Index 410
Concrete Barriers

ORIGINATION

Date: September 5, 2017
Name: Richard Stepp
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COMMENTARY

Redesign all concrete sections and reinforcing details for Single-Slope Barriers as part of the MASH Implementation Plan. Reorganize and redevelop all Index Sheets to improve quality, including the redrawing of all details to scale and the rewriting of all notes for added clarity.

The FDOT is adopting Single-Slope Concrete Barriers and Pier Protection Barriers per the Design Bulletins Below:
http://www.fdot.gov/design/bulletins/RDB16-02.pdf
http://www.fdot.gov/design/bulletins/RDB16-04.pdf

COMMENTS AND RESPONSES

BLACK = Industry Review Comments **RED** = Standard Plans Response

Name: Daniel Strickland
Date: Wednesday, September 27, 2017 9:03 AM

COMMENT:
The barrier delineator chart was removed from sheet one and a reference to Spec 705 for delineator spacing was added to the General Notes. Since the current Spec 705 doesn't address spacing, are you planning to revise this Spec to include the specific spacing requirements?

RESPONSE:
Date: 10/12/17

Yes, Specification Section 705 will be revised to provide delineator spacing in next eBook release. Okay as-is.

Name: Jimmy Greeson
Date: Tuesday October 3, 2017 4:42 PM

COMMENT:

1. Longitudinal V-Grove – We are asking that the ½" V-Grove be removed from the standard. This is going to cause a lot of headache for both slip-form and hand form barrier.
    a. In slip-form, any jump, or knock, or movement in the machine what-so-ever will show up in the face of the wall. By adding this V-Grove, this will be magnified. It will be an "eye sore".
    b. The Concrete Finishers will have a very difficult task of trying to finish around the V-Grove. As you know, behind the slip-form machine, finishers have to quickly wipe the walls using trowels, darbies, and brooms. Trying to keep from filling in this ½" grove while working 1"-2" above finished grade is going to add in labor costs.
    c. Any type of material that runs down the wall is subject to fill in the grove.
    d. When forming by hand, it will be almost impossible to match up the V-Grove between sections.
    e. Asphalt folks are going to have a time with this, too. If the asphalt roller drum gets too close to the V-Grove, they run the risk of the barrier cracking along this longitudinal grove. The ½" grove creates a weak plane. If the roller does not roll the asphalt down even at the edge against the wall (as they are subject to do), the asphalt can cover / fill in the V-Grove.
    f. General Note #9 gives a tolerance of ½" to the finish grade pavement. This will result in the pavement fluctuating up and down, which WILL NOT be visually smooth and even. The V-Grove will be creating a line that shows every little fluctuation in finished grade. At this point, what will you do? What will be done?
    How will the V-Grove be handled when transitioning to a bridge? Will the transition have the grove, or will it play out along the transition, or just abruptly stop at the beginning of the transition?

2. Continuous Steel – General Note number 6 references the Construction Joints.
    a. It states that there are no requirements to accommodate concrete expansion or contraction joints, and to maintain continuous steel across the joints. This is a recipe for argument on random cracks in the wall. We would recommend that the standard either require the joints or say no joints. At least this will put all the contractors constructing them the same way. But without joints and the steel being continuous, the barrier is going to have random cracking. We can construct the barrier per spec, under the watchful eye of the FDOT inspector, and we will still have cracking in the barrier. The contractor cannot be held responsible for random cracks of any size and location in barrier that is built this way. There is nothing that can be done to prevent it. Building barriers with continuous steel and no joints will ALWAYS result in random cracking. What is the FDOT's position on this?

3. 38" Road Barrier VS. 36" Bridge Barrier
    a. This has been mentioned before, but the roadway barrier and bridge barrier heights need to match. By making them the same, you will allow the contractors to slip-form the roadway right up to the bridge and continue over the bridge and off the other end of the bridge. With the difference in height, width, and batter, this is impossible to do without stopping and changing molds.
    b. A difference in the height will cause a barrier transition on each end of the bridge. This transition will be a triple transition. For example the median will transition down from 38" to 36" and also transition in the batter. Roadway has a single slope batter of 7 ¼", while the bridge has a batter of 7". The width across the top of the roadway median is 9 ½", while

bridge median has a 10” wide top. The same discrepancies apply to the outside barrier as well. These changes will result in additional costs to the state.

RESPONSE:
Date: 10/13/2017

1. Agreed. Longitudinal V-Grooves will be removed to lessen potential for construction complications and delays. Change made.

2. Agreed. Doweled Joint requirements will be added to require these expansion joints to be spaced at 100-foot maximum intervals for Median Barrier. Additionally, the contraction crack control V-grooves will be required at 20 foot intervals per past practice. Changes made.

3. The 38 inch height median barrier is designed to allow for 2” of additional future asphalt overlay while still meeting MASH requirements for minimum barrier height. The bridge Traffic Railing will not require accommodation of future asphalt overlay, so the Traffic Railing is kept as light-weight as possible for bridges. It is understood that slip form operations could stop and change setup configuration between bridge Traffic Railings and roadway Concrete Barrier. Okay as-is.

Name: Hailing Zhang, P.E.
Date: Friday, October 6, 2017 5:18 PM

COMMENT:

521-001: There are no details for dual upright median barrier mounted sign support (old Index 410 Sheet 5).

RESPONSE:
Date: 10/13/2017

New Sheet 6 of 22 handles this condition. Okay as-is.

Name: Karina Fuentes, P.E.
Date: Friday, October 6, 2017 5:18 PM

COMMENT:

1. Sheet 1 of 21 (General Notes):
    - Note 8 indicates the compaction (density) requirement for the top 12-in. of sub-grade. For consistency with the Specifications, it appears that the note should read "…..98% of the Modified Proctor maximum density……."
    - The compaction (density) requirement (98% of the Modified Proctor maximum density per FM 1-T180, Method D) is the same as given in the Specifications for STABILIZING (see Specs. 160-4.2.3.1 and 160-4.3.2.3). For consistency with the standard Roadway pavement stabilizing requirement shown in the Plans, please consider modifying the general note by indicating "Type B Stabilization, LBR 40 (12-in.)", rather than indicating the Specifications requirement. This should be specified at least for the standard median barrier (2-ft. wide at bottom) where the Type B Stabilization would be extended below the barrier from the adjacent roadways.
    - General: Please consider indicating that the cost of stabilizing is to be included in the cost of the barrier in the note for stabilizing below the barriers and footings.
2. Sheet 2 of 21:
    - Median Barrier (Section A-A): The Finish Grade label on the left indicates "(shoulder or roadway pavement)". Suggestion to not indicate "roadway" since it is only shoulder that is adjacent to the barrier. Same applies to other sheets throughout the Index.
    - General: Suggestion to show the dimensions for the chamfer at the top of barrier (previously, it showed ¾" radius).
3. Sheet 5 of 21:
    - Tall-Grade Section Dimension Table: Suggestion to show a height (Y) of >9" to 1'-0" in the first column, since the 'Short Grade Separated Section' is for Y</= to 9".
    - Tall-Grade-Separated Heel Footing Section: When the height (Y) between adjacent pavements is small (for example, Y=1'-0"), it may not be possible to construct the full depth of the roadway stabilization thickness, and the roadway pavement base would be close to or atop of the footing. This may create a potential for longitudinal cracking of the roadway flexible pavement along the tip of the footing, since footing is much stiffer than the roadway embankment. Should consider increasing the 10-in. vertical dimension.
    - Tall Grade-Separated Toe Footing Section: It shows the 10-in. vertical dimension from the top of the shoulder pavement to the top of footing. Same comment as above with regard to potential longitudinal cracking.
    - General: Suggestion to include a note (or detail) to provide longitudinal expansion joint when rigid (concrete) pavement is used adjacent to barriers.

RESPONSE:

Date: 10/13/2017

1. Sheet 1 of 21 (General Notes):
   - Note 8 indicates the compaction (density) requirement for the top 12-in. of sub-grade. For consistency with the Specifications, it appears that the note should read "…..98% of the Modified Proctor maximum density……."
   - The compaction (density) requirement (98% of the Modified Proctor maximum density per FM 1-T180, Method D) is the same as given in the Specifications for STABILIZING (see Specs. 160-4.2.3.1 and 160-4.3.2.3). For consistency with the standard Roadway pavement stabilizing requirement shown in the Plans, please consider modifying the general note by indicating "Type B Stabilization, LBR 40 (12-in.)", rather than indicating the Specifications requirement. This should be specified at least for the standard median barrier (2-ft. wide at bottom) where the Type B Stabilization would be extended below the barrier from the adjacent roadways.
     Agreed. Change made.
   - General: Please consider indicating that the cost of stabilizing is to be included in the cost of the barrier in the note for stabilizing below the barriers and footings.
     Agreed. The cost of additional stabilization
     This will be added to Index or Spec 521. Change made.
2. Sheet 2 of 21:
   - Median Barrier (Section A-A): The Finish Grade label on the left indicates "(shoulder or roadway pavement)". Suggestion to not indicate "roadway" since it is only shoulder that is adjacent to the barrier. Same applies to other sheets throughout the Index.
     Agreed. Changes made.
   - General: Suggestion to show the dimensions for the chamfer at the top of barrier (previously, it showed ¾" radius).
     This topic is addressed in Specification Section 400, which is referenced by Specification 521. Okay as-is.
3. Sheet 5 of 21:
   - Tall-Grade Section Dimension Table: Suggestion to show a height (Y) of >9" to 1'-0" in the first column, since the 'Short Grade Separated Section' is for Y</= to 9".
     To conservatively apply the table, it's implied that Width, W, handles up to the Height Y shown above it. That said, we can make this clearer by labeling Y as "Max." Height. Change made.
   - Tall-Grade-Separated Heel Footing Section: When the height (Y) between adjacent pavements is small (for example, Y=1'-0"), it may not be possible to construct the full depth of the roadway stabilization thickness, and the roadway pavement base would be close to or atop of the footing. This may create a potential for longitudinal cracking of the roadway flexible pavement along the tip of the footing, since footing is much stiffer than the roadway embankment. Should consider increasing the 10-in. vertical dimension.
     This will remain as-is per past practice. Okay as-is.
   - Tall Grade-Separated Toe Footing Section: It shows the 10-in. vertical dimension from the top of the shoulder pavement to the top of footing. Same comment as above with regard to potential longitudinal cracking. See above.
   - General: Suggestion to include a note (or detail) to provide longitudinal expansion joint when rigid (concrete) pavement is used adjacent to barriers.
     This will remain as-is per past practice. Okay as-is.

Name: Jay Cooper, P.E.
Date: Friday, October 6, 2017 5:18 PM
COMMENT:

Sheet 1:

1. Is there a maximum # of allowable joints?

2. Tolerances (and/or options for contractor to increase bottom cover) for footing mat steel cover from the dirt?

Sheet 2:

3. A reverse key?

4. Why is this (Traffic Railing Connection Note) necessary?
   Does this apply to existing traffic railings? If so, that will require drilling into the existing railings.

Sheet 5:

5. Is purpose of Bar 4C1 solely to keep the two #4 longitudinal bars at the top of the wall?
   This hoop bar will not be very rigid (unless 4 points of contact are tied) and would often "rack" during slipforming. I would suggest making it optional and allowing slipform mold to have "tunnels" to feed the 2 #4 bars (as is currently done with the 2 bars in current Standard and VH walls Y<=6"

6. If Bar 4C1 has to remain in drawing, at what height (e.g. Y>2") is it required?

7. This should be reduced to 2.5" or the bottom cover for the 38" Height and Short Grade-Separated barriers should be increased to 3" for better continuity across the different sections

8. Where is Bar 4Y?

9. Are there any requirements for this surface of these joints (e.g. Note 4 of Sheet 2)?

10. It will be difficult to order bars with correct lengths for splicing on the low side profile for walls with Y-values less than 18" because the splice would have to extend into the single slope profile. Each bar would have to be field bent (because the Y-value changes)--this costs extra. How important is this splice?

11. Spacing needs to be identified (longitudinal bars in footing).

12. Does this note conflict with (or supersede) Note 8 on Sheet 2? (Comment points to Note 3, reduced vertical steel spacing requirement)

Sheet 14:

13. Note 2, Highlight “Connect Differing Median Barrier sections”

RESPONSE:
Date: 10/13/2017

Sheet 1:

1. Is there a maximum # of allowable joints?
   No, there is no limit on quantity of construction joints. Okay as-is.

2. Tolerances (and/or options for contractor to increase bottom cover) for footing mat steel cover from the dirt?
   Agreed. We will add the option of allowing footing bottom concrete cover to vary by an additional 2” from what is shown. Change made.

Sheet 2:

3. A reverse key?
   Agreed. Change made.

4. Why is this (Traffic Railing Connection Note) necessary?
   Does this apply to existing traffic railings? If so, that will require drilling into the existing railings.
   The connection to Traffic Railings via Doweled Joint is required, moving forward, to prevent differential deflection and vehicle snagging upon errant vehicle impact for MASH impact loads. Yes, this requires drilling into existing railings. Okay as-is.

Sheet 5:

5. Is purpose of Bar 4C1 solely to keep the two #4 longitudinal bars at the top of the wall?
   This hoop bar will not be very rigid (unless 4 points of contact are tied) and would often "rack" during slipforming. I would suggest making it optional and allowing slipform mold to have "tunnels" to feed the 2 #4 bars (as is currently done with the 2 bars in current Standard and VH walls Y<=6"
   Bars 4C1 are required for structural integrity purposes. Okay as-is.

6. If Bar 4C1 has to remain in drawing, at what height (e.g. Y>2") is it required?
   Agreed. Will add a note to use Bars 4C1 where required for segments where Y is 2” or greater. Change made.

7. This should be reduced to 2.5" or the bottom cover for the 38" Height and Short Grade-Separated barriers should be increased to 3" for better continuity across the different sections
   Agreed. Change made.

8. Where is Bar 4Y?
   The callout is now updated to Bar 4V1. Change made.

9. Are there any requirements for this surface of these joints (e.g. Note 4 of Sheet 2)?
   No. Okay as-is.

10. It will be difficult to order bars with correct lengths for splicing on the low side profile for walls with Y-values less than 18" because the splice would have to extend into the single slope profile. Each bar would have to be field bent (because the Y-value changes)--this costs extra. How important is this splice?
    The splice is important on both sides for impact moment capacity. Per our discussion, freedom of steel configuration is permitted per the notes to maintain continuous equivalent steel in locations shown by whatever method is preferred by each contractor to accommodate the varying heights. Okay as-is.

11. Spacing needs to be identified (longitudinal bars in footing).
    The "No. 4 Bars @ 8" Sp. Max. (Typ.)" callout defines the max. spacing for these footing bars using the "Typical" or "Typ." label. Additionally, the small quantity of bars drawn is visually evident. Okay as-is.

12. Does this note conflict with (or supersede) Note 8 on Sheet 2? (Comment points to Note 3, reduced vertical steel spacing requirement)
    No. As the note provides, this is an additional requirement for the specific case of Transverse Joints in "Tall Grade-Separated Sections" not requiring continuous steel across the joint. That said, free ends would not be expected to occur where adjacent shoulder grades are at largely different elevations, so no free end reinforcing is provided specifically for these sections (they would be transitioned to symmetrical Median Barrier on Sheet 2 before ending, if not connecting to a Traffic Railing). Okay as-is.

<u>Sheet 14:</u>

13. Note 2, Highlight "Connect Differing Median Barrier sections"
    Agreed. Should read "Shoulder Barrier sections". Change made.

Name: Keith Waugh
Date: Tuesday, September 26, 2017 2:27 PM

COMMENT:
It just hard to understand why roadway wall will be 38" and bridge wall will be 36".

RESPONSE:
Date: 10/12/17

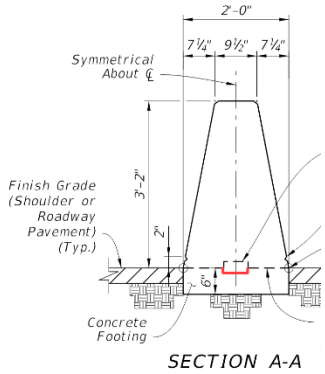
The 38 inch height median barrier is designed to allow for 2" of additional future asphalt overlay while still meeting MASH requirements for minimum barrier height. The bridge Traffic Railing will not require accommodation of future asphalt overlay, so the Traffic Railing is kept as light-weight as possible for bridges. It is understood that slip form operations could stop and change setup configuration between bridge Traffic Railings and roadway Concrete Barrier. Okay as-is.

Name: Stephanie Sharp, P.E., FTE compiled comments
Date: Friday, October 6, 2017 5:18 PM

COMMENT:

General

1. Index does not have language or details to account for RRR projects where we often times need to raise the roadway elevation. In the past, we've been allowed to use up the 3" reveal. With the reveal gone, is 3" (or more) of the barrier still available to designer for overlays? How will this information be communicated to the designers; FDM or Standard Plans?
2. Similar to question above, how will the barrier wall height be maintained when shoulder rocking is proposed?
3. Will there be details included on transitioning single slope concrete barrier to f-shape concrete barrier?
4. *Sheet 2 of 21* – Regarding Section A-A, the shear key seems like it would be easier to construct if it were facing down into the first pour instead of up into the second pour (see below).



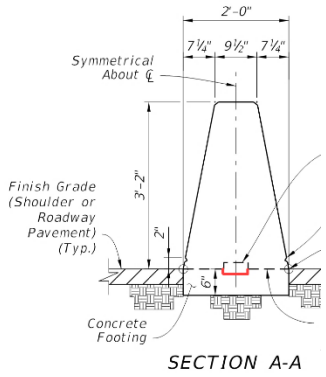
5. *Sheet 11 of 21* –Contains details for transitioning the new single slope median barrier back to existing F-Shape Median Roadway Barrier. Is this detail also intended to be used for transitioning to existing F-Shape Median Bridge Barrier?
6. If not, is this detail provided elsewhere in the Standard Plans?
7. If elsewhere, consider including a note directing the contractor to the appropriate index for such transitions.

8. *Sheet 11 of 21* –Is this detail also intended to be used for transitioning to existing F-Shape Bridge Shoulder Barrier?
9. If not, is this detail provided elsewhere in the standard plans?
10. If elsewhere, consider including a note directing the contractor to the appropriate index for such transitions.

RESPONSE:
Date: 10/13/2017

1. Index does not have language or details to account for RRR projects where we often times need to raise the roadway elevation. In the past, we've been allowed to use up the 3" reveal. With the reveal gone, is 3" (or more) of the barrier still available to designer for overlays? How will this information be communicated to the designers; FDM or Standard Plans?
   There is currently no existing policy for additional pavement; District variations will be evaluated on a case-by-case basis. The previous F-Shape did have a built-in 3" additional height above NCHRP350 compliance, and the new Single-Slope barrier has a built-in 2" additional height above MASH compliance. Okay as-is.
2. Similar to question above, how will the barrier wall height be maintained when shoulder rocking is proposed?
   See previous. Okay as-is.
3. Will there be details included on transitioning single slope concrete barrier to f-shape concrete barrier?

   Yes, see Sheets 11 and 18. Okay as-is.
4. *Sheet 2 of 21* – Regarding Section A-A, the shear key seems like it would be easier to construct if it were facing down into the first pour instead of up into the second pour (see below).



SECTION A-A

   Agreed. Will update to allow for inverted shear key. Change made.

5. *Sheet 11 of 21* –Contains details for transitioning the new single slope median barrier back to existing F-Shape Median Roadway Barrier. Is this detail also intended to be used for transitioning to existing F-Shape Median Bridge Barrier?

   Yes, the end shapes are compatible between all combinations of Traffic Railing and Concrete Barrier of both F-Shape and Single-Slope. The detail and note generically references F-Shape "Section" to accommodate both Traffic Railing and Barrier (which have the same face shape, historically compatible) Okay as-is.
6. If not, is this detail provided elsewhere in the Standard Plans?

   See previous. Okay as-is.

7. If elsewhere, consider including a note directing the contractor to the appropriate index for such transitions.

   See previous. Okay as-is.

8. *Sheet 11 of 21* –

   Is this detail also intended to be used for transitioning to existing F-Shape Bridge Shoulder Barrier?

   See Sheet 11 response. Okay as-is.

9. If not, is this detail provided elsewhere in the standard plans?

   See previous. Okay as-is.

10. If elsewhere, consider including a note directing the contractor to the appropriate index for such transitions.

    See previous. Okay as-is.

SHEET NO.	CONTENTS
1	Index Contents; General Notes
2	Median Barrier
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4	Median Barrier – Sloped End Treatment
5	Median Barrier – Grade Separated
6	Median Barrier – 56" Height Section for Barrier-Mounted Sign Support Shielding – Symmetrical
7	Median Barrier – 56" Height Section for Barrier-Mounted Sign Support Shielding – Asymmetrical
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9	Median Barrier – 44" Height Split Section for Pier Shielding
10	Median Barrier – 44" Height Split Section for Pier Shielding – Details
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15	Shoulder Barrier – Section Options (Continued)
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18	Shoulder Barrier – Connection to F-Shape
19	Curb and Gutter Barrier
20	Curb and Gutter Barrier Details
21	Reinforcing Bar Bending Diagrams

Added Sheet 22, Specifically for Sloped End Treatment details

Removed longitudinal V-grooves throughout (all Index Sheets)

Width of Doweled joint changed to 3/4" throughout (all Index Sheets)

Removed "Roadway" Pavement callout throughout (all Index Sheets)

Removed expansion and contraction joint statement

Updated to require Doweled Joints for expansion joint purpose in Median Barrier only

Updated to instead reference equivalent "Type B Stabilization"

Added General Notes for "Crack Control V-groove" and "Footing Bottom Concrete Cover"

GENERAL NOTES:

1. CONCRETE: Use Class II concrete for all barriers constructed in slightly aggressive environments, and use Class IV Concrete for all barriers constructed in moderately or extremely aggressive environments. On all exposed surfaces, apply a Class 3 surface finish in accordance with Specification 400.

2. STEEL BAR REINFORCEMENT: Where required to maintain continuity, provide lap splices of at least 18 inches for No. 4 bars and 20 inches for No. 5 bars, unless otherwise shown herein (including shorter splices as provided by the default bar bending diagrams).

   The default reinforcing details shown herein, including bar shapes and lap splice positions, are intended to show required steel locations and provide for a constructible design. However, with the approval of the Engineer, alternate steel configurations may be used in the same locations shown herein, given that the equivalent strength reinforcing is provided and the cover, maximum spacing, and continuity requirements are maintained.

3. OPTIONAL WELDED WIRE REINFORCEMENT: With the approval of the Engineer, steel welded wire reinforcement in accordance with Specification 415 may be substituted for the steel bars shown herein. Place the welded wire in the same locations specified for the steel bars, and maintain the equivalent strength, cover, maximum spacing, and continuity requirements.

4. TOP FACE LONGITUDINAL REINFORCEMENT: Unless otherwise specified, the longitudinal reinforcement shown closest to the top face of the barrier has a maximum cover of 4½", measured from the top face of the barrier.

5. MINIMUM BARRIER LENGTH: Unless otherwise shown in the Plans, the minimum Concrete Barrier length is 40 feet.

6. CONSTRUCTION JOINTS: Install Construction Joints only as needed for discontinuous concrete casting or cold joints. There are no joint requirements specifically to accommodate concrete expansion or contraction. Maintain continuity of steel reinforcement across Construction Joints; reinforcement lap splices are permitted immediately adjacent to joints. Construction Joints are classified herein as Transverse Joints or Longitudinal Joints.

   Transverse Joints are permitted at 20 foot or greater intervals along the barrier. For Tall Grade-Separated Sections, see Sheet 5 for additional Transverse Joint requirements.

   Longitudinal Joints are only permitted where indicated in the following details and notes, with a vertical position tolerance of ± 1½" from the locations shown.

7. DOWELED JOINTS: If Transverse Joints lack continuity of steel reinforcement across the joint, substitute a ½" Doweled Joint as shown per the Dowel Details on Sheets 2 & 12. Doweled Joints are also required for Concrete Barrier connections to Pier Protection Barrier and Traffic Railings as shown. Doweled Joints are not permitted between Tall Grade-Separated Barrier segments.

8. SUBGRADE: Compact the top 12 inches of subgrade to a minimum of 98% of the maximum density per FM 1-T 180, Method D.

9. FINISH GRADE ELEVATION: At the barrier face location, the finish grade pavement has a vertical position tolerance of ± ½" from the locations shown herein, relative to the barrier elevation. Maintain visually smooth and even pavement at the barrier face, per the approval of the Engineer.

10. DRAINAGE INLETS: Where called for in the Plans, install corresponding inlets per Indexes 425-030 thru 425-032.

11. LIGHT POLE MOUNTING: Where called for in the Plans, install aluminum light poles per Index 715-002.

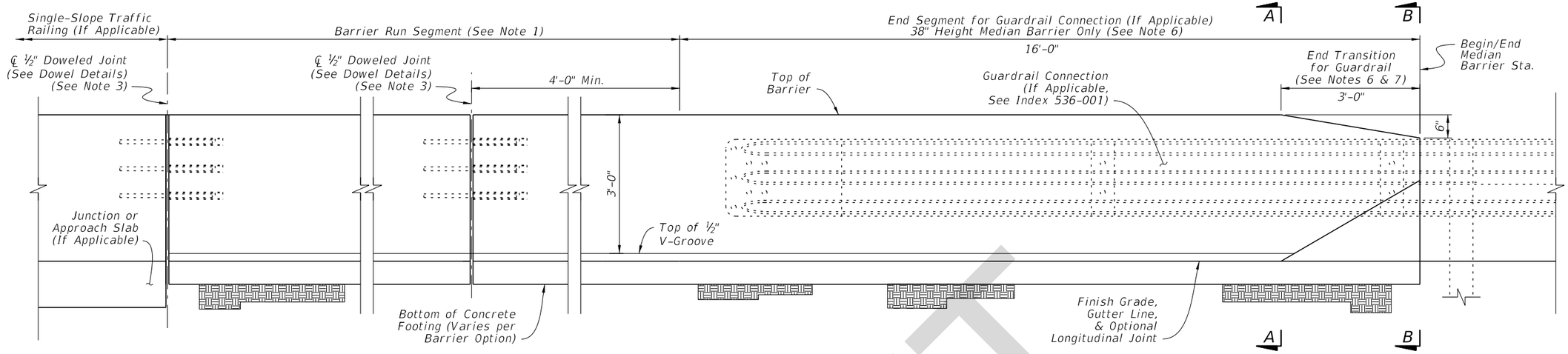
12. SUPPLEMENTAL GLARE SCREENS: Where called for in the Plans, install Glare Screens per Index 521-010.

13. BARRIER END MARKERS: For all free ends of concrete barriers that are not shielded with an end treatment or connection to another barrier or traffic railing type, install a Type 3 Object Marker on the end face per Specification 705.

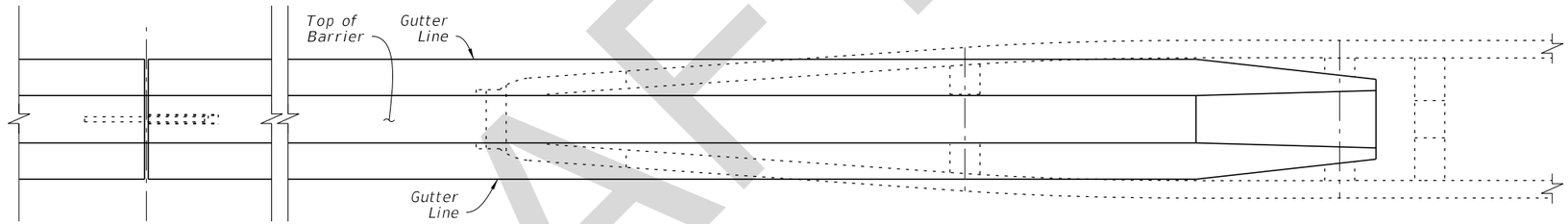
14. BARRIER DELINEATORS: Install Barrier Delineators in accordance with Specification 705. For median barriers, mount the delineator on the top of the barrier, at the centerline of barrier, with reflective sheeting facing traffic on both approaches. For shoulder barriers and split sections, mount the delineators on the top of the barrier, with the roadway side of the delineator located 2" from the front face of the barrier and the reflective sheeting facing traffic of the nearest approach.

15. LONGITUDINAL V-GROOVE: Where depicted herein, place a ½" V-Groove running longitudinally on the barrier face(s). Locate the top of the V-Groove at a point measured from the top of the barrier, at a vertical distance of the nominal barrier height minus 2".

9/26/2017 4:34:10 PM



ELEVATION

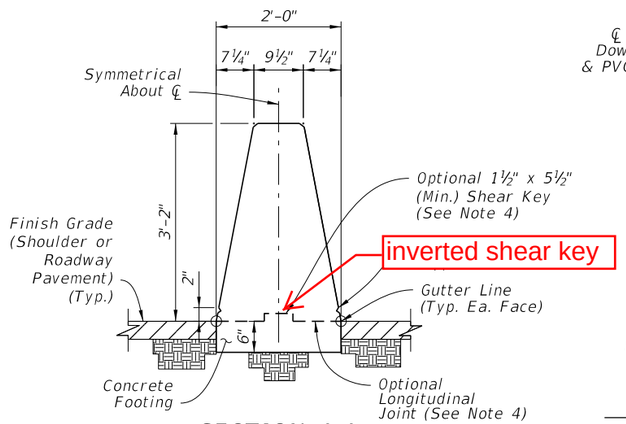


PLAN

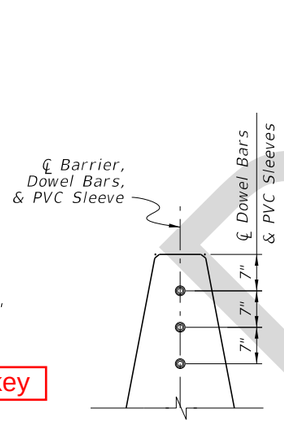
Removed longitudinal V-grooves throughout

Width of Doweled joint changed to 3/4" throughout

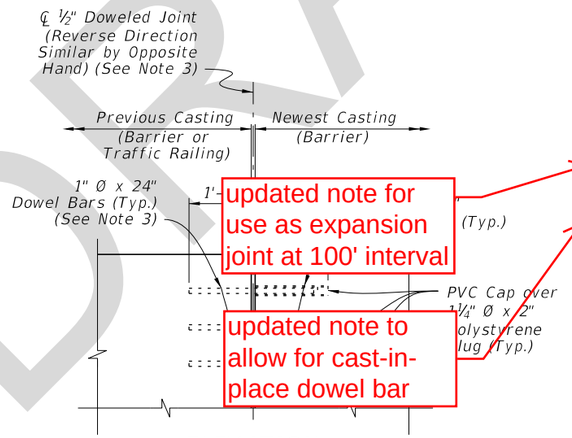
Removed "Roadway" Pavement callout throughout



SECTION A-A
38" HEIGHT MEDIAN BARRIER
(See Sheet 3 for Steel Reinforcing Details)



SECTION
DOWEL PLACEMENT



ELEVATION
DOWEL BAR & PVC
CONNECTION

DOWEL DETAILS

NOTES:

1. BARRIER RUN SEGMENT: Within the Barrier Run Segment, either the 38" Height Median Barrier or the differing Median Barrier sections shown throughout the Index may be placed as required per the Plans.
2. SECTION VIEWS: For additional Views A–A and B–B, see Sheet 3.
3. DOWELED JOINTS: See General Notes 6 & 7 on Sheet 1 for usage of joint types.

   Use ASTM A36 smooth round bars with hot-dip galvanization. For installation into existing structures, use adhesive bonded dowels in accordance with Specification Section 416. No load testing is required.

   Use 1¼" NPS Schedule 80 PVC pipe with a sealed cap as shown.
4. OPTIONAL LONGITUDINAL JOINT: When a longitudinal joint is placed above the footing, use the Optional 1½" x 5½" Shear Key shown. As a substitute for the Shear Key, the concrete footing's top surface may be raked to provide additional shear friction. Rake the fresh concrete surface so that about half of the surface area consists of approximately ¼" depth longitudinal grooves, distributed evenly and approved by the Engineer.
5. TRAFFIC RAILING CONNECTIONS: Align the barrier and Traffic Railing faces and connect with the ½" Doweled Joint.
6. GUARDRAIL CONNECTIONS: Connect Guardrail using the Transition Connections to Rigid Barrier per Index 536-001 in conjunction with the 16'-0" End Segment for Guardrail shown herein.
7. CRASH CUSHION CONNECTIONS: Connect Crash Cushions per Index 544-001 in conjunction with the 3'-0" End Transition for Guardrail as shown herein.
8. FREE ENDS: When the barrier end does not terminate with a Traffic Railing Connection, Guardrail Connection, Crash Cushion Connection, or Sloped End Treatment as called for in the Plans, terminate in accordance with the Free End Reinforcing detail on Sheet 3.

MEDIAN BARRIER

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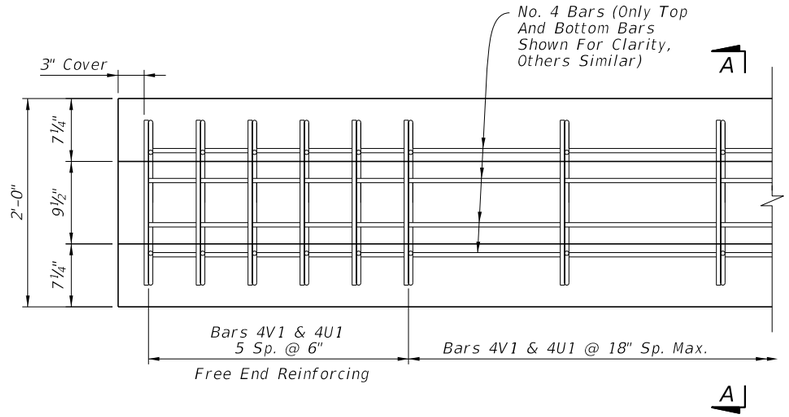
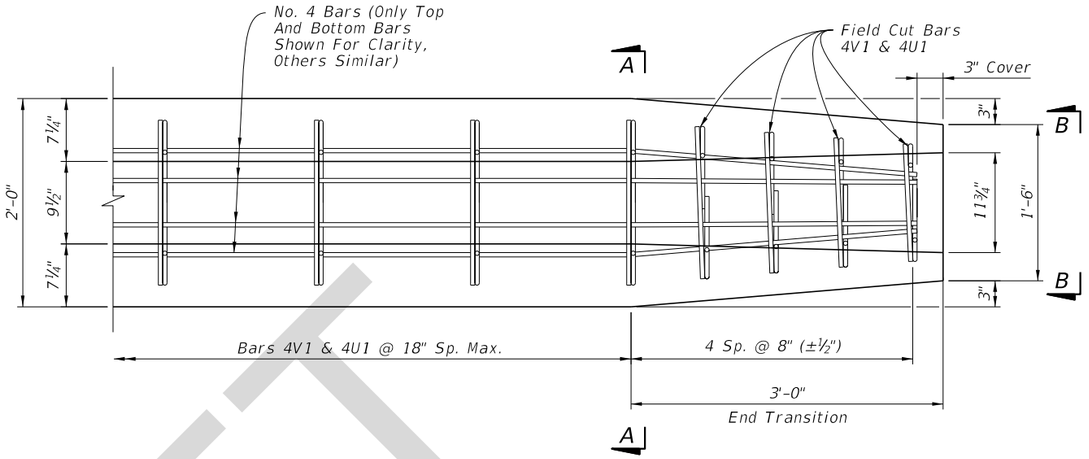
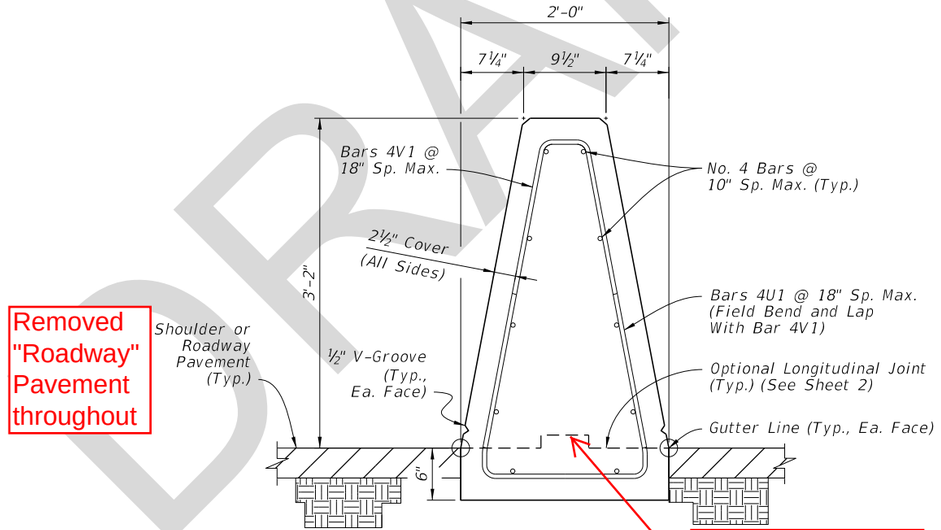


PLAN VIEW - 38" HEIGHT MEDIAN BARRIER
FREE END REINFORCING (See Note 3)

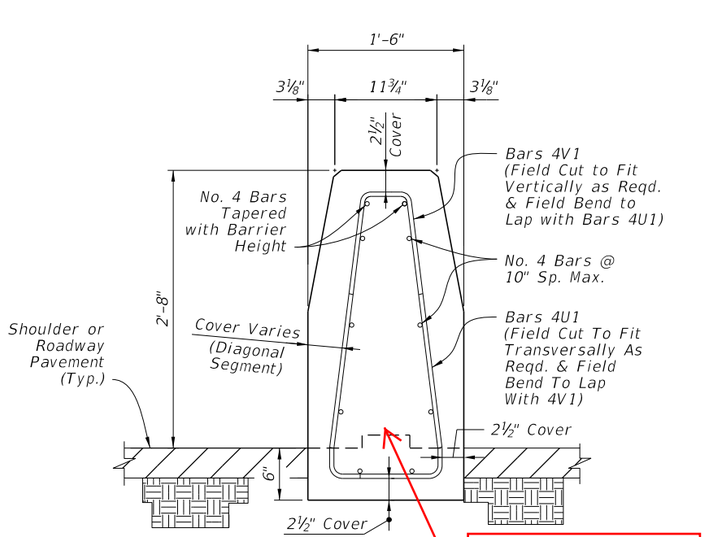


PLAN VIEW - END SEGMENT FOR
GUARDRAIL CONNECTION (See Note 3)



SECTION A-A
38" HEIGHT
MEDIAN BARRIER

Concrete Qty. = 0.20 CY/FT
Steel Qty. = 11.8 LB/FT



VIEW B-B
REDUCED SECTION
OF END TRANSITION

Removed "Roadway" Pavement throughout

NOTES:

1. GENERAL: Work with the Plan and Elevation Views on Sheet 2.
2. BAR BENDING DIAGRAMS: For additional information on Bars 4V1 and 4U1, see the details on Sheet 21.
3. PLAN VIEWS: Only top and bottom longitudinal reinforcing is shown for clarity. For all longitudinal steel locations, see the section views.

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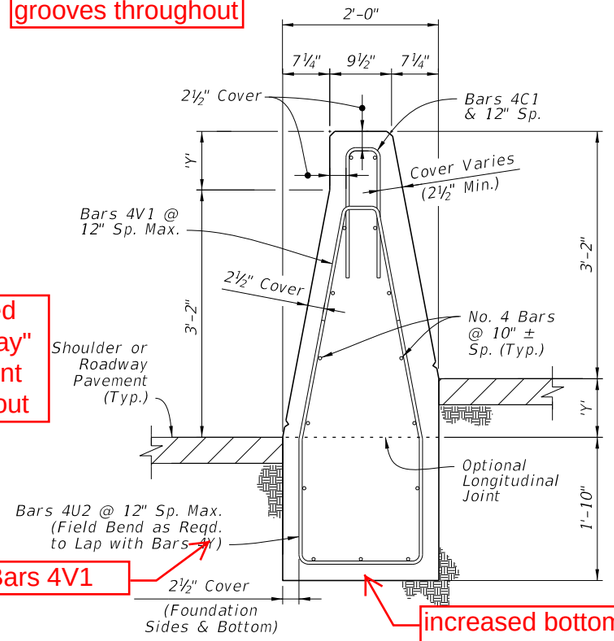
MEDIAN BARRIER - REINFORCING DETAILS

Removed longitudinal V-grooves throughout

Removed "Roadway" Pavement throughout

Bars 4V1

Added expansion joint requirement between Grade-Separated section and Median Barrier section of Sheet 2



increased bottom cover to 3"

SHORT GRADE-SEPARATED SECTION FOR Y ≤ 9"

:

L: Install the Grade-Separated sections where shown in the Plans and as required mmodate vertical offsets in pavement of Height Y.

2. CONNECTIONS BETWEEN DIFFERENT SECTIONS: Connect differing 38" Height, Short Grade-Separated, and Tall Grade-Separated Median Barrier sections using a continuous pour or Transverse Joint, where longitudinal steel that aligns within the adjacent section is maintained continuously between sections. Alternatively, a Doweled Joint may be used as shown on Sheet 2.

3. TALL GRADE-SEPARATED SECTIONS: For the vertical and transverse steel reinforcement shown in the Tall Grade-Separated Sections, bar bending diagrams are not provided due to varying section dimensions and Longitudinal Joint locations. Use any combination of spliced reinforcing steel to position the reinforcement with the same cover, spacing, continuity, and equivalent strength shown herein, as approved by the Engineer.

Longitudinal Joints are permitted between the vertical limits shown, and must remain level and at a consistent height per each continuous casting of concrete. Longitudinal Joints may change elevations at Transverse Joint locations. Field bending of bars is permitted at Longitudinal Joint locations.

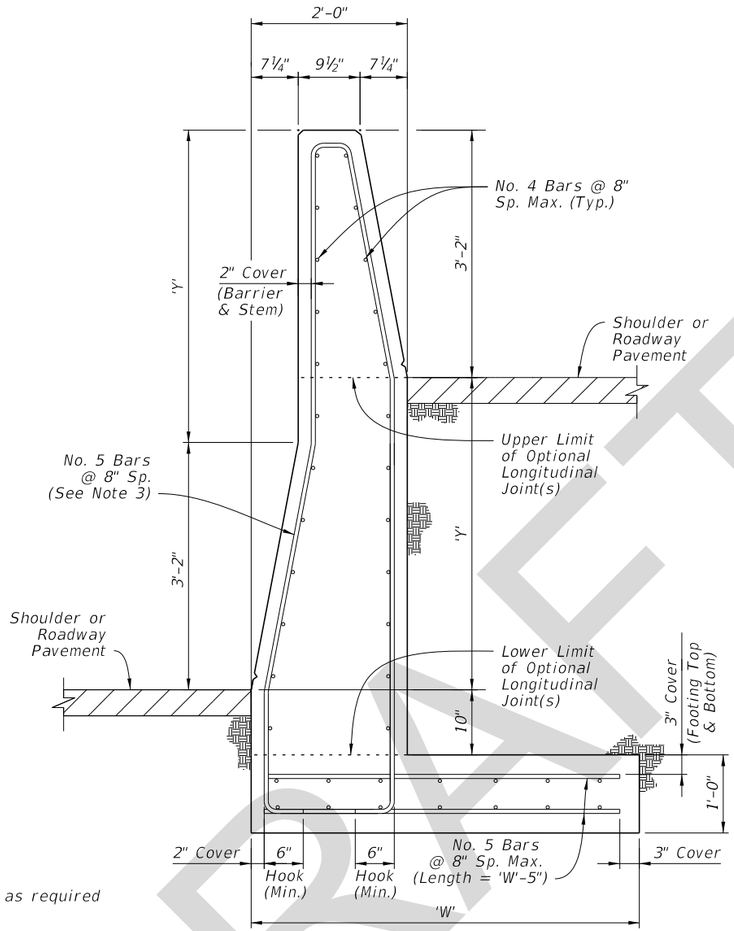
Transverse Joints between Tall Grade-Separated Sections do not require continuous steel across the joint if the following conditions are met:

i. The barrier length on both sides is at least 40 feet, where each segment has continuous steel reinforcement.

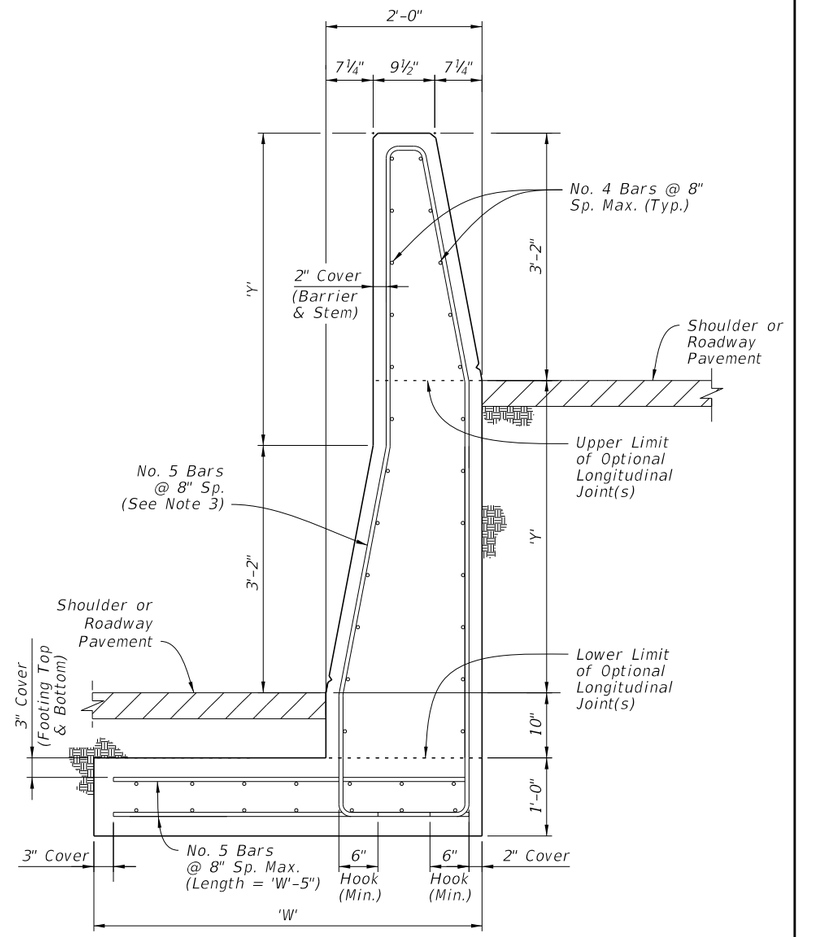
ii. The barrier's vertical steel spacing is reduced to 4" O.C. for a total of 12 spaces on both sides of the joint.

Doweled Joints are not permitted between Tall Grade-Separated Sections.

Grade separation Heights of Y ≤ 9" are permitted on a limited basis using the Tall Grade-Separated section; this is to accommodate cases where maintaining the spread footing through lower height segments is more practical than changing to the Short Grade-Separated section.



TALL GRADE-SEPARATED HEEL FOOTING SECTION FOR Y ≤ 4'-0"



TALL GRADE-SEPARATED TOE FOOTING SECTION FOR Y ≤ 4'-0"

Added Short Grade- Separated Section Note... Bar 4C may be removed for Y < 2"

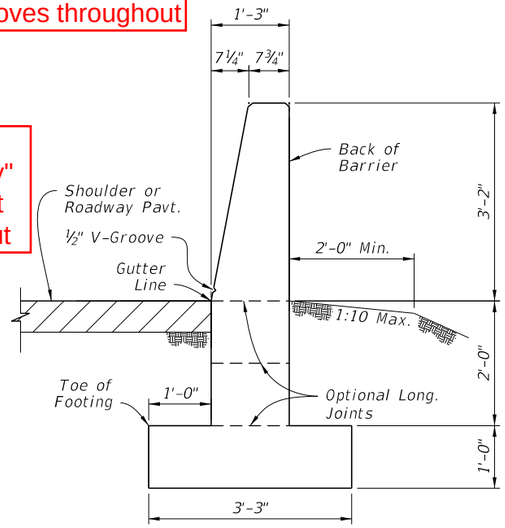
TALL GRADE-SEPARATED SECTIONS DIMENSION TABLE							
Height, Y	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"	3'-6"	4'-0"
Width, W	3'-3"	3'-6"	3'-9"	4'-0"	4'-3"	4'-6"	4'-6"

Changed to "Max Height, Y"

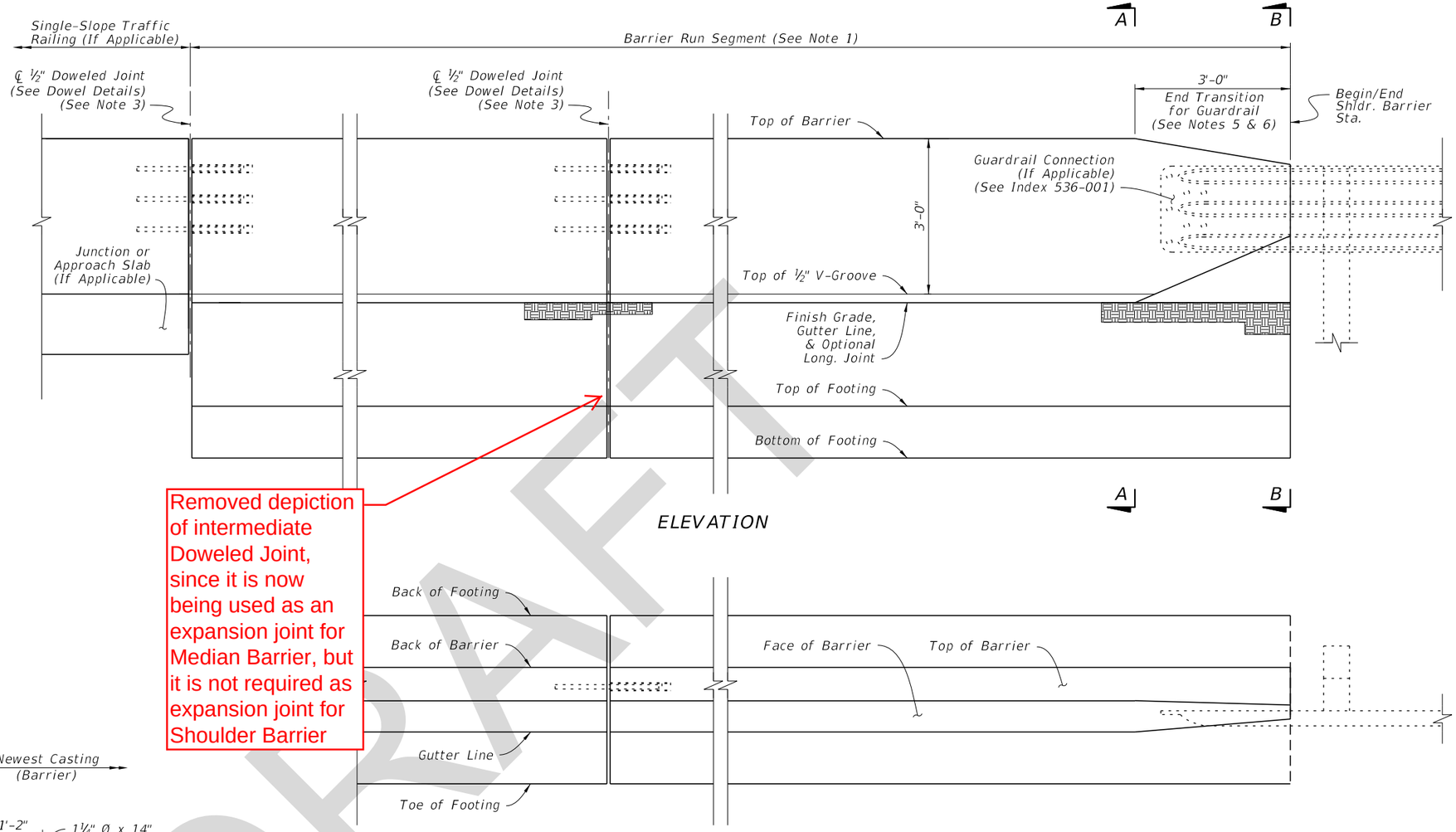
MEDIAN BARRIER - GRADE-SEPARATED

Removed longitudinal V-grooves throughout

Removed "Roadway" Pavement throughout



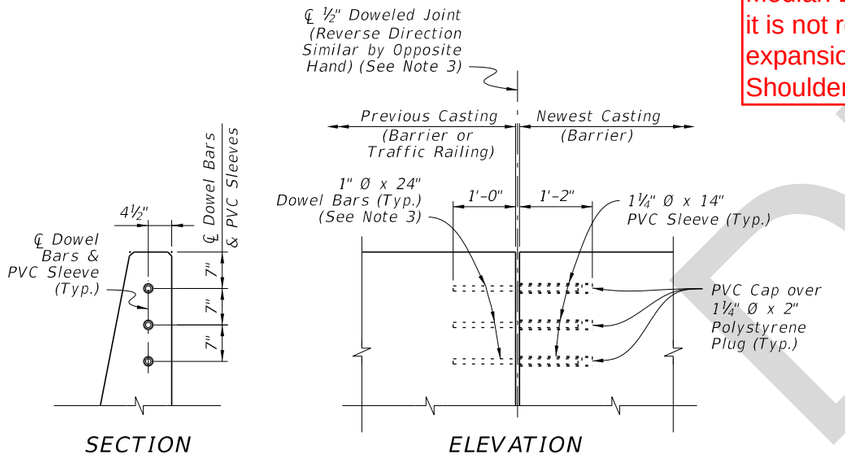
SECTION A-A
38" HEIGHT SHOULDER BARRIER
(See Sheet 13 for Reinforcing Steel Details)



ELEVATION

Removed depiction of intermediate Doweled Joint, since it is now being used as an expansion joint for Median Barrier, but it is not required as expansion joint for Shoulder Barrier

PLAN



SECTION
DOWEL PLACEMENT

ELEVATION
DOWEL BAR & PVC CONNECTION

DOWEL DETAILS

updated note to allow for cast-in-place dowel bar

NOTES:

1. BARRIER RUN SEGMENT: Either the 38" Height Shoulder Barrier or the differing Shoulder Barrier sections shown throughout the Index may be placed within this segment as required per the Plans.
2. SECTION VIEWS: For additional Views A-A and B-B, see Sheet 13.
3. DOWELED JOINTS: See General Notes 6 & 7 on Sheet 1 for usage of joint types.

   Use ASTM A36 smooth round bars with hot-dip galvanization. For installation into existing structures, use adhesive bonded dowels in accordance with Specification Section 416. No load testing is required.

   Use 1¼" NPS Schedule 80 PVC pipe with a sealed cap as shown.
4. TRAFFIC RAILING CONNECTIONS: Align the barrier and Traffic Railing faces and connect with the ½" Doweled Joint.
5. GUARDRAIL CONNECTIONS: Connect Guardrail using the Transition Connections to Rigid Barrier per Index 536-001 in conjunction with the 16'-0" End Segment for Guardrail shown herein.
6. CRASH CUSHION CONNECTIONS: Connect Crash Cushions per Index 544-001 in conjunction with the 3'-0" End Transition for Guardrail as shown herein.
7. FREE ENDS: When the barrier end does not terminate with a Traffic Railing Connection, Guardrail Connection, or Crash Cushion Connection as called for in the Plans, terminate in accordance with the Free End Reinforcing Note on Sheet 13.

SHOULDER BARRIER

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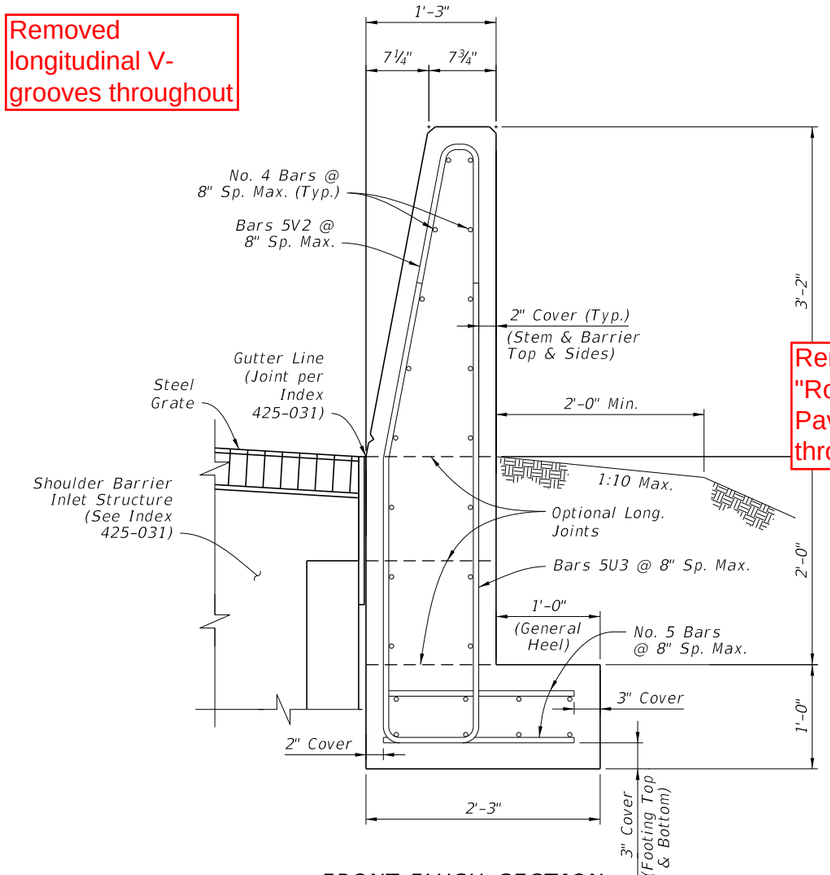
LAST REVISION	REVISION	DESCRIPTION:	FDOT	FY 2018-19 STANDARD PLANS	CONCRETE BARRIER	INDEX	SHEET
11/01/17						521-001	12 of 21

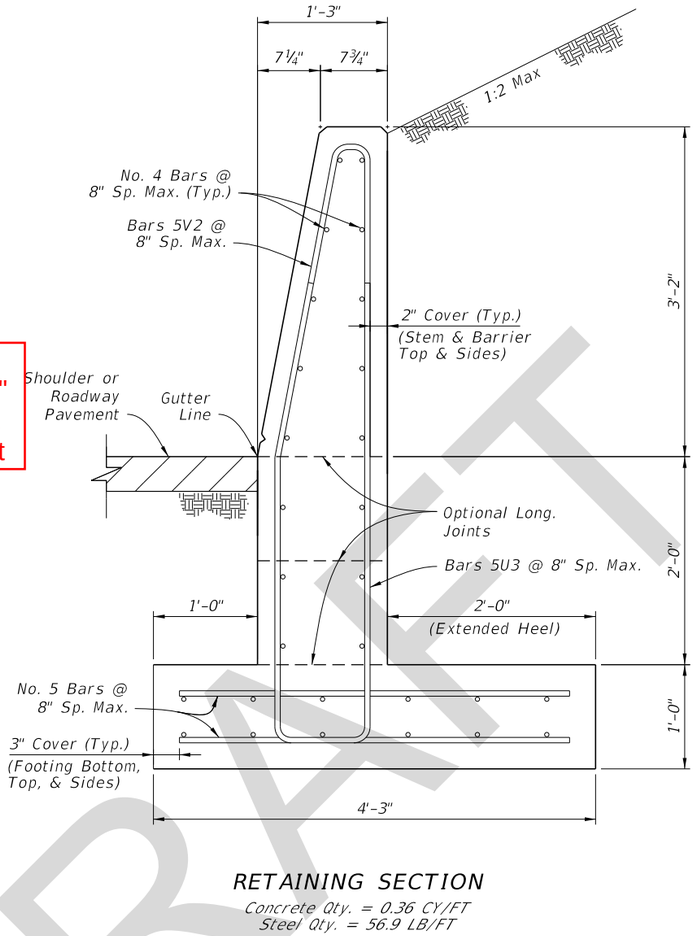
Removed longitudinal V-grooves throughout



FRONT-FLUSH SECTION
(Where Required For Barrier Inlet Locations)

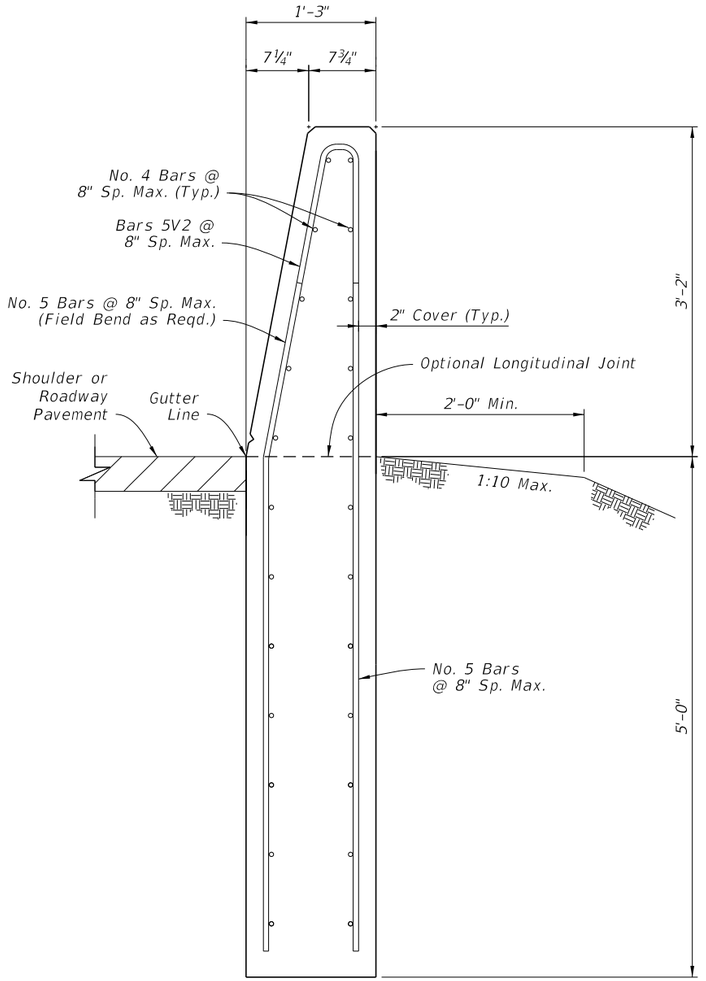
Concrete Qty. = 0.29 CY/FT
Steel Qty. = 46.7 LB/FT

Removed "Roadway" Pavement throughout



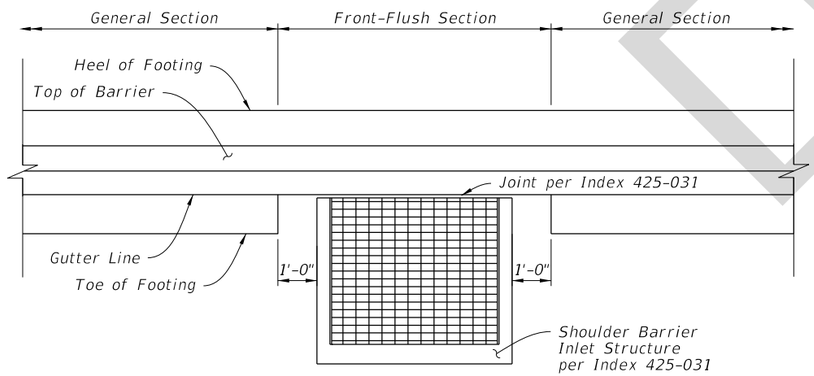
RETAINING SECTION

Concrete Qty. = 0.36 CY/FT
Steel Qty. = 56.9 LB/FT



TRENCH FOOTING SECTION

Concrete Qty. = 0.35 CY/FT
Steel Qty. = 48.4 LB/FT



FRONT-FLUSH SECTION - PLAN VIEW
(Not Applicable for Trench Footing Sections)

NOTES:

1. GENERAL: Install the differing Section Options as required per the Plans.
2. CONNECTIONS BETWEEN DIFFERENT SECTIONS: Connect differing Median Barrier sections using a continuous pour or Transverse Joint, where longitudinal steel that aligns within the adjacent section is maintained continuously between sections. Alternatively, a Doweled Joint may be used as shown on Sheet 12.
3. FLUSH RETAINING SECTION COMBINATION: Where Barrier Inlets are required in retaining segments, install the Flush Section, except replace the 1'-0" General Heel with the 2'-0" Extended Heel as shown in the Retaining Section. Use longer lateral reinforcing bars of 2'-10" length to maintain the cover shown.

Change to "Shoulder"

SHOULDER BARRIER - SECTION OPTIONS

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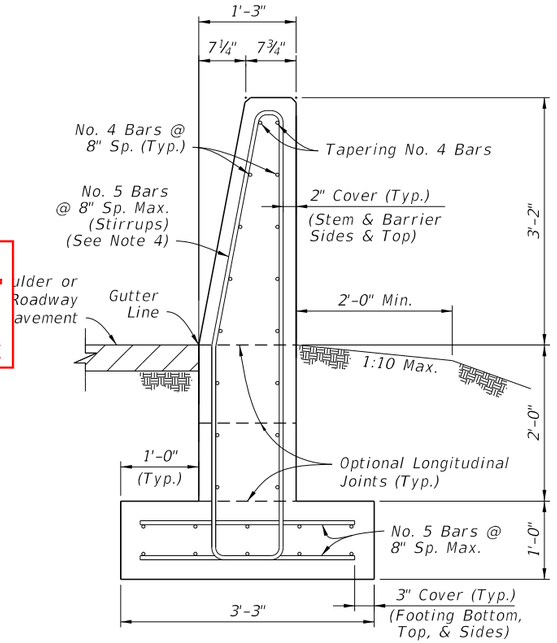
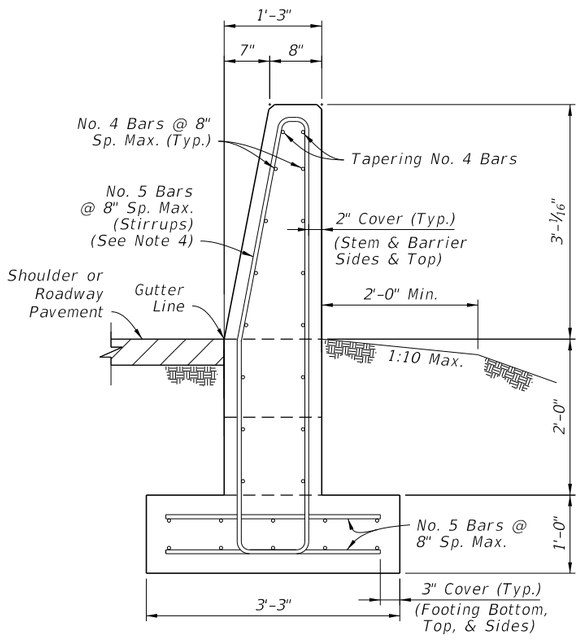
LAST REVISION	REVISION	DESCRIPTION:	FDOT	FY 2018-19 STANDARD PLANS	CONCRETE BARRIER	INDEX	SHEET
11/01/17						521-001	14 of 21

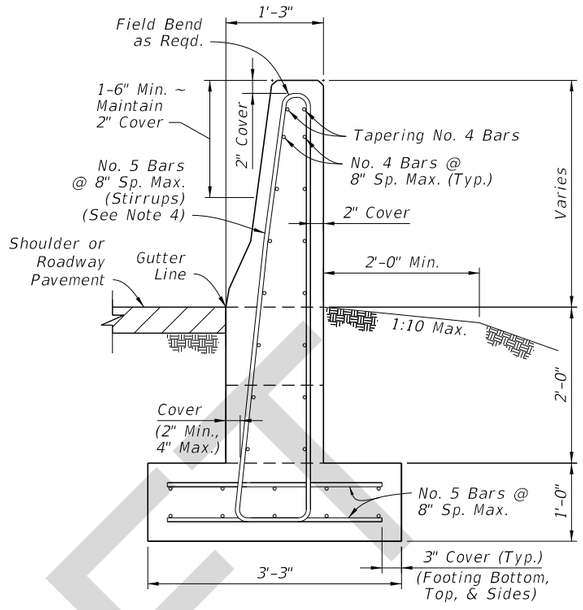
Removed "Roadway" Pavement throughout



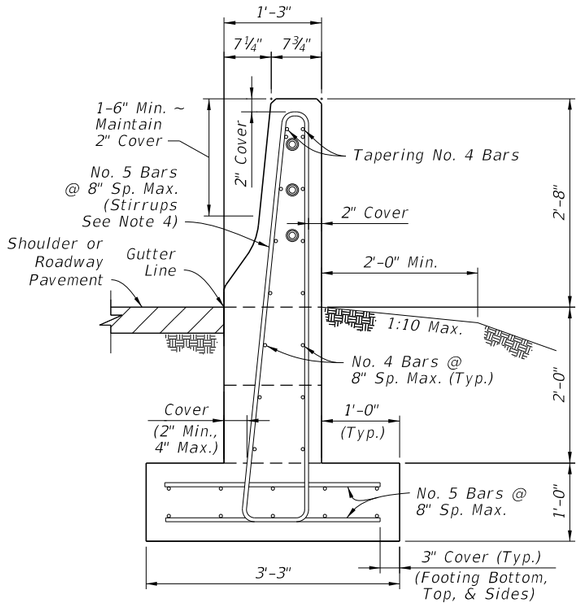
SECTION A-A
BEGIN TRANSITION - OPTION 'A'
MATCH SINGLE-SLOPE
38" HEIGHT SHOULDER BARRIER



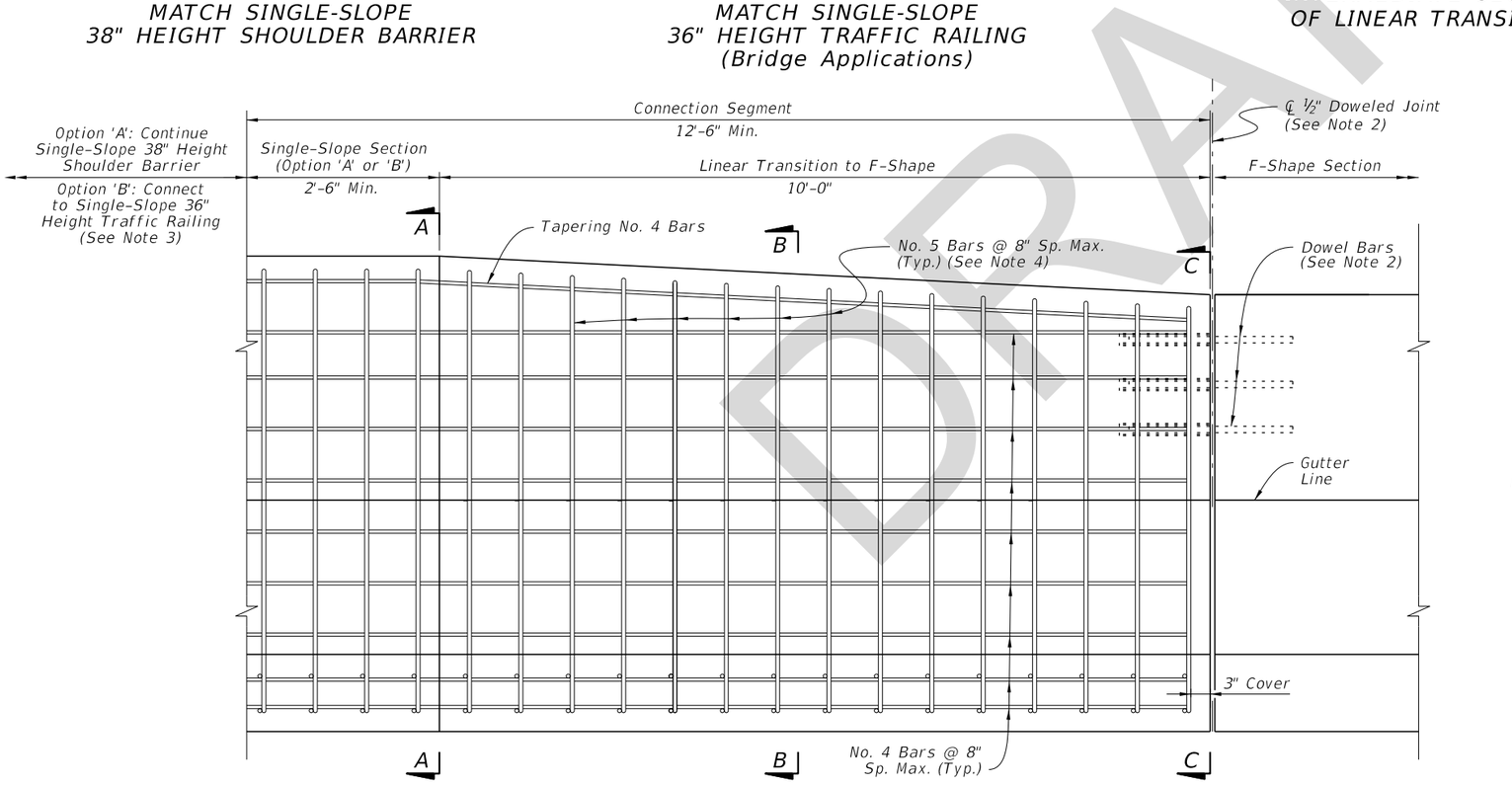
SECTION A-A
BEGIN TRANSITION - OPTION 'B'
MATCH SINGLE-SLOPE
36" HEIGHT TRAFFIC RAILING
(Bridge Applications)



SECTION B-B
INTERMEDIATE SECTION
OF LINEAR TRANSITION

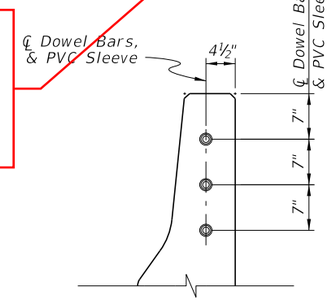


SECTION C-C
END TRANSITION
MATCH 32" HEIGHT
F-SHAPE BARRIER



ELEVATION

Changed to "Section" for matching both bridge Traffic Railing and Barrier



SECTION - F-SHAPE
DOWEL PLACEMENT
(See Note 2)

NOTES:

1. GENERAL: Construct the Connection Segment as required per the Plans to connect existing F-Shape sections to Single-Slope Shoulder Barrier or Traffic Railing sections. Construct Option 'A' or 'B' as required to match the heights of the connecting sections.
2. DOWELED JOINT: Install Dowel Bars per the Dowel Details on Sheet 12.
3. TRAFFIC RAILING CONNECTION: For the Option 'B' connection, use a Doweled Joint per Sheet 12 and the additional Free End Reinforcing with reduced bar spacing per Sheet 13.
4. STIRRUP BARS: For the vertical and transverse reinforcement requirements shown, bar bending diagrams are not provided due to varying section dimensions. Use any combination of spliced reinforcing steel to position the reinforcement with the same cover, spacing, continuity, and equivalent strength shown herein, as approved by the Engineer.

SHOULDER BARRIER - CONNECTION TO F-SHAPE

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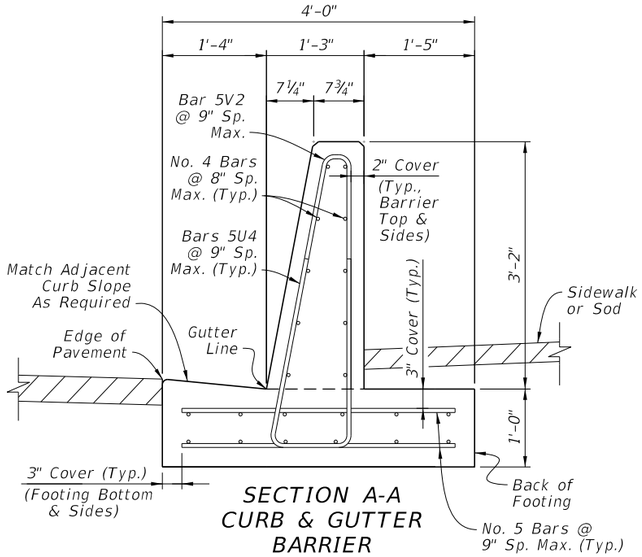
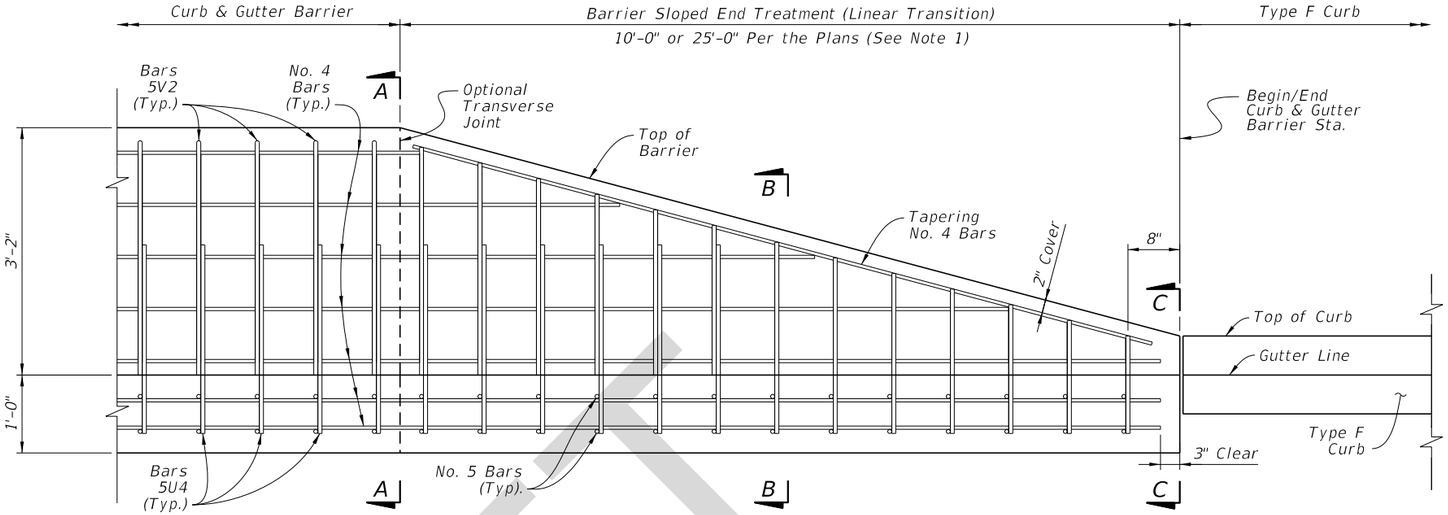
LAST REVISION	REVISION	DESCRIPTION:	FDOT	FY 2018-19 STANDARD PLANS	CONCRETE BARRIER	INDEX	SHEET
11/01/17						521-001	18 of 21

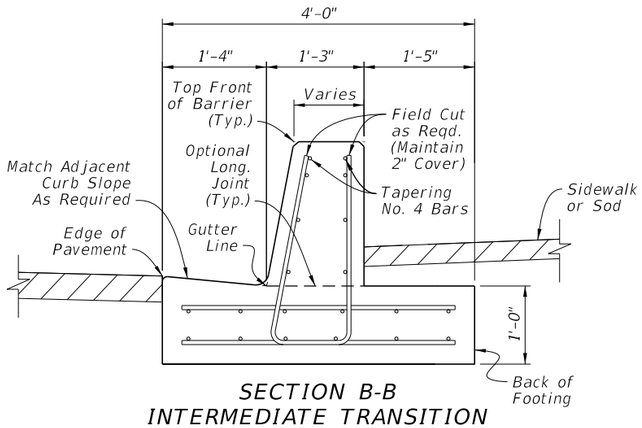


SECTION A-A
CURB & GUTTER BARRIER

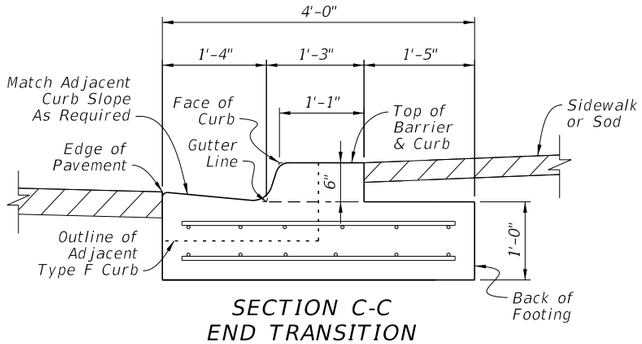
Concrete Qty. = 0.26 CY/FT
Steel Qty. = 41.2 LB/FT



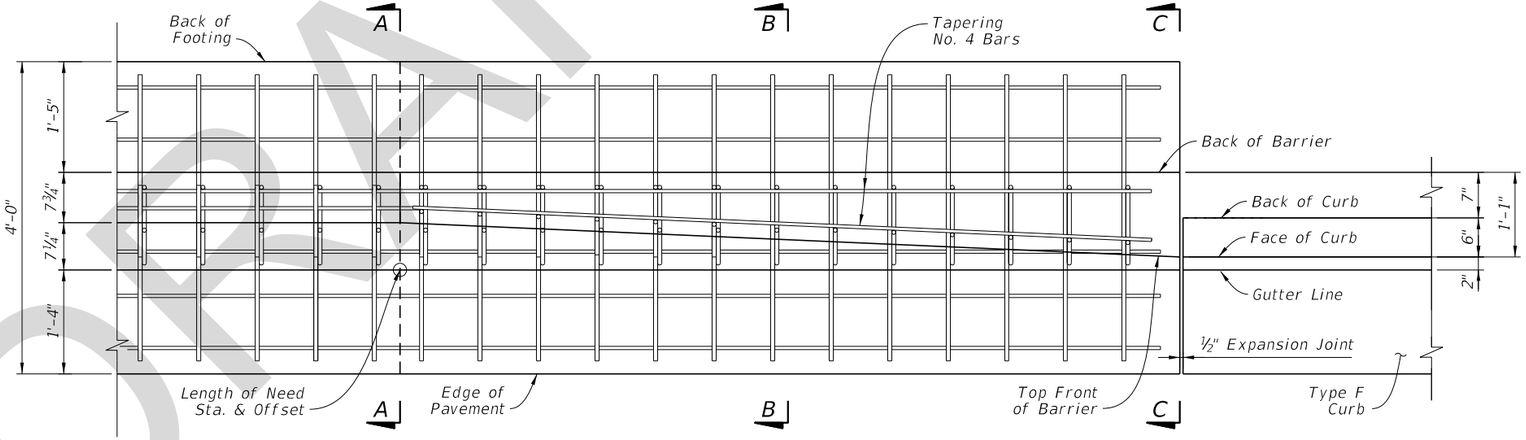
ELEVATION - CURB AND GUTTER BARRIER
SHOWING SLOPED END TREATMENT
(Approach and Trailing
End Similar by Opposite Hand)



SECTION B-B
INTERMEDIATE TRANSITION
(Height Varies Linearly
Per Elevation View)



SECTION C-C
END TRANSITION
(Align with Type-F Curb)



PLAN - CURB AND GUTTER BARRIER
SHOWING SLOPED END TREATMENT
(Approach and Trailing End
Similar by Opposite Hand;
See Sections for All
Longitudinal Steel Locations)

NOTES:

1. GENERAL: Install Curb and Gutter Barrier where called for in the Plans, using either a 10'-0" length or 25'-0" length Barrier Sloped Height Transition as called for in the Plans. The 10'-0" length option is shown herein, while the 25'-0" length option requires additional trimmed Bars 5U4 & 5V2 at the same longitudinal spacing.
2. BAR BENDING DIAGRAMS: For additional details on Bars 5V2 & 5U4, see the Bar Bending Diagrams on Sheet 21.
3. TRANSVERSE JOINTS: Where longitudinal reinforcing steel is not
per Sheet 12.
4. DRAINAGE: For Drainage Slot details and requirements, see She

ADDED NEW SHEET TO SHOW PLAN AND ELEVATION OF CURB AND GUTTER BARRIER WITH CONNECTION TO GUARDRAIL AS PRIMARY OPTION - SEE UPDATED SHEETS 19-21.

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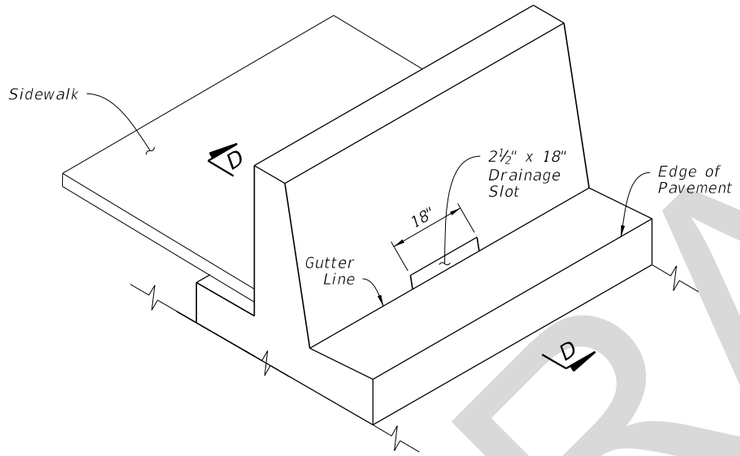
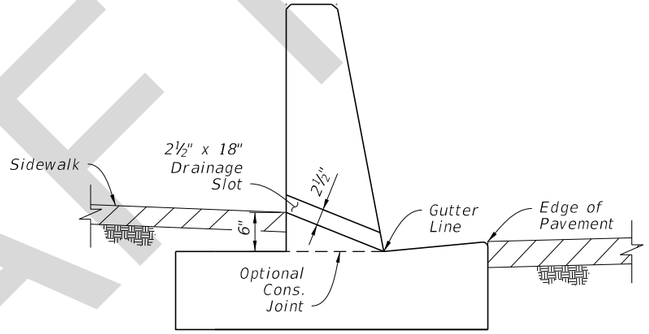
LAST REVISION	REVISION	DESCRIPTION:	FDOT	FY 2018-19 STANDARD PLANS	CONCRETE BARRIER	INDEX	SHEET
11/01/17						521-001	19 of 21



ISOMETRIC VIEW
CURB GUTTER WITH
DRAINAGE SLOT



SECTION D-D
CURB GUTTER BARRIER
WITH DRAINAGE SLOT

NOTES:

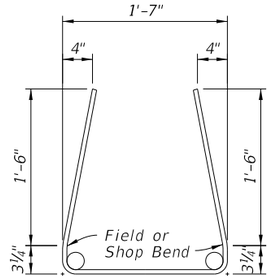
1. GENERAL: Place 2½" x 18" Drainage Slots at locations and/or spacing called for in the Plans. Work with the Curb and Gutter Barrier details on Sheet 19.

2. STEEL REINFORCEMENT CONFLICT: When the Drainage Slot encounters a conflict with reinforcing steel, shift or cut the reinforcing steel to provide 2½"(± ½") of concrete cover for the reinforcing around the Drainage Slot. If cutting the vertical bars, maintain 8" bar spacing. If shifting the vertical bars, move the bars from the standard 8" spacing location to the closest end of the drainage slot (distributing additional vertical reinforcement evenly on each side of the Drainage Slot).

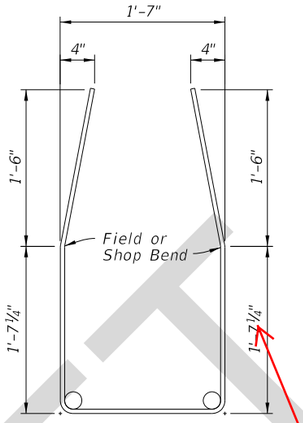
CURB AND GUTTER BARRIER DETAILS

BILL OF REINFORCING STEEL		
MARK	SIZE	LENGTH
C1	4	3'-8"
C2	5	3'-0"
U1	4	5'-1"
U2	4	7'-9"
U3	5	9'-7"
U4	5	5'-9"
V1	4	6'-4"
V2	5	6'-3"

updated for new increased bottom cover on Sheet 5

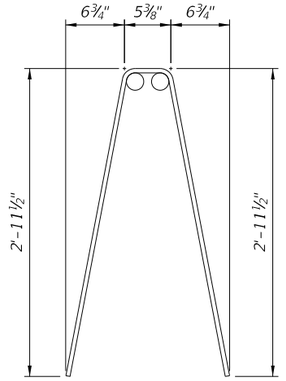


BARS 4U1

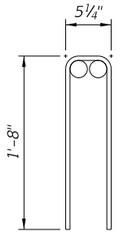


BAR 4U2

updated for new increased bottom cover on Sheet 5



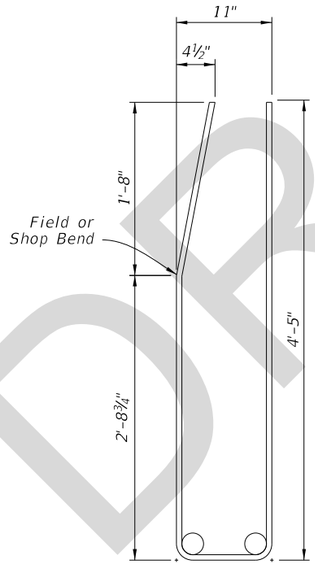
BAR 4V1



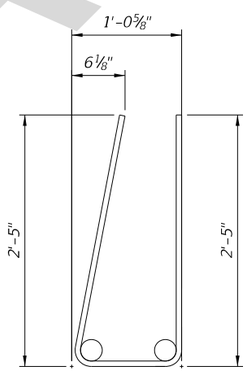
BAR 4C1

NOTES:

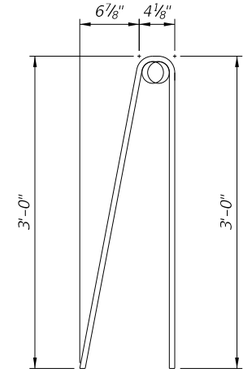
1. Work with the Standard Bar Bending Details per Index 415-001.
2. All bar dimensions in the bending diagrams are out to out.



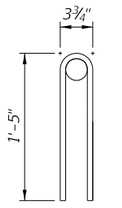
BAR 5U3



BAR 5U4



BAR 5V2



BAR 5C2

REINFORCING BAR BENDING DIAGRAMS

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LAST REVISION	REVISION	DESCRIPTION:	FDOT	FY 2018-19 STANDARD PLANS	CONCRETE BARRIER	INDEX	SHEET
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3	Median Barrier – Reinforcing Details
4	Median Barrier – Sloped End Treatment
5	Median Barrier – Grade Separated
6	Median Barrier – 56" Height Section for Barrier-Mounted Sign Support Shielding – Symmetrical
7	Median Barrier – 56" Height Section for Barrier-Mounted Sign Support Shielding – Asymmetrical
8	Median Barrier – 38" Height Split Section for Stand-Alone Sign Support Shielding
9	Median Barrier – 44" Height Split Section for Pier Shielding
10	Median Barrier – 44" Height Split Section for Pier Shielding – Details
11	Median Barrier – Connection to F-Shape
12	Shoulder Barrier
13	Shoulder Barrier – Reinforcing Details
14	Shoulder Barrier – Section Options
15	Shoulder Barrier – Section Options (Continued)
16	Shoulder Barrier – 38" Height Rear-Flush Section for Reduced Setback Pier Shielding (Low-Speed)
17	Shoulder Barrier – 44" Height Rear-Flush Section for Reduced Setback Pier Shielding
18	Shoulder Barrier – Connection to F-Shape
19	Curb and Gutter Barrier
20	Curb and Gutter Barrier – Reinforcing Details
21	Curb and Gutter Barrier – Sloped End Treatment
22	Reinforcing Bar Bending Diagrams

GENERAL NOTES:

1. CONCRETE: Use Class II concrete for all barriers constructed in slightly aggressive environments, and use Class IV Concrete for all barriers constructed in moderately or extremely aggressive environments. On all exposed surfaces, apply a Class 3 surface finish in accordance with Specification 400.

2. STEEL BAR REINFORCEMENT: Where required to maintain continuity, provide lap splices of at least 18 inches for No. 4 bars and 20 inches for No. 5 bars, unless otherwise shown herein (including shorter splices as provided by the default bar bending diagrams).

   The default reinforcing details shown herein, including bar shapes and lap splice positions, are intended to show required steel locations and provide for a constructible design. However, with the approval of the Engineer, alternate steel configurations may be used in the same locations shown herein, given that the equivalent strength reinforcing is provided and the cover, maximum spacing, and continuity requirements are maintained.

3. OPTIONAL WELDED WIRE REINFORCEMENT: With the approval of the Engineer, steel welded wire reinforcement in accordance with Specification 415 may be substituted for the steel bars shown herein. Place the welded wire in the same locations specified for the steel bars, and maintain the equivalent strength, cover, maximum spacing, and continuity requirements.

4. TOP FACE LONGITUDINAL REINFORCEMENT: Unless otherwise specified, the longitudinal reinforcement shown closest to the top face of the barrier has a maximum cover of 4½", measured from the top face of the barrier.

5. MINIMUM BARRIER LENGTH: Unless otherwise shown in the Plans, the minimum Concrete Barrier length is 40 feet.

6. CONSTRUCTION JOINTS: Install Construction Joints only as needed for discontinuous concrete casting or cold joints. Maintain continuity of steel reinforcement across Construction Joints. Construction Joints are classified herein as Transverse Joints or Longitudinal Joints.

   Transverse Joints are permitted at 20-foot or greater intervals along the barrier. For Tall Grade-Separated Sections, see Sheet 5 for additional Transverse Joint requirements.

   Longitudinal Joints are only permitted where indicated in the following details and notes, with a vertical position tolerance of ± 1½" from the locations shown.

7. DOWELED JOINTS: As shown in the Dowel Details on Sheets 2 & 12, install ¾" Doweled Joints for Concrete Barrier connections to Pier Protection Barrier and Traffic Railings. Doweled Joints are also required for expansion mitigation in Median Barrier as defined per Sheets 2 & 5. Doweled Joints are not permitted within Grade-Separated Median Barrier.

8. CRACK CONTROL V-GROOVES: At 20-foot intervals, place ⅜" depth V-grooves that run vertically and/or transversely in the front, top, and back faces of barriers. The V-grooves can be either molded or scored while the concrete is still plastic.

9. SUBGRADE: Compact the top layer of subgrade with Type B Stabilization, LBR 40 (12 in.).

10. FOOTING BOTTOM CONCRETE COVER: At the bottom of barrier footings shown throughout this Index, up to 2 inches of additional concrete cover is permitted beyond what is shown herein to accommodate soil grade irregularities.

11. FINISH GRADE ELEVATION: At the barrier face location, the finish grade pavement has a vertical position tolerance of ± ½" from the locations shown herein, relative to the barrier elevation. Maintain visually smooth and even pavement at the barrier face, per the approval of the Engineer.

12. DRAINAGE INLETS: Where called for in the Plans, install corresponding inlets per Indexes 425-030 thru 425-032.

13. LIGHT POLE MOUNTING: Where called for in the Plans, install aluminum light poles per Index 715-002.

14. SUPPLEMENTAL GLARE SCREENS: Where called for in the Plans, install Glare Screens per Index 521-010.

15. BARRIER END MARKERS: For all free ends of concrete barriers that are not shielded with an end treatment or connection to another barrier or traffic railing type, install a Type 3 Object Marker on the end face per Specification 705.

16. BARRIER DELINEATORS: Install Barrier Delineators in accordance with Specification 705. For median barriers, mount the delineator on the top of the barrier, at the centerline of barrier, with reflective sheeting facing traffic on both approaches. For shoulder barriers and split sections, mount the delineators on the top of the barrier, with the roadway side of the delineator located 2" from the front face of the barrier and the reflective sheeting facing traffic of the nearest approach.

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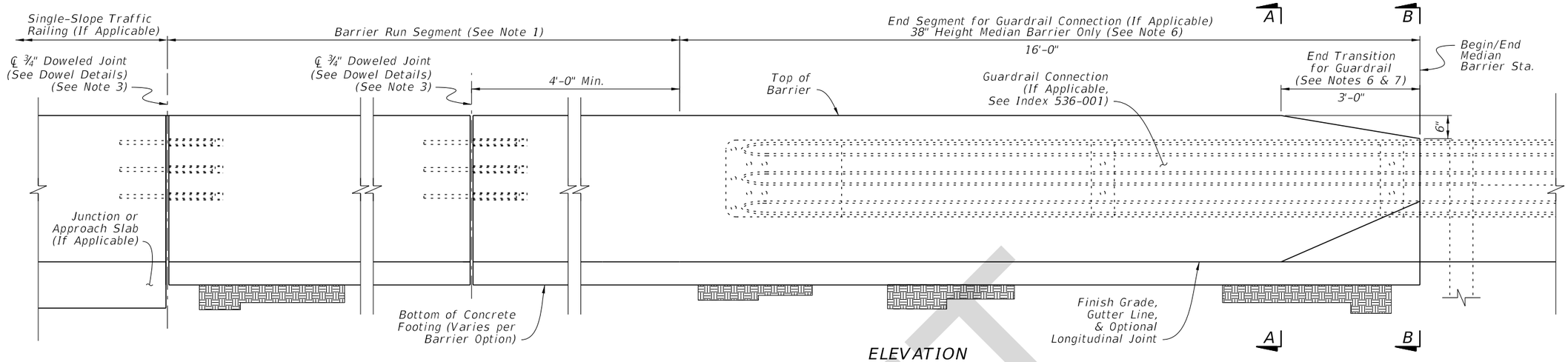
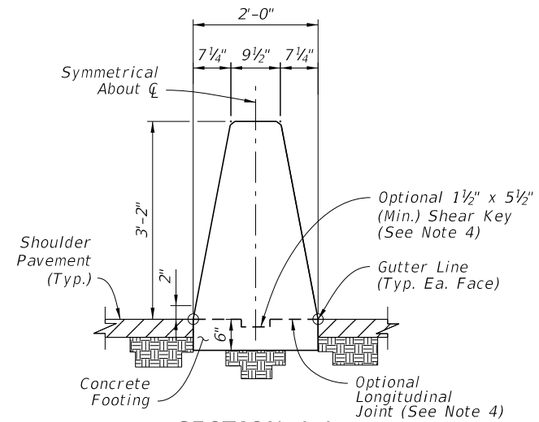
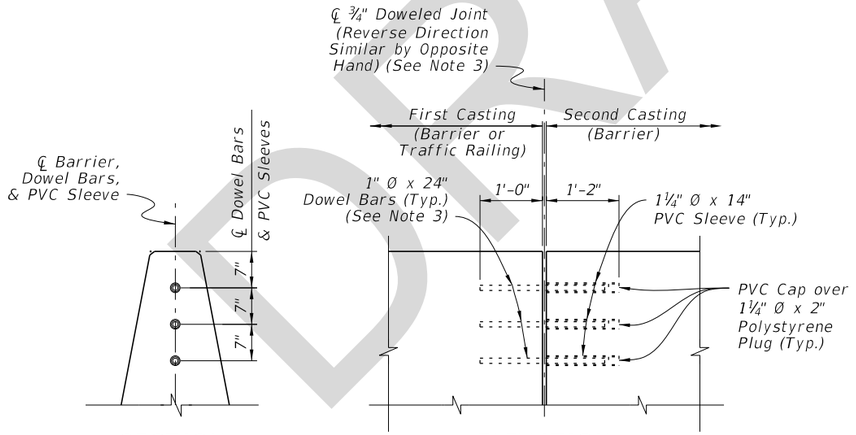




SECTION A-A
38" HEIGHT MEDIAN BARRIER
(See Sheet 3 for Steel Reinforcing Details)



SECTION
DOWEL PLACEMENT

ELEVATION
DOWEL BAR & PVC CONNECTION

DOWEL DETAILS

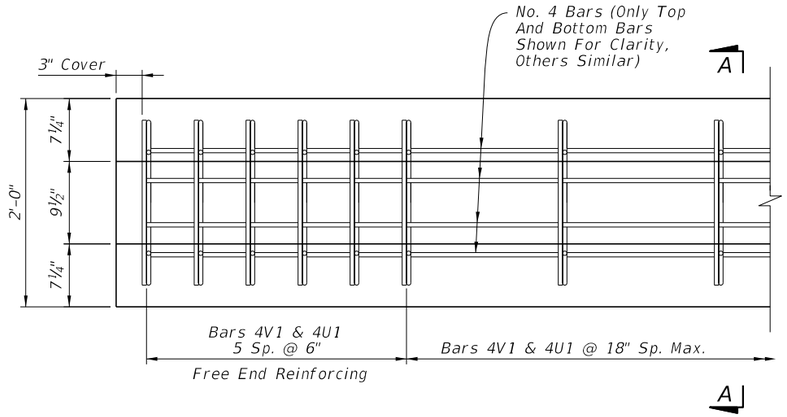
NOTES:

1. BARRIER RUN SEGMENT: Within the Barrier Run Segment, either the 38" Height Median Barrier or the differing Median Barrier sections shown throughout the Index may be placed as required per the Plans.
2. SECTION VIEWS: For additional Views A-A and B-B, see Sheet 3.
3. DOWELED JOINTS: See the General Notes on Sheet 1 for usage of joint types. Space Doweled Joints at 100-foot maximum intervals. Place steel reinforcing with a longitudinal 3" cover adjacent to the joint face(s) in the barrier. Use ASTM A36 smooth round bars with hot-dip galvanization.

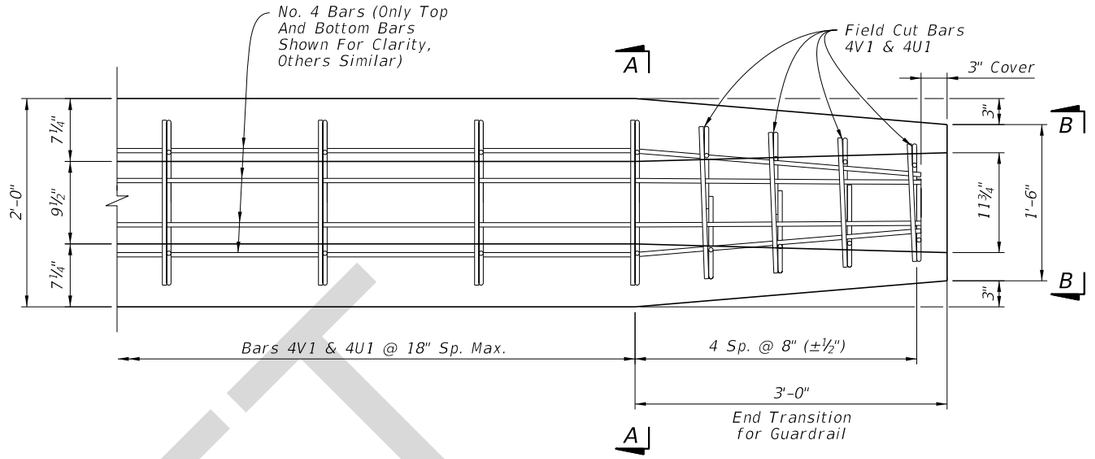
   For the dowel connection into the first casting, the dowel may be cast-in-place for new concrete or placed into a 1⅛"∅ x 13"(± ½") drilled hole for cured concrete. For drilled holes larger than 1⅛"∅, secure the dowel with adhesive in accordance with Specification Section 416. No load testing is required.

   For the dowel connection into the second casting, use a 1¼" NPS Schedule 80 PVC pipe with a sealed cap, cast-in-place as shown.
4. OPTIONAL LONGITUDINAL JOINT: When a longitudinal joint is placed above the footing, use the Optional 1½" x 5½" Shear Key shown. As a substitute for the Shear Key, the concrete footing's top surface may be raked to provide additional shear friction. Rake the fresh concrete surface so that about half of the surface area consists of approximately ¼" depth longitudinal grooves, distributed evenly and approved by the Engineer.
5. TRAFFIC RAILING CONNECTIONS: Align the barrier and Traffic Railing faces and connect with the ¾" Doweled Joint.
6. GUARDRAIL CONNECTIONS: Connect Guardrail using the Transition Connections to Rigid Barrier per Index 536-001 in conjunction with the 16'-0" End Segment for Guardrail shown herein.
7. CRASH CUSHION CONNECTIONS: Connect Crash Cushions per Index 544-001 in conjunction with the 3'-0" End Transition for Guardrail as shown herein.
8. FREE ENDS: When the barrier end does not terminate with a Traffic Railing Connection, Guardrail Connection, Crash Cushion Connection, or Sloped End Treatment as called for in the Plans, terminate in accordance with the Free End Reinforcing detail on Sheet 3.

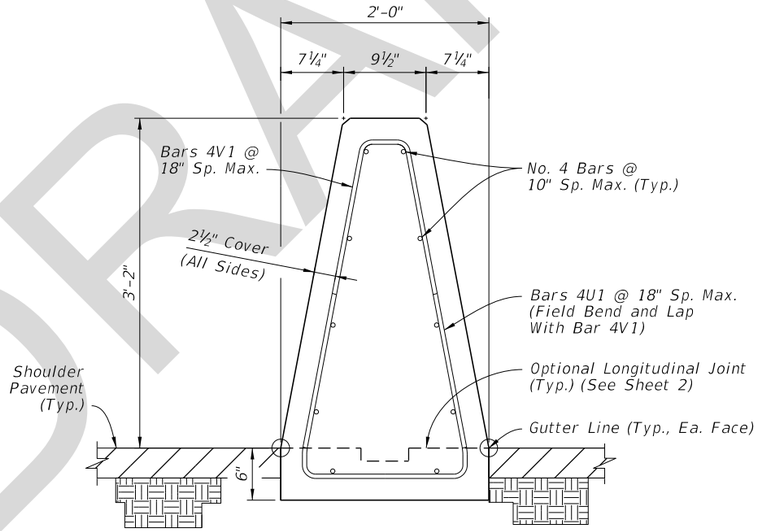
MEDIAN BARRIER



PLAN VIEW - 38" HEIGHT MEDIAN BARRIER
FREE END REINFORCING (See Note 3)

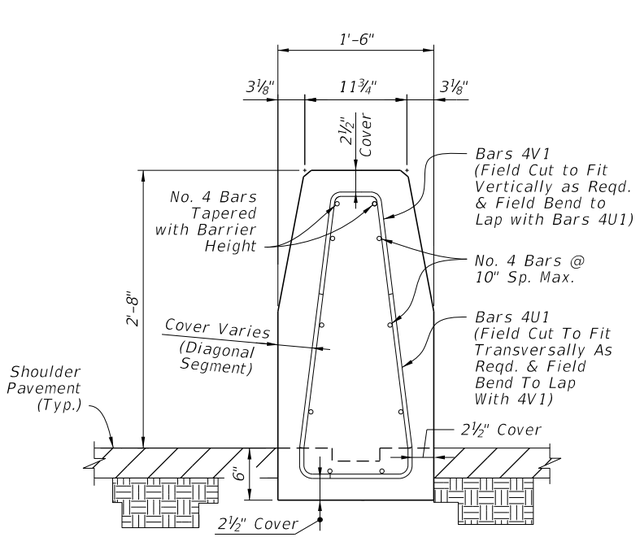


PLAN VIEW - END SEGMENT FOR
GUARDRAIL CONNECTION (See Note 3)



SECTION A-A
38" HEIGHT
MEDIAN BARRIER

Concrete Qty. = 0.20 CY/FT
Steel Qty. = 11.8 LB/FT



VIEW B-B
REDUCED SECTION
OF END TRANSITION
FOR GUARDRAIL
(End of Barrier)

NOTES:

1. GENERAL: Work with the Plan and Elevation Views on Sheet 2.
2. BAR BENDING DIAGRAMS: For additional information on Bars 4V1 and 4U1, see the details on Sheet 22.
3. PLAN VIEWS: Only top and bottom longitudinal reinforcing is shown for clarity. For all longitudinal steel locations, see the section views.

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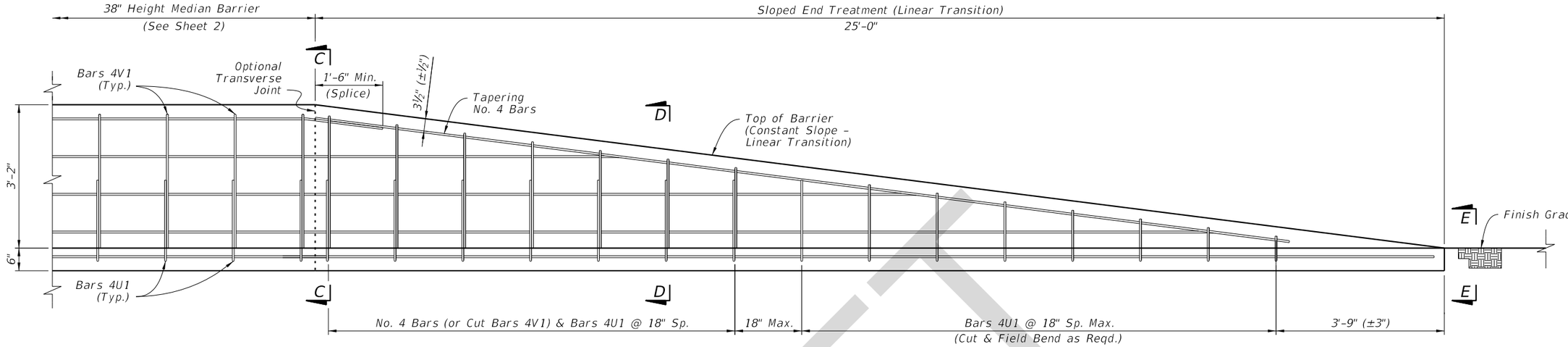
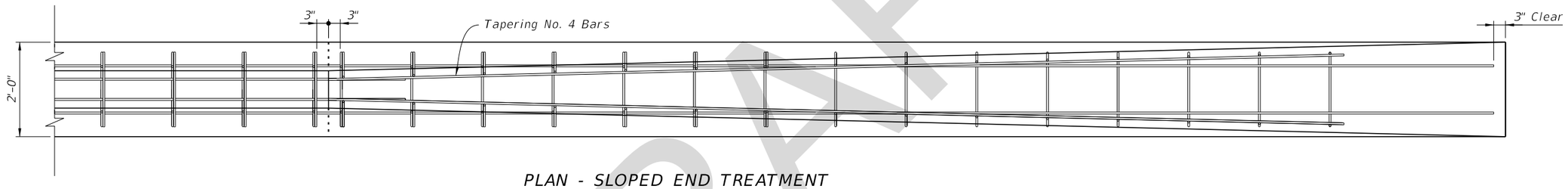
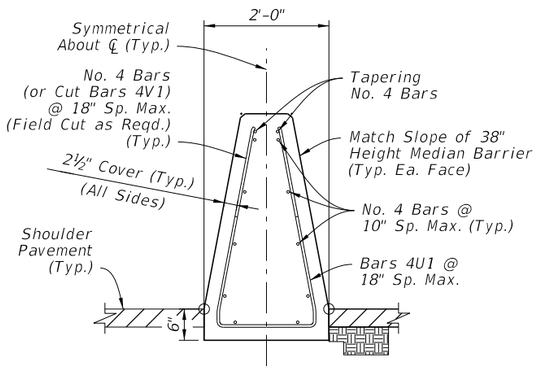
MEDIAN BARRIER - REINFORCING DETAILS



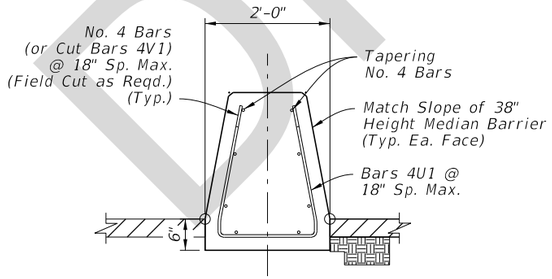
ELEVATION - SLOPED END TREATMENT



PLAN - SLOPED END TREATMENT
(Only Top & Bottom Longitudinal Bars Shown for Clarity,
See Section Views for All Longitudinal Steel Locations)



SECTION C-C
BEGIN TRANSITION
REINFORCING
(Height Varies Linearly
per Elevation View)



SECTION D-D
INTERMEDIATE TRANSITION
REINFORCING
(Height Varies Linearly
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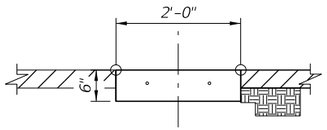

VIEW E-E
END TRANSITION

NOTES:

1. GENERAL: Install Sloped End Treatment only where called for in the plans.
2. JOINTS: Construction or Doweled Joints are not permitted within the Sloped End Treatment segment.

MEDIAN BARRIER -
SLOPED END TREATMENT

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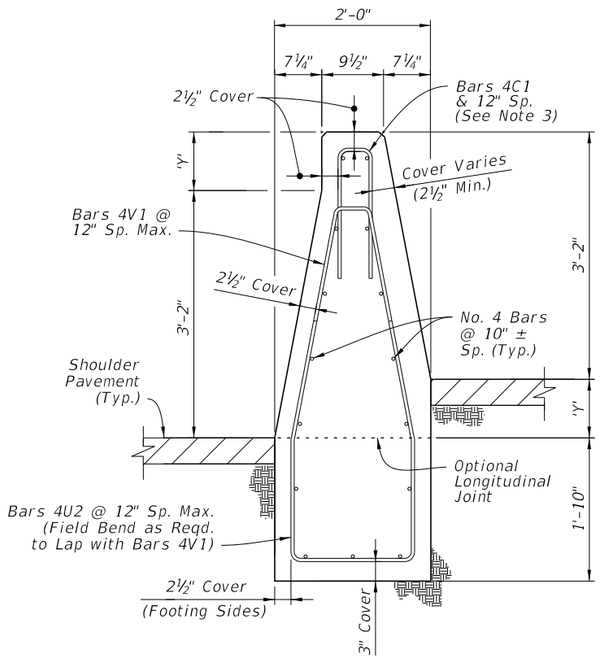
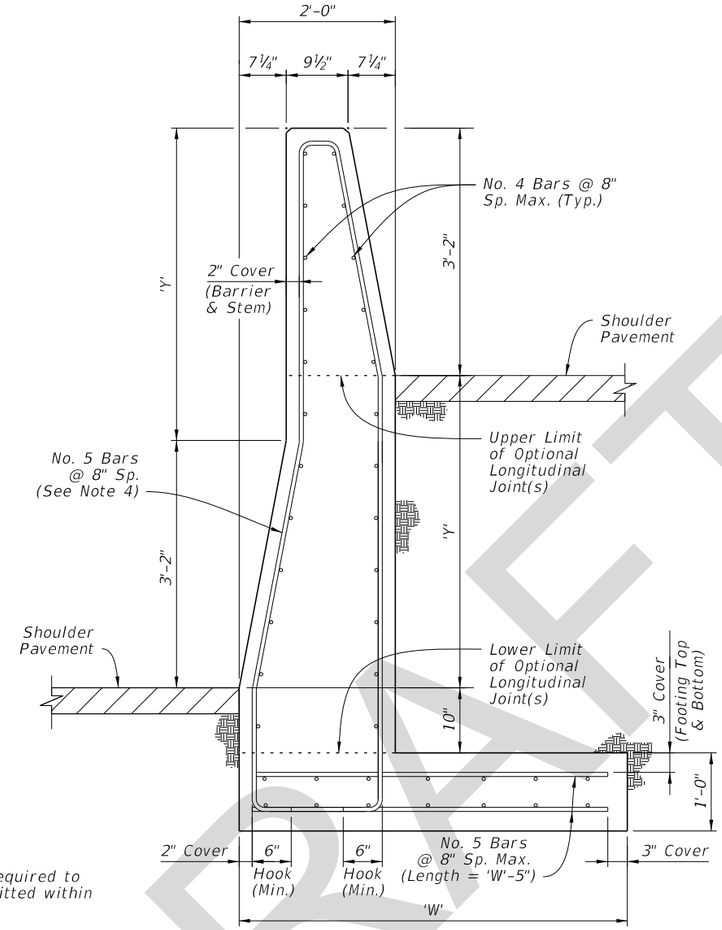
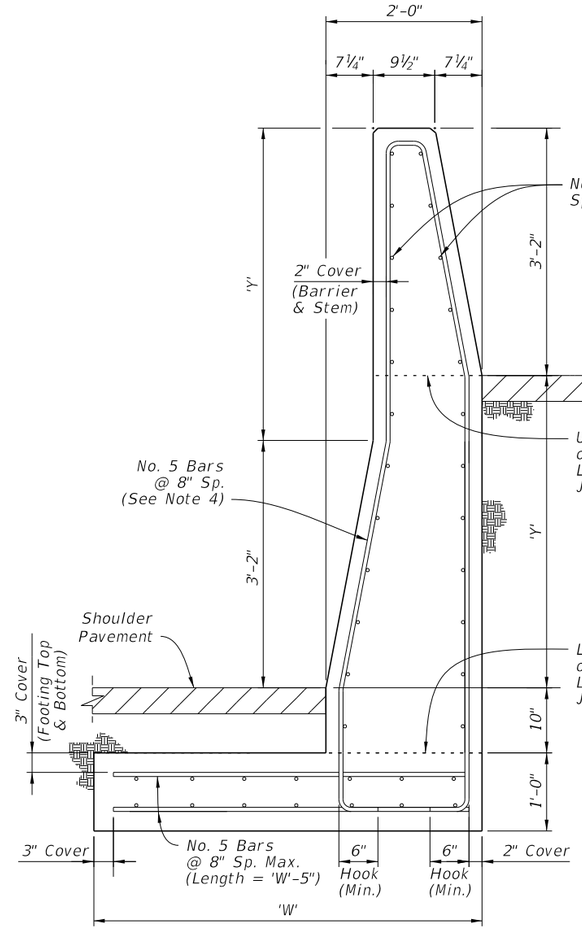


SHORT GRADE-SEPARATED SECTION FOR Y ≤ 9"



TALL GRADE-SEPARATED HEEL FOOTING SECTION FOR Y ≤ 4'-0"



TALL GRADE-SEPARATED TOE FOOTING SECTION FOR Y ≤ 4'-0"

NOTES:

1. GENERAL: Install the Grade-Separated sections where shown in the Plans and as required to accommodate vertical offsets in pavement of Height Y. Doweled Joints are not permitted within Grade-Separated sections.

2. CONNECTIONS BETWEEN DIFFERENT SECTIONS: Connect Short Grade-Separated sections and Tall Grade-Separated sections using a continuous pour or Transverse Joint, where longitudinal steel that aligns within the adjacent section is maintained continuously between sections or has a full lap splice with the adjacent section's longitudinal steel. Connect Short Grade-Separated sections and 38" Height Median Barrier sections of Sheet 2 using a ¾" Doweled Joint.

3. SHORT GRADE-SEPARATED SECTIONS: Bars 4C1 and the two uppermost longitudinal bars may be omitted for segments where Y < 2".

4. TALL GRADE-SEPARATED SECTIONS: For the vertical and transverse steel reinforcement shown in the Tall Grade-Separated Sections, bar bending diagrams are not provided due to varying section dimensions and Longitudinal Joint locations. Use any combination of spliced reinforcing steel to position the reinforcement with the same cover, spacing, continuity, and equivalent strength shown herein, as approved by the Engineer.

   Longitudinal Joints are permitted between the vertical limits shown, and must remain level and at a consistent height per each continuous casting of concrete. Longitudinal Joints may change elevations at Transverse Joint locations. Field bending of bars is permitted at Longitudinal Joint locations.

   Transverse Joints between Tall Grade-Separated Sections do not require continuous steel across the joint if the following conditions are met:
   - i. The barrier length on both sides is at least 40 feet, where each segment has continuous steel reinforcement.
   - ii. The barrier's vertical steel spacing is reduced to 4" O.C. for a total of 12 spaces on both sides of the joint.

   Grade separation Heights of Y ≤ 9" are permitted on a limited basis using the Tall Grade-Separated section; this is to accommodate cases where maintaining the spread footing through lower height segments is more practical than changing to the Short Grade-Separated section.

TALL GRADE-SEPARATED SECTIONS DIMENSION TABLE

Max. Height, Y	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"	3'-6"	4'-0"
Footing Width, W	3'-3"	3'-6"	3'-9"	4'-0"	4'-3"	4'-6"	4'-6"

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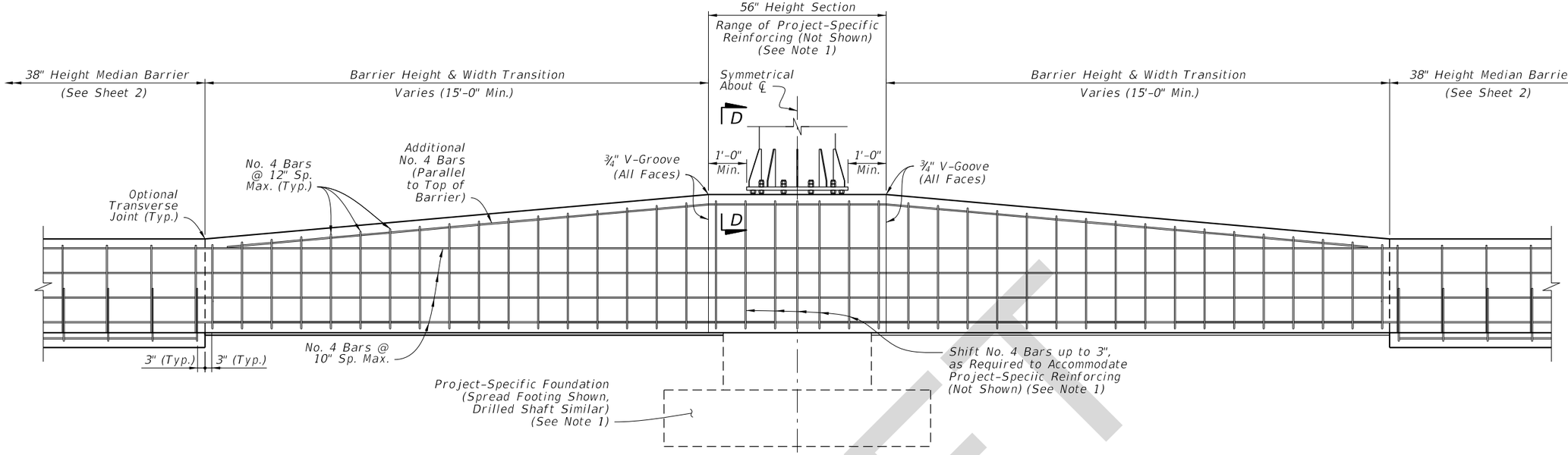
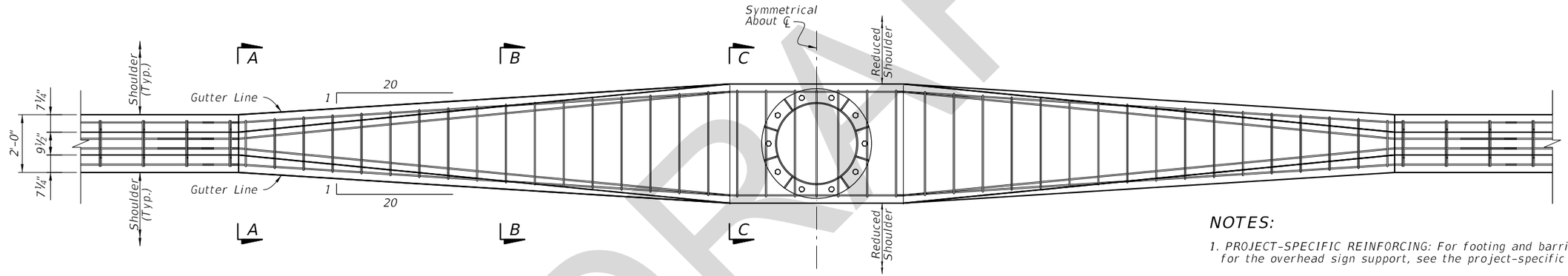
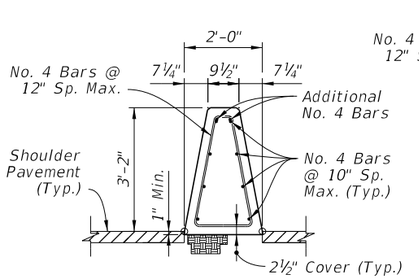
MEDIAN BARRIER - GRADE-SEPARATED



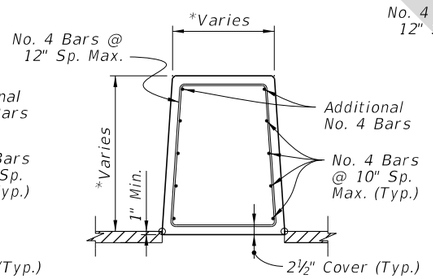
ELEVATION



PLAN
(See Note 4)



SECTION A-A
BEGIN TRANSITION



SECTION B-B
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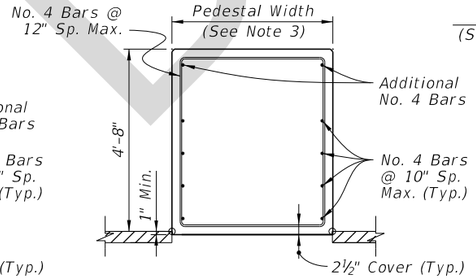
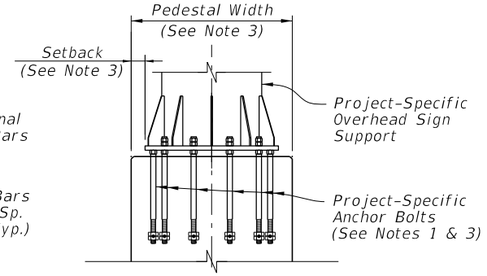


SECTION C-C
END TRANSITION
(56" Height Section)



SECTION D-D
(Reinforcing Steel Not Shown for Clarity)

NOTES:

1. PROJECT-SPECIFIC REINFORCING: For footing and barrier reinforcing required for the overhead sign support, see the project-specific design in the Plans.

2. BARRIER REINFORCING: Maintain the 38" Height Median Barrier's longitudinal steel reinforcing continuously through the barrier height transition and pedestal. Provide the Additional No. 4 Bars and taper as required to maintain a 4½" maximum cover from the top of the barrier.

   For the vertical and transverse reinforcement requirements shown in Sections A-A through C-C, bar bending diagrams are not provided due to varying section dimensions. Use any combination of spliced reinforcing steel to position the reinforcement with the same cover, spacing, continuity, and equivalent strength shown herein, as approved by the Engineer.

3. PROJECT-SPECIFIC PEDESTAL WIDTH & SETBACK: The pedestal width is governed by the size requirements of the overhead sign support, as detailed in the Plans. Likewise, the setback distance from the sign support base to the barrier face is governed by the anchor bolt cover requirements, as defined per the Plans. The minimum pedestal width is 2'-0", where a complete removal of the gutter line taper is permitted.

4. PLAN VIEW: Only top and bottom longitudinal reinforcing is shown for clarity. For all longitudinal reinforcing locations, see the Section Views.

MEDIAN BARRIER - 56" HEIGHT SECTION FOR BARRIER-MOUNTED SIGN SUPPORT SHIELDING - SYMMETRICAL

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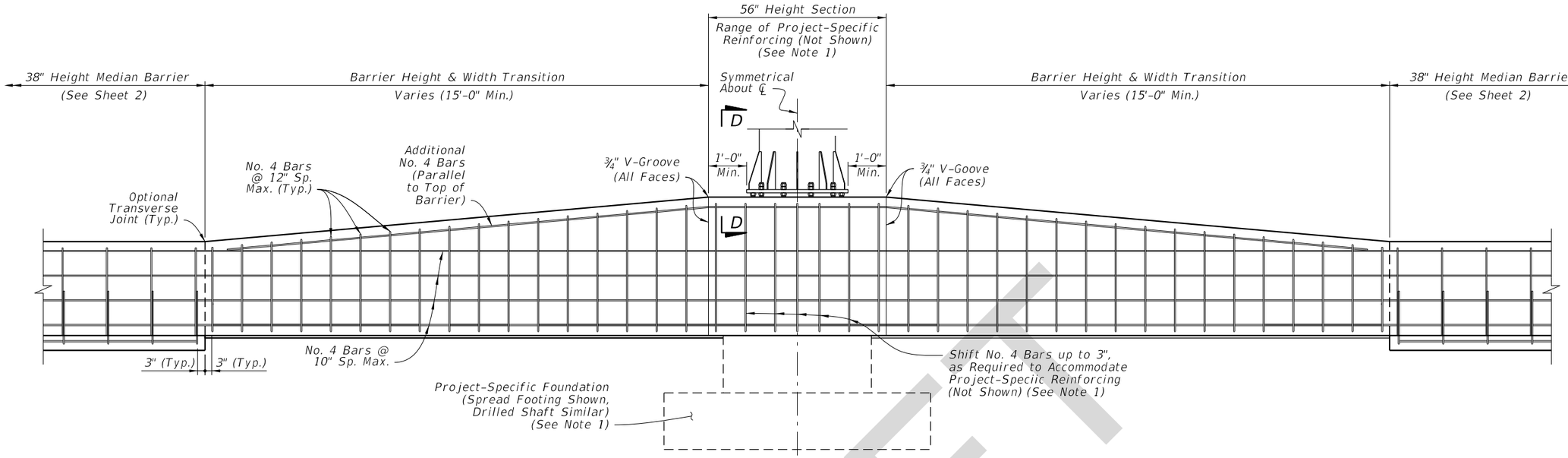
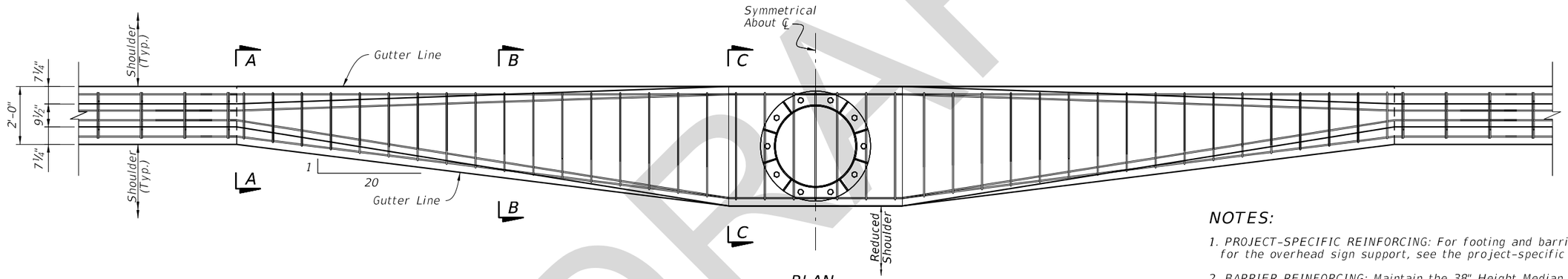
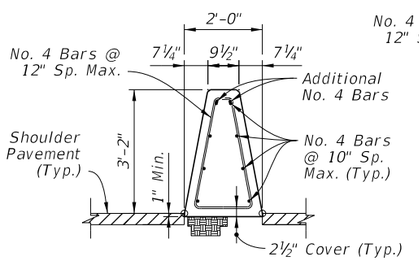
11/01/17						521-001	6 of 22



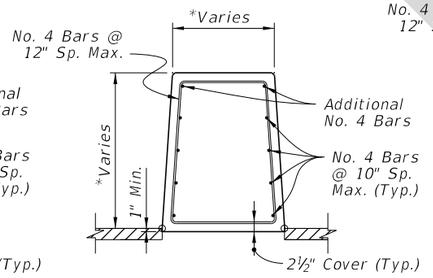
ELEVATION



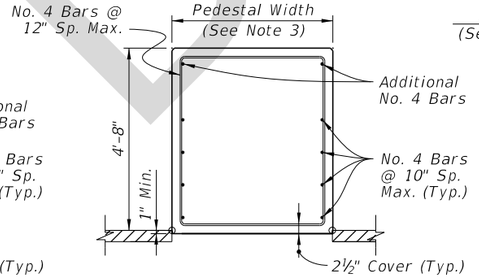
PLAN
(See Note 4)



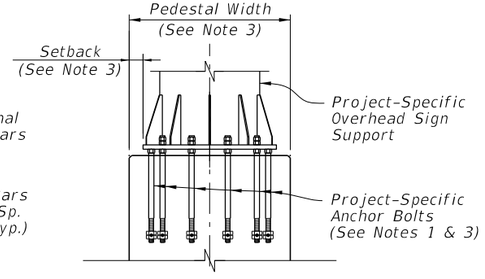
SECTION A-A
BEGIN TRANSITION



SECTION B-B
*Dimension Varies Linearly Between Section A-A and C-C



SECTION C-C
END TRANSITION
(56" Height Section)



SECTION D-D
(Reinforcing Steel Not Shown for Clarity)

NOTES:

1. PROJECT-SPECIFIC REINFORCING: For footing and barrier reinforcing required for the overhead sign support, see the project-specific design in the Plans.

2. BARRIER REINFORCING: Maintain the 38" Height Median Barrier's longitudinal steel reinforcing continuously through the barrier height transition and pedestal. Provide the Additional No. 4 Bars and taper as required to maintain a 4½" maximum cover from the top of the barrier.

   For the vertical and transverse reinforcement requirements shown in Sections A-A through C-C, bar bending diagrams are not provided due to varying section dimensions. Use any combination of spliced reinforcing steel to position the reinforcement with the same cover, spacing, continuity, and equivalent strength shown herein, as approved by the Engineer.

3. PROJECT-SPECIFIC PEDESTAL WIDTH & SETBACK: The pedestal width is governed by the size requirements of the overhead sign support, as detailed in the Plans. Likewise, the setback distance from the sign support base to the barrier face is governed by the anchor bolt cover requirements, as defined per the Plans. The minimum pedestal width is 2'-0", where a complete removal of the gutter line taper is permitted.

4. PLAN VIEW: Only top and bottom longitudinal reinforcing is shown for clarity. For all longitudinal reinforcing locations, see the Section Views.

MEDIAN BARRIER - 56" HEIGHT SECTION FOR BARRIER-MOUNTED SIGN SUPPORT SHIELDING - ASYMMETRICAL

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LAST REVISION	REVISION	DESCRIPTION:	FY 2018-19 STANDARD PLANS	CONCRETE BARRIER	INDEX	SHEET
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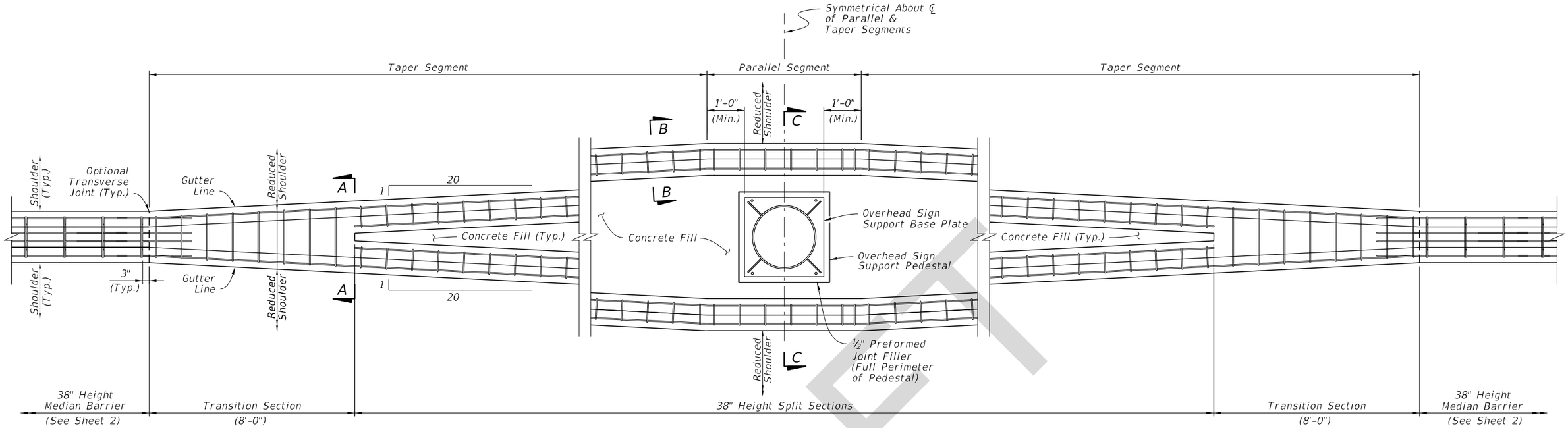
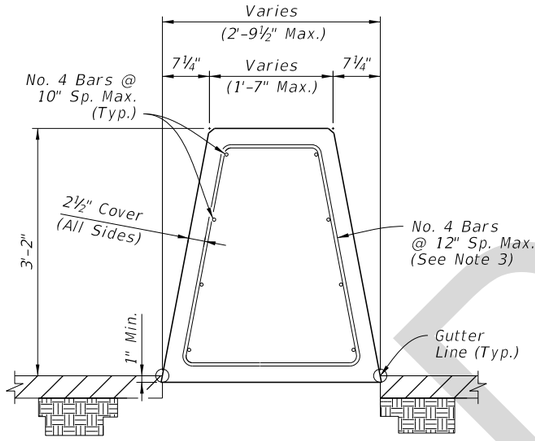
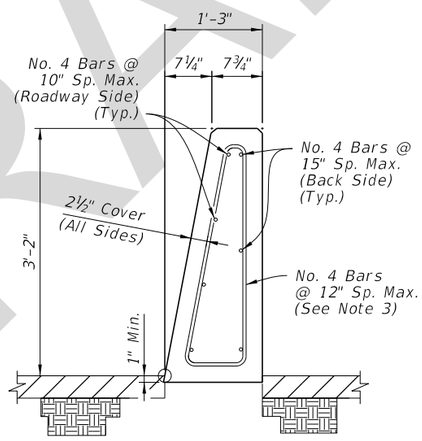


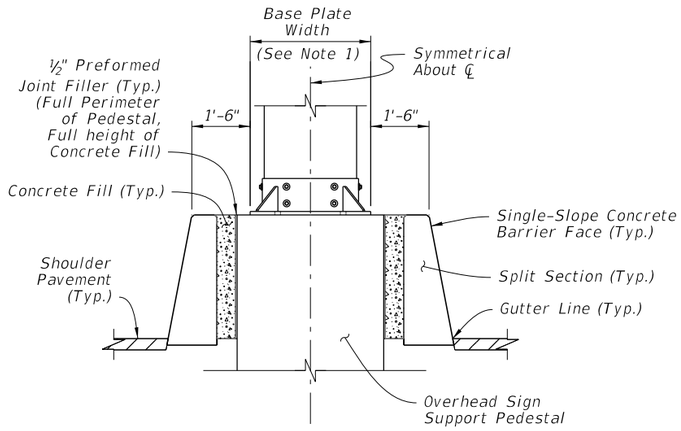
PLAN
(See Note 4)



SECTION A-A
TRANSITION SECTION
(AT BEGIN
SPLIT SECTIONS)



SECTION B-B
38" HEIGHT SPLIT SECTION
(OPPOSITE SIDE SIMILAR
BY OPPOSITE HAND)



SECTION C-C

NOTES:

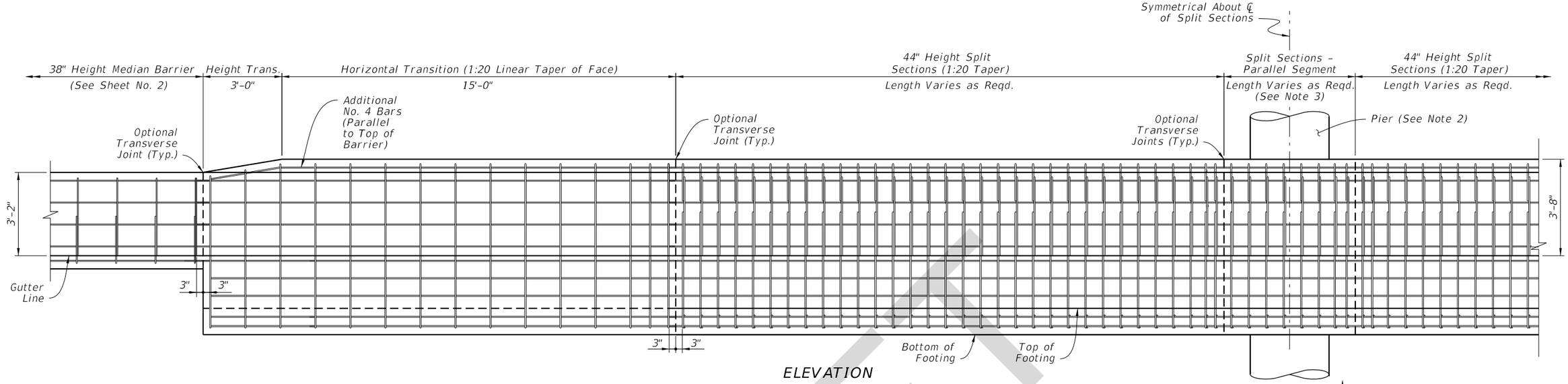
1. OVERHEAD SIGN SUPPORT: The overhead sign support shown is an example only; see the Plans for the actual shape dimensions and requirements. The overall length and width of the split barrier system is governed by the project-specific overhead sign support dimensions, as defined in the Plans.

2. MULTIPLE SIGN SUPPORTS: The parallel segment may be lengthened to accommodate multiple sign supports, with the approach and trailing tapers located 1 foot, measured longitudinally, upstream and downstream from the first and last sign support bases, respectively.

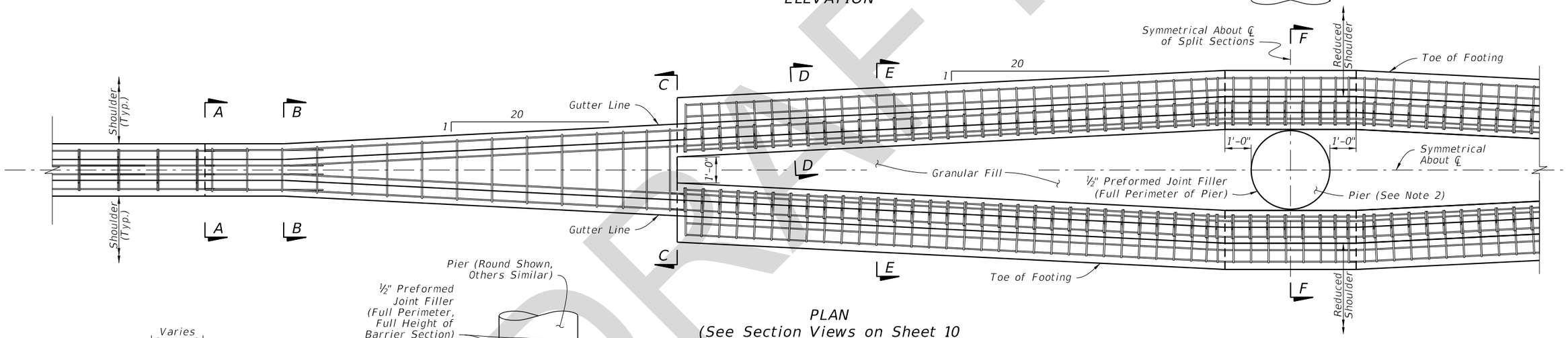
3. STIRRUP BARS: For the vertical and transverse reinforcement requirements shown in Sections A-A and B-B, bar bending diagrams are not provided due to varying section dimensions. Use any combination of spliced reinforcing steel to position the reinforcement with the same cover, spacing, continuity, and equivalent strength shown herein, as approved by the Engineer.

4. PLAN VIEW: Only outermost longitudinal reinforcing is shown for clarity. For all longitudinal reinforcing locations, see the Section Views.

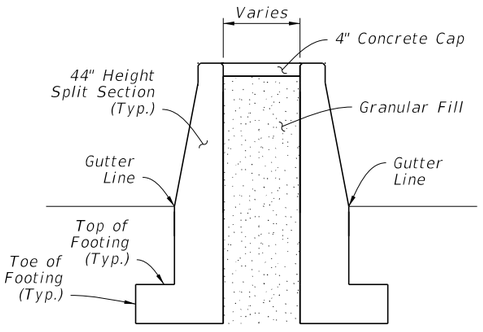
MEDIAN BARRIER - 38" HEIGHT SPLIT SECTION FOR STAND-ALONE SIGN SUPPORT SHIELDING



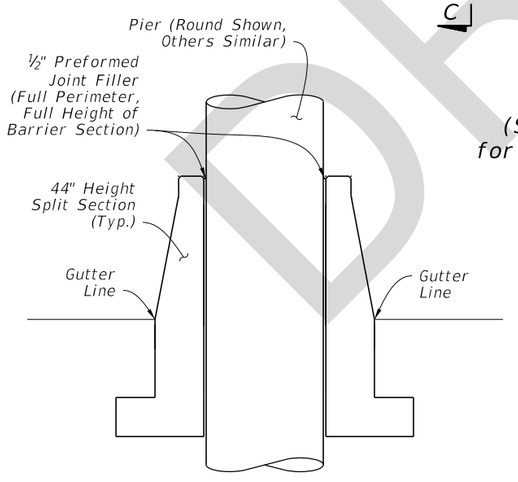
ELEVATION



PLAN
(See Section Views on Sheet 10 for All Longitudinal Steel Locations)



SECTION E-E
SPLIT SECTIONS

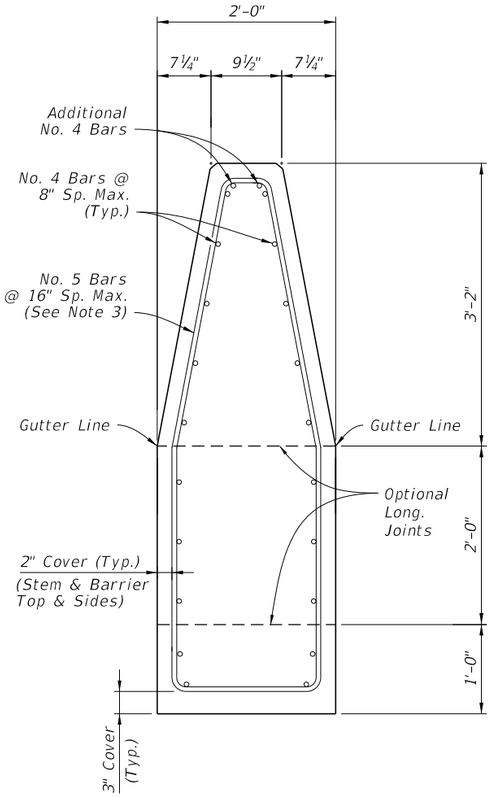


SECTION F-F
SPLIT SECTIONS AT PIER

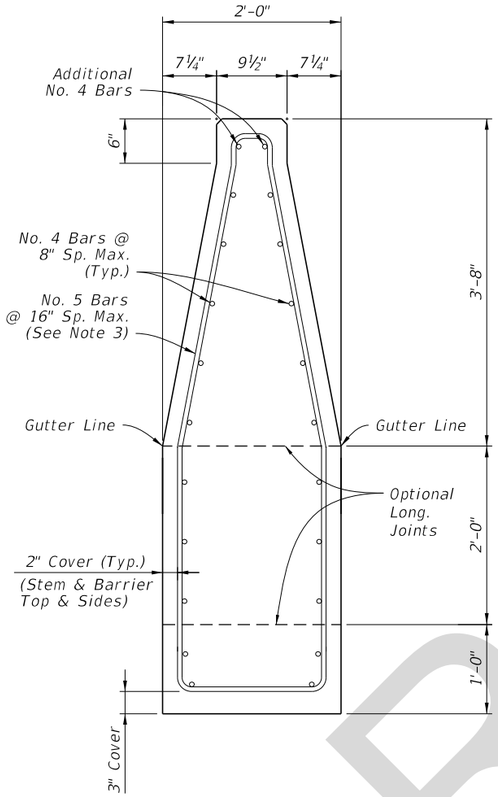
NOTES:

1. SECTION VIEWS: See Sheet 10 for Section Views A-A through D-D and corresponding reinforcing steel details.
2. PIER: The round pier shown is an example only, and project-specific pier shapes may vary. For actual dimensions and requirements, see the Plans. The overall length and width of the split barrier system is governed by the project-specific pier dimensions, as defined in the Plans.
3. MULTIPLE PIERS: The parallel segment may be lengthened to accommodate multiple consecutive piers, with the approach and trailing tapers located 1 foot, measured longitudinally, upstream and downstream from the first and last piers, respectively.

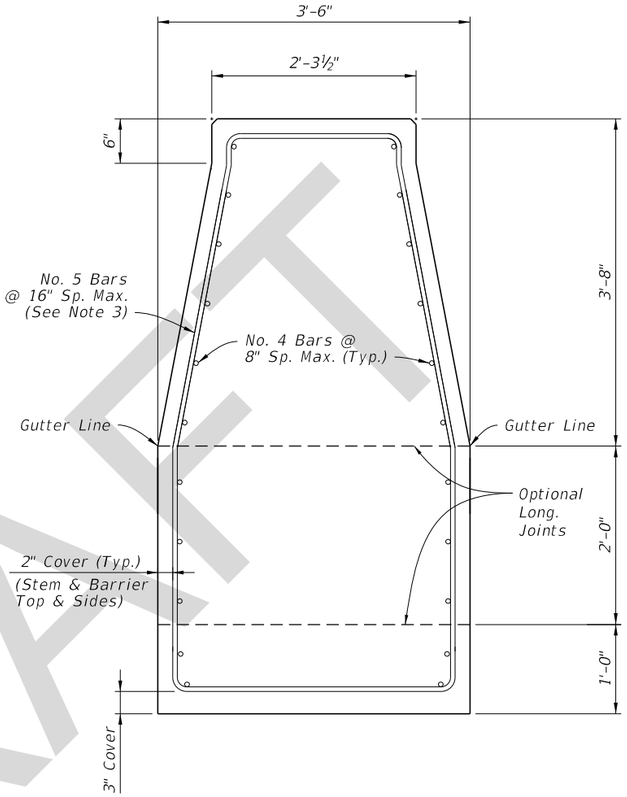
MEDIAN BARRIER - 44 INCH HEIGHT SPLIT SECTION FOR PIER SHIELDING



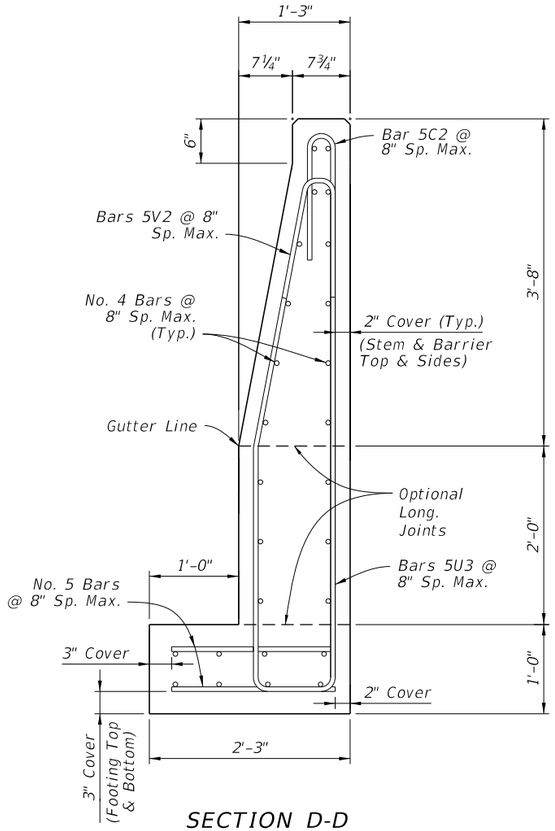
SECTION A-A
BEGIN HEIGHT TRANSITION
(show spliced bars)



SECTION B-B
END HEIGHT TRANSITION
BEGIN WIDTH TRANSITION



SECTION C-C
END WIDTH TRANSITION
BEGIN SPLIT SECTIONS



SECTION D-D
44" HEIGHT SPLIT SECTION
(Opposite Side of Median
Similar by Opposite Hand)

Concrete Qty. = 0.30 CY/FT
Steel Qty. = 52.7 LB/FT

NOTES:

1. GENERAL: Work with the Plan and Elevation views on Sheet 9.
2. LONGITUDINAL REINFORCING CONTINUITY: Maintain all longitudinal steel reinforcing shown in Section C–C continuously into Section D–D (spliced where required). The additional longitudinal reinforcing shown in Section D–D does not require continuity into Section C–C, and it starts 3" from the construction joint or edge of concrete per the details on Sheet 9.
3. STIRRUP BARS: For the vertical and transverse reinforcement requirement shown, bar bending diagrams are not provided due to varying section dimensions. Use any combination of spliced reinforcing steel to position the reinforcement with the same cover, spacing, continuity, and equivalent strength shown herein, as approved by the Engineer.

MEDIAN BARRIER - 44 INCH HEIGHT
SPLIT SECTION PIER SHIELDING - DETAILS

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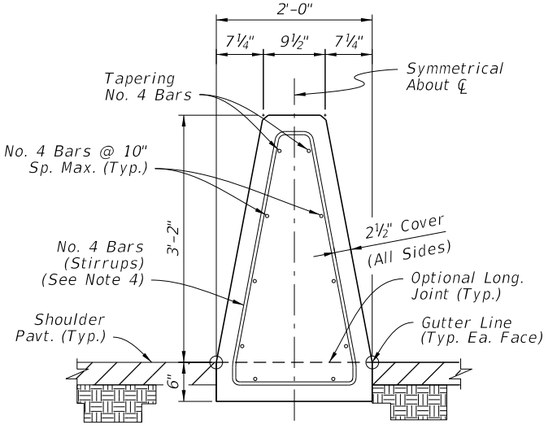
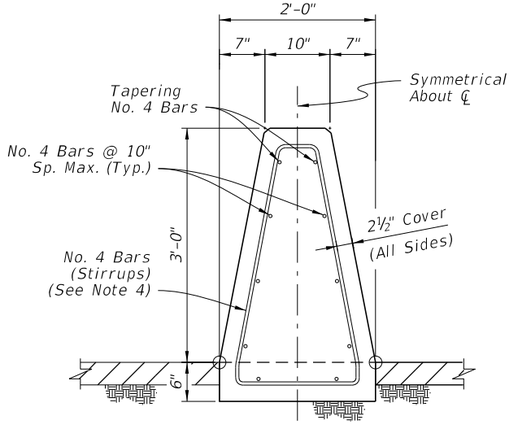
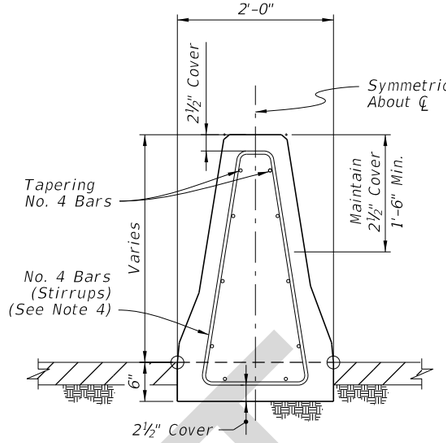


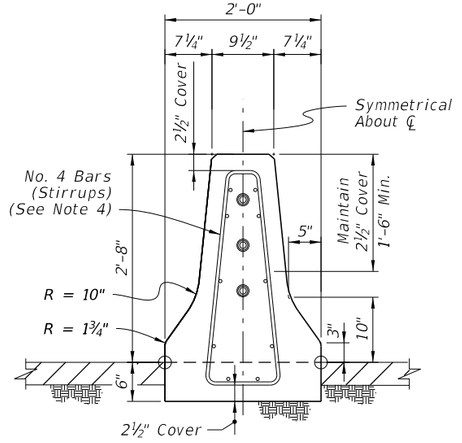
SECTION A-A
BEGIN TRANSITION - OPTION 'A'
MATCH SINGLE-SLOPE
38" HEIGHT MEDIAN BARRIER



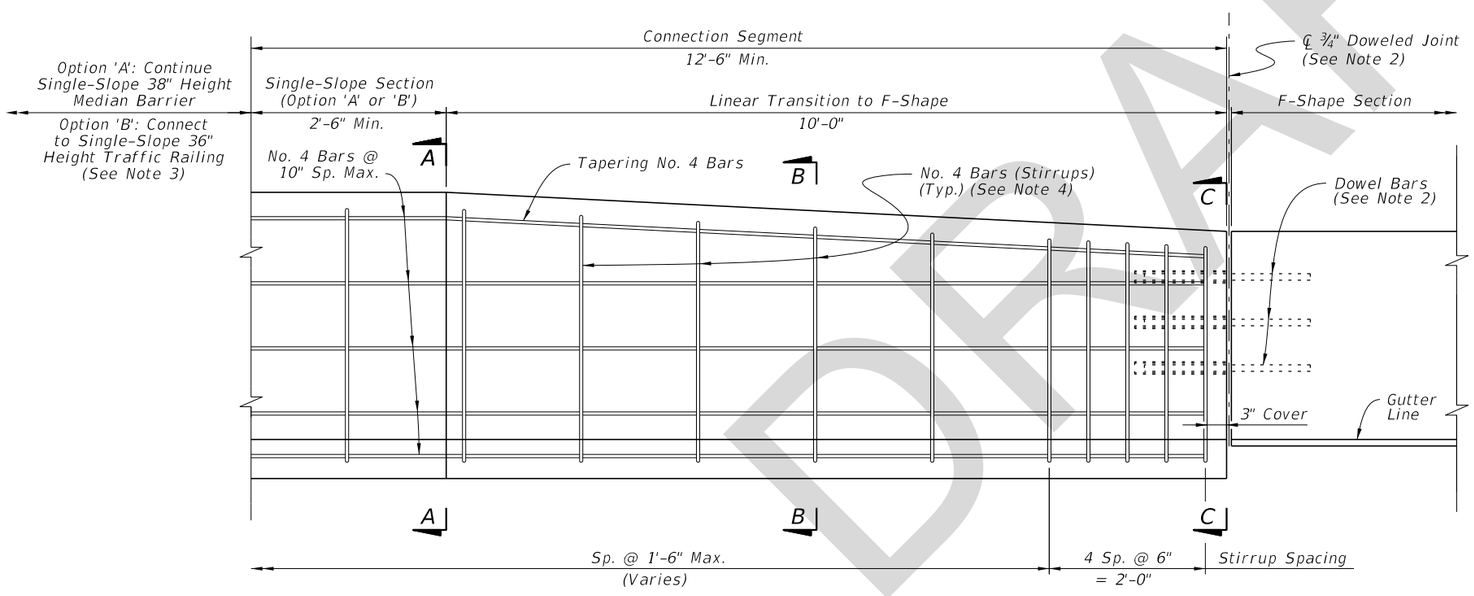
SECTION A-A
BEGIN TRANSITION - OPTION 'B'
MATCH SINGLE-SLOPE
36" HEIGHT TRAFFIC RAILING
(Bridge Applications)



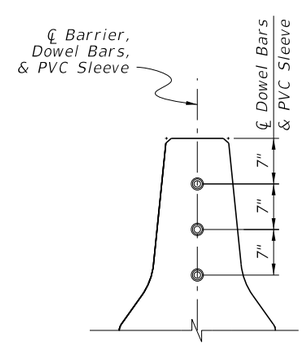
SECTION B-B
INTERMEDIATE SECTION
OF LINEAR TRANSITION



SECTION C-C
END TRANSITION
MATCH 32" HEIGHT
F-SHAPE SECTION



ELEVATION
(Reverse Direction Similar
by Opposite Hand)



SECTION - F-SHAPE
DOWEL PLACEMENT
(See Note 2)

NOTES:

1. *GENERAL: Construct the Connection Segment as required per the Plans to connect existing F-Shape sections to Single-Slope Median Barrier or Traffic Railing sections. Construct Option 'A' or 'B' as required to match the heights of the connecting sections.*
2. *DOWELED JOINT: Install Dowel Bars per the Dowel Details on Sheet 2.*
3. *TRAFFIC RAILING CONNECTION: For the Option 'B' connection, use a Doweled Joint per Sheet 2 and the additional Free End Reinforcing with reduced bar spacing per Sheet 3.*
4. *STIRRUP BARS: For the vertical and transverse reinforcement requirements shown, bar bending diagrams are not provided due to varying section dimensions. Use any combination of spliced reinforcing steel to position the reinforcement with the same cover, spacing, continuity, and equivalent strength shown herein, as approved by the Engineer.*

MEDIAN BARRIER - CONNECTION TO F-SHAPE

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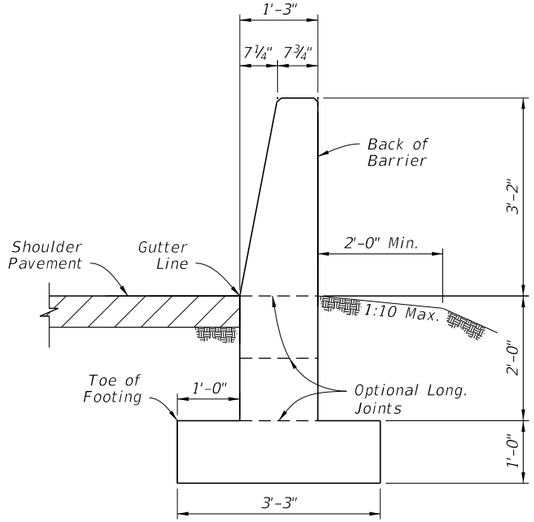
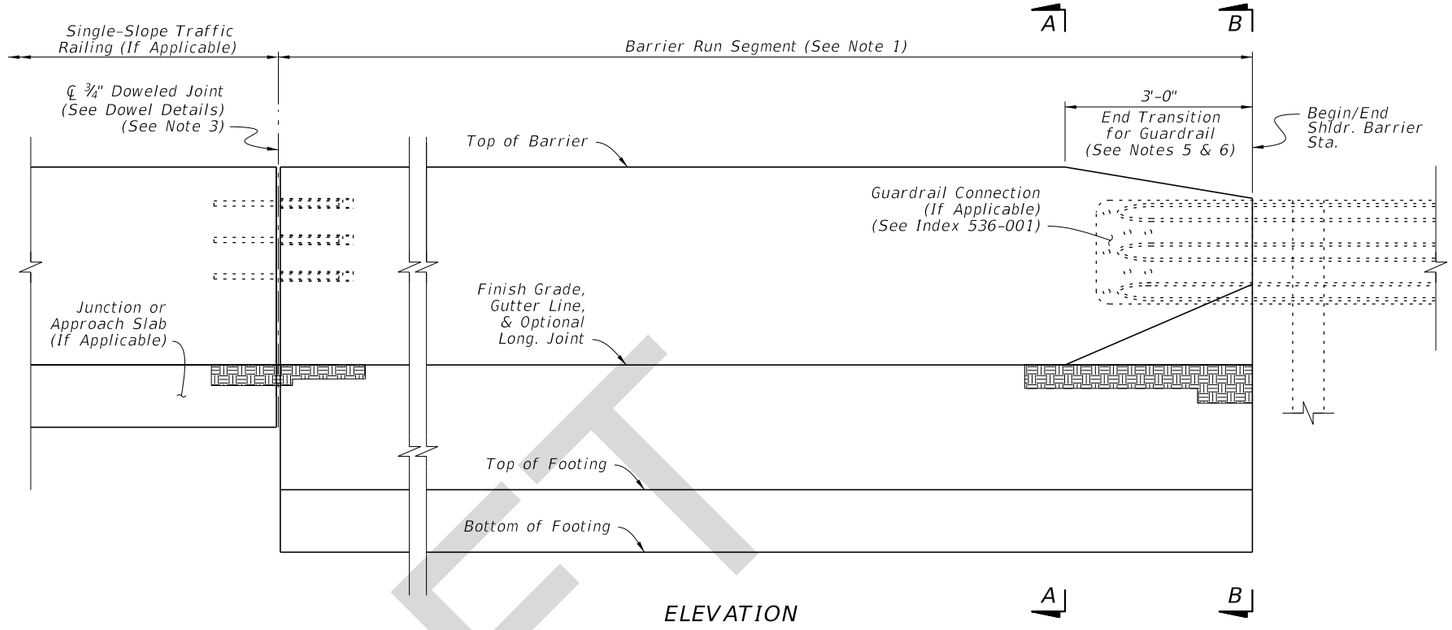
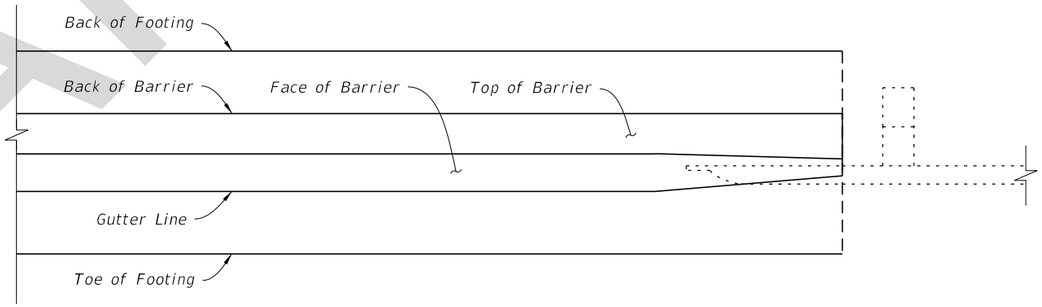


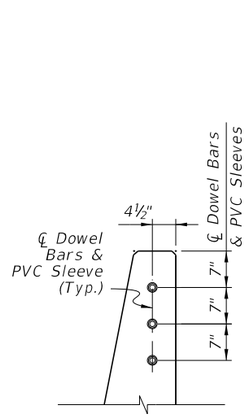
SECTION A-A
38" HEIGHT SHOULDER BARRIER
(See Sheet 13 for Reinforcing Steel Details)



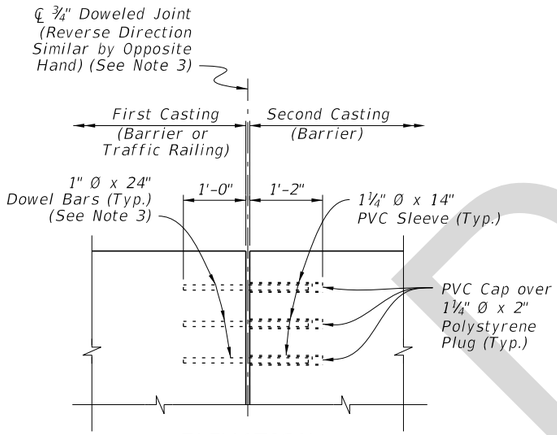
ELEVATION



PLAN



SECTION
DOWEL PLACEMENT



ELEVATION
DOWEL BAR & PVC CONNECTION

DOWEL DETAILS

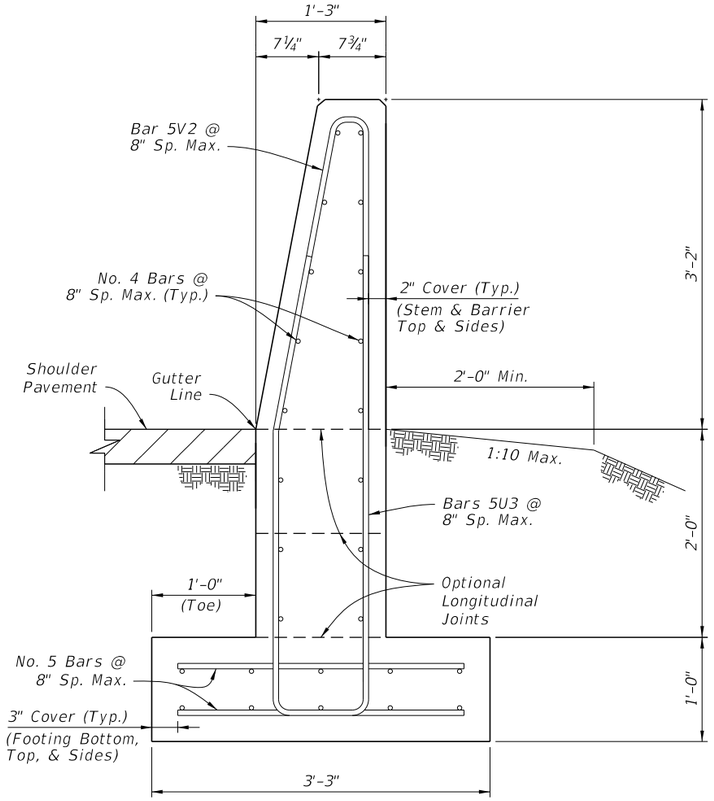
NOTES:

1. *BARRIER RUN SEGMENT: Either the 38" Height Shoulder Barrier or the differing Shoulder Barrier sections shown throughout the Index may be placed within this segment as required per the Plans.*
2. *SECTION VIEWS: For additional Views A-A and B-B, see Sheet 13.*
3. *DOWELED JOINTS: See the General Notes on Sheet 1 for usage of joint types. Place steel reinforcing with a longitudinal 3" cover adjacent to the joint face in the barrier. Use ASTM A36 smooth round bars with hot-dip galvanization.*

   For the dowel connection into the first casting, the dowel may be cast-in-place for new concrete or placed into a 1⅛"∅ x 13"(± ½") drilled hole for cured concrete. For drilled holes larger than 1⅛"∅, secure the dowel with adhesive in accordance with Specification Section 416. No load testing is required.

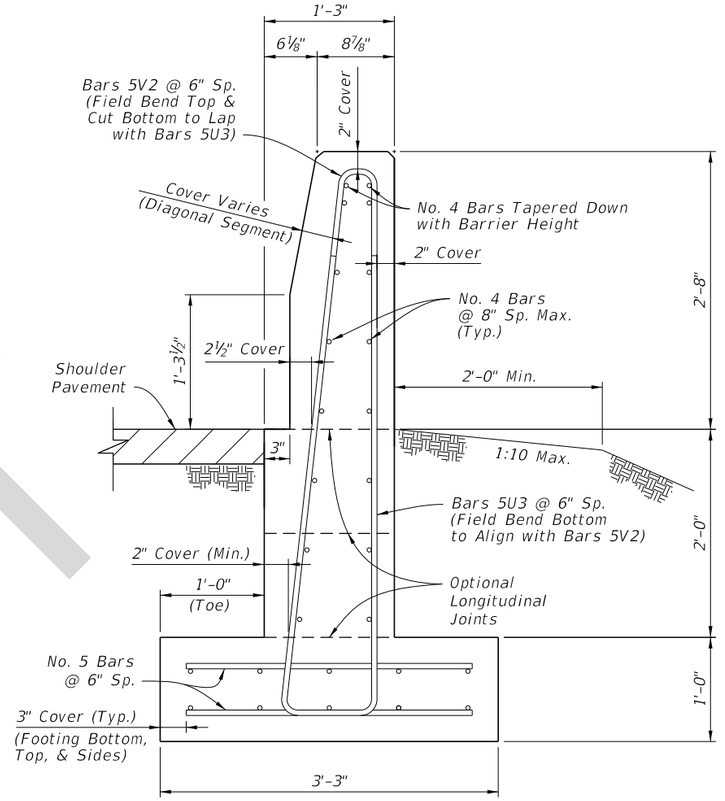
   For the dowel connection into the second casting, use a 1¼" NPS Schedule 80 PVC pipe with a sealed cap, cast-in-place as shown.
4. *TRAFFIC RAILING CONNECTIONS: Align the barrier and Traffic Railing faces and connect with the ¾" Doweled Joint.*
5. *GUARDRAIL CONNECTIONS: Connect Guardrail using the Transition Connections to Rigid Barrier per Index 536-001 in conjunction with the 16'-0" End Segment for Guardrail shown herein.*
6. *CRASH CUSHION CONNECTIONS: Connect Crash Cushions per Index 544-001 in conjunction with the 3'-0" End Transition for Guardrail as shown herein.*
7. *FREE ENDS: When the barrier end does not terminate with a Traffic Railing Connection, Guardrail Connection, or Crash Cushion Connection as called for in the Plans, terminate in accordance with the Free End Reinforcing Note on Sheet 13.*

SHOULDER BARRIER



SECTION A-A
38" HEIGHT SHOULDER BARRIER

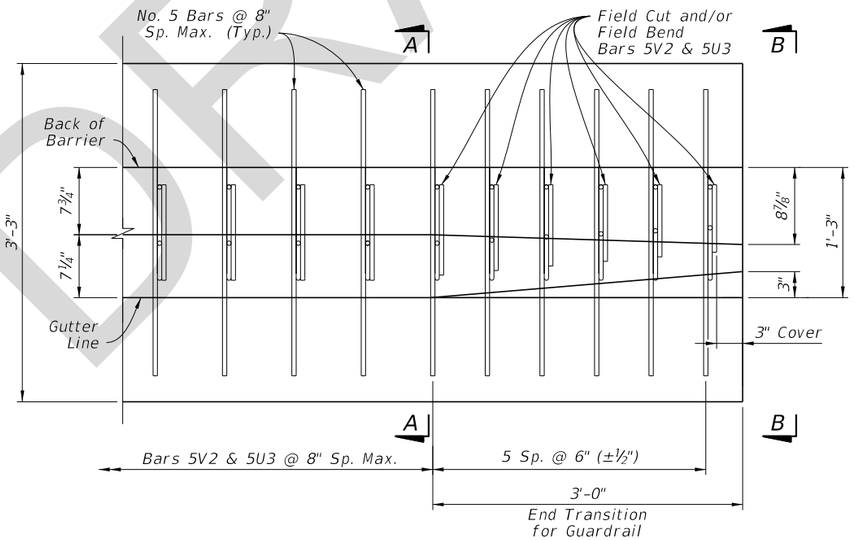
Concrete Qty. = 0.32 CY/FT
Steel Qty. = 50.9 LB/FT



VIEW B-B
REDUCED SECTION OF END TRANSITION FOR GUARDRAIL
(End of Barrier)

NOTES:

1. GENERAL: Work with the Plan and Elevation Views on Sheet 12. The Section Option footings shown on Sheet 14 may be substituted where called for in the Plans.
2. FREE END REINFORCING: Where shown in the Plans, terminate the 38" Height Barrier section with a transverse vertical end face. Reduce the spacing of Bars 5V2 and 5U3 to 6" for 5 Spaces, placed with 3" cover from the barrier's end face.
3. BAR BENDING DIAGRAMS: For additional details for bars 5V2 and 5U3, see the Bar Bending Diagrams on Sheet 22.



PLAN VIEW - END SEGMENT FOR GUARDRAIL CONNECTION
(Longitudinal Steel Not Shown for Clarity)

SHOULDER BARRIER - REINFORCING DETAILS

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LAST REVISION	REVISION	DESCRIPTION:	FDOT	FY 2018-19 STANDARD PLANS	CONCRETE BARRIER	INDEX	SHEET
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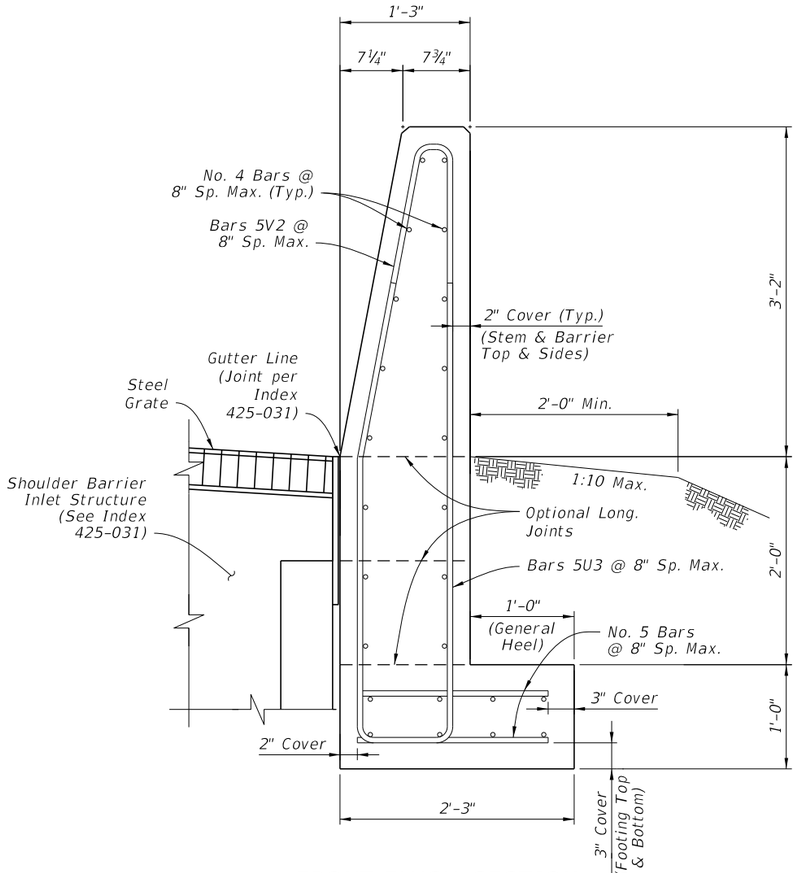
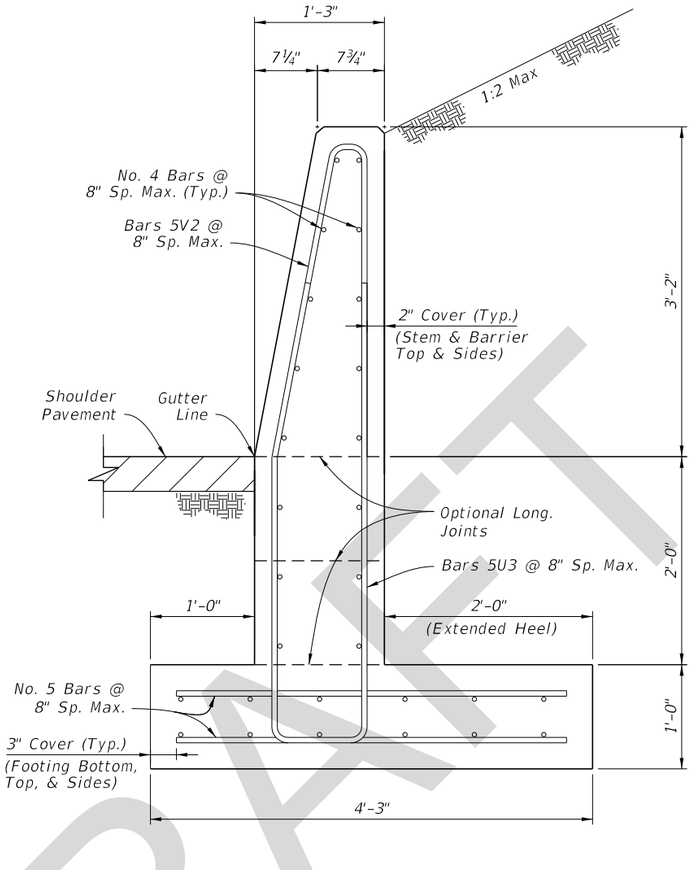


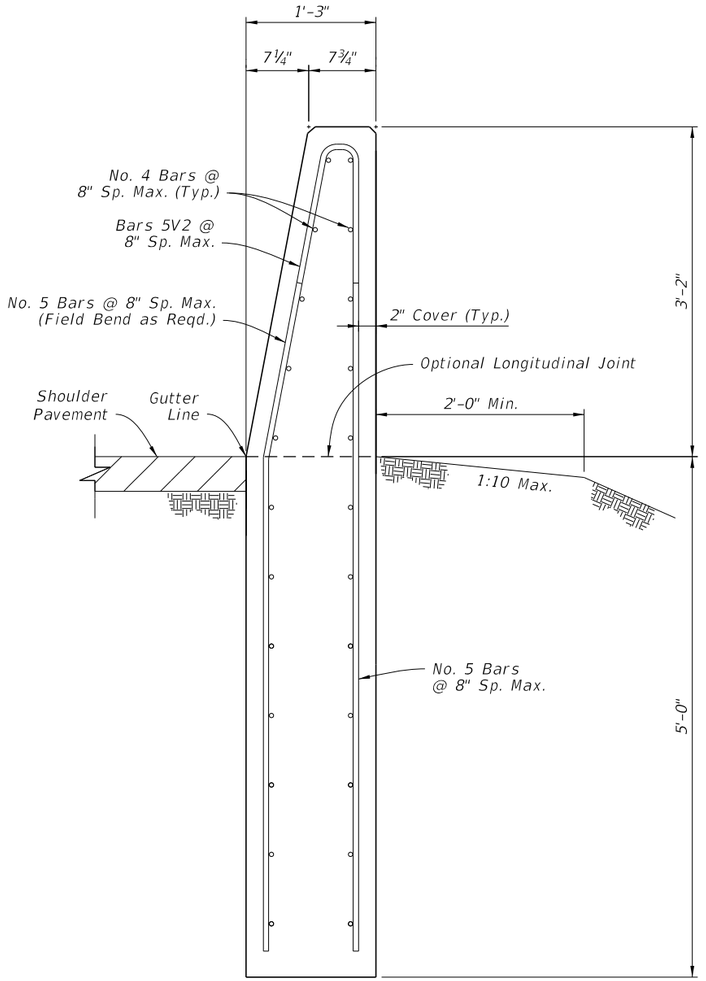
FRONT-FLUSH SECTION
(Where Required For Barrier Inlet Locations)

Concrete Qty. = 0.29 CY/FT
Steel Qty. = 46.7 LB/FT



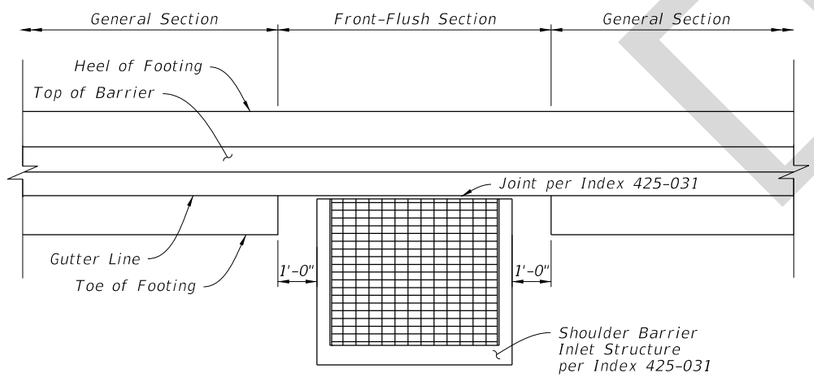
RETAINING SECTION

Concrete Qty. = 0.36 CY/FT
Steel Qty. = 56.9 LB/FT



TRENCH FOOTING SECTION

Concrete Qty. = 0.35 CY/FT
Steel Qty. = 48.4 LB/FT



FRONT-FLUSH SECTION - PLAN VIEW
(Not Applicable for Trench Footing Sections)

NOTES:

1. *GENERAL: Install the differing Section Options as required per the Plans.*
2. *CONNECTIONS BETWEEN DIFFERENT SECTIONS: Connect differing Shoulder Barrier sections using a continuous pour or Transverse Joint, where longitudinal steel that aligns within the adjacent section is maintained continuously between sections. Alternatively, a Doweled Joint may be used as shown on Sheet 12.*
3. *FLUSH RETAINING SECTION COMBINATION: Where Barrier Inlets are required in retaining segments, install the Flush Section, except replace the 1'-0" General Heel with the 2'-0" Extended Heel as shown in the Retaining Section. Use longer lateral reinforcing bars of 2'-10" length to maintain the cover shown.*

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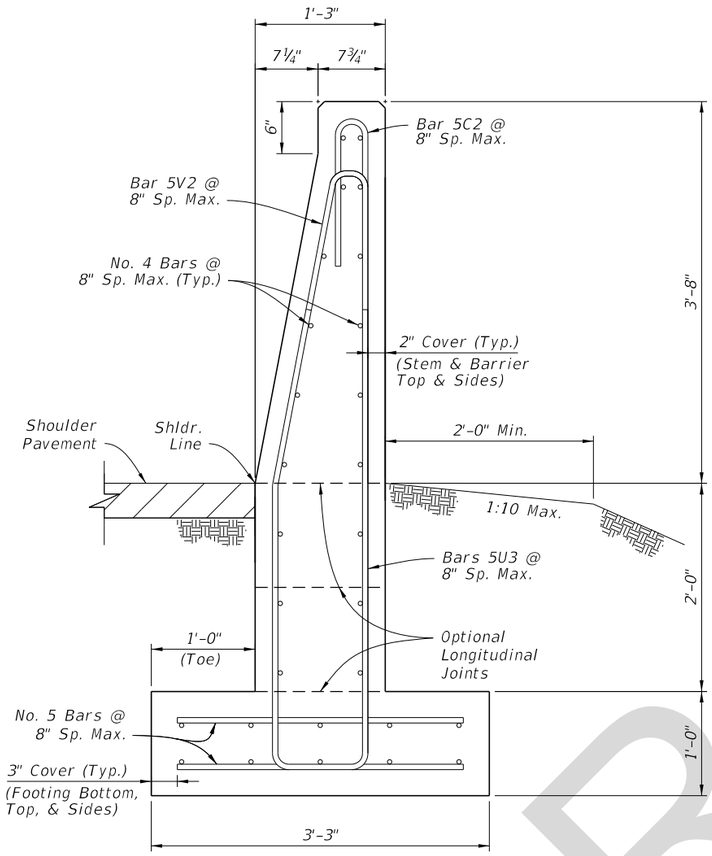
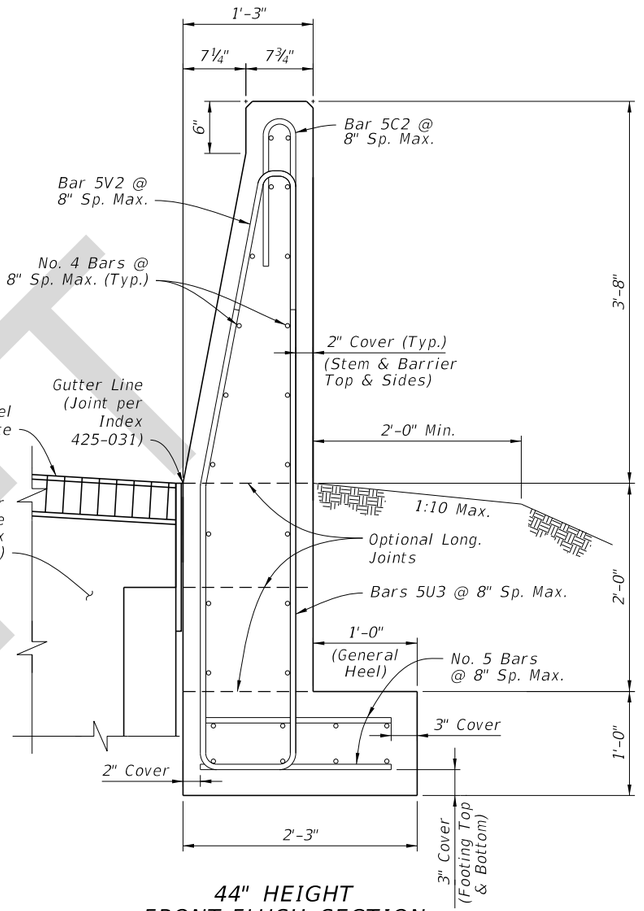
SHOULDER BARRIER - SECTION OPTIONS



44" HEIGHT SECTION
(For Use Adjacent to Rear-Flush Section on Sheet 17)

Concrete Qty. = 0.34 CY/FT
Steel Qty. = 57.1 LB/FT



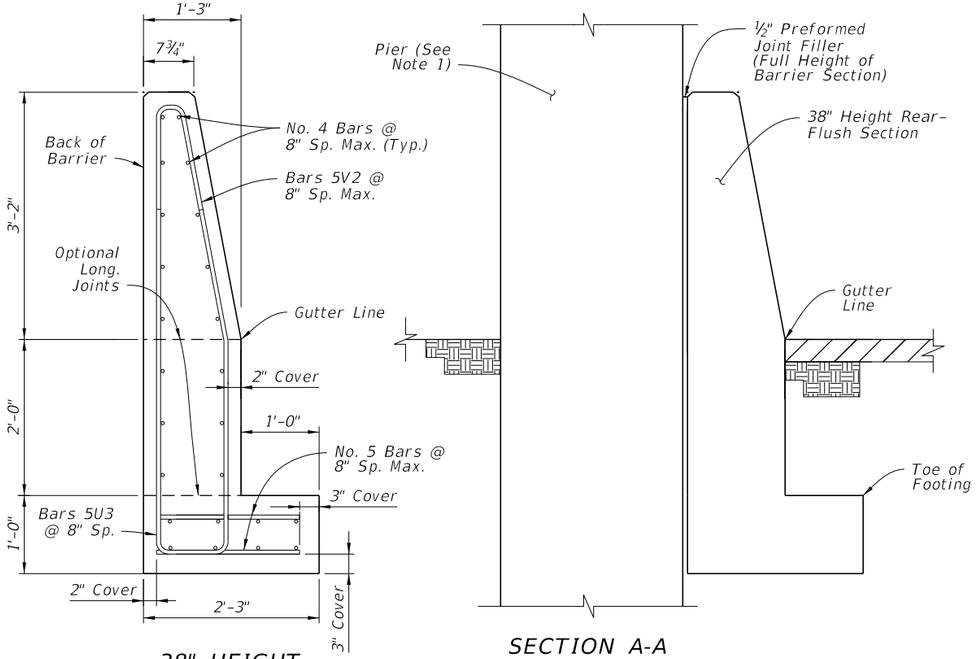
44" HEIGHT
FRONT-FLUSH SECTION
(For Use Adjacent to Rear-Flush Section on Sheet 17, as Required for Barrier Inlets)

Concrete Qty. = 0.30 CY/FT
Steel Qty. = 52.6 LB/FT

NOTE:

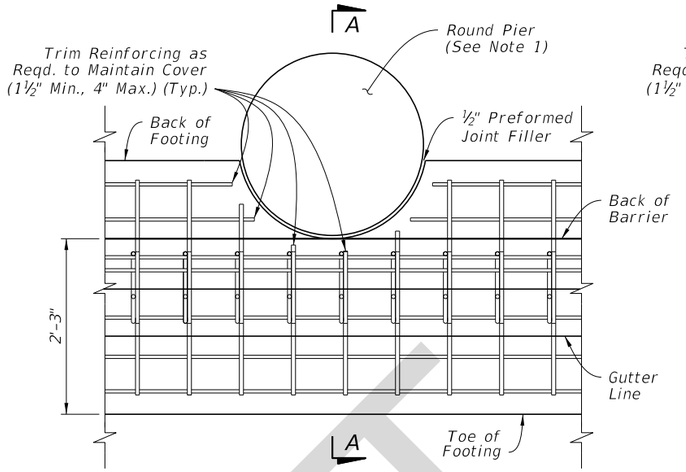
1. GENERAL: See the applicable Notes on Sheet 14.

SHOULDER BARRIER - SECTION OPTIONS (CONTINUED)

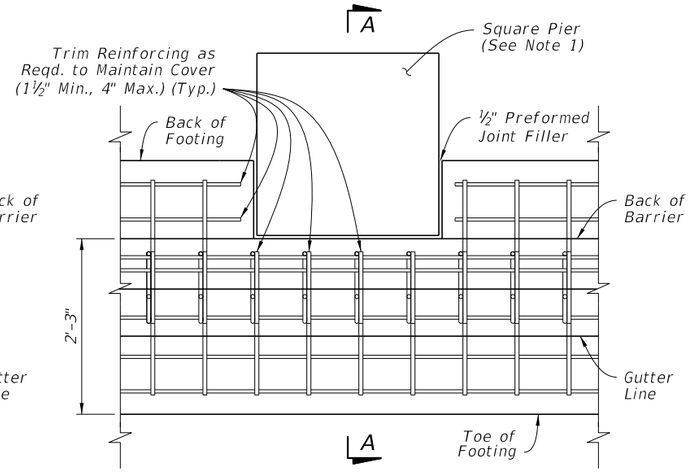


38" HEIGHT
REAR-FLUSH SECTION

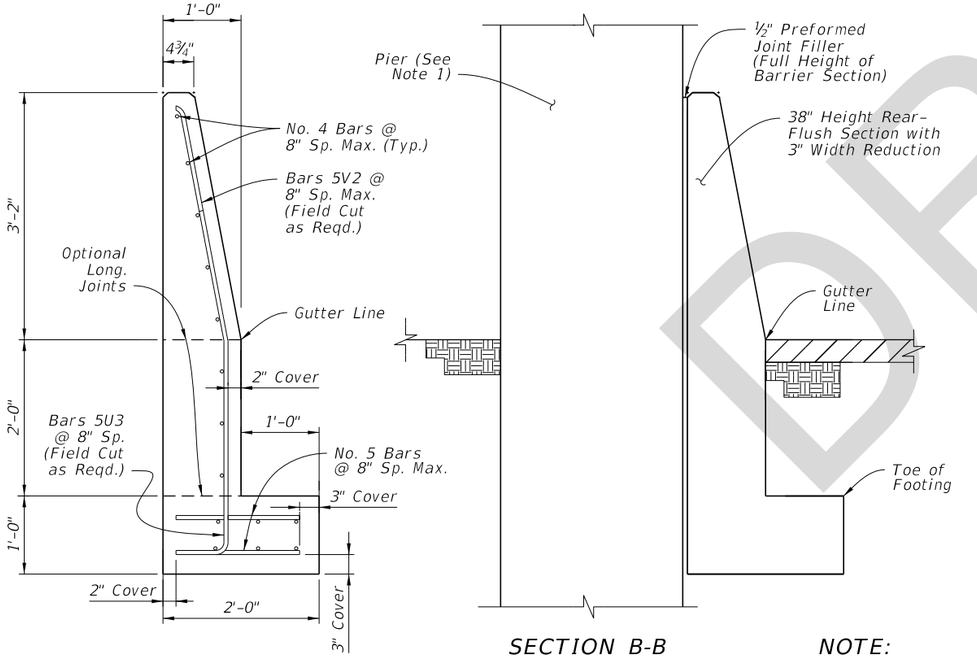
SECTION A-A
ABOVE-GROUND HAZARD
EMBEDDED IN FOOTING



PLAN - ROUND PIER EXAMPLE
REAR-FLUSH SECTION
(See Section View for All
Longitudinal Steel Locations)

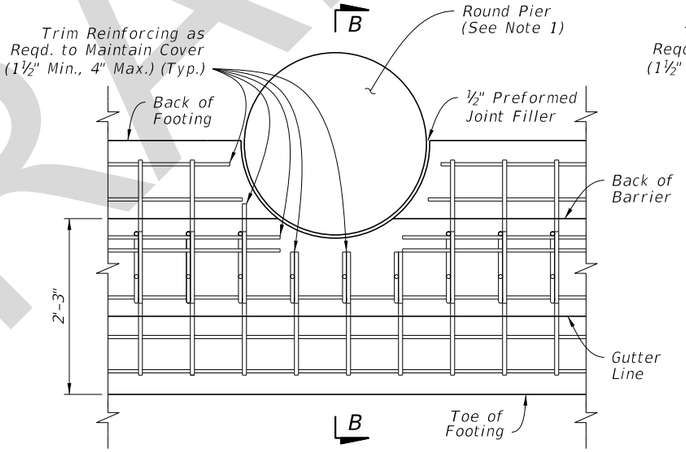


PLAN - SQUARE PIER EXAMPLE
REAR-FLUSH SECTION
(See Section View for All
Longitudinal Steel Locations)

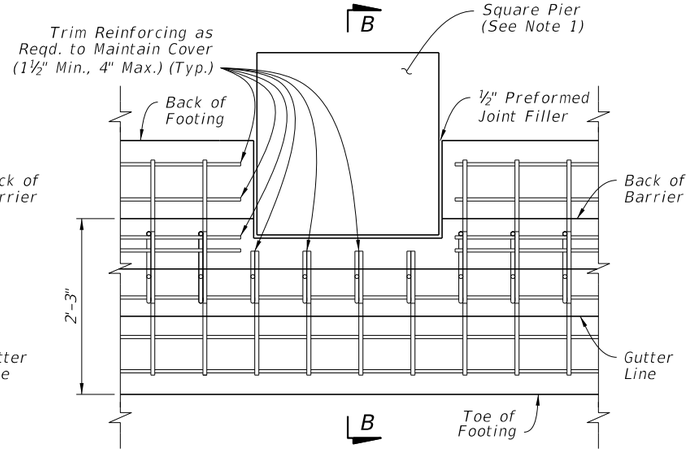


38" HEIGHT
REAR-FLUSH SECTION
WITH 3" WIDTH REDUCTION

SECTION B-B
ABOVE-GROUND HAZARD
EMBEDDED IN FOOTING
& BARRIER



PLAN - ROUND PIER EXAMPLE
REAR-FLUSH SECTION
WITH 3" WIDTH REDUCTION
(See Section View for All
Longitudinal Steel Locations)

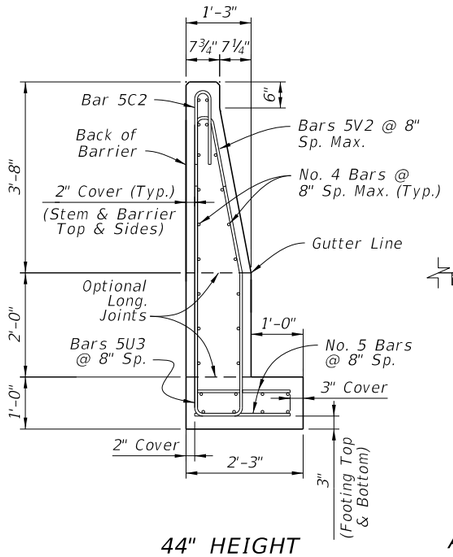


PLAN - SQUARE PIER EXAMPLE
REAR-FLUSH SECTION
WITH 3" WIDTH REDUCTION
(See Section View for All
Longitudinal Steel Locations)

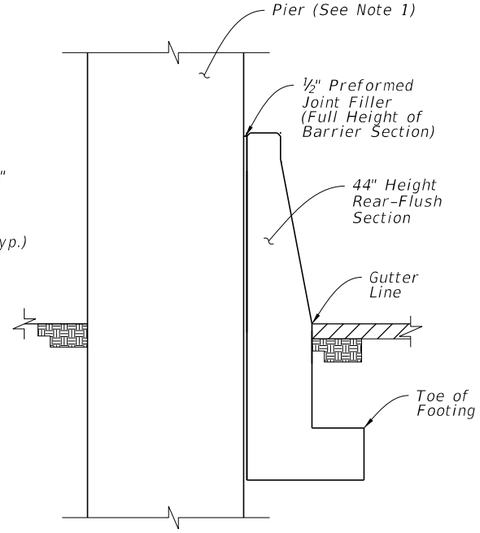
NOTE:

1. PIERS: The piers shown herein are example shapes only; see the Plans for the project-specific dimensions. The details shown herein are only for use when piers do not require protection per the AASHTO LRFD requirements. For piers requiring protection, see Index 521-002.

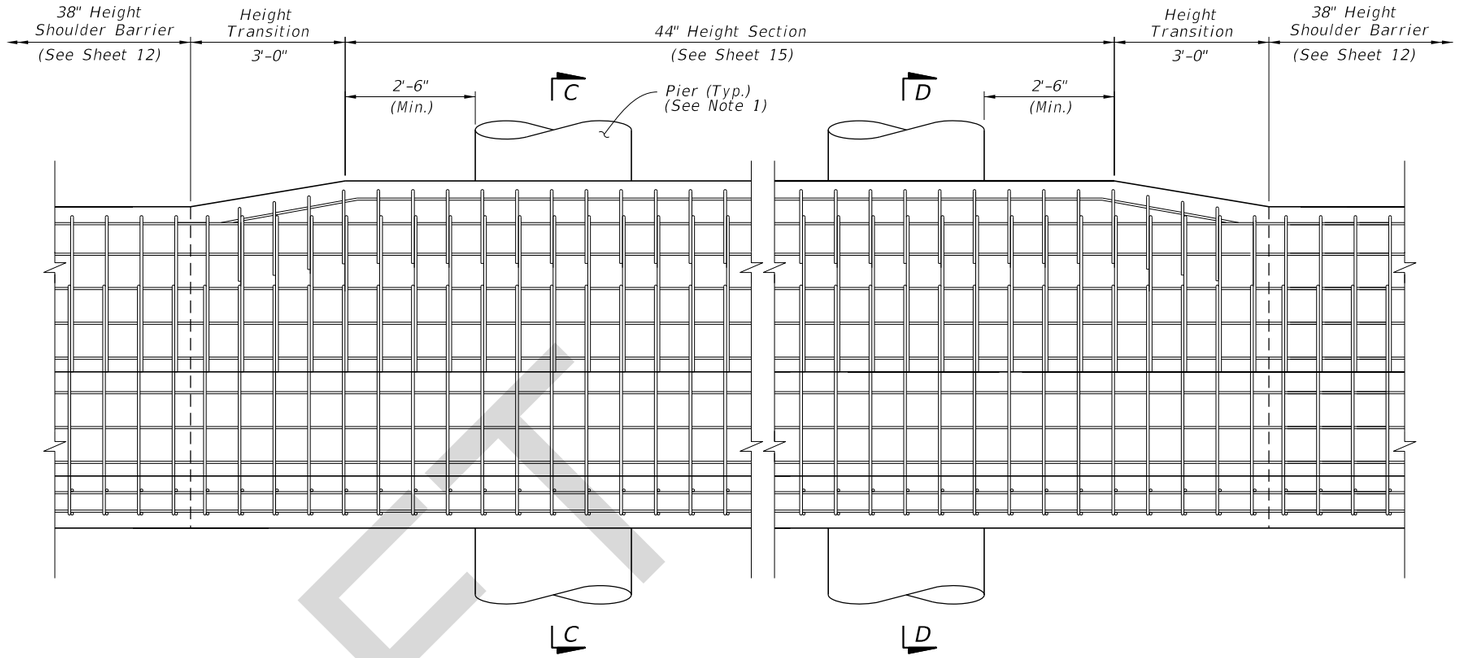
SHOULDER BARRIER - 38" HEIGHT REAR-FLUSH SECTION FOR REDUCED SETBACK PIER SHIELDING (DESIGN SPEED ≤ 45 MPH)



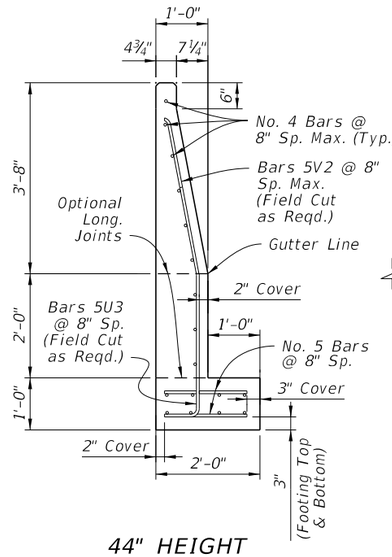
44" HEIGHT
REAR-FLUSH SECTION



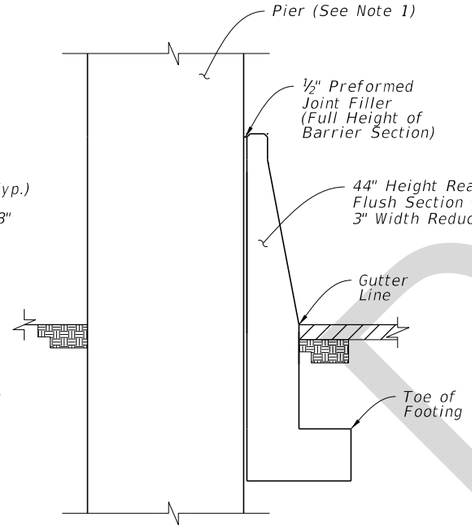
SECTION C-C
ABOVE-GROUND HAZARD
EMBEDDED IN FOOTING



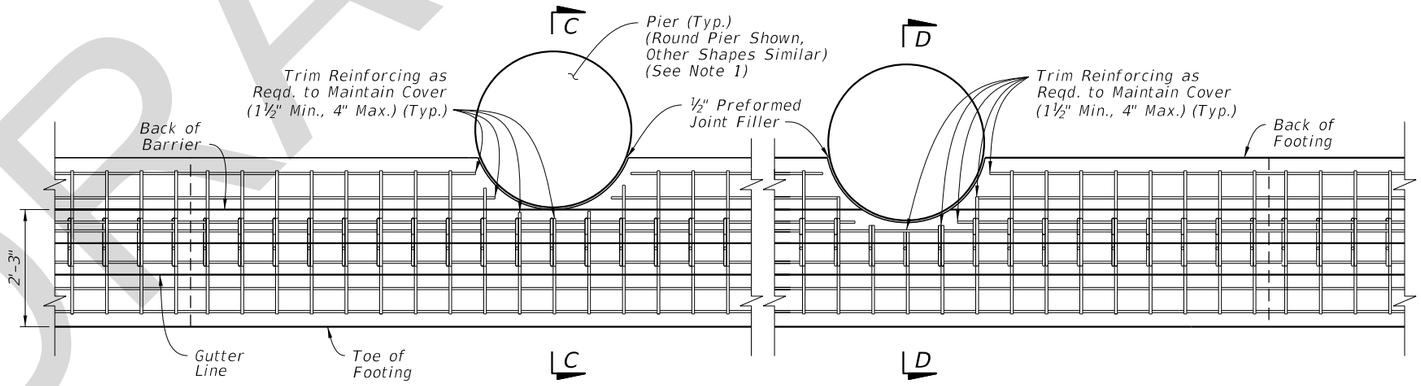
ELEVATION - ROUND PIERS EXAMPLE
(SQUARE PIERS SIMILAR)



44" HEIGHT
REAR-FLUSH SECTION
WITH 3" WIDTH REDUCTION



SECTION D-D
ABOVE-GROUND HAZARD
EMBEDDED IN FOOTING
& BARRIER



PLAN - ROUND PIERS EXAMPLE
(SQUARE PIERS SIMILAR)
(For All Longitudinal Steel Locations,
See the Section Views)

NOTE:

1. PIERS: The piers shown herein are example shapes only; see the Plans for the project-specific dimensions. The details shown herein are only for use when piers do not require protection per the AASHTO LRFD requirements. For piers requiring protection, see Index 521-002.

SHOULDER BARRIER - 44" HEIGHT REAR-FLUSH SECTION
FOR REDUCED SETBACK PIER SHIELDING

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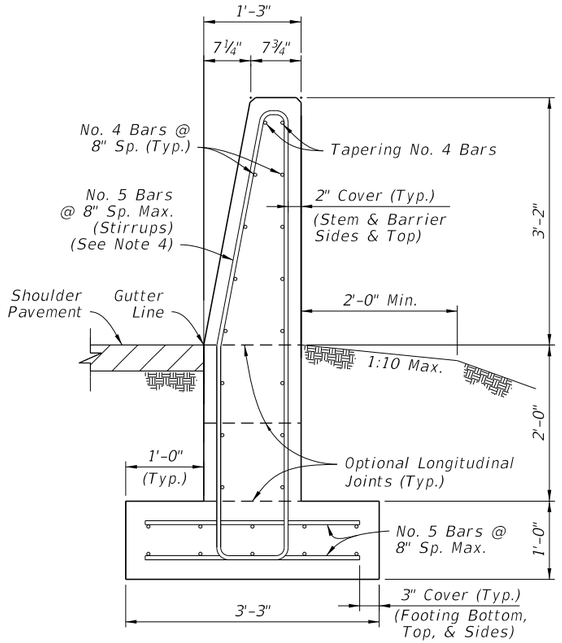
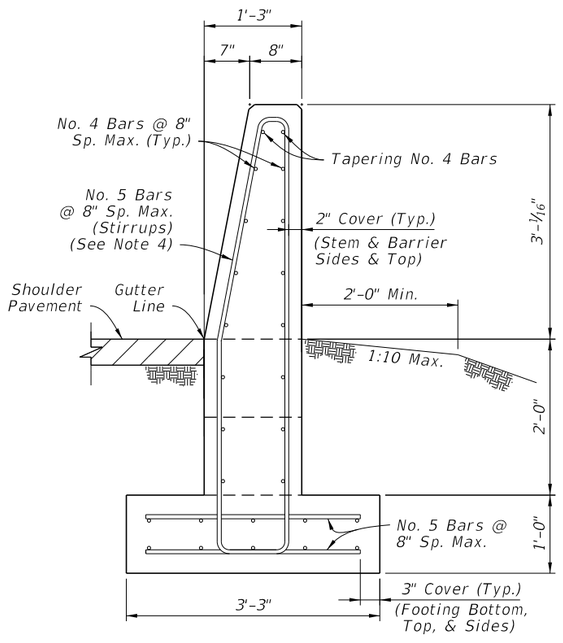
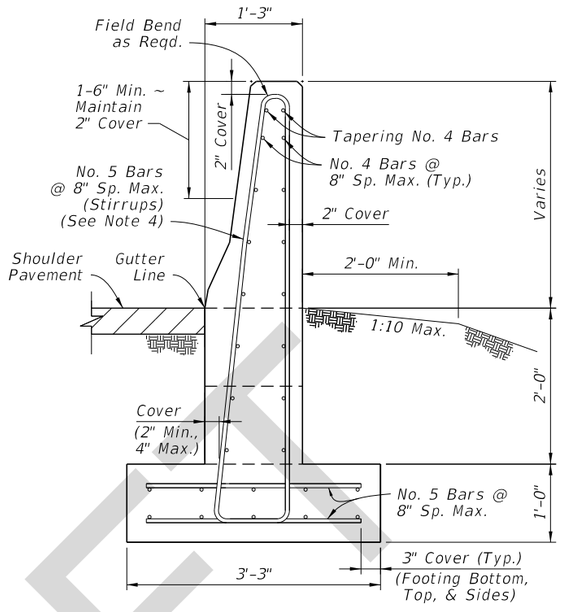


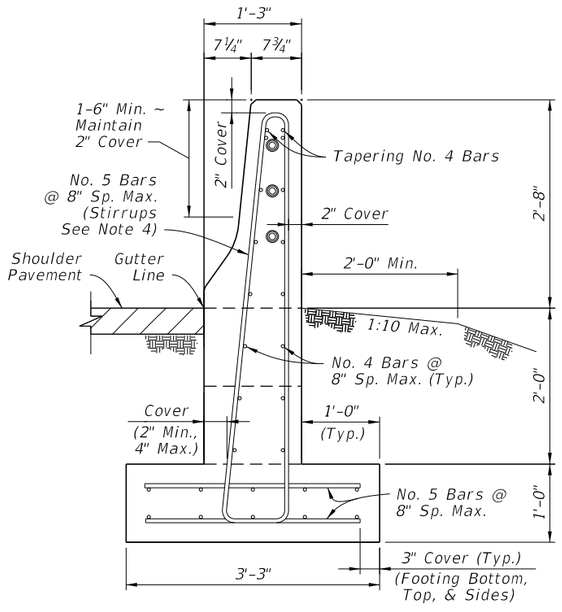
SECTION A-A
BEGIN TRANSITION - OPTION 'A'
MATCH SINGLE-SLOPE
38" HEIGHT SHOULDER BARRIER



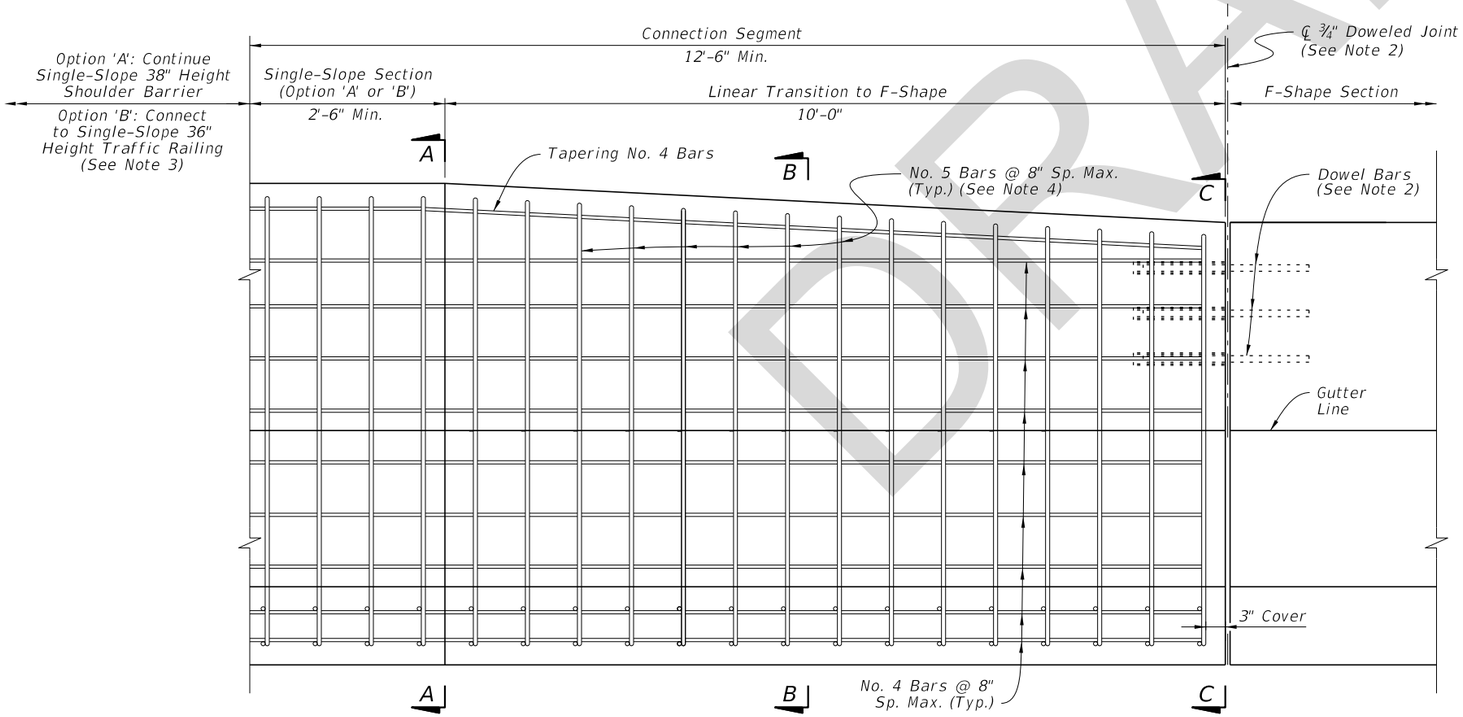
SECTION A-A
BEGIN TRANSITION - OPTION 'B'
MATCH SINGLE-SLOPE
36" HEIGHT TRAFFIC RAILING
(Bridge Applications)



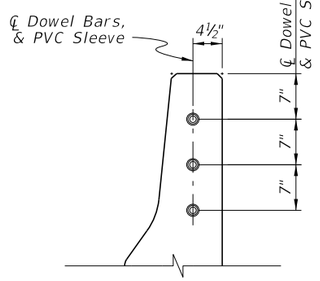
SECTION B-B
INTERMEDIATE SECTION
OF LINEAR TRANSITION



SECTION C-C
END TRANSITION
MATCH 32" HEIGHT
F-SHAPE SECTION



ELEVATION



SECTION - F-SHAPE
DOWEL PLACEMENT
(See Note 2)

NOTES:

1. *GENERAL: Construct the Connection Segment as required per the Plans to connect existing F-Shape sections to Single-Slope Shoulder Barrier or Traffic Railing sections. Construct Option 'A' or 'B' as required to match the heights of the connecting sections.*
2. *DOWELED JOINT: Install Dowel Bars per the Dowel Details on Sheet 12.*
3. *TRAFFIC RAILING CONNECTION: For the Option 'B' connection, use a Doweled Joint per Sheet 12 and the additional Free End Reinforcing with reduced bar spacing per Sheet 13.*
4. *STIRRUP BARS: For the vertical and transverse reinforcement requirements shown, bar bending diagrams are not provided due to varying section dimensions. Use any combination of spliced reinforcing steel to position the reinforcement with the same cover, spacing, continuity, and equivalent strength shown herein, as approved by the Engineer.*

SHOULDER BARRIER - CONNECTION TO F-SHAPE

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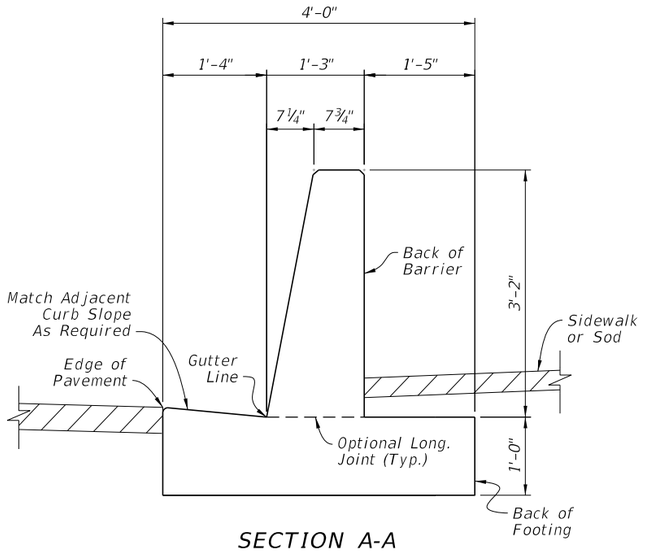
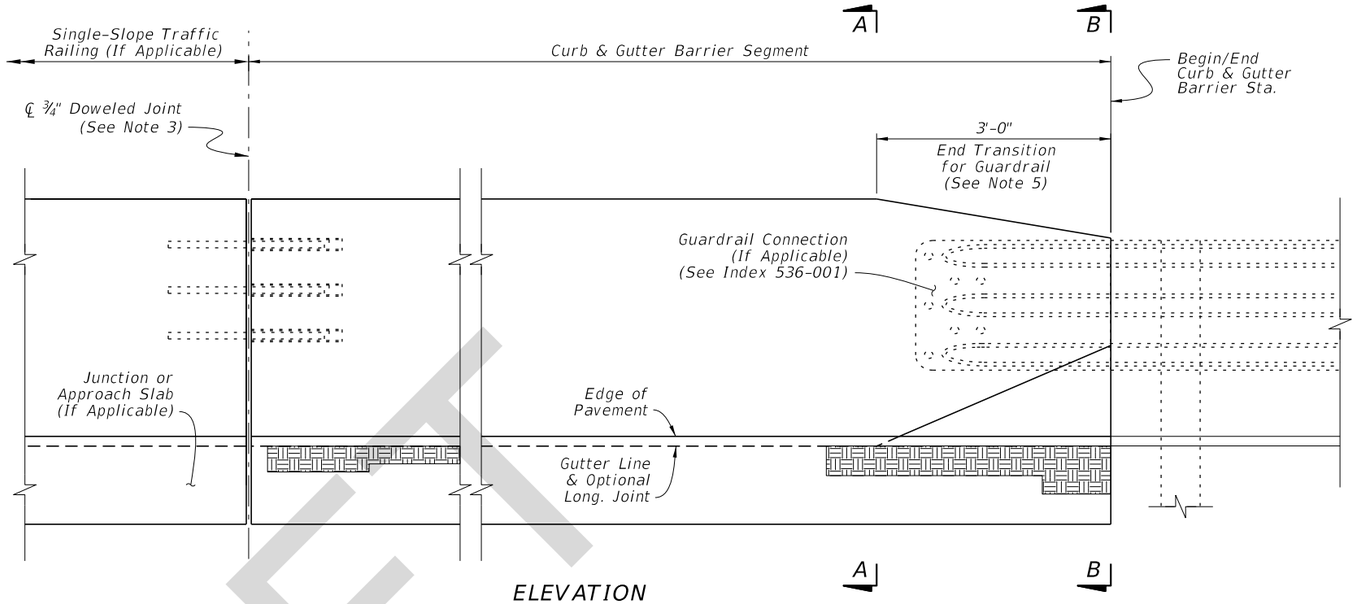
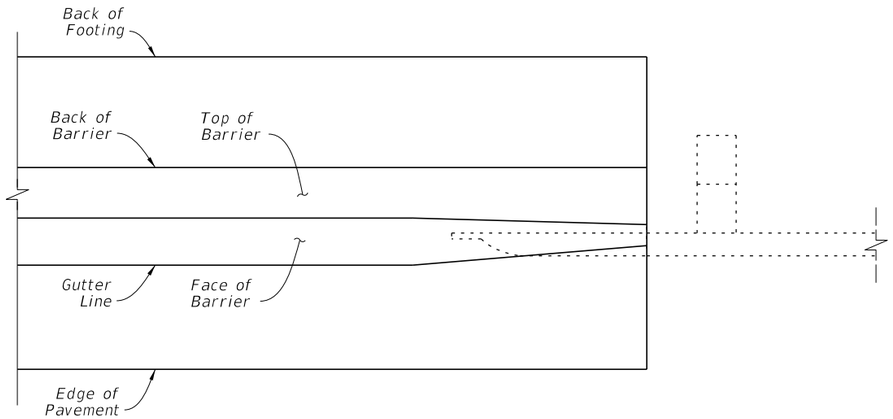


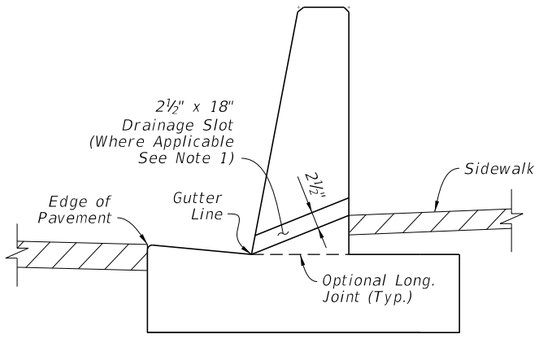
SECTION A-A
CURB & GUTTER BARRIER



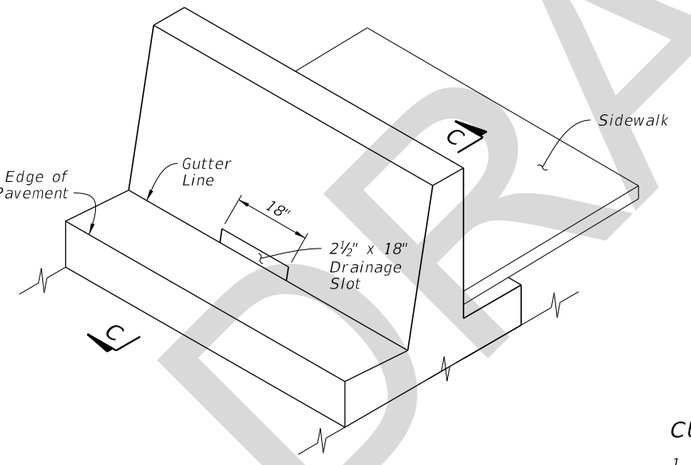
ELEVATION



PLAN



SECTION C-C
CURB & GUTTER BARRIER WITH DRAINAGE SLOT



ISOMETRIC VIEW
CURB GUTTER BARRIER
WITH DRAINAGE SLOT

DRAINAGE SLOT DETAILS

DRAINAGE SLOT NOTES:

1. GENERAL: Place 2½" x 18" Drainage Slots at locations and/or spacing called for in the Plans.

2. STEEL REINFORCEMENT CONFLICT: When the Drainage Slot encounters a conflict with reinforcing steel, shift or cut the reinforcing steel to provide 2½"(± ½") of concrete cover for the reinforcing around the Drainage Slot. If cutting the vertical bars, maintain 8" bar spacing. If shifting the vertical bars, move the bars from the standard 8" spacing location to the closest end of the drainage slot (distributing additional vertical reinforcement evenly on each side of the Drainage Slot).

CURB AND GUTTER BARRIER NOTES:

1. SECTION VIEWS: For additional Views A–A and B–B, see Sheet 20.

2. EXPANSION JOINTS: Place ½" width transverse expansion joints through the barrier and footing spaced at 100–foot maximum intervals. On both sides of each joint, use the Free End Reinforcing bar spacing per Sheet 20.

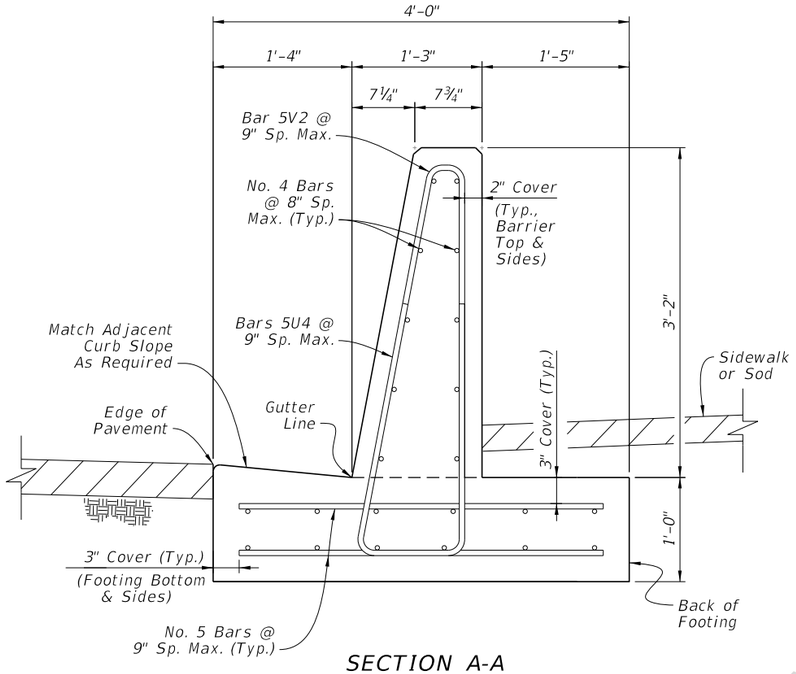
3. DOWELED JOINTS: See the General Notes on Sheet 1 for usage of joint types. Where required, install ¾" Doweled Joints as defined on Sheet 12.

4. TRAFFIC RAILING CONNECTIONS: Align the barrier and Traffic Railing faces and connect with the ¾" Doweled Joint per Sheet 12.

5. GUARDRAIL CONNECTIONS: Connect Guardrail using the Transition Connections to Rigid Barrier per Index 536–001 in conjunction with 3'–0" End Transition for Guardrail as shown herein.

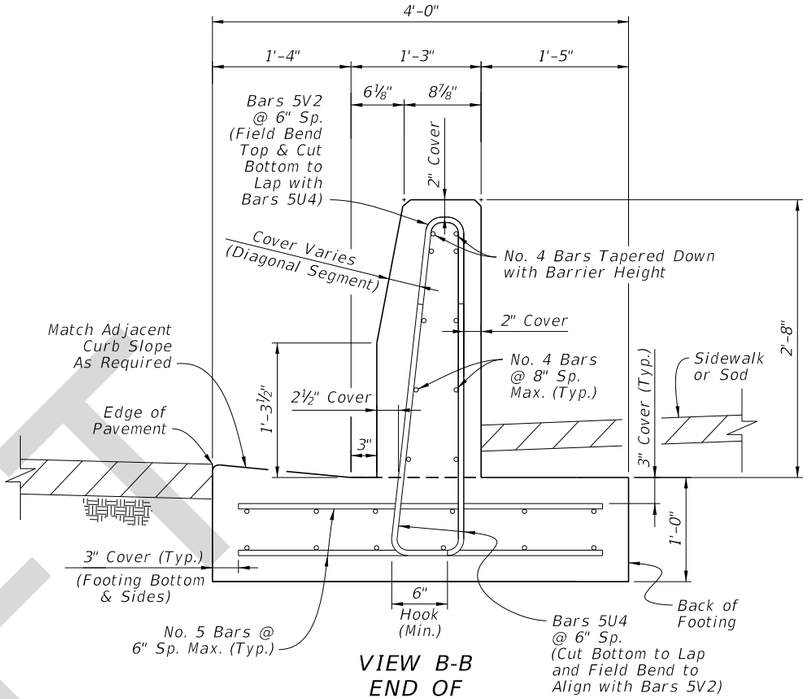
6. FREE ENDS: When the barrier end does not terminate with a Traffic Railing connection or Guardrail connection as called for in the Plans, terminate the barrier in accordance with the Free End Reinforcing Note on Sheet 20.

CURB AND GUTTER BARRIER

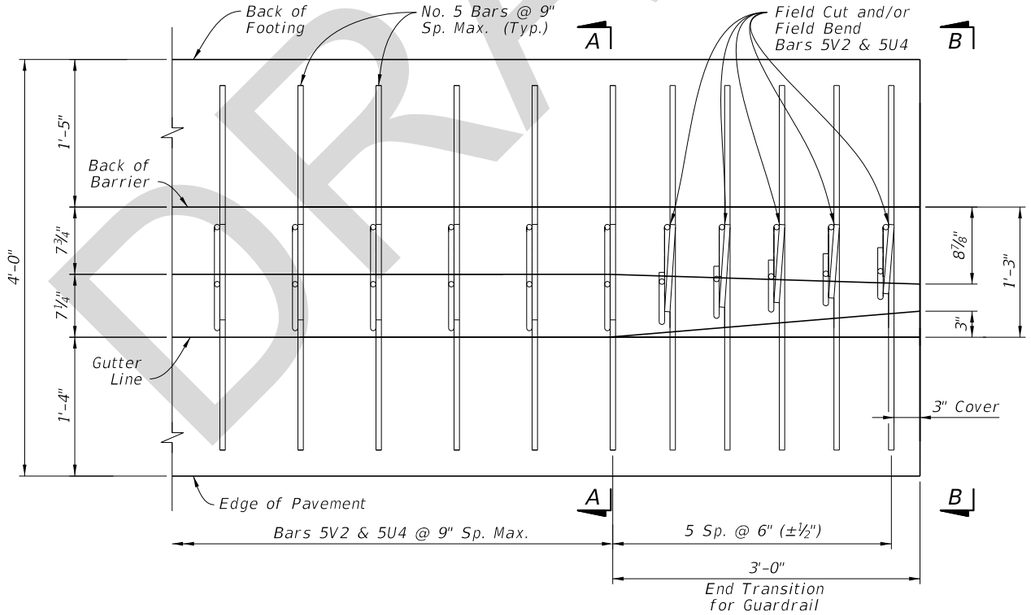


SECTION A-A
CURB & GUTTER
BARRIER

Concrete Qty. = 0.26 CY/FT
Steel Qty. = 41.2 LB/FT



VIEW B-B
END OF
TRANSITION
FOR GUARDRAIL



PLAN VIEW - END SEGMENT FOR GUARDRAIL CONNECTION
(Longitudinal Steel Not Shown for Clarity)

NOTES:

1. GENERAL: Work with the Plan and Elevation Views on Sheet 19.
2. FREE END REINFORCING: Where shown in the Plans, terminate the 38" Curb & Gutter Barrier section with a transverse vertical end face. Reduce the spacing of Bars 5V2 and 5U4 to 6" for 5 Spaces, placed with 3" cover from the barrier's end face.
3. BAR BENDING DIAGRAMS: For additional details for bars 5V2 and 5U4, see the Bar Bending Diagrams on Sheet 22.

CURB AND GUTTER BARRIER - REINFORCING DETAILS

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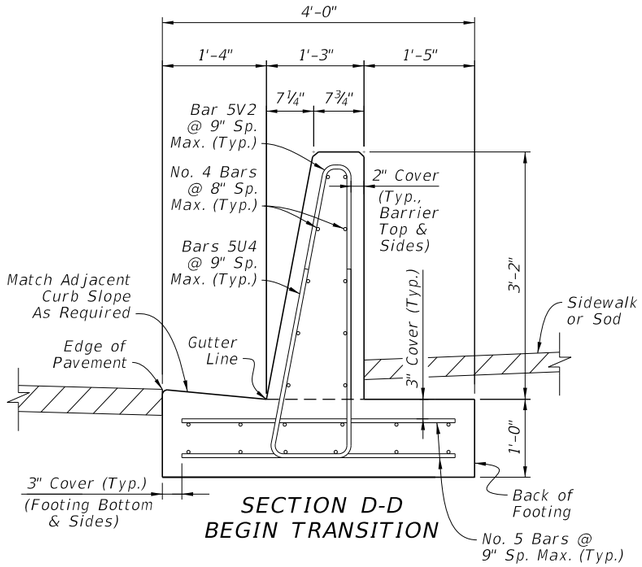
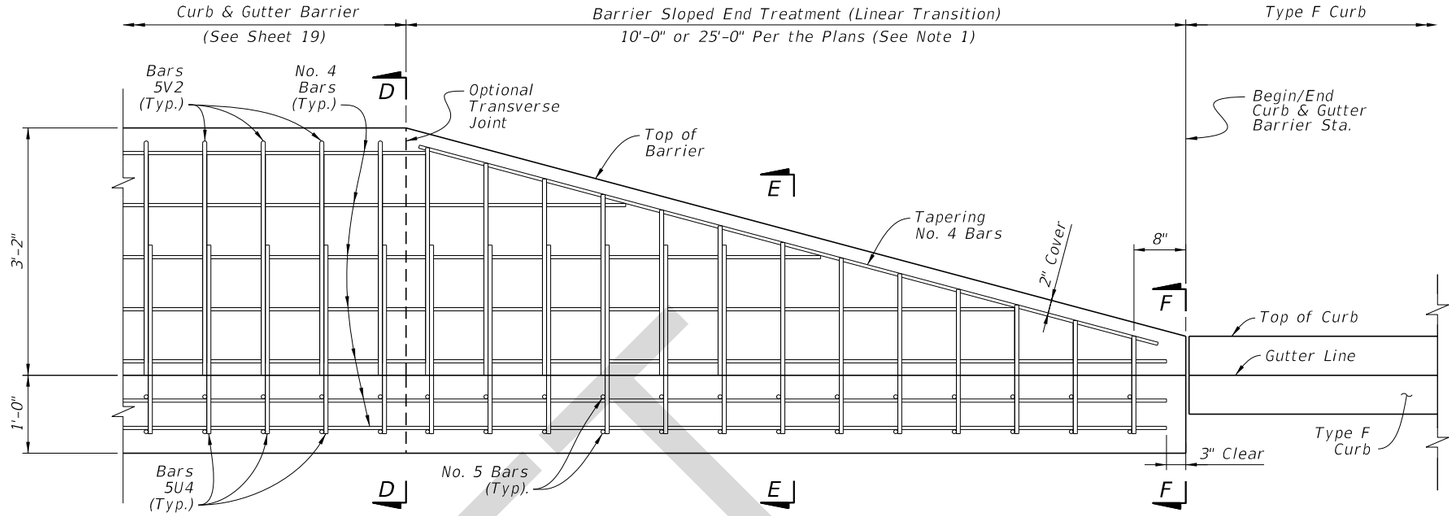
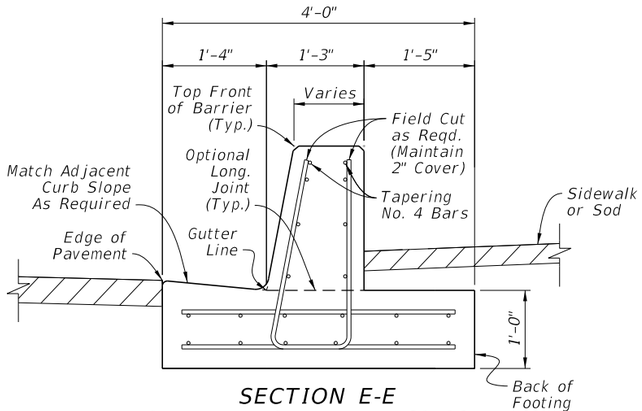


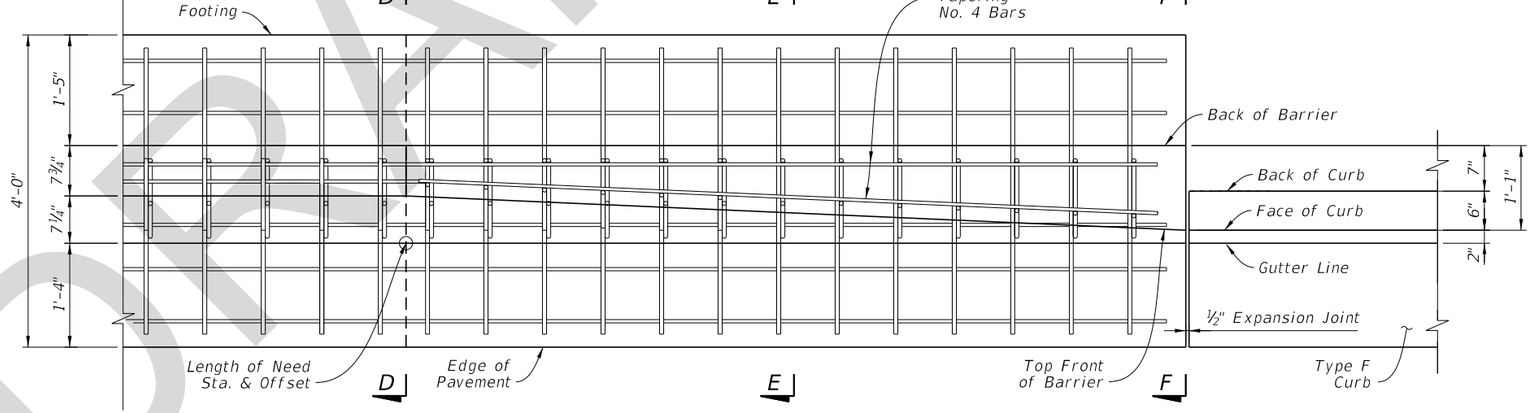
SECTION D-D
BEGIN TRANSITION



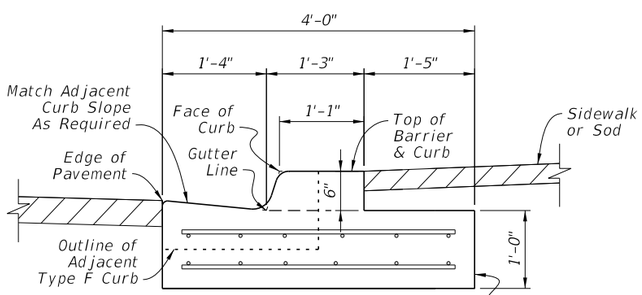
ELEVATION - CURB AND GUTTER BARRIER
SHOWING SLOPED END TREATMENT
(Approach and Trailing
End Similar by Opposite Hand)



SECTION E-E
INTERMEDIATE TRANSITION
(Height Varies Linearly
Per Elevation View)



PLAN - CURB AND GUTTER BARRIER
SHOWING SLOPED END TREATMENT
(Approach and Trailing End
Similar by Opposite Hand;
See Sections for All
Longitudinal Steel Locations)



SECTION F-F
END TRANSITION
(Align with Type-F Curb)

NOTES:

1. GENERAL: Install a Sloped End Treatment only where called for in the Plans, using either a 10'-0" length or 25'-0" length treatment as specified in the Plans. The 10'-0" length option is shown herein, while the 25'-0" length option requires additional trimmed Bars 5U4 & 5V2 at the same 9" longitudinal spacing.

2. BAR BENDING DIAGRAMS: For additional details on Bars 5V2 & 5U4, see the Bar Bending Diagrams on Sheet 22.

CURB AND GUTTER BARRIER -
SLOPED END TREATMENT

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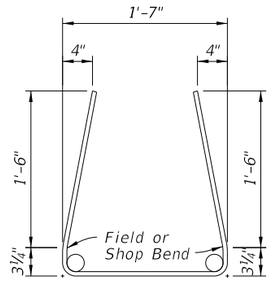
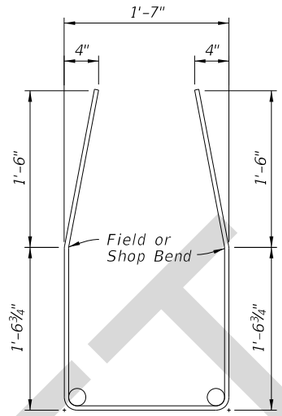
BILL OF REINFORCING STEEL		
MARK	SIZE	LENGTH
C1	4	3'-8"
C2	5	3'-0"
U1	4	5'-1"
U2	4	7'-8"
U3	5	9'-7"
U4	5	5'-9"
V1	4	6'-4"
V2	5	6'-3"

NOTES:

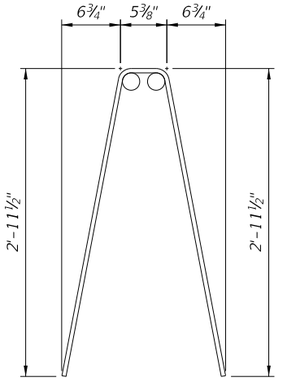
1. Work with the Standard Bar Bending Details per Index 415-001.
2. All bar dimensions in the bending diagrams are out to out.



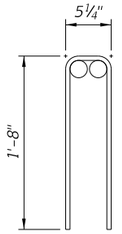
BARS 4U1



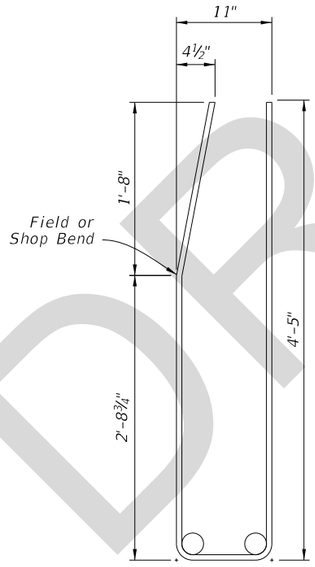
BAR 4U2



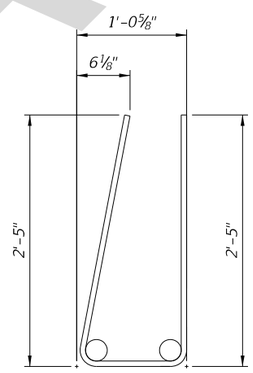
BAR 4V1



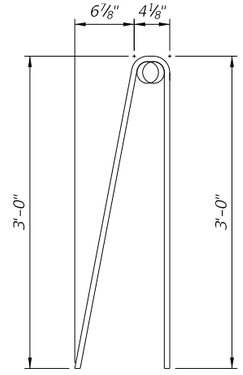
BAR 4C1



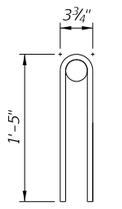
BAR 5U3



BAR 5U4



BAR 5V2



BAR 5C2

REINFORCING BAR BENDING DIAGRAMS

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