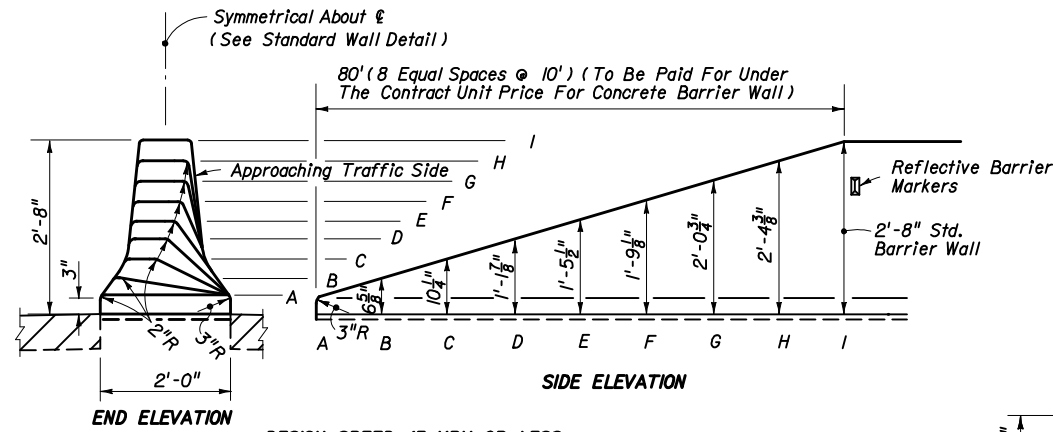


TO BE USED ONLY WHERE TERMINAL LOCATED CLEAR ZONE WIDTH FROM EDGE OF THE NEAR APPROACH TRAFFIC LANE.

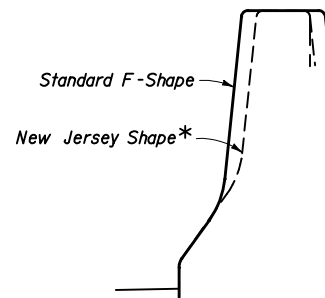
**CONCRETE BARRIER WALL TERMINAL
DETAIL II**



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

DESIGN SPEED 45 MPH OR LESS

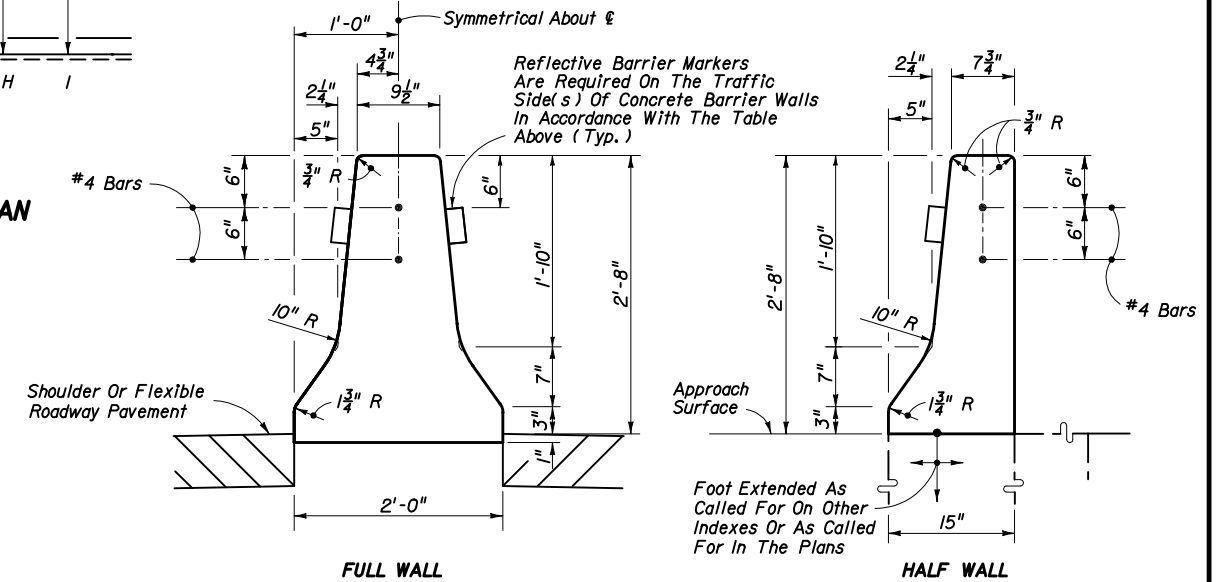
DETAIL III



* Where standard F-Shape walls abut existing NJ Shape walls, face transitions of not less than 5' in length shall be constructed at the adjoining end of the F-Shape wall.

WALL FACE SAFETY SHAPES

REFLECTIVE BARRIER MARKER SPACING ON WALL		
Distance - Edge of Travel Lane to Barrier Wall. (Ft.)	Spacing (Ft.)	REMARKS
< 4'	40'	1. Reflectors shall conform to Section 993-5 of the Standard Specifications. 2. Reflector color (white or yellow) shall conform to the color of the near edgeline.
4' to 8'	80'	
> than 8'	none required	



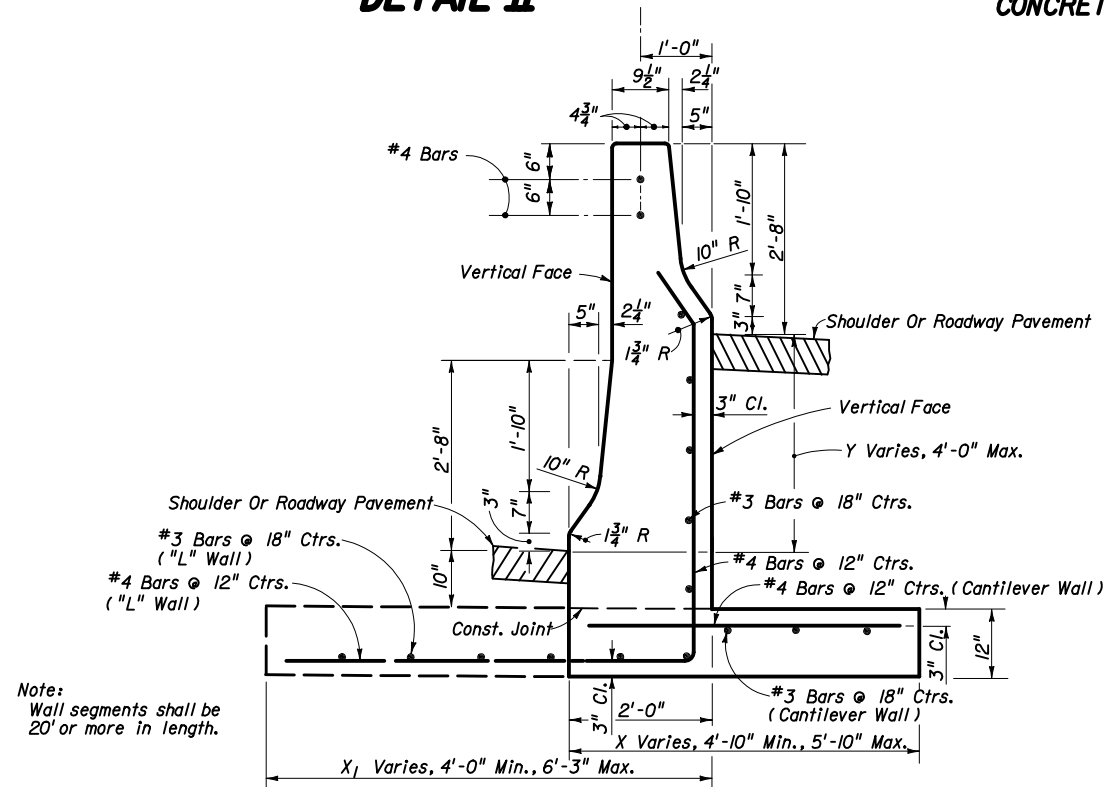
For concrete barrier wall details at piers, highway lighting and guardrail connections, see other sheets of this index.

Standard barrier to be paid for under the contract unit price for Concrete Barrier Wall, LF.

STANDARD BARRIER WALL SECTIONS

GENERAL NOTES

- Class II concrete shall be used for all reinforced and plain (nonreinforced) concrete barrier walls; except, in moderately and extremely aggressive environments, Class IV concrete shall be used. All reinforcing steel with undesignated size shall be #4 bars. Exposed concrete surfaces shall have a Class 3 surface finish in accordance with Section 521 of the Standard Specifications, unless other finish called for in plans. The surfaces shall have a Class 5 Applied Finished Coating in accordance with Section 400 only when called for in the plans.
- Concrete barrier wall terminal notes for design speeds ≥ 50 mph.
 - Terminated outside clear zone of the approach traffic with '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 in wall required only at bridge ends and/or at locations where wall is an integral part of existing or proposed concrete slab; wall joints are to match an existing or proposed expansion joint.
- When the barrier is installed adjacent to the pavement the top 12" of the subgrade shall be compacted to at least 100% of the density as defined in the AASHTO T-99 specifications.
- Cast-in place barrier wall normally will be a continuous pour without transverse contraction joints. Cast-in-place segments with a length < 40' shall be joined to adjacent sections by doweling. See Detail B.
- 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 Details C & D. 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.
- Cost of reinforcing steel and reflective barrier markers shall be included in the contract unit price for concrete barrier wall. See individual details for pay item information.
- For barrier wall inlet details see Indexes Nos. 217, 218 and 219.



Note: Wall segments shall be 20' or more in length.

Design Criteria:

Vehicle: 4000 lbs., 60 mph, 25°, Avg. Lat. Impact Deceleration Force - 7G's (28 kips)
Vehicle Force Applications: 1000 lbs. Vert. At Top of Toe; 28 kips Horiz. At 5 1/2" Above Pavt.

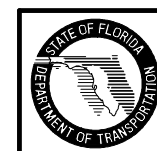
Unless the plans stipulate a specific wall type, either the cantilever wall or the "L" wall may be constructed at the Contractor's option.

Steel not required in walls of heights Y=0' To 0'-6" when footing and stem cast as one unit. When footing and stem cast separately by construction joint, the footing joint surface shall be roughened and #4 dowels 24" long installed at the centerline of the stem on 24" centers with 9" embedment in the footing.

Cost of the steel and concrete footing to be included in the contract unit price for Barrier Wall Concrete, LF.

	Height Y	0'-0"	0'-6"	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"	3'-6"	4'-0"
Cantilever Wall	Width X	4'-10"	5'-0"	5'-2"	5'-3"	5'-5"	5'-6"	5'-7"	5'-9"	5'-10"
"L" Wall	Width X ₁	4'-0"	4'-4"	4'-8"	5'-0"	5'-3"	5'-6"	5'-9"	6'-0"	6'-3"

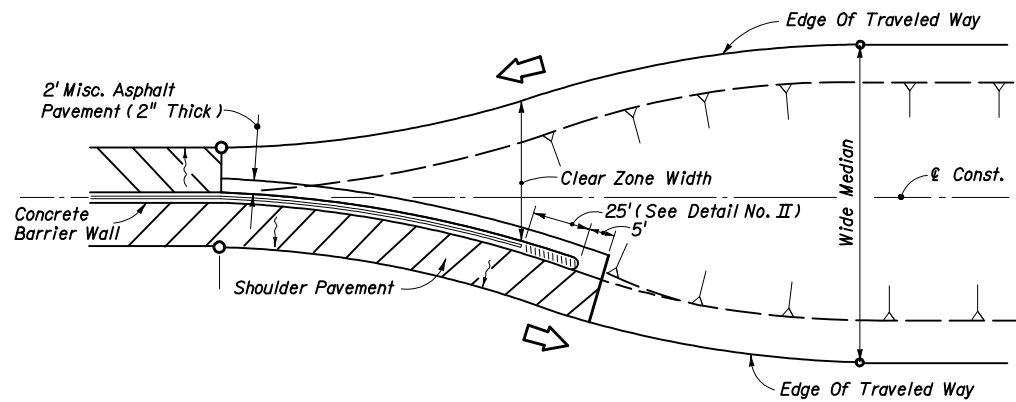
**MEDIAN BARRIER WALL FOR SUPERELEVATED SECTIONS
OR FOR VARIABLE ROADWAY PROFILE GRADES**



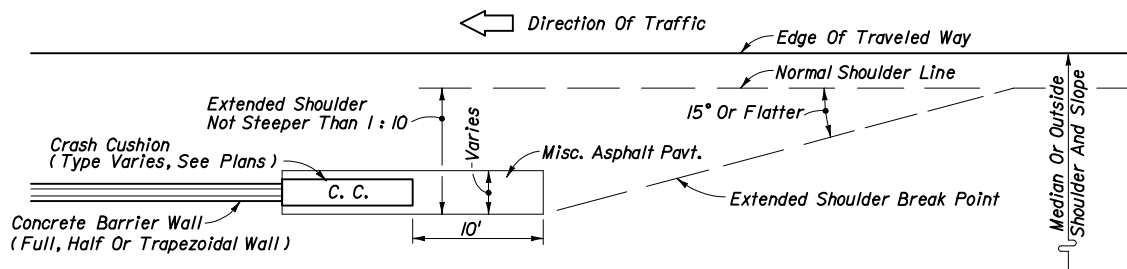
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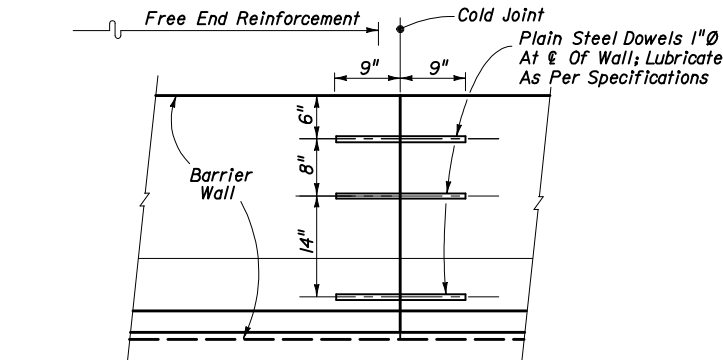


CONCRETE BARRIER WALL TRANSITION BETWEEN WIDE AND NARROW MEDIANS WHEN BARRIER WALL END LOCATED OUTSIDE APPROACH CLEAR ZONE OR HORIZONTAL CLEARANCE



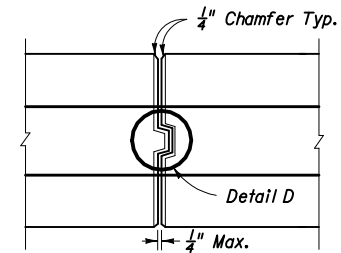
SHOULDER TREATMENT WHEN CRASH CUSHIONS SHIELDING CONCRETE BARRIER WALL END LOCATED INSIDE APPROACH CLEAR ZONE OR HORIZONTAL CLEARANCE

DETAIL A

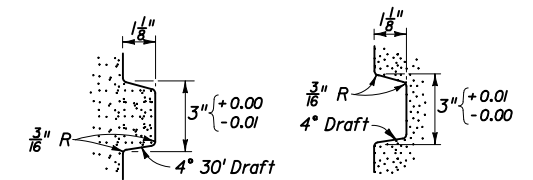


DOWELED TRANSVERSE CONSTRUCTION JOINT WHEN ABUTTING SEGMENT(S) LESS THAN 40' IN LENGTH

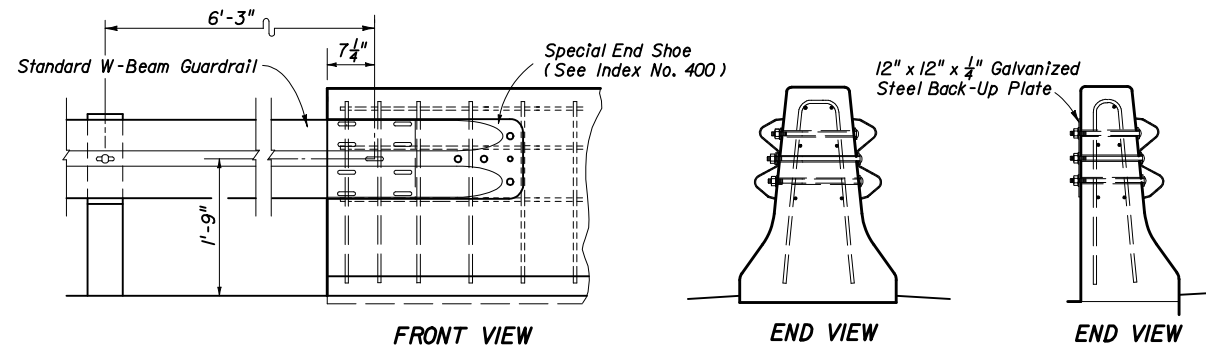
DETAIL B



**PRECAST BARRIER TRANSVERSE JOINTS
DETAIL C**

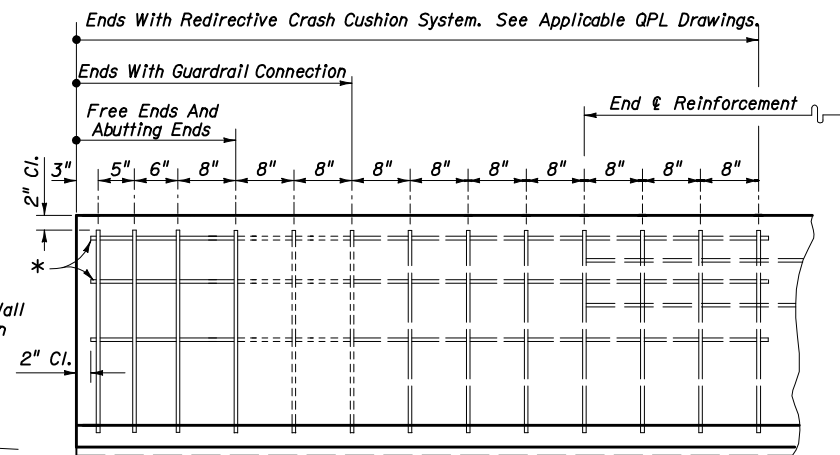
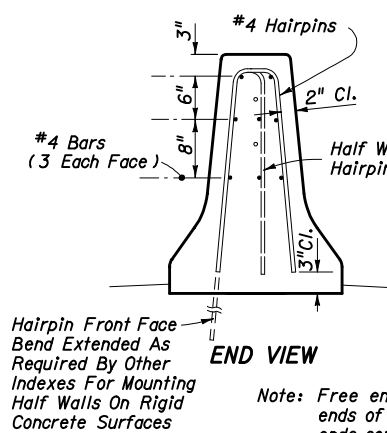


**STRAIGHT TONGUE AND GROOVE
DETAIL D**



- NOTES**
- End of wall flush mounted connections are not applicable to two-lane two-way facilities. See Sheets 18 and 20 for trailing end connections on two-lane two-way facilities and for approach guardrail connections.
 - Trailing guardrail connections to double face safety shaped walls will be under one of the following traffic conditions and mounting methods:
 - One-way traffic trailing condition one side only - flush mount with flat steel back-up plate on back side.
 - One-way traffic trailing condition both sides - flush mount both sides.
 - For trailing condition one side and approach traffic condition opposite side - see "Median Barrier Wall" mounting, Sheet 20.

W-BEAM GUARDRAIL CONNECTION TO CONCRETE BARRIER WALL TRAILING ENDS



Note: Free end reinforcement required for nonreinforced walls at the following locations: All exposed ends; abutting ends of true joints; ends with guardrail connections; ends with redirective crash cushion connections; and, ends connecting to bridge traffic rails or other rigid barrier walls.

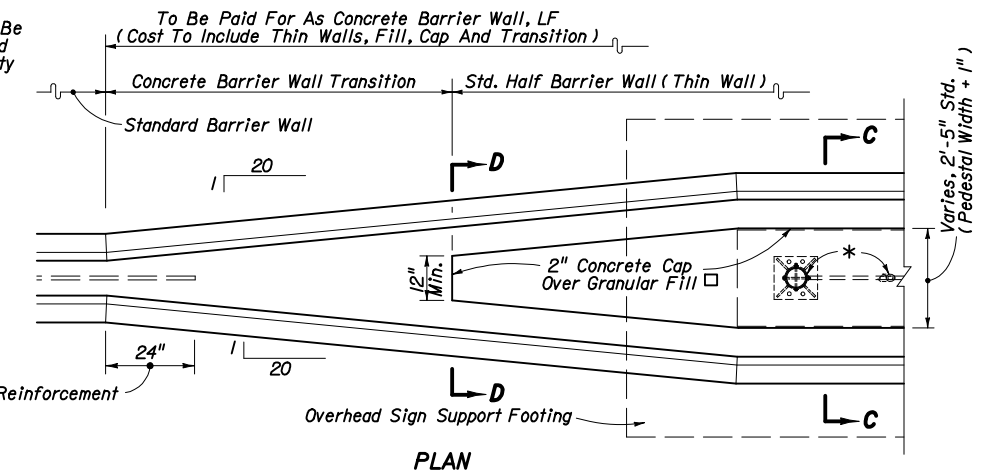
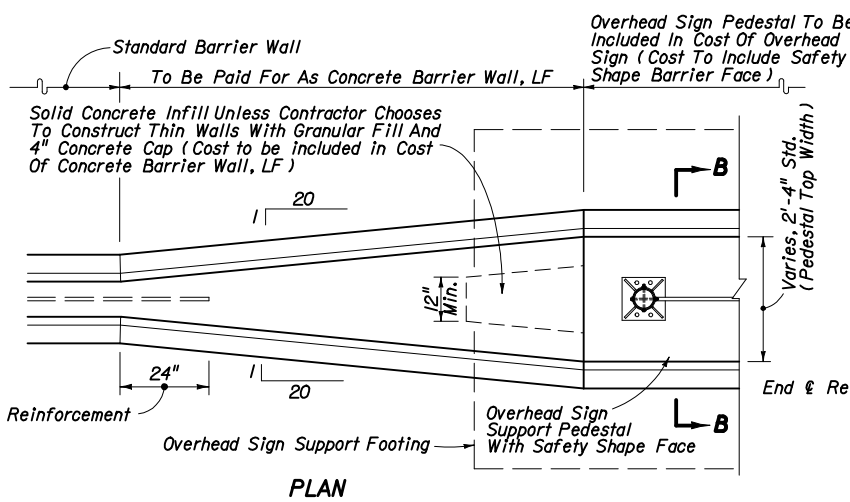
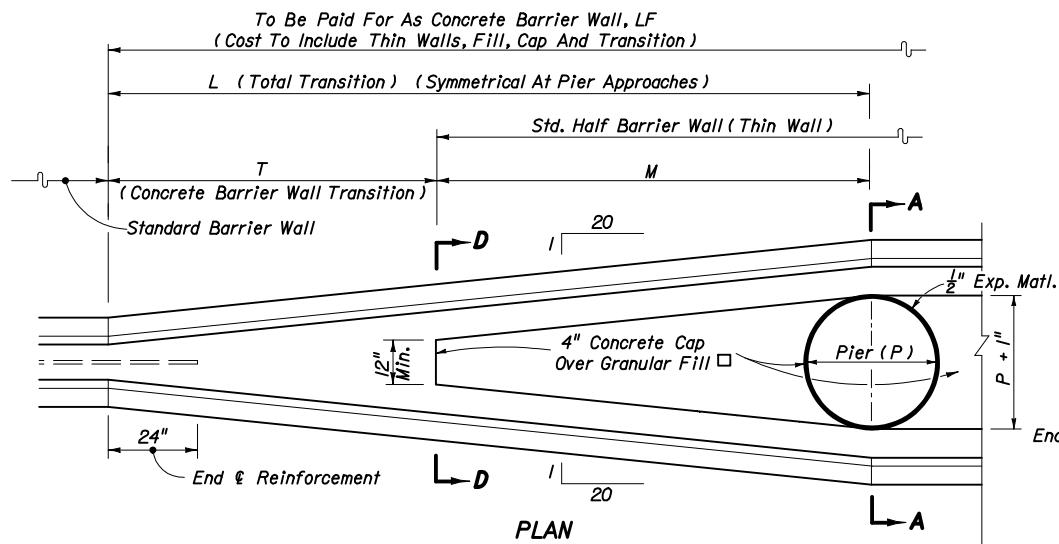
FREE END REINFORCEMENT



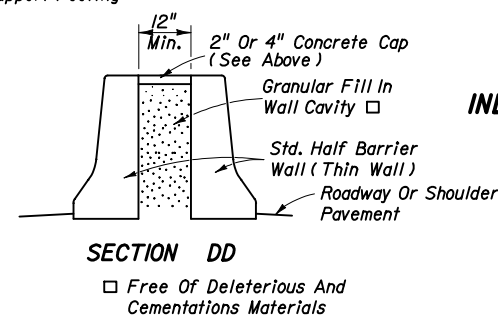
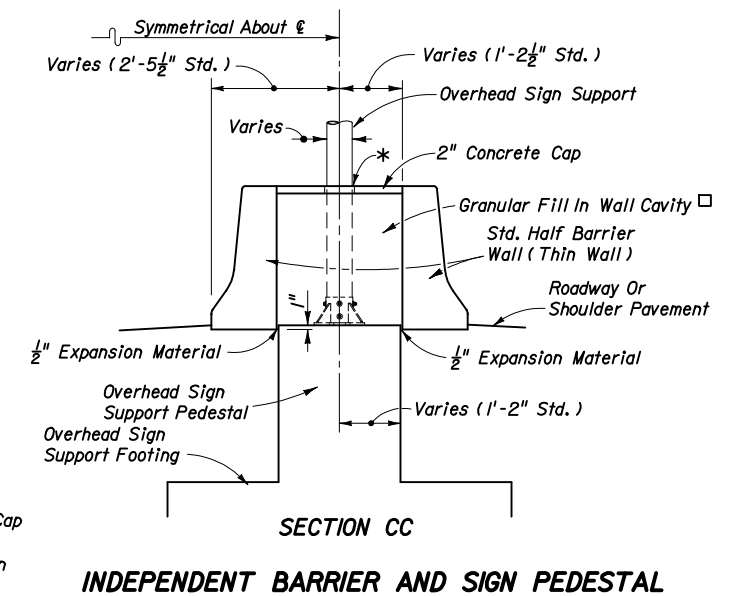
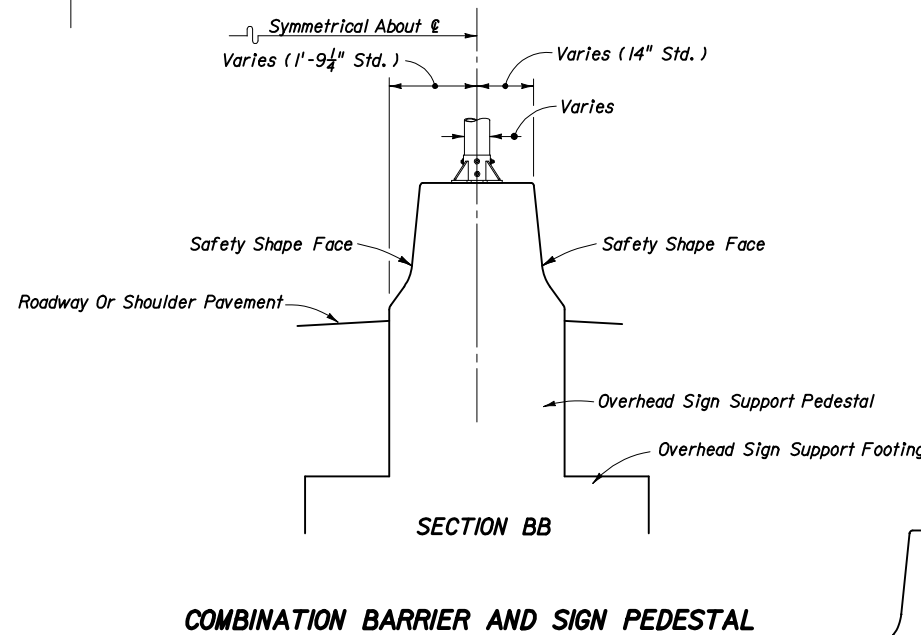
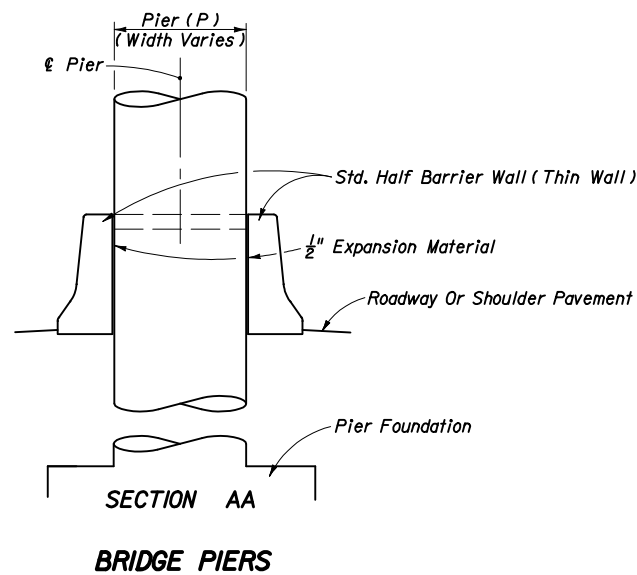
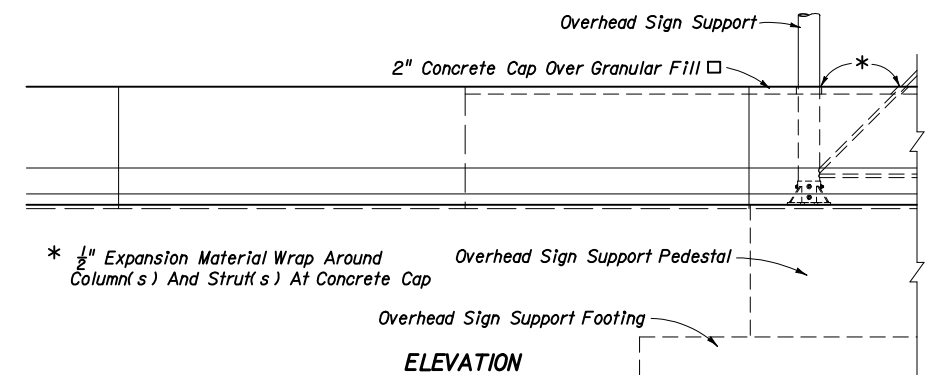
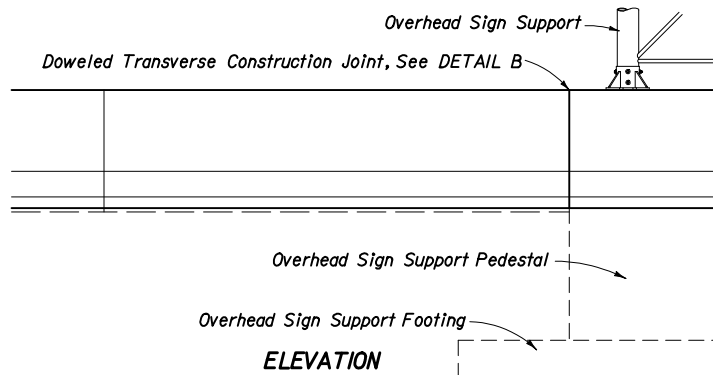
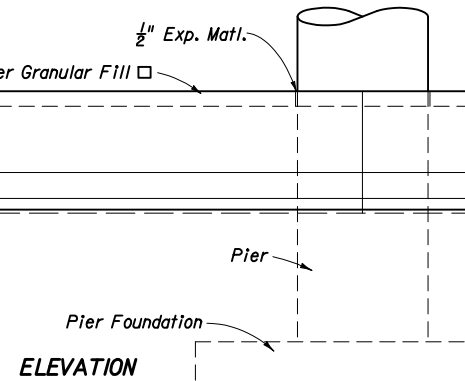
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DIMENSIONS (Ft.) (WHEN P=3'-0")		
L	M	T
35'	20'	15'



CONCRETE MEDIAN BARRIER WALL TRANSITIONS AT BRIDGE PIERS AND OVERHEAD SIGN SUPPORTS

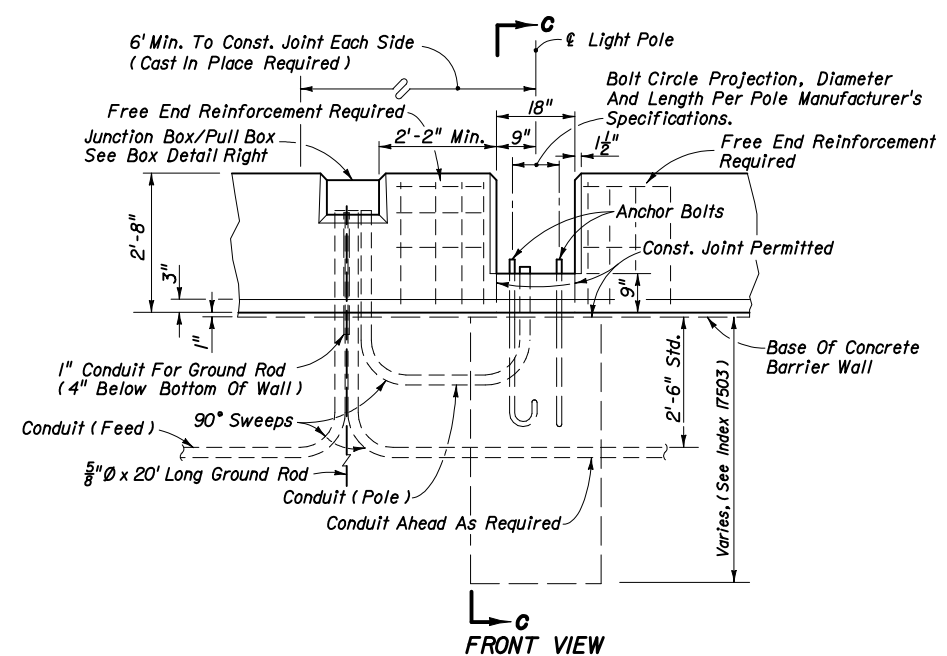
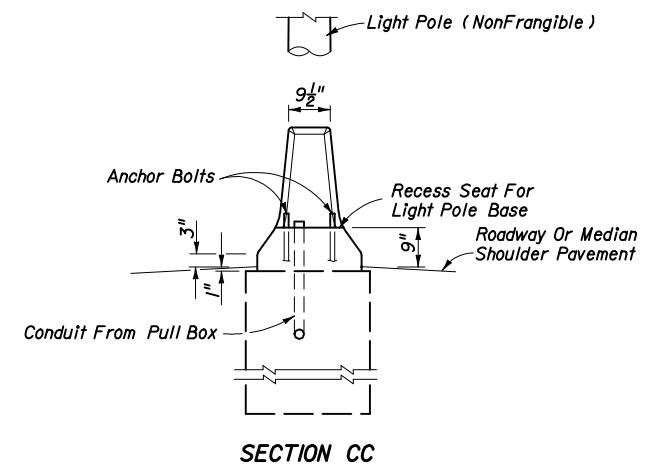
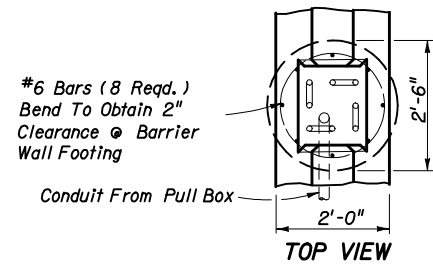


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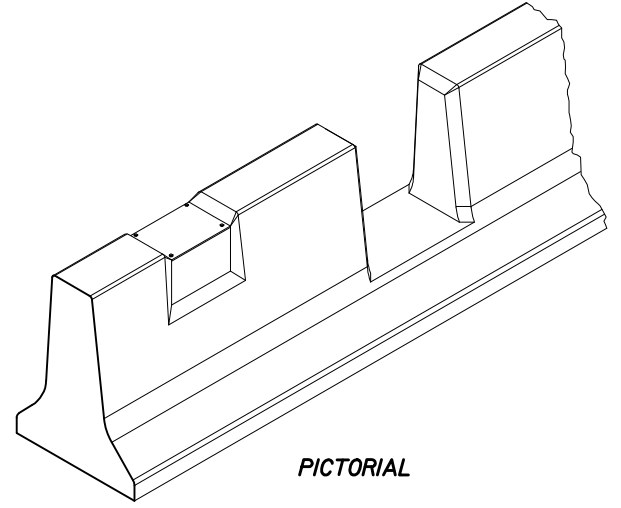
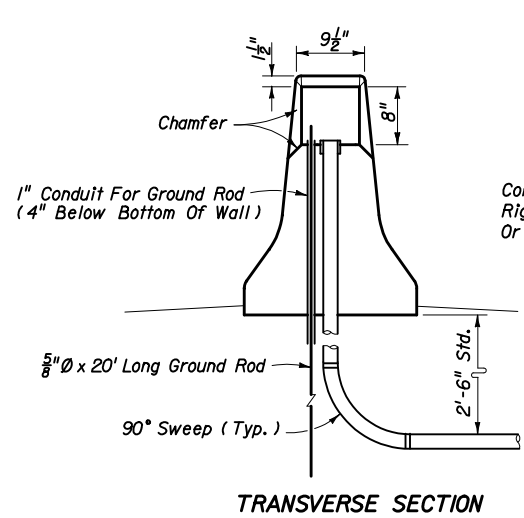
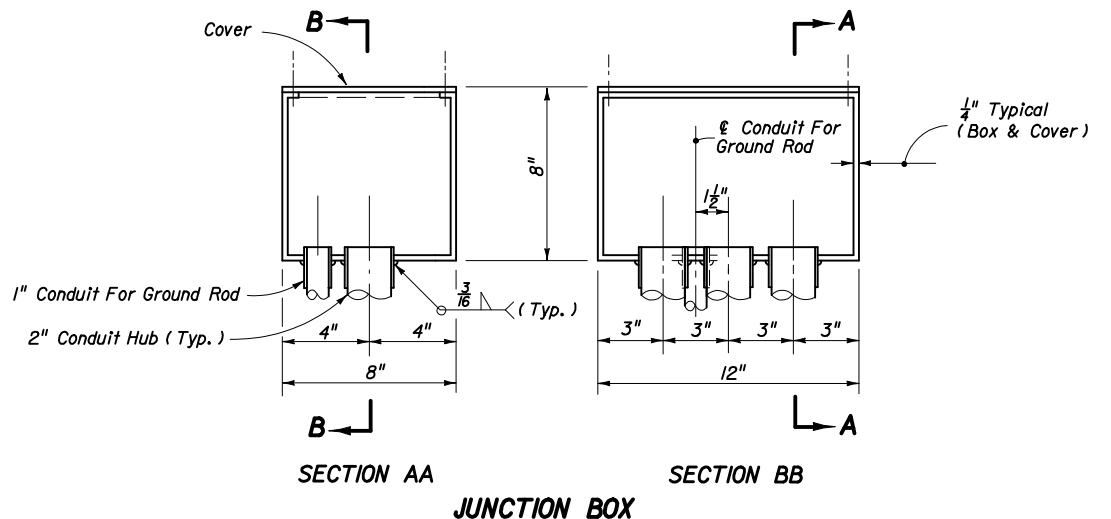
CONCRETE BARRIER WALL

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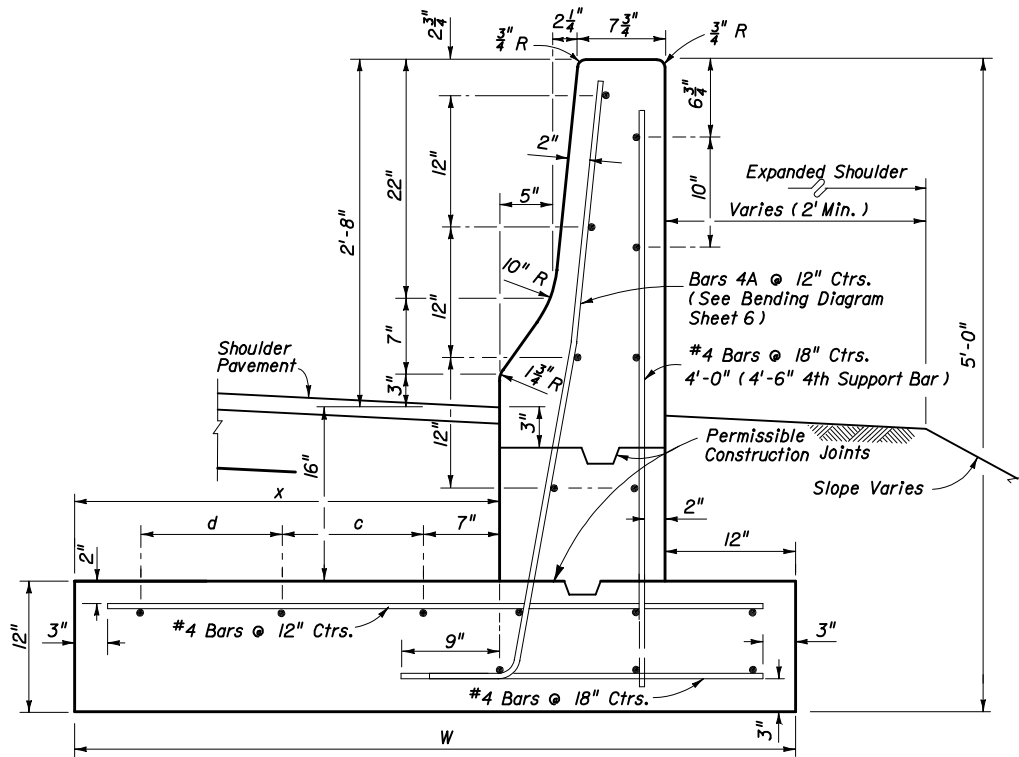
Note: For foundation design and details see Index No. I7503.
Refer to Lighting Plans for size of conduit.
Payment for the 2'-6" concrete shaft including reinforcing steel,
anchor bolts and accessories shall be included in the contract unit
price for Light Pole Complete, EA.



- JUNCTION BOX NOTES**
1. Junction boxes are to be fabricated from steel conforming to ASTM A36 and be hot dipped 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. 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.
 4. Junction boxes for use on barrier walls with opaque visual barrier shall have a side access cover. All side access junction boxes shall be orientated to the same side of the barrier wall.

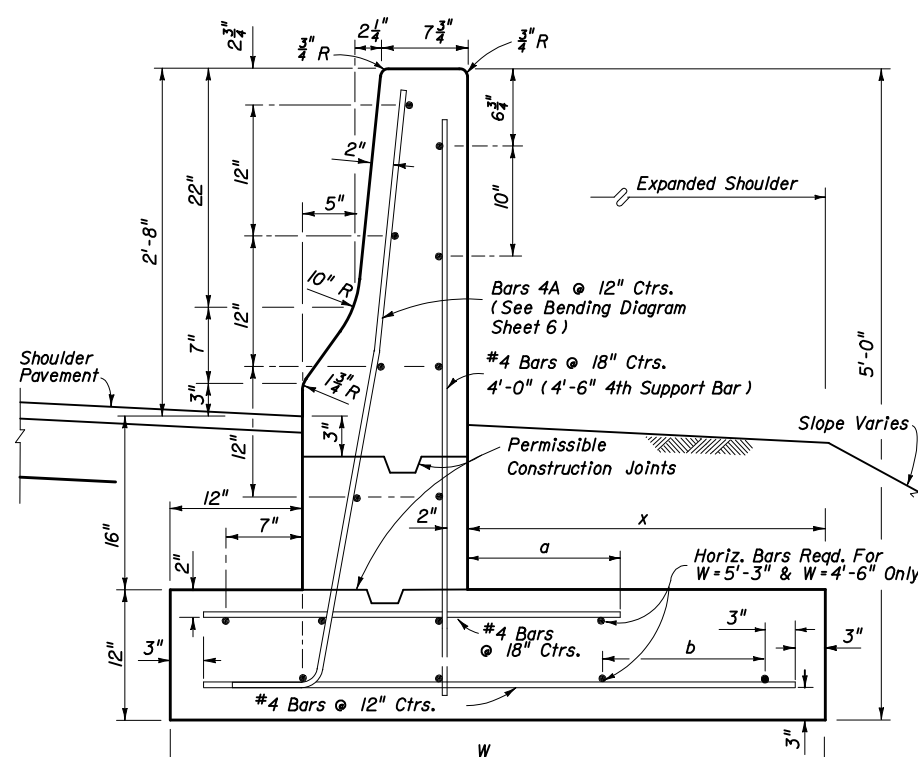
JUNCTION BOX - ELECTRICAL

LIGHT POLE MOUNTING IN MEDIAN BARRIER WALL

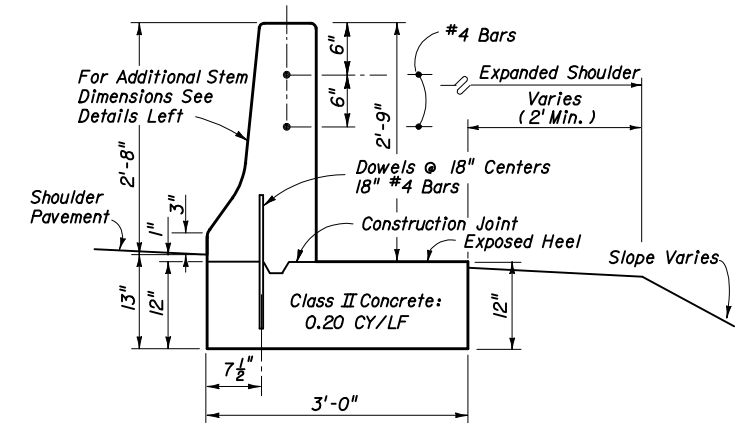
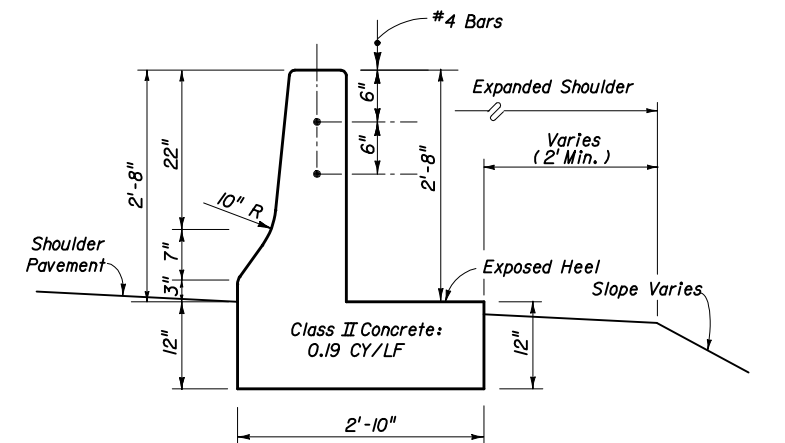


CANTILEVER WALL

NOTE: All longitudinal reinforcement #4 bars.



L-WALL

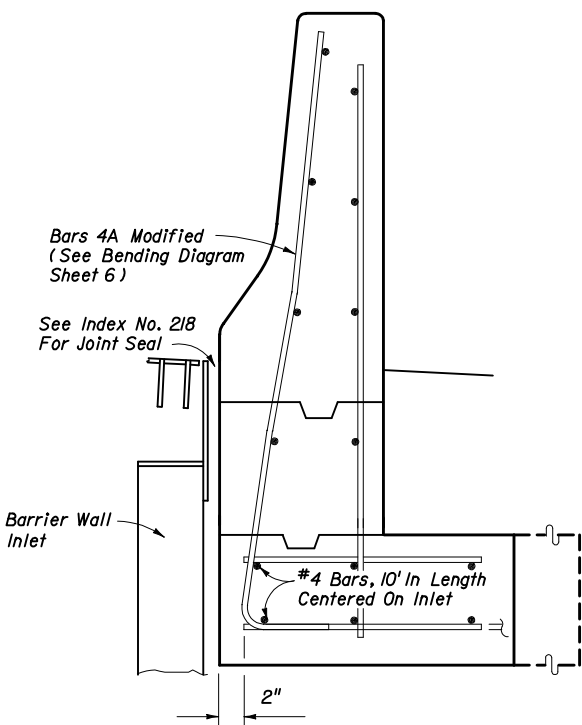


WALL OPTIONS

NOTE:
Wall to be paid for under the contract unit price for Concrete Barrier Wall (Plain-Shoulder), LF.

DESIGN NOTE:
Wall shall have a length of 40' or greater. Wall of 40' or more in length may be made up of segments of 20' or more in length provided the segments are joined by a transverse joint in accordance with Detail B, Sheet 2; segments shall have dimensions same as wall shown above.

PLAIN CONCRETE BARRIER WALL (SHOULDER)



REINFORCING STEEL MODIFICATIONS AT BARRIER WALL INLETS (INDEX NO. 218)

DIMENSIONS AND QUANTITIES													
CANTILEVER WALL						L-WALL							
Length* Of Barrier Wall	W	x	c	d	Class II Concrete CY Per Lin. Ft.	Reinforcing Steel LBS. Per Lin. Ft.	Length* Of Barrier Wall	W	x	a	b	Class II Concrete CY Per Lin. Ft.	Reinforcing Steel LBS. Per Lin. Ft.
≥ 40'	3'-3"	1'-0"	NA	NA	0.27	18	≥ 40'	3'-3"	1'-0"	6"	NA	0.27	18
35' to 39'	3'-6"	1'-3"	NA	NA	0.28	18	35' to 39'	3'-6"	1'-3"	6"	NA	0.28	18
30' to 34'	4'-0"	1'-9"	NA	NA	0.29	19	30' to 34'	3'-9"	1'-6"	6"	NA	0.29	18
25' to 29'	4'-6"	2'-3"	14"	NA	0.31	20	25' to 29'	4'-0"	1'-9"	9"	NA	0.30	19
21' to 24'	5'-0"	2'-9"	18"	NA	0.33	20	20' to 24'	4'-6"	2'-3"	12"	12"	0.31	20
19' & 20'	5'-6"	3'-3"	13"	13"	0.35	21	15' to 19'	5'-3"	3'-0"	16"	17"	0.34	21
17' & 18'	6'-0"	3'-9"	16"	16"	0.37	21							
15' & 16'	6'-6"	4'-3"	18"	18"	0.39	22							

Quantities shown are for information only. For method of payment see payment note below.
Barrier wall inlets (Index 218) shall be isolated from the barrier wall stem and footing by 1" expansion material.
*Any length less than 40' must be a continuous (nonjointed) segment. Walls of 40' or more in length may be made up of segments of 20' or more in length provided the segments are joined by a transverse joint in accordance with Detail B, Sheet 2; segments shall have dimensions same as wall ≥ 40' above.

PAYMENT:
Wall to be paid for under the contract unit price for Concrete Barrier Wall (Rigid-Shoulder), LF.

DESIGN NOTES:
Use of this barrier wall should be limited to special applications such as hazard encroachment into the clear zone where barrier wall deflection, rotation or translation cannot be tolerated; example hazards to consider are as follows:
(a) Structure supporting piers, bents and pylons (b) Pumping, metering, control or other similar critical stations (c) Quarries (d) Intolerable vertical drops (e) Historic structures or monuments (f) Rail transit travel way or passenger station (g) Other similar occupancies

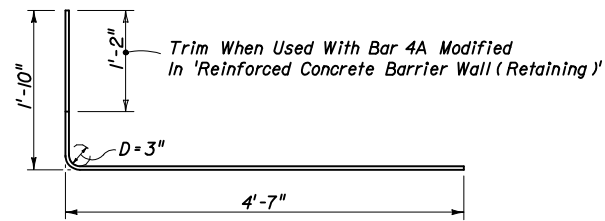
REINFORCED CONCRETE BARRIER WALL (SHOULDER)



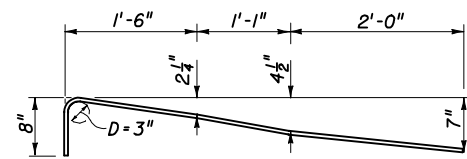
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CONCRETE BARRIER WALL

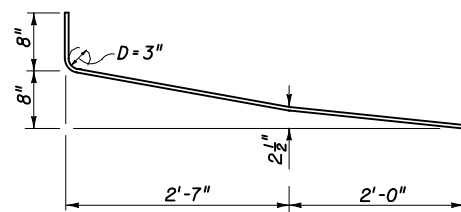
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BAR 4B

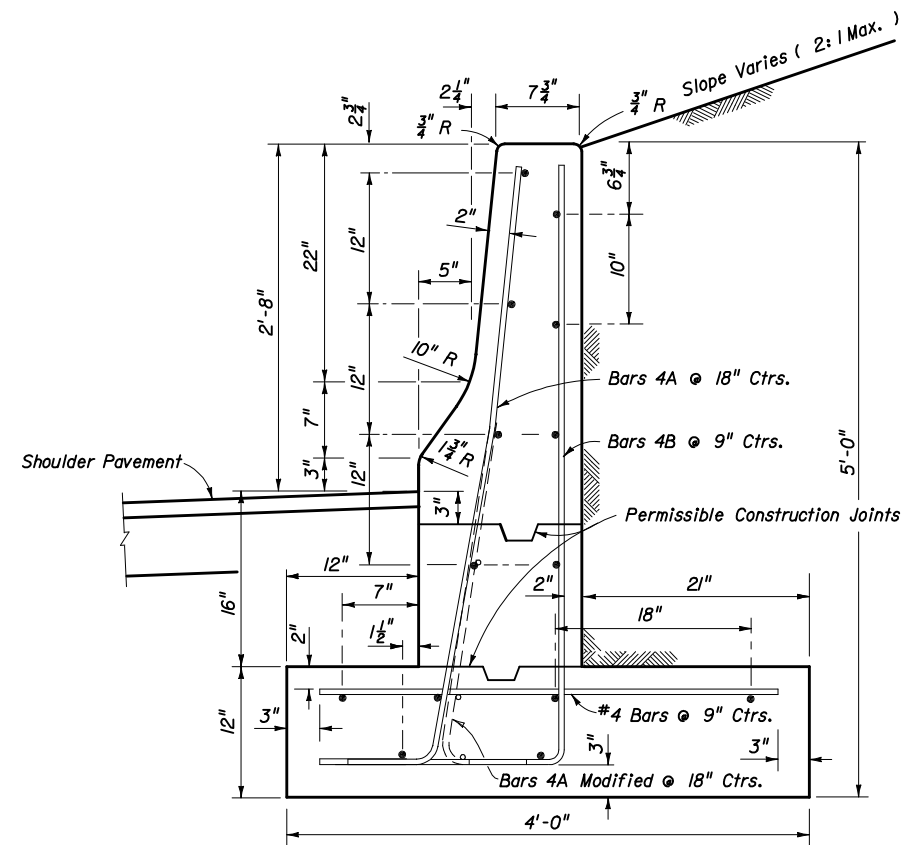


For Use In Areas Where Obstructions
Require Localized Omission Of Toe
BAR 4A MODIFIED



BAR 4A

BENDING DIAGRAMS



NOTE: All longitudinal reinforcement #4 bars.
Minimum segment length for this wall is 20 feet.
Wall to be paid for under the contract unit price
for Concrete Barrier Wall (Rigid-Retaining), LF.

QUANTITIES: Class II Concrete 0.29 CY/LF
Reinforcing Steel 21 LBS/LF

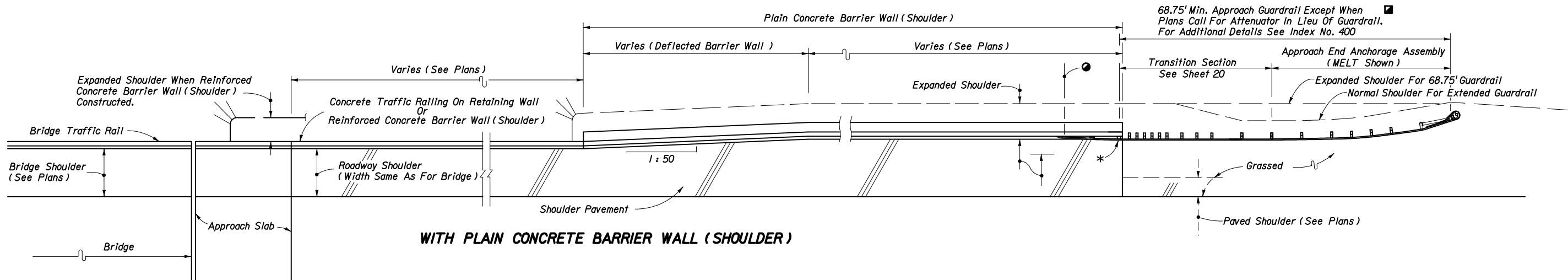
REINFORCED CONCRETE BARRIER WALL (RETAINING)



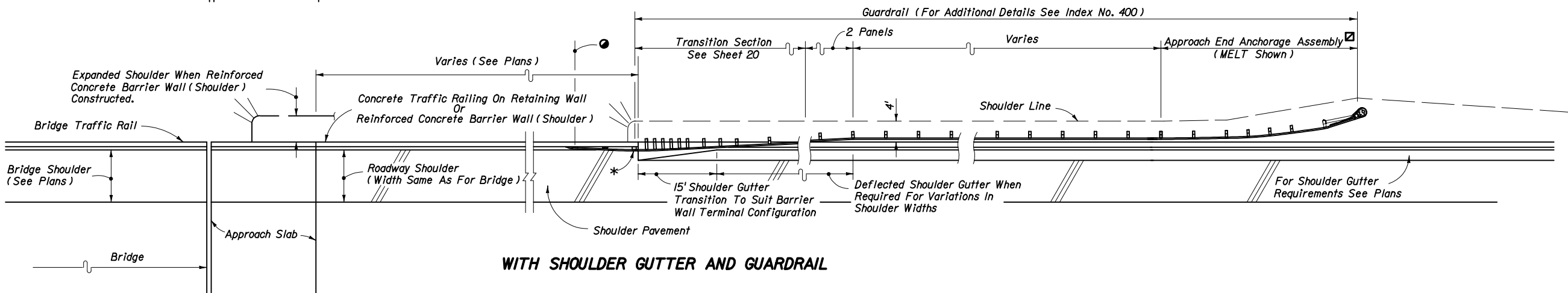
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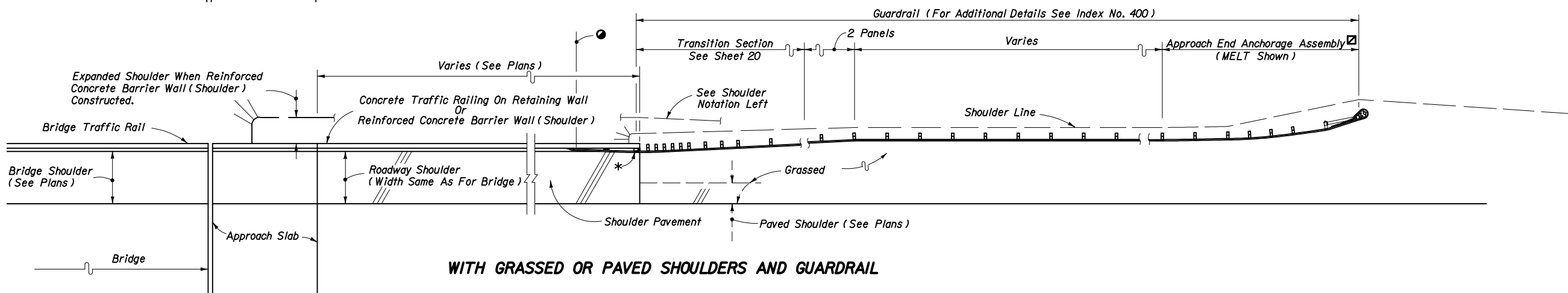
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WITH PLAIN CONCRETE BARRIER WALL (SHOULDER)



WITH SHOULDER GUTTER AND GUARDRAIL



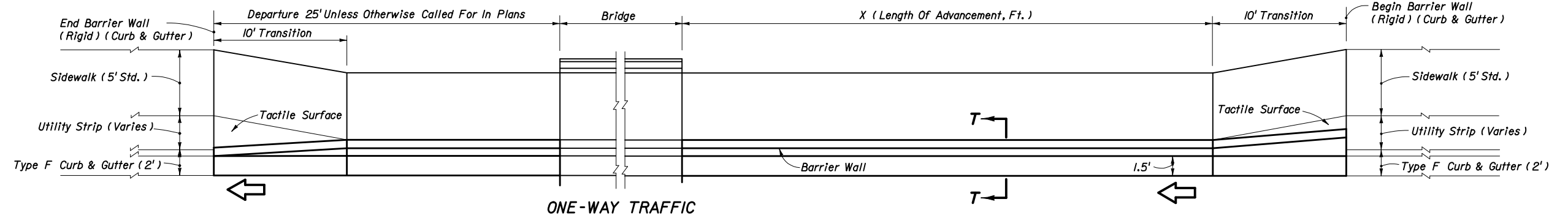
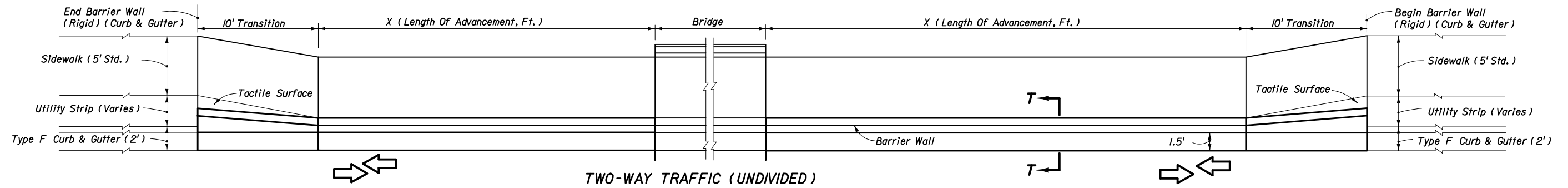
WITH GRASSED OR PAVED SHOULDERS AND GUARDRAIL

△ Views show approach roadside barriers when length of need exceeds the length of either retaining walls with concrete traffic railings* or Reinforced Concrete Barrier Wall (Shoulder) on shoulders. When either of these rigid barriers alone satisfies the approach length of need, the wall ends shall be shielded by crash cushions, or, by guardrail the same as for bridge traffic rails, as detailed in Index No. 400.
See other flagged notes for trailing end treatments.
Miscellaneous asphalt paving under guardrail not shown.

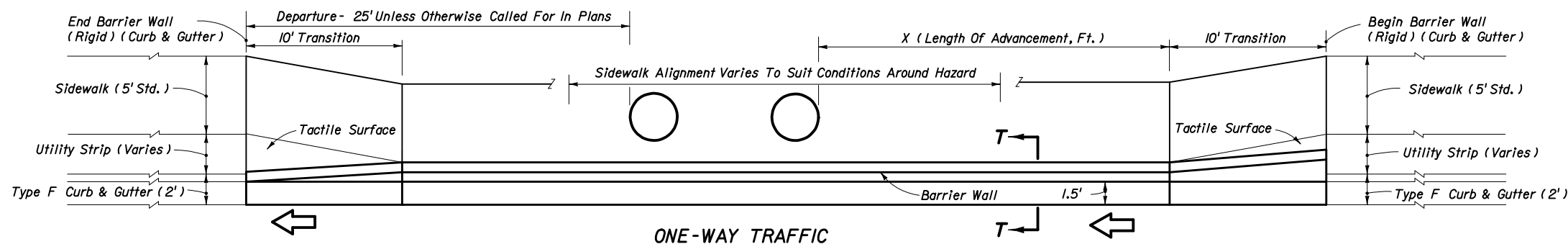
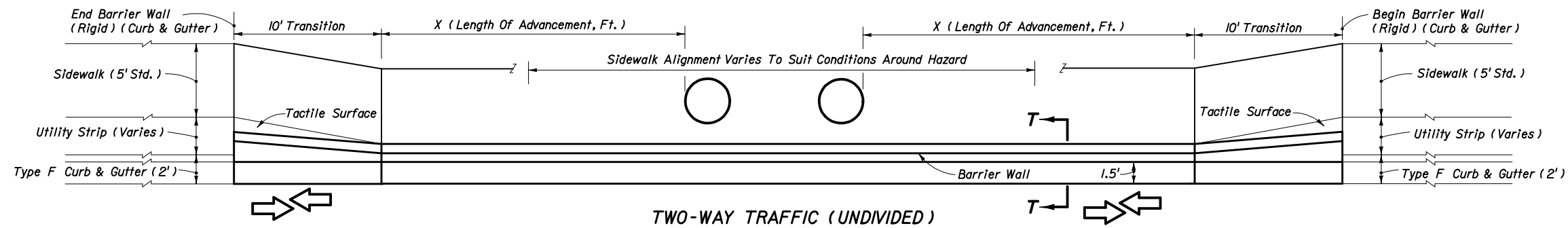
* Guardrail connection to concrete traffic railings on retaining walls shall be in accordance with the Structures Design Office Standard Drawings and the plans. Approach guardrail connections to shoulder concrete barrier walls shall be in accordance with the details shown on Sheets 2 and 20 of this Index and Index No. 400, Detail J.
● End measurement for guardrail payment when guardrail connected to shoulder barrier walls. See Index No. 400, Detail J for end measurement when guardrail connected to concrete traffic rails constructed with approach slab or on retaining walls.

☑ To be deleted on trailing ends except for 2-lane 2-way facilities. The tangent guardrail shall be anchored by End Anchorage Type II, Index No. 400.
☑ To be deleted on trailing ends except for 2-lane 2-way facilities.

**EITHER REINFORCED CONCRETE BARRIER WALL (SHOULDER) OR RETAINING WALL WITH CONCRETE TRAFFIC RAILING △
CONCRETE BARRIER WALLS ON APPROACHES TO BRIDGES**



BRIDGE END HAZARD



HAZARD 4' OR LESS FROM FACE OF CURB

**CONCRETE BARRIER WALL (RIGID) (CURB & GUTTER)
CURB AND GUTTER WITH UTILITY STRIP AND WITH ADJACENT BICYCLE LANE**

NOTE:
 X = Length of advancement in feet for near and opposing approach lanes. See Sheet 12.
 For locations without utility strips see Sheet 9.
 For transition, sidewalk and sectional details see Sheets 10 & 11.
 The 1.5' 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 detail on Sheet 19.

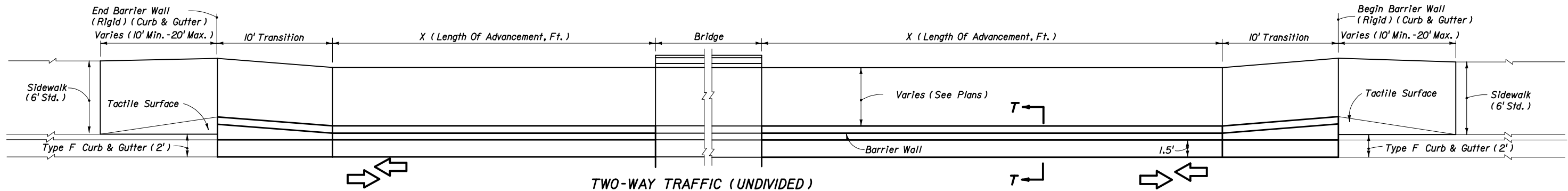


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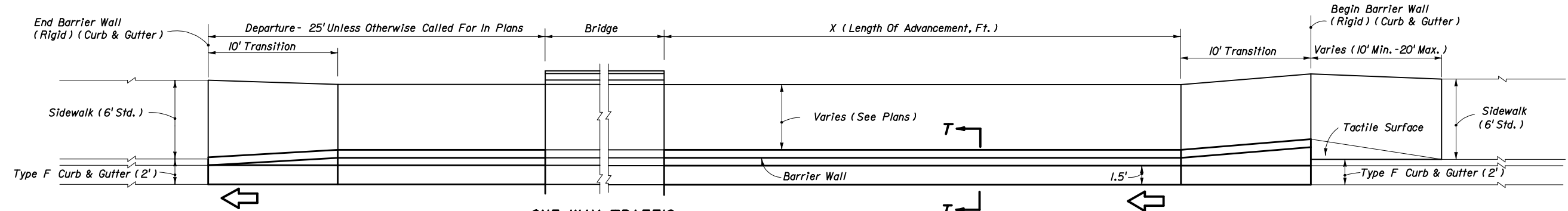
CONCRETE BARRIER WALL

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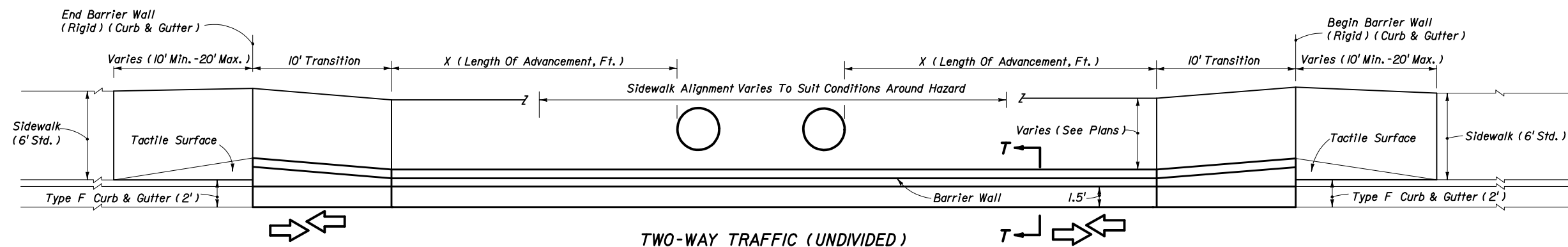


TWO-WAY TRAFFIC (UNDIVIDED)

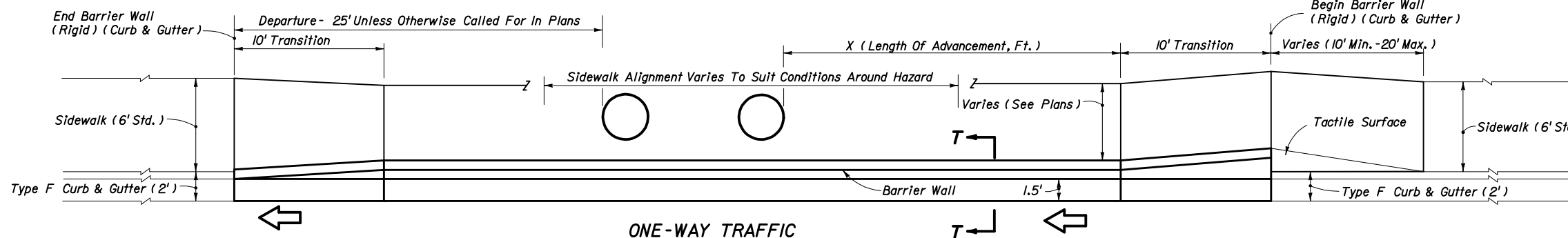


ONE-WAY TRAFFIC

BRIDGE END HAZARD



TWO-WAY TRAFFIC (UNDIVIDED)



ONE-WAY TRAFFIC

HAZARD 4' OR LESS FROM FACE OF CURB

NOTE:
 X = Length of advancement in feet for near and opposing approach lanes. See Sheet 12.
 For locations with utility strips see Sheet 8.
 For transition, sidewalk and sectional details see Sheet 10 & 11.
 The 1.5' 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 detail on Sheet 19.

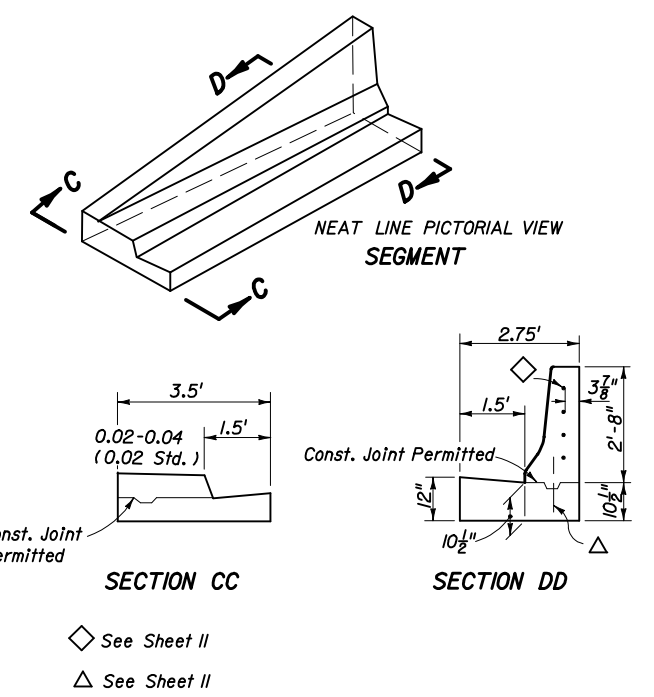
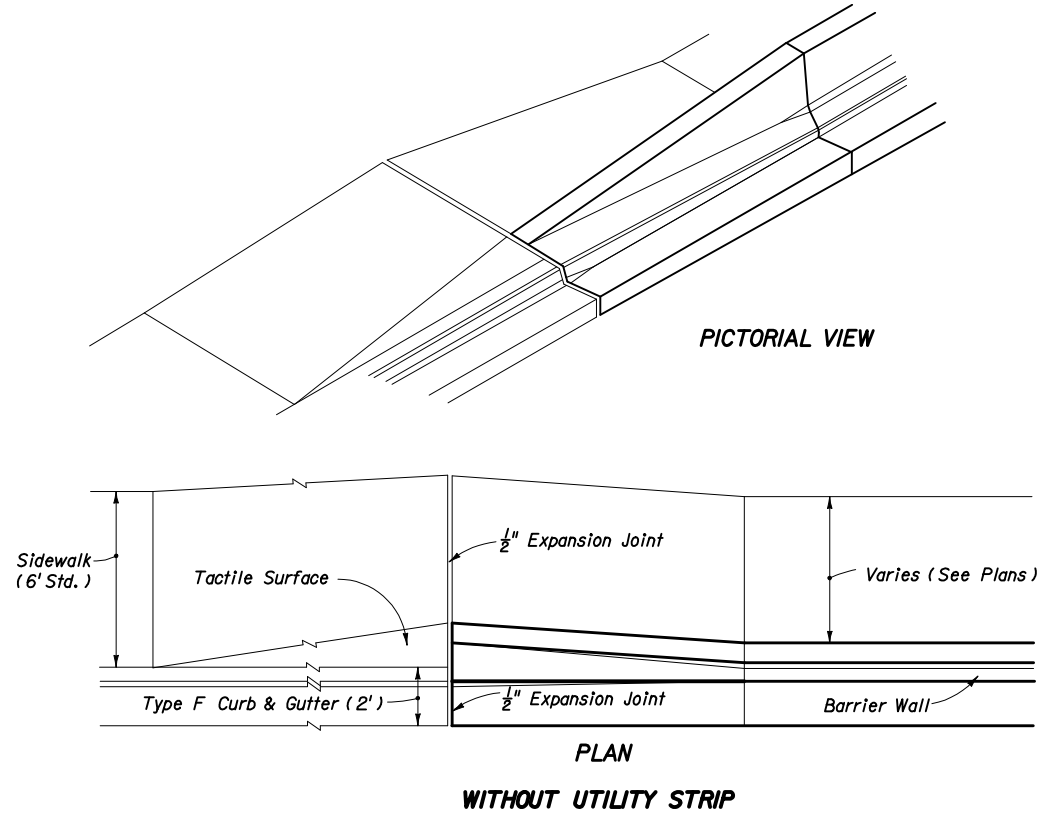
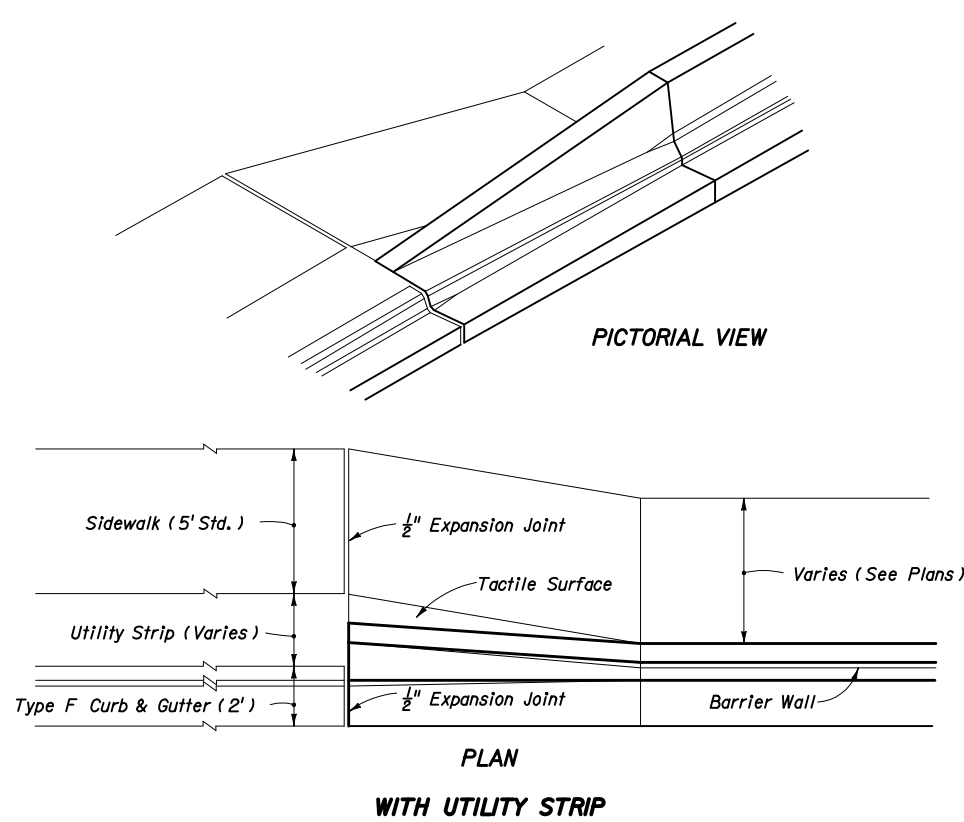
**CONCRETE BARRIER WALL (RIGID) (CURB & GUTTER)
 CURB AND GUTTER WITHOUT UTILITY STRIP AND WITH ADJACENT BICYCLE LANE**



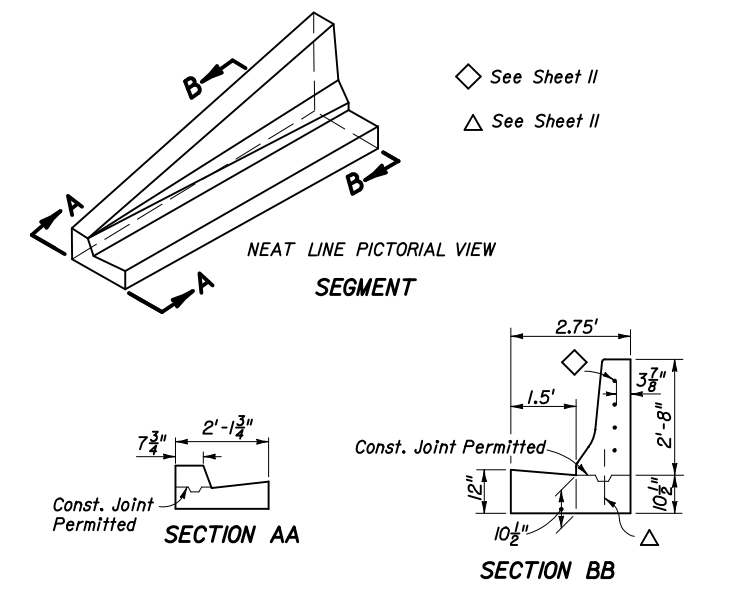
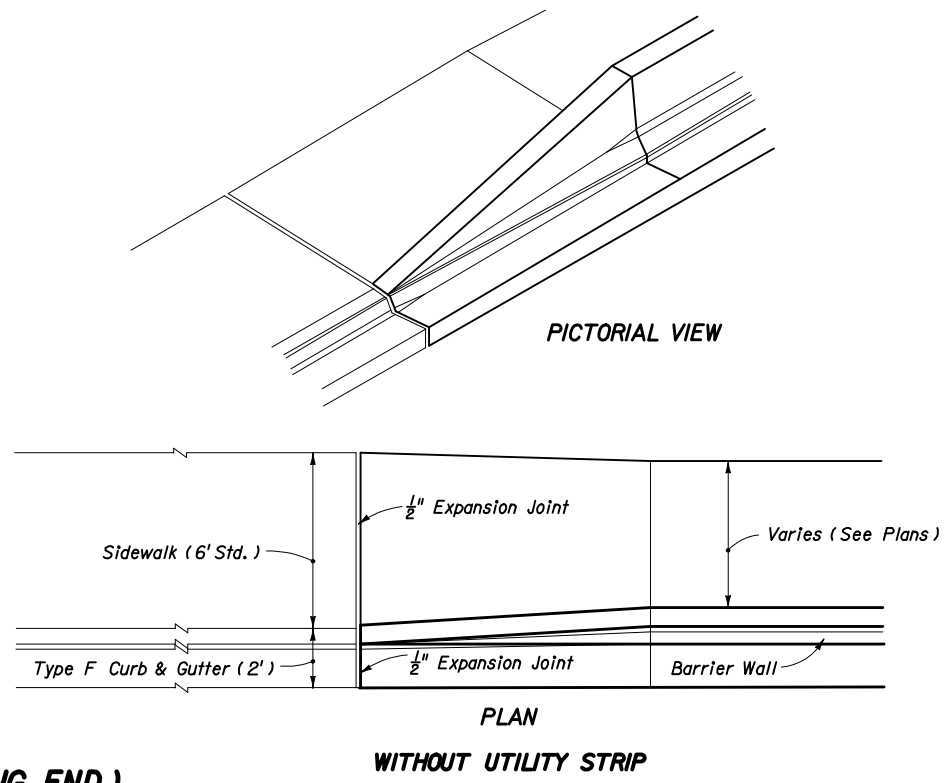
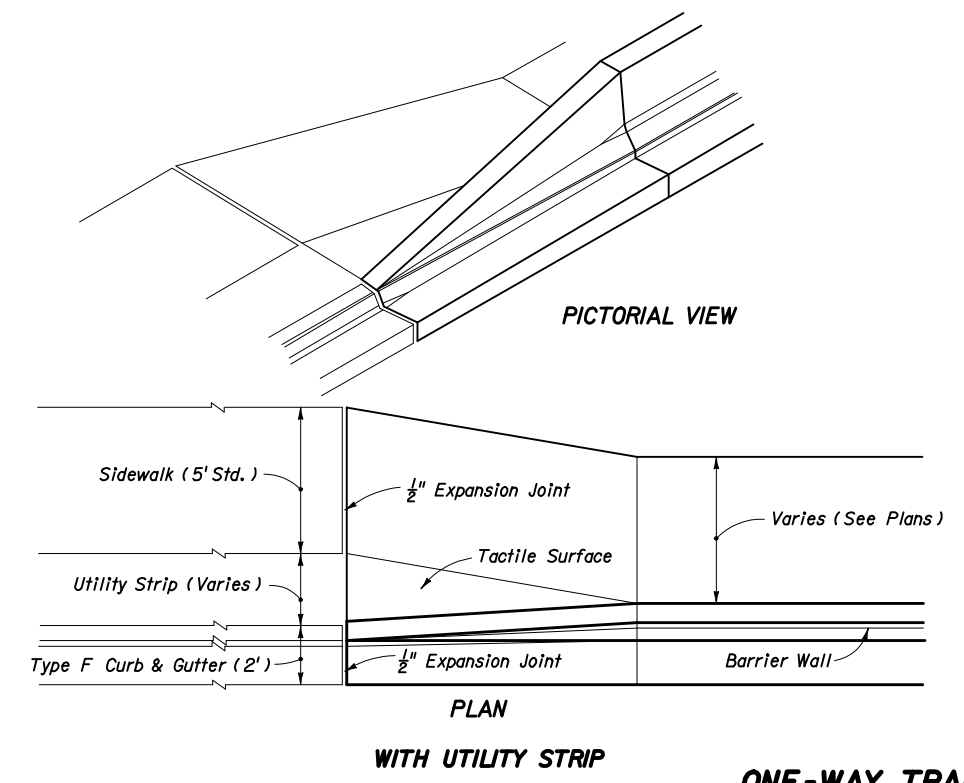
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CONCRETE BARRIER WALL

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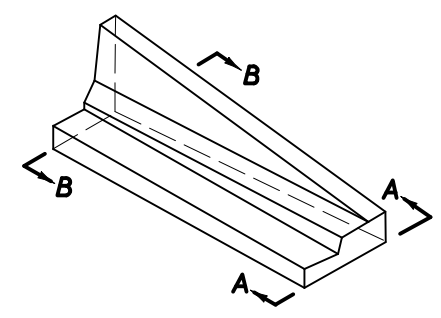
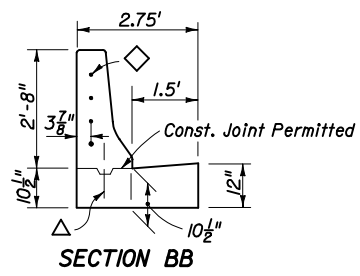


TWO-WAY TRAFFIC (OPPOSING LANE APPROACH)

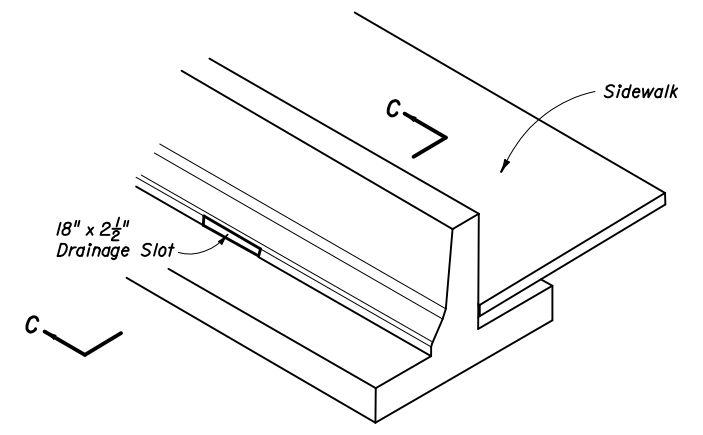
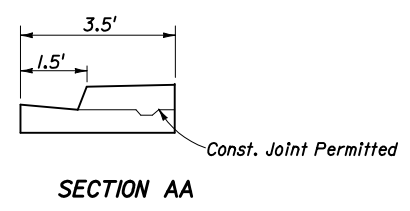


ONE-WAY TRAFFIC (TRAILING END)

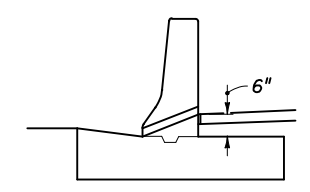
CONCRETE BARRIER WALL (RIGID) (CURB & GUTTER) • TRANSITION SEGMENTS • WITH ADJACENT BICYCLE LANE



WITH OR WITHOUT UTILITY STRIP
NEAT LINE PICTORIAL VIEW



NEAT LINE PICTORIAL VIEW

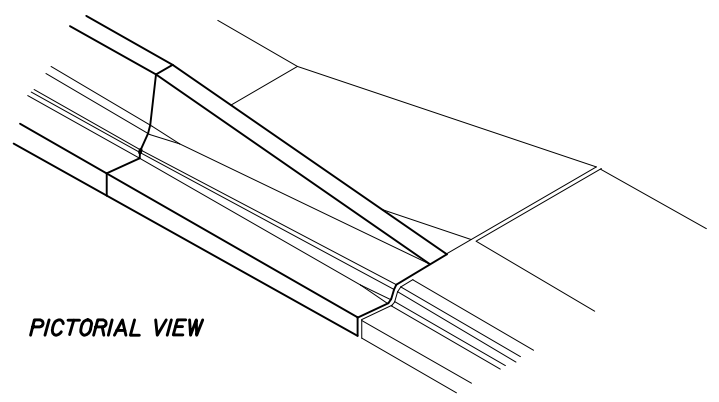


SECTION CC

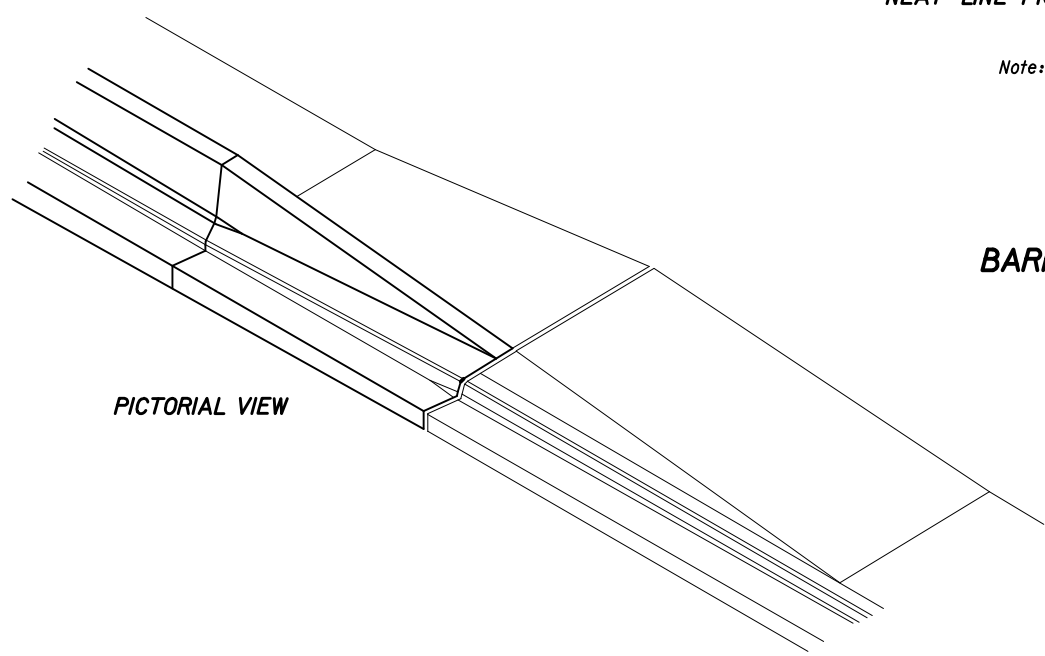
◇ See Notes This Sheet
△ See Notes This Sheet

Note: 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' in cut sections. Slots shall be located such that only one bar is cut away or deleted in front and back lines of vertical reinforcement.

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



PICTORIAL VIEW

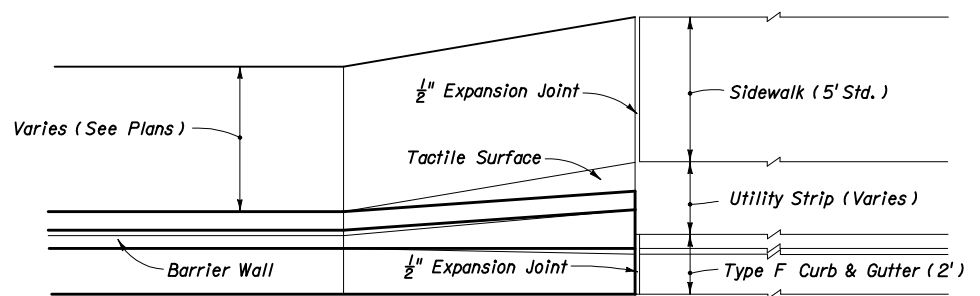


PICTORIAL VIEW

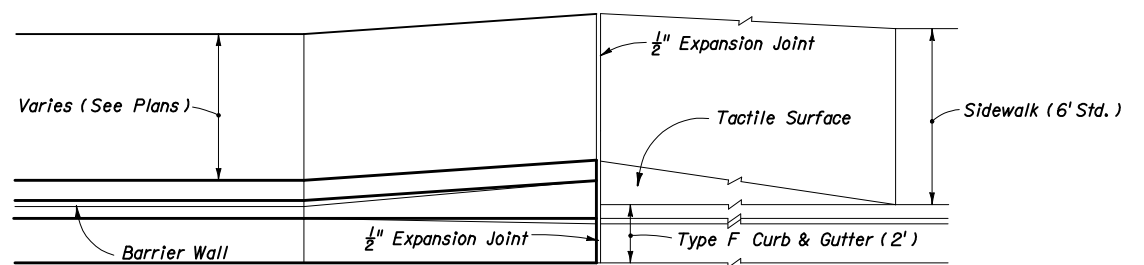
NOTE:

◇ Transition Segments Shall Be Doweled Into The End Of The Barrier Wall In The Following Manner:
Four 1 1/4" diameter holes 6" deep on 6" centers shall be drilled in the end of the barrier and #6 bars 15" long set in epoxy mortar. The ends of the dowels extending into the transition segment shall be wrapped with one layer of 15 lb. Type I asphalt-saturated roofing felt with the ends crimped.

△ When Construction Joints Are Utilized For Transition Segment Construction The Stem Shall Be Doweled To The Footing In The Following Manner:
Five #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.



PLAN
WITH UTILITY STRIP



PLAN
WITHOUT UTILITY STRIP

RIGHT SIDE SHOWN, LEFT SIDE OPPOSITE HAND
ONE-WAY AND TWO-WAY TRAFFIC (NEAR LANE APPROACH)

CONCRETE BARRIER WALL (RIGID) (CURB & GUTTER) • TRANSITION SEGMENT • WITH ADJACENT BICYCLE LANE



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