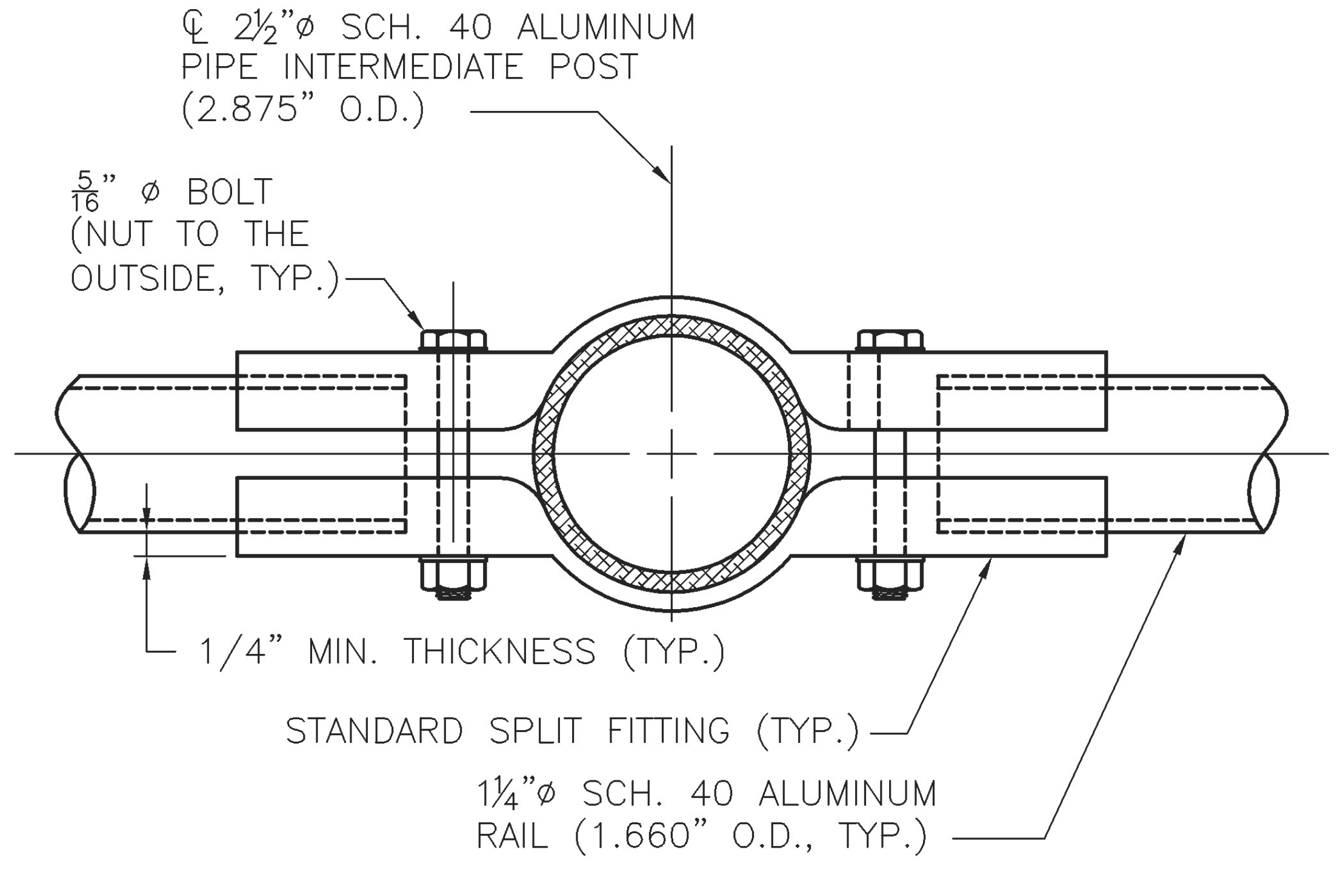

2'–4"
BARBED FINISH
STANDARD END CAP
TENSION WIRES No. 7 GA. GALV. COIL SPRING STEEL
2'–0" RADIUS
2'–1"±
CONNECTION CLAMP (TYP.)
2½"ø SCH. 40 PIPE ALUMINUM POST (2.875" O.D.)
2"x2" No. 9 GAGE ALUMINUM CHAIN LINK FABRIC PROVIDE No. 6 GAGE WIRE TIES @ 6" O.C. TO ALL POSTS
W6X25 RAILING POST
6'–4"±
8'–6" CLEARANCE
4–BAR STEEL BRIDGE RAIL
1/2"

SECTION A 10.41


D 10.41
1"
(TYP.)
4"
(TYP.)
1"
(TYP.)
W6X25 POST
TOP RAIL
PROTECTIVE SCREEN CLAMP (TYP.)
℄ ½" ø HEX HEAD BOLTS WITH LOCK WASHER
2½"ø SCH. 40 ALUMINUM PIPE POST (2.875" O.D.)
BOT. RAIL
ALUMINUM CONNECTION CLAMP
5"
1/2"

ELEVATION – PROTECTIVE SCREEN CLAMPS

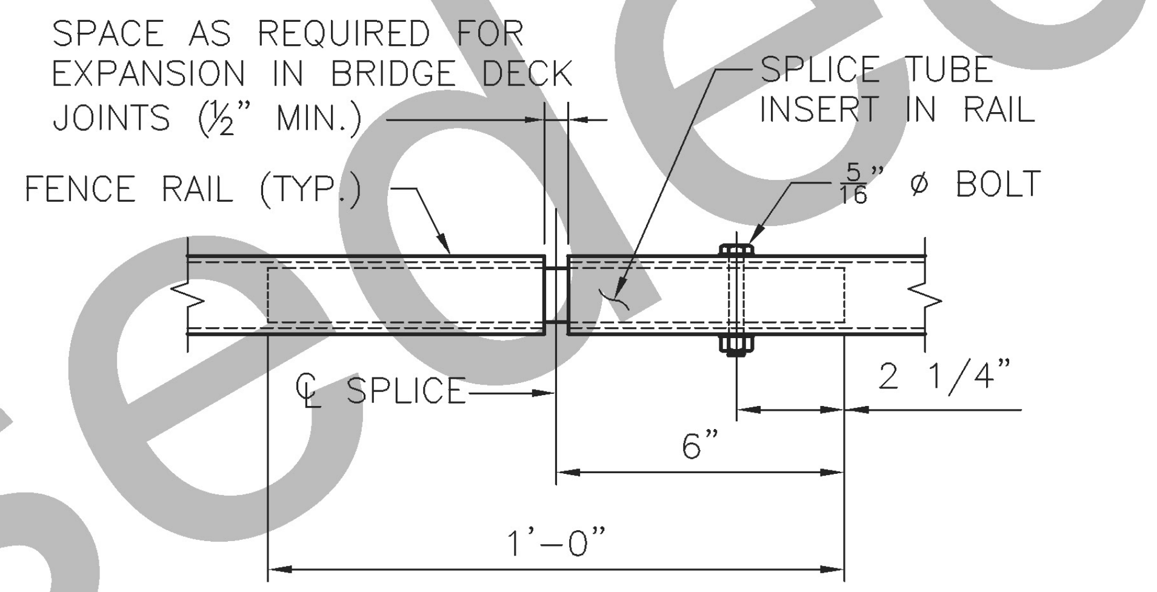
SCALE: 3" = 1'–0"


℄ 2½"ø SCH. 40 ALUMINUM PIPE INTERMEDIATE POST (2.875" O.D.)
5/16" ø BOLT (NUT TO THE OUTSIDE, TYP.)
1/4" MIN. THICKNESS (TYP.)
STANDARD SPLIT FITTING (TYP.)
1¼"ø SCH. 40 ALUMINUM RAIL (1.660" O.D., TYP.)

POST CONNECTION CLAMP

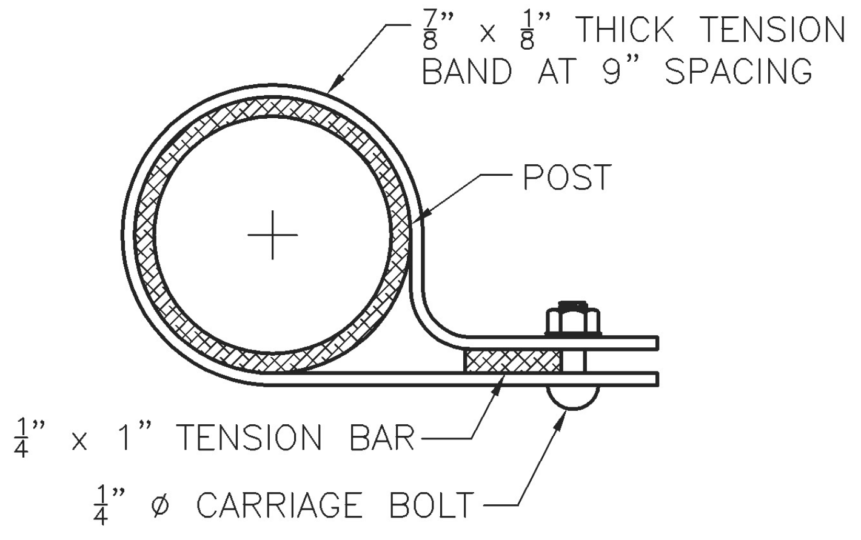
SECTION C 10.41

SCALE: 6" = 1'–0"


SPACE AS REQUIRED FOR EXPANSION IN BRIDGE DECK JOINTS (½" MIN.)
SPLICE TUBE INSERT IN RAIL
FENCE RAIL (TYP.)
5/16" ø BOLT
℄ SPLICE
2 1/4"
6"
1'–0"

RAIL SPLICE

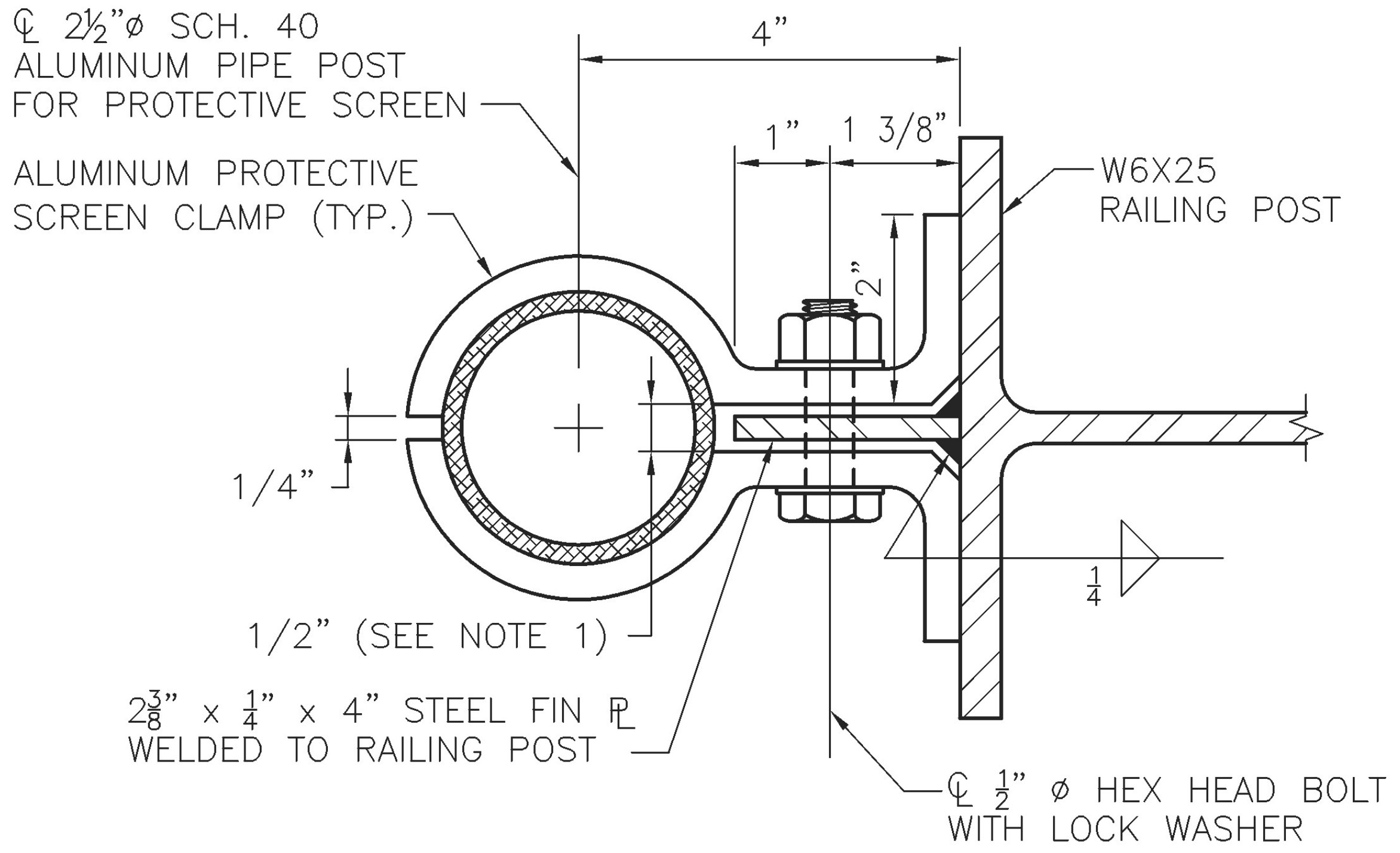
SCALE: 3" = 1'–0"



TENSION BAND CONNECTION

SECTION B 10.41

SCALE: 6" = 1'–0"


℄ 2½"ø SCH. 40 ALUMINUM PIPE POST FOR PROTECTIVE SCREEN
4"
1"
1 3/8"
ALUMINUM PROTECTIVE SCREEN CLAMP (TYP.)
W6X25 RAILING POST
2"
1/4"
1/4
1/2" (SEE NOTE 1)
2⅜" x ¾" x 4" STEEL FIN ℄ WELDED TO RAILING POST
℄ ½" ø HEX HEAD BOLT WITH LOCK WASHER

NOTES:
1. DRAW FOR FABRICATION TO ENSURE CLAMPING ACTION.
2. SLIGHT VARIATIONS IN EXTRUSION DIMENSIONS MAY BE SUBMITTED FOR APPROVAL.

SECTION D 10.41

SCALE: 6" = 1'–0"

NOTES:

1 ALL POSTS SHALL BE SET VERTICAL UNLESS OTHERWISE SPECIFIED.

2 MAXIMUM POST SPACING SHALL BE 8'–0".

3 POSTS, RAILS, TENSION BARS, RAIL SPLICES, WASHERS AND POST CONNECTION CLAMPS SHALL BE ALUMINUM ALLOY 6061–T6 ASTM DESIGNATION B 221.

4 THE ALUMINUM FABRIC SHALL BE ALUMINUM ALLOY 6061–T89–94 ASTM DESIGNATION B 221, NO. 9 GAUGE (0.148" DIAMETER).

5 THE WIRE TIES SHALL BE ALUMINUM ALLOY 1100–H–18 NO. 6 GAUGE (0.194" DIAMETER).

6 THE TENSION BANDS SHALL BE ALUMINUM ALLOY 6063–T5 ASTM DESIGNATION B 221.

7 THE BOLTS SHALL BE STAINLESS STEEL ASTM DESIGNATION A 193 (AISI TYPE 304) Fy = 30 KSI.

8 THE NUTS SHALL BE STAINLESS STEEL ASTM DESIGNATION A 194.

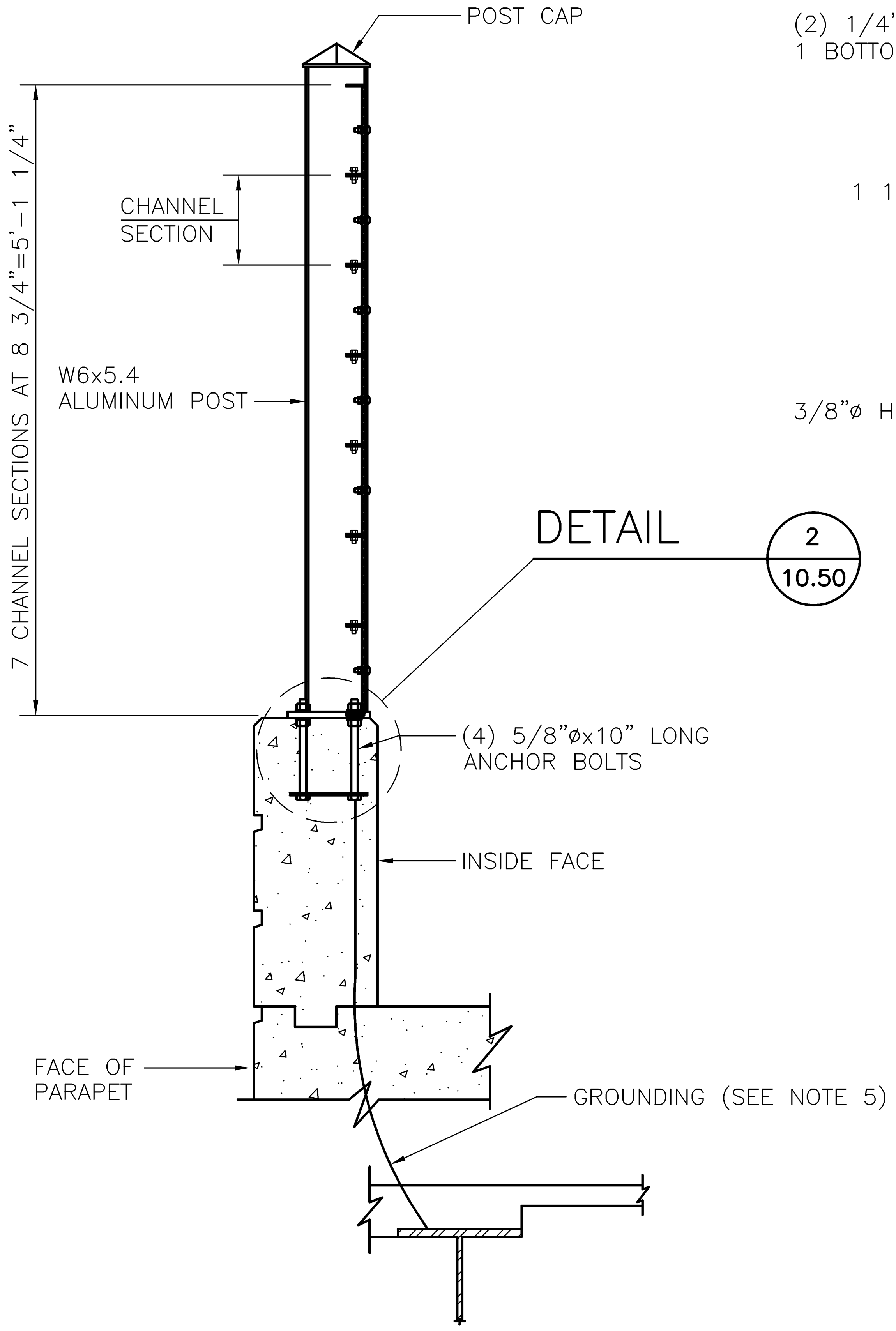
REVISIONS	
No.	DATE

RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

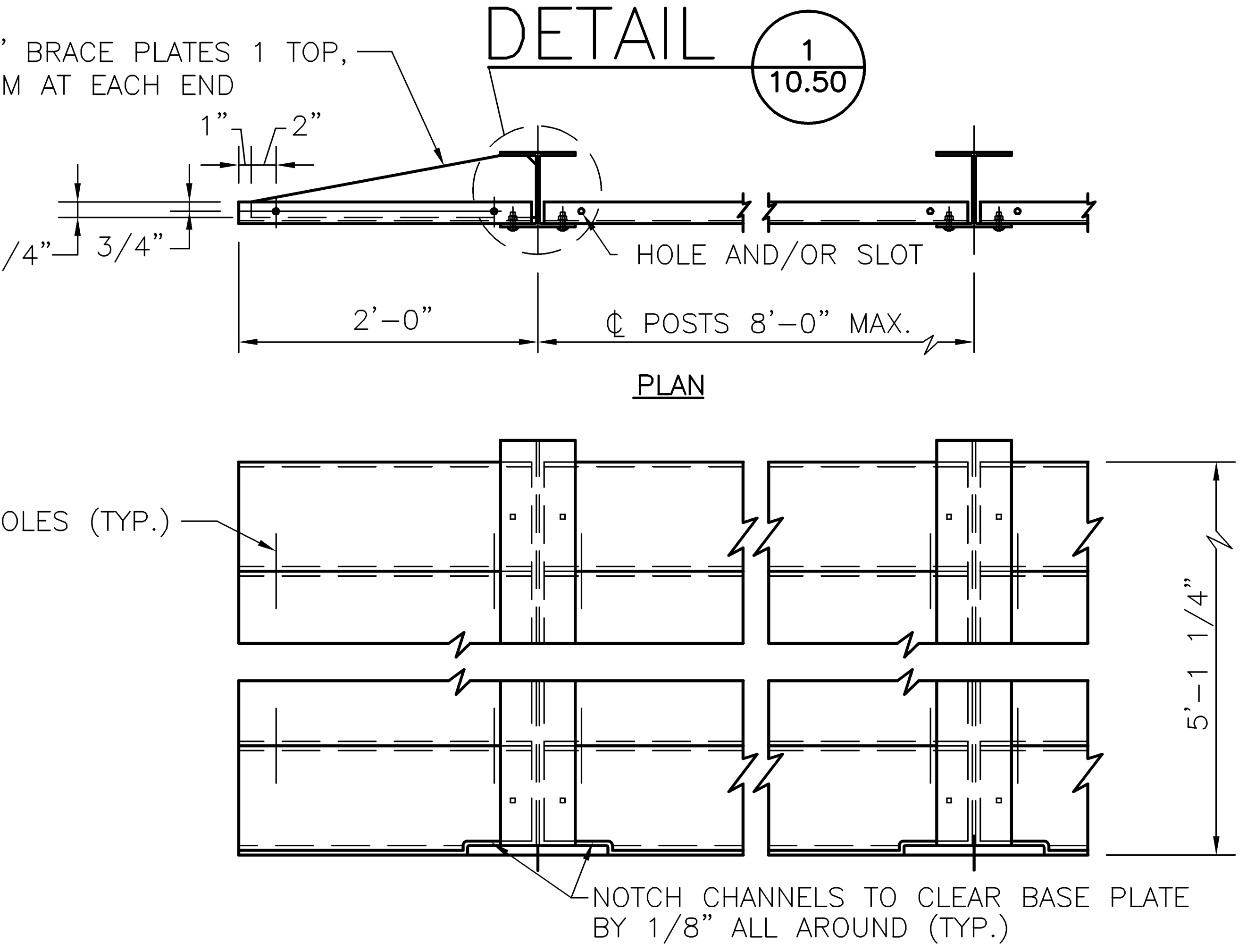
BRIDGE STANDARDS

PROTECTIVE SCREEN
(CHAIN LINK FENCE)
SHEET 2

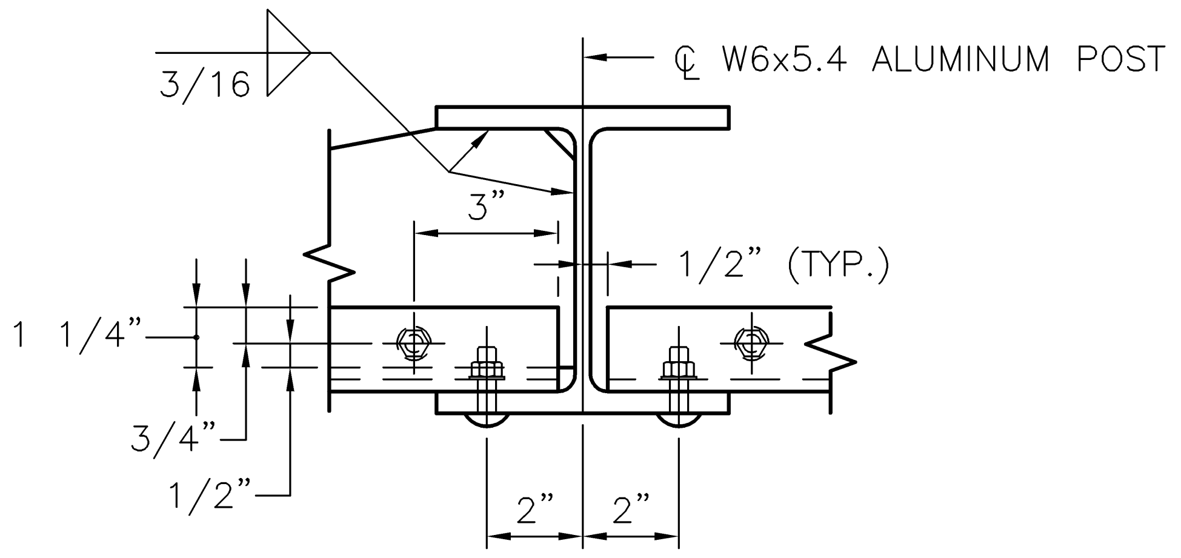
DRAWING NUMBER: 10.41



TYPICAL SECTION THRU PROTECTIVE BARRIER RAILING

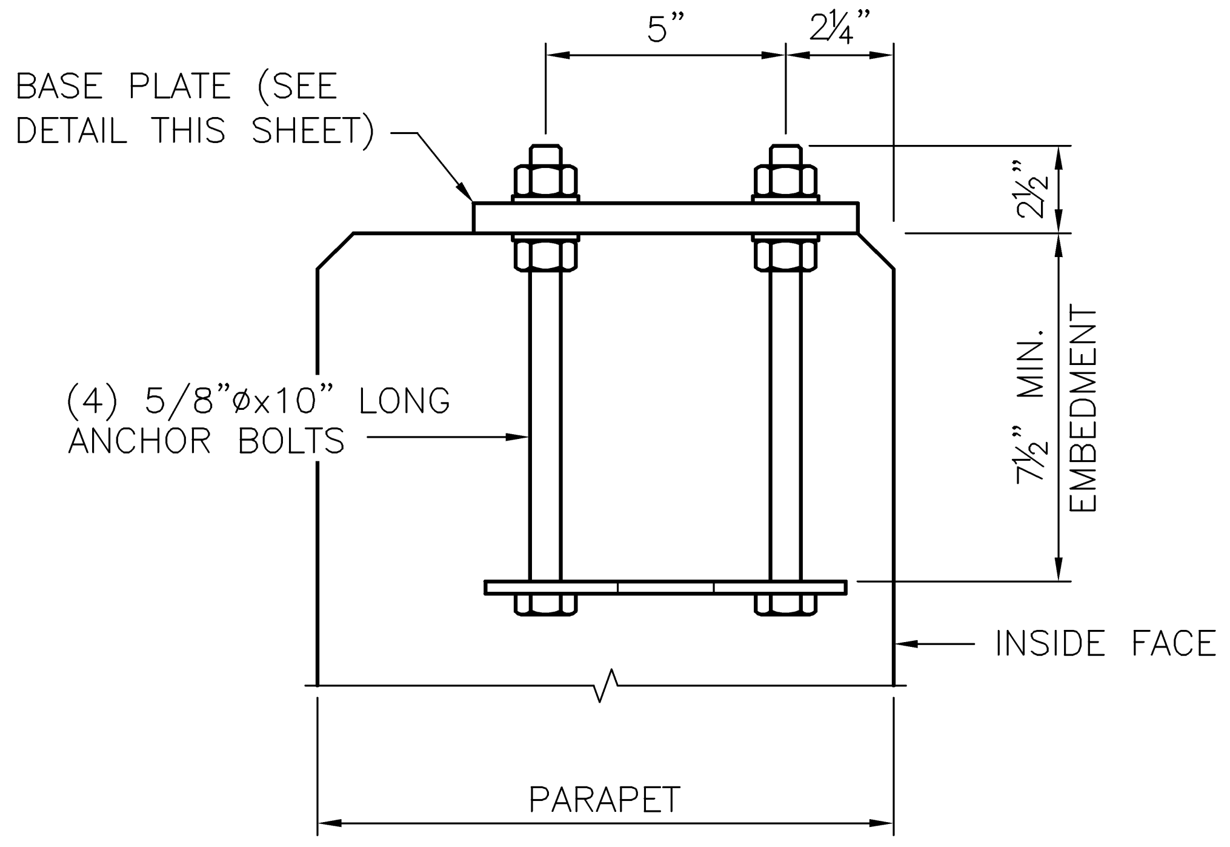

(2) 1/4" BRACE PLATES 1 TOP, 1 BOTTOM AT EACH END
DETAIL 1 10.50
1"
2"
1 1/4"
3/4"
HOLE AND/OR SLOT
2'-0"
℄ POSTS 8'-0" MAX.
PLAN
3/8"ø HOLES (TYP.)
5'-1 1/4"
NOTCH CHANNELS TO CLEAR BASE PLATE BY 1/8" ALL AROUND (TYP.)
ELEVATION

END OF PROTECTIVE SCREEN



DETAIL 1/10.50

SCALE:=3"=1'-0"


5"
2¼"
BASE PLATE (SEE DETAIL THIS SHEET)
2½"
(4) 5/8"ø x10" LONG ANCHOR BOLTS
7½" MIN. EMBEDMENT
INSIDE FACE
PARAPET

DETAIL 2/10.50

SCALE:=3"=1'-0"

DESIGNER NOTES:

1. *THE RAILROAD PROTECTIVE BARRIER RAILING SHOULD BE USED FOR BRIDGES SPANNING RAILROAD TRACKS AND WHEN PLANS FOR FUTURE TRACK ELECTRIFICATION IS ANTICIPATED. THE USE OF THESE TYPES OF PROTECTIVE BARRIER RAILINGS SHALL BE COORDINATED WITH AND APPROVED BY THE DEPARTMENT.*
2. *THE NOTES PROVIDED BELOW SHALL BE INCLUDED ON THE CONTRACT DRAWINGS.*
3. *USE SAME DETAILS FOR PROTECTIVE SCREEN BARRIER (BARRIER TYPE) MOUNTED ON JERSEY BARRIER SHAPED PARAPETS.*

NOTES:

1 ALL SHAPES AND PLATES (EXCEPT 1/4" ANCHOR PLATE) TO BE ALUMINUM DESIGNATION 6061–T6 (ASTM DESIGNATION B221).

2 MATERIAL FOR ANCHOR BOLTS SHALL CONFORM TO ASTM A 276, TYPE 430 STAINLESS STEEL, ANNEALED HOT FINISH, ULTIMATE STRENGTH 70,000 PSI MIN., 20% MIN. ELONGATION. THREAD TO BE ROLLED AND NOT CUT.

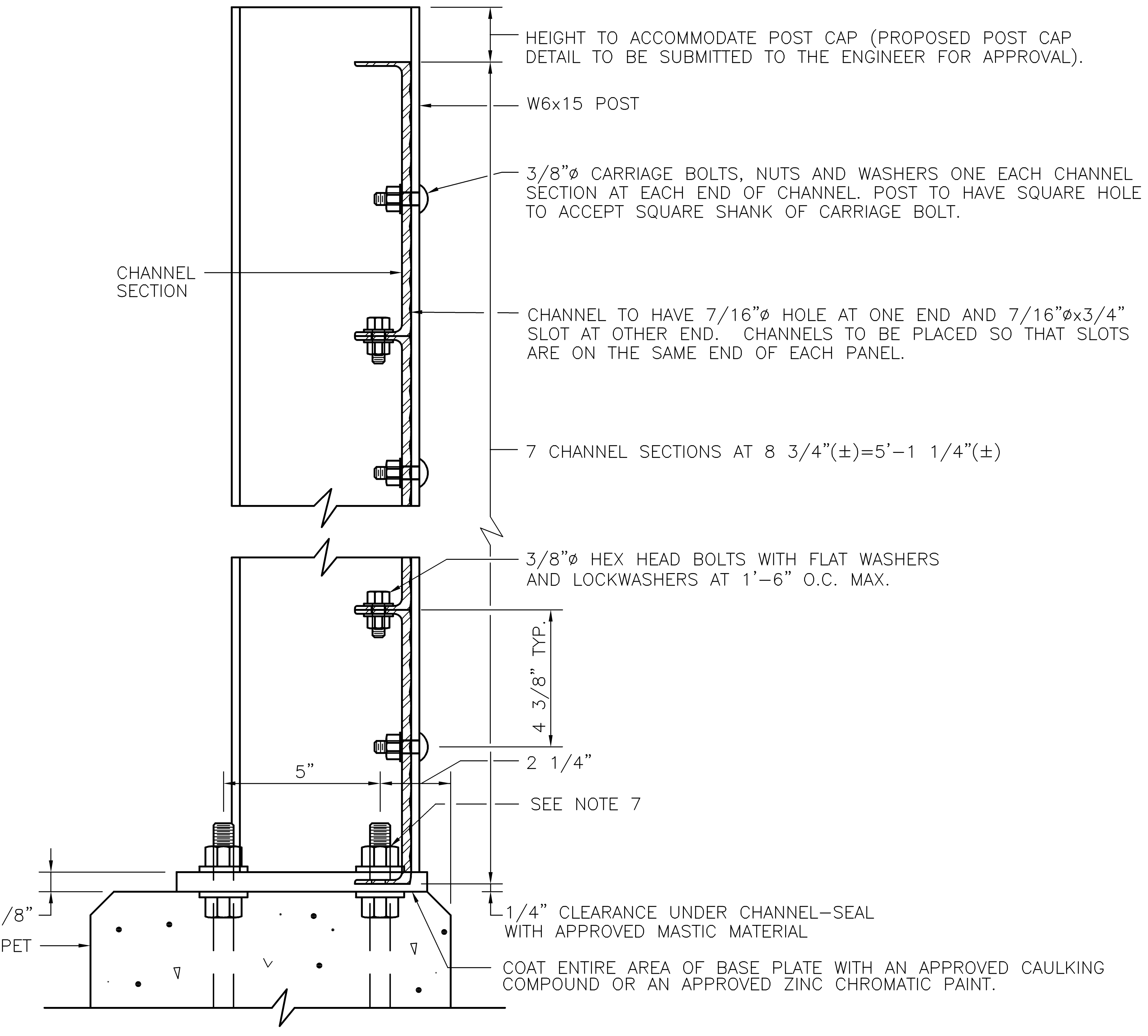
3 ALL HARDWARE NOT SPECIFICALLY CALLED FOR ON ANY DETAIL SHALL BE STAINLESS STEEL ASTM A 193 (AISI TYPE 304).

4 COST OF POST CAPS TO BE INCLUDED IN TOTAL COST OF THE PROTECTIVE SCREEN.

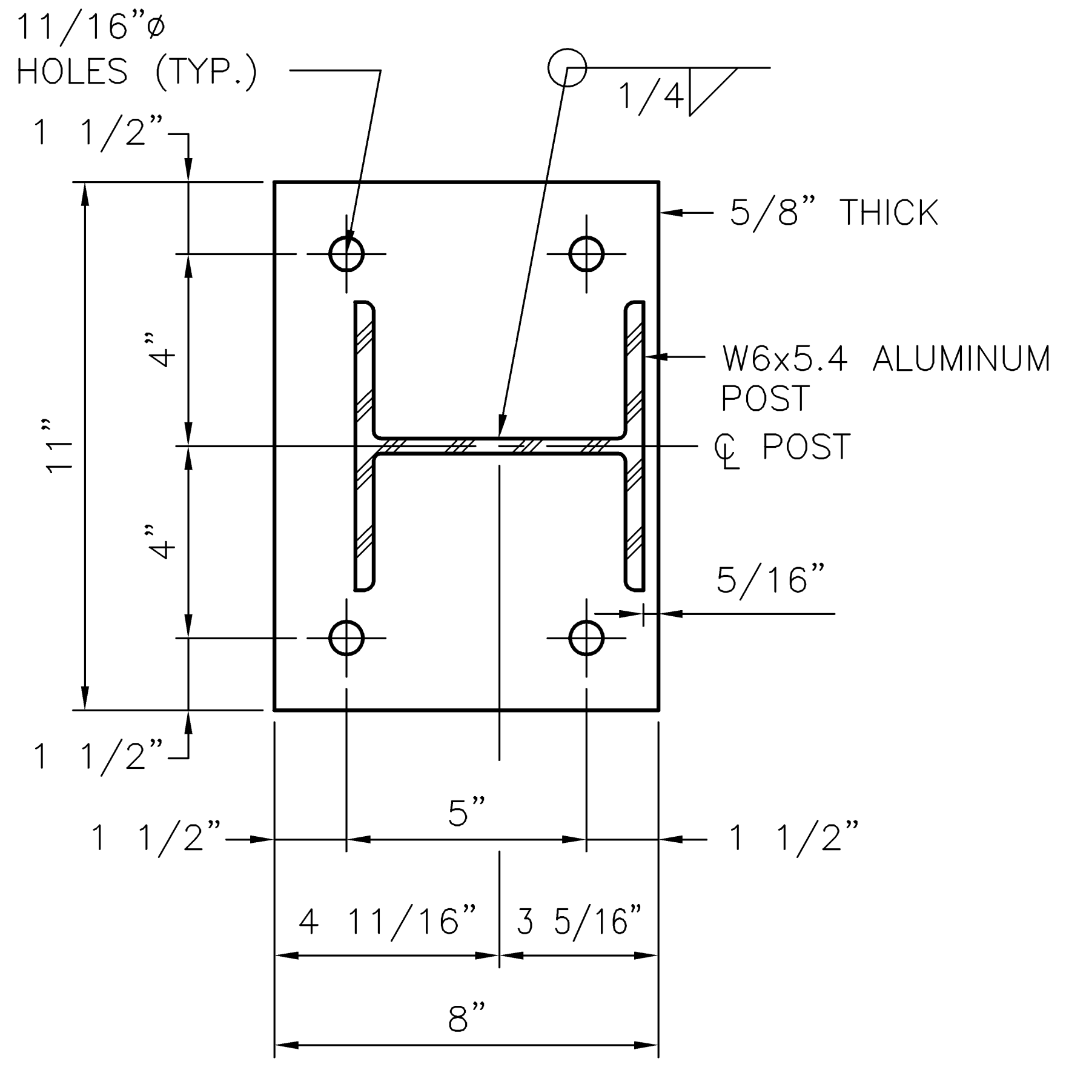
5 AN APPROVED METHOD OF GROUNDING THE PROTECTIVE SCREEN TO THE STRUCTURAL STEEL AND OF GROUNDING THE STRUCTURAL STEEL WILL BE REQUIRED. THIS DETAIL MUST BE COORDINATED WITH THE GOVERNING RAILROAD AGENCY.

6 POST SPACING TO BE 8'–0" MAX.

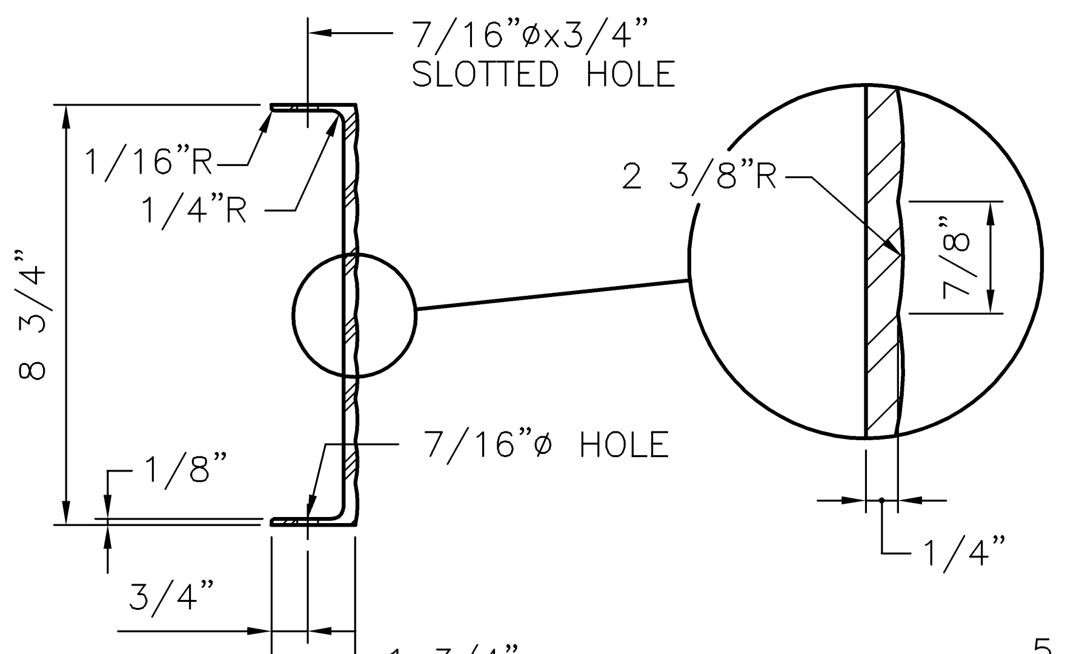
7 ANCHOR BOLT HEX NUTS & WASHERS TO BE STAINLESS STEEL AND STRUCTURALLY COMPATIBLE WITH ANCHOR BOLTS.


HEIGHT TO ACCOMMODATE POST CAP (PROPOSED POST CAP DETAIL TO BE SUBMITTED TO THE ENGINEER FOR APPROVAL).
W6x15 POST
3/8"ø CARRIAGE BOLTS, NUTS AND WASHERS ONE EACH CHANNEL SECTION AT EACH END OF CHANNEL. POST TO HAVE SQUARE HOLE TO ACCEPT SQUARE SHANK OF CARRIAGE BOLT.
CHANNEL SECTION
CHANNEL TO HAVE 7/16"ø HOLE AT ONE END AND 7/16"øx3/4" SLOT AT OTHER END. CHANNELS TO BE PLACED SO THAT SLOTS ARE ON THE SAME END OF EACH PANEL.
7 CHANNEL SECTIONS AT 8 3/4"(±)=5'-1 1/4"(±)
3/8"ø HEX HEAD BOLTS WITH FLAT WASHERS AND LOCKWASHERS AT 1'-6" O.C. MAX.
4 3/8" TYP.
2 1/4"
5"
SEE NOTE 7
5/8"
BRIDGE PARAPET
1/4" CLEARANCE UNDER CHANNEL-SEAL WITH APPROVED MASTIC MATERIAL
COAT ENTIRE AREA OF BASE PLATE WITH AN APPROVED CAULKING COMPOUND OR AN APPROVED ZINC CHROMATIC PAINT.

TYPICAL SECTION AT POST



BASE PLATE DETAIL



CHANNEL SECTION

AN ALTERNATE CHANNEL SECTION MAY BE SUBSTITUTED SUBJECT TO APPROVAL BY THE ENGINEER.

THIS SHEET IS NOT TO SCALE

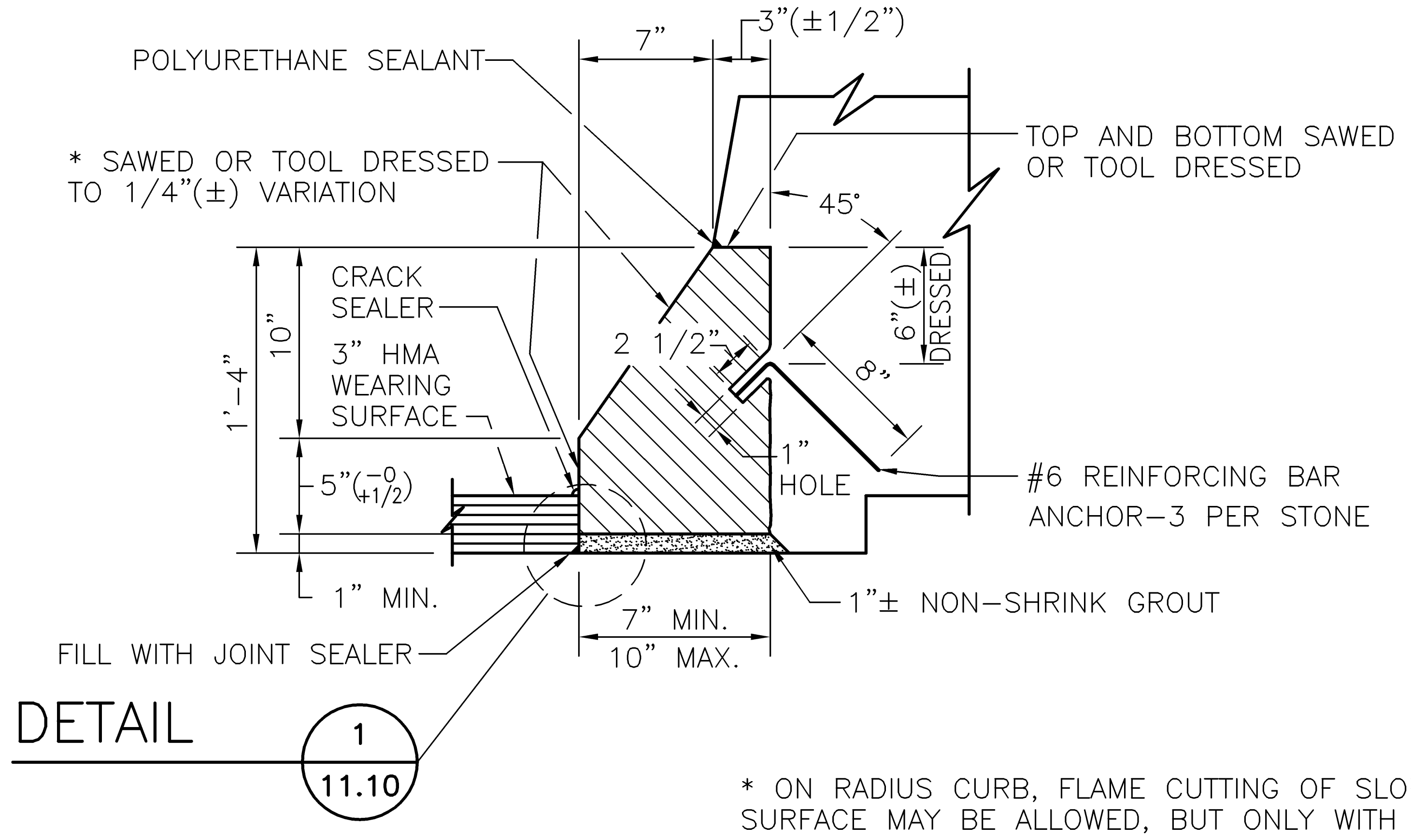
REVISIONS	
No.	DATE

RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

BRIDGE STANDARDS

PROTECTIVE SCREEN
(BARRIER TYPE)

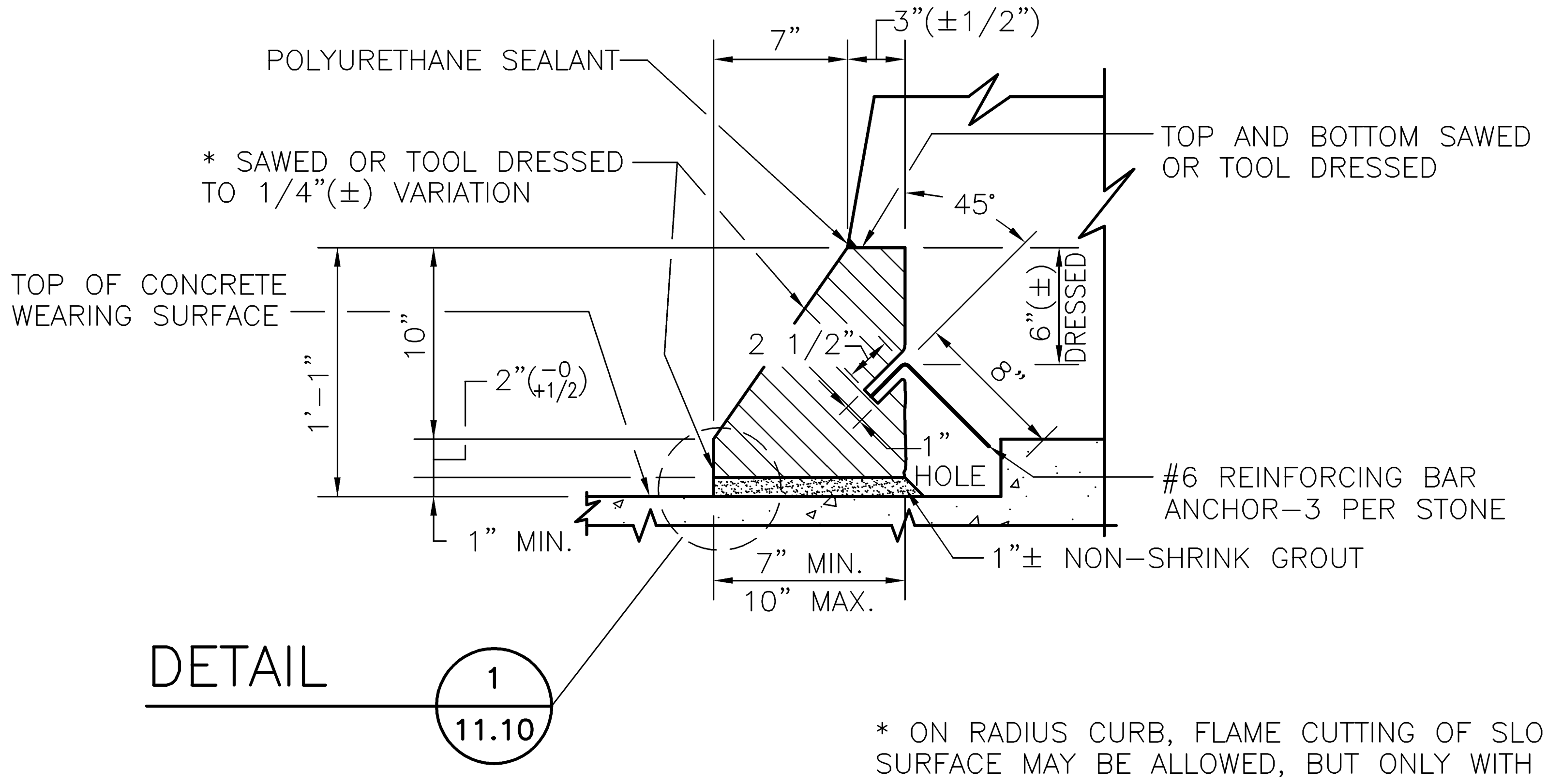
DRAWING NUMBER: 10.50



* ON RADIUS CURB, FLAME CUTTING OF SLOPED SURFACE MAY BE ALLOWED, BUT ONLY WITH THE APPROVAL OF THE BRIDGE ENGINEER.

10"x15" SLOPE FACE GRANITE CURB

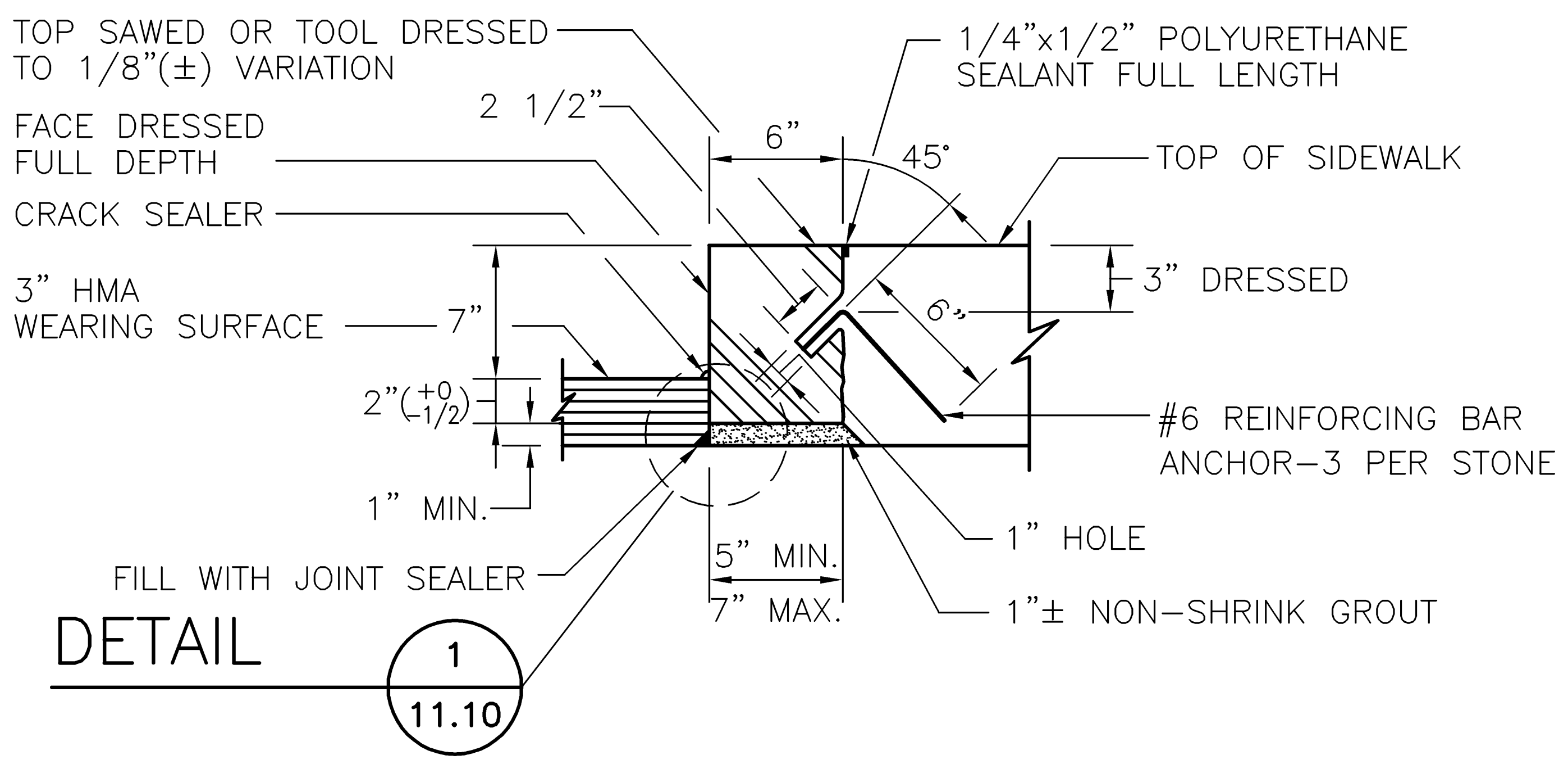
SCALE: 1 1/2"=1'-0"


POLYURETHANE SEALANT
7"
3"(±1/2")
* SAWED OR TOOL DRESSED TO 1/4"(±) VARIATION
TOP AND BOTTOM SAWED OR TOOL DRESSED
45°
6"(±) DRESSED
TOP OF CONCRETE WEARING SURFACE
1'-1"
10"
2"($^{-0}_{+1/2}$)
2 1/2"
8"
1" HOLE
#6 REINFORCING BAR ANCHOR-3 PER STONE
1" MIN.
7" MIN.
10" MAX.
1"± NON-SHRINK GROUT
DETAIL
1
11.10

* ON RADIUS CURB, FLAME CUTTING OF SLOPED SURFACE MAY BE ALLOWED, BUT ONLY WITH THE APPROVAL OF THE BRIDGE ENGINEER.

10"x12" SLOPE FACE GRANITE CURB

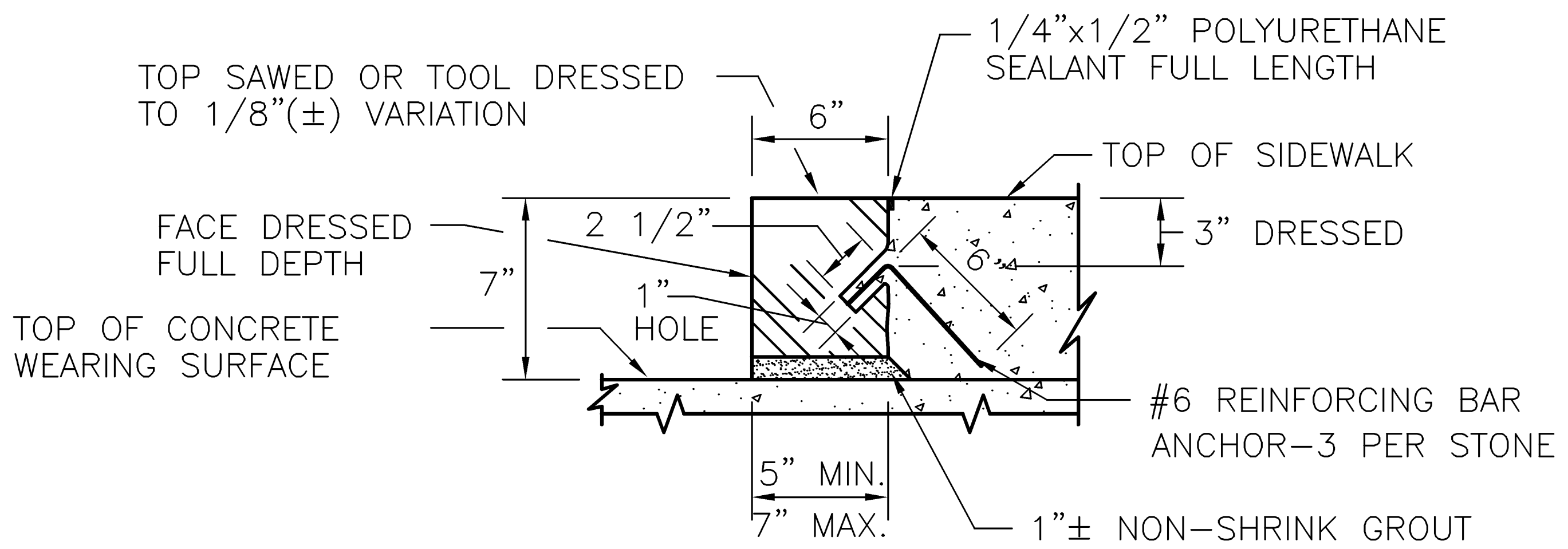
SCALE: 1 1/2"=1'-0"



6"x9" VERTICAL FACE GRANITE CURB

(HMA WEARING SURFACE)

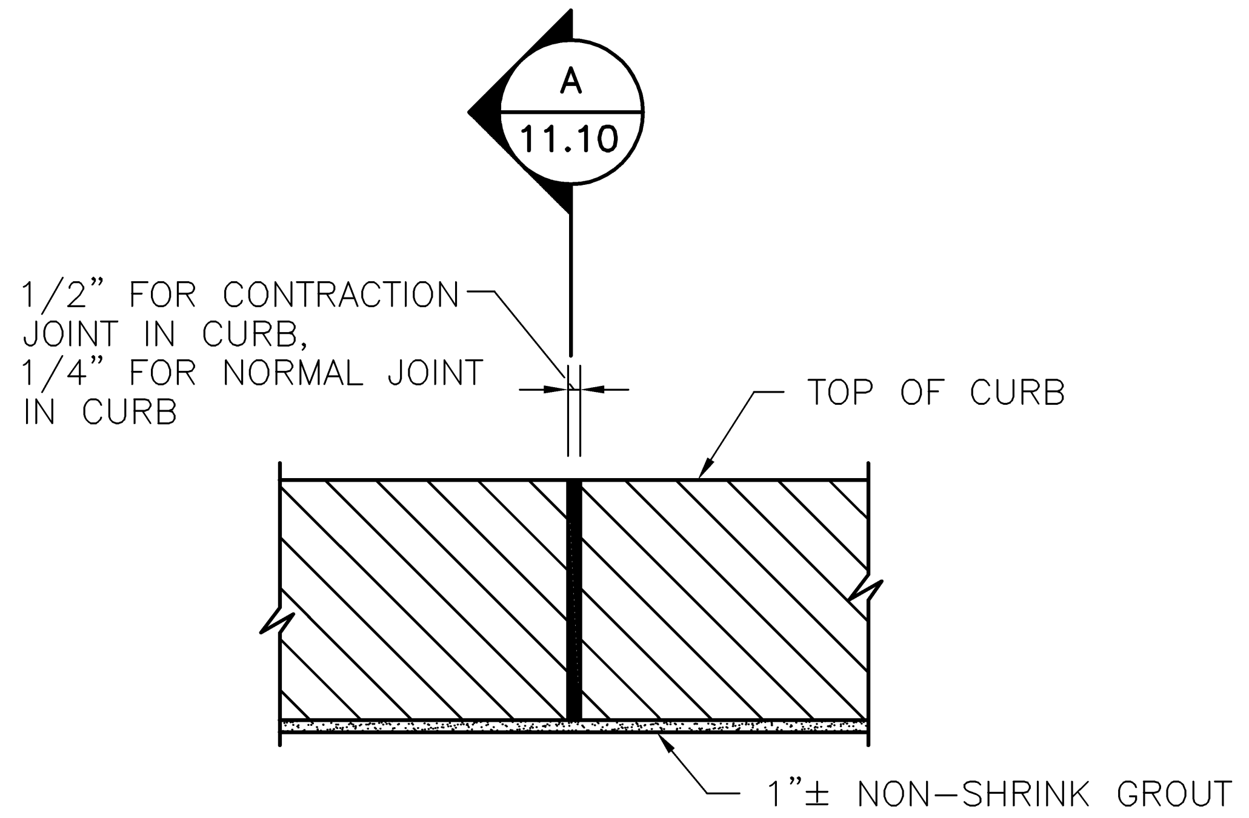
SCALE: 1 1/2"=1'-0"


TOP SAWED OR TOOL DRESSED TO 1/8"(±) VARIATION
1/4"x1/2" POLYURETHANE SEALANT FULL LENGTH
6"
TOP OF SIDEWALK
FACE DRESSED FULL DEPTH
2 1/2"
6"
3" DRESSED
7"
1" HOLE
TOP OF CONCRETE WEARING SURFACE
#6 REINFORCING BAR ANCHOR-3 PER STONE
5" MIN.
7" MAX.
1"± NON-SHRINK GROUT

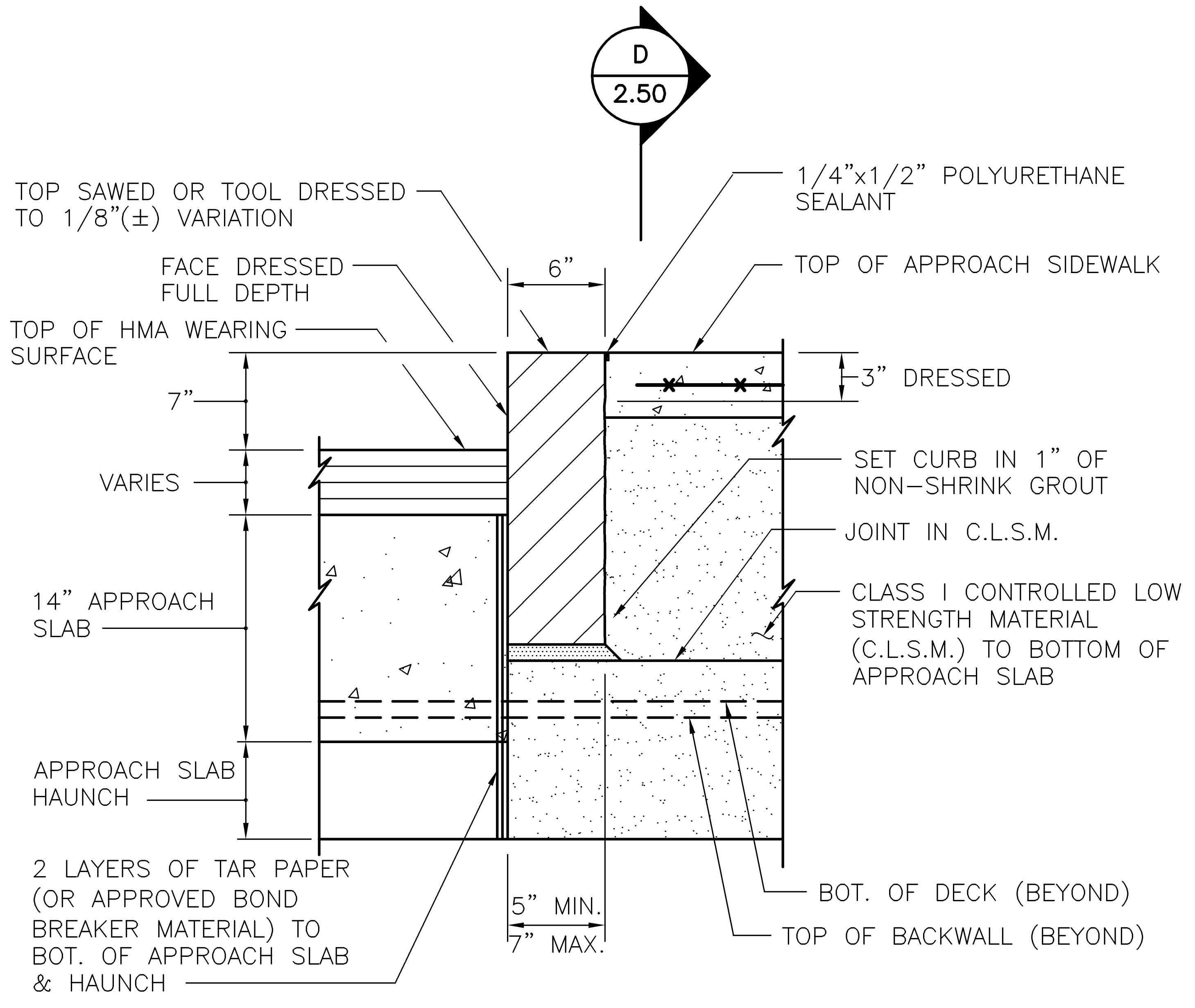
6"x6" VERTICAL FACE GRANITE CURB

(CONCRETE WEARING SURFACE)

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


A
11.10
1/2" FOR CONTRACTION JOINT IN CURB, 1/4" FOR NORMAL JOINT IN CURB
TOP OF CURB
1"± NON-SHRINK GROUT

ELEVATION AT FACE OF CURB


D
2.50
TOP SAWED OR TOOL DRESSED TO 1/8"(±) VARIATION
1/4"x1/2" POLYURETHANE SEALANT
FACE DRESSED FULL DEPTH
6"
TOP OF APPROACH SIDEWALK
TOP OF HMA WEARING SURFACE
3" DRESSED
7"
SET CURB IN 1" OF NON-SHRINK GROUT
VARIES
JOINT IN C.L.S.M.
14" APPROACH SLAB
CLASS I CONTROLLED LOW STRENGTH MATERIAL (C.L.S.M.) TO BOTTOM OF APPROACH SLAB
APPROACH SLAB HAUNCH
2 LAYERS OF TAR PAPER (OR APPROVED BOND BREAKER MATERIAL) TO BOT. OF APPROACH SLAB & HAUNCH
5" MIN.
7" MAX.
BOT. OF DECK (BEYOND)
TOP OF BACKWALL (BEYOND)

NOTE:
BEYOND LIMITS OF APPROACH SLAB, THE CURB AND APPROACH SLAB SIDEWALK ARE SET ON A GRAVEL BASE.

6"x18" GRANITE CURB AT ABUTMENT BACKWALL

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

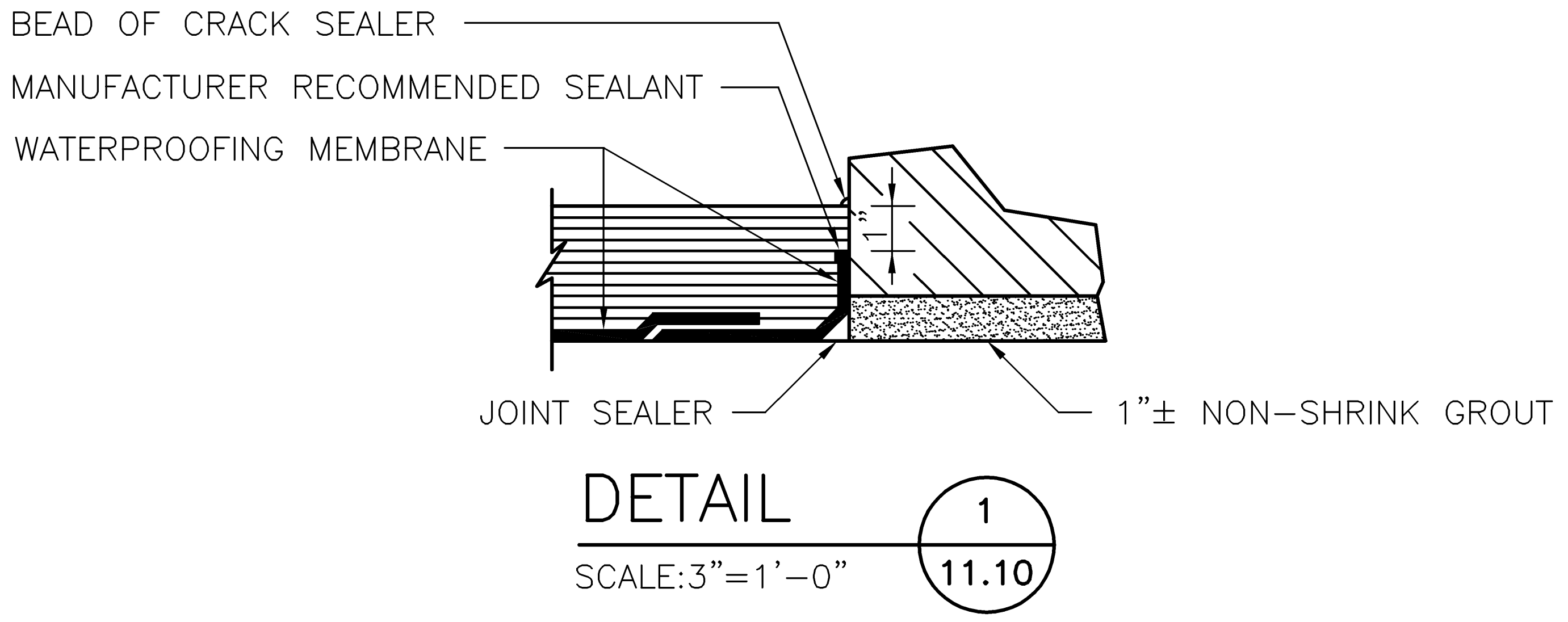
CURB NOTES:

1 FOR CUTTING TOLERANCES ON GRANITE CURB SEE R.I. STANDARD SPECIFICATION M-09.05.

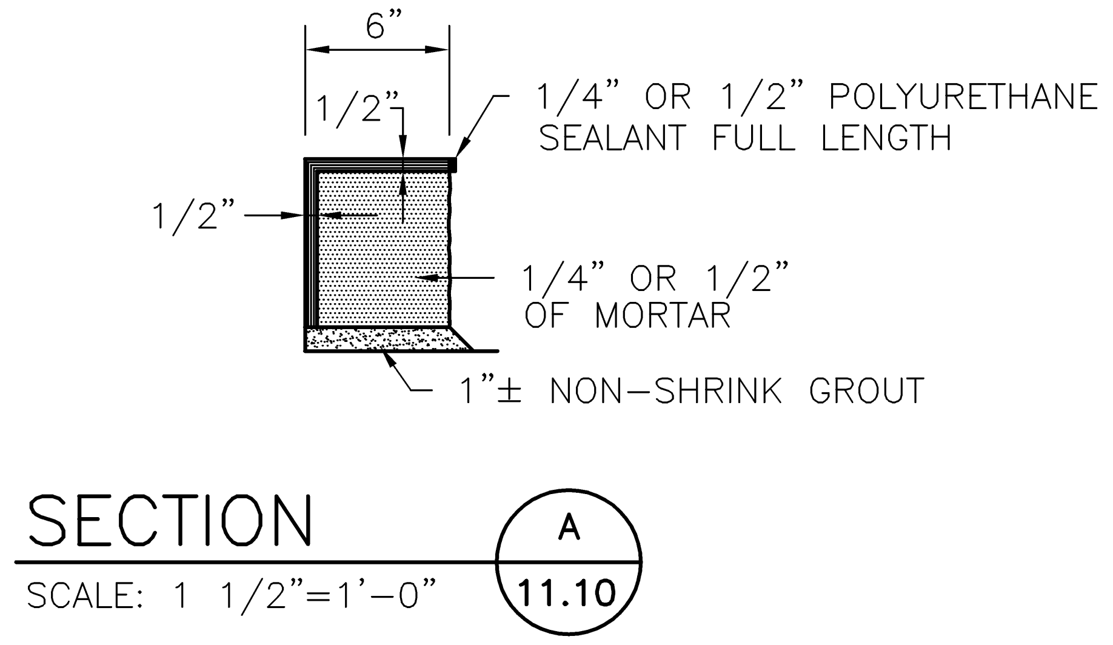
2 STRAIGHT CURB SHALL BE FURNISHED IN LENGTHS OF NOT LESS THAN 6 FEET OR GREATER THAN 10 FEET. (5 FOOT LENGTHS MAY BE ALLOWED UNDER UNUSUAL CIRCUMSTANCES, BUT ONLY WITH THE APPROVAL OF THE BRIDGE ENGINEER).

3 CURB WHICH IS SET ON A RADIUS BETWEEN 160 FEET AND 300 FEET MAY BE FURNISHED STRAIGHT IN LENGTHS NOT TO EXCEED 6 FEET.

4 CURB TO BE SET ON A RADIUS OF 160 FEET OR LESS SHALL BE CUT TO THE CURVE REQUIRED.



SCALE:3"=1'-0"



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

REVISIONS	
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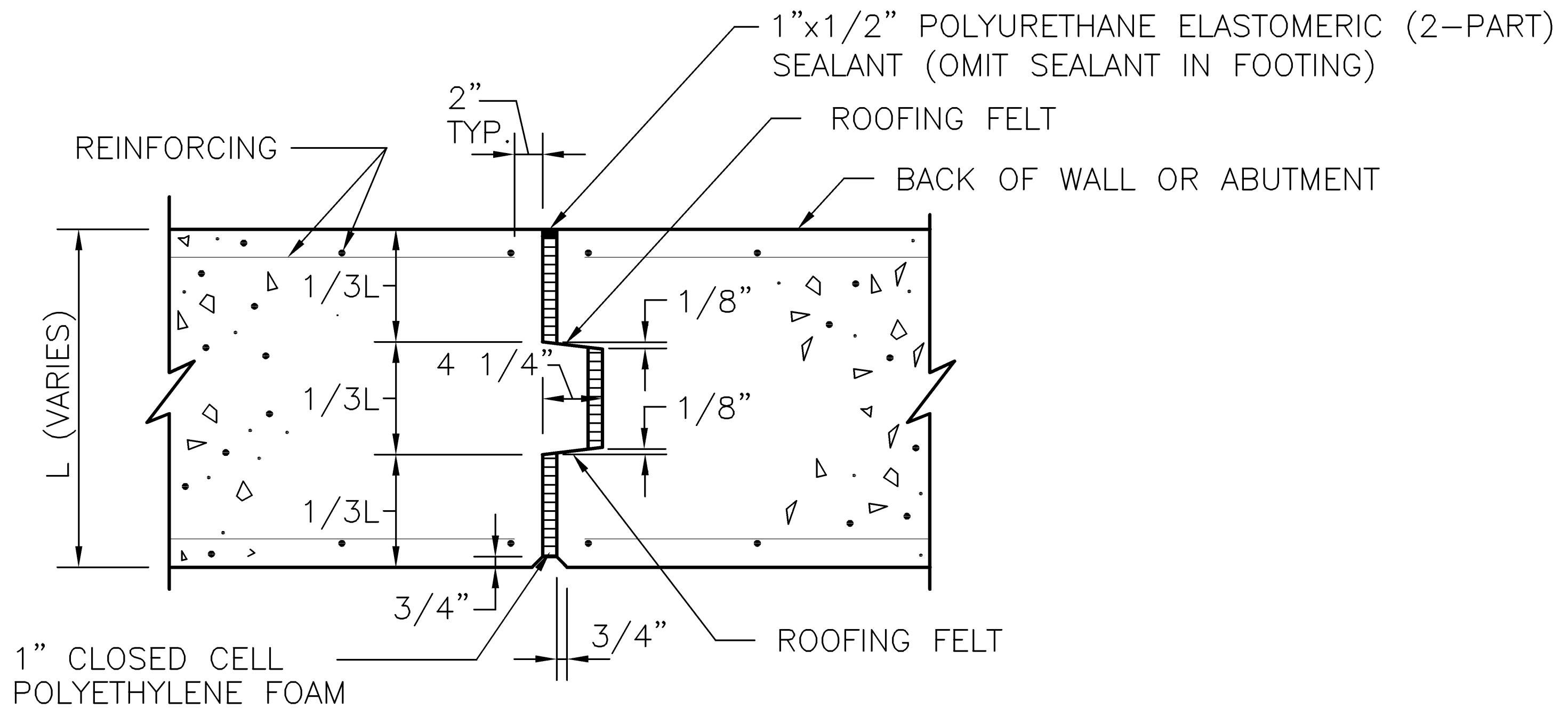
RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

BRIDGE STANDARDS

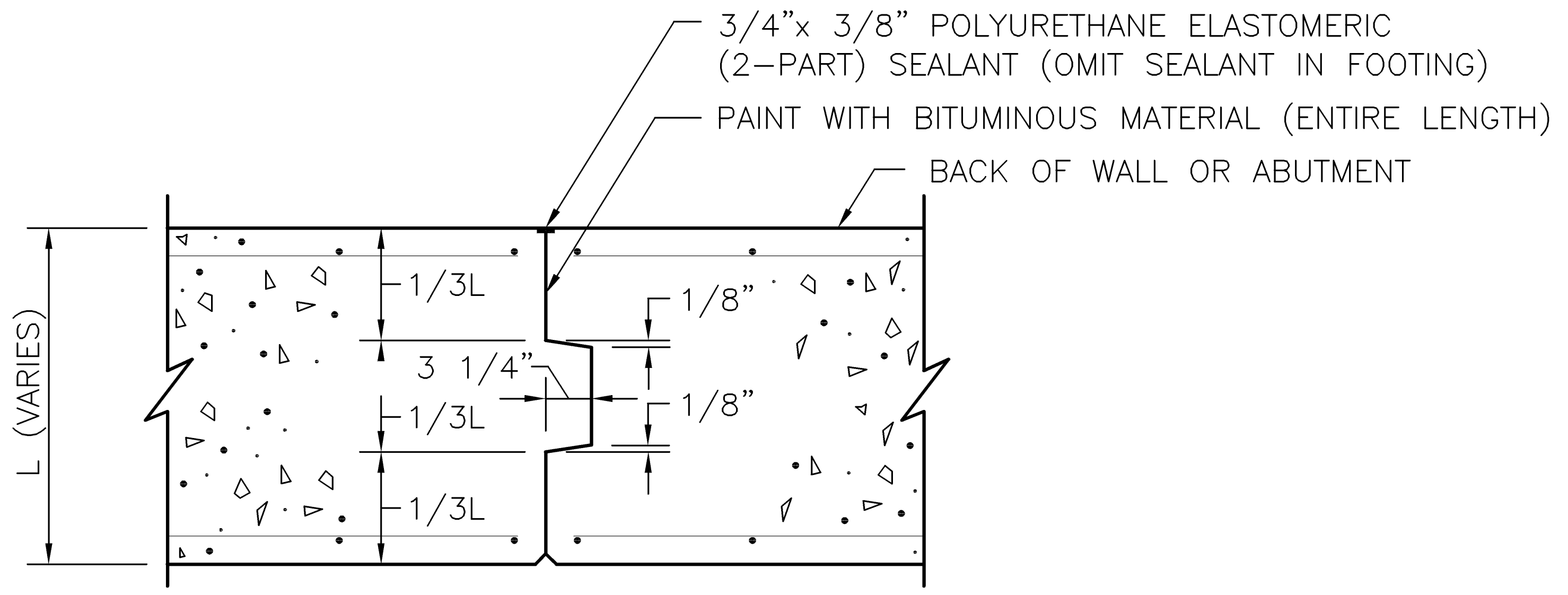
CURB DETAILS

DRAWING NUMBER: 11.10

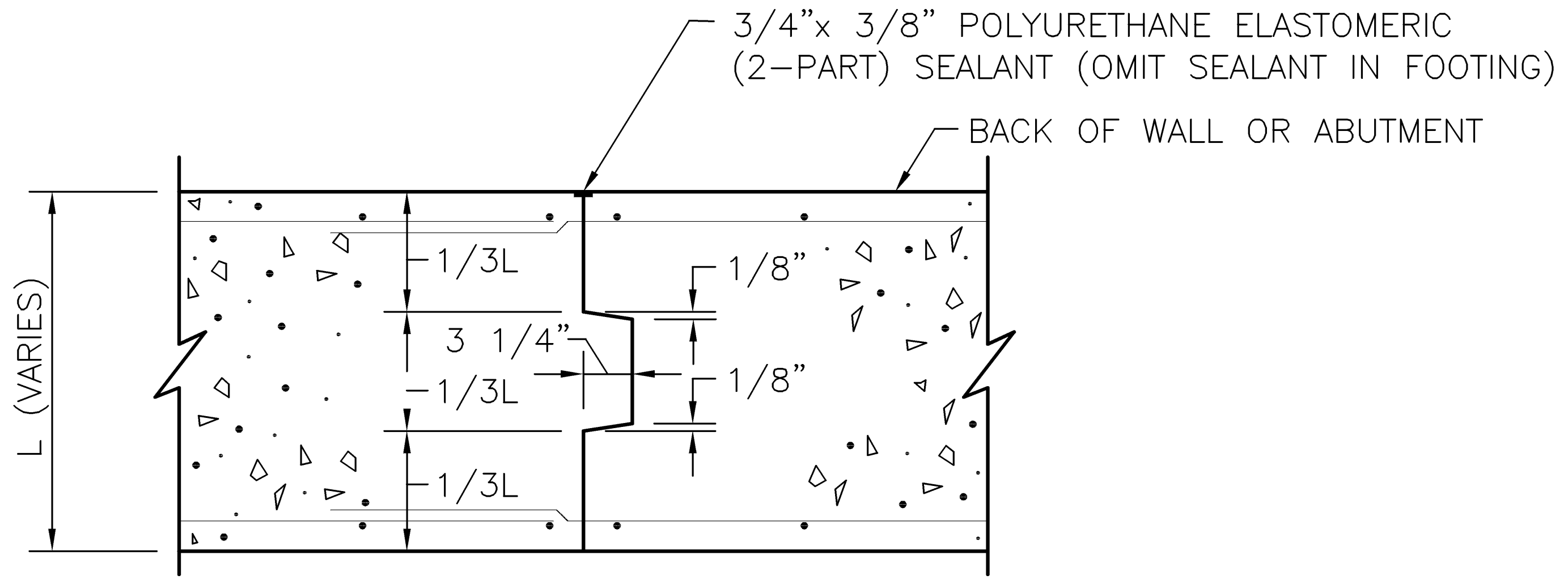
P:\1000\10027.00 On-Call Bridge Design\10027.20 Bridge Design Std Details_Drawings\Structural_Current_Drawings\RIS11-10.dwg, 7/22/2015 1:30:12 PM, JTA



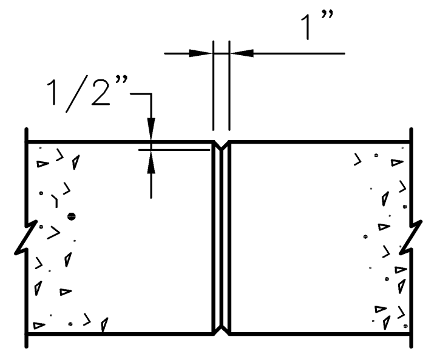
EXPANSION JOINT IN WALLS AND ABUTMENTS


3/4"x 3/8" POLYURETHANE ELASTOMERIC (2-PART) SEALANT (OMIT SEALANT IN FOOTING)
PAINT WITH BITUMINOUS MATERIAL (ENTIRE LENGTH)
BACK OF WALL OR ABUTMENT
L (VARIES)
1/3L
3 1/4"
1/3L
1/3L
1/8"
1/8"

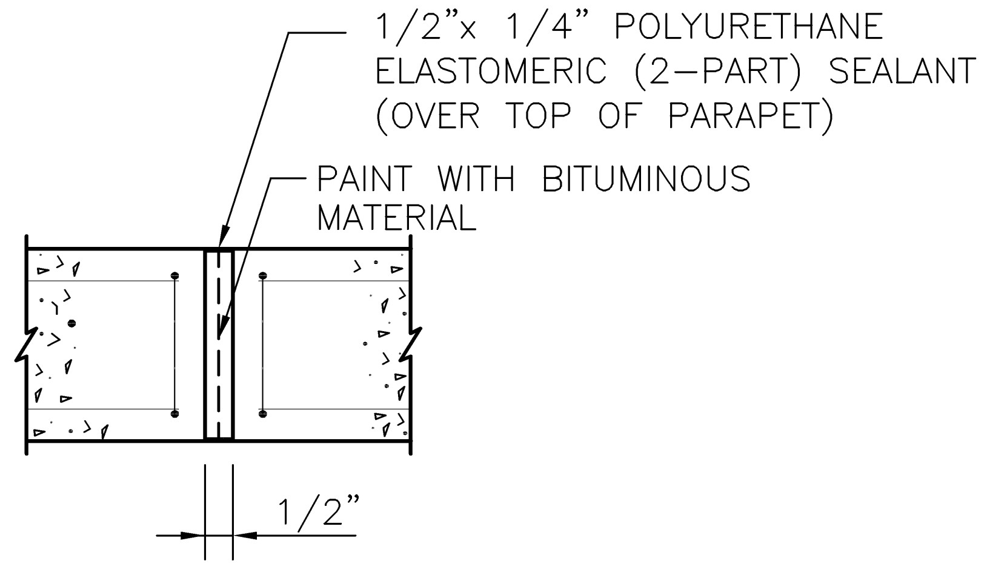
CONTRACTION JOINT IN WALLS AND ABUTMENTS


3/4"x 3/8" POLYURETHANE ELASTOMERIC (2-PART) SEALANT (OMIT SEALANT IN FOOTING)
BACK OF WALL OR ABUTMENT
L (VARIES)
1/3L
3 1/4"
1/3L
1/3L
1/8"
1/8"

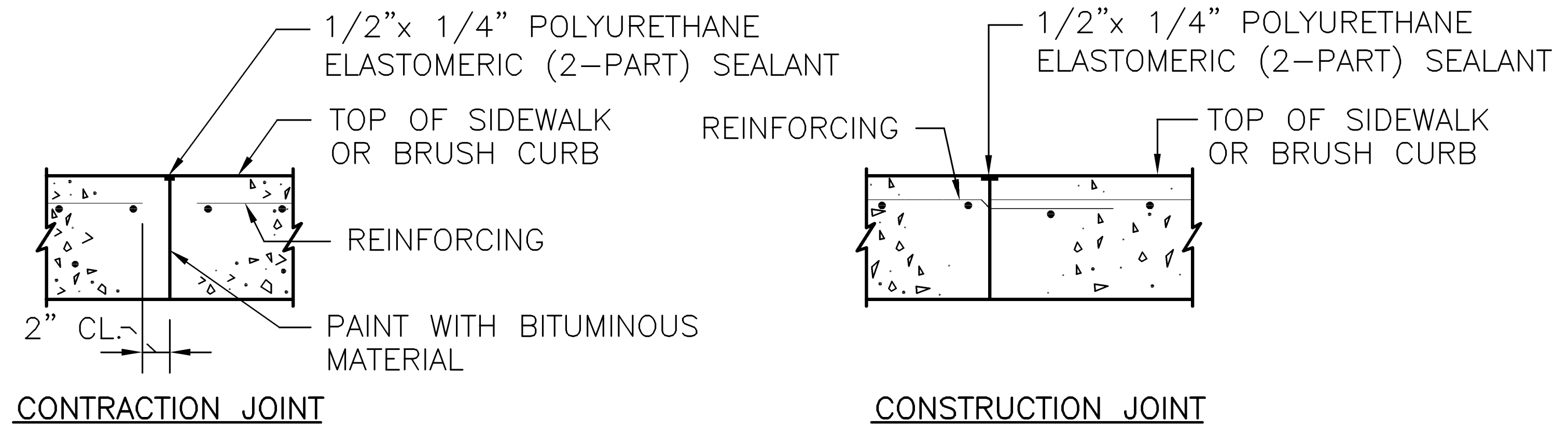
CONSTRUCTION JOINT IN WALLS AND ABUTMENTS



V-GROOVE IN PARAPET


1/2"x 1/4" POLYURETHANE ELASTOMERIC (2-PART) SEALANT (OVER TOP OF PARAPET)
PAINT WITH BITUMINOUS MATERIAL
1/2"

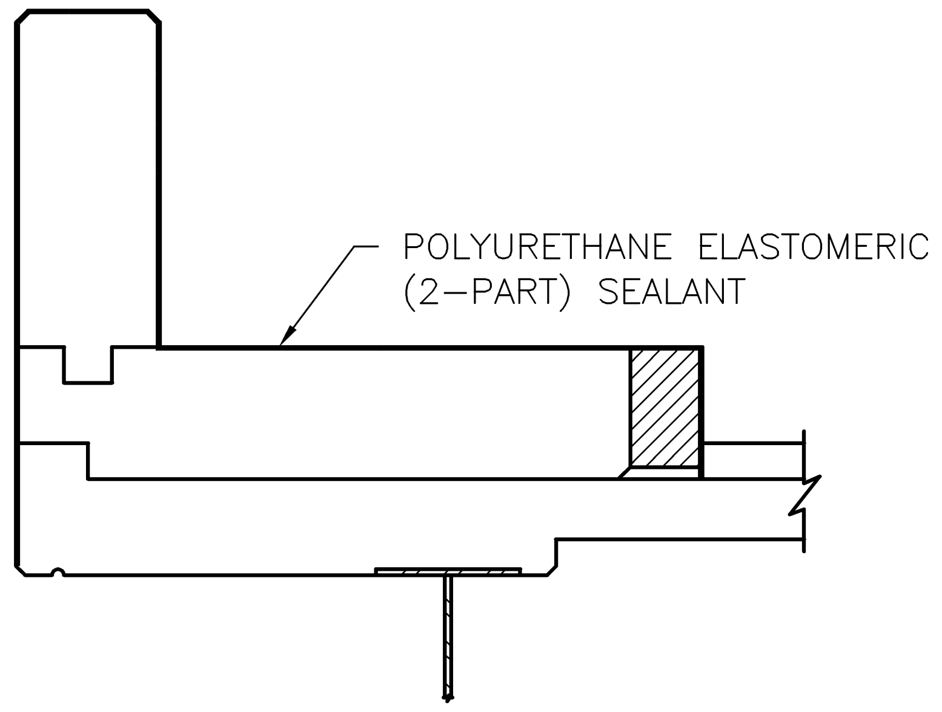
CONTRACTION JOINT IN PARAPET


1/2"x 1/4" POLYURETHANE ELASTOMERIC (2-PART) SEALANT
TOP OF SIDEWALK OR BRUSH CURB
REINFORCING
PAINT WITH BITUMINOUS MATERIAL
2" CL.
1/2"x 1/4" POLYURETHANE ELASTOMERIC (2-PART) SEALANT
REINFORCING
TOP OF SIDEWALK OR BRUSH CURB

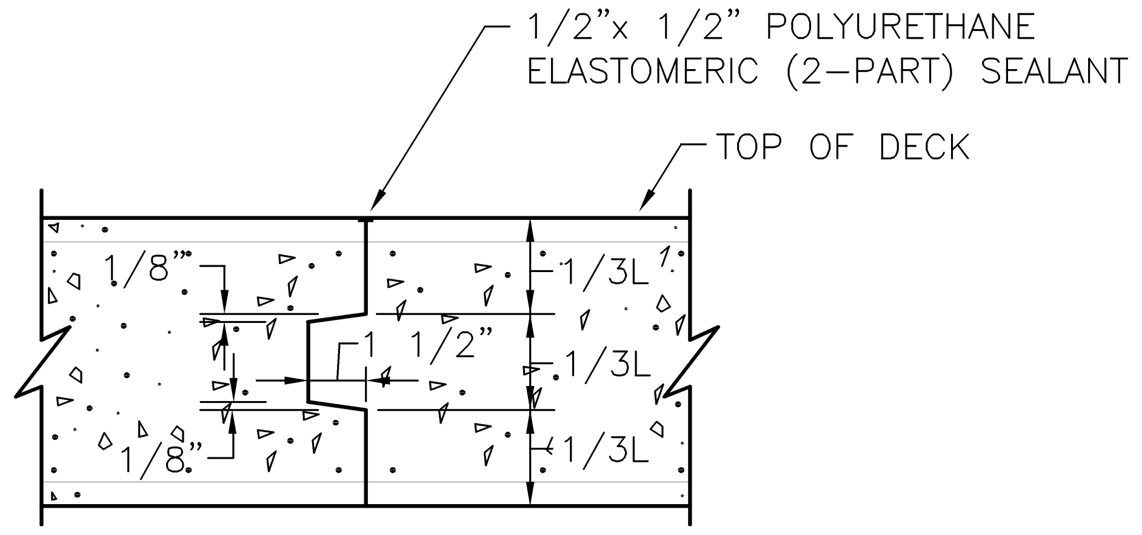
CONTRACTION JOINT

CONSTRUCTION JOINT

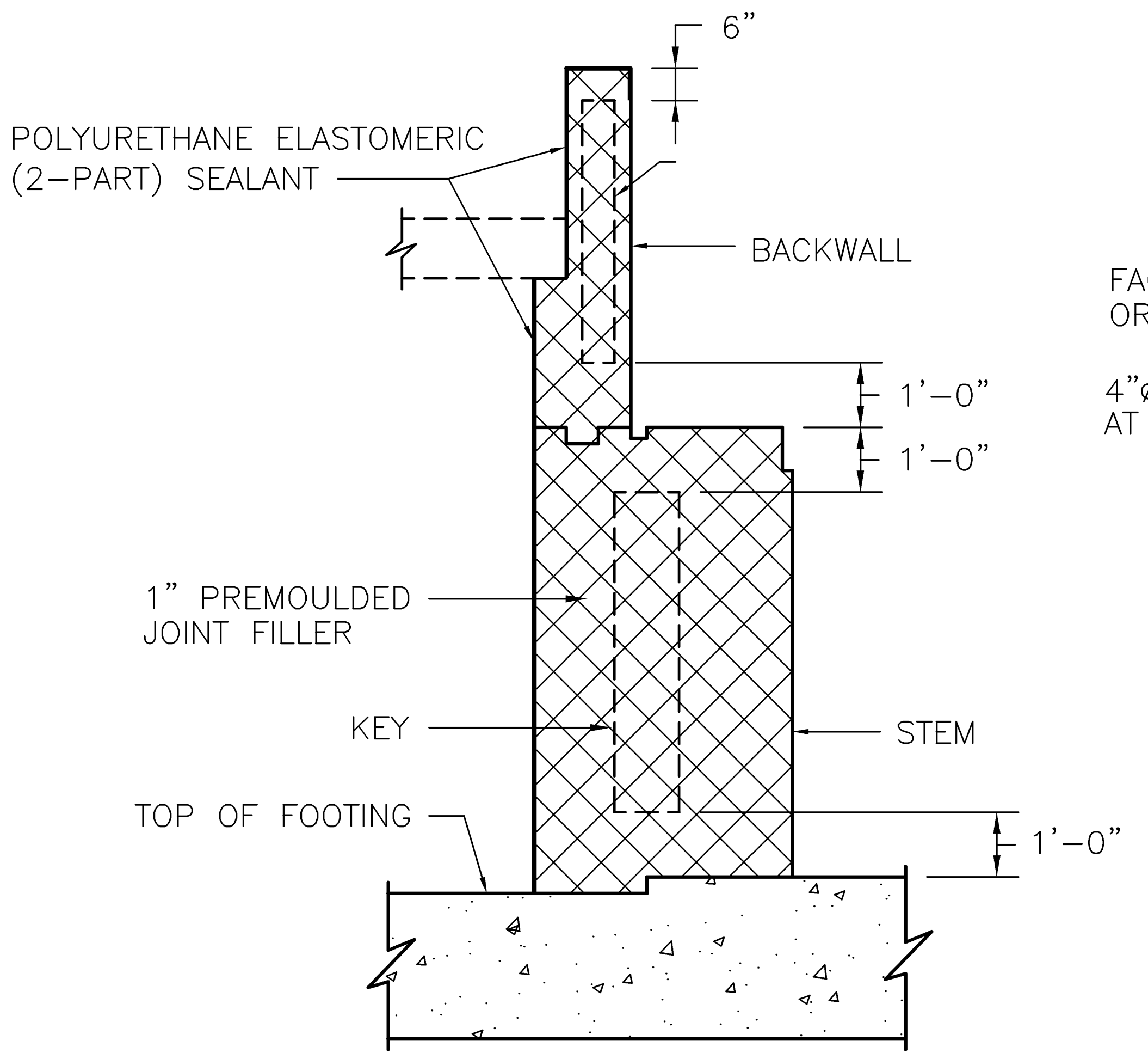
JOINTS IN SIDEWALK OR BRUSH CURB



PARAPET AND SIDEWALK CONTRACTION JOINT SEALANT LIMIT

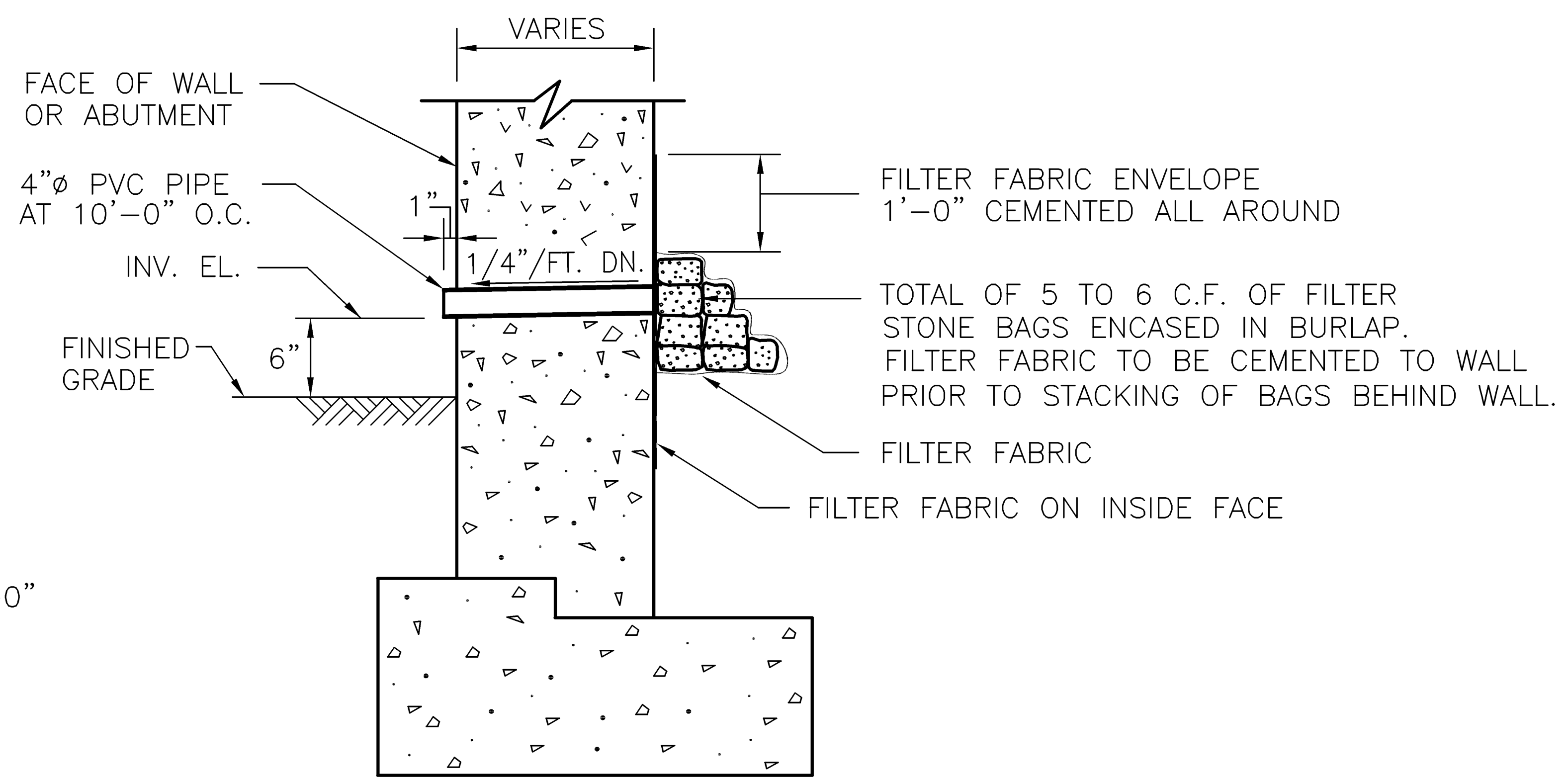


CONSTRUCTION JOINT IN DECK

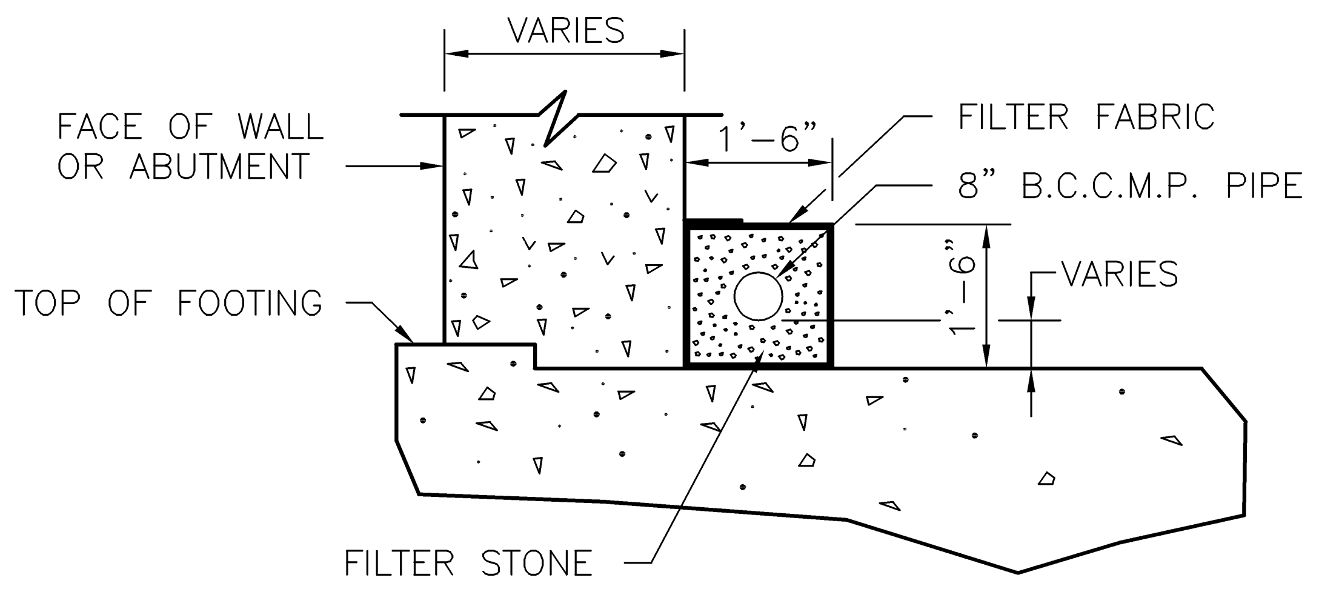

6"
POLYURETHANE ELASTOMERIC (2-PART) SEALANT
BACKWALL
1'-0"
1'-0"
1" PREMOULDED JOINT FILLER
KEY
STEM
TOP OF FOOTING
1'-0"

TYPICAL SECTIONS THROUGH WALL JOINTS

(EXPANSION JOINT SHOWN)


VARIES
FACE OF WALL OR ABUTMENT
4"ø PVC PIPE AT 10'-0" O.C.
1"
1/4"/FT. DN.
INV. EL.
FINISHED GRADE
6"
FILTER FABRIC ENVELOPE 1'-0" CEMENTED ALL AROUND
TOTAL OF 5 TO 6 C.F. OF FILTER STONE BAGS ENCASED IN BURLAP. FILTER FABRIC TO BE CEMENTED TO WALL PRIOR TO STACKING OF BAGS BEHIND WALL.
FILTER FABRIC
FILTER FABRIC ON INSIDE FACE

WEEP DRAIN



DESIGNER TO PROVIDE ADEQUATE ACCOMMODATIONS TO DISCHARGE WATER BEYOND ABUTMENT.

WALL DRAIN

DESIGNER NOTES:

1. *EXPANSION JOINTS SHALL BE PROVIDED AT INTERVALS NOT EXCEEDING 90'-0".*
2. *CONTRACTION JOINTS SHALL BE LOCATED AT INTERVALS NOT EXCEEDING 30'-0".*
3. *ALL JOINTS IN ABUTMENTS SHALL BE LOCATED APPROXIMATELY MIDWAY BETWEEN STRINGERS.*

THIS SHEET IS NOT TO SCALE

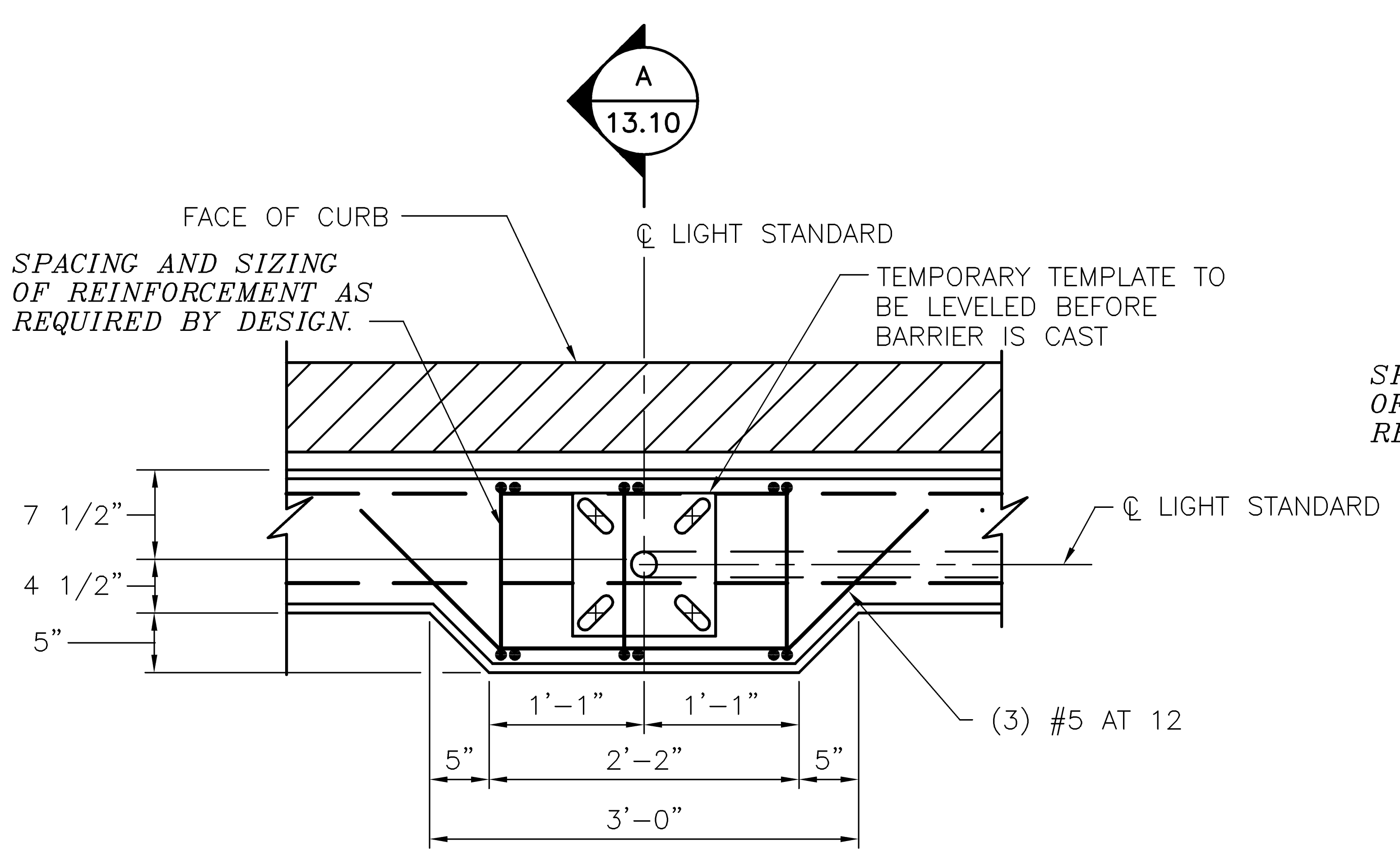
REVISIONS	
No.	DATE

RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

BRIDGE STANDARDS

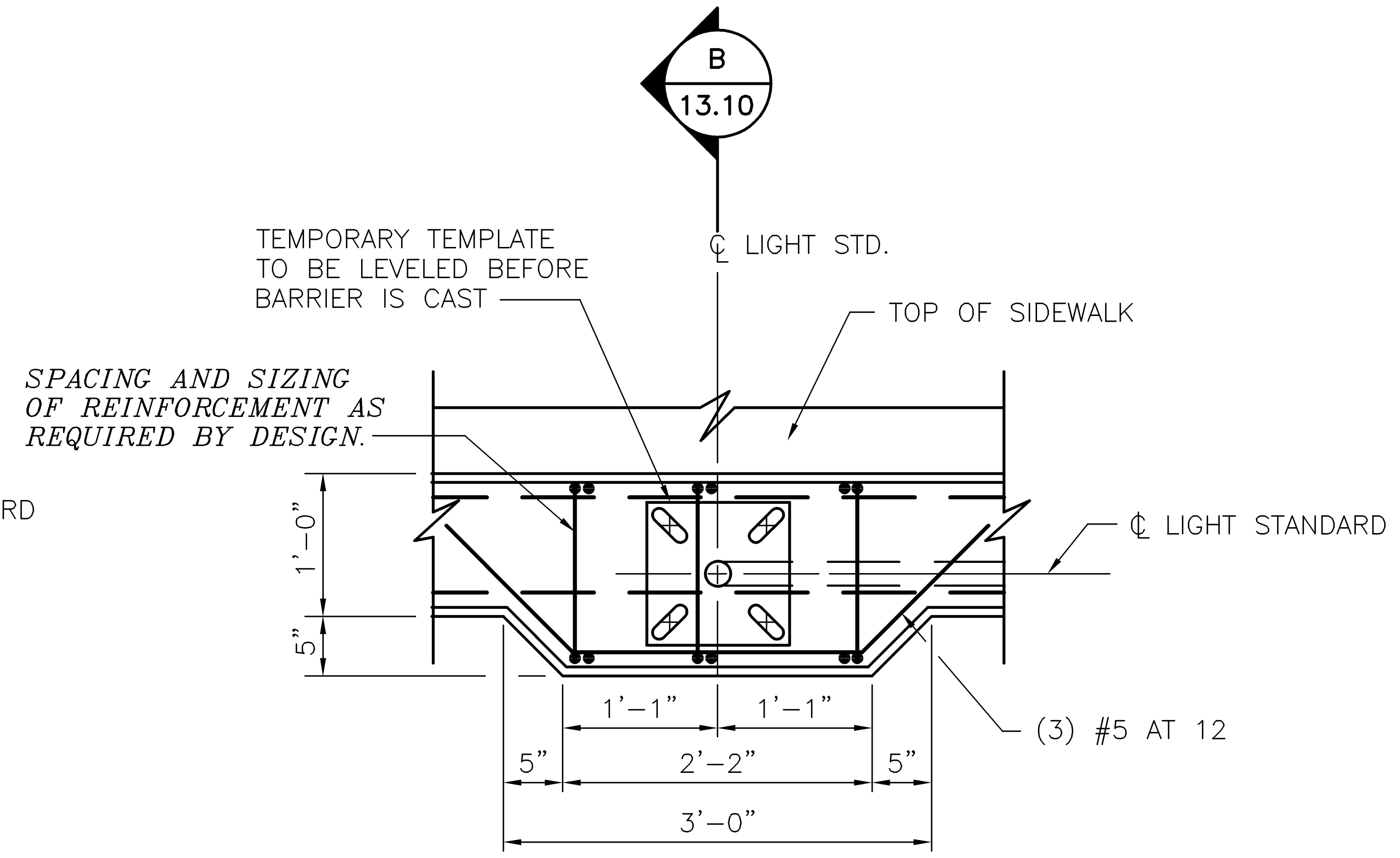
WALL JOINTS AND
MISCELLANEOUS DETAILS

DRAWING NUMBER: 12.10


A
13.10
FACE OF CURB
SPACING AND SIZING OF REINFORCEMENT AS REQUIRED BY DESIGN.
℄ LIGHT STANDARD
TEMPORARY TEMPLATE TO BE LEVELED BEFORE BARRIER IS CAST
℄ LIGHT STANDARD
7 1/2"
4 1/2"
5"
1'-1"
1'-1"
5"
2'-2"
5"
3'-0"
(3) #5 AT 12

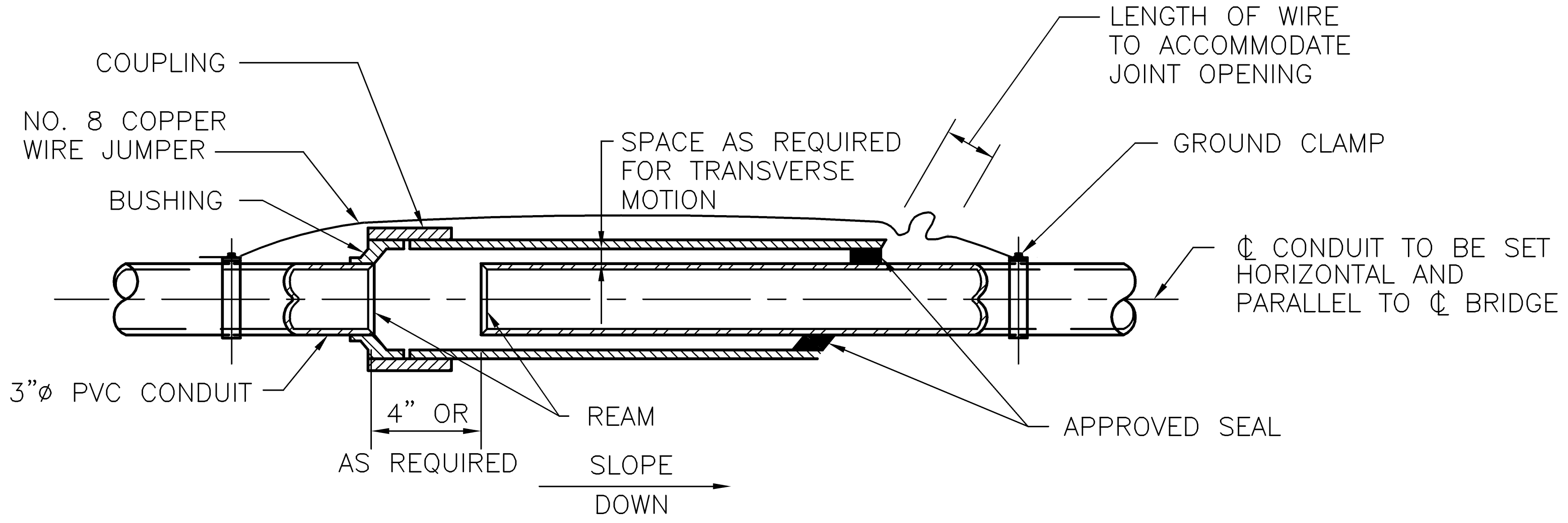
PLAN

AT SAFETY BARRIER


B
13.10
TEMPORARY TEMPLATE TO BE LEVELED BEFORE BARRIER IS CAST
℄ LIGHT STD.
TOP OF SIDEWALK
SPACING AND SIZING OF REINFORCEMENT AS REQUIRED BY DESIGN.
℄ LIGHT STANDARD
1'-0"
5"
1'-1"
1'-1"
5"
2'-2"
5"
3'-0"
(3) #5 AT 12

PLAN

AT SIDEWALK


COUPLING
NO. 8 COPPER WIRE JUMPER
BUSHING
3"ø PVC CONDUIT
SPACE AS REQUIRED FOR TRANSVERSE MOTION
LENGTH OF WIRE TO ACCOMMODATE JOINT OPENING
GROUND CLAMP
℄ CONDUIT TO BE SET HORIZONTAL AND PARALLEL TO ℄ BRIDGE
4" OR AS REQUIRED
REAM
SLOPE
DOWN
APPROVED SEAL

ELECTRICAL CONDUIT EXPANSION COUPLING

ALL EXPANSION FITTINGS TO BE FACTORY MANUFACTURED

NOTES:

1. EACH LENGTH OF CONDUIT SHALL BEAR THE LABEL OF UNDERWRITERS LABORATORIES INC.
2. AN ALTERNATE ELECTRICAL CONDUIT EXPANSION COUPLING DETAIL MAY BE USED SUBJECT TO APPROVAL BY THE ENGINEER.
3. INSTALLATIONS SHALL CONFORM TO THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE.
4. WORK SHALL CONFORM TO PUBLIC CHAPTER 5-6-2, FOR WHICH A LICENSE IS REQUIRED.
5. METAL CONDUIT AND FITTINGS SHALL BE ZINC COATED.
6. MINIMUM BOLT PROJECTION ABOVE NUT IS 1/2 BOLT DIAMETER.

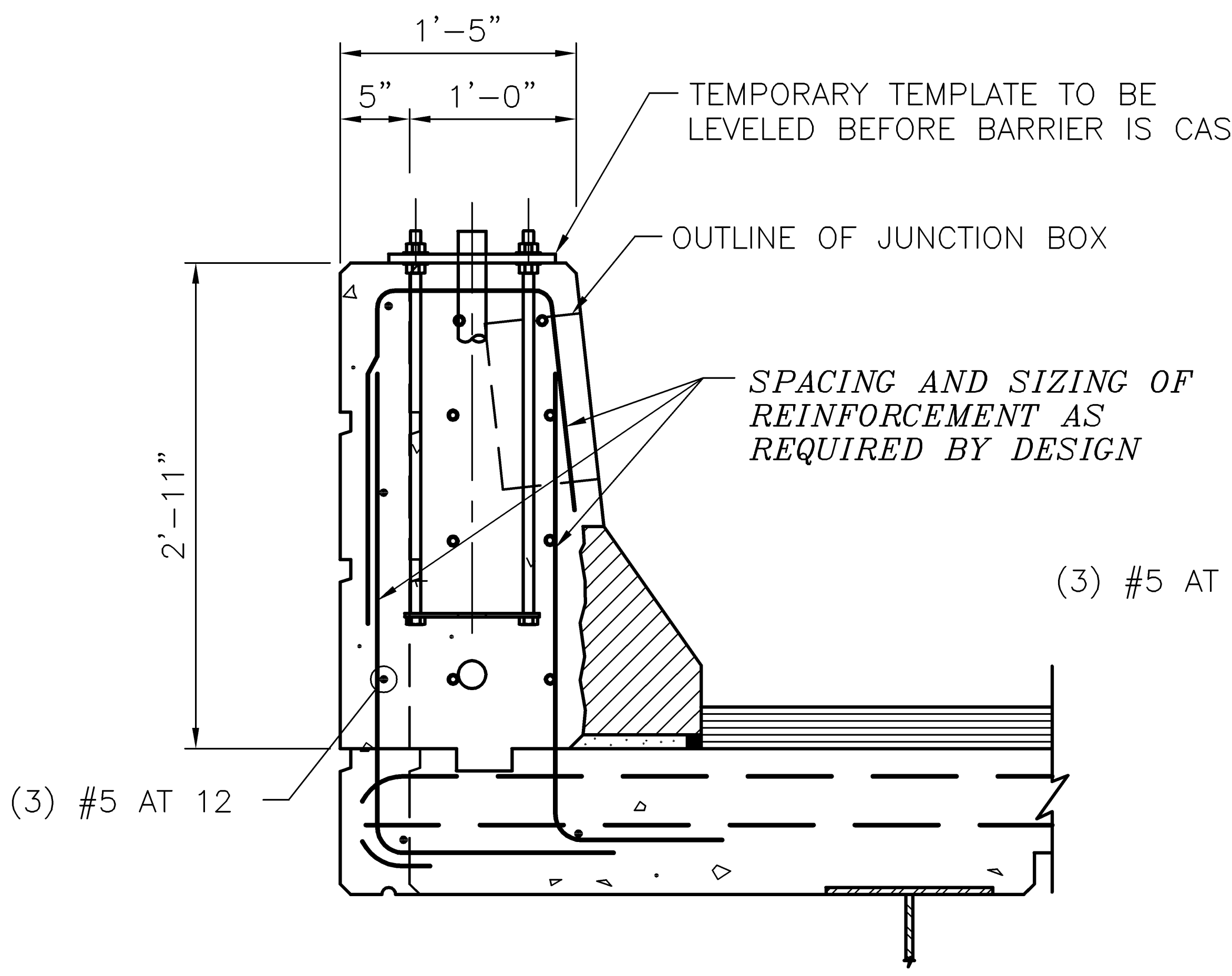
JUNCTION BOX NOTES

1. JUNCTION BOXES SHALL BE GALVANIZED, FERROUS, AND FLUSH MOUNTED WITH RECESSED WEATHERPROOF COVER.
2. THE MINIMUM STEEL GAUGE SHALL BE 10 GA.
3. THE MINIMUM CAST IRON GAUGE SHALL BE 9/32" GA.
4. THE COVER PLATE SHALL BE CHECKERED STEEL PLATE, THE COVER SCREWS SHALL BE FLAT HEAD BRASS, AND THE GASKET SHALL BE NEOPRENE.
5. THE DIMENSIONS SHOWN ARE MINIMUM.
6. ALL CONDUITS SHALL BE PITCHED TOWARD THE BOXES WITH A MINIMUM SLOPE OF .0025. A DRAIN AT THE LOW POINT SHALL BE PROVIDED FOR EACH JUNCTION BOX.
7. 18"x12"x10" JUNCTION BOXES ARE TO BE USED WHEN BOXES ARE PLACED IN SIDEWALKS. 18"x12"x8" JUNCTION BOXES ARE TO BE USED WHEN BOXES ARE PLACED IN PARAPETS OR JERSEY BARRIERS.

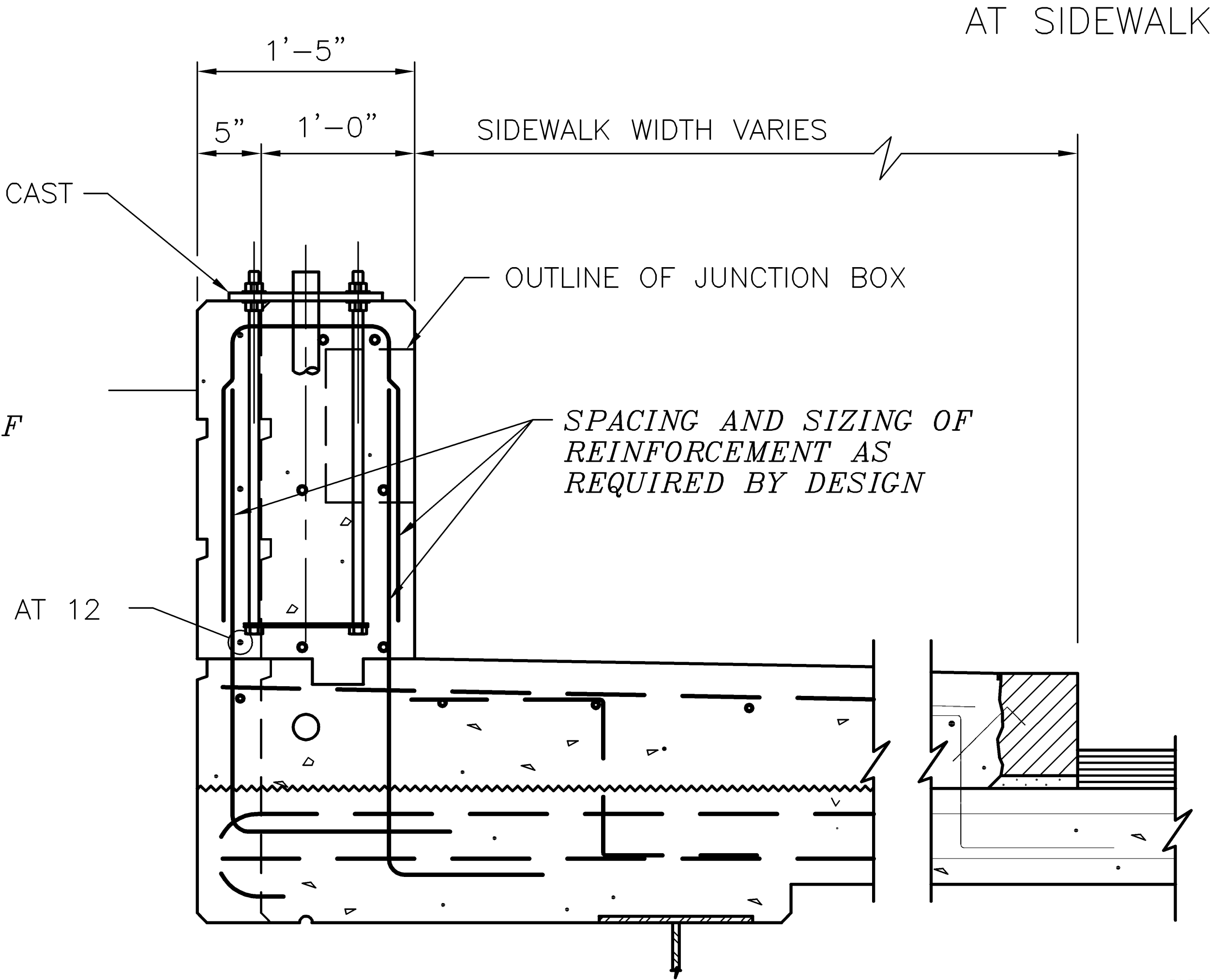
DESIGNER:

1. *UNDER SPECIAL CONDITIONS, JUNCTION BOXES MAY BE OMITTED WITH THE APPROVAL OF THE ENGINEER.*

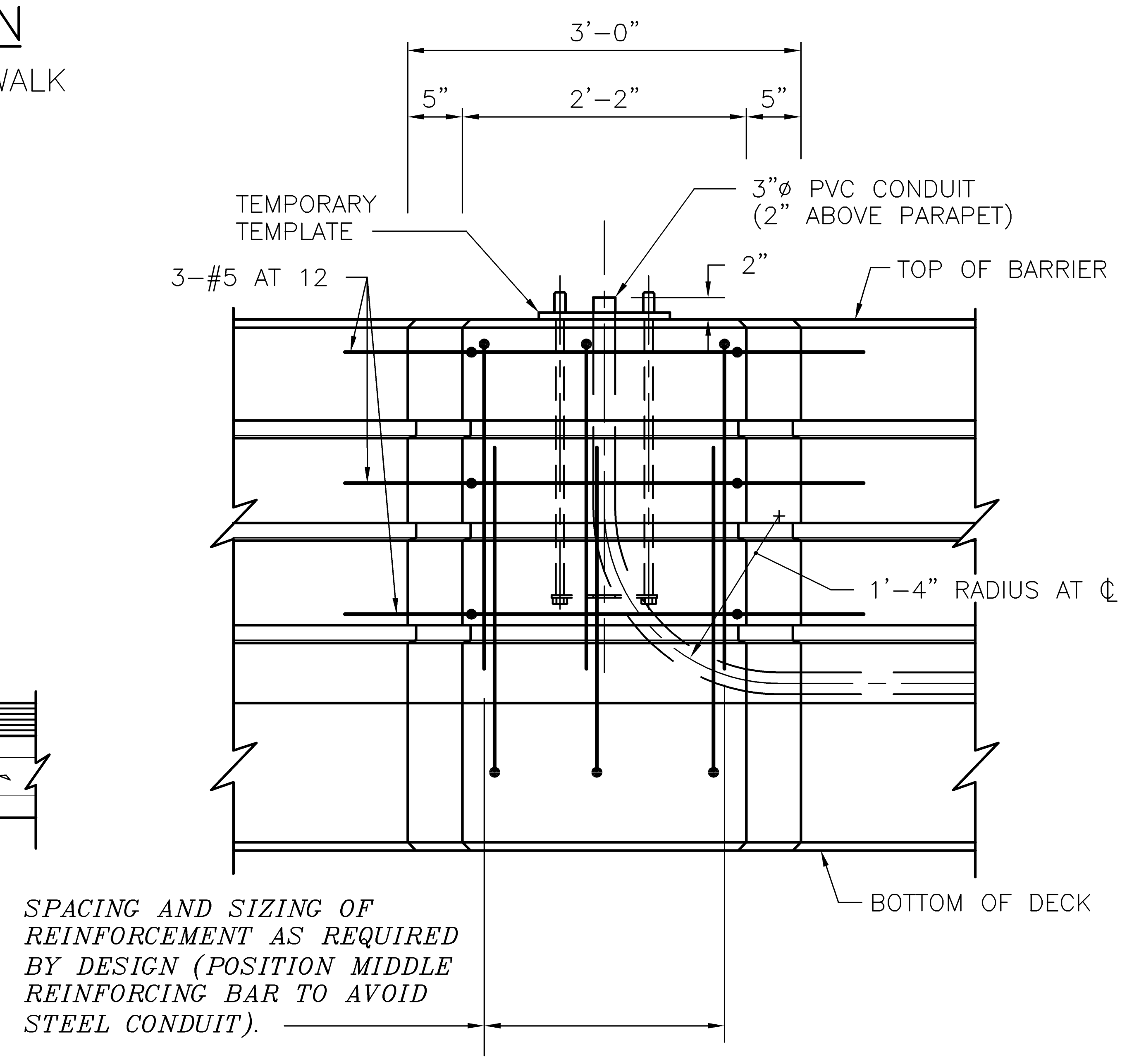
THIS SHEET IS NOT TO SCALE


1'-5"
5"
1'-0"
TEMPORARY TEMPLATE TO BE LEVELED BEFORE BARRIER IS CAST
OUTLINE OF JUNCTION BOX
SPACING AND SIZING OF REINFORCEMENT AS REQUIRED BY DESIGN
2'-11"
(3) #5 AT 12

SECTION A 13.10



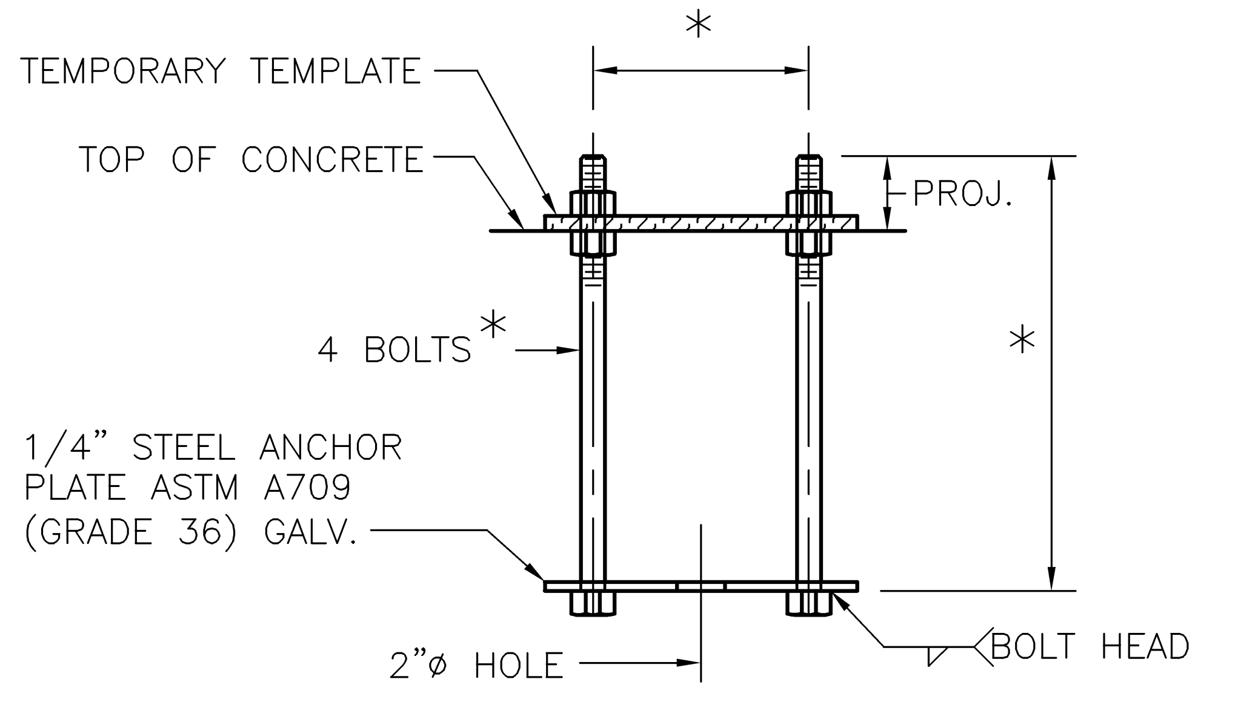
SECTION B 13.10


3'-0"
5"
2'-2"
5"
TEMPORARY TEMPLATE
3-#5 AT 12
3"ø PVC CONDUIT (2" ABOVE PARAPET)
2"
TOP OF BARRIER
1'-4" RADIUS AT ℄
BOTTOM OF DECK
SPACING AND SIZING OF REINFORCEMENT AS REQUIRED BY DESIGN (POSITION MIDDLE REINFORCING BAR TO AVOID STEEL CONDUIT).

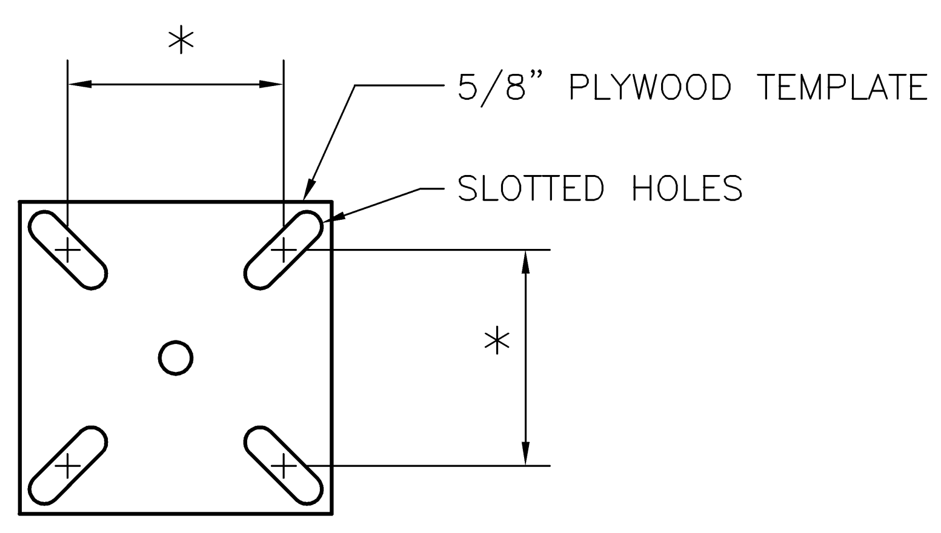
ELEVATION

(AT SIDEWALK SHOWN)

NOTE:
ELEVATION AT SAFETY BARRIER IS SIMILAR



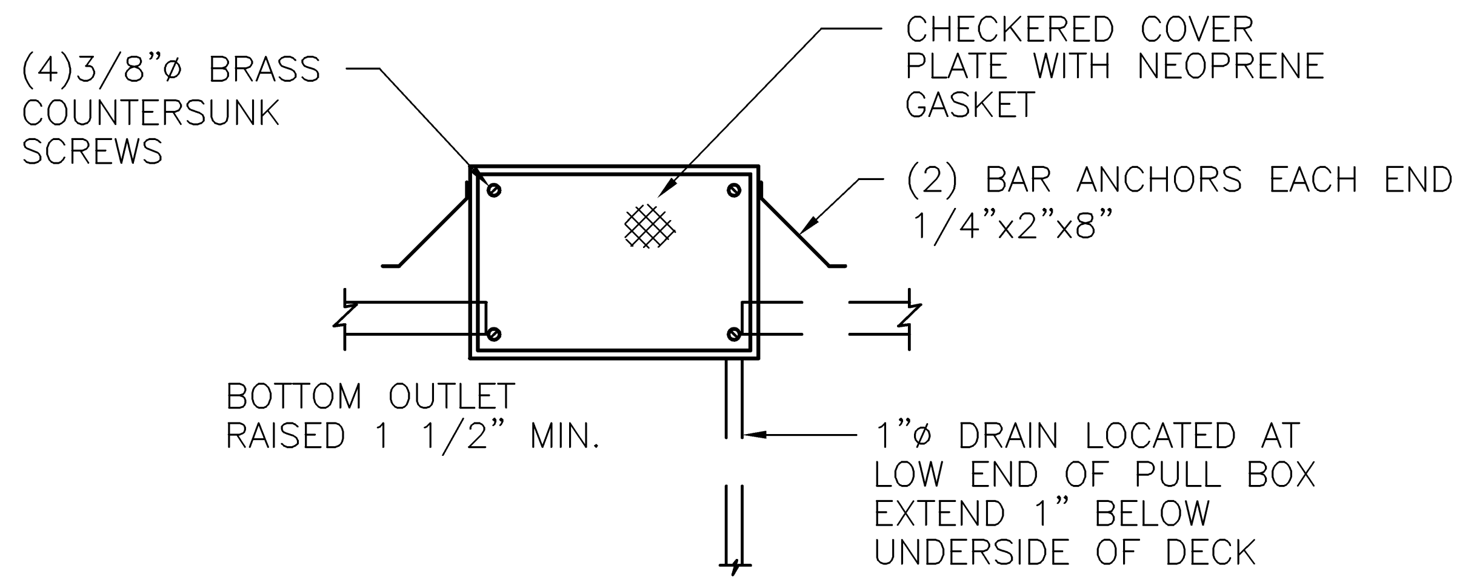
ANCHOR FOR LIGHT STANDARD



TEMPORARY TEMPLATE IS USED TO PROPERLY SET THE ANCHOR BOLT CAGE AND IS TO BE REMOVED BEFORE PLACING LIGHT STANDARD

TEMPORARY TEMPLATE

*BOLT CIRCLE, SIZE, MATERIAL, PROJECTION AND EMBEDMENT TO BE DETERMINED BY MANUFACTURER


(4)3/8"ø BRASS COUNTERSUNK SCREWS
CHECKERED COVER PLATE WITH NEOPRENE GASKET
(2) BAR ANCHORS EACH END 1/4"x2"x8"
BOTTOM OUTLET RAISED 1 1/2" MIN.
1"ø DRAIN LOCATED AT LOW END OF PULL BOX EXTEND 1" BELOW UNDERSIDE OF DECK

STANDARD JUNCTION BOX

FOR VERTICAL MOUNTING

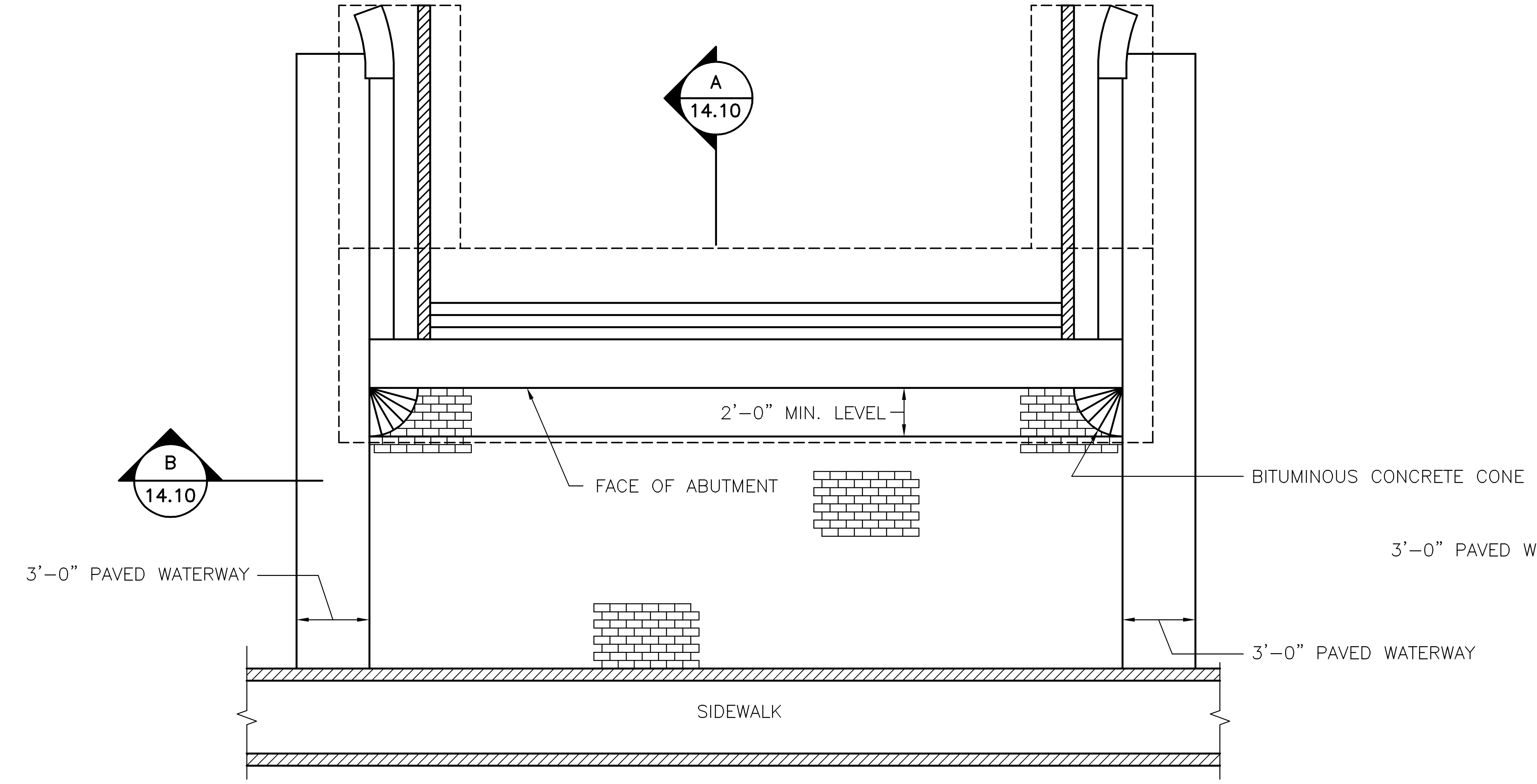
REVISIONS	
No.	DATE

RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

BRIDGE STANDARDS

LIGHT STANDARD
ANCHORAGES &
ELECTRICAL DETAILS

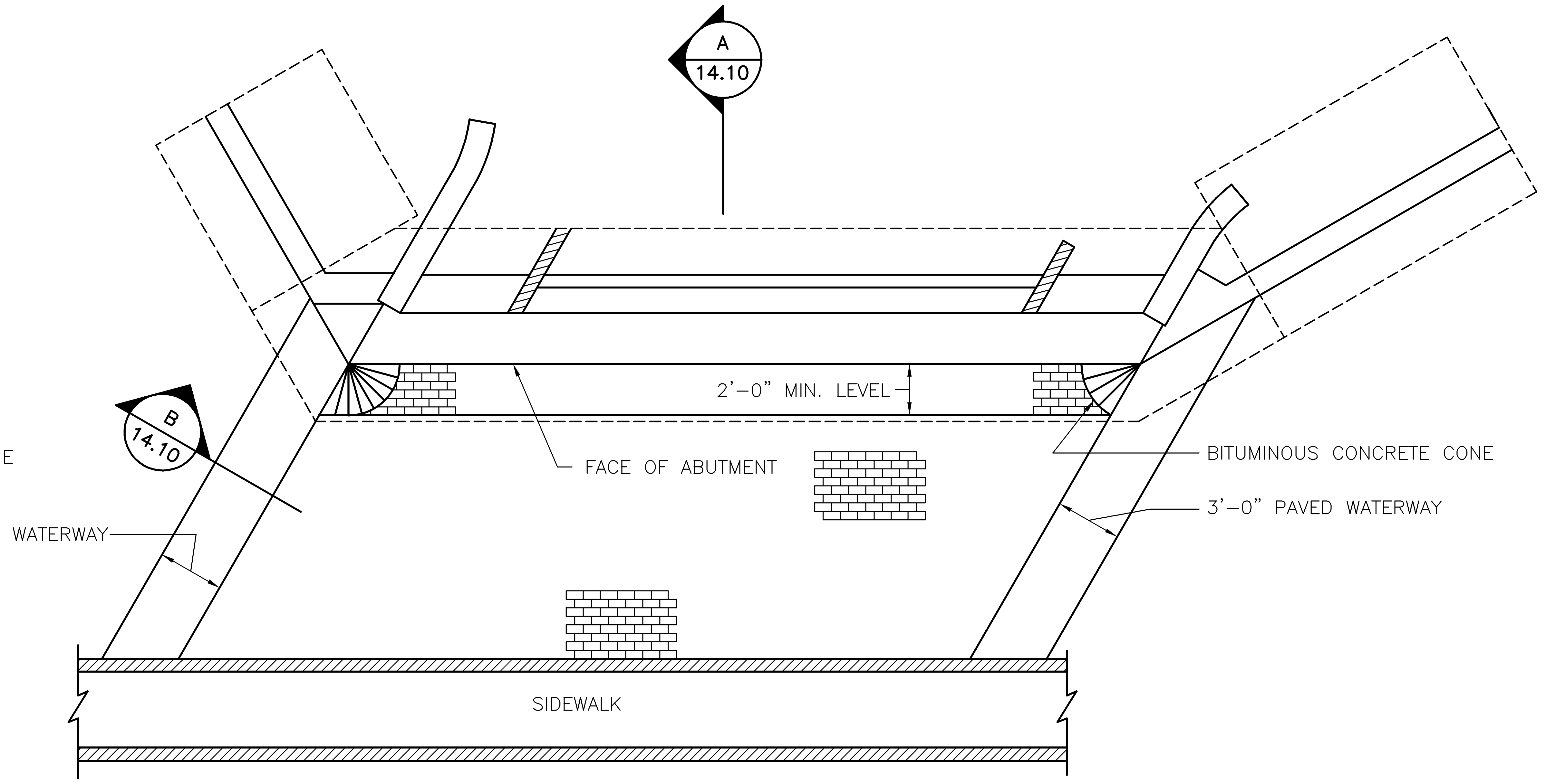
DRAWING NUMBER: 13.10



PLAN OF ABUTMENT

(WITHOUT SKEW)

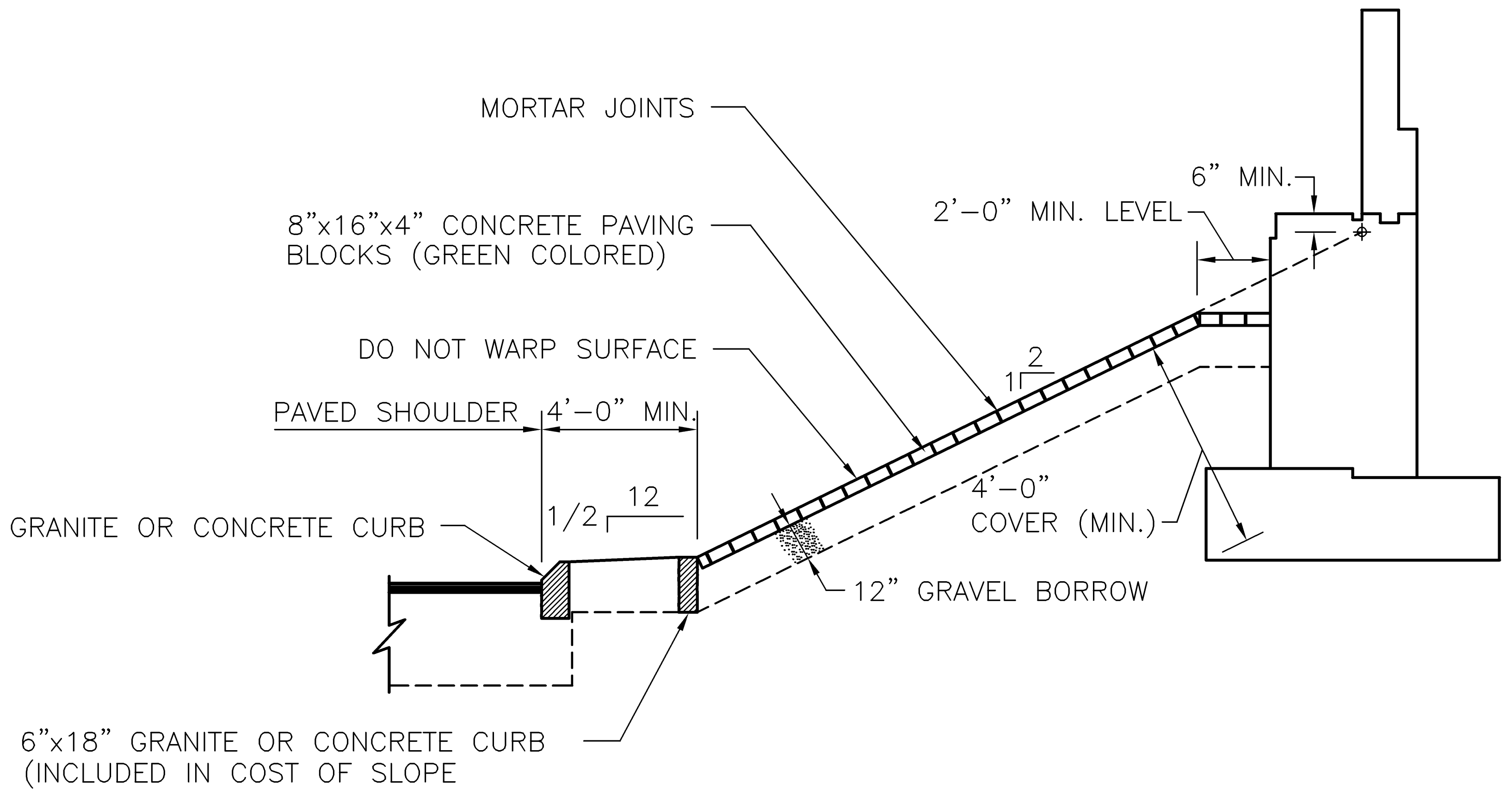
SCALE: 1/4"=1'-0"



PLAN OF ABUTMENT

(WITH SKEW)

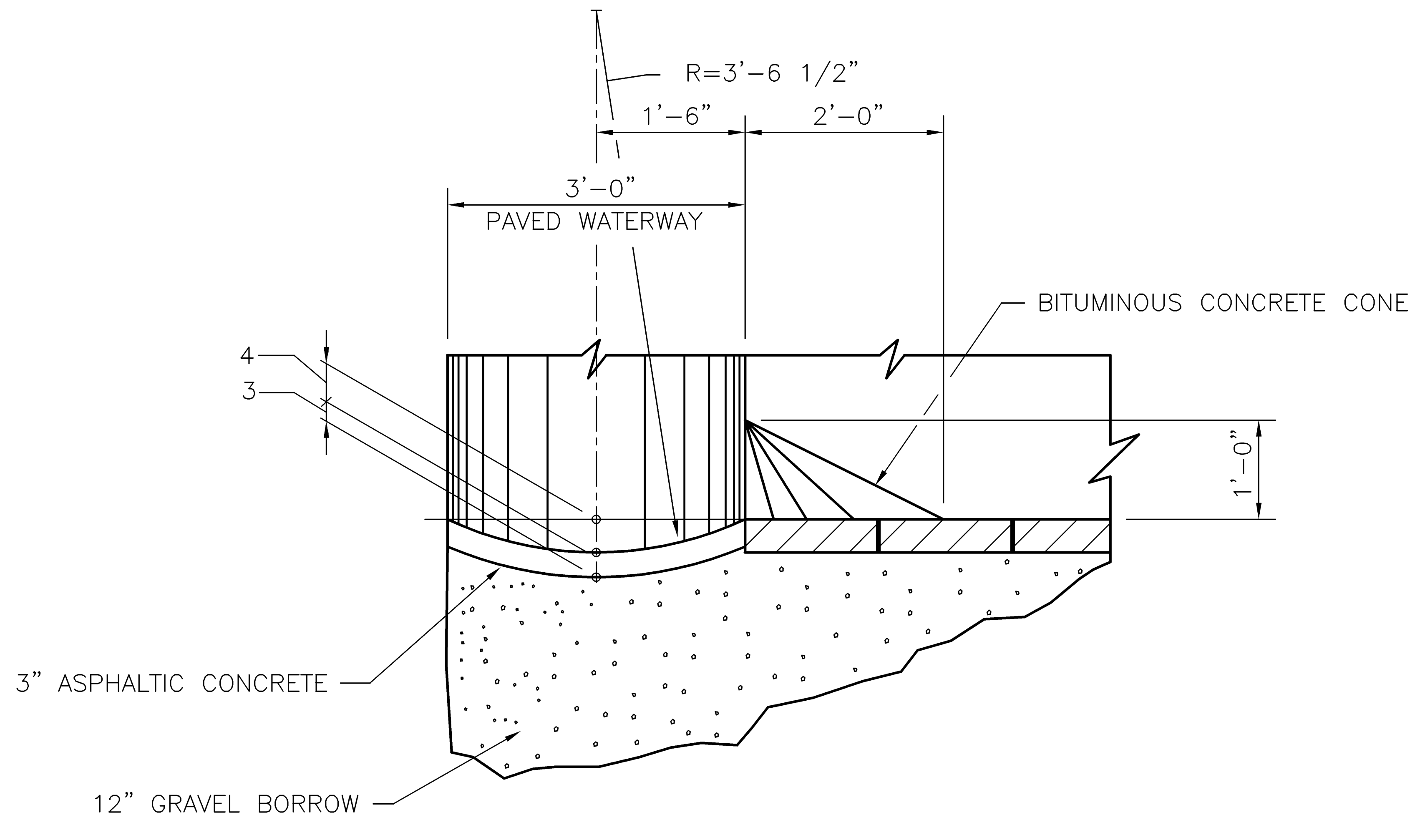
SCALE: 1/4"=1'-0"


MORTAR JOINTS
6" MIN.
2'-0" MIN. LEVEL
8"x16"x4" CONCRETE PAVING BLOCKS (GREEN COLORED)
DO NOT WARP SURFACE
2
1
PAVED SHOULDER
4'-0" MIN.
* GRANITE OR CONCRETE CURB
1/2
12
4'-0" COVER (MIN.)
12" GRAVEL BORROW
6"x18" GRANITE OR CONCRETE CURB (INCLUDED IN COST OF SLOPE PAVEMENT BLOCKS)

* AS PER CONTRACT PROPOSAL

SECTION A 14.10

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



SECTION B 14.10

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

REVISIONS

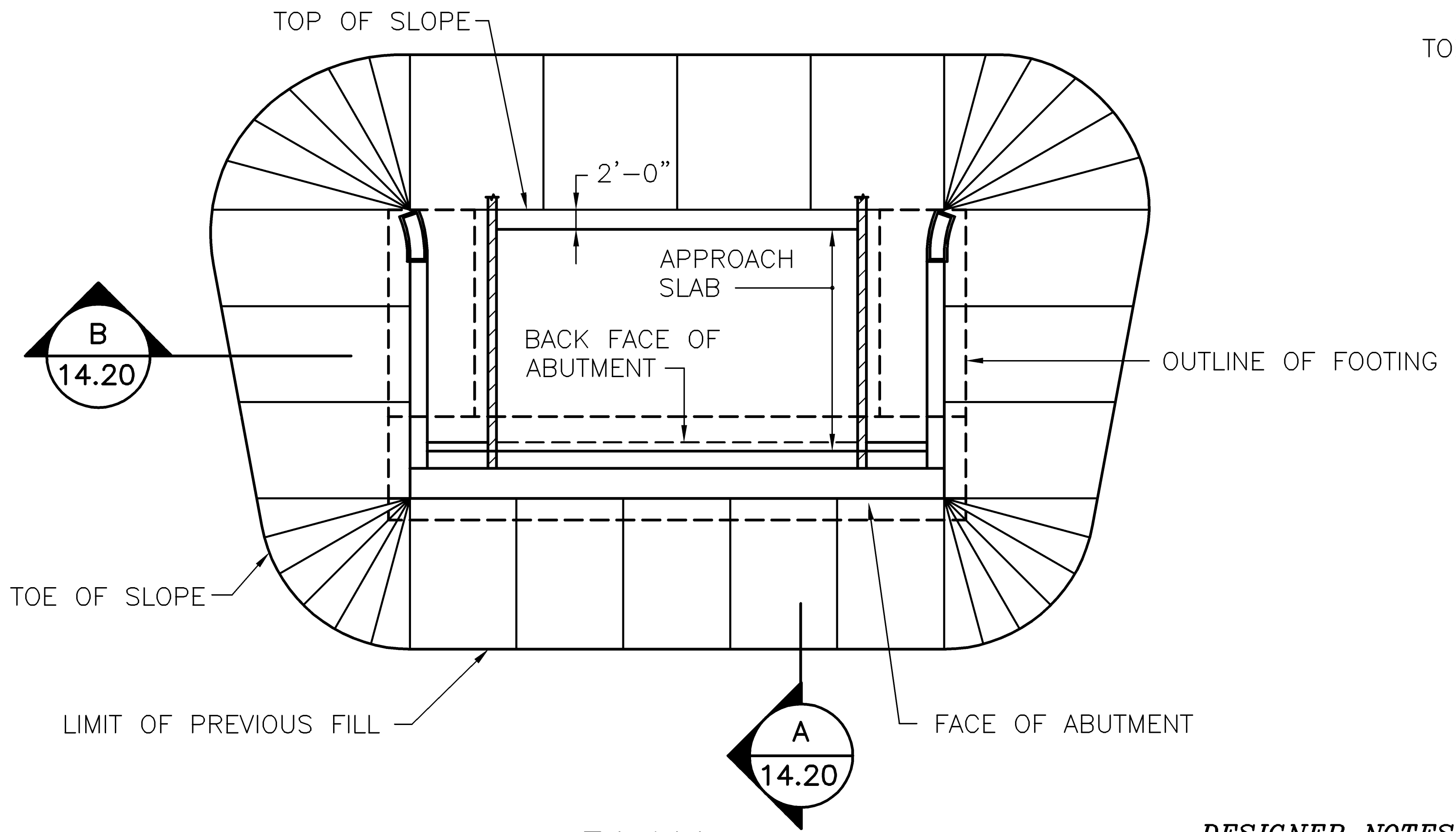
No.	DATE

RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

BRIDGE STANDARDS

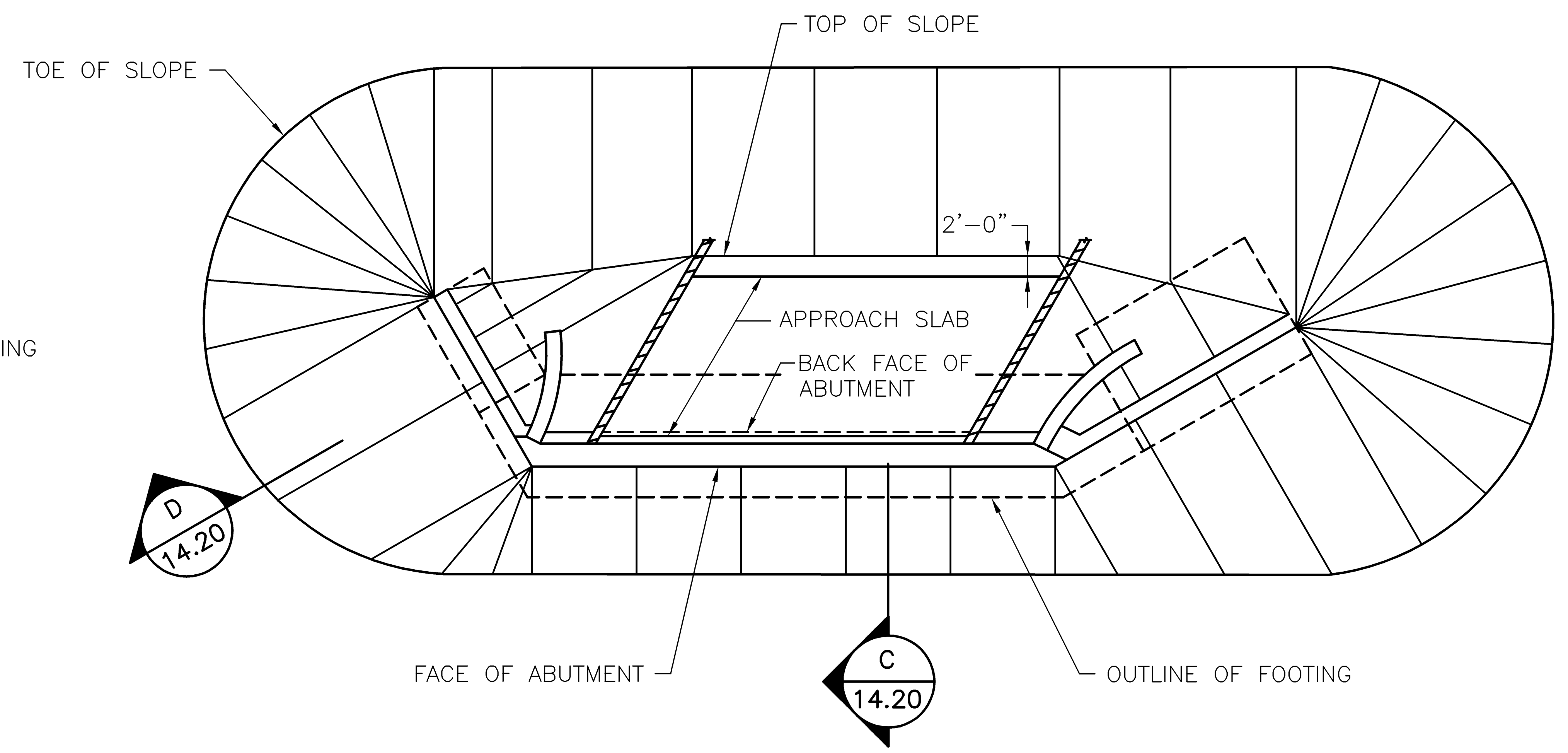
PAVED SLOPE DETAILS

DRAWING NUMBER: 14.10



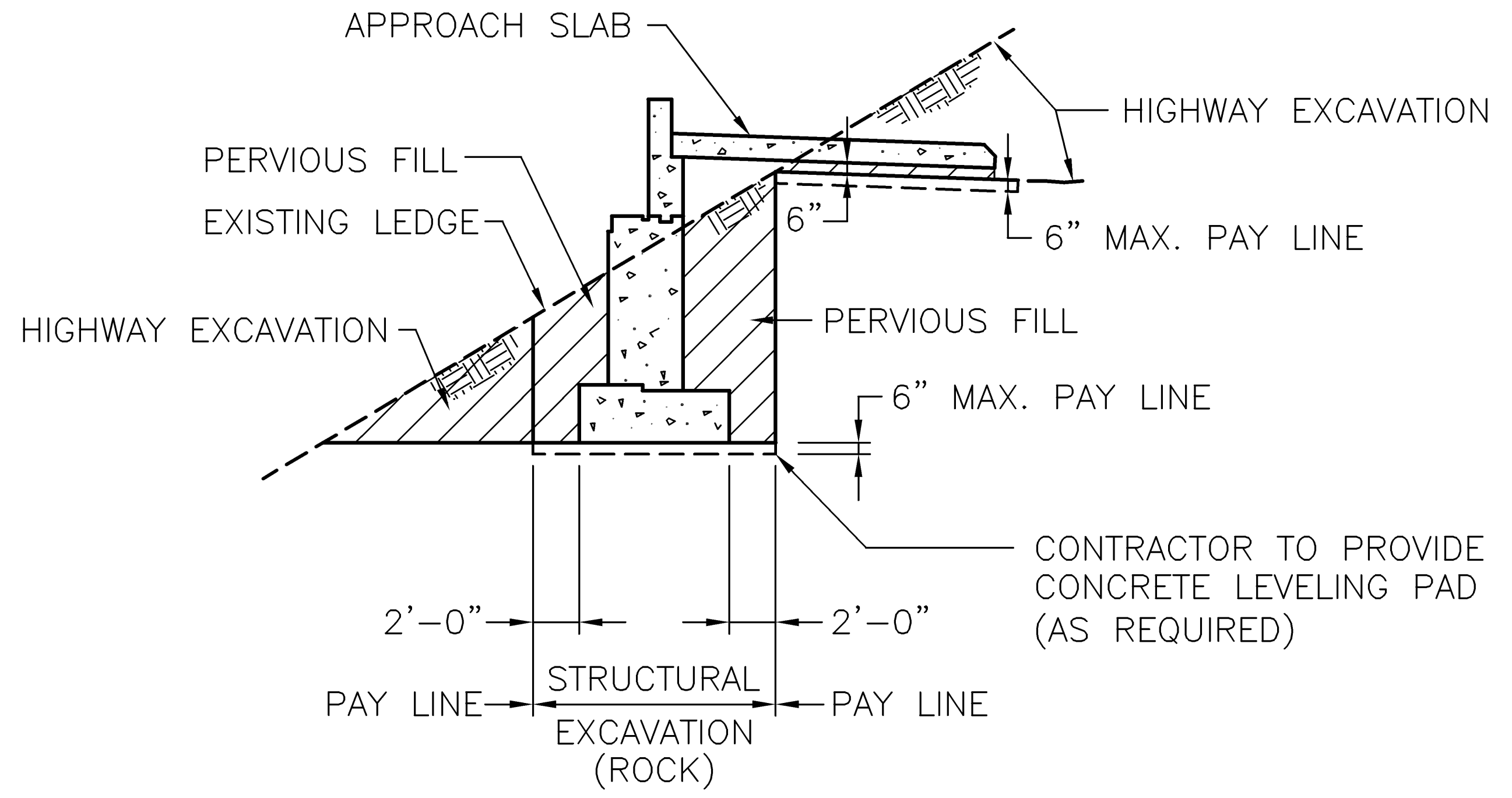
PLAN

PARALLEL WINGWALLS



PLAN

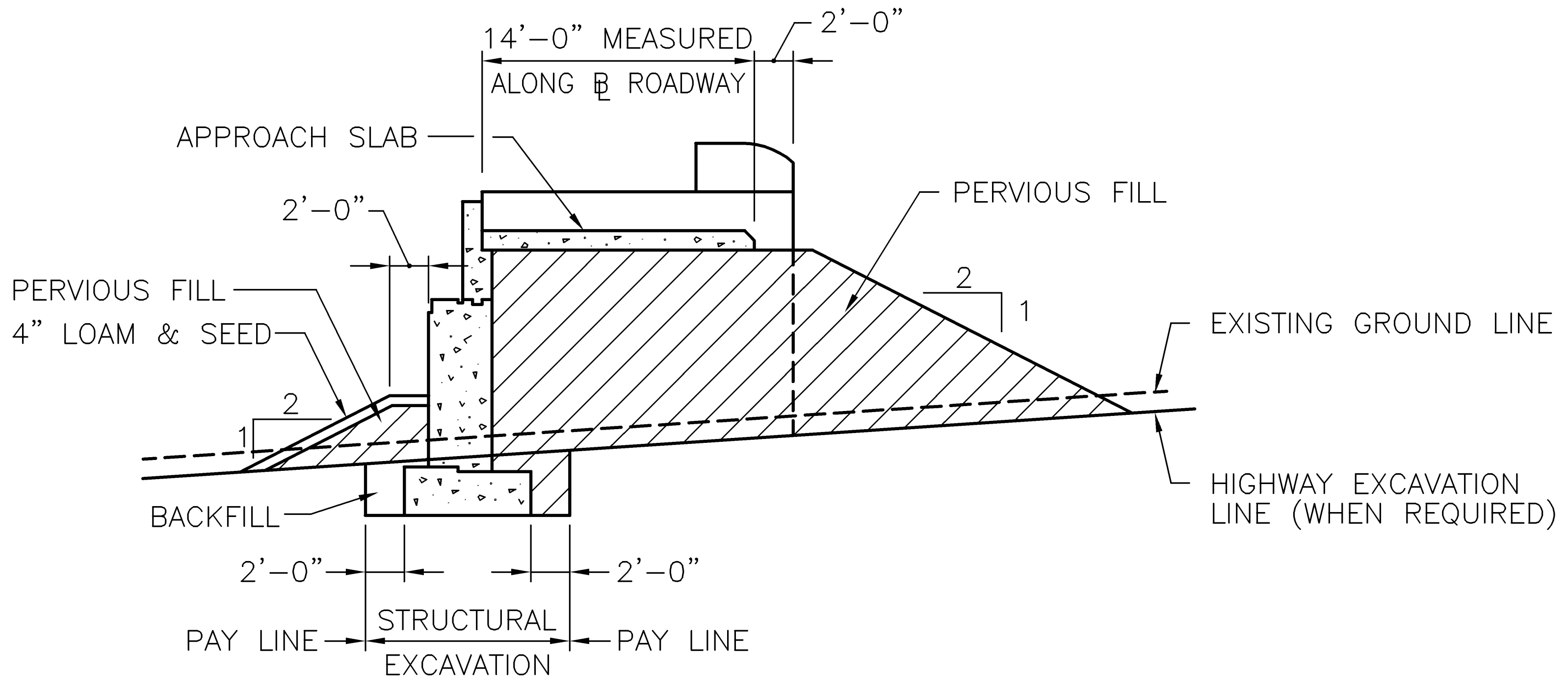
BISECTING WINGWALLS



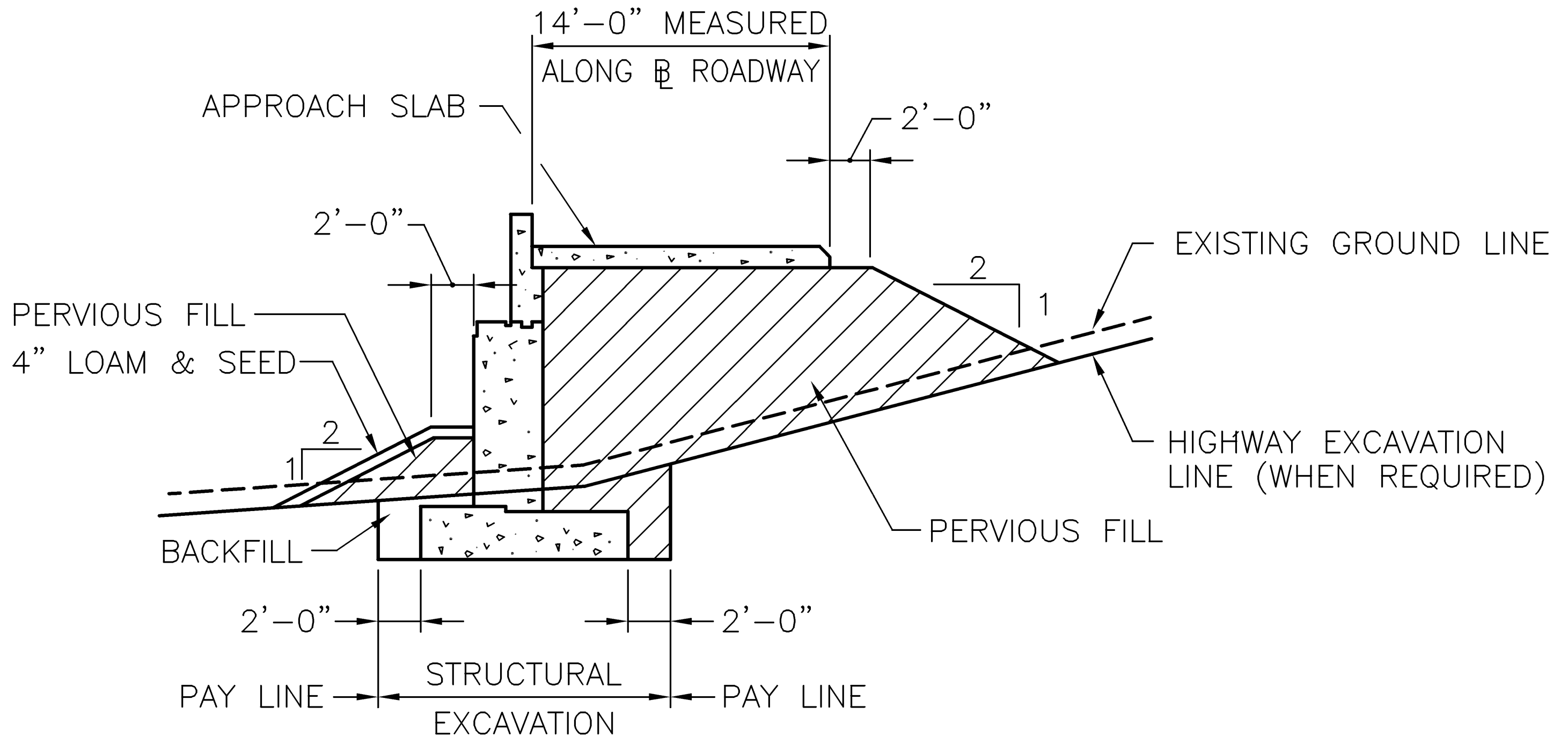
IN LEDGE

DESIGNER NOTES:

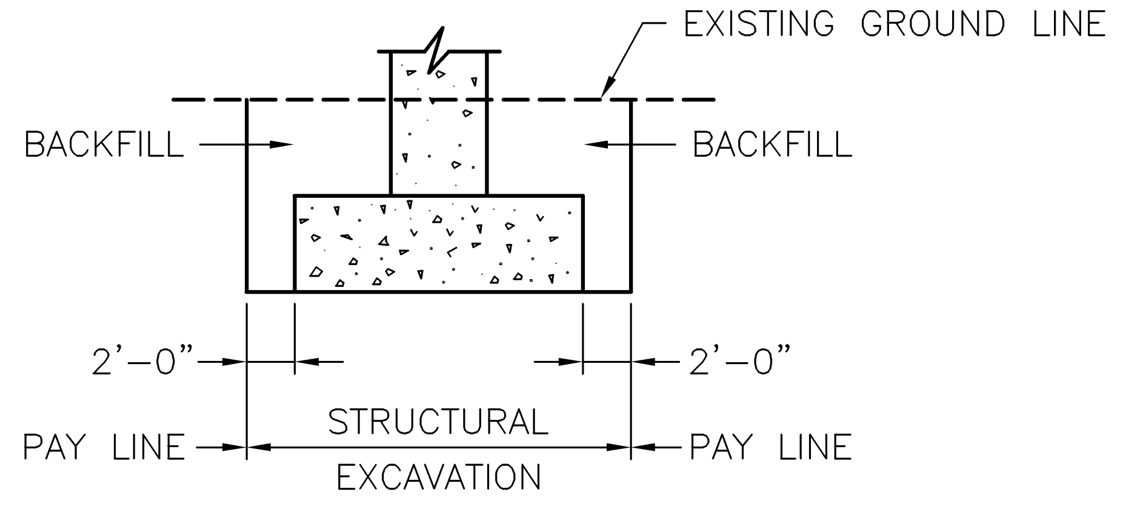
1. *PLAN MUST BE DRAWN TO SCALE SHOWING EXISTING GROUND CONTOURS FOR EACH INDIVIDUAL BRIDGE.*
2. *USE SAME SECTIONS WITH PILED FOUNDATIONS*
3. *PROVIDE ONE FOOT OF CRUSHED STONE UNDER FOOTINGS WHEN DEWATERING IS EXPECTED.*
4. *EXCAVATION QUANTITY SHALL BE COMPUTED BASED ON AN ASSUMED GROUND CONTOUR AFTER REMOVAL OF EXISTING SUBSTRUCTURES.*



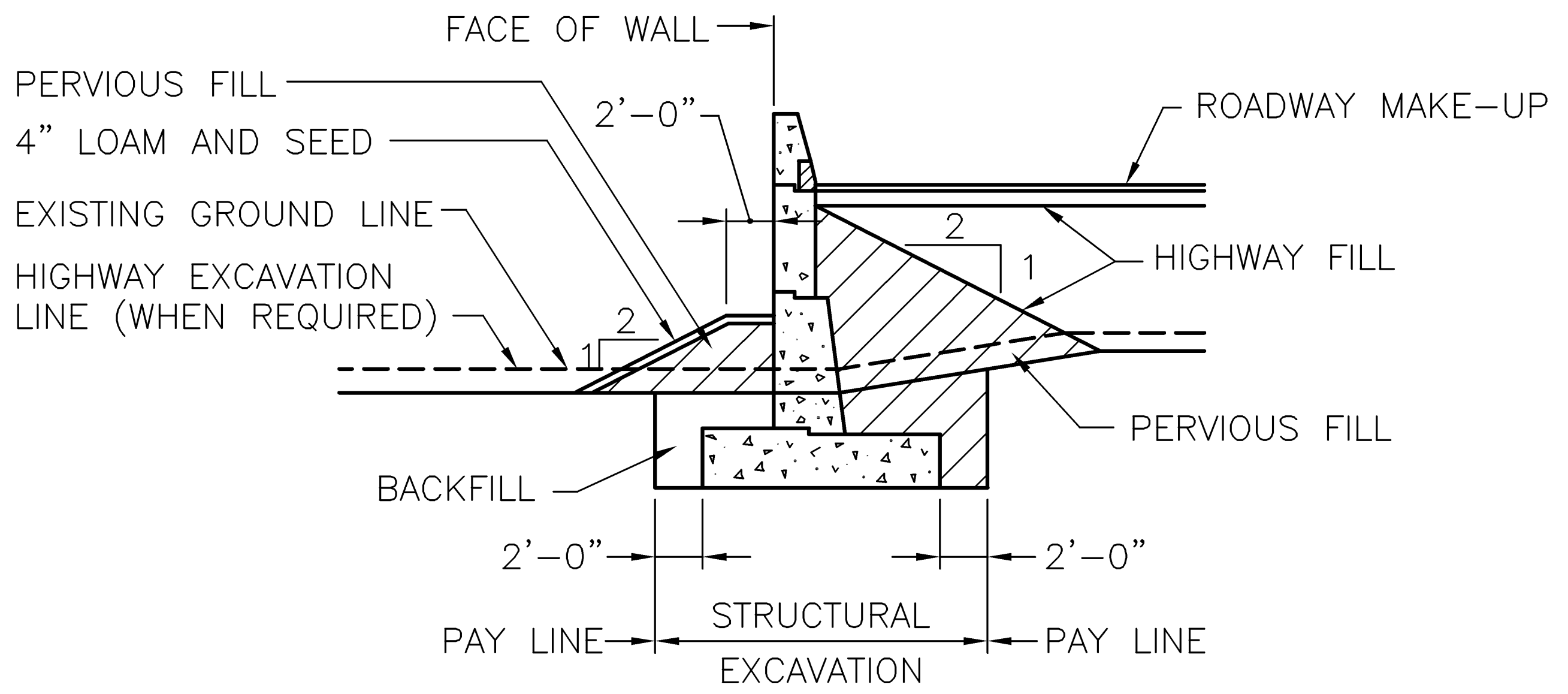
SECTION A 14.20



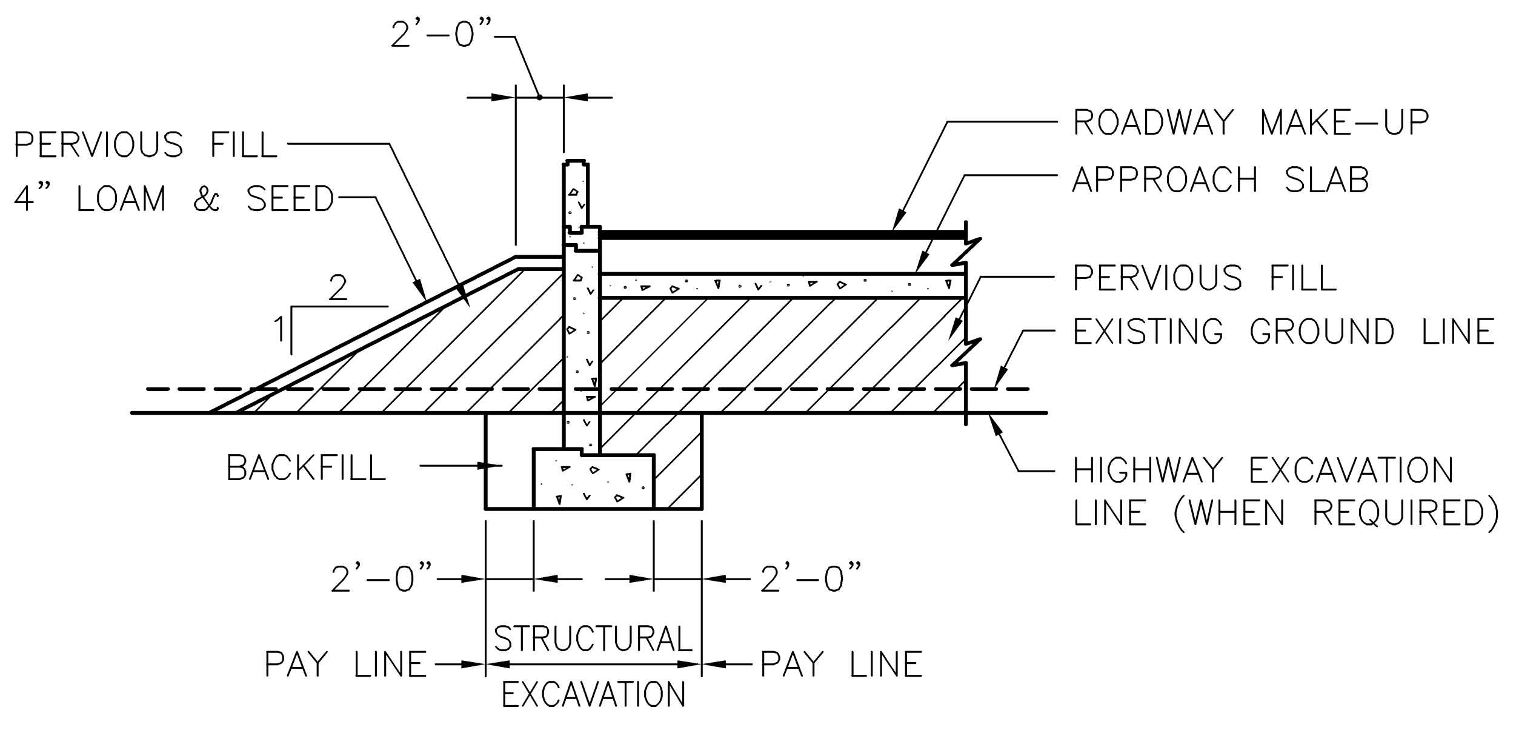
SECTION C 14.20



PIER



RETAINING WALL



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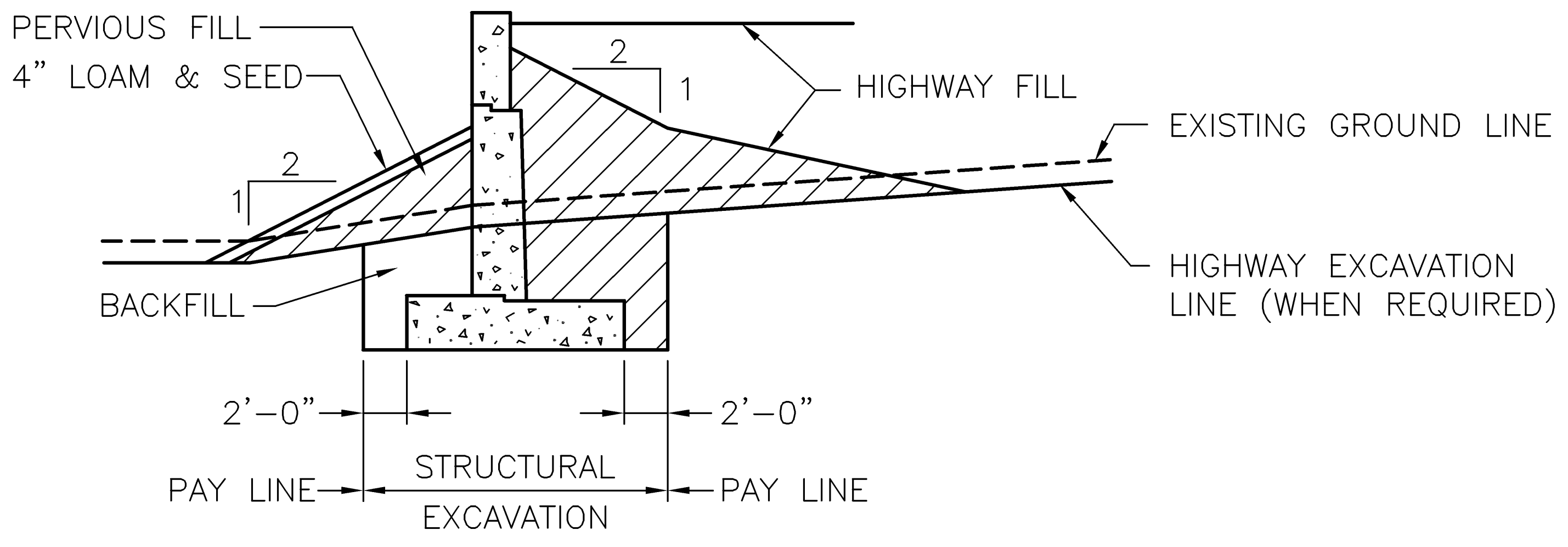


SECTION D 14.20

THIS SHEET IS NOT TO SCALE

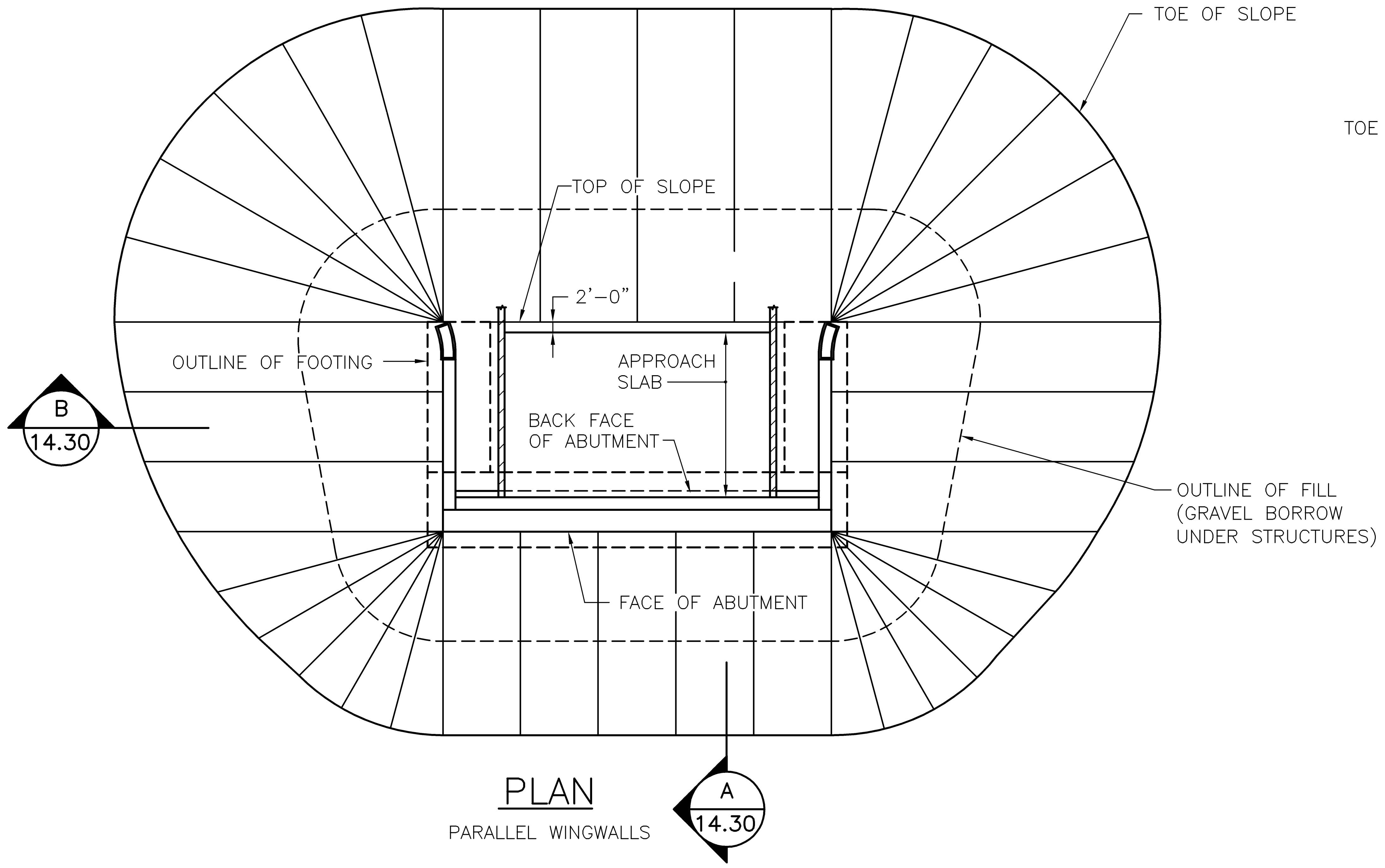
REVISIONS	
No.	DATE

RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

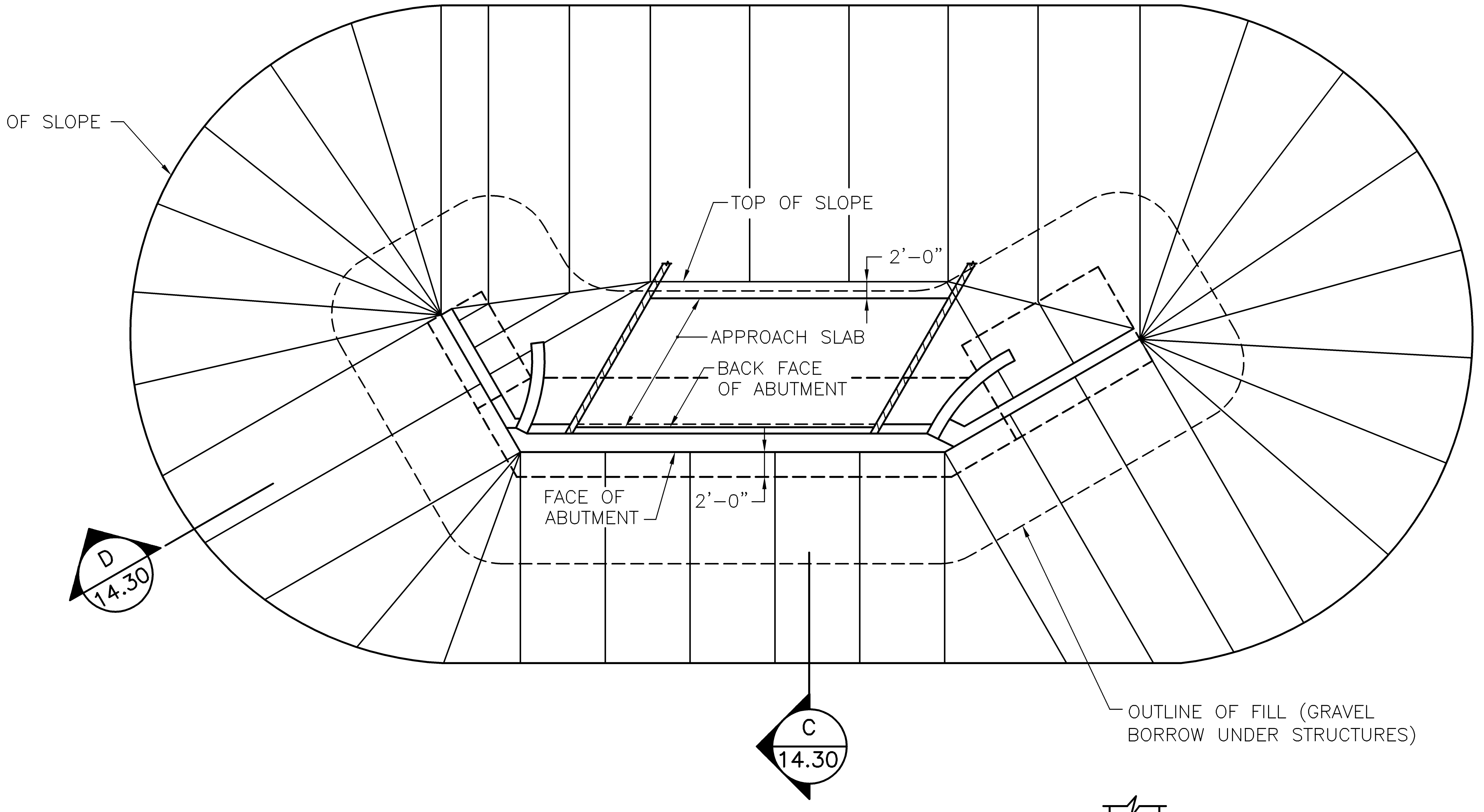
BRIDGE STANDARDS

ABUTMENTS, PIERS AND WALLS IN CUT

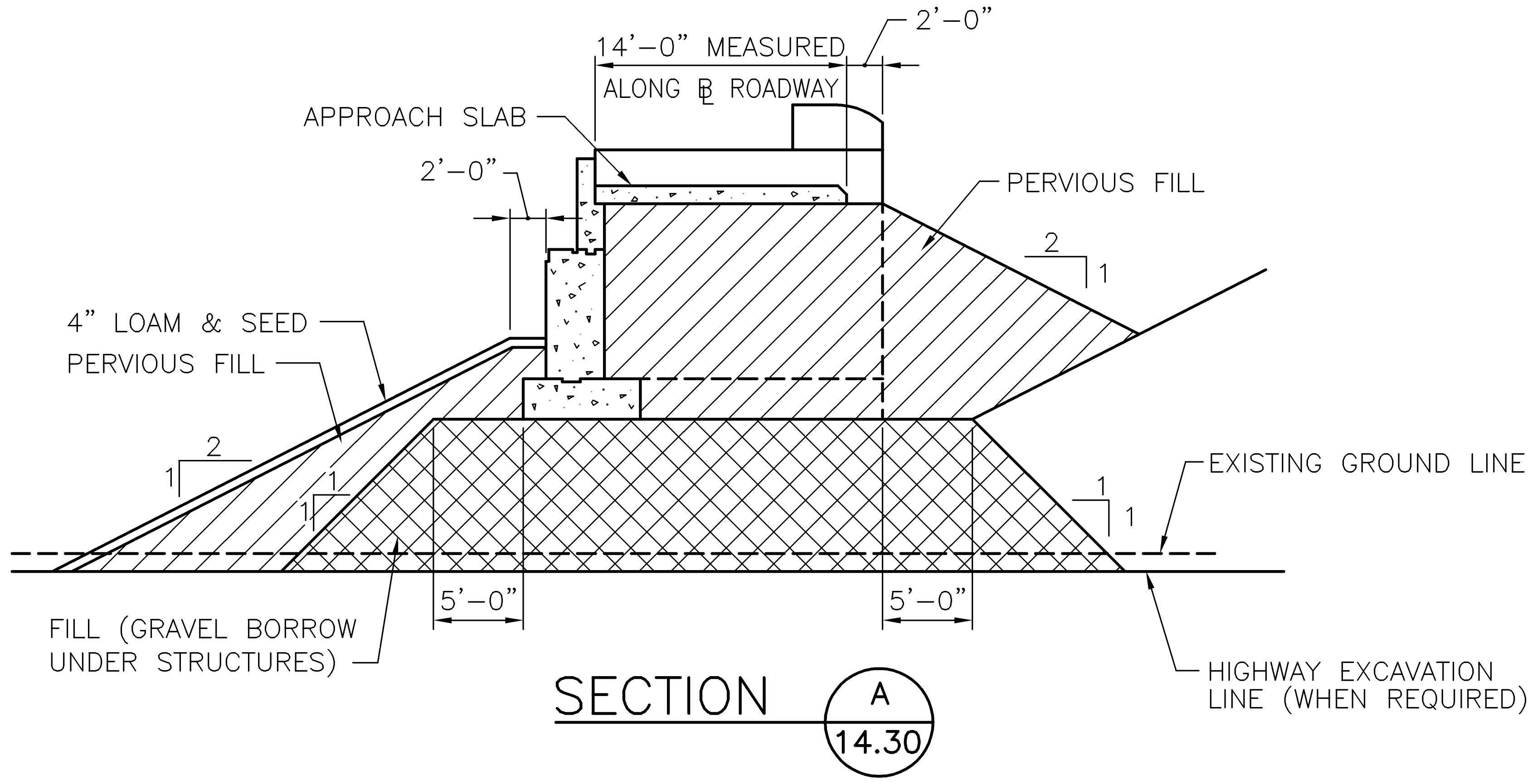
DRAWING NUMBER: 14.20



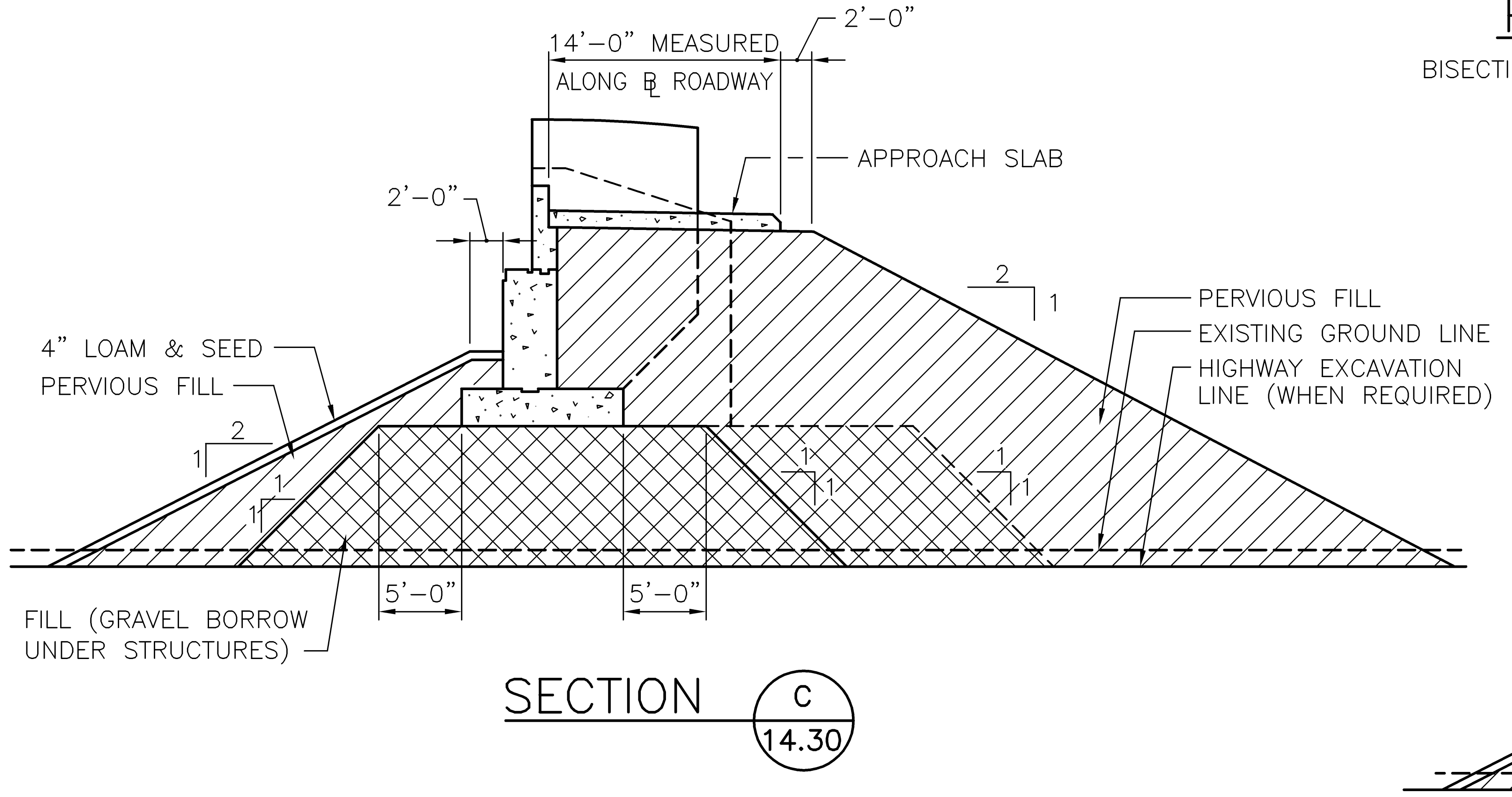
PLAN
PARALLEL WINGWALLS



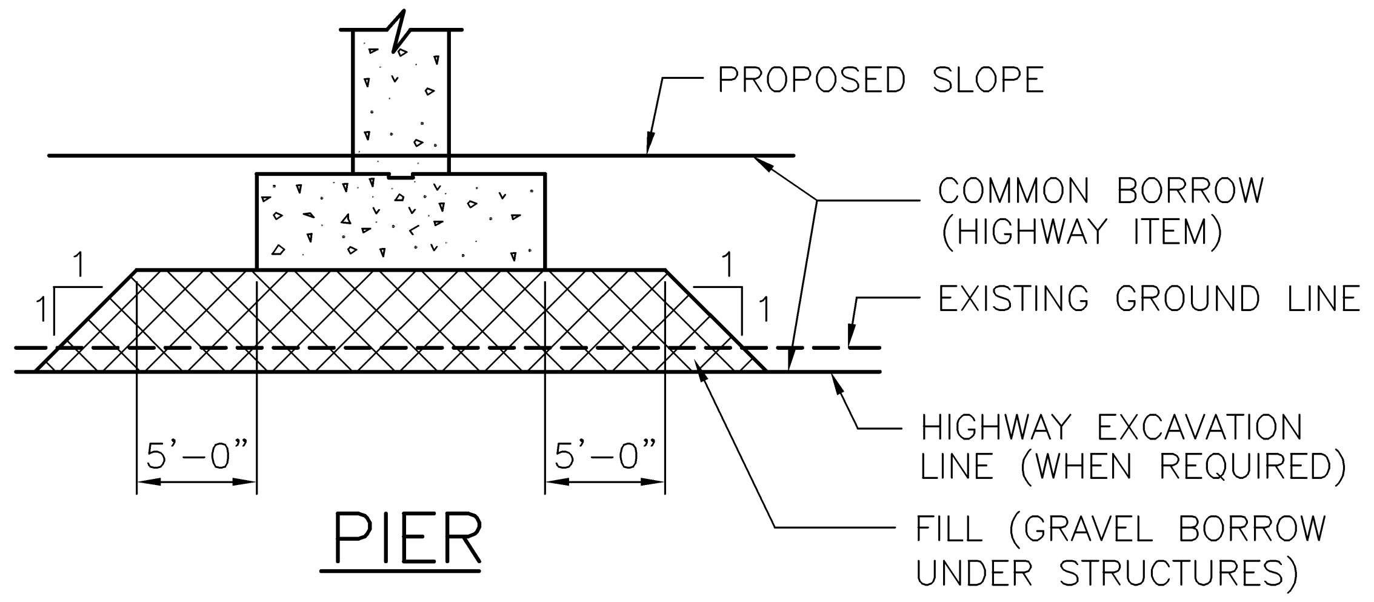
PLAN
BISECTING WINGWALLS


14'-0" MEASURED ALONG ℄ ROADWAY
2'-0"
APPROACH SLAB
2'-0"
PERVIOUS FILL
2
1
4" LOAM & SEED
PERVIOUS FILL
2
1
1
1
1
1
EXISTING GROUND LINE
5'-0"
5'-0"
FILL (GRAVEL BORROW UNDER STRUCTURES)
HIGHWAY EXCAVATION LINE (WHEN REQUIRED)

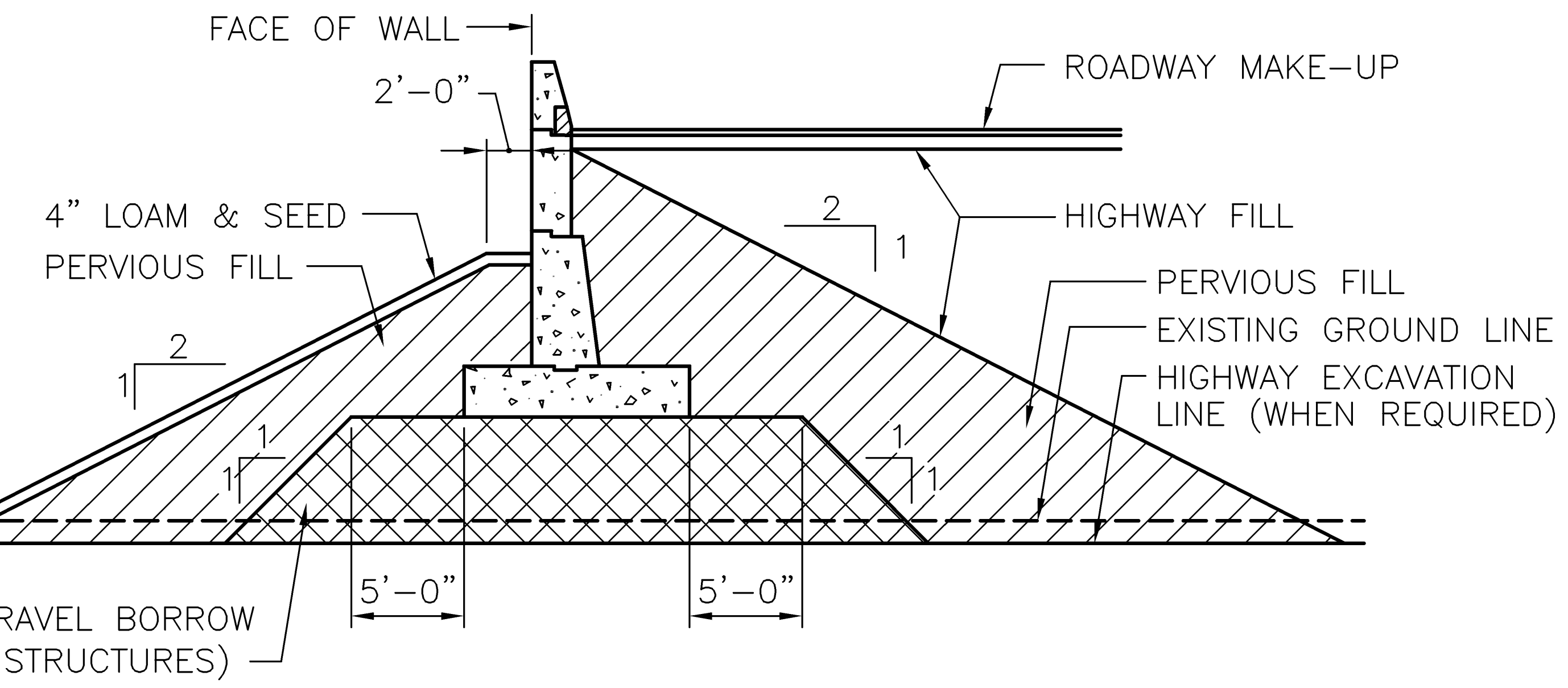
SECTION A 14.30


14'-0" MEASURED ALONG ℄ ROADWAY
2'-0"
APPROACH SLAB
2'-0"
2
1
PERVIOUS FILL
EXISTING GROUND LINE
HIGHWAY EXCAVATION LINE (WHEN REQUIRED)
4" LOAM & SEED
PERVIOUS FILL
2
1
1
1
1
1
1
1
5'-0"
5'-0"
FILL (GRAVEL BORROW UNDER STRUCTURES)

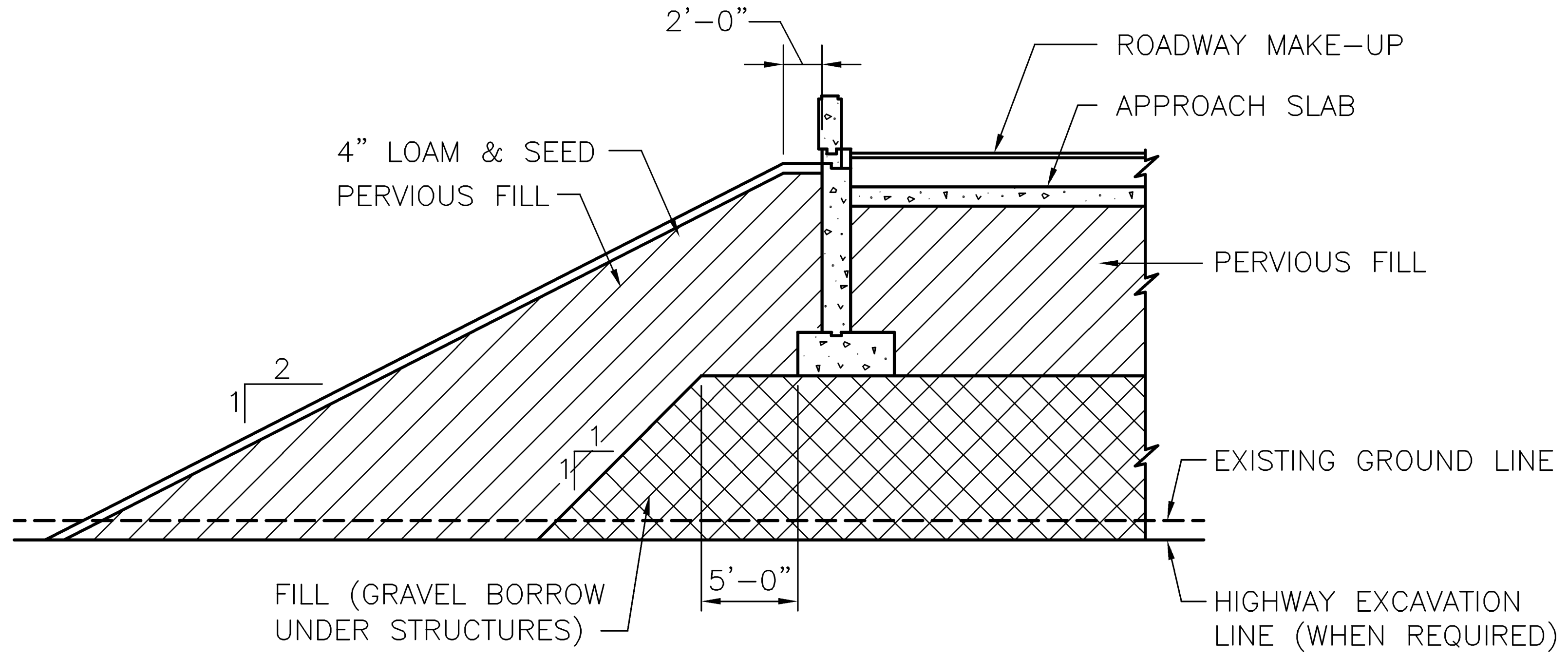
SECTION C 14.30


PROPOSED SLOPE
COMMON BORROW (HIGHWAY ITEM)
EXISTING GROUND LINE
HIGHWAY EXCAVATION LINE (WHEN REQUIRED)
FILL (GRAVEL BORROW UNDER STRUCTURES)
1
1
1
1
5'-0"
5'-0"

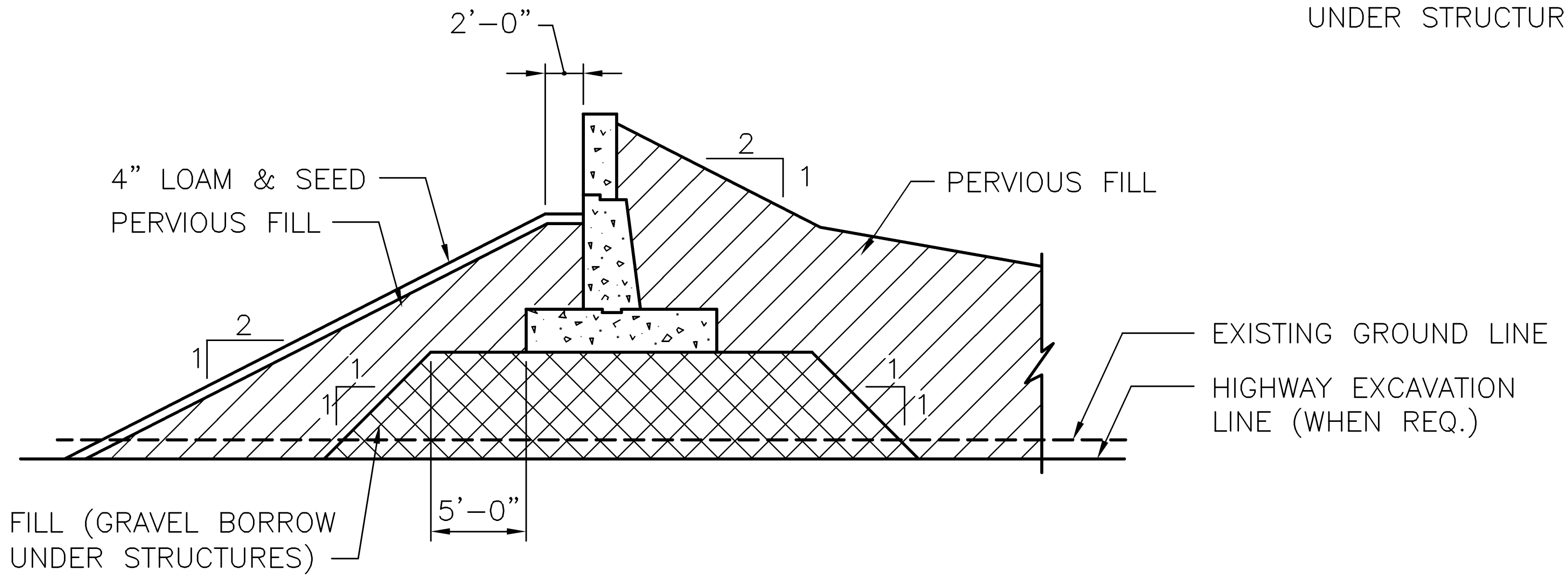
PIER



RETAINING WALL



SECTION B 14.03



SECTION D 14.30

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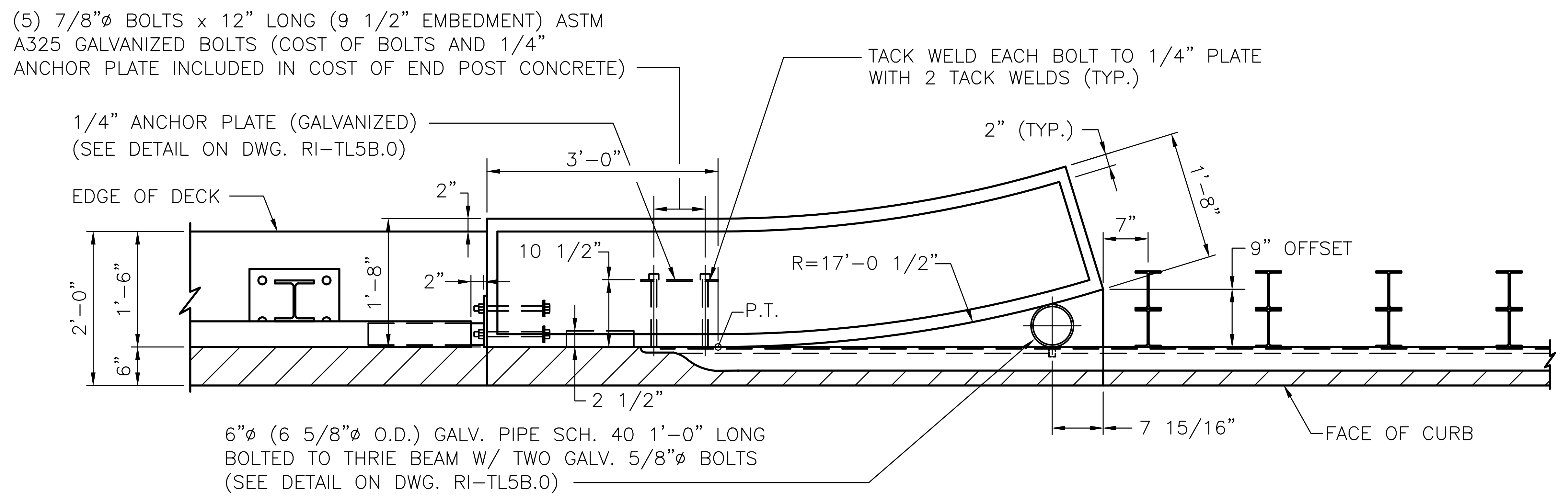
REVISIONS	
No.	DATE

RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

BRIDGE STANDARDS

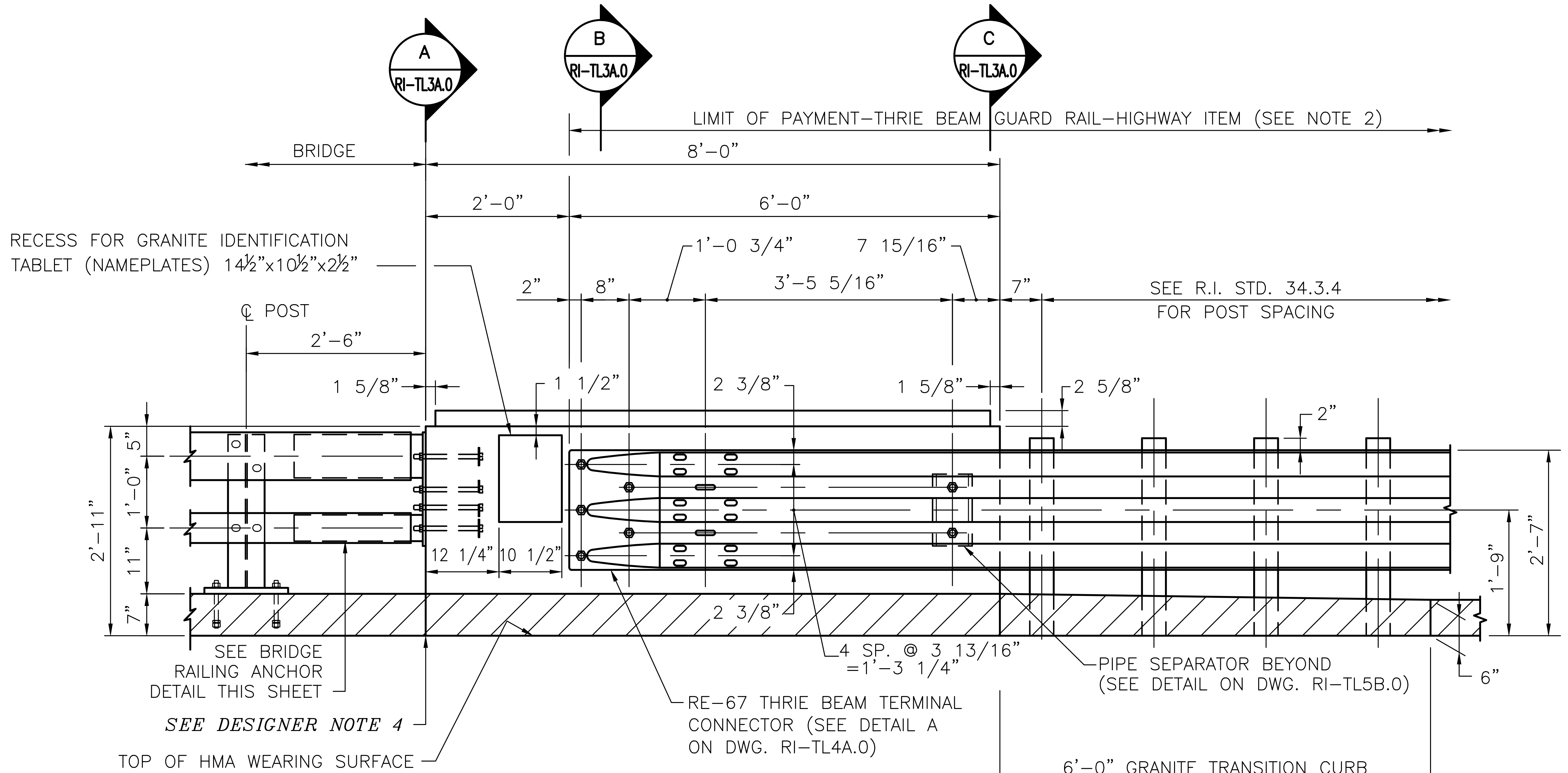
ABUTMENTS, PIERS AND WALLS ON FILL

DRAWING NUMBER: 14.30


(5) 7/8"ø BOLTS x 12" LONG (9 1/2" EMBEDMENT) ASTM A325 GALVANIZED BOLTS (COST OF BOLTS AND 1/4" ANCHOR PLATE INCLUDED IN COST OF END POST CONCRETE)
TACK WELD EACH BOLT TO 1/4" PLATE WITH 2 TACK WELDS (TYP.)
1/4" ANCHOR PLATE (GALVANIZED) (SEE DETAIL ON DWG. RI-TL5B.0)
EDGE OF DECK
3'-0"
2" (TYP.)
1'-8"
2"
10 1/2"
R=17'-0 1/2"
7"
9" OFFSET
P.T.
2'-0"
1'-6"
1'-8"
6"
2 1/2"
7 15/16"
FACE OF CURB
6"ø (6 5/8"ø O.D.) GALV. PIPE SCH. 40 1'-0" LONG BOLTED TO THRIE BEAM W/ TWO GALV. 5/8"ø BOLTS (SEE DETAIL ON DWG. RI-TL5B.0)

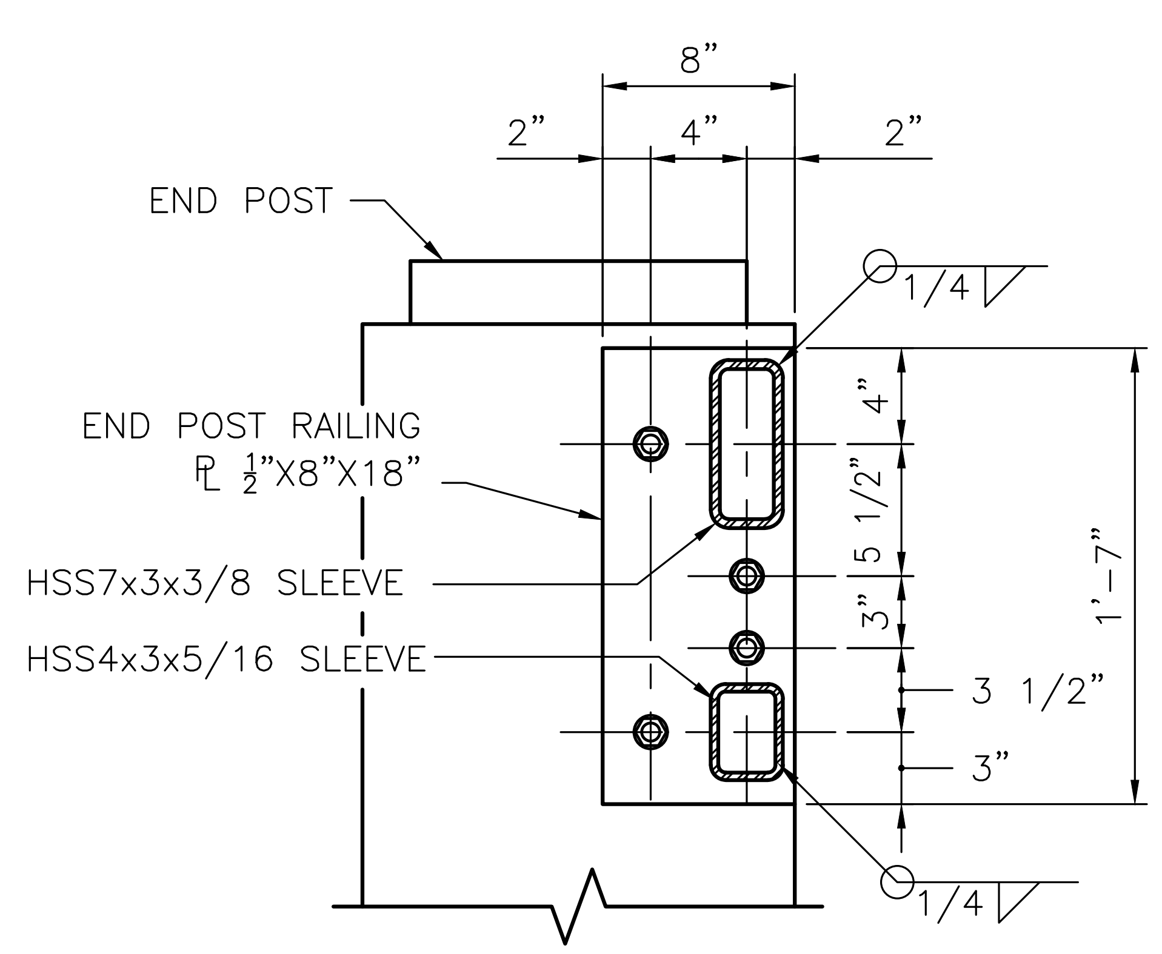
PLAN

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


A RI-TL3A.0
B RI-TL3A.0
C RI-TL3A.0
LIMIT OF PAYMENT-THRIE BEAM GUARD RAIL-HIGHWAY ITEM (SEE NOTE 2)
BRIDGE
8'-0"
2'-0"
6'-0"
RECESS FOR GRANITE IDENTIFICATION TABLET (NAMEPLATES) 14½"x10½"x2½"
1'-0 3/4"
7 15/16"
2"
8"
3'-5 5/16"
7"
SEE R.I. STD. 34.3.4 FOR POST SPACING
℄ POST
2'-6"
1 5/8"
1 1/2"
2 3/8"
1 5/8"
2 5/8"
2"
5"
1'-0"
2'-11"
11"
7"
12 1/4"
10 1/2"
2 3/8"
1'-9"
2'-7"
SEE BRIDGE RAILING ANCHOR DETAIL THIS SHEET
SEE DESIGNER NOTE 4
TOP OF HMA WEARING SURFACE
4 SP. @ 3 13/16" =1'-3 1/4"
RE-67 THRIE BEAM TERMINAL CONNECTOR (SEE DETAIL A ON DWG. RI-TL4A.0)
PIPE SEPARATOR BEYOND (SEE DETAIL ON DWG. RI-TL5B.0)
6"
6'-0" GRANITE TRANSITION CURB (HIGHWAY ITEM)

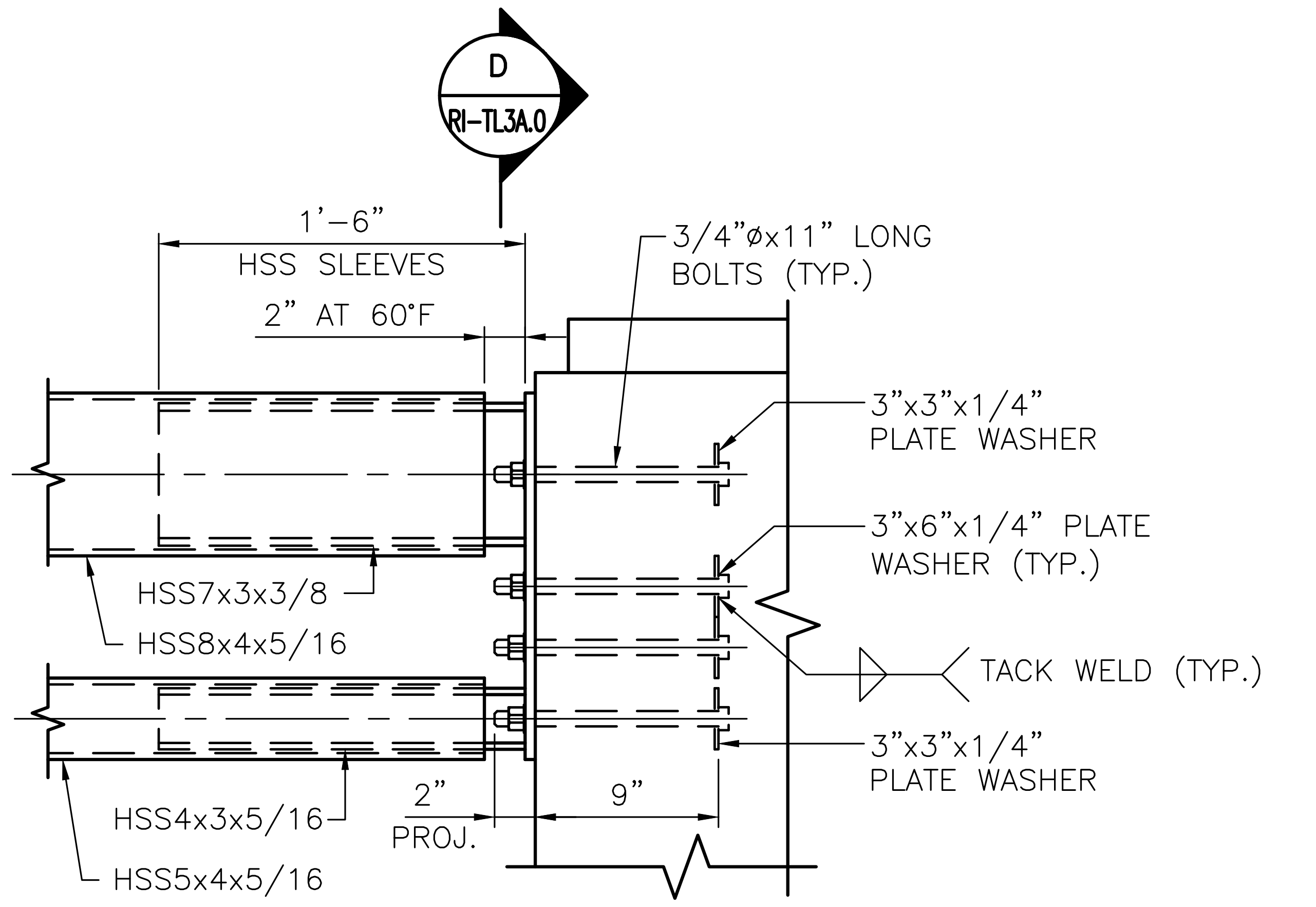
ELEVATION

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



SECTION D RI-TL3A.0

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



BRIDGE RAILING ANCHOR DETAIL

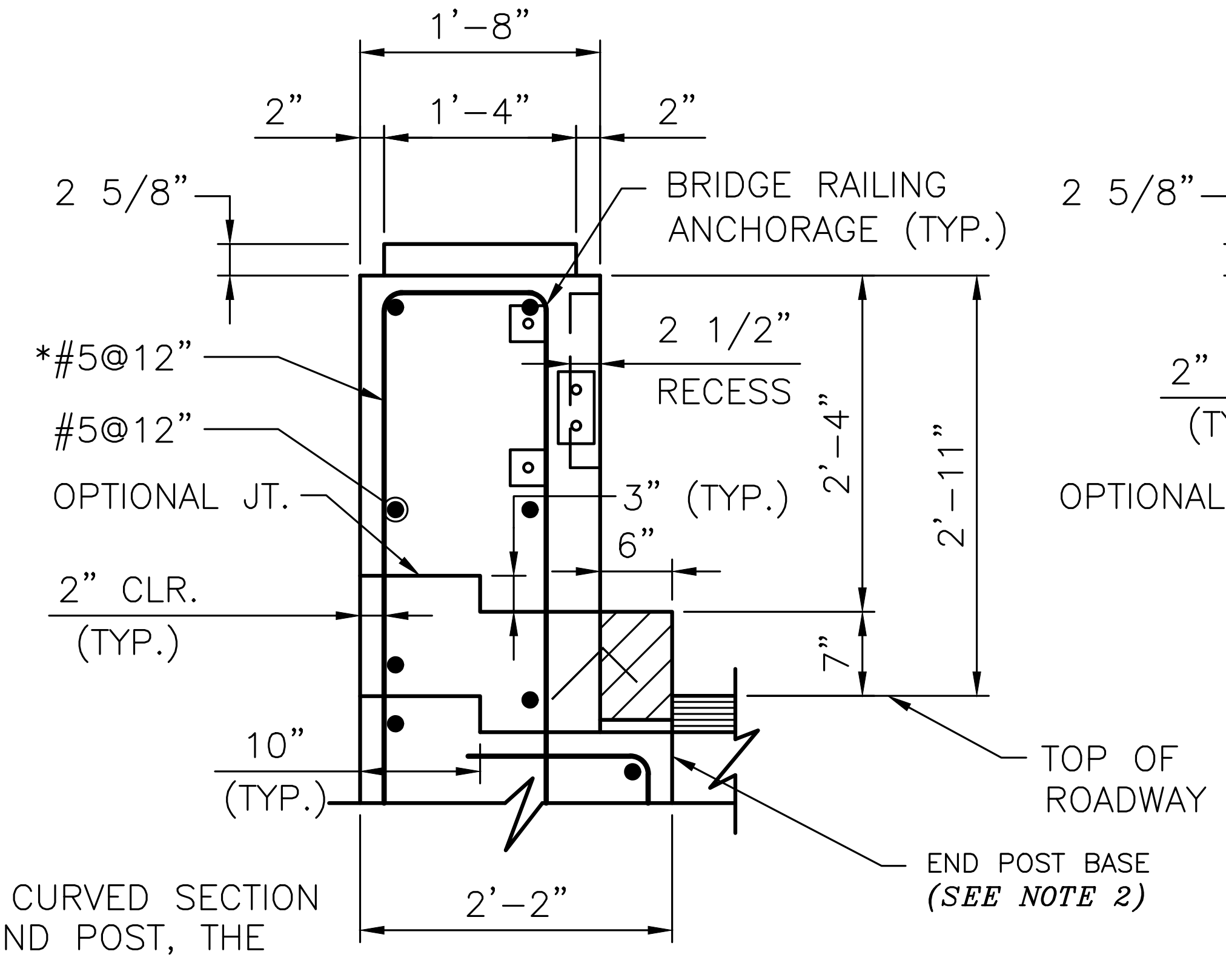
SCALE: 1 1/2"=1'-0"

DESIGNER NOTES:

1. *COORDINATE THIS DRAWING WITH DRAWING (RI-TL3A.1)*
2. *THE END POST SHALL BE FOUNDED ON A BASE THAT IS CAPABLE FOR RESISTING THE IMPACT LOAD OF MASH TL-3. THE BASE AND CONNECTION BETWEEN THE END POST AND BASE SHALL BE DESIGNED AND DETAILED ON THE CONTRACT PLANS. THE END POST VERTICAL REINFORCING BARS SHALL HAVE SUFFICIENT TENSION DEVELOPMENT LENGTH AND/OR TENSION LAP SPLICES INTO THE BASE.*
3. *REFER TO DRAWING (RI-TL5B.0) FOR NAMEPLATE TABLET, PIPE SEPARATOR, AND ANCHOR PLATE FOR THRIE BEAM DETAILS. PROVIDE THESE DETAILS IN THE PROJECT CONTRACT PLANS AS APPLICABLE.*
4. *REFER TO DRAWING (11.10) FOR CURB DETAILS. THE JOINT SHALL BE DESIGNED AND DETAILED ON THE CONTRACT PLANS. IF THIS IS THE LOCATION FOR THE BRIDGE JOINT, THE JOINT SHALL BE DETAILED IN ACCORDANCE WITH DRAWINGS (2.20 THRU 2.50 AND 4.20 THRU 4.41) AS APPLICABLE.*
5. *REFER TO MATERIAL NOTES ON DRAWING (RI-TL3A.1) FOR STRUCTURAL TUBING AND END POST RAILING PLATE REQUIREMENTS. PROVIDE MATERIAL NOTES ON THE PROJECT CONTRACT PLANS AS APPLICABLE.*

NOTES:

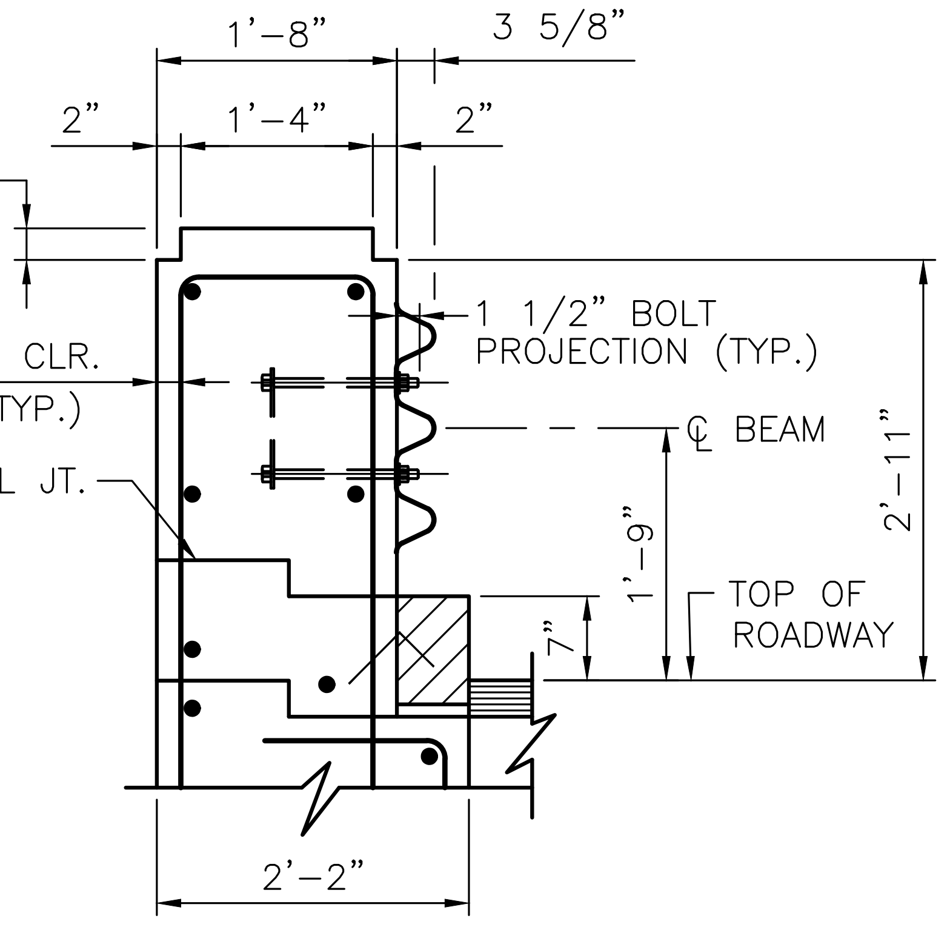
1. TO ENSURE PROPER GUARD RAIL ANCHORAGE, THE GUARD RAIL INSTALLATION SHALL BEGIN AT EACH END OF THE BRIDGE AND WORK INTO THE APPROACHES.
2. THE COST OF THE GUARD RAIL TRANSITIONS TO BRIDGE END POSTS ARE HIGHWAY ITEMS.
3. THE COST OF BRIDGE RAIL ANCHORAGE (PLATES, ANCHOR BOLTS AND PLATE SLEEVES) IS INCLUDED IN COST OF END POST CONCRETE.



* IN THE CURVED SECTION OF THE END POST, THE REINFORCING SHALL BE DETAILED WITH A MAXIMUM SPACING OF 12" AND A MINIMUM SPACING OF 3" ALONG THE ARC.

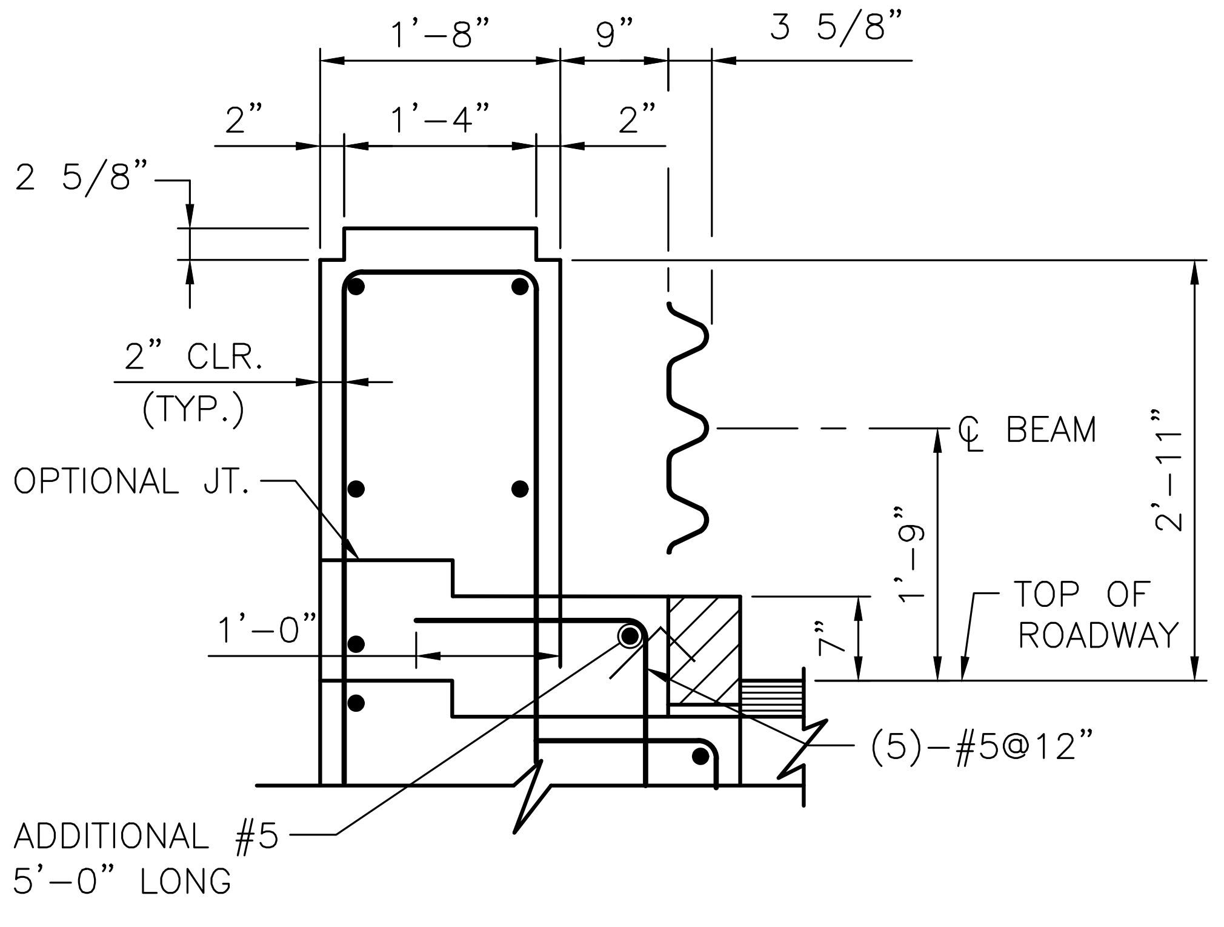
SECTION A RI-TL3A.0

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



SECTION B RI-TL3A.0

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



SECTION C RI-TL3A.0

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

END POST IS MASH
2016 TL-3 COMPLIANT

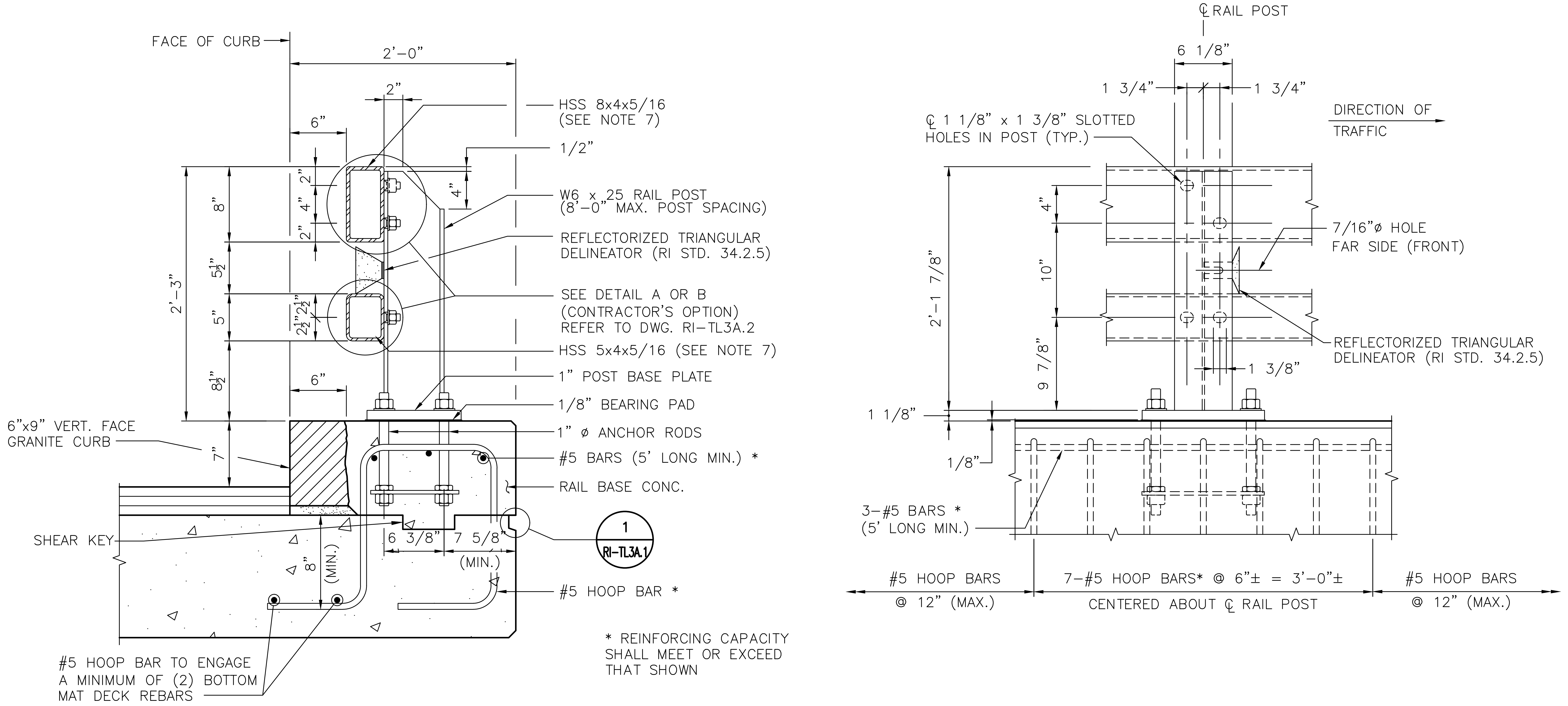
REVISIONS	
No.	DATE
0	11/2022

RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

BRIDGE STANDARDS

END POST DETAILS FOR
TWO BAR STEEL BRIDGE RAIL
(MASH TL-3)

DRAWING NUMBER: RI-TL3A.0

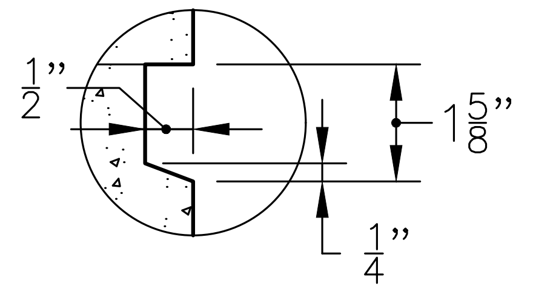


SECTION VIEW

BACK ELEVATION VIEW

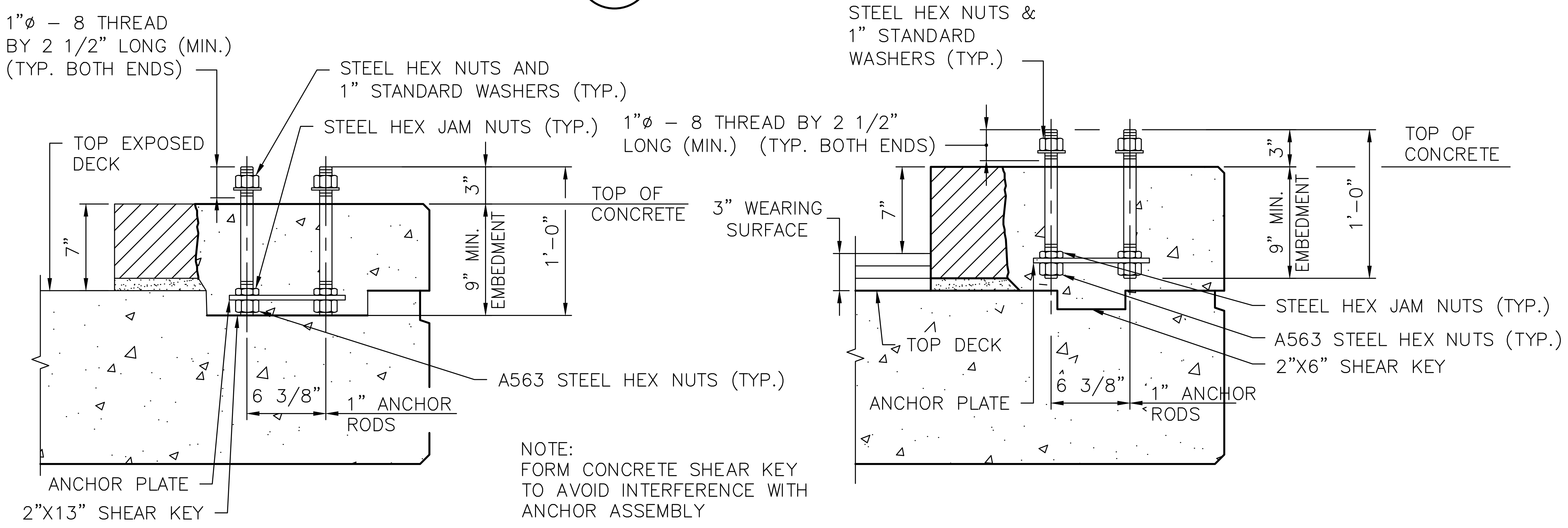
POST ASSEMBLY

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



DETAIL 1 RI-TL3A.1

SCALE 3"= 1'-0"

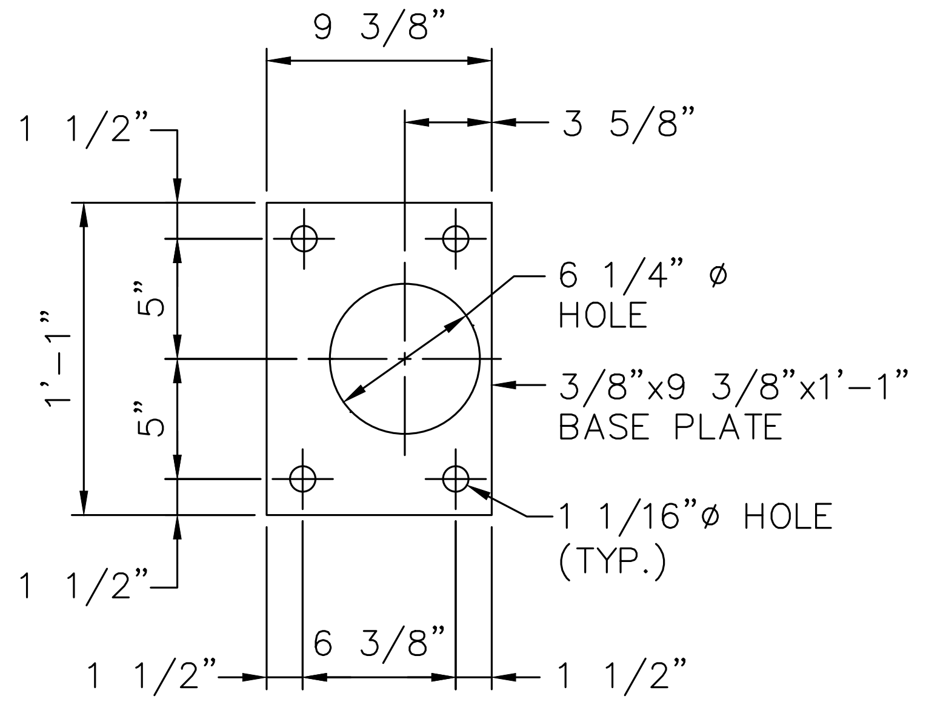


EXPOSED CONCRETE
BRIDGE DECK

BRIDGE DECK WITH BITUMINOUS
WEARING SURFACE

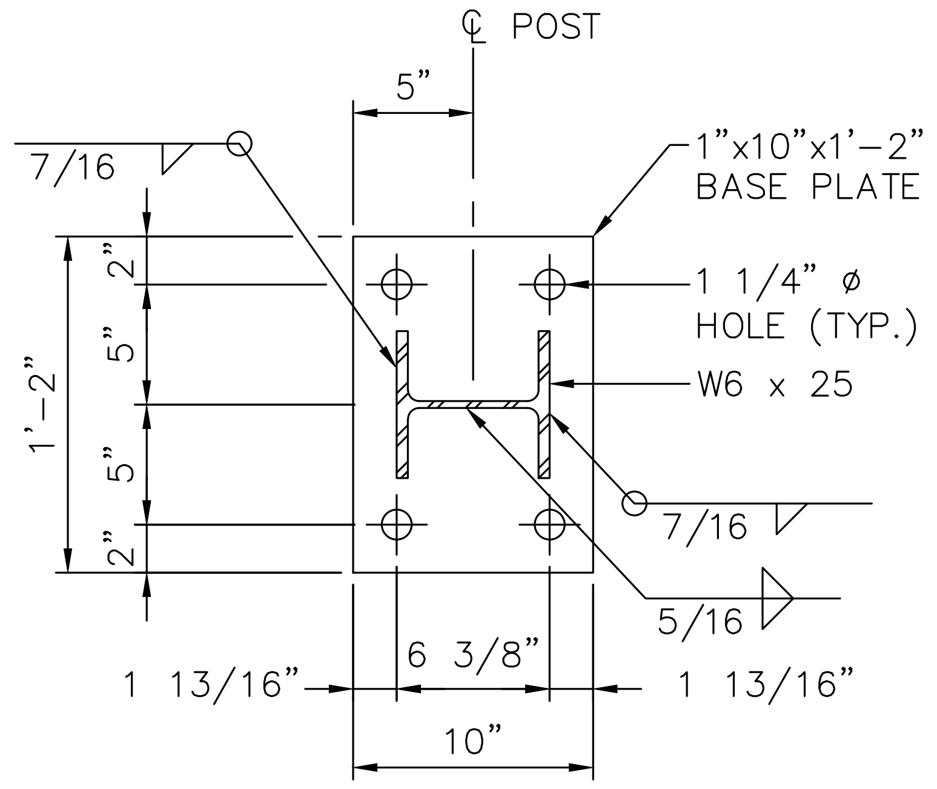
POST ANCHOR ASSEMBLY

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



ANCHOR PLATE

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



POST BASE PLATE

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

RAIL NOTES:

1. TWO BAR MASH STEEL BRIDGE RAIL, SHALL INCLUDE POSTS, BASE PLATES, ANCHOR RODS, PREFORMED PADS, RAIL ASSEMBLY BOLTS, NUTS, WASHERS, STUDS, STRUCTURAL TUBING, SPLICE BARS, PIPE SPACERS, REFLECTIVE DELINEATORS, ALL APPURTENANCES, METALIZING, AND PAINTING (IF SPECIFIED).
2. BRIDGE RAIL POSTS SHALL BE SET NORMAL (90 DEGREES) TO THE PROFILE GRADE, EXCEPT ON GRADES OVER 1.5% WHERE POSTS SHALL BE SET VERTICAL.
3. ENDS OF RAIL TUBE SECTIONS SHALL BE SAWED OR MILLED AND SHALL BE TRUE AND SMOOTH. ALL CUT EDGES OF ALL MATERIAL SHALL BE GROUND SMOOTH.
4. EACH PIECE OF RAIL TUBING SHALL BE ATTACHED TO A MINIMUM OF THREE (3) POSTS.
5. BOLT HOLES SHALL BE DRILLED OR PUNCHED. FLAME CUTTING MAY BE USED TO FINISH SLOTTED HOLES IF MECHANICALLY GUIDED.
6. AT INTERIOR SPLICES, PIPE SPACERS SHALL BE USED ON ONLY ONE SIDE OF THE SPLICE TO ALLOW MOVEMENT ON THAT SIDE. BOTH RAILS AT A SPLICE SHALL RECEIVE THE SAME TREATMENT. AT INTERIOR EXPANSION JOINTS AND AT ALL END SPLICES, THE SLOTTED HOLES AND PIPE SPACERS SHALL BE USED ON BOTH SIDES OF THE SPLICE TO ALLOW MOVEMENT ON EACH SIDE.
7. MILL OR SHOP TRANSVERSE WELDS SHALL NOT BE PERMITTED ON ANY RAIL ELEMENT. RAIL ELEMENTS USED ON CURVES SHALL USE 3/8" WALL TUBES AND SHALL BE SHOP FORMED TO THE REQUIRED CURVATURE.
8. NO PUNCHING, DRILLING, CUTTING OR WELDING SHALL BE PERMITTED AFTER METALIZING OR GALVANIZING. DAMAGED AREAS OF METALIZING OR GALVANIZING SHALL BE REPAIRED IN STRICT CONFORMANCE WITH THE MATERIAL SUPPLIER'S RECOMMENDATIONS AND SHALL BE APPROVED BY THE ENGINEER.
9. NUTS FOR 1"ø THREADED ANCHOR RODS CONNECTING THE BASE PLATE TO THE CONCRETE SHALL BE TIGHTENED TO A SNUG FIT AND GIVEN AN ADDITIONAL 1/8 TURN.
10. THREADS FOR ANCHOR RODS MAY BE ROLLED OR CUT. IF CUT THREADS ARE USED, BOLT DIAMETER SHALL NOT BE LESS THAN NOMINAL DIAMETER. IF ROLLED THREADS ARE USED, ROD DIAMETER SHALL NOT BE LESS THAN ROOT DIAMETER OF THREADS.
11. THE RAIL POST, BASE PLATE AND ANCHOR CAGE MUST BE INSTALLED PRECISELY TO THE LOCATION DIMENSIONED ON THESE PLANS. THE POSITION OF THE (3)-#5 LONGITUDINAL REBARS MAY BE ADJUSTED TO ACCOMMODATE THE ANCHOR CAGE, BUT MUST NOT BE CUT.
12. FOR GRANITE CURB DETAILS REFER TO DRAWING (11.10).
13. RAILING SHALL BE SHOP PAINTED [INSERT PAINT COLOR].

MATERIAL NOTES:

1. STRUCTURAL TUBING SHALL CONFORM TO THE REQUIREMENTS OF ASTM A500, GRADE B, STRUCTURAL STEEL TUBING. RAIL TUBING SHALL MEET THE LONGITUDINAL CHARPY V-NOTCH REQUIREMENTS OF 15 LBS. AT 0°F FOR ASTM A500, GRADE B. THE TEST SAMPLES SHALL BE TAKEN AFTER FORMING THE TUBES. CHARPY V-NOTCH IS NOT REQUIRED FOR SPLICE TUBES.
2. RAIL POSTS, BASE PLATES, AND END POST RAILING PLATES SHALL CONFORM TO THE REQUIREMENTS OF ASTM A572 GR. 50, EXCEPT ANCHOR PLATES MAY BE ASTM A36.
3. THREADED STUDS AND MATCHING NUTS FOR RAIL-TO-POST ATTACHMENT (DETAIL A) SHALL CONFORM TO ASTM A276 TYPE 304, STAINLESS STEEL, AND SHALL BE TORQUE TESTED PER AWS D1.5, 7.7.1. DETAIL B BOLTS SHALL BE ASTM F3125 (GR. A325 OR A449). ALL OTHER BOLTS AND NUTS SHALL CONFORM TO ASTM A307 AND ASTM A563 GRADE A RESPECTIVELY OR BETTER. ANCHOR RODS SHALL CONFORM TO ASTM A449. ASTM A563 NUTS SHALL BE USED AT THE BOTTOM OF ANCHOR ASSEMBLY. WASHERS SHALL BE HARDENED STEEL COMMERCIAL TYPE A PLAIN WIDE WASHERS AND SHALL MEET THE DIMENSIONAL REQUIREMENTS OF A.N.S.I. B18.22.
4. STEEL COMPONENTS (EXCEPT STAINLESS) SHALL BE METALIZED IN ACCORDANCE WITH RIDOT SPECIFICATION 827 OR GALVANIZED IN ACCORDANCE WITH RIDOT SPECIFICATION 843. THE METALIZING OR GALVANIZING SHALL HAVE A UNIFORM APPEARANCE, AND THE COATED MATERIAL SHALL BE PROPERLY STORED.
5. DETAIL "A" STUDS, SHOWN ON DWG. (RI-TL3A.2), SHALL BE WELDED BEFORE TUBES ARE METALIZED OR GALVANIZED.
6. FORMED BEARING PADS (1/8" THICK) SHALL CONFORM TO AASHTO M251.

TWO BAR STEEL BRIDGE
RAIL IS MASH 2016 TL-3
COMPLIANT

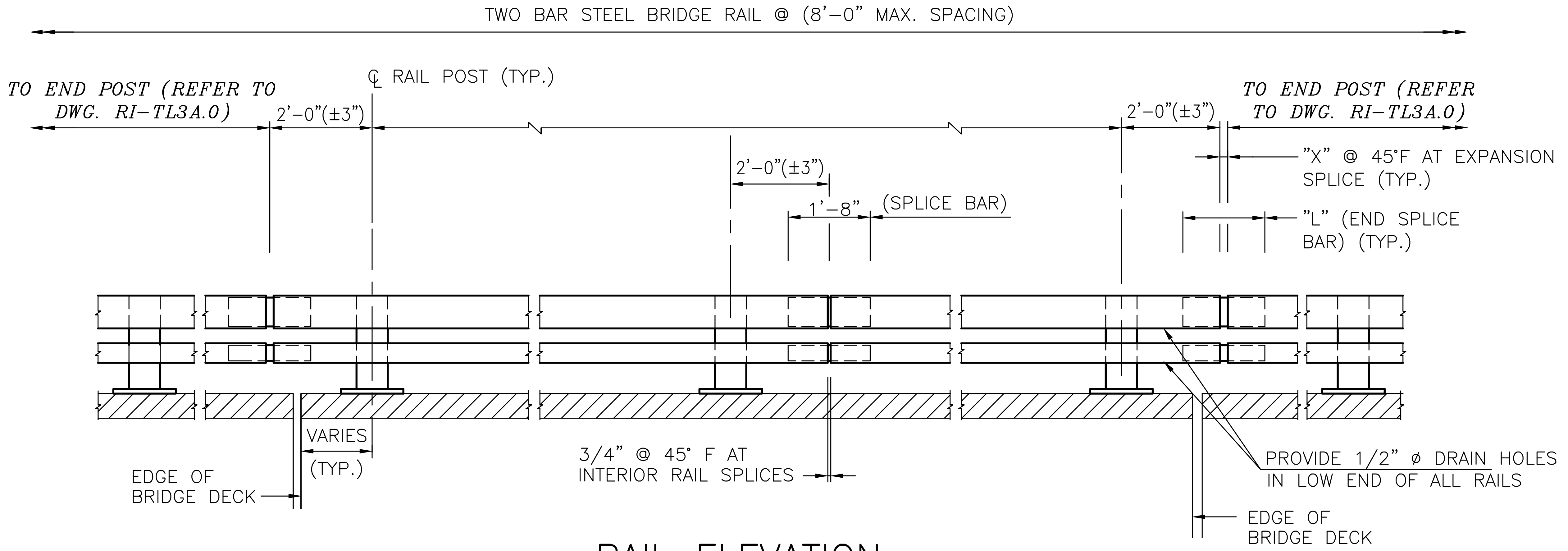
REVISIONS	
No.	DATE
0	11/2022

RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

BRIDGE STANDARDS

TWO BAR STEEL BRIDGE
RAIL (MASH TL-3)
SHEET 1

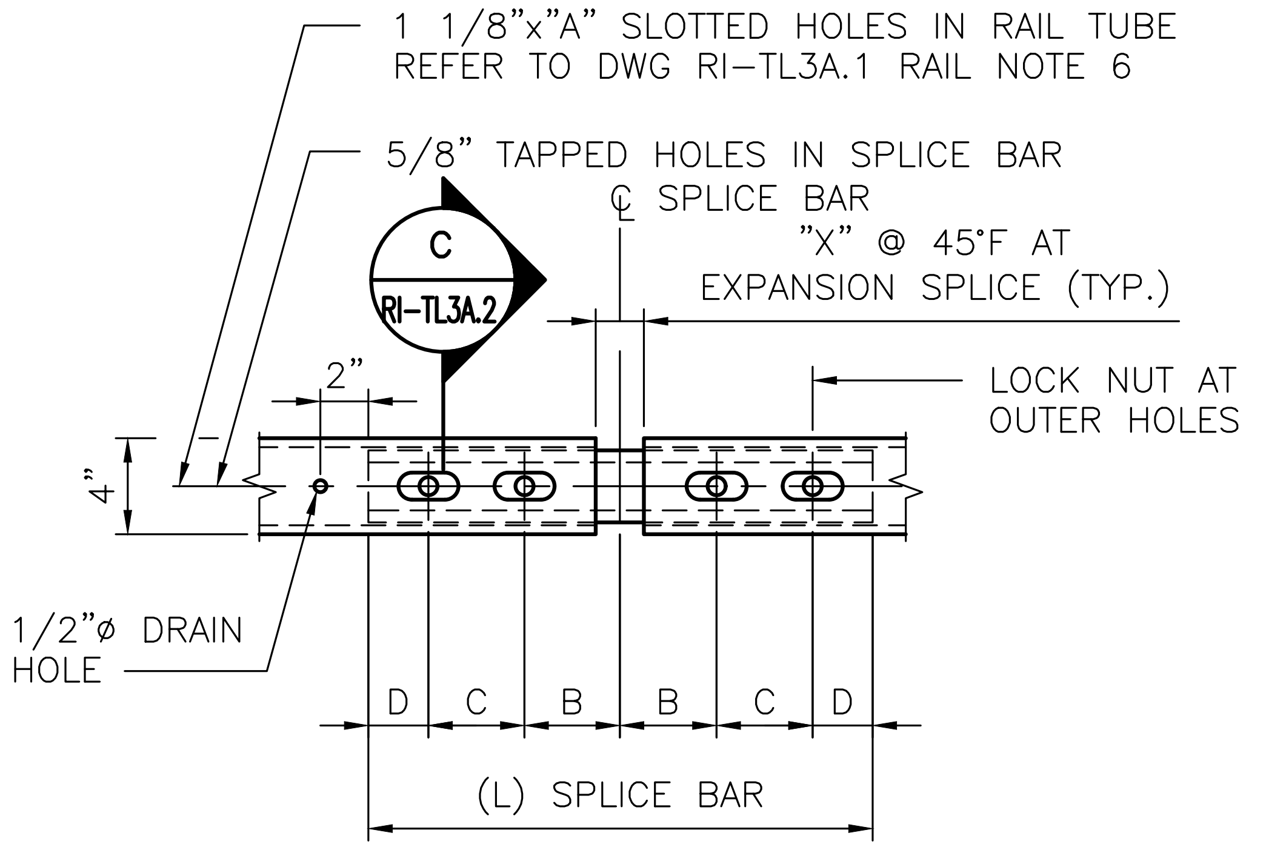
DRAWING NUMBER: RI-TL3A.1


TWO BAR STEEL BRIDGE RAIL @ (8'-0" MAX. SPACING)
TO END POST (REFER TO DWG. RI-TL3A.0)
℄ RAIL POST (TYP.)
2'-0"(±3")
2'-0"(±3")
1'-8" (SPLICE BAR)
TO END POST (REFER TO DWG. RI-TL3A.0)
2'-0"(±3")
"X" @ 45°F AT EXPANSION SPLICE (TYP.)
"L" (END SPLICE BAR) (TYP.)
VARIES (TYP.)
EDGE OF BRIDGE DECK
3/4" @ 45° F AT INTERIOR RAIL SPLICES
PROVIDE 1/2" ⌀ DRAIN HOLES IN LOW END OF ALL RAILS
EDGE OF BRIDGE DECK

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

	SPLICE BAR DIMENSION TABLE					
T	A	B	C	D	X	L
INTERIOR	2 1/2"	4"	4"	2"	3/4"	1'-8"
* <3 1/4"	2 1/2"	4"	4"	2"	2"	1'-8"
* 3 1/4" TO 5 1/4"	3 1/2"	5"	5"	2 1/2"	3"	2'-1"

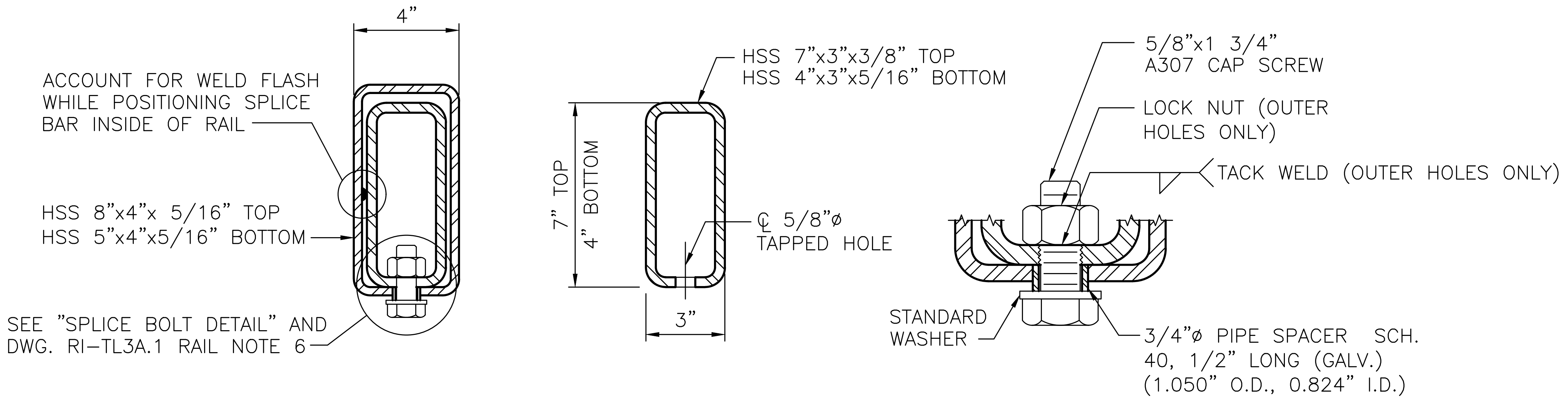
T = TOTAL MOVEMENT OF BRIDGE
* = END SPLICE BAR


1 1/8"x"A" SLOTTED HOLES IN RAIL TUBE REFER TO DWG RI-TL3A.1 RAIL NOTE 6
5/8" TAPPED HOLES IN SPLICE BAR
℄ SPLICE BAR
"X" @ 45°F AT EXPANSION SPLICE (TYP.)
C
RI-TL3A.2
2"
LOCK NUT AT OUTER HOLES
4"
1/2"⌀ DRAIN HOLE
D C B B C D
(L) SPLICE BAR

SEE SPLICE BAR DIMENSION TABLE THIS SHEET

(BOTTOM VIEW)

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

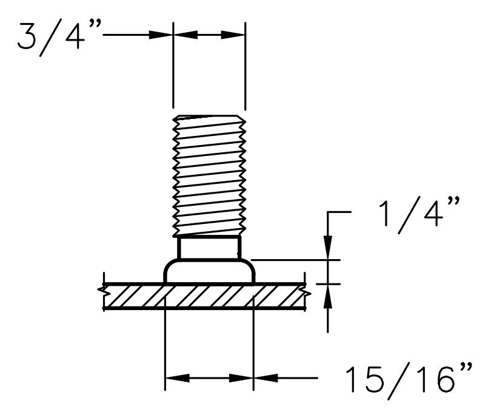

4"
ACCOUNT FOR WELD FLASH WHILE POSITIONING SPLICE BAR INSIDE OF RAIL
HSS 8"x4"x 5/16" TOP
HSS 5"x4"x5/16" BOTTOM
SEE "SPLICE BOLT DETAIL" AND DWG. RI-TL3A.1 RAIL NOTE 6
HSS 7"x3"x3/8" TOP
HSS 4"x3"x5/16" BOTTOM
7" TOP
4" BOTTOM
℄ 5/8"⌀ TAPPED HOLE
3"
5/8"x1 3/4" A307 CAP SCREW
LOCK NUT (OUTER HOLES ONLY)
TACK WELD (OUTER HOLES ONLY)
STANDARD WASHER
3/4"⌀ PIPE SPACER SCH. 40, 1/2" LONG (GALV.) (1.050" O.D., 0.824" I.D.)

SECTION C RI-TL3A.2

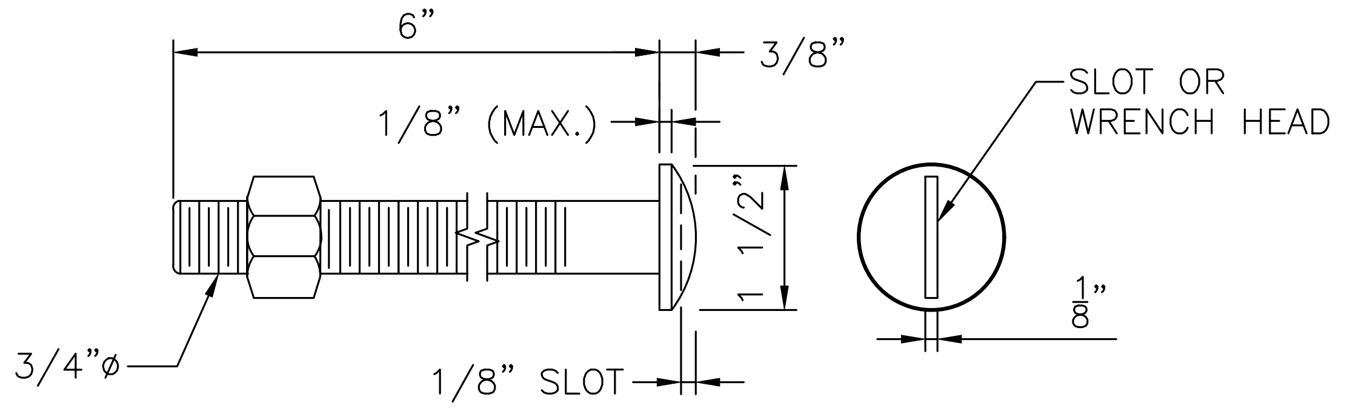
SPLICE BAR SECTION

SPLICE BOLT DETAIL

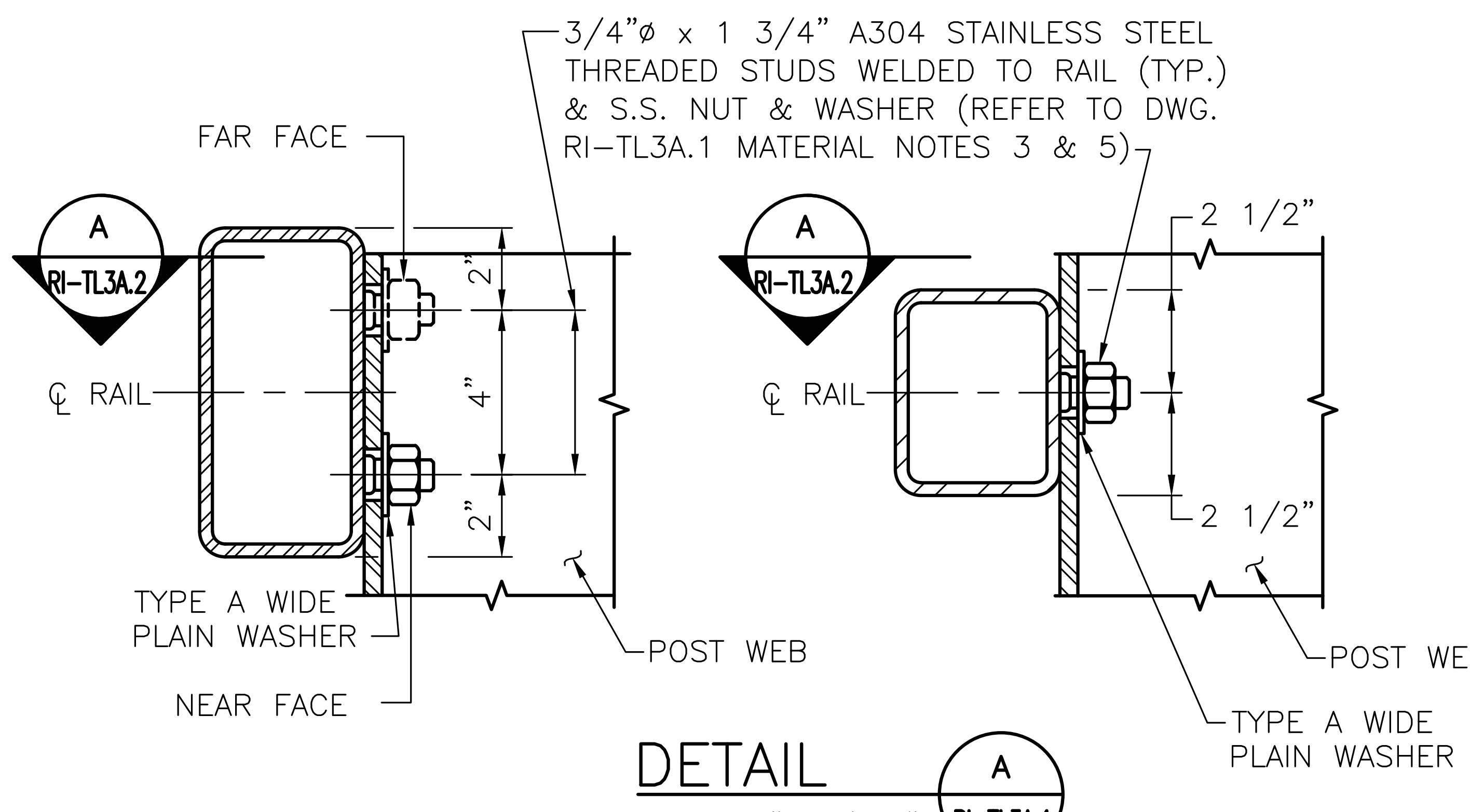
RAIL SPLICE DETAILS
SCALE: 3"=1'-0"



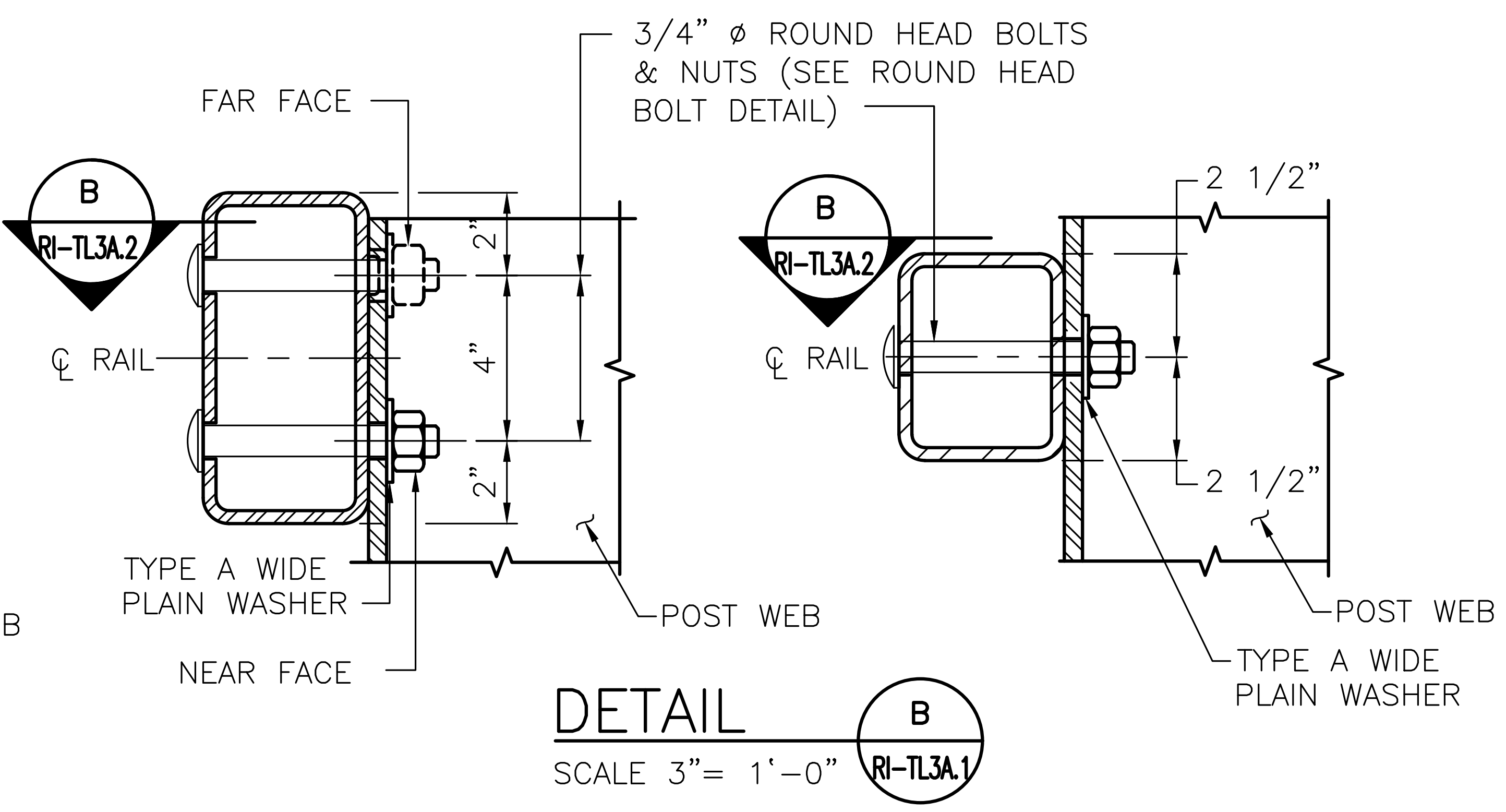
STUD WELD DETAIL
NOT TO SCALE



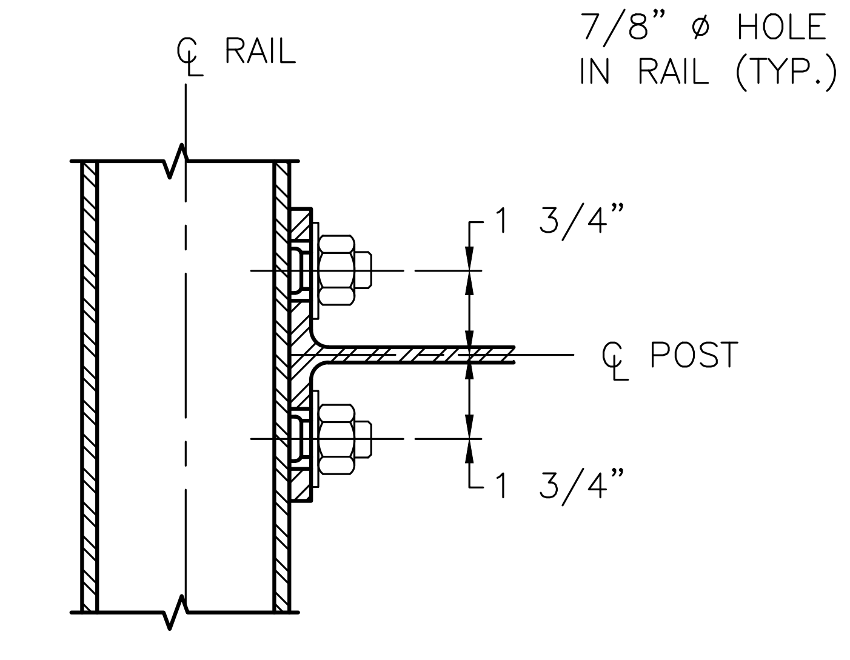
ROUND HEAD BOLT DETAIL
NOT TO SCALE


3/4"⌀ x 1 3/4" A304 STAINLESS STEEL THREADED STUDS WELDED TO RAIL (TYP.) & S.S. NUT & WASHER (REFER TO DWG. RI-TL3A.1 MATERIAL NOTES 3 & 5)
FAR FACE
A
RI-TL3A.2
℄ RAIL
2"
4"
2"
TYPE A WIDE PLAIN WASHER
NEAR FACE
POST WEB
A
RI-TL3A.2
2 1/2"
℄ RAIL
2 1/2"
POST WEB
TYPE A WIDE PLAIN WASHER

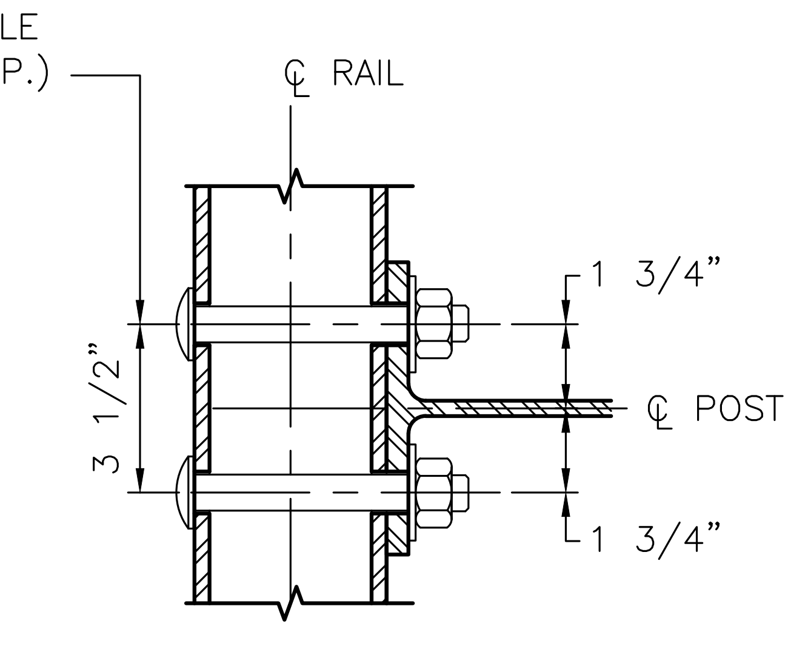
DETAIL A RI-TL3A.1
SCALE 3"= 1'-0"



DETAIL B RI-TL3A.1
SCALE 3"= 1'-0"



SECTION A RI-TL3A.2
SCALE 3"= 1'-0"



SECTION B RI-TL3A.2
SCALE 3"= 1'-0"

TWO BAR STEEL BRIDGE
RAIL IS MASH 2016 TL-3
COMPLAINT

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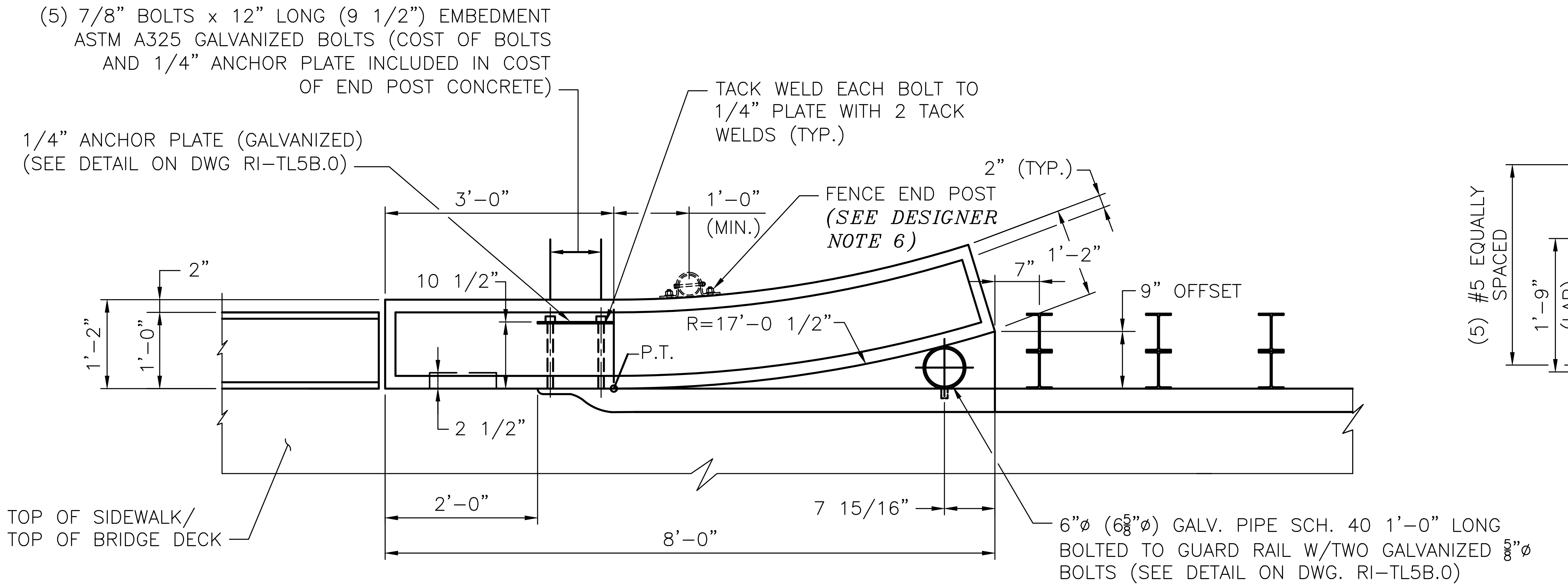
RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

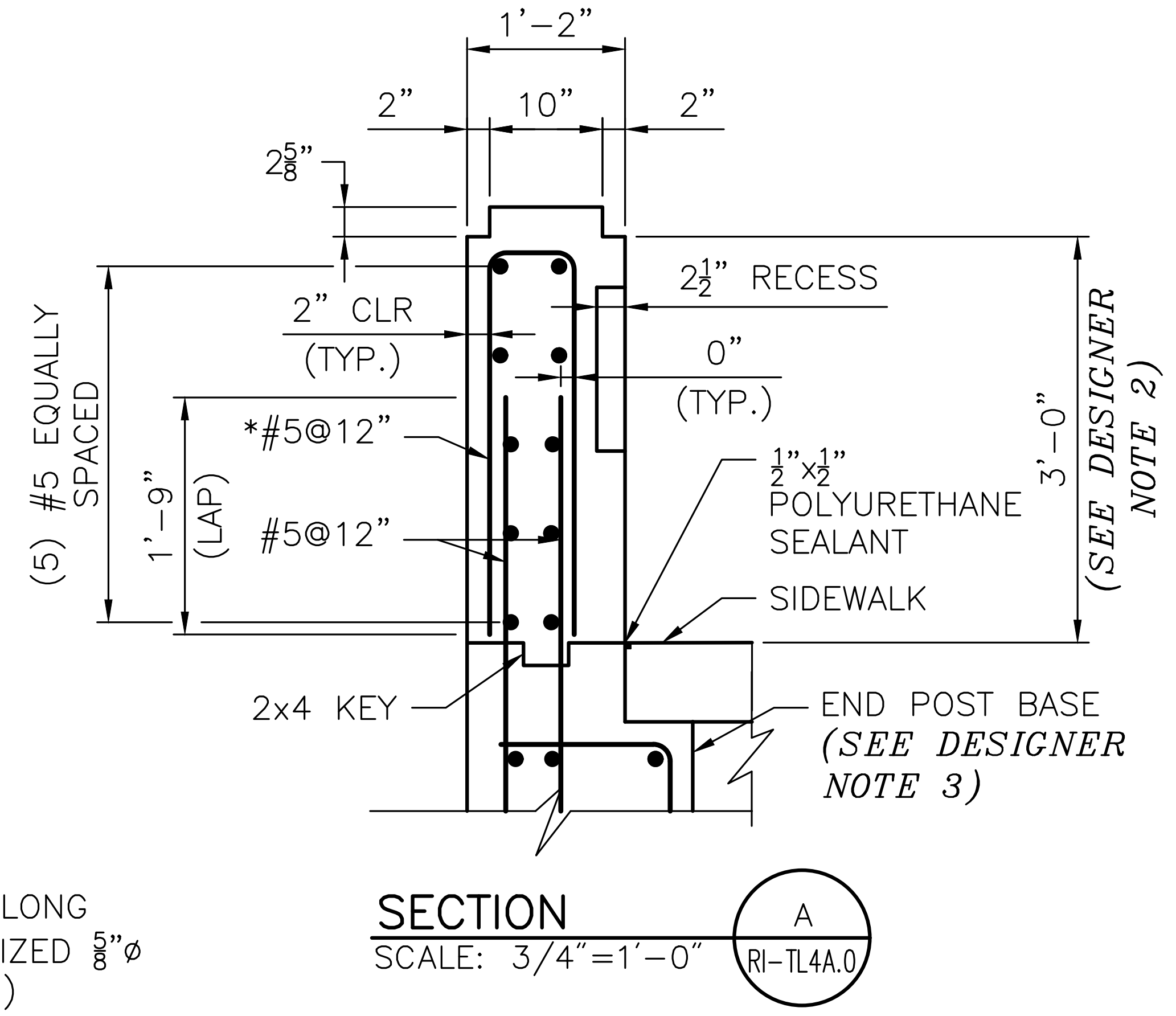
BRIDGE STANDARDS

TWO BAR STEEL BRIDGE
RAIL (MASH TL-3)
SHEET 2

DRAWING NUMBER: RI-TL3A.2

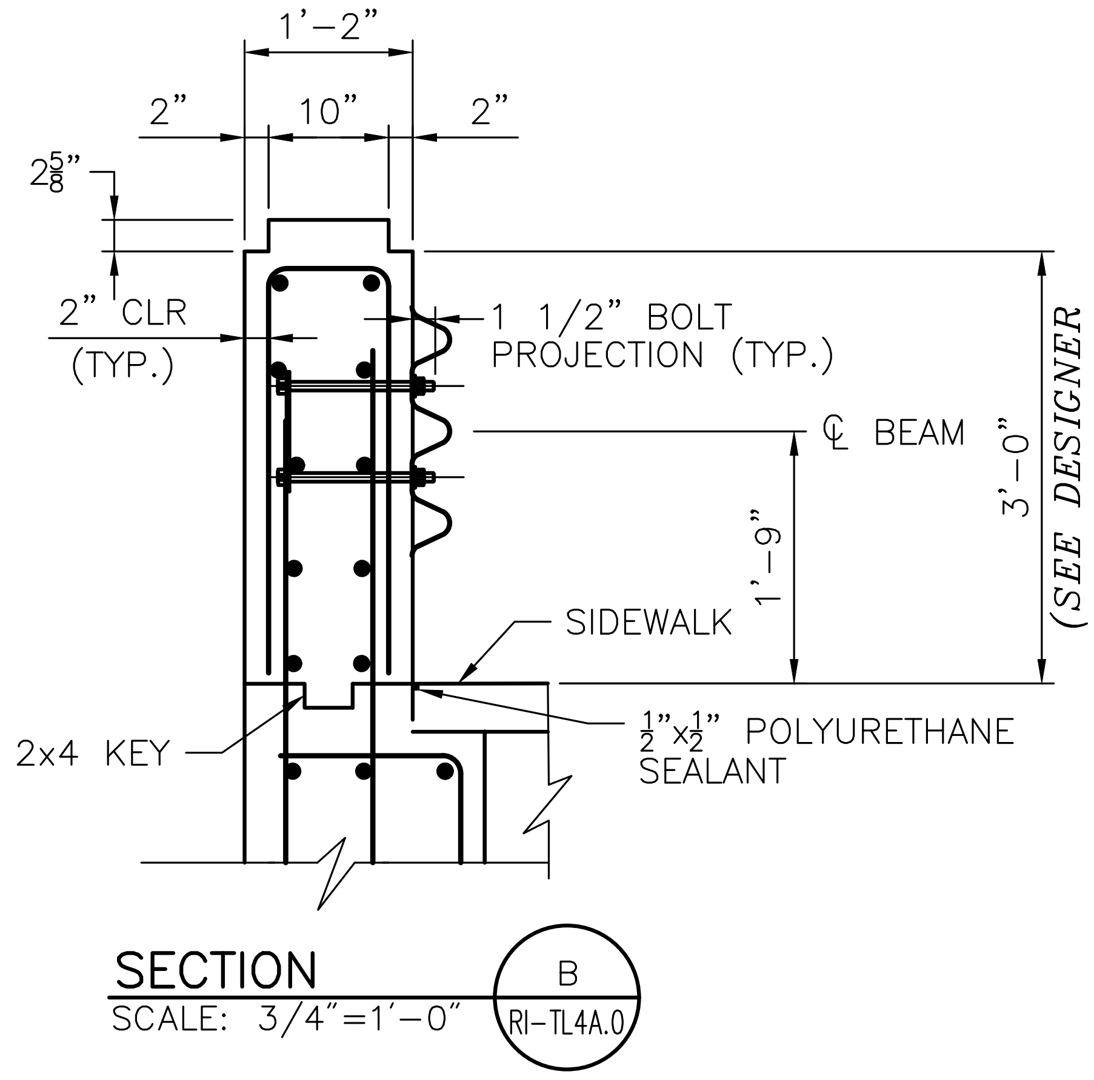

(5) 7/8" BOLTS x 12" LONG (9 1/2") EMBEDMENT ASTM A325 GALVANIZED BOLTS (COST OF BOLTS AND 1/4" ANCHOR PLATE INCLUDED IN COST OF END POST CONCRETE)
1/4" ANCHOR PLATE (GALVANIZED) (SEE DETAIL ON DWG RI-TL5B.0)
TACK WELD EACH BOLT TO 1/4" PLATE WITH 2 TACK WELDS (TYP.)
FENCE END POST (SEE DESIGNER NOTE 6)
2" (TYP.)
3'-0"
1'-0" (MIN.)
1'-2"
7"
9" OFFSET
2"
10 1/2"
1'-2"
1'-0"
R=17'-0 1/2"
P.T.
2 1/2"
TOP OF SIDEWALK/ TOP OF BRIDGE DECK
2'-0"
8'-0"
7 15/16"
6"ø (6 5/8"ø) GALV. PIPE SCH. 40 1'-0" LONG BOLTED TO GUARD RAIL W/TWO GALVANIZED 5/8"ø BOLTS (SEE DETAIL ON DWG. RI-TL5B.0)

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

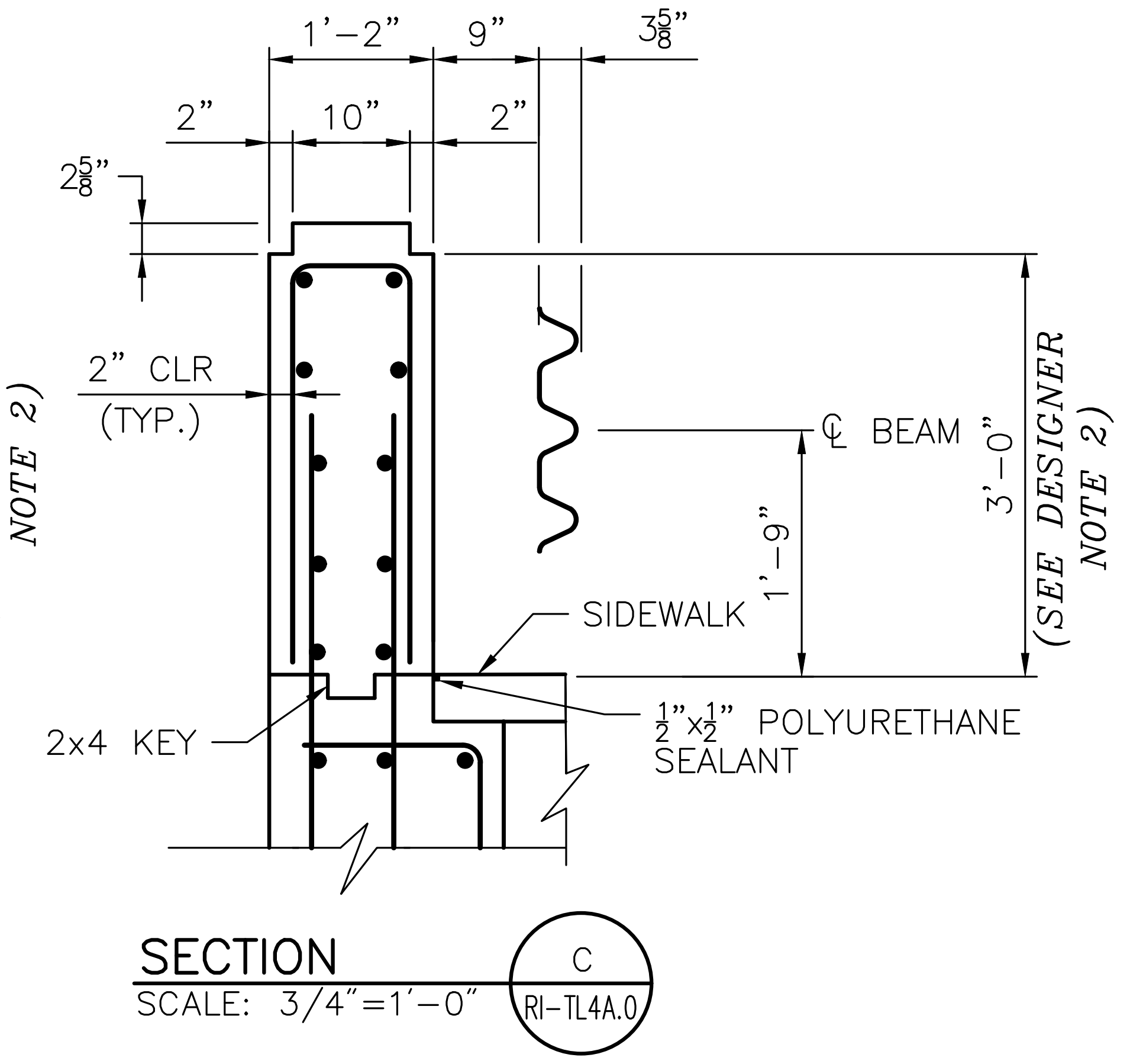


SECTION A RI-TL4A.0
SCALE: 3/4"=1'-0"

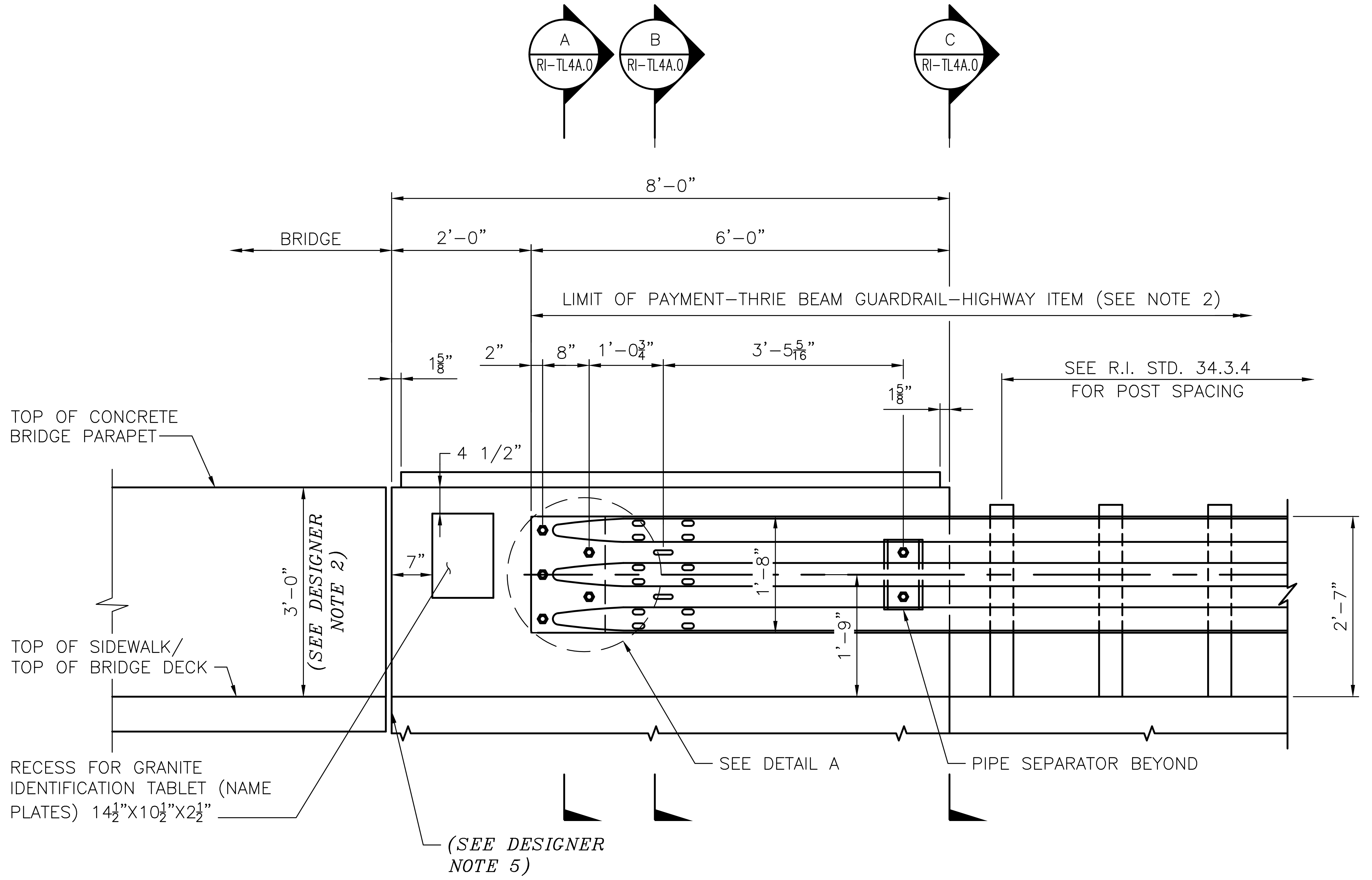
* IN THE CURVED SECTION OF THE END POST, THE REINFORCING SHALL BE DETAILED WITH A MAXIMUM SPACING OF 12" AND A MIMIMUM SPACING OF 3" ALONG THE ARC.


1'-2"
2"
10"
2"
2 5/8"
2" CLR (TYP.)
1 1/2" BOLT PROJECTION (TYP.)
℄ BEAM
1'-9"
3'-0" (SEE DESIGNER NOTE 2)
SIDEWALK
2x4 KEY
1/2"x1/2" POLYURETHANE SEALANT

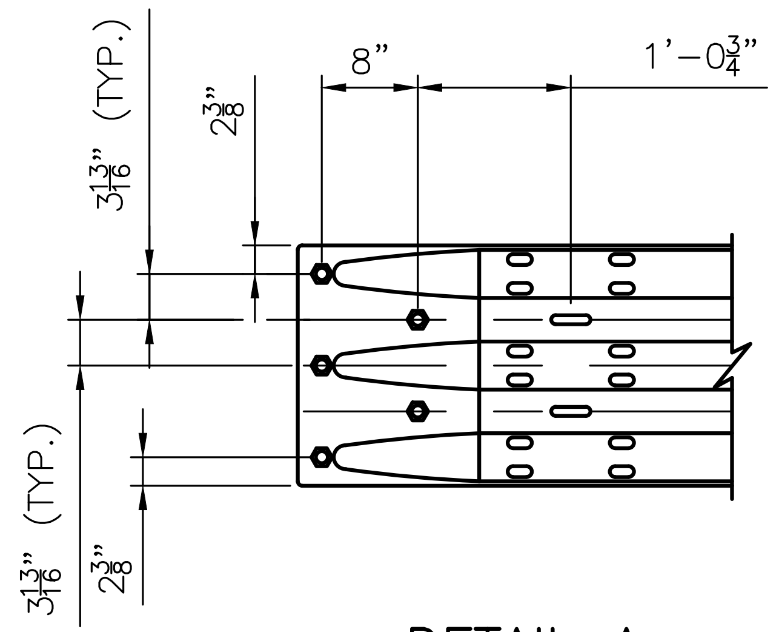
SECTION B RI-TL4A.0
SCALE: 3/4"=1'-0"



SECTION C RI-TL4A.0
SCALE: 3/4"=1'-0"


A RI-TL4A.0
B RI-TL4A.0
C RI-TL4A.0
8'-0"
BRIDGE
2'-0"
6'-0"
LIMIT OF PAYMENT-THRIE BEAM GUARDRAIL-HIGHWAY ITEM (SEE NOTE 2)
1 5/8"
2"
8"
1'-0 3/4"
3'-5 5/16"
1 5/8"
SEE R.I. STD. 34.3.4 FOR POST SPACING
TOP OF CONCRETE BRIDGE PARAPET
4 1/2"
7"
3'-0" (SEE DESIGNER NOTE 2)
1'-8"
1'-9"
2'-7"
TOP OF SIDEWALK/ TOP OF BRIDGE DECK
RECESS FOR GRANITE IDENTIFICATION TABLET (NAME PLATES) 14 1/2"X10 1/2"X2 1/2"
(SEE DESIGNER NOTE 5)
SEE DETAIL A
PIPE SEPARATOR BEYOND

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



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

DESIGNER NOTES:

1. *COORDINATE THIS DRAWING WITH DRAWING (RI-TL4A.1).*
2. *INCREASE END POST HEIGHT TO 3'-3" WHEN BRIDGE DECK IS PAVED WITH A WEARING SURFACE. END POST HEIGHT SHALL NOT EXCEED 3'-3" FROM THE TOP OF BRIDGE DECK.*
3. *THE END POST SHALL BE FOUNDED ON A BASE THAT IS CAPABLE FOR RESISTING THE IMPACT LOAD OF MASH TL-4. THE BASE AND CONNECTION BETWEEN THE END POST AND THE BASE SHALL BE DESIGNED AND DETAILED ON THE CONTRACT PLANS. THE END POST VERTICAL REINFORCING BARS SHALL HAVE SUFFICIENT TENSION DEVELOPMENT LENGTH AND/OR TENSION LAP SPLICES INTO THE BASE.*
4. *REFER TO DRAWING (RI-TL5B.0) FOR NAMEPLATE TABLET, PIPE SEPARATOR, AND ANCHOR PLATE FOR THRIE BEAM DETAILS. PROVIDE THESE DETAILS IN THE PROJECT CONTRACT DRAWINGS AS APPLICABLE.*
5. *THE JOINT SHALL BE DESIGNED AND DETAILED ON THE CONTRACT PLANS. IF THIS IS THE LOCATION FOR THE BRIDGE JOINT, THE JOINT SHALL BE DETAILED IN ACCORDANCE WITH DRAWINGS (2.20 THRU 2.50 AND 4.20 THRU 4.41) AS APPLICABLE.*
6. *WHEN A SIDEWALK IS PROPOSED WITH THE END POST AND A DROP-OFF CONDITION EXISTS, A 6'-0" PROTECTIVE SCREEN SHALL BE MOUNTED AT THE BACK OF THE END POST. REFER TO DWG. (RI-FENCE.0 – RI-FENCE.3) FOR FENCE DETAILS AND CHANGE IN CRASHWORTHINESS OF THE END POST.*

NOTES:

1. TO ENSURE PROPER GUARDRAIL ANCHORAGE, THE GUARD RAIL INSTALLATION SHALL BEGIN AT EACH END OF THE BRIDGE AND WORK INTO THE APPROACHES.
2. THE COST OF THE GUARD RAIL TRANSITIONS TO BRIDGE END POSTS ARE HIGHWAY ITEMS.

END POST IS MASH 2016
TL-4 COMPLIANT

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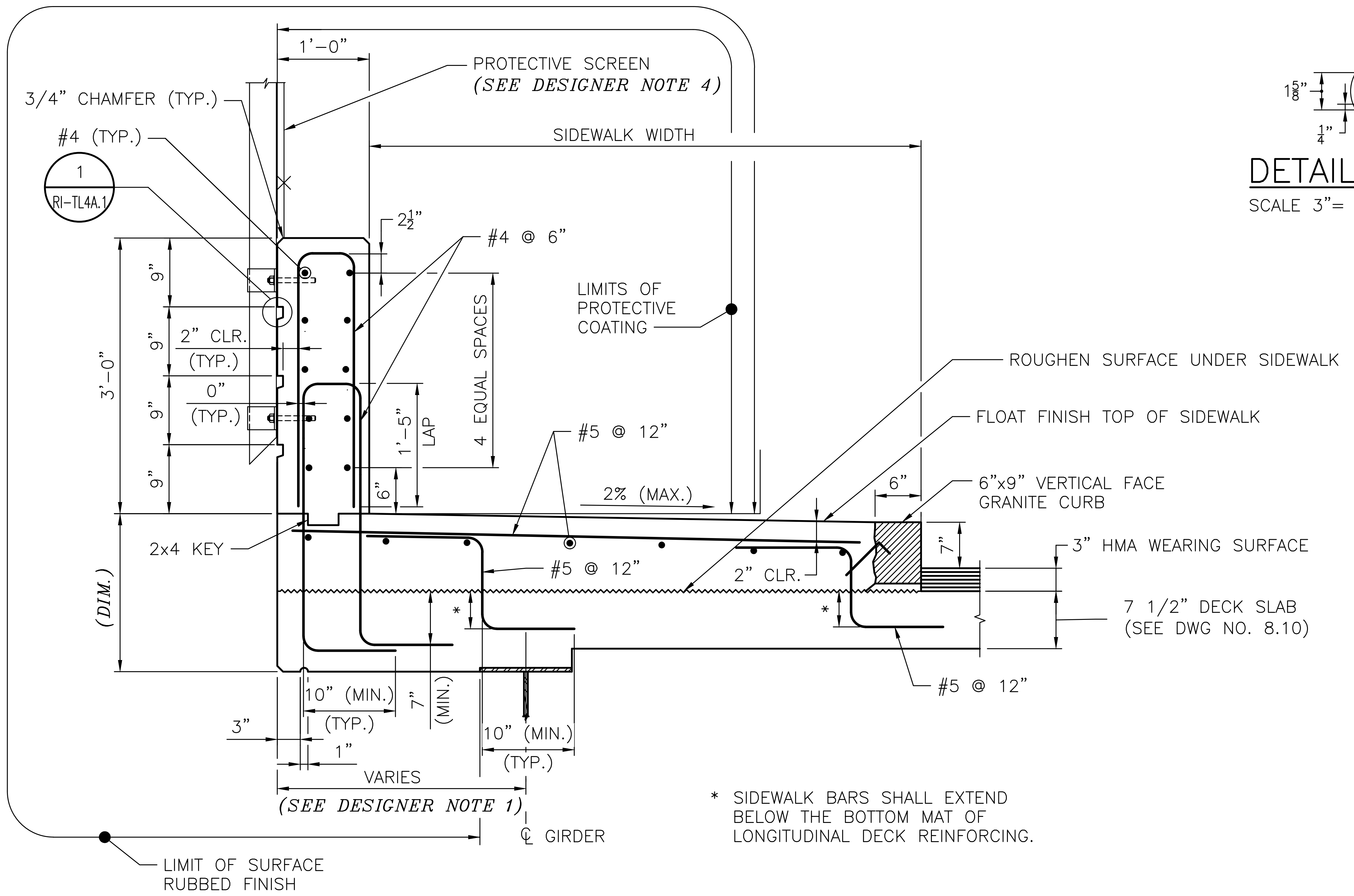
RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

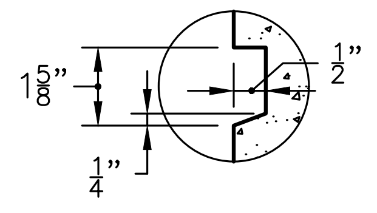
BRIDGE STANDARDS

END POST DETAILS FOR
VERTICAL FACE PARAPET
(MASH TL-4)

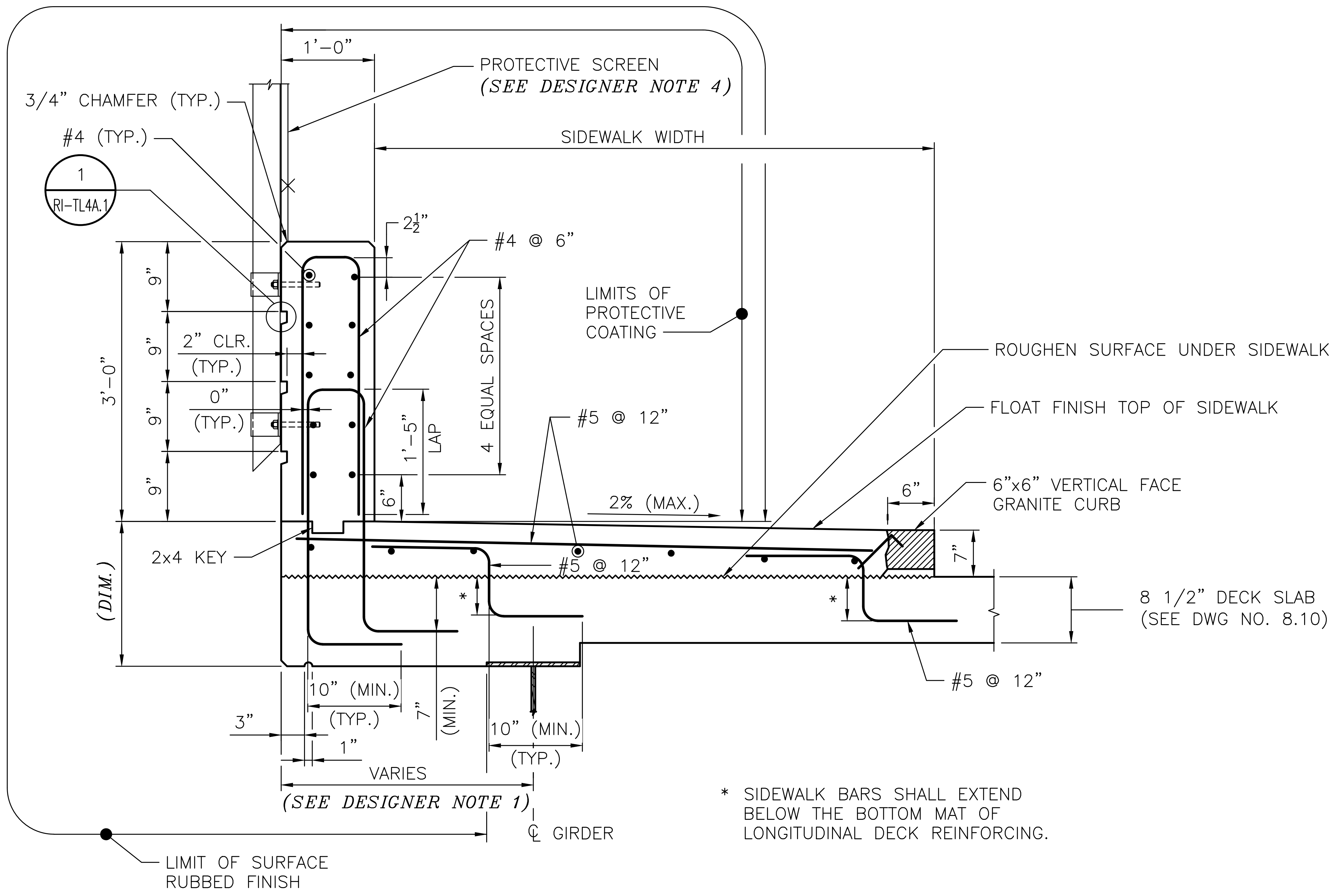
DRAWING NUMBER: RI-TL4A.0



SECTION THRU SIDEWALK MOUNTED VERTICAL FACE CONCRETE PARAPET (MASH TL-4)
(WITH HMA WEARING SURFACE)
SCALE 1"=1'-0"



DETAIL 1 RI-TL4A.1
SCALE 3"= 1'-0"

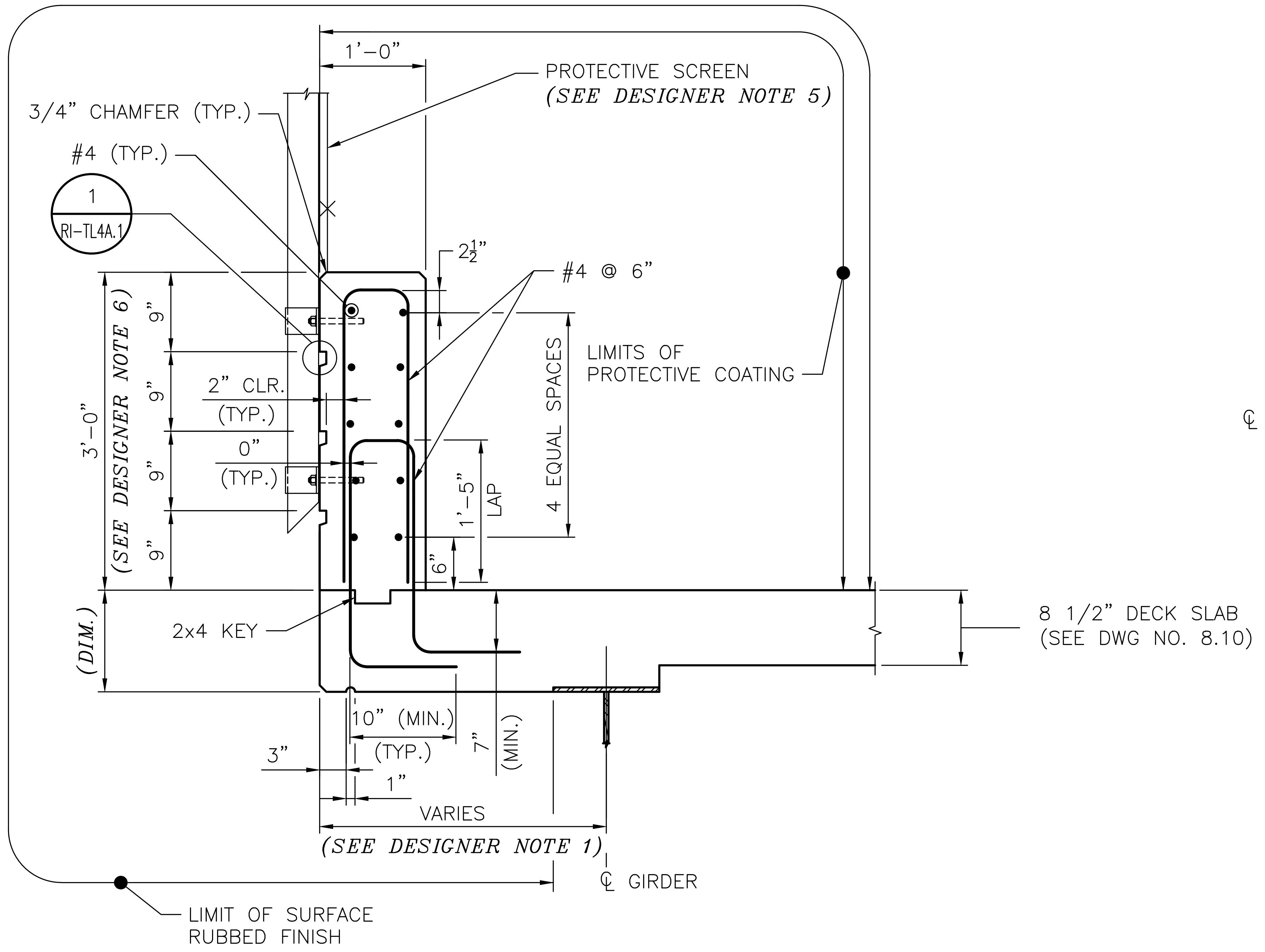


SECTION THRU SIDEWALK MOUNTED VERTICAL FACE CONCRETE PARAPET (MASH TL-4)
(WITH EXPOSED CONCRETE DECK SURFACE)
SCALE 1"=1'-0"

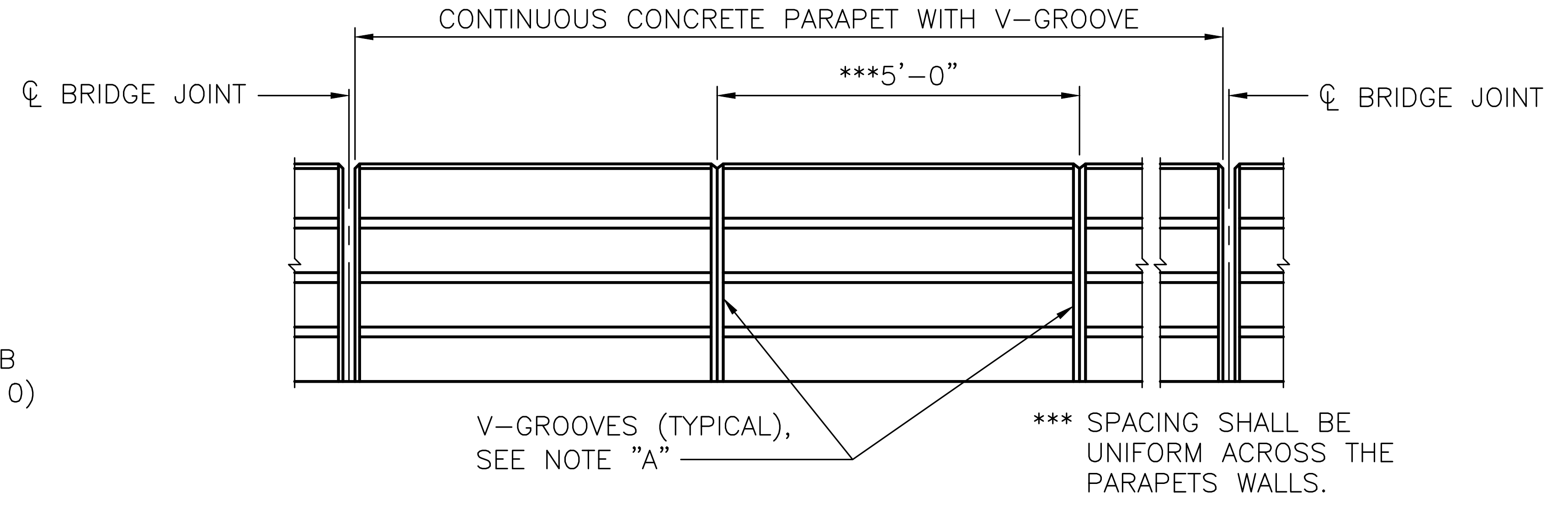
DESIGNER NOTES:

1. *FOR DESIGN REQUIREMENTS OF THE DECK OVERHANG REFER TO THE RIDOT LRFD BRIDGE DESIGN MANUAL. DECK REINFORCING NOT SHOWN FOR CLARITY.*
2. *SPECIFY CONCRETE SURFACE TREATMENT (PROTECTIVE COATING) IN ACCORDANCE WITH THE RIDOT LRFD BRIDGE DESIGN MANUAL.*
3. *FOR CURB DETAILS, REFER TO DWG. (11.10)*
4. *WHEN A SIDEWALK IS PROPOSED WITH THE VERTICAL FACE PARAPET A 6'-0" PROTECTIVE SCREEN SHALL BE MOUNTED AT THE BACK OF THE PARAPET. REFER TO DWG. (RI-FENCE.0 - RI-FENCE.3) FOR FENCE DETAILS AND CHANGE IN CRASHWORTHINESS OF THE PARAPET.*
5. *WHEN A BIKE LANE IS ADJACENT TO THE ROADWAY FACE OF THE DECK MOUNTED PARAPET, A 6'-0" PROTECTIVE SCREEN SHALL BE MOUNTED TO THE BACK OF THE PARAPET. REFER TO DWG. (RI-FENCE.0 - RI-FENCE.3) FOR FENCE DETAILS AND CHANGE IN CRASHWORTHINESS OF THE PARAPET.*
6. *INCREASE DECK MOUNTED PARAPET HEIGHT TO 3'-3" ON BRIDGE DECKS WITH A WEARING SURFACE. PARAPET HEIGHT SHALL NOT EXCEED 3'-3" FROM THE TOP OF BRIDGE DECK.*

VERTICAL FACE PARAPET
IS MASH 2016 TL-4
COMPLIANT

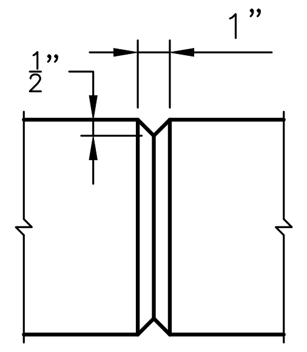


SECTION THRU DECK MOUNTED VERTICAL FACE CONCRETE PARAPET (MASH TL-4)
(WITH EXPOSED CONCRETE DECK SURFACE SHOWN, WITH HMA WEARING SURFACE SIMILAR)
SCALE 1"=1'-0"


CONTINUOUS CONCRETE PARAPET WITH V-GROOVE
***5'-0"
℄ BRIDGE JOINT
℄ BRIDGE JOINT
V-GROOVES (TYPICAL), SEE NOTE "A"
*** SPACING SHALL BE UNIFORM ACROSS THE PARAPETS WALLS.

NOTE "A":
FORMED V-GROOVES IN THE CAST-IN-PLACE PARAPETS SHALL MAKE A 45° ANGLE WITH THE BARRIER SURFACES. THE LONGITUDINAL REINFORCING BARS IN THE CONCRETE PARAPETS SHALL BE CONTINUOUS BETWEEN BRIDGE EXPANSION JOINTS. WHERE SPLICES ARE REQUIRED, THE LENGTH OF THE LAP SHALL BE SUFFICIENT TO DEVELOP EACH BAR.

ELEVATION
CONCRETE PARAPET V-GROOVE SPACING
SCALE: NOT TO SCALE



V-GROOVE IN PARAPET
NOT TO SCALE

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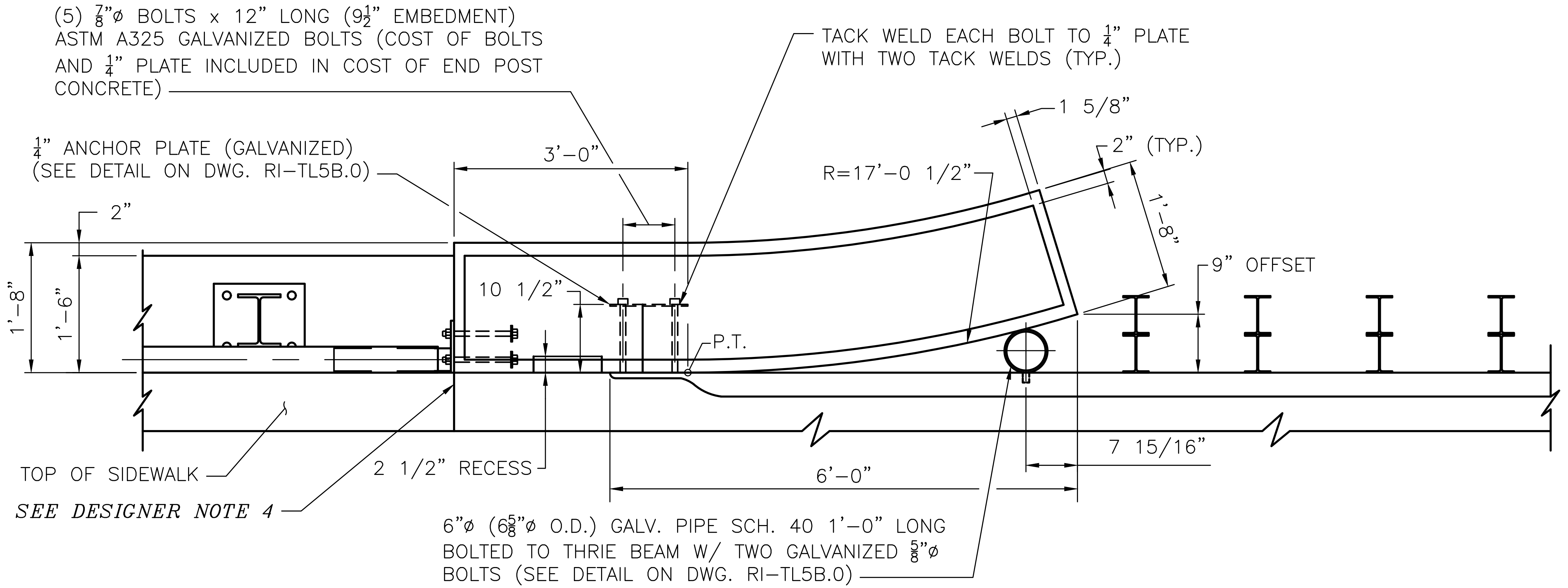
DEPARTMENT OF TRANSPORTATION

BRIDGE STANDARDS

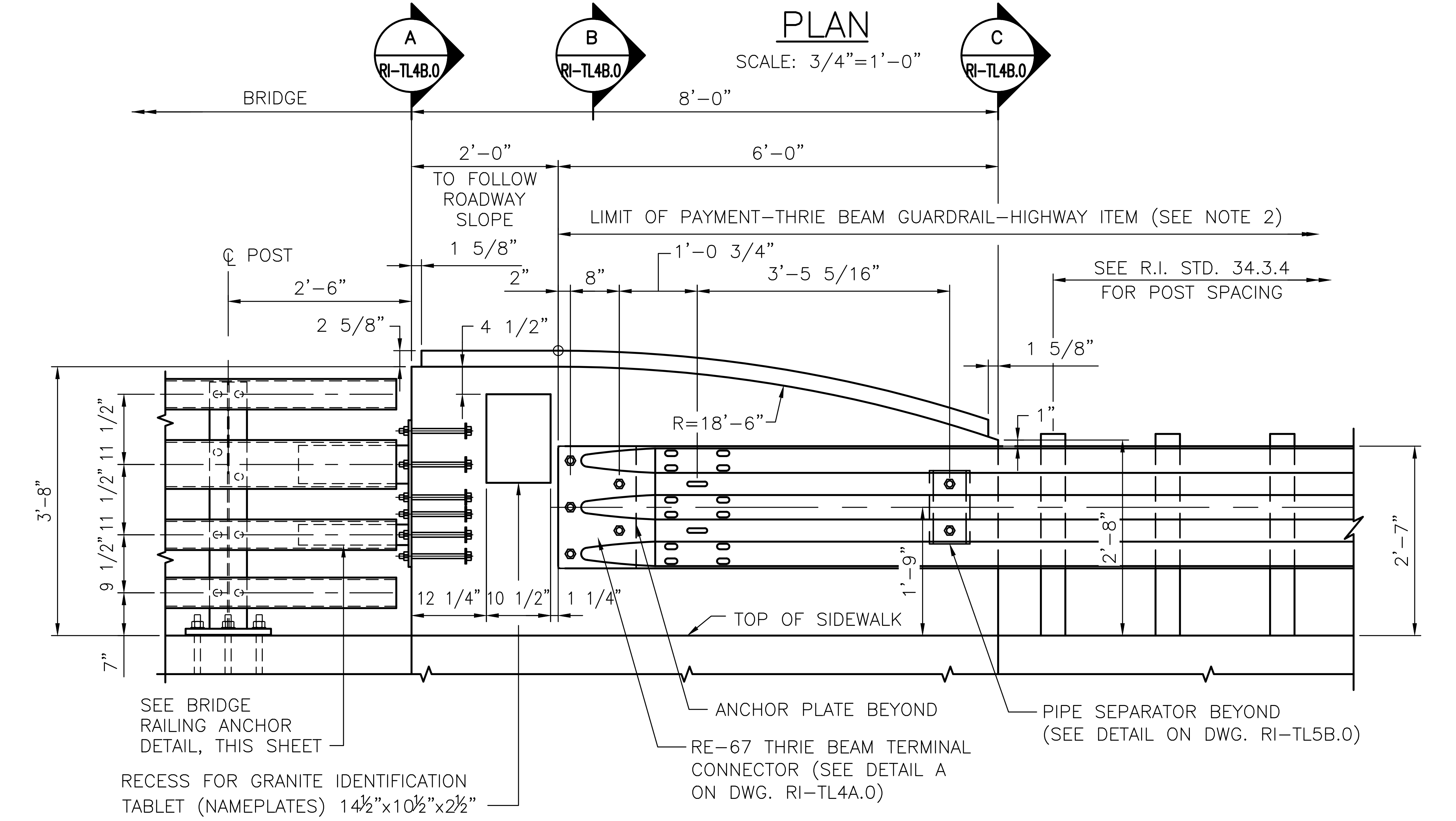
VERTICAL FACE
CONCRETE PARAPET
(MASH TL-4)

DRAWING NUMBER: RI-TL4A.1


(5) $\frac{7}{8}$"ø BOLTS x 12" LONG (9$\frac{1}{2}$" EMBEDMENT) ASTM A325 GALVANIZED BOLTS (COST OF BOLTS AND $\frac{1}{4}$" PLATE INCLUDED IN COST OF END POST CONCRETE)
TACK WELD EACH BOLT TO $\frac{1}{4}$" PLATE WITH TWO TACK WELDS (TYP.)
$\frac{1}{4}$" ANCHOR PLATE (GALVANIZED) (SEE DETAIL ON DWG. RI-TL5B.0)
3'-0"
1 5/8"
2" (TYP.)
R=17'-0 1/2"
1'-8"
2"
1'-8"
1'-6"
9" OFFSET
10 1/2"
P.T.
TOP OF SIDEWALK
2 1/2" RECESS
6'-0"
7 15/16"
SEE DESIGNER NOTE 4
6"ø (6$\frac{5}{8}$"ø O.D.) GALV. PIPE SCH. 40 1'-0" LONG BOLTED TO THRIE BEAM W/ TWO GALVANIZED $\frac{5}{8}$"ø BOLTS (SEE DETAIL ON DWG. RI-TL5B.0)

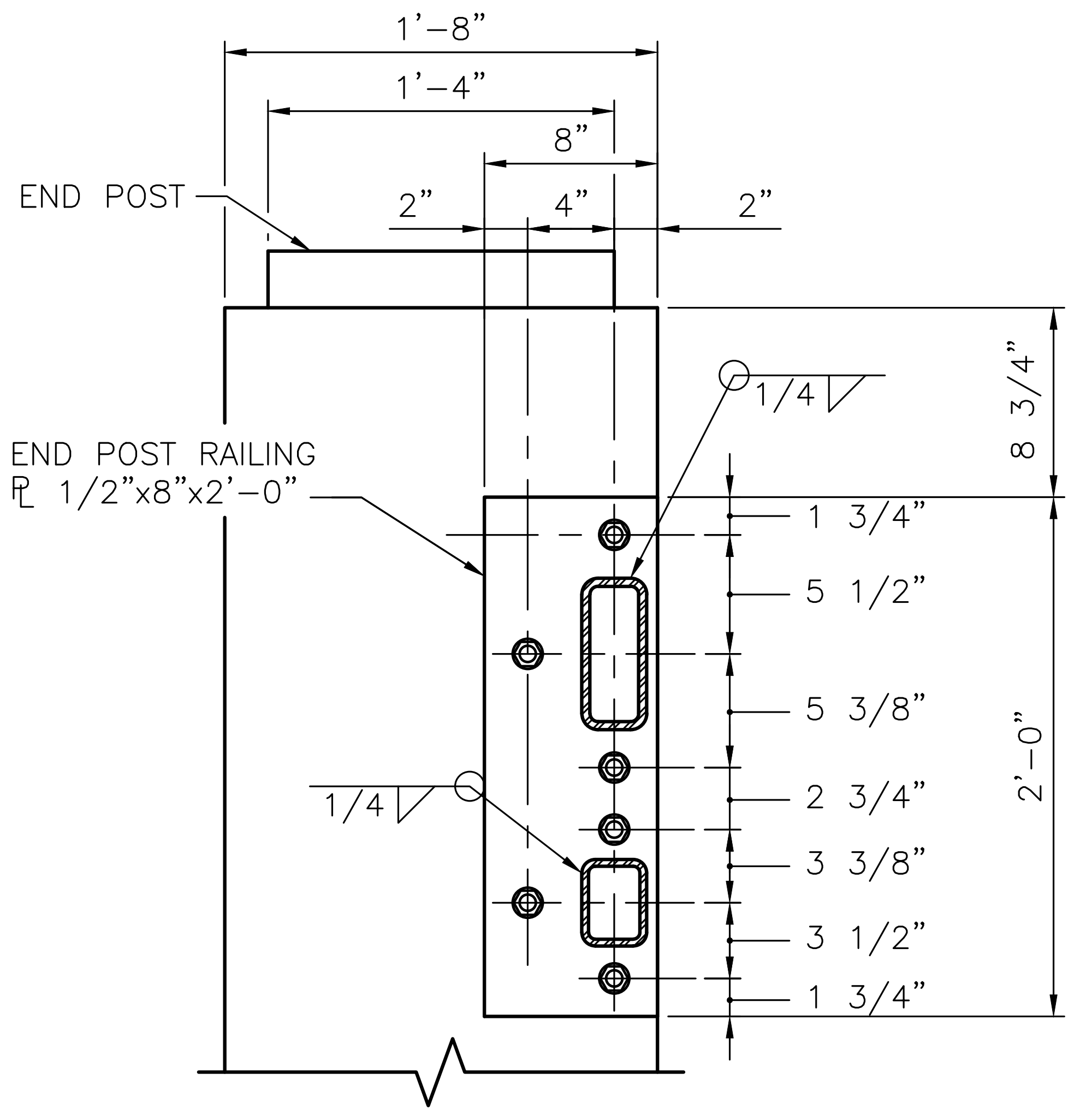
PLAN

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


A RI-TL4B.0
B RI-TL4B.0
C RI-TL4B.0
BRIDGE
8'-0"
2'-0"
6'-0"
TO FOLLOW ROADWAY SLOPE
LIMIT OF PAYMENT-THRIE BEAM GUARDRAIL-HIGHWAY ITEM (SEE NOTE 2)
℄ POST
1 5/8"
1'-0 3/4"
2'-6"
2"
8"
3'-5 5/16"
SEE R.I. STD. 34.3.4 FOR POST SPACING
2 5/8"
4 1/2"
1 5/8"
R=18'-6"
1"
3'-8"
11 1/2"
11 1/2"
9 1/2"
7"
1'-9"
2'-8"
2'-7"
12 1/4"
10 1/2"
1 1/4"
TOP OF SIDEWALK
SEE BRIDGE RAILING ANCHOR DETAIL, THIS SHEET
ANCHOR PLATE BEYOND
PIPE SEPARATOR BEYOND (SEE DETAIL ON DWG. RI-TL5B.0)
RE-67 THRIE BEAM TERMINAL CONNECTOR (SEE DETAIL A ON DWG. RI-TL4A.0)
RECESS FOR GRANITE IDENTIFICATION TABLET (NAMEPLATES) 14½"x10½"x2½"

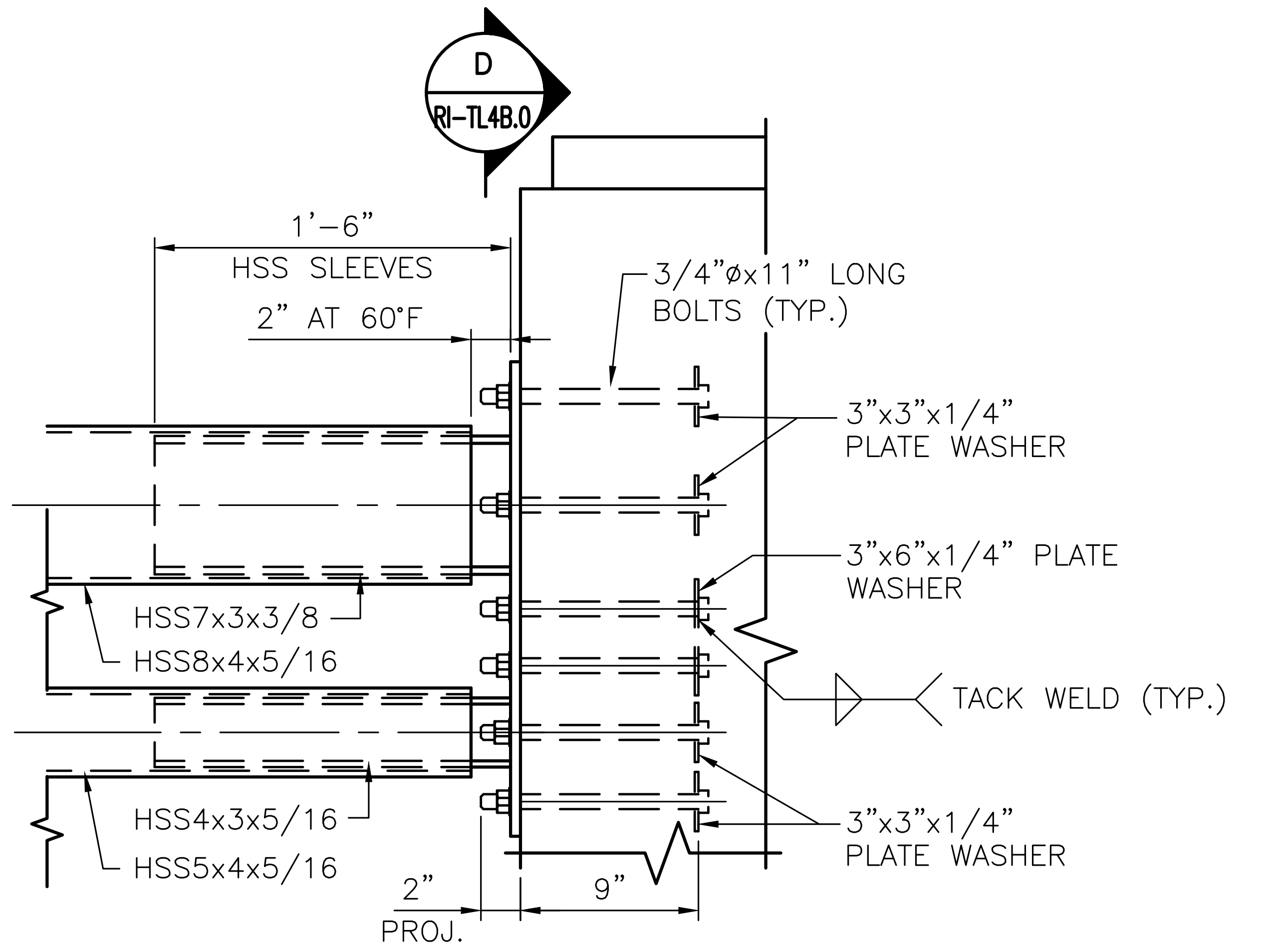
ELEVATION

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



SECTION D

SCALE: 1 1/2"=1'-0" RI-TL4B.0



BRIDGE RAILING ANCHOR DETAIL

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

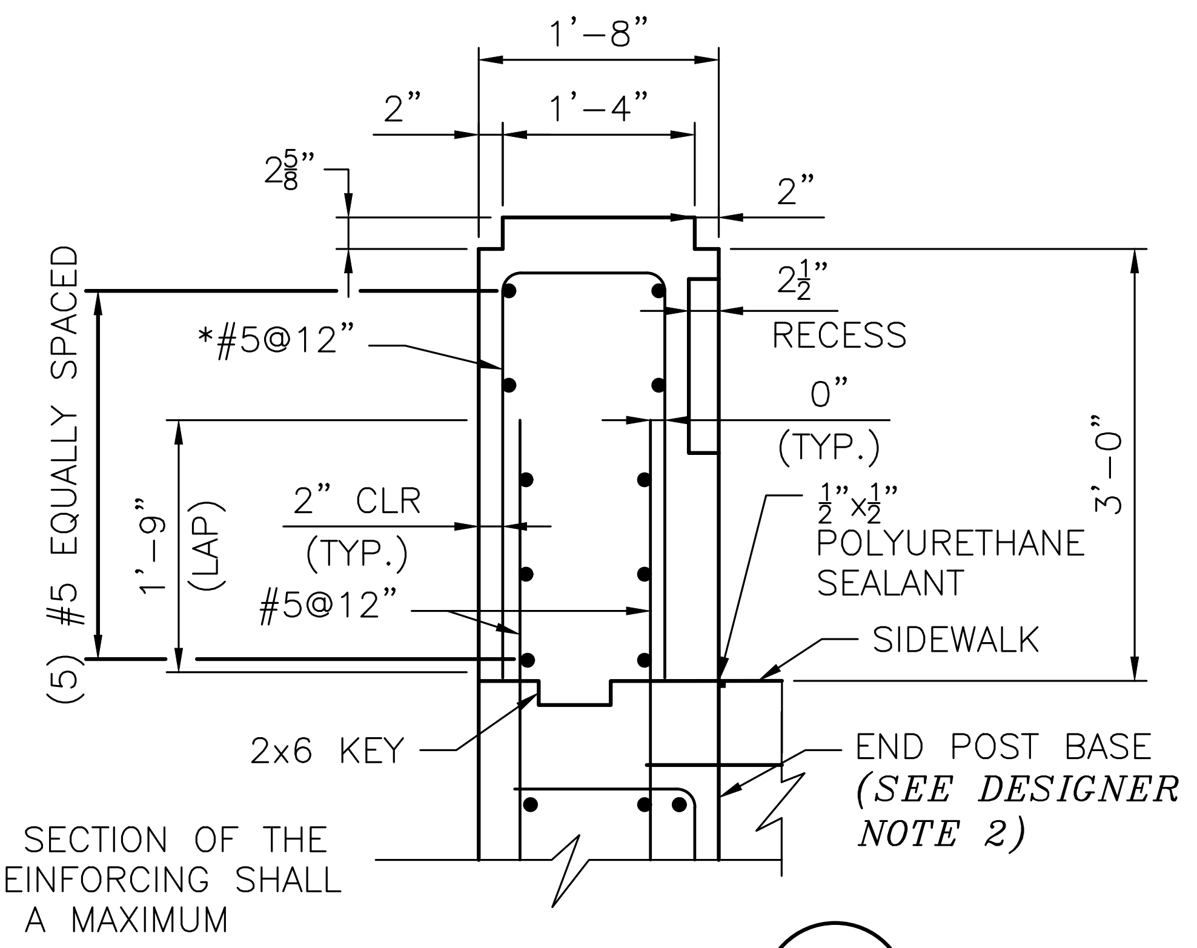
DESIGNER NOTES:

1. *COORDINATE THIS DRAWING WITH DRAWING (RI-TL4B.2)*
2. *THE END POST SHALL BE FOUNDED ON A BASE THAT IS CAPABLE FOR RESISTING THE IMPACT LOAD OF MASH TL-4. THE BASE AND CONNECTION BETWEEN THE END POST AND BASE SHALL BE DESIGNED AND DETAILED ON THE CONTRACT PLANS. THE END POST VERTICAL REINFORCING BARS SHALL HAVE SUFFICIENT TENSION DEVELOPMENT LENGTH AND/OR TENSION LAP SPLICES INTO THE BASE.*
3. *REFER TO DRAWING (RI-TL5B.0) FOR NAMEPLATE TABLET, PIPE SEPARATOR, AND ANCHOR PLATE FOR THRIE BEAM DETAILS. PROVIDE THESE DETAILS IN THE PROJECT CONTRACT DRAWINGS AS APPLICABLE.*
4. *REFER TO DRAWING (11.10 AND 12.10) FOR CURB AND SIDEWALK DETAILS RESPECTIVELY. THE JOINT SHALL BE DESIGNED AND DETAILED BY ON THE CONTRACT PLANS. IF THIS IS THE LOCATION FOR THE BRIDGE JOINT, THE JOINT SHALL BE DETAILED IN ACCORDANCE WITH DRAWINGS (2.20 THRU 2.50 AND 4.20 THRU 4.41) AS APPLICABLE.*
5. *REFER TO MATERIAL NOTES ON DRAWING (RI-TL4B.1) FOR STRUCTURAL TUBING AND END POST RAILING PLATE REQUIREMENTS. PROVIDE MATERIAL NOTES ON THE CONTRACT PLANS AS APPLICABLE.*

NOTES:

1. TO ENSURE PROPER GUARD RAIL ANCHORAGE, THE GUARD RAIL INSTALLATION SHALL BEGIN AT EACH END OF THE BRIDGE AND WORK INTO THE APPROACHES.
2. THE COST OF THE THRIE BEAM GUARDRAIL TRANSITIONS TO BRIDGE END POSTS ARE HIGHWAY ITEMS.
3. THE COST OF BRIDGE RAIL ANCHORAGE (PLATES, ANCHOR BOLTS, WASHERS AND PLATE SLEEVES) IS INCLUDED IN COST OF END POST CONCRETE.

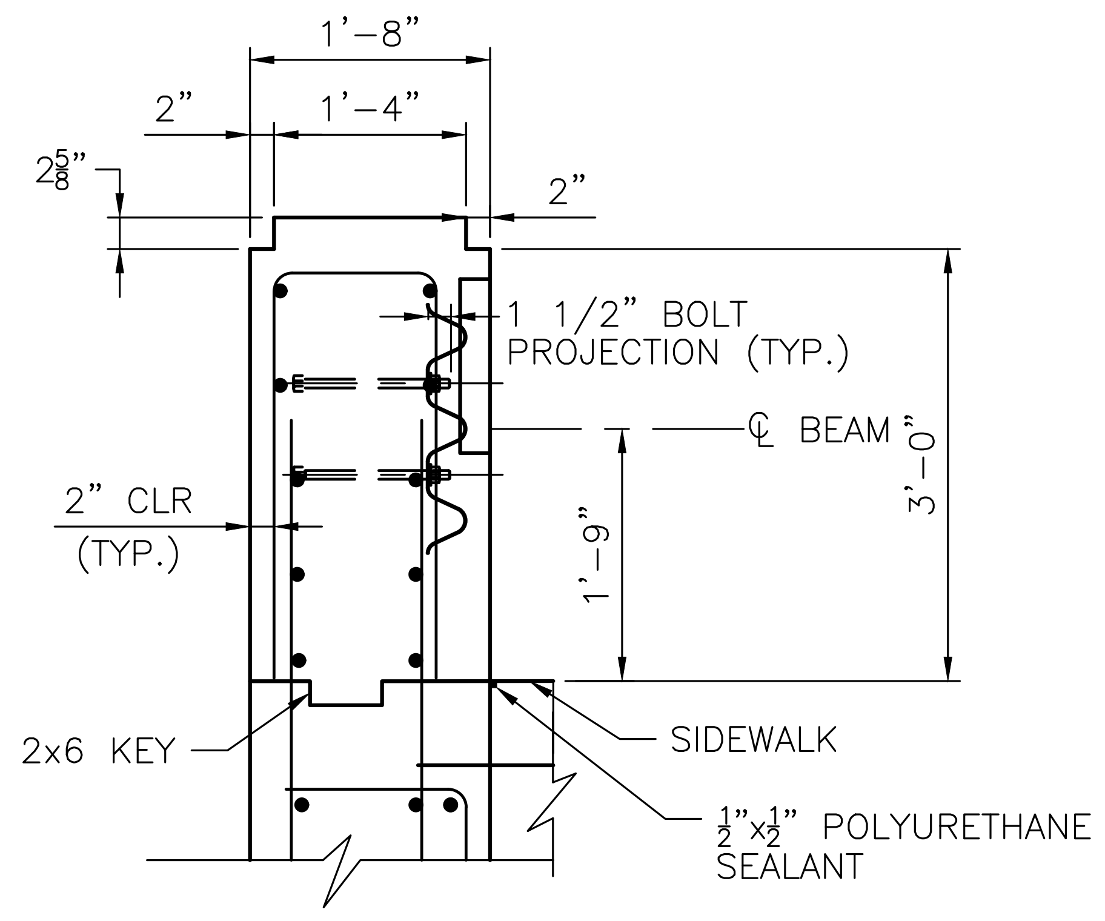
END POST IS MASH
TL-4 2016 COMPLIANT



* IN THE CURVED SECTION OF THE END POST, THE REINFORCING SHALL BE DETAILED WITH A MAXIMUM SPACING OF 12" AND A MINIMUM SPACING OF 3" ALONG THE ARC.

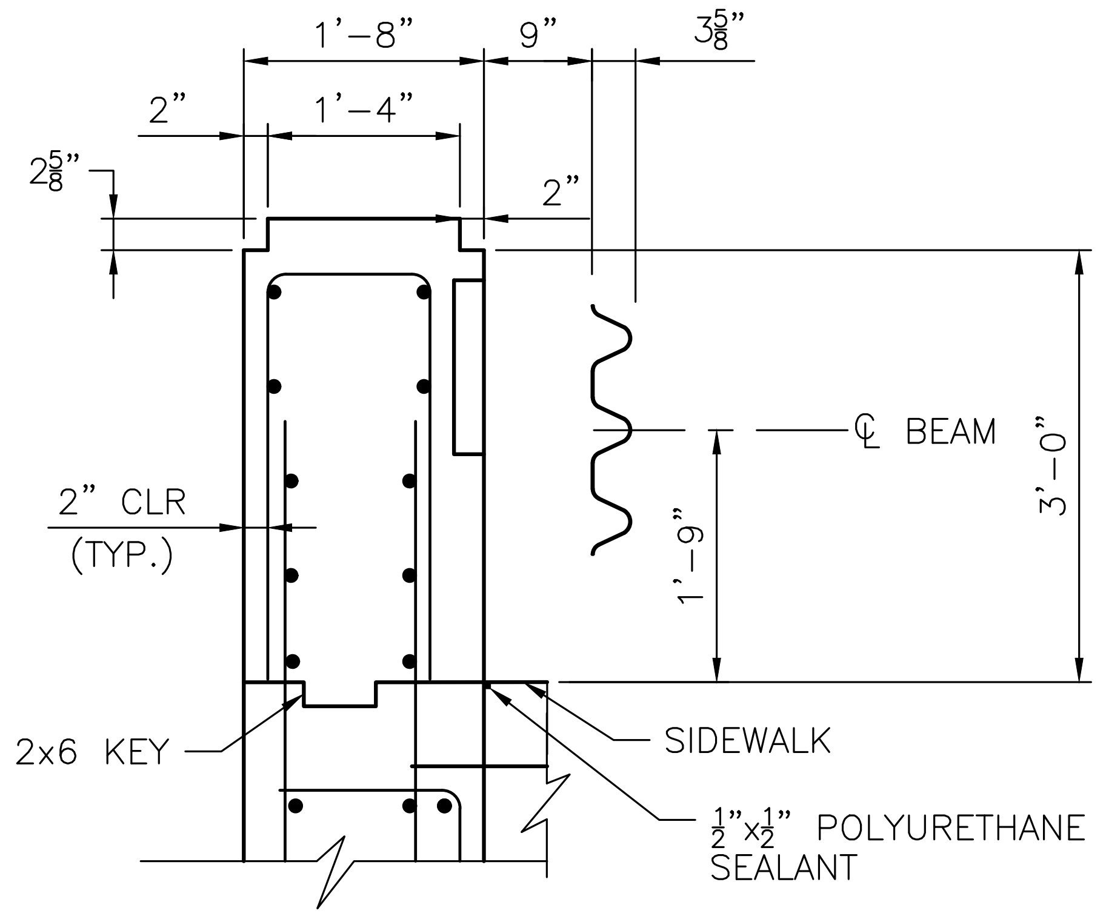
SECTION A

SCALE: 3/4"=1'-0" RI-TL4B.0


1'-8"
2"
1'-4"
2$\frac{5}{8}$"
2"
1 1/2" BOLT PROJECTION (TYP.)
℄ BEAM
2" CLR (TYP.)
1'-9"
3'-0"
2x6 KEY
SIDEWALK
$\frac{1}{2}$"x$\frac{1}{2}$" POLYURETHANE SEALANT

SECTION B

SCALE: 3/4"=1'-0" RI-TL4B.0



SECTION C

SCALE: 3/4"=1'-0" RI-TL4B.0

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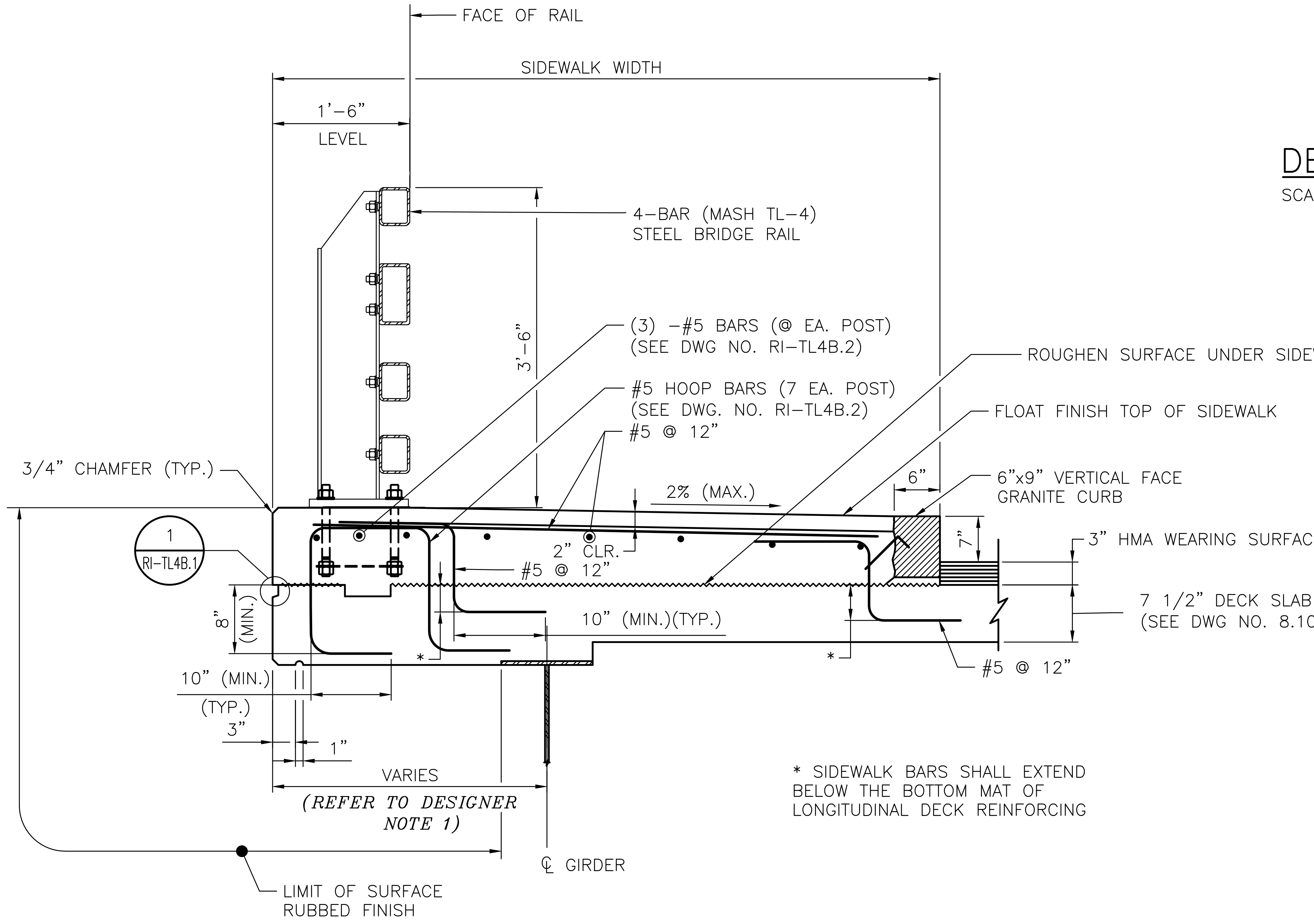
RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

BRIDGE STANDARDS

END POST DETAILS FOR FOUR BAR STEEL BRIDGE RAIL (MASH TL-4)

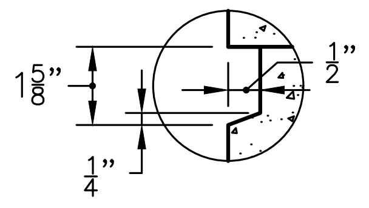
DRAWING NUMBER:RI-TL4B.0



SECTION THRU SIDEWALK – FOUR BAR BRIDGE RAIL (MASH TL–4)

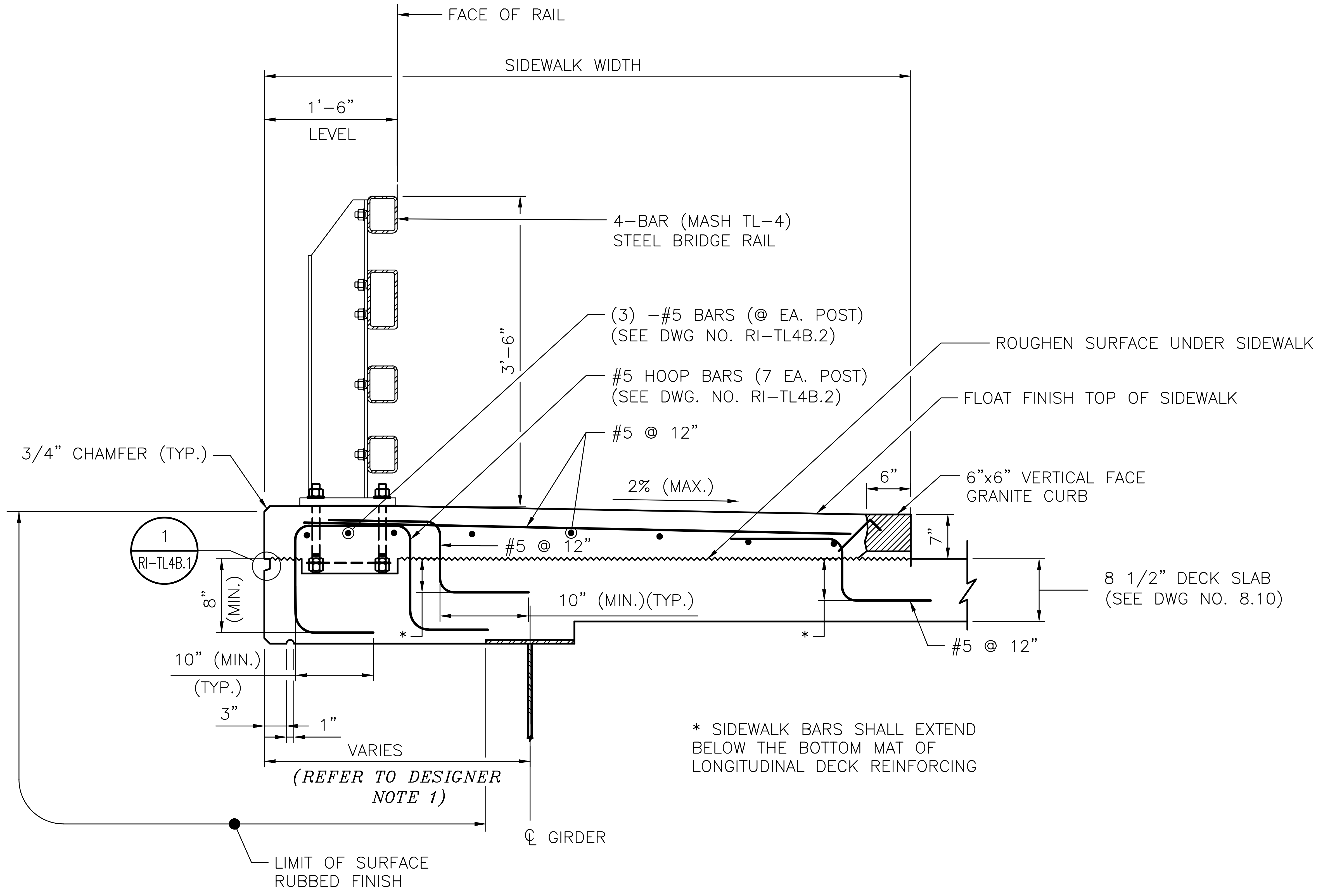
(WITH HMA WEARING SURFACE)

SCALE 1"=1'-0"



DETAIL 1 (RI-TL4B.1)

SCALE 3"= 1'-0"



SECTION THRU SIDEWALK – FOUR BAR BRIDGE RAIL (MASH TL–4)

(WITH EXPOSED CONCRETE DECK SURFACE)

SCALE 1"=1'-0"

RAILING DETAILS ARE
MASH 2016 TL–4
COMPLIANT

DESIGNER NOTES:

1. *FOR DESIGN REQUIREMENTS OF THE DECK OVERHANG REFER TO THE RIDOT LRFD BRIDGE DESIGN MANUAL. DECK REINFORCING NOT SHOWN FOR CLARITY.*
2. *FOR DETAILS OF THE FOUR BAR STEEL BRIDGE RAIL (MASH TL-4), REFER TO DWG. (RI-TL4B.2).*
3. *FOR CURB DETAILS, REFER TO DWG. (11.10).*

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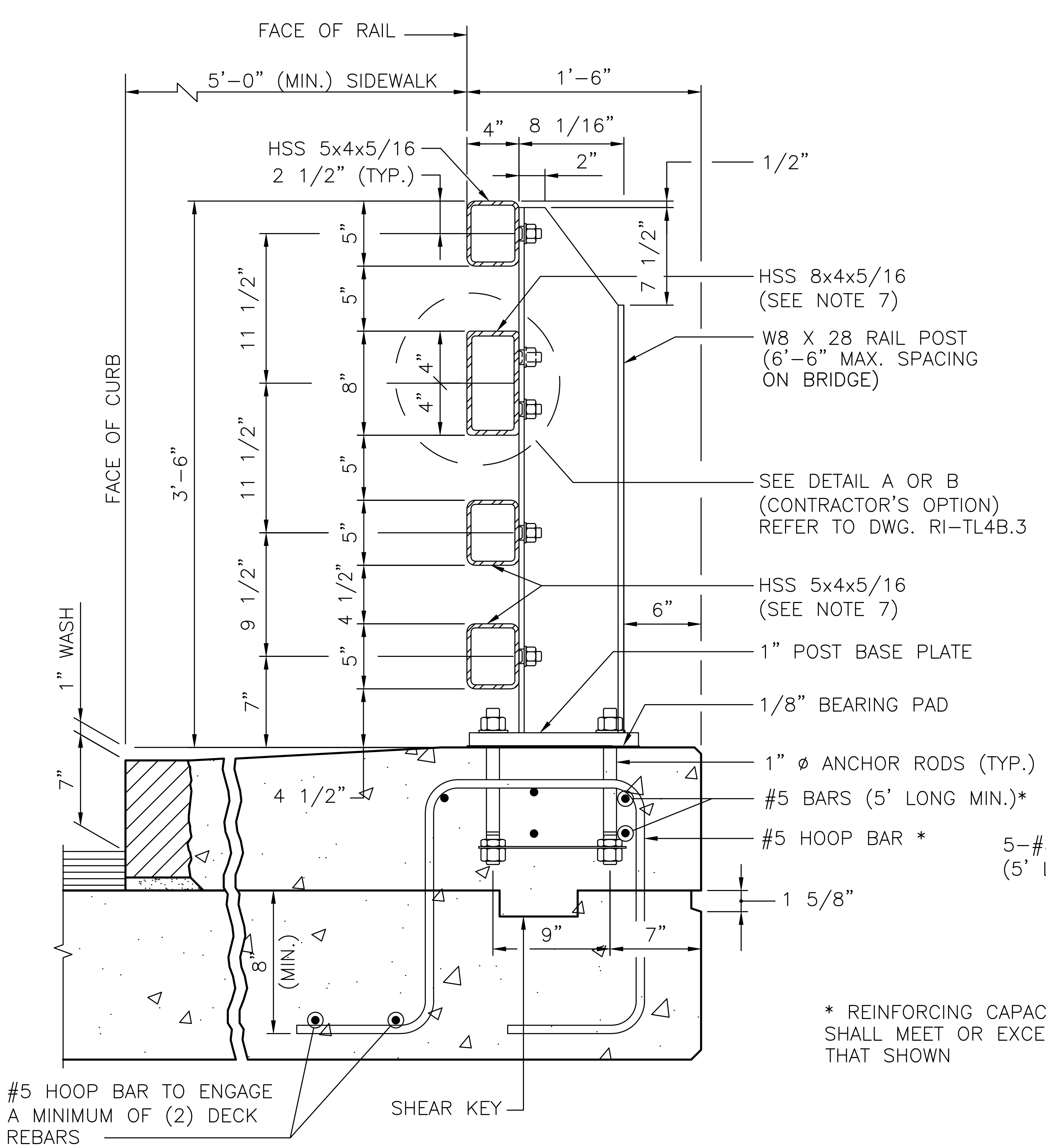
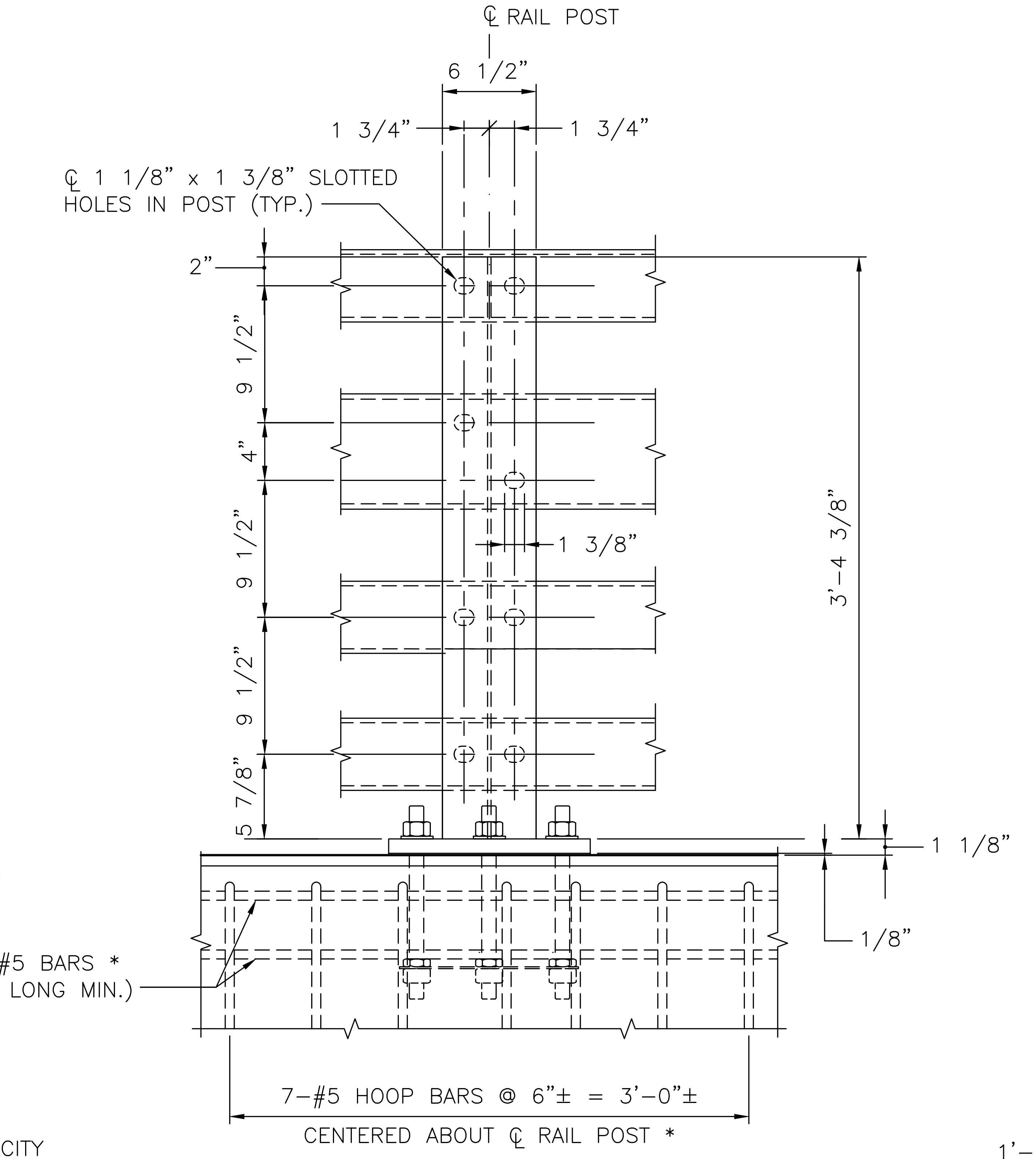
BRIDGE STANDARDS

FOUR BAR STEEL
BRIDGE RAIL (MASH TL–4)
SHEET 1

DRAWING NUMBER: RI-TL4B.1



SECTION VIEW



BACK ELEVATION VIEW

* REINFORCING CAPACITY
SHALL MEET OR EXCEED
THAT SHOWN

POST ASSEMBLY

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

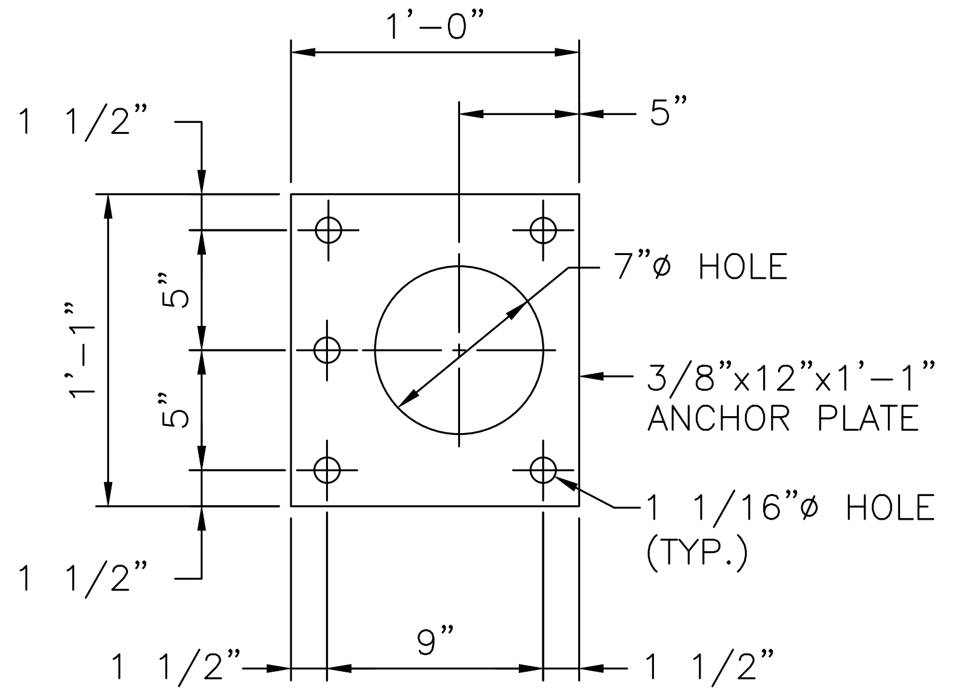
RAIL NOTES:

1. FOUR BAR (MASH) STEEL BRIDGE RAIL SHALL INCLUDE POSTS, BASE PLATES, ANCHOR RODS, PREFORMED PADS, RAIL ASSEMBLY BOLTS, NUTS, WASHERS, STUDS, STRUCTURAL TUBING, SPLICE BARS, PIPE SPACERS, ALL APPURTENANCES, METALIZING, AND PAINTING (IF SPECIFIED).
2. BRIDGE RAIL POSTS SHALL BE SET NORMAL (90 DEGREES) TO THE PROFILE GRADE, EXCEPT ON GRADES OVER 1.5% WHERE POSTS SHALL BE SET VERTICAL.
3. ENDS OF RAIL TUBE SECTIONS SHALL BE SAWED OR MILLED AND SHALL BE TRUE AND SMOOTH. ALL CUT EDGES OF ALL MATERIAL SHALL BE GROUND SMOOTH.
4. EACH PIECE OF RAIL TUBING SHALL BE ATTACHED TO A MINIMUM OF THREE (3) POSTS.
5. BOLT HOLES SHALL BE DRILLED OR PUNCHED. FLAME CUTTING MAY BE USED TO FINISH SLOTTED HOLES IF MECHANICALLY GUIDED.
6. AT INTERIOR SPLICES, PIPE SPACERS SHALL BE USED ON ONLY ONE SIDE OF THE SPLICE TO ALLOW MOVEMENT ON THAT SIDE. ALL 4 RAILS AT A SPLICE SHALL RECEIVE THE SAME TREATMENT. AT END SPLICES AND AT INTERIOR EXPANSION SPLICES PIPE SPACERS SHALL BE USED ON BOTH SIDES OF THE SPLICE TO ALLOW MOVEMENT ON BOTH SIDES.
7. MILL OR SHOP TRANSVERSE WELDS SHALL NOT BE PERMITTED ON ANY RAIL ELEMENT. RAIL ELEMENTS USED ON CURVES SHALL USE 3/8" WALL TUBES AND SHALL BE SHOP FORMED TO THE REQUIRED CURVATURE.
8. NO PUNCHING, DRILLING, CUTTING OR WELDING SHALL BE PERMITTED AFTER METALIZING OR GALVANIZING. DAMAGED AREAS OF METALIZING OR GALVANIZING SHALL BE REPAIRED IN STRICT CONFORMANCE WITH THE MATERIAL SUPPLIER'S RECOMMENDATIONS AND SHALL BE APPROVED BY THE ENGINEER.
9. NUTS FOR 1"ø THREADED ANCHOR RODS CONNECTING THE BASE PLATE TO THE CONCRETE SHALL BE TIGHTENED TO A SNUG FIT AND GIVEN AN ADDITIONAL 1/8 TURN.
10. THREADS FOR ANCHOR RODS MAY BE ROLLED OR CUT. IF CUT THREADS ARE USED BOLT DIAMETER SHALL NOT BE LESS THAN NOMINAL DIAMETER. IF ROLLED THREADS ARE USED, ROD DIAMETER SHALL NOT BE LESS THAN ROOT DIAMETER OF THREADS.
11. THE RAIL POST, BASE PLATE AND ANCHOR CAGE MUST BE INSTALLED PRECISELY TO THE LOCATION DIMENSIONED ON THESE PLANS. THE POSITION OF THE (3)-#5 LONGITUDINAL REBARS MAY BE ADJUSTED TO ACCOMMODATE THE ANCHOR CAGE, BUT MUST NOT BE CUT.
12. FOR GRANITE CURB DETAILS REFER TO DRAWING (11.10).
13. RAILING SHALL BE SHOP PAINTED [INSERT PAINT COLOR].

MATERIAL NOTES:

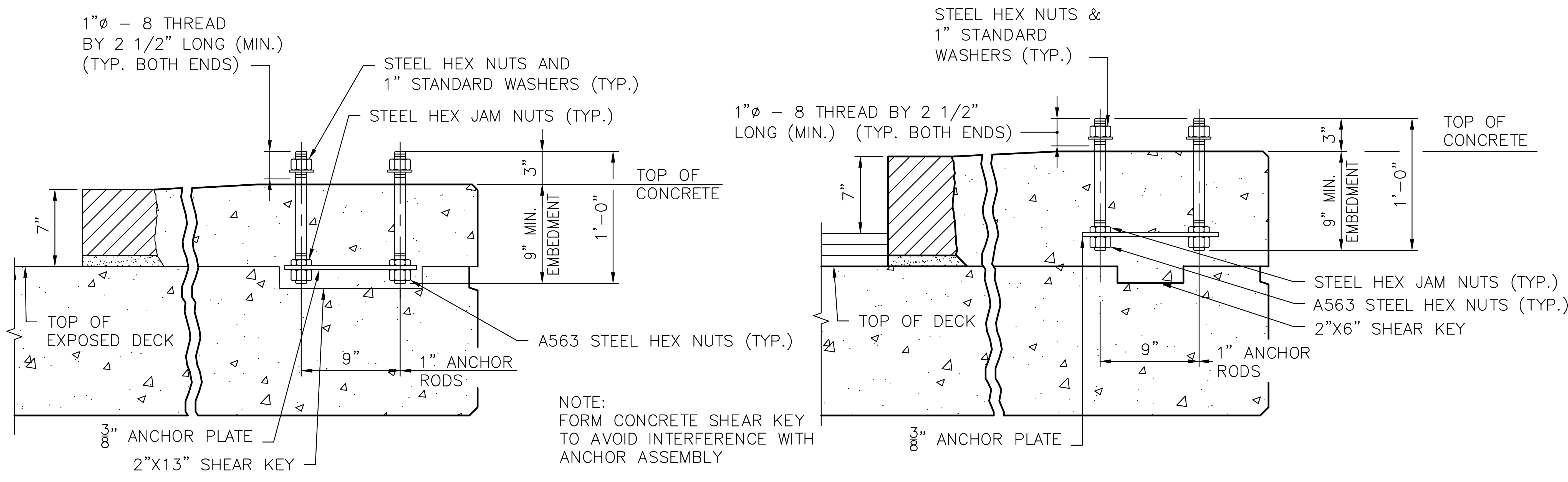
1. STRUCTURAL TUBING SHALL CONFORM TO THE REQUIREMENTS OF ASTM A500, GRADE B, STRUCTURAL STEEL TUBING. RAIL TUBING SHALL MEET THE LONGITUDINAL CHARPY V-NOTCH REQUIREMENTS OF 15 LBS. AT 0°F FOR ASTM A500, GRADE B. THE TEST SAMPLES SHALL BE TAKEN AFTER FORMING THE TUBES. CHARPY V-NOTCH IS NOT REQUIRED FOR SPLICE TUBES.
2. RAIL POSTS, BASE PLATES, AND END POST RAILING PLATES SHALL CONFORM TO THE REQUIREMENTS OF ASTM A572 GR. 50, EXCEPT ANCHOR PLATES MAY BE ASTM A36.
3. THREADED STUDS AND MATCHING NUTS FOR RAIL-TO-POST ATTACHMENT (DETAIL A) SHALL CONFORM TO ASTM A276 TYPE 304, STAINLESS STEEL, AND SHALL BE TORQUE TESTED PER AWS D1.5, 7.7.1. DETAIL B BOLTS SHALL BE ASTM F3125 (GR. A325 OR A449). ALL OTHER BOLTS AND NUTS SHALL CONFORM TO ASTM A307 AND ASTM A563 GRADE A RESPECTIVELY OR BETTER. ANCHOR RODS SHALL CONFORM TO ASTM A449. ASTM A563 NUTS SHALL BE USED AT THE BOTTOM OF ANCHOR ASSEMBLY. WASHERS SHALL BE HARDENED STEEL COMMERCIAL TYPE A PLAIN WIDE WASHERS AND SHALL MEET THE DIMENSIONAL REQUIREMENTS OF A.N.S.I. B18.22.
4. ALL STEEL COMPONENTS (EXCEPT STAINLESS) SHALL BE METALIZED IN ACCORDANCE WITH RIDOT SPECIFICATION 827 OR GALVANIZED IN ACCORDANCE WITH RIDOT SPECIFICATION 843. THE METALIZING OR GALVANIZING SHALL HAVE A UNIFORM APPEARANCE, AND THE COATED MATERIAL SHALL BE PROPERLY STORED.
5. DETAIL "A" STUDS, SHOWN ON (RI-TL3A.2), SHALL BE WELDED BEFORE TUBES ARE METALIZED OR GALVANIZED.
6. PREFORMED BEARING PADS (1/8" THICK) SHALL CONFORM TO AASHTO M251.

DESIGNER NOTE:
COORDINATE THIS DRAWING WITH DRAWING (RI-TL4B.3)



ANCHOR PLATE

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



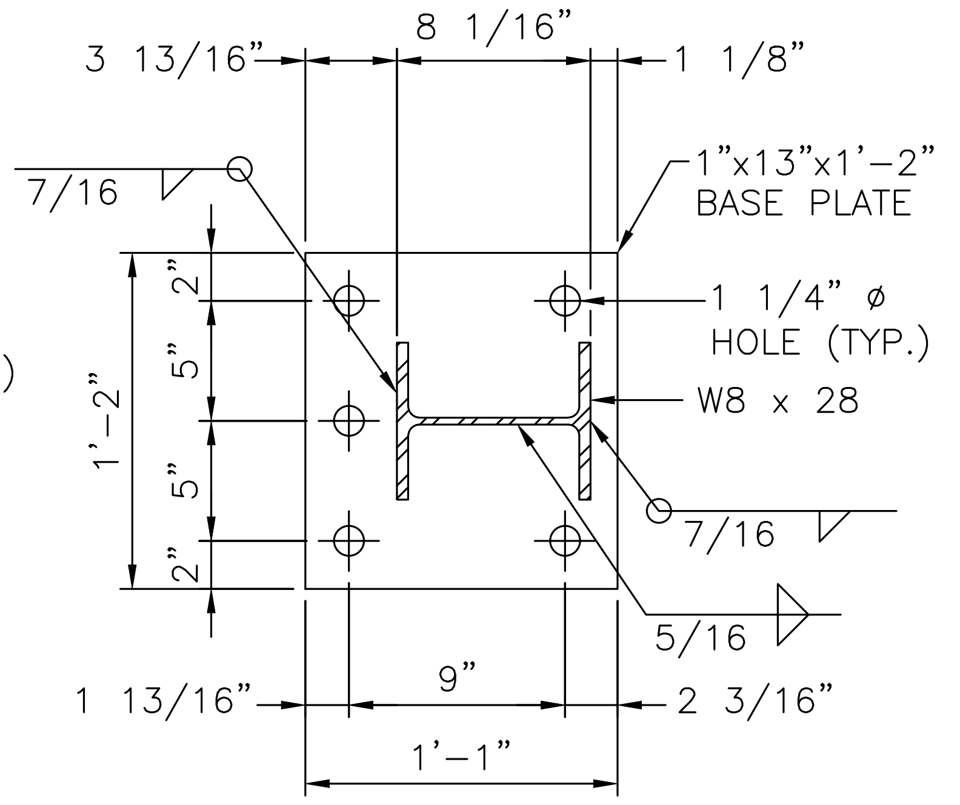
NOTE:
FORM CONCRETE SHEAR KEY
TO AVOID INTERFERENCE WITH
ANCHOR ASSEMBLY

EXPOSED CONCRETE
BRIDGE DECK

BRIDGE DECK WITH BITUMINOUS
WEARING SURFACE

POST ANCHOR ASSEMBLY

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



POST BASE PLATE

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

FOUR BAR STEEL BRIDGE
RAIL IS MASH 2016 TL-4
COMPLIANT

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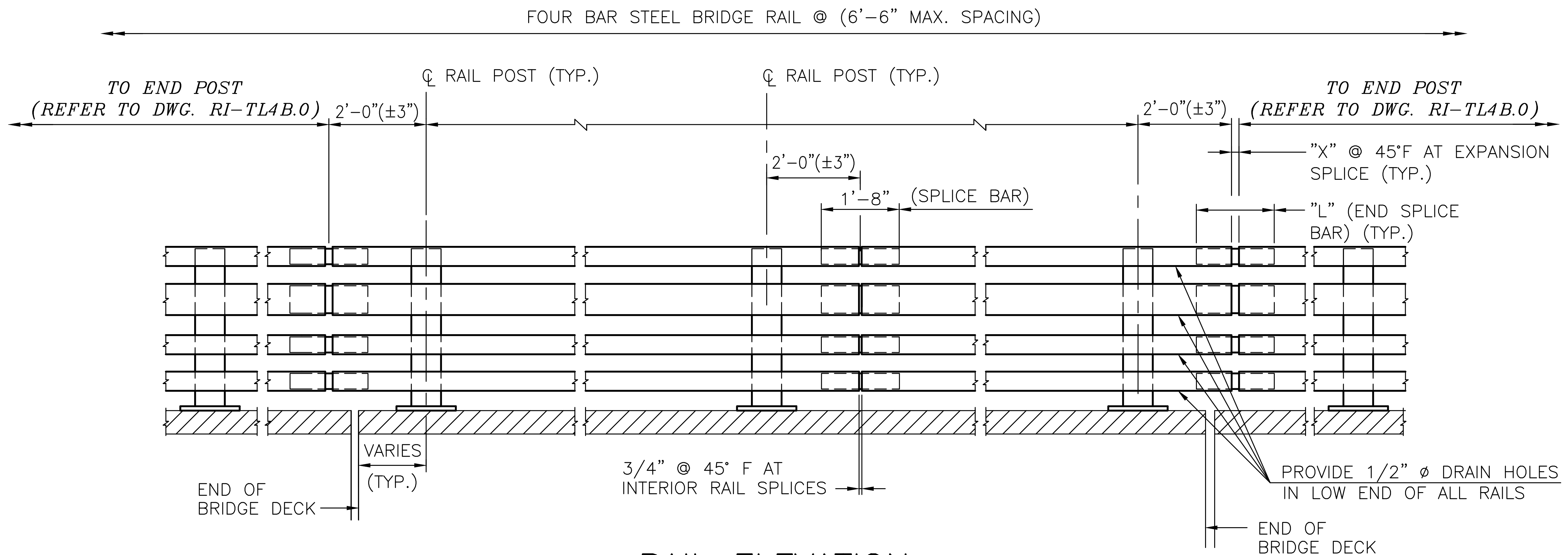
RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

BRIDGE STANDARDS

FOUR BAR STEEL BRIDGE
RAIL (MASH TL-4)
SHEET 2

DRAWING NUMBER: RI-TL4B.2

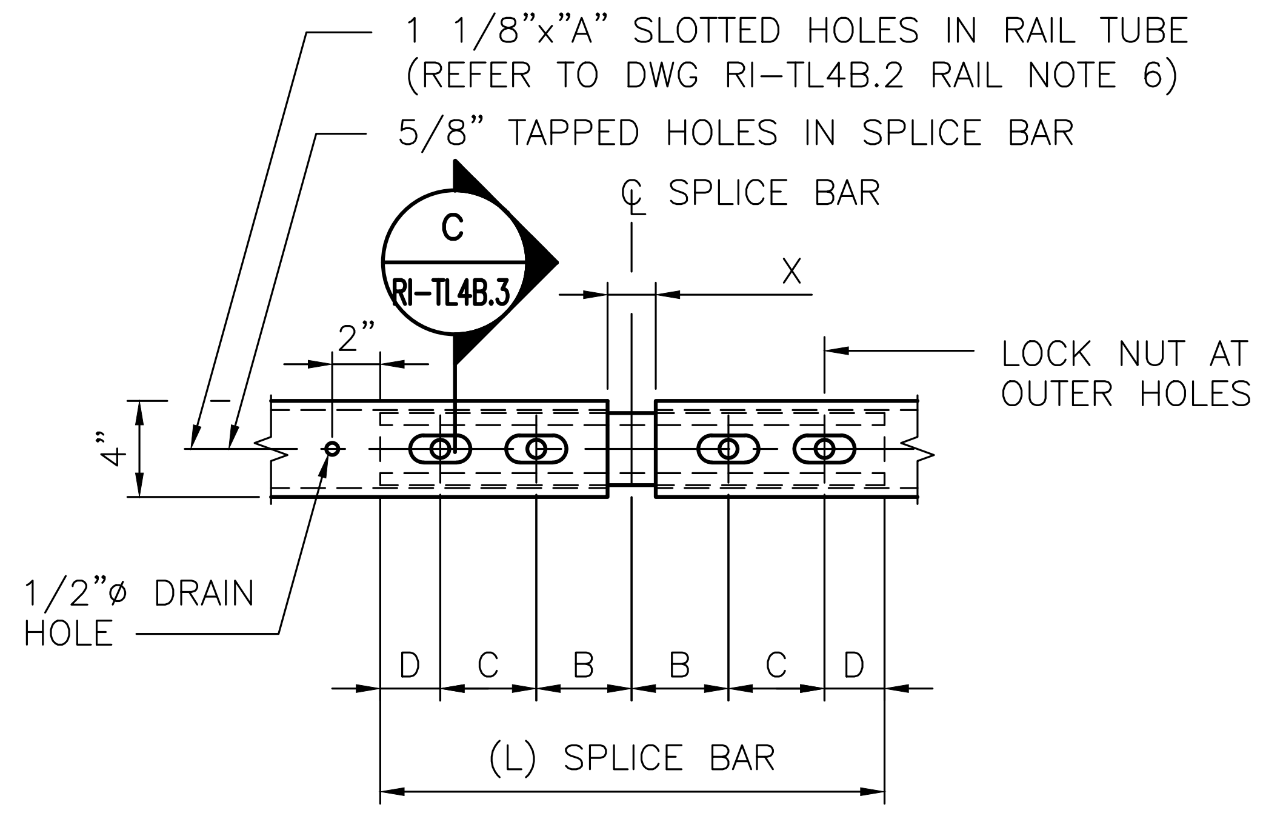

FOUR BAR STEEL BRIDGE RAIL @ (6'-6" MAX. SPACING)
TO END POST
(REFER TO DWG. RI-TL4B.0)
2'-0"(±3")
℄ RAIL POST (TYP.)
℄ RAIL POST (TYP.)
2'-0"(±3")
TO END POST
(REFER TO DWG. RI-TL4B.0)
2'-0"(±3")
1'-8" (SPLICE BAR)
"X" @ 45°F AT EXPANSION SPLICE (TYP.)
"L" (END SPLICE BAR) (TYP.)
VARIES (TYP.)
END OF BRIDGE DECK
3/4" @ 45° F AT INTERIOR RAIL SPLICES
PROVIDE 1/2" ø DRAIN HOLES IN LOW END OF ALL RAILS
END OF BRIDGE DECK

RAIL ELEVATION

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

SPLICE BAR DIMENSION TABLE						
T	A	B	C	D	X	L
INTERIOR	2 1/2"	4"	4"	2"	3/4"	1'-8"
* <3 1/4"	2 1/2"	4"	4"	2"	2"	1'-8"
* 3 1/4" TO 5 1/4"	3 1/2"	5"	5"	2 1/2"	3"	2'-1"

T = TOTAL MOVEMENT OF BRIDGE
* = END SPLICE BAR

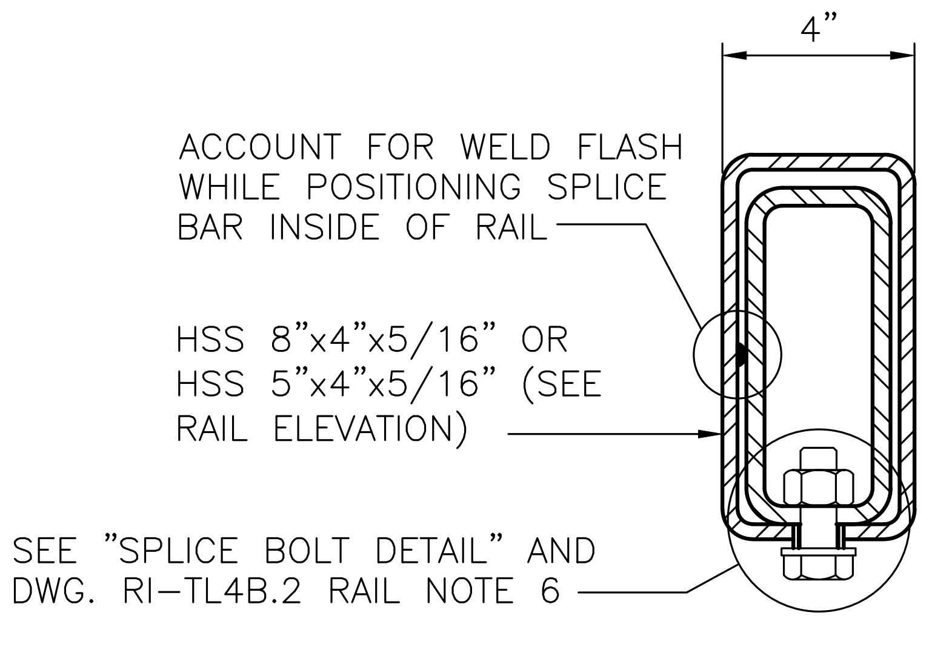

1 1/8"x"A" SLOTTED HOLES IN RAIL TUBE (REFER TO DWG RI-TL4B.2 RAIL NOTE 6)
5/8" TAPPED HOLES IN SPLICE BAR
C
RI-TL4B.3
℄ SPLICE BAR
X
2"
LOCK NUT AT OUTER HOLES
4"
1/2"ø DRAIN HOLE
D
C
B
B
C
D
(L) SPLICE BAR

SEE SPLICE BAR DIMENSION TABLE THIS SHEET

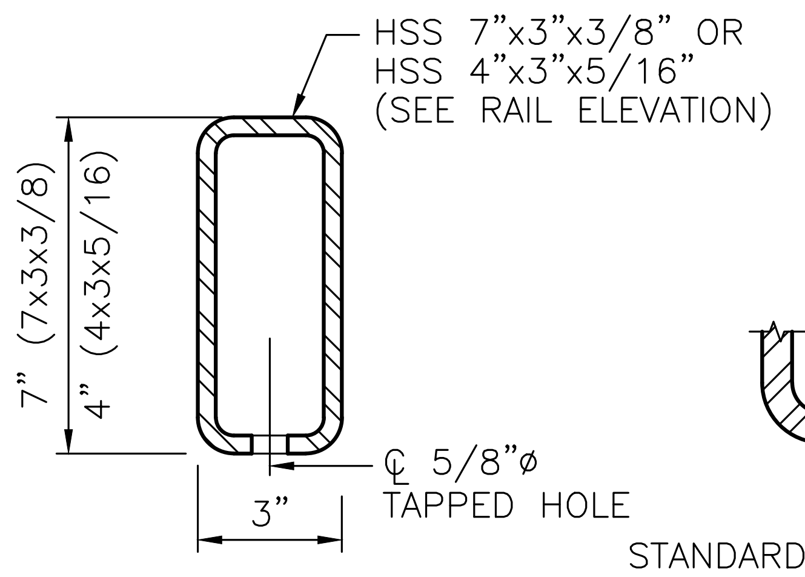
(BOTTOM VIEW)

RAIL SPLICE

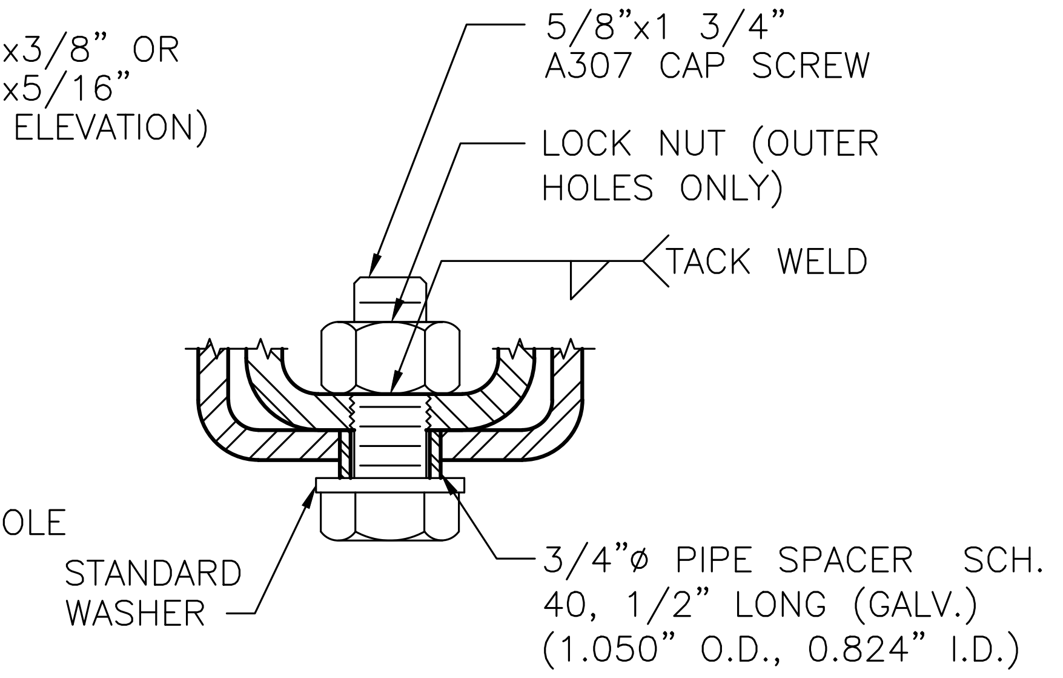
SCALE: 1 1/2"=1'-0"


4"
ACCOUNT FOR WELD FLASH WHILE POSITIONING SPLICE BAR INSIDE OF RAIL
HSS 8"x4"x5/16" OR HSS 5"x4"x5/16" (SEE RAIL ELEVATION)
SEE "SPLICE BOLT DETAIL" AND DWG. RI-TL4B.2 RAIL NOTE 6

SECTION C RI-TL4B.3



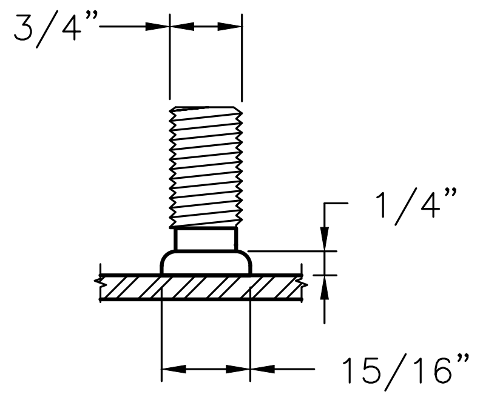
SPLICE BAR SECTION


5/8"x1 3/4" A307 CAP SCREW
LOCK NUT (OUTER HOLES ONLY)
TACK WELD
STANDARD WASHER
3/4"ø PIPE SPACER SCH. 40, 1/2" LONG (GALV.) (1.050" O.D., 0.824" I.D.)

SPLICE BOLT DETAIL

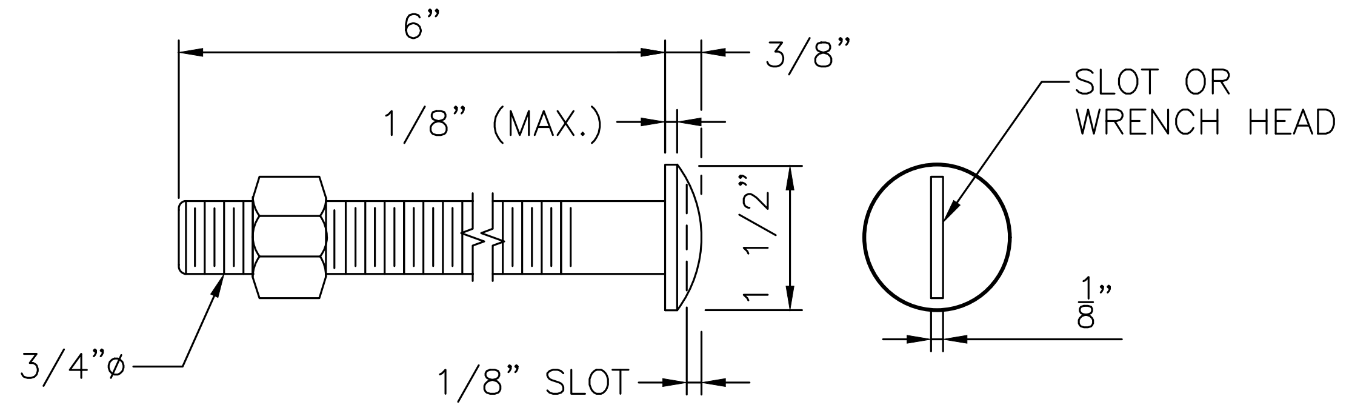
RAIL SPLICE DETAILS

SCALE: 3"=1'-0"



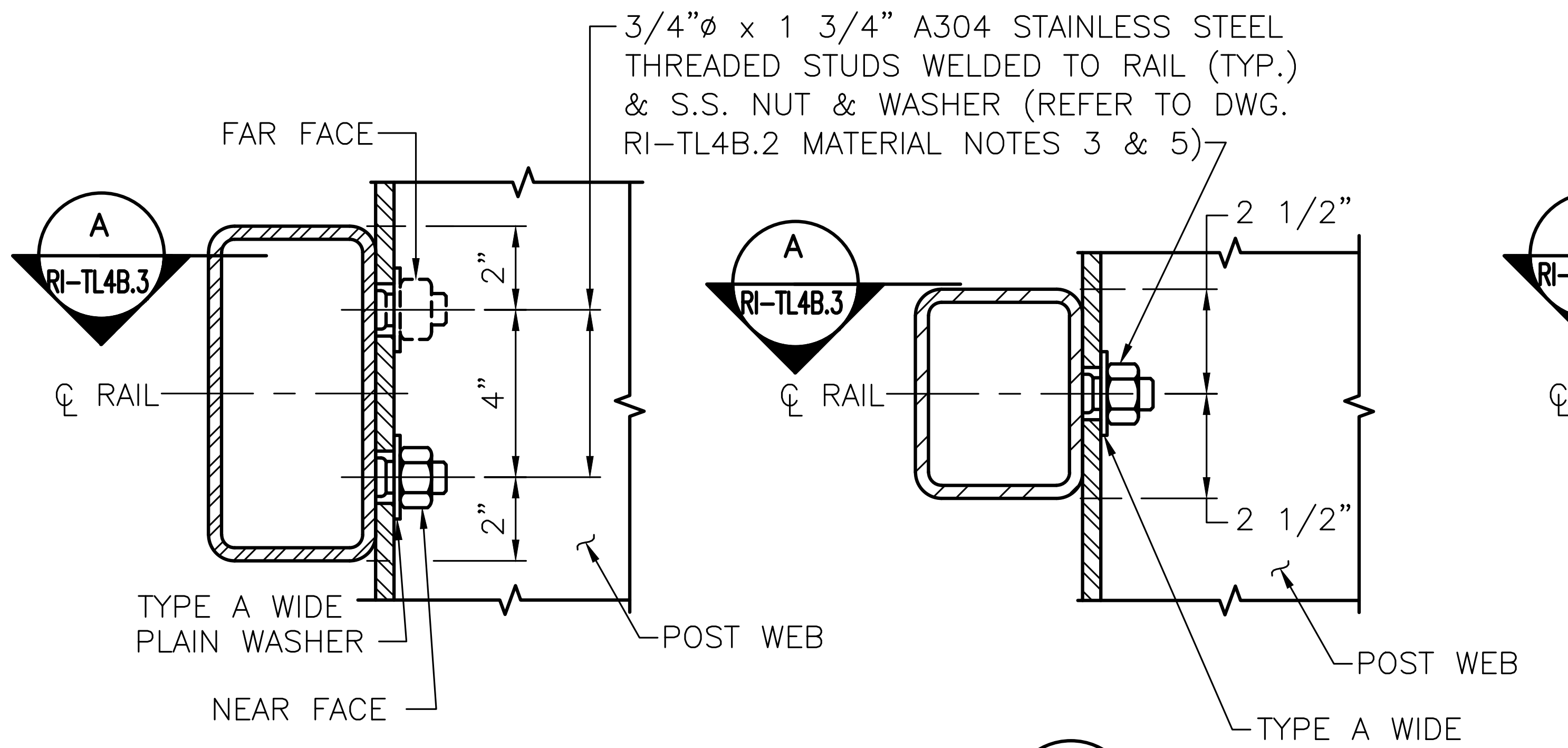
STUD WELD DETAIL

NOT TO SCALE



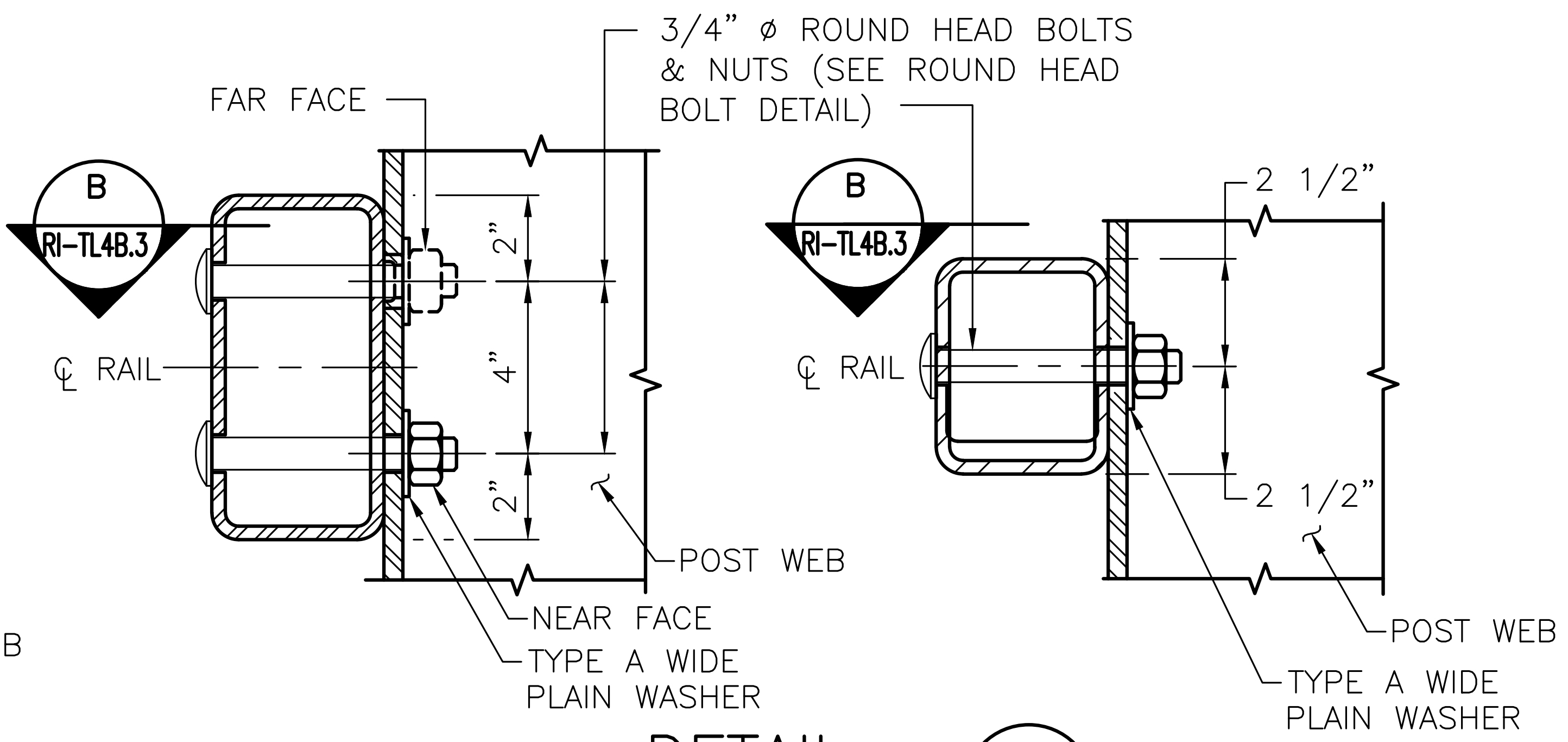
ROUND HEAD BOLT DETAIL

NOT TO SCALE


FAR FACE
3/4"ø x 1 3/4" A304 STAINLESS STEEL THREADED STUDS WELDED TO RAIL (TYP.) & S.S. NUT & WASHER (REFER TO DWG. RI-TL4B.2 MATERIAL NOTES 3 & 5)
A
RI-TL4B.3
℄ RAIL
2"
4"
2"
TYPE A WIDE PLAIN WASHER
NEAR FACE
POST WEB
A
RI-TL4B.3
℄ RAIL
2 1/2"
2 1/2"
POST WEB
TYPE A WIDE PLAIN WASHER

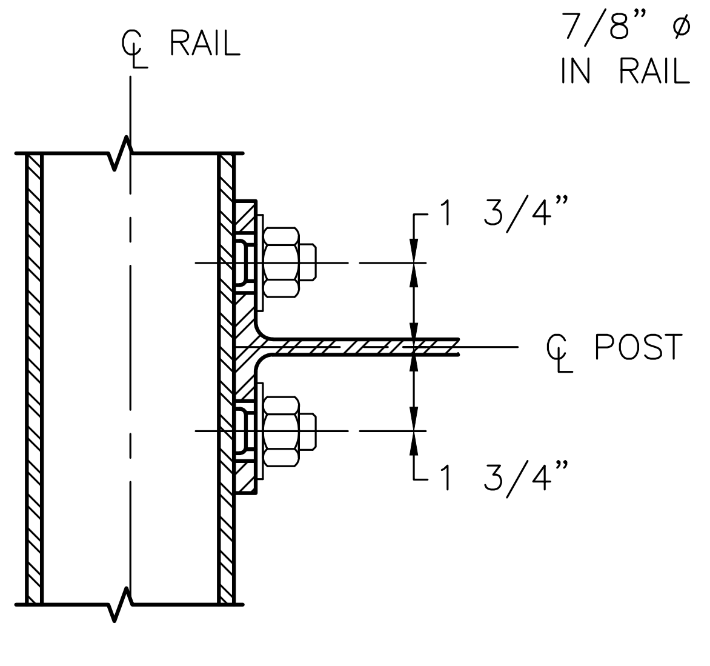
DETAIL A RI-TL4B.2

SCALE 3"= 1'-0"



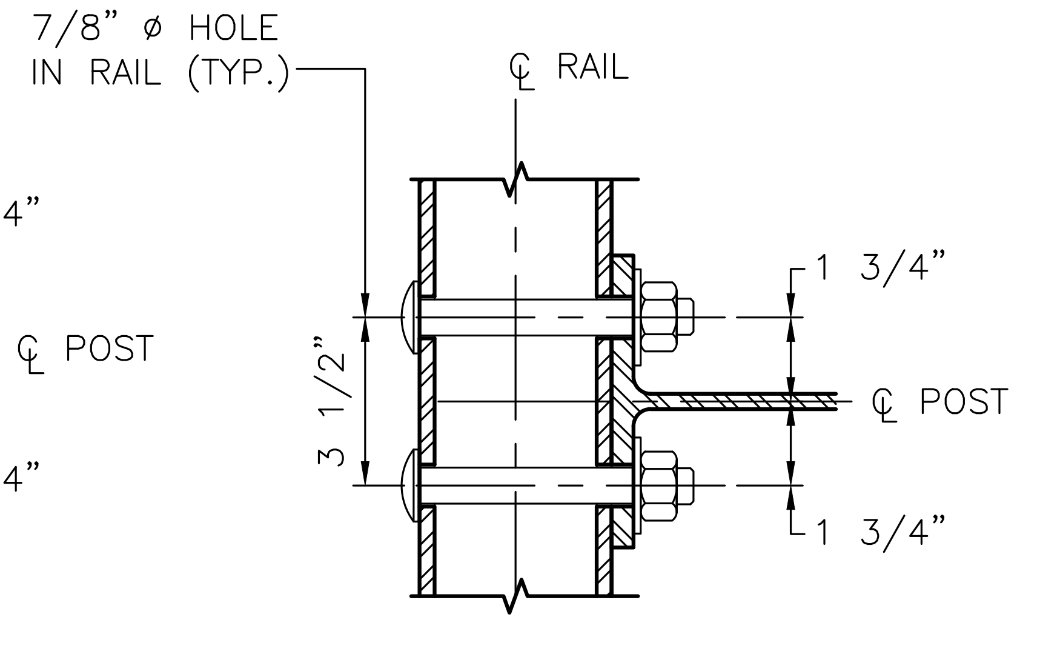
DETAIL B RI-TL4B.2

SCALE 3"= 1'-0"



SECTION A RI-TL4B.3

SCALE 3"= 1'-0"



SECTION B RI-TL4B.3

SCALE 3"= 1'-0"

FOUR BAR STEEL BRIDGE RAIL IS MASH 2016 TL-4 COMPLAINT

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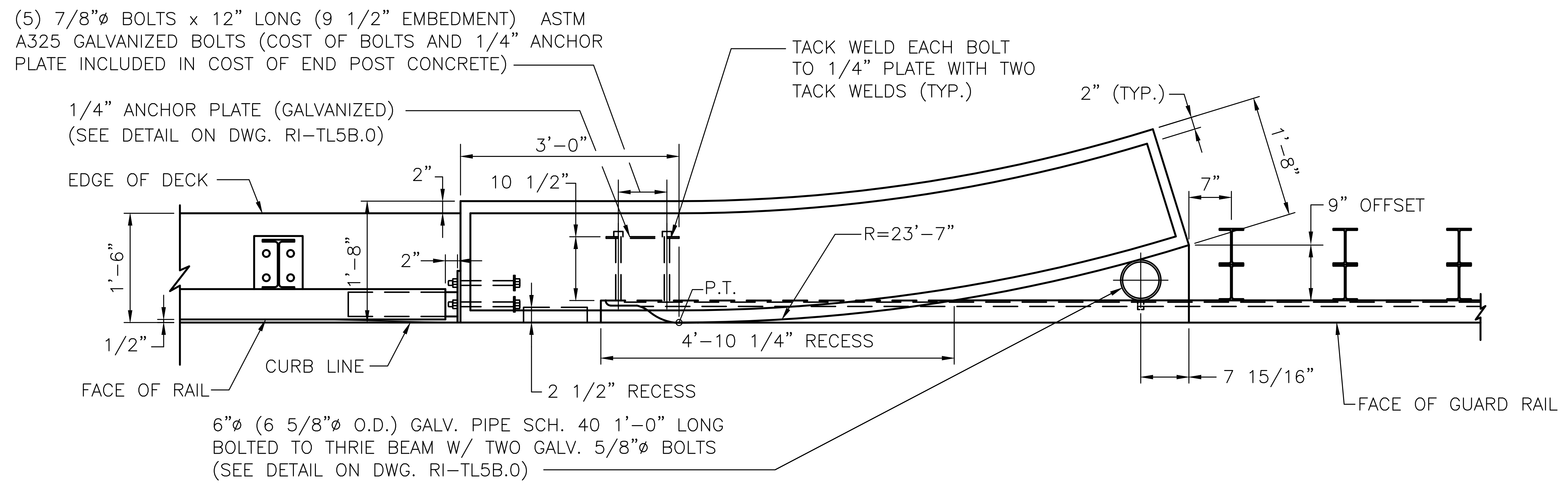
RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

BRIDGE STANDARDS

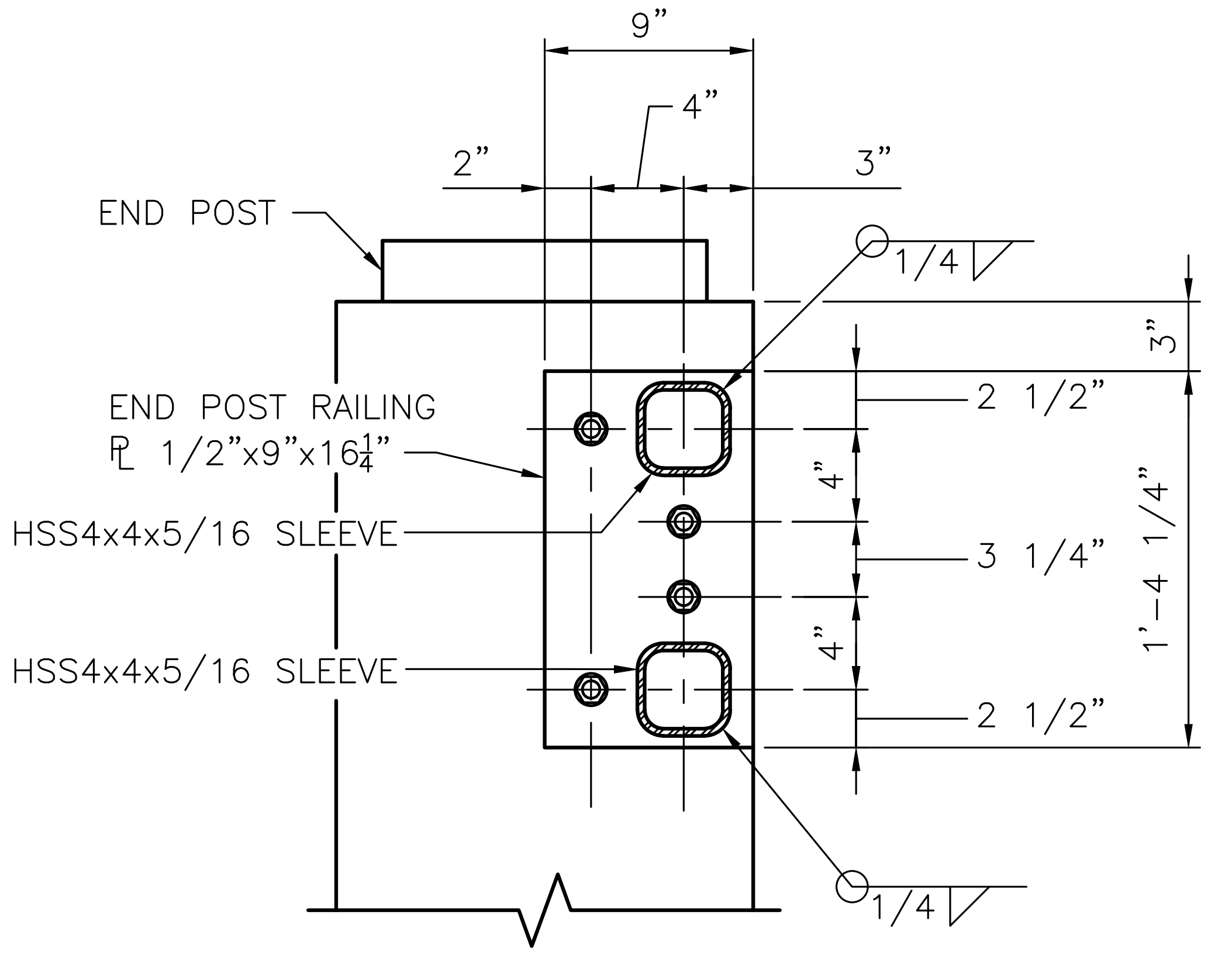
FOUR BAR STEEL BRIDGE RAIL (MASH TL-4) SHEET 3

DRAWING NUMBER: RI-TL4B.3


(5) 7/8"ø BOLTS x 12" LONG (9 1/2" EMBEDMENT) ASTM A325 GALVANIZED BOLTS (COST OF BOLTS AND 1/4" ANCHOR PLATE INCLUDED IN COST OF END POST CONCRETE)
TACK WELD EACH BOLT TO 1/4" PLATE WITH TWO TACK WELDS (TYP.)
1/4" ANCHOR PLATE (GALVANIZED) (SEE DETAIL ON DWG. RI-TL5B.0)
2" (TYP.)
1'-8"
EDGE OF DECK
3'-0"
2"
10 1/2"
7"
9" OFFSET
R=23'-7"
1'-6"
1'-8"
2"
P.T.
1/2"
4'-10 1/4" RECESS
FACE OF RAIL
CURB LINE
2 1/2" RECESS
7 15/16"
FACE OF GUARD RAIL
6"ø (6 5/8"ø O.D.) GALV. PIPE SCH. 40 1'-0" LONG BOLTED TO THRIE BEAM W/ TWO GALV. 5/8"ø BOLTS (SEE DETAIL ON DWG. RI-TL5B.0)

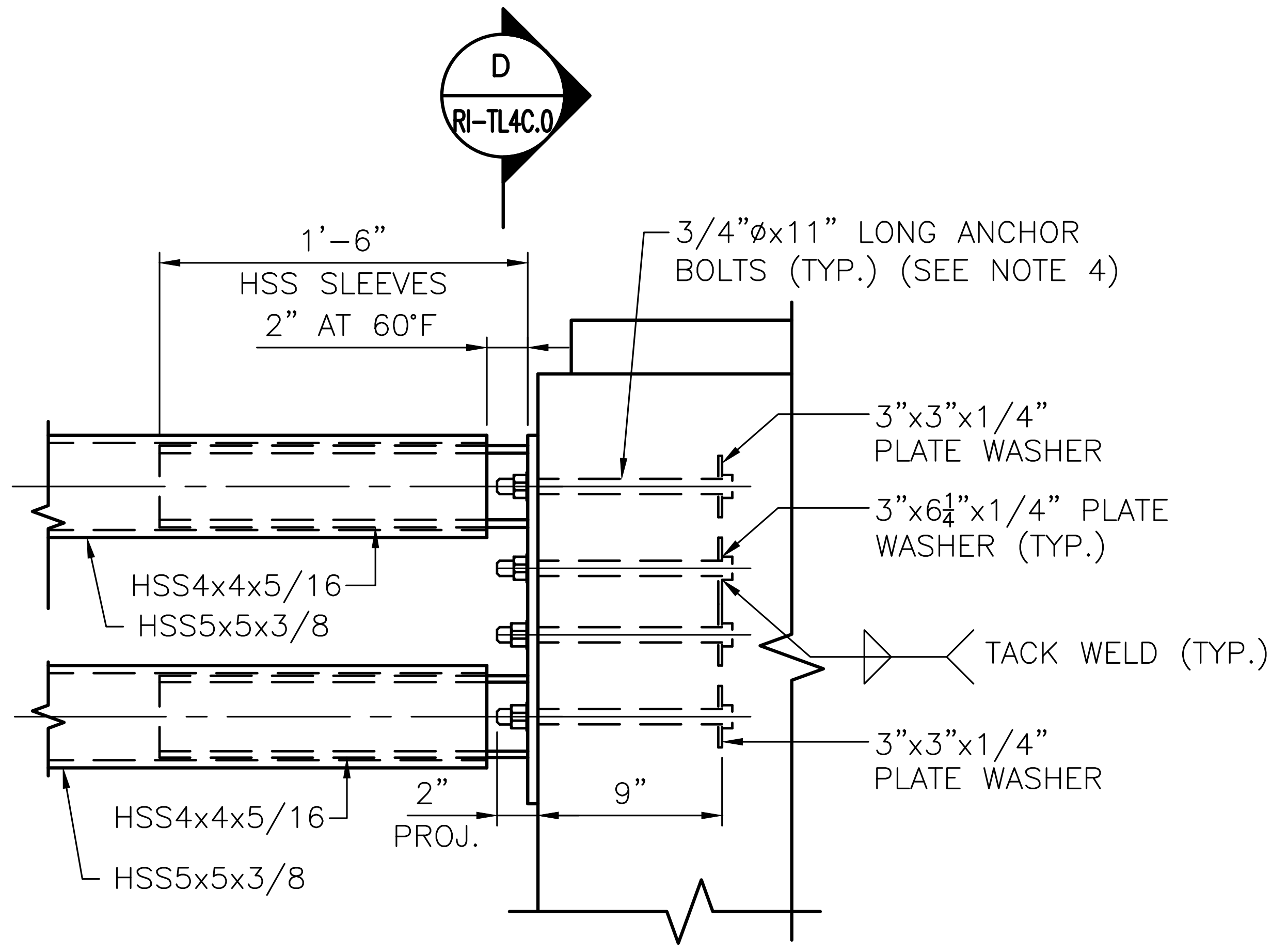
PLAN

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



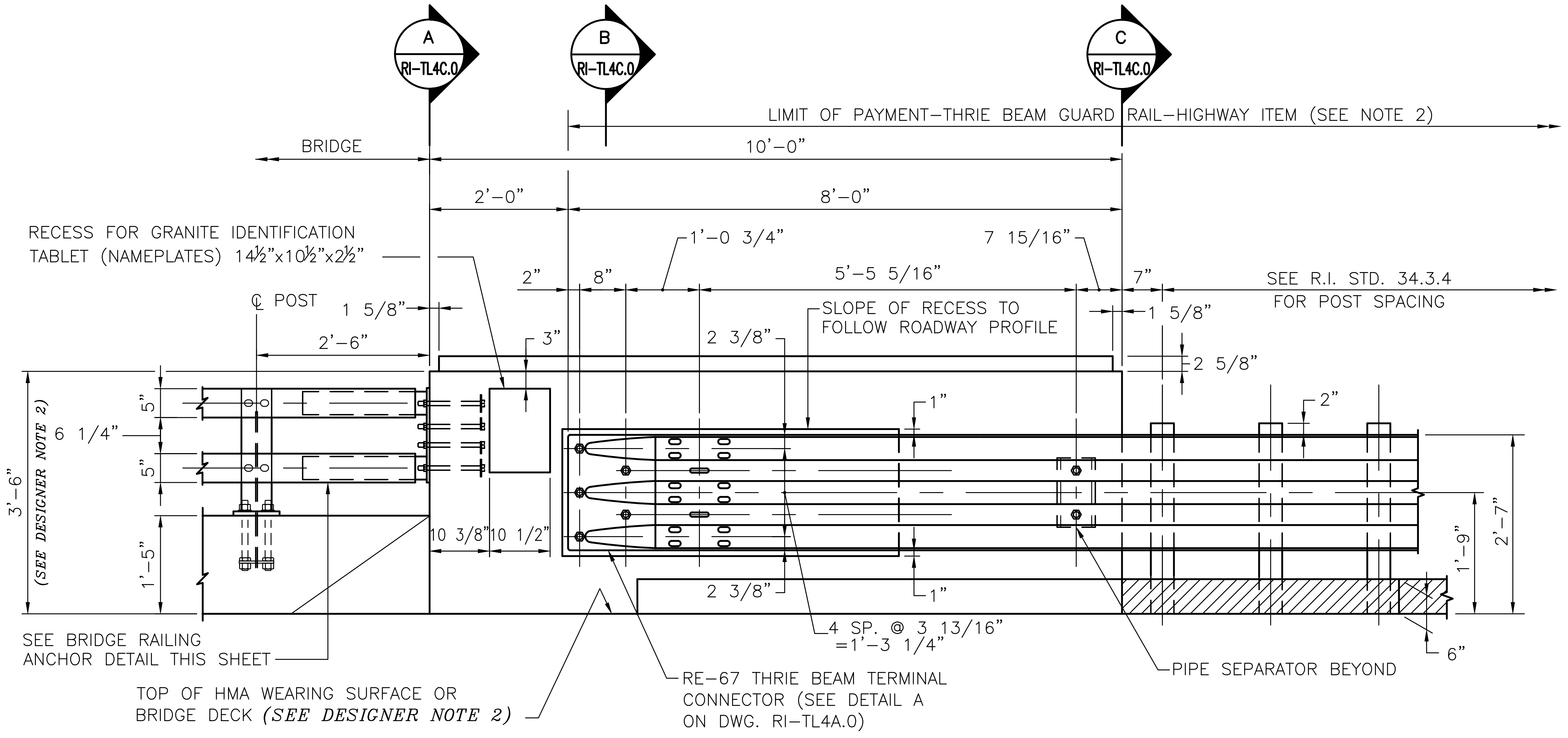
SECTION D RI-TL4C.0

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



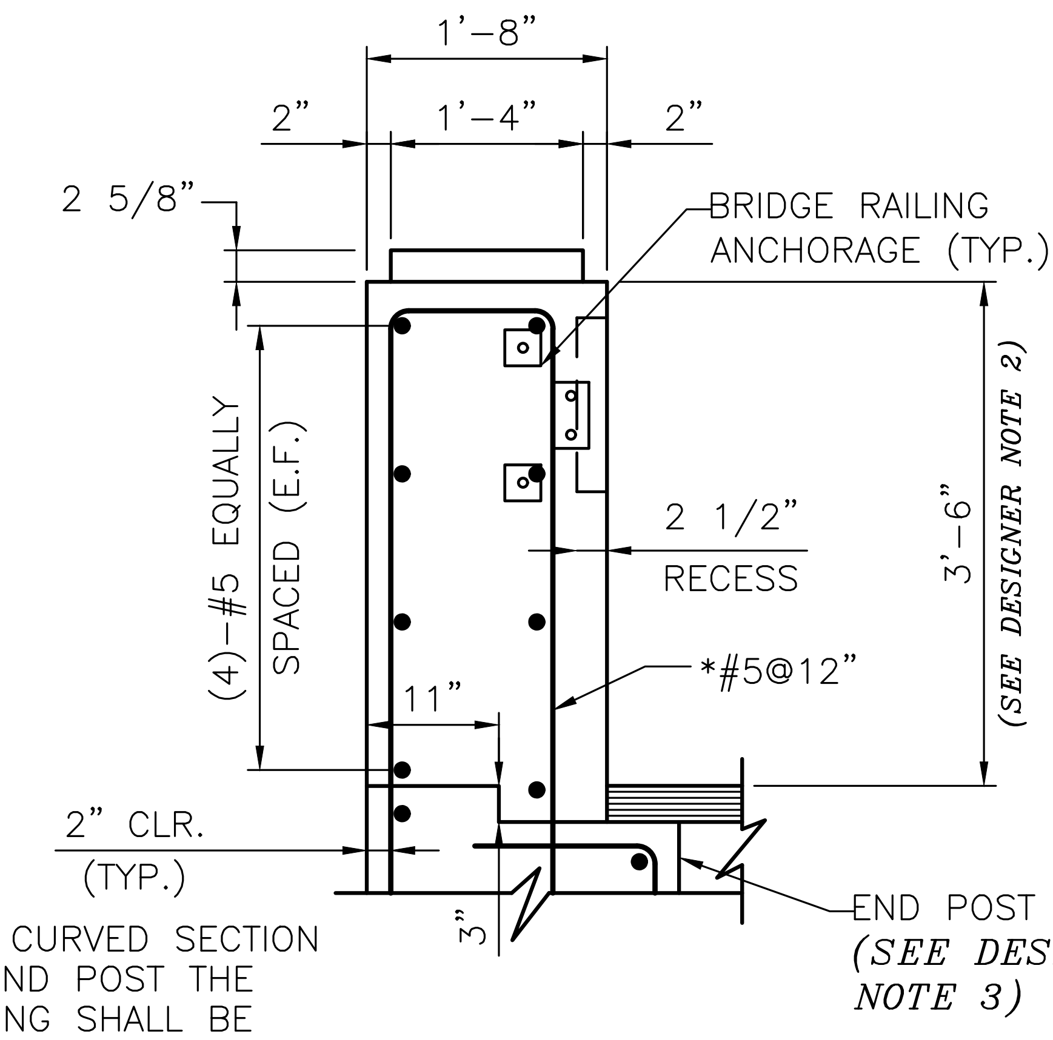
BRIDGE RAILING ANCHOR DETAIL

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


A
RI-TL4C.0
B
RI-TL4C.0
C
RI-TL4C.0
LIMIT OF PAYMENT-THRIE BEAM GUARD RAIL-HIGHWAY ITEM (SEE NOTE 2)
BRIDGE
10'-0"
2'-0"
8'-0"
RECESS FOR GRANITE IDENTIFICATION TABLET (NAMEPLATES) 14½"x10½"x2½"
1'-0 3/4"
7 15/16"
2"
8"
5'-5 5/16"
7"
SEE R.I. STD. 34.3.4 FOR POST SPACING
℄ POST
1 5/8"
SLOPE OF RECESS TO FOLLOW ROADWAY PROFILE
1 5/8"
2'-6"
3"
2 3/8"
2 5/8"
1"
2"
5"
6 1/4"
5"
3'-6"
(SEE DESIGNER NOTE 2)
1'-5"
10 3/8"
10 1/2"
1'-9"
2'-7"
2 3/8"
1"
6"
SEE BRIDGE RAILING ANCHOR DETAIL THIS SHEET
4 SP. @ 3 13/16" =1'-3 1/4"
PIPE SEPARATOR BEYOND
TOP OF HMA WEARING SURFACE OR BRIDGE DECK (SEE DESIGNER NOTE 2)
RE-67 THRIE BEAM TERMINAL CONNECTOR (SEE DETAIL A ON DWG. RI-TL4A.0)

ELEVATION

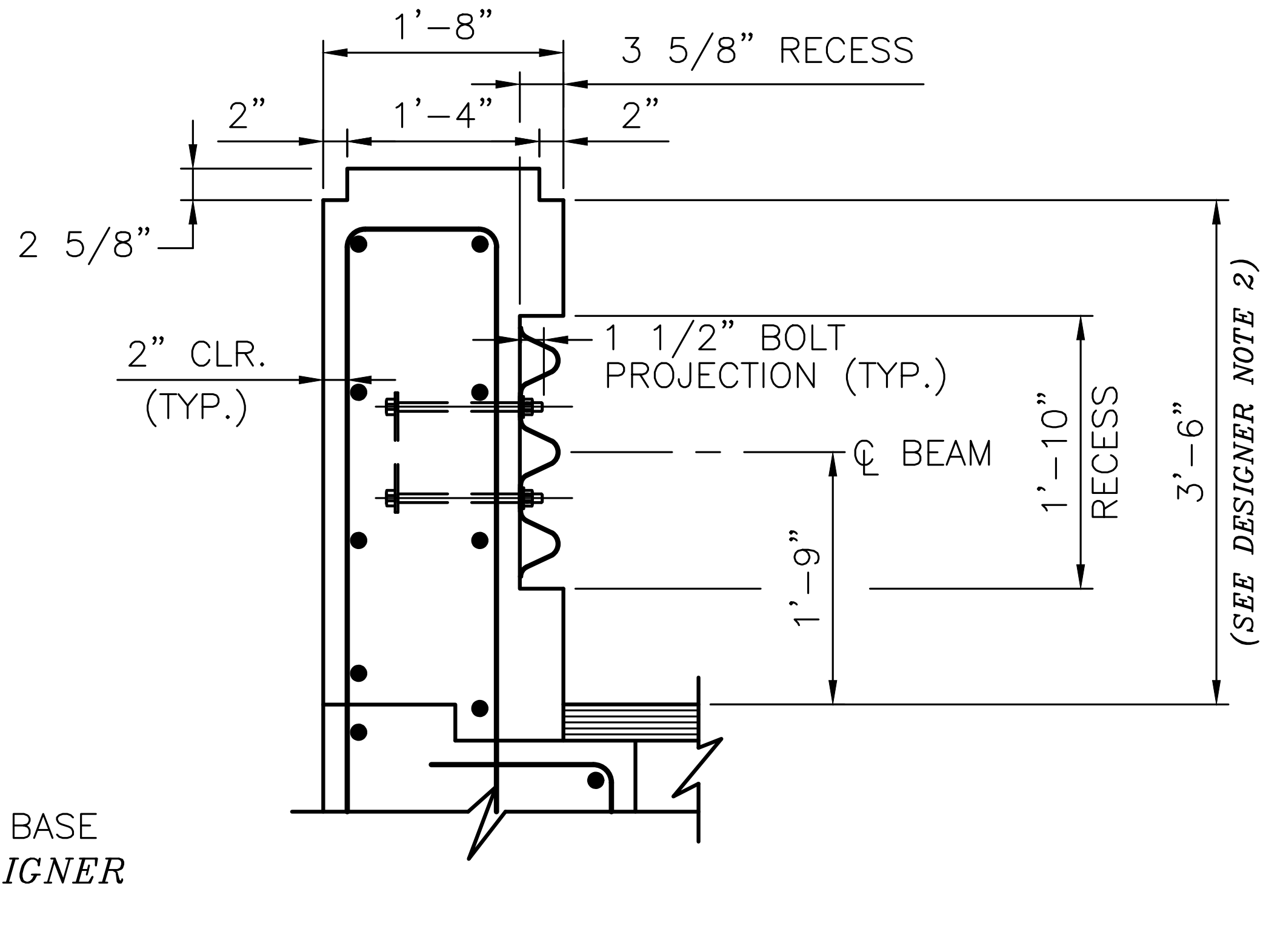
SCALE: 3/4"=1'-0"


1'-8"
2"
1'-4"
2"
2 5/8"
BRIDGE RAILING ANCHORAGE (TYP.)
(4)-#5 EQUALLY SPACED (E.F.)
2 1/2" RECESS
3'-6"
(SEE DESIGNER NOTE 2)
11"
*#5@12"
2" CLR. (TYP.)
3"
END POST BASE (SEE DESIGNER NOTE 3)

* IN THE CURVED SECTION OF THE END POST THE REINFORCING SHALL BE DETAILED WITH A MAXIMUM SPACING OF 12" AND A MINIMUM SPACING OF 3" ALONG THE ARC.

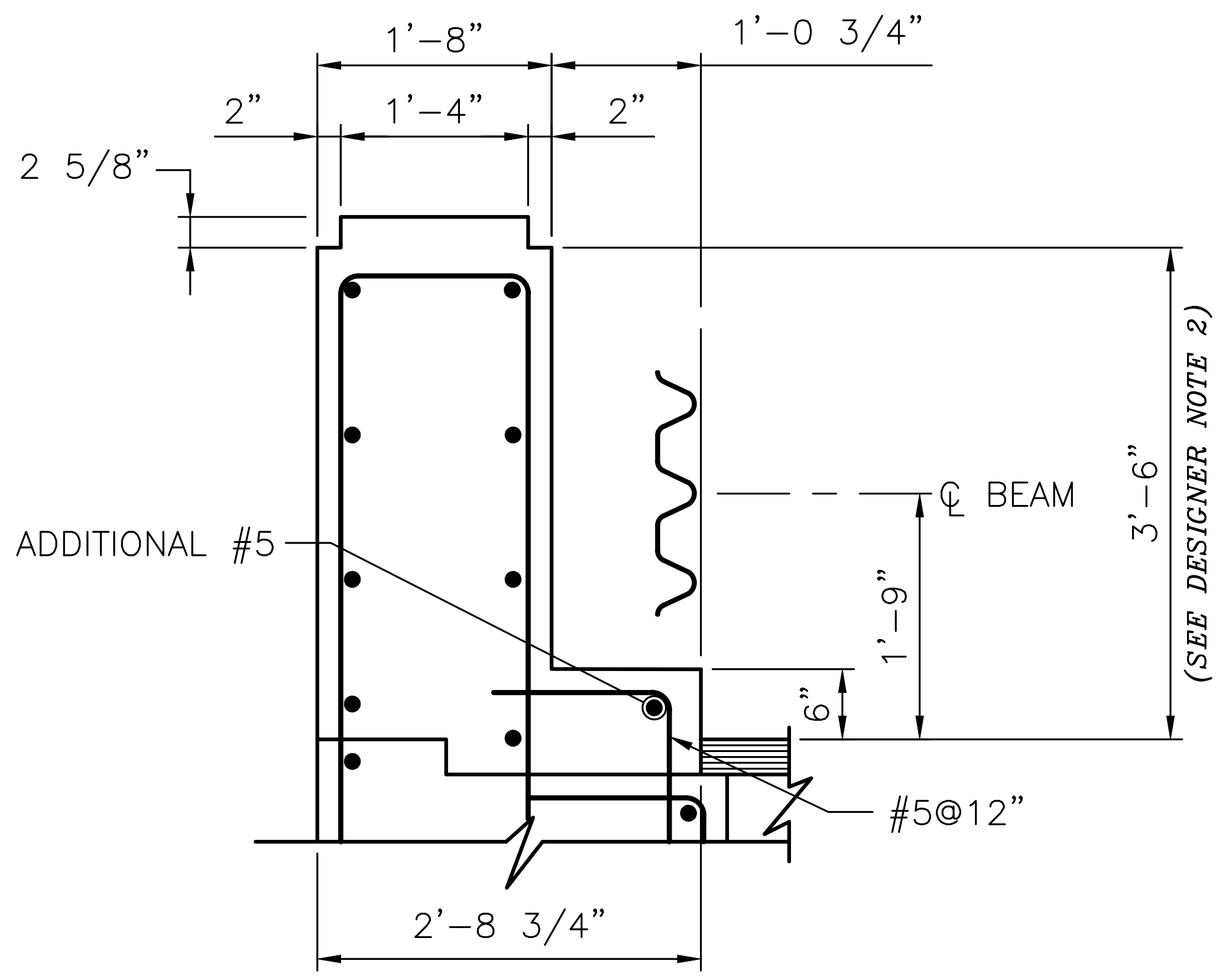
SECTION A RI-TL4C.0

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



SECTION B RI-TL4C.0

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



SECTION C RI-TL4C.0

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

DESIGNER:

1. *COORDINATE THIS DRAWING WITH DRAWING (RI-TL4C.1)*
2. *INCREASE END POST HEIGHT TO 3'-9" WHEN BRIDGE DECK IS PAVED WITH A WEARING SURFACE. END POST HEIGHT SHALL NOT EXCEED 3'-9" FROM THE TOP OF BRIDGE DECK*
3. *THE END POST SHALL BE FOUNDED ON A BASE THAT IS CAPABLE FOR RESISTING THE IMPACT LOAD OF MASH TL-4. THE BASE AND CONNECTION BETWEEN THE END POST AND THE BASE SHALL BE DESIGNED AND DETAILED ON THE CONTRACT PLANS. THE END POST VERTICAL REINFORCING BARS SHALL HAVE SUFFICIENT TENSION DEVELOPMENT LENGTH AND/OR TENSION LAP SPLICES INTO THE BASE.*

NOTES:

1. TO ENSURE PROPER GUARD RAIL ANCHORAGE, THE GUARD RAIL INSTALLATION SHALL BEGIN AT EACH END OF THE BRIDGE AND WORK INTO THE APPROACHES.
2. THE COST OF THE GUARD RAIL TRANSITIONS TO BRIDGE END POSTS ARE HIGHWAY ITEMS.
3. THE COST OF BRIDGE RAIL ANCHORAGE (PLATES, ANCHOR BOLTS AND PLATE SLEEVES) IS INCLUDED IN COST OF END POST CONCRETE.
4. ANCHOR BOLTS AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM DESIGNATION A307 AND A563, RESPECTIVELY.
5. REFER TO DRAWING (RI-TL5B.0) FOR NAMEPLATE TABLET, PIPE SEPARATOR, AND ANCHOR PLATE FOR THRIE BEAM DETAILS.
6. REFER TO MATERIAL NOTES ON DRAWING (RI-TL4C.1) FOR STRUCTURAL TUBING AND END POST RAILING PLATE REQUIREMENTS.

END POST IS MASH
2016 TL-4 COMPLIANT

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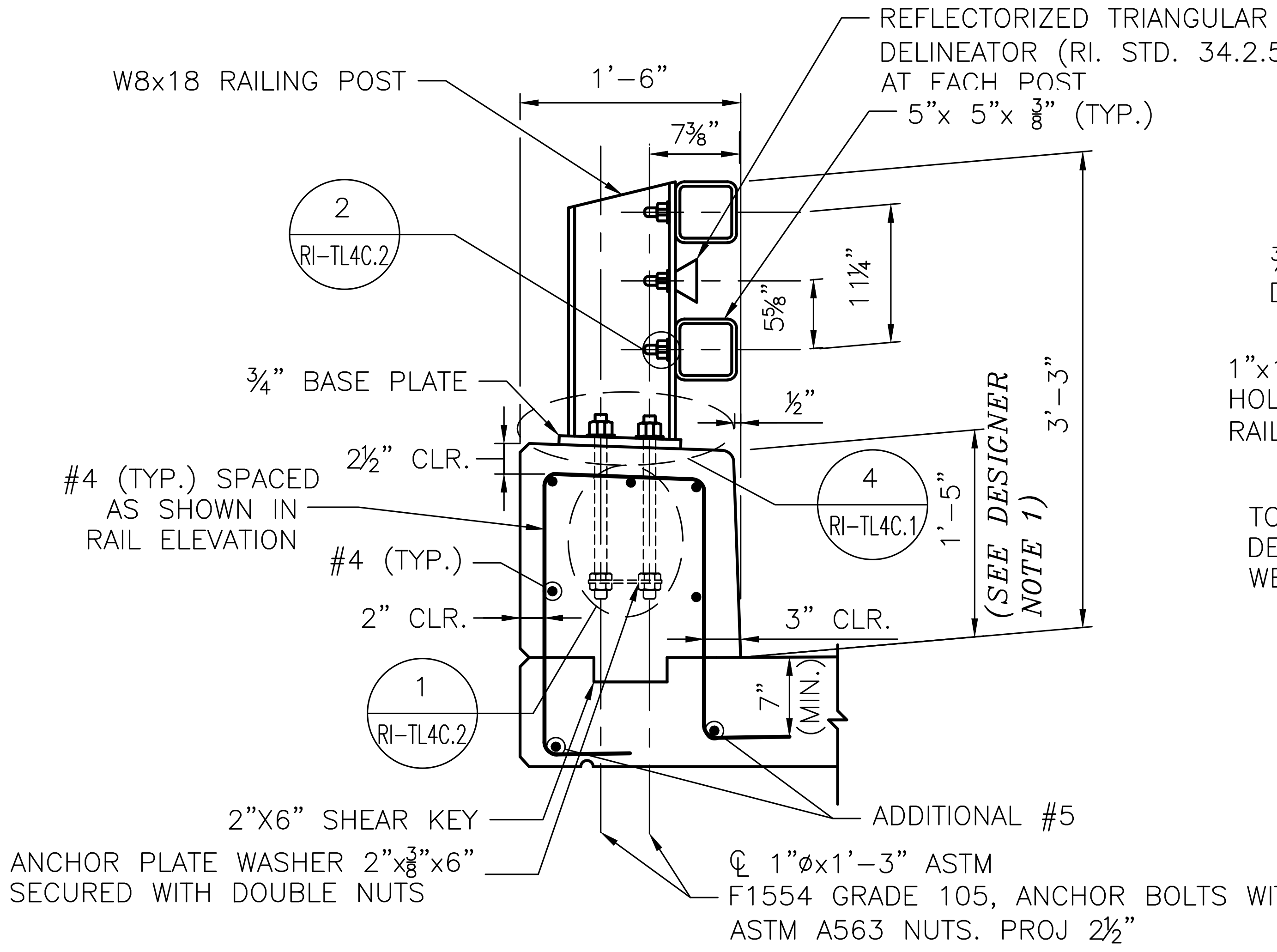
0	11/2022

RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

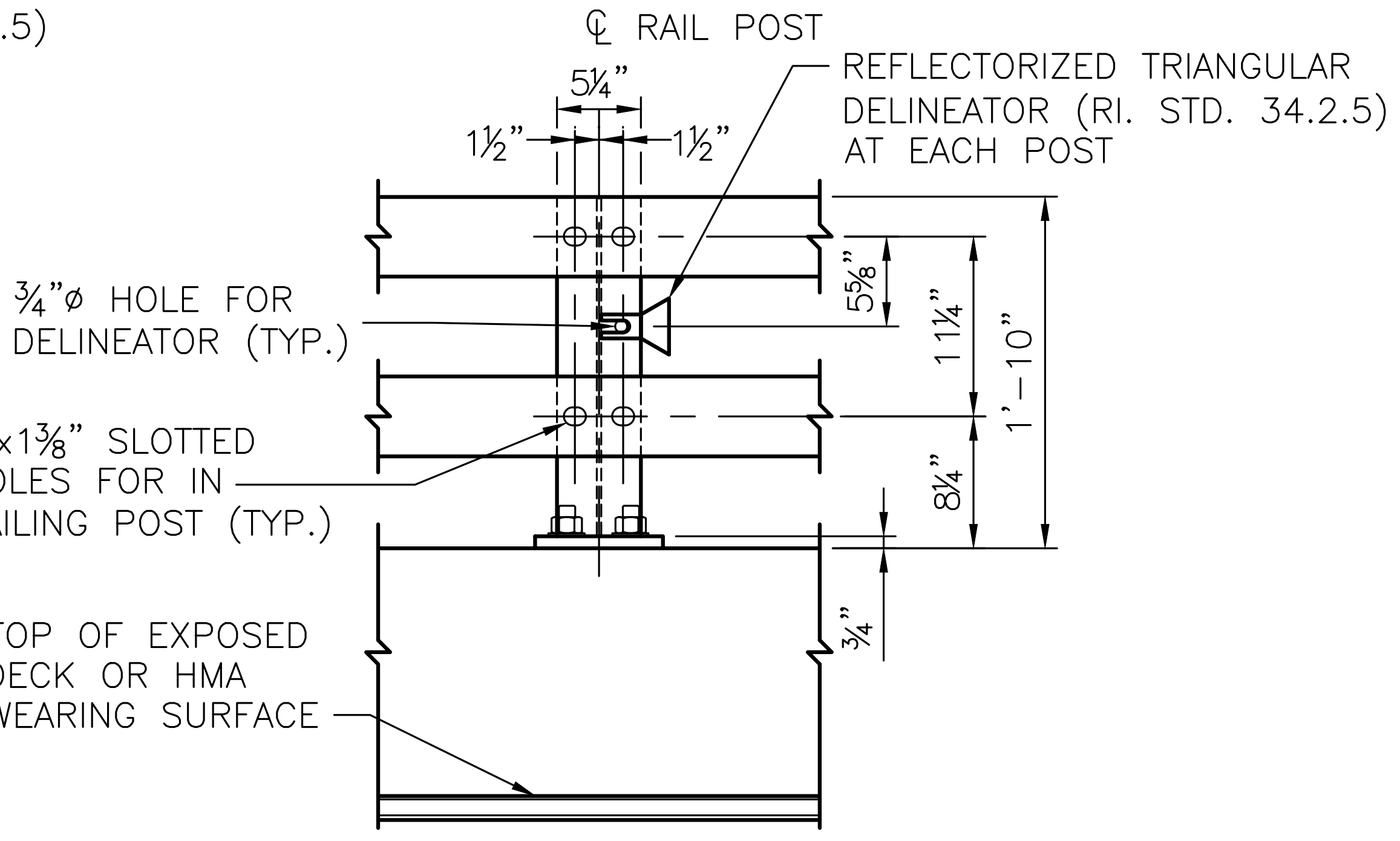
BRIDGE STANDARDS

END POST DETAILS FOR BRIDGE COMBINATION RAIL (MASH TL-4)

DRAWING NUMBER: RI-TL4C.0


W8x18 RAILING POST
1'-6"
7⅜"
REFLECTORIZED TRIANGULAR DELINEATOR (RI. STD. 34.2.5) AT EACH POST
5"x 5"x ⅜" (TYP.)
2 RI-TL4C.2
5⅝"
11¼"
3'-3"
(SEE DESIGNER NOTE 1)
¾" BASE PLATE
½"
2½" CLR.
#4 (TYP.) SPACED AS SHOWN IN RAIL ELEVATION
4 RI-TL4C.1
1'-5"
#4 (TYP.)
2" CLR.
3" CLR.
1 RI-TL4C.2
7" (MIN.)
2"X6" SHEAR KEY
ADDITIONAL #5
ANCHOR PLATE WASHER 2"x⅜"x6" SECURED WITH DOUBLE NUTS
℄ 1"øx1'-3" ASTM F1554 GRADE 105, ANCHOR BOLTS WITH ASTM A563 NUTS. PROJ 2½"

SECTION VIEW B RI-TL4C.1


℄ RAIL POST
5¼"
1½"
1½"
REFLECTORIZED TRIANGULAR DELINEATOR (RI. STD. 34.2.5) AT EACH POST
¾"ø HOLE FOR DELINEATOR (TYP.)
1"x1⅜" SLOTTED HOLES FOR IN RAILING POST (TYP.)
5⅝"
11¼"
1'-10"
8¼"
¾"
TOP OF EXPOSED DECK OR HMA WEARING SURFACE

FRONT ELEVATION

BRIDGE COMBINATION RAIL (MASH TL-4)

SCALE: 1"=1'-0"

RAIL NOTES

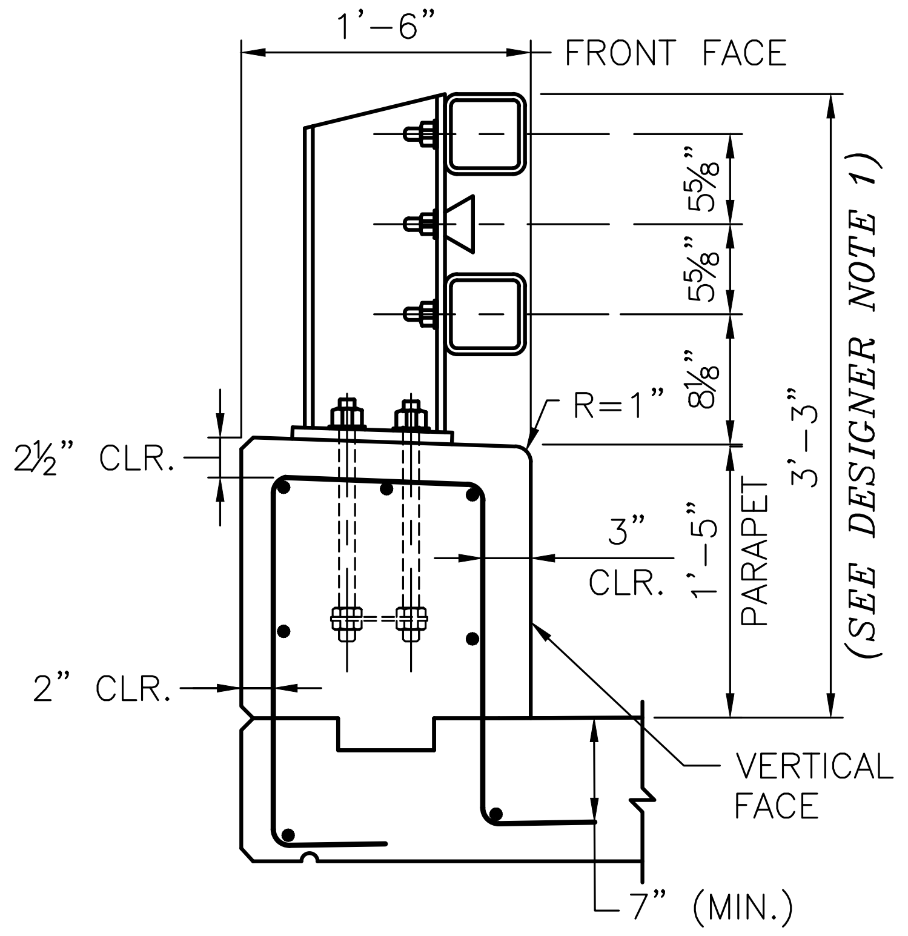
1. BRIDGE RAIL SHALL INCLUDE POSTS, BASE PLATES, ANCHOR RODS, PREFORMED PADS, RAIL ASSEMBLY BOLTS, NUTS, WASHERS, STUDS, STRUCTURAL TUBING, SPLICE BARS, PIPE SPACERS, REFLECTIVE DELINEATORS, ALL APPURTENANCES, METALIZING, AND PAINTING (IF SPECIFIED).
2. BRIDGE RAIL POSTS SHALL BE SET VERTICAL.
3. ENDS OF RAIL TUBE SECTIONS SHALL BE SAWED OR MILLED AND SHALL BE TRUE AND SMOOTH. ALL CUT EDGES OF ALL MATERIAL SHALL BE GROUND SMOOTH.
4. EACH PIECE OF RAIL TUBING SHALL BE CONTINUOUS OVER A MINIMUM OF THREE (3) POSTS BETWEEN SPLICES.
5. BOLT HOLES SHALL BE DRILLED OR PUNCHED.
6. AT INTERIOR SPLICES, PIPE SPACERS SHALL BE USED ON ONLY ONE SIDE OF THE SPLICE TO ALLOW MOVEMENT ON THAT SIDE. THE TOP AND BOTTOM RAIL SHALL RECEIVE THE SAME TREATMENT. AT END SPLICES PIPE SPACERS SHALL BE USED ON BOTH SIDES OF THE SPLICE TO ALLOW MOVEMENT ON EACH SIDE.
7. MILL OR SHOP TRANSVERSE WELDS SHALL NOT BE PERMITTED ON ANY RAIL ELEMENT. RAIL ELEMENTS USED ON CURVES SHALL BE SHOP FORMED TO THE REQUIRED CURVATURE.
8. NO PUNCHING, DRILLING, CUTTING OR WELDING SHALL BE PERMITTED AFTER METALIZING, OR GALVANIZING. DAMAGED AREAS OF METALIZING OR GALVANIZING SHALL BE REPAIRED IN STRICT CONFORMANCE WITH THE MATERIAL SUPPLIER'S RECOMMENDATIONS AND SHALL BE APPROVED BY THE ENGINEER.
9. NUTS FOR 1"ø THREADED ANCHOR RODS CONNECTING THE BASE PLATE TO THE CONCRETE SHALL BE TIGHTENED TO A SNUG FIT AND GIVEN AN ADDITIONAL ⅓ TURN.
10. THREADS FOR ANCHOR RODS MAY BE ROLLED OR CUT. IF CUT THREADS ARE USED, BOLT DIAMETER SHALL NOT BE LESS THAN NOMINAL DIAMETER. IF ROLLED THREADS ARE USED, ROD DIAMETER SHALL NOT BE LESS THAN ROOT DIAMETER OF THREADS.
11. FOR RAIL CONNECTION TO END POST, SEE "END POST DETAILS FOR BRIDGE COMBINATION RAIL (MASH TL-4)", DWG. (RI-TL4C.0).
12. RAILING SHALL BE SHOP PAINTED [INSET PAINT COLOR].

MATERIAL NOTES

1. STRUCTURAL TUBING SHALL CONFORM TO THE REQUIREMENTS OF ASTM A500, GRADE B, STRUCTURAL STEEL TUBING. RAIL TUBING SHALL MEET THE LONGITUDINAL CHARPY V-NOTCH REQUIREMENTS OF 15 FT. LBS. AT 0° F. FOR ASTM A500, GRADE B, THE TEST SAMPLES SHALL BE TAKEN AFTER FORMING THE TUBES. CHARPY V-NOTCH IS NOT REQUIRED FOR SPLICE TUBES.
2. RAIL POSTS, BASE PLATES, AND END RAILING PLATES SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M270 GRADE 50 (ASTM A572 GR 50), EXCEPT ANCHOR PLATES MAY BE AASHTO M270 GRADE 36 (ASTM A36).
3. THREADED STUDS AND MATCHING NUTS FOR RAIL-TO-POST ATTACHMENT (DETAIL 2) SHALL CONFORM TO ASTM A276 TYPE 304, STAINLESS STEEL, AND SHALL BE TORQUE TESTED PER AWS D1.5, 7.7.1. ALL OTHER BOLTS AND NUTS SHALL CONFORM TO ASTM A307 AND ASTM A563 GRADE A RESPECTIVELY OR BETTER. ANCHOR RODS SHALL CONFORM TO F1554, GRADE 105 WITH ASTM A563 NUTS. WASHERS SHALL BE SAE HARDENED ASTM F436.
4. ALL STEEL COMPONENTS (EXCEPT STAINLESS STEEL COMPONENTS) SHALL BE METALIZED IN ACCORDANCE WITH RIDOT SPECIFICATION 827 OR GALVANIZED IN ACCORDANCE WITH RIDOT SPECIFICATION 843. THE METALIZING OR GALVANIZING SHALL HAVE A UNIFORM APPEARANCE, AND THE COATED MATERIAL SHALL BE PROPERLY STORED.
5. DETAIL 2 STUDS SHALL BE WELDED BEFORE TUBES ARE METALIZED OR GALVANIZED.

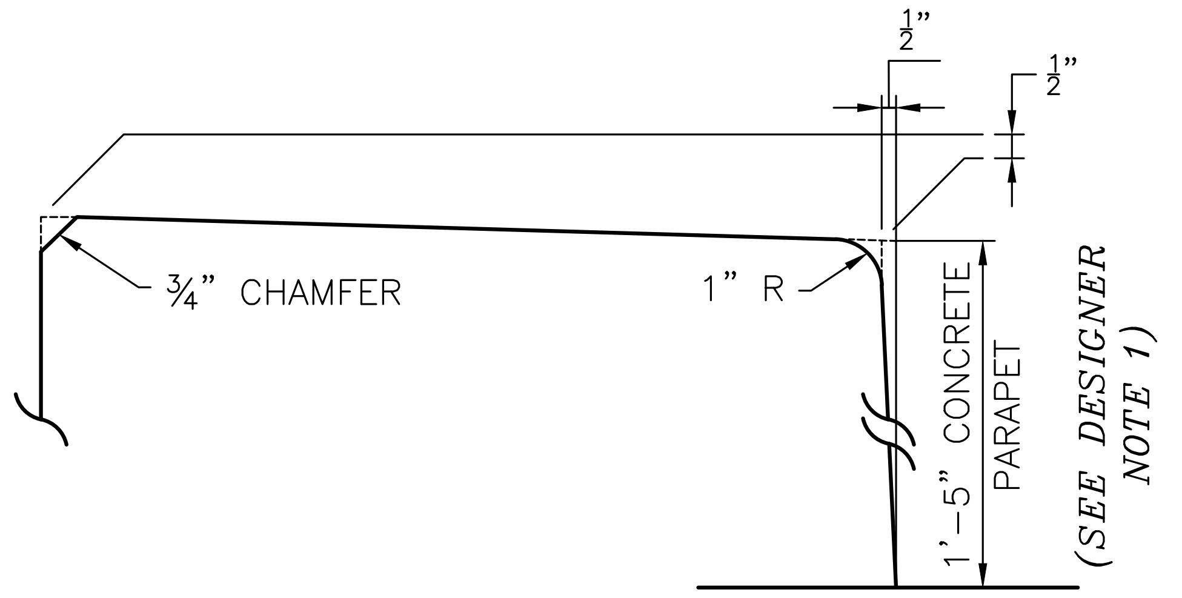
DESIGNER NOTES:

1. *INCREASE CONCRETE PARAPET HEIGHT TO 1-8" WHEN BRIDGE DECK IS PAVED WITH A WEARING SURFACE. CONCRETE PARAPET HEIGHT SHALL NOT EXCEED 1'-8" FROM THE TOP OF BRIDGE DECK.*



SECTION VIEW A RI-TL4C.1

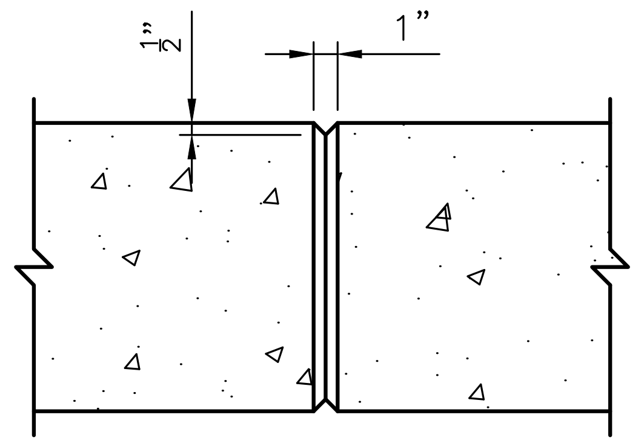
SCALE: 1"=1'-0"



DETAIL 4 RI-TL4C.1

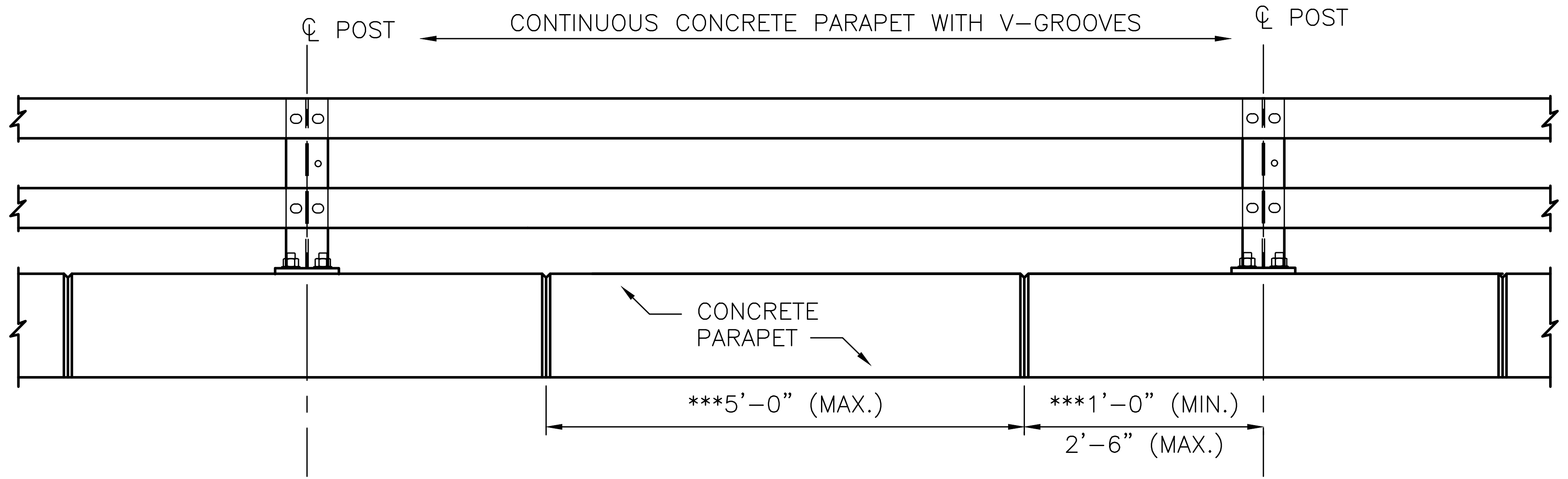
SCALE: 3"=1'-0"

(BASE PLATE AND ANCHOR BOLTS NOT SHOWN FOR CLARITY)



V GROOVE IN PARAPET

NOT TO SCALE



ELEVATION

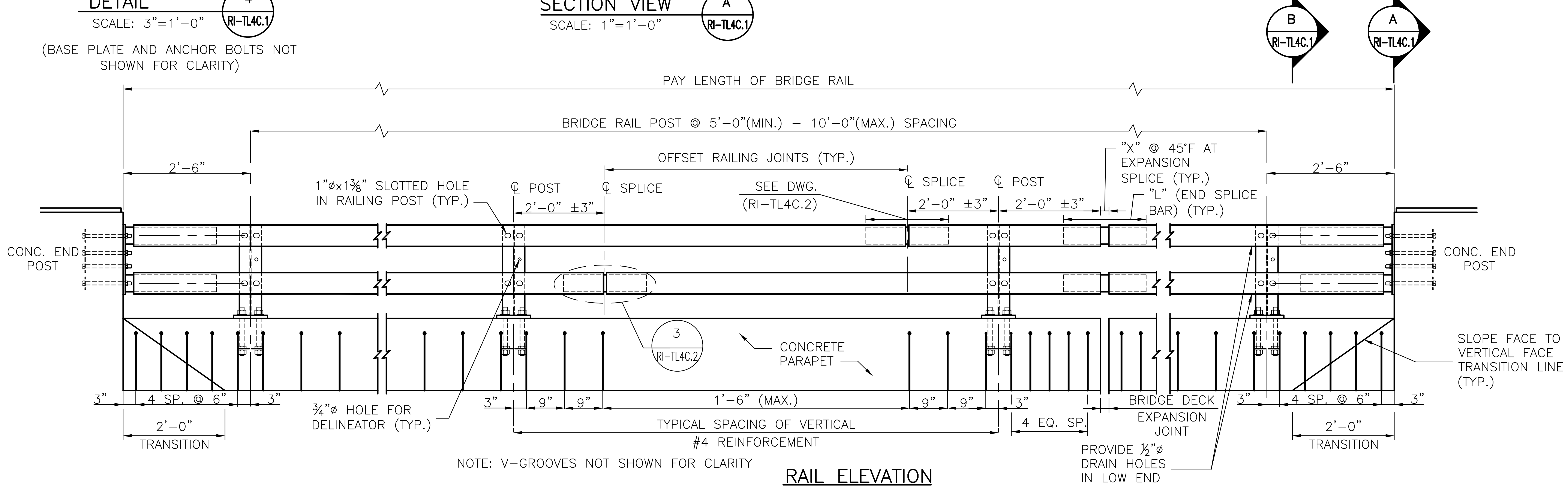
CONCRETE PARAPET V-GROOVE SPACING

NOT TO SCALE

*** SPACING SHALL BE UNIFORM ACROSS THE PARAPET WALLS.

NOTE "A":

FORMED V-GROOVES IN THE CAST-IN-PLACE PARAPET SHALL MAKE A 45° ANGLE WITH THE BARRIER SURFACES. THE LONGITUDINAL REINFORCING BARS IN THE CONCRETE PARAPET SHALL BE CONTINUOUS BETWEEN BRIDGE EXPANSION JOINTS. WHERE SPLICES ARE REQUIRED, THE LENGTH OF THE LAP SHALL BE SUFFICIENT TO DEVELOP EACH BAR.


B RI-TL4C.1
A RI-TL4C.1
PAY LENGTH OF BRIDGE RAIL
BRIDGE RAIL POST @ 5'-0"(MIN.) – 10'-0"(MAX.) SPACING
OFFSET RAILING JOINTS (TYP.)
"X" @ 45°F AT EXPANSION SPLICE (TYP.)
2'-6"
2'-6"
1"øx1⅜" SLOTTED HOLE IN RAILING POST (TYP.)
℄ POST
℄ SPLICE
SEE DWG. (RI-TL4C.2)
℄ SPLICE
℄ POST
"L" (END SPLICE BAR) (TYP.)
2'-0" ±3"
2'-0" ±3"
2'-0" ±3"
CONC. END POST
CONC. END POST
3 RI-TL4C.2
CONCRETE PARAPET
SLOPE FACE TO VERTICAL FACE TRANSITION LINE (TYP.)
3"
4 SP. @ 6"
3"
2'-0"
TRANSITION
¾"ø HOLE FOR DELINEATOR (TYP.)
3"
9"
9"
1'-6" (MAX.)
9"
9"
3"
TYPICAL SPACING OF VERTICAL #4 REINFORCEMENT
4 EQ. SP.
BRIDGE DECK EXPANSION JOINT
PROVIDE ½"ø DRAIN HOLES IN LOW END OF ALL RAILS
3"
4 SP. @ 6"
3"
2'-0"
TRANSITION

NOTE: V-GROOVES NOT SHOWN FOR CLARITY

RAIL ELEVATION

NOT TO SCALE

BRIDGE COMBINATION RAIL
IS MASH 2016 TL-4
COMPLIANT

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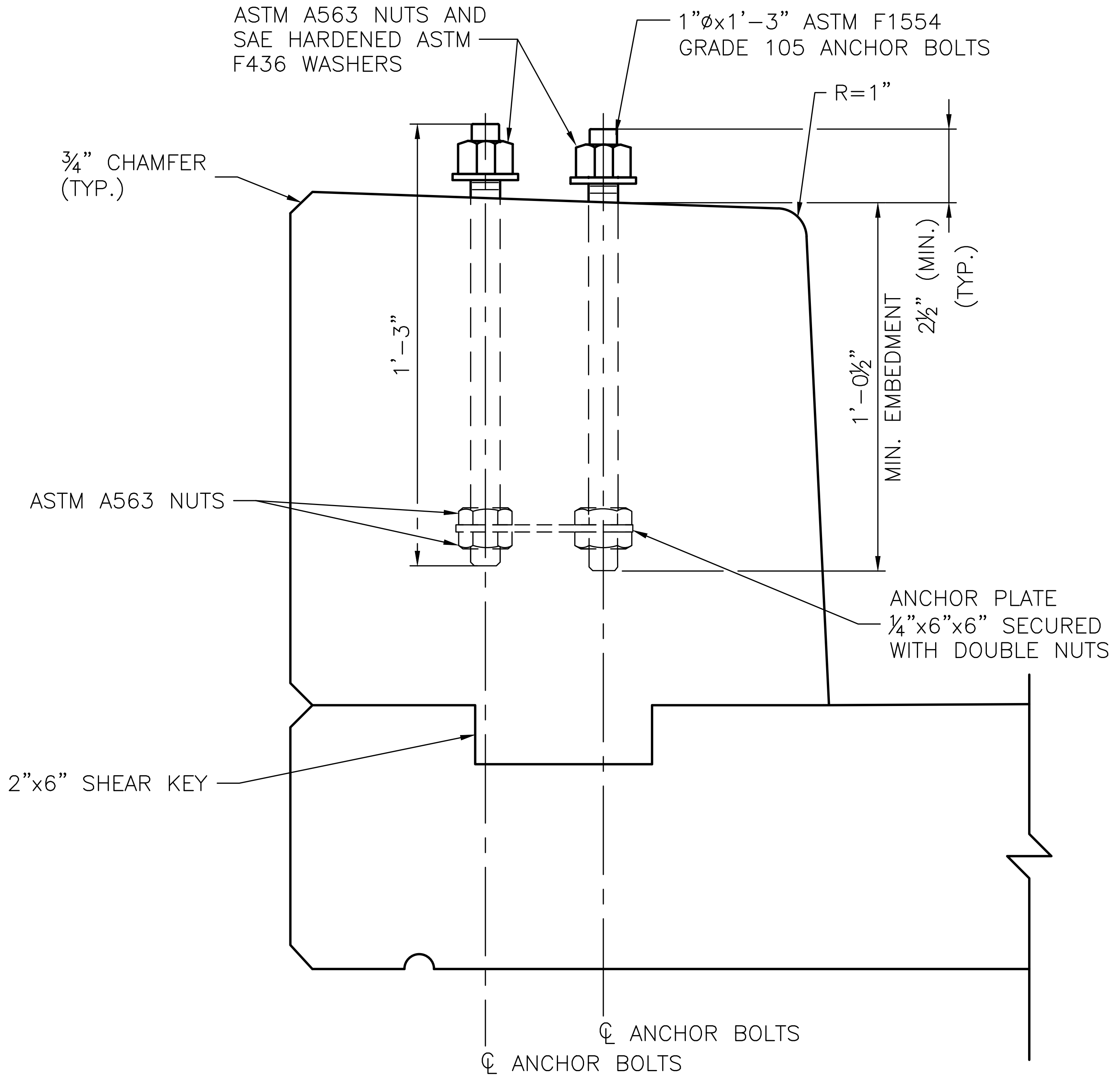
DEPARTMENT OF TRANSPORTATION

BRIDGE STANDARDS

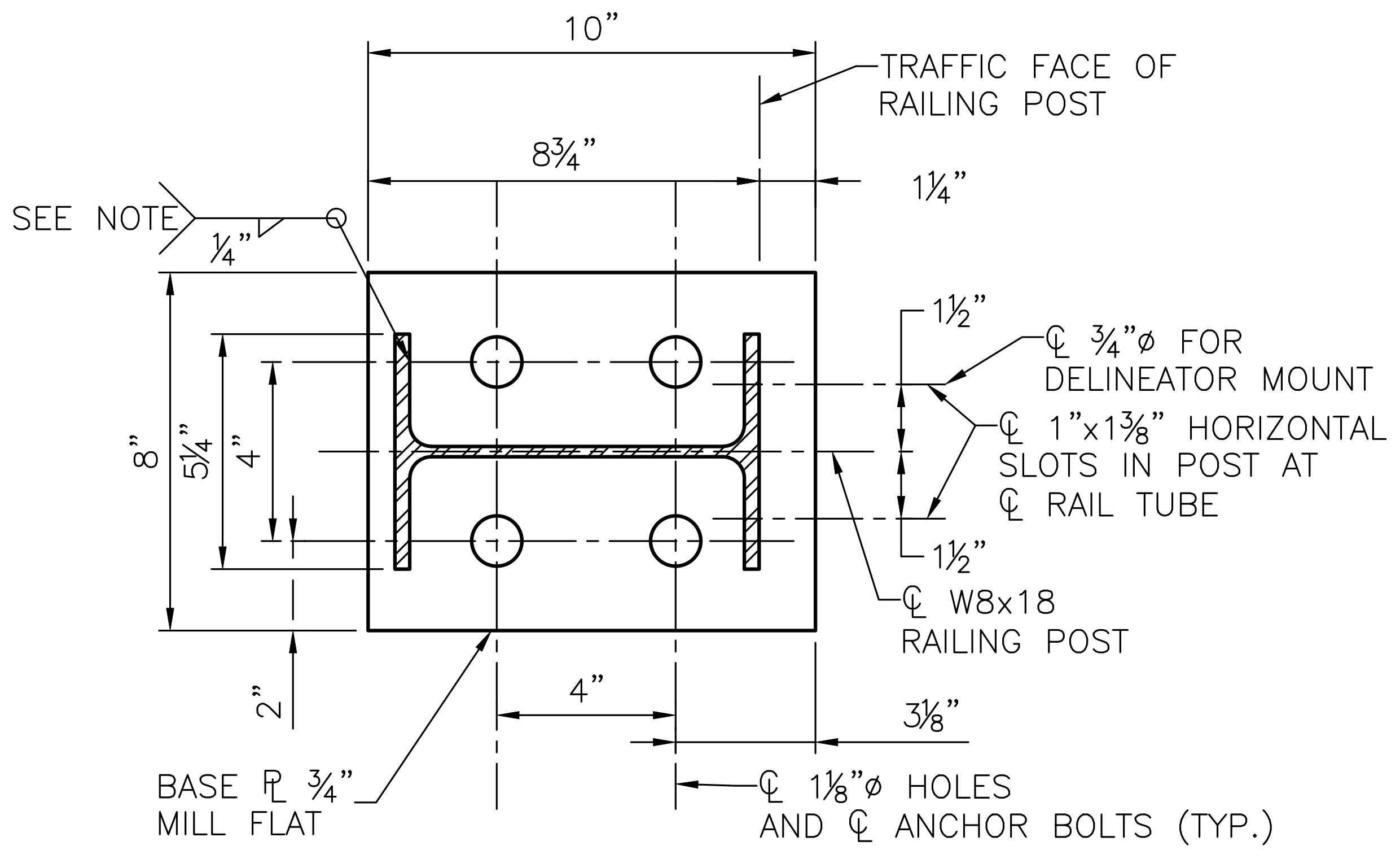
BRIDGE COMBINATION RAIL (MASH TL-4) SHEET 1

DRAWING NUMBER: RI-TL4C.1


ASTM A563 NUTS AND SAE HARDENED ASTM F436 WASHERS
1"øx1'-3" ASTM F1554 GRADE 105 ANCHOR BOLTS
R=1"
¾" CHAMFER (TYP.)
1'-3"
1'-0½" MIN. EMBEDMENT
2½" (MIN.) (TYP.)
ASTM A563 NUTS
ANCHOR PLATE ¼"x6"x6" SECURED WITH DOUBLE NUTS
2"x6" SHEAR KEY
℄ ANCHOR BOLTS
℄ ANCHOR BOLTS

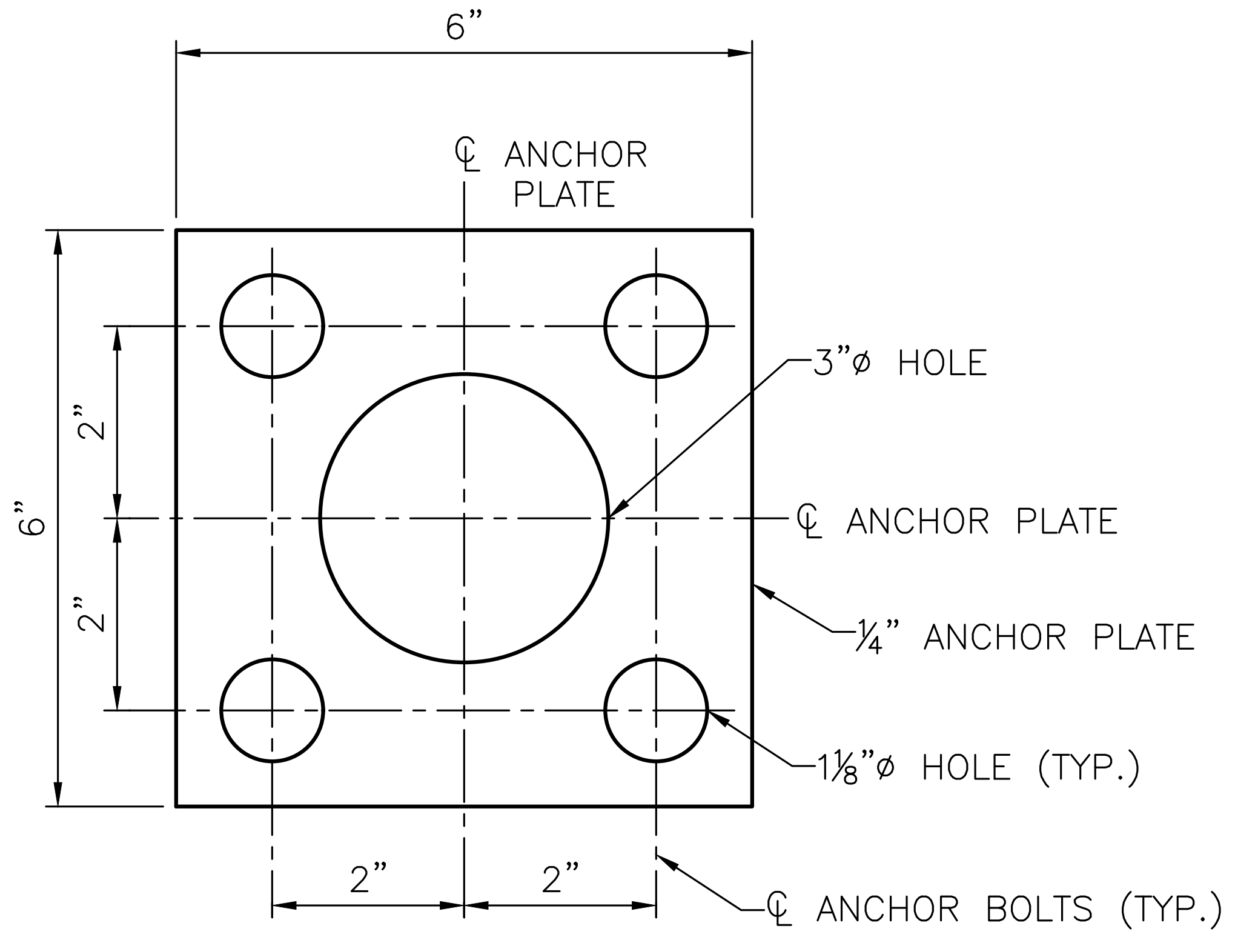
POST ANCHOR ASSEMBLY

DETAIL 1 RI-TL4C.1
SCALE: 3"=1'-0"

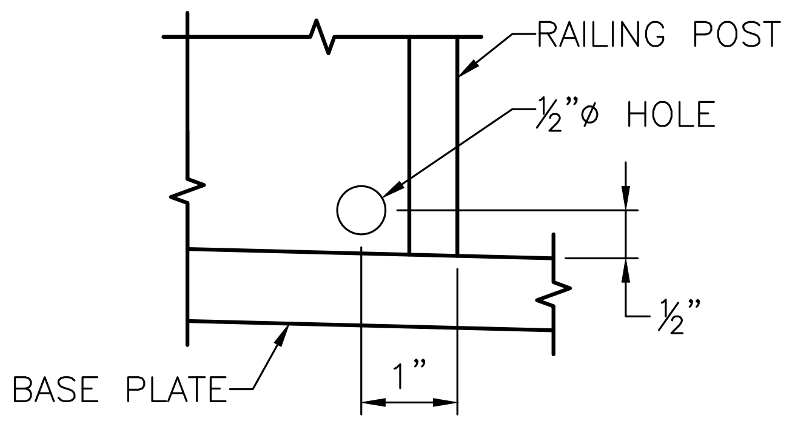

10"
8¾"
TRAFFIC FACE OF RAILING POST
1¼"
SEE NOTE
¼"
1½"
℄ ¾"ø FOR DELINEATOR MOUNT
℄ 1"x1⅜" HORIZONTAL SLOTS IN POST AT ℄ RAIL TUBE
1½"
℄ W8x18 RAILING POST
8"
5¼"
4"
2"
4"
3⅛"
BASE ℙ ¾" MILL FLAT
℄ 1⅛"ø HOLES AND ℄ ANCHOR BOLTS (TYP.)

NOTE: KEEP WELD ⅜" CLEAR OF ANCHOR BOLT HOLES

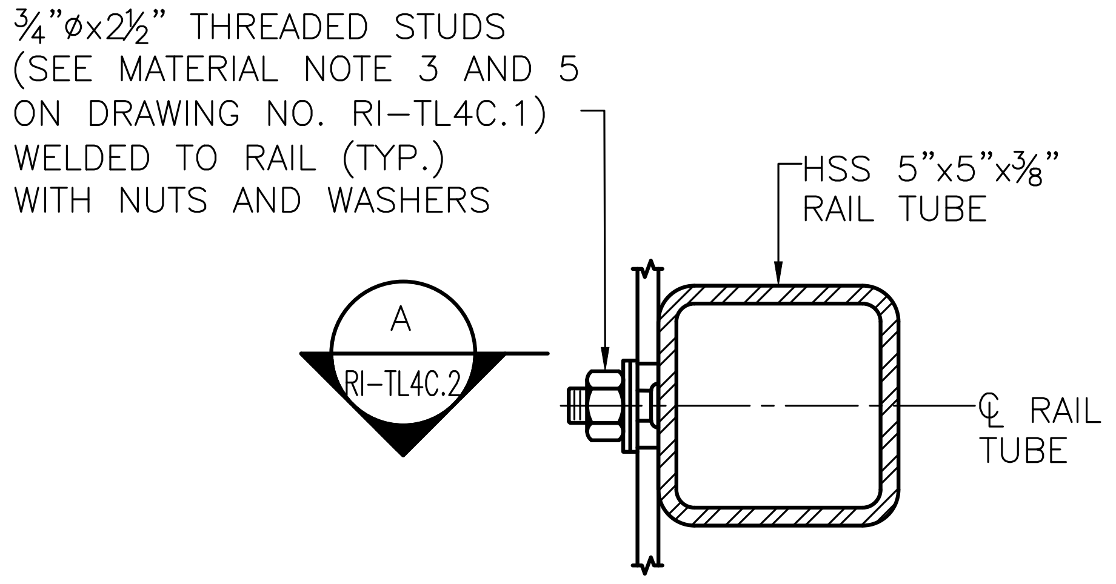
POST BASE PLATE
SCALE: 3"=1'-0"



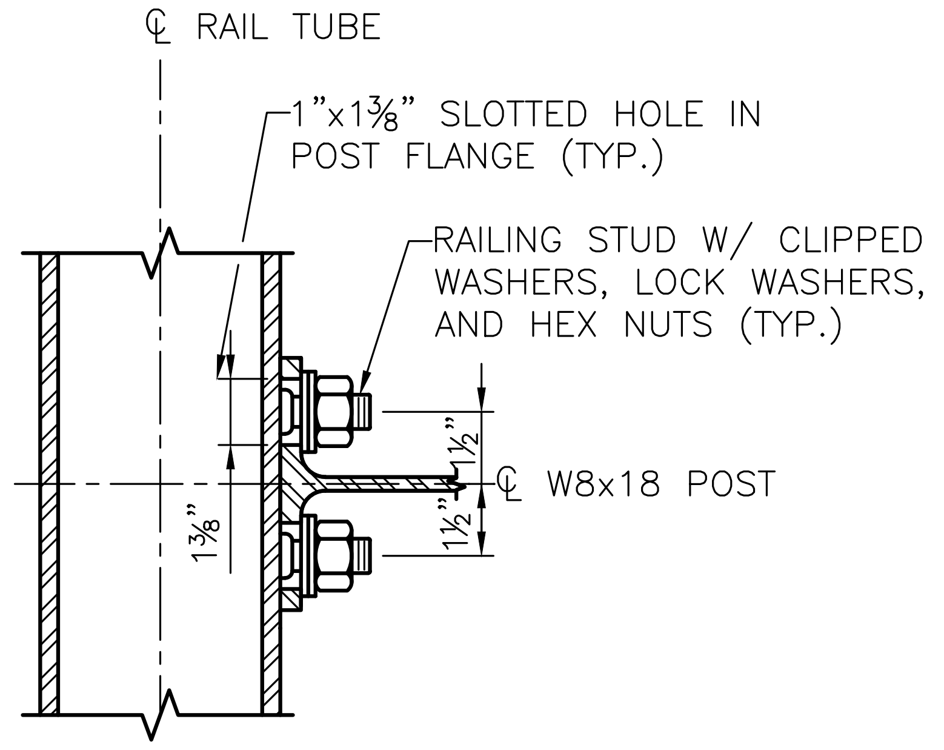
ANCHOR PLATE DETAIL
NOT TO SCALE



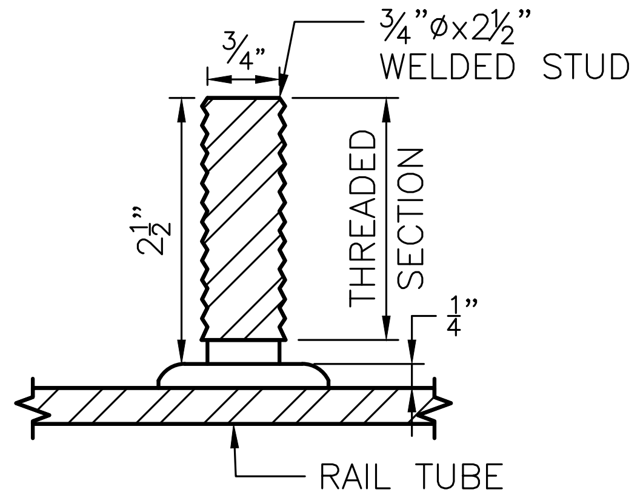
DETAIL 5 RI-TL4C.2
SCALE: 6"=1'-0"


¾"øx2½" THREADED STUDS (SEE MATERIAL NOTE 3 AND 5 ON DRAWING NO. RI-TL4C.1) WELDED TO RAIL (TYP.) WITH NUTS AND WASHERS
HSS 5"x5"x⅜" RAIL TUBE
A RI-TL4C.2
℄ RAIL TUBE

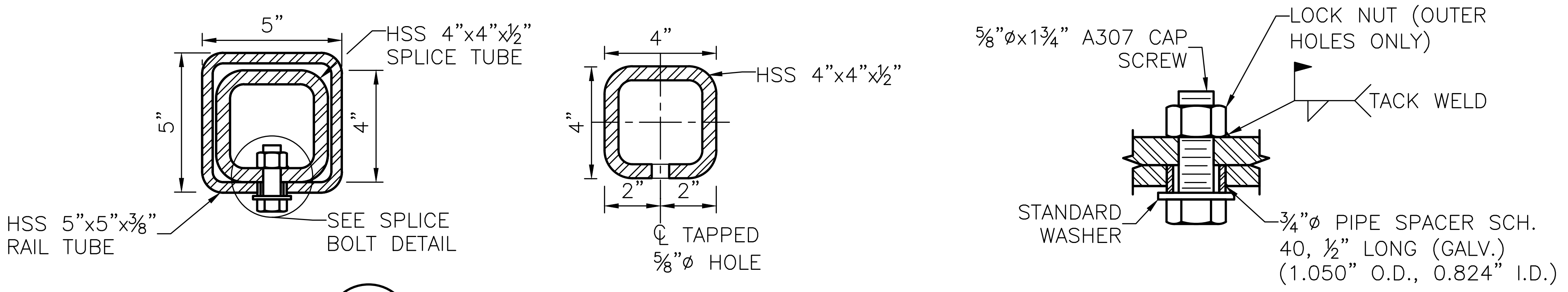
DETAIL 2 RI-TL4C.1
SCALE: 3"=1'-0"


℄ RAIL TUBE
1"x1⅜" SLOTTED HOLE IN POST FLANGE (TYP.)
RAILING STUD W/ CLIPPED WASHERS, LOCK WASHERS, AND HEX NUTS (TYP.)
℄ W8x18 POST
1⅜"
½"
½"

SECTION A RI-TL4C.2
SCALE: 3"=1'-0"



RAILING STUD DETAIL
NOTE TO SCALE



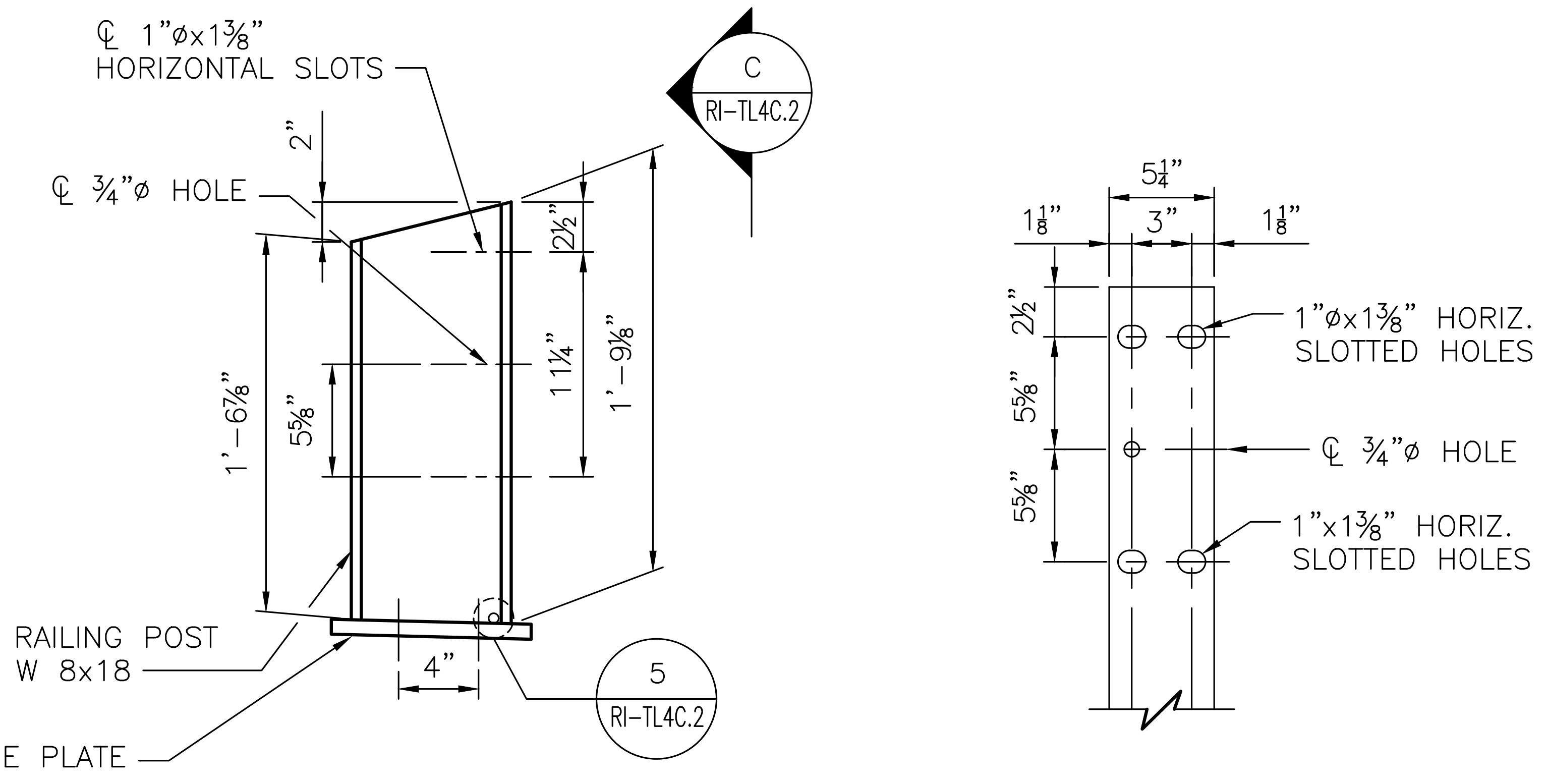
SECTION B RI-TL4C.2

SPLICE TUBE SECTION

SPLICE BOLT DETAIL
NOT TO SCALE

RAIL SPLICE DETAILS
SCALE: 3"=1'-0"

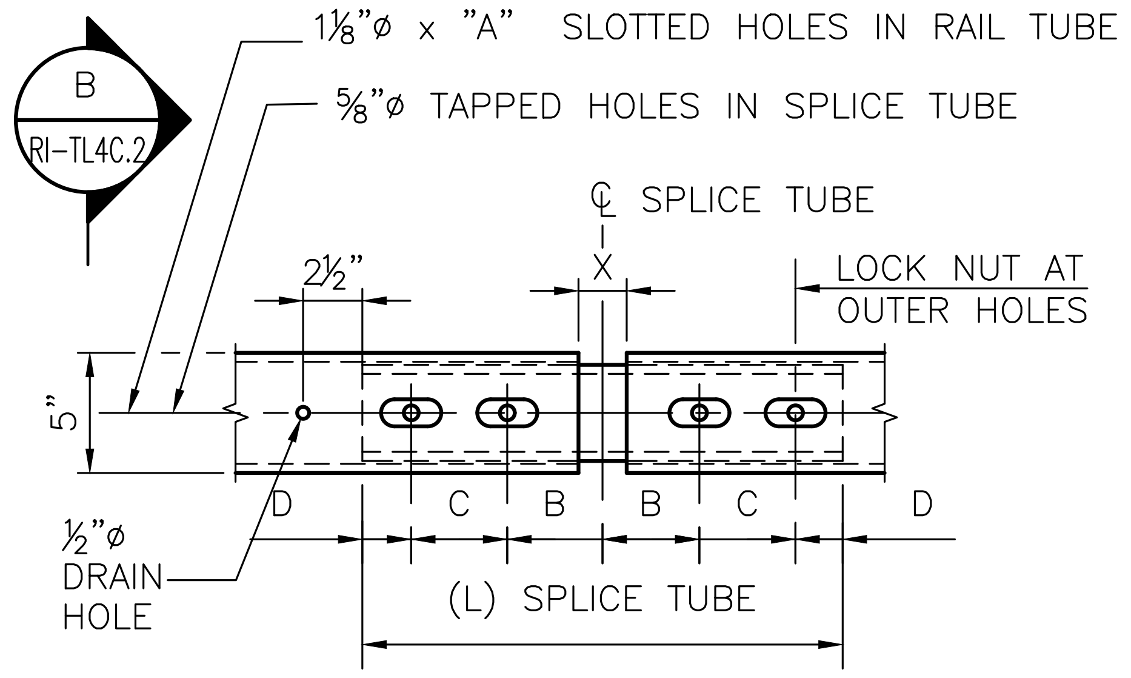
BRIDGE COMBINATION RAIL IS MASH 2016 TL-4 COMPLIANT



SIDE ELEVATION

VIEW C RI-TL4C.2

RAIL POST DETAILS
SCALE: 1½"=1'-0"



RAIL SPLICE (BOTTOM VIEW)

DETAIL 3 RI-TL4C.1
SCALE: 1½"=1'-0"

SPLICE TUBE DIMENSION TABLE

	TOTAL MOVEMENT	A	B	C	D	X	L
	INTERIOR	2½"	5"	5"	2½"	1"	2'-1"
*	< 3¼"	2½"	5"	5"	3"	2"	2'-2"
*	3¼" TO 5¼"	3½"	5"	5"	3½"	3"	2'-3"

* = END SPLICE BAR

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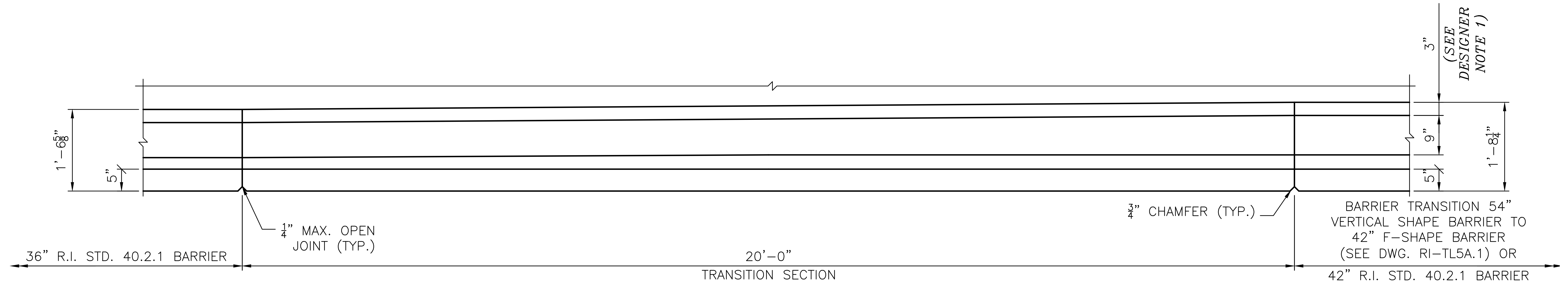
DEPARTMENT OF TRANSPORTATION

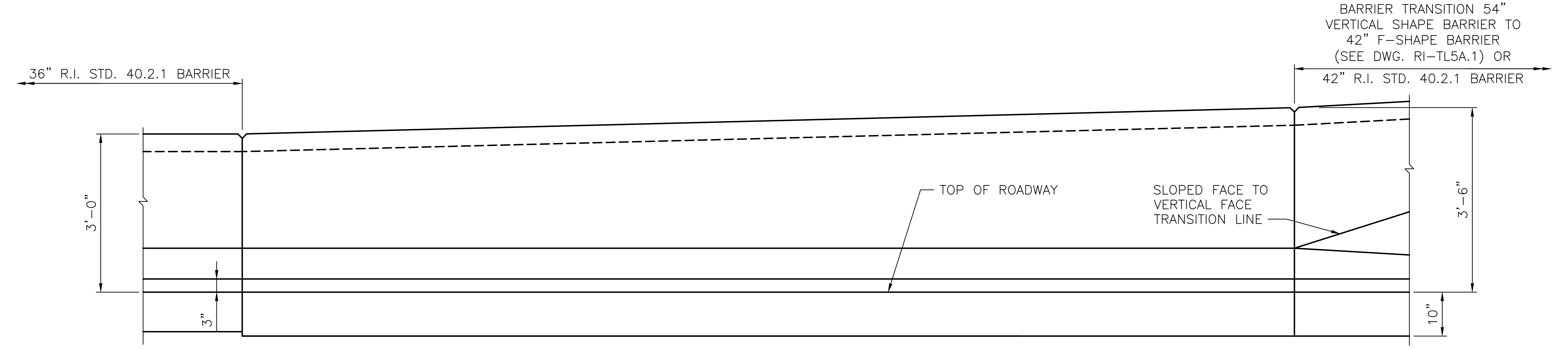
BRIDGE STANDARDS

BRIDGE COMBINATION RAIL
(MASH TL-4)
SHEET 2

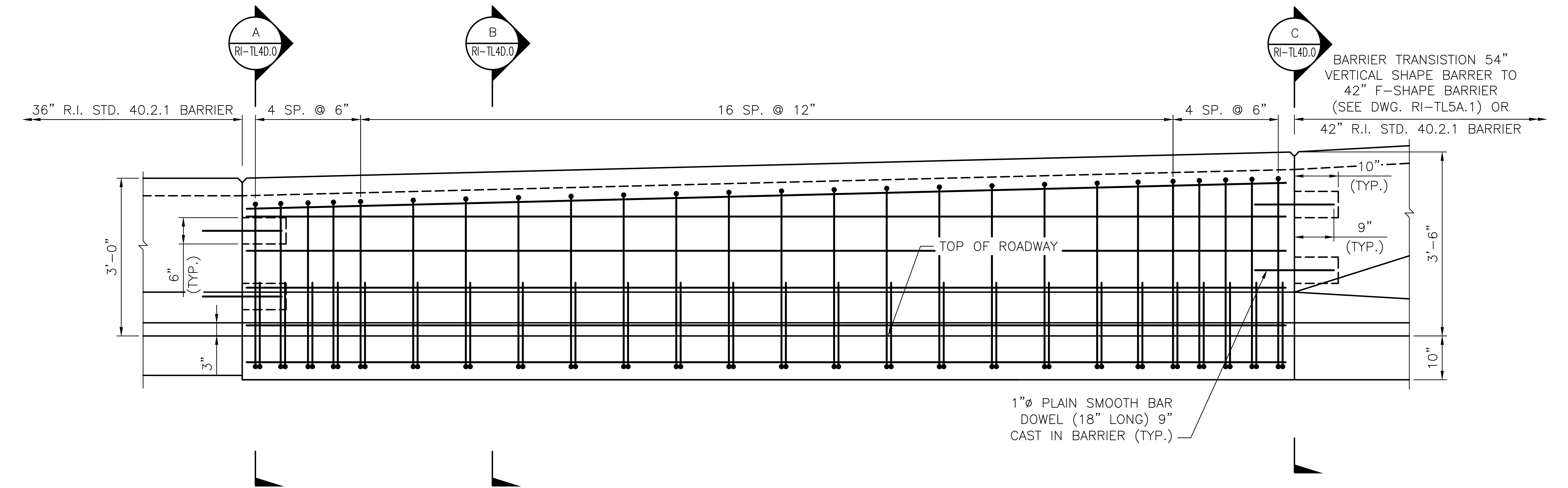
DRAWING NUMBER: RI-TL4C.2


3" (SEE DESIGNER NOTE 1)
1'-6⅝"
5"
9"
5"
1'-8¼"
¼" MAX. OPEN JOINT (TYP.)
¾" CHAMFER (TYP.)
36" R.I. STD. 40.2.1 BARRIER
20'-0"
TRANSITION SECTION
BARRIER TRANSITION 54" VERTICAL SHAPE BARRIER TO 42" F-SHAPE BARRIER (SEE DWG. RI-TL5A.1) OR
42" R.I. STD. 40.2.1 BARRIER

PLAN


36" R.I. STD. 40.2.1 BARRIER
BARRIER TRANSITION 54" VERTICAL SHAPE BARRIER TO 42" F-SHAPE BARRIER (SEE DWG. RI-TL5A.1) OR
42" R.I. STD. 40.2.1 BARRIER
3'-0"
TOP OF ROADWAY
SLOPED FACE TO VERTICAL FACE TRANSITION LINE
3'-6"
3"
10"

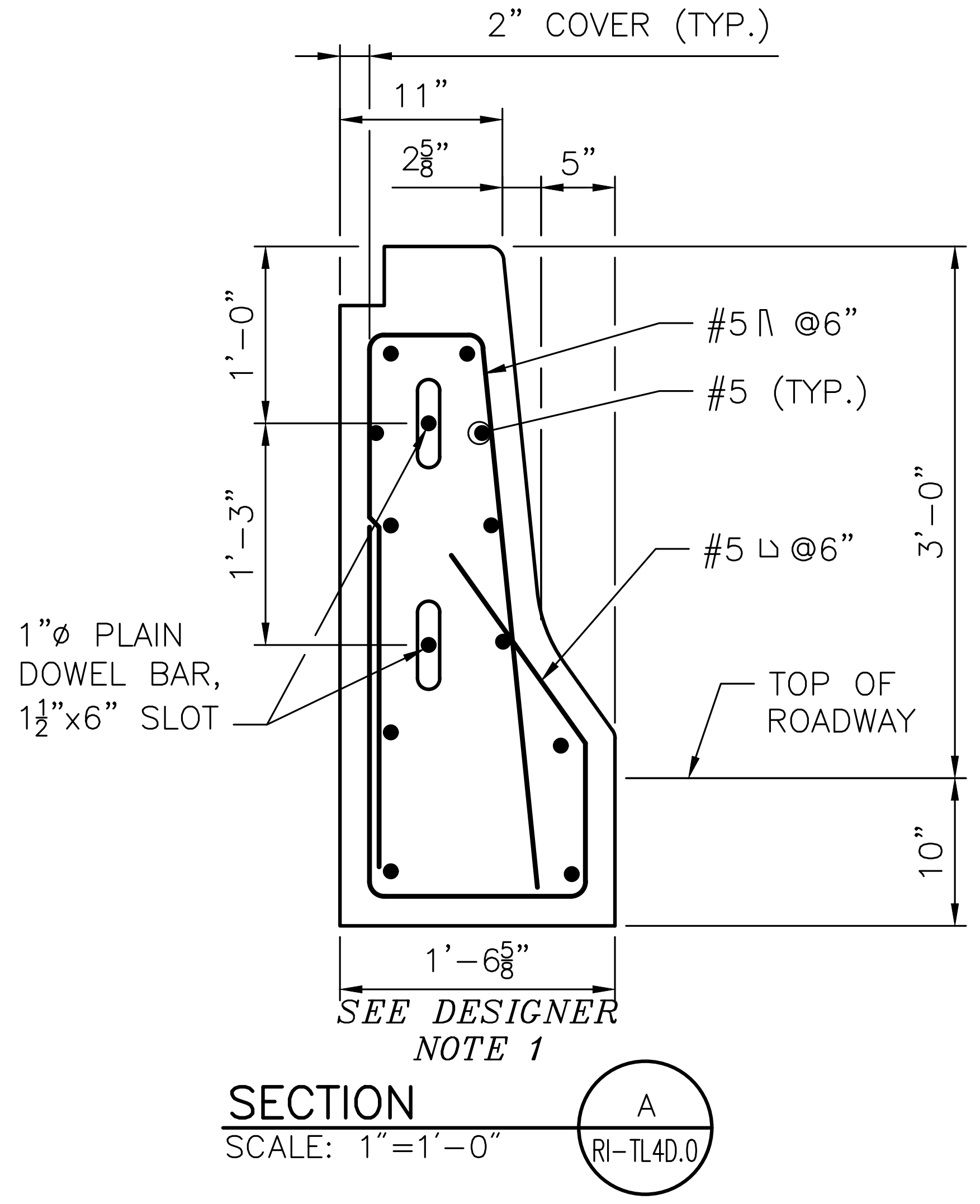
FRONT ELEVATION


A
RI-TL4D.0
B
RI-TL4D.0
C
RI-TL4D.0
36" R.I. STD. 40.2.1 BARRIER
4 SP. @ 6"
16 SP. @ 12"
4 SP. @ 6"
BARRIER TRANSISTION 54" VERTICAL SHAPE BARRER TO 42" F-SHAPE BARRIER (SEE DWG. RI-TL5A.1) OR
42" R.I. STD. 40.2.1 BARRIER
10" (TYP.)
9" (TYP.)
3'-0"
6" (TYP.)
TOP OF ROADWAY
3'-6"
3"
10"
1"ø PLAIN SMOOTH BAR DOWEL (18" LONG) 9" CAST IN BARRIER (TYP.)

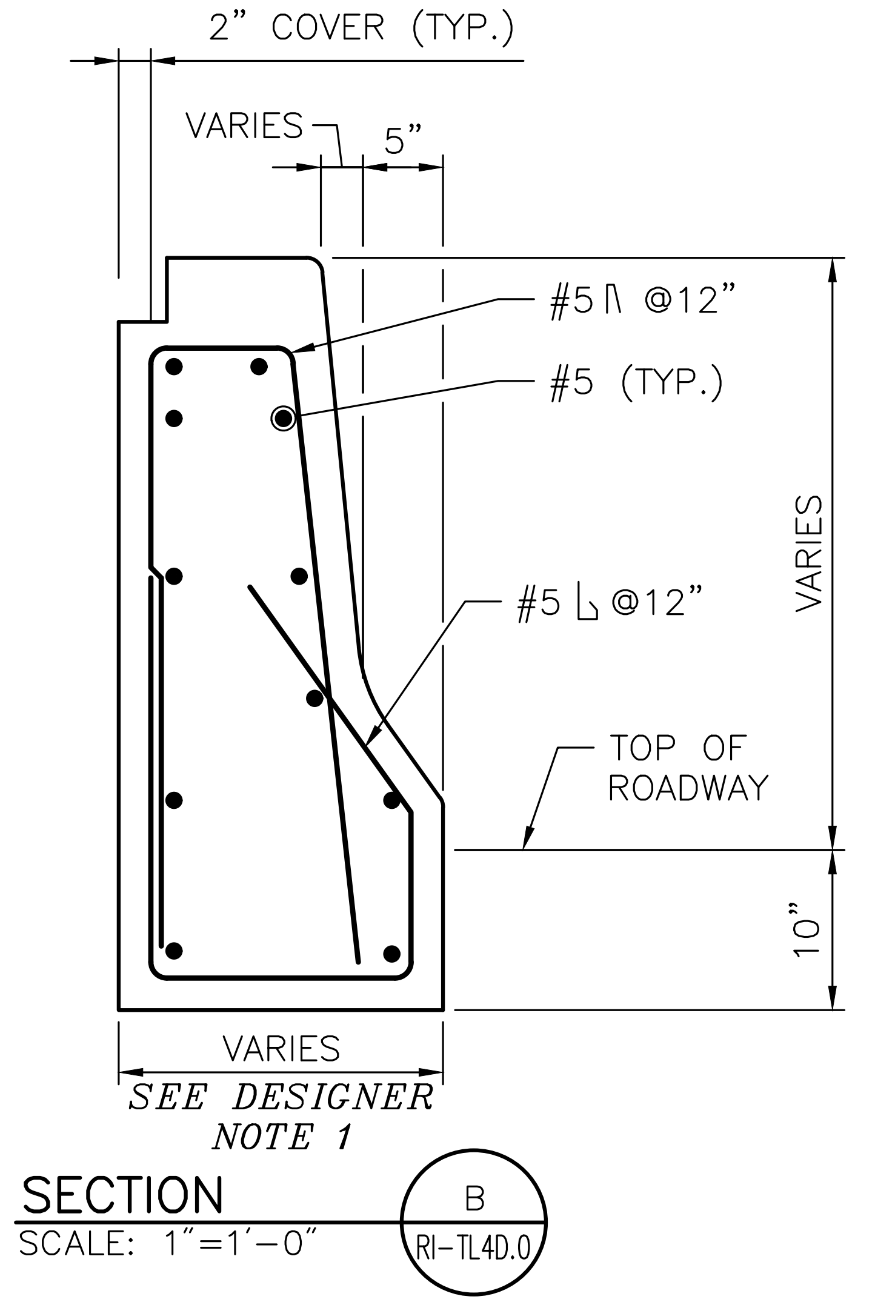
FRONT ELEVATION – REINFORCEMENT DETAIL

BARRIER TRANSITION 42" F-SHAPE TO 36" RI STD 40.2.1 BARRIER

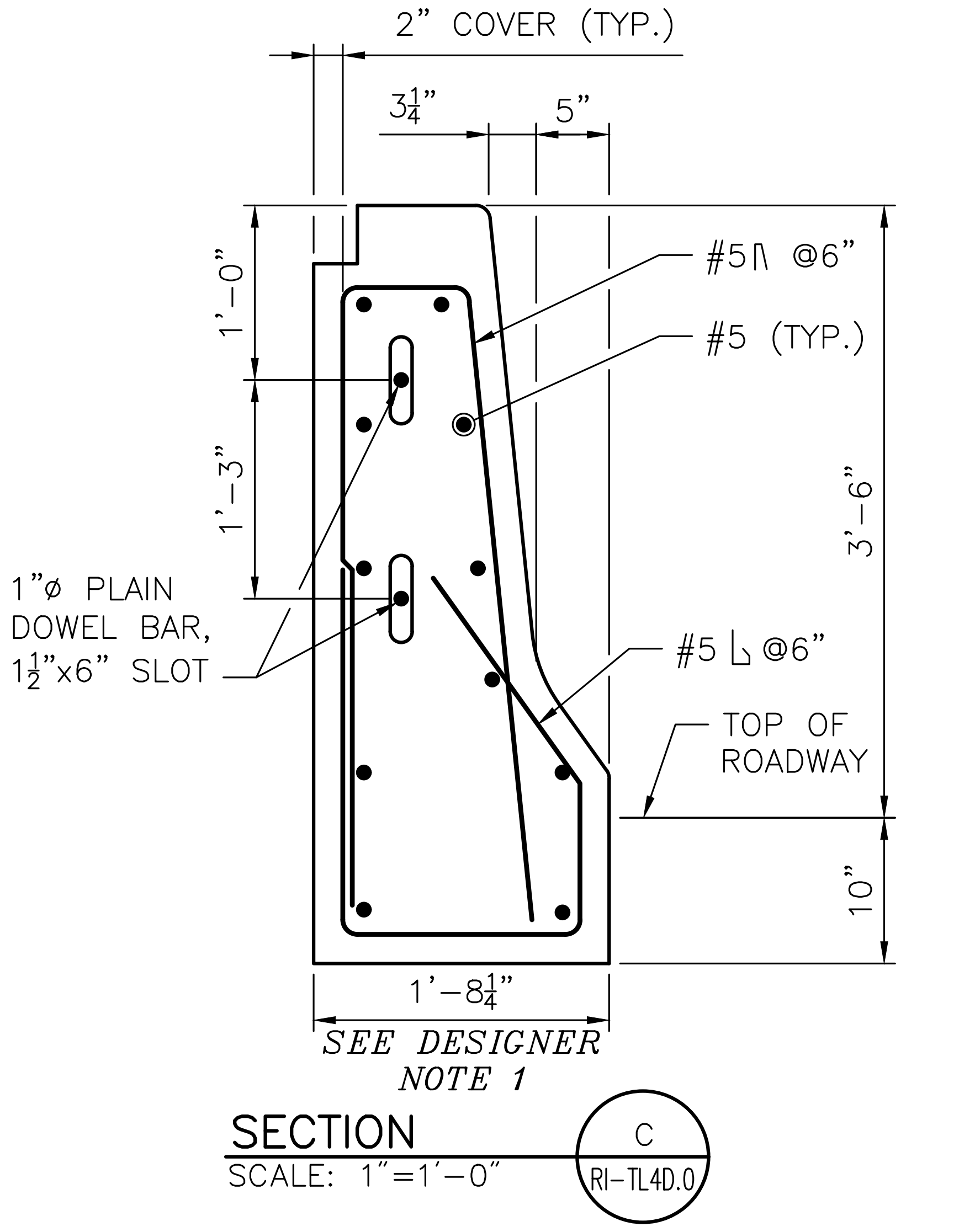
SCALE: 3/4"=1'-0"



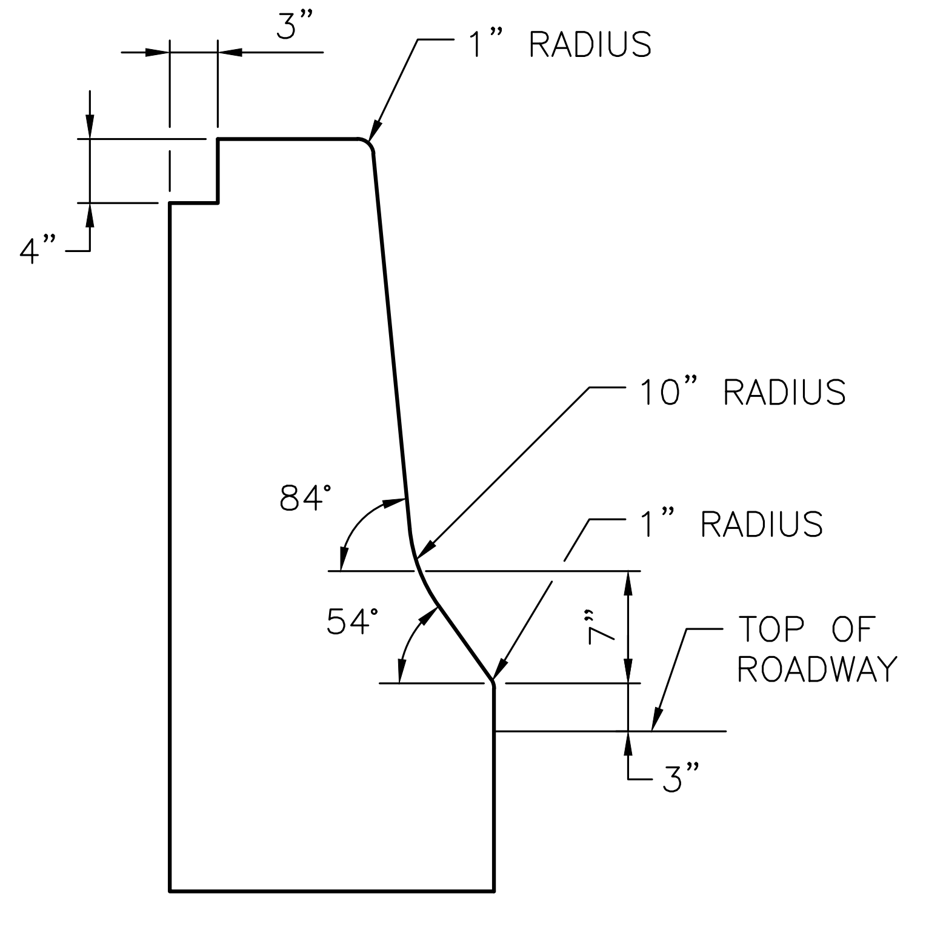
SECTION
SCALE: 1"=1'-0"



SECTION
SCALE: 1"=1'-0"



SECTION
SCALE: 1"=1'-0"



TYPICAL DIMENSIONS
SCALE: 1"=1'-0"

42" BARRIER TO 36" RI
STANDARD 40.2.1 BARRIER IS
MASH 2016 TL–4 COMPLIANT

DESIGNER NOTES:

1. *TOPPING SLAB NOTCH IS OPTIONAL WHEN TOPPING SLAB IS EXCLUDED. THE OVERALL WIDTHS OF THE TRANSITION BARRIER FROM END TO END SHALL NOT CHANGE WHEN THE TOPPING SLAB NOTCH IS OMITTED.*

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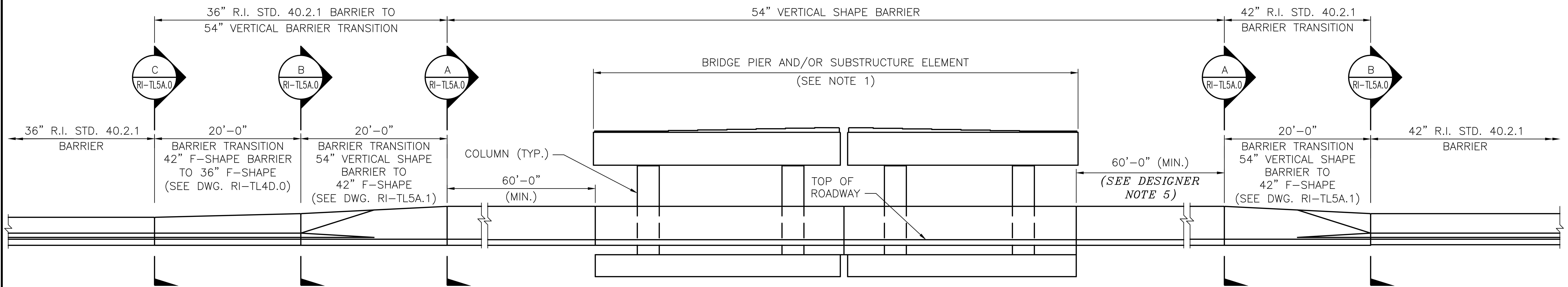
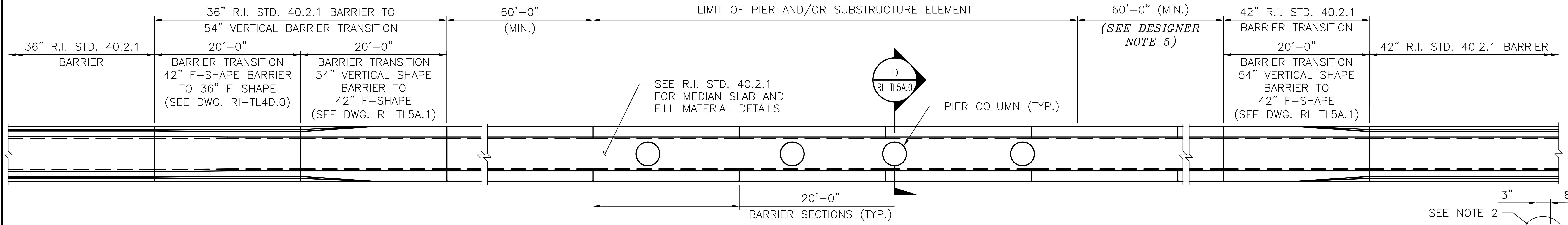
BRIDGE STANDARDS

42" BARRIER TRANSITION TO 36" RI STD 40.2.1 BARRIER (MASH TL–4)

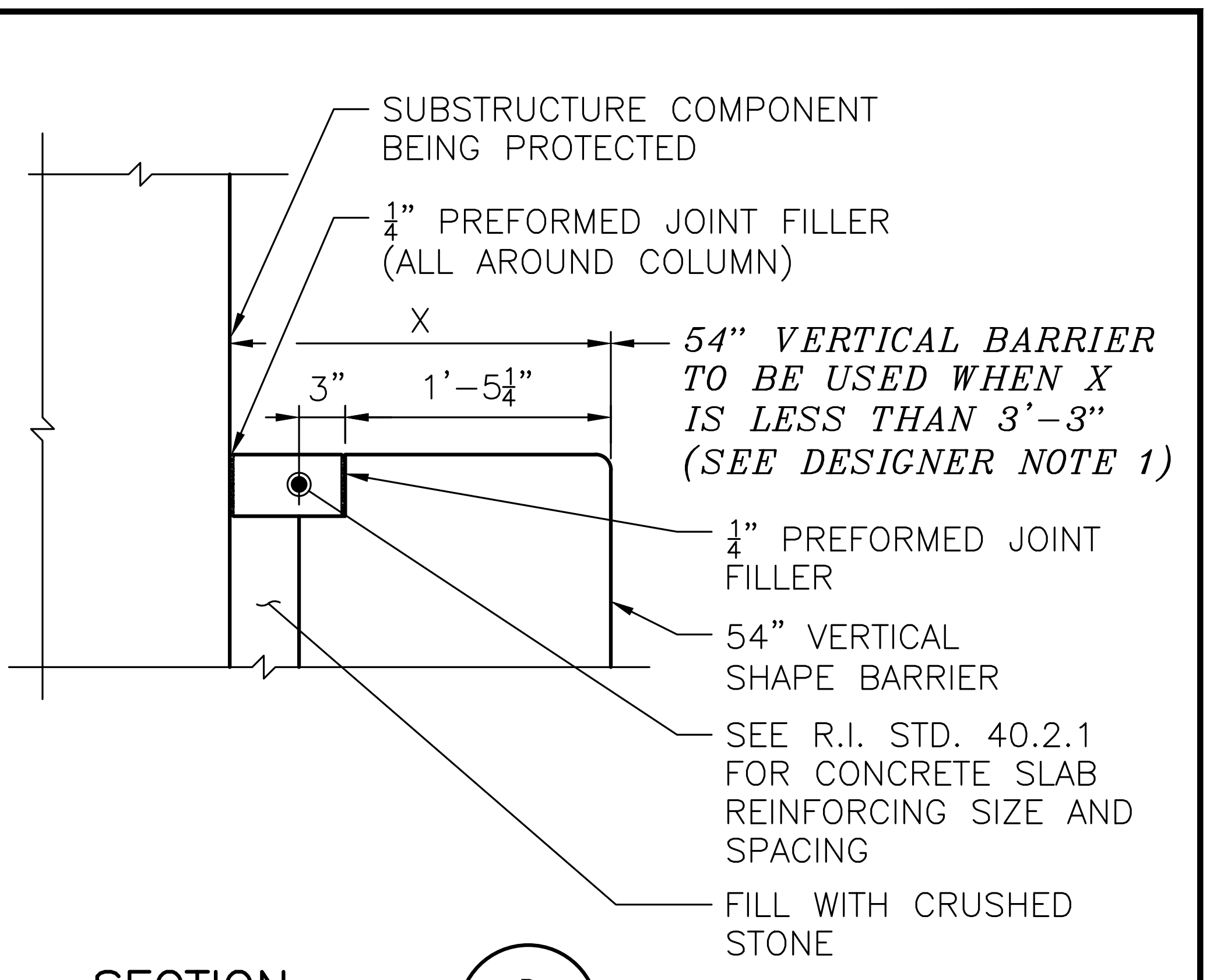
DRAWING NUMBER: RI-TL4D.0



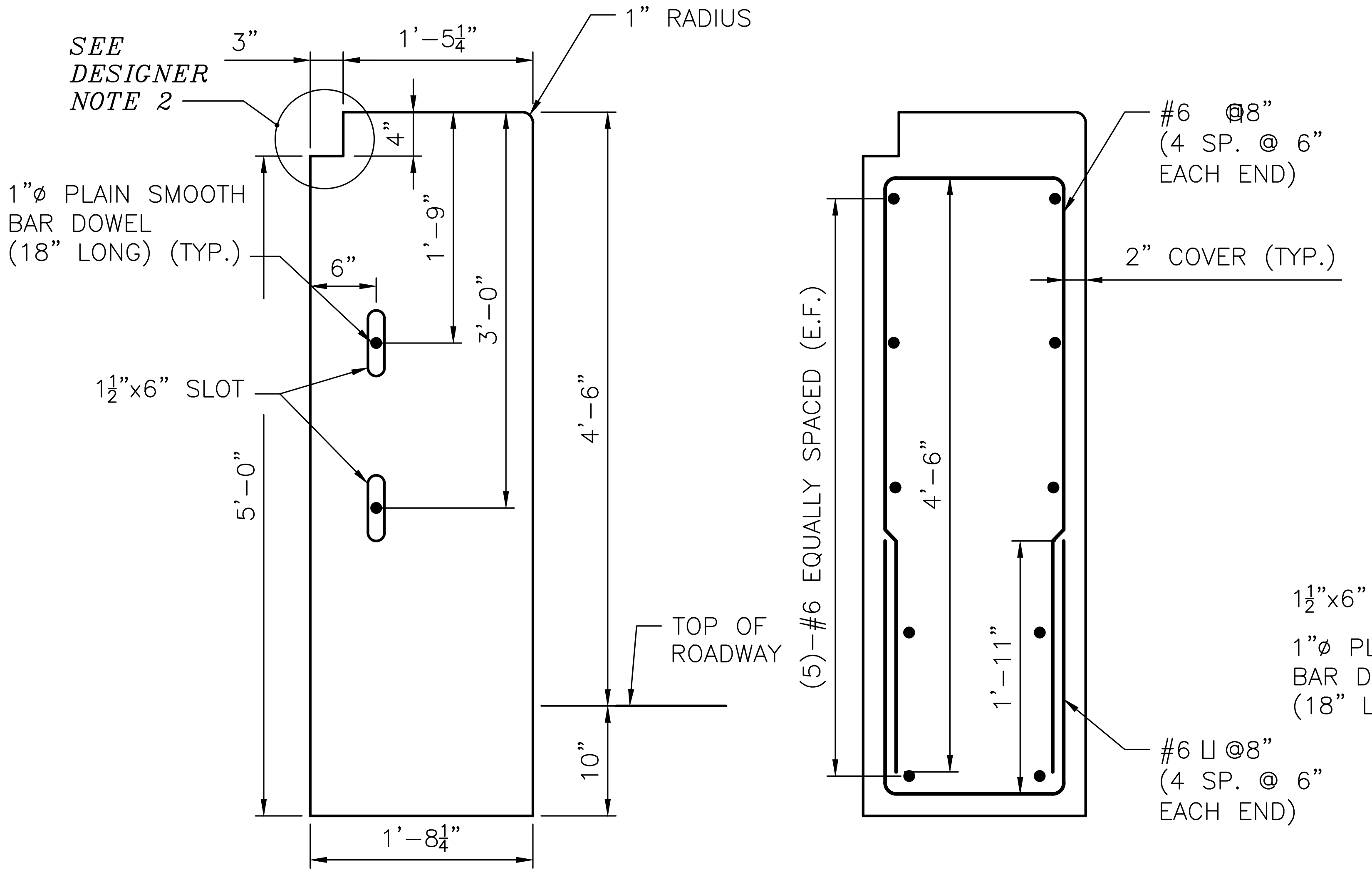
BARRIER AT SUBSTRUCTURE ELEVATION
SCALE: 1/8"=1'-0"
MEDIAN DETAILS ARE SHOWN. SIDE OF ROAD DETAILS ARE SIMILAR.



BARRIER AT SUBSTRUCTURE PLAN
SCALE: 1/8"=1'-0"
MEDIAN DETAILS ARE SHOWN. SIDE OF ROAD DETAILS ARE SIMILAR.



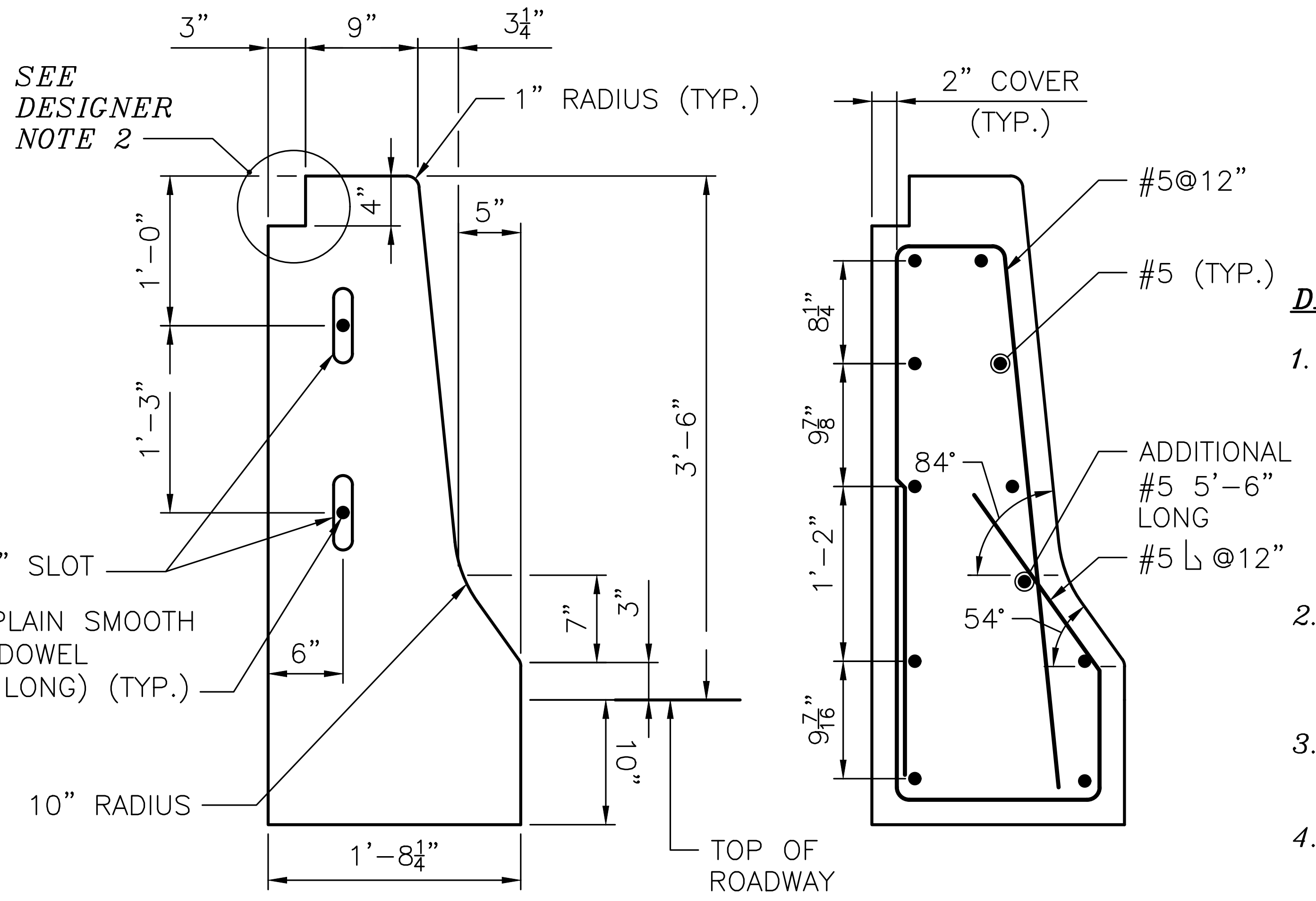
SECTION D
SCALE: 1"=1'-0"
RI-TL5A.0



54" VERTICAL SHAPE BARRIER

54" VERTICAL SHAPE BARRIER REINFORCING

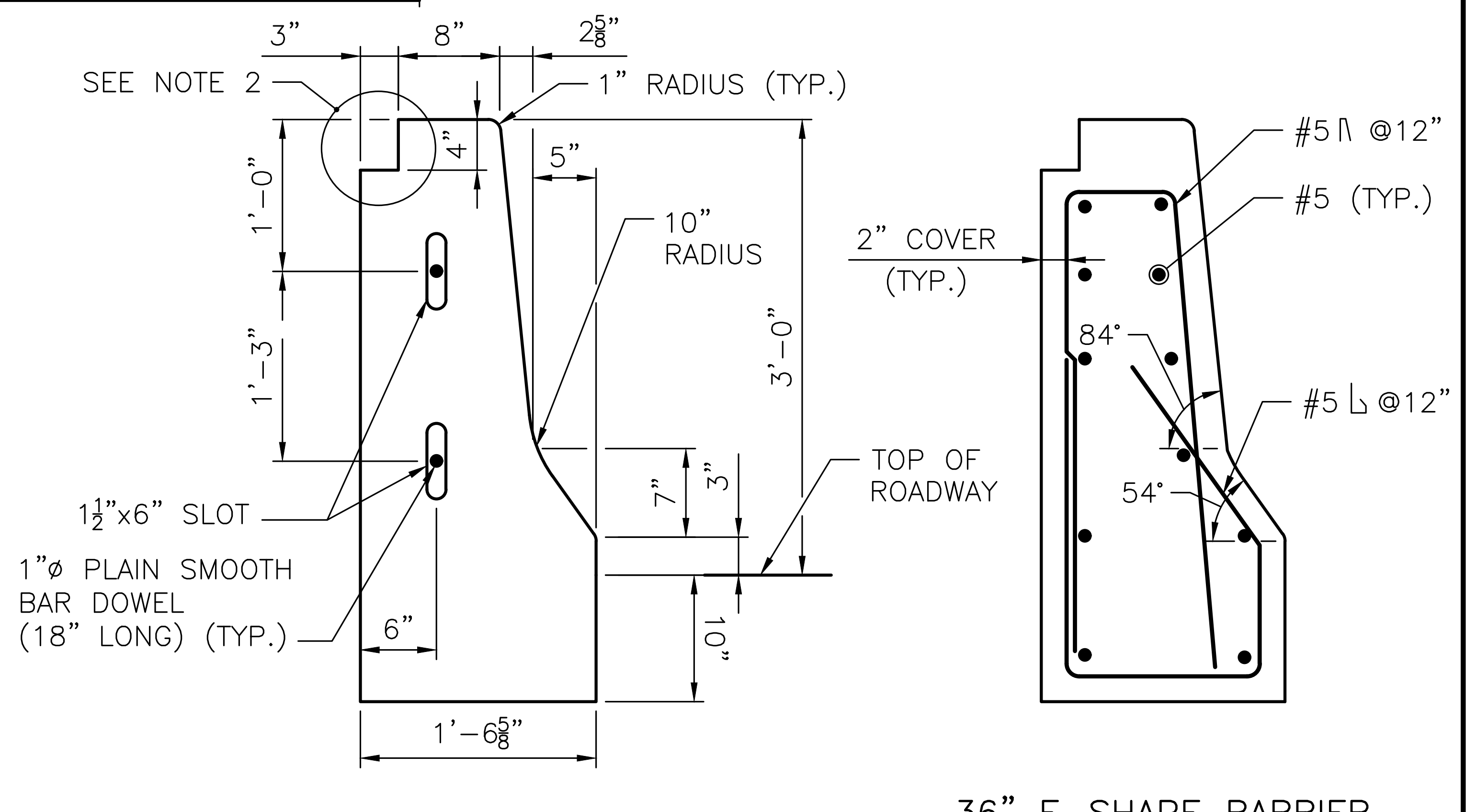
SECTION A
SCALE: 1"=1'-0"
RI-TL5A.0



42" F-SHAPE BARRIER

42" F-SHAPE BARRIER REINFORCING

SECTION B
SCALE: 1"=1'-0"
RI-TL5A.0



36" F-SHAPE BARRIER

36" F-SHAPE BARRIER REINFORCING

SECTION C
SCALE: 1"=1'-0"
RI-TL5A.0

DESIGNER NOTES:

1. *ABUTMENTS, PIERS AND OTHER SUBSTRUCTURE ELEMENTS MAY NEED TO BE PROTECTED FROM VEHICLE COLLISION. REFER TO AASHTO LRFD FOR DESIGN AND PROTECTION CRITERIA. IN A RETROFIT APPLICATION WHERE THE REQUIRED 3'-3" (PER AASHTO LRFD) OFFSET FROM THE TOP FACE OF THE TRAFFIC BARRIER CANNOT BE PROVIDED, THE 54" BARRIER PROVIDED IN THESE DETAILS SHALL BE USED.*
2. *TOPPING SLAB NOTCH OUT IS OPTIONAL DEPENDING ON SITE CONDITIONS. IF TOPPING SLAB NOTCH IS EXCLUDED, THE OVERALL WIDTH OF THE BARRIERS AND TRANSITIONS SHALL NOT CHANGE.*
3. *REFER TO RIDOT BRIDGE STD. DWG. (RI-TL5A.1) AND (RI-TL4D.0) FOR TRANSITION BARRIER DETAILS.*
4. *FOR ABUTMENTS AND WALL TYPE PIERS IF THE DISTANCE FROM THE BACK OF BARRIER TO FACE OF ELEMENT IS LESS THAN 5'-0", THEN A CONCRETE SLAB SHALL BE USED.*
5. *FOR MEDIAN APPLICATIONS WHERE THE SUBSTRUCTURE ELEMENT ADJACENT TO TWO-WAY TRAFFIC 60'-0" (MIN.) SHALL BE PROVIDED ON EACH END. IF THE SUBSTRUCTURE ELEMENT IS ONLY ADJACENT TO ONE-WAY TRAFFIC, 10'-0" MAY BE PROVIDED ON THE TRAILING END.*
6. *WHEN BARRIERS ARE CAST-IN-PLACE THEY SHALL RECEIVE A RUBBED SURFACE FINISH AND FILM FORMING CONCRETE SEALER SHALL BE APPLIED TO ALL FACES THAT ARE EXPOSED IN THE FINAL CONDITION.*

54" VERTICAL BARRIER IS
MASH 2016 TL-5
COMPLIANT

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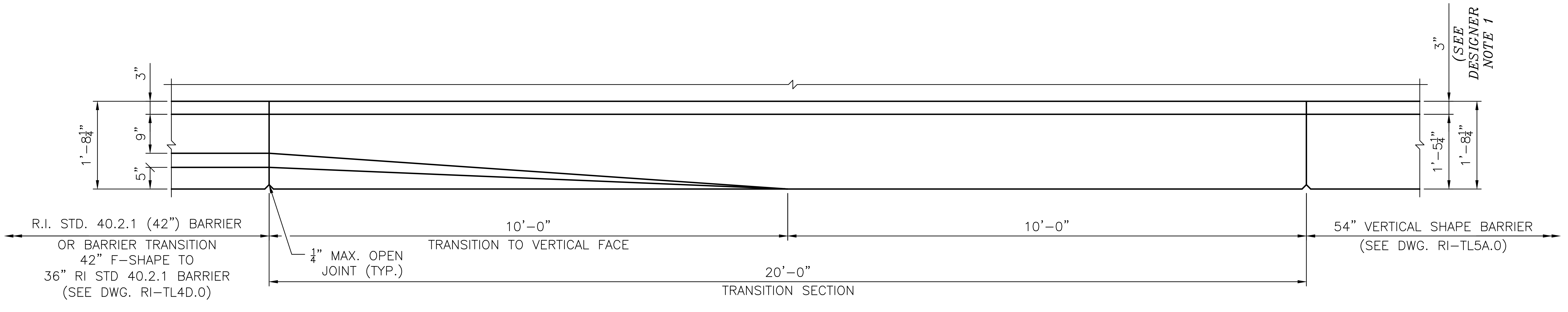
RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

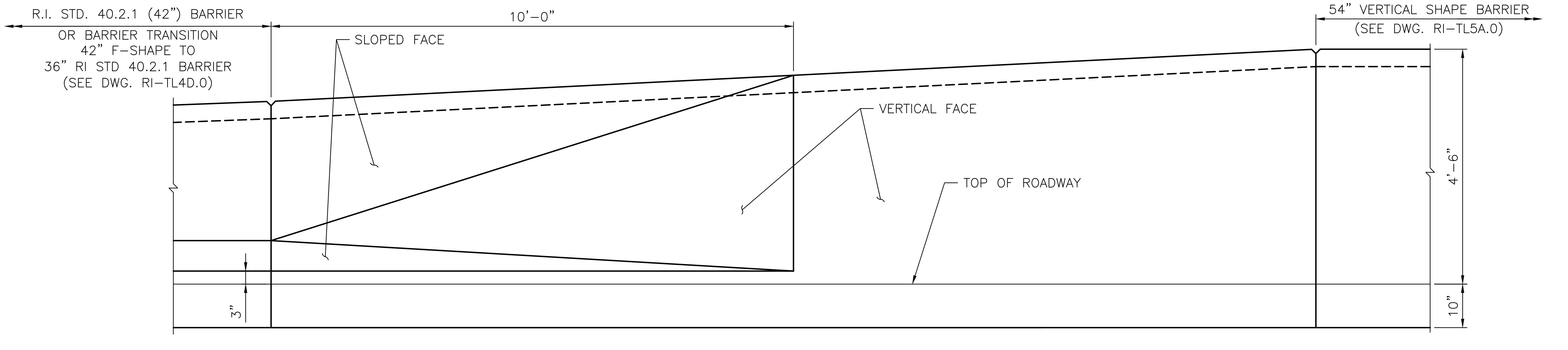
BRIDGE STANDARDS

54" BARRIER AT PIERS AND SUBSTRUCTURE ELEMENTS (MASH TL-5)

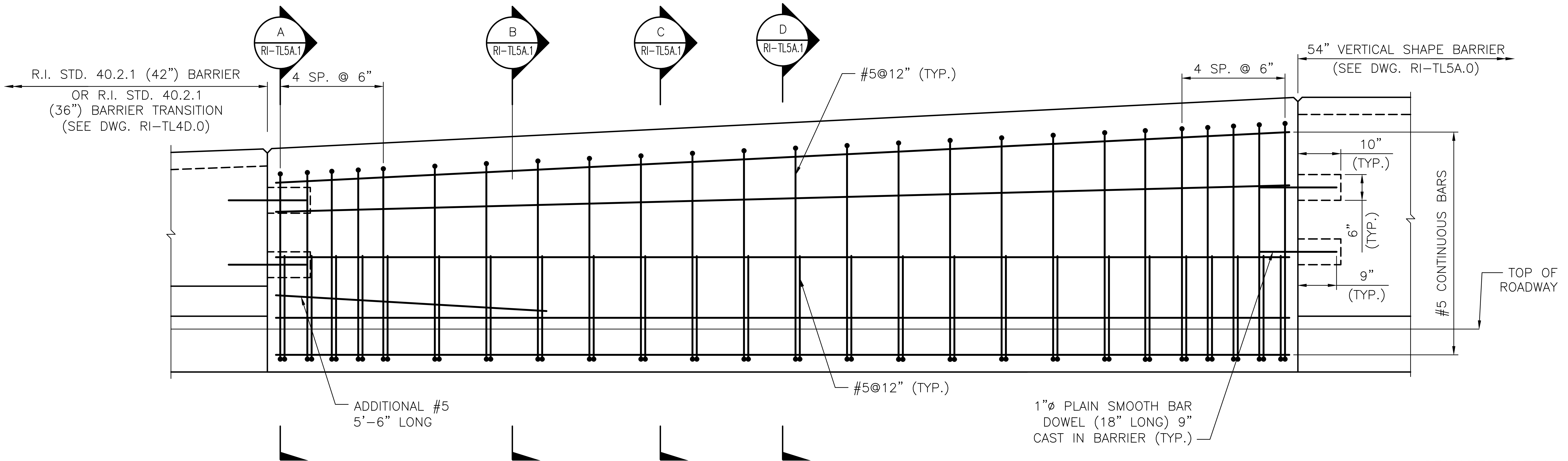
DRAWING NUMBER: RI-TL5A.0


3"
1'-8¼"
9"
5"
3" (SEE DESIGNER NOTE 1)
1'-5¼"
1'-8¼"
R.I. STD. 40.2.1 (42") BARRIER
OR BARRIER TRANSITION 42" F-SHAPE TO 36" RI STD 40.2.1 BARRIER (SEE DWG. RI-TL4D.0)
¼" MAX. OPEN JOINT (TYP.)
10'-0"
TRANSITION TO VERTICAL FACE
10'-0"
54" VERTICAL SHAPE BARRIER (SEE DWG. RI-TL5A.0)
20'-0"
TRANSITION SECTION

PLAN


R.I. STD. 40.2.1 (42") BARRIER
OR BARRIER TRANSITION 42" F-SHAPE TO 36" RI STD 40.2.1 BARRIER (SEE DWG. RI-TL4D.0)
10'-0"
SLOPED FACE
VERTICAL FACE
TOP OF ROADWAY
54" VERTICAL SHAPE BARRIER (SEE DWG. RI-TL5A.0)
4'-6"
10"
3"

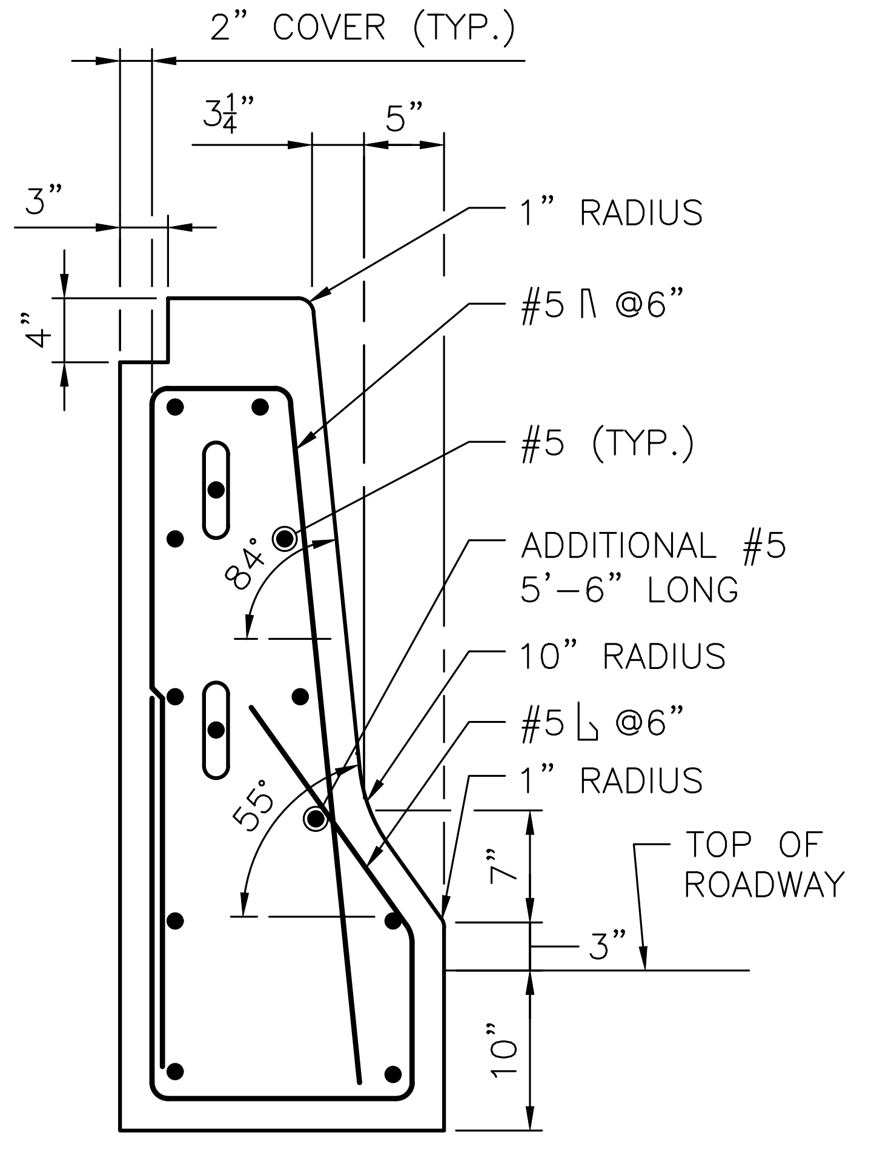
FRONT ELEVATION


A
RI-TL5A.1
B
RI-TL5A.1
C
RI-TL5A.1
D
RI-TL5A.1
R.I. STD. 40.2.1 (42") BARRIER
OR R.I. STD. 40.2.1 (36") BARRIER TRANSITION (SEE DWG. RI-TL4D.0)
4 SP. @ 6"
#5@12" (TYP.)
4 SP. @ 6"
54" VERTICAL SHAPE BARRIER (SEE DWG. RI-TL5A.0)
10" (TYP.)
6" (TYP.)
9" (TYP.)
#5 CONTINUOUS BARS
TOP OF ROADWAY
ADDITIONAL #5 5'-6" LONG
#5@12" (TYP.)
1"ø PLAIN SMOOTH BAR DOWEL (18" LONG) 9" CAST IN BARRIER (TYP.)

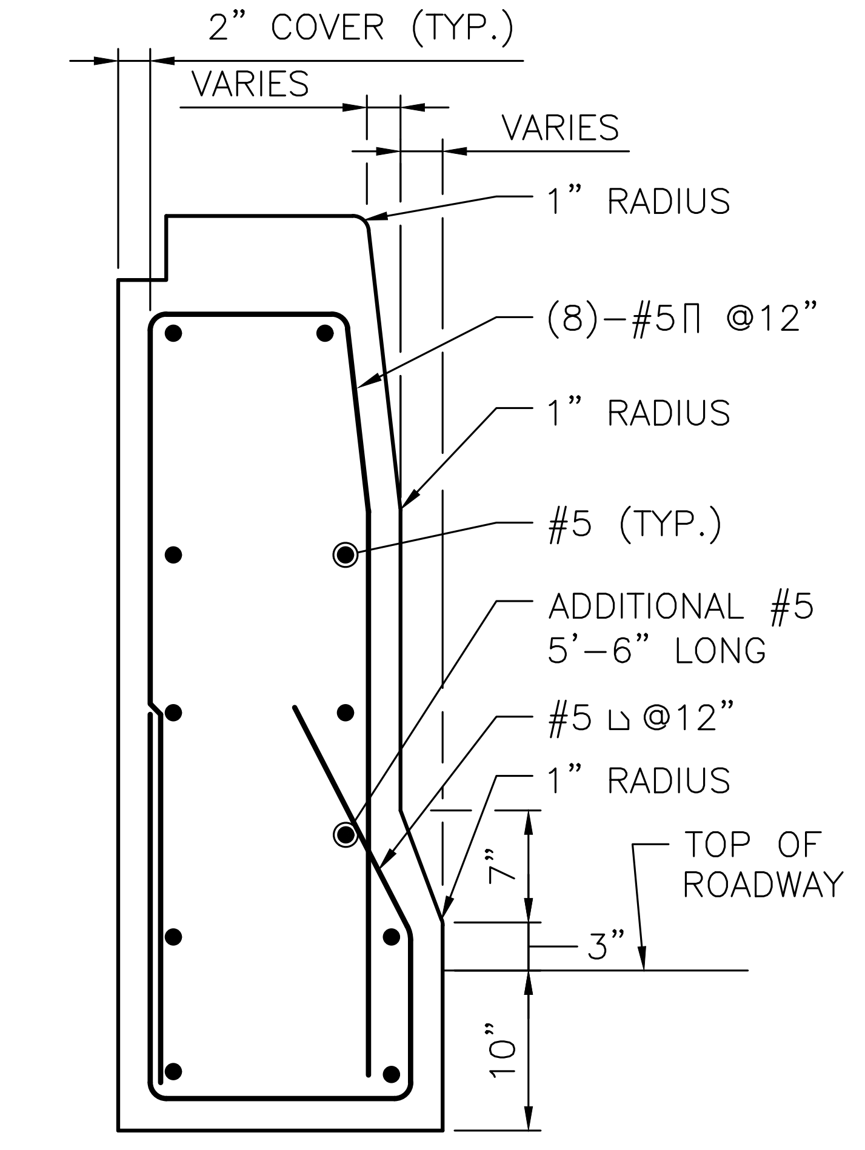
FRONT ELEVATION – REINFORCEMENT DETAIL

BARRIER TRANSITION 54" VERTICAL BARRIER TO 42" F-SHAPE

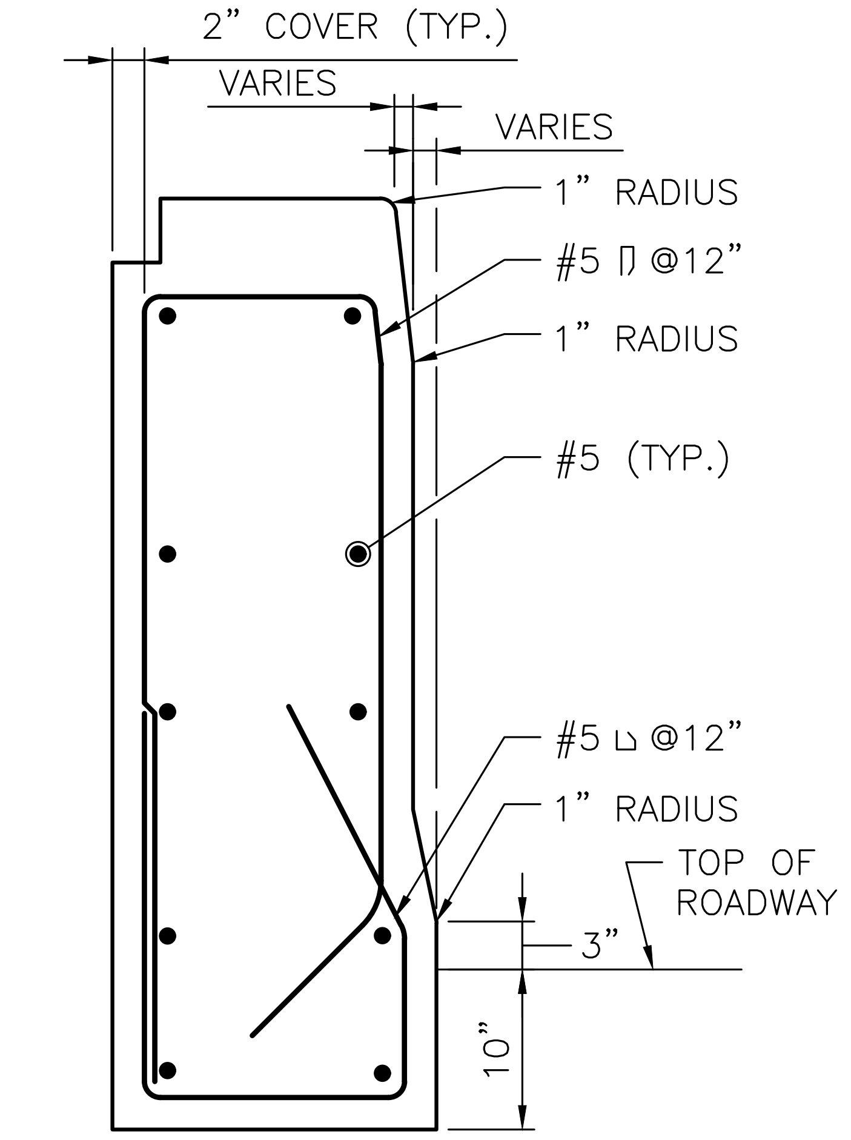
SCALE: 3/4"=1'-0"



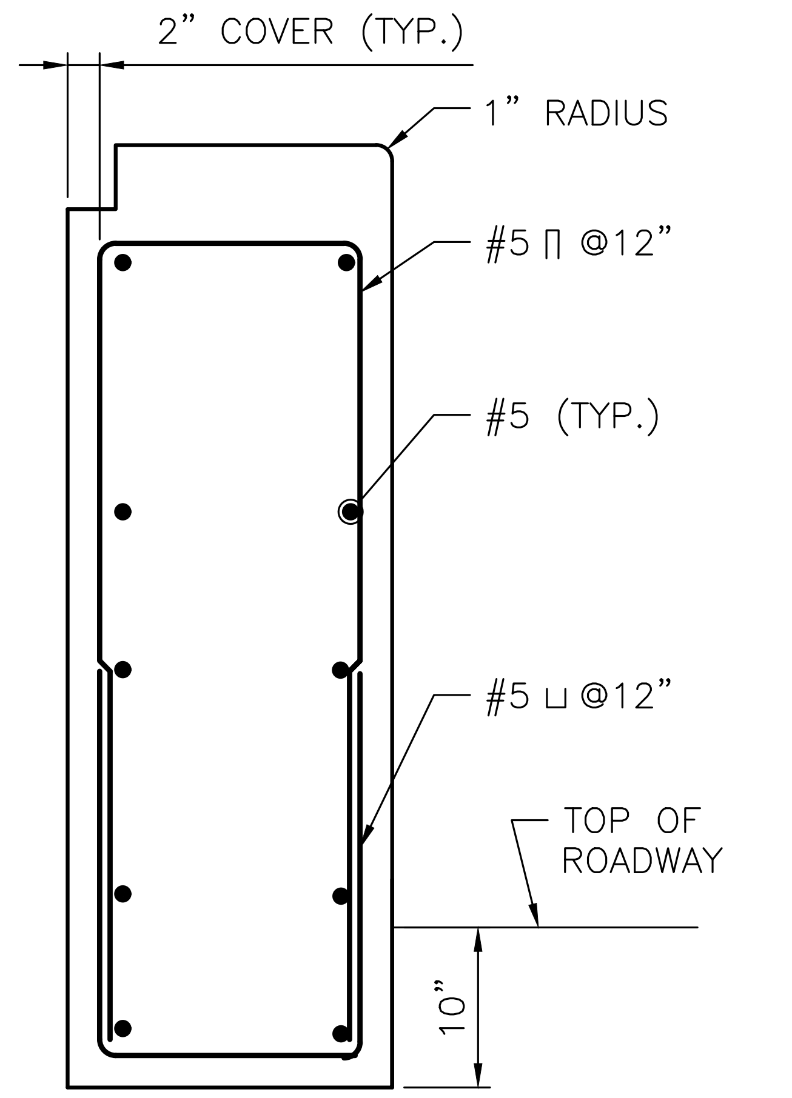
SECTION A RI-TL5A.1
SCALE: 1"=1'-0"



SECTION B RI-TL5A.1
SCALE: 1"=1'-0"



SECTION C RI-TL5A.1
SCALE: 1"=1'-0"



SECTION D RI-TL5A.1
SCALE: 1"=1'-0"

54" VERTICAL BARRIER TO 42" F-SHAPE BARRIER IS MASH 2016 TL-5 COMPLIANT

DESIGNER NOTES:

1. *TOPPING SLAB NOTCH IS OPTIONAL WHEN TOPPING SLAB IS EXCLUDED. THE OVERALL WIDTH OF THE TRANSITION BARRIER SHALL NOT CHANGE WHEN THE TOPPING SLAB NOTCH IS OMITTED.*

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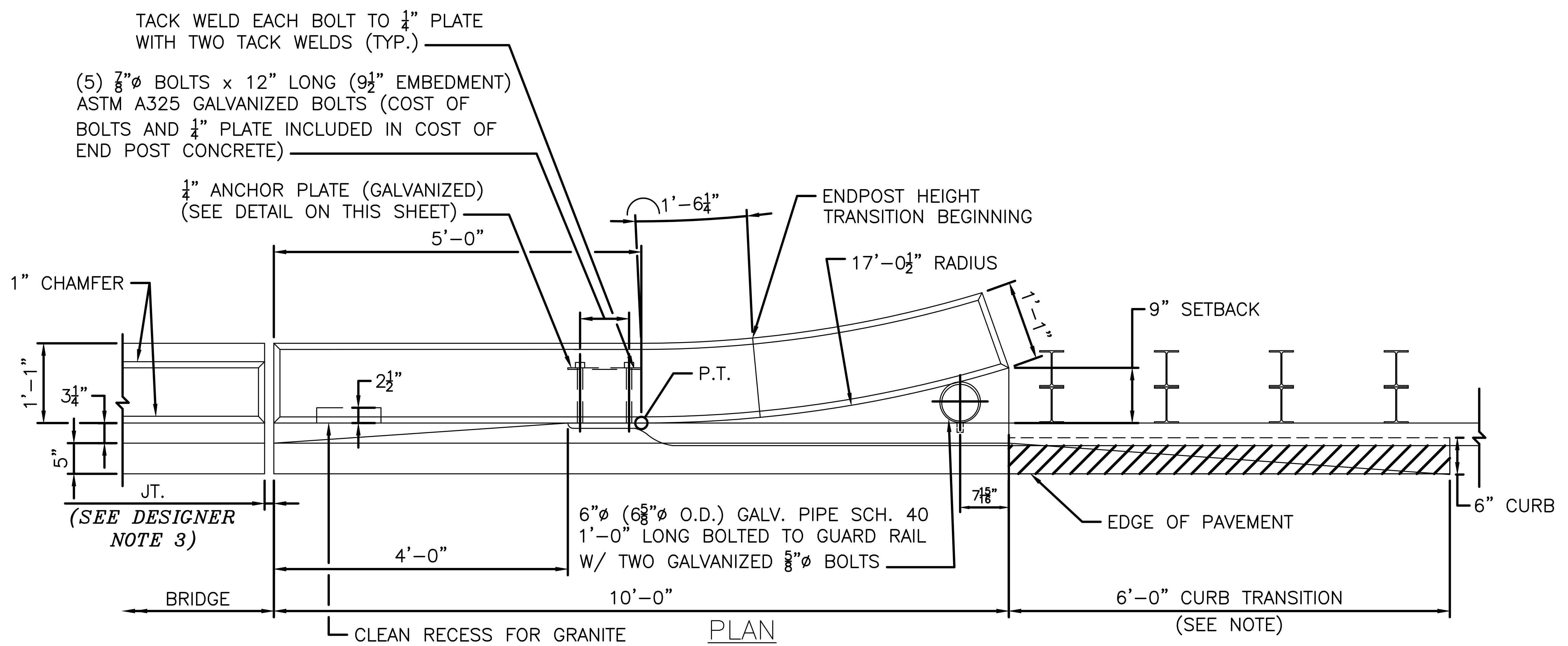
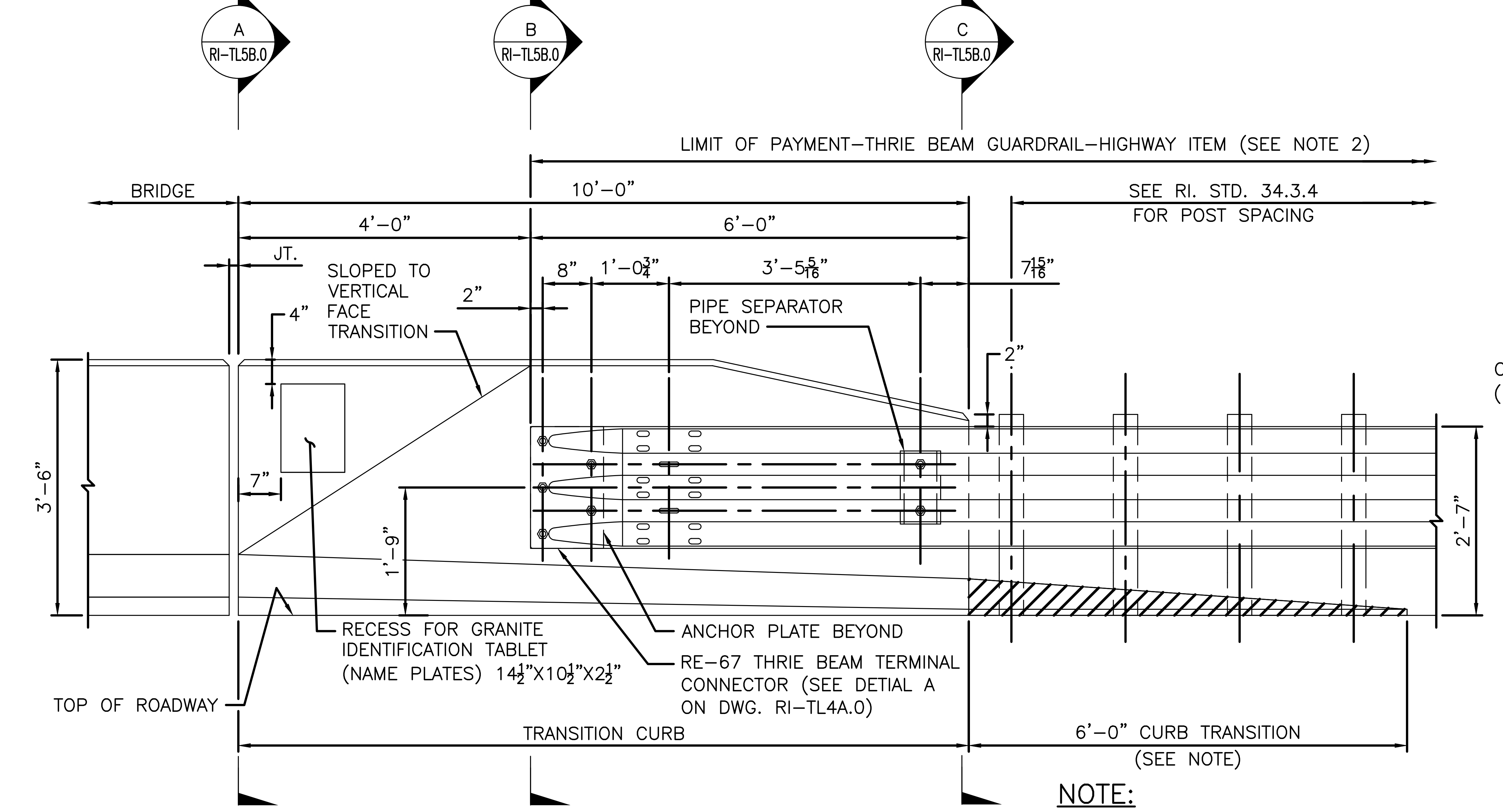
BRIDGE STANDARDS

54" BARRIER TRANSITION
TO 42" F-SHAPE BARRIER
(MASH TL-5)

DRAWING NUMBER: RI-TL5A.1


TACK WELD EACH BOLT TO ¼" PLATE WITH TWO TACK WELDS (TYP.)
(5) ⅞"ø BOLTS x 12" LONG (9½" EMBEDMENT) ASTM A325 GALVANIZED BOLTS (COST OF BOLTS AND ¼" PLATE INCLUDED IN COST OF END POST CONCRETE)
¼" ANCHOR PLATE (GALVANIZED) (SEE DETAIL ON THIS SHEET)
1'-6¼"
ENDPOST HEIGHT TRANSITION BEGINNING
5'-0"
17'-0½" RADIUS
1" CHAMFER
9" SETBACK
1'-1"
3¼"
2½"
P.T.
5"
JT.
(SEE DESIGNER NOTE 3)
7$\frac{15}{16}$"
6" CURB
EDGE OF PAVEMENT
6"ø (6⅝"ø O.D.) GALV. PIPE SCH. 40 1'-0" LONG BOLTED TO GUARD RAIL W/ TWO GALVANIZED ⅝"ø BOLTS
4'-0"
BRIDGE
10'-0"
6'-0" CURB TRANSITION (SEE NOTE)
CLEAN RECESS FOR GRANITE IDENTIFICATION TABLET

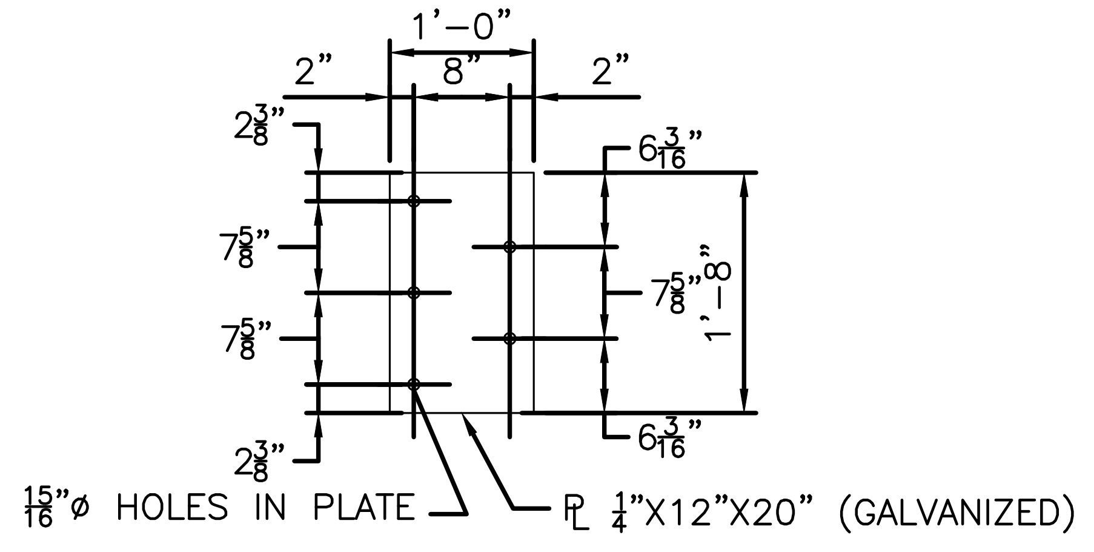
PLAN
SCALE: 3/4"=1'-0"


A RI-TL5B.0
B RI-TL5B.0
C RI-TL5B.0
LIMIT OF PAYMENT-THRIE BEAM GUARDRAIL-HIGHWAY ITEM (SEE NOTE 2)
BRIDGE
10'-0"
SEE RI. STD. 34.3.4 FOR POST SPACING
4'-0"
6'-0"
JT.
SLOPED TO VERTICAL FACE TRANSITION
2"
4"
8"
1'-0¾"
3'-5$\frac{5}{16}$"
7$\frac{15}{16}$"
PIPE SEPARATOR BEYOND
2"
3'-6"
7"
1'-9"
2'-7"
RECESS FOR GRANITE IDENTIFICATION TABLET (NAME PLATES) 14½"X10½"X2½"
ANCHOR PLATE BEYOND
RE-67 THRIE BEAM TERMINAL CONNECTOR (SEE DETIAL A ON DWG. RI-TL4A.0)
TOP OF ROADWAY
TRANSITION CURB
6'-0" CURB TRANSITION (SEE NOTE)

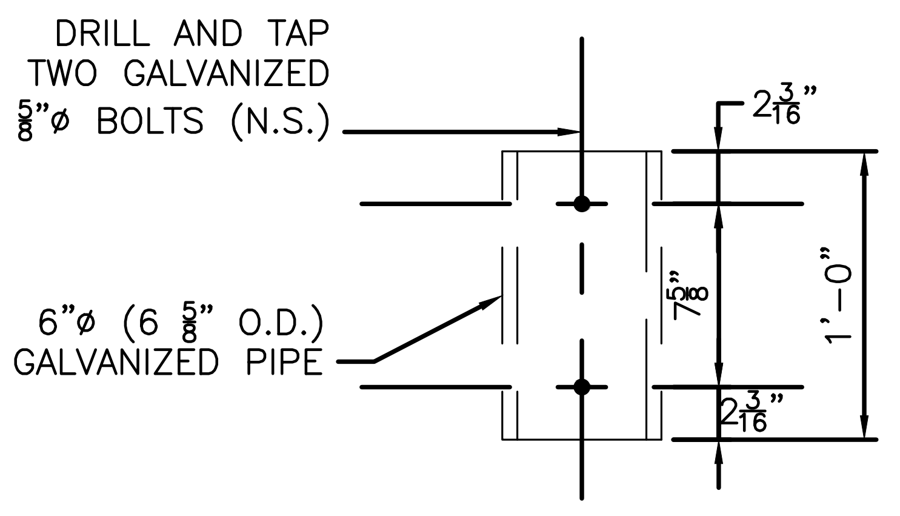
ELEVATION
SCALE: 3/4"=1'-0"

NOTE:

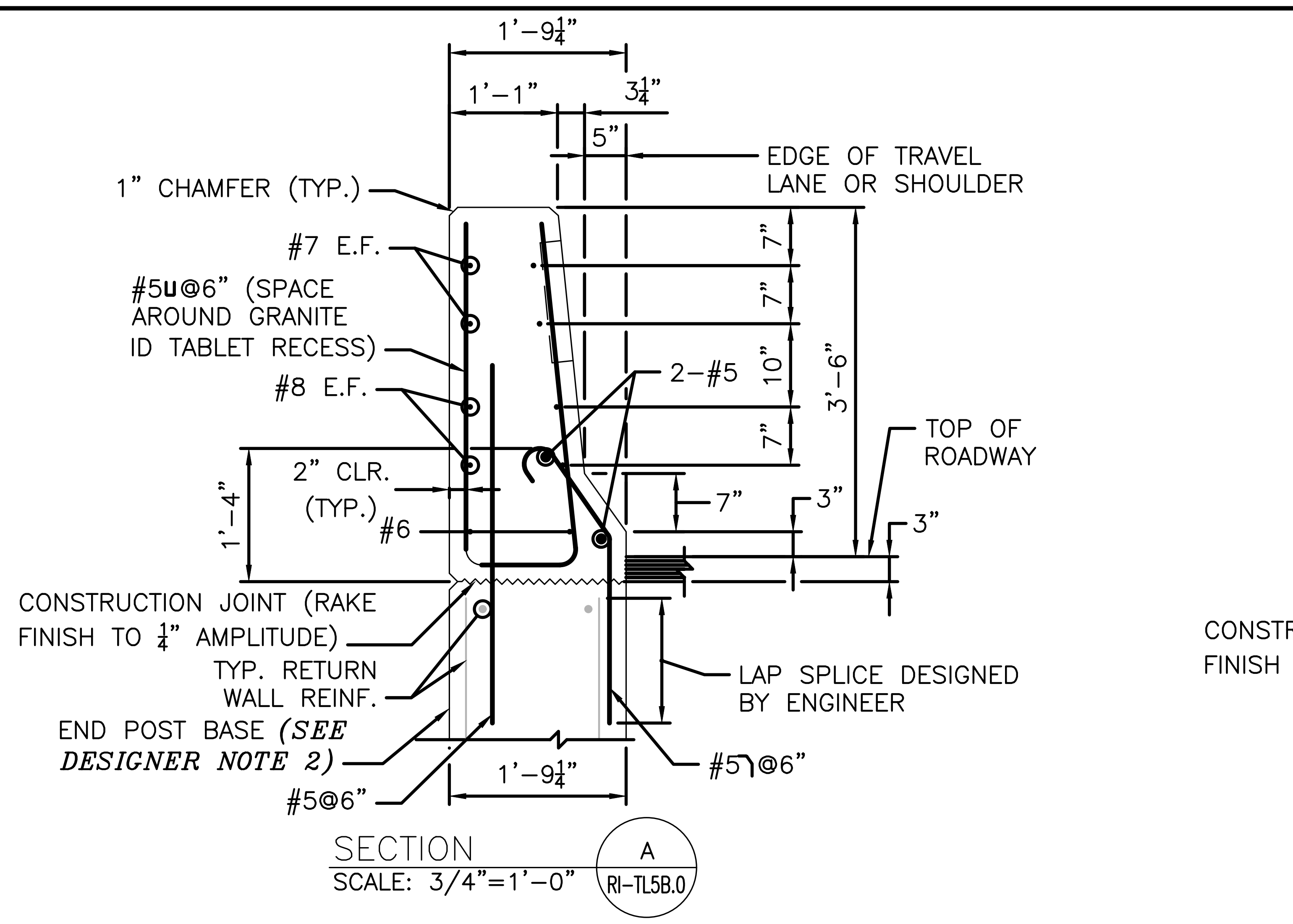
FOR TRANSITIONS TO GUARDRAIL INSTALLED FLUSH WITH ROADWAY OR WITH BITUMINOUS BERM, USE R.I. STD. DETAIL 7.4.1. FOR TRANSITIONS TO GUARDRAIL INSTALLED WITH VERTICAL FACE CURB, USE R.I. STD. DETAIL 7.4.2.



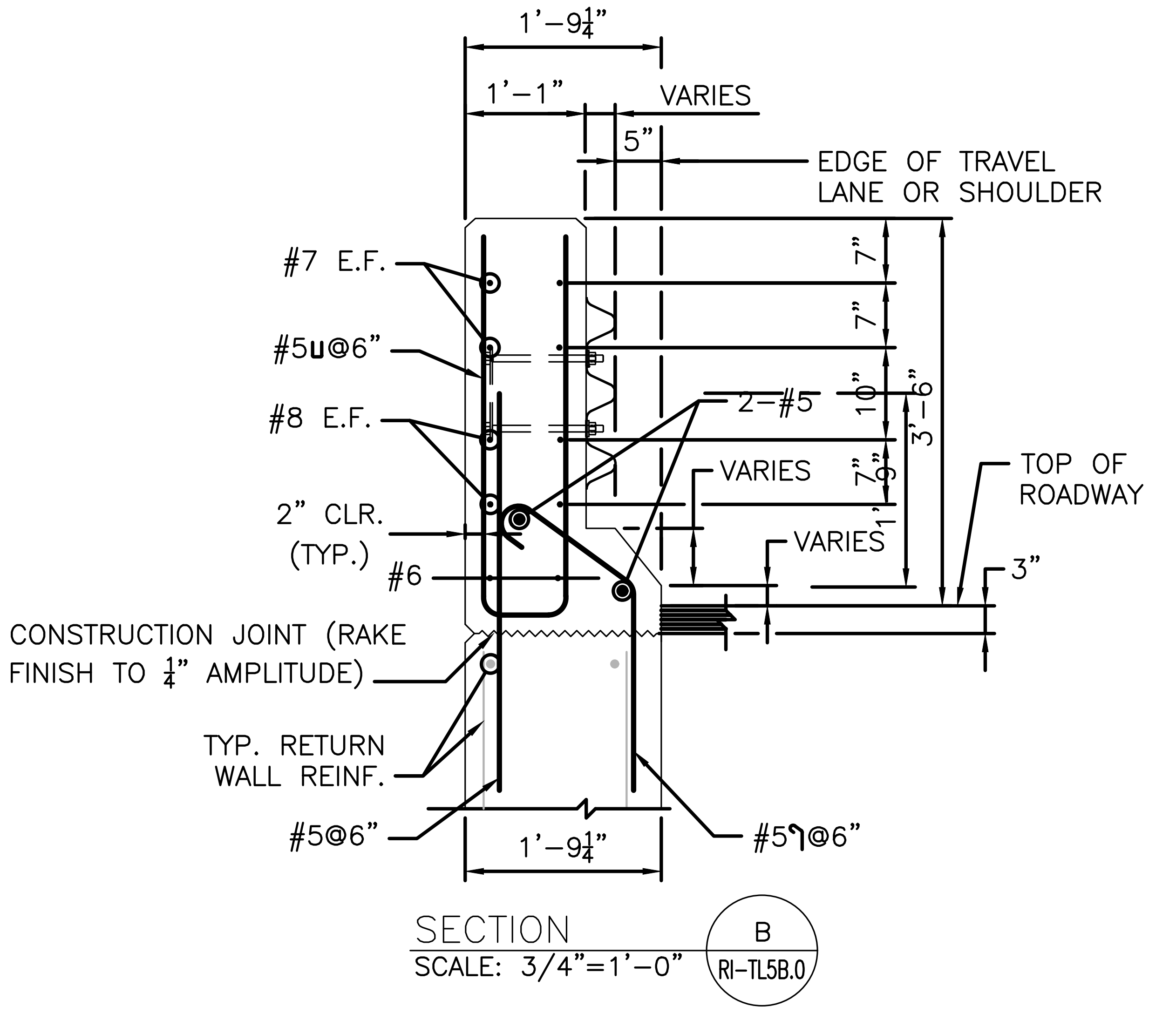
DETAIL OF ANCHOR PLATE FOR THRIE BEAM
SCALE: 3/4"=1'-0"


DRILL AND TAP TWO GALVANIZED ⅝"ø BOLTS (N.S.)
2$\frac{3}{16}$"
6"ø (6⅝" O.D.) GALVANIZED PIPE
7⅝"
1'-0"
2$\frac{3}{16}$"

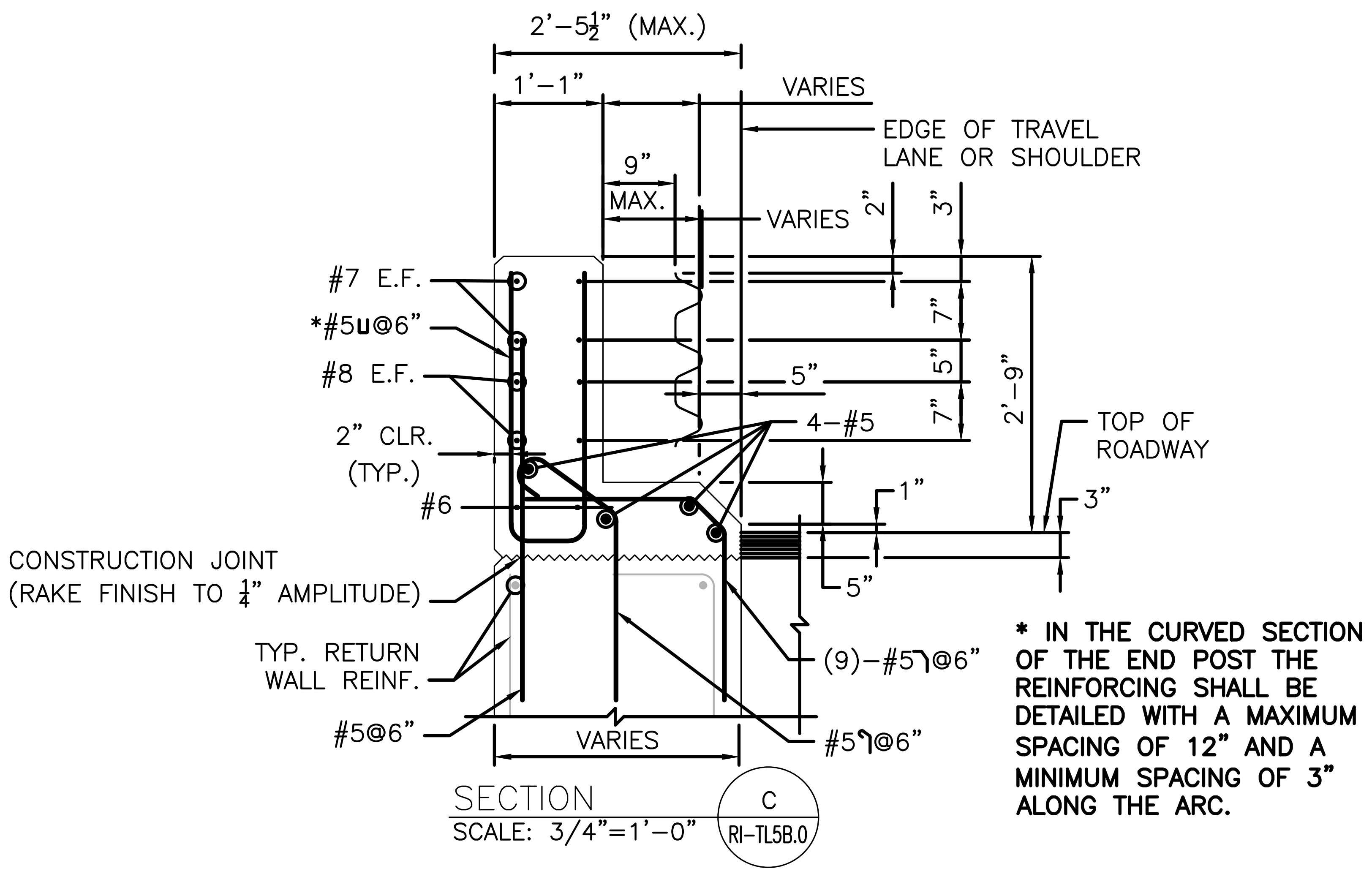
PIPE SEPARATOR DETAIL
SCALE: 1½"=1'-0"


1'-9¼"
1'-1"
3¼"
5"
1" CHAMFER (TYP.)
EDGE OF TRAVEL LANE OR SHOULDER
#7 E.F.
#5u@6" (SPACE AROUND GRANITE ID TABLET RECESS)
#8 E.F.
2-#5
7"
7"
10"
7"
3'-6"
2" CLR. (TYP.)
#6
1'-4"
7"
3"
TOP OF ROADWAY
3"
CONSTRUCTION JOINT (RAKE FINISH TO ¼" AMPLITUDE)
TYP. RETURN WALL REINF.
END POST BASE (SEE DESIGNER NOTE 2)
#5@6"
1'-9¼"
LAP SPLICE DESIGNED BY ENGINEER
#5⅂@6"

SECTION A RI-TL5B.0
SCALE: 3/4"=1'-0"



SECTION B RI-TL5B.0
SCALE: 3/4"=1'-0"



SECTION C RI-TL5B.0
SCALE: 3/4"=1'-0"

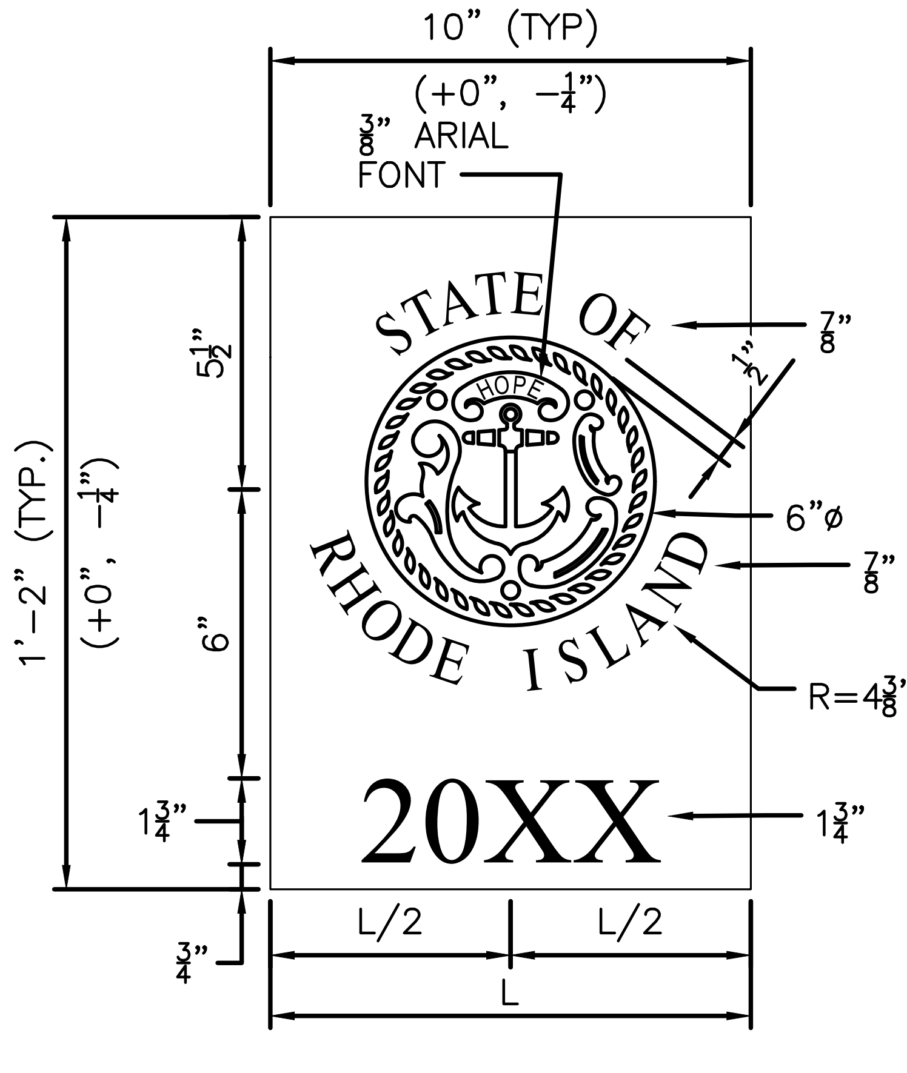
* IN THE CURVED SECTION OF THE END POST THE REINFORCING SHALL BE DETAILED WITH A MAXIMUM SPACING OF 12" AND A MINIMUM SPACING OF 3" ALONG THE ARC.

DESIGNER NOTES:

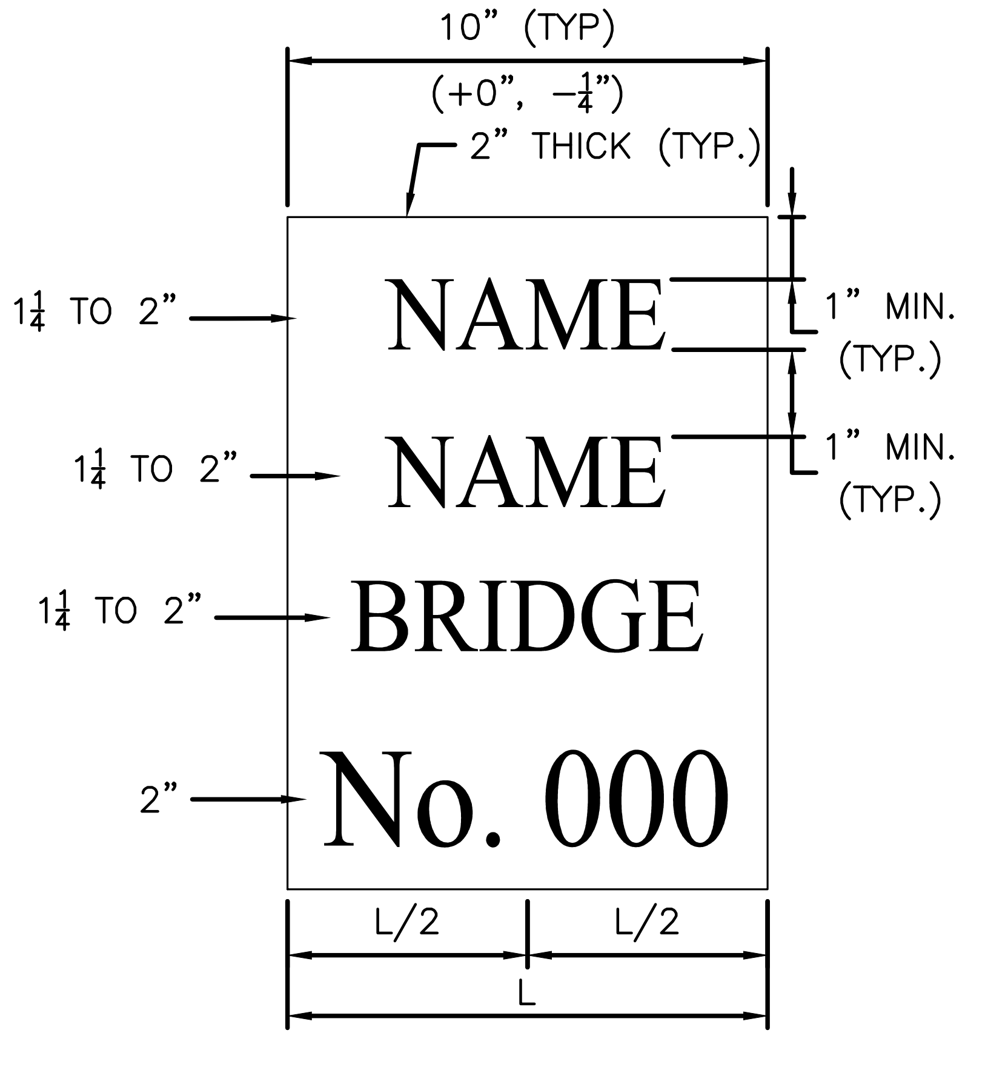
1. ***COORDINATE THIS DRAWING WITH DRAWING (RI-TL5B.1) & (RI-TL5B.2).***
2. ***THE END POST SHALL BE FOUNDED ON A BASE THAT IS CAPABLE FOR RESISTING THE IMPACT LOAD OF MASH TL-5. THE BASE AND CONNECTION BETWEEN THE END POST AND THE BASE SHALL BE DESIGNED AND DETAILED ON THE CONTRACT PLANS. THE END POST VERTICAL REINFORCING BARS SHALL HAVE SUFFICIENT TENSION DEVELOPMENT LENGTH AND/OR TENSION LAP SPLICES INTO THE BASE.***
3. ***REFER TO DRAWINGS (12.10) FOR BARRIER JOINT DETAILS. THE JOINT SHALL BE DESIGNED AND DETAILED ON THE CONTRACT PLANS. IF THIS IS THE LOCATION FOR THE BRIDGE JOINT, THE JOINT SHALL BE DETAILED IN ACCORDANCE WITH DRAWINGS (2.20 THRU 2.50 AND 4.20 THRU 4.41) AS APPLICABLE.***

NOTES:

1. TO ENSURE PROPER GUARD RAIL ANCHORAGE, THE GUARD RAIL INSTALLATION SHALL BEGIN AT EACH END OF THE BRIDGE AND WORK INTO THE APPROACHES.
2. THE COST OF THE GUARD RAIL TRANSITION TO BRIDGE END POSTS ARE HIGHWAY ITEMS.



STATE SEAL TABLET



BRIDGE NAME TABLET

NOTE:
ALL FONT STYLES ARE TO BE NEW TIMES ROMAN, UNLESS NOTED OTHERWISE.

GRANITE IDENTIFICATION TABLETS (NAMEPLATES)
SCALE: 3/4"=1'-0"

END POST IS MASH 2016
TL-5 COMPLIANT

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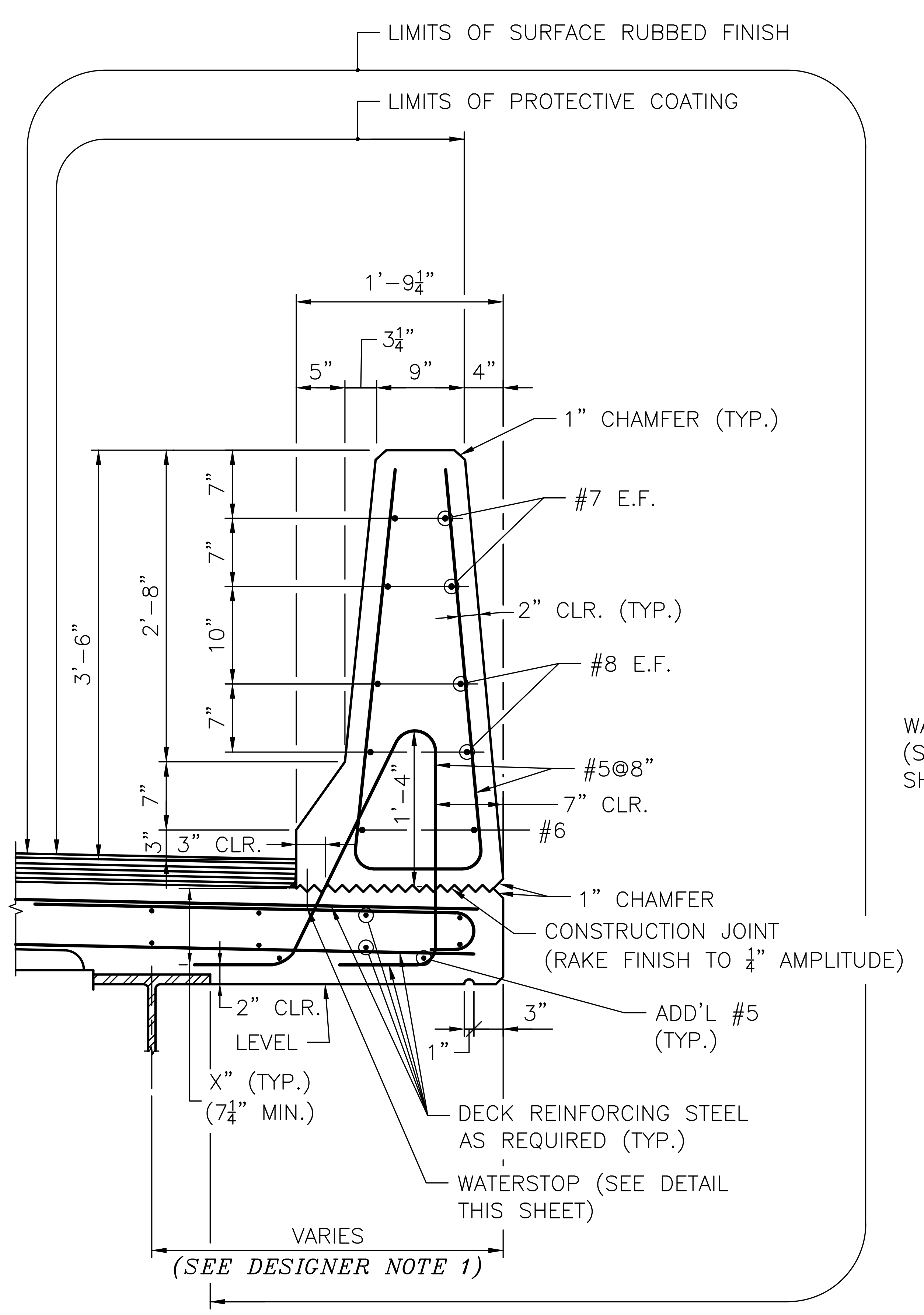
RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

BRIDGE STANDARDS

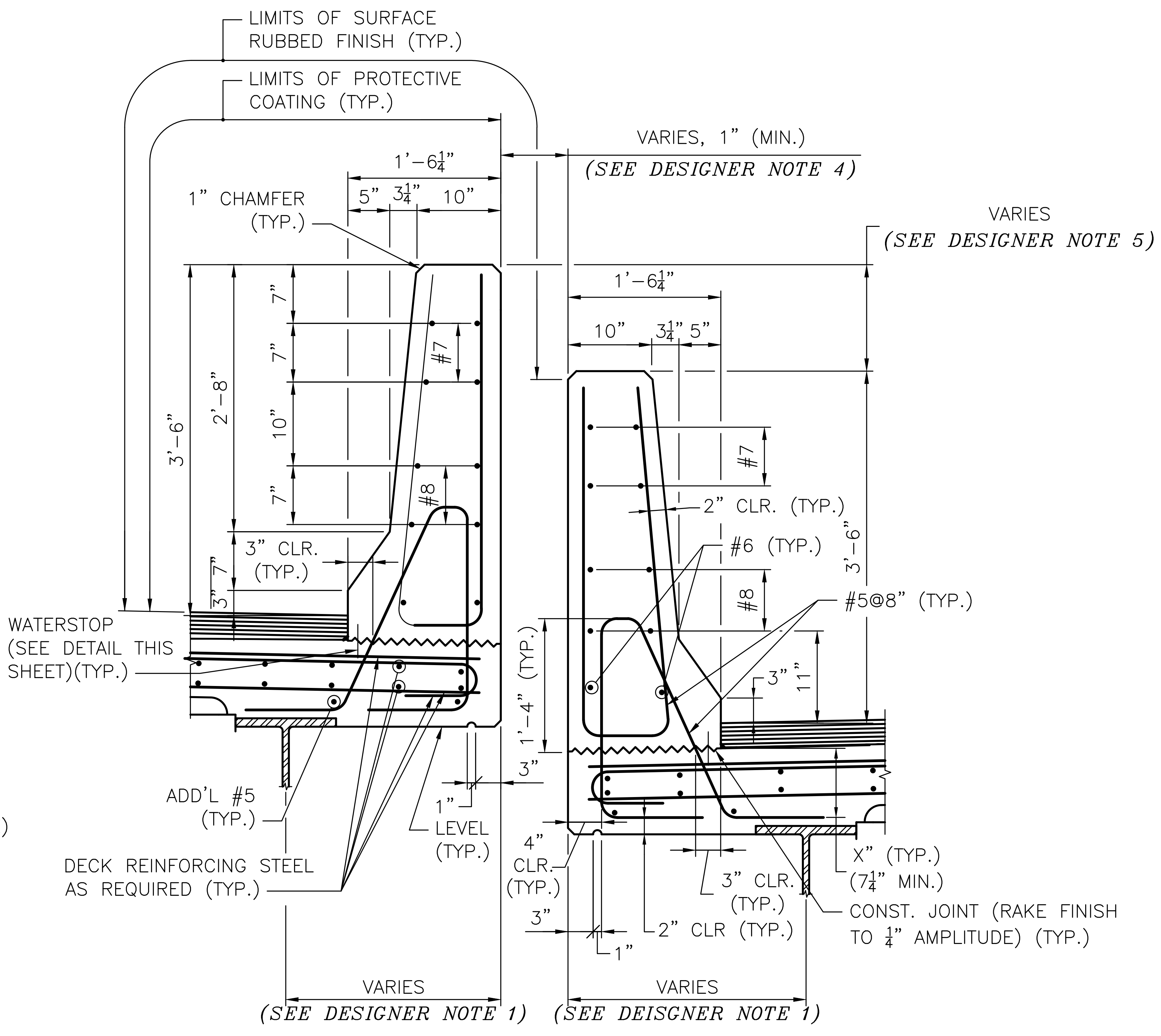
END POST DETAILS
FOR F-SHAPE BARRIER
(MASH TL-5)

DRAWING NUMBER: RI-TL5B.0



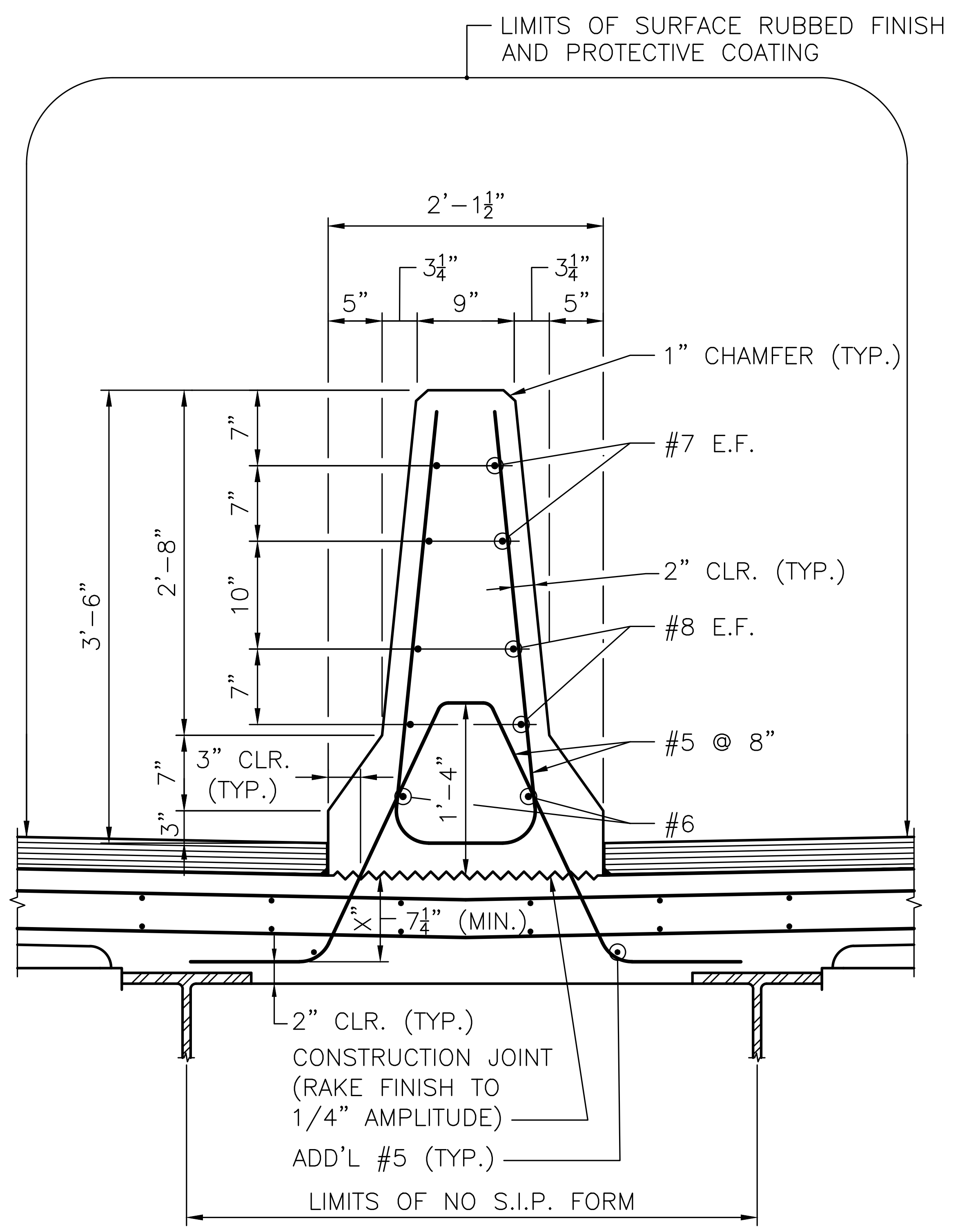
SECTION THRU F-SHAPE BARRIER

SCALE: 1"=1'-0"



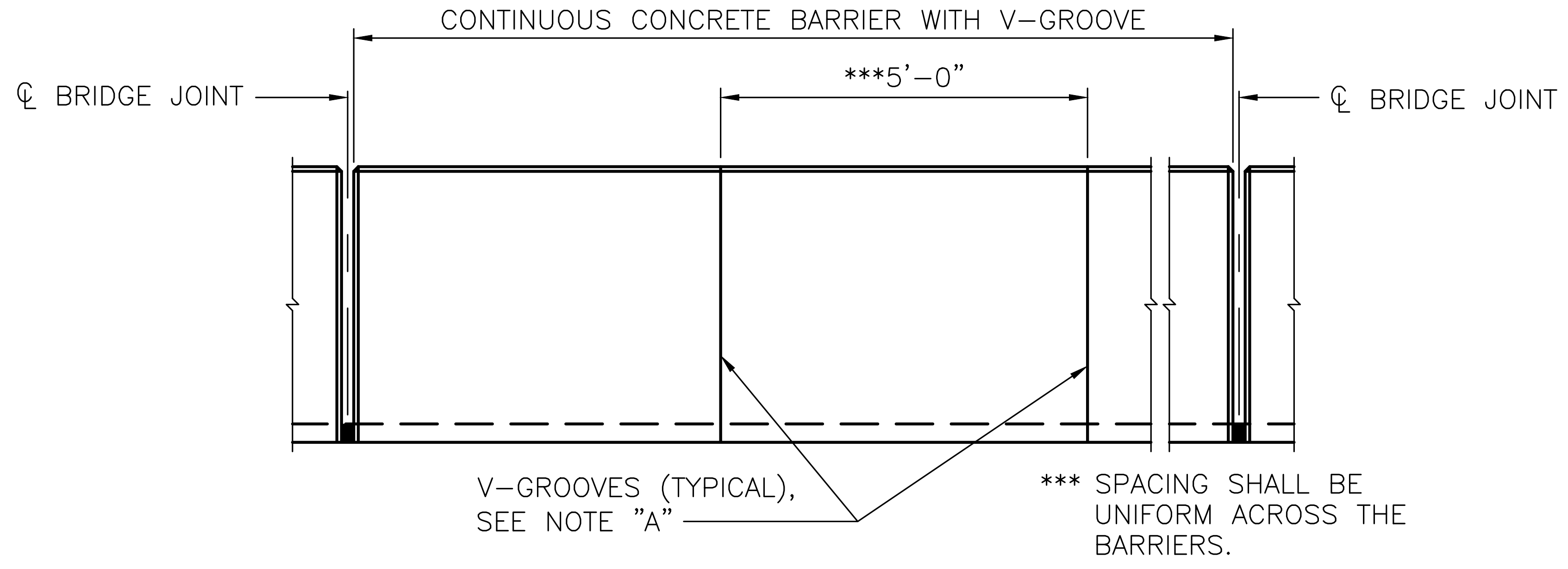
SECTION THRU SINGLE FACE MEDIAN BARRIER

SCALE: 1"=1'-0"



DOUBLE FACE MEDIAN BARRIER

SCALE: 1"=1'-0"



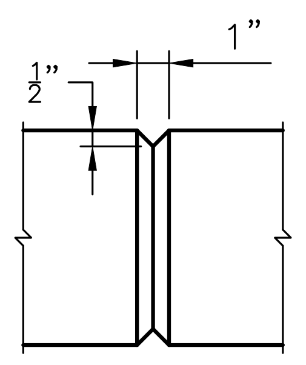
NOTE "A":

FORMED V-GROOVES IN THE CAST-IN-PLACE BARRIERS SHALL MAKE A 45° ANGLE WITH THE BARRIER SURFACES. THE LONGITUDINAL REINFORCING BARS IN THE CONCRETE BARRIERS SHALL BE CONTINUOUS BETWEEN BRIDGE EXPANSION JOINTS. WHERE SPLICES ARE REQUIRED, THE LENGTH OF THE LAP SHALL BE SUFFICIENT TO DEVELOP EACH BAR.

ELEVATION

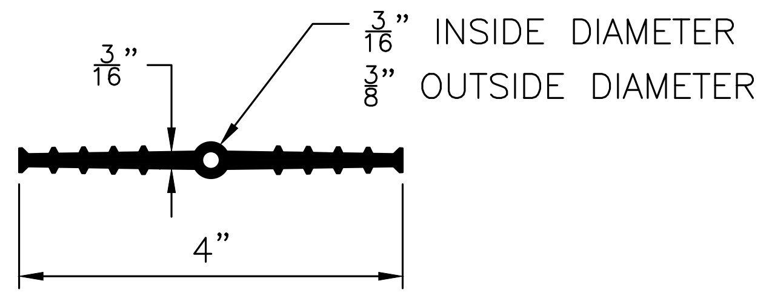
CONCRETE BARRIER V-GROOVE SPACING

NOT TO SCALE



V-GROOVE IN PARAPET

NOT TO SCALE



WATERSTOP DETAIL

SCALE: N.T.S.

DESIGNER NOTES:

1. *FOR DESIGN REQUIREMENTS OF THE DECK OVERHANG REFER TO THE RIDOT LRFD BRIDGE DESIGN MANUAL.*
2. *SPECIFY CONCRETE SURFACE TREATMENT (PROTECTIVE COATING) IN ACCORDANCE WITH THE RIDOT LRFD BRIDGE DESIGN MANUAL.*
3. *SEE DWG. (RI-TL5B.2) FOR DETAILS WITH EXPOSED CONCRETE DECK SURFACE.*
4. *IF THE GAP BETWEEN BRIDGE STRUCTURES EXCEEDS 3'-0", THEN THE SLOPED BACK FACE BARRIER SHALL BE USED FOR THE MEDIAN BARRIER. REFER TO "SECTION THRU F-SHAPE BARRIER" ON THIS SHEET.*
5. *IF THE DIFFERENCE IN HEIGHT BETWEEN THE TOPS OF THE MEDIAN BARRIERS EXCEEDS 1'-6" THEN THE DESIGNER SHALL CONSIDER USING THE SLOPED BACK FACE BARRIER FOR THE HIGHER MEDIAN BARRIER. REFER TO "SECTION THRU F-SHAPE BARRIER" ON THIS SHEET.*
6. *WHEN SNOW FENCE IS REQUIRED WITH THE F-SHAPE BARRIER, THE TOP OF THE BARRIER SHALL BE MODIFIED. FOR F-SHAPE BARRIER MODIFICATIONS, SNOW FENCE DETAILS AND CHANGE IN CRASHWORTHINESS OF THE BARRIER, REFER TO RIDOT BRIDGE STD. DWG. (RI-FENCE.4).*

F-SHAPE BARRIER, SINGLE
AND DOUBLE FACE MEDIAN
BARRIERS ARE MASH 2016
TL-5 COMPLIANT

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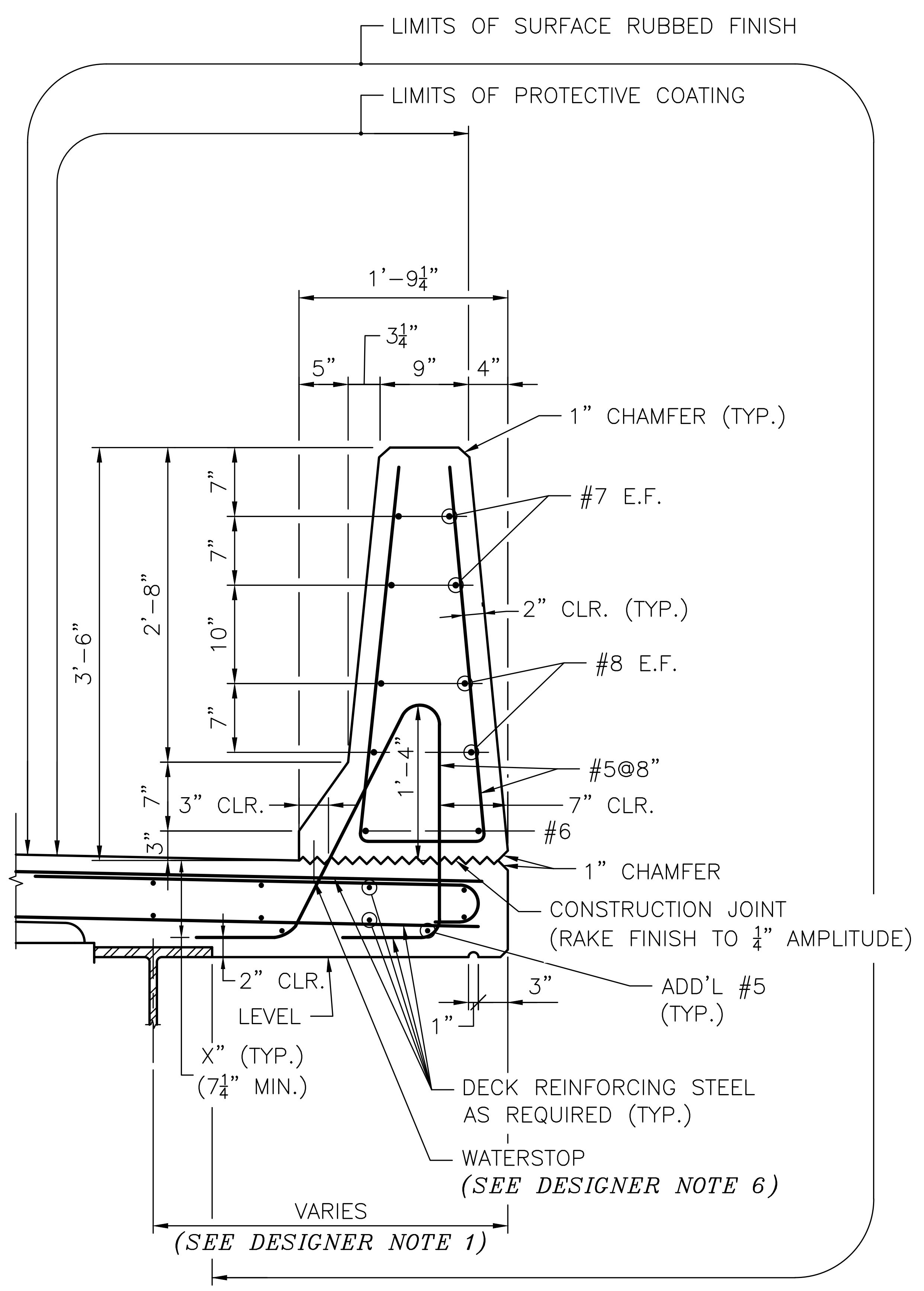
DEPARTMENT OF TRANSPORTATION

BRIDGE STANDARDS

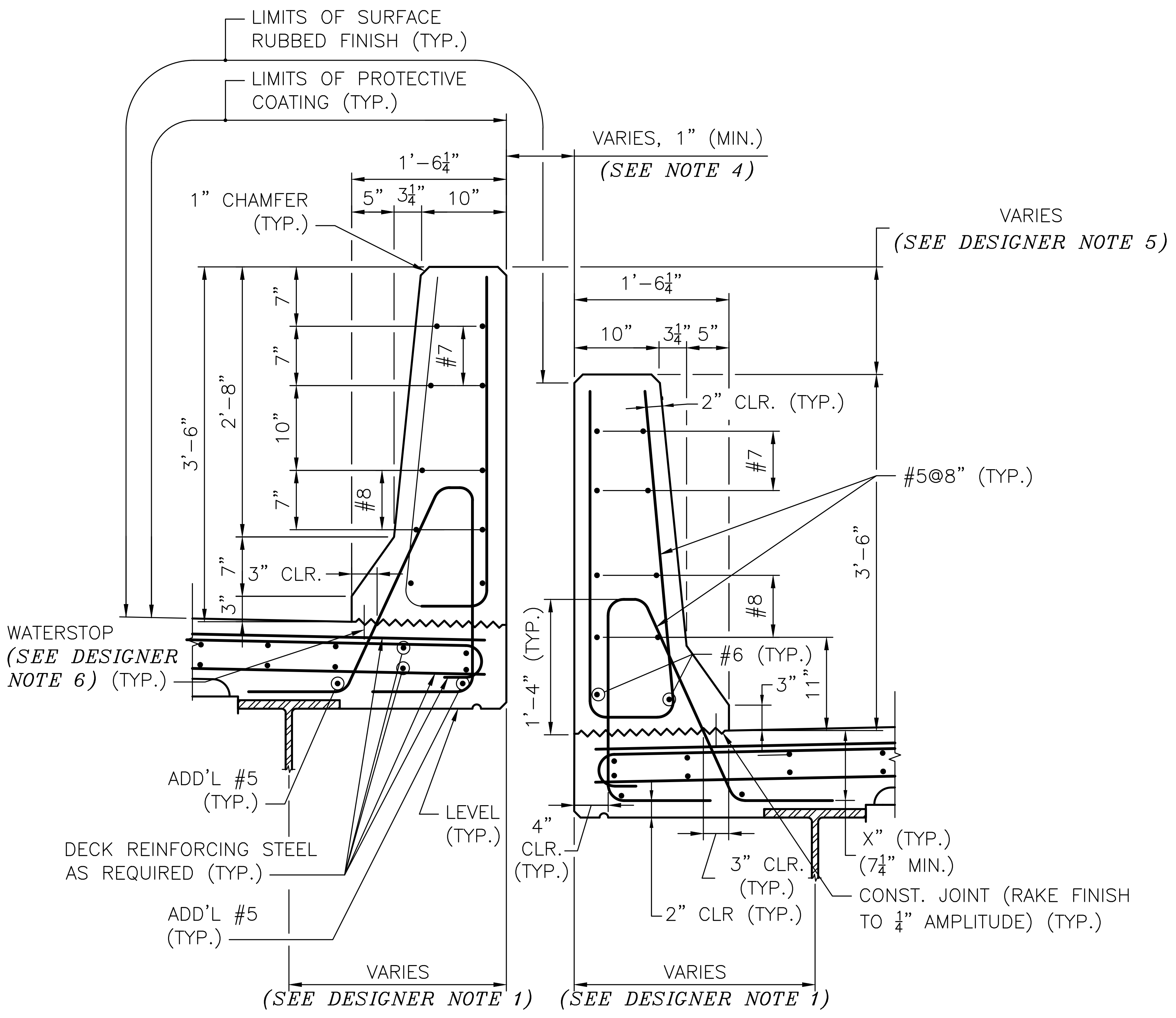
F-SHAPE BARRIER
(MASH TL-5) DETAILS-1
(WITH HMA WEARING SURFACE)

DRAWING NUMBER: RI-TL5B.1



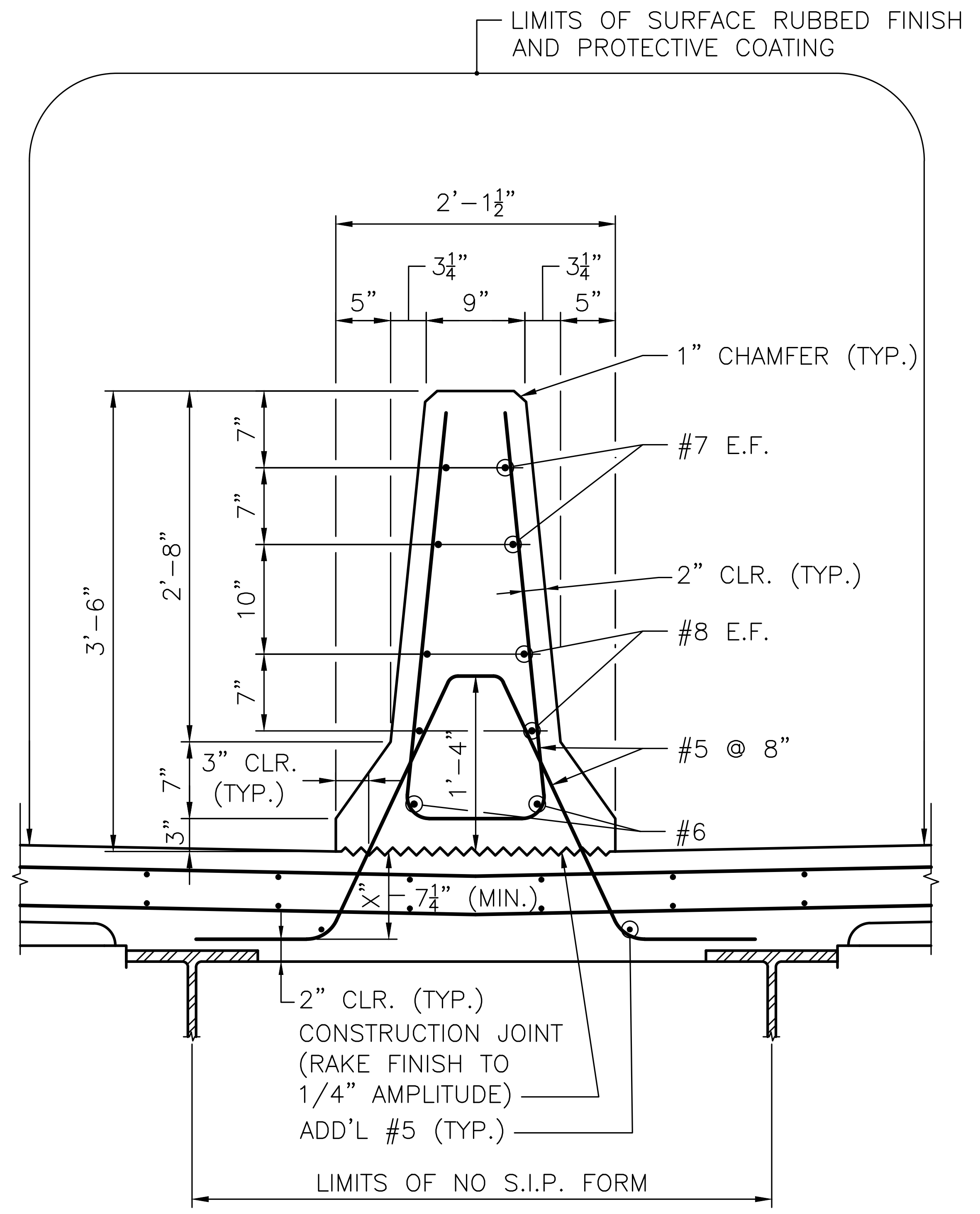
SECTION THRU F-SHAPE BARRIER

SCALE: 1"=1'-0"



SECTION THRU SINGLE FACE MEDIAN BARRIER

SCALE: 1"=1'-0"



DOUBLE FACE MEDIAN BARRIER

SCALE: 1"=1'-0"

DESIGNER NOTES:

1. *FOR DESIGN REQUIREMENTS OF THE DECK OVERHANG REFER TO THE RIDOT LRFD BRIDGE DESIGN MANUAL.*
2. *SPECIFY CONCRETE SURFACE TREATMENT (PROTECTIVE COATING) IN ACCORDANCE WITH THE RIDOT LRFD BRIDGE DESIGN MANUAL.*
3. *SEE DWG. (RI-TL5B.1) FOR DETAILS WITH HMA WEARING SURFACE.*
4. *IF THE GAP BETWEEN BRIDGE STRUCTURES EXCEEDS 3'-0", THEN THE SLOPED BACK FACE BARRIER SHALL BE USED FOR THE MEDIAN BARRIER. REFER TO "SECTION THRU F-SHAPE BARRIER" ON THIS SHEET.*
5. *IF THE DIFFERENCE IN HEIGHT BETWEEN THE TOPS OF THE MEDIAN BARRIERS EXCEEDS 1'-6" THEN THE DESIGNER SHALL CONSIDER USING THE SLOPED BACK FACE BARRIER FOR THE HIGHER MEDIAN BARRIER. REFER TO "SECTION THRU F-SHAPE BARRIER" ON THIS SHEET.*
6. *INCLUDE WATERSTOP DETAIL ON RIDOT BRIDGE STD. DWG. (RI-TL5B.1) IN CONTRACT PLANS.*
7. *WHEN SNOW FENCE IS REQUIRED WITH THE F-SHAPE BARRIER, THE TOP OF THE BARRIER SHALL BE MODIFIED. FOR F-SHAPE BARRIER MODIFICATIONS, SNOW FENCE DETAILS AND CHANGE IN CRASHWORTHINESS OF THE BARRIER, REFER TO RIDOT BRIDGE STD. DWG. (RI-FENCE.4).*
8. *SEE DWG. (RI-TL5B.1) FOR V-GROOVE SPACING AND DETAIL.*

F-SHAPE BARRIER, SINGLE
AND DOUBLE FACE MEDIAN
BARRIERS ARE MASH 2016
TL-5 COMPLIANT

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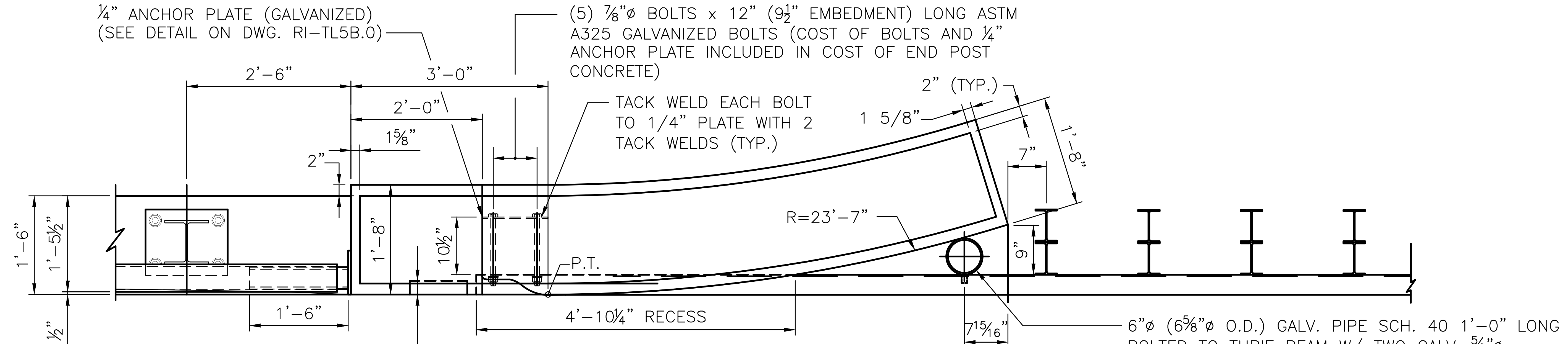
DEPARTMENT OF TRANSPORTATION

BRIDGE STANDARDS

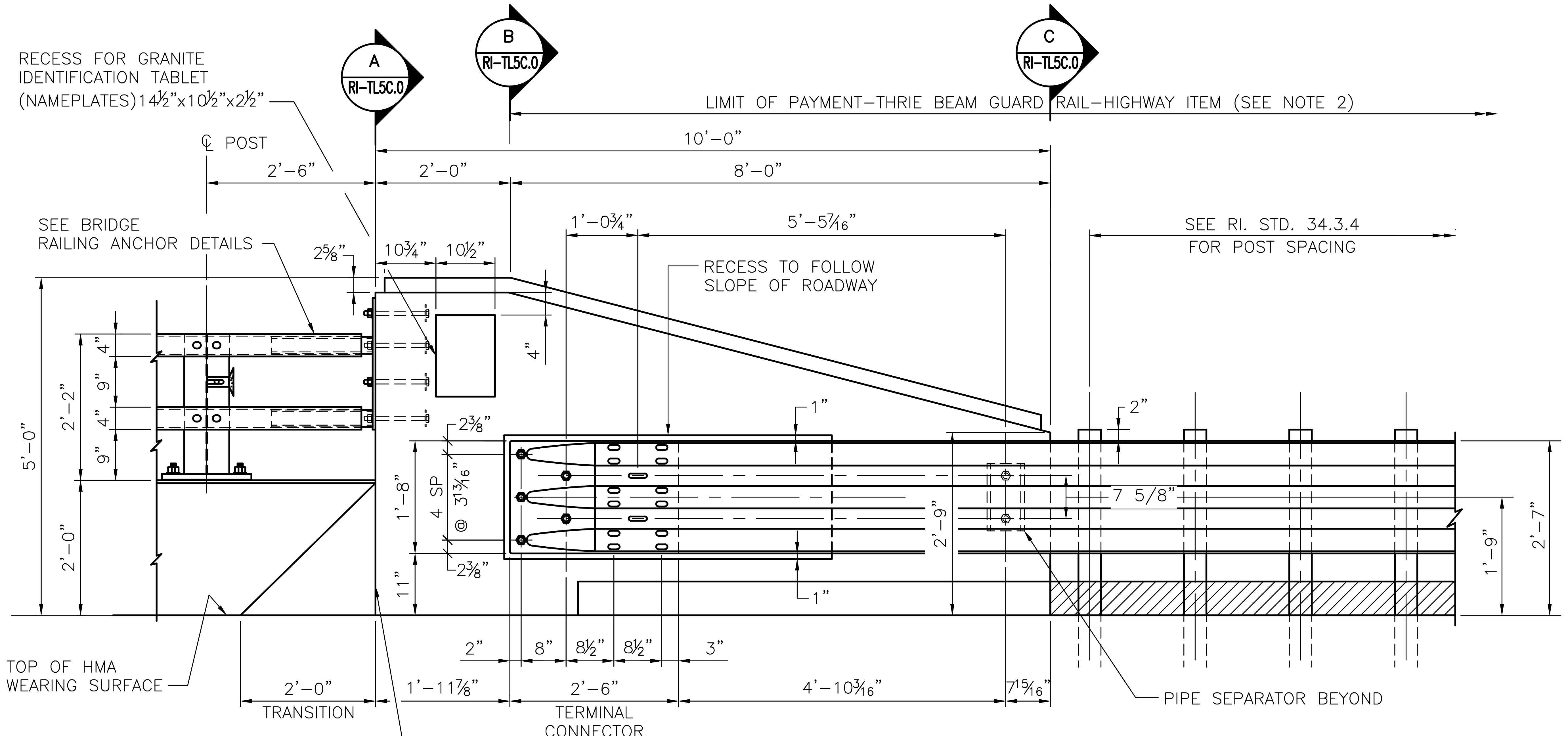
F-SHAPE BARRIER
(MASH TL-5) DETAIL -2
(WITH EXPOSED CONC. DECK SURFACE)

DRAWING NUMBER: RI-TL5B.2


¼" ANCHOR PLATE (GALVANIZED) (SEE DETAIL ON DWG. RI-TL5B.0)
(5) ⅞"ø BOLTS x 12" (9½" EMBEDMENT) LONG ASTM A325 GALVANIZED BOLTS (COST OF BOLTS AND ¼" ANCHOR PLATE INCLUDED IN COST OF END POST CONCRETE)
TACK WELD EACH BOLT TO 1/4" PLATE WITH 2 TACK WELDS (TYP.)
2'-6"
3'-0"
2'-0"
1⅝"
2"
2" (TYP.)
1 5/8"
1'-8"
7"
R=23'-7"
P.T.
1'-6"
1'-5½"
½"
1'-8"
10½"
9"
1'-6"
4'-10¼" RECESS
7¹⁵⁄₁₆"
6"ø (6⅝"ø O.D.) GALV. PIPE SCH. 40 1'-0" LONG BOLTED TO THRIE BEAM W/ TWO GALV. ⅝"ø BOLTS (SEE DETAIL ON DWG. RI-TL5B.0)
2½" RECESS

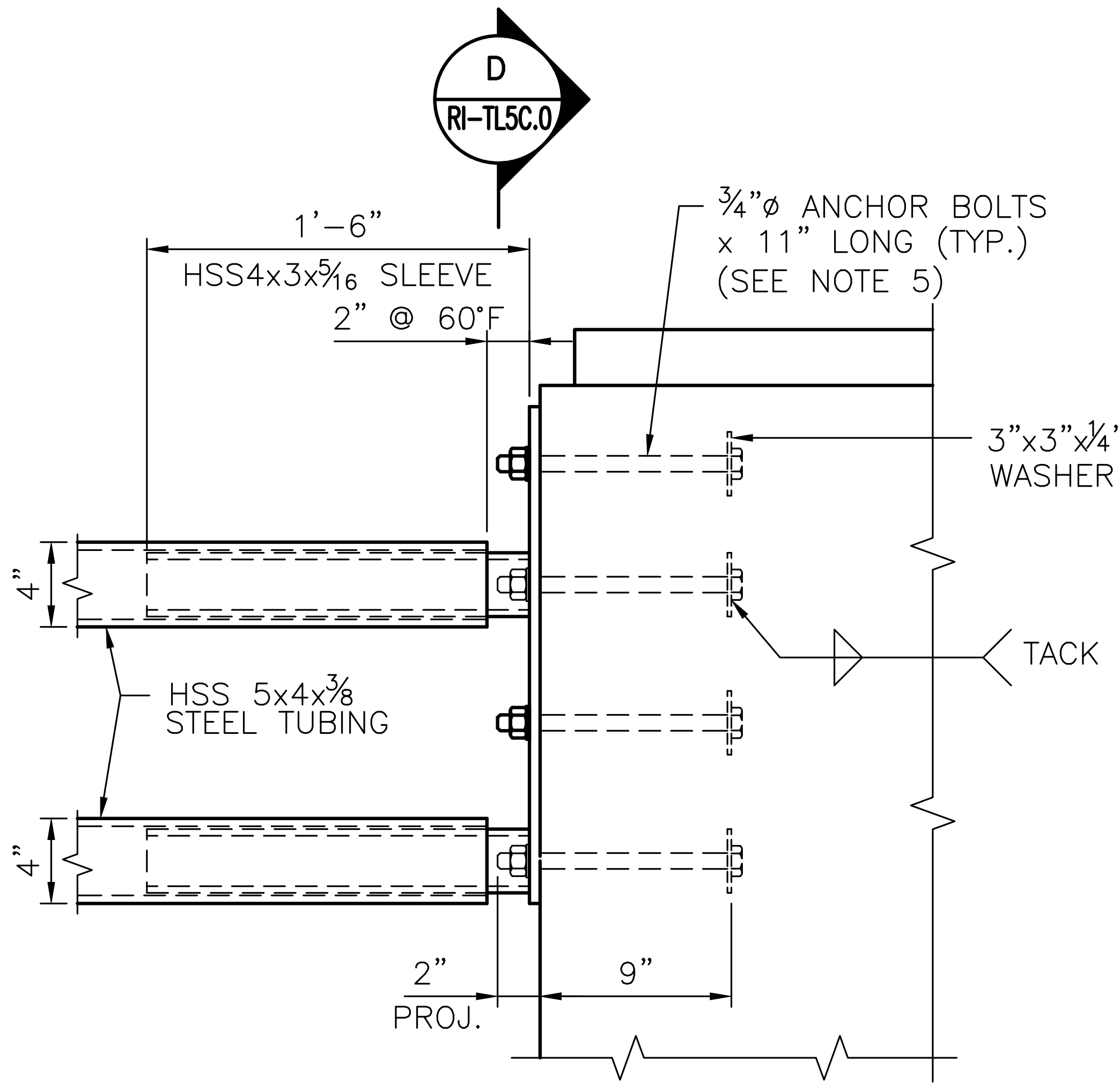
PLAN

SCALE: ¾"=1'-0"



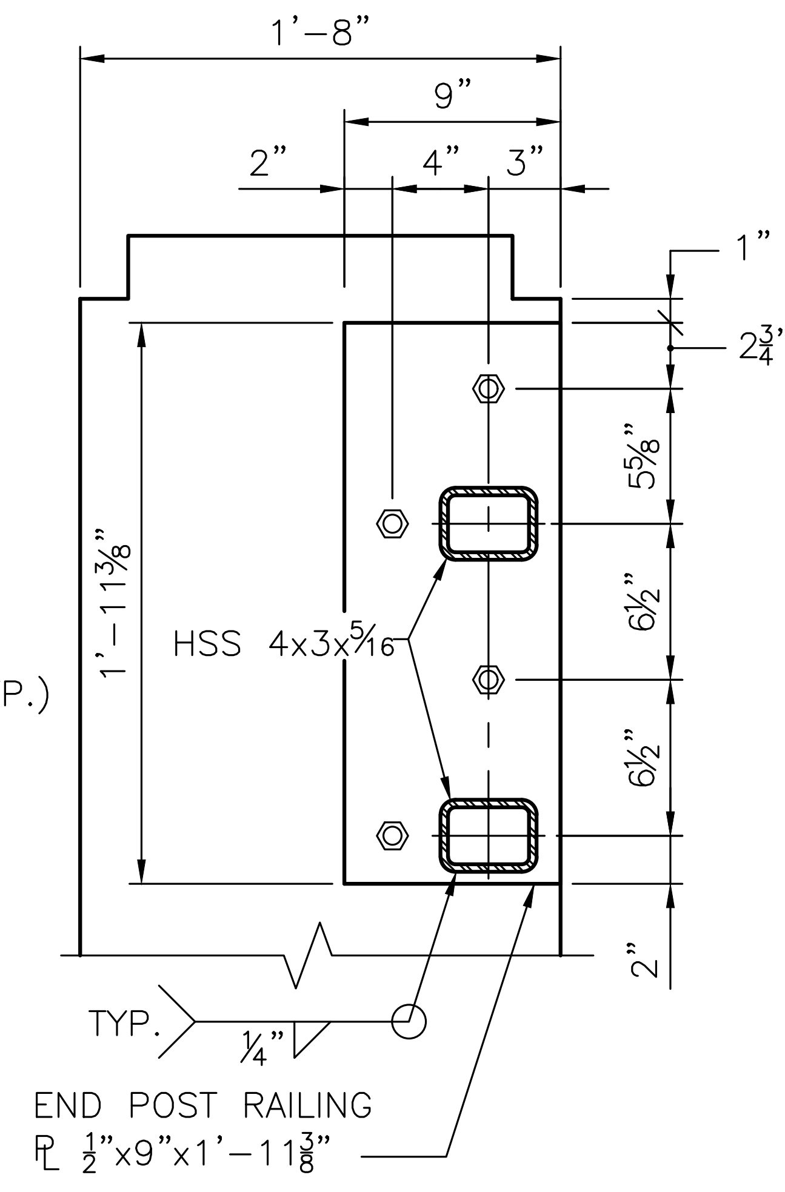
ELEVATION

SCALE: ¾"=1'-0"



BRIDGE RAILING ANCHOR DETAIL

SCALE: 1"=1'-0"



SECTION D (RI-TL5C.0)

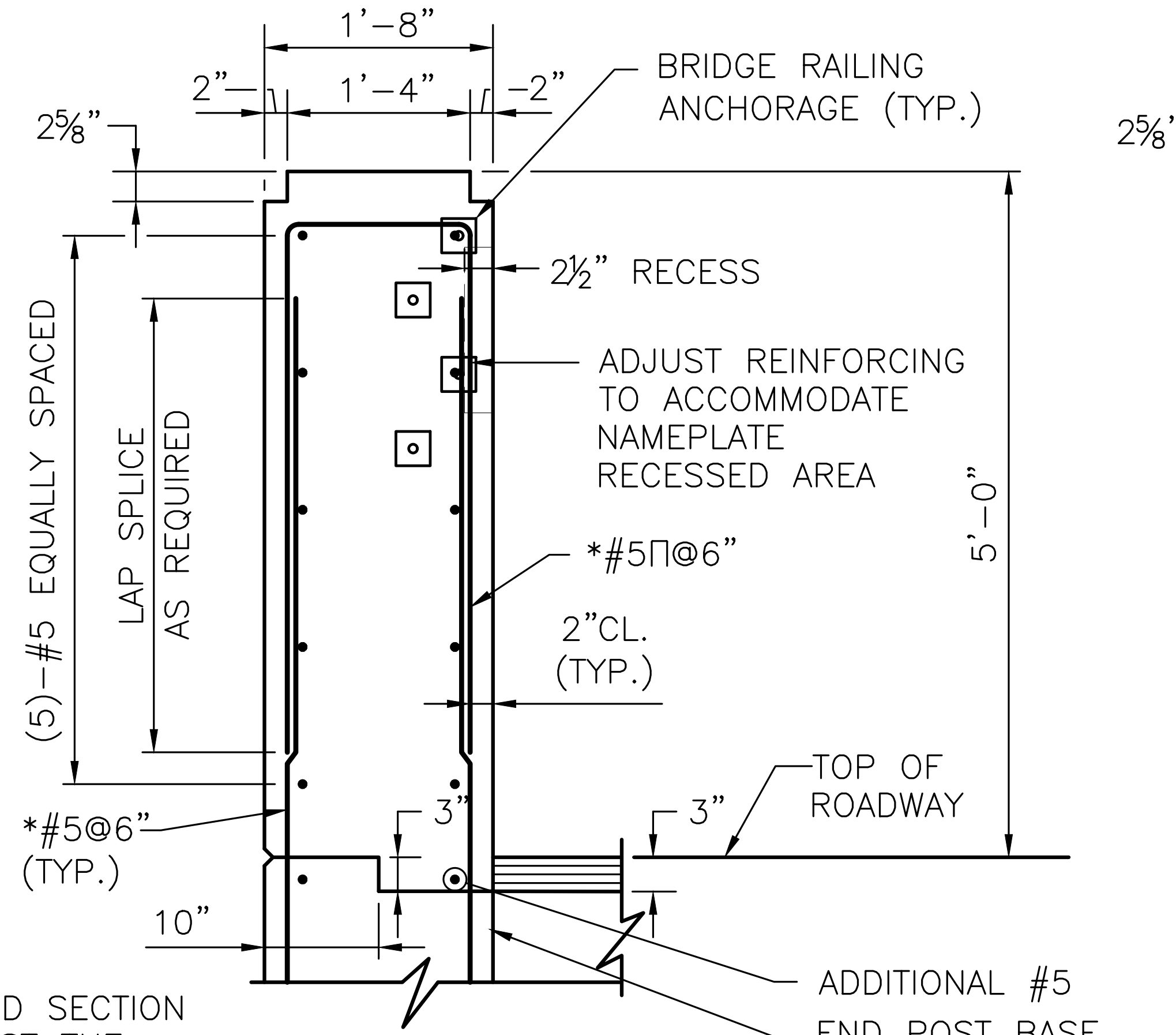
SCALE: 1"=1'-0"

DESIGNER NOTES:

1. *COORDINATE THIS DRAWING WITH DRAWING (RI-TL5C.1)*
2. *THE END POST SHALL BE FOUNDED ON A BASE THAT IS CAPABLE FOR RESISTING THE IMPACT LOAD OF MASH TL-5. THE BASE AND CONNECTION BETWEEN THE END POST AND THE BASE SHALL BE DESIGNED AND DETAILED BY THE CONSULTANT. THE END POST VERTICAL REINFORCING BARS SHALL HAVE SUFFICIENT TENSION DEVELOPMENT LENGTH AND/OR TENSION LAP SPLICES INTO THE BASE.*
3. *REFER TO DRAWING (RI-TL5B.0) FOR NAMEPLATE TABLET, PIPE SEPARATOR, AND ANCHOR PLATE FOR THRIE BEAM DETAILS. PROVIDE THESE DETAILS IN THE PROJECT CONTRACT DRAWINGS AS APPLICABLE.*
4. *REFER TO DRAWINGS (12.10) FOR BARRIER JOINT DETAILS. THE JOINT SHALL BE DESIGNED AND DETAILED ON THE CONTRACT PLANS. IF THIS IS THE LOCATION FOR THE BRIDGE JOINT, THE JOINT SHALL BE DETAILED IN ACCORDANCE WITH DRAWINGS (2.20 THRU 2.50 AND 4.20 THRU 4.41) AS APPLICABLE.*
5. *REFER TO MATERIAL NOTES ON DRAWING (RI-TL5C.1) FOR STRUCTURAL TUBING AND END POST RAILING PLATE REQUIREMENTS.*

NOTES:

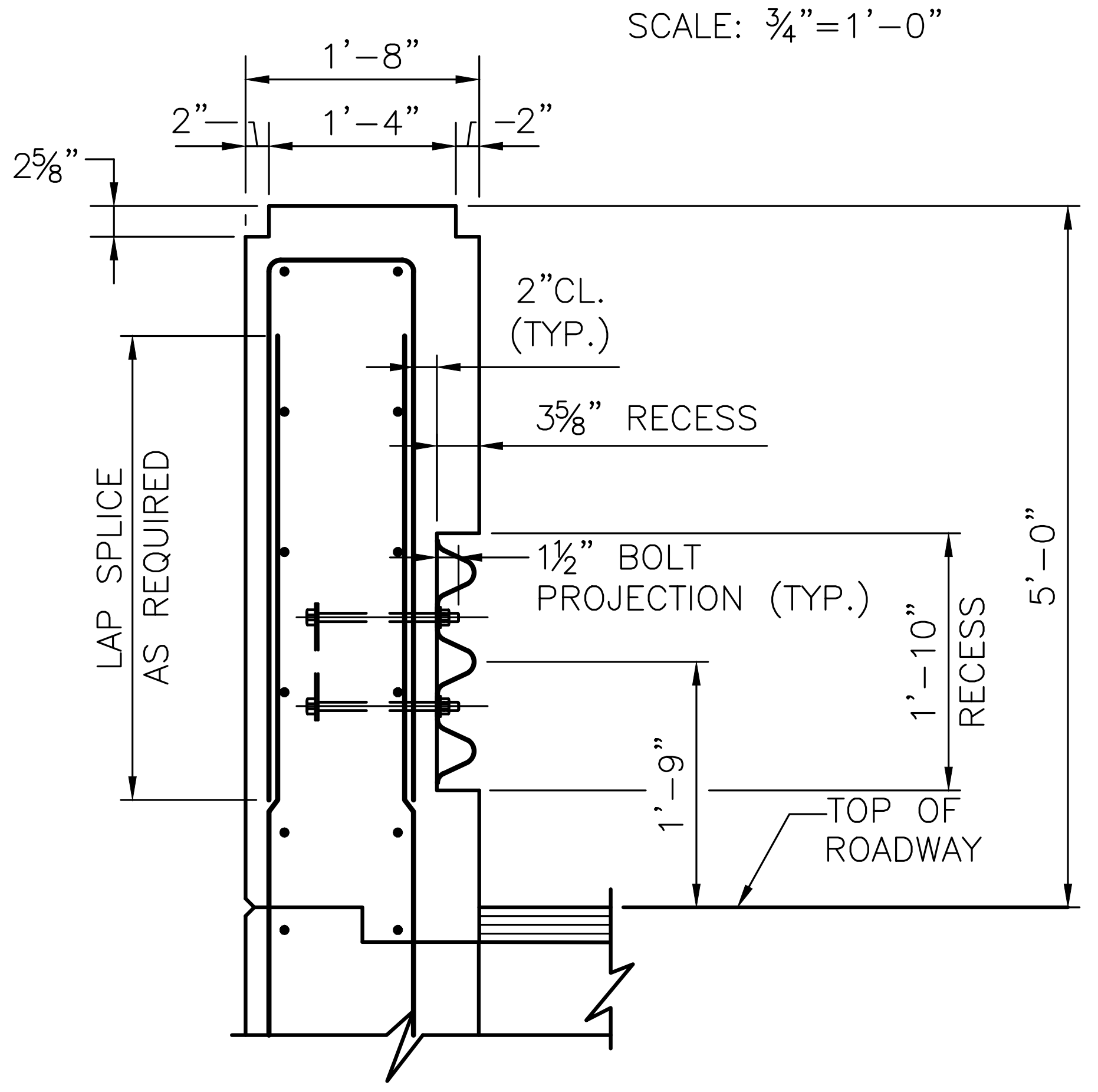
1. TO ENSURE PROPER GUARD RAIL ANCHORAGE, THE GUARD RAIL INSTALLATION SHALL BEGIN AT EACH END OF THE BRIDGE AND WORK INTO THE APPROACHES.
2. THE COST OF THE GUARD RAIL TRANSITIONS TO BRIDGE END POSTS ARE HIGHWAY ITEMS.
3. THE COST OF BRIDGE RAIL ANCHORAGE (PLATES, ANCHOR BOLTS, WASHERS AND PLATE SLEEVES) IS INCLUDED IN THE COST OF END POST CONCRETE.



SECTION A (RI-TL5C.0)

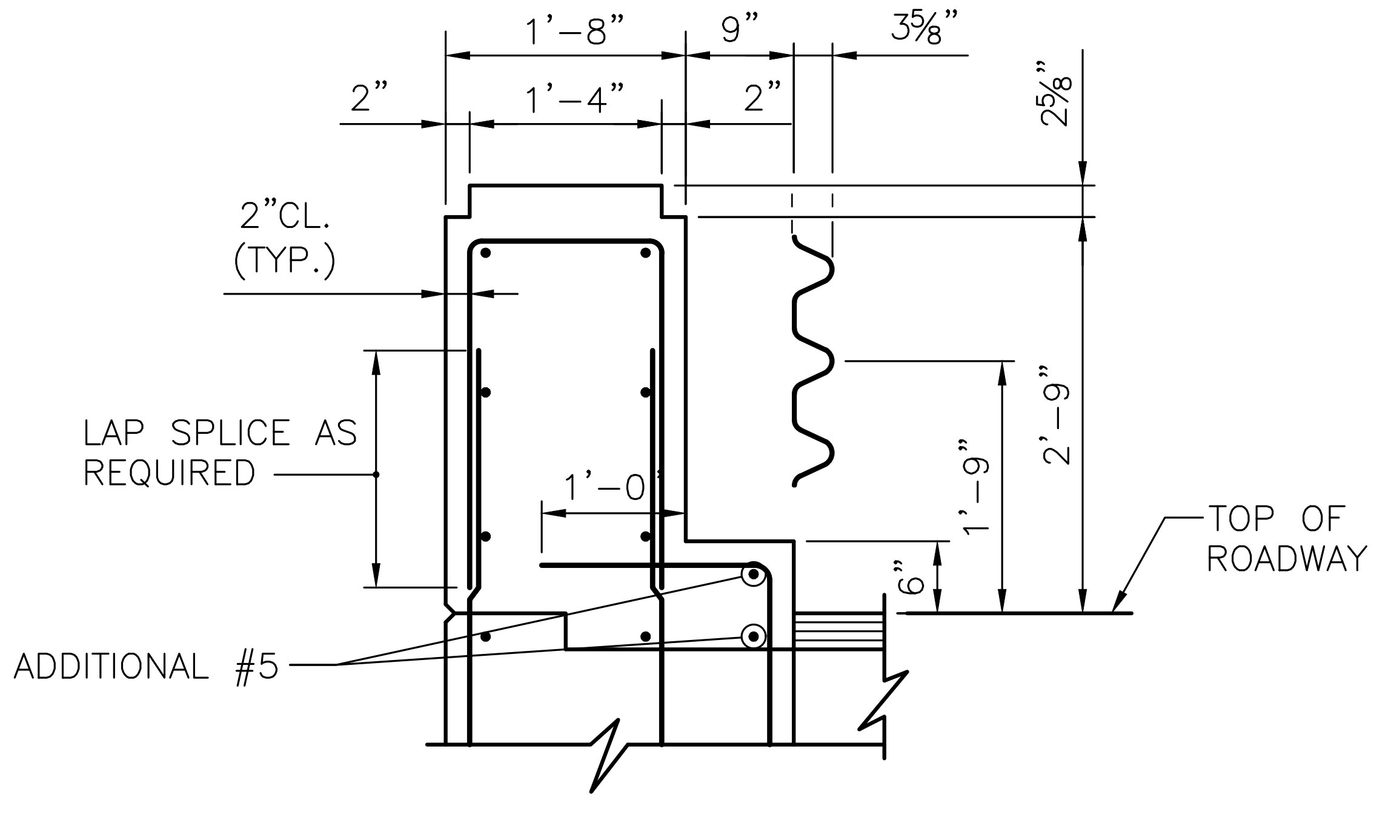
SCALE: ¾"=1'-0"

* IN THE CURVED SECTION OF THE END POST THE REINFORCING SHALL BE DETAILED WITH A MAXIMUM SPACING OF 12" AND A MINIMUM SPACING OF 3" ALONG THE ARC.



SECTION B (RI-TL5C.0)

SCALE: ¾"=1'-0"



SECTION C (RI-TL5C.0)

SCALE: ¾"=1'-0"

END POST IS MASH 2016
TL-5 COMPLIANT

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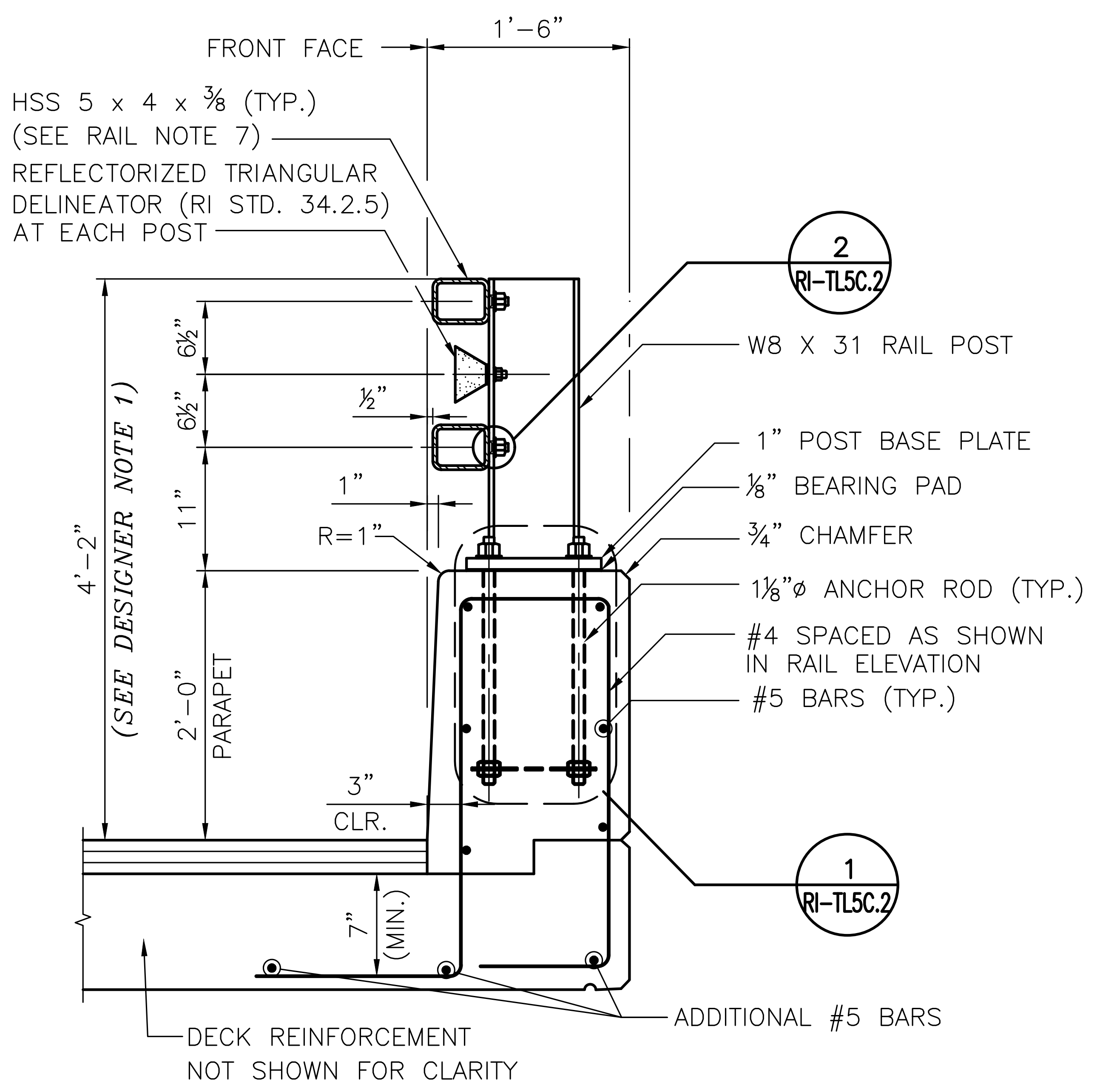
RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

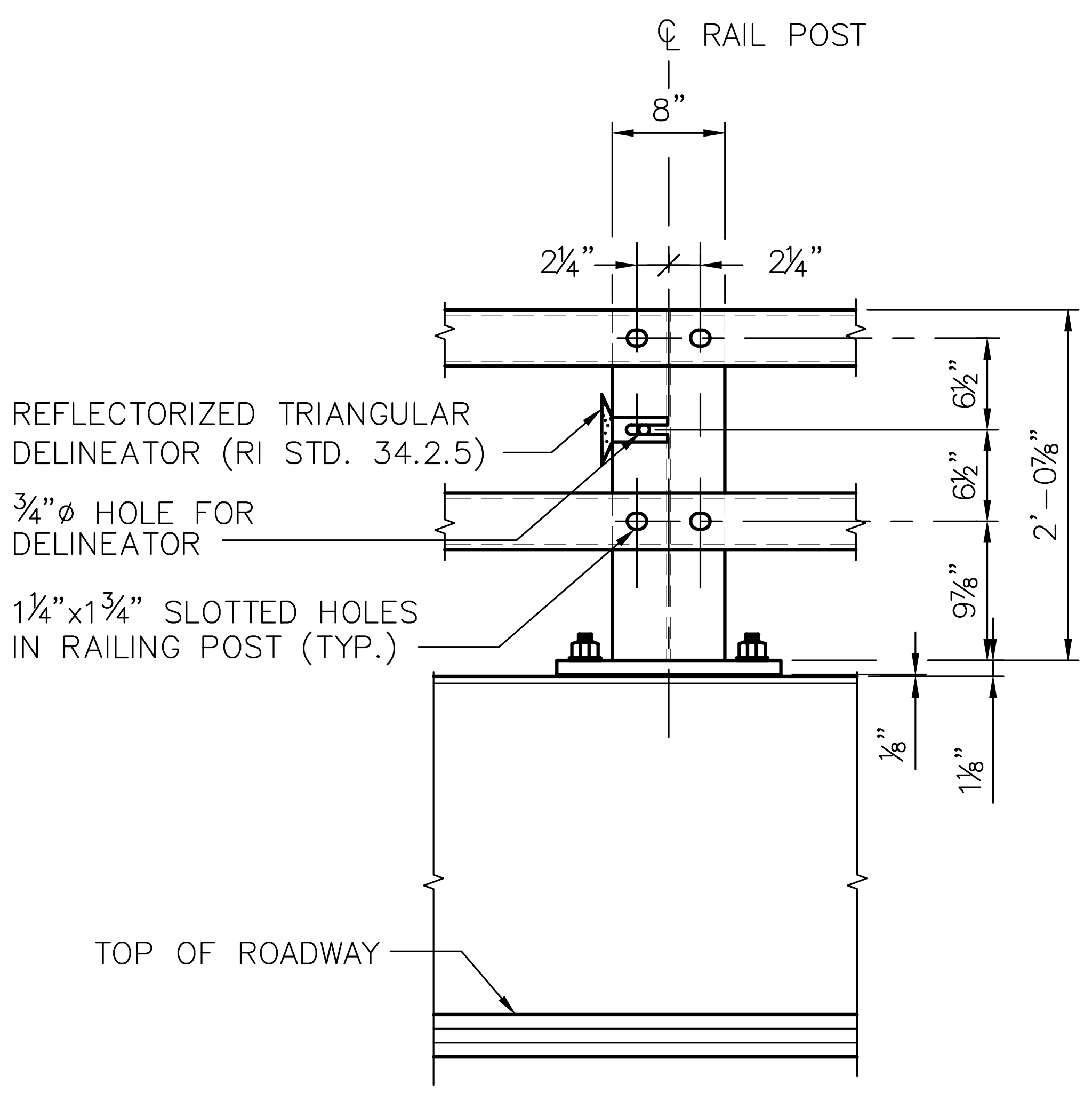
BRIDGE STANDARDS

END POST DETAILS FOR
BRIDGE COMBINATION RAIL
(MASH TL-5)

DRAWING NUMBER: RI-TL5C.0



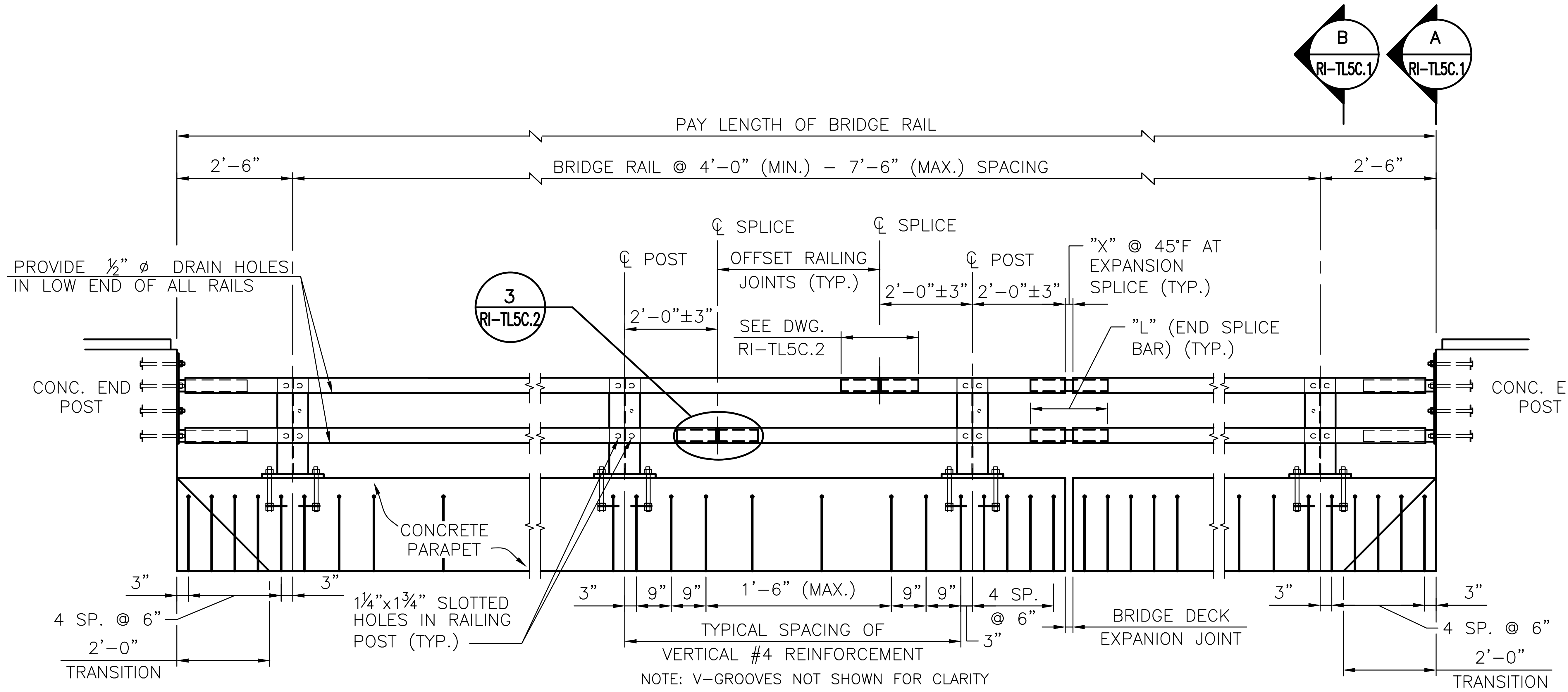
SECTION VIEW B RI-TL5C.1



FRONT ELEVATION

BRIDGE COMBINATION RAIL (MASH TL–5)

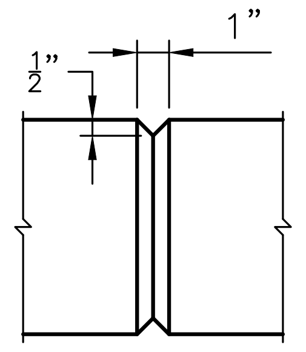
SCALE: 1"=1'-0"



NOTE: V-GROOVES NOT SHOWN FOR CLARITY

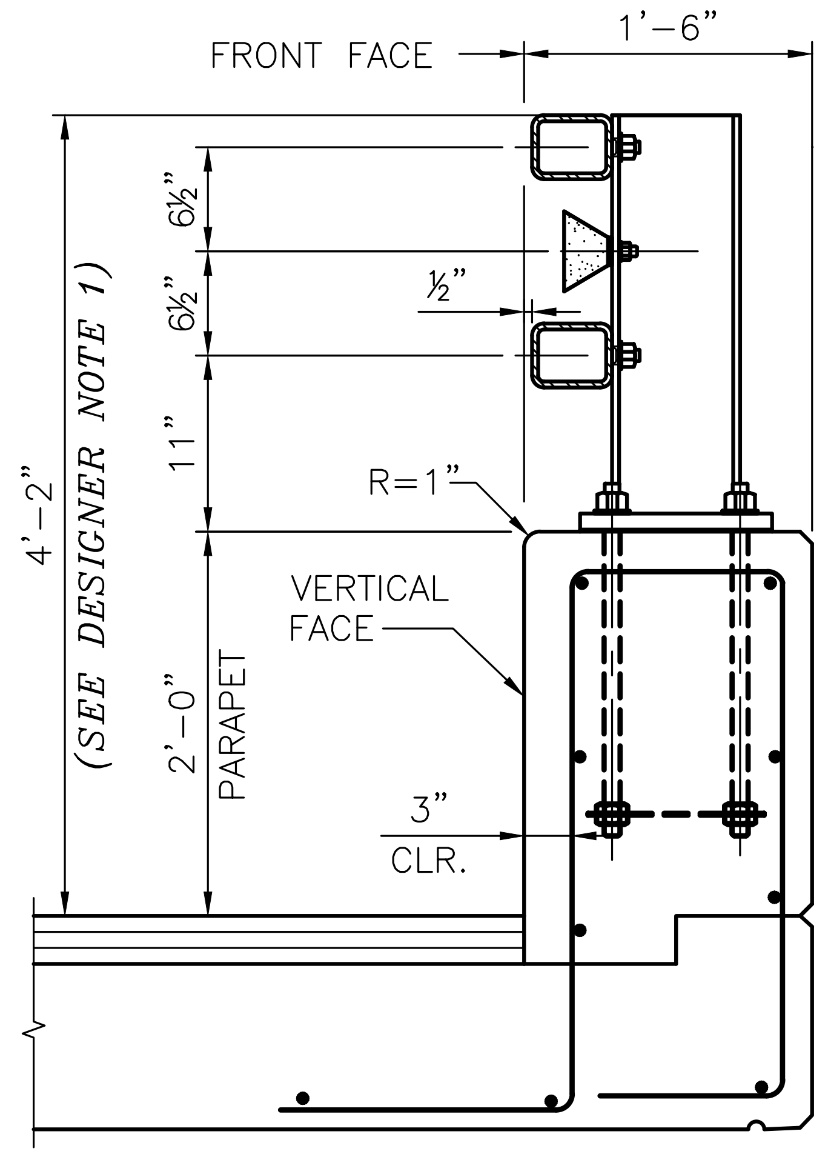
RAIL ELEVATION

NOT TO SCALE



V–GROOVE IN PARAPET

NOT TO SCALE



SECTION VIEW A RI-TL5C.1

RAIL NOTES

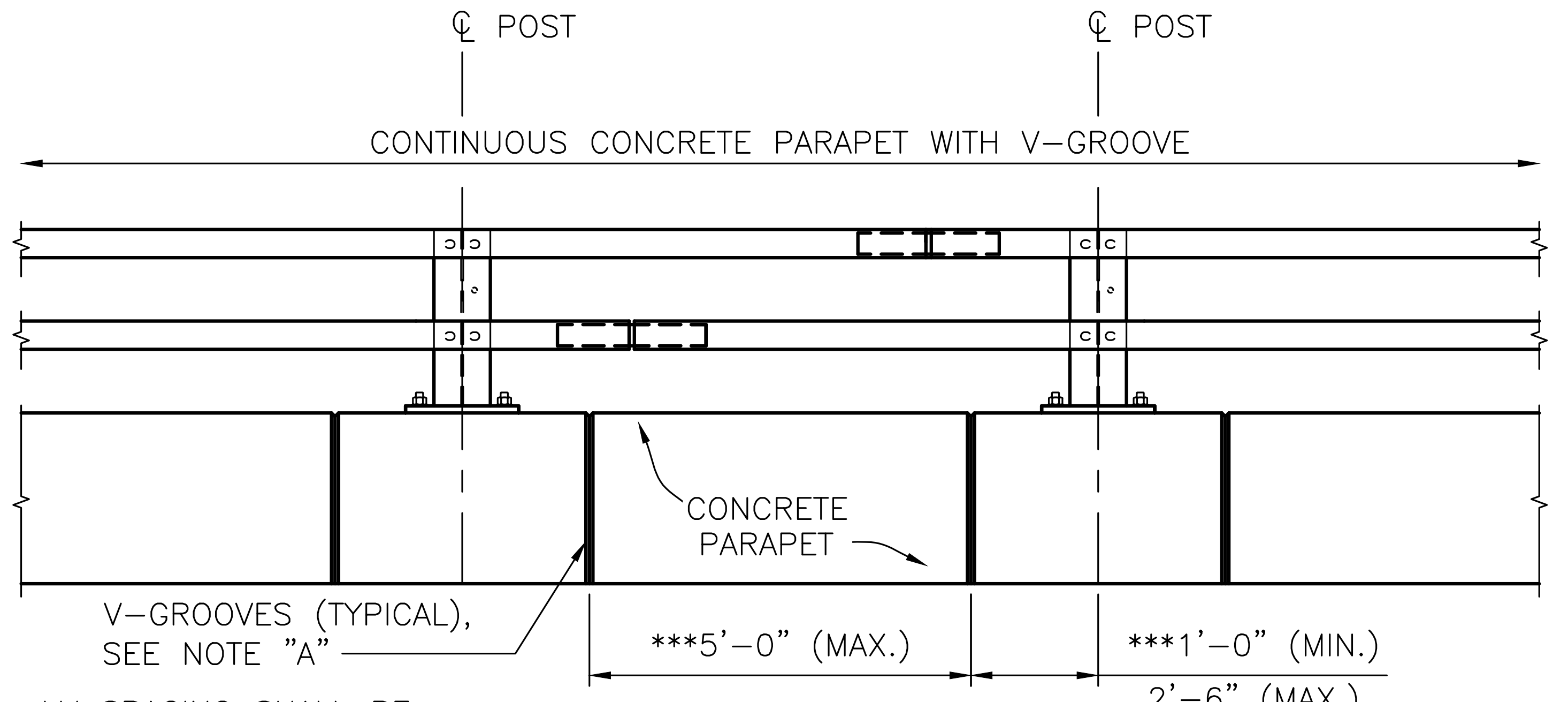
1. BRIDGE RAIL SHALL INCLUDE POSTS, BASE PLATES, ANCHOR RODS, PREFORMED PADS, RAIL ASSEMBLY BOLTS, NUTS, WASHERS, STUDS, STRUCTURAL TUBING, SPLICE BARS, PIPE SPACERS, REFLECTIVE DELINEATORS, ALL APPURTENANCES, METALIZING, AND PAINTING (IF SPECIFIED).
2. BRIDGE RAIL POSTS SHALL BE SET VERTICAL.
3. ENDS OF RAIL TUBE SECTIONS SHALL BE SAWED OR MILLED AND SHALL BE TRUE AND SMOOTH. ALL CUT EDGES OF ALL MATERIAL SHALL BE GROUND SMOOTH.
4. EACH PIECE OF RAIL TUBING SHALL BE CONTINUOUS OVER A MINIMUM OF THREE (3) POSTS BETWEEN SPLICES.
5. BOLT HOLES SHALL BE DRILLED OR PUNCHED.
6. AT INTERIOR SPLICES, PIPE SPACERS SHALL BE USED ON ONLY ONE SIDE OF THE SPLICE TO ALLOW MOVEMENT ON THAT SIDE. THE TOP AND BOTTOM RAIL SHALL RECEIVE THE SAME TREATMENT. AT END SPLICES PIPE SPACERS SHALL BE USED ON BOTH SIDES OF THE SPLICE TO ALLOW MOVEMENT ON EACH SIDE.
7. MILL OR SHOP TRANSVERSE WELDS SHALL NOT BE PERMITTED ON ANY RAIL ELEMENT. RAIL ELEMENTS USED ON CURVES SHALL BE SHOP FORMED TO THE REQUIRED CURVATURE.
8. NO PUNCHING, DRILLING, CUTTING OR WELDING SHALL BE PERMITTED AFTER METALIZING OR GALVANIZING. DAMAGED AREAS OF METALIZING OR GALVANIZING SHALL BE REPAIRED IN STRICT CONFORMANCE WITH THE MATERIAL SUPPLIER'S RECOMMENDATIONS AND SHALL BE APPROVED BY THE ENGINEER.
9. NUTS FOR 1 1/8"ø THREADED ANCHOR RODS CONNECTING THE BASE PLATE TO THE CONCRETE SHALL BE TIGHTENED TO A SNUG FIT AND GIVEN AN ADDITIONAL 1/8 TURN.
10. THREADS FOR ANCHOR RODS MAY BE ROLLED OR CUT. IF CUT THREADS ARE USED, BOLT DIAMETER SHALL NOT BE LESS THAN NOMINAL DIAMETER. IF ROLLED THREADS ARE USED, ROD DIAMETER SHALL NOT BE LESS THAN ROOT DIAMETER OF THREADS.
11. FOR RAIL CONNECTION TO END POST, SEE "END POST DETAILS FOR BRIDGE COMBINATION RAIL (MASH TL–5)" DWG. (RI–TL5C.0).
12. RAILING SHALL BE SHOP PAINTED [INSERT PAINT COLOR].

MATERIAL NOTES

1. STRUCTURAL TUBING SHALL CONFORM TO THE REQUIREMENTS OF ASTM A500, GRADE B, STRUCTURAL STEEL TUBING. RAIL TUBING SHALL MEET THE LONGITUDINAL CHARPY V–NOTCH REQUIREMENTS OF 15 FT. LBS. AT 0° F. FOR ASTM A500, GRADE B, THE TEST SAMPLES SHALL BE TAKEN AFTER FORMING THE TUBES. CHARPY V–NOTCH IS NOT REQUIRED FOR SPLICE TUBES.
2. RAIL POSTS, BASE PLATES AND END POST RAILING PLATES SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M270 GRADE 50 (ASTM A572 GR 50), EXCEPT ANCHOR PLATES MAY BE AASHTO M270 GRADE 36 (ASTM A36).
3. THREADED STUDS AND MATCHING NUTS FOR RAIL–TO–POST ATTACHMENT (DETAIL 2) SHALL CONFORM TO ASTM A276 TYPE 304, STAINLESS STEEL, AND SHALL BE TORQUE TESTED PER AWS D1.5, 7.7.1. ALL OTHER BOLTS AND NUTS SHALL CONFORM TO ASTM A307 AND ASTM A563 GRADE A RESPECTIVELY OR BETTER. ANCHOR RODS SHALL CONFORM TO ASTM F1554, GRADE 105 WITH ASTM A563 NUTS, WASHERS SHALL BE SAE HARDENED ASTM F436.
4. ALL STEEL COMPONENTS (EXCEPT STAINLESS STEEL COMPONENTS) SHALL BE METALIZED IN ACCORDANCE WITH RIDOT SPECIFICATION 827 OR GALVANIZED IN ACCORDANCE WTIH RIDOT SPECIFICATION 843. THE METALIZING OR GALVANIZING SHALL HAVE A UNIFORM APPEARANCE, AND THE COATED MATERIAL SHALL BE PROPERLY STORED.
5. DETAIL 2 STUDS SHALL BE WELDED BEFORE TUBES ARE METALIZED OR GALVANIZED.
6. PREFORMED BEARING PADS (1/8" THICK) SHALL CONFORM TO AASHTO M251.

DESIGNER NOTES:

1. *THE BRIDGE COMBINATION RAIL HEIGHT MEASURED FROM THE ROADWAY SURFACE SHALL BE 4'–2". THE TOTAL HEIGHT OF THE BRIDGE COMBINATION RAIL MEASURED FROM THE BRIDGE DECK SHALL NOT EXCEED 4'–5" FOR BRIDGES WITH HMA WEARING SURFACES. THE ADDITIONAL 3" IN HEIGHT SHALL BE MADE UP IN THE CONCRETE PARAPET PORTION OF THE BRIDGE COMBINATION RAIL.*



*** SPACING SHALL BE UNIFORM ACROSS THE PARAPETS.

ELEVATION

CONCRETE PARAPET V–GROOVE SPACING

NOT TO SCALE

NOTE "A":

FORMED V–GROOVES IN THE CAST–IN–PLACE PARAPETS SHALL MAKE A 45° ANGLE WITH THE PARAPET SURFACES. THE LONGITUDINAL REINFORCING BARS IN THE CONCRETE PARAPET SHALL BE CONTINUOUS BETWEEN BRIDGE EXPANSION JOINTS. WHERE SPLICES ARE REQUIRED, THE LENGTH OF THE LAP SHALL BE SUFFICIENT TO DEVELOP EACH BAR.

BRIDGE COMBINATION RAIL
IS MASH 2016 TL–5
COMPLIANT

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No.	DATE
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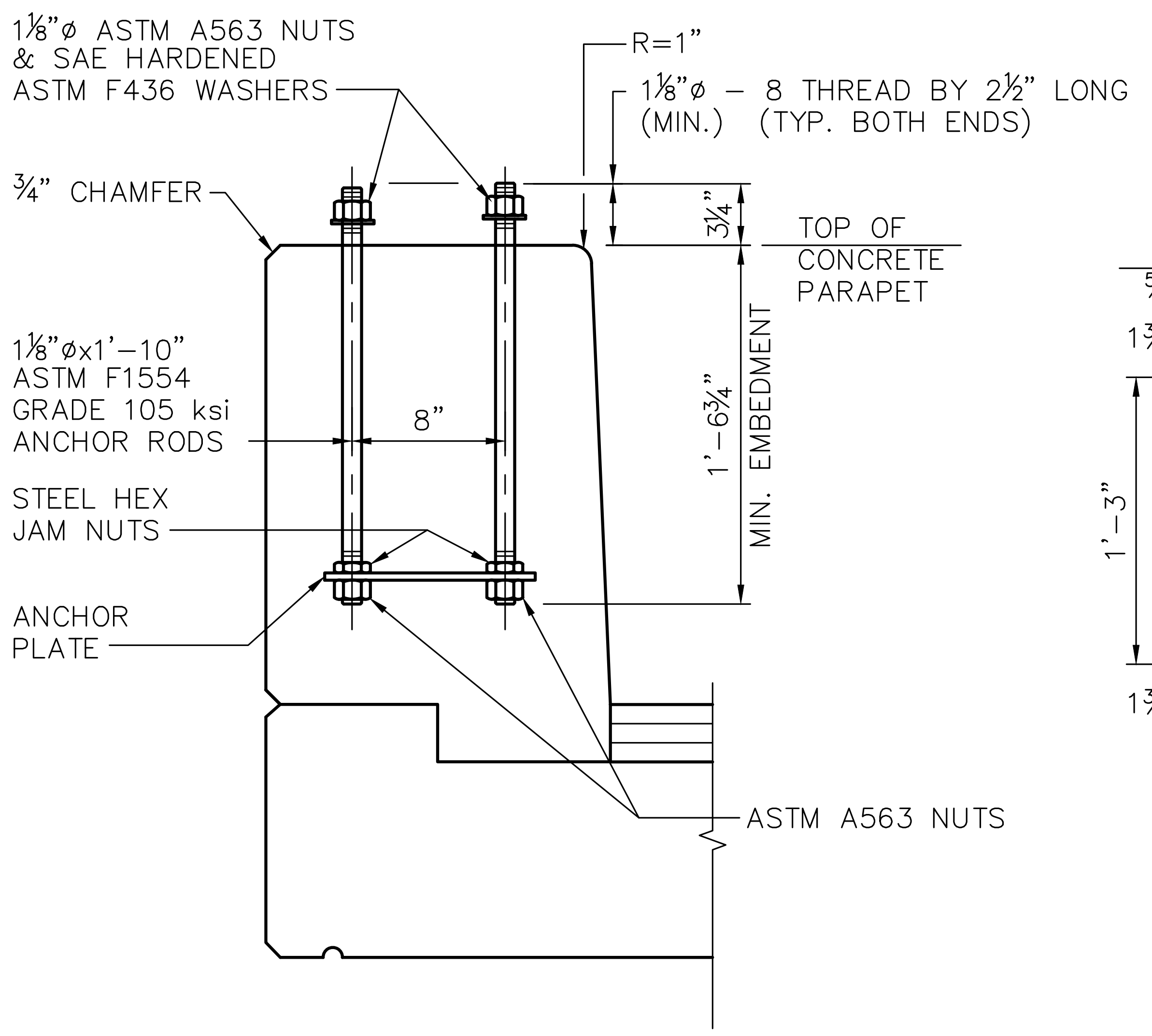
RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

BRIDGE STANDARDS

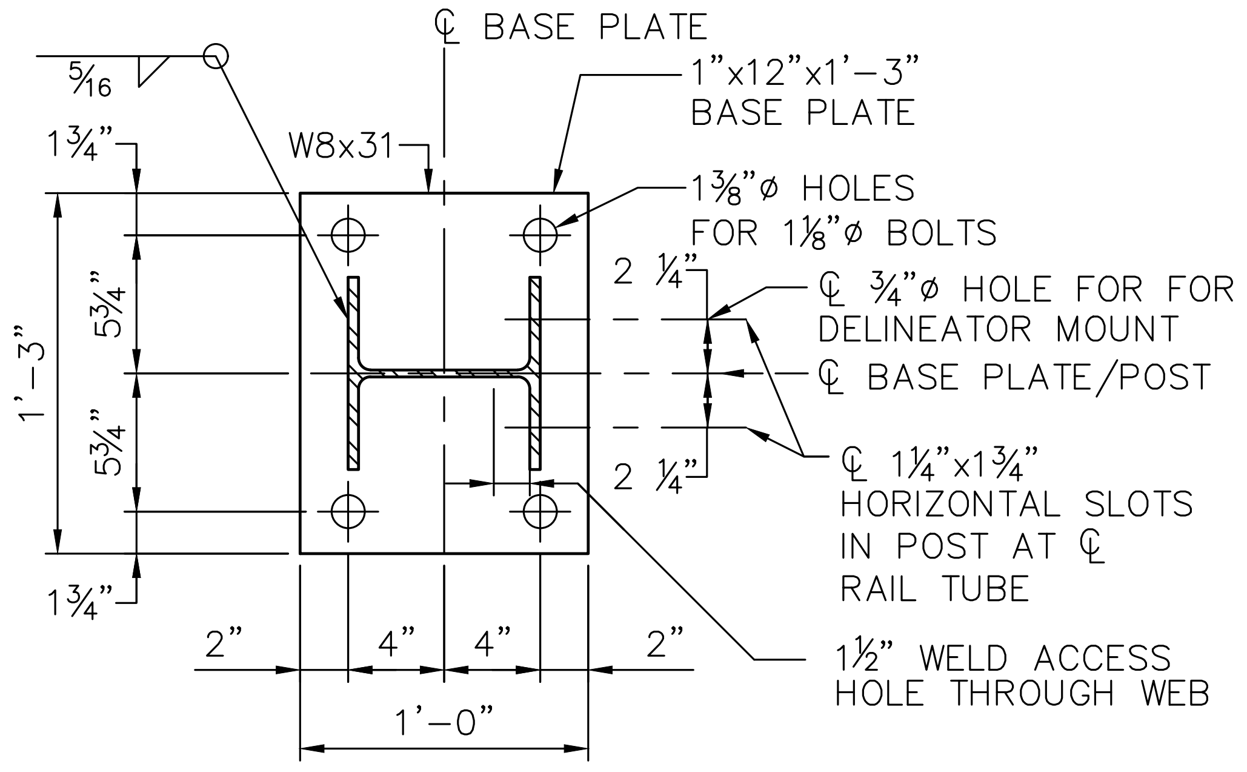
BRIDGE COMBINATION RAIL
(MASH TL–5)
SHEET 1

DRAWING NUMBER: RI-TL5C.1

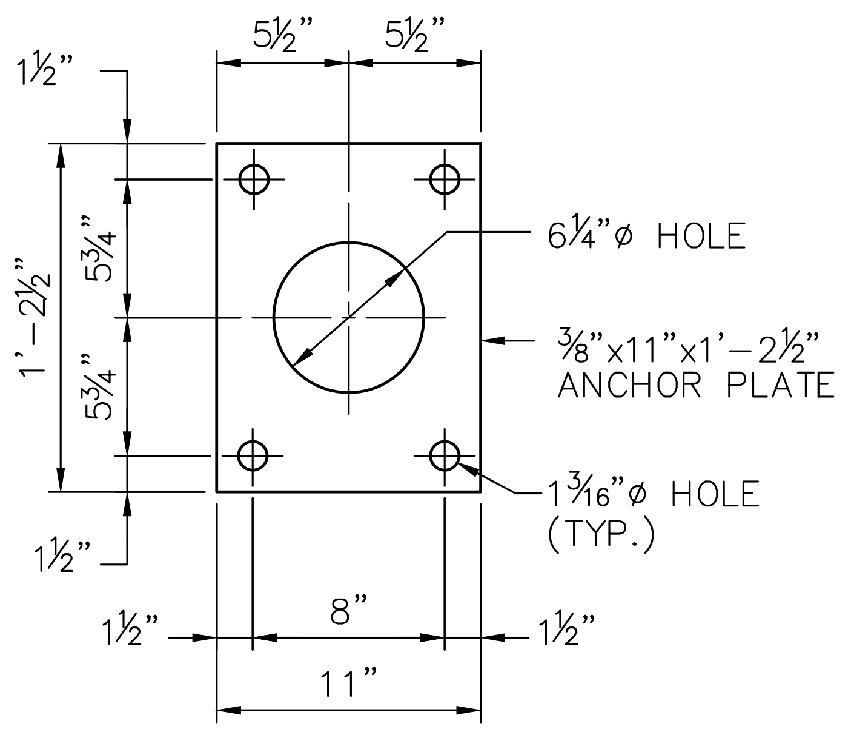

1⅛"ø ASTM A563 NUTS & SAE HARDENED ASTM F436 WASHERS
R=1"
1⅛"ø – 8 THREAD BY 2½" LONG (MIN.) (TYP. BOTH ENDS)
¾" CHAMFER
3¾"
TOP OF CONCRETE PARAPET
1⅛"øx1'–10" ASTM F1554 GRADE 105 ksi ANCHOR RODS
8"
1'-6¾" MIN. EMBEDMENT
STEEL HEX JAM NUTS
ANCHOR PLATE
ASTM A563 NUTS

POST ANCHOR ASSEMBLY

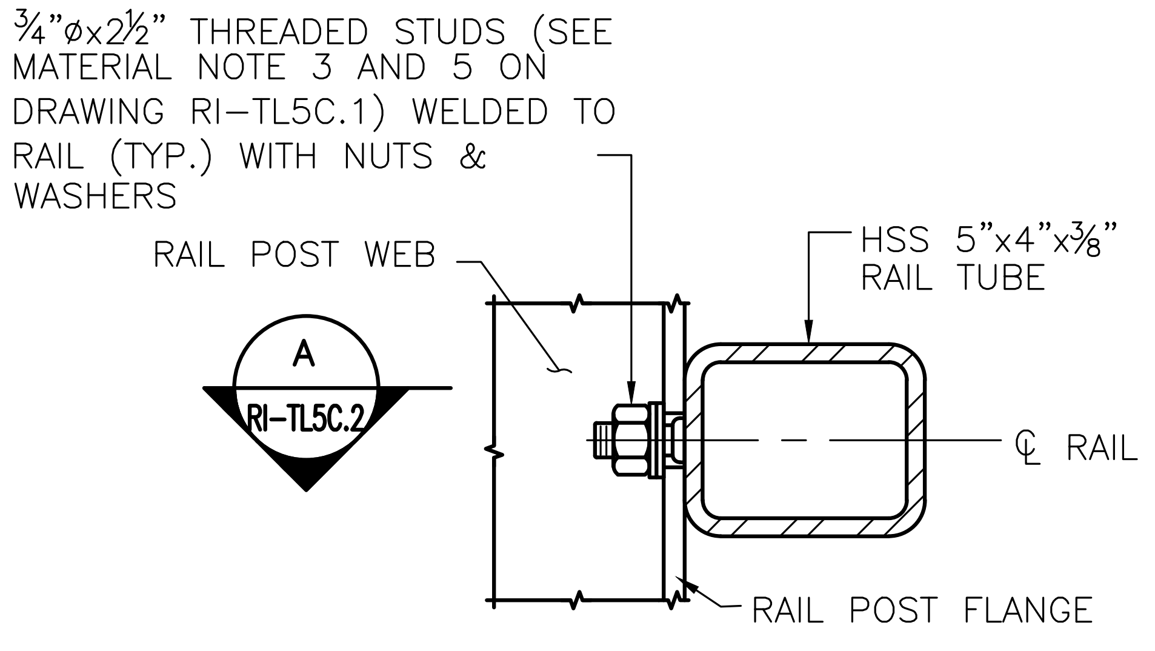
DETAIL ① RI-TL5C.1
SCALE: 1½"=1'–0"


℄ BASE PLATE
1"x12"x1'–3" BASE PLATE
5⁄16
W8x31
1¾"
1⅜"ø HOLES FOR 1⅛"ø BOLTS
2 ¼"
℄ ¾"ø HOLE FOR FOR DELINEATOR MOUNT
℄ BASE PLATE/POST
1'–3"
5¾"
5¾"
2 ¼"
℄ 1¼"x1¾" HORIZONTAL SLOTS IN POST AT ℄ RAIL TUBE
1¾"
1½" WELD ACCESS HOLE THROUGH WEB
2"
4"
4"
2"
1'–0"

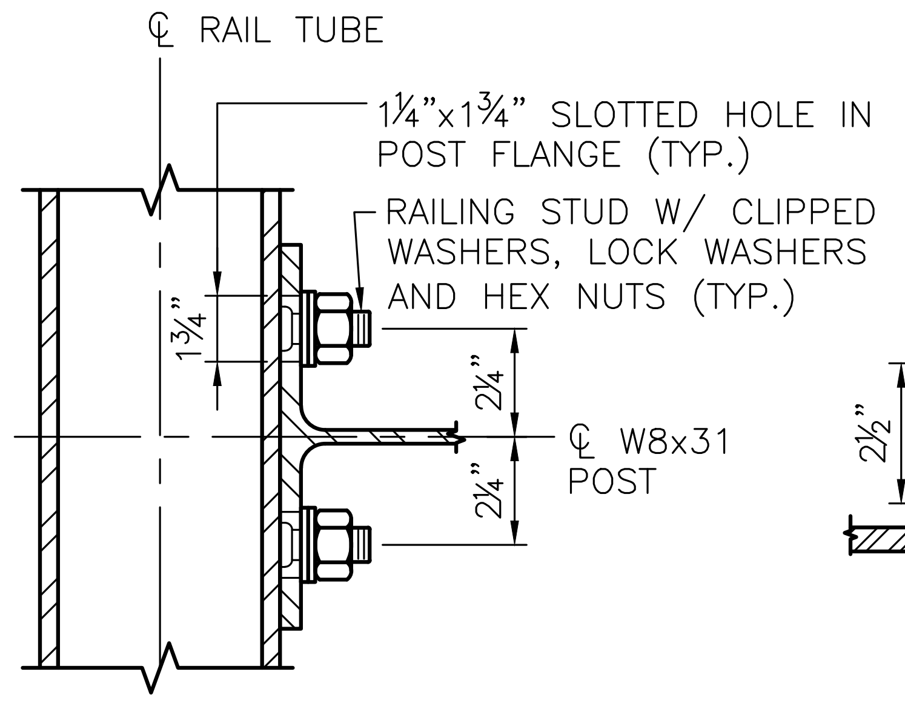
POST BASE PLATE
SCALE: 1½"=1'–0"



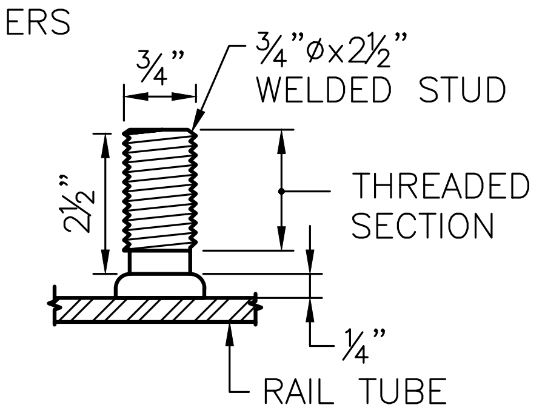
ANCHOR PLATE
SCALE: 1½"=1'–0"


¾"øx2½" THREADED STUDS (SEE MATERIAL NOTE 3 AND 5 ON DRAWING RI-TL5C.1) WELDED TO RAIL (TYP.) WITH NUTS & WASHERS
RAIL POST WEB
HSS 5"x4"x⅜" RAIL TUBE
A
RI-TL5C.2
℄ RAIL
RAIL POST FLANGE

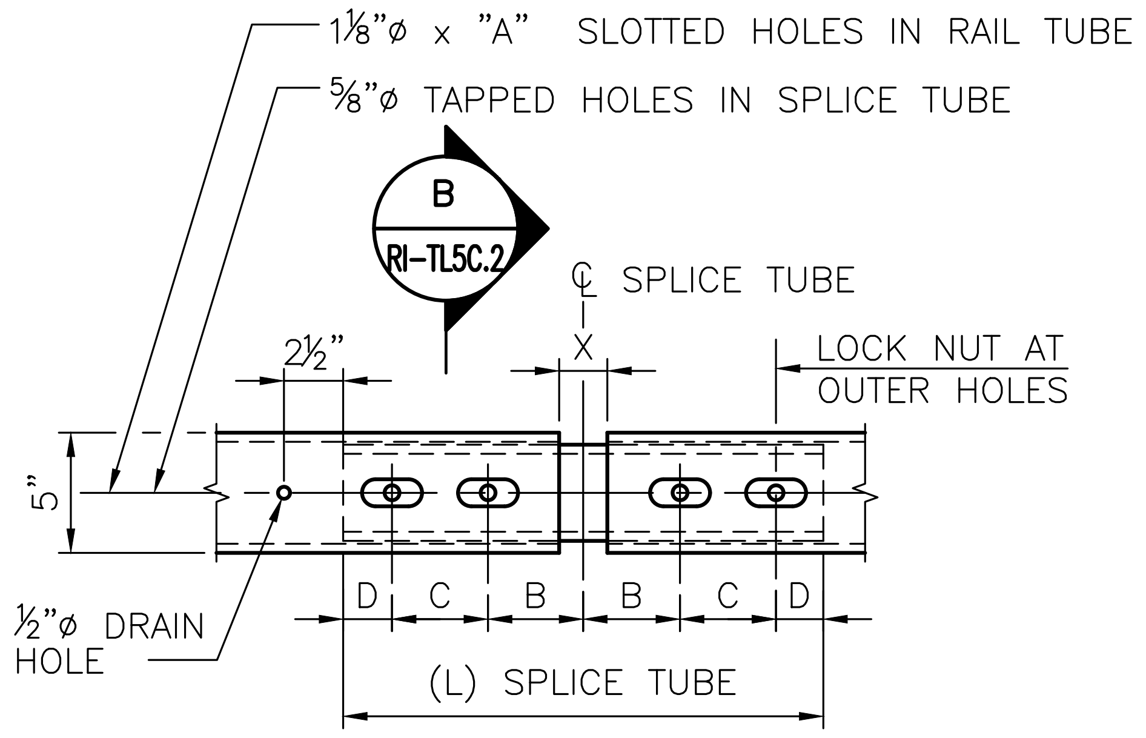
DETAIL ② RI-TL5C.1
SCALE: 3"=1'–0"


℄ RAIL TUBE
1¼"x1¾" SLOTTED HOLE IN POST FLANGE (TYP.)
RAILING STUD W/ CLIPPED WASHERS, LOCK WASHERS AND HEX NUTS (TYP.)
1¾"
2¼"
2¼"
℄ W8x31 POST

SECTION (A) RI-TL5C.2
SCALE: 3"=1'–0"



RAILING STUD DETAIL
NOT TO SCALE

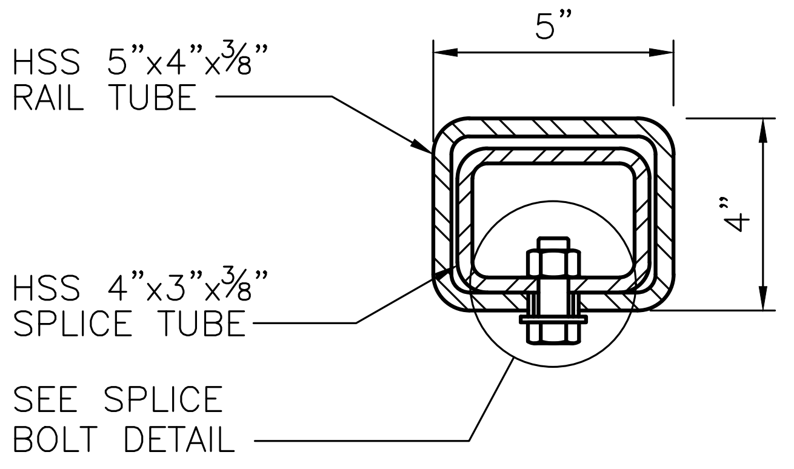


RAIL SPLICE (BOTTOM VIEW)

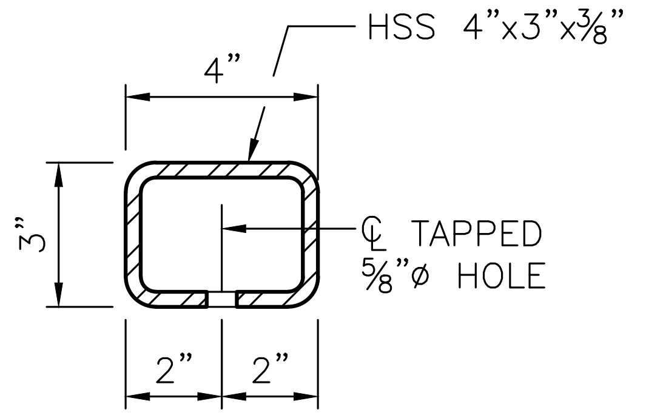
DETAIL ③ RI-TL5C.1
SCALE: 1½"=1'–0"

SPLICE TUBE DIMENSION TABLE							
	TOTAL MOVEMENT	A	B	C	D	X	L
	INTERIOR	2½"	5"	5"	2½"	1"	2'–1"
*	< 3¼"	2½"	5"	5"	3"	2"	2'–2"
*	3¼" TO 5 ¼"	3½"	5"	5"	3½"	3"	2'–3"

* = END SPLICE BAR

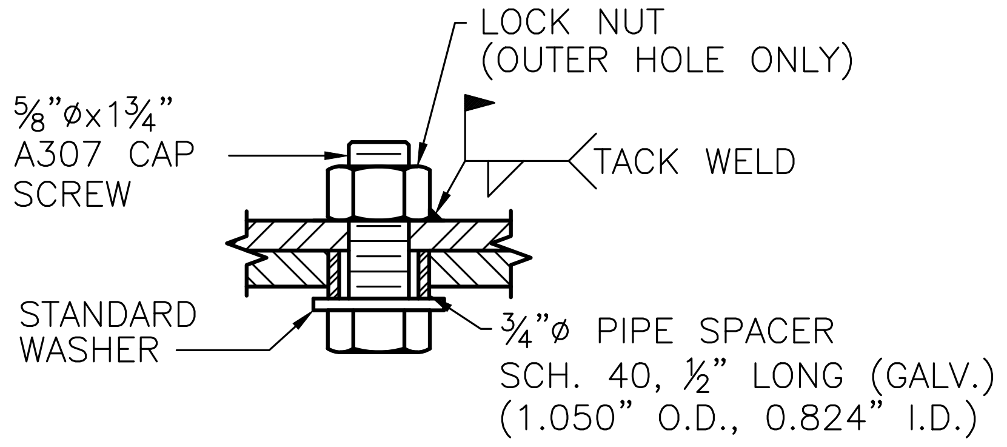


SECTION (B) RI-TL5C.2
SCALE: 3"=1'–0"

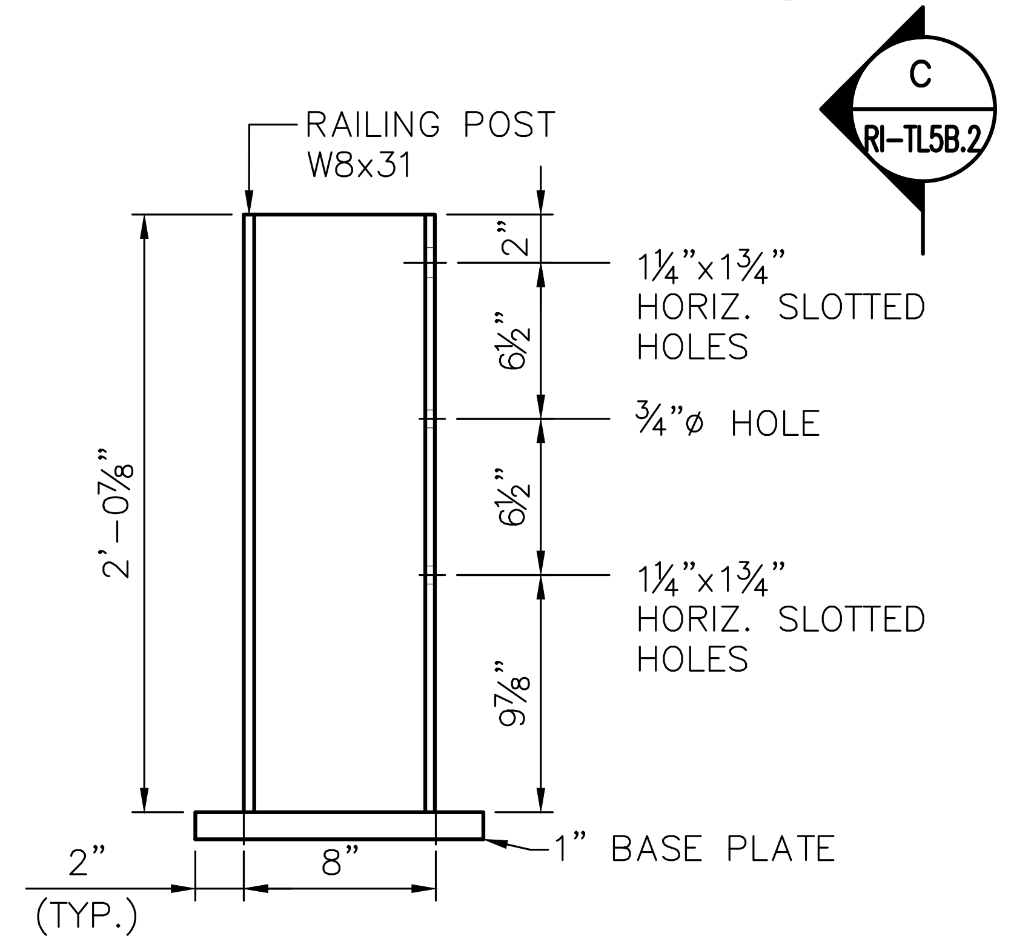


SPLICE TUBE SECTION
SCALE: 3"=1'–0"

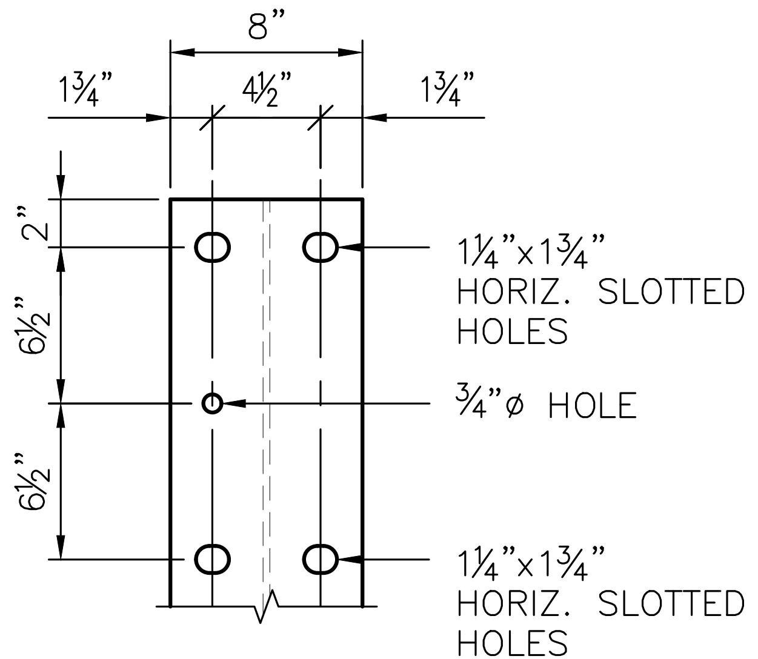
RAIL SPLICE DETAILS
SCALE: 3"=1'–0"


LOCK NUT (OUTER HOLE ONLY)
⅝"øx1¾" A307 CAP SCREW
TACK WELD
STANDARD WASHER
¾"ø PIPE SPACER SCH. 40, ½" LONG (GALV.) (1.050" O.D., 0.824" I.D.)

SPLICE BOLT DETAIL
NOT TO SCALE



SIDE ELEVATION



VIEW (C) RI-TL5B.2

RAIL POST DETAILS
SCALE: 1½"=1'–0"

BRIDGE COMBINATION RAIL IS
MASH 2016 TL–5
COMPLIANT

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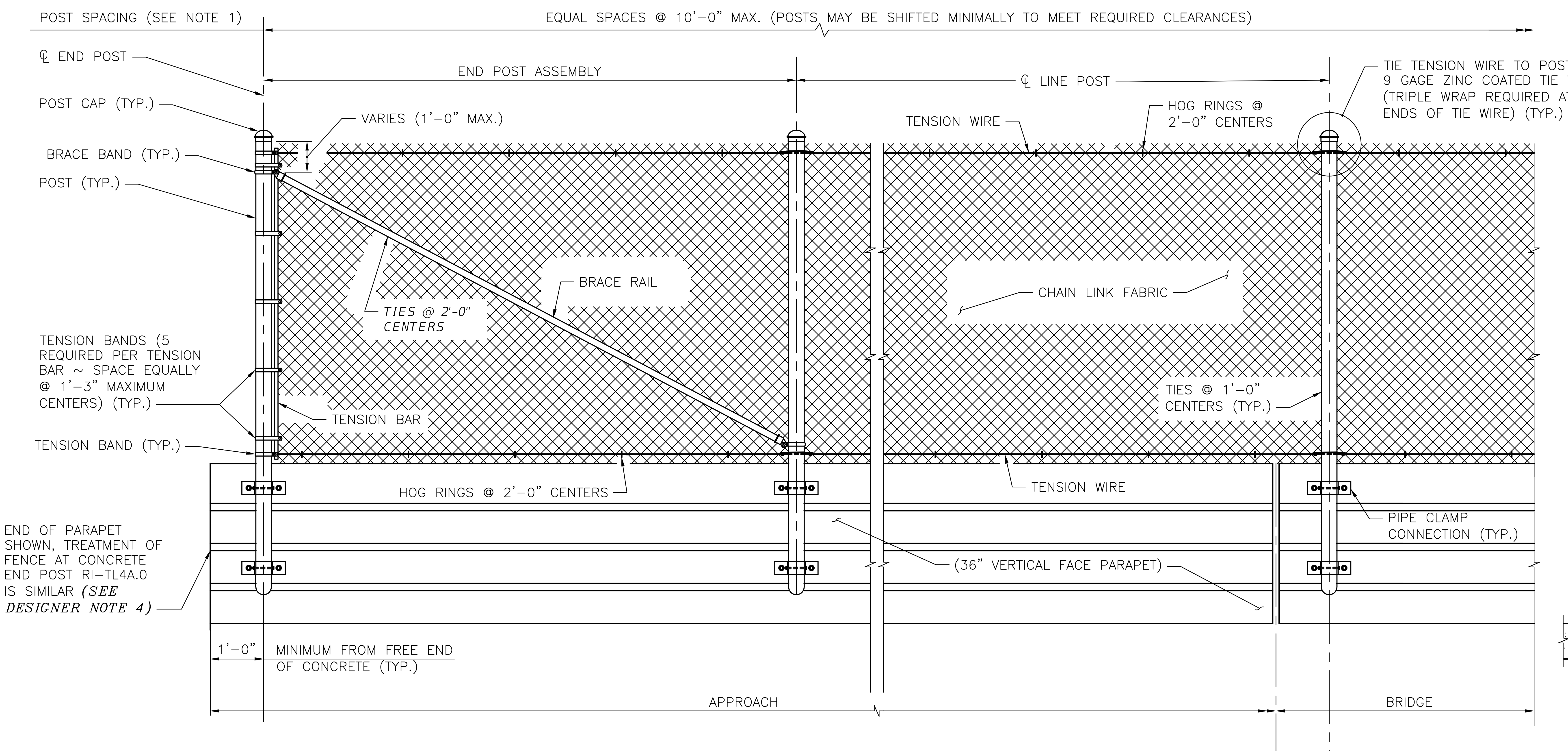
RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

BRIDGE STANDARDS

BRIDGE COMBINATION RAIL
(MASH TL–5)
SHEET 2

DRAWING NUMBER: RI-TL5C.2



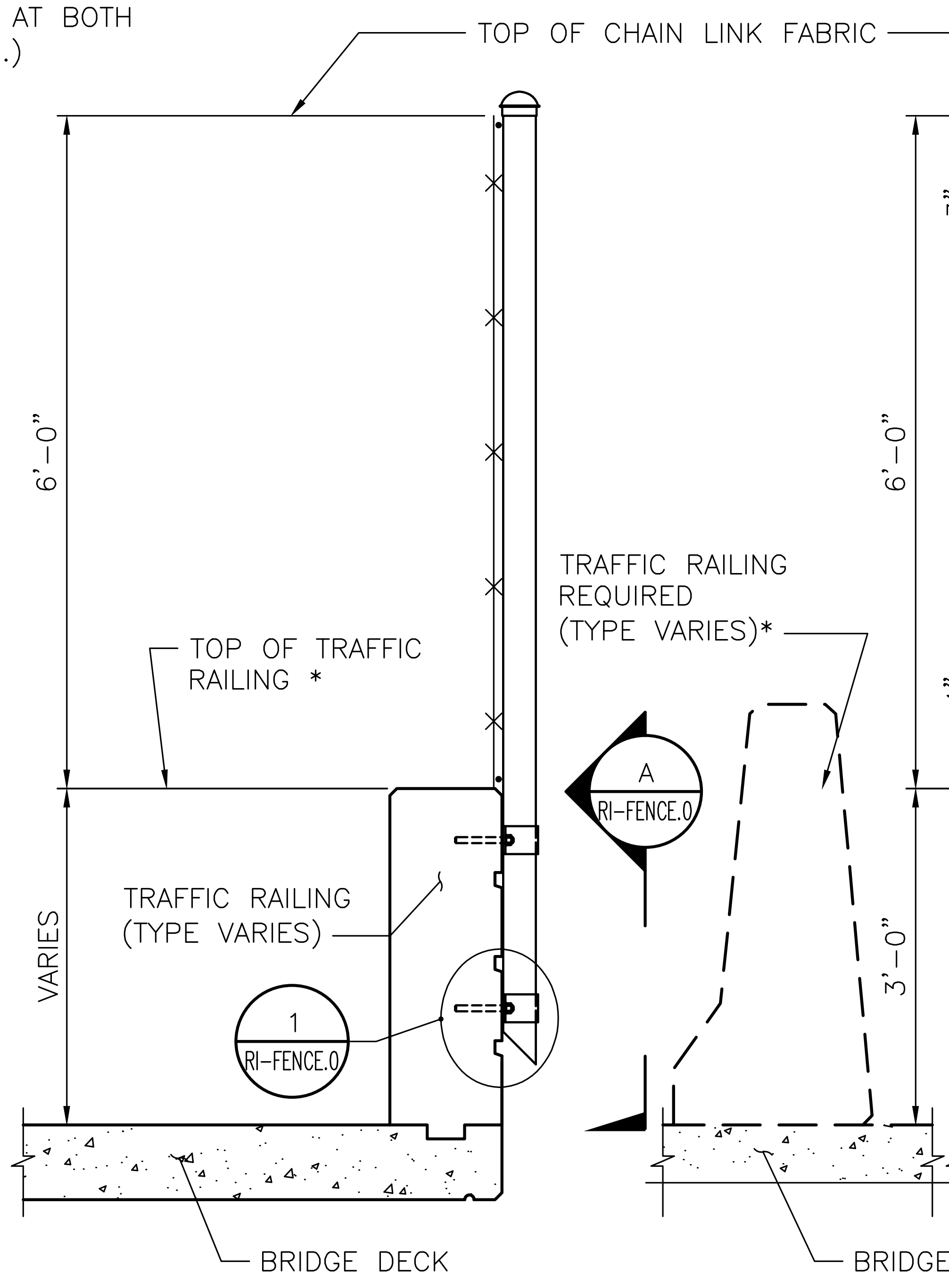
POST SPACING (SEE NOTE 1)
EQUAL SPACES @ 10'-0" MAX. (POSTS MAY BE SHIFTED MINIMALLY TO MEET REQUIRED CLEARANCES)
℄ END POST
END POST ASSEMBLY
℄ LINE POST
TIE TENSION WIRE TO POST WITH 9 GAGE ZINC COATED TIE WIRE (TRIPLE WRAP REQUIRED AT BOTH ENDS OF TIE WIRE) (TYP.)
POST CAP (TYP.)
VARIES (1'-0" MAX.)
TENSION WIRE
HOG RINGS @ 2'-0" CENTERS
BRACE BAND (TYP.)
POST (TYP.)
BRACE RAIL
TIES @ 2'-0" CENTERS
CHAIN LINK FABRIC
TENSION BANDS (5 REQUIRED PER TENSION BAR ~ SPACE EQUALLY @ 1'-3" MAXIMUM CENTERS) (TYP.)
TENSION BAR
TIES @ 1'-0" CENTERS (TYP.)
TENSION BAND (TYP.)
HOG RINGS @ 2'-0" CENTERS
TENSION WIRE
PIPE CLAMP CONNECTION (TYP.)
END OF PARAPET SHOWN, TREATMENT OF FENCE AT CONCRETE END POST RI-TL4A.0 IS SIMILAR (SEE DESIGNER NOTE 4)
(36" VERTICAL FACE PARAPET)
1'-0"
MINIMUM FROM FREE END OF CONCRETE (TYP.)
APPROACH
BRIDGE
1'-0"
MINIMUM FROM ℄ EXPANSION JOINT (SHOWN) AND ℄ OPEN JOINT IN BARRIER OR PARAPET (TYP.) (SEE RI-FENCE.2 FOR JOINTS THAT EXCEED 6" MOVEMENT)

ELEVATION OF OUTSIDE FACE OF RAILING

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

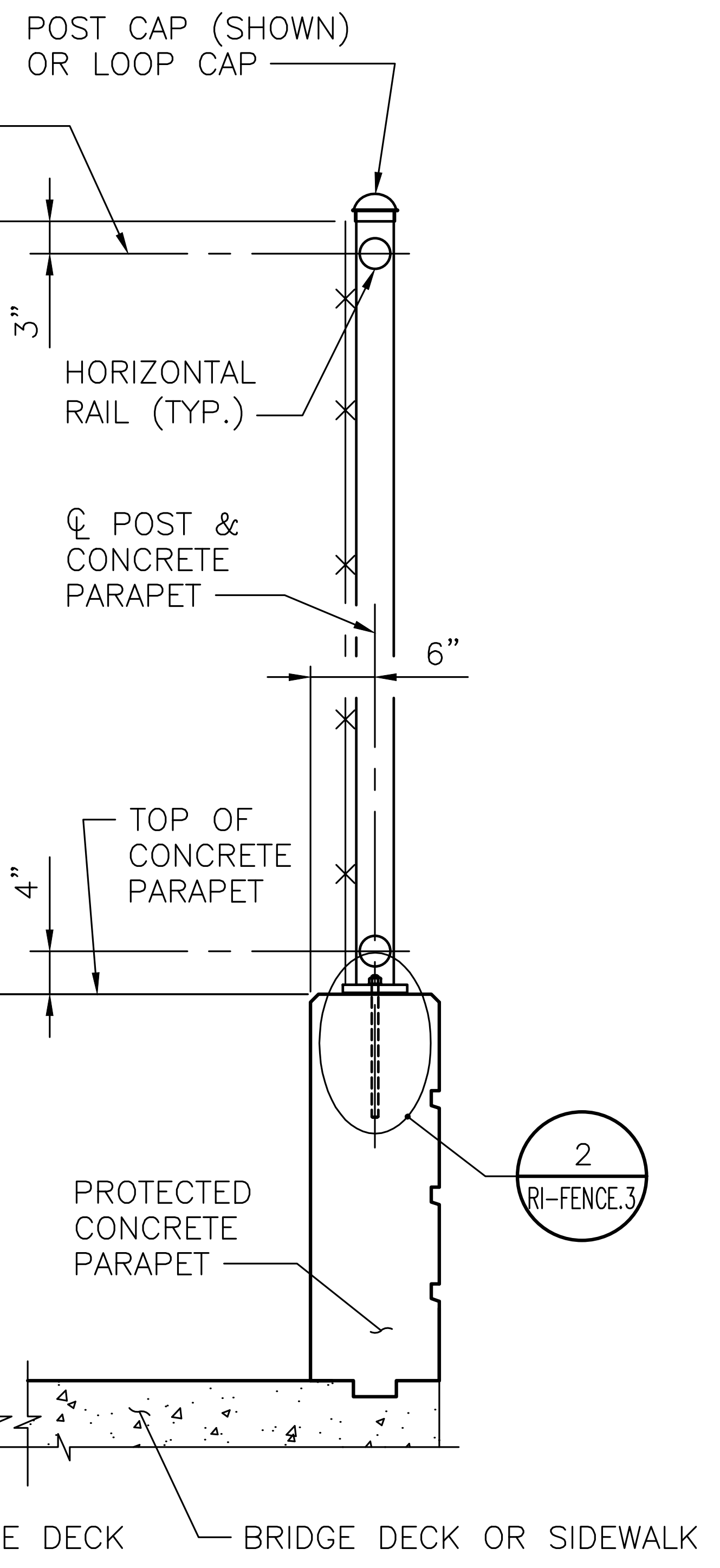
NOTES:

1. A PULL POST ASSEMBLY IS REQUIRED AT MAXIMUM INTERVALS OF 500'-0". SEE DWG. RI-FENCE.2



TYPICAL SECTION ON TRAFFIC RAILING BARRIER

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



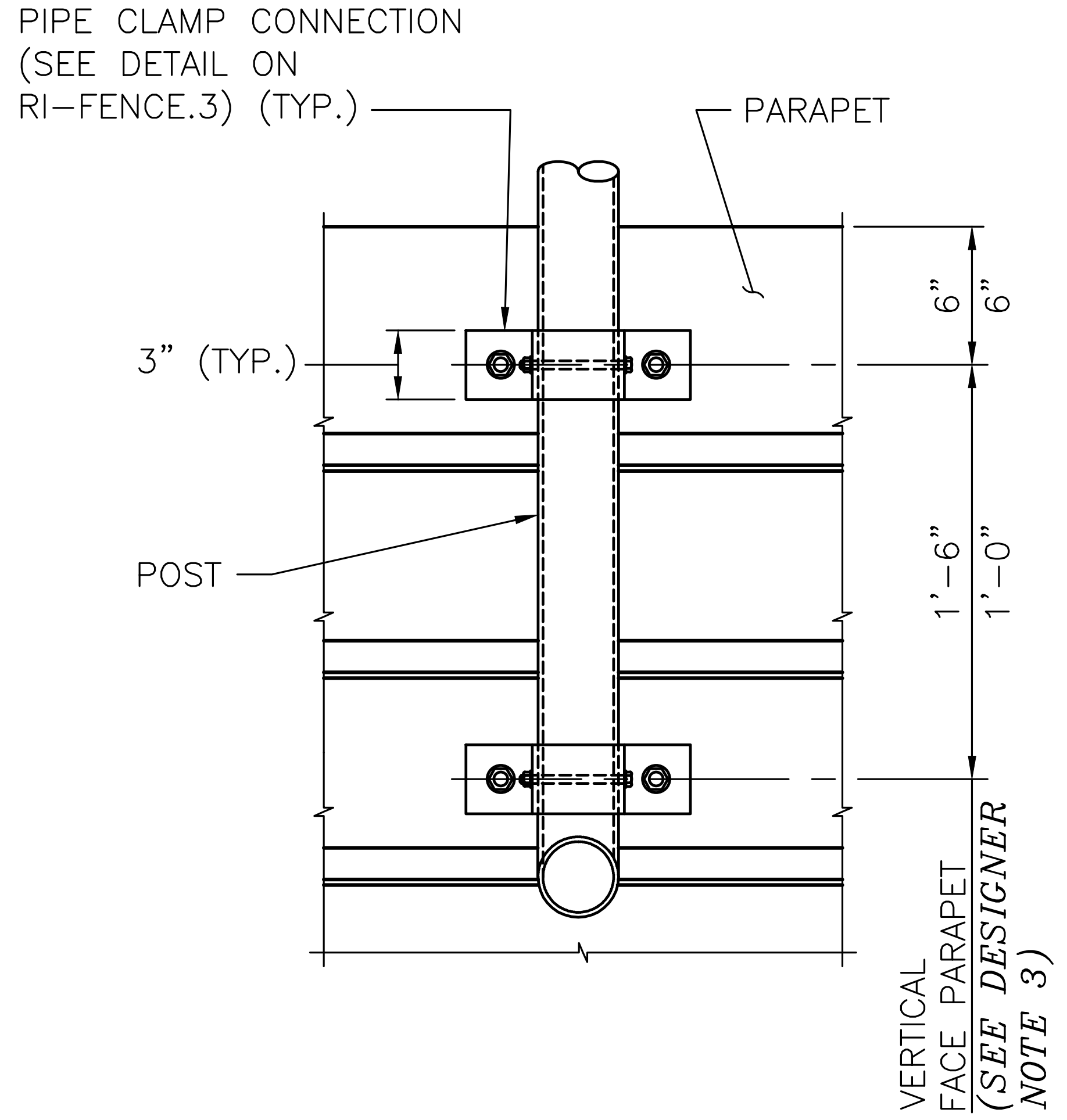
TYPICAL SECTION ON CONCRETE PARAPET

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

* DO NOT ANCHOR PROTECTIVE SCREEN TO THE TOP OF TRAFFIC RAILING/BARRIER.

DESIGNER NOTES:

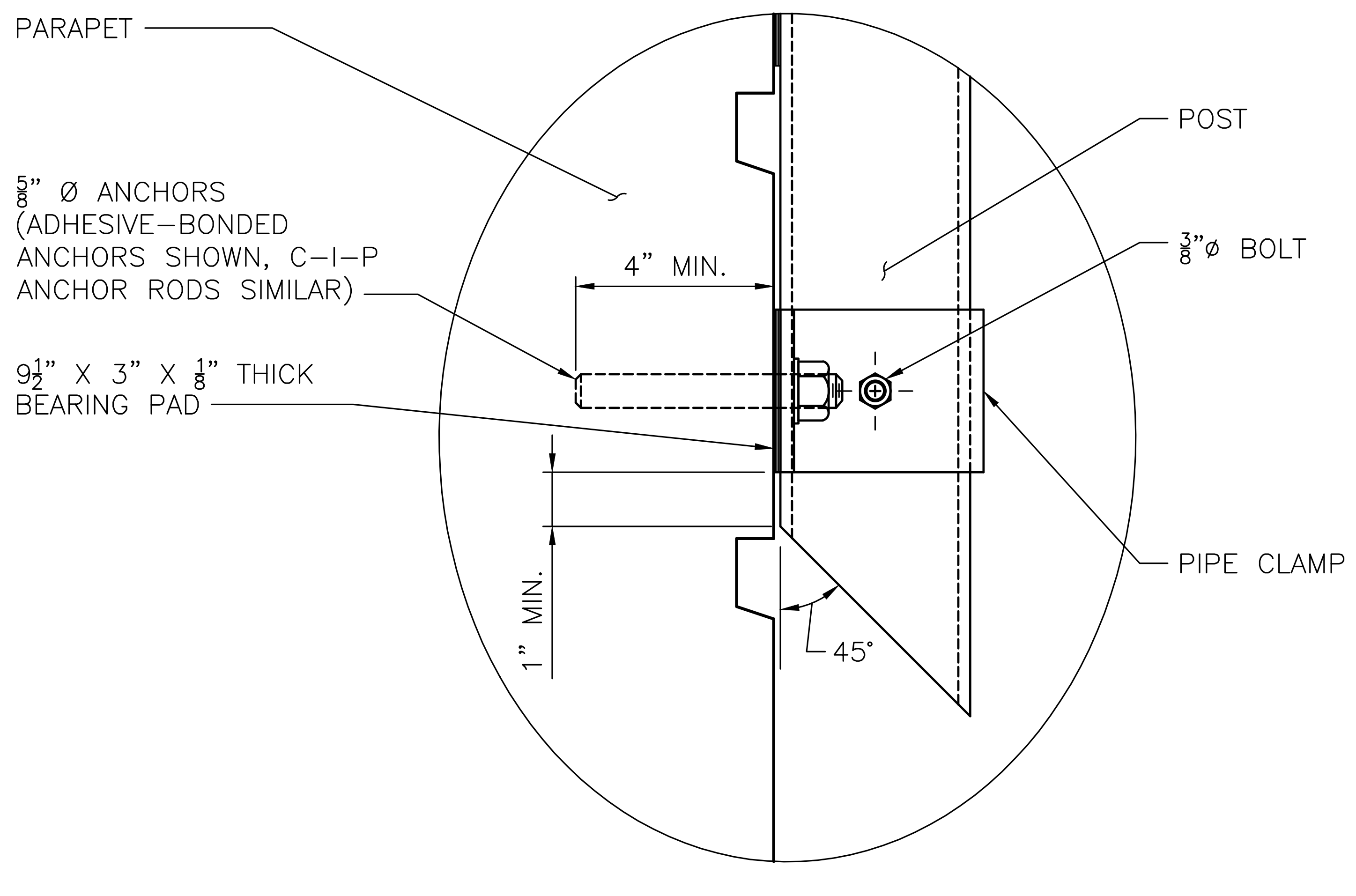
1. *ATTACHMENTS TO THE BARRIER SYSTEM SHALL BE AVOIDED WHENEVER POSSIBLE. A CHAIN LINK FENCE ATTACHED TO A BARRIER, WHETHER MOUNTED ON TOP OR TO THE BACKSIDE DOWN GRADES THE CRASHWORTHINESS OF THE SYSTEM TO MASH TL-3 DUE TO OCCUPANCY RISK.*
2. *FENCE ANCHORAGE TO THE CONCRETE TRAFFIC RAIL SHALL BE CAST-IN-PLACE FOR NEW CONSTRUCTION. ANCHORAGE INSTALLED IN EPOXY ADHESIVE SHALL BE USED TO CONNECT PROPOSED PROTECTIVE SCREEN TO AN EXISTING PARAPET.*
3. *PROTECTIVE SCREEN SHALL BE USED WITH RI-TL4 VERTICAL FACE PARAPET AND END POST (RI-TL-4A.0) ONLY.*
4. *FENCE END TREATMENT AT CONCRETE END POST RI-TL4A.0 SHALL BE DETERMINED AND PROVIDED ON THE CONTRACT DRAWINGS BY THE DESIGNER. ATTENTION SHOULD BE GIVEN TO LOCATION OF BRACE RAILS RELATIVE TO BRIDGE EXPANSION JOINTS.*



PIPE CLAMP CONNECTION (SEE DETAIL ON RI-FENCE.3) (TYP.)
PARAPET
6"
6"
3" (TYP.)
1'-6"
1'-0"
POST
VERTICAL FACE PARAPET (SEE DESIGNER NOTE 3)

SECTION A

SCALE: 1"=1'-0" RI-FENCE.0



PARAPET
POST
5/8" Ø ANCHORS (ADHESIVE-BONDED ANCHORS SHOWN, C-I-P ANCHOR RODS SIMILAR)
4" MIN.
3/8"Ø BOLT
9 1/2" X 3" X 1/8" THICK BEARING PAD
1" MIN.
45°
PIPE CLAMP

DETAIL 1

SCALE: N.T.S. RI-FENCE.0

NOTES:

1. ALL POSTS SHALL BE SET VERTICAL UNLESS OTHERWISE SPECIFIED. INSTALL CHAIN LINK FENCE IN ACCORDANCE WITH ASTM F567 AS APPLICABLE.
2. MAXIMUM POST SPACING SHALL BE 10'-0".

POST ATTACHMENT NOTES

ANCHOR RODS, NUTS AND WASHERS:

AFTER THE NUTS HAVE BEEN TIGHTENED, DISTORT THE ANCHOR ROD THREADS TO PREVENT REMOVAL OF THE NUTS.

COATINGS:

HOT-DIP GALVANIZE ALL NUTS, WASHERS, BOLTS, FENCE FRAMEWORK (POSTS, INTERNAL SLEEVES, SHIM PLATES, BASE PLATES, PIPE CLAMPS AND SPACERS), C-I-P ANCHOR RODS, ADHESIVE ANCHORS, NUTS AND WASHERS ASSOCIATED WITH THE ANCHORAGE CONNECTION IN ACCORDANCE WITH SPECIFICATION SECTION M.05.

ADHESIVE-BONDED ANCHORS AND DOWELS
(PROPOSED FENCE MOUNTED ON EXISTING BARRIERS ONLY):

ADHESIVE BONDING MATERIAL SYSTEMS FOR ANCHORS AND DOWELS SHALL BE PROPOSED BY THE CONTRACTOR FOR APPROVAL BY THE ENGINEER. THE ADHESIVE BONDING MATERIAL SHALL BE LISTED ON THE DEPARTMENT'S APPROVED MATERIAL LIST. DAMAGE TO EXISTING REINFORCING STEEL DURING ANCHOR BOLT DRILLING IS NOT PERMITTED

WELDING:

ALL WELDING WILL BE IN ACCORDANCE WITH THE AMERICAN WELDING SOCIETY STRUCTURAL WELDING CODE (STEEL) ANSI/AWS D1.1 (CURRENT EDITION). WELD METAL WILL BE E60XX OR E70XX. NONDESTRUCTIVE TESTING OF WELDS IS NOT REQUIRED.

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RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

BRIDGE STANDARDS

PROTECTIVE SCREEN
(CHAIN LINK FENCE)
SHEET 1

DRAWING NUMBER:RI-FENCE.0

TABLE OF CHAIN LINK FENCE COMPONENTS

	COMPONENT	ASTM DESIGNATION	COMPONENT INFORMATION
TRAFFIC RAILINGS AND CONCRETE PARAPETS	POSTS (PEDESTRIAN FENCE)	F1083	GALVANIZED STEEL PIPE – 3" NPS, SCHEDULE 40 REGULAR GRADE
	POSTS (SNOW FENCE)	A53 GR. B	GALVANIZED STEEL PIPE – 2 1/2" NPS, SCHEDULE 40
	CHAIN LINK FABRIC (PEDESTRIAN FENCE) (2" MESH WITH TWISTED TOP AND KNUCKLED BOTTOM SELVAGE)	A392	ZINC COATED STEEL – 9 GAGE (COATED WIRE DIAMETER), CLASS 2 COATING
		A491	ALUMINUM COATED STEEL – 9 GAGE (COATED WIRE DIAMETER)
		F668	POLYVINYL CHLORIDE (PVC) COATED STEEL – 9 GAGE CLASS 2B
	CHAIN LINK FABRIC (SNOW FENCE) (1" MESH WITH TWISTED TOP AND BOTTOM SELVAGE)	A392	ZINC COATED STEEL – 9 GAGE (COATED WIRE DIAMETER), CLASS 2 COATING
		A491	ALUMINUM COATED STEEL – 9 GAGE (COATED WIRE DIAMETER)
		F668	POLYVINYL CHLORIDE (PVC) COATED STEEL – 9 GAGE CLASS 2B
	TIE WIRES	F626	ZINC COATED STEEL WIRE – 9 GAGE
	BRACE BANDS	F626	12 GAGE (MIN. THICKNESS) X ¾" (MIN. WIDTH) STEEL BANDS (BEVELED OR HEAVY) (GALVANIZED)
	TENSION BARS (PEDESTRIAN FENCE)	F626	3/16" (MIN. THICKNESS) X ¾" (MIN. WIDTH) X 5'–10" (MIN. HEIGHT) STEEL BARS (GALVANIZED)
	TENSION BARS (SNOW FENCE)	F626	3/16" (MIN. THICKNESS) X ¾" (MIN. WIDTH) X 1'–10" (MIN. HEIGHT) STEEL BARS (GALVANIZED)
	TENSION BANDS	F626	14 GAGE (MIN. THICKNESS) X ¾" (MIN. WIDTH) STEEL BANDS (GALVANIZED)
	MISCELLANEOUS FENCE COMPONENTS	F626	ZINC COATED STEEL ~ (INCLUDES POST OR LOOP CAPS, HORIZONTAL AND BRACE RAIL ENDS, COMBINATION RAIL ENDS, BOULEVARD CLAMPS AND ALL OTHER MISCELLANEOUS FITTINGS & HARDWARE)
PROTECTED FROM COLLISION CONCRETE PARAPETS	HORIZONTAL RAILS	F1083	GALVANIZED STEEL PIPE – 2½" NPS, SCHEDULE 40 REGULAR GRADE
	EXPANSION RAILS	F1083	GALVANIZED STEEL PIPE – 2" NPS, SCHEDULE 40 REGULAR GRADE
	BOLTS	A307	¼" Ø X 4¼" HEX HEAD BOLTS FOR EXPANSION RAIL CONNECTIONS (GALVANIZED)
	NUTS	A563	HEX NUTS FOR EXPANSION RAIL CONNECTIONS (GALVANIZED)
	WASHERS	F436	FLAT WASHERS FOR EXPANSION RAIL CONNECTIONS (GALVANIZED)
TRAFFIC RAILINGS	TENSION WIRE	A824 & A817	TYPE II (ZINC COATED STEEL WIRE) – 7 GAGE, CLASS 4 COATING
			TYPE I (ALUMINUM COATED STEEL WIRE) – 7 GAGE
	HOG RINGS	F626	ZINC COATED STEEL WIRE – 12 GAGE
	BRACE RAILS	F1083	GALVANIZED STEEL PIPE – 1¼" NPS, SCHEDULE 40 REGULAR GRADE

TABLE OF POST ATTACHMENT COMPONENTS

COMPONENT		ASTM DESIGNATION	COMPONENT INFORMATION
PIPE CLAMPS		A36 OR A709 GRADE 36	¼" STEEL PL
BASE PLATES		A36 OR A709 GRADE 36	¾" STEEL PL
SHIM PLATES		A36 OR A709 GRADE 36 OR B209 ALLOY 6061–T6 OR B221 ALLOY 6063–T5	PLATE THICKNESSES AS REQUIRED; HOLES IN SHIM PLATES WILL BE ¾" Ø
PIPE CLAMP CONNECTION	ADHESIVE ANCHOR RODS (EXISTING BARRIER CONNECTION)	F1554 GRADE 36	FULLY THREADED HEADLESS ANCHOR RODS ~ ⅝" Ø X 6"
	C–I–P ANCHOR RODS	F1554 GRADE 36	HEX HEAD ANCHOR RODS ~⅝" Ø X 6"
BASE PLATE CONNECTION	ADHESIVE ANCHOR RODS (EXISTING BARRIER CONNECTION)	F1554 GRADE 36	FULLY THREADED HEADLESS ANCHOR RODS ~ ⅞" Ø X 14½"
	C–I–P ANCHOR RODS	F1554 GRADE 36	HEX HEAD ANCHOR RODS ~ ⅞" Ø X 14½"
BOLTS		A307	⅜" Ø X 4¾" HEX HEAD BOLTS FOR PIPE CLAMP CONNECTIONS TO POSTS
NUTS		A563	HEX NUTS FOR PIPE CLAMP AND BASE PLATE CONNECTIONS
WASHERS		F436	FLAT WASHERS FOR PIPE CLAMP AND BASE PLATE CONNECTIONS
BEARING PADS (PLAIN NEOPRENE)		N/A	SHALL CONFORM TO AASHTO M251

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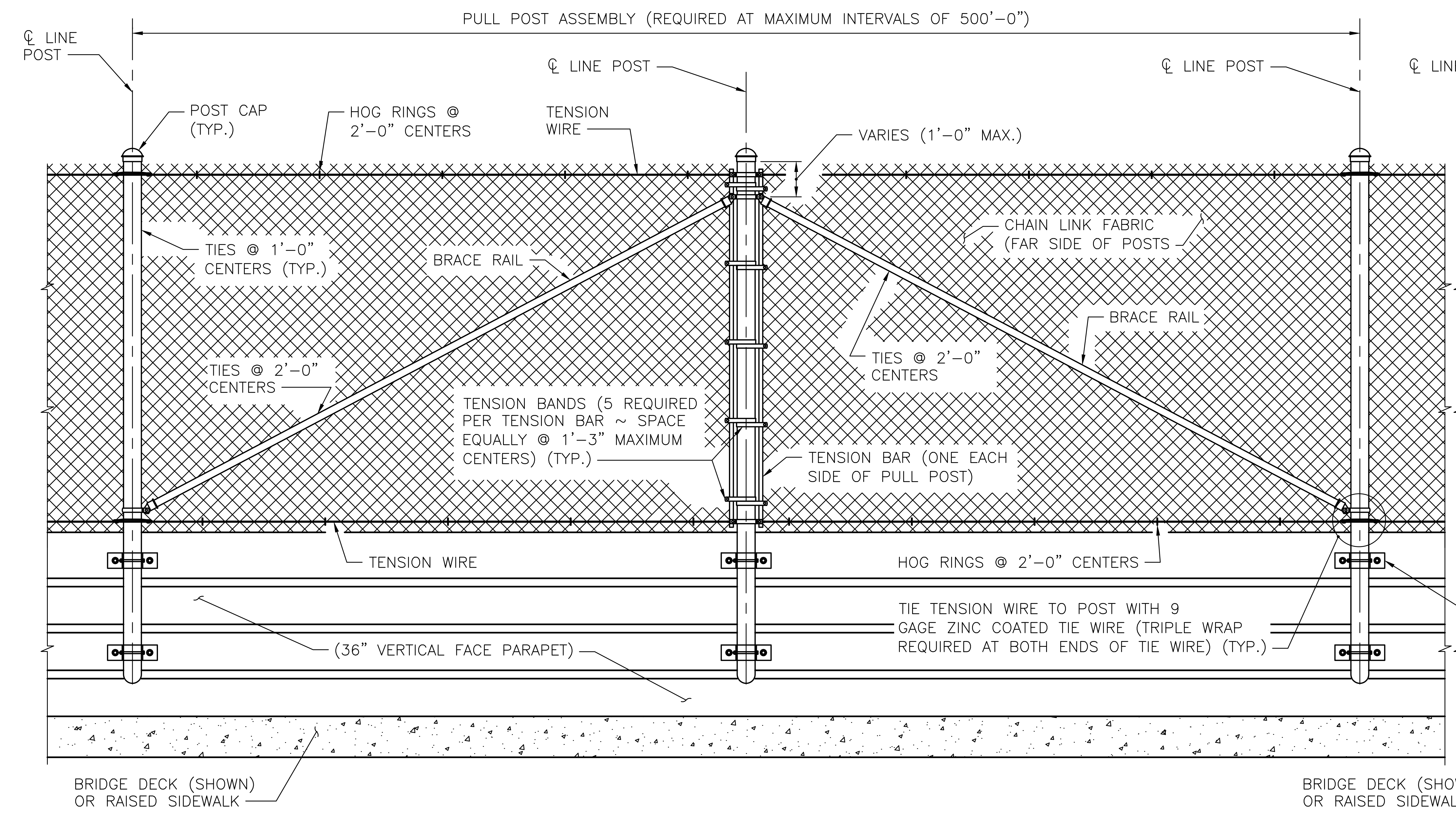
RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

BRIDGE STANDARDS

PROTECTIVE SCREEN (CHAIN LINK FENCE) SHEET 2

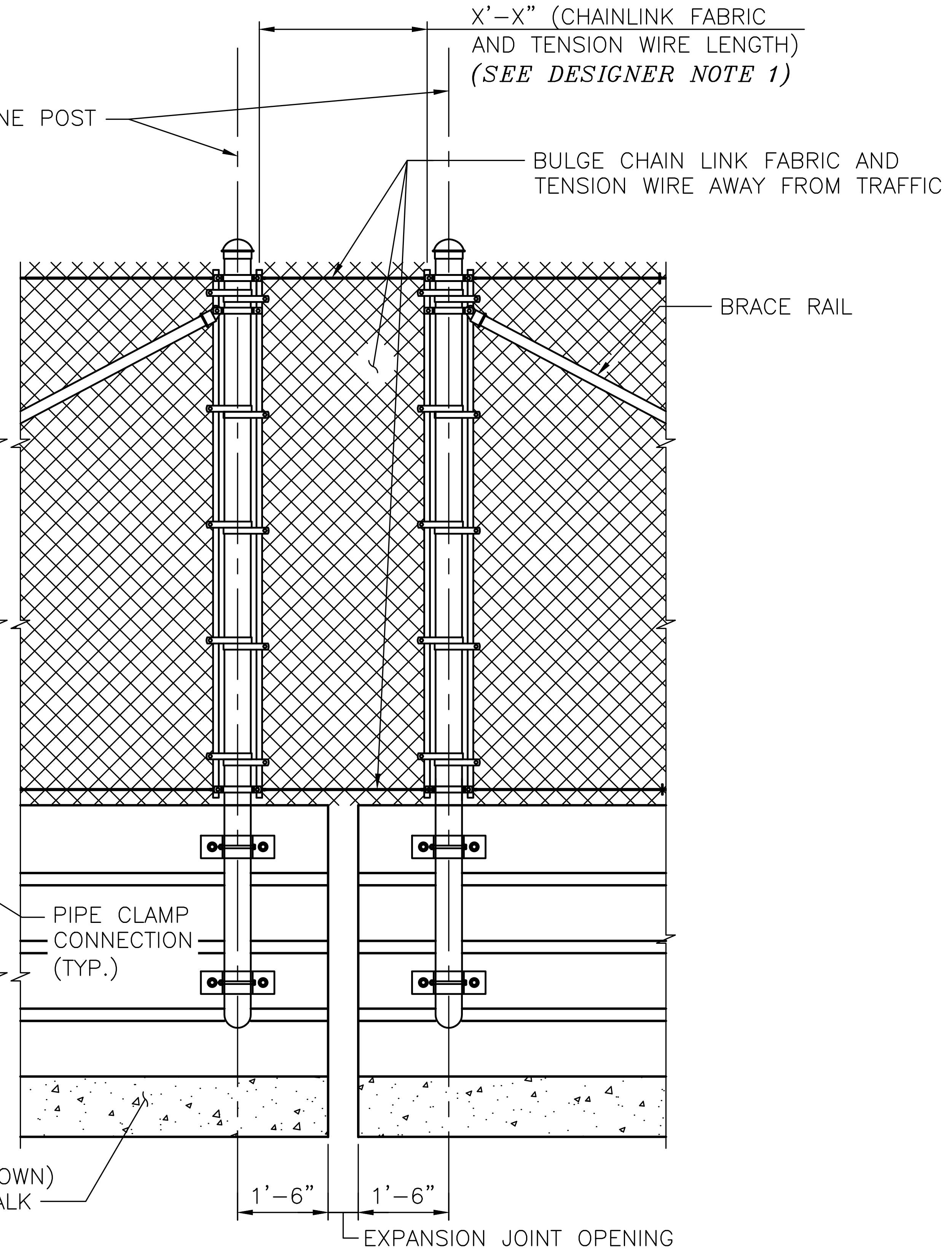
DRAWING NUMBER: RI–FENCE.1


PULL POST ASSEMBLY (REQUIRED AT MAXIMUM INTERVALS OF 500'-0")
℄ LINE POST
℄ LINE POST
℄ LINE POST
POST CAP (TYP.)
HOG RINGS @ 2'-0" CENTERS
TENSION WIRE
VARIES (1'-0" MAX.)
TIES @ 1'-0" CENTERS (TYP.)
BRACE RAIL
CHAIN LINK FABRIC (FAR SIDE OF POSTS)
BRACE RAIL
TIES @ 2'-0" CENTERS
TIES @ 2'-0" CENTERS
TENSION BANDS (5 REQUIRED PER TENSION BAR ~ SPACE EQUALLY @ 1'-3" MAXIMUM CENTERS) (TYP.)
TENSION BAR (ONE EACH SIDE OF PULL POST)
TENSION WIRE
HOG RINGS @ 2'-0" CENTERS
TIE TENSION WIRE TO POST WITH 9 GAGE ZINC COATED TIE WIRE (TRIPLE WRAP REQUIRED AT BOTH ENDS OF TIE WIRE) (TYP.)
(36" VERTICAL FACE PARAPET)
BRIDGE DECK (SHOWN) OR RAISED SIDEWALK
BRIDGE DECK (SHOWN) OR RAISED SIDEWALK

PULL POST ASSEMBLY DETAIL FOR PARAPET

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

(OUTSIDE FACE OF RAILING)


X'-X" (CHAINLINK FABRIC AND TENSION WIRE LENGTH)
(SEE DESIGNER NOTE 1)
℄ LINE POST
BULGE CHAIN LINK FABRIC AND TENSION WIRE AWAY FROM TRAFFIC
BRACE RAIL
PIPE CLAMP CONNECTION (TYP.)
1'-6"
1'-6"
EXPANSION JOINT OPENING

EXPANSION ASSEMBLY DETAIL

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

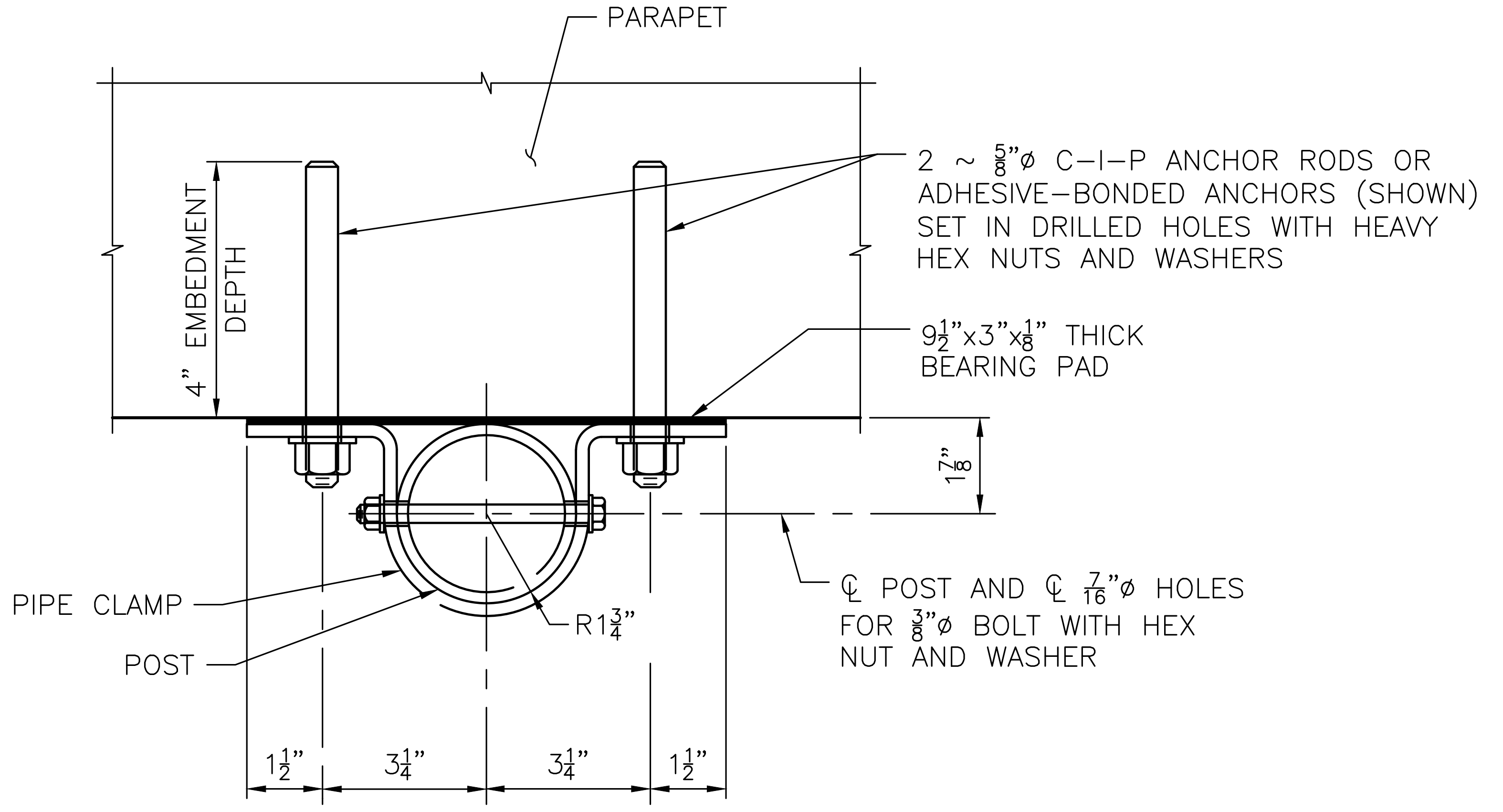
(REQUIRED ONLY AT EXPANSION JOINT LOCATIONS WHERE TOTAL MOVEMENT EXCEEDS 6")

DESIGNER NOTE:

1. *CHAINLINK FABRIC AND TENSION WIRE LENGTH AT EXPANSION JOINT SHALL BE DETERMINED BASED ON THE MAXIMUM OPENING OF THE EXPANSION JOINT AT MINIMUM AMBIENT TEMPERATURE.*

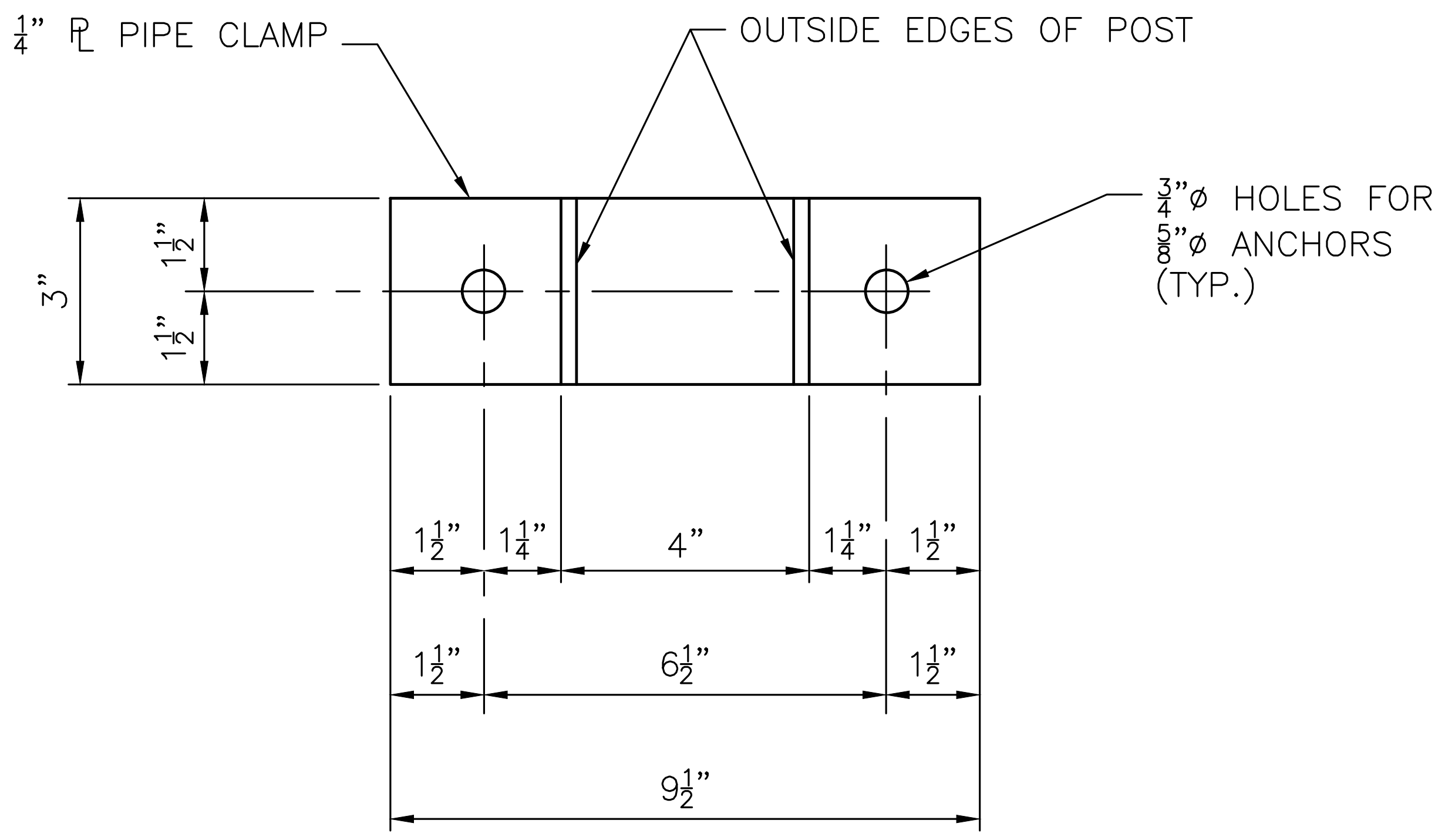
NOTE:

1. FOR TREATMENT AT BRIDGE ENDS, SEE DWG. RI–FENCE.0.


PARAPET
2 ~ ⅝"ø C-I-P ANCHOR RODS OR ADHESIVE-BONDED ANCHORS (SHOWN) SET IN DRILLED HOLES WITH HEAVY HEX NUTS AND WASHERS
4" EMBEDMENT DEPTH
9½"x3"x⅛" THICK BEARING PAD
1⅞"
℄ POST AND ℄ 7/16"ø HOLES FOR ⅜"ø BOLT WITH HEX NUT AND WASHER
PIPE CLAMP
POST
R1¾"
1½"
3¼"
3¼"
1½"

PIPE CLAMP CONNECTION DETAIL

NOT TO SCALE



PIPE CLAMP DETAIL

NOT TO SCALE

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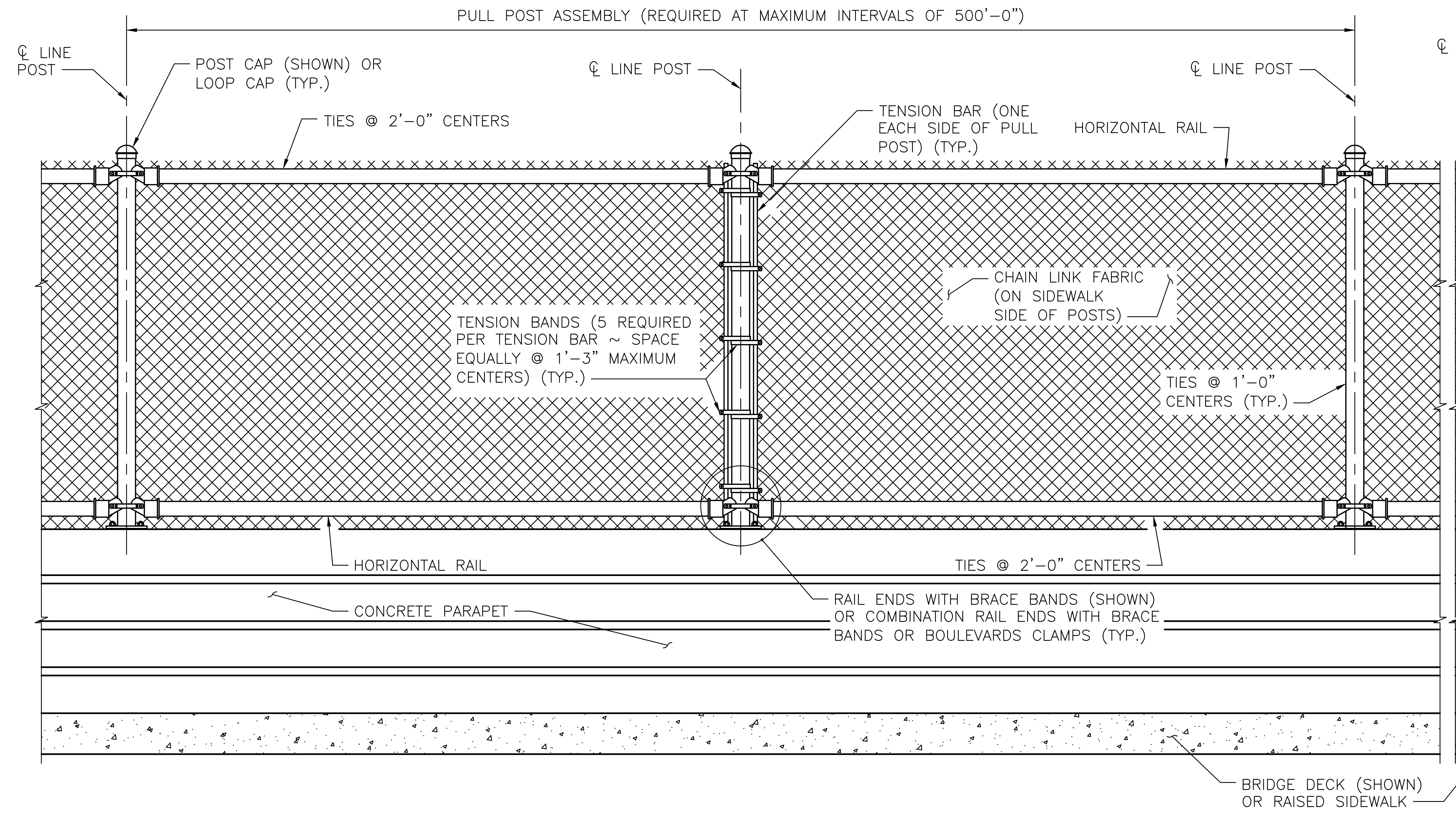
RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

BRIDGE STANDARDS

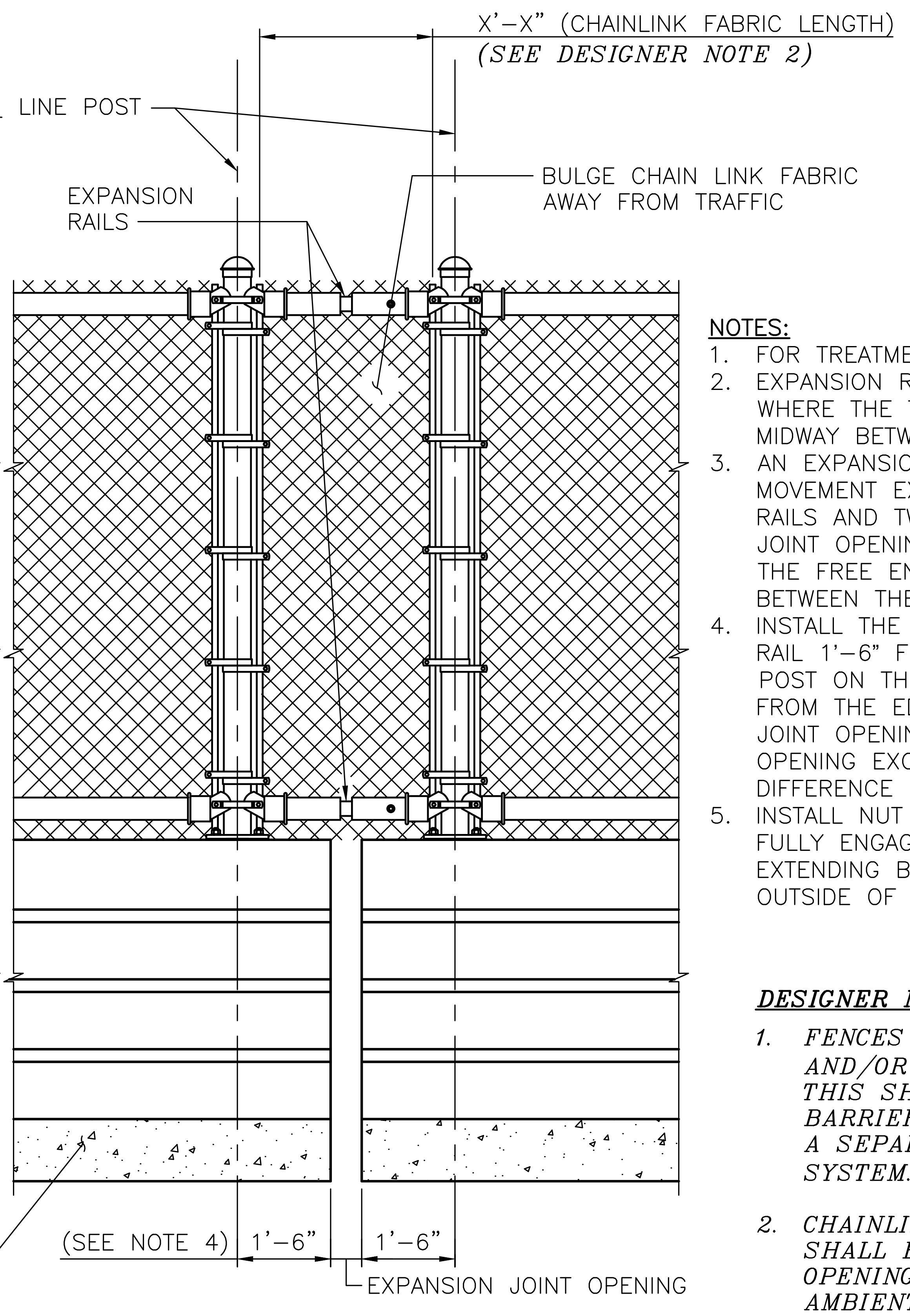
PROTECTIVE SCREEN
(CHAIN LINK FENCE)
SHEET 3

DRAWING NUMBER: RI–FENCE.2


PULL POST ASSEMBLY (REQUIRED AT MAXIMUM INTERVALS OF 500'-0")
℄ LINE POST
POST CAP (SHOWN) OR LOOP CAP (TYP.)
TIES @ 2'-0" CENTERS
℄ LINE POST
TENSION BAR (ONE EACH SIDE OF PULL POST) (TYP.)
HORIZONTAL RAIL
℄ LINE POST
CHAIN LINK FABRIC (ON SIDEWALK SIDE OF POSTS)
TENSION BANDS (5 REQUIRED PER TENSION BAR ~ SPACE EQUALLY @ 1'-3" MAXIMUM CENTERS) (TYP.)
TIES @ 1'-0" CENTERS (TYP.)
HORIZONTAL RAIL
TIES @ 2'-0" CENTERS
RAIL ENDS WITH BRACE BANDS (SHOWN) OR COMBINATION RAIL ENDS WITH BRACE BANDS OR BOULEVARDS CLAMPS (TYP.)
CONCRETE PARAPET
BRIDGE DECK (SHOWN) OR RAISED SIDEWALK

ELEVATION OF OUTSIDE FACE OF RAILING

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



EXPANSION ASSEMBLY DETAIL

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

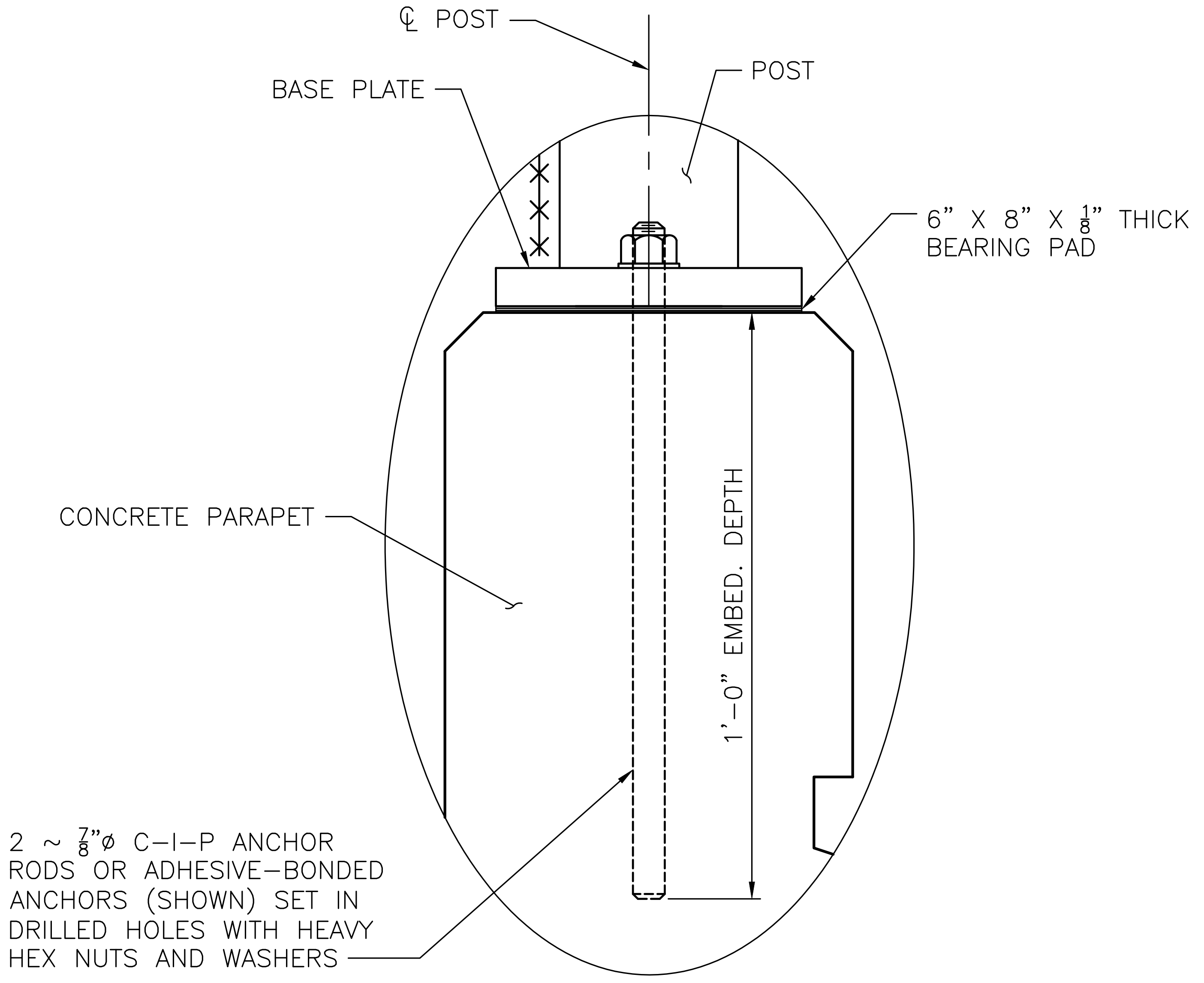
(REQUIRED ONLY AT EXPANSION JOINT LOCATIONS WHERE TOTAL MOVEMENT EXCEEDS 6")

NOTES:

1. FOR TREATMENT AT THE BRIDGE ENDS, SEE DWG. RI-FENCE.0.
2. EXPANSION RAILS ARE REQUIRED AT EXPANSION JOINT LOCATIONS WHERE THE TOTAL MOVEMENT EXCEEDS 1". INSTALL EXPANSION RAILS MIDWAY BETWEEN THE FENCE POSTS SPANNING THE EXPANSION JOINT.
3. AN EXPANSION ASSEMBLY IS REQUIRED WHERE THE TOTAL JOINT MOVEMENT EXCEEDS 6". EXPANSION ASSEMBLY INCLUDES EXPANSION RAILS AND TWO PULL POSTS (AS SHOWN). WHEN THE EXPANSION JOINT OPENING IS GREATER THAN 9" ADD AN ADDITIONAL LENGTH TO THE FREE END OF THE EXPANSION RAIL EQUAL TO THE DIFFERENCE BETWEEN THE EXPANSION JOINT OPENING AND 9".
4. INSTALL THE POST ON THE FIXED (BOLTED) SIDE OF THE EXPANSION RAIL 1'-6" FROM THE EDGE OF THE EXPANSION JOINT. INSTALL THE POST ON THE SLIP (UNBOLTED) SIDE OF THE EXPANSION RAIL 1'-6" FROM THE EDGE OF THE EXPANSION JOINT UNLESS THE EXPANSION JOINT OPENING IS GREATER THAN 9". WHEN THE EXPANSION JOINT OPENING EXCEEDS 9" INCREASE THE 1'-6" DIMENSION BY THE DIFFERENCE BETWEEN THE EXPANSION JOINT OPENING AND 9".
5. INSTALL NUT FOR THE EXPANSION RAIL FINGER-TIGHT. THE NUT WILL FULLY ENGAGE BOLTS WITH A MINIMUM OF ONE BOLT THREAD EXTENDING BEYOND THE NUTS. DISTORT THE FIRST THREAD ON THE OUTSIDE OF THE NUT TO PREVENT LOOSENING.

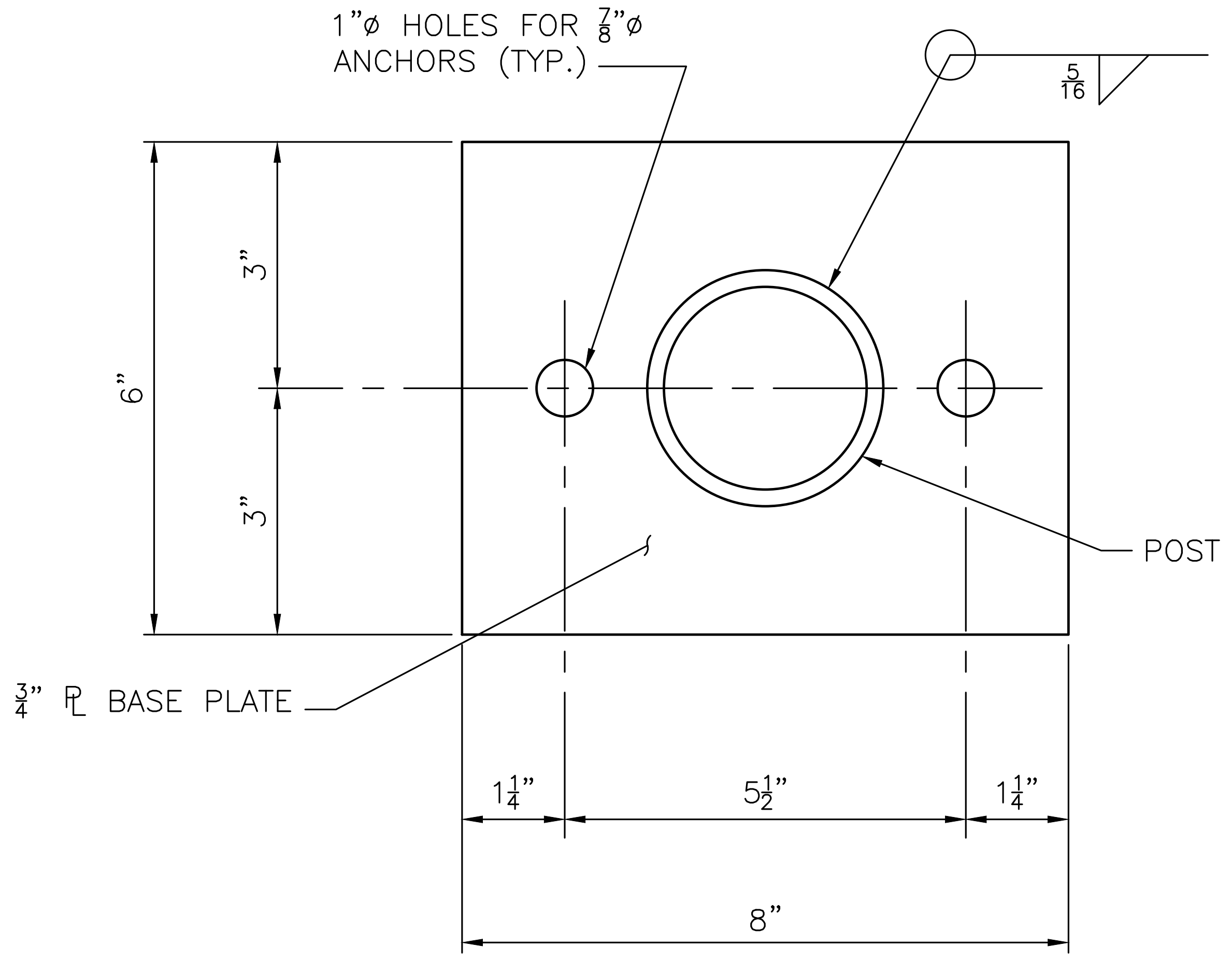
DESIGNER NOTES:

1. *FENCES MOUNTED TO THE TOP OF THE BARRIER AND/OR INCLUDING HORIZONTAL RAILS, AS SHOWN ON THIS SHEET, SHALL ONLY BE USED WHEN THE BARRIER IS PROTECTED FROM VEHICLE COLLISION BY A SEPARATE MASH APPROVED BARRIER OR RAILING SYSTEM. REFER TO DWG. (RI-FENCE.0).*
2. *CHAINLINK FABRIC LENGTH AT EXPANSION JOINT SHALL BE DETERMINED BASED ON THE MAXIMUM OPENING OF THE EXPANSION JOINT AT MINIMUM AMBIENT TEMPERATURE.*


℄ POST
BASE PLATE
POST
6" X 8" X ⅛" THICK BEARING PAD
CONCRETE PARAPET
1'-0" EMBED. DEPTH
2 ~ ⅞"⌀ C-I-P ANCHOR RODS OR ADHESIVE-BONDED ANCHORS (SHOWN) SET IN DRILLED HOLES WITH HEAVY HEX NUTS AND WASHERS

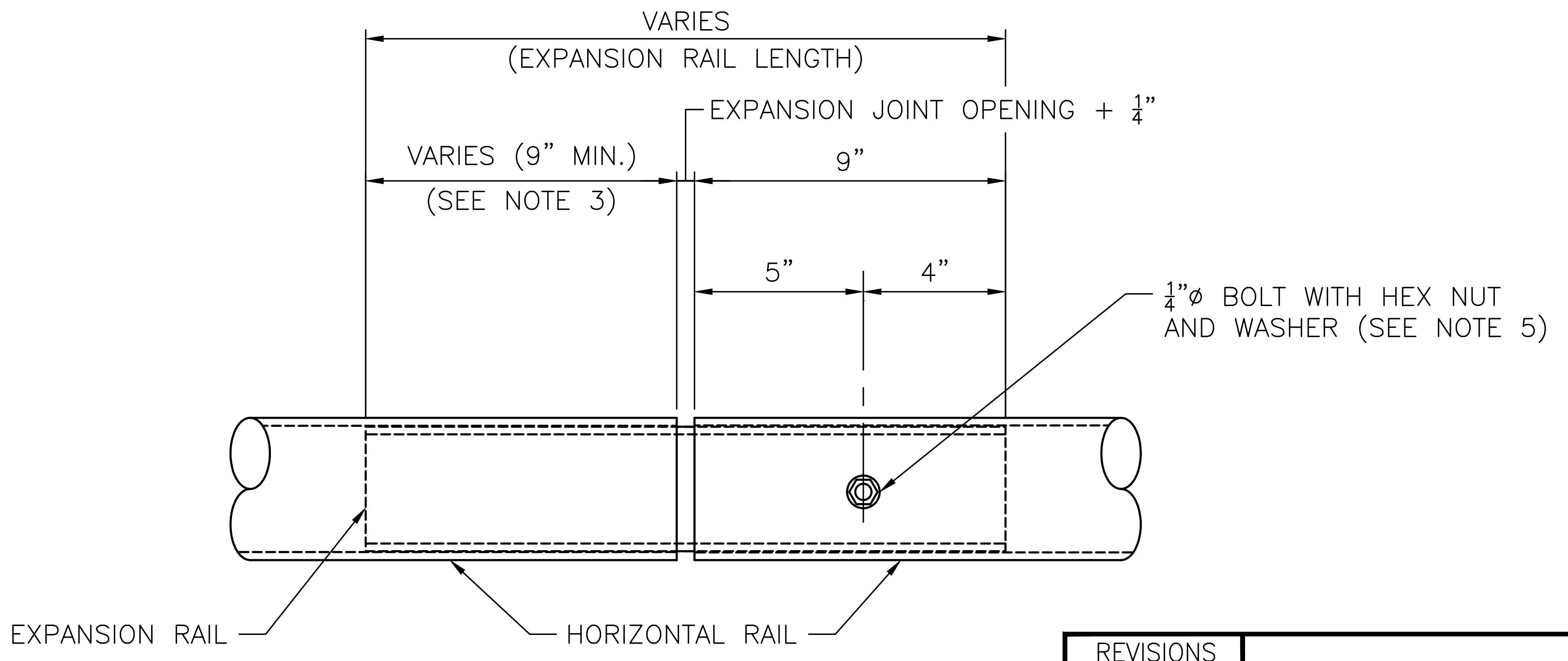
DETAIL 2 / RI-FENCE.0

SCALE: N.T.S.



BASE PLATE DETAIL

N.T.S.



EXPANSION RAIL DETAIL

N.T.S.

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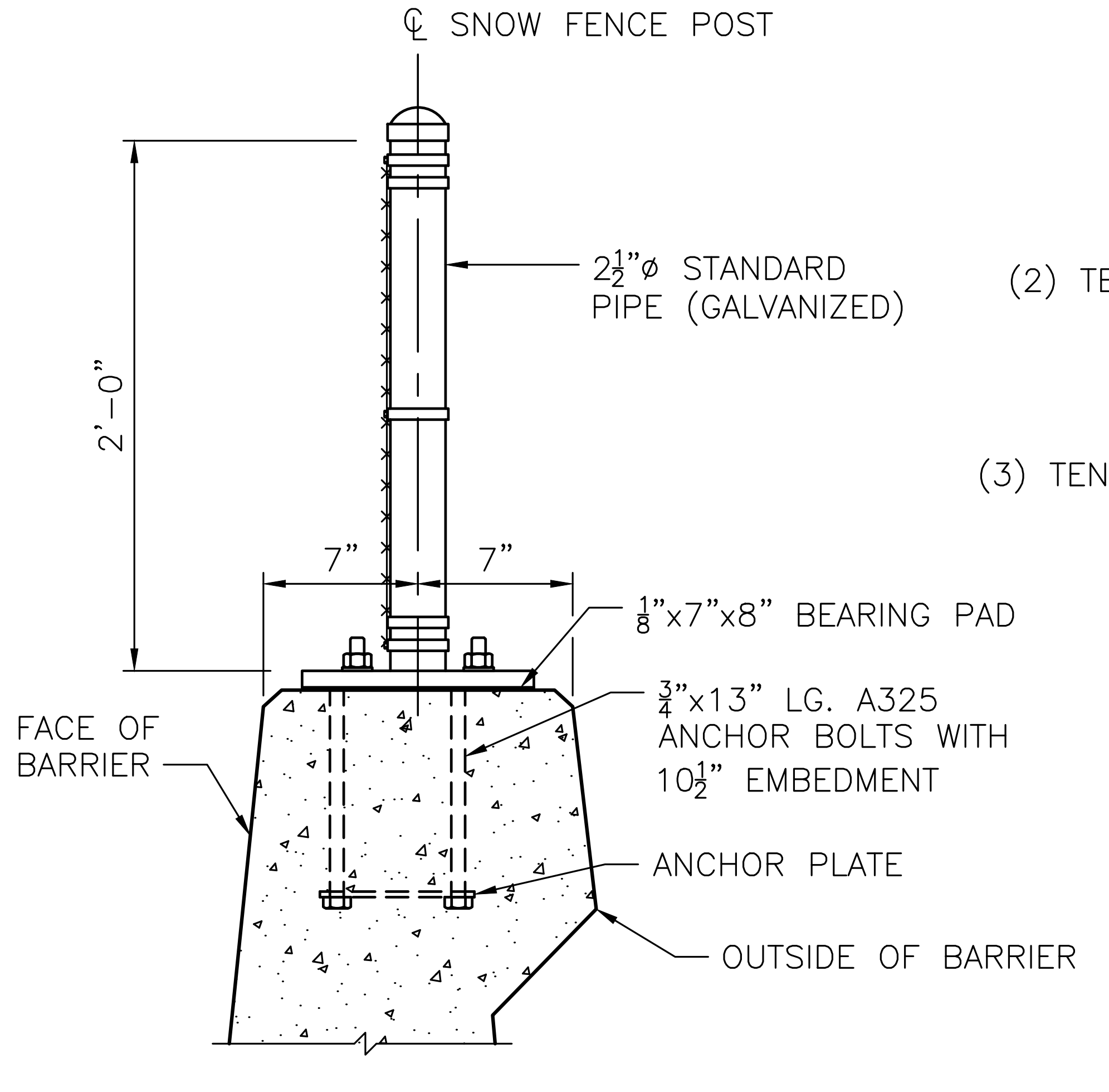
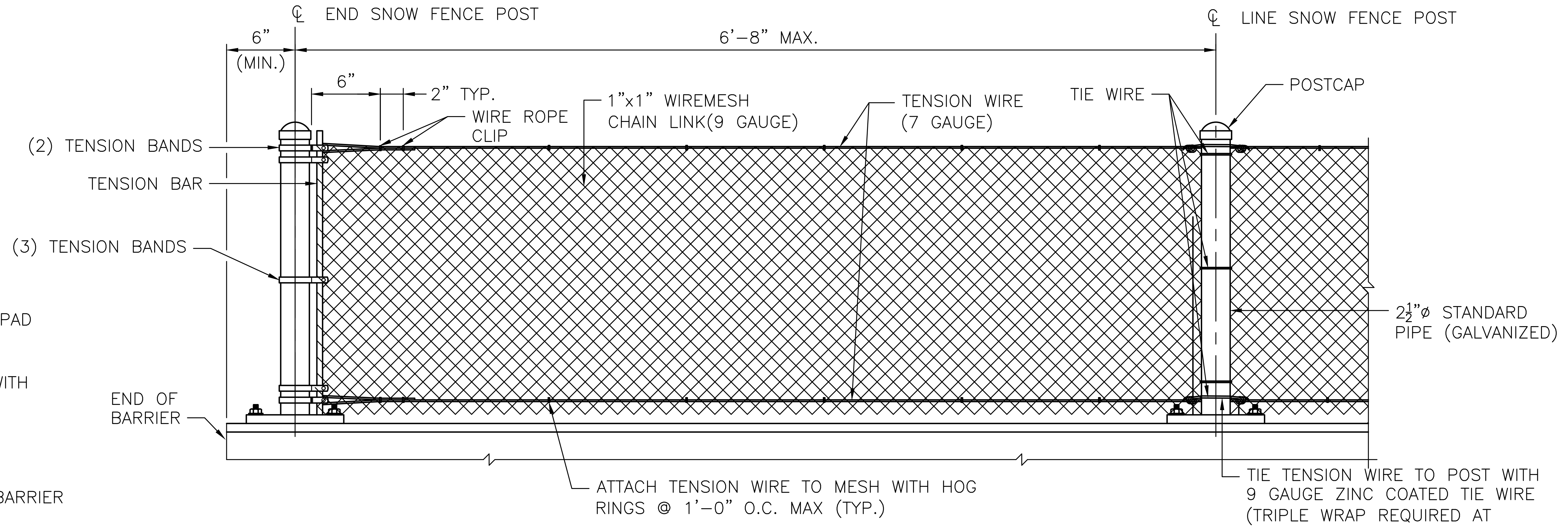
BRIDGE STANDARDS

PROTECTIVE SCREEN
(CHAIN LINK FENCE)
SHEET 4

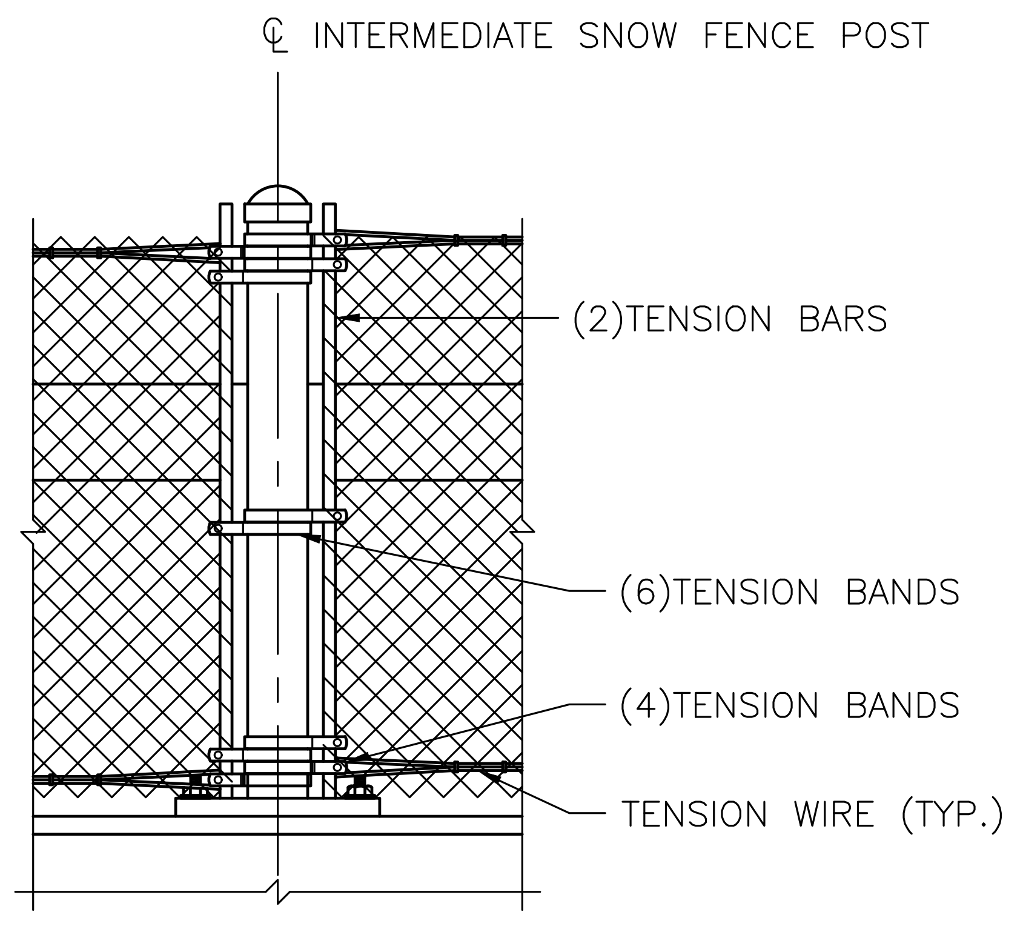
DRAWING NUMBER: RI-FENCE.3



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


℄ END SNOW FENCE POST
6" (MIN.)
6'-8" MAX.
℄ LINE SNOW FENCE POST
6"
2" TYP.
WIRE ROPE CLIP
1"x1" WIREMESH CHAIN LINK(9 GAUGE)
TENSION WIRE (7 GAUGE)
TIE WIRE
POSTCAP
(2) TENSION BANDS
TENSION BAR
(3) TENSION BANDS
2½"ø STANDARD PIPE (GALVANIZED)
END OF BARRIER
ATTACH TENSION WIRE TO MESH WITH HOG RINGS @ 1'-0" O.C. MAX (TYP.)
TIE TENSION WIRE TO POST WITH 9 GAUGE ZINC COATED TIE WIRE (TRIPLE WRAP REQUIRED AT BOTH ENDS OF TIE WIRE) (TYP.)

ELEVATION

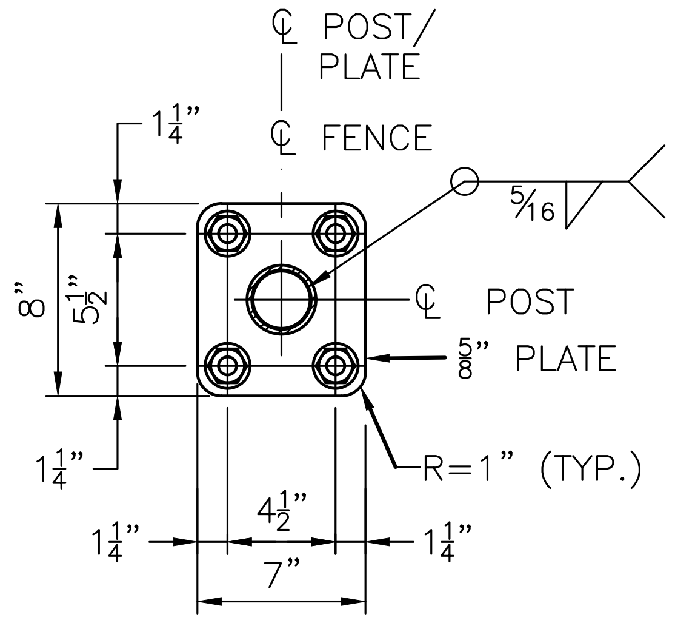


ELEVATION

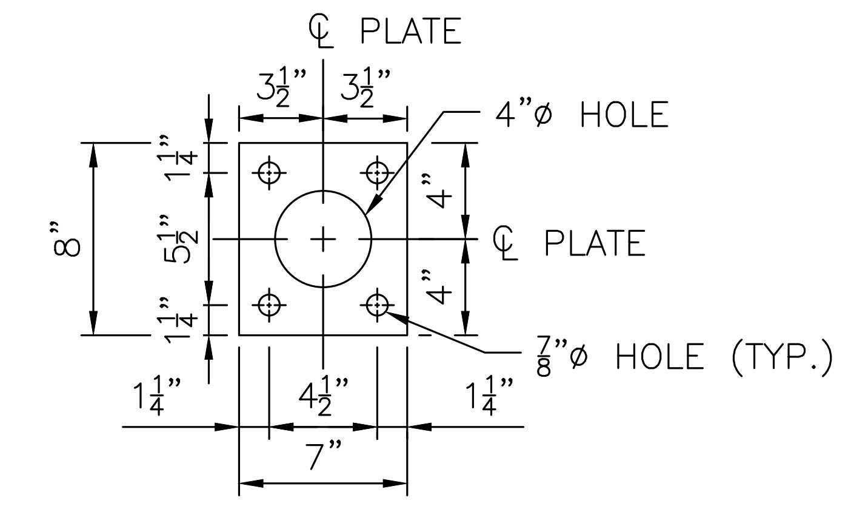
INTERMEDIATE POST DETAIL
SCALE: 1 1/2"=1'-0"

NOTE

INTERMEDIATE POSTS REQUIRED EVERY 200'-0" (MAX.) ALONG TOTAL LENGTH OF SNOW BARRIER FENCE.

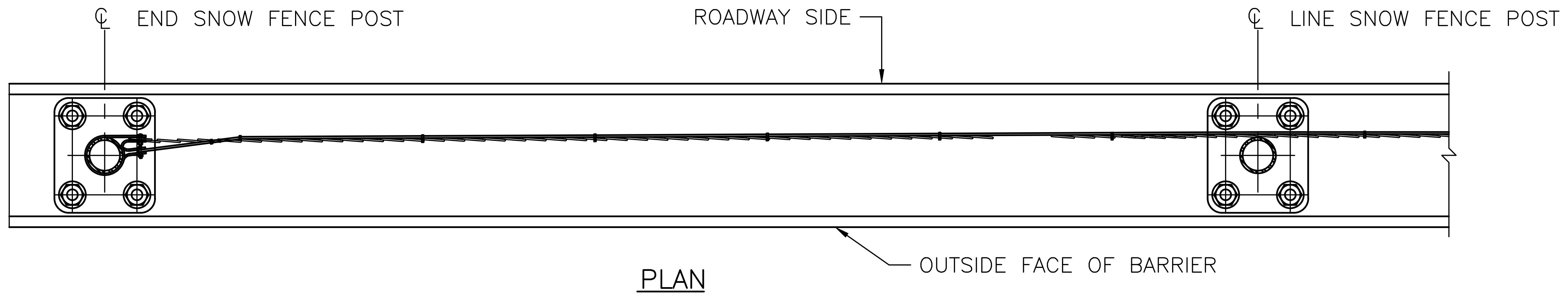


BASE PLATE DETAIL
SCALE: 1 1/2"=1'-0"



NOTE: ANCHOR PLATE IS ¼" THICK AASHTO M270 GRADE 36 (GALV.)

ANCHOR PLATE DETAIL
SCALE: 1 1/2"=1'-0"

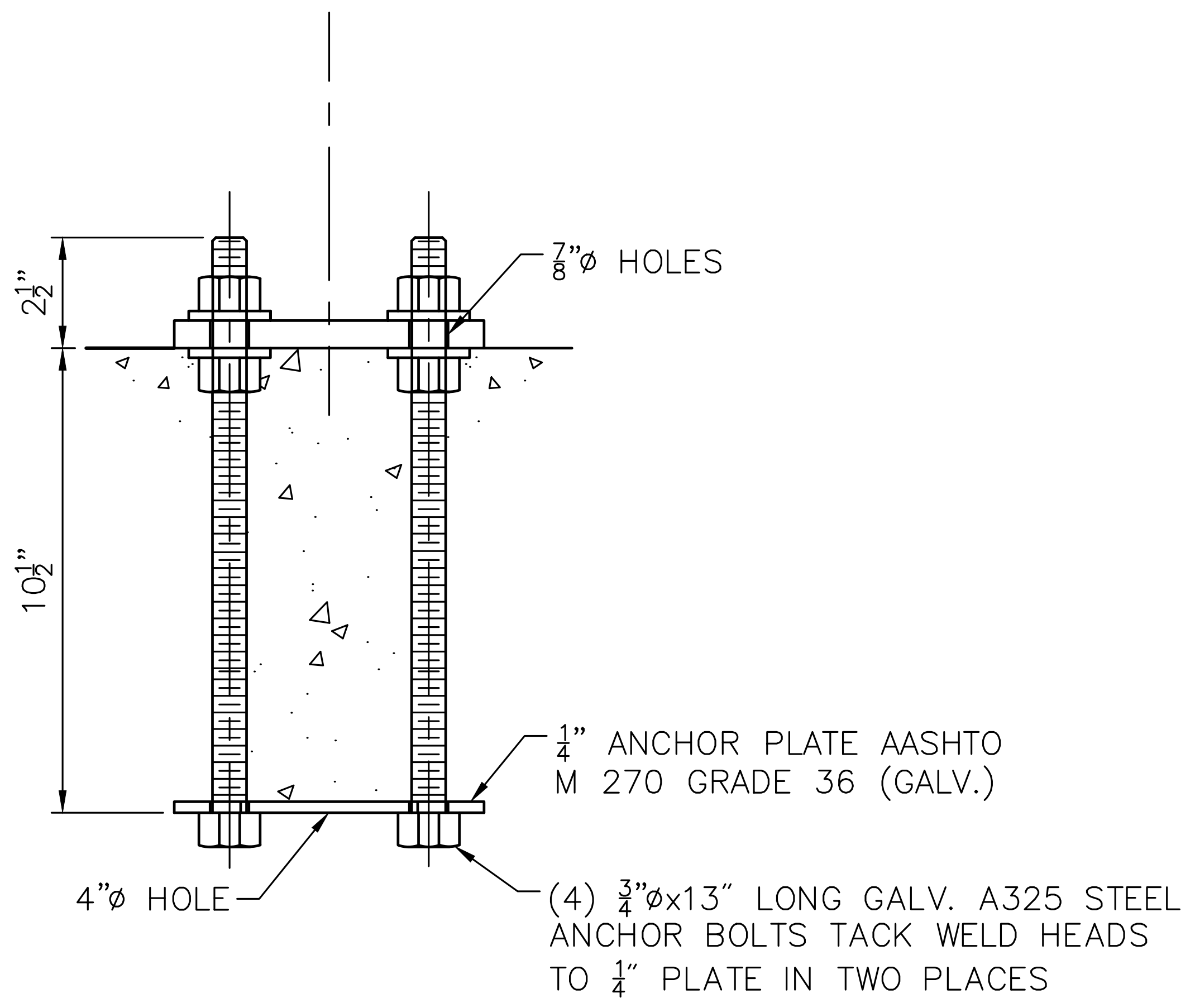


PLAN

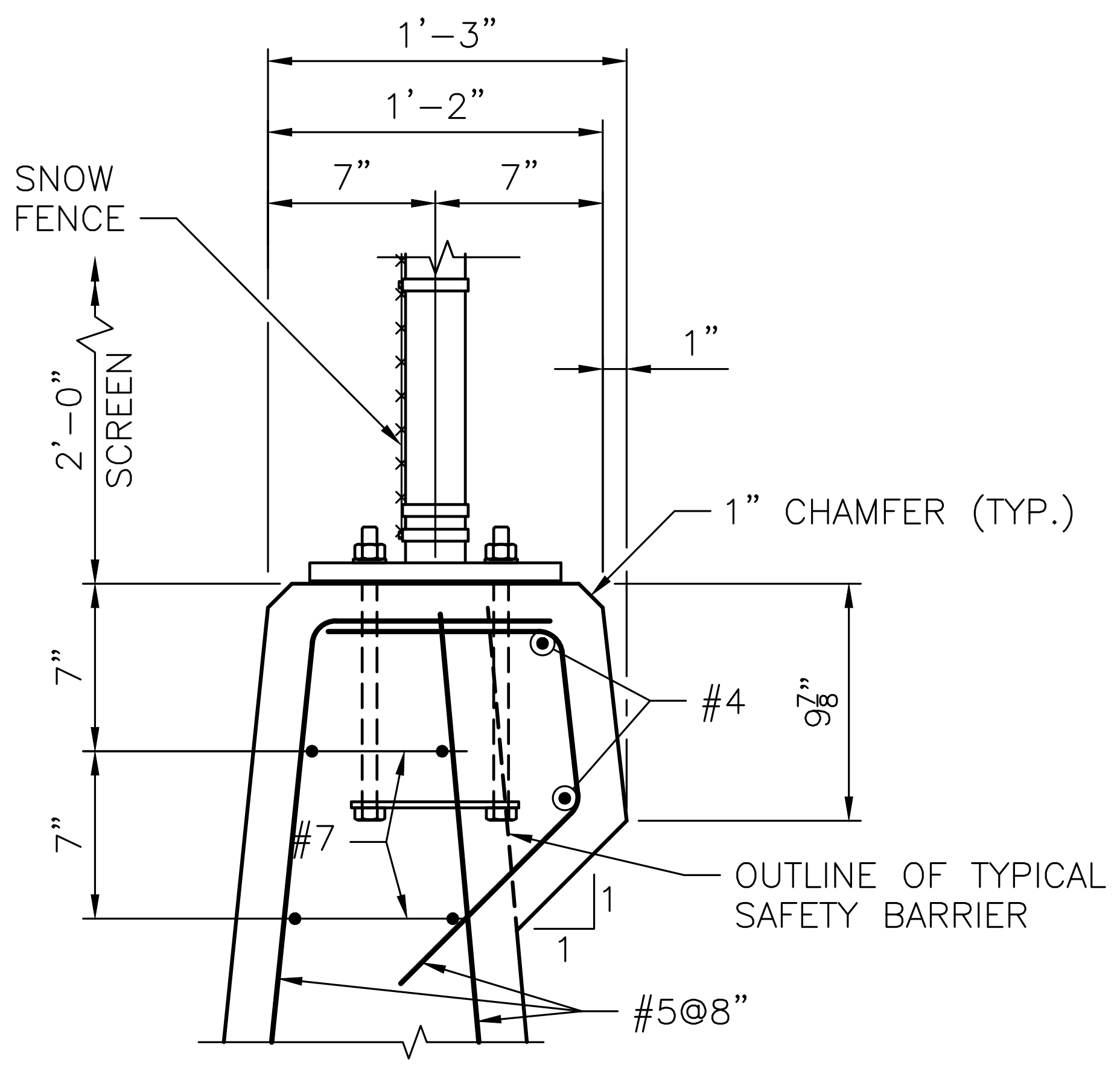
SNOW FENCE DETAILS
SCALE:1 1/2"=1'-0"

NOTES

1. REFER TO DWG. (RI-FENCE.1) FOR MATERIAL PROPERTIES.
2. UNLESS NOTED OTHERWISE, ALL FENCING HARDWARE AND COMPONENTS SHALL BE GALVANIZED STEEL IN ACCORDANCE WITH AASHTO M181.
3. ALL WELDING SHALL BE IN ACCORDANCE WITH THE AMERICAN WELDING SOCIETY STRUCTURAL WELDING CODE (STEEL) ANS/AWS (CURRENT EDITION). WELD METAL SHALL BE E60XX OR E70XX. NONDESTRUCTIVE TESTING OF WELDS SHALL NOT BE REQUIRED.
4. SNOW FENCE POST, POST CAP, AND BASE PLATE SHALL GALVANIZED AFTER FABRICATION. GALVANIZING SHALL BE IN ACCORDANCE WITH THE APPLICABLE PROVISIONS OF SECTION 827 OF THE RI STANDARD SPECIFICATIONS. UNLESS OTHERWISE SPECIFIED, ALL OTHER FASTENERS AND FENCING HARDWARE ITEMS SHALL BE GALVANIZED IN ACCORDANCE WITH EITHER AASHTO M232 (ASTM A153), OR AASHTO M111 (ASTM A123) AS APPROPRIATE.
5. COMPLETE DETAILS SHALL BE SUBMITTED BY THE CONTRACTOR FOR THE ENGINEER'S APPROVAL PRIOR TO FABRICATION OF THE SNOW FENCE. SHOP DRAWINGS SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS.


2½"
⅞"ø HOLES
10½"
¼" ANCHOR PLATE AASHTO M 270 GRADE 36 (GALV.)
4"ø HOLE
(4) ¾"øx13" LONG GALV. A325 STEEL ANCHOR BOLTS TACK WELD HEADS TO ¼" PLATE IN TWO PLACES

ANCHOR DETAIL
SCALE: 3"=1'-0"



SECTION THRU 42" F-SHAPE MODIFIED BARRIER
SCALE: 1 1/2"=1'-0"

DESIGNER NOTES:

1. *IN GENERAL ANY ATTACHMENTS TO THE BARRIER SYSTEM SHALL BE AVOIDED WHENEVER POSSIBLE. THE ADDITION OF A SNOW FENCE TO A BARRIER, WHETHER MOUNTED ON TOP OR TO THE BACKSIDE DOWN GRADES THE CRASHWORTHINESS OF THE SYSTEM TO MASH TL-3 DUE TO OCCUPANCY RISK.*
2. *WHEN SNOW FENCES ARE DEEMED NECESSARY, THEY SHALL EXTEND 10'-0" BEYOND THE EDGE OF ROADWAY OR BACK OF SIDEWALK (IF PRESENT) THAT IS BEING PROTECTED.*
3. *SNOW FENCE SHOWN SHALL BE USED WITH 42" F-SHAPE MODIFIED BARRIER (RI-TL5B) ONLY. IF A SNOW FENCE IS REQUIRED FOR RI-TL4A 36" PARAPET THEN RI-FENCE.0 SHALL BE USED.*
4. *SHOW LIMITS AND LENGTH OF SNOW FENCE IN CONTRACT PLANS.*

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BRIDGE STANDARDS

SNOW FENCE
(CHAIN LINK FENCE)

DRAWING NUMBER:RI-FENCE.4