#### GENERAL NOTES:

- 1. PROVIDE MATERIALS AND PERFORM WORK IN ACCORDANCE WITH PUBLICATION 408.
- 2. PROVIDE RAILING TUBES CONFORMING TO ASTM A500 GRADE B OR C.
- 3. PROVIDE RAILING POSTS CONFORMING TO AASHTO M270 (ASTM A709) GRADE 50 OR 50W OR ASTM A992. PROVIDE BASE PLATES CONFORMING TO AASHTO M270 (ASTM A709) GRADE 50 OR 50W. PROVIDE ANCHOR PLATES CONFORMING TO AASHTO M270 (ASTM A709) GRADE 36.
- 4. ALL RAILING COMPONENTS SHALL BE GALVANIZED (AFTER FABRICATION) ACCORDING TO PUBLICATION 408, SECTION 1105.02(s) UNLESS OTHERWISE SHOWN ON PLANS. GALVANIZE POSTS, BASE PLATES, ANCHOR PLATES, AND SPLICE SLEEVES ACCORDING TO ASTM A123. GALVANIZE RAIL TUBES ACCORDING TO ASTM A123, EXCEPT COATING ON THREADED STUDS AND NUTS USED WITH THE STUDS SHALL MEET THE REQUIREMENTS OF ASTM A133 FOR CLASS C MATERIAL. GALVANIZE ALL ANCHOR HARDWARE ACCORDING TO ASTM A133 OR ASTM A608 ACCORDING TO ASTM A153 OR ASTM B695.
- 5. THE RAILING TUBES ARE SHOP BENT OR FABRICATED TO FIT HORIZONTAL CURVE WHEN RADIUS IS LESS THAN 1,500 FEET.
- 6. PROVIDE THREADED ANCHOR STUDS CONFORMING TO ASTM A108 TYPE B.

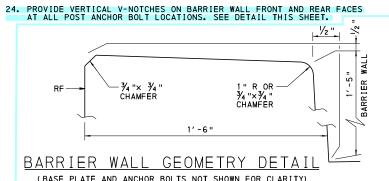
**CHANGE 3** 

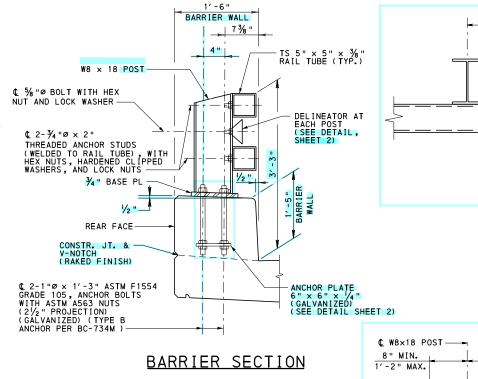
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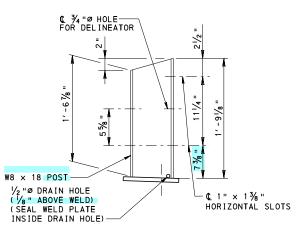
revisions not highlighted)

- 7. STEEL TUBE TOLERANCES:
  A. STRAIGHTNESS: THE PERMISSIBLE VARIATION FOR STRAIGHTNESS SHALL
  BE 1/8" TIMES THE NUMBER OF FEET OF THE TOTAL LENGTH DIVIDED BY 5.
  - B. TWIST: SPECIFIED DIMENSION OF THE LONGEST SIDE IN INCHES FROM OVER 4" TO 6" INCLUSIVE: 0.087" MAX TWIST IN THE FIRST 3 FEET AND IN EACH ADDITIONAL 3 FEET.
- E TWIST IS MEASURED BY HOLDING DOWN ONE END OF SQUARE OR RECTANGULAR TUBE ON A FLAT SURFACE PLATE WITH THE BOTTOM SIDE OF THE TUBE PARALLEL TO THE SURFACE PLATE AND NOTING THE HEIGHT DIFFERENCE BETWEEN THE TWO CORNERS AT THE OPPOSITE END OF THE BOTTOM SIDE OF THE TUBE.
- ALL WELDING SHALL CONFORM TO THE PROVISIONS OF AASHTO/AWS BRIDGE WELDING CODE D1.5, EXCEPT USE AASHTO/AWS STRUCTURAL WELDING CODE D1.1 FOR WELDING NOT COVERED IN D1.5.
- 9. IF FLAME CUTTING OR PLASMA CUTTING IS USED TO CREATE SLOTTED HOLES, GRIND SMOOTH TO PROVIDE VERTICAL AND FLAT SURFACES ALONG THE HOLE.
- THE OUT OF FLATNESS TOLERANCE FOR THE POST BASE PLATES
  IS 1/8 " CHECKED BETWEEN EDGES OF THE PLATE IN ANY DIRECTION
  AFTER WELDING IS COMPLETED. THE CONTRACTOR MAY ELECT TO USE
  THICKER PLATE MATERIAL AND WILL THE BASE PLATE TO A THICKNESS OF NO LESS THAN 58 " TO MEET THIS TOLERANCE.
- 11. BOLT TIGHTENING PROCEDURES ARE AS FOLLOWS:
  SNUG TIGHTEN ALL ANCHOR BOLTS. TIGHTEN THE NUTS AN
  ADDITIONAL 1/3 TURN USING A WRENCH.
- 12. MILL TO BEAR IS DEFINED AS FOLLOWS:

  A MINIMUM OF 25% OF THE POST WEB AND COMPRESSION FLANGE END AREA MUST FIT WITHIN 1/2" OF THE BASE PLATE WITH NO GAP MORE THAN 0.040" FOR THE REMAINING 75% OF THE END AREA.
- 13. FOR BARRIER RAIL TO POST CONNECTION AND SIDEWALK RAIL CONNECTION, USE AUTOMATIC WELDED THREADED ANCHOR STUDS MEETING THE REQUIREMENTS OF ASTM A108. USE HEX NUTS MEETING THE REQUIREMENTS OF ASTM A663. USE A 3/6 "THICK PLATE LOCK WASHER ON EACH STUD AND A 3/6 "THICK PLATE ASTM A709, GRADE 36 KSI WASHER. U-WASHERS SHALL MEET THE REQUIREMENTS OF ASTM A709,
- 14. FOR ANCHOR BOLTS, USE 1" DIA. BOLTS CONFORMING TO THE REQUIREMENTS OF ASTM F1554, GRADE 105 KSI. INCLUDING THE SUPPLEMENTARY REQUIREMENT, S5, FOR CHARPY IMPACT STRENGTH. USE ASTM A563, GRADE DH HEAVY HEX NUTS. USE ONE ASTM F436 WASHER AT THE TOP.
- 15. NO POST REQUIRED ADJACENT TO FLUSH JOINTS AT WINGWALL, IF POSTS LOCATED AT EXPANSION JOINT/ABUTMENT CORNER.
- 16. THE CENTERLINE OF THE RAIL TUBE SPLICE TO A POST IS TO BE 1'-8" MINIMUM AND 2'-6" MAXIMUM FROM THE CENTERLINE OF THE RAILING POST.
- 17. ONE OR MORE 10'-0" MAXIMUM POST SPACINGS MAY BE REDUCED TO 5'-0" MINIMUM IN ORDER TO MAINTAIN APPROPRIATE SPACING DIMENSIONS FROM THE END OF THE RAIL, EXPANSION JOINTS AND DRAINAGE SCUPPERS.
- 18. LOCATE RAIL SPLICES AT EXPANSION JOINTS AND AT OTHER LOCATIONS, WHERE NECESSARY PROVIDE RAILS AS LONG AS PRACTICAL, WITH MINIMUM OF THREE POSTS BETWEEN SPLICES, UNLESS OTHERWISE REQUIRED FOR EXPANSION.
- 19. PROVIDE RAIL TUBES CONTINUOUS OVER NOT LESS THAN TWO RAILING POSTS. NO WELDED BUTT SPLICES WILL BE ALLOWED IN THE RAIL TUBE SECTION.
- 20. PLACE POST AND POST ANCHOR BOLTS NORMAL TO GRADE AND RAILS PARALLEL TO GRADE.
- 21. COAT ALL SURFACES OF THE BASE PLATE IN CONTACT WITH CONCRETE WITH CAULKING COMPOUND PRIOR TO ERECTION. AFTER ERECTION AND ALIGNMENT, SEAL OPENINGS BETWEEN THE METAL SURFACES AND THE CONCRETE WITH CAULKING COMPOUND CONFORMING TO PUBLICATION 408, SECTION 705.7(b).
- 22. THE PA TYPE 10M BRIDGE BARRIER IS DESIGNATED AS MASH TL-4.
- 23. FOR GUIDE RAIL TRANSITION TO PA TYPE 10M BRIDGE BARRIER, SEE RC-50M.



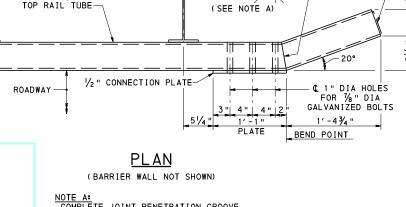




#### **ELEVATION-POST**

<u>VERTICAL V-NOTCH DETAIL</u>

(BARRIER REAR FACE SHOWN, FRONT FACE SIMILAR)



— C W8×18

CPJ )

RAIL TUBE CAP

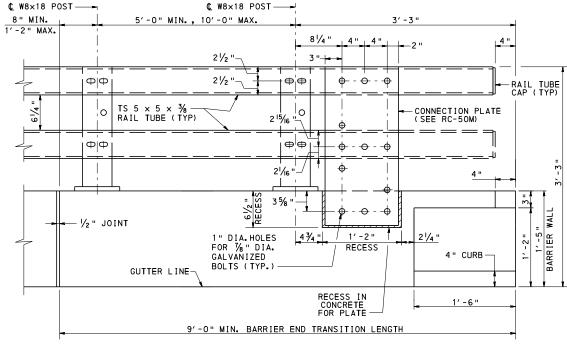
POST

NOTE A:
COMPLETE JOINT PENETRATION GROOVE WELD. GRIND FLUSH ON OUTSIDE FACE. SHOW SPECIFIC WELD SYMBOL ON SHOP

- C W8×18

TS 5×5×3/8"

POST



#### **ELEVATION**

## PA TYPE 10M BRIDGE BARRIER

(GUIDE RAIL AND ANCHOR BOLTS OMITTED FOR CLARITY) (WITH CURB SHOWN, WITHOUT CURB SIMILAR)

			ıl.
- ¾ " VERTICAL V-NOTCH AT © POST ANCHOR BOLT LOCATIONS (SEE NOTE 24) (TYP. BOTH FACES) 	BC-711M	ALUMINUM PROTECTIVE BARRIER	(
	BC-720M	ALUMINUM OR STEEL BRIDGE HAND RAILING	1
	BC-721M	ELECTRICAL DETAILS	
	BC-734M	ANCHOR SYSTEMS	1
	BC-736M	REINFORCEMENT BAR FABRICATION DETAILS	
	BC-752M	CONCRETE DECK SLAB DETAILS	1
	BC-762M	TOOTH EXPANSION DAM FOR PRESTRESSED CONCRETE AND STEEL BEAM BRIDGES	
	BC-767M	NEOPRENE STRIP SEAL DAM FOR PRESTRESSED CONCRETE AND STEEL I-BEAM BRIDGES	
	BC-799M	MECHANICALLY STABILIZED EARTH RETAINING WALLS	1
<u>DETA'IL</u>	RC-20M	CONCRETE PAVEMENT JOINTS	$\vdash$
	RC-50M	GUIDE RAIL TO BRIDGE BARRIER TRANSITIONS	RE

REFERENCE DRAWINGS

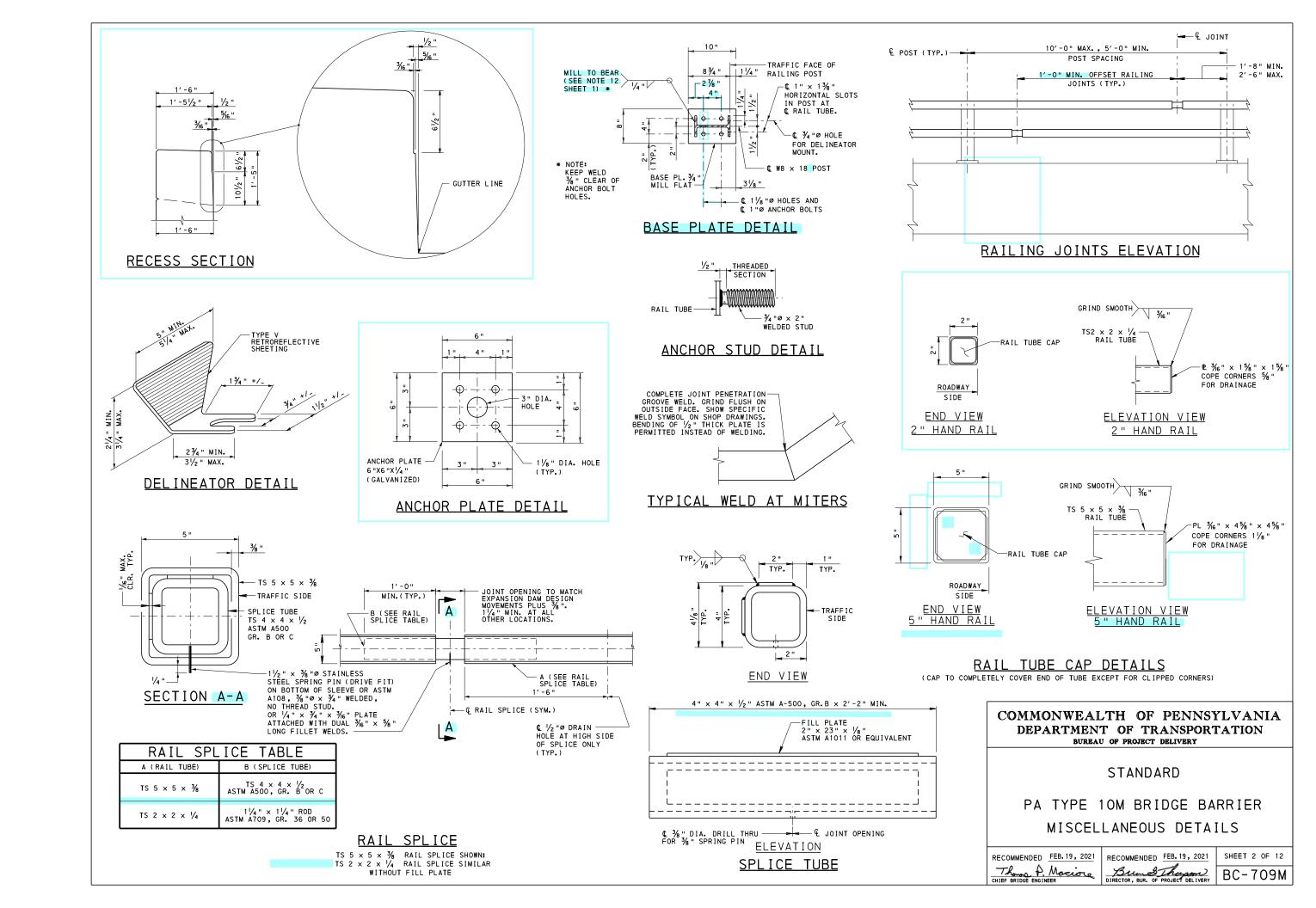
#### COMMONWEALTH OF PENNSYLVANIA DEPARTMENT OF TRANSPORTATION BUREAU OF PROJECT DELIVERY

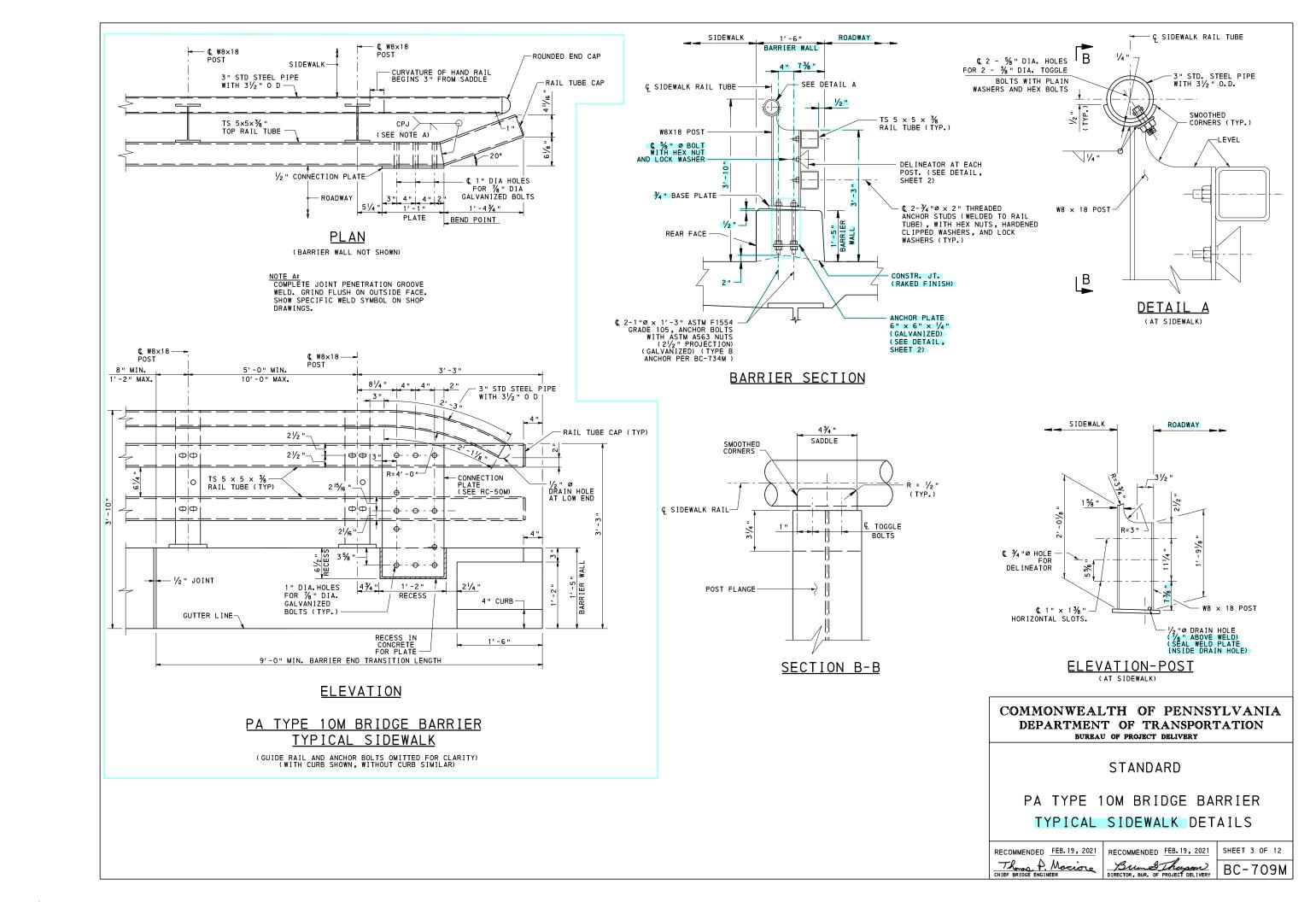
#### STANDARD

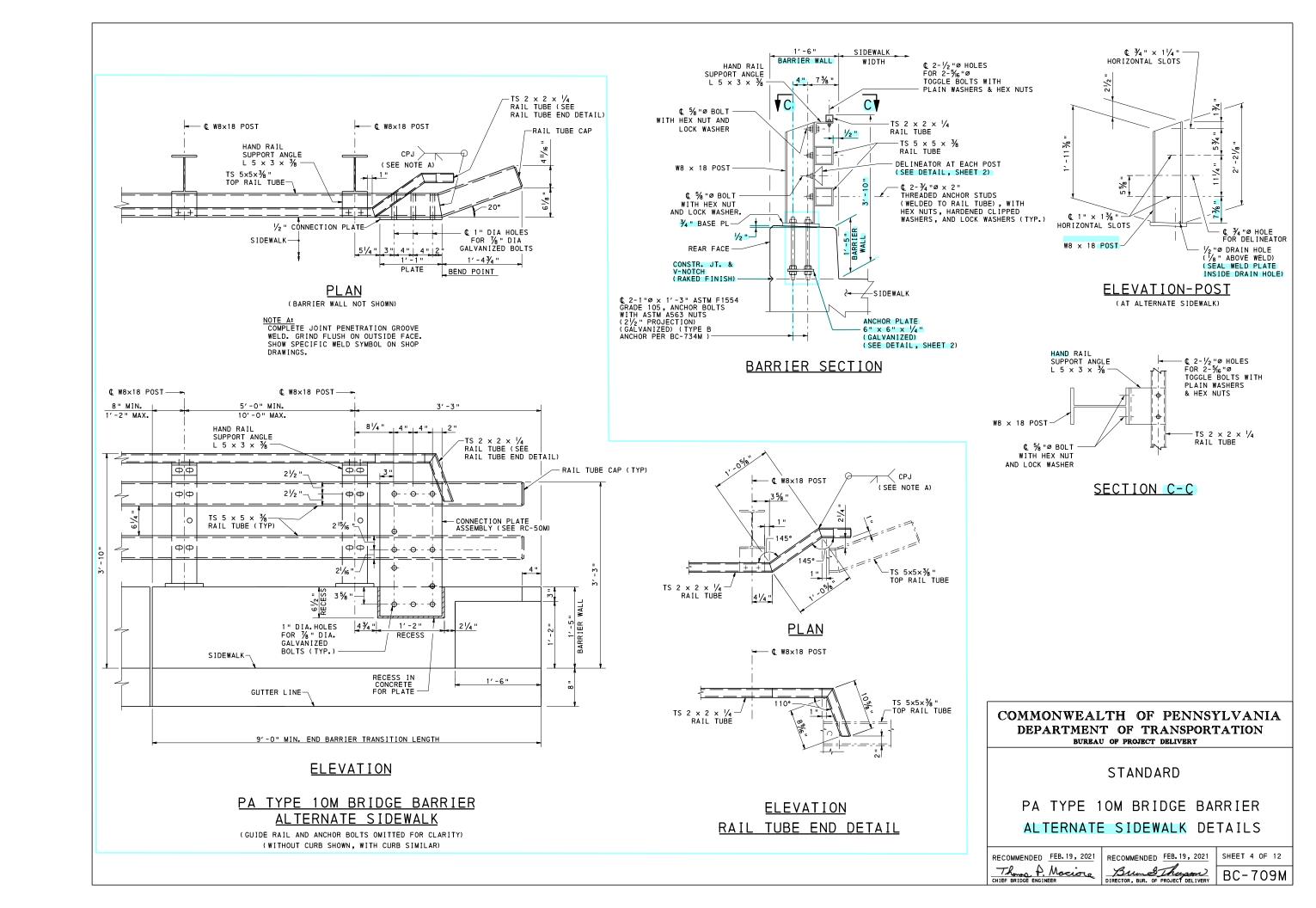
PA TYPE 10M BRIDGE BARRIER MISCELLANEOUS DETAILS

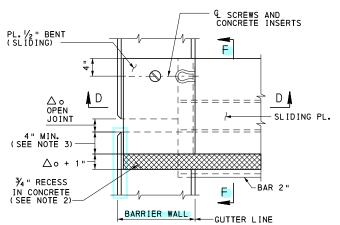
ECOMMENDED FEB. 19, 2021 Thomas A. Macione
CHIEF BRIDGE ENGINEER RECOMMENDED FEB. 19, 2021 Bund Theyam DIRECTOR, BUR. OF PROJECT DELIVERY

SHEET 1 OF 12 BC-709M

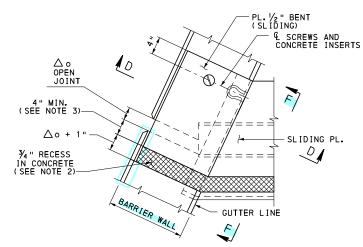




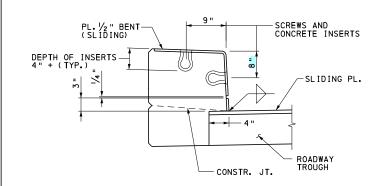




PLAN - SKEW ANGLE ≥ 75° (AT GUTTER LINE SHOWN; AT ALTERNATE SIDEWALK SIMILAR)



PLAN - SKEW ANGLE < 75° (AT GUTTER LINE SHOWN; AT ALTERNATE SIDEWALK SIMILAR)



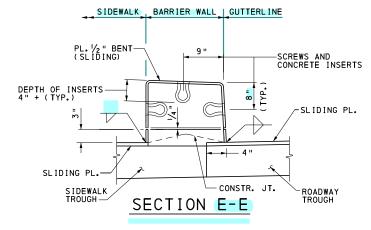
SECTION D-D (NO SIDEWALK CONDITION SHOWN; ALTERNATE SIDEWALK SIMILAR)

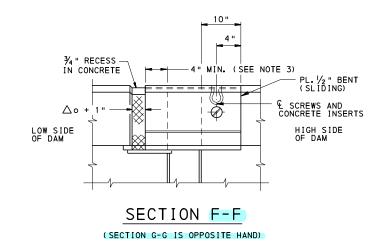
# PL. 1/2 " BENT (SLIDING) 6" **A E** ΕÅ - SLIDING PL. 4" MIN. (SEE NOTE 3)-∆o + 1" 3/4" RECESS IN CONCRETE SIDEWALK BARRIER WALL -GUTTER LINE

G

& SCREWS AND CONCRETE INSERTS

# PLAN AT TYPICAL SIDEWALK- SKEW ANGLE ≥ 75°



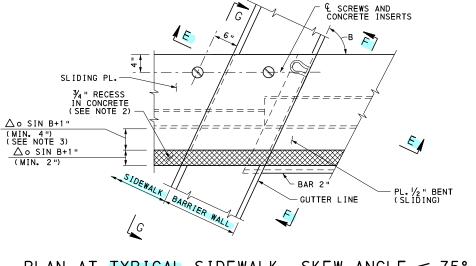


# PA TYPE 10M BRIDGE BARRIER AT TOOTH EXPANSION DAM

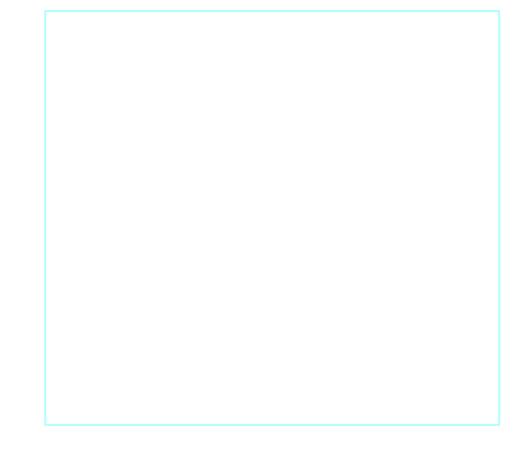
(RAILING POST AND TUBE RAILS NOT SHOWN)

#### NOTES:

- 1. FOR △ o SEE BC-762M
- FORM CONCRETE RECESS AREA IN BARRIER WALL AND GRIND TO PROVIDE SMOOTH SURFACE. APPLY ONE COAT OF ASPHALT CEMENT PAINT WA-1 OR PERFORMANCE GRADED ASPHALT CEMENT PG 64-22 TO ALLOW BENT SLIDING PLATE TO MOVE FREELY WITHOUT FRICTION.
- MAINTAIN 4" MIN. BETWEEN EDGE OF STEEL TO THE EDGE OF CONCRETE AT TEMP. OF -10°F FOR STEEL BRIDGES AND 10°F FOR P/S CONCRETE BRIDGES.
- 4. MAXIMUM DISTANCE FROM EDGE OF EXTENSION OR BEND TO FIRST STUD IS 3".



PLAN AT TYPICAL SIDEWALK- SKEW ANGLE < 75°



#### COMMONWEALTH OF PENNSYLVANIA DEPARTMENT OF TRANSPORTATION BUREAU OF PROJECT DELIVERY

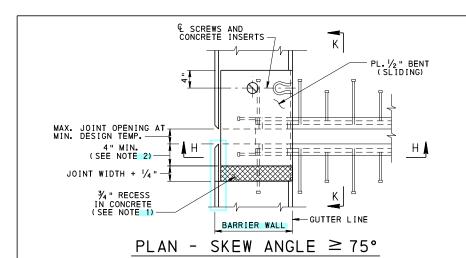
STANDARD

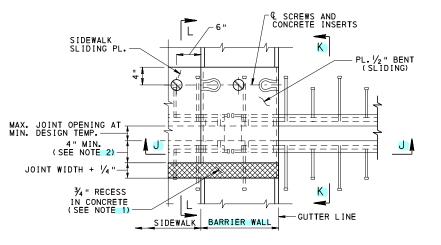
PA TYPE 10M BRIDGE BARRIER

DETAILS AT TOOTH EXPANSION DAM

RECOMMENDED FEB. 19, 2021 Thomas A. Macione

RECOMMENDED FEB. 19, 2021 SHEET 5 OF 12 Bund Thurson BC-709M





CONCRETE INSERTS SIDEWALK SLIDING PL. PL. 1/2 " BENT (SLIDING) **⊗** 3/4" RECESS IN CONCRETE (SEE NOTE 1) MAX. JOINT OPENING AT MIN. DESIGN TEMP. 4" MIN. (SEE NOTE 2) JOINT WIDTH + 1/4" -GUTTER LINE

PLAN AT TYPICAL SIDEWALK- SKEW ANGLE ≥ 75°

PLAN AT TYPICAL SIDEWALK- SKEW ANGLE < 75°

4" MIN. (SEE NOTE 2)

© SCREWS AND CONCRETE INSERT

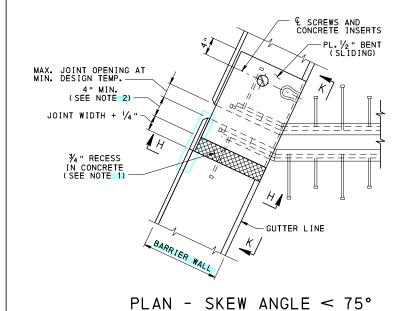
HIGH SIDE OF DAM

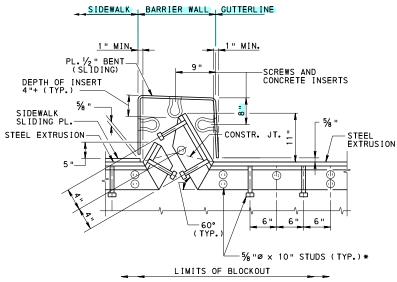
MAX. JOINT OPENING AT MIN. DESIGN TEMP.

-JOINT WIDTH + ¼"

LOW SIDE

3/4" RECESS IN CONCRETE





# - STEEL EXTRUSION

# NOTES:

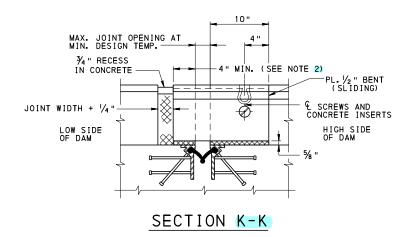
SECTION J-J

FORM CONCRETE RECESS AREA IN BARRIER WALL AND GRIND TO PROVIDE SMOOTH SURFACE. APPLY ONE COAT OF ASPHALT CEMENT PAINT WA-1 OR PERFORMANCE GRADED ASPHALT CEMENT PG 64-22 TO ALLOW BENT SLIDING PLATE TO MOVE FREELY WITHOUT FRICTION.

SECTION L-L

- MAINTAIN 4" MIN. BETWEEN EDGE OF STEEL TO THE EDGE OF CONCRETE AT TEMP. OF -10°F FOR STEEL BRIDGES AND 10°F FOR P/S CONCRETE BRIDGES.
- MAXIMUM DISTANCE ALONG THE EXTRUSION FROM EDGE OF EXTENSION OR BEND TO FIRST STUD IS  $3\,\text{"}\text{.}$

# <u>1" MIN. ≥ 75°</u> SEE BC-767M < 75° PL. 1/2 " BENT (SLIDING) -SCREWS AND CONCRETE INSERTS DEPTH OF INSERT CONSTR. JT. STEEL EXTRUSION 6" 6" 6" -5% "Ø × 10" STUDS (TYP.)\* LIMITS OF BLOCKOUT SECTION H-H



#### PA TYPE 10M BRIDGE BARRIER AT NEOPRENE STRIP SEAL DAM (RAILING POST AND TUBE RAILS NOT SHOWN)

\* IF 10" STUDS CANNOT BE ACCOMMODATED IN THE SPACE AVAILABLE, REQUEST SPECIFIC LENGTH APPROVAL FROM THE DISTRICT BRIDGE ENGINEER AT THE SHOP DRAWINGS APPROVAL STAGE.

#### COMMONWEALTH OF PENNSYLVANIA DEPARTMENT OF TRANSPORTATION BUREAU OF PROJECT DELIVERY

STANDARD

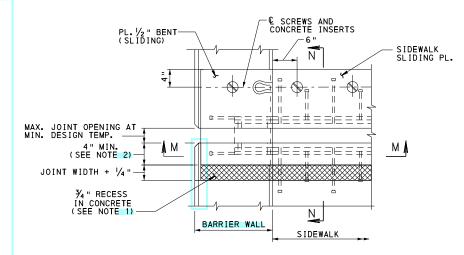
PA TYPE 10M BRIDGE BARRIER

DETAILS AT NEOPRENE STRIP SEAL DAM

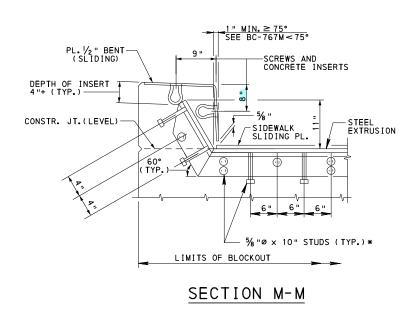
RECOMMENDED FEB. 19, 2021 Thoma A. Macione

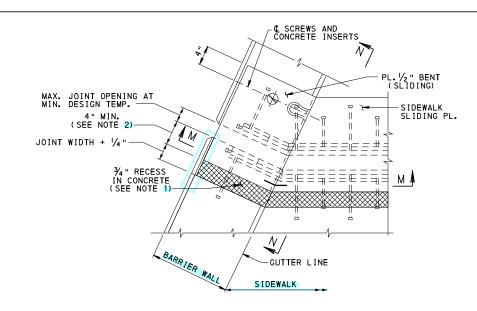
RECOMMENDED FEB. 19, 2021

SHEET 6 OF 12 BC-709M

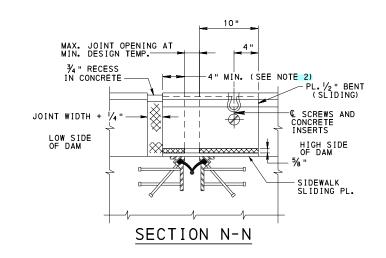


## PLAN AT ALTERNATE SIDEWALK- SKEW ANGLE ≥ 75°





## PLAN AT ALTERNATE SIDEWALK- SKEW ANGLE < 75°



#### NOTES:

- 1. FORM CONCRETE RECESS AREA IN BARRIER WALL AND GRIND TO PROVIDE SMOOTH SURFACE. APPLY ONE COAT OF ASPHALT CEMENT PAINT WA-1 OR PERFORMANCE GRADED ASPHALT CEMENT PG 64-22 TO ALLOW BENT SLIDING PLATE TO MOVE FREELY WITHOUT FRICTION.
- 2. MAINTAIN 4" MIN. BETWEEN EDGE OF STEEL TO THE EDGE OF CONCRETE AT TEMP. OF -10°F FOR STEEL BRIDGES AND 10°F FOR P/S CONCRETE BRIDGES.
- 3. MAXIMUM DISTANCE ALONG THE EXTRUSION FROM EDGE OF EXTENSION OR BEND TO FIRST STUD IS 3".

#### PA TYPE 10M BRIDGE BARRIER AT NEOPRENE STRIP SEAL DAM

(RAILING POST AND TUBE RAILS NOT SHOWN)

STANDARD

PA TYPE 10M BRIDGE BARRIER

COMMONWEALTH OF PENNSYLVANIA

DEPARTMENT OF TRANSPORTATION BUREAU OF PROJECT DELIVERY

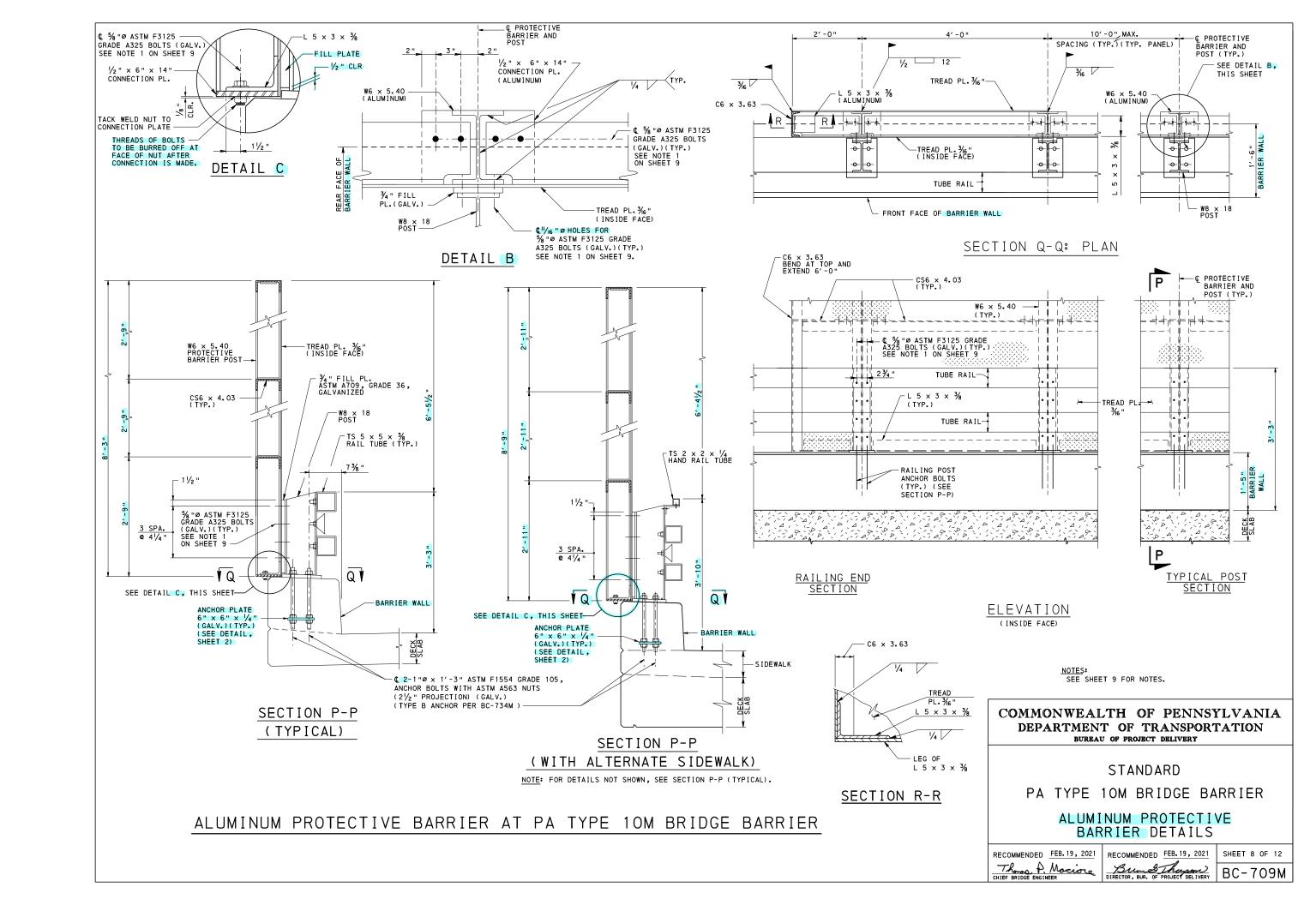
> DETAILS AT NEOPRENE STRIP SEAL DAM

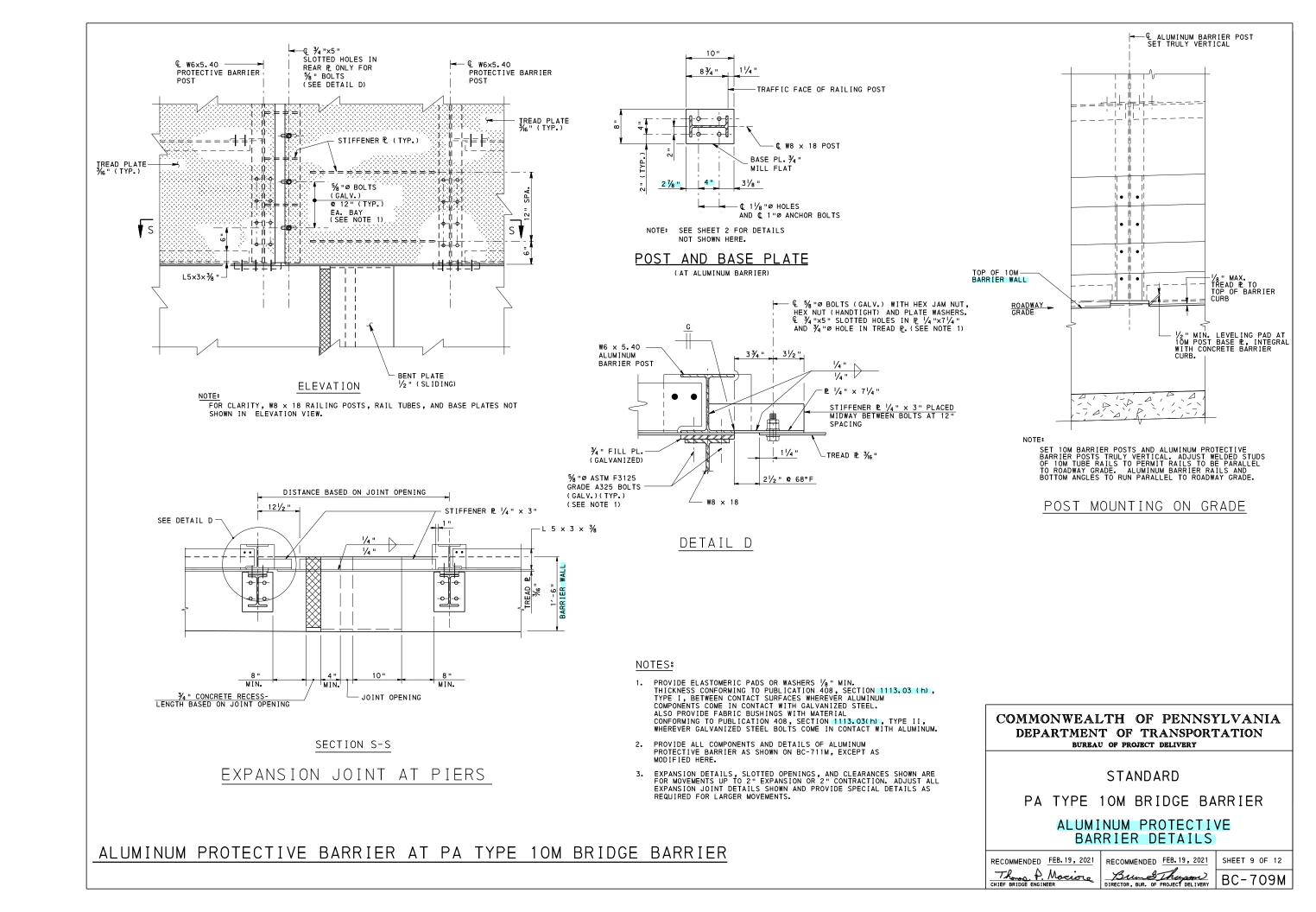
RECOMMENDED FEB. 19, 2021 Thomas A. Macione
CHIEF BRIDGE ENGINEER

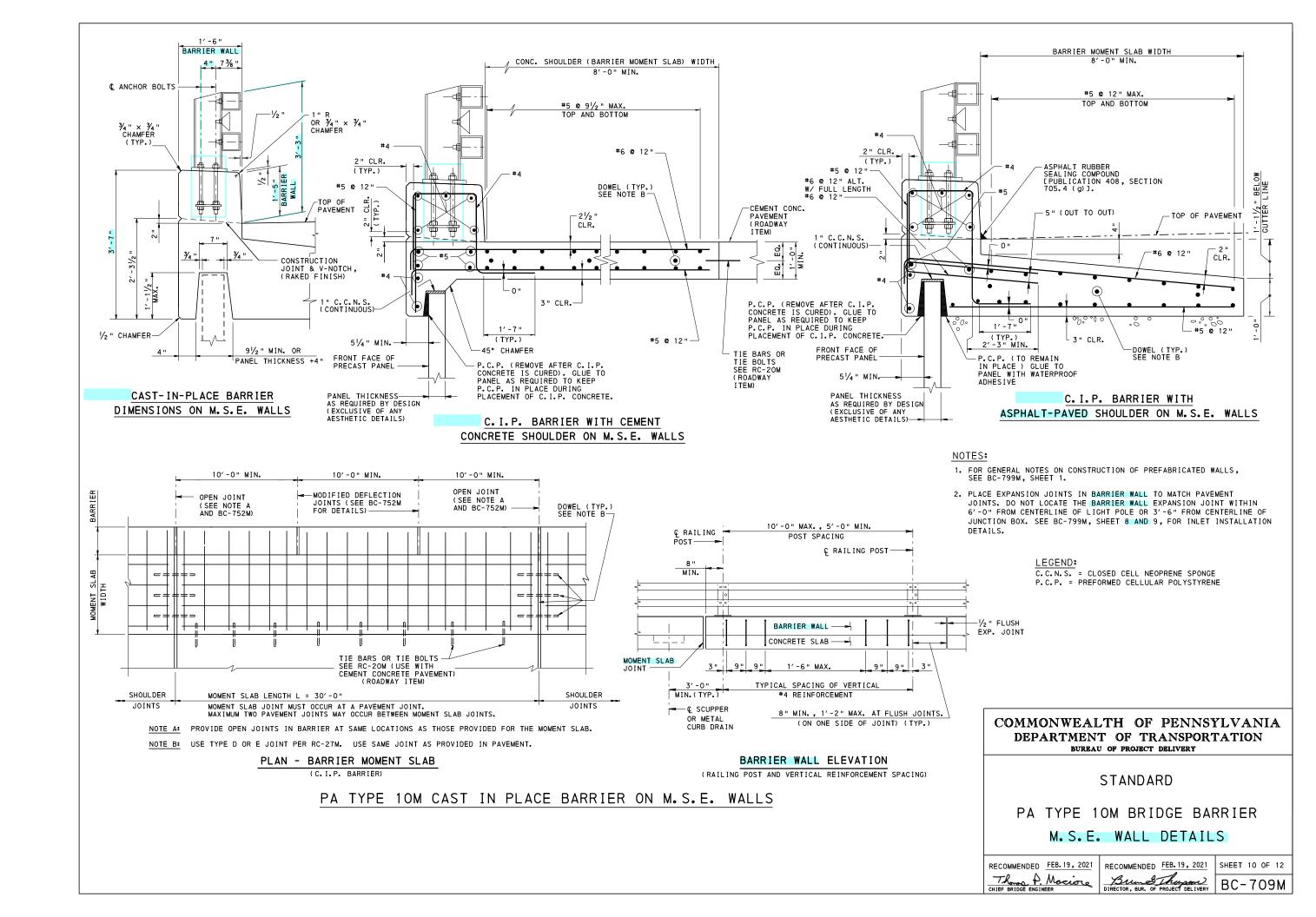
Bund Theyan BC-709M

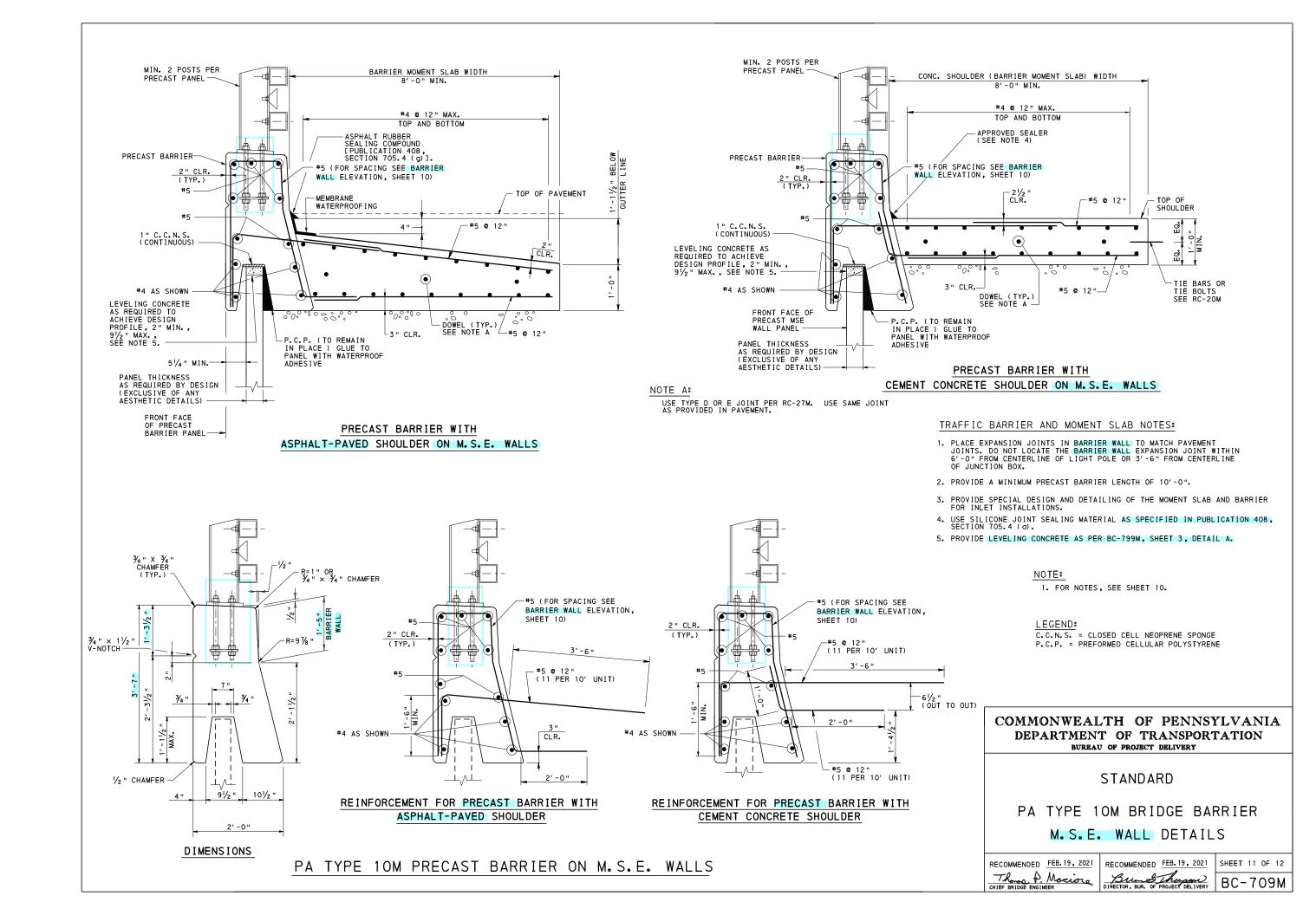
RECOMMENDED FEB. 19, 2021 | SHEET 7 OF 12

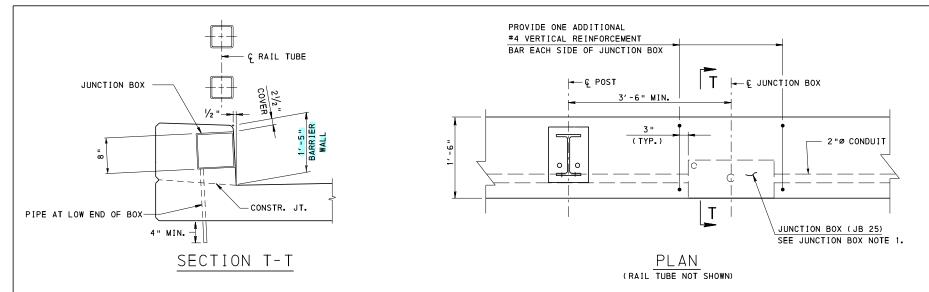
FIGURE 10" STUDS CANNOT BE ACCOMMODATED IN THE SPACE AVAILABLE, REQUEST SPECIFIC LENGTH APPROVAL FROM THE DISTRICT BRIDGE ENGINEER AT THE SHOP DRAWINGS APPROVAL STAGE.







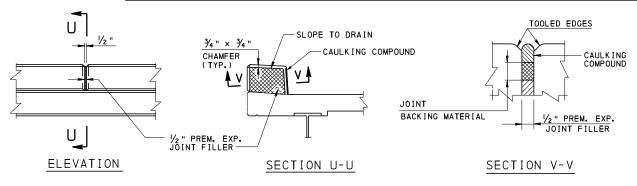




#### JUNCTION BOX NOTES:

- JUNCTION BOX MAY BE LOCATED EITHER TO THE LEFT OR TO THE RIGHT OF THE LIGHTING POLE.
- JUNCTION BOXES ARE ONLY REQUIRED, IF SPECIFIED ON THE CONTRACT DRAWINGS.
- 3. FOR TYPICAL SIDEWALK, PLACE JUNCTION BOX ON SIDEWALK SIDE.

## PA TYPE 10M BRIDGE BARRIER ALTERNATE JUNCTION BOX DETAIL

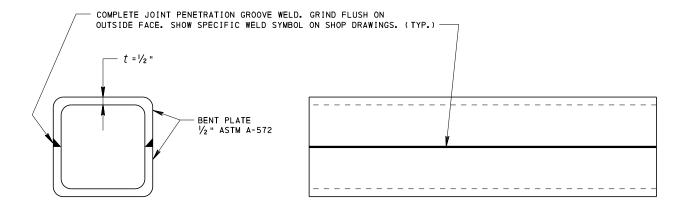


#### OPEN JOINT DETAIL (RAILING POST AND TUBE NOT SHOWN)

#### OPEN JOINT NOTES:

- FOR LOCATION OF CONSTRUCTION JOINTS AND OPEN JOINTS, REFER TO DESIGN DRAWINGS.
- PROVIDE CAULKING COMPOUND CONFORMING TO PUBLICATION 408, SECTION 705.7 (b).
- PROVIDE JOINT BACKING MATERIAL CONFORMING TO PUBLICATION 408, SECTION 705.8.
- 4. PROVIDE PREMOLDED EXPANSION JOINT FILLER CONFORMING TO PUBLICATION 408, SECTION 705.1.
- 5. PROVIDE 2" CLEAR ON ALL REINFORCEMENT UNLESS NOTED.
- 6. FOR ADDITIONAL NOTES, SEE SHEET 1.

#### PA TYPE 10M BRIDGE BARRIER AT OPEN JOINT



END VIEW

ELEVATION

<u>ALTERNATE</u> RAIL SPLICE SLEEVE

#### COMMONWEALTH OF PENNSYLVANIA DEPARTMENT OF TRANSPORTATION BUREAU OF PROJECT DELIVERY

STANDARD

PA TYPE 10M BRIDGE BARRIER MISCELLANEOUS DETAILS

RECOMMENDED FEB. 19, 2021 Thoma A. Macione
CHIEF BRIDGE ENGINEER

RECOMMENDED FEB. 19, 2021 SHEET 12 OF 12

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