

NOTES:

1. Railings and barriers are referenced by their material, type code and performance or test level:

Railing/Barrier Name:

CT-TL2 BARRIER
CP-PL2 BARRIER
CF-PL2 BARRIER
CF-PL3 BARRIER
S3-TL4 RAILING
BR-2 RAILING
CM-TL3 RAILING

2. All concrete for railing/traffic barrier systems, sidewalks and safety curbs shall be 5000 PSI, $\frac{3}{4}$ IN, 685 HP Cement Concrete, except for the CT-TL2 Barrier, which shall be 5000 PSI, $\frac{3}{8}$ IN, 710 HP Cement Concrete and shall be noted on the Construction Drawings. Concrete penetrant is not required for barriers composed of HP cement concrete.
3. Transverse steel in sidewalks and safety curbs shall follow the same direction as the transverse deck steel.
4. Details of railing/barriers for separated precast concrete box/deck and NEBT beam bridges are similar to the details for the steel stringer bridges, except that the maximum overhang shall be as follows: 2'-6" from the outside fascia of the precast box/deck beam; 2'-0" from the outside edge of the top flange for the NEBT beam.
5. The details of the dowel arrangement for the attachment of the sidewalk slab to precast adjacent beam bridges are shown in Section 3 of Chapter 4.
6. Deck Slab Thickness and Reinforcement as well as the Additional Overhang Reinforcement and its extension length (Lext.) shall be as per the design tables of Chapter 7. It was pre-designed for all referenced barrier/railing systems based on the type of beams and their spacing.
7. The minimum depth of slab for the overhanging sidewalk is 11". All overhanging sidewalks have been pre-designed for utility loads up to 250 lb/ft that are centered in the overhang. The minimum depth of slab for the roadway deck (outside the exterior beam) is $9\frac{1}{4}$ " at the location of the embedded reinforcement.
8. If the limits specified in the design tables or the minimum thicknesses stated above are violated, the Designer shall design the appropriate reinforcement in the decks, overhangs, and sidewalk slabs as well as the required embedment of the barrier reinforcement and rail anchor bolts.
9. The unit weights of the unmodified railings/barriers are as follows:

CT-TL2 at sidewalk:	369 lb/ft (between pilasters)
CT-TL2 pilaster (16" wide) at sidewalk:	608 lb/each
CT-TL2 at safety curb:	444 lb/ft
CT-TL2 pilaster (16" wide) at safety curb:	682 lb/each
S3-TL4 at sidewalk:	90 lb/ft (assuming 6'-6" rail post spacing)
S3-TL4 at safety curb:	85 lb/ft (assuming 6'-6" rail post spacing)
CP-PL2 at sidewalk:	400 lb/ft
CP-PL2 at safety curb:	459 lb/ft
CF-PL2:	457 lb/ft
CF-PL2 (Modified):	531 lb/ft
CF-PL3:	644 lb/ft
CF-PL3 (Modified):	706 lb/ft
BR-2:	21 lb/ft (assuming 6'-6" rail post spacing)
CM-TL3:	30 lb/ft (assuming 6'-6" rail post spacing)
TYPE I PROTECTIVE SCREEN:	34 lb/ft
TYPE II PROTECTIVE SCREEN:	21 lb/ft
TYPE II ELECTRIFICATION BARRIER:	47 lb/ft



LRFD BRIDGE
MANUAL, PART II

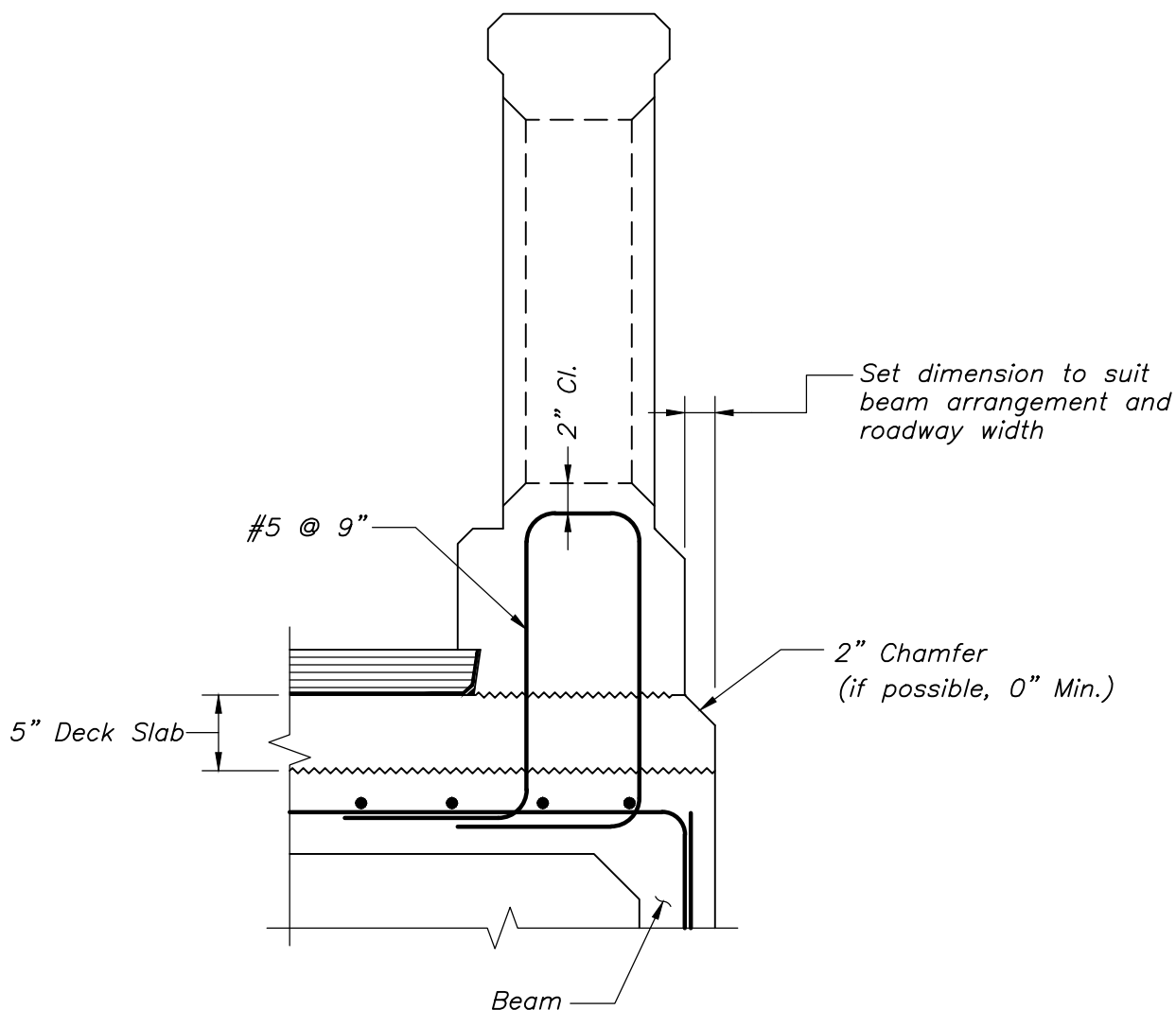
DESIGNER NOTES

GENERAL

DATE OF ISSUE
JUNE 2013

DRAWING NUMBER

9.1.1



SECTION THRU SAFETY CURB

SCALE: 1" = 1'-0"



LRFD BRIDGE
MANUAL, PART II

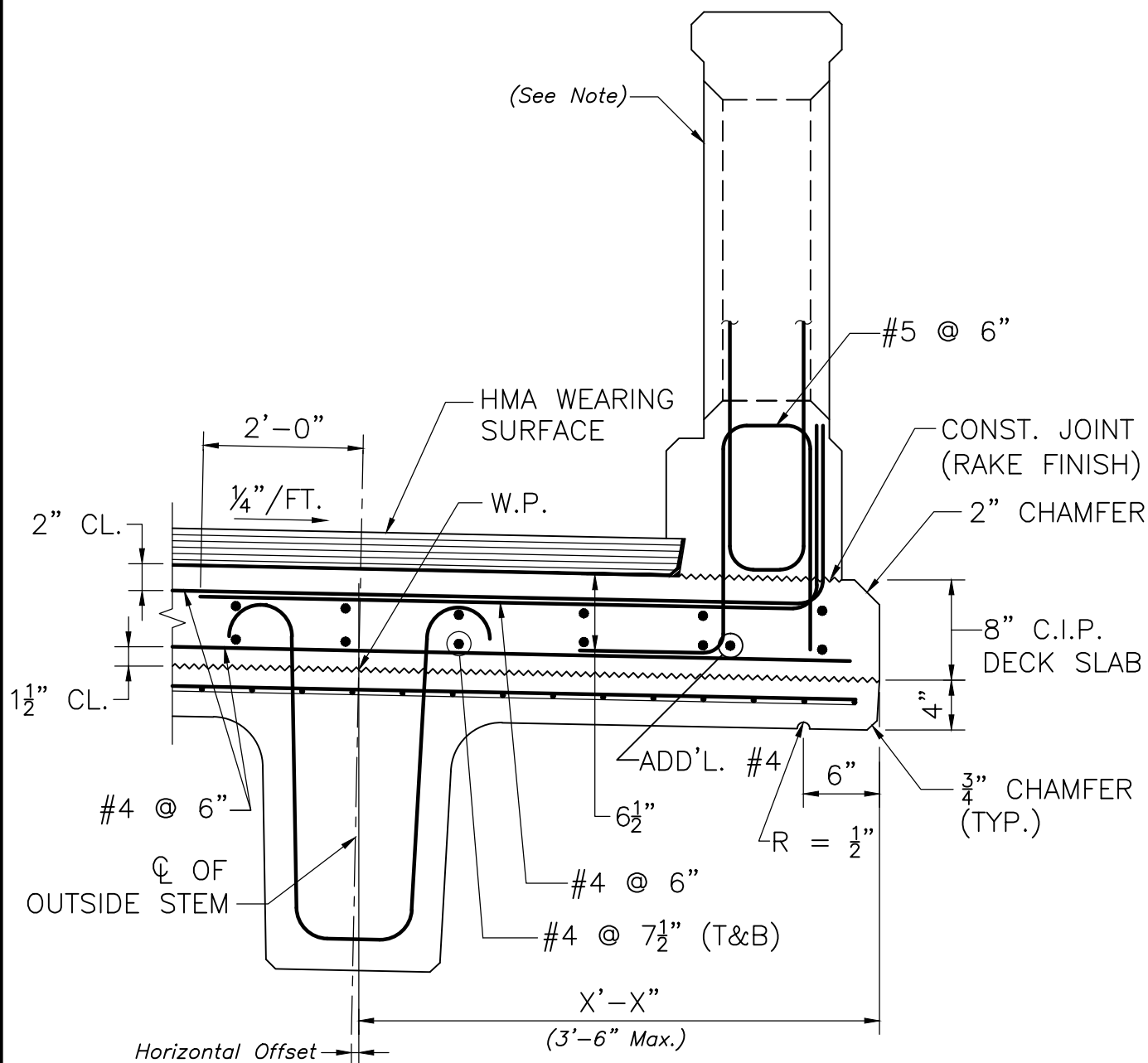
MODIFICATIONS FOR ADJACENT BEAM BRIDGES

CT-TL2 BARRIER

DATE OF ISSUE
JUNE 2013

DRAWING NUMBER

9.2.2



NOTE:

PRESTRESSING STRANDS IN THE BEAM ARE NOT SHOWN FOR CLARITY.

SECTION THRU SAFETY CURB

SCALE: 1" = 1'-0"

NOTE:

Provide all required barrier geometry and reinforcement information as per Dwg. No. 9.2.1.



LRFD BRIDGE
MANUAL, PART II

**SECTION THRU SAFETY CURB
NEXT F BEAM BRIDGES**

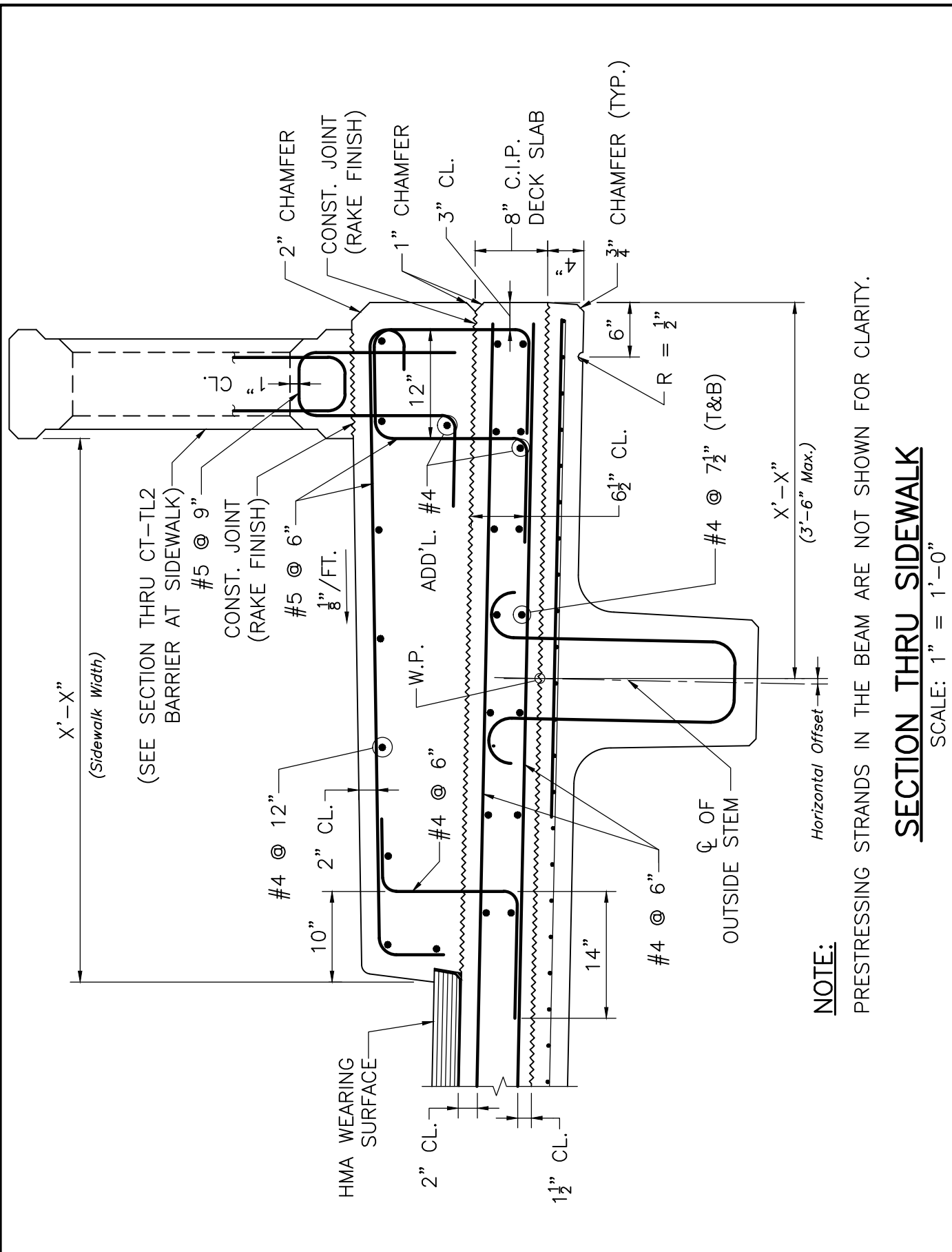
CT-TL2 BARRIER

DATE OF ISSUE
JUNE 2013

DRAWING NUMBER

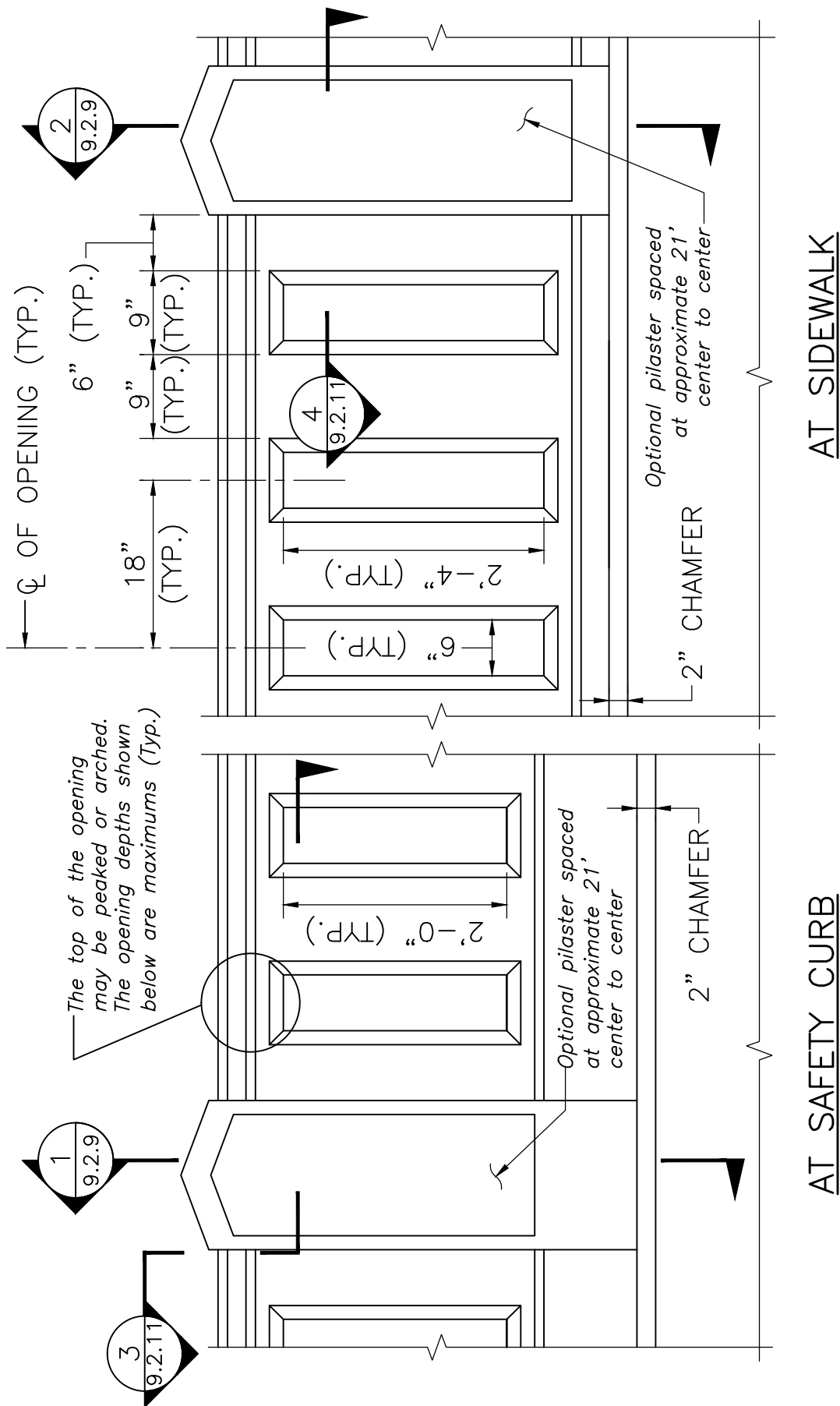
9.2.3





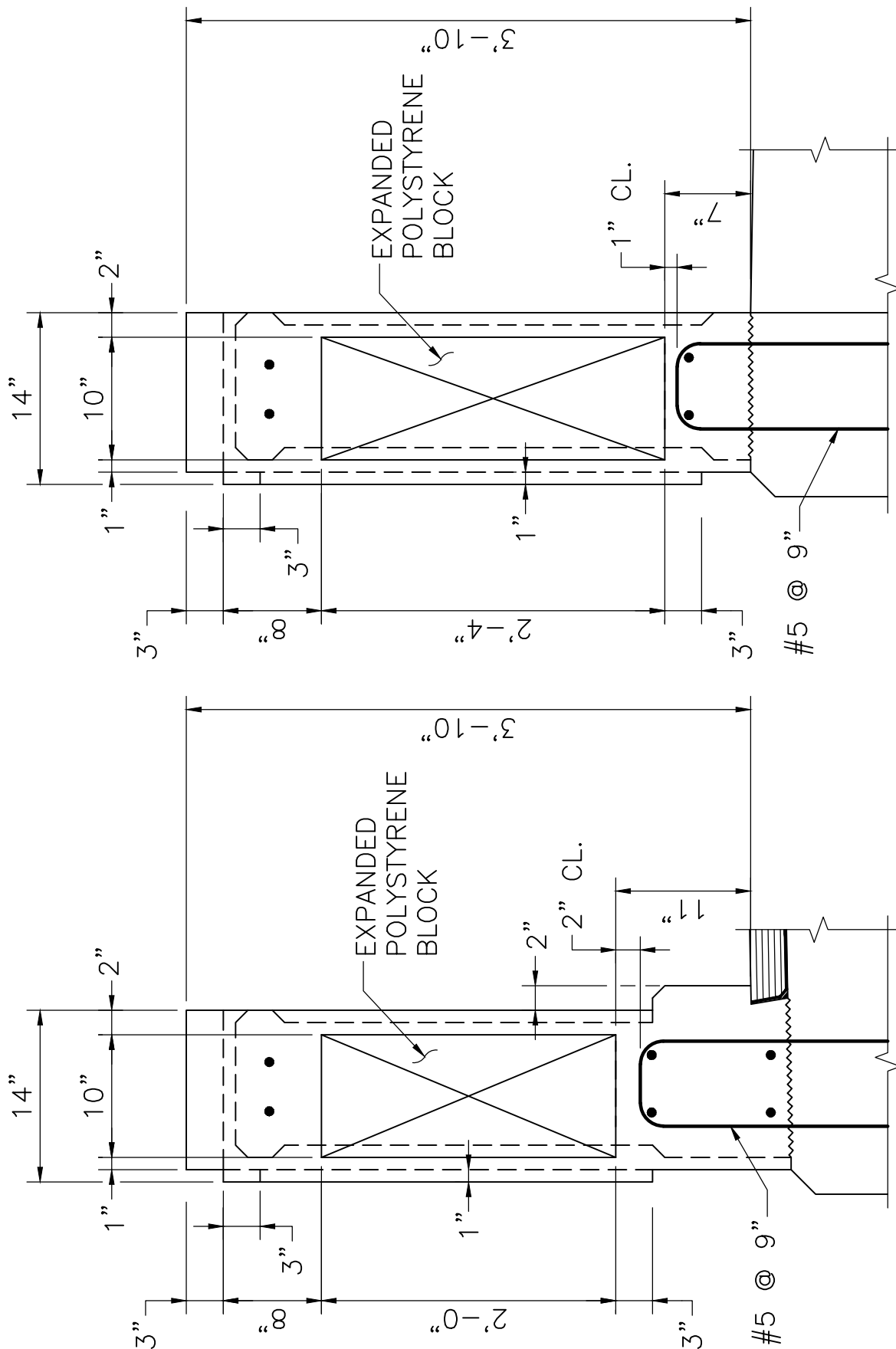
NOTE:
PRESTRESSING STRANDS IN THE BEAM ARE NOT SHOWN FOR CLARITY.

SECTION THRU SIDEWALK
SCALE: 1" = 1'-0"



EXTERIOR BARRIER ELEVATION

SCALE: $\frac{3}{4}" = 1'-0"$



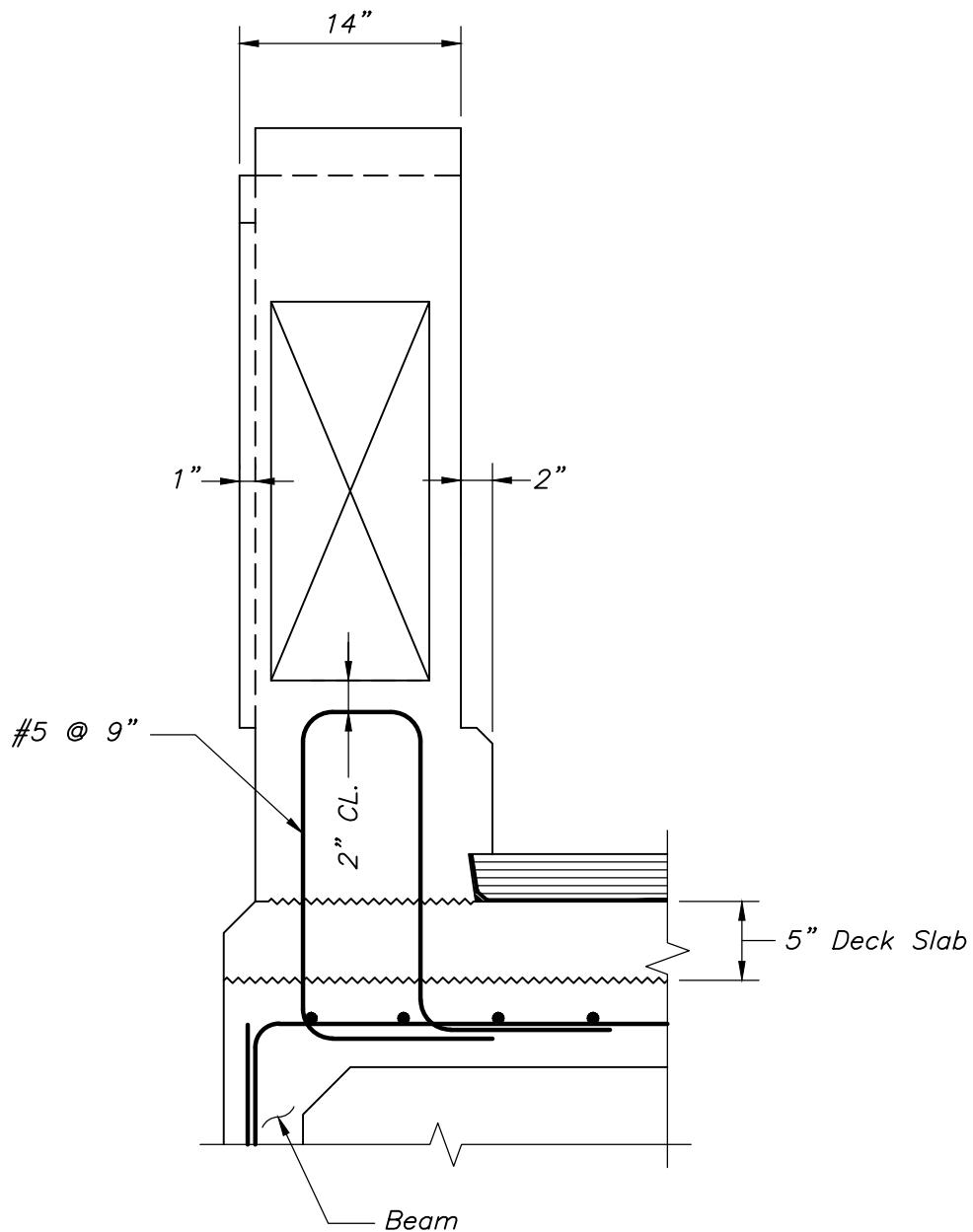
LRFD BRIDGE
MANUAL, PART II

VERTICAL SECTIONS THRU OPTIONAL PILASTERS CT-TL2 BARRIER

DATE OF ISSUE
JUNE 2013

DRAWING NUMBER

9.2.9



VERTICAL SECTION THRU OPTIONAL PILASTER
 SCALE: 1" = 1'-0"

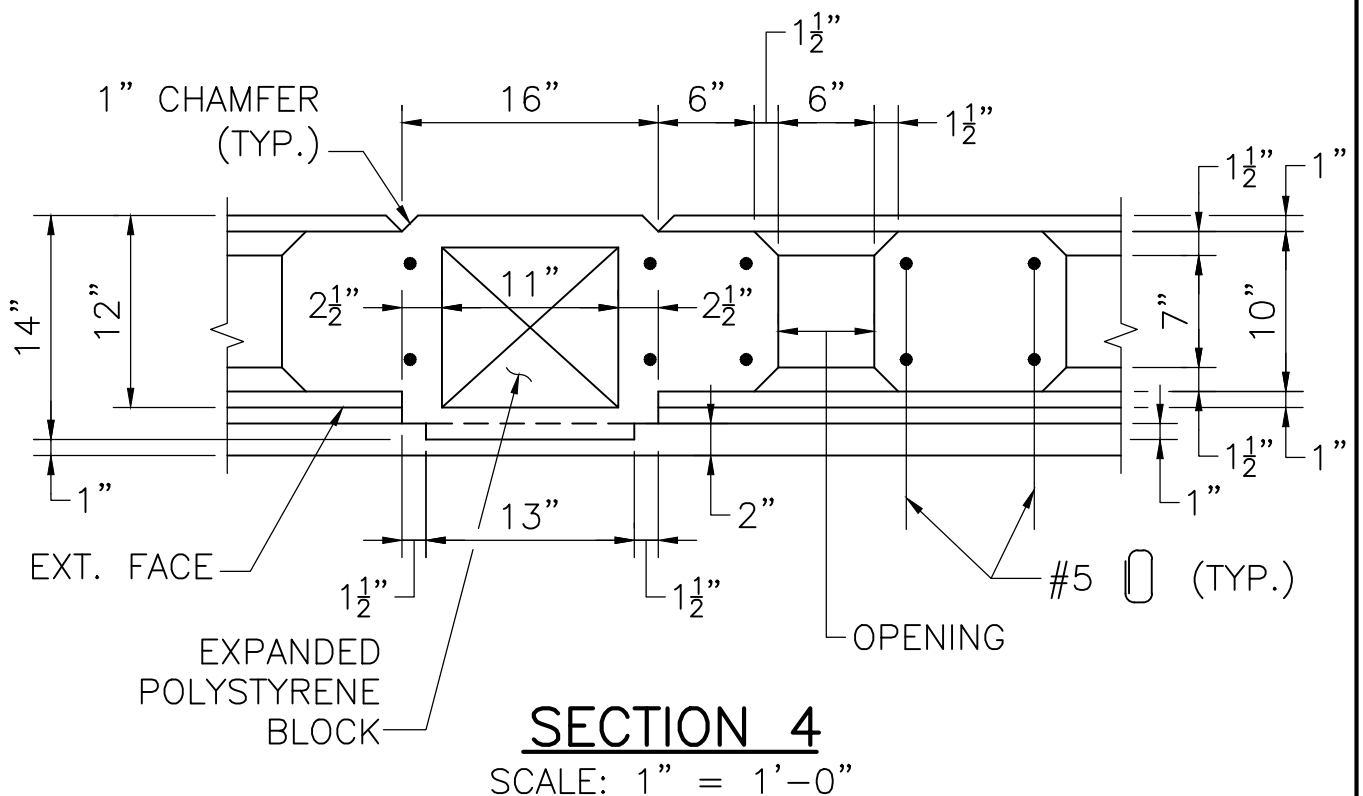
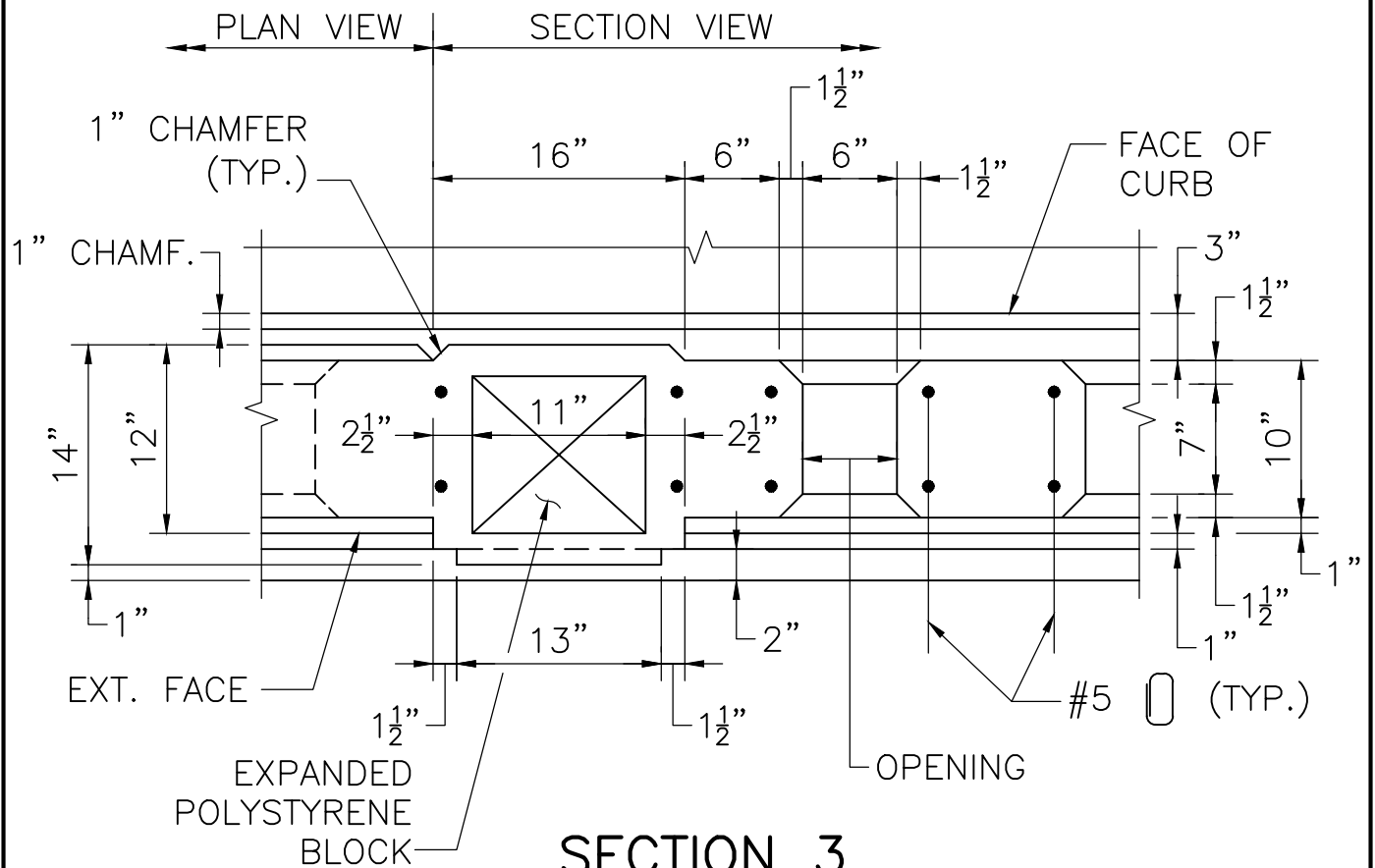


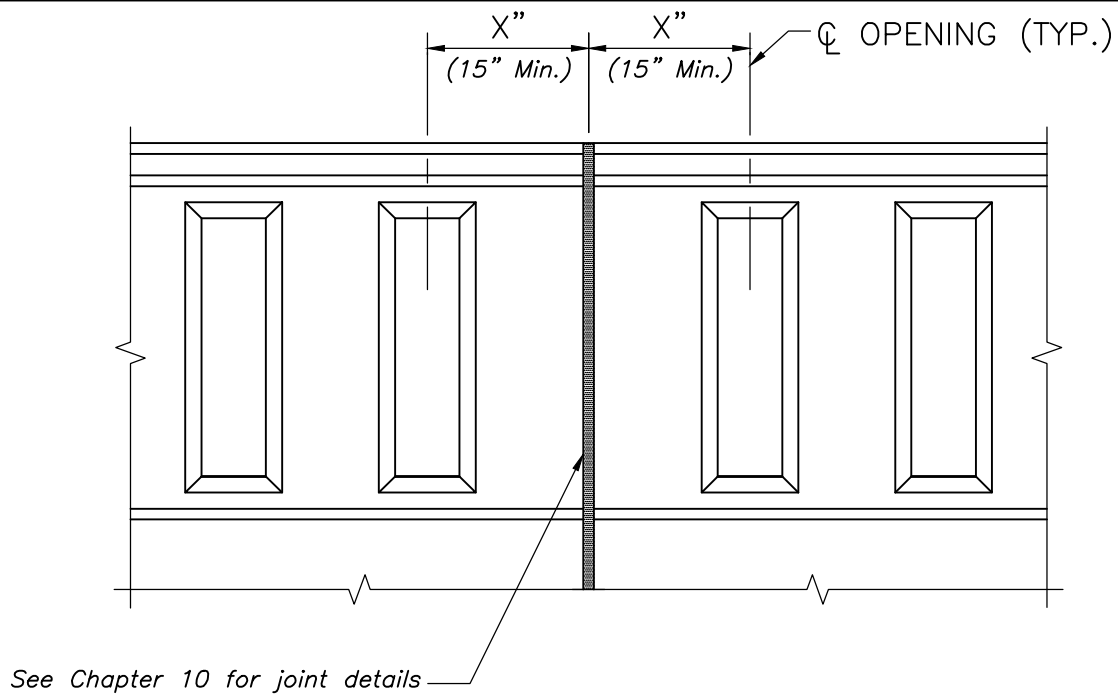
LRFD BRIDGE
 MANUAL, PART II

MODIFICATIONS FOR ADJACENT BEAM BRIDGES CT-TL2 BARRIER

DATE OF ISSUE
 JUNE 2013

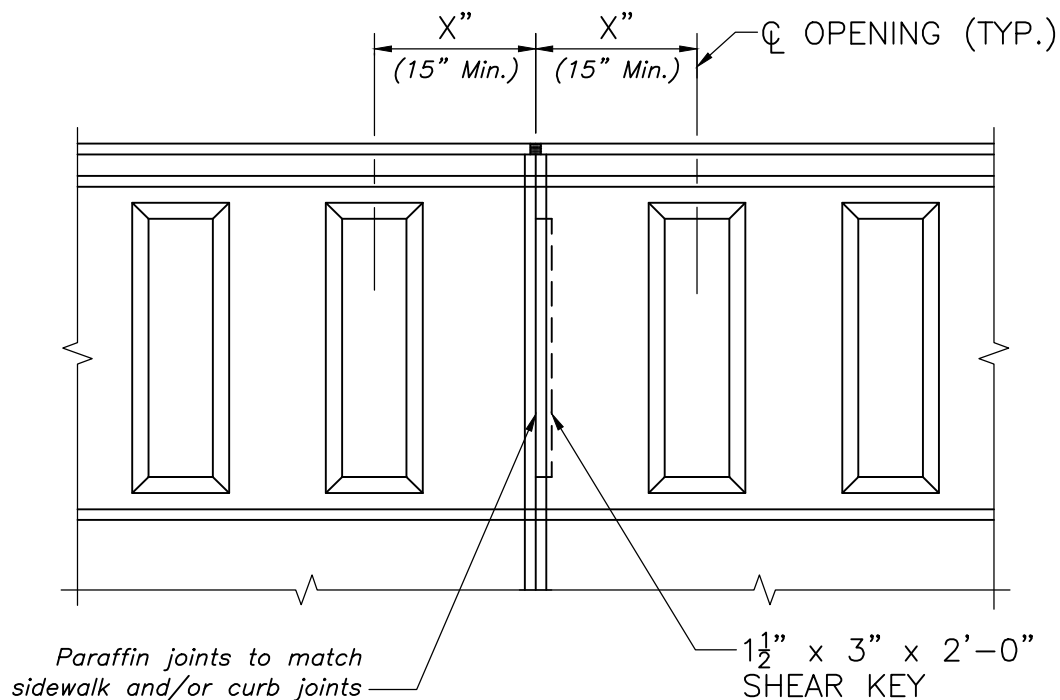
DRAWING NUMBER
9.2.10





EXPANSION JOINT

SCALE: $\frac{3}{4}" = 1'-0"$



PARAFFIN JOINT

SCALE: $\frac{3}{4}" = 1'-0"$

NOTE:

Paraffin joints shall be spaced a minimum of 20' and a maximum of 25' over deck and at construction joints on wingwalls.



LRFD BRIDGE
MANUAL, PART II

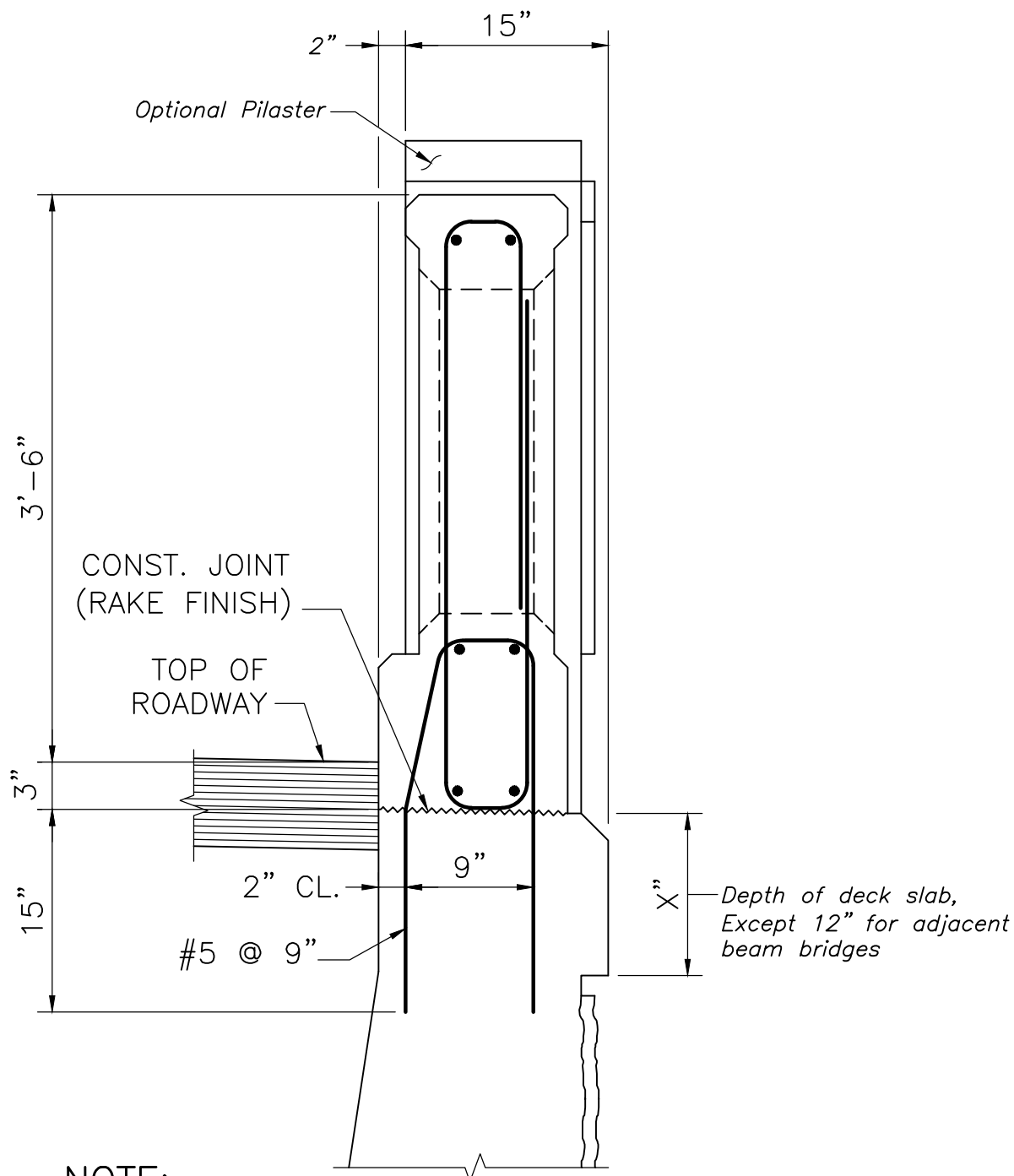
JOINT DETAILS

CT-TL2 BARRIER

DATE OF ISSUE
JUNE 2013

DRAWING NUMBER

9.2.12



NOTE:

SEE SECTION THRU CT-TL2 BARRIER AT SAFETY CURB FOR DIMENSIONS AND REINFORCEMENT NOT SHOWN HERE.

TOP OF U-WINGWALL DETAILS
AT SAFETY CURB

SCALE: 1" = 1'-0"

NOTE:

Include and label all reinforcement at the top of the wingwall.



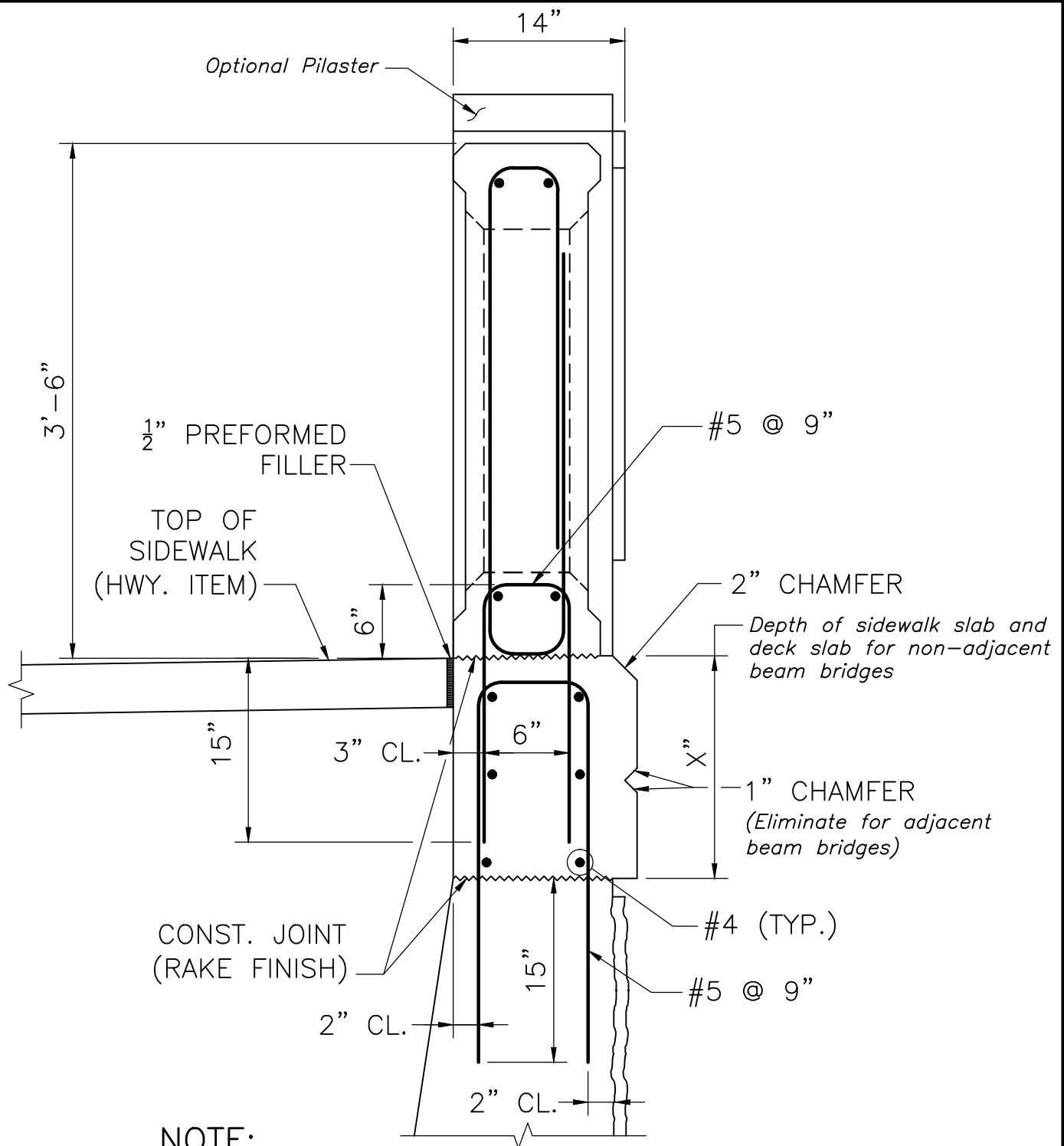
LRFD BRIDGE
MANUAL, PART II

TOP OF U-WINGWALL
DETAILS AT SAFETY CURB
CT-TL2 BARRIER

DATE OF ISSUE
JUNE 2013

DRAWING NUMBER

9.2.13



NOTE:

SEE SECTION THRU CT-TL2 AT SIDEWALK FOR DIMENSIONS AND REINFORCEMENT NOT SHOWN HERE.

**TOP OF U-WINGWALL DETAILS
AT SIDEWALK**

SCALE: 1" = 1'-0"

NOTE:

Include and label all reinforcement at the top of the wingwall.



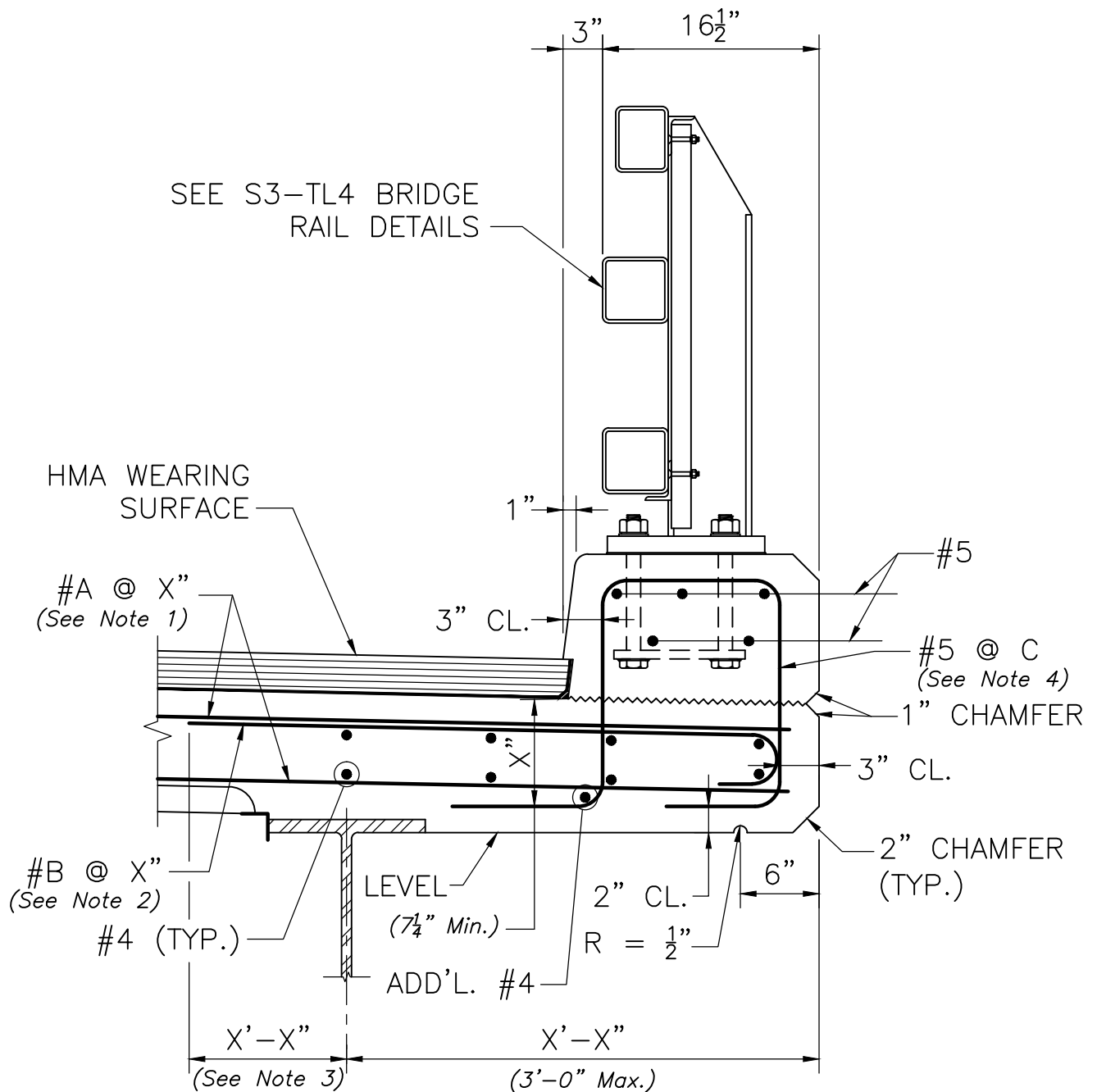
LRFD BRIDGE
MANUAL, PART II

TOP OF U-WINGWALL
DETAILS AT SIDEWALK
CT-TL2 BARRIER

DATE OF ISSUE
JUNE 2013

DRAWING NUMBER

9.2.14



SECTION THRU SAFETY CURB

SCALE: 1" = 1'-0"

NOTES:

1. #A @ X" = Size and spacing of the primary deck slab reinforcement as per Design Tables of Chapter 7.
2. #B @ X" = Size and spacing of the Additional Overhang Reinforcement as per Design Tables of Chapter 7.
3. Additional Overhang Reinforcement extension (Lext.) as per Design Tables of Chapter 7.
4. C = Same spacing as primary deck slab reinforcement.



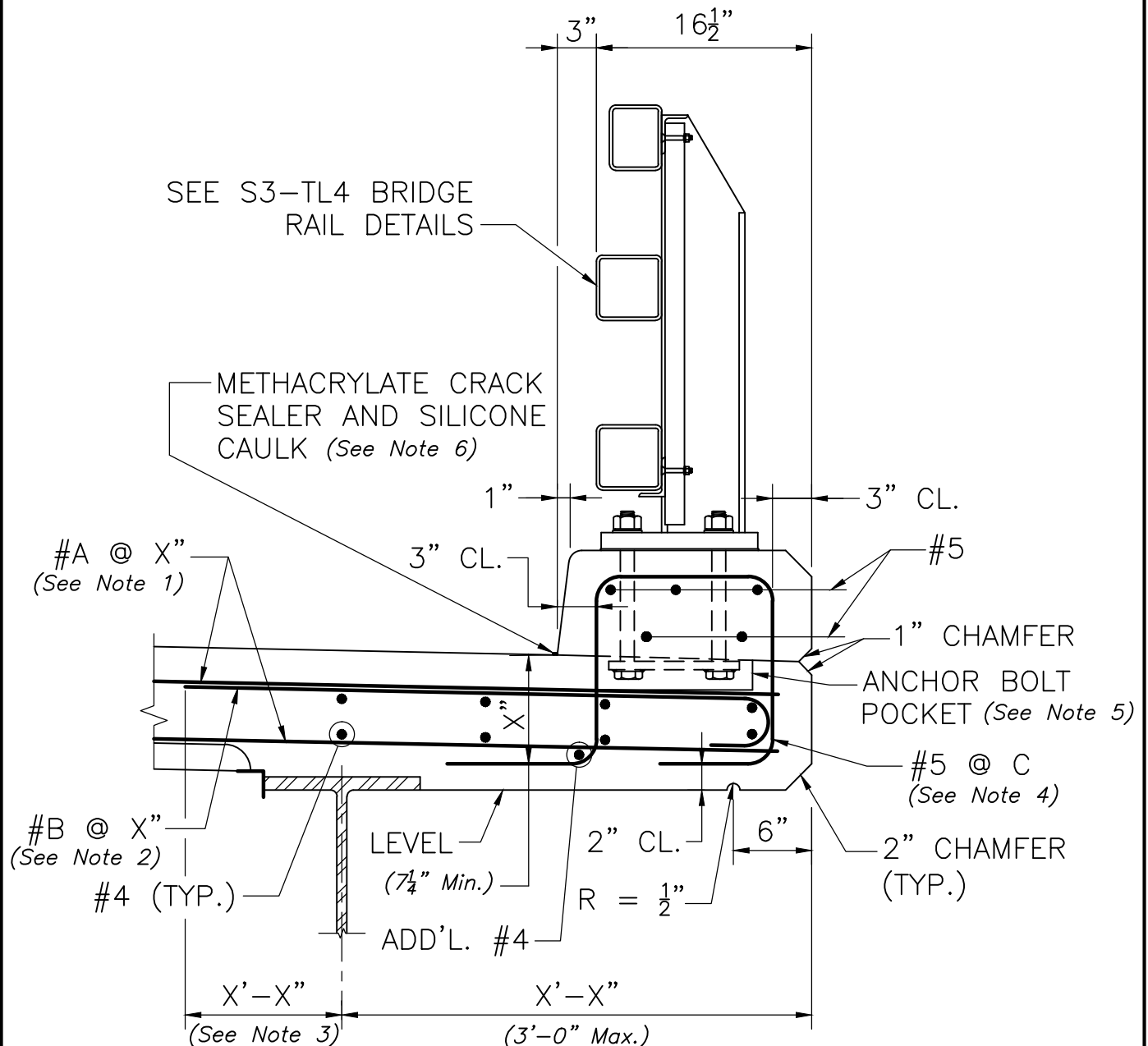
LRFD BRIDGE
MANUAL, PART II

SECTION THRU SAFETY CURB
STRINGER BRIDGES w/HMA W.S.
S3-TL4 RAIL

DATE OF ISSUE
JUNE 2013

DRAWING NUMBER

9.3.1

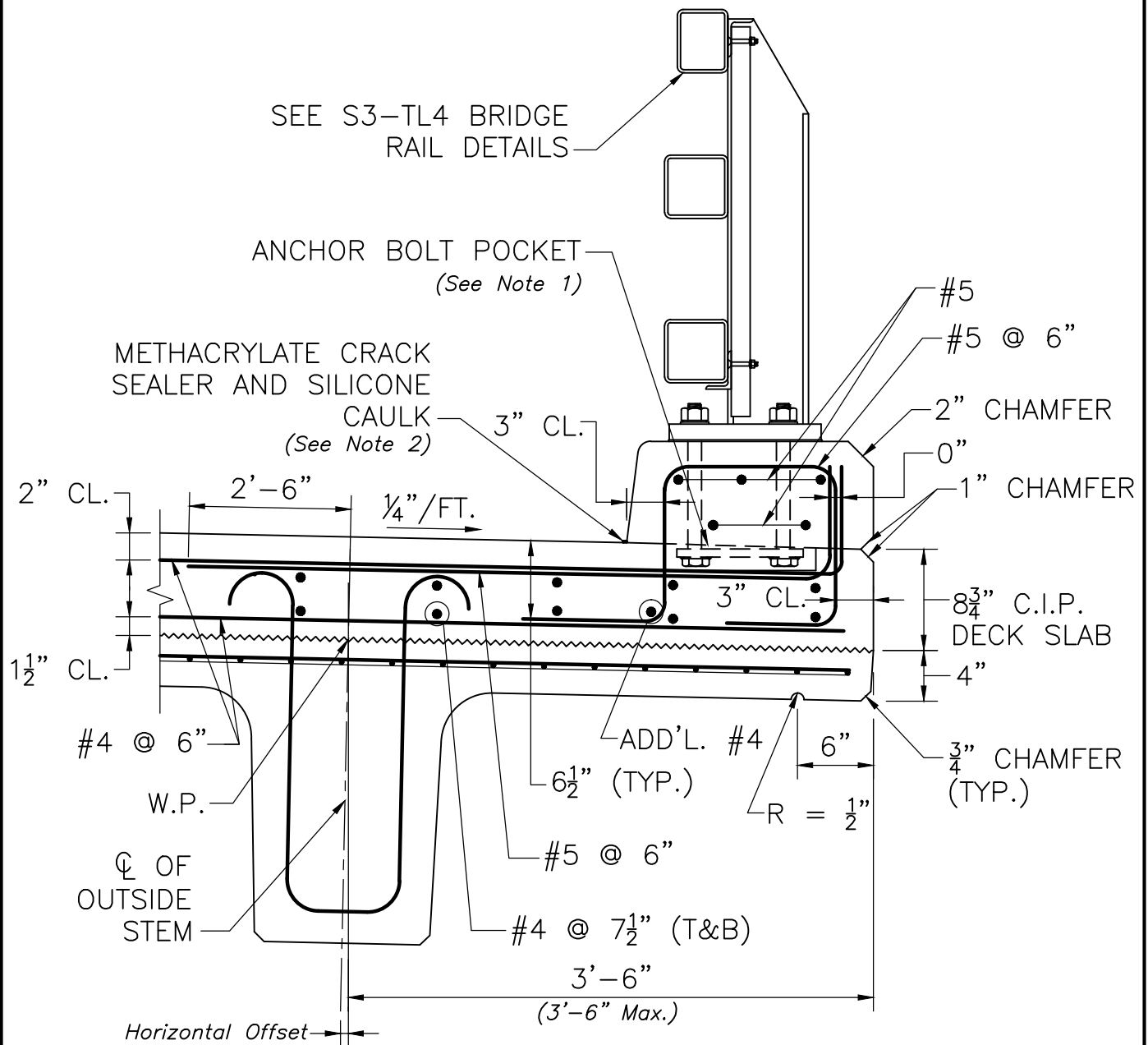


SECTION THRU SAFETY CURB

SCALE: 1" = 1'-0"

NOTES:

1. #A @ X" = Size and spacing of the primary deck slab reinforcement as per Design Tables of Chapter 7.
2. #B @ X" = Size and spacing of the Additional Overhang Reinforcement as per Design Tables of Chapter 7.
3. Additional Overhang Reinforcement extension (Lext.) as per Design Tables of Chapter 7.
4. C = Same spacing as primary deck slab reinforcement.
5. See Dwg. No. 9.3.5 for Details of Anchor Bolt Pocket.
6. See Dwg. No. 9.8.2 for Details of Curb Treatment.



NOTE:

PRESTRESSING STRANDS IN THE BEAM ARE NOT SHOWN FOR CLARITY.

SECTION THRU SAFETY CURB

SCALE: 1" = 1'-0"

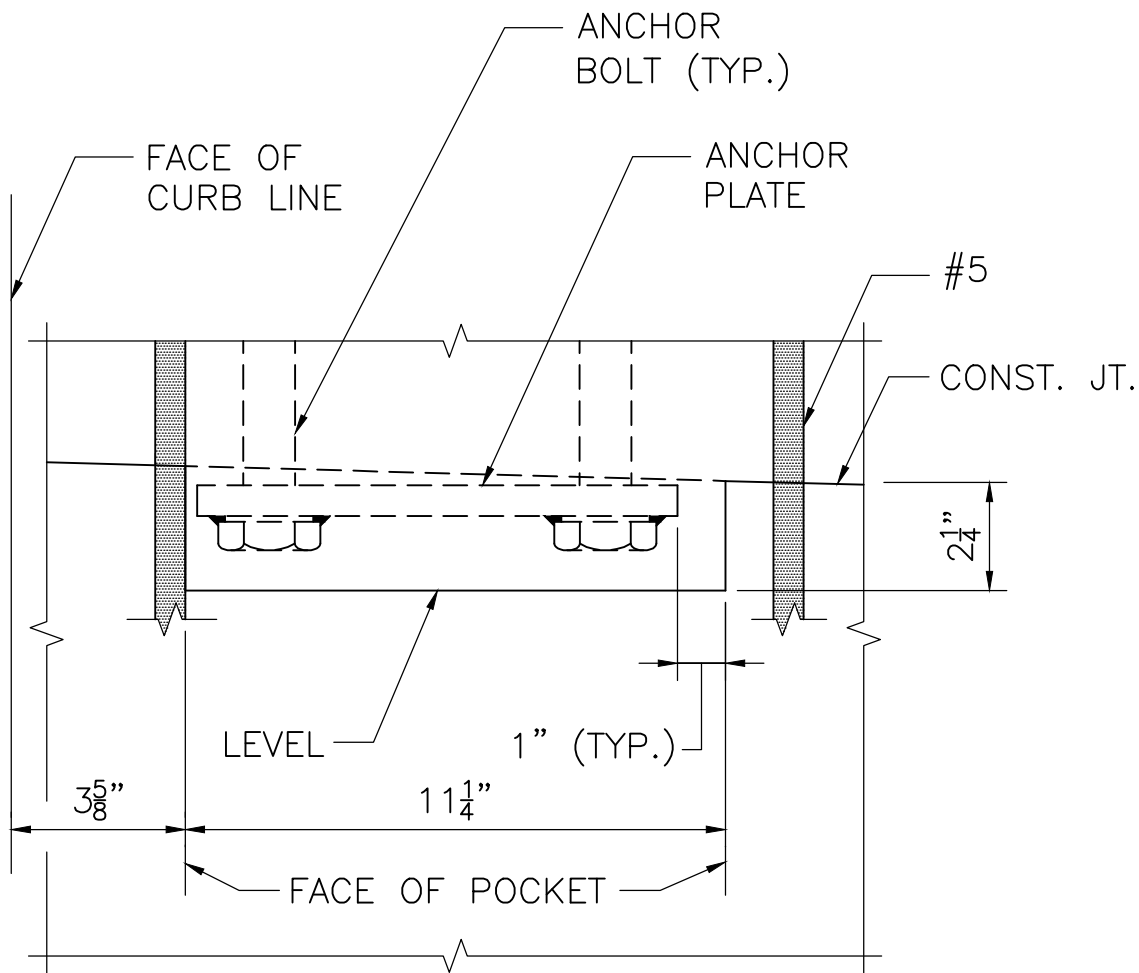


LRFD BRIDGE
MANUAL, PART II

SECTION THRU SAFETY CURB, NEXT
F BEAM BRIDGES w/ EXPOSED DECK
S3-TL4 RAIL

DATE OF ISSUE
JUNE 2013

DRAWING NUMBER
9.3.4

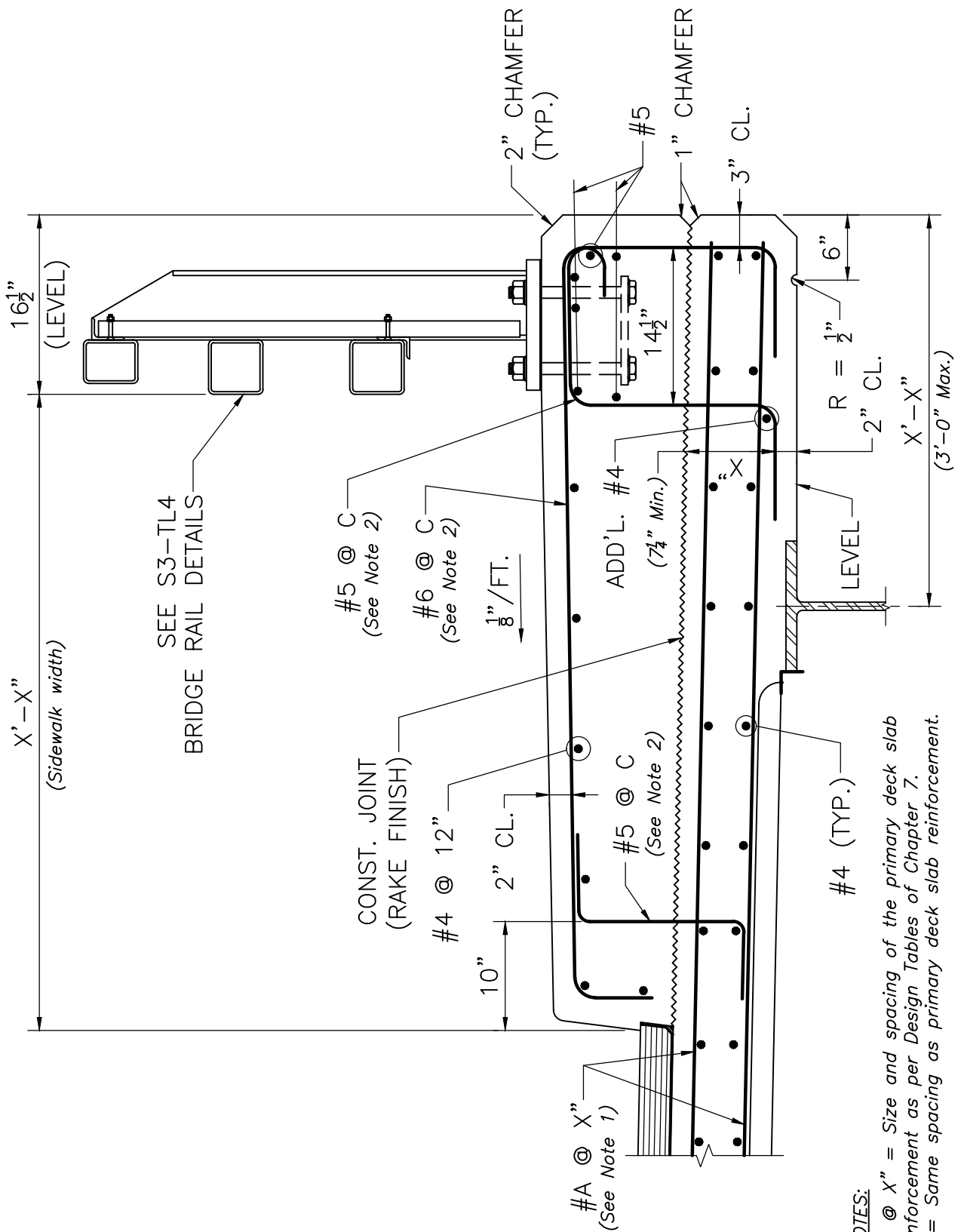


NOTE:

PROVIDE 15 3/4" LONG, 11 1/4" WIDE, 2 1/4" DEEP POCKET IN THE DECK SLAB AT THE LOCATION OF EACH RAIL POST AT SAFETY CURB ONLY.

ANCHOR BOLT POCKET

SCALE: 3" = 1'-0"

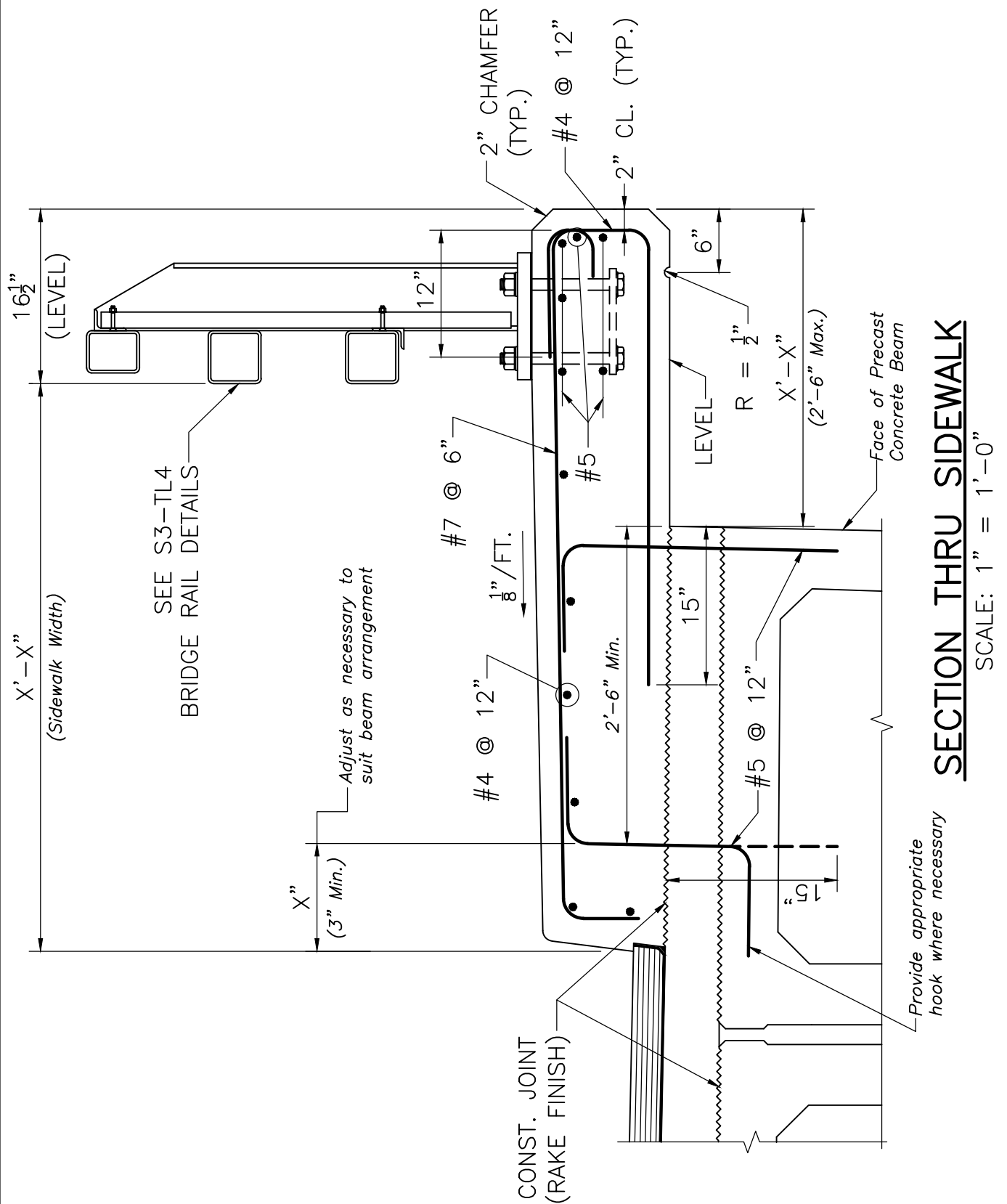


NOTES:

1. #A @ X" = Size and spacing of the primary deck slab reinforcement as per Design Tables of Chapter 7.
2. C = Same spacing as primary deck slab reinforcement.

SECTION THRU SIDEWALK

SCALE: 1" = 1'-0"



SECTION THRU SIDEWALK

SCALE: 1" = 1'-0"



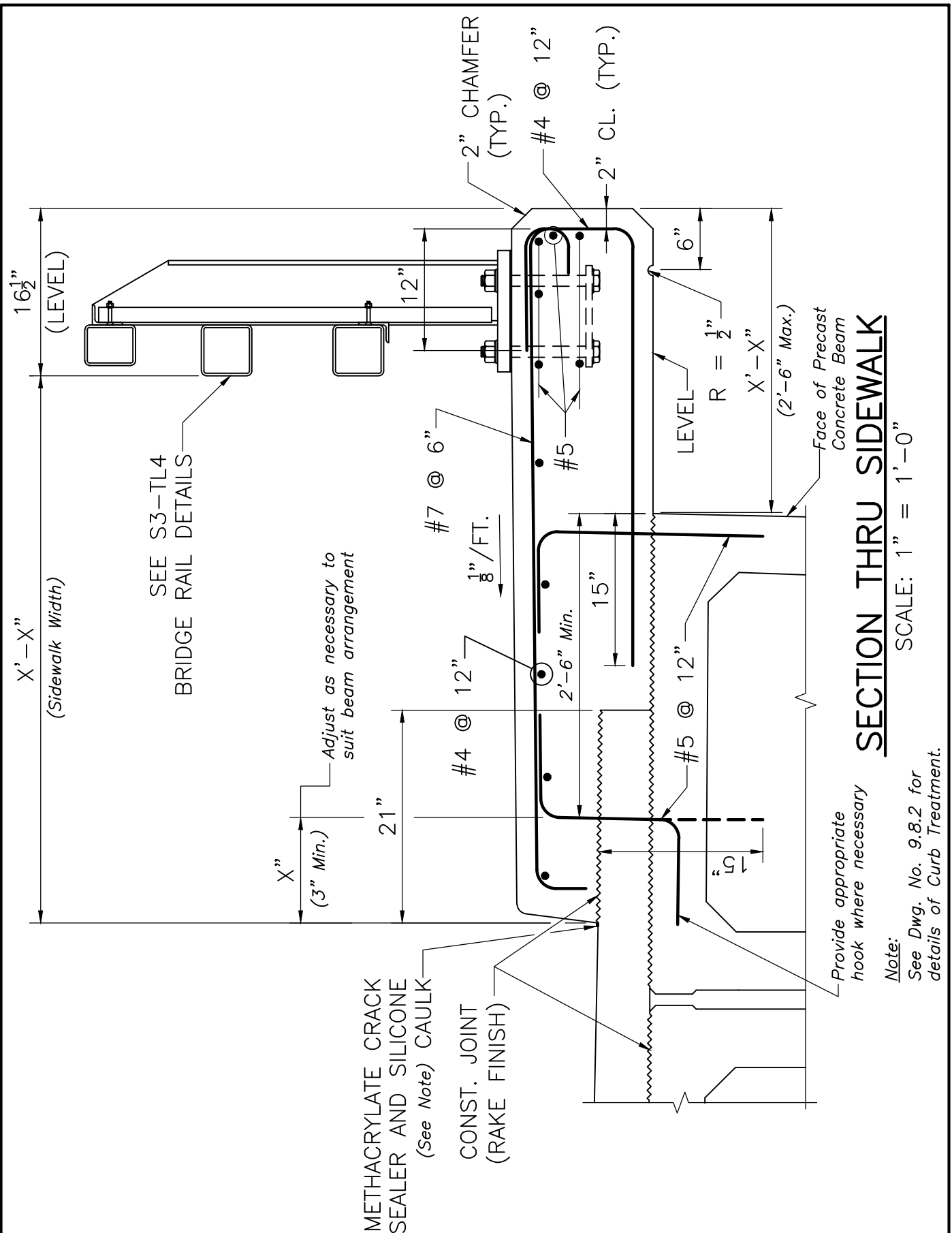
LRFD BRIDGE
MANUAL, PART II

SECTION THRU SIDEWALK
ADJACENT BEAMS w/ HMA W.S.
S3-TL4 RAIL

DATE OF ISSUE
JUNE 2013

DRAWING NUMBER

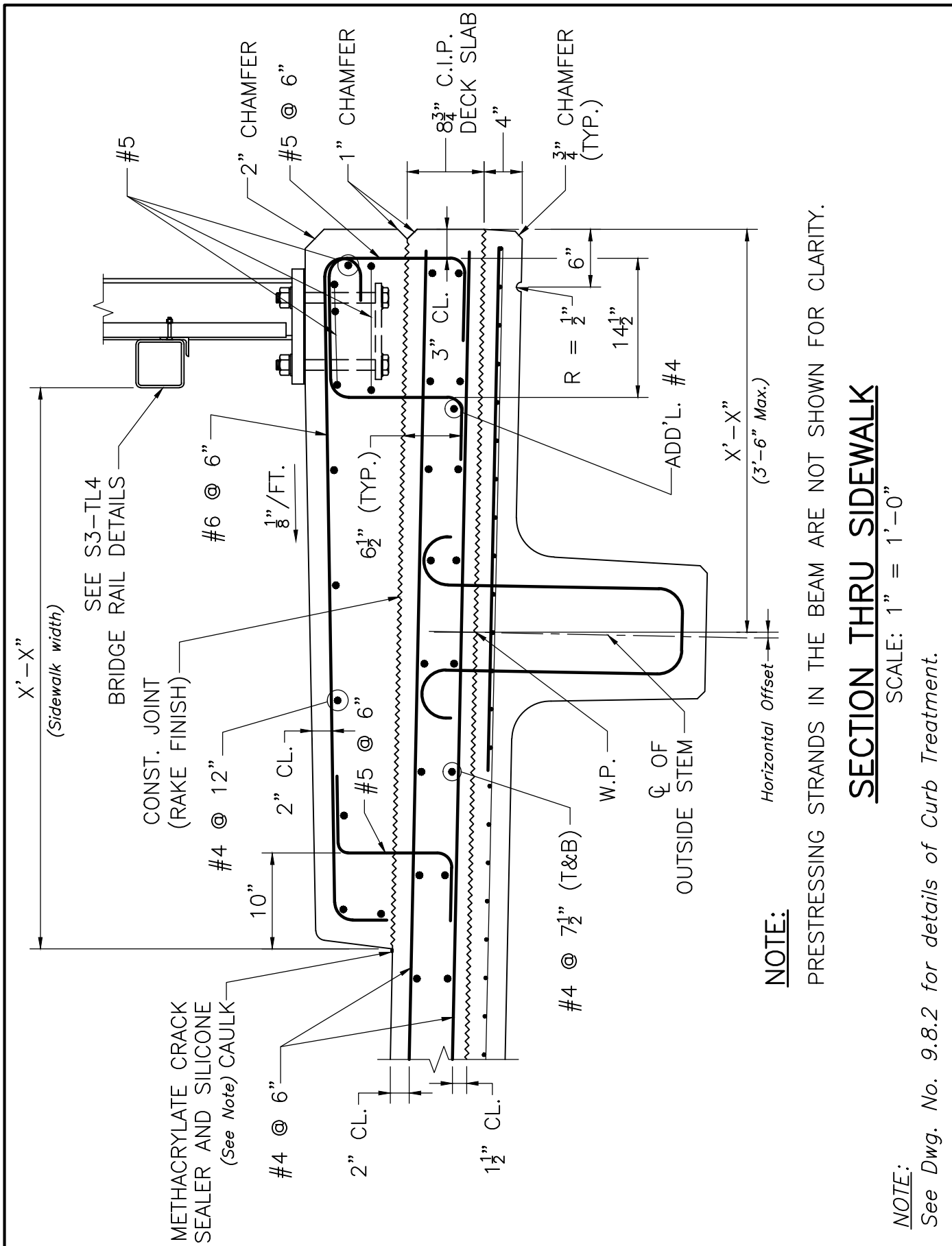
9.3.7





SECTION THRU SIDEWALK

SCALE: 1" = 1'-0"

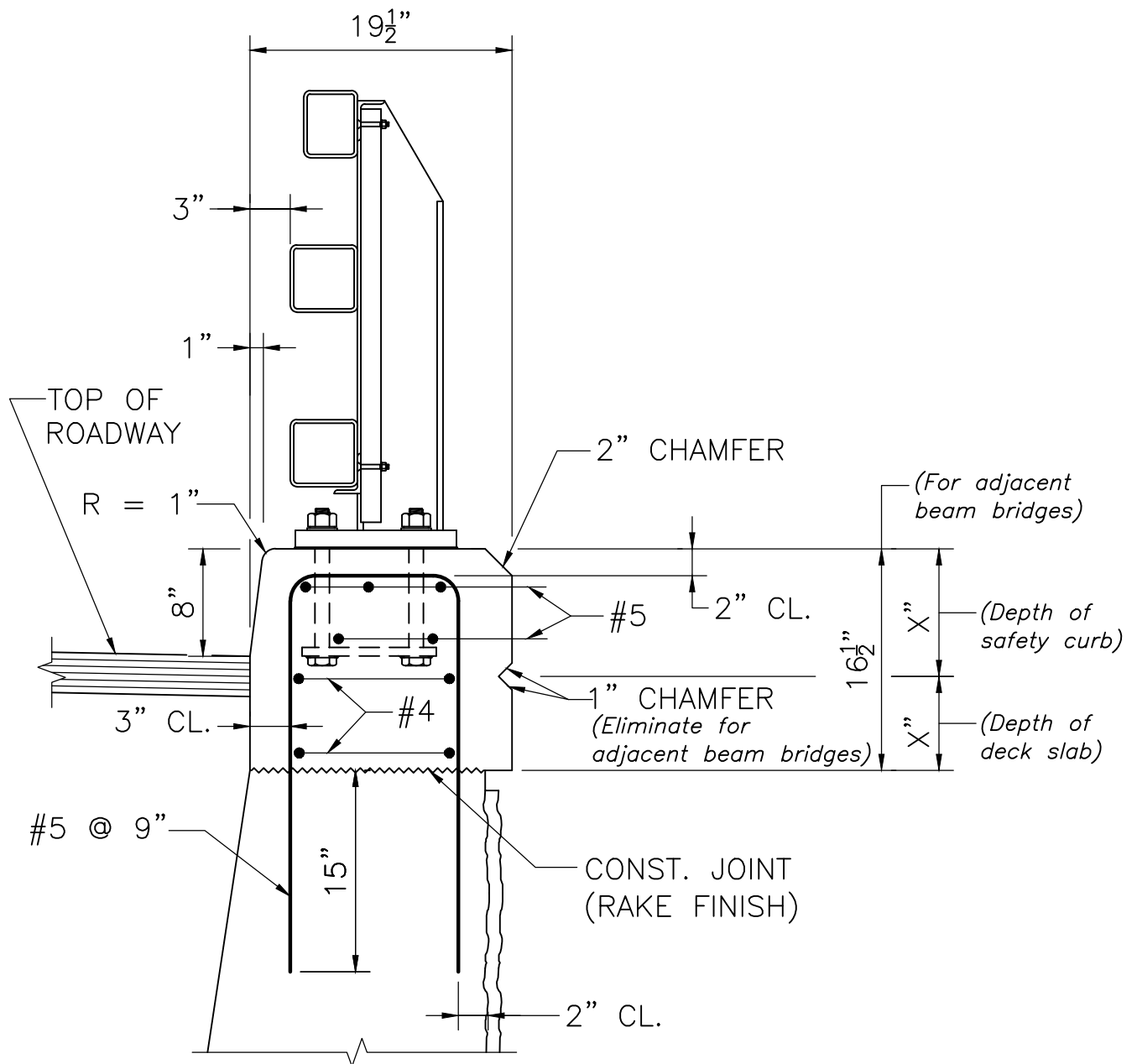


NOTE:
PRESTRESSING STRANDS IN THE BEAM ARE NOT SHOWN FOR CLARITY.

SECTION THRU SIDEWALK

SCALE: 1" = 1'-0"

NOTE:
See Dwg. No. 9.8.2 for details of Curb Treatment.



TOP OF U-WINGWALL DETAILS AT SAFETY CURB

SCALE: 1" = 1'-0"

NOTE:

Include and label all reinforcement at the top of the wingwall.



LRFD BRIDGE
MANUAL, PART II

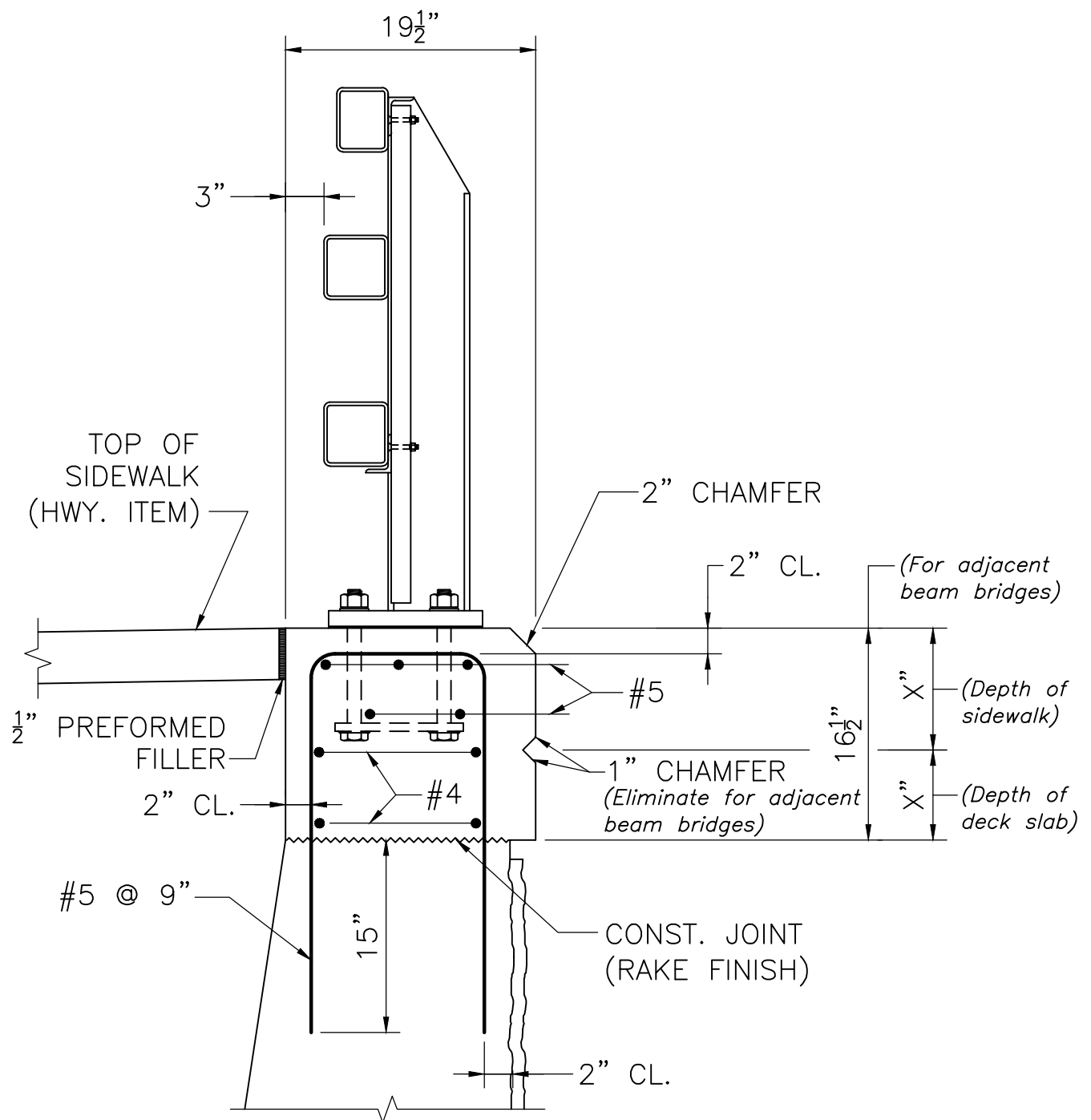
TOP OF U-WINGWALL DETAILS AT SAFETY CURB

S3-TL4 RAIL

DATE OF ISSUE
JUNE 2013

DRAWING NUMBER

9.3.11



TOP OF U-WINGWALL DETAILS AT SIDEWALK

SCALE: $1" = 1'-0"$

NOTE:

Include and label all reinforcement at the top of the wingwall.



LRFD BRIDGE
 MANUAL, PART II

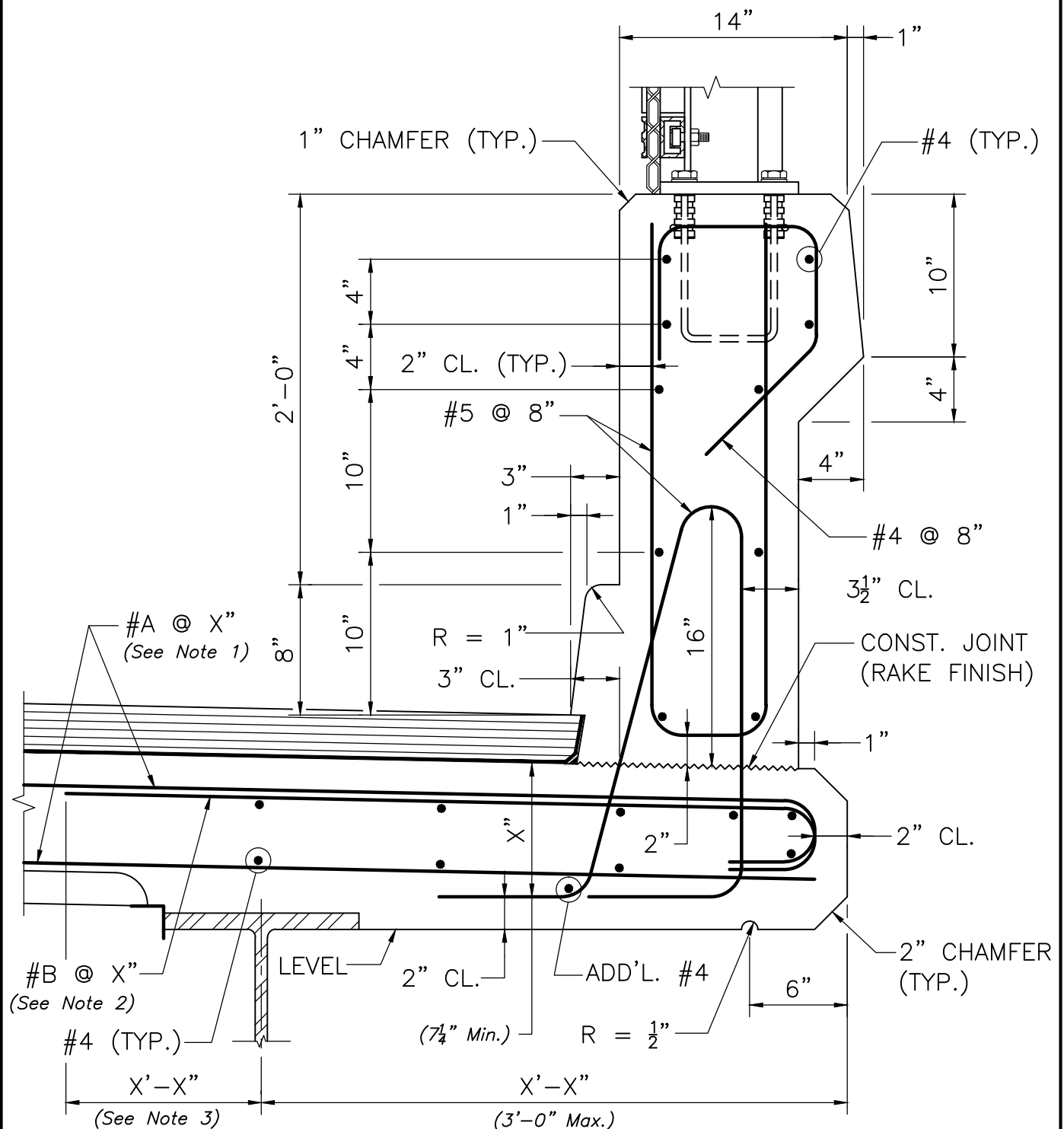
TOP OF U-WINGWALL
 DETAILS AT SIDEWALK

S3-TL4 RAIL

DATE OF ISSUE
 JUNE 2013

DRAWING NUMBER

9.3.12



SECTION THRU SAFETY CURB

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

NOTES:

1. #A @ X" = Size and spacing of the primary deck slab reinforcement as per Design Tables of Chapter 7.
2. #B @ X" = Size and spacing of the Additional Overhang Reinforcement as per Design Tables of Chapter 7.
3. Additional Overhang Reinforcement extension (Lext.) as per Design Tables of Chapter 7.



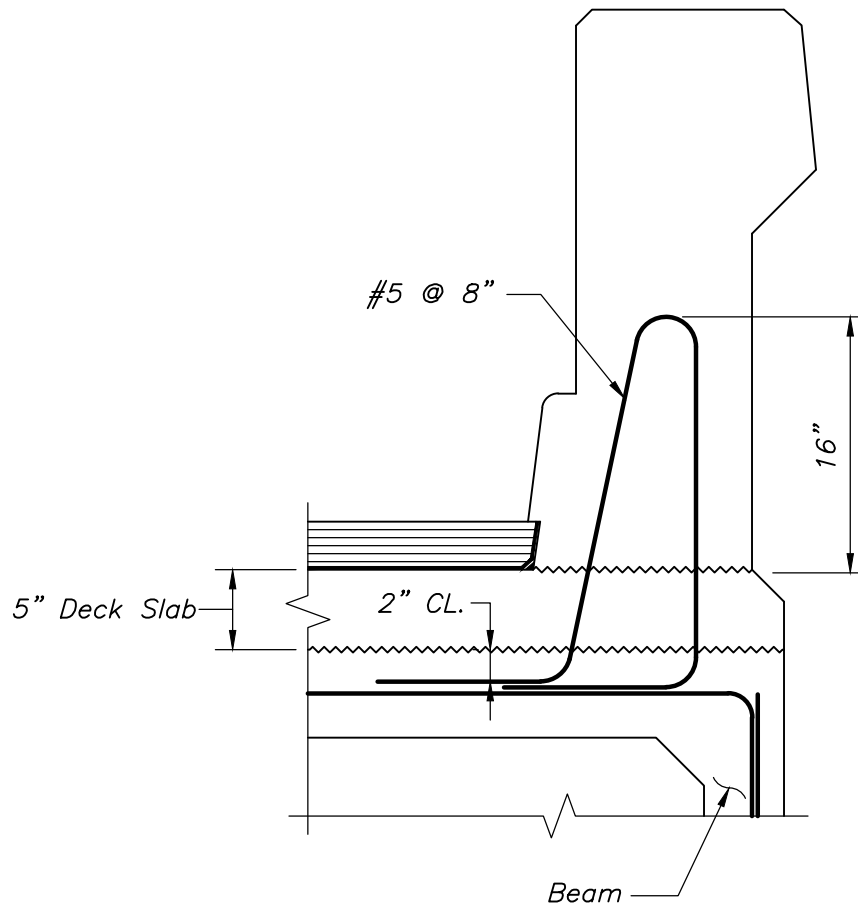
LRFD BRIDGE
MANUAL, PART II

SECTION THRU SAFETY CURB STRINGER BRIDGES CP-PL2 BARRIER

DATE OF ISSUE
JUNE 2013

DRAWING NUMBER

9.4.1



SECTION THRU SAFETY CURB

SCALE: 1" = 1'-0"



LRFD BRIDGE
MANUAL, PART II

MODIFICATIONS FOR ADJACENT BEAM BRIDGES

CP-PL2 BARRIER

DATE OF ISSUE
JUNE 2013

DRAWING NUMBER

9.4.2



SCALE: 1" = 1'-0"

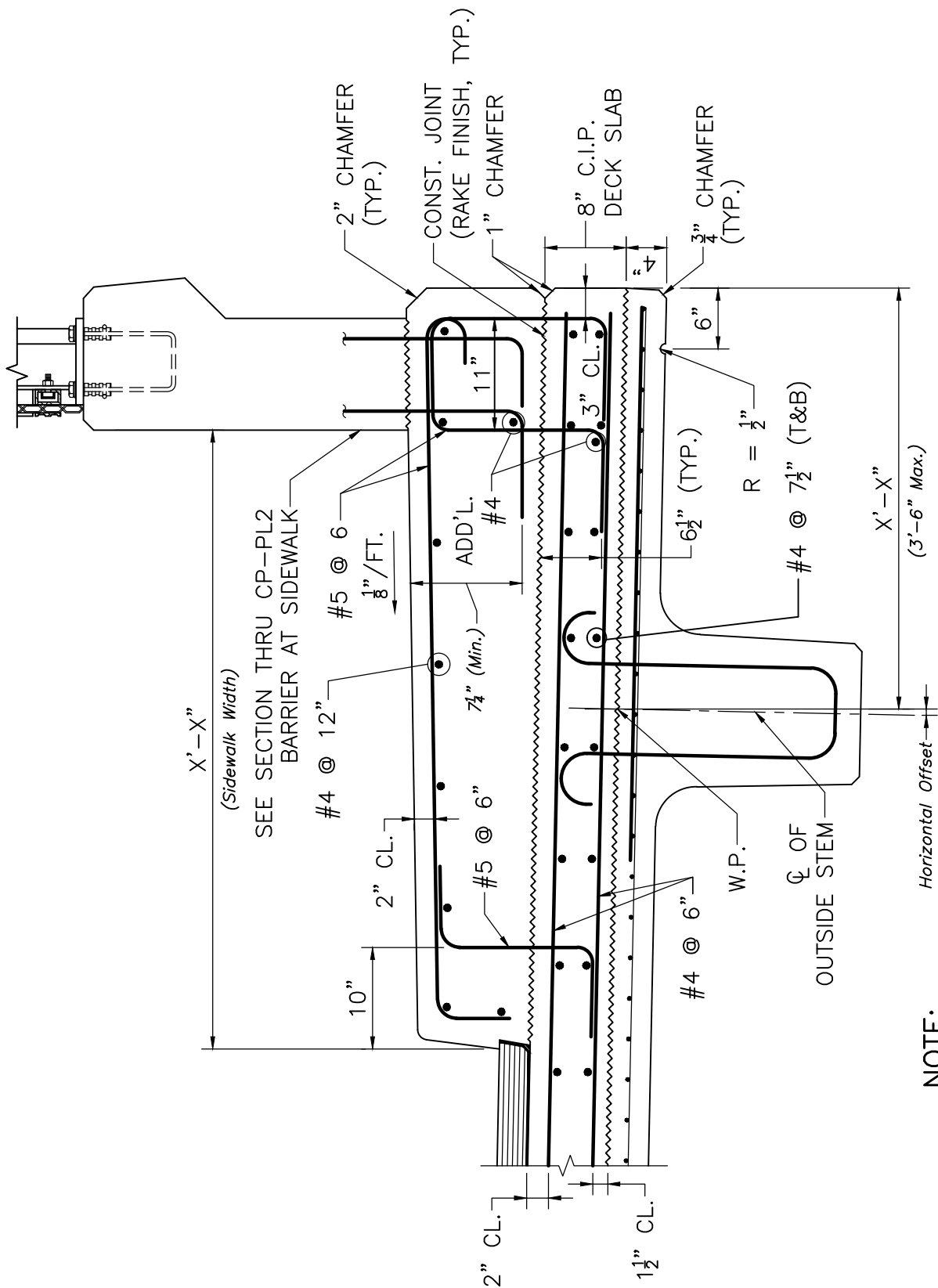


SECTION THRU SIDEWALK
ADJACENT BEAM BRIDGES
CP-PL2 BARRIER

DATE OF ISSUE
JUNE 2013

DRAWING NUMBER

9.4.5

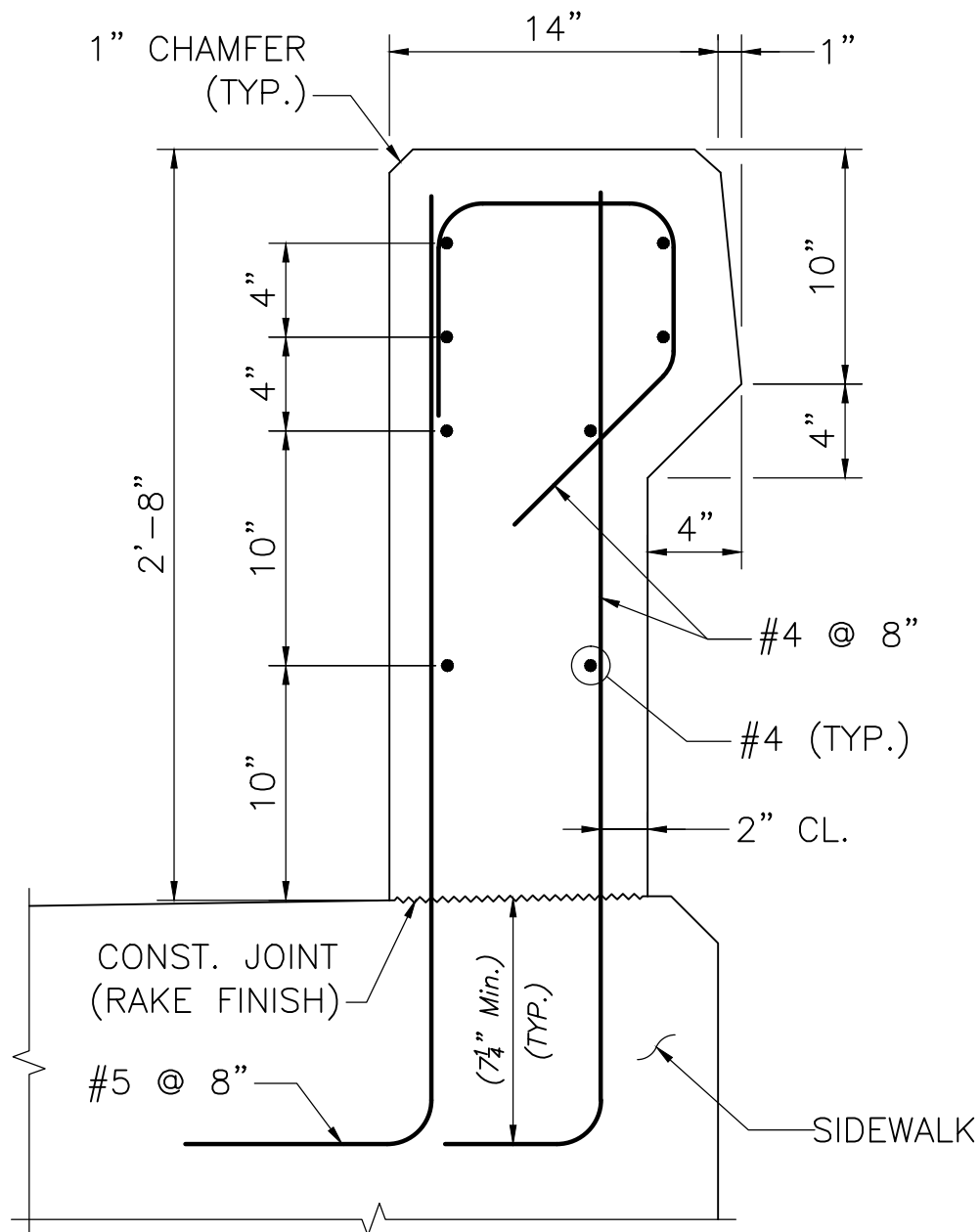


NOTE:

PRESTRESSING STRANDS IN THE BEAM ARE NOT SHOWN FOR CLARITY.

SECTION THRU CP-PL2 BARRIER AT SIDEWALK

SCALE: 1" = 1'-0"

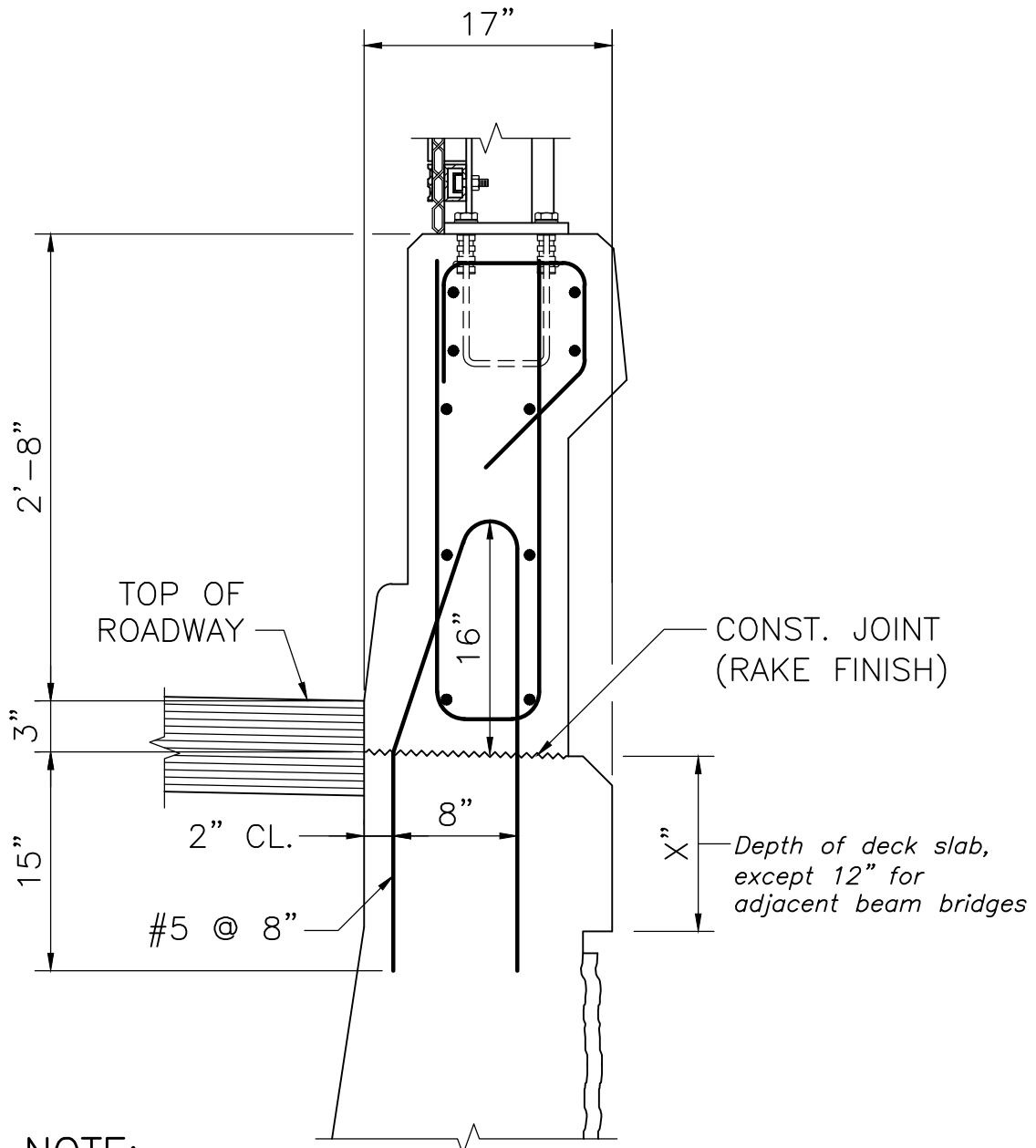


NOTE:

FOR SIDEWALK REINFORCEMENT SEE SECTION THRU SIDEWALK.

**SECTION THRU BARRIER
AT SIDEWALK**

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



NOTE:

SEE SECTION THRU CP-PL2 BARRIER AT SAFETY CURB FOR DIMENSIONS AND REINFORCEMENT NOT SHOWN HERE.

TOP OF U-WINGWALL
DETAILS AT SAFETY CURB

SCALE: 1" = 1'-0"

NOTE:

Include and label all reinforcement at the top of the wingwall.



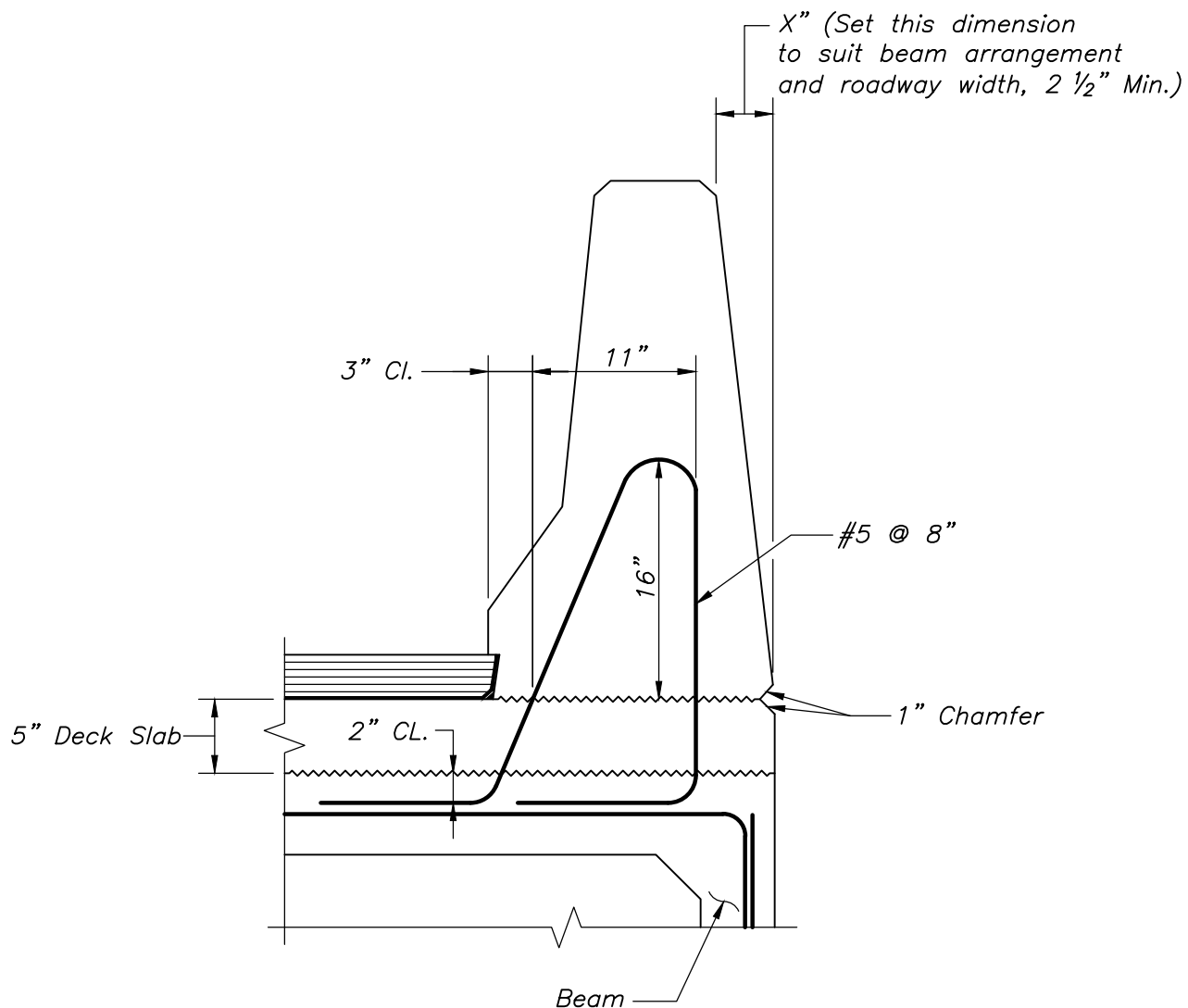
LRFD BRIDGE
MANUAL, PART II

TOP OF U-WINGWALL
DETAILS AT SAFETY CURB
CP-PL2 BARRIER

DATE OF ISSUE
JUNE 2013

DRAWING NUMBER

9.4.8



SECTION THRU OVERHANG

SCALE: $1'' = 1'-0''$



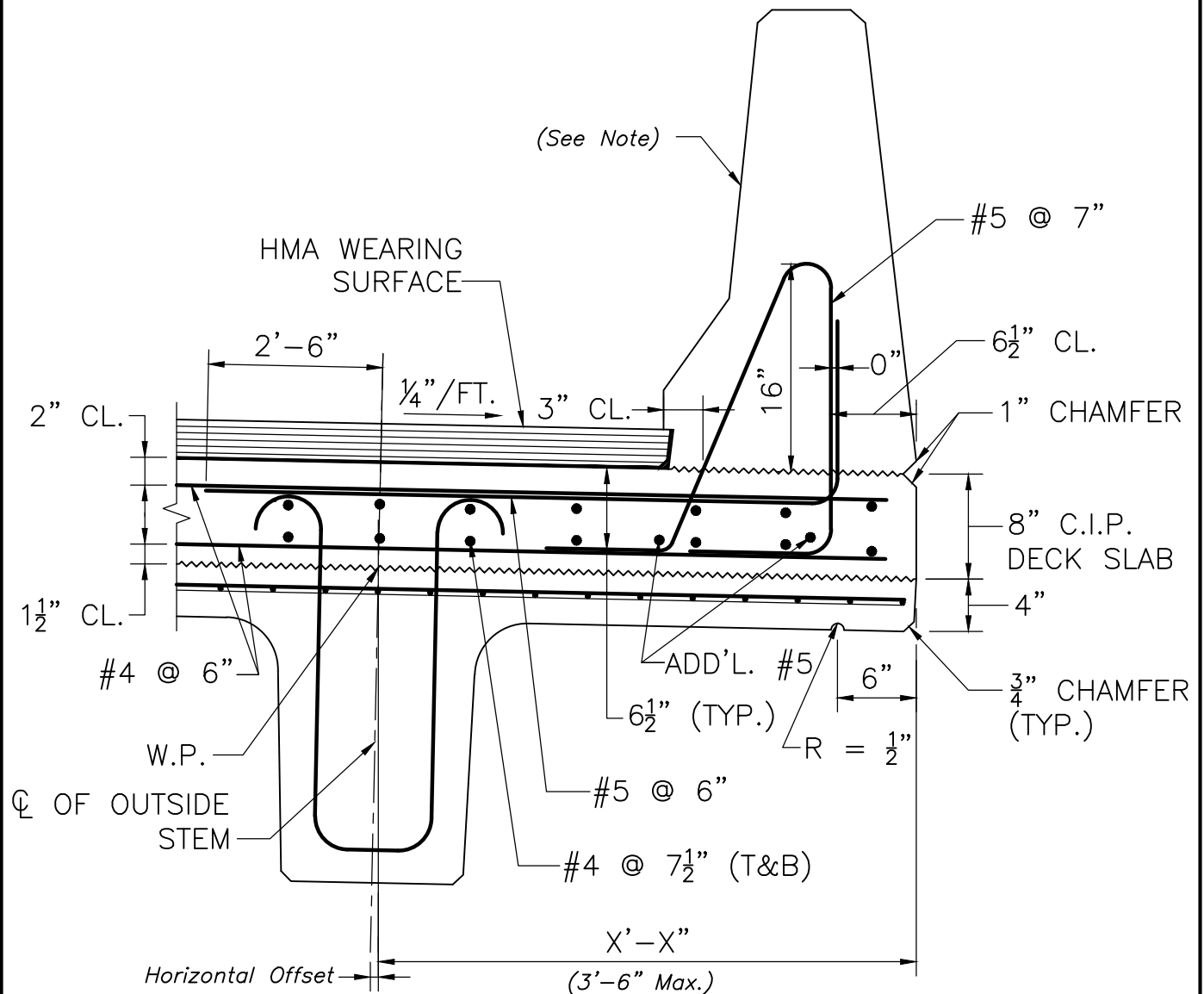
LRFD BRIDGE
MANUAL, PART II

MODIFICATIONS FOR ADJACENT BEAM BRIDGES

CF-PL2 BARRIER

DATE OF ISSUE
JUNE 2013

DRAWING NUMBER
9.5.2



NOTE:

PRESTRESSING STRANDS IN THE BEAM ARE NOT SHOWN FOR CLARITY.

SECTION THRU OVERHANG

SCALE: 1" = 1'-0"

NOTE:

Provide all required barrier geometry and reinforcement as per Dwg. No. 9.5.1.



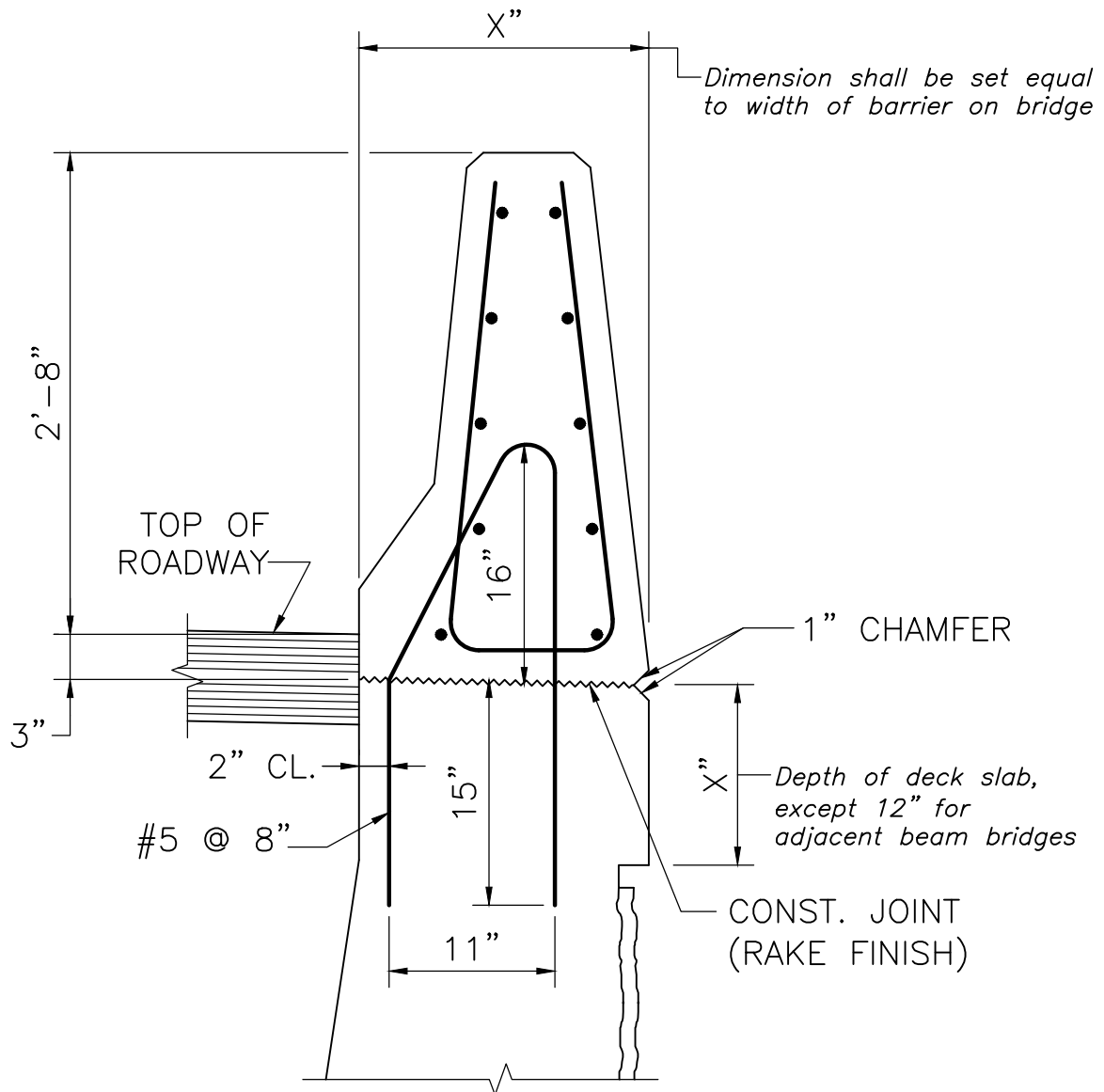
LRFD BRIDGE
MANUAL, PART II

SECTION THRU OVERHANG
NEXT F BEAM BRIDGES
CF-PL2 BARRIERS

DATE OF ISSUE
JUNE 2013

DRAWING NUMBER

9.5.3



NOTE:

SEE SECTION THRU CF-PL2 BARRIER FOR DIMENSIONS AND REINFORCEMENT NOT SHOWN HERE.

TOP OF U-WINGWALL DETAILS

SCALE: 1" = 1'-0"

NOTE:

Include and label all reinforcement at the top of the wingwall.



LRFD BRIDGE
MANUAL, PART II

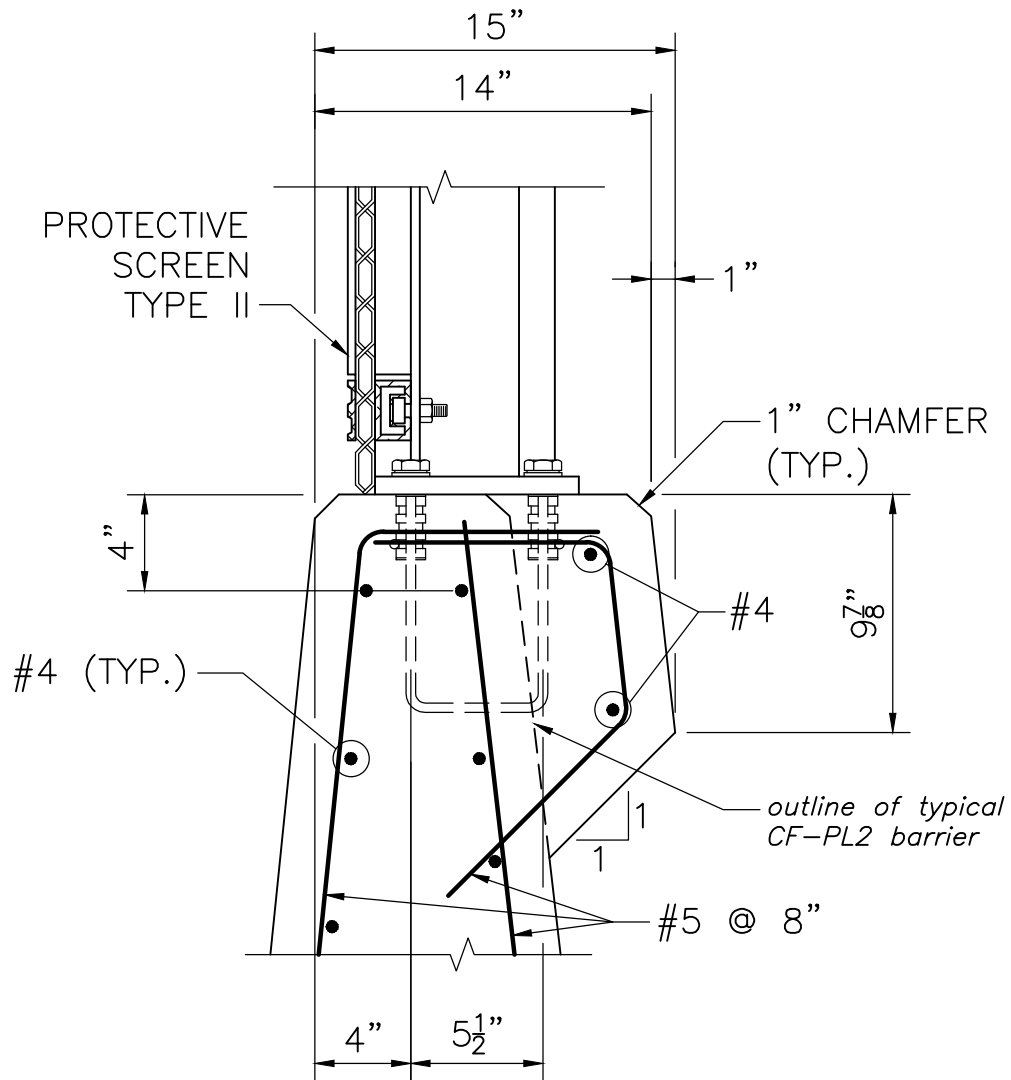
TOP OF U-WINGWALL DETAILS

CF-PL2 BARRIER

DATE OF ISSUE
JUNE 2013

DRAWING NUMBER

9.5.4



SECTION THRU MODIFIED BARRIER

SCALE: $1\frac{1}{2}" = 1'-0"$



LRFD BRIDGE
MANUAL, PART II

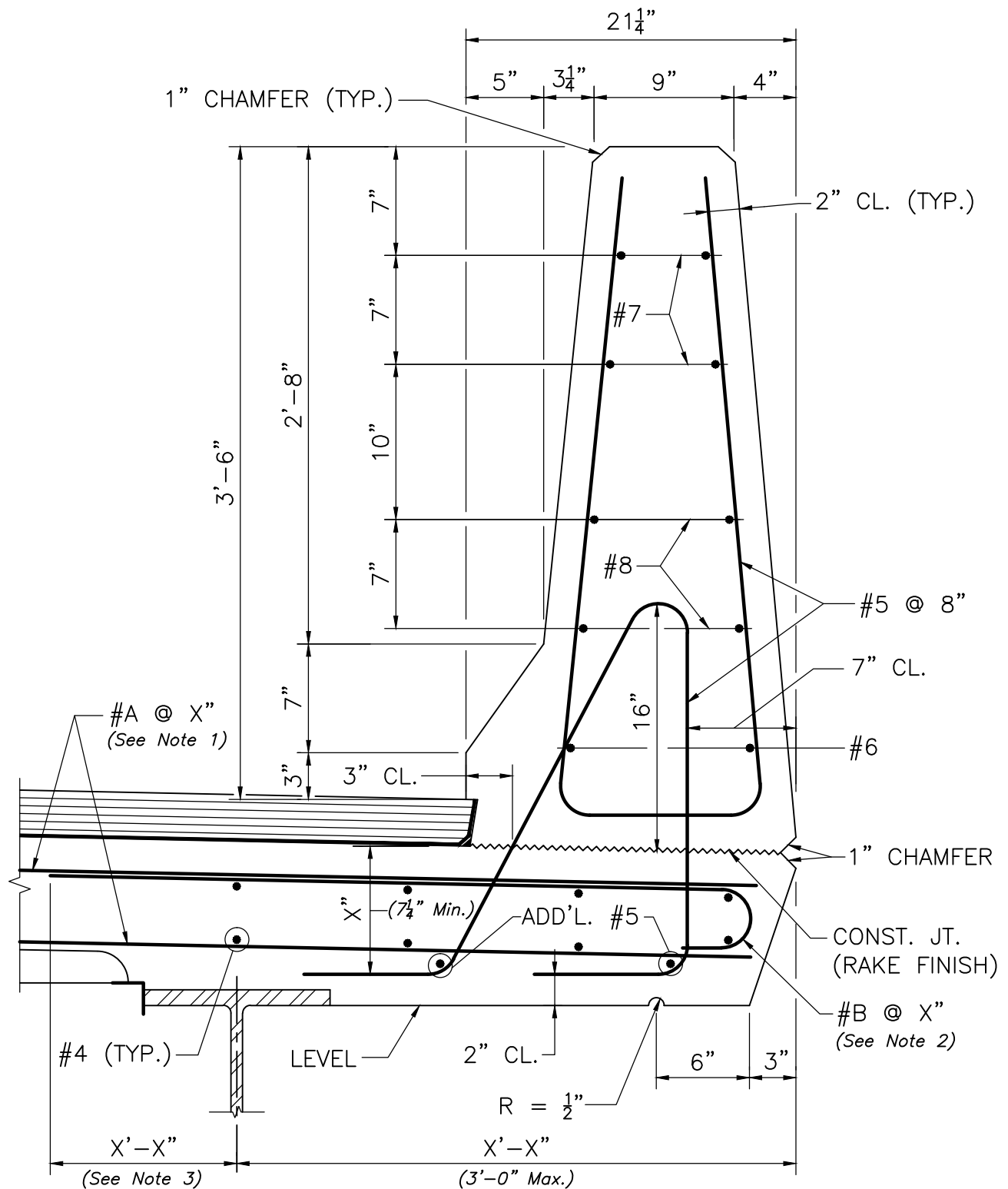
MODIFICATIONS FOR PROTECTIVE SCREEN TYPE II

CF-PL2 BARRIER

DATE OF ISSUE
JUNE 2013

DRAWING NUMBER

9.5.5



SECTION THRU BARRIER AND OVERHANG

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

NOTES:

1. #A @ X" = Size and spacing of the primary deck slab reinforcement as per Design Tables of Chapter 7.
2. #B @ X" = Size and spacing of the Additional Overhang Reinforcement as per Design Tables of Chapter 7.
3. Additional Overhang Reinforcement extension (Lext.) as per Design Tables of Chapter 7.



LRFD BRIDGE
MANUAL, PART II

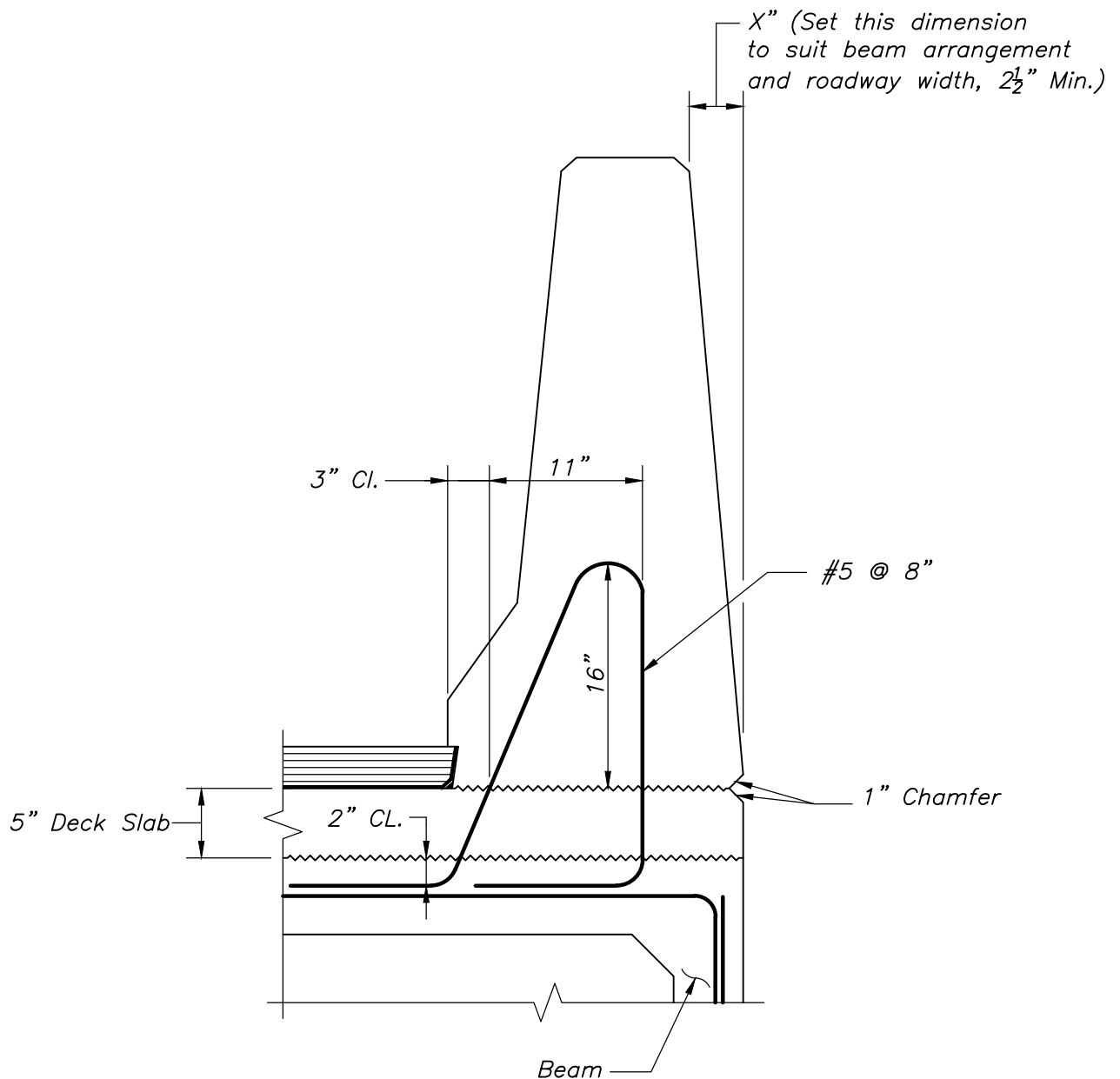
SECTION THRU BARRIER AND OVERHANG, STRINGER BRIDGES

CF-PL3 BARRIER

DATE OF ISSUE
JUNE 2013

DRAWING NUMBER

9.6.1



SECTION THRU OVERHANG

SCALE: 1" = 1'-0"



LRFD BRIDGE
MANUAL, PART II

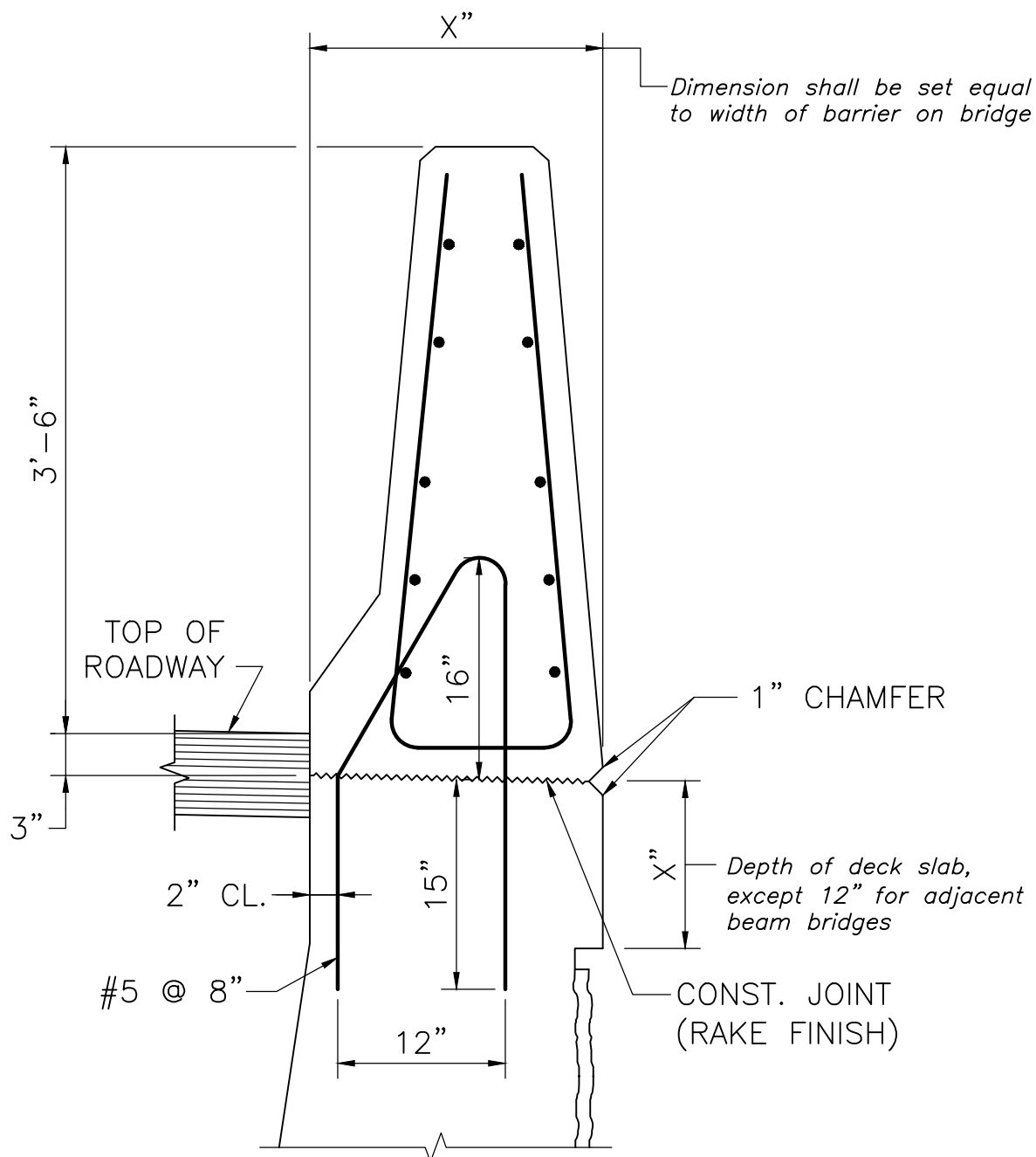
MODIFICATIONS FOR ADJACENT BEAM BRIDGES

CF-PL3 BARRIER

DATE OF ISSUE
JUNE 2013

DRAWING NUMBER

9.6.2



NOTE:

SEE SECTION THRU CF-PL3 BARRIER FOR DIMENSIONS AND REINFORCEMENT NOT SHOWN HERE.

TOP OF U-WINGWALL
DETAILS

SCALE: 1" = 1'-0"

NOTE:

Include and label all reinforcement at the top of the wingwall.



LRFD BRIDGE
MANUAL, PART II

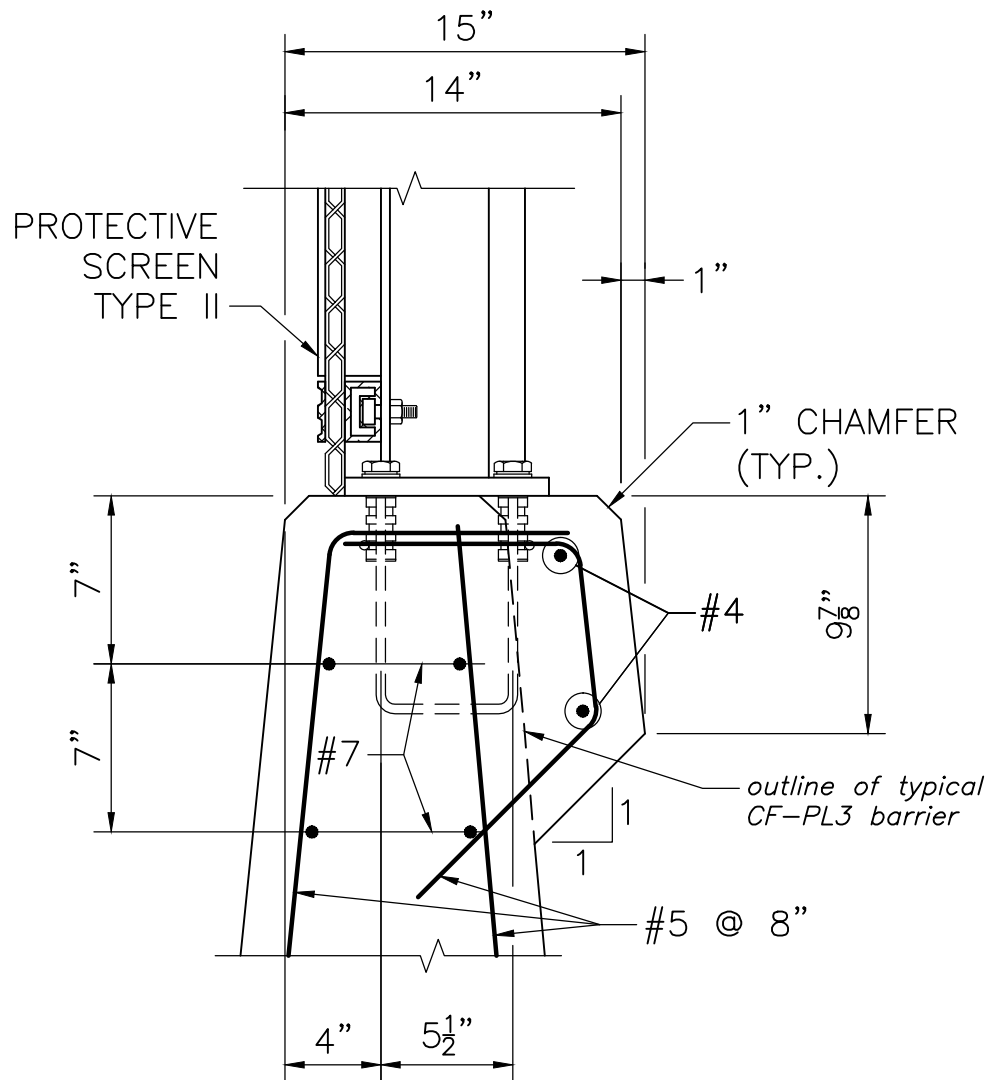
TOP OF U-WINGWALL
DETAILS

CF-PL3 BARRIER

DATE OF ISSUE
JUNE 2013

DRAWING NUMBER

9.6.4



SECTION THRU MODIFIED BARRIER

SCALE: $1\frac{1}{2}" = 1'-0"$



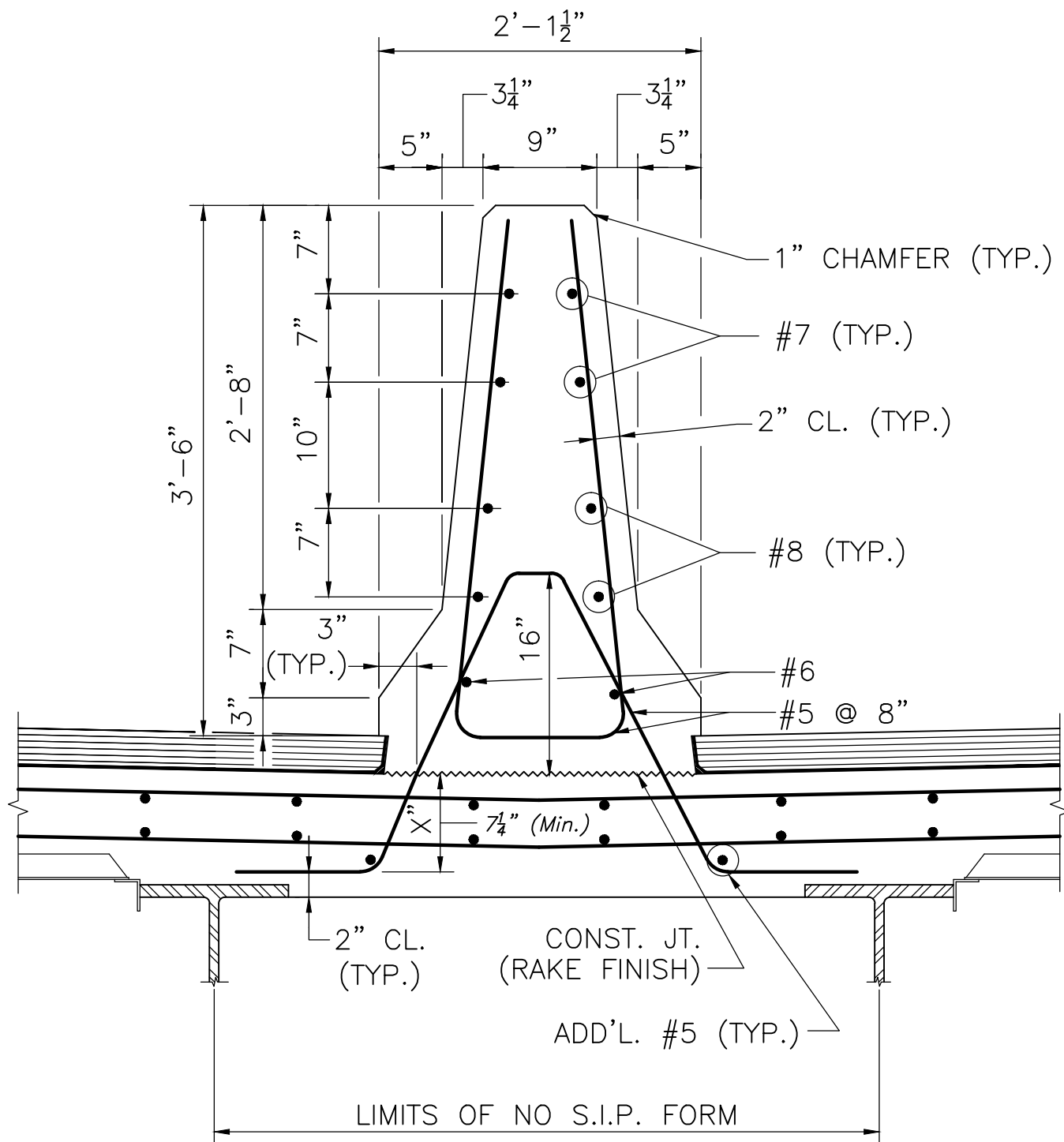
LRFD BRIDGE
MANUAL, PART II

MODIFICATIONS FOR
PROTECTIVE SCREEN TYPE II
CF-PL3 BARRIER

DATE OF ISSUE
JUNE 2013

DRAWING NUMBER

9.6.5



DOUBLE FACE MEDIAN BARRIER

SCALE: 1" = 1'-0"

NOTE:

CF-PL2 Barrier similar, except modify details to be consistent with Dwg. No. 9.5.1.



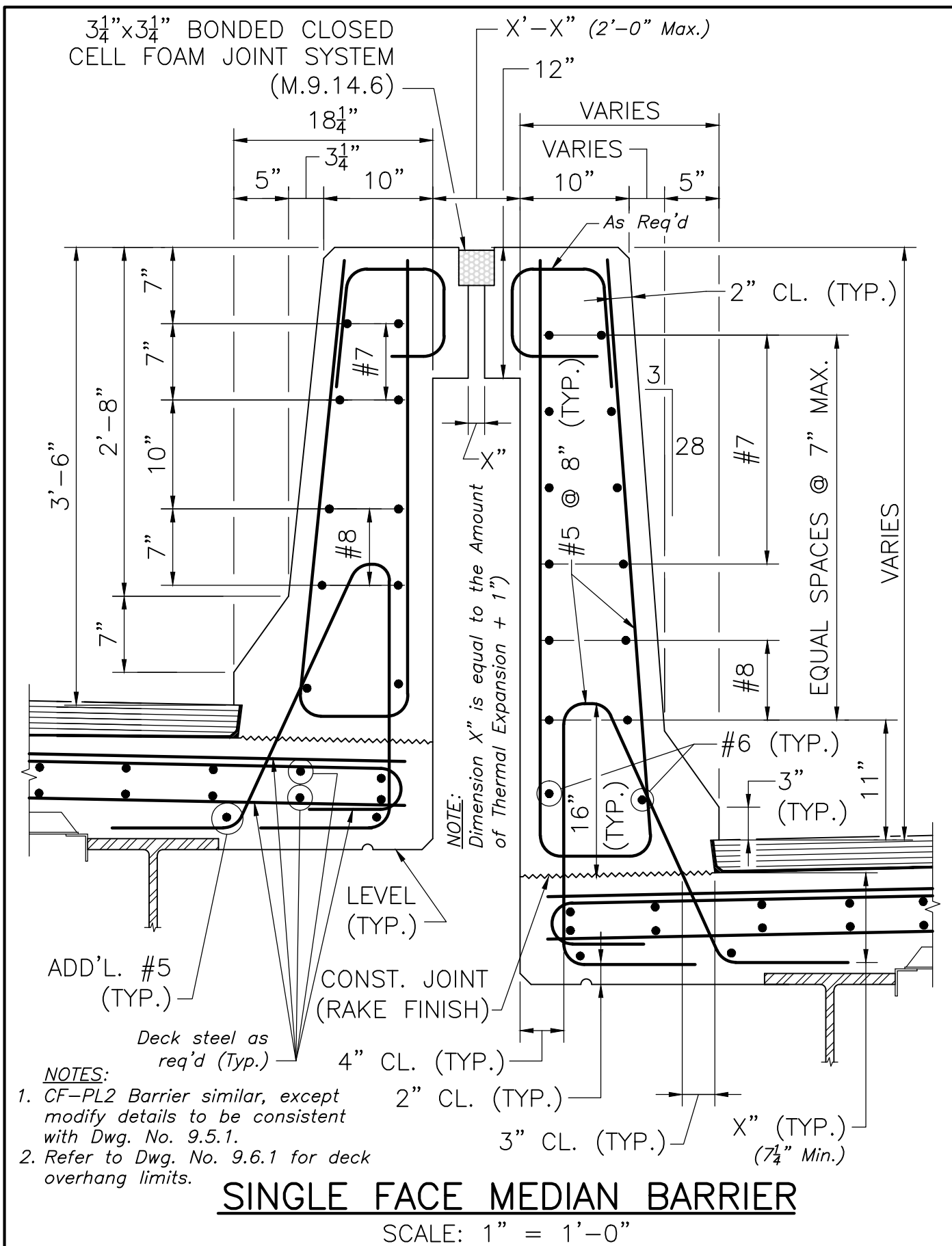
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MANUAL, PART II

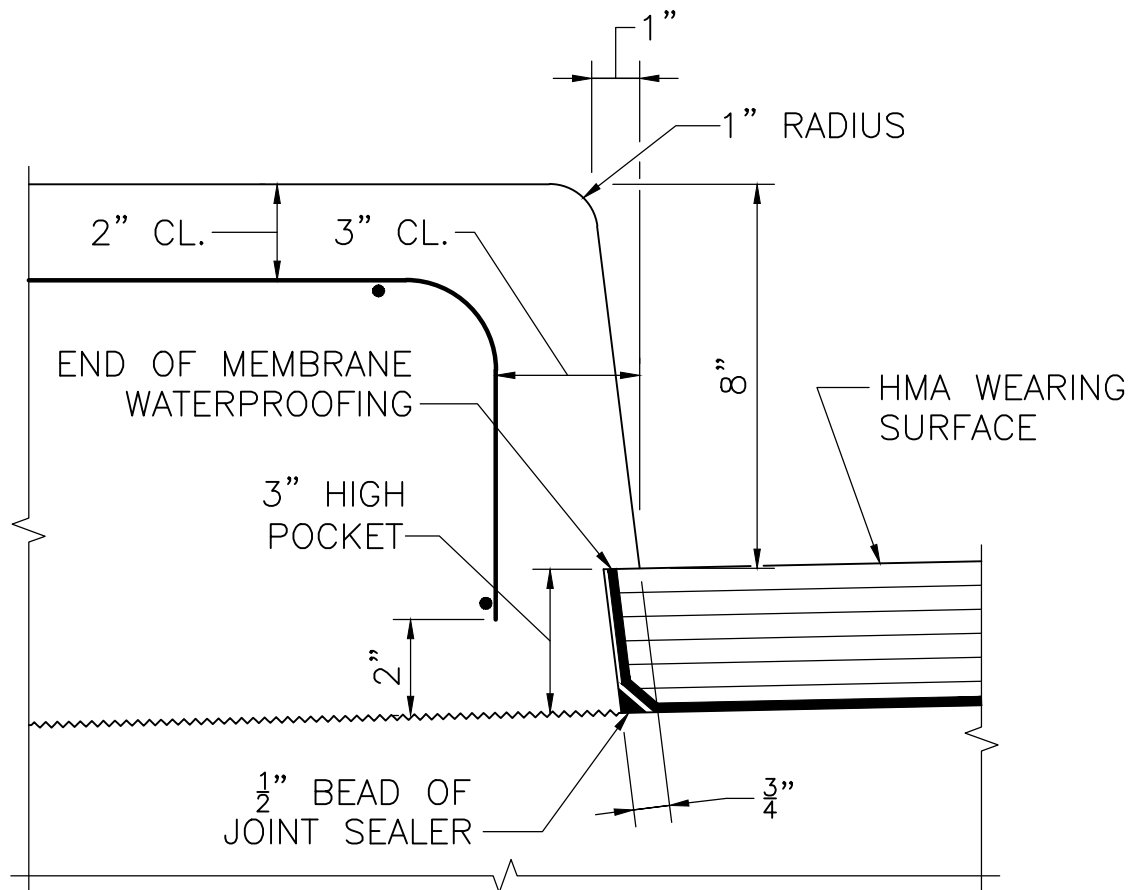
DOUBLE FACE
MEDIAN BARRIER
CF-PL3 MEDIAN BARRIER

DATE OF ISSUE
JUNE 2013

DRAWING NUMBER

9.7.1





NOTES:

1. TURN MEMBRANE UP INTO 3" HIGH POCKET.
2. DIMENSIONS AT THE FACE OF CURB ARE THE SAME FOR THE SAFETY CURB.

FACE OF SIDEWALK CURB DETAILS

SCALE: 3" = 1'-0"

NOTE:

For bridges with a variable depth HMA wearing surface, eliminate Note 1 and omit the height of pocket dimension on Construction Drawings.



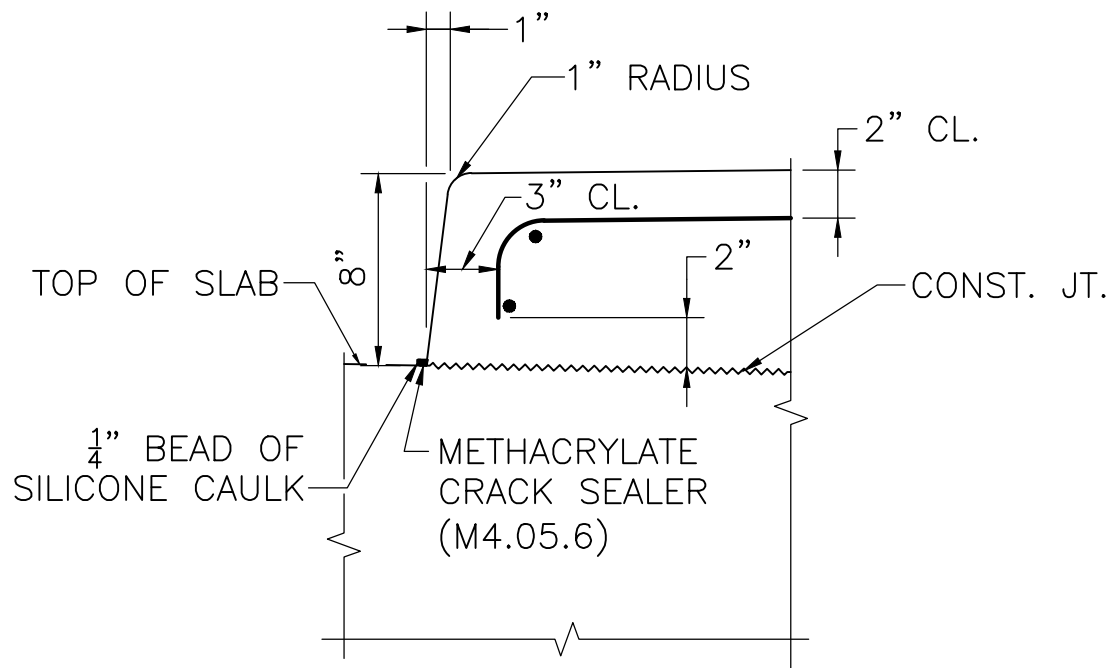
LRFD BRIDGE
MANUAL, PART II

SIDEWALK CURB DETAILS
BRIDGES WITH HMA W.S.
CURB DETAILS

DATE OF ISSUE
JUNE 2013

DRAWING NUMBER

9.8.1

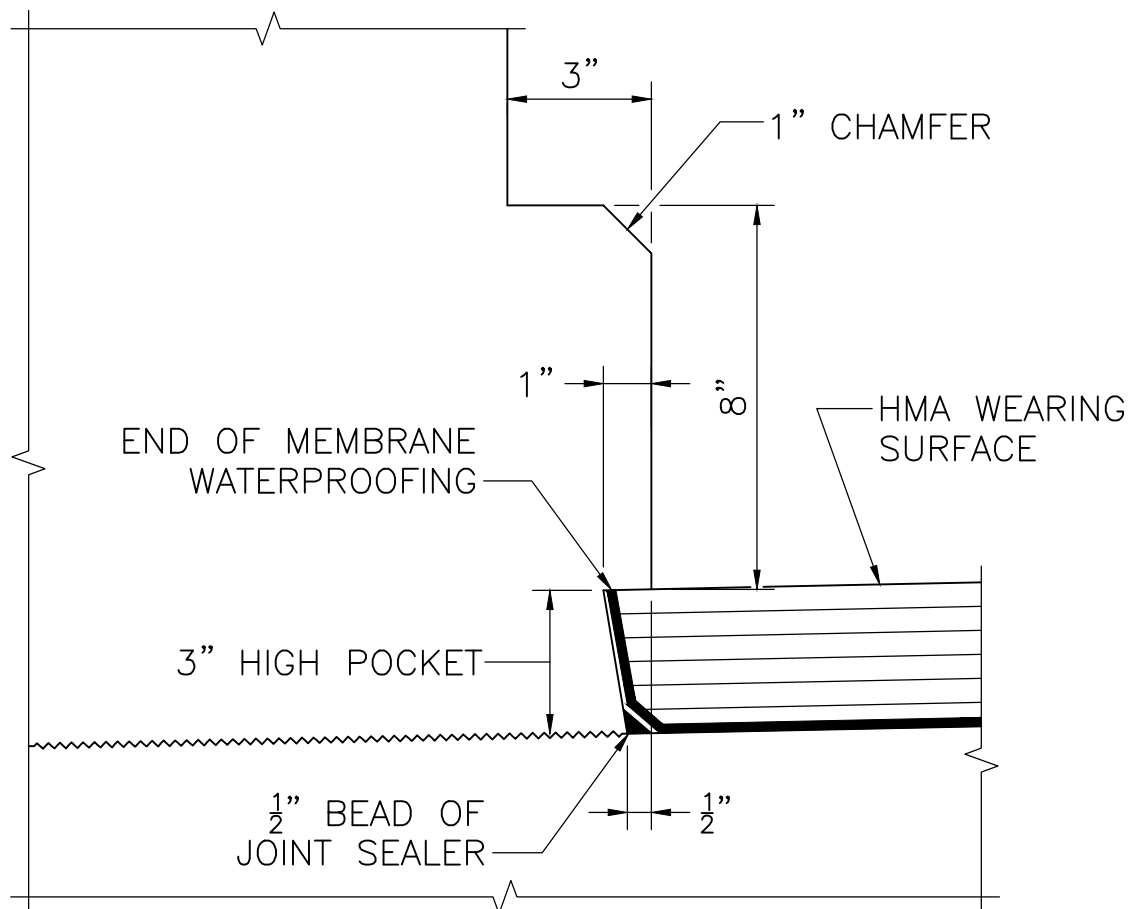


NOTES:

1. METHACRYLATE CRACK SEALER SHALL BE APPLIED AFTER SIDEWALK OR SAFETY CURB/BARRIER CURING PERIOD IS COMPLETE AND IN ACCORDANCE WITH REQUIREMENTS OF MANUFACTURER AND THE STANDARD SPECIFICATIONS.
2. BEFORE SEALING, THE CONCRETE AT THE INTERFACE OF DECK AND CURB SHALL BE SWEEPED CLEAN AND BLOWN OFF USING OIL FREE COMPRESSED AIR IMMEDIATELY PRIOR TO APPLYING THE SEALER.
3. APPLY $\frac{1}{4}$ " HIGH BEAD OF SILICONE CAULKING COMPOUND ABOUT $\frac{1}{4}$ " FROM THE FACE OF CURB.
4. METHACRYLATE SHALL THEN BE POURED INTO THE $\frac{1}{4}$ " WIDE GAP BETWEEN THE FACE OF CURB AND THE BEAD OF CAULK.
5. CURB AT SIDEWALK SHOWN. SAFETY CURB IS SIMILAR.

FACE OF CURB DETAILS

SCALE: $1\frac{1}{2}" = 1'-0"$



NOTE:

TURN MEMBRANE UP INTO 3" HIGH POCKET.

FACE OF SAFETY CURB DETAILS

SCALE: 3" = 1'-0"

NOTE:

For bridges with a variable depth HMA wearing surface, eliminate Note and omit the height of pocket dimension on Construction Drawings.

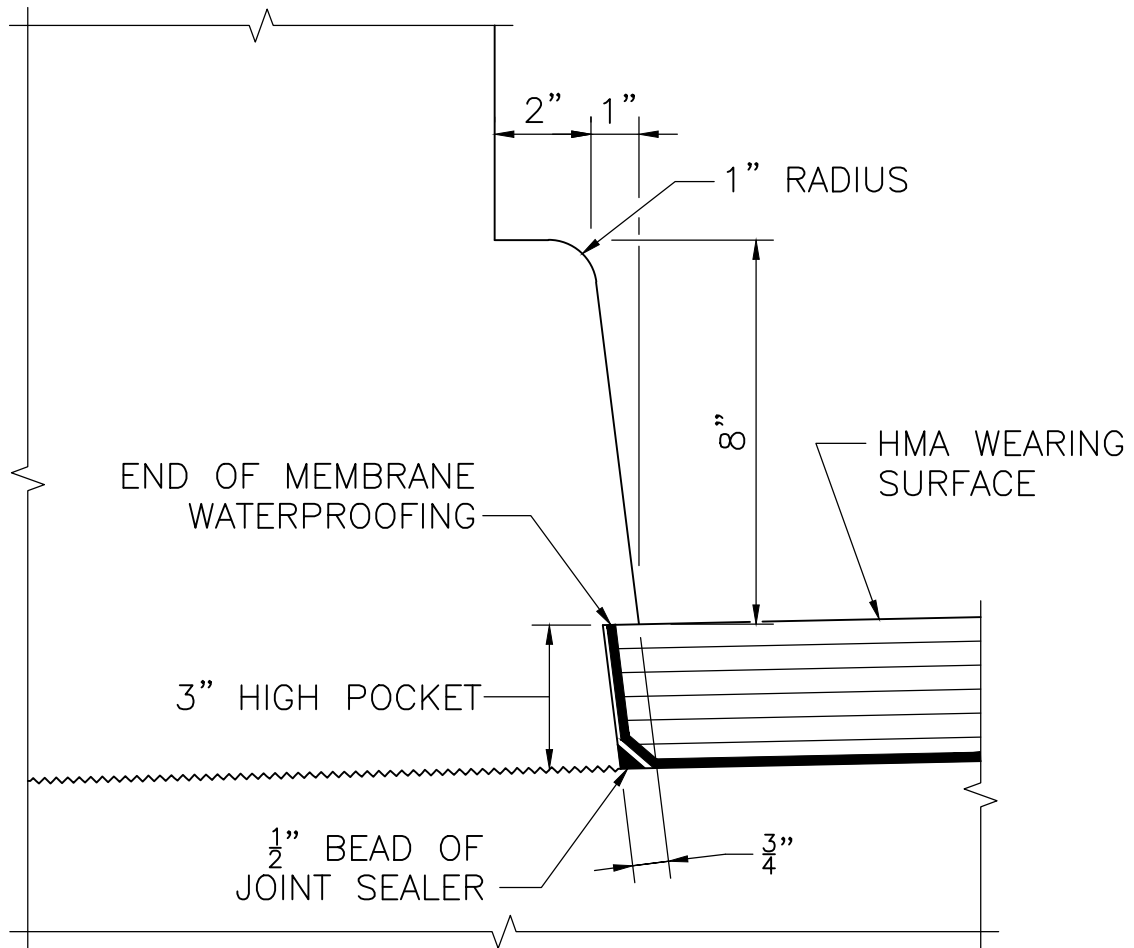


LRFD BRIDGE
MANUAL, PART II

FACE OF SAFETY CURB
FOR CT-TL2 BARRIER
CURB DETAILS

DATE OF ISSUE
JUNE 2013

DRAWING NUMBER
9.8.3



NOTE:

TURN MEMBRANE UP INTO 3" HIGH POCKET.

FACE OF SAFETY CURB DETAILS

SCALE: 3" = 1'-0"

NOTE:

For bridges with a variable depth HMA wearing surface, eliminate Note and omit the height of pocket dimension on Construction Drawings.



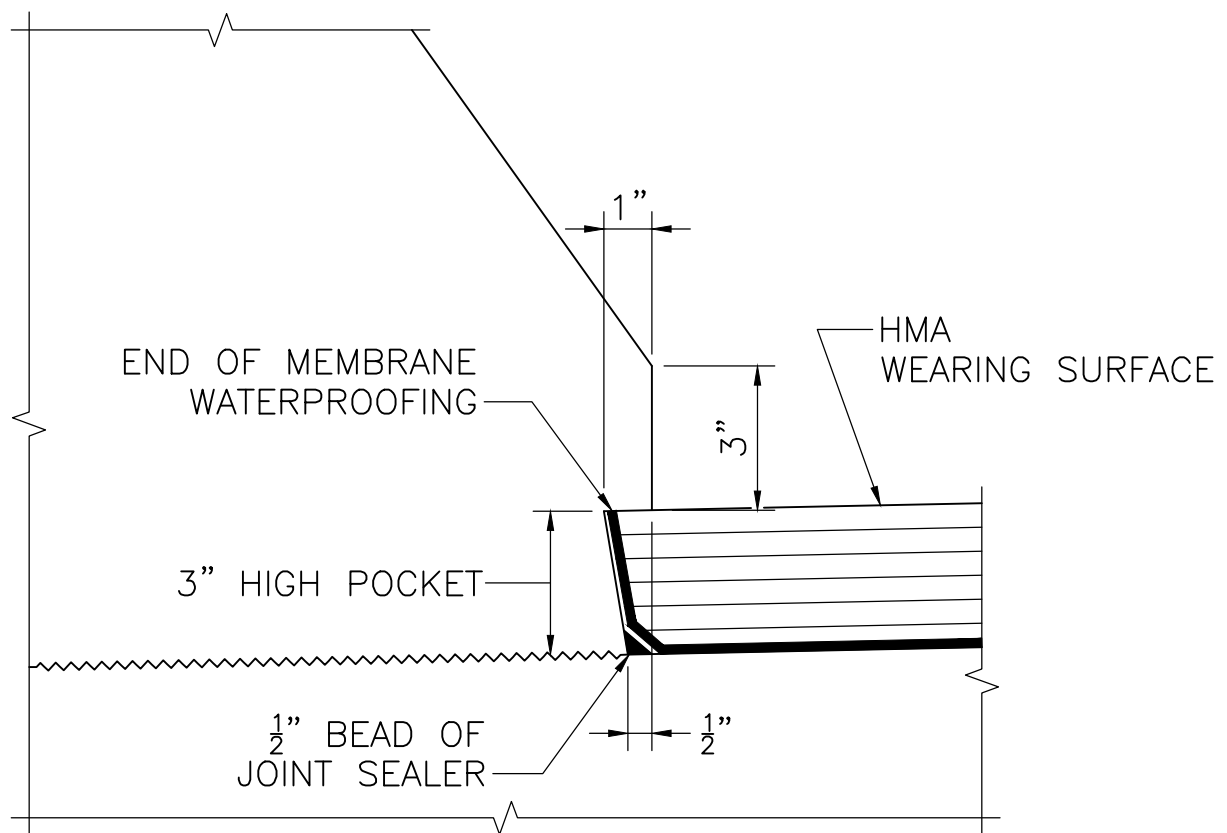
LRFD BRIDGE
MANUAL, PART II

FACE OF SAFETY CURB
FOR CP-PL2 BARRIER
CURB DETAILS

DATE OF ISSUE
JUNE 2013

DRAWING NUMBER

9.8.4



NOTE:

TURN MEMBRANE UP INTO 3" HIGH POCKET.

FACE OF SAFETY CURB DETAILS

SCALE: 3" = 1'-0"

NOTE:

For bridges with a variable depth HMA wearing surface, eliminate Note and omit the height of pocket dimension on Construction Drawings.



LRFD BRIDGE
MANUAL, PART II

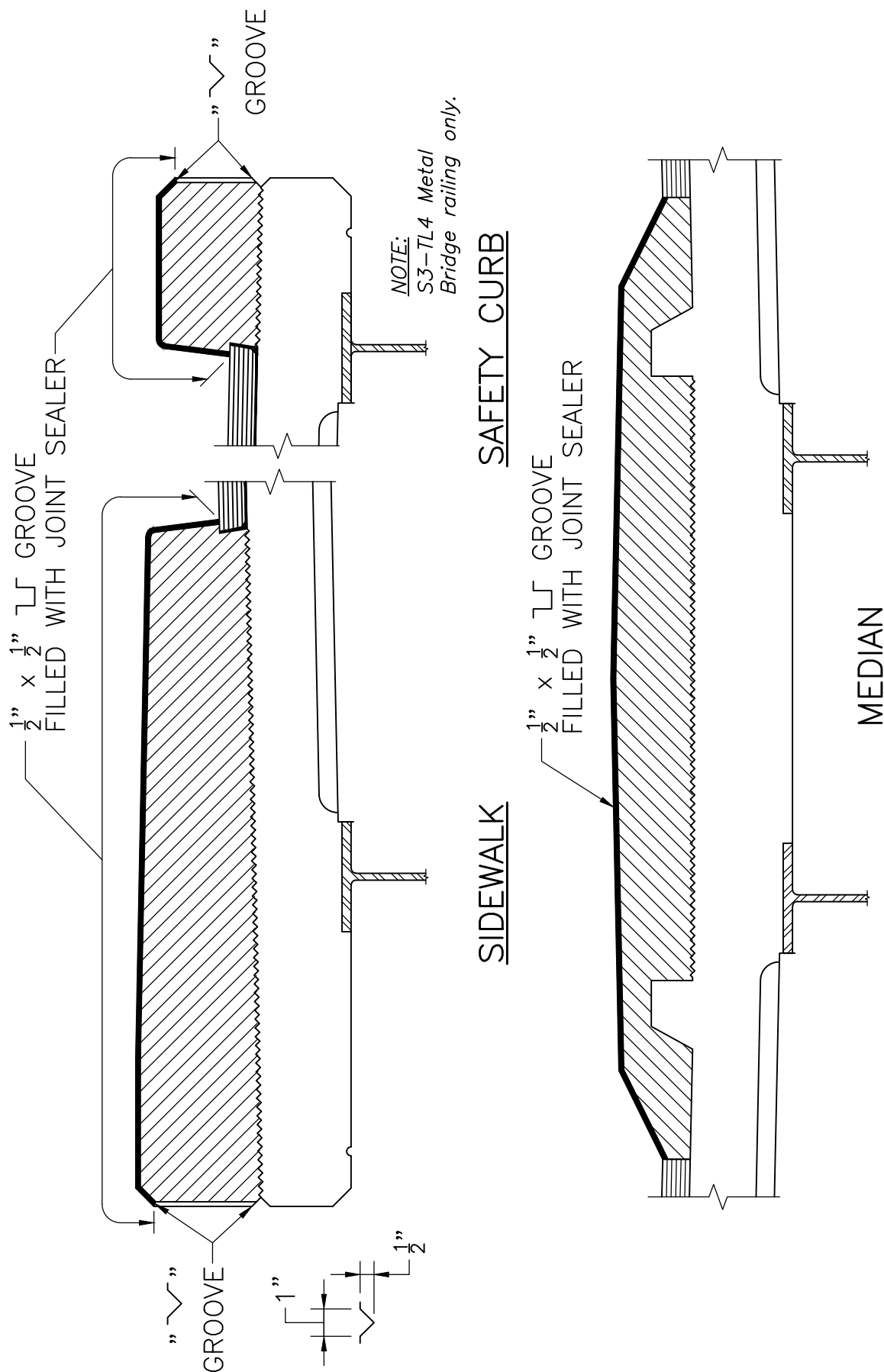
**FACE OF SAFETY CURB
FOR CF BARRIERS**

CURB DETAILS

DATE OF ISSUE
JUNE 2013

DRAWING NUMBER

9.8.5



PARAFFIN JOINT DETAILS

SCALE: $\frac{3}{4}" = 1'-0"$

NOTES:

(See Dwg. No. 9.9.3 for notes to appear on Construction Drawings)



LRFD BRIDGE
MANUAL, PART II

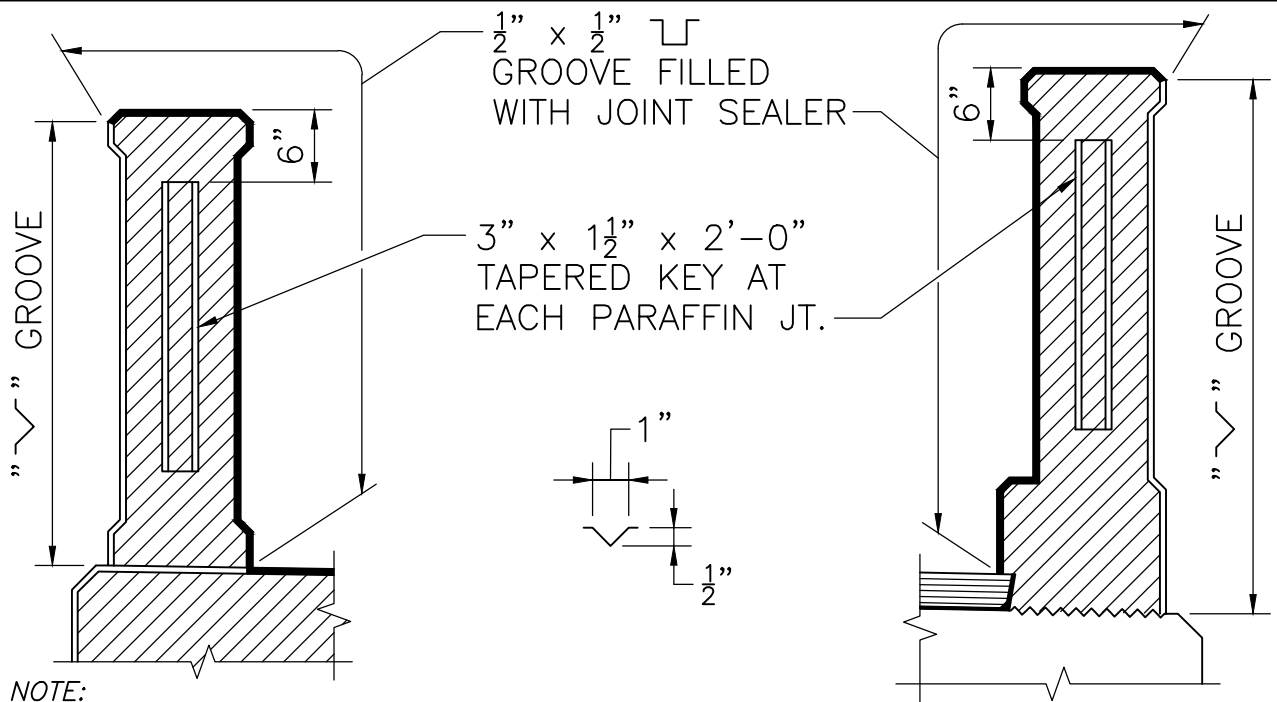
SIDEWALK, SAFETY CURB AND MEDIAN SLABS

PARAFFIN JOINT DETAILS

DATE OF ISSUE
JUNE 2013

DRAWING NUMBER

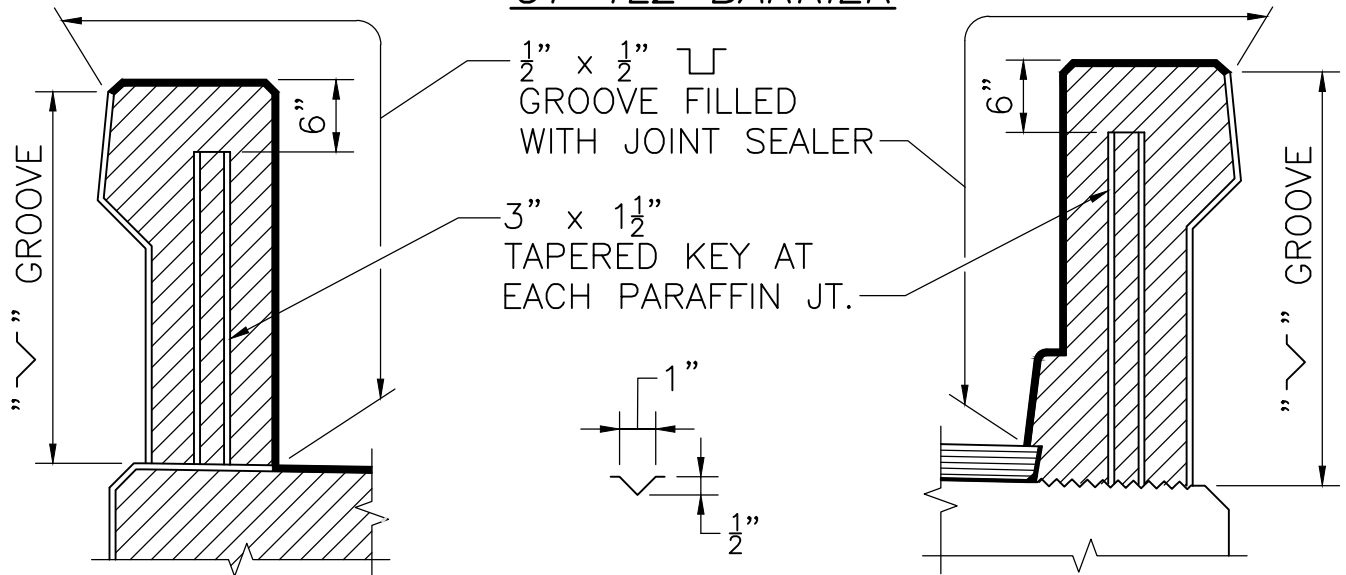
9.9.1



SIDEWALK SIDE

SAFETY CURB SIDE

CT-TL2 BARRIER



SIDEWALK SIDE

SAFETY CURB SIDE

CP-PL2 BARRIER

PARAFFIN JOINT DETAILS

NOTES:

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

(See Dwg. No. 9.9.3 for notes to appear on Construction Drawings)



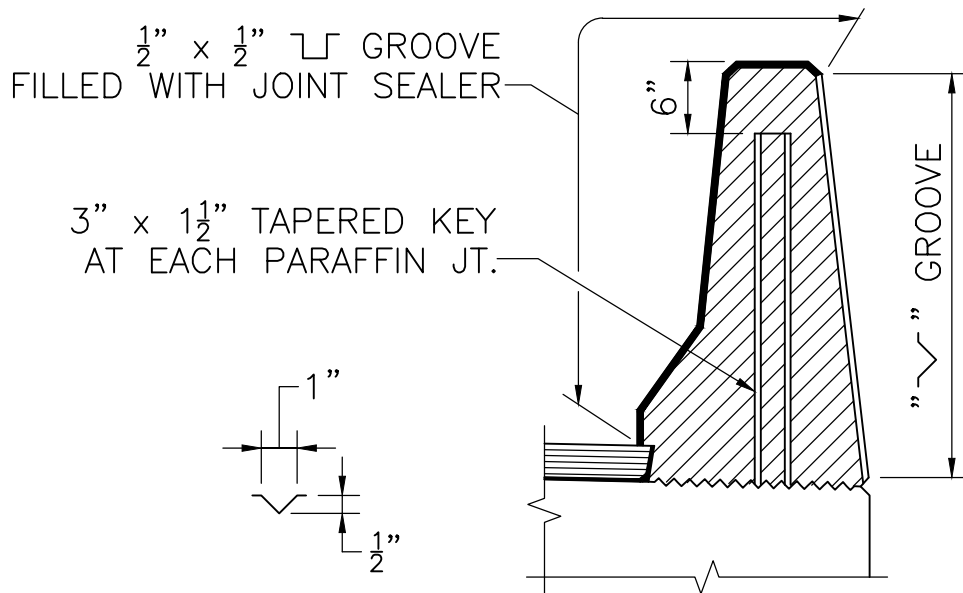
LRFD BRIDGE
MANUAL, PART II

CT-TL2 AND CP-PL2
BARRIERS
PARAFFIN JOINT DETAILS

DATE OF ISSUE
JUNE 2013

DRAWING NUMBER

9.9.2



CF BARRIERS

NOTES:

1. ALL CONCRETE ABOVE SLAB SHALL BE POURED IN ALTERNATING SECTIONS WITH NOT LESS THAN 3 DAYS BETWEEN POURS.
2. DO NOT CARRY LONGITUDINAL BARS THROUGH THE PARAFFIN JOINTS. END THE REINFORCEMENT 2" CLEAR OF JOINT.
3. JOINT SHALL BE SQUARE TO FACE OF CURB (*or coping*).

PARAFFIN JOINT DETAILS

SCALE: $\frac{3}{4}" = 1'-0"$

NOTES:

1. Modify the details shown in this section as required to show the correct shape, wearing surface and support beams.
2. Paraffin joints shall be spaced preferably between 20' and 25'. A minimum of 15' may be used, if necessary. Paraffin joints for sidewalks and safety curbs with S3-TL4 rail shall be located using the above spacing, provided that the location of the joint falls approximately at the center of the railing panel. The location of the joints shall be dimensioned on the Construction Drawings.