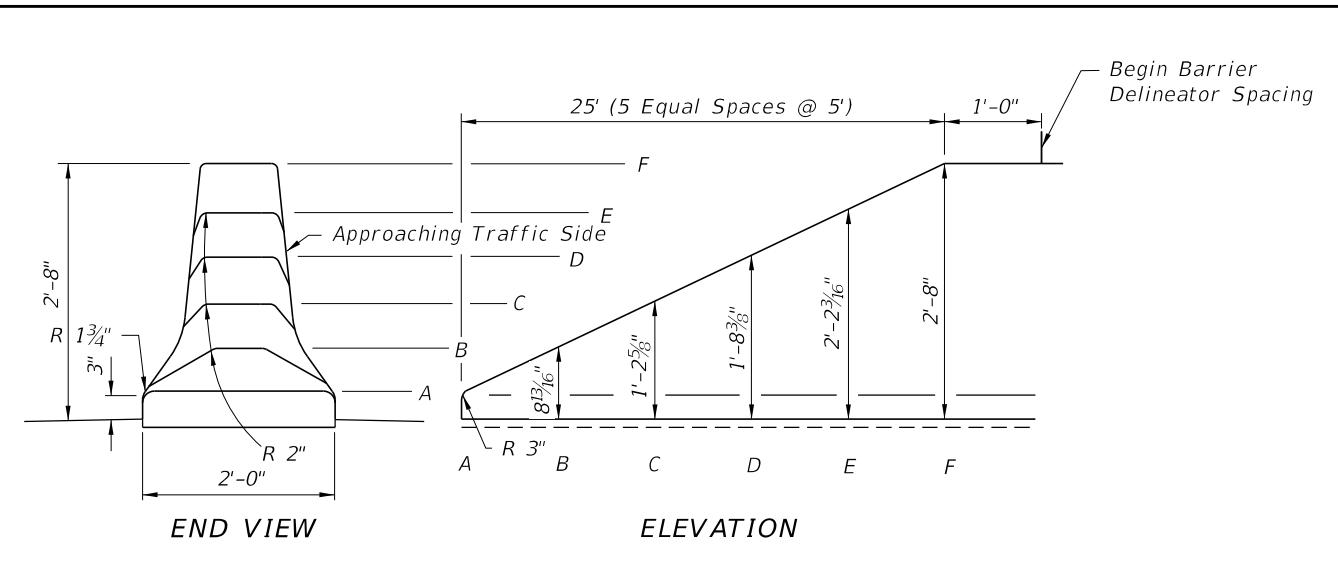


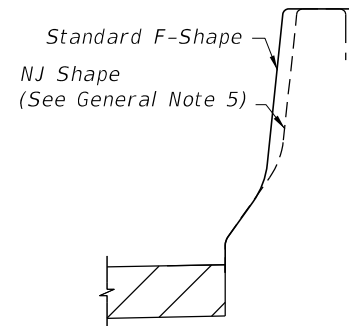
**STANDARD BARRIER WALL SECTIONS  
DETAIL I**



**CONCRETE BARRIER WALL TERMINAL  
DETAIL II**

BARRIER DELINEATOR SPACING FOR CONCRETE BARRIER WALLS		
LOCATION		REMARKS
OFFSET	SPACING	
< 4'	40'	1. Install barrier delineators for use on Concrete Barrier Walls in accordance with Specification Section 993.
4' to 8'	80'	2. Retroreflective sheeting shall be yellow or white and conform to the color of the near Edge of Travel Way, Lane Line.
> 8'	100'	

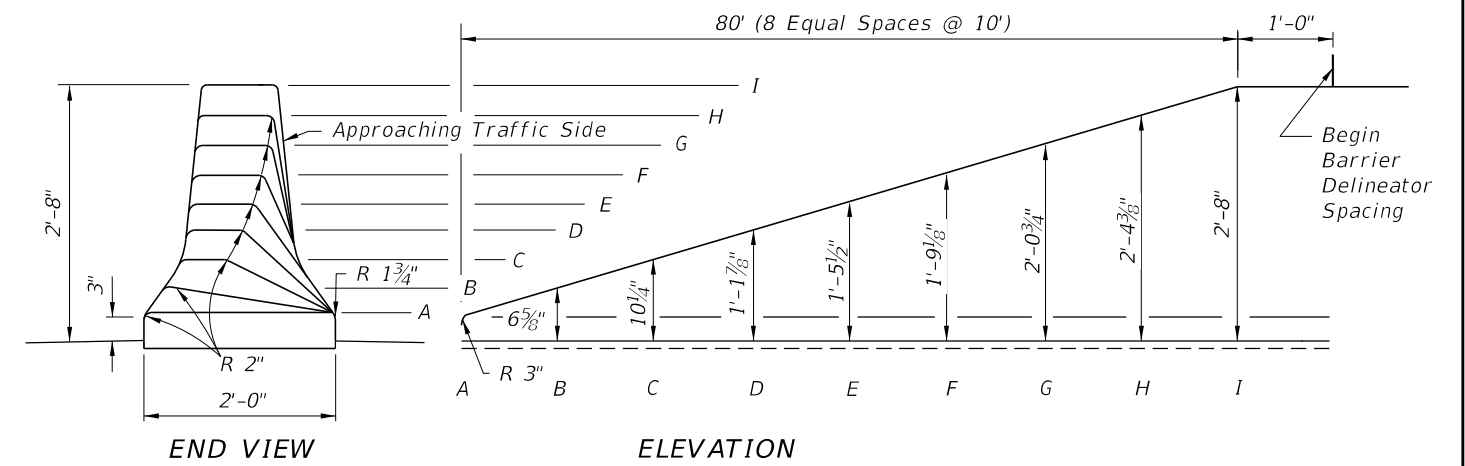
Note: Location Offset is measured from the Edge of Travel Way, Lane Line to the Concrete Barrier Wall, Gutter Line.



**WALL FACE SAFETY SHAPES**

**GENERAL NOTES**

- Class II concrete shall be used for the construction of Concrete Barrier Walls; except, in moderately and extremely aggressive environments, Class IV concrete shall be used. All nondesignated size reinforcing steel shall be No. 5 bars. Exposed concrete surfaces shall have a Class 3 surface finish in accordance with Specification Section 521 or as required in the plans.
- Longitudinal reinforcement to be continuous or spliced No. 5 Bars. Lap splices a minimum of 2'-0".
- Concrete barrier wall terminal notes for design speeds  $\geq 50$  mph.
  - Terminated outside clear zone of the approach traffic, use DETAIL II end treatment.
  - Terminated within a shielded location.
  - Terminal protection by the use of a crash cushion system.
  - Terminated in conjunction with a suitably designed transition to another barrier.
- Expansion joints are required at bridge ends and/or at locations where the wall is an integral part of an existing or proposed concrete slab. Construct required joints to match existing or proposed expansion joints.
- When the barrier is installed adjacent to the pavement, compact the top 12" of the subgrade to at least 98% of the maximum density determined by FM 1-T 180, Method D.
- Where standard F-Shape walls abut existing New Jersey (NJ) Shape walls, face transitions of not less than 5' in length shall be constructed at the adjoining end of the F-Shape wall.



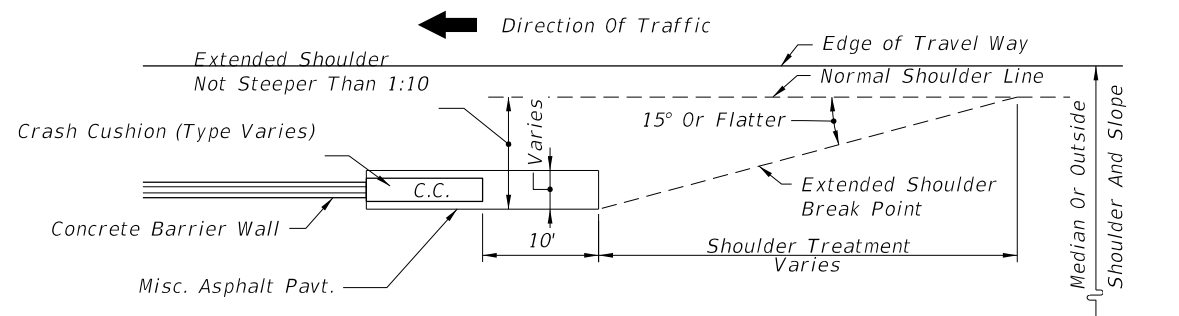
**CONCRETE BARRIER WALL TERMINAL FOR NARROW MEDIANS  
DETAIL III**

- Shoulder concrete barrier wall has been structurally evaluated to be equivalent or greater in strength to other safety shapes which have been crash tested to NCHRP Report 350, TL-4 requirements.
- For wall segments constructed with the slip form method, score 3/8" deep crack control V-Grooves while the concrete is still plastic and mold them when walls are constructed with the stationary form method. V-Grooves shall be spaced at 20' intervals, the end of the side face grooves shall be in line with the ends of the top face groove and the long dimension of all grooves shall align at 90 degrees to the longitudinal axis of the wall. When wall segments are less than 40' in length, space the V-Groove equally between open joints. Dowel transverse construction joints for abutting segments less than 40' (See DETAIL B).
- Minimum length of cast-in-place or precast segments is 20 feet.
- Precast construction is allowed as an alternate to cast-in-place construction.
  - Wall segments < 40' in length shall be joined by a transverse joint in accordance with DETAIL C. The minimum segment length is 20'.
  - Bedding of the precast sections shall be facilitated by the use of sand-cement grout or equal method to assure uniform bearing.
  - Reinforcement may be required for handling stresses.
- On roadways designated for reverse laning, all downstream ends that are not shielded or outside the clear zone shall be marked by Type 3 Object Markers.
- For BARRIER WALL INLET details see Index 218 and Index 219. For MEDIAN BARRIER INLETS see Index 217.
- Concrete barrier wall with NJ Safety Shape may not be substituted for the Standard F Shape Barrier.

**CONCRETE BARRIER WALL TERMINALS**

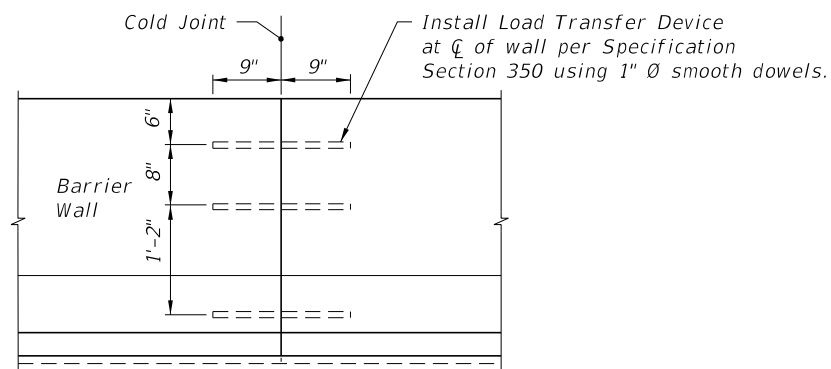
10/24/2016 10:43:40 AM

LAST REVISION 11/01/16	DESCRIPTION:	FY 2017-18 DESIGN STANDARDS	CONCRETE BARRIER WALL	INDEX NO. 410	SHEET NO. 1 of 25
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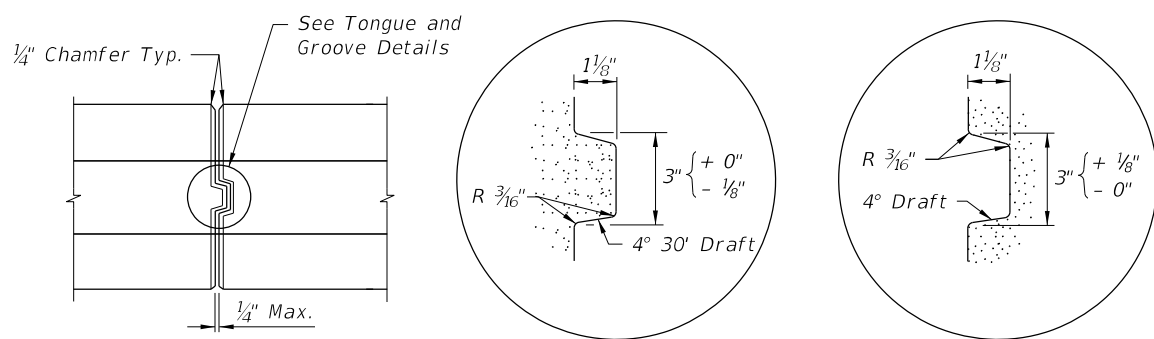
**SHOULDER TREATMENT WHEN CRASH CUSHIONS SHIELD CONCRETE BARRIER WALL ENDS LOCATED INSIDE APPROACH CLEAR ZONE OR LATERAL OFFSET**

**DETAIL A**



**DOWELED TRANSVERSE CONSTRUCTION JOINT WHERE ABUTTING SEGMENT(S) LESS THAN 40' IN LENGTH (Required on abutting ends of Segments < 40' long)**

**DETAIL B**



**TOP VIEW**

**TONGUE DETAIL**

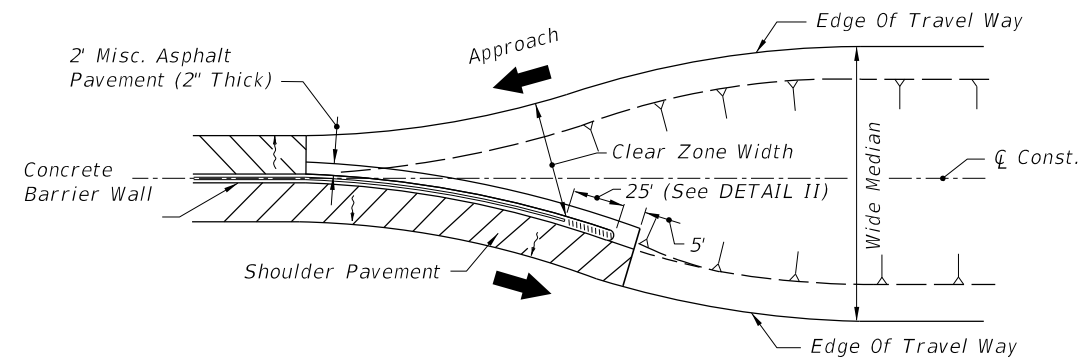
**GROOVE DETAIL**

**PRECAST TONGUE AND GROOVE TRANSVERSE JOINT**

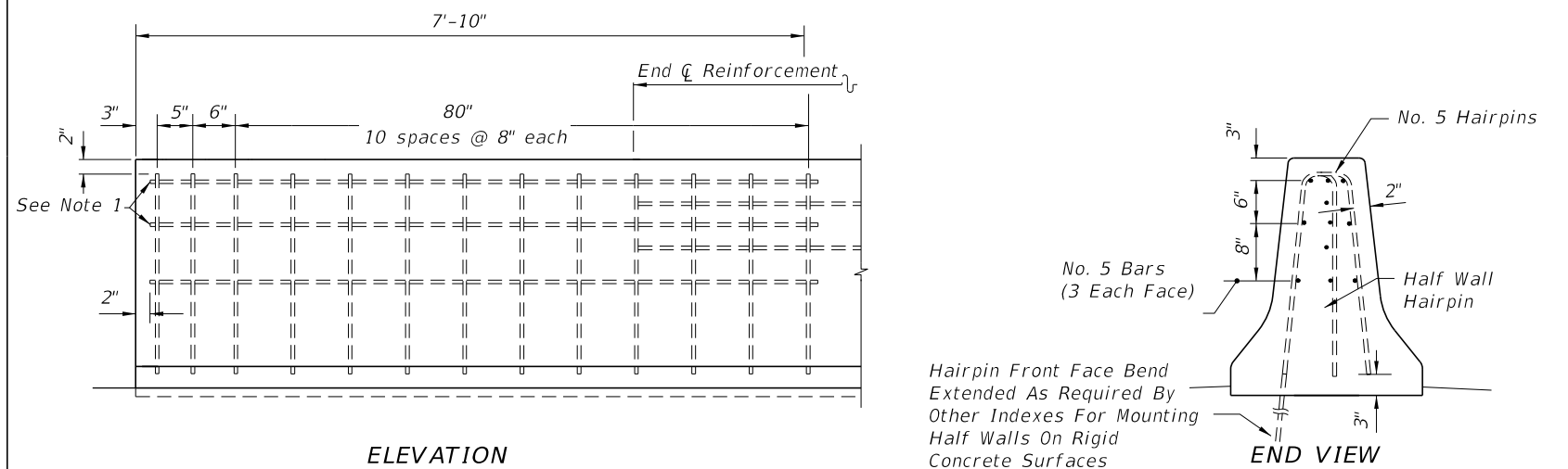
**(Required on abutting ends of Precast Segments ≥ 40' long)**

**DETAIL C**

**CONCRETE BARRIER WALL SPECIAL DETAILS**



**TRANSITION BETWEEN NARROW AND WIDE MEDIANS WHERE END OF BARRIER WALL IS LOCATED OUTSIDE THE APPROACH CLEAR ZONE OR LATERAL OFFSET**



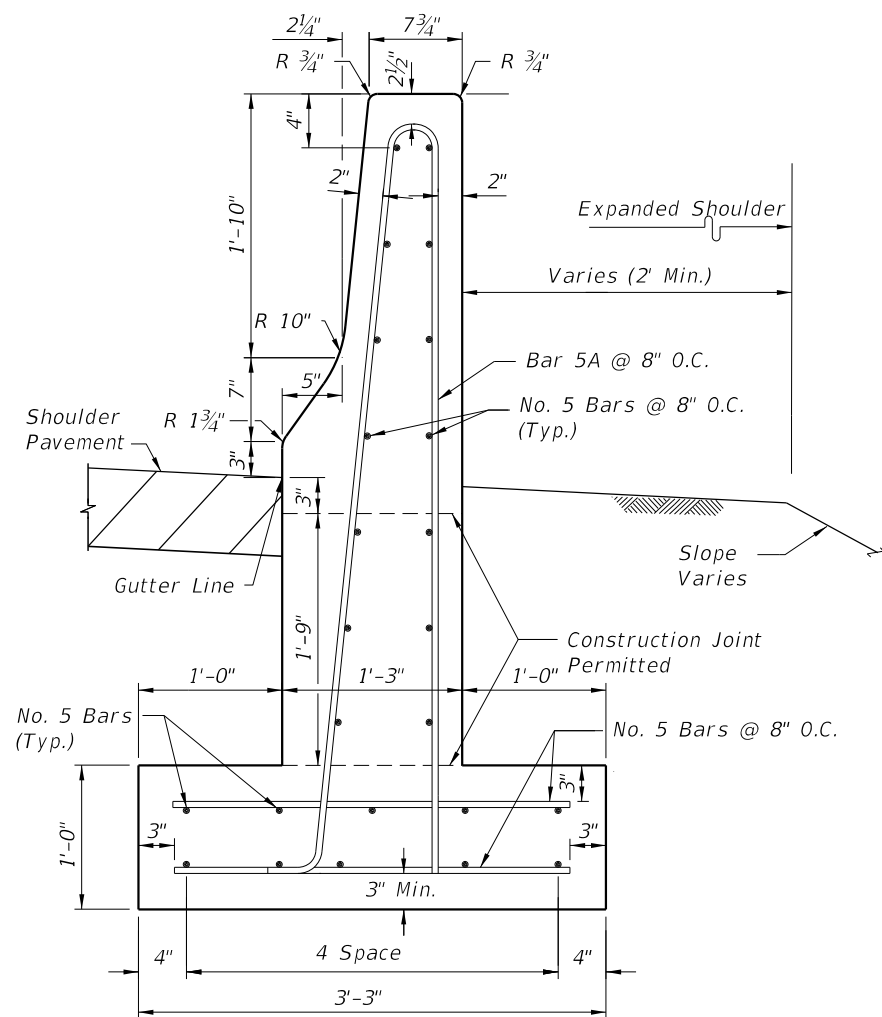
**NOTE:**

- Free end reinforcement required for nonreinforced walls at the following locations: All exposed ends; abutting ends of precast segments ≥ 40'; ends with guardrail connections; ends with redirective crash cushion connections; and, ends connecting to bridge traffic rails or other rigid barriers.

**FREE END REINFORCEMENT**

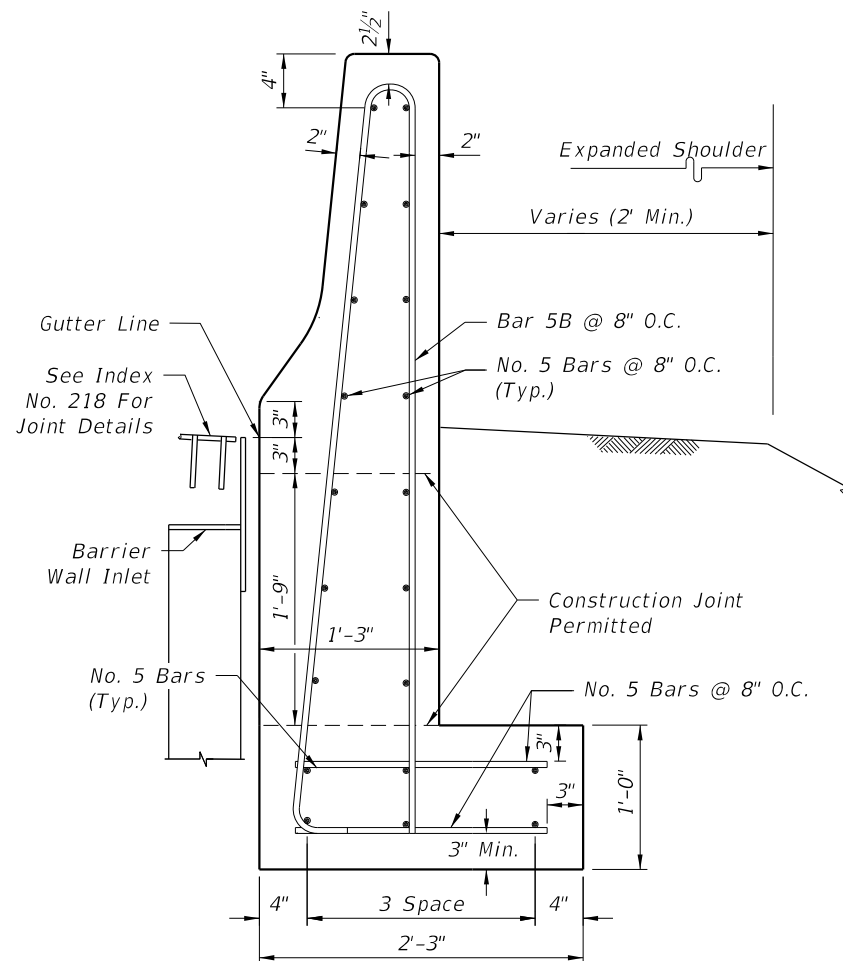
10/24/2016 10:43:46 AM

LAST REVISION 02/01/16	DESCRIPTION:
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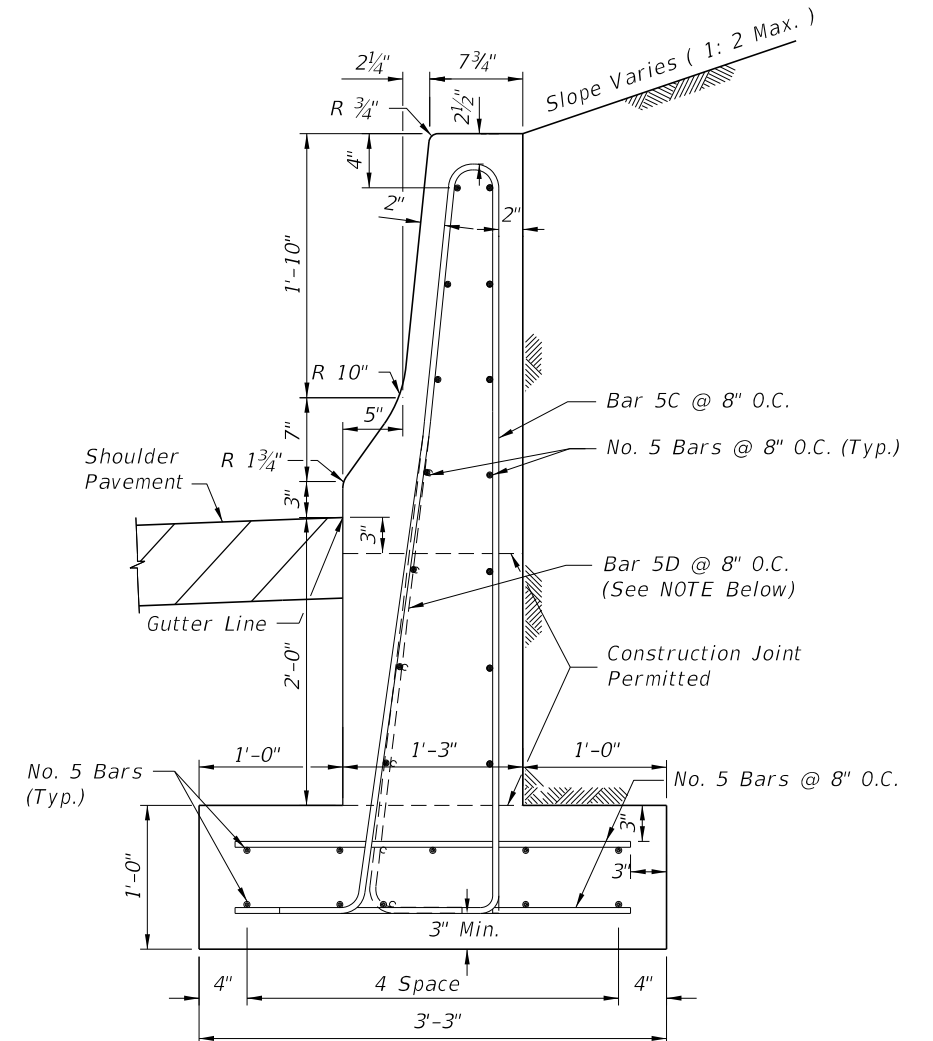
QUANTITIES: Concrete 0.30 CY/LF  
Reinforcing Steel 52 LBS/LF

**SHOULDER WALL (TYPICAL)**



QUANTITIES: Concrete 0.26 CY/LF  
Reinforcing Steel 44 LBS/LF

**SHOULDER WALL (MODIFIED)**



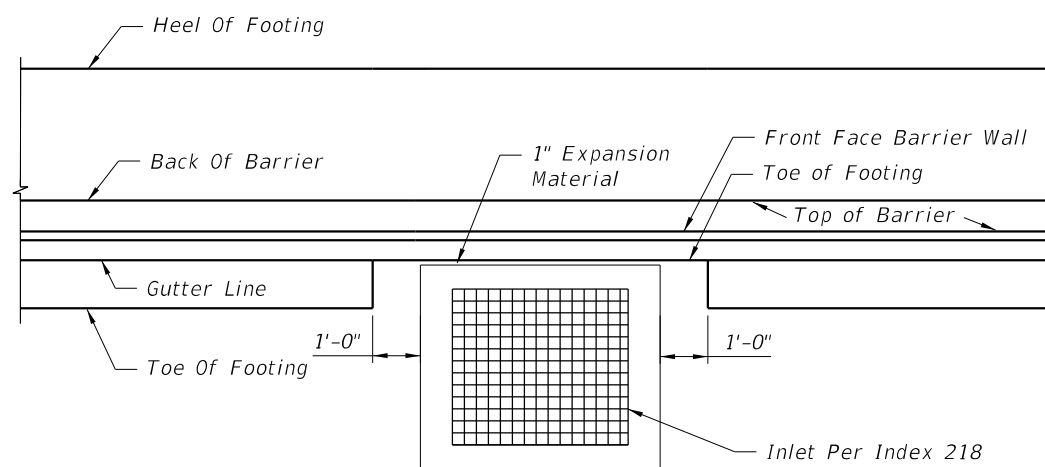
NOTE: Bar 5D Shall Be Used In Lieu of Bar 5C In Areas Where Obstructions Require Localized Omission Of Toe

QUANTITIES:  
With Reinforcing Steel (Bar 5C) 55 LBS/LF; Concrete 0.27 CY/LF

With Reinforcing Steel (Bar 5D) 52 LBS/LF; Concrete 0.23 CY/LF

**SHOULDER WALL (RETAINING)**


- NOTES:
1. Reduce the vertical steel spacing to 4 inches O.C. a distance of 4 feet for each side of all cold or expansion joints.
  2. Unless otherwise noted, Minimum Segment Wall Length is 20 LF.
  3. All walls may be made up of segments 20' or more in length provided the segments are joined by a transverse joint in accordance with the CONCRETE BARRIER WALL SPECIAL DETAILS, DETAIL B.
  4. Quantities shown are for information only. Barrier wall inlets (Index 218) shall be isolated from the barrier wall stem and footing by 1" expansion material.
  5. All longitudinal reinforcement to be continuous or spliced No. 5 bars. Lap splices a minimum of 2'-0".
  6. For additional information on Bars 5A, 5B, 5C and 5D, see BAR BENDING DIAGRAMS.

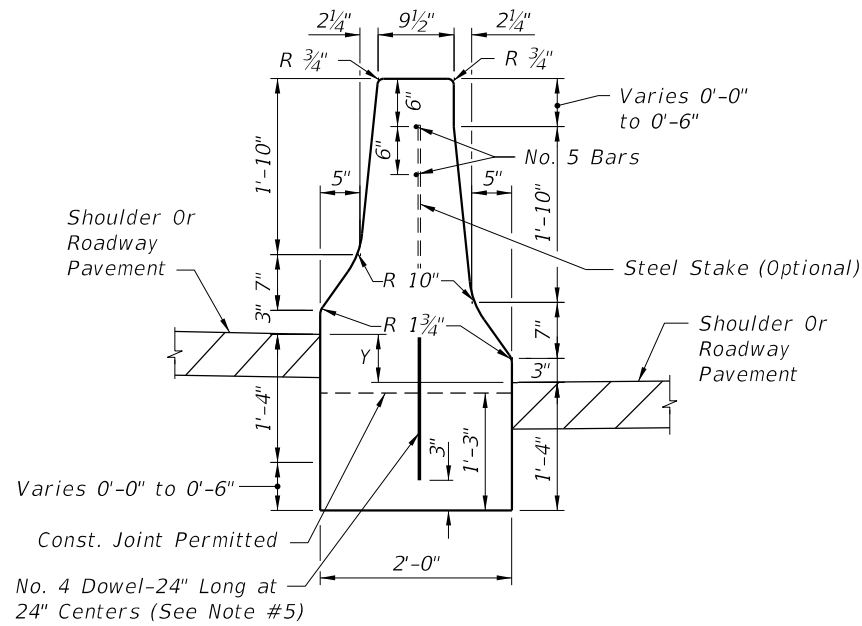


PLAN VIEW  
SHOULDER WALL FOOTING  
TRANSITION AT INLETS

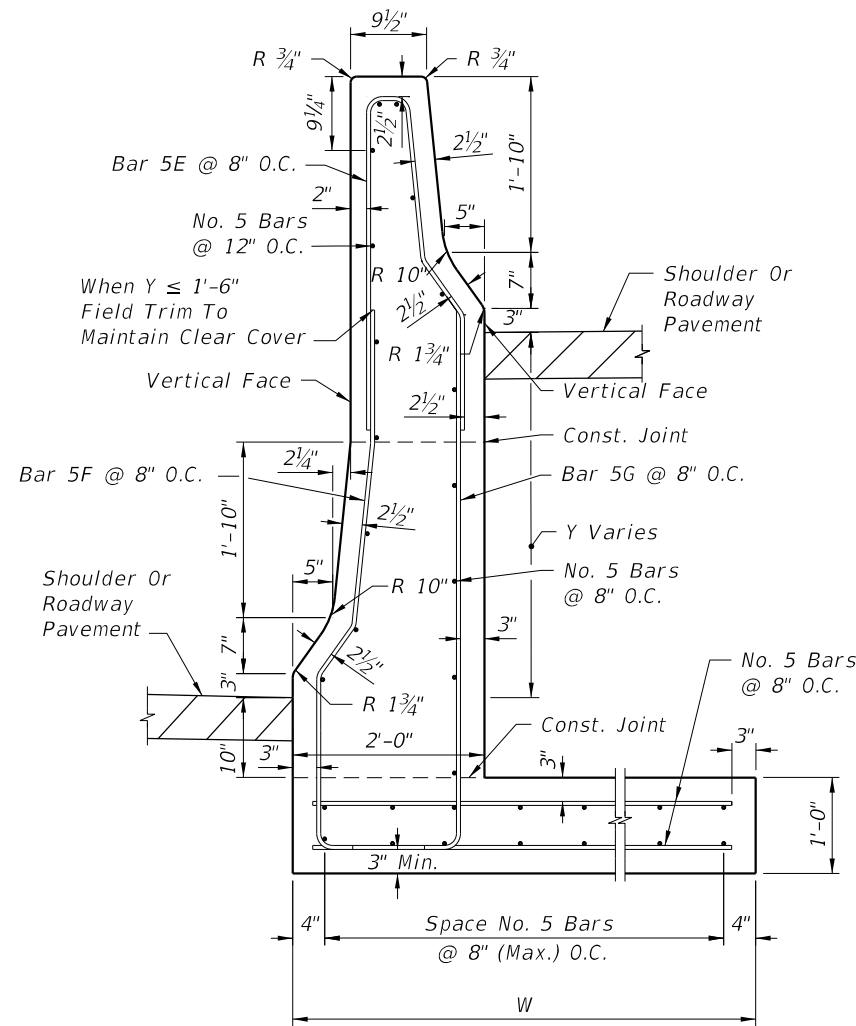
**REINFORCED CONCRETE SHOULDER WALL**

2/7/2017 8:42:41 AM

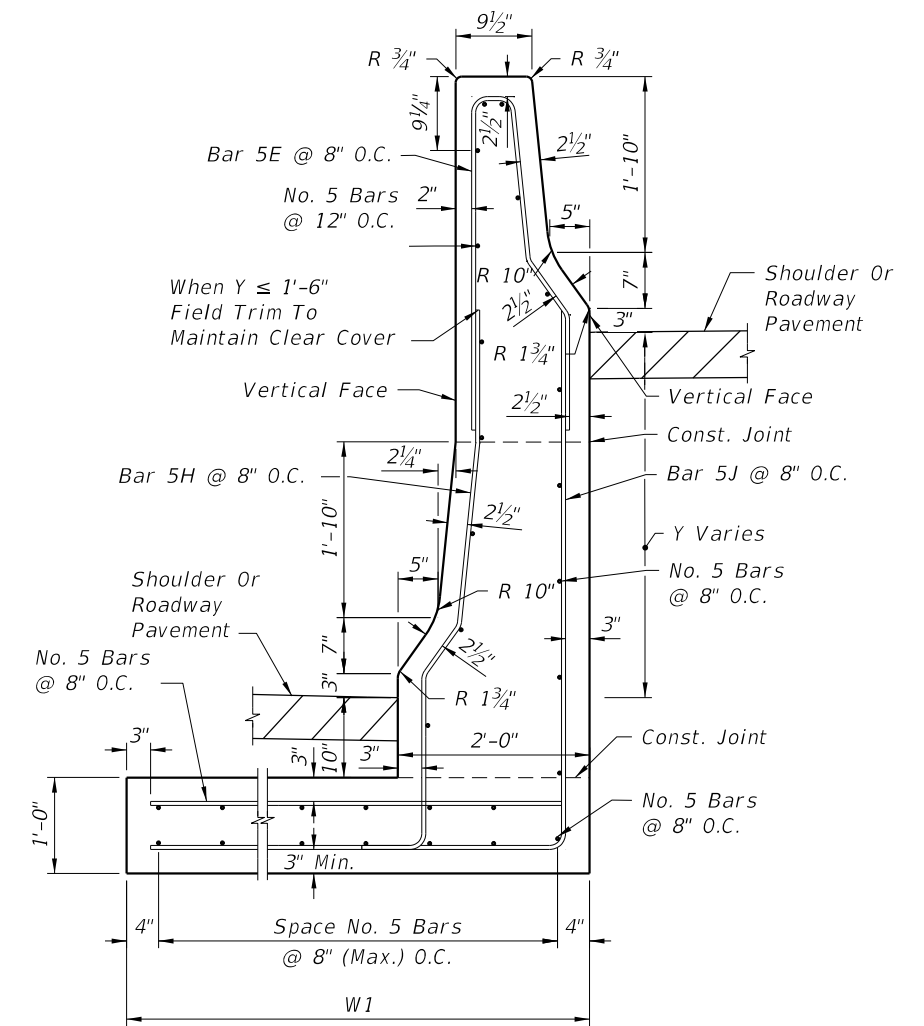
LAST REVISION 11/01/16	DESCRIPTION:	 <b>FY 2017-18 DESIGN STANDARDS</b>	<b>CONCRETE BARRIER WALL</b>	INDEX NO. <b>410</b>	SHEET NO. <b>3 of 25</b>
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**F-SHAPE MEDIAN BARRIER  
WHEN Y IS LESS THAN OR EQUAL TO 6 INCHES**



**CANTILEVER WALL  
SUPERELEVATED SECTION**



**L-WALL  
SUPERELEVATED SECTION**

DIMENSIONS TABLE								
Cantilever Wall	Height Y	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"	3'-6"	4'-0"
	Width W	2'-6"	2'-9"	3'-0"	3'-3"	3'-3"	3'-6"	3'-6"
Min. Segment Wall Length		29'	27'	25'	23'	24'	22'	24'
L-Wall	Height Y	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"	3'-6"	4'-0"
	Width W1	2'-6"	2'-9"	3'-0"	3'-3"	3'-3"	3'-6"	3'-6"
Min. Segment Wall Length		26'	24'	22'	21'	22'	21'	24'

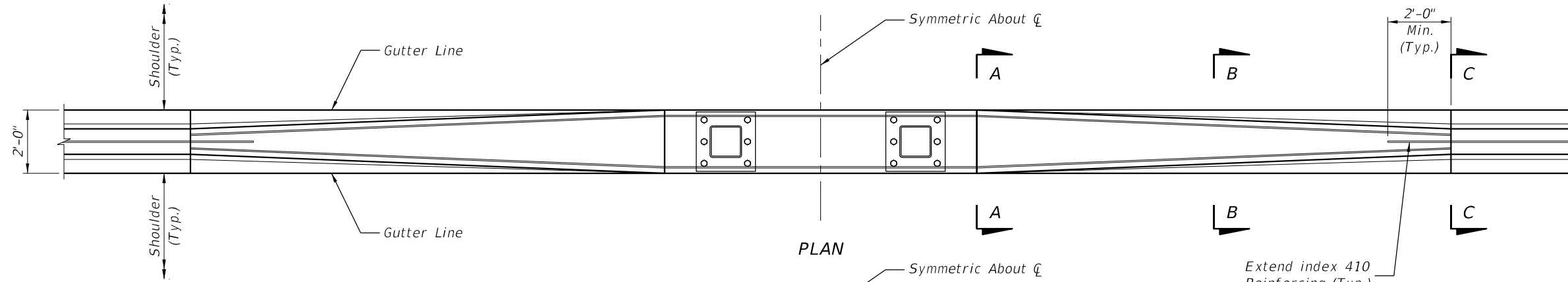
**NOTES:**

1. Unless the plans stipulate a specific wall type, either the Cantilever Wall or the L-Wall may be constructed at the Contractor's option.
2. Reduce the vertical steel spacing to 4 inches O.C. a distance of 4 feet for each side of all cold or expansion joints.
3. All longitudinal reinforcement to be continuous or spliced No. 5 bars. Lap splices a minimum of 2'-0".
4. For additional information on Bars 5E, 5F, 5G, 5H and 5J, see BAR BENDING DIAGRAMS.
5. No. 4 dowel may be extended to provide steel stake. Omit dowel bars when construction joint is not used.

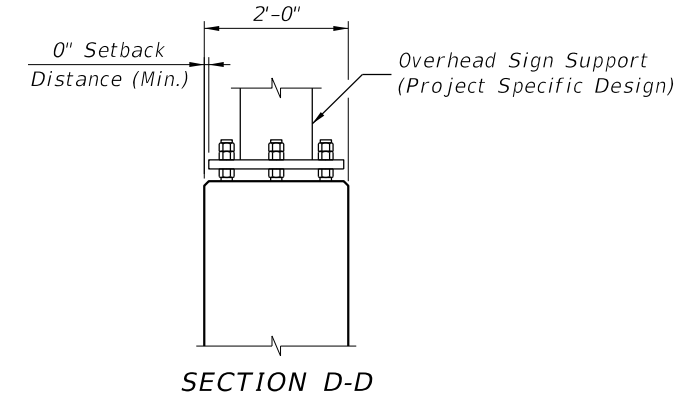
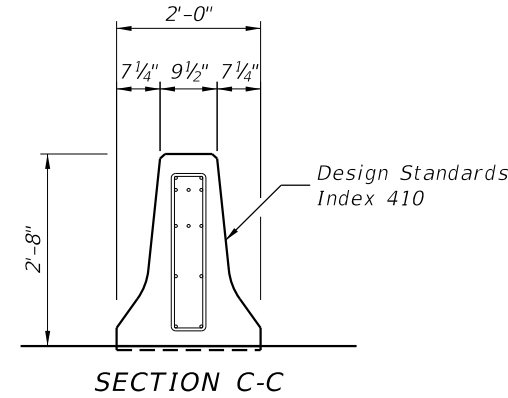
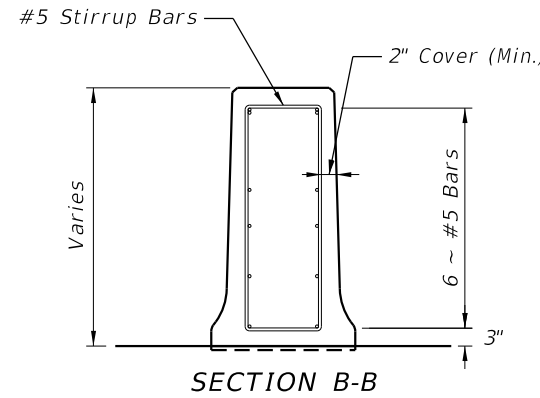
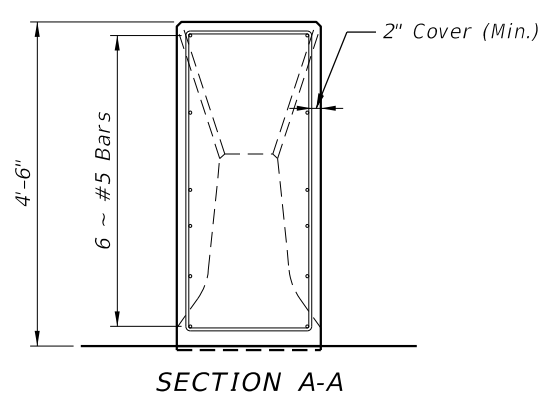
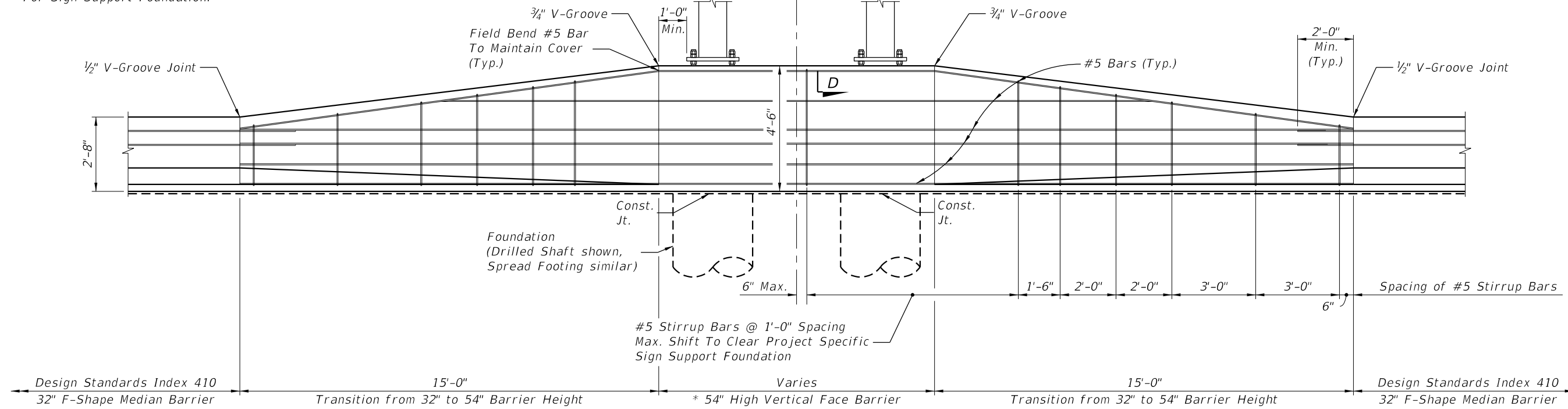
**MEDIAN BARRIER WALL FOR SUPERELEVATED SECTIONS WITH VARIABLE ROADWAY PROFILE GRADE LINES**

10/24/2016 10:43:52 AM

LAST REVISION 07/01/15	DESCRIPTION:
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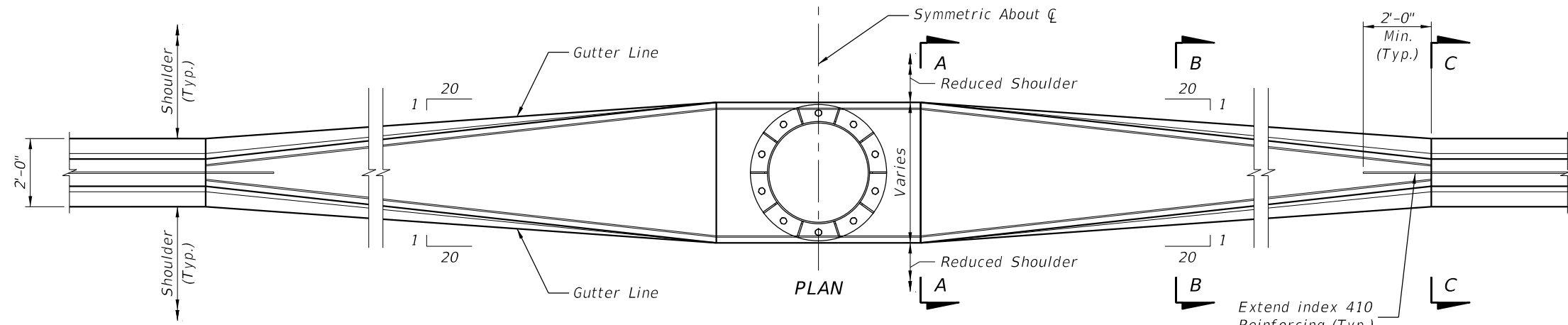
\* See Plans For Additional Project Specific Reinforcement For Sign Support Foundation.



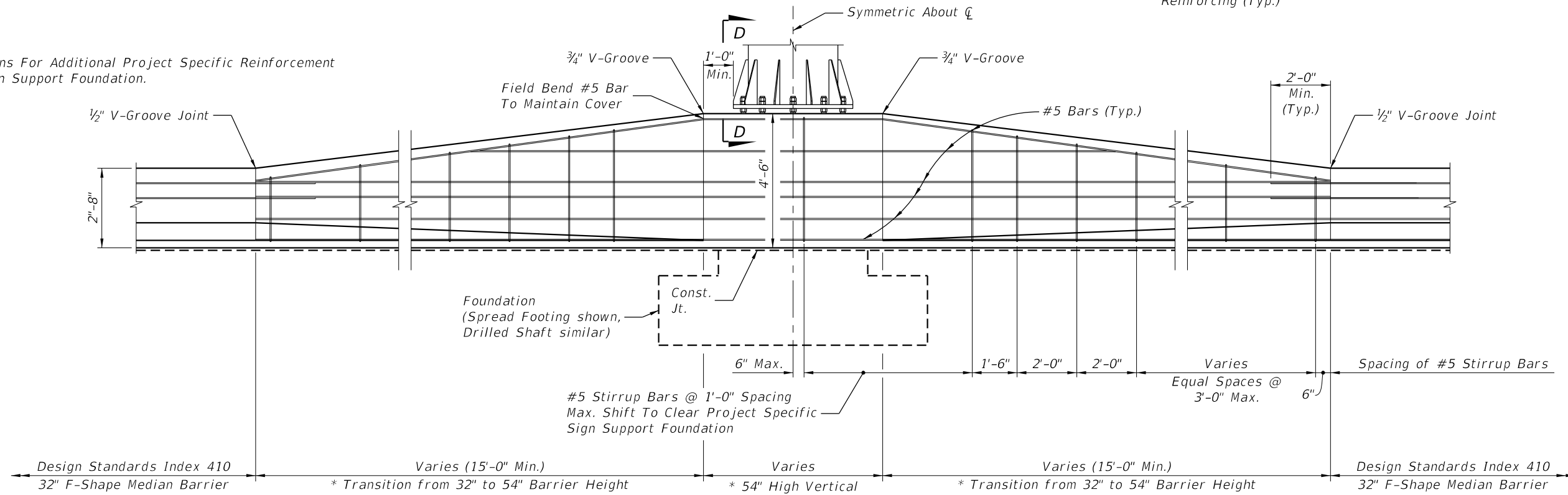
LARGE SIGN MEDIAN BARRIER MOUNTED SIGN SUPPORT TRANSITION (OPTION 1)

10/24/2016 10:43:54 AM

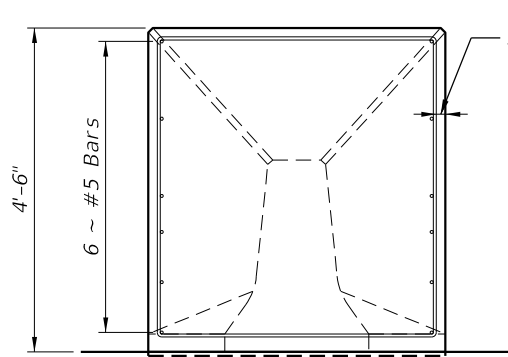
LAST REVISION 07/01/15	REVISION	DESCRIPTION:	 FY 2017-18 DESIGN STANDARDS	CONCRETE BARRIER WALL	INDEX NO. 410	SHEET NO. 5 of 25
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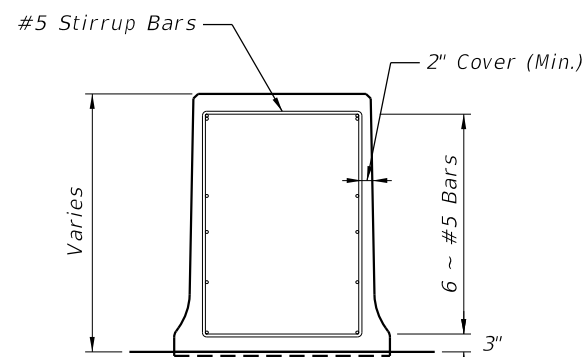
\* See Plans For Additional Project Specific Reinforcement For Sign Support Foundation.



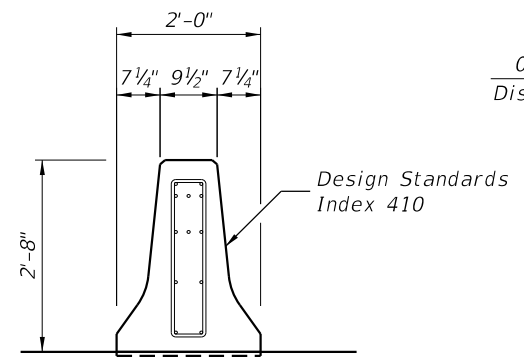
ELEVATION



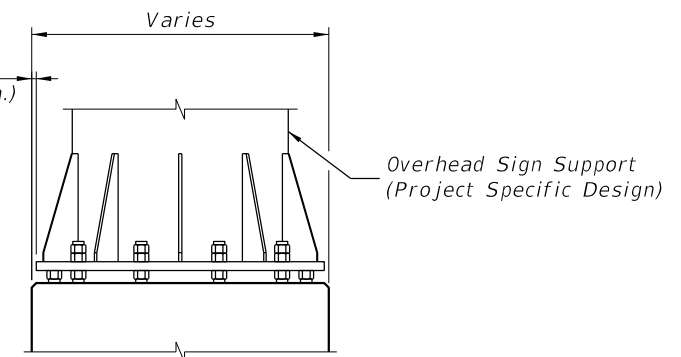
SECTION A-A



SECTION B-B



SECTION C-C

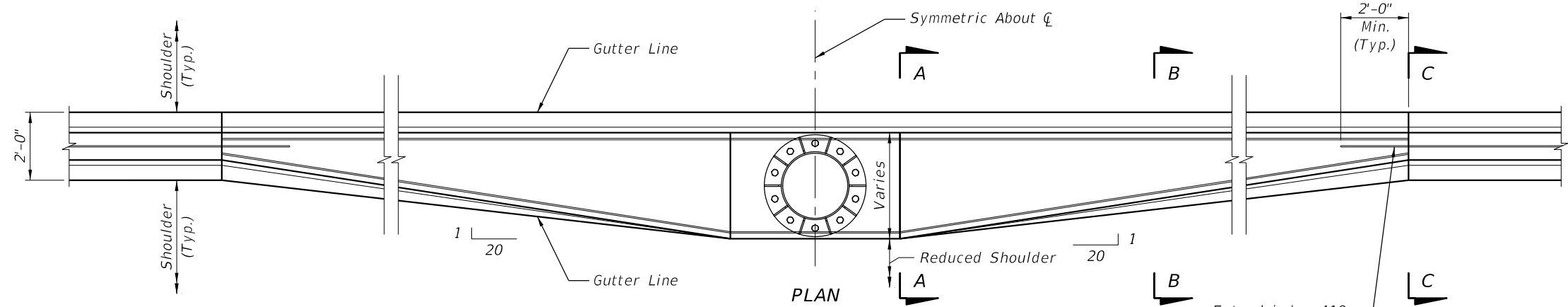


SECTION D-D

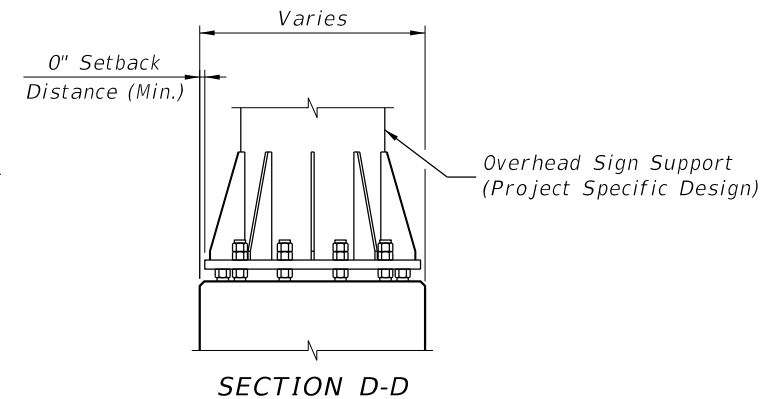
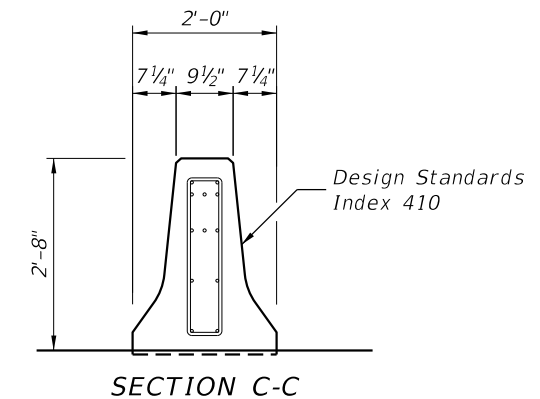
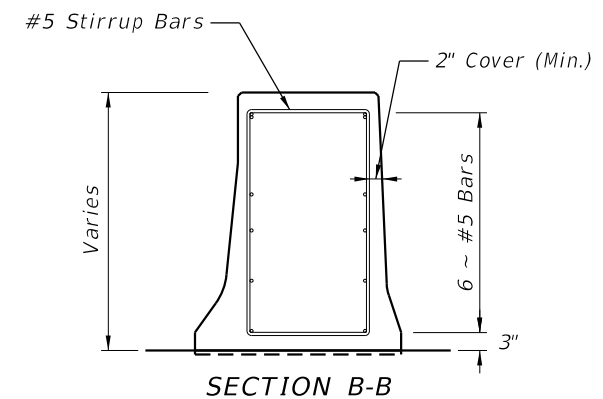
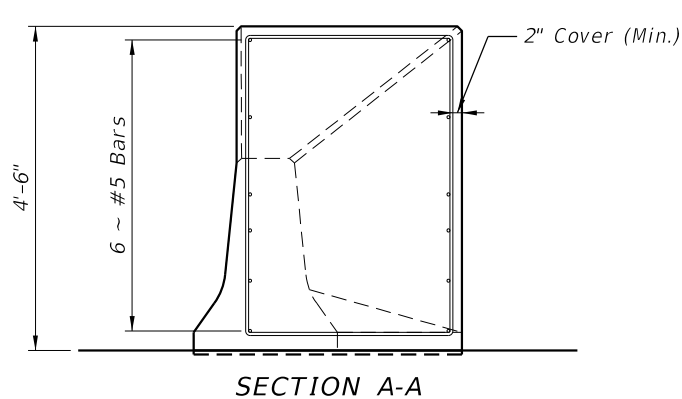
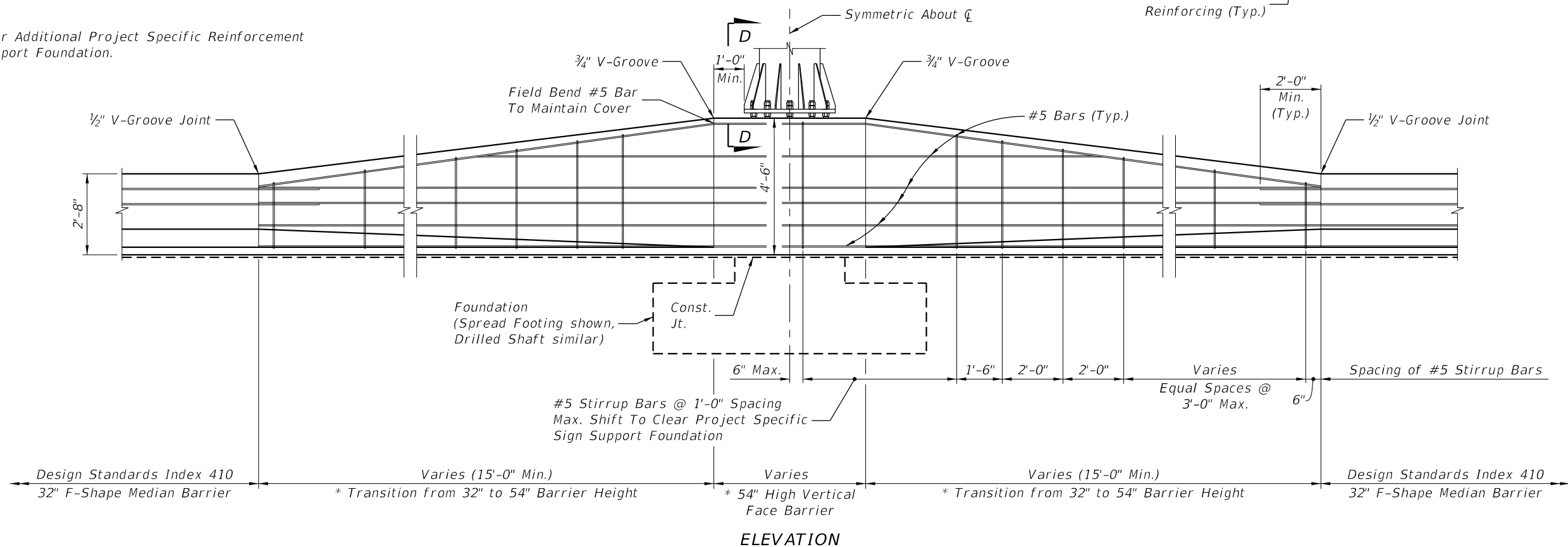
LARGE SIGN MEDIAN BARRIER MOUNTED SIGN SUPPORT TRANSITION (OPTION 2)

10/24/2016 10:43:56 AM

LAST REVISION 07/01/15	REVISION	DESCRIPTION:	FY 2017-18 DESIGN STANDARDS	CONCRETE BARRIER WALL	INDEX NO. 410	SHEET NO. 6 of 25
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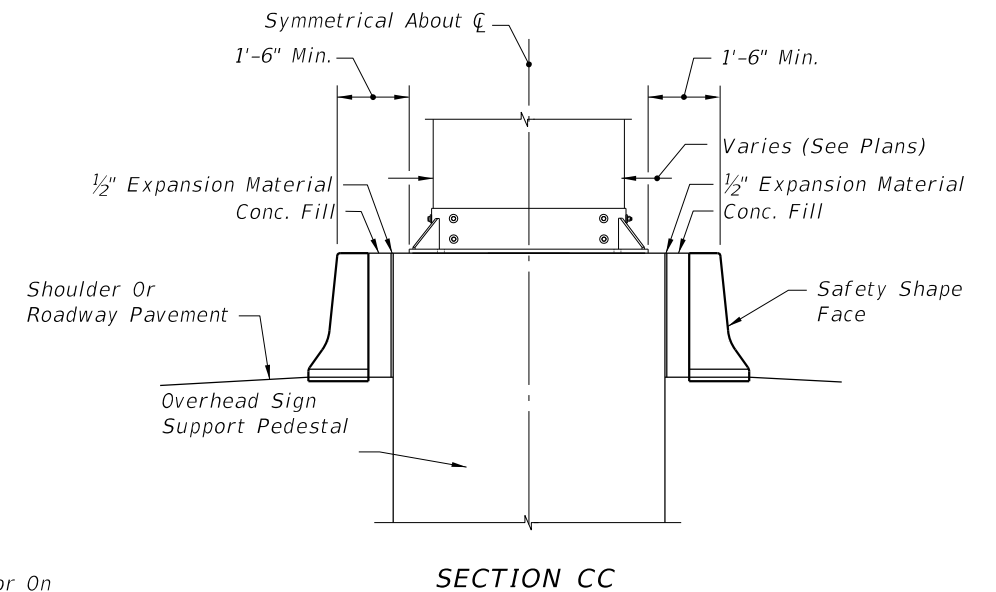
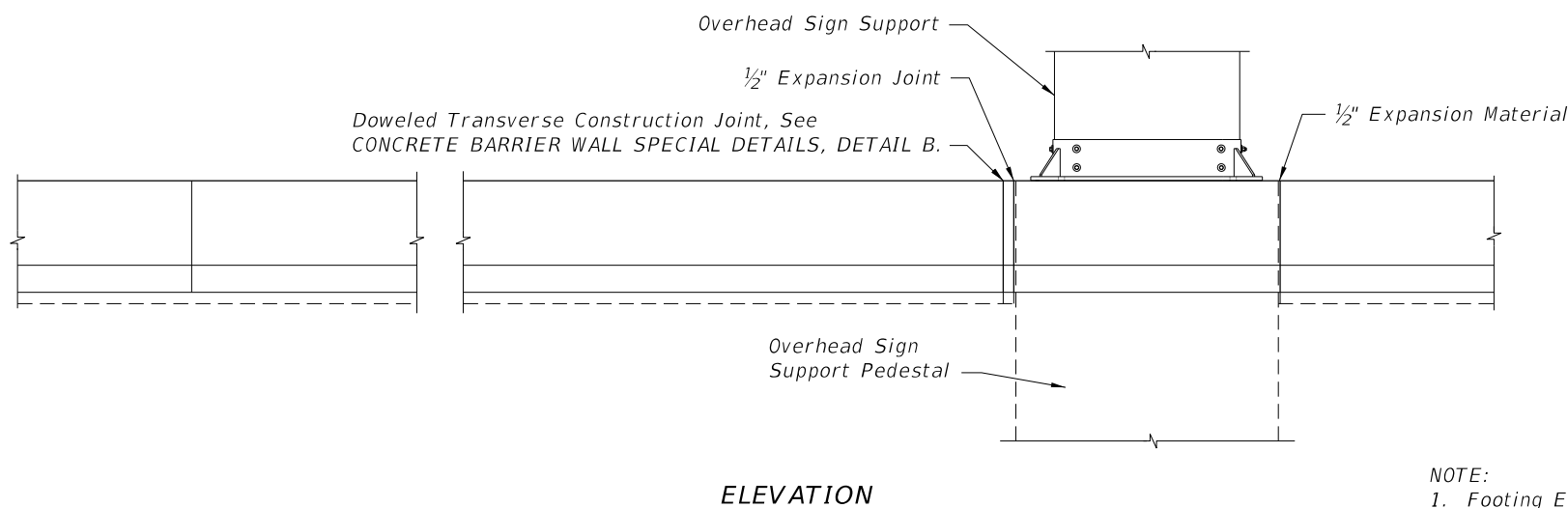
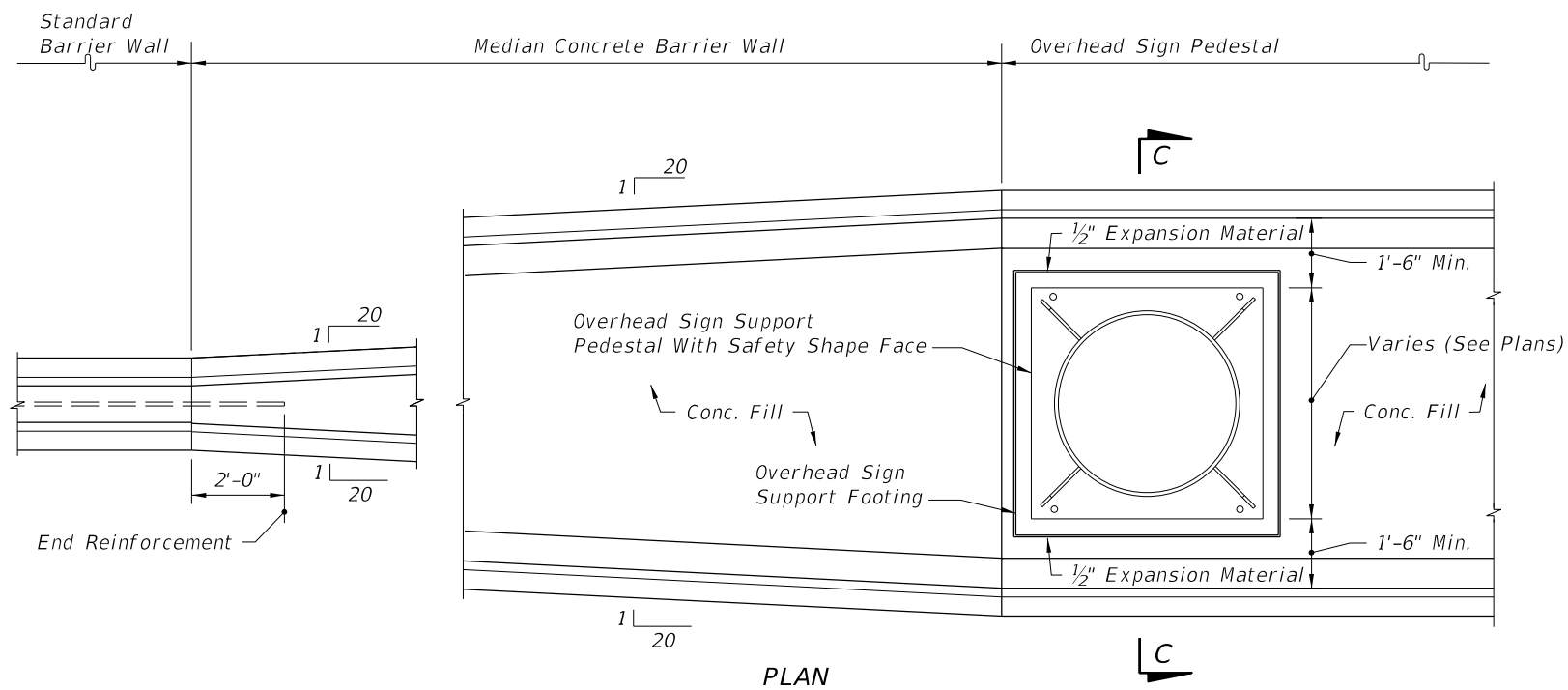
\* See Plans For Additional Project Specific Reinforcement For Sign Support Foundation.



LARGE SIGN MEDIAN BARRIER MOUNTED SIGN SUPPORT TRANSITION (OPTION 3)

10/24/2016 10:43:59 AM


LAST REVISION 07/01/15	REVISION	DESCRIPTION:	 FY 2017-18 DESIGN STANDARDS	CONCRETE BARRIER WALL	INDEX NO. 410	SHEET NO. 7 of 25
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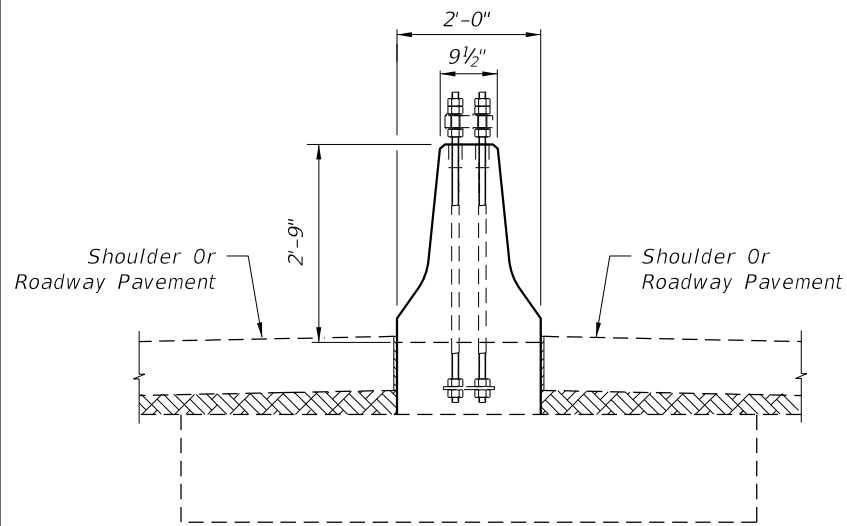
NOTE:  
 1. Footing Extended As Called For On Other Indexes Or As Called For In The Plans

CONCRETE MEDIAN BARRIER WALL TRANSITIONS AT OVERHEAD SIGN SUPPORTS

10/24/2016 10:44:01 AM

LAST REVISION 07/01/14	REVISION DESCRIPTION:	 FY 2017-18 DESIGN STANDARDS	CONCRETE BARRIER WALL	INDEX NO. 410	SHEET NO. 8 of 25
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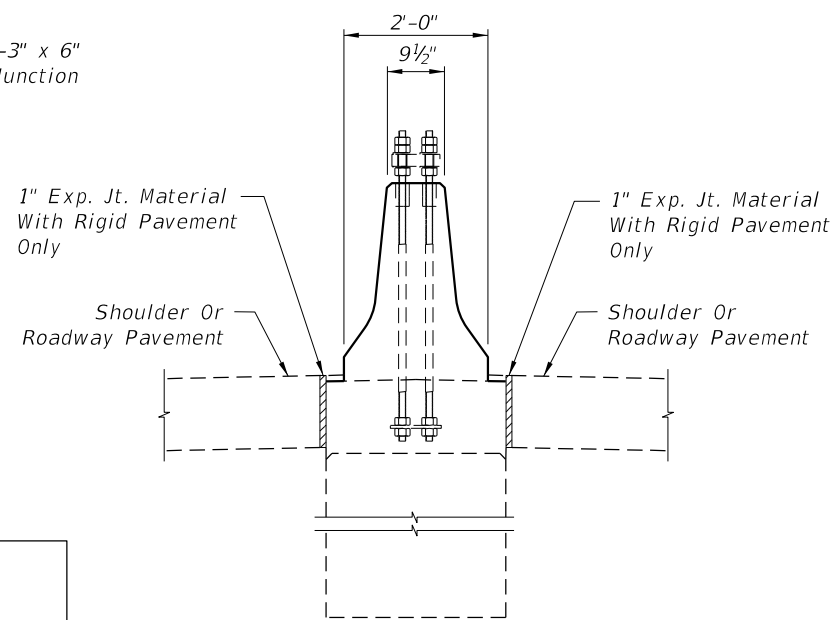




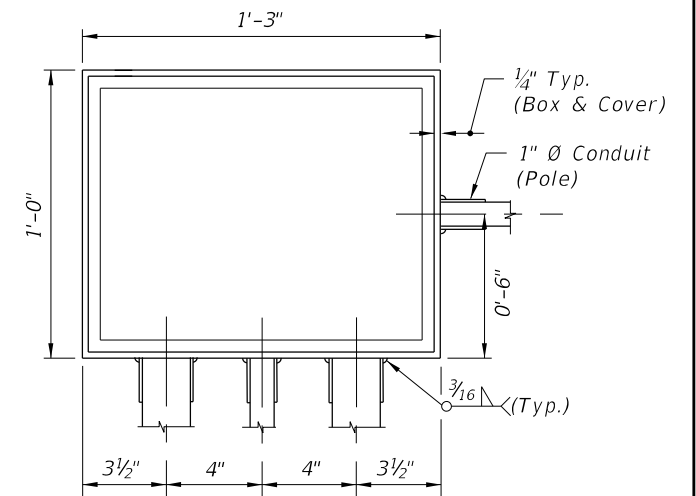
END VIEW  
SPREAD FOOTING OPTION

TRANSVERSE SECTION  
INSTALLATION

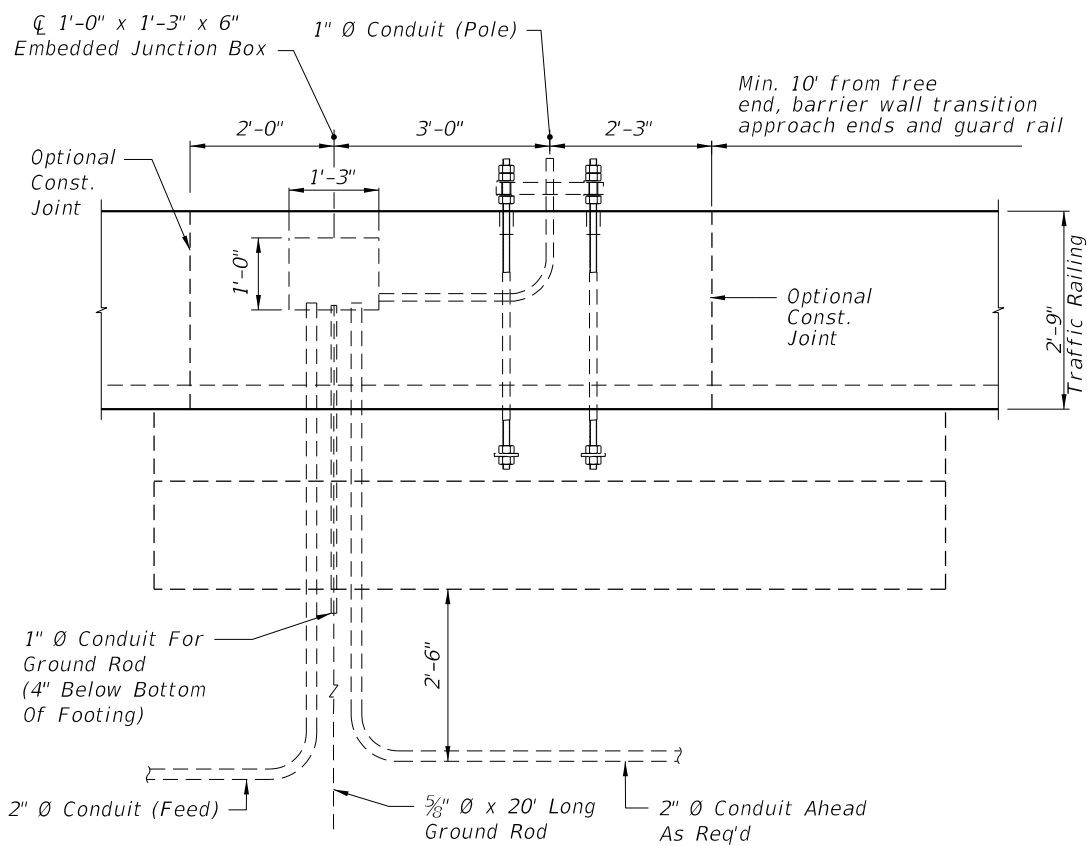
**SPREAD FOOTING AND  
CYLINDRICAL NOTES**  
The Reinforcement Details And  
Dimensions For Both The Spread  
Footing And Cylindrical Foundations  
Can Be Found In Index 17515.



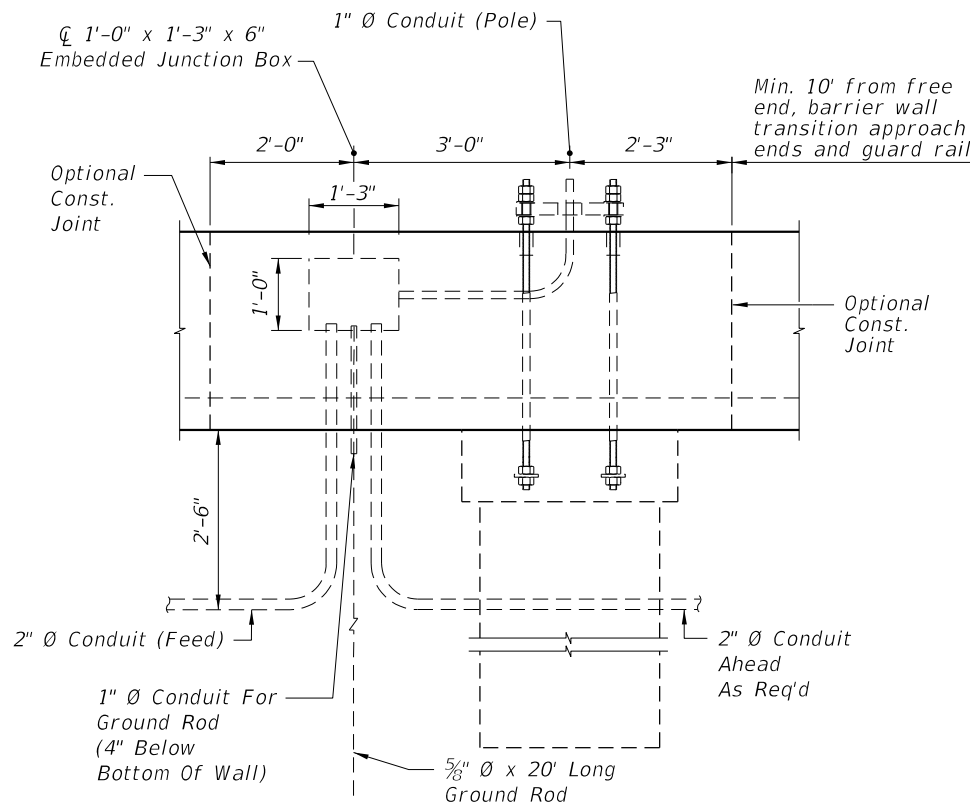
END VIEW  
CYLINDRICAL OPTION



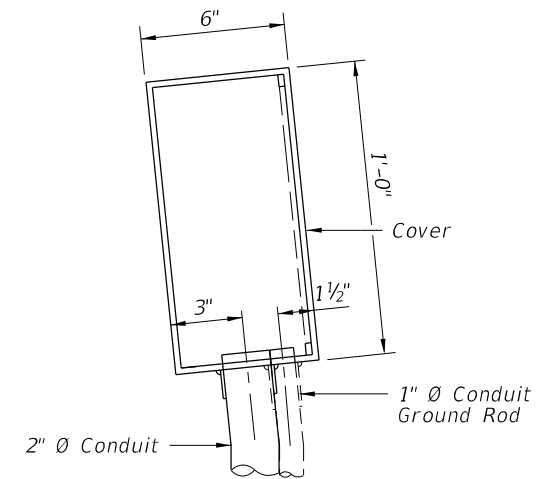
FRONT VIEW  
EMBEDDED JUNCTION BOX



ELEVATION  
SPREAD FOOTING OPTION



ELEVATION  
CYLINDRICAL OPTION



SIDE VIEW  
EMBEDDED JUNCTION BOX

**NOTES:**

1. Embedded junction boxes are to be fabricated from steel conforming to ASTM A36 and be hot-dip galvanized after fabrication. All seams shall be continuously welded and ground smooth. A neoprene gasket shall be attached to the box to provide a watertight cover. The cover screws shall be fully galvanized.
2. Remove excess concrete while green and hand form chamfers.
3. Embedded junction box complete and conduit risers are incidental to the construction and cost of the barrier wall; there is to be no separate compensation for the box, risers or installation unless specifically called for in the plans.

**MEDIAN BARRIER MOUNTED LIGHT POLE DETAILS**


**EMBEDDED JUNCTION BOX - ELECTRICAL**

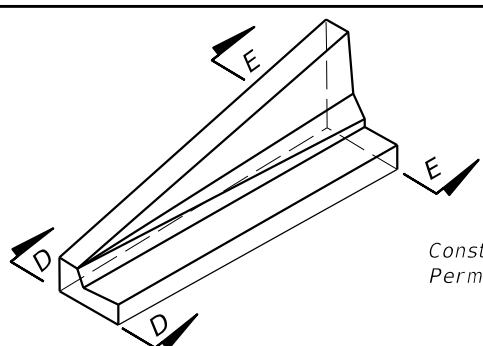
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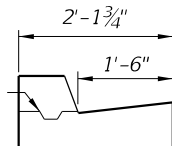
LAST REVISION 02/01/16	REVISION DESCRIPTION:	 <b>FY 2017-18</b> DESIGN STANDARDS	CONCRETE BARRIER WALL	INDEX NO. 410	SHEET NO. 10 of 25
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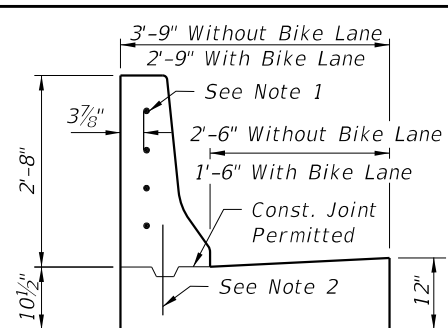
WITH AND WITHOUT UTILITY STRIP  
PICTORIAL VIEW

Const. Joint Permitted

SECTION DD

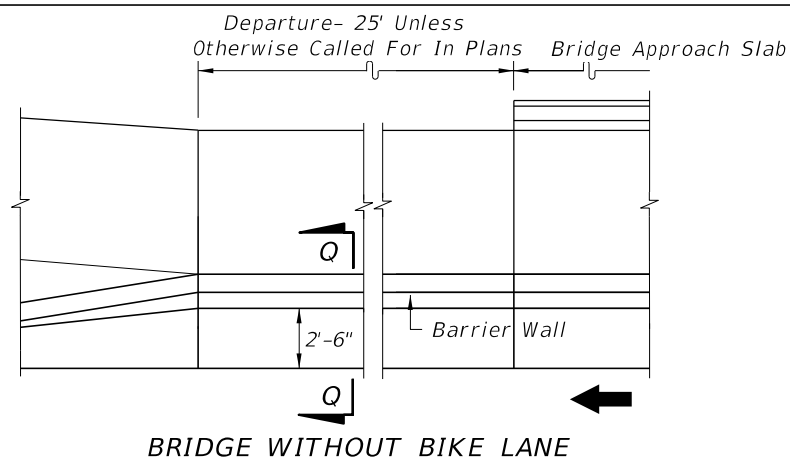


SECTION EE

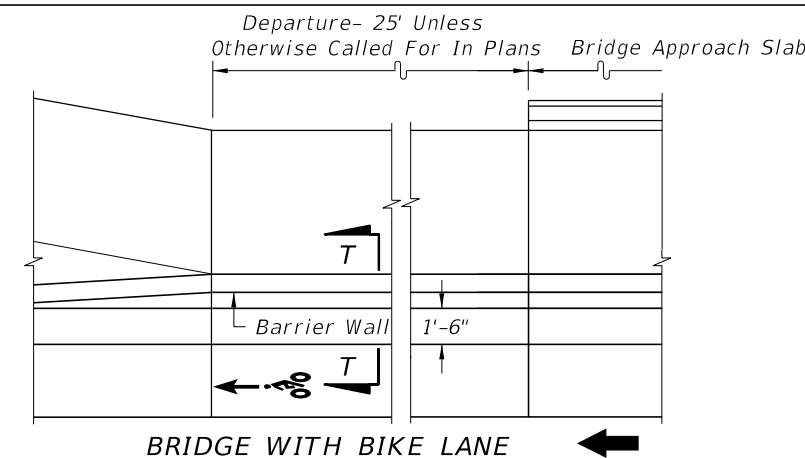


NOTES:

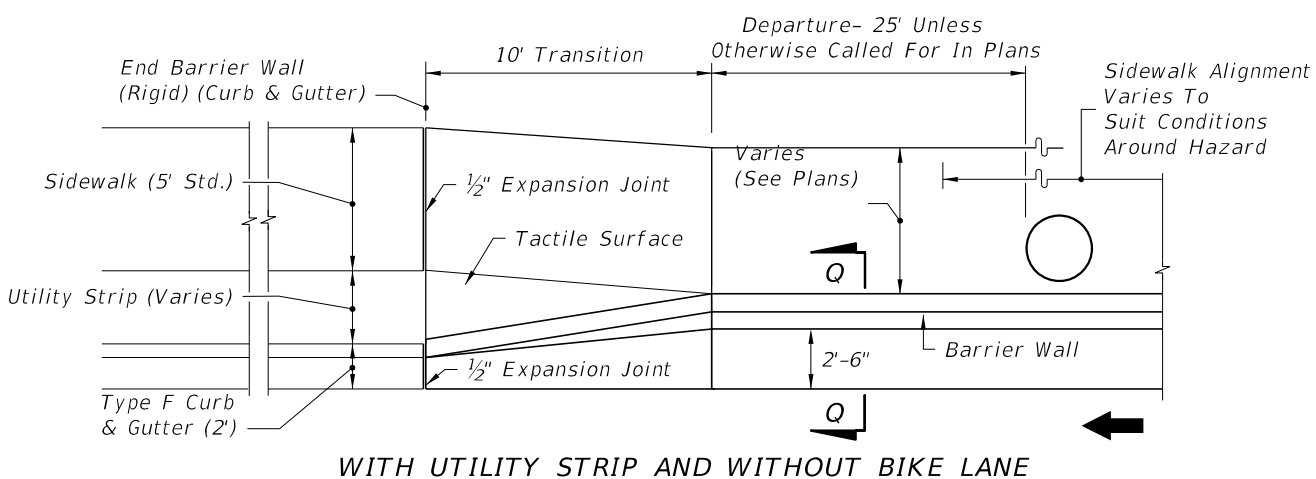
1. Transition Segments Shall Be Doweled Into The End Of The Barrier Wall In The Following Manner: Four 1" diameter holes 6" deep on 6" centers shall be drilled in the end of the barrier and No. 6 bars 15" long set in an Adhesive Bonded Material System per Standard Specification Section 416. The ends of the dowels extending into the transition segment shall be wrapped with one layer of ASTM D226, Type I (15 lb.) asphalt-saturated organic felt with the ends crimped.
2. When Construction Joints Are Utilized For Transition Segment Construction The Stem Shall Be Doweled To The Footing In The Following Manner: Five No. 5 bars 15" long shall be embedded 7" into the footing. The dowels shall be spaced 15" on centers with the first dowel located 12" from the barrier wall. Dowels may be placed within or adjacent to the keyway.
3. The detail BRIDGE WITH BIKE LANE can be superimposed over the details: WITH UTILITY STRIPS AND WITH BIKE LANE and WITHOUT UTILITY STRIPS AND WITH BIKE LANE. The detail BRIDGE WITHOUT BIKE LANE can be superimposed over the details: WITH UTILITY STRIPS AND WITHOUT BIKE LANE and WITHOUT UTILITY STRIPS AND WITHOUT BIKE LANE.
4. For SECTION QQ, see CURB AND GUTTER WITHOUT ADJACENT BICYCLE LANE. For SECTION TT, see CURB AND GUTTER WITH ADJACENT BICYCLE LANE.



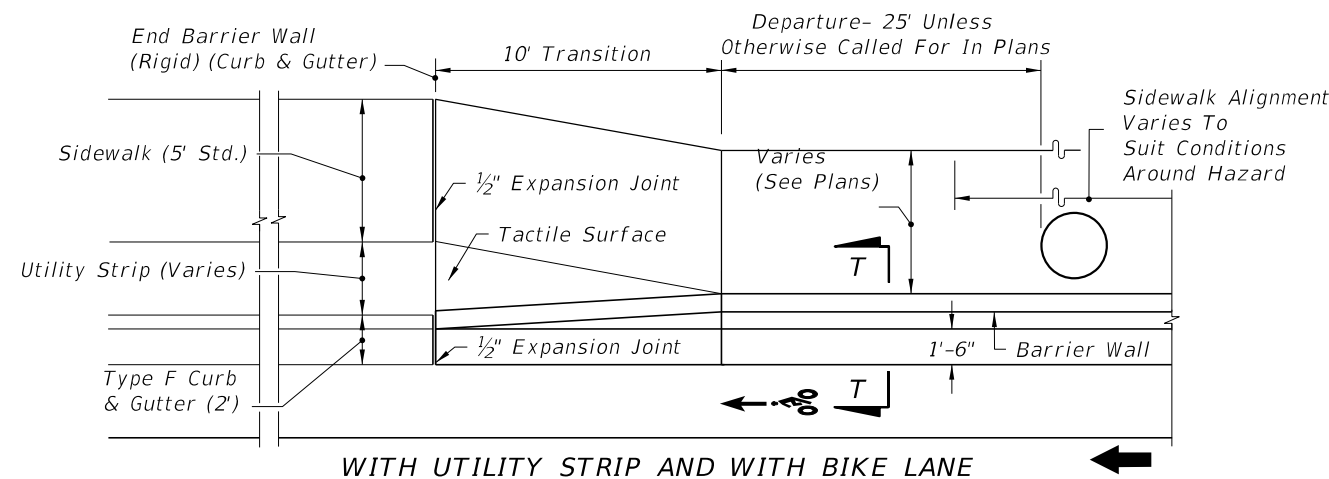
BRIDGE WITHOUT BIKE LANE



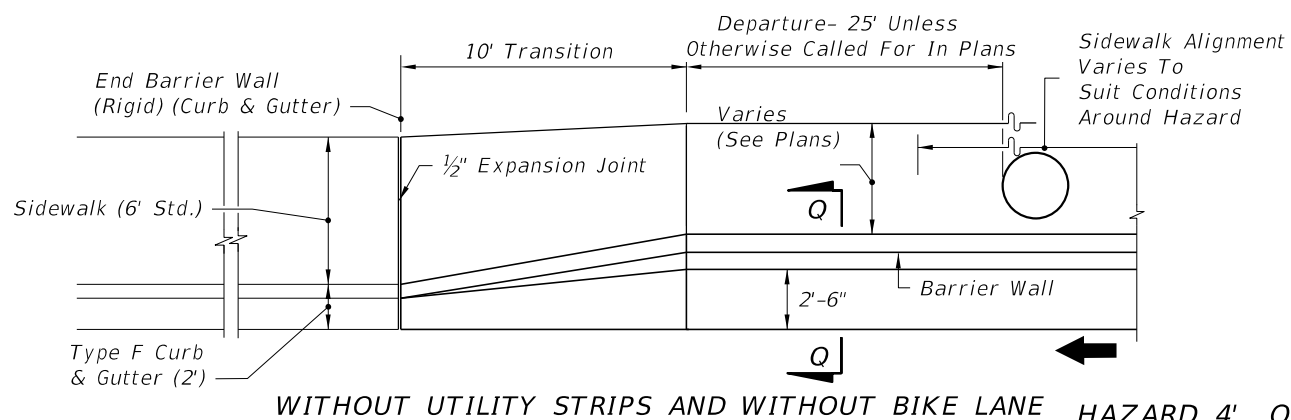
BRIDGE WITH BIKE LANE



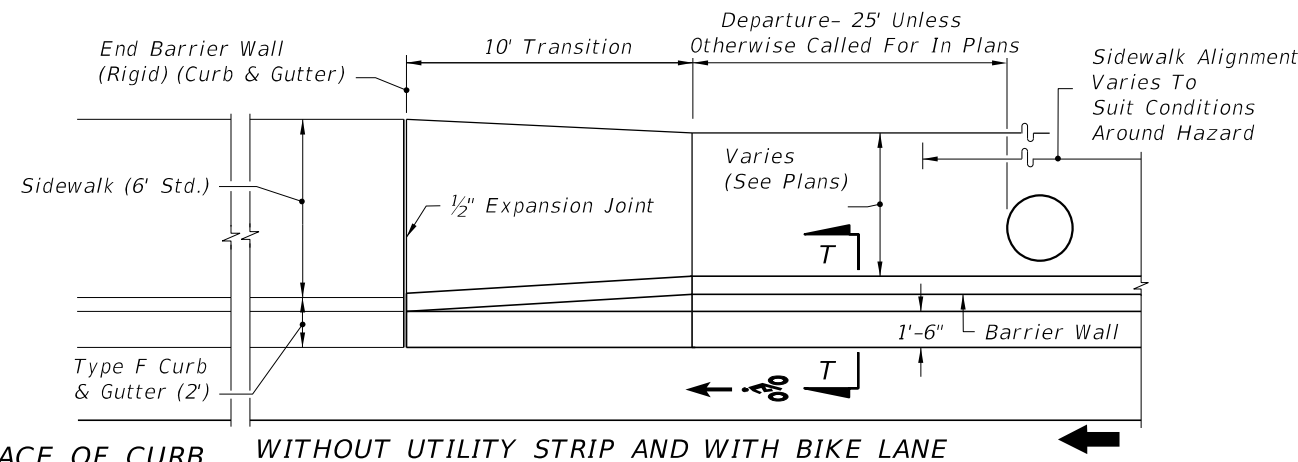
WITH UTILITY STRIP AND WITHOUT BIKE LANE



WITH UTILITY STRIP AND WITH BIKE LANE



WITHOUT UTILITY STRIPS AND WITHOUT BIKE LANE



WITHOUT UTILITY STRIP AND WITH BIKE LANE

HAZARD 4' OR LESS FROM FACE OF CURB  
ONE-WAY CURB AND GUTTER DEPARTURES

10/24/2016 10:44:09 AM

LAST REVISION 11/01/16	REVISION	DESCRIPTION:
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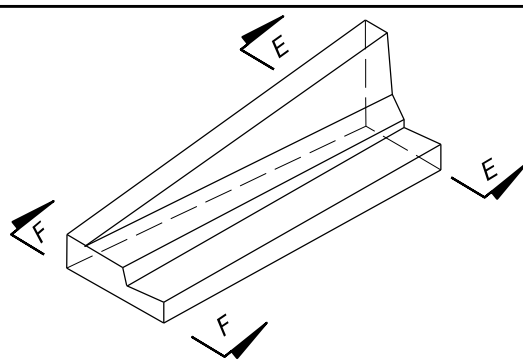


FY 2017-18  
DESIGN STANDARDS

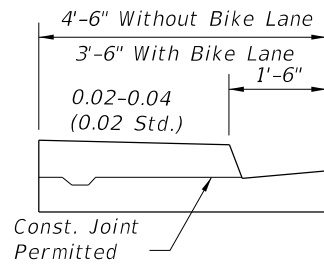
CONCRETE BARRIER WALL

INDEX NO.  
410

SHEET NO.  
11 of 25



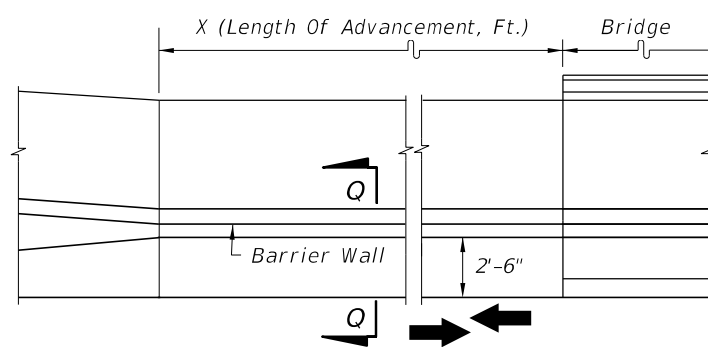
WITH AND WITHOUT UTILITY STRIP  
PICTORIAL VIEW



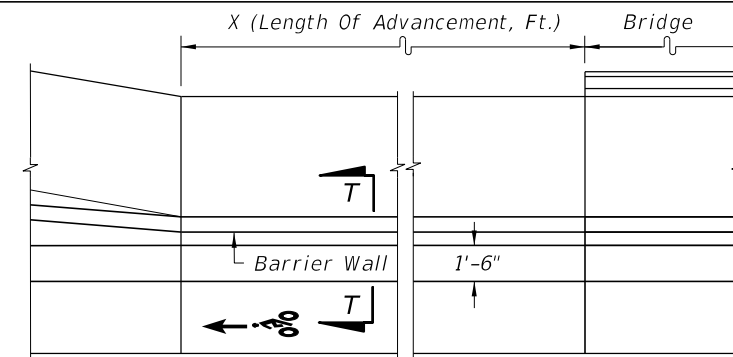
SECTION FF

NOTES:

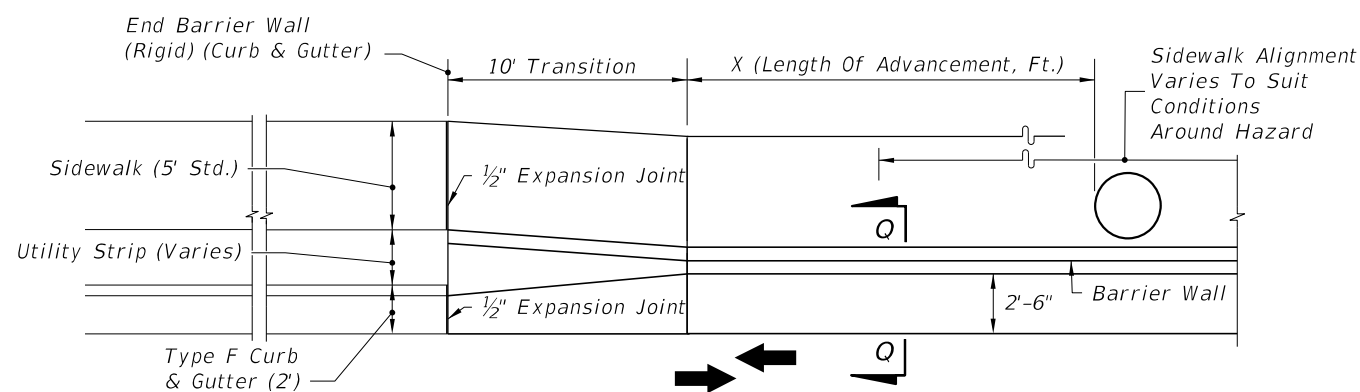
1. For X=Length of advancement in feet for near and opposing lanes and for sectional details see CURB AND GUTTER WITHOUT ADJACENT BICYCLE LANE.
2. The 1'-6" and 2'-6" offsets to toe of barrier wall cannot be reduced to accommodate hazards; however, hazards located in the stem of the wall may be accommodated by the details on HAZARD PENETRATION INTO STEM OF RIGID CONCRETE BARRIER WALLS; AND SHOULDER BARRIER WALL WHEN OFFSET FROM ABOVE GROUND HAZARD < 1'-6" AND THE DESIGN SPEED ≤ 45 MPH.
3. The detail BRIDGE WITH BIKE LANE can be superimposed over the details: WITH UTILITY STRIPS AND WITH BIKE LANE and WITHOUT UTILITY STRIPS AND WITH BIKE LANE. The detail BRIDGE WITHOUT BIKE LANE can be superimposed over the details: WITH UTILITY STRIPS AND WITHOUT BIKE LANE and WITHOUT UTILITY STRIPS AND WITHOUT BIKE LANE.
4. For SECTION EE, see ONE-WAY CURB AND GUTTER DEPARTURES.
5. For SECTION QQ, see CURB AND GUTTER WITHOUT ADJACENT BICYCLE LANE.  
For Section TT, see CURB AND GUTTER WITH ADJACENT BICYCLE LANE.



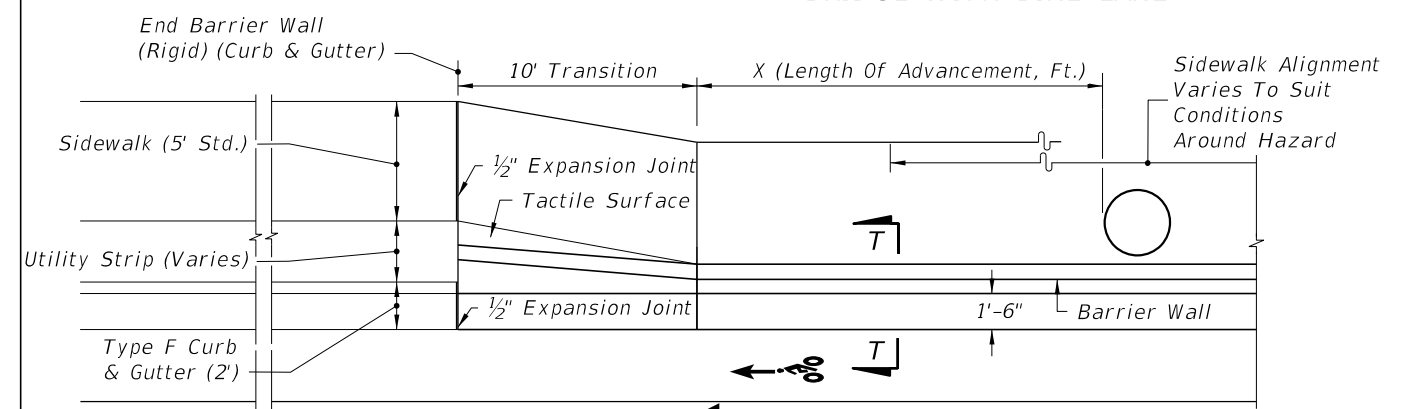
BRIDGE WITHOUT BIKE LANE



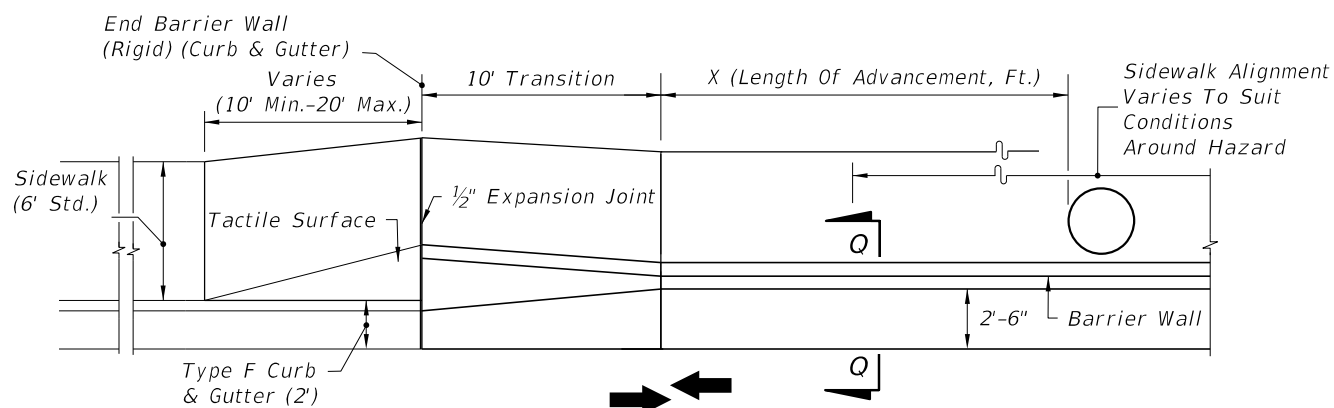
BRIDGE WITH BIKE LANE



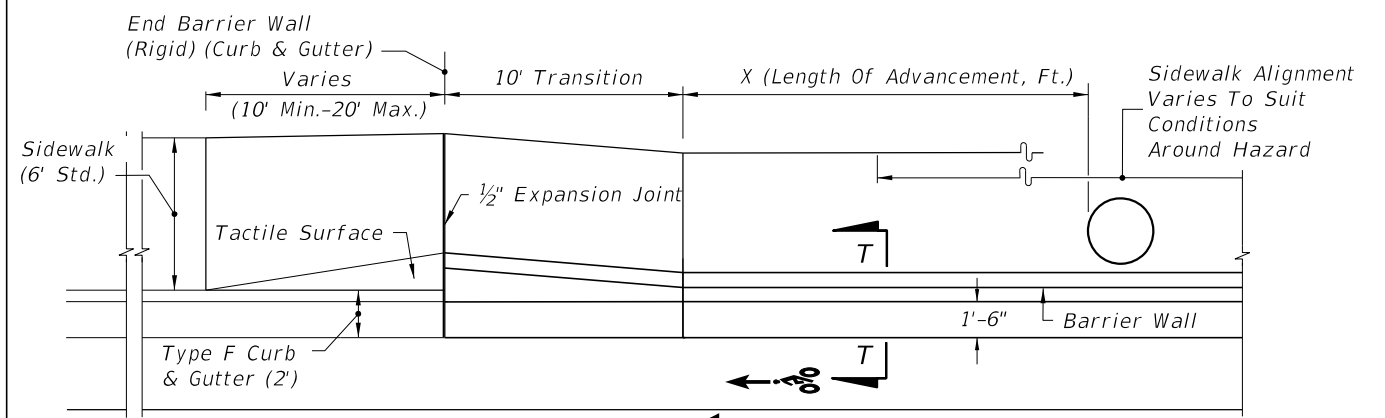
WITH UTILITY STRIP AND WITHOUT BIKE LANE



WITH UTILITY STRIP AND WITH BIKE LANE



WITHOUT UTILITY STRIP AND WITHOUT BIKE LANE

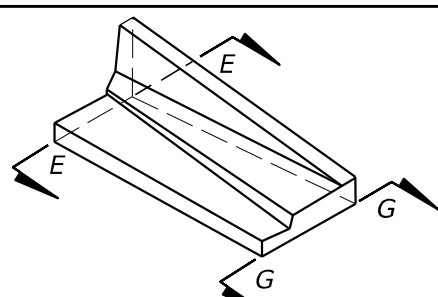


WITHOUT UTILITY STRIP AND WITH BIKE LANE

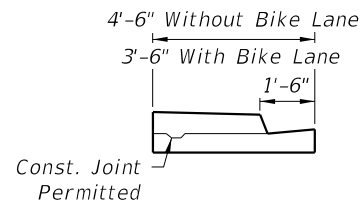
HAZARD 4' OR LESS FROM FACE OF CURB  
TWO-WAY CURB AND GUTTER TRAFFIC DEPARTURE

10:44:12 AM  
10/24/2016

LAST REVISION 07/01/14	DESCRIPTION:
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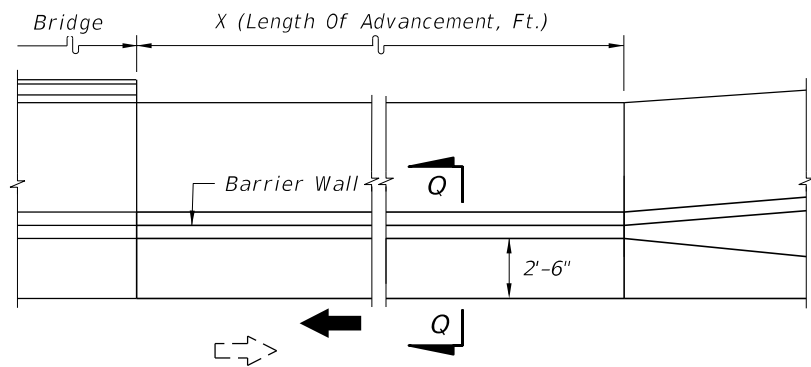
WITH AND WITHOUT UTILITY STRIP  
PICTORIAL VIEW



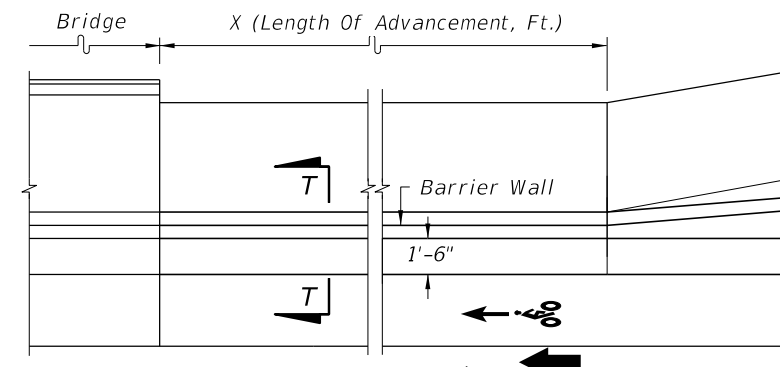
SECTION GG

NOTES:

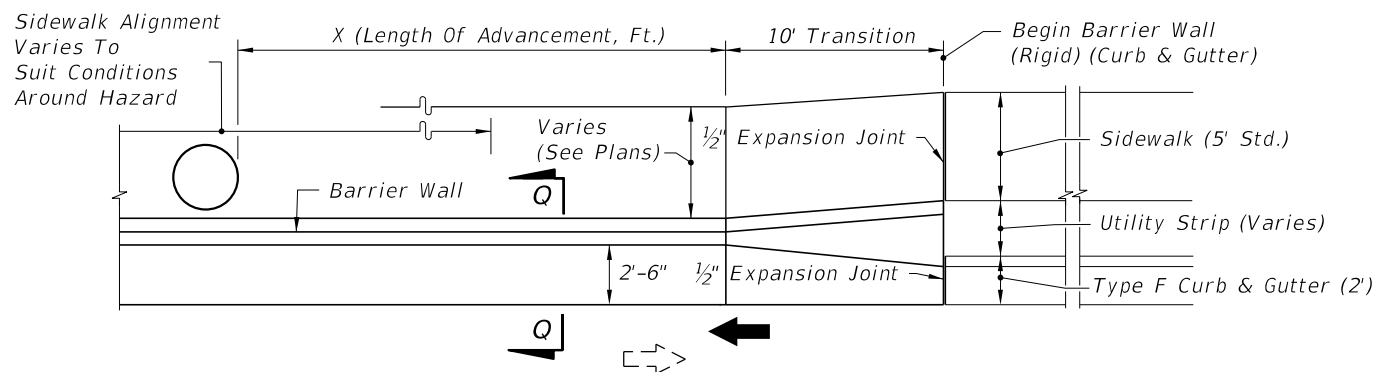
1. For SECTION EE, see ONE-WAY CURB AND GUTTER DEPARTURES.
2. For SECTION QQ, see CURB AND GUTTER WITHOUT ADJACENT BICYCLE LANE.  
For SECTION TT, see CURB AND GUTTER WITH ADJACENT BICYCLE LANE.
3. The detail BRIDGE WITH BIKE LANE can be superimposed over the details: WITH UTILITY STRIPS AND WITH BIKE LANE and WITHOUT UTILITY STRIPS AND WITH BIKE LANE. The detail BRIDGE WITHOUT BIKE LANE can be superimposed over the details: WITH UTILITY STRIPS AND WITHOUT BIKE LANE and WITHOUT UTILITY STRIPS AND WITHOUT BIKE LANE.



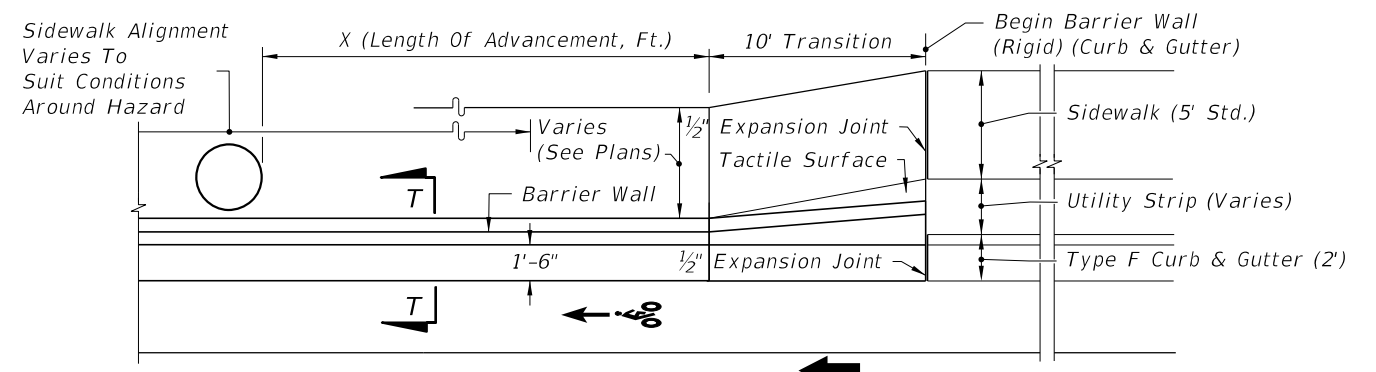
BRIDGE WITHOUT BIKE LANE



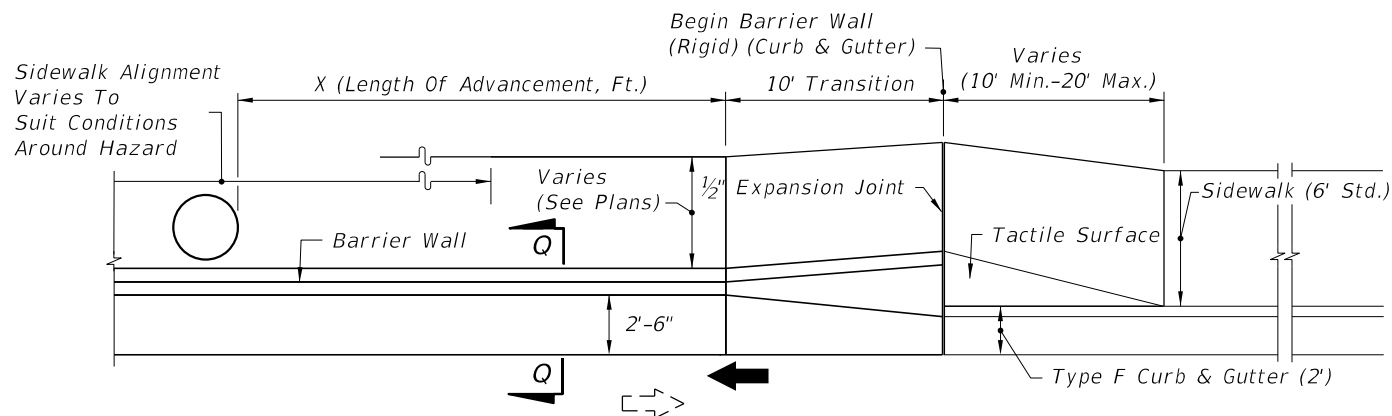
BRIDGE WITH BIKE LANE



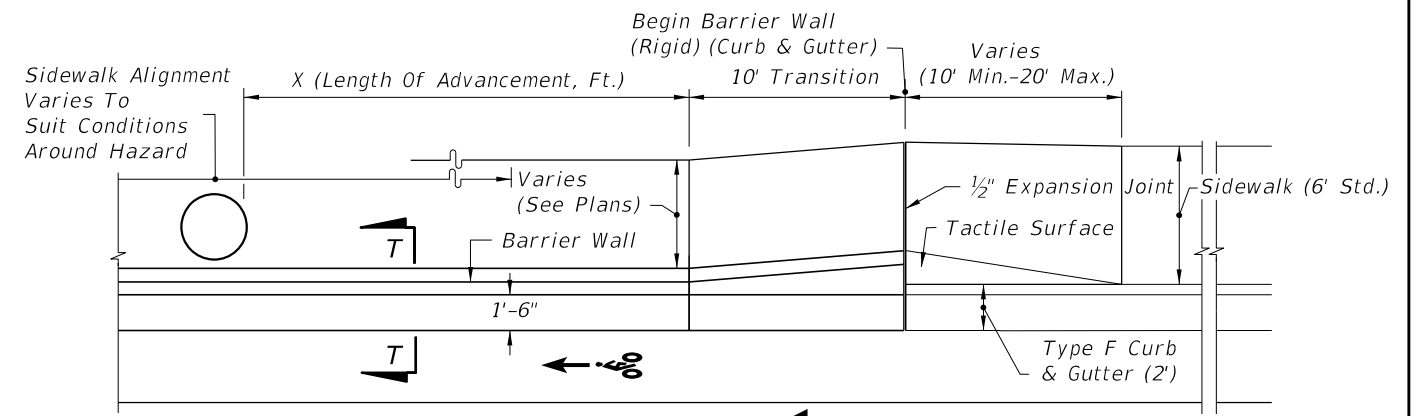
WITH UTILITY STRIP AND WITHOUT BIKE LANE



WITH UTILITY STRIP AND WITH BIKE LANE



WITHOUT UTILITY STRIP AND WITHOUT BIKE LANE

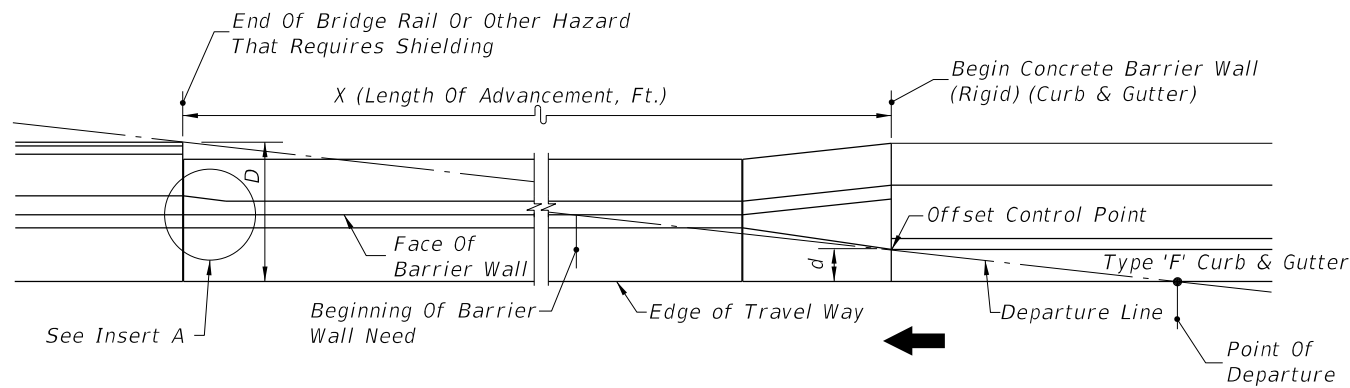


WITHOUT UTILITY STRIP AND WITH BIKE LANE

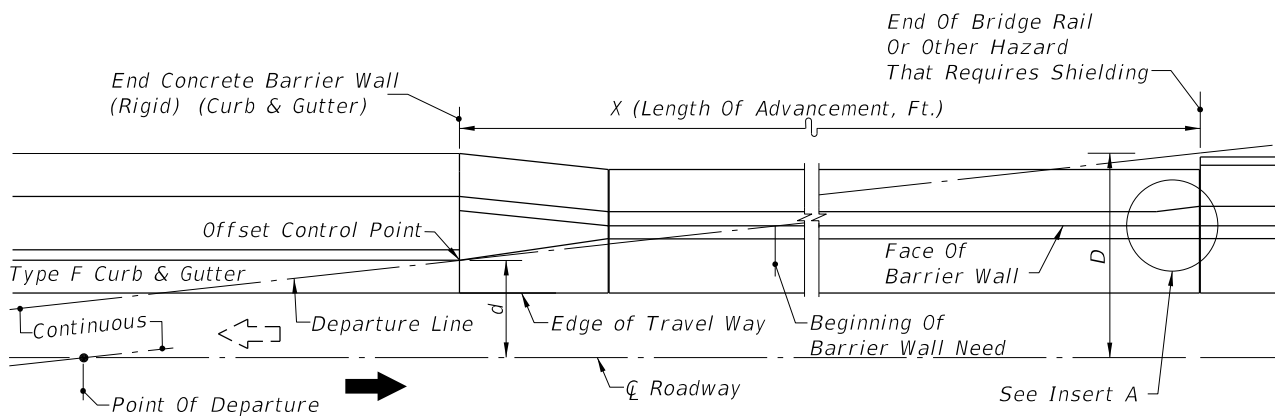
HAZARD 4' OR LESS FROM FACE OF CURB  
ONE-WAY AND TWO-WAY CURB AND GUTTER NEAR LANE APPROACHES TRAFFIC (UNDIVIDED)

10/24/2016 10:44:14 AM

LAST REVISION 07/01/14	DESCRIPTION:
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RIGHT SIDE APPROACH SHOWN - LEFT SIDE OPPOSITE HAND  
NEAR LANE APPROACH



OPPOSING LANE APPROACH  
WITH OR WITHOUT UTILITY STRIP - UTILITY STRIP SHOWN  
For Applications, see CURB AND GUTTER (WITH AND WITHOUT) UTILITY STRIP AND WITHOUT ADJACENT BIKE LANE

Design Speed mph	Length Of Advancement, Ft. (X)
≤45	= 16 (D-d)

Note: The minimum length of advancement for both near and opposing lane approaches is 40'.

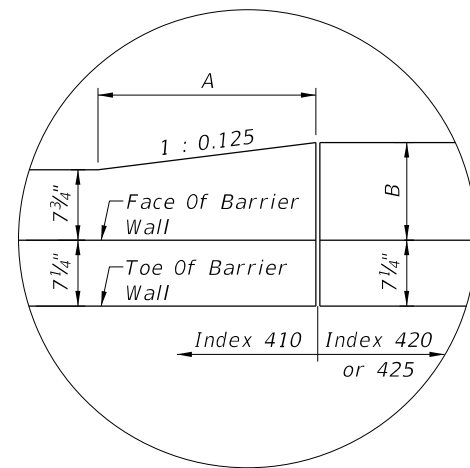
EQUATION VARIABLES:

D= Distance in feet from near edge of the near approach traffic lane to back of hazard or clear zone width whichever is lesser. For left side hazards and clear zones on two-way undivided facilities D is measured from the inside edge of the near approach traffic lane.

d= Distance in feet from near edge of the near approach traffic lane to the face of barrier (at offset control point). For left side hazards on two-way undivided facilities d is measured from the inside edge of the nearest opposing traffic lane.

LENGTH OF ADVANCEMENT

CURB AND GUTTER WITHOUT ADJACENT BICYCLE LANE

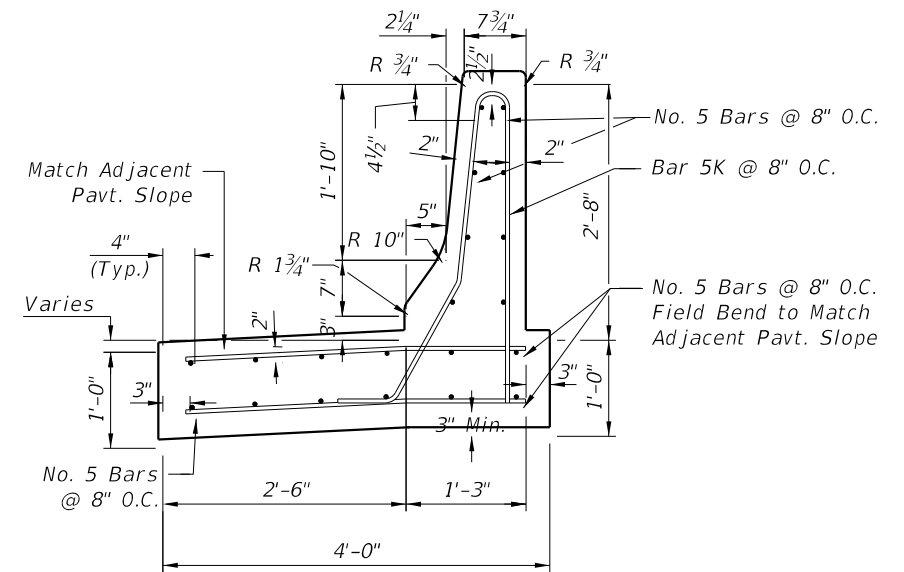


INSERT A

Transition Concrete Barrier Wall (Index 410) to Mate With Back Side of F Shape Bridge Traffic Railing (Index 420/425).

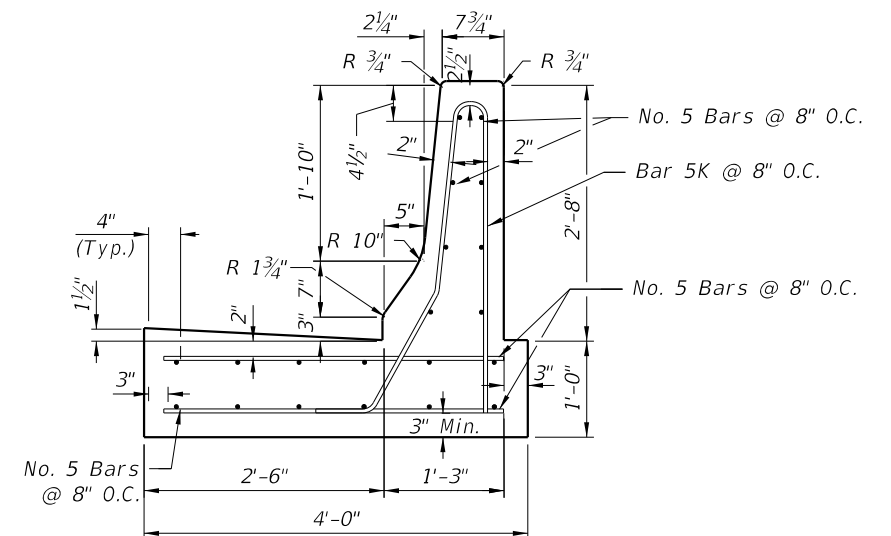
For Opposing Lane Approach (Near Lane Approach Opposite Hand)

Index	A	B
420	2'-0"	10 3/4"
425	3'-0"	1'-0 1/4"



QUANTITIES:  
Concrete: 0.24 CY/LF; Reinforcing Steel: 26 LBS/LF

SECTION QQ  
(FOR HIGH SIDE)



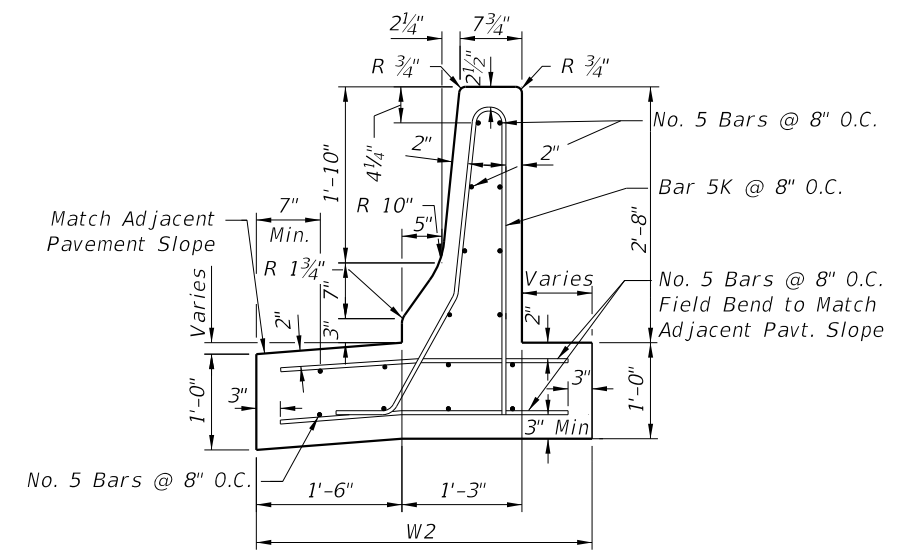
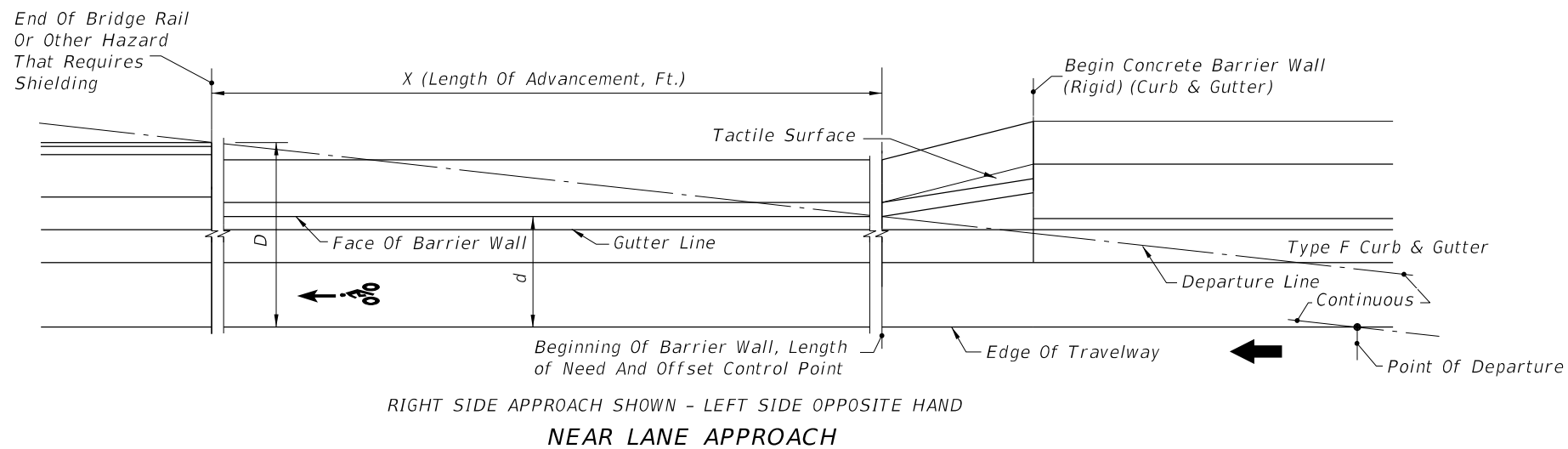
QUANTITIES:  
Concrete: 0.24 CY/LF; Reinforcing Steel: 26 LBS/LF

SECTION QQ  
(FOR LOW SIDE)

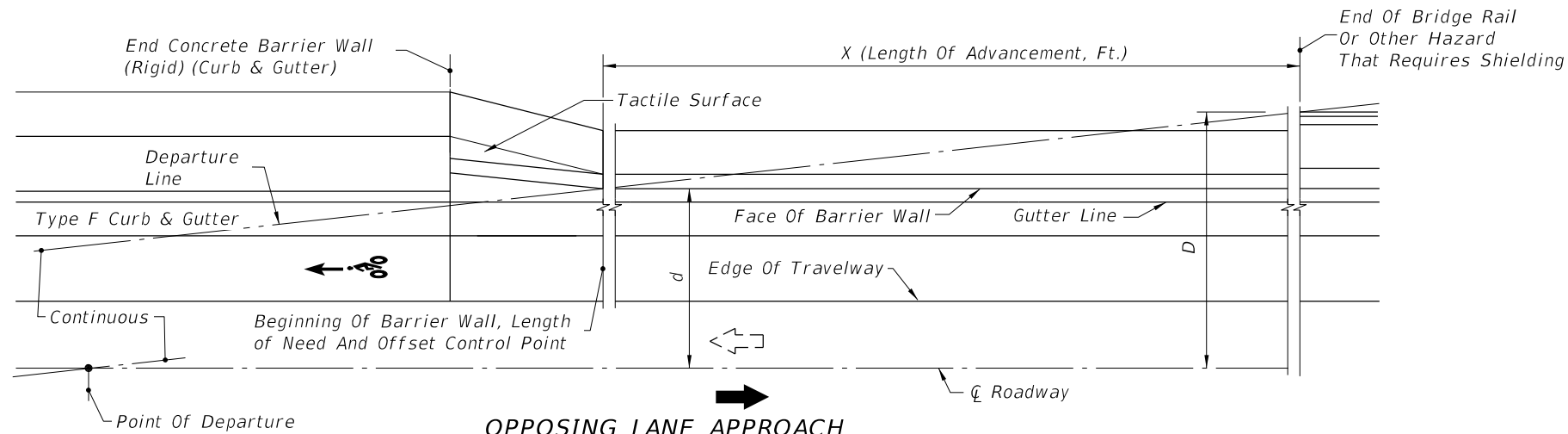
NOTES:

1. Reduce the vertical steel spacing to 4 inches O.C. a distance of 4 feet for each side of all cold or expansion joints.
2. All longitudinal reinforcement to be continuous or spliced No. 5 bars. Lap splices a minimum of 2'-0".
3. Transverse expansion joints are to be constructed at the juncture of wall transitions and curb and gutter, and at intervals so that spacing will not exceed 100'.
4. For Concrete Barrier Wall Inlet details with Rigid Curb and Gutter applications, see Index No. 219.
5. Minimum Segment Wall Length = 20 LF.
6. For additional information on Bar 5K, see BAR BENDING DIAGRAM.

10/24/2016 10:44:17 AM

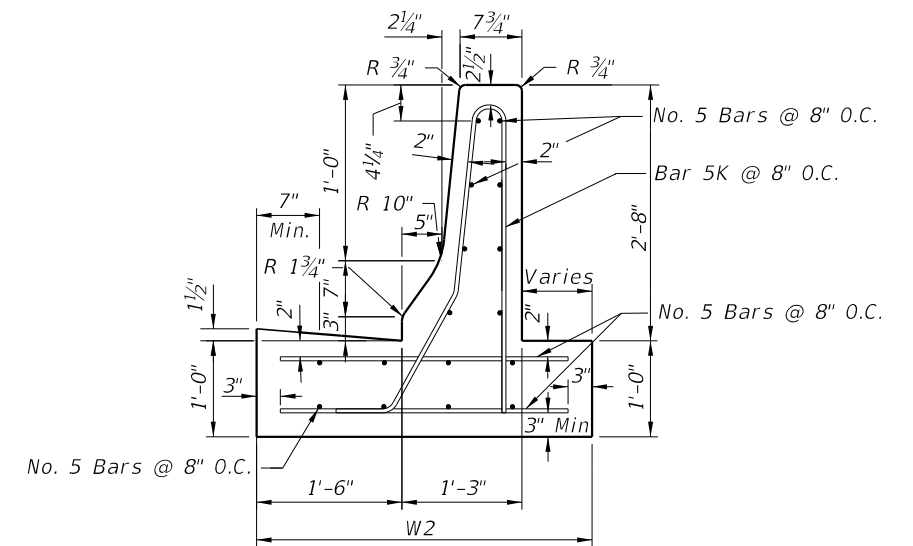


**SECTION TT (FOR HIGH SIDE)**

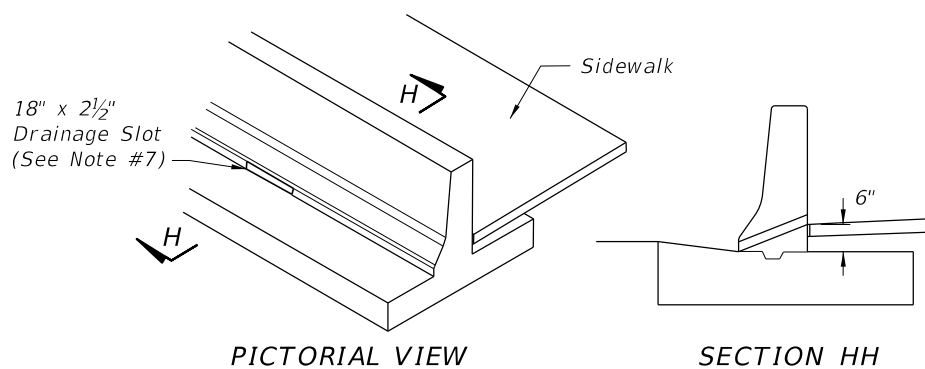


WITH OR WITHOUT UTILITY STRIP - UTILITY STRIP SHOWN  
For Applications, see CURB AND GUTTER (WITH AND WITHOUT UTILITY STRIP AND ADJACENT BIKE LANE FOR APPLICATIONS)

QUANTITIES			
Length Of Barrier Wall (LF)	W2	Concrete CY/LF	Reinforcing Steel LBS/LF
≥ 30'	3'-3"	0.21	24
26' to 29'	3'-6"	0.22	24



**SECTION TT (FOR LOW SIDE)**



**SIDEWALK DRAINAGE SLOT FOR BARRIER WALL (RIGID) (CURB & GUTTER)**

**NOTES:**

1. Reduce the vertical steel spacing to 4 inches O.C. a distance of 4 feet for each side of all cold or expansion joints.
2. All longitudinal reinforcement to be continuous or spliced No. 5 bars. Lap splices a minimum of 2'-0".
3. Transverse expansion joints are to be constructed at the juncture of wall transitions and curb and gutter, and at intervals so that spacing will not exceed 100'.
4. For Concrete Barrier Wall Inlet details with Rigid Curb and Gutter applications, see Index No. 219.
5. Minimum Segment Wall Length = 20 LF.
6. For additional information on Bar 5K, see BAR BENDING DIAGRAM.
7. Drainage slots shall be located at all low points along the sidewalk and unless otherwise shown in the plans, slots shall be spaced at intervals not exceeding 50' in fill sections and 20' cut sections. Slots shall be located such that only two bars are cut away or deleted in front and back lines of vertical reinforcement. On each side of Drainage slots, vertical and horizontal bars shall be placed to provide 2" concrete cover.


**CURB AND GUTTER WITH ADJACENT BICYCLE LANE**

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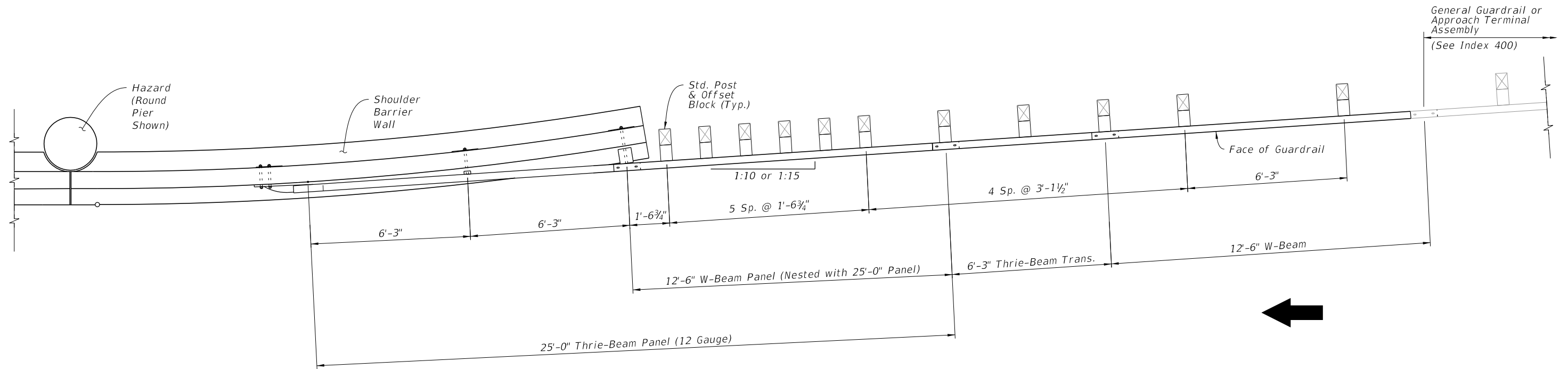
LAST REVISION	DESCRIPTION:
07/01/15	

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LAST REVISION 02/01/16	REVISION DESCRIPTION:	 <b>FY 2017-18</b> DESIGN STANDARDS	CONCRETE BARRIER WALL	INDEX NO. 410	SHEET NO. 16 of 25
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GUARDRAIL CONNECTING PANELS AND POST SPACING

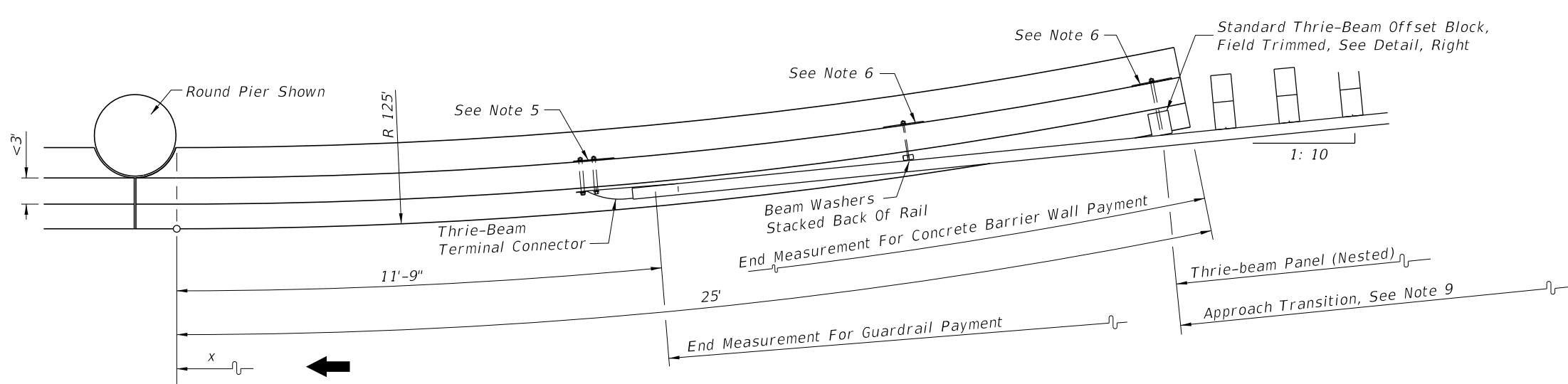
NOTES:

1. For additional connection details for guardrail to barrier wall, work with Sheet 18 and Index 411.
2. For component details including Standard Posts and Panels, see Index 400.
3. For connecting General Guardrail and Approach Terminal details, see Index 400.

GUARDRAIL APPROACH TRANSITION  
TO CURVED SHOULDER BARRIER WALL

10/24/2016 10:44:24 AM

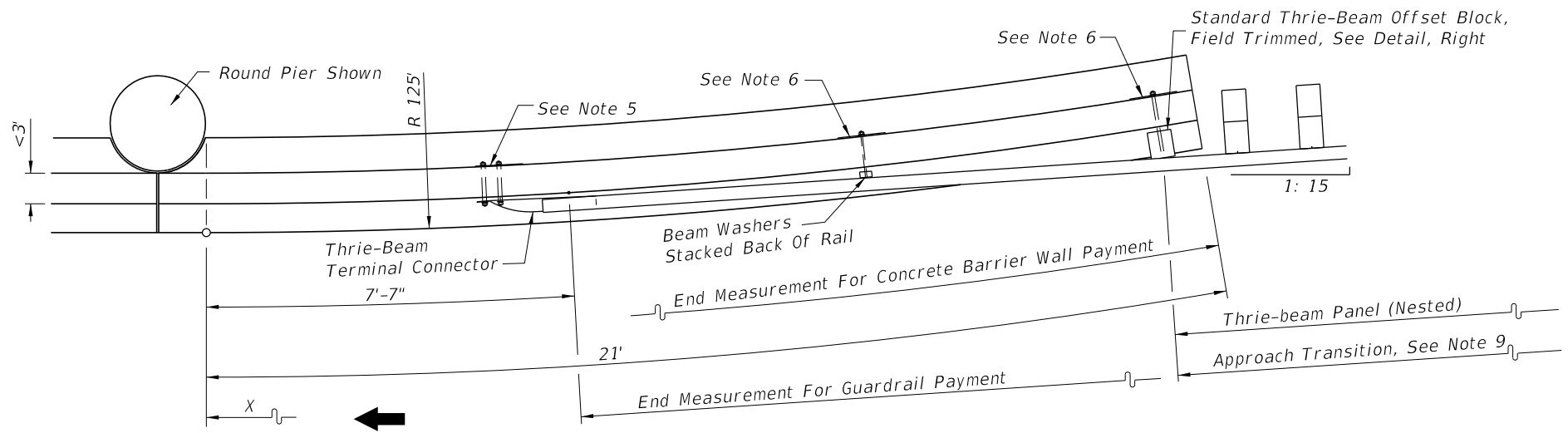
LAST REVISION 02/01/16	REVISION	DESCRIPTION:	 FY 2017-18 DESIGN STANDARDS	CONCRETE BARRIER WALL	INDEX NO. 410	SHEET NO. 17 of 25
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PLAN FOR DESIGN SPEED ≤ 45 MPH

STANDARD THRIE-BEAM OFFSET BLOCK (FIELD TRIMMED)

FOR USE WITH EITHER  
1: 10 OR 1: 15  
GUARDRAIL TRANSITIONS

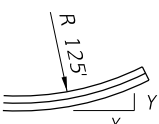


PLAN FOR DESIGN SPEED ≥ 50 MPH

NOTES:

- The affected segments between bent supports or pier columns shall be constructed in accordance with the detail for REINFORCED CONCRETE SHOULDER WALL, Section QQ, or Section TT. In cases where the barrier wall and slope pavement or other structure would occupy the same location, the wall and structure are to be modified as detailed in the plans.
- The barrier wall radial segments are intended for use on approach and trailing ends of both one-way and two-way facilities. The guardrail connections shown on this sheet apply to one-way approaches and to the approaching and trailing ends of two-lane two-way facilities. For Details on trailing ends of two-way multilane and one-way facilities, the trailing connection in Index 400 may be used.  
  
For walls with normal offsets from hazards and their guardrail connections, see GUARDRAIL CONNECTION TO CONCRETE BARRIER WALL APPROACH ENDS.
- Refer to Index No. 400 for additional guardrail information.
- Attach thrie-beam terminal connector to shoulder barrier wall with a 21"x12"x5/8" thrie beam terminal connector plate and 5-7/8"x12" long HS hex bolts and nuts with 7/8" plain round washers under heads and nuts.
- 12"x12"x1/4" galvanized steel back-up plate with 5/8" post bolts (either 14" or 18" long) and nuts with 5/8" plain round washers under nuts.
- For details at Rigid Hazard, see HAZARD PENETRATION INTO STEM OF RIGID CONCRETE BARRIER WALLS.
- For additional information on PLAN FOR DESIGN SPEED ≤ 45 MPH, see SHOULDER BARRIER WHEN OFFSET FROM ABOVE GROUND HAZARD < 1'-6" AND THE DESIGN SPEED ≤ 45 MPH.
- For additional information on PLAN FOR DESIGN SPEED ≥ 50 MPH, see SHOULDER BARRIER WHEN OFFSET FROM ABOVE GROUND HAZARD < 1'-6" AND THE DESIGN SPEED ≥ 50 MPH.
- See APPROACH TRANSITION TO CURVED SHOULDER BARRIER WALL on Sheet 17 for Guardrail Panel and Post Spacing information.

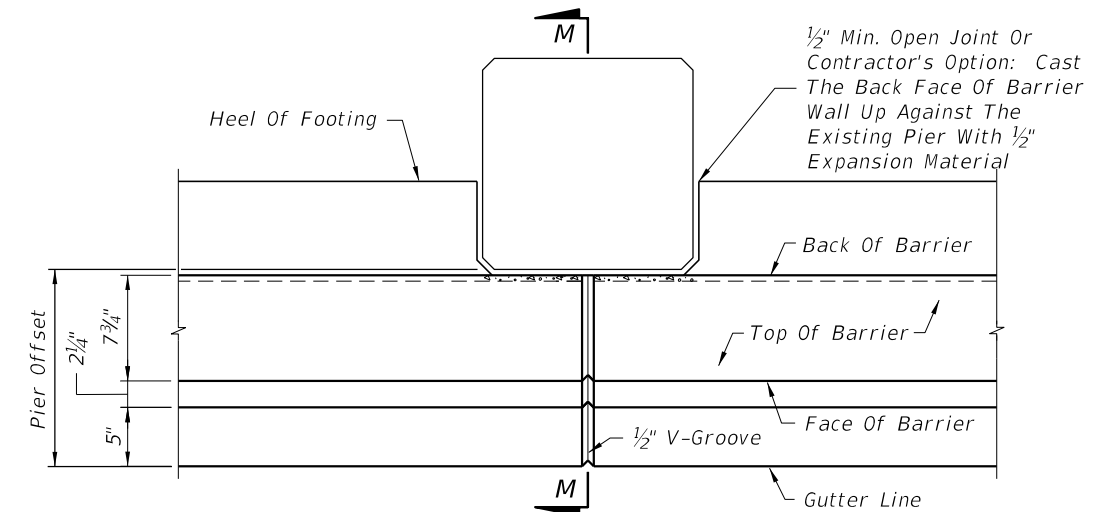
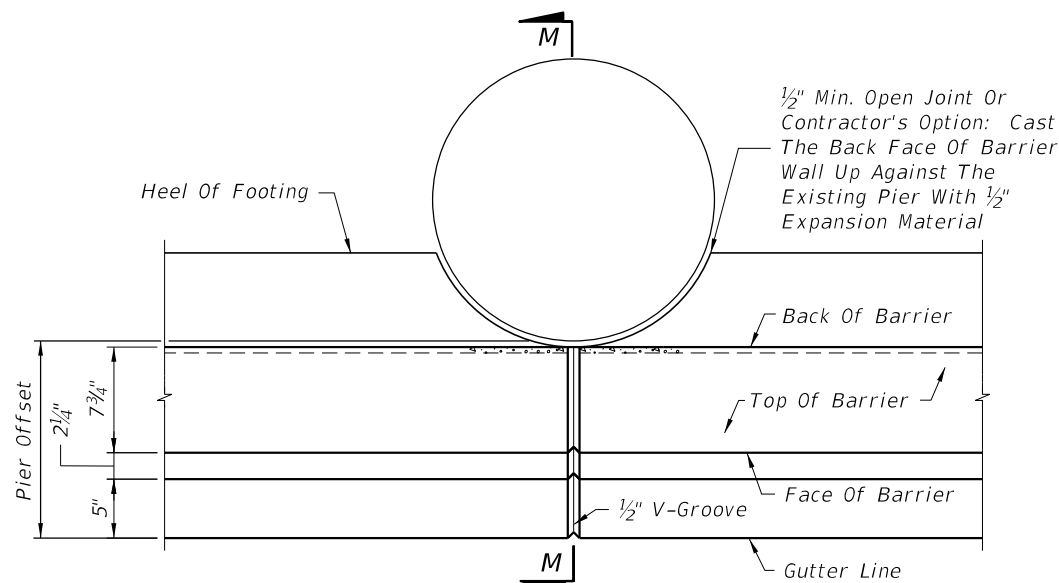
ARC LENGTH (FT)	DISTANCE "X" (FT)	OFFSETS "Y" (FT)
4	4.00	0.06
8	7.99	0.26
12	11.98	0.58
16	15.96	1.02
20	19.91	1.60
21	20.91	1.76
24	23.85	2.30
25	24.83	2.49



Note:  
Wall may be constructed in chords having lengths ≤ 4 feet.

SHOULDER BARRIER WALL AT ABOVE GROUND RIGID HAZARDS WHEN OFFSET FROM HAZARD < 3'

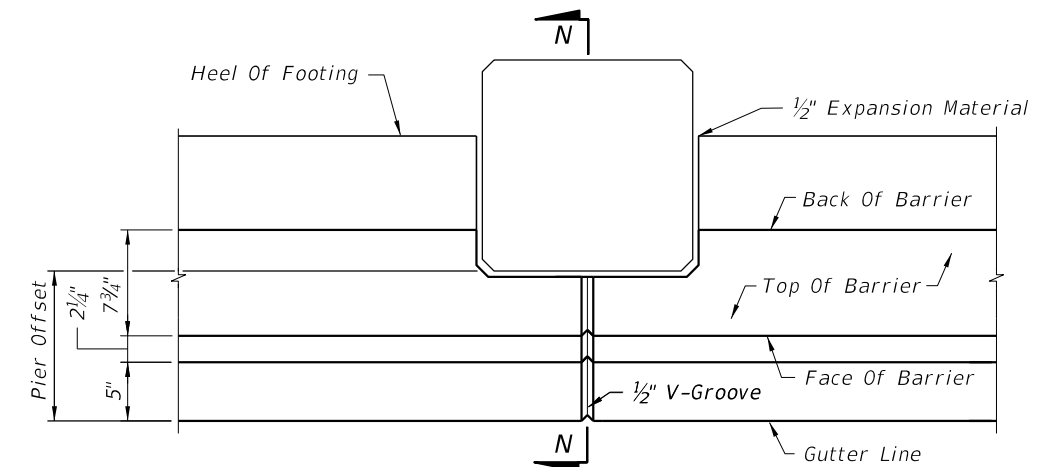
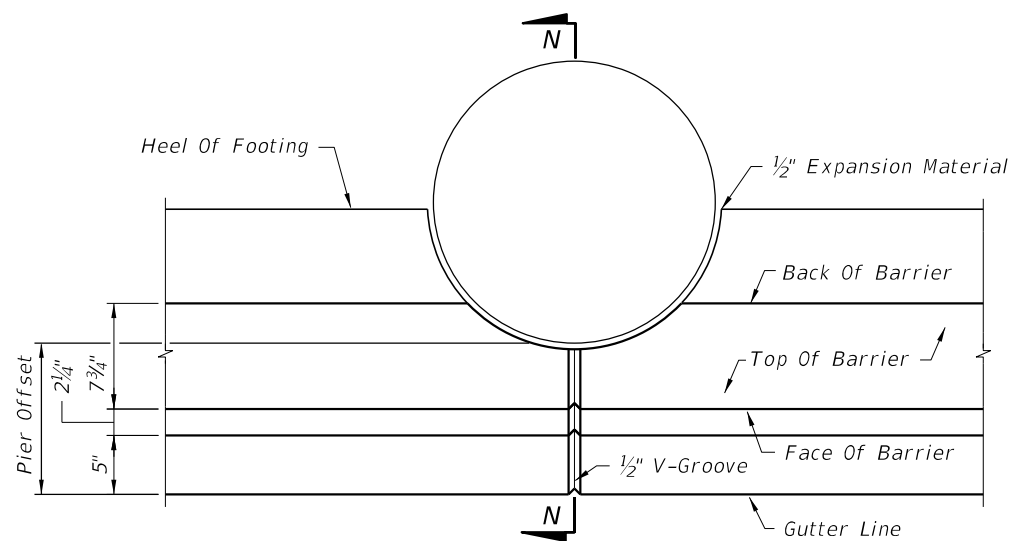
10/24/2016 10:44:29 AM



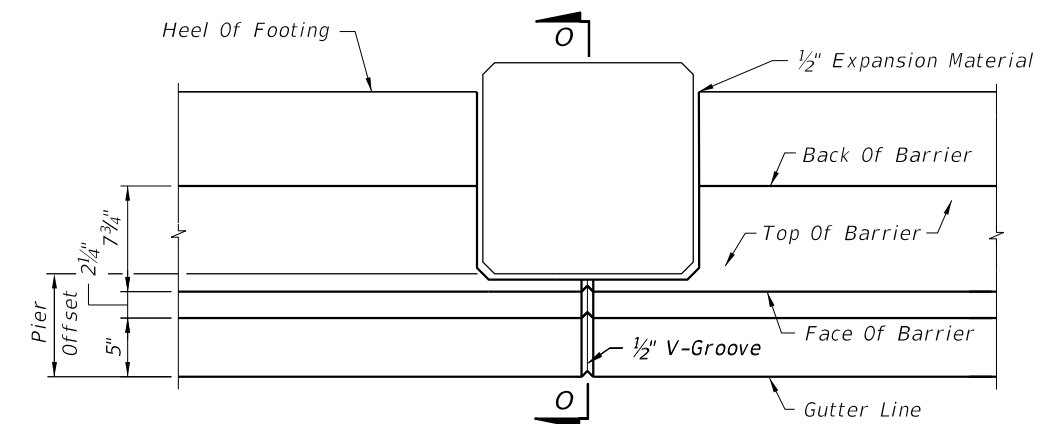
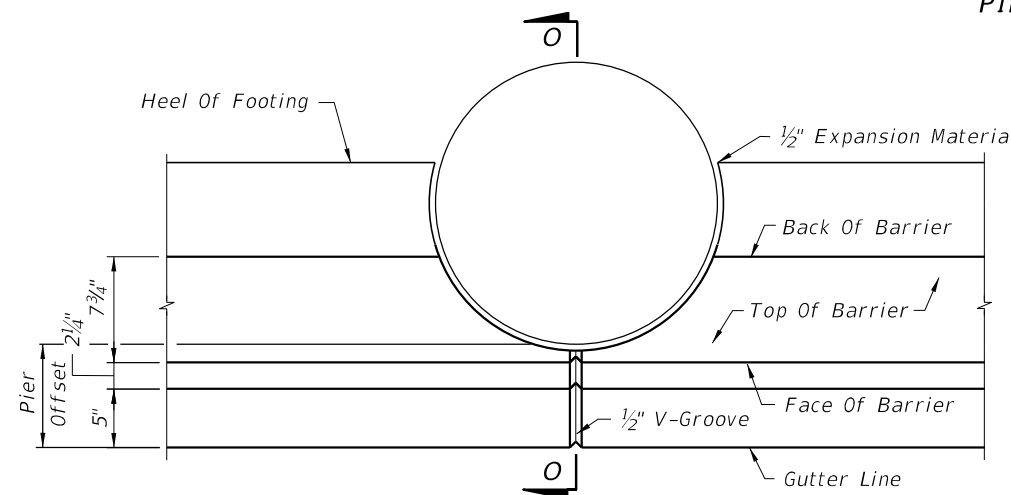
**PIER AT BACK OF CONCRETE BARRIER WALL**

**NOTES:**

1. These treatments are not applicable to hazards that cannot provide lateral support to resist the LRF lateral equivalent static force. See the plans for limits of wall sections and other associated wall treatments.
2. For Low Speed SECTIONS MM, NN and OO, see SHOULDER BARRIER WALL WHEN OFFSET FROM ABOVE GROUND HAZARD < 1'-6" AND THE DESIGN SPEED ≤ 45 MPH.
3. For High Speed SECTIONS MM and NN, see SHOULDER BARRIER WALL WHEN OFFSET FROM ABOVE GROUND HAZARD < 1'-6" AND THE DESIGN SPEED ≥ 50 MPH.
4. The details on this sheet are treatments to the F-shape concrete barrier walls, where site conditions impose reduced clearances between above ground hazards and the walls. Bridge bent supports and piers are shown.
5. When thru drainage is required, a 3"x 12" Drain Slot shall be provided at one of the following locations:
  - a. 4' upstream of pier edge for a declining approach.
  - b. 4' downstream of pier edge for an inclining approach.



**PIER PENETRATION INTO TOP OF CONCRETE BARRIER WALL**



**PIER AT FACE OF CONCRETE BARRIER WALL**

**RIGID HAZARD PENETRATION INTO STEM OF CONCRETE BARRIER WALL**

10/24/2016 10:44:32 AM

LAST REVISION 07/01/14	DESCRIPTION:
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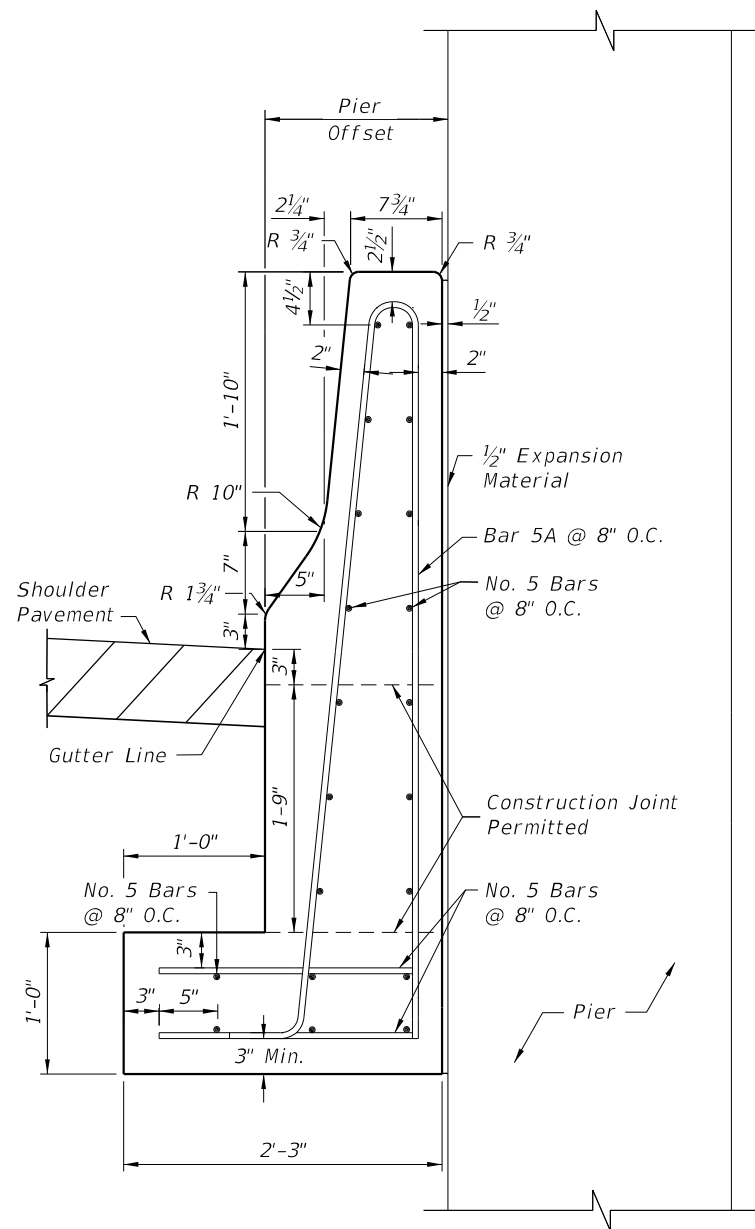


FY 2017-18  
DESIGN STANDARDS

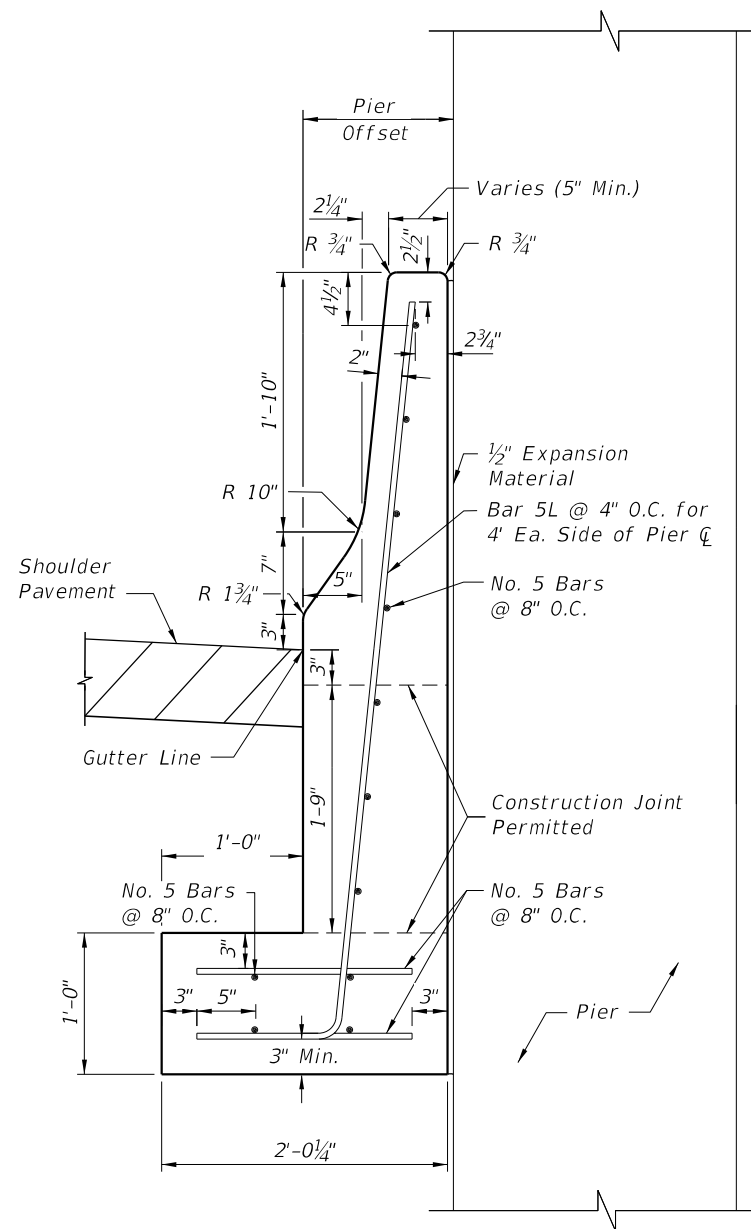
CONCRETE BARRIER WALL

INDEX NO.  
410

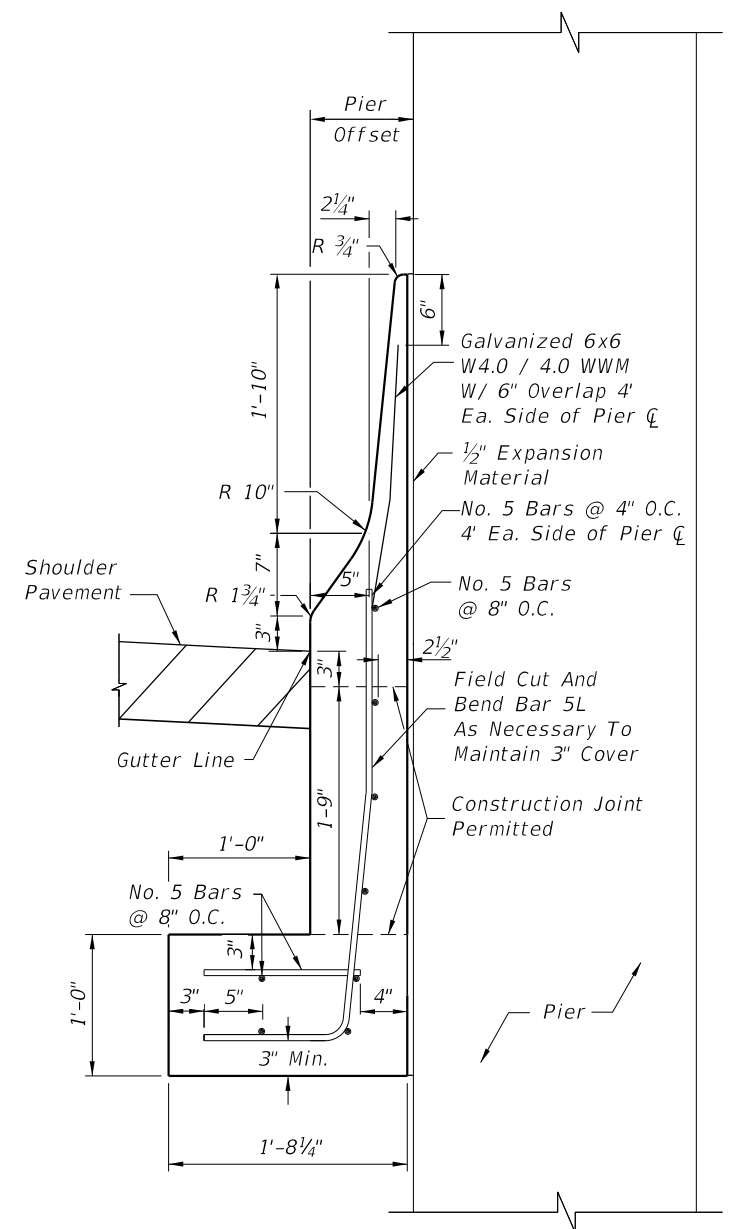
SHEET NO.  
19 of 25



32" SHOULDER WALL  
SECTION MM  
WHEN PIER OFFSET  $\geq 15\frac{1}{2}$ "



32" SHOULDER WALL  
SECTION NN  
WHEN  $12\frac{3}{4}$ "  $\leq$  PIER OFFSET  $< 15\frac{1}{2}$ "



32" OR 42" SHOULDER WALL  
SECTION OO  
WHEN  $8\frac{3}{4}$ "  $\leq$  PIER OFFSET  $< 12\frac{3}{4}$ "

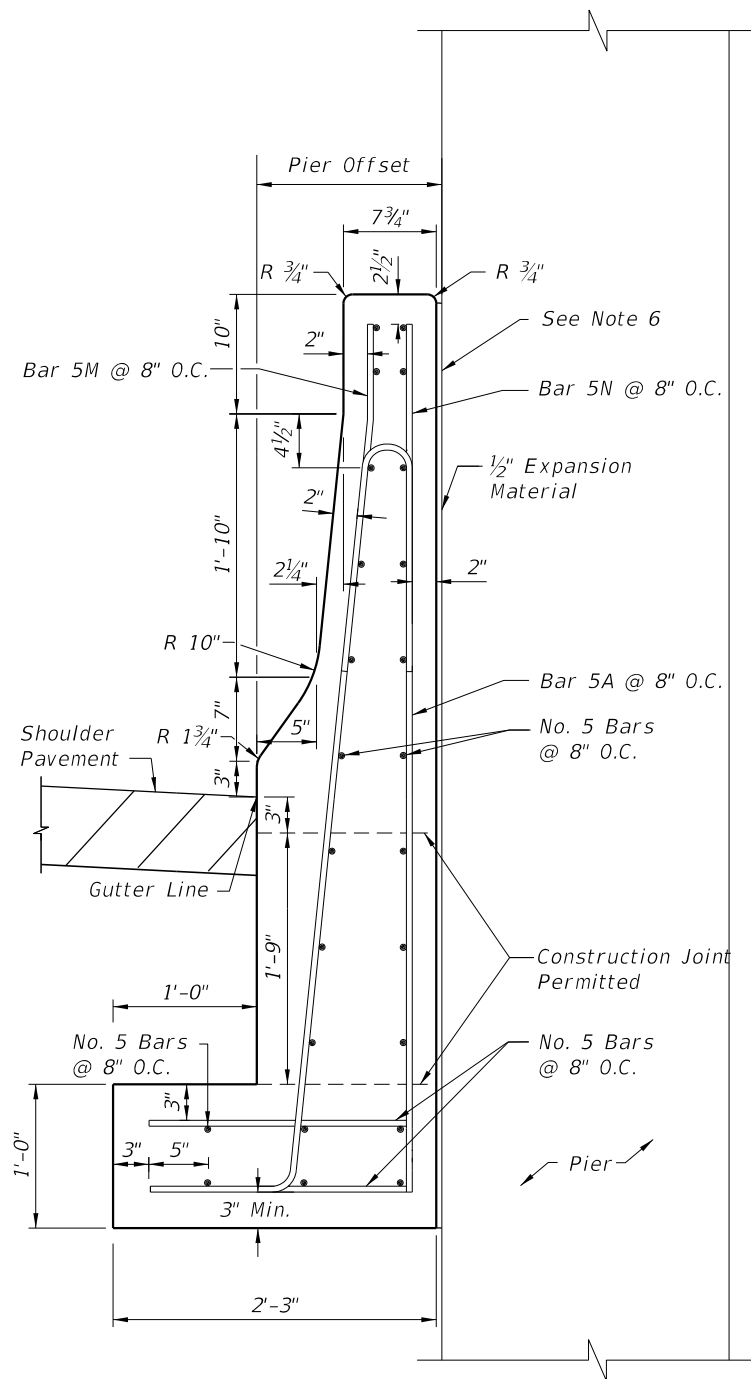
NOTES:

1. Reduce the vertical steel spacing to 4 inches O.C. a distance of 4 feet for each side of all cold or expansion joints.
2. All longitudinal reinforcement to be continuous or spliced No. 5 bars. Lap splices a minimum of 2'-0".
3. For additional information on Bars 5A and 5L, see BAR BENDING DIAGRAMS.
4. 1/2" Min. Expansion Joint or at the contractor's option: Back face of barrier wall may be cast against Pier with 1/2" Expansion Material.

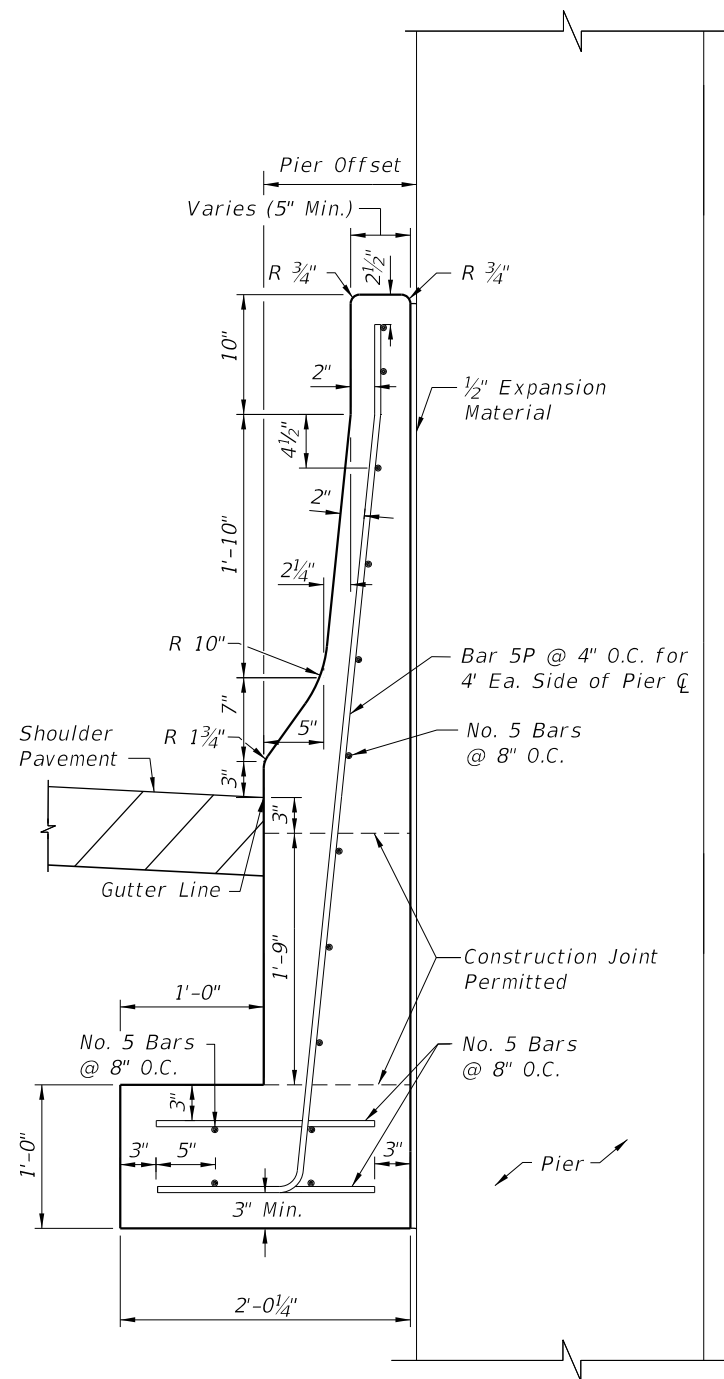
SHOULDER BARRIER WALL WHEN OFFSET FROM ABOVE GROUND HAZARD  $< 1'-6"$  AND THE DESIGN SPEED  $\leq 45$  MPH

10/24/2016 10:44:35 AM

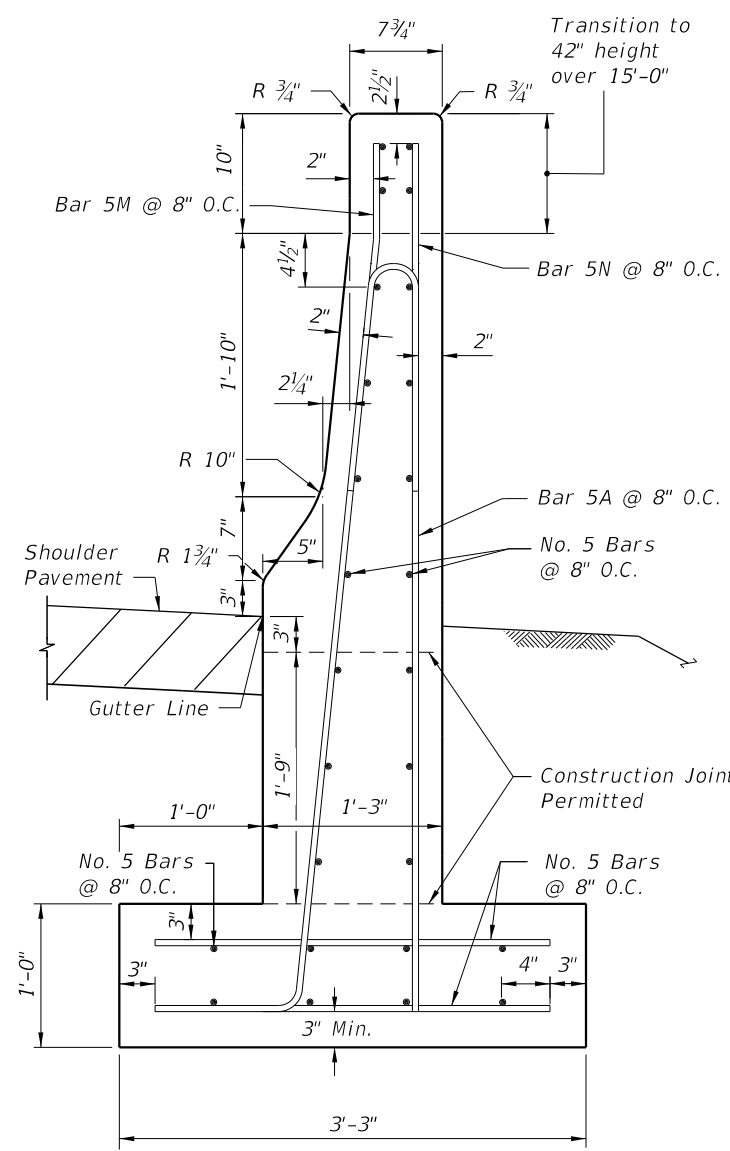
LAST REVISION 07/01/15	DESCRIPTION:
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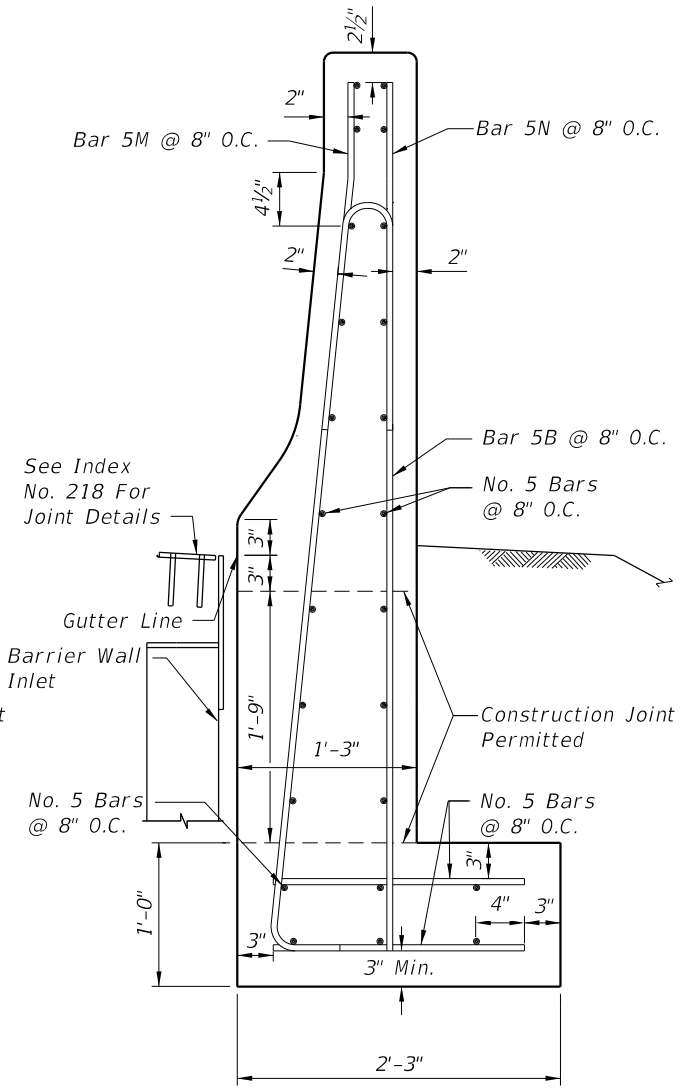
**42" SHOULDER WALL SECTION MM**  
WHEN PIER OFFSET  $\geq 16\frac{3}{4}"$



**42" SHOULDER WALL SECTION NN**  
WHEN  $12\frac{3}{4}" \leq \text{PIER OFFSET} < 16\frac{3}{4}"$



**42" SHOULDER WALL (TYPICAL)**  
QUANTITIES:  
Concrete 0.35 CY/LF  
Reinforcing Steel 43 LBS/LF




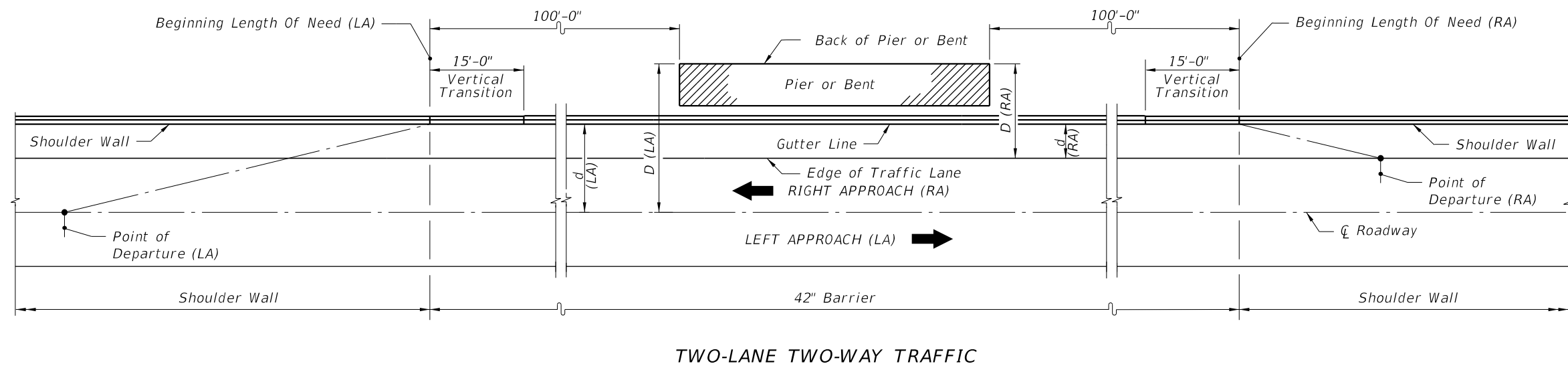
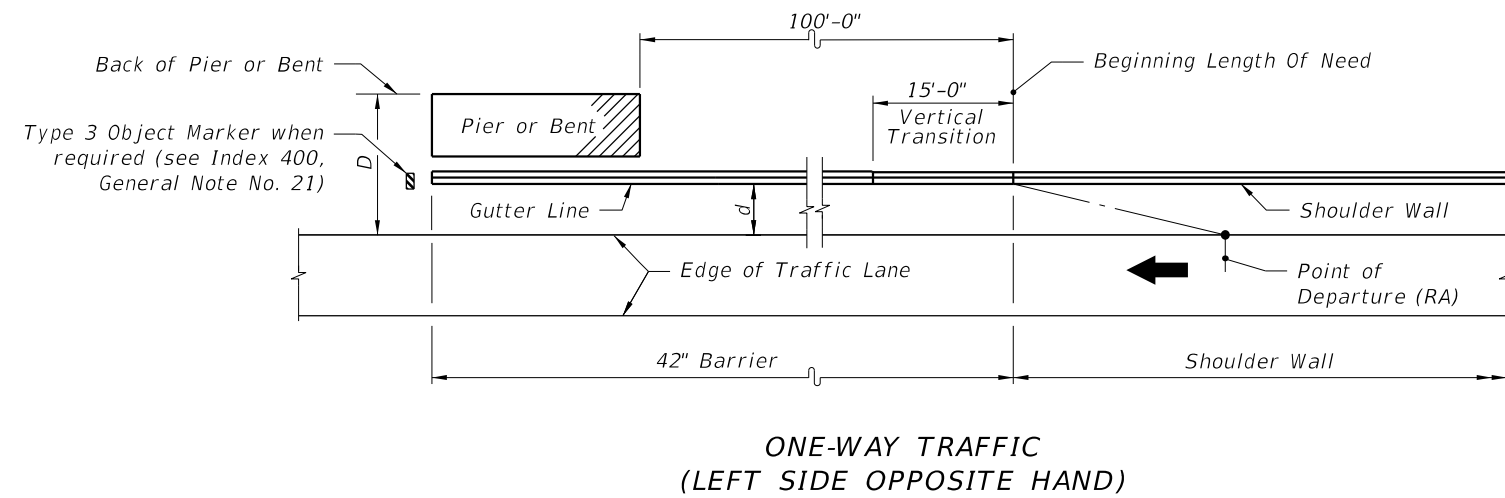
**42" SHOULDER WALL (MODIFIED)**  
QUANTITIES:  
Concrete 0.31 CY/LF  
Reinforcing Steel 39 LBS/LF

- NOTES:
1. Reduce the vertical steel spacing to 4 inches O.C. a distance of 4 feet each side of all cold joints.
  2. All longitudinal reinforcement to be continuous or spliced No. 5 bars. Lap splices a minimum of 2'-0".
  3. For additional information on Bars 5A, 5B, 5M, 5N and 5P, see BAR BENDING DIAGRAMS.
  4. For Section 00, see SHOULDER BARRIER WALL WHEN OFFSET FROM ABOVE GROUND HAZARD < 1'-6" AND THE DESIGN SPEED  $\leq 45$  MPH.
  5. Where the 42" SHOULDER WALL does not abut the pier, use the TYPICAL or MODIFIED sections.
  6. 1/2" Min. Expansion Joint or at the contractor's option: Back face of barrier wall may be cast against Pier with 1/2" Expansion Material.

**SHOULDER BARRIER WALL WHEN OFFSET FROM ABOVE GROUND HAZARD < 1'-6" AND DESIGN SPEED  $\geq 50$  MPH**

10/24/2016 10:44:37 AM

LAST REVISION 07/01/15	DESCRIPTION:	 <b>FY 2017-18 DESIGN STANDARDS</b>	<b>CONCRETE BARRIER WALL</b>	INDEX NO. <b>410</b>	SHEET NO. <b>21 of 25</b>
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SHOULDER BARRIER WALL WHEN OFFSET FROM ABOVE GROUND HAZARD < 1'-6" AND DESIGN SPEED ≥ 50 MPH

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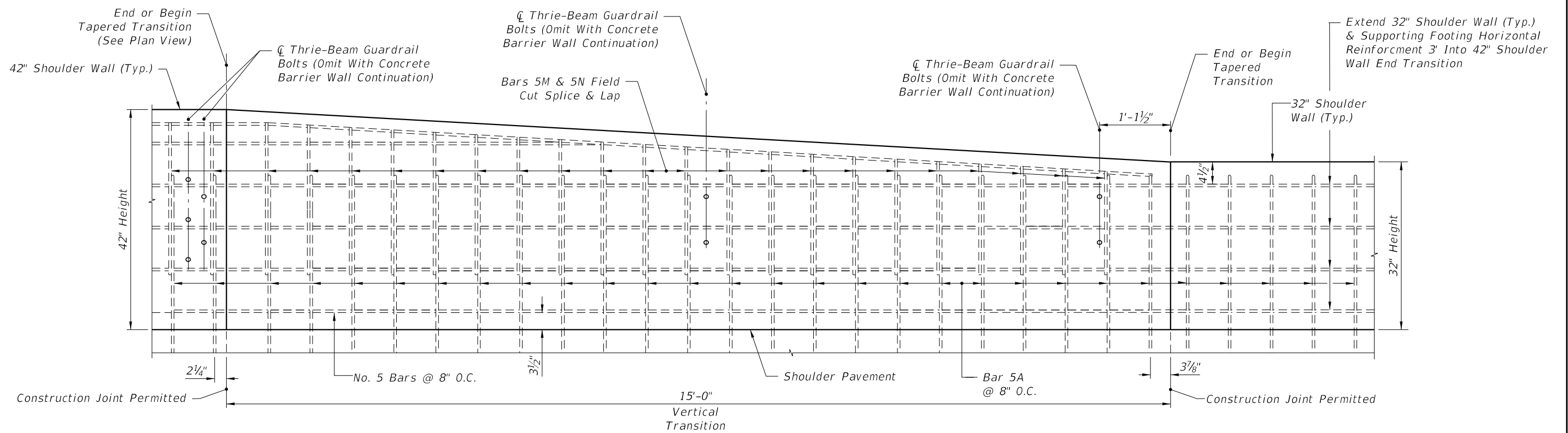
LAST REVISION	REVISION	DESCRIPTION:
07/01/15		



CONCRETE BARRIER WALL

INDEX NO.	SHEET NO.
410	22 of 25

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ELEVATION VIEW  
42" SHOULDER WALL END TRANSITION

NOTES:  
For additional information on Bars 5A, 5M and 5N see BAR BENDING DIAGRAMS.

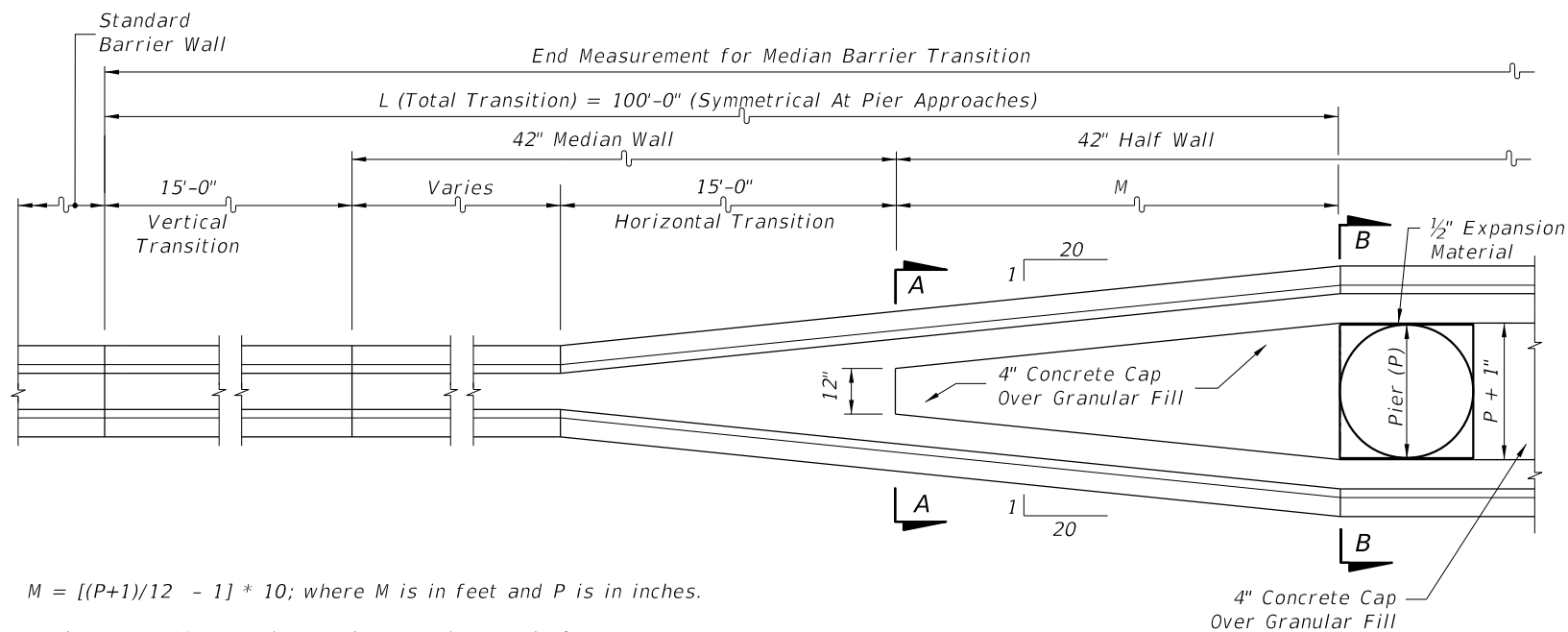
END TRANSITION DETAILS - 42" SHOULDER WALL WITH GUARDRAIL OR SHOULDER WALL CONTINUATION FOR DESIGN SPEED ≥ 50 MPH

LAST REVISION 07/01/14	DESCRIPTION:
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**FDOT** FY 2017-18  
DESIGN STANDARDS

CONCRETE BARRIER WALL

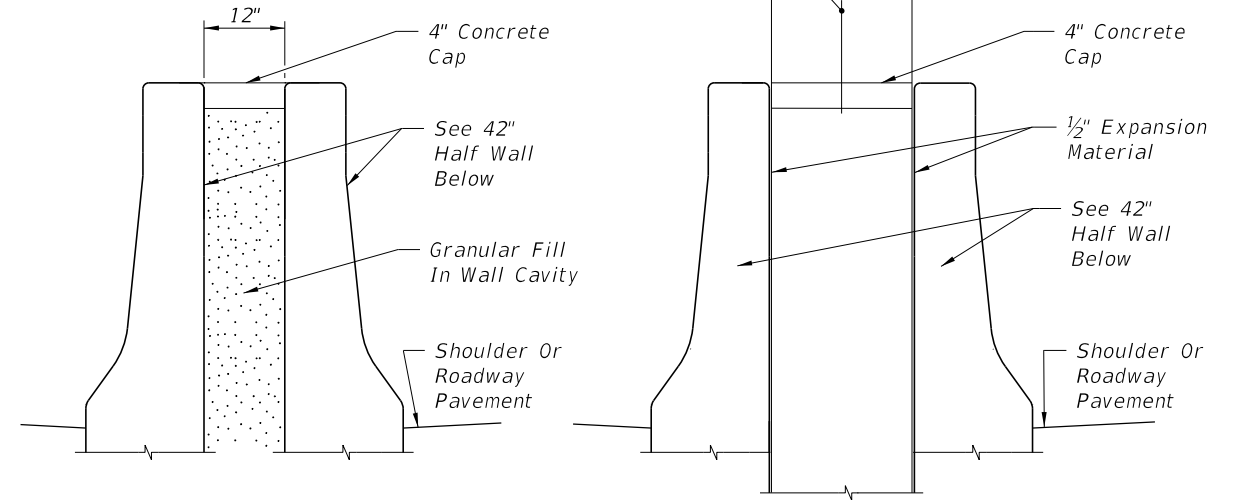
INDEX NO. 410	SHEET NO. 23 of 25
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$$M = [(P+1)/12 - 1] * 10; \text{ where } M \text{ is in feet and } P \text{ is in inches.}$$

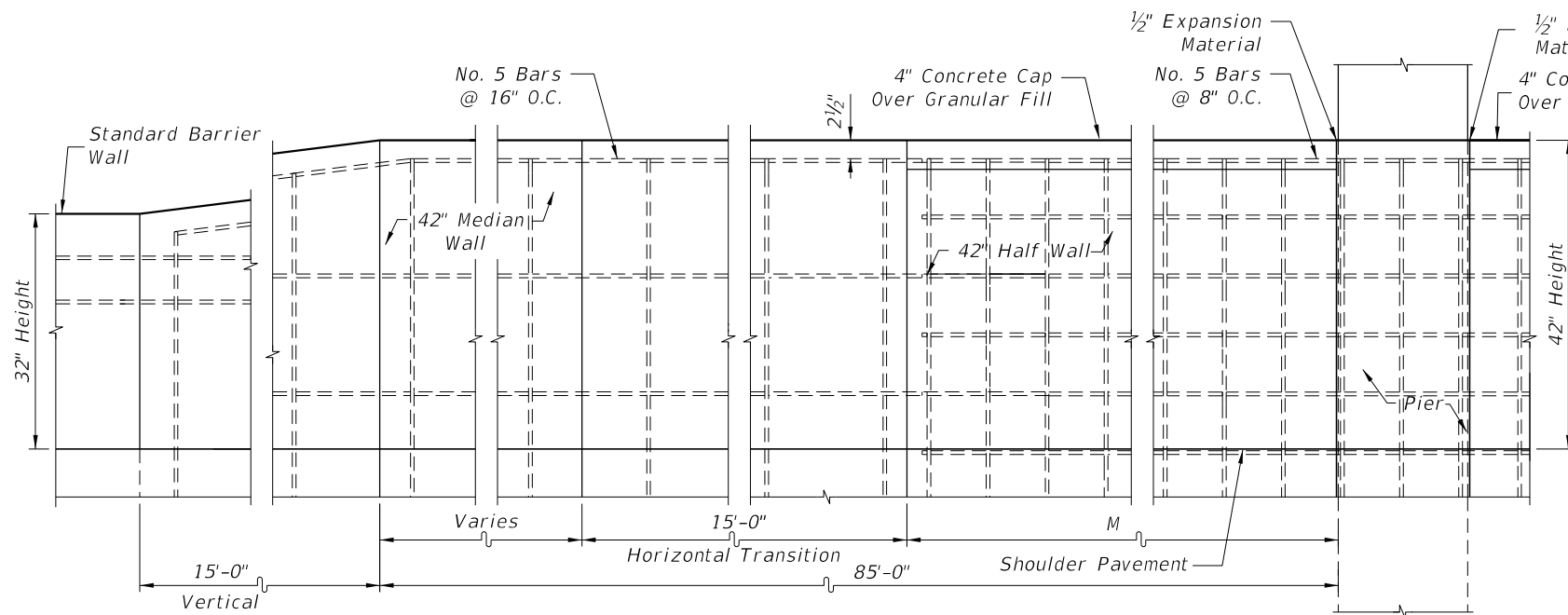
$$\text{Varies} = L - 30 - M; \text{ when } \text{Varies}, L \text{ and } M \text{ are in feet.}$$

PLAN



SECTION AA (42" BARRIER)

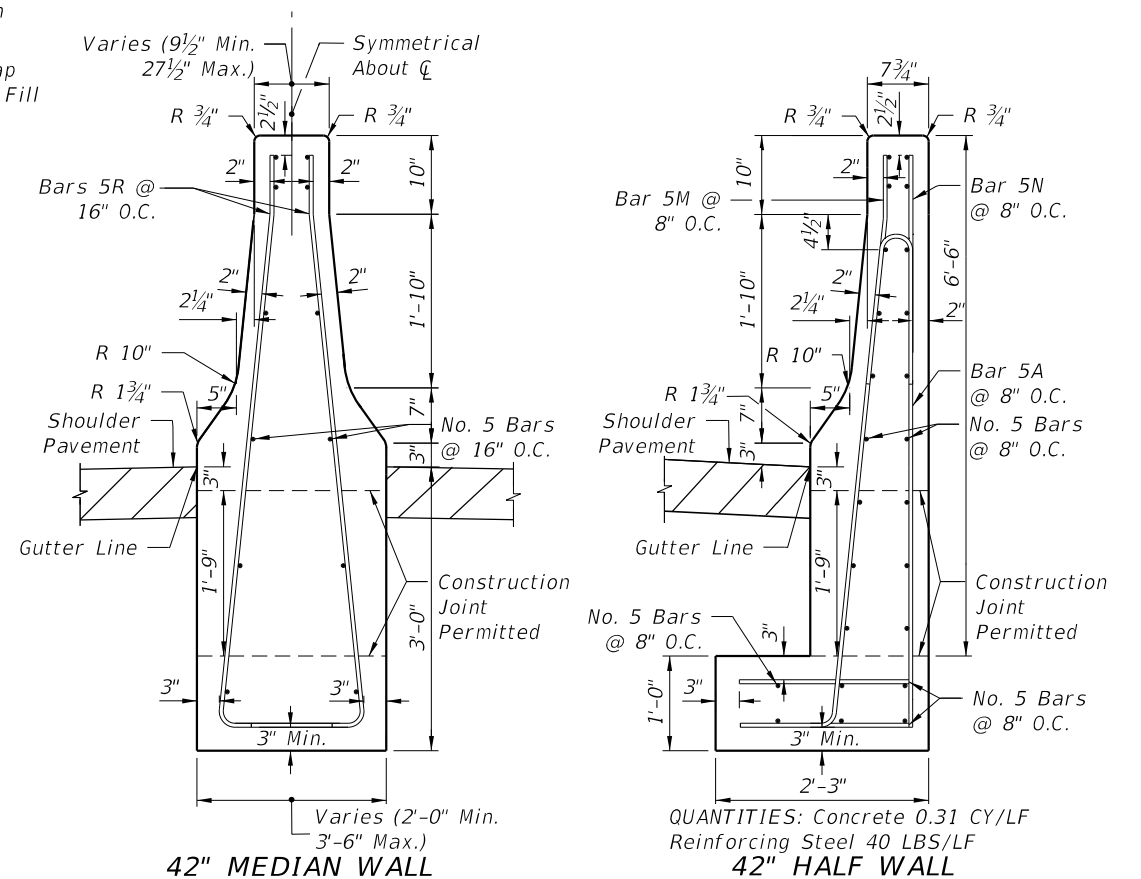
SECTION BB (42" BARRIER)



ELEVATION

NOTES:

1. Reduce the vertical steel spacing to 4 inches O.C. a distance of 4 feet for each side of all cold or expansion joints.
2. All longitudinal reinforcement to be continuous or spliced No. 5 bars. Lap splices a minimum of 2'-0".
3. Granular Fill To Be Free of Deleterious and Cementitious Material.
4. For additional information on Bars 5A, 5M, 5N and 5R, see BAR BENDING DIAGRAMS.



42" MEDIAN WALL

QUANTITIES: Concrete 0.31 CY/LF  
Reinforcing Steel 40 LBS/LF  
42" HALF WALL

CONCRETE MEDIAN BARRIER WALL TRANSITIONS AT BRIDGE PIERS FOR DESIGN SPEEDS ≥ 50 MPH

10/24/2016 10:44:48 AM

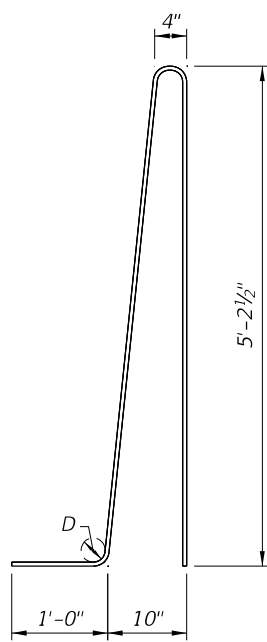
LAST REVISION 07/01/15	DESCRIPTION:
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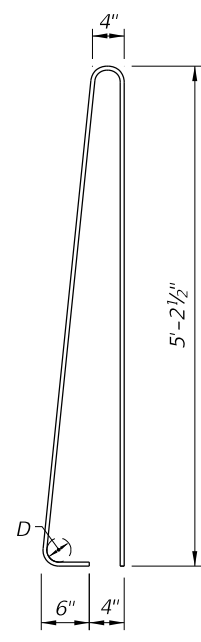
CONCRETE BARRIER WALL

INDEX NO. 410	SHEET NO. 24 of 25
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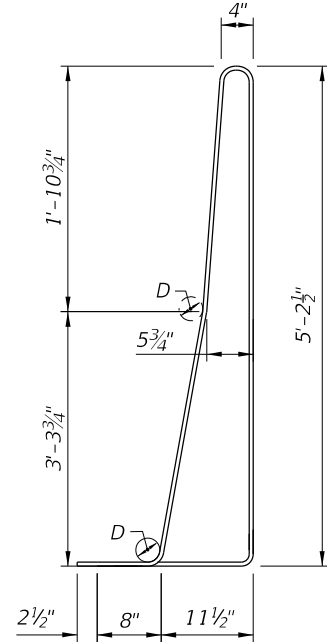




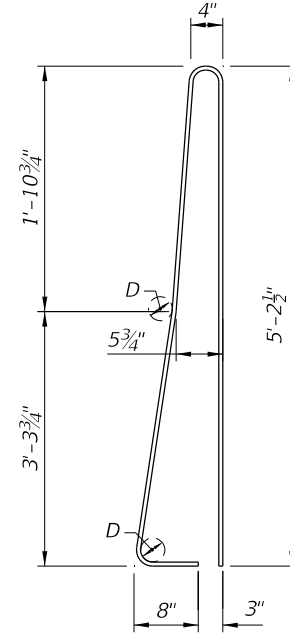
BAR 5A



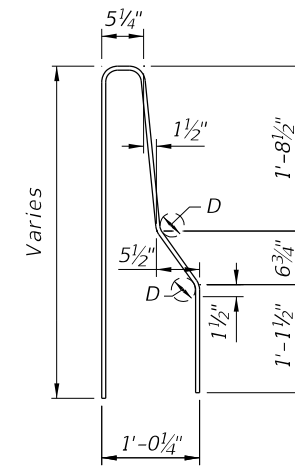
BAR 5B



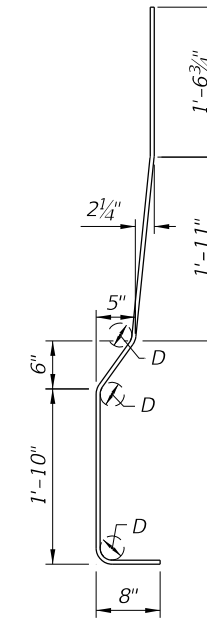
BAR 5C



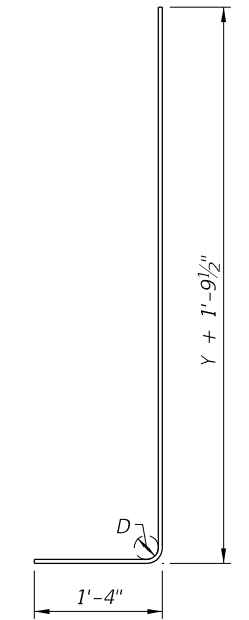
BAR 5D



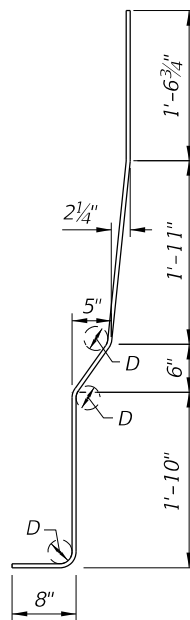
CANTILEVER WALL & L-WALL  
BAR 5E



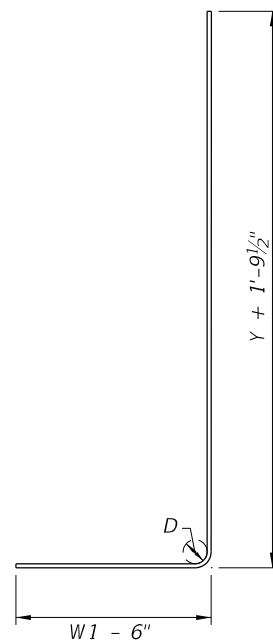
CANTILEVER WALL  
BAR 5F



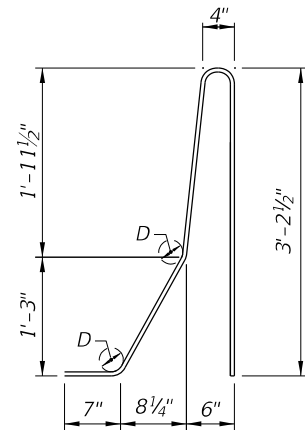
CANTILEVER WALL  
BAR 5G



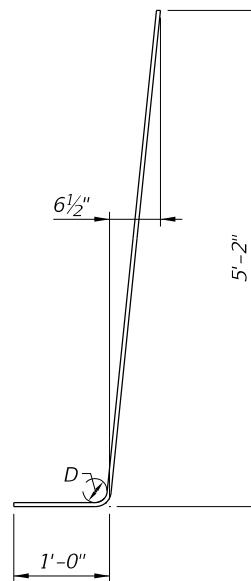
L-WALL  
BAR 5H



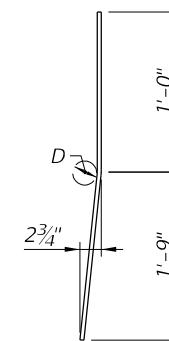
L-WALL  
BAR 5J



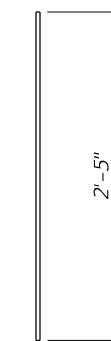
BAR 5K



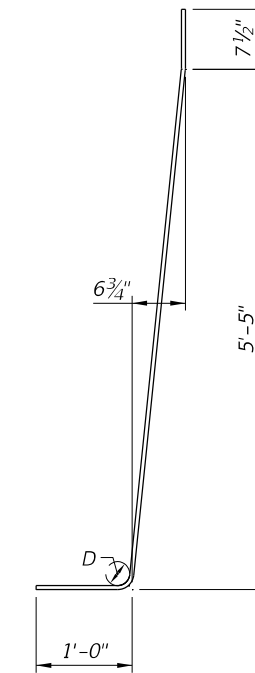
BAR 5L



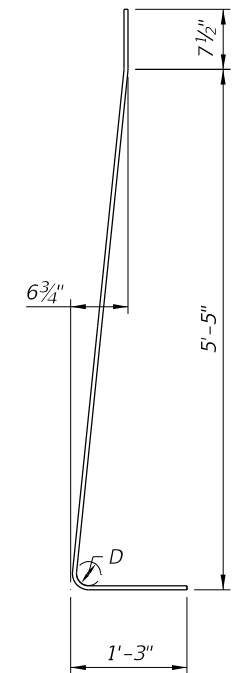
BAR 5M



BAR 5N



BAR 5P



BAR 5R

- NOTES:  
 1. For Additional Information on "STANDARD BAR BENDING DETAILS," See Index 21300.  
 2. For Bar 5G, Bar 5J, and Dimensions (W, W1 and Y), see CANTILEVER WALL DIMENSIONS TABLE.

BAR BENDING DIAGRAMS

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LAST REVISION 01/01/16	DESCRIPTION:
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