

# ORIGINATION FORM

Proposed Revisions to a Standard Plans Index  
(Please provide all information – Incomplete forms will be returned)

## Contact Information:

Date: September 5, 2017  
Originator: **Richard Stepp**  
Phone: (850) 414-4313  
Email: richard.stepp@dot.state.fl.us

## Standard Plans:

Index Number: **411**  
Sheet Number (s): All  
Index Title: Pier Protection Barrier

## Summary of the changes:

Redesign all Pier Protection Barrier sections and reinforcing details for Single-Slope Barriers as part of the MASH Implementation Plan. Reorganize and redevelop all Index Sheets as required, including the redrawing of all details to scale and the rewriting of most notes as needed. Move all Length-of-Need layouts and designer information to the Standard Plans Instructions (SPIs). The PPB Footing and Crash Wall designs are reorganized. but unchanged. +

## Commentary / Background:

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>

## Other Affected Offices / Documents: (Provide name of responsible personnel)

- | Yes                                 | No                                  |   |
|-------------------------------------|-------------------------------------|---|
| <input checked="" type="checkbox"/> | <input type="checkbox"/>            | Other Standard Plans – Richard Stepp                      |
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> | FDOT Design Manual –                                      |
| <input checked="" type="checkbox"/> | <input type="checkbox"/>            | Basis of Estimates Manual – Richard Stepp, Melissa Hollis |
| <input checked="" type="checkbox"/> | <input type="checkbox"/>            | Standard Specifications – Richard Stepp, Rebecca Frimmel  |
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> | Approved Product List –                                   |
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> | Construction –  |
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> | Maintenance –   |

## Origination Package Includes: (Email or hand deliver package to Derwood Sheppard)

- | Yes                      | N/A                                 |   |
|--------------------------|-------------------------------------|---|
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Redline Mark-ups                          |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Proposed Standard Plan Instructions (SPI) |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Revised SPI                               |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Other Support Documents                   |

## Implementation:

- Design Bulletin (Interim)    DCE Memo    Program Mgmt. Bulletin    FY-Standard Plans (Next Release)


Contact the Roadway Design Office for assistance in completing this form

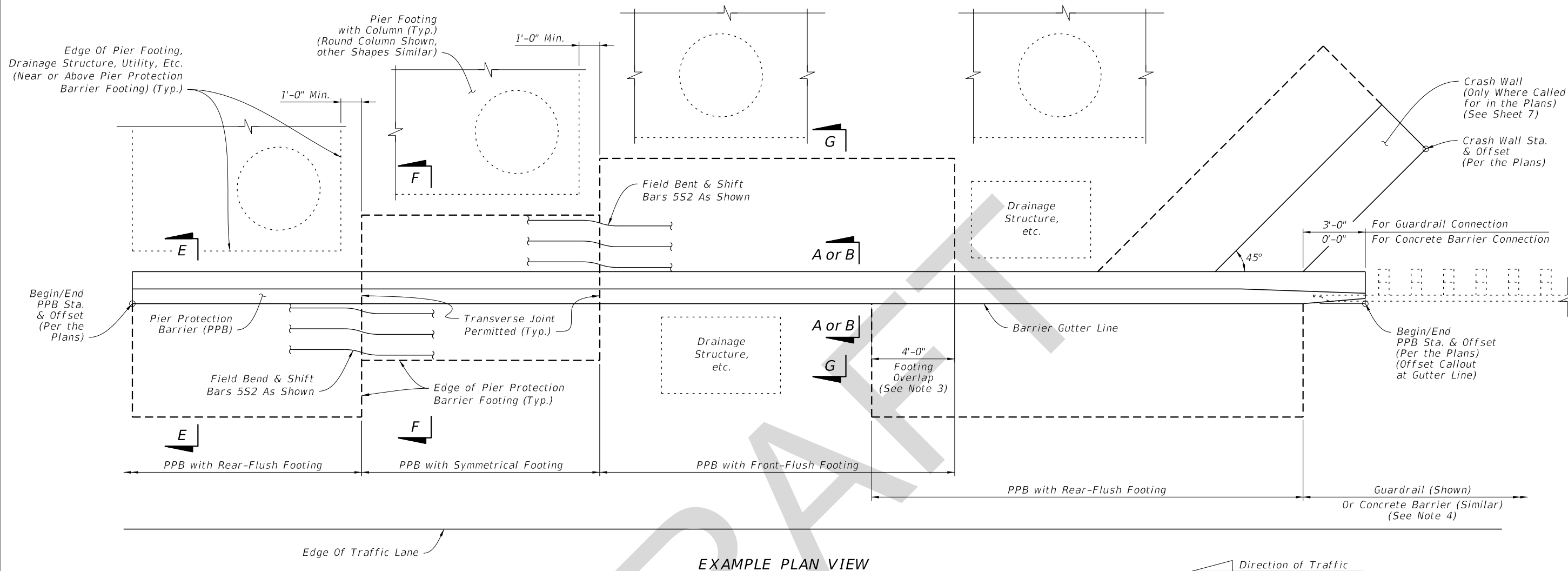
SHEET NO.	CONTENTS
1	Index Contents; General Notes
2	Example Layouts - Footing Placement and Connections
3	Barrier Plan and Elevation - Connection to Concrete Barrier - Connection to Guardrail
4	Barrier Details - Connection to Concrete Barrier
5	Barrier Details - Connection to Guardrail
6	Barrier Footing Options
7	Crash Wall Details
8	Reinforcing Bar Bending Diagrams

**GENERAL NOTES:**

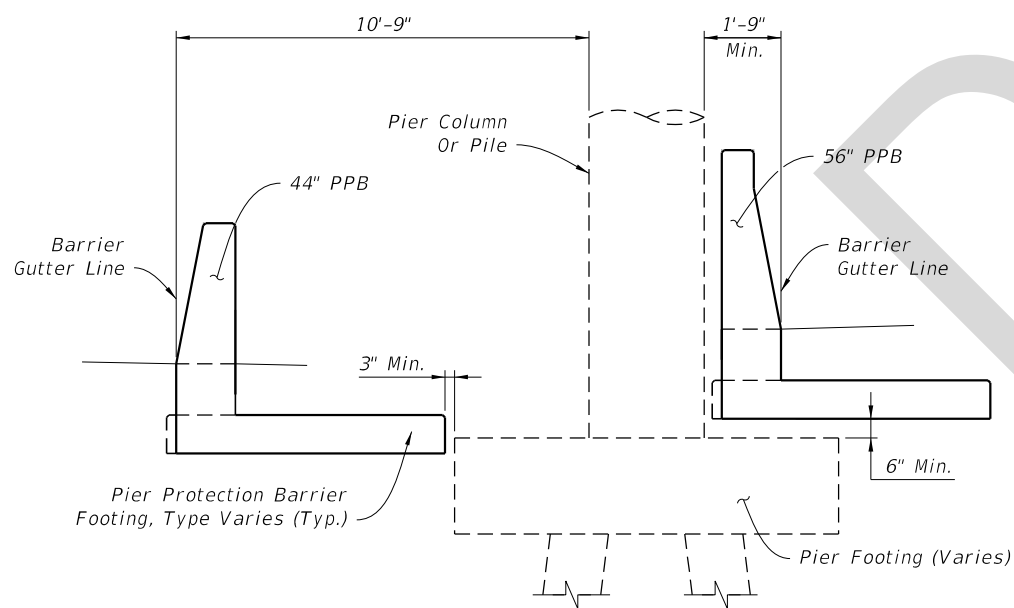
1. **CONCRETE:** Use Class III or IV concrete unless otherwise called for in the Plans.
2. **CONSTRUCTION JOINTS:** Maintain continuity of reinforcement steel across Construction Joints; reinforcement lap splices are permitted immediately adjacent to joints. Construct all Pier Protection Barrier continuously, with no expansion or contraction joints. Construction Joints are classified herein as Transverse Joints or Longitudinal Joints.  
  
Transverse Joints are permitted at 40 foot or greater intervals along the barrier.  
  
Longitudinal Joints may only be installed where indicated in the following details and notes, with a location tolerance of  $\pm 1"$  from the locations shown.
3. **SUBGRADE:** When the Pier Protection Barrier is installed adjacent to Roadway or Shoulder pavement, compact the top 12" of the subgrade to at least 98% of the maximum density determined by FM 1-T 180, Method D.
4. **DRAINAGE INLETS:** See Index 425-001 for Shoulder Barrier Inlets, and isolate these structures from Pier Protection Barriers and Footings with 1" Preformed Joint Filler.
5. **BARRIER END MARKERS:** For all free ends of barriers that are not connected to guardrail or concrete barrier, install a Type 3 Object Marker on the end face per Specification 705.
6. **BARRIER DELINEATORS:** Install Barrier Delineators in accordance with Specification Section 705. Mount the delineators on the top face 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.
7. **CRACK CONTROL:** Provide  $\frac{1}{2}"$  depth crack control V-Grooves at 15' to 30' spacing. Locate V-Grooves above any joint or discontinuity in the barrier footing. Align V-Grooves perpendicular to the longitudinal axis of the Pier Protection Barrier and make continuous across the top surface and both side faces. For slip formed barriers, score  $\frac{1}{2}"$  V-Grooves while the concrete is still plastic, otherwise pre-form the joints when stationary forms are utilized.
8. **LONGITUDINAL V-GROOVE:** Where depicted herein, place a  $\frac{1}{2}"$  V-Groove running longitudinally on the barrier face. 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".

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EXAMPLE PLAN VIEW




EXAMPLE SECTION VIEW

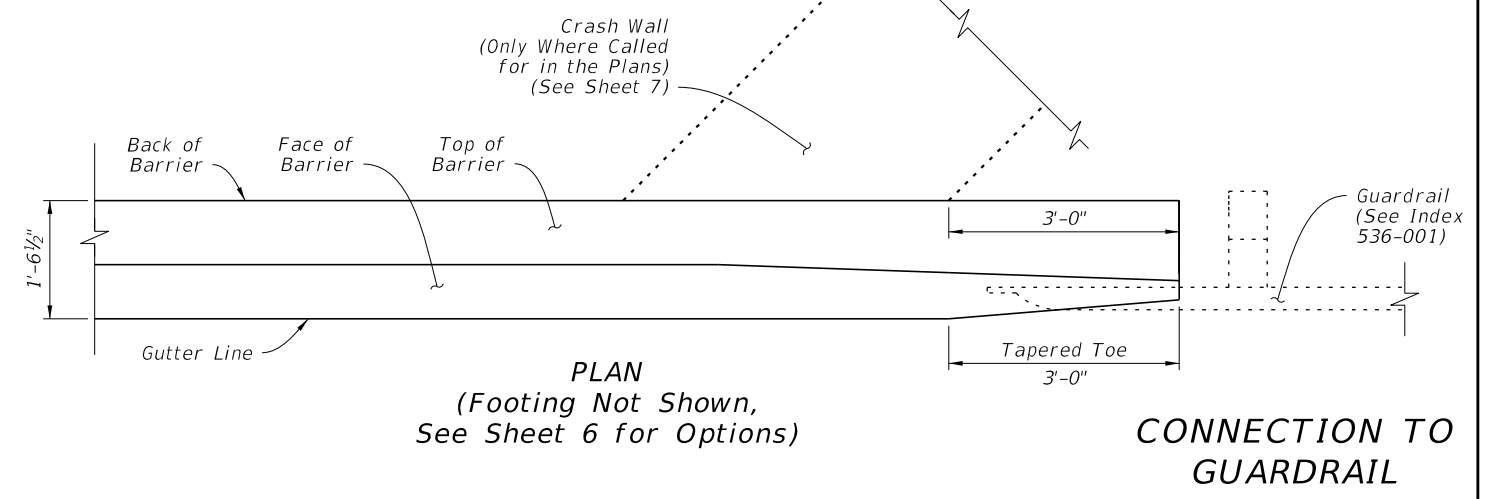
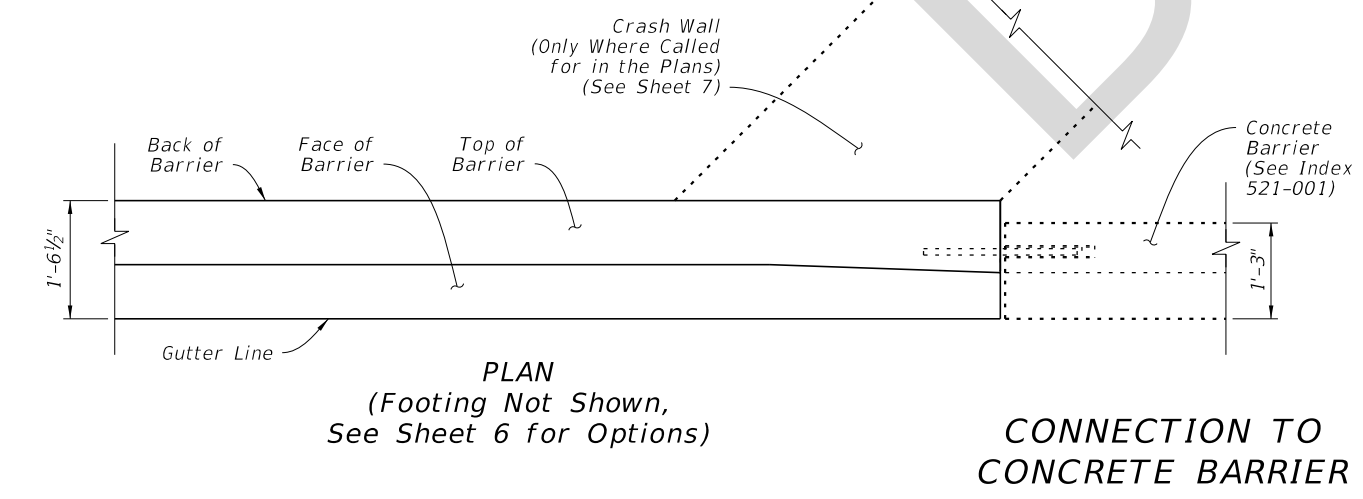
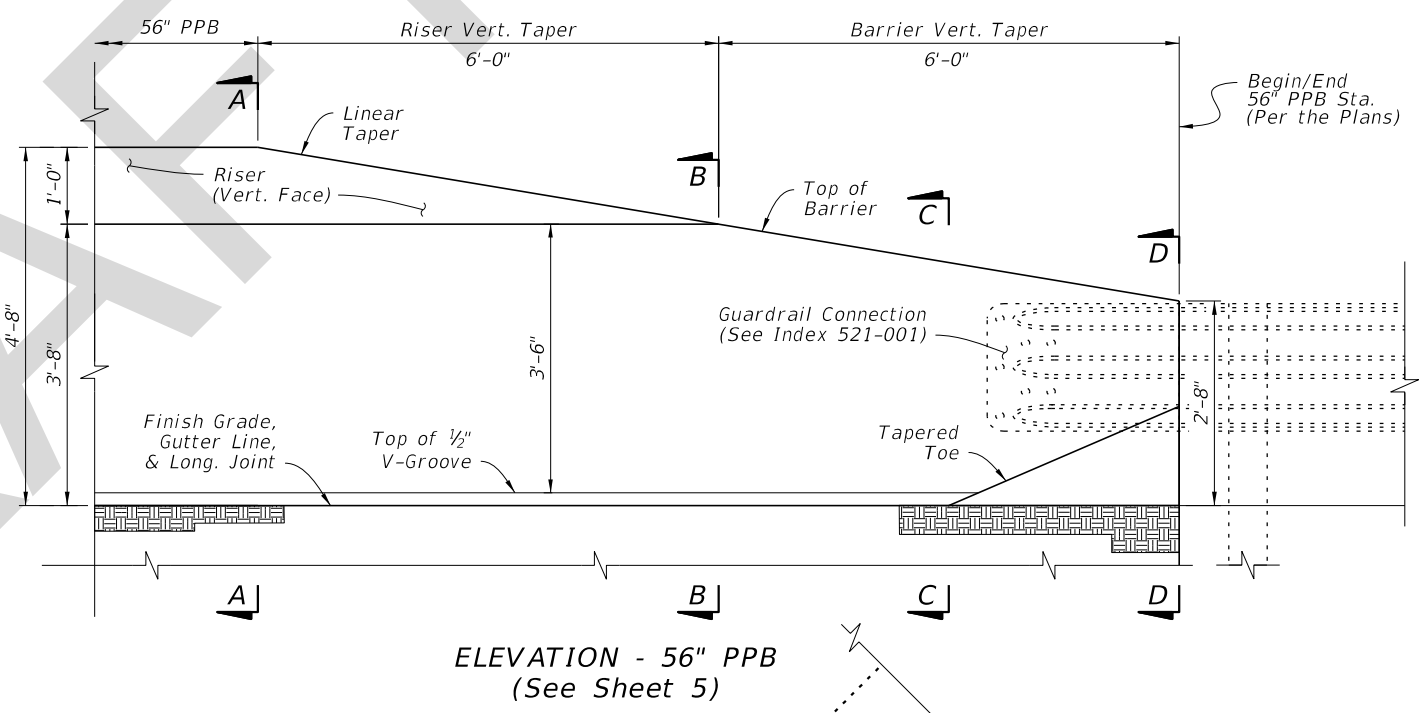
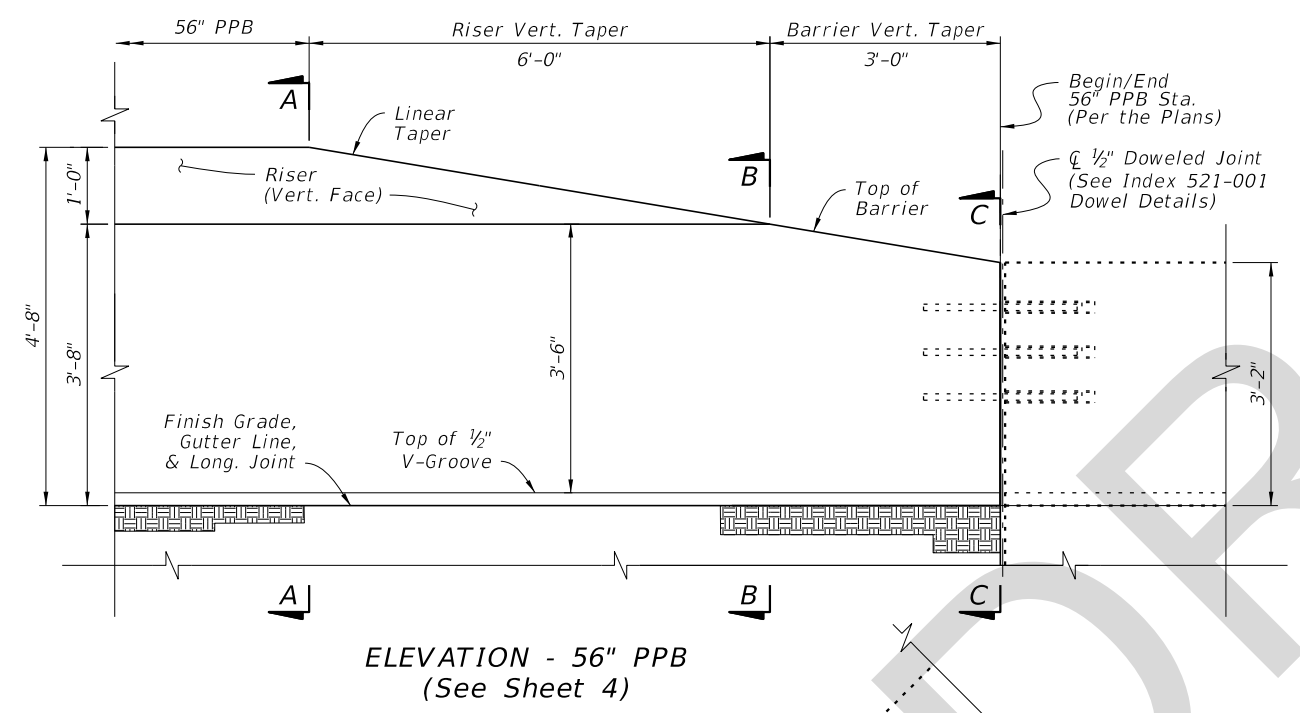
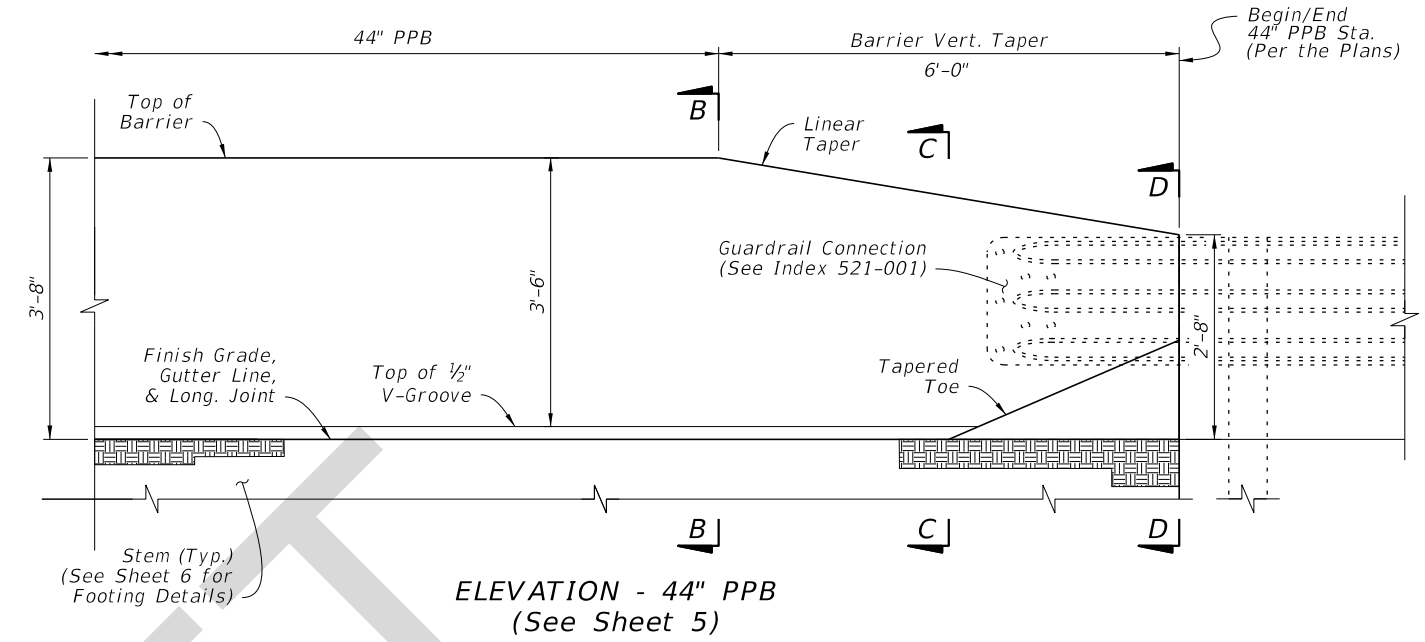
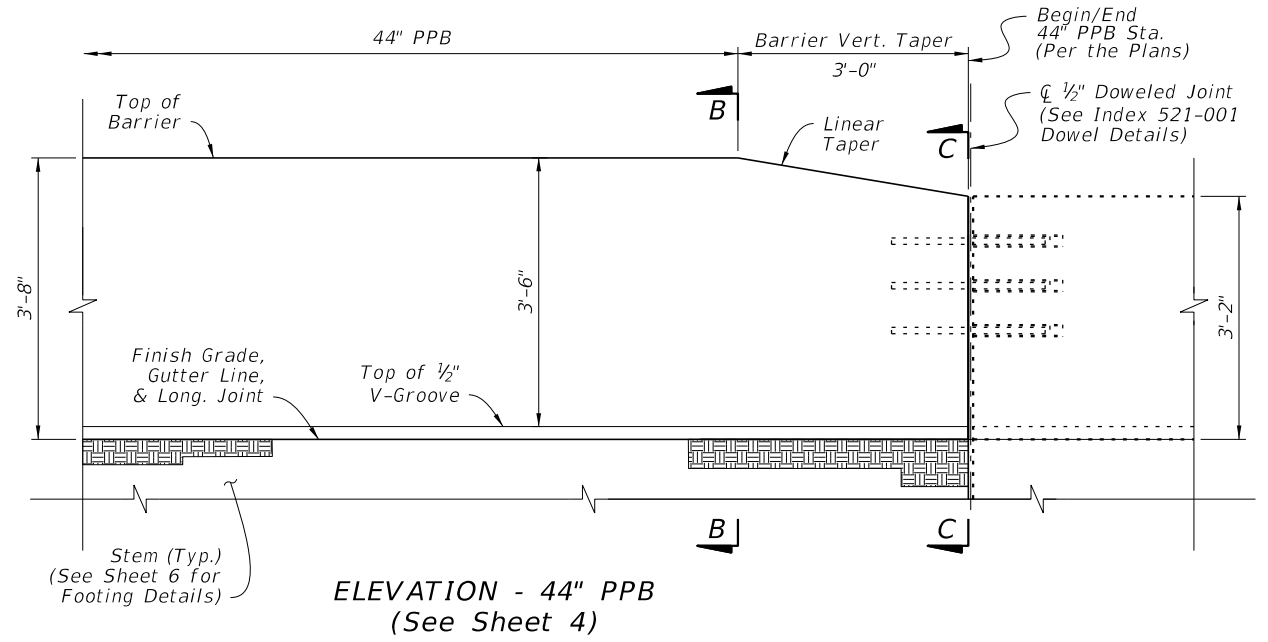
NOTES:

1. GENERAL: The views shown herein are schematic only, showing example layouts for Pier Protection Barrier (PPB) footings and Crash Wall placement in relation to adjacent miscellaneous structures (including bridge piers, footings, drainage structures, etc.). The actual PPB footing placement depends on the project-specific configuration of adjacent structures and obstacles. For project-specific locations of PPB and adjacent features, see the Plans.
2. MINIMUM FOOTING LENGTH: The minimum length of a single footing option (i.e. Symmetrical Footing, Rear-Flush Footing, Front-Flush Footing), is 8'-0", measured longitudinally. See Sheet 6 for the footing option details.
3. FOOTING OVERLAP: When a Front-Flush Footing section connects to a Rear-Flush Footing section, a 4'-0" footing overlap is required as shown. In footing overlap segments, place all lateral steel reinforcement continuously for the entire width of the combined footing while maintaining the cover requirements per Sheet 6.
4. CONNECTING GUARDRAIL OR CONCRETE BARRIER: Connect the PPB to either Guardrail or Concrete Barrier as specified in the Plans. For additional Guardrail Details, see Sheet 3 and Index 536-001. For additional Concrete Barrier Details, see Sheet 3 and Index 521-001.

EXAMPLE LAYOUTS - FOOTING PLACEMENT AND CONNECTIONS

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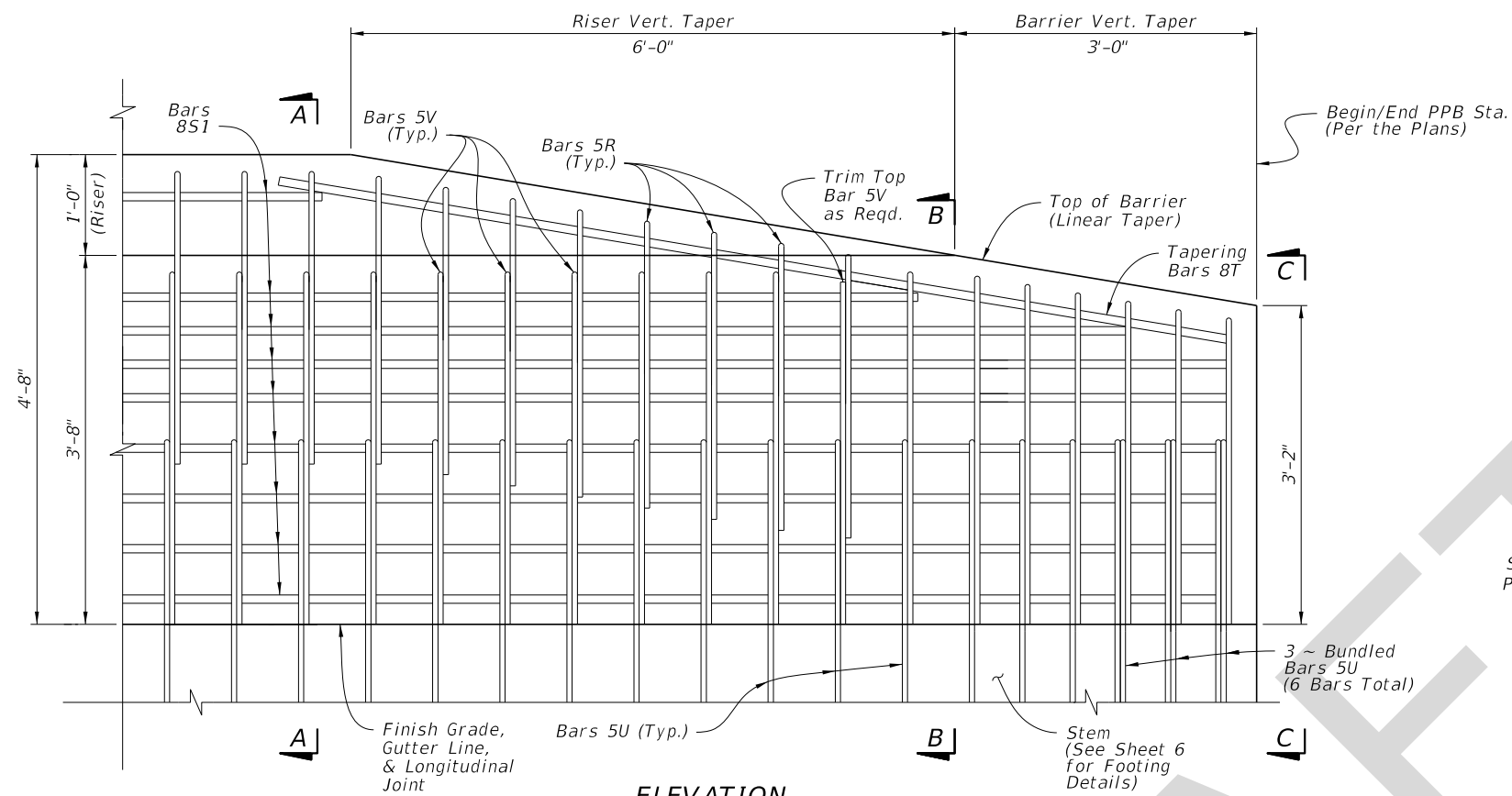
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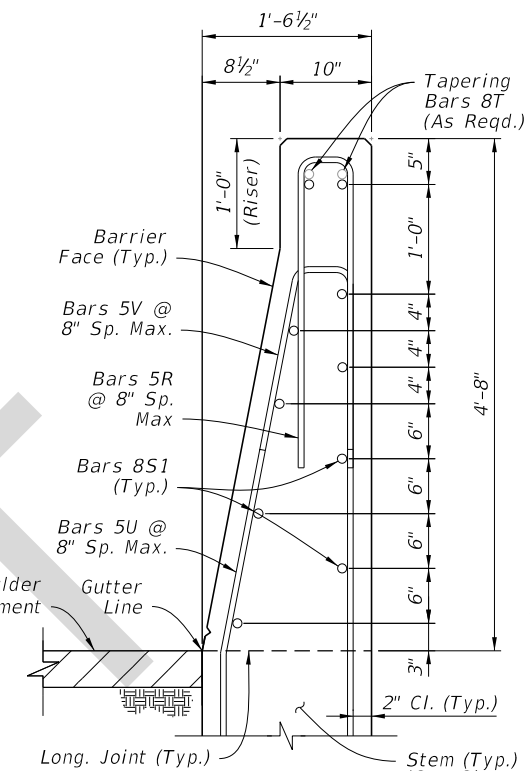
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FY 2018-19  
STANDARD PLANS

PIER PROTECTION BARRIER

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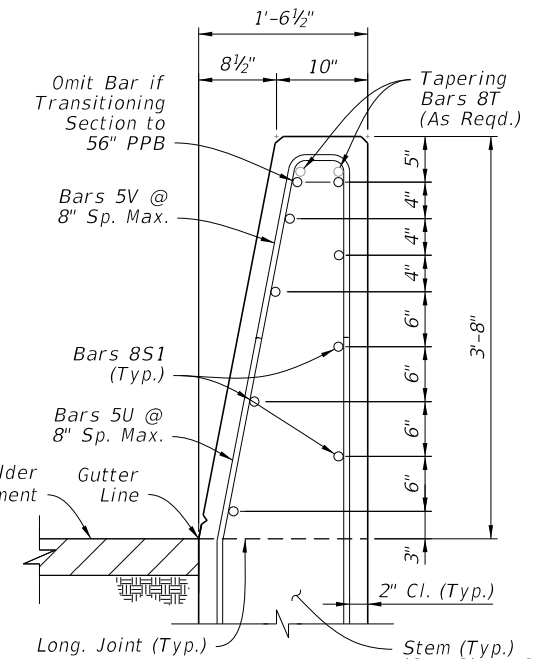


**ELEVATION**  
 (56" PPB Shown, 44" PPB Similar with 1'-0" Riser and Related Reinforcing Removed)



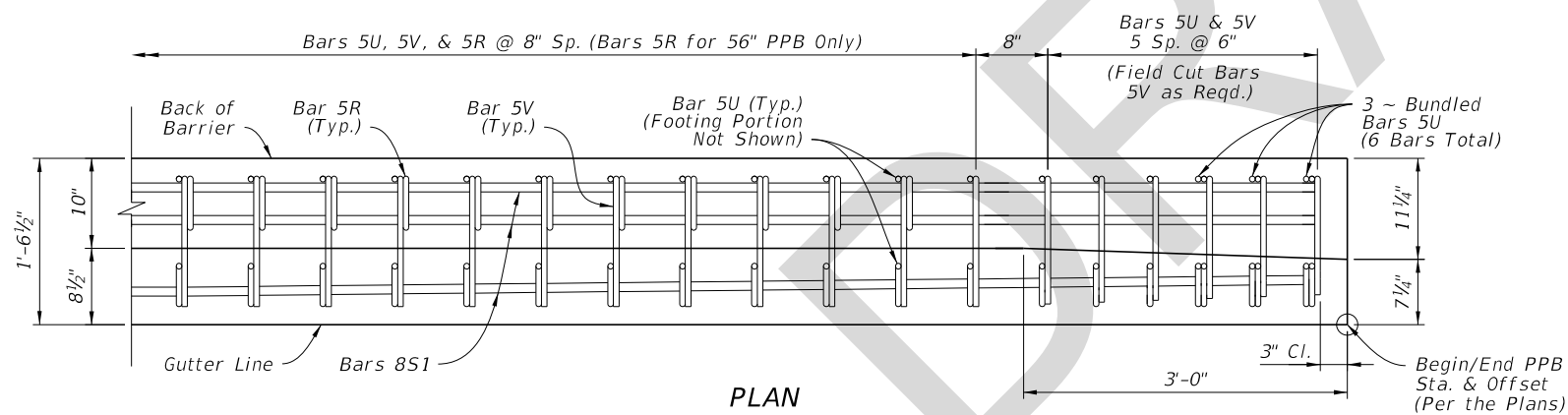
**SECTION A-A**  
 56" PPB

Concrete Qty. = 0.19 CY/FT (Above Gutter Line)  
 Steel Qty. = 47.6 LB/FT (Excluding Bars 5U & 8T)

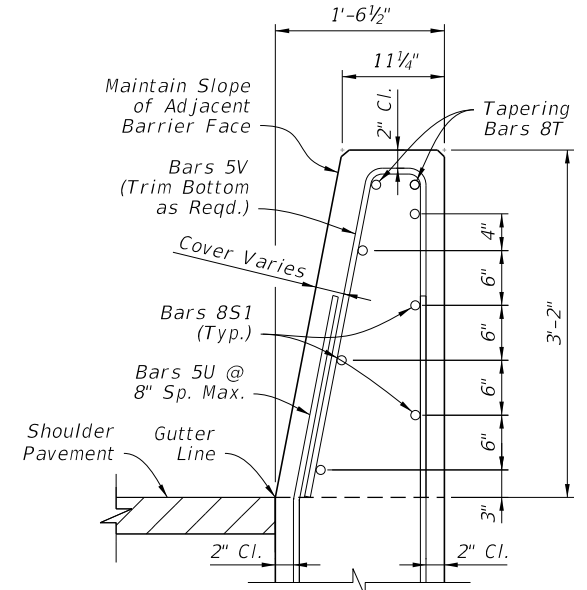


**SECTION B-B**  
 44" PPB

Concrete Qty. = 0.19 CY/FT (Above Gutter Line)  
 Steel Qty. = 35.7 LB/FT (Excluding Bars 5U & 8T)



**PLAN**  
 (Details Not Shown Below Gutter Line, See Sheet 6 for Footing and Stem Details) (Only Top & Bottom Longitudinal Steel Shown, See Section Views for All Steel Locations)



**END VIEW C-C**  
 (Connects to Adjacent Concrete Barrier, Aligned at Gutter Line)

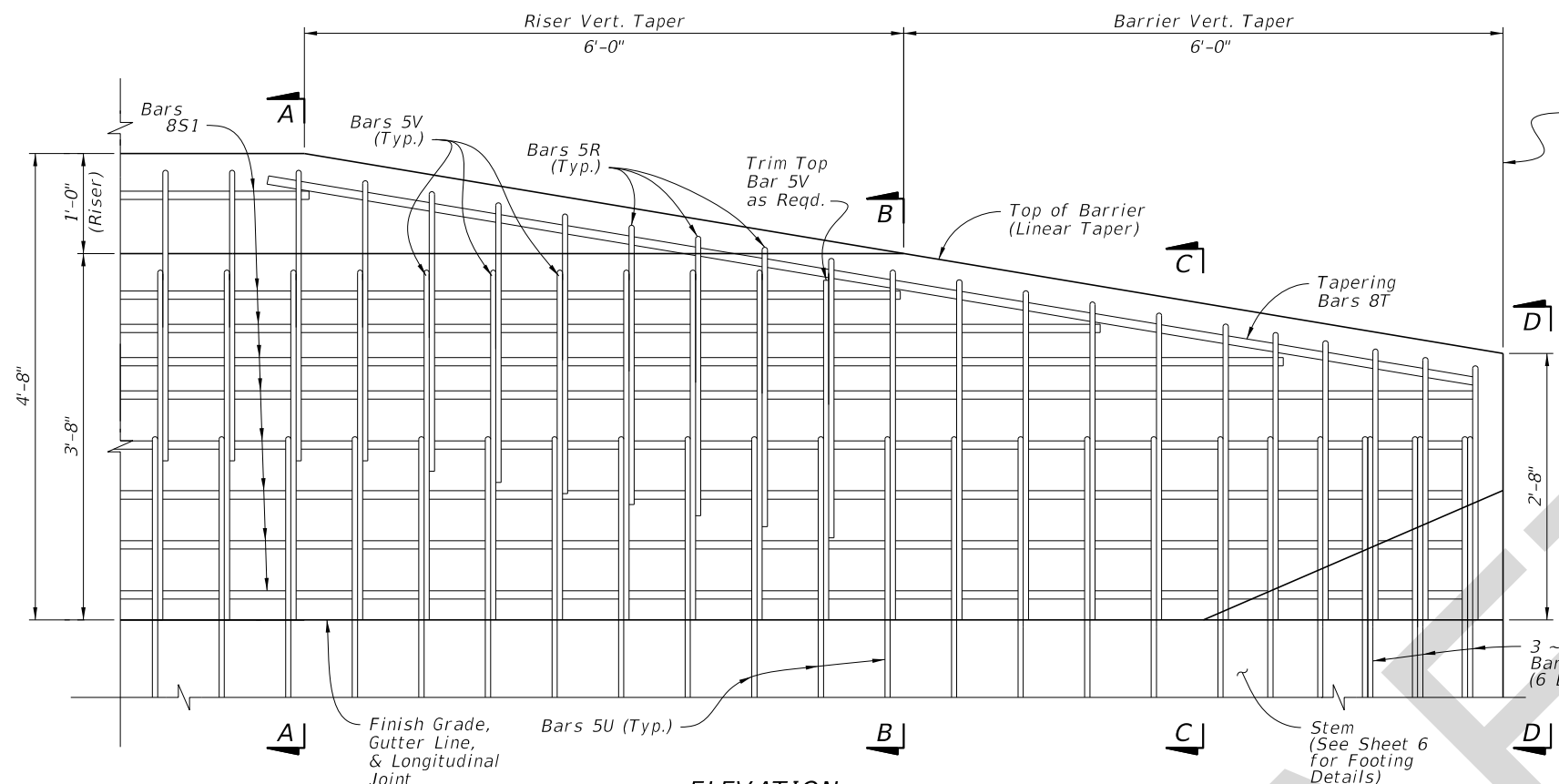
**NOTES:**

- GENERAL: Construct either the 56" PPB or the 44" PPB height as called for in the Plans. See Sheets 2 & 3 for additional plan and elevation details.
- FOOTING OPTIONS: See Sheet 6 for the supporting stem and footing details.

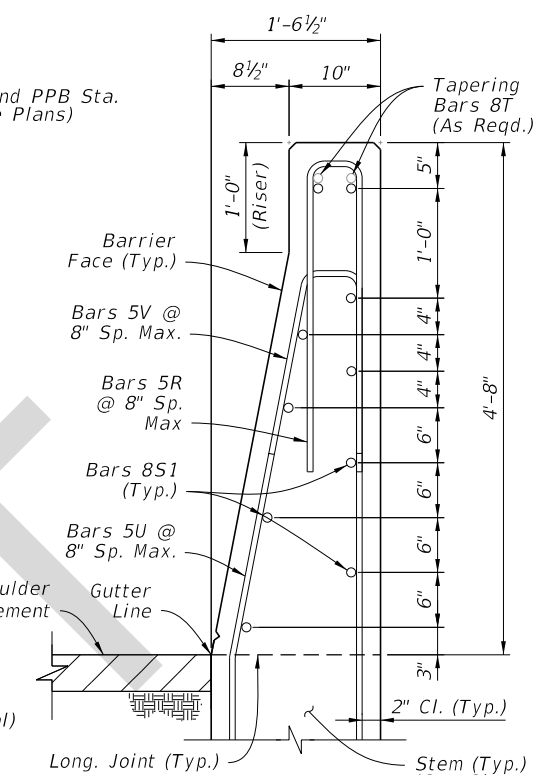
**BARRIER DETAILS - CONNECTION TO CONCRETE BARRIER**

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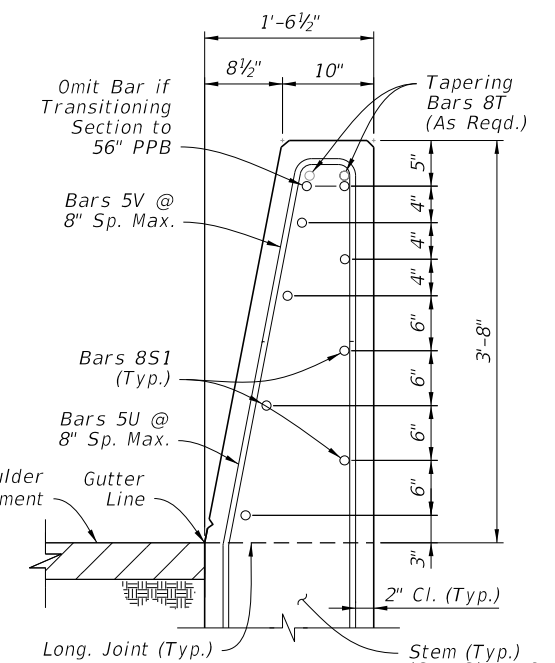


**ELEVATION**  
(56" PPB Shown, 44" PPB Similar with 1'-0" Riser and Related Reinforcing Removed)



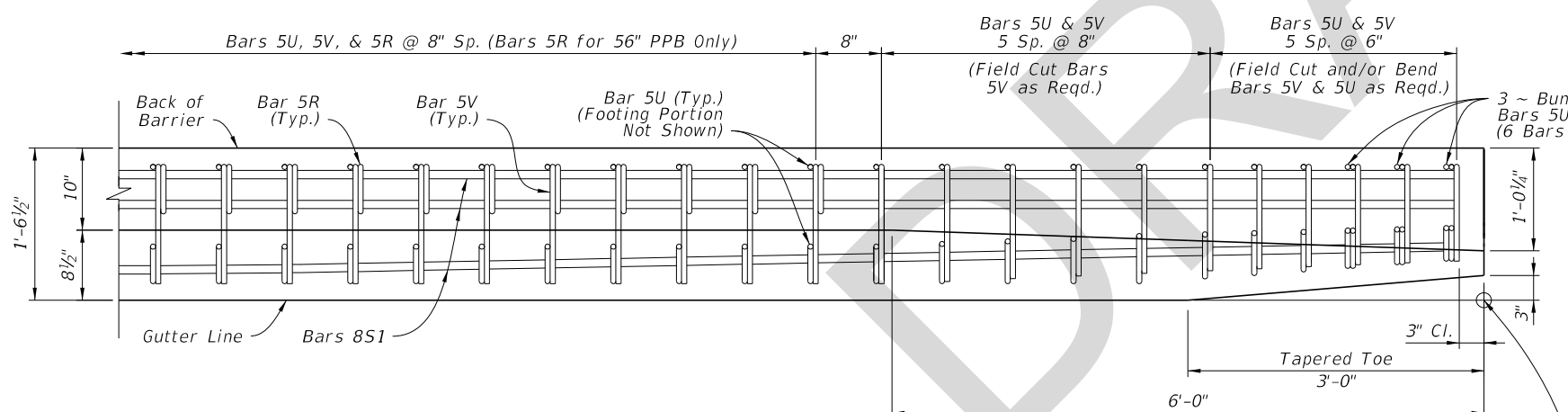
**SECTION A-A**  
56" PPB

Concrete Qty. = 0.19 CY/FT (Above Gutter Line)  
Steel Qty. = 47.6 LB/FT (Excluding Bars 5U & 8T)

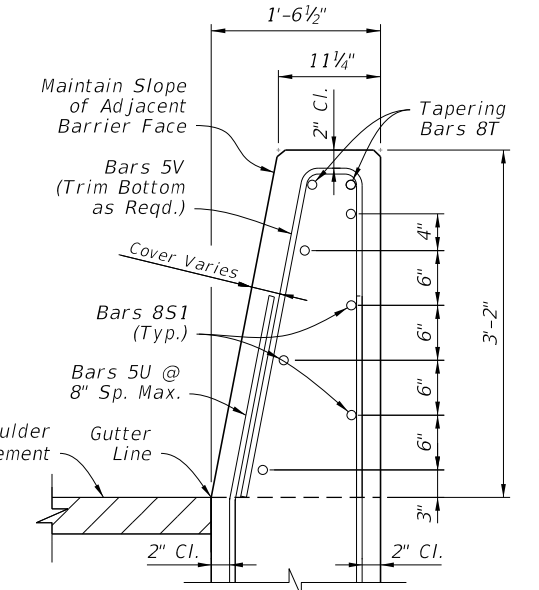


**SECTION B-B**  
44" PPB

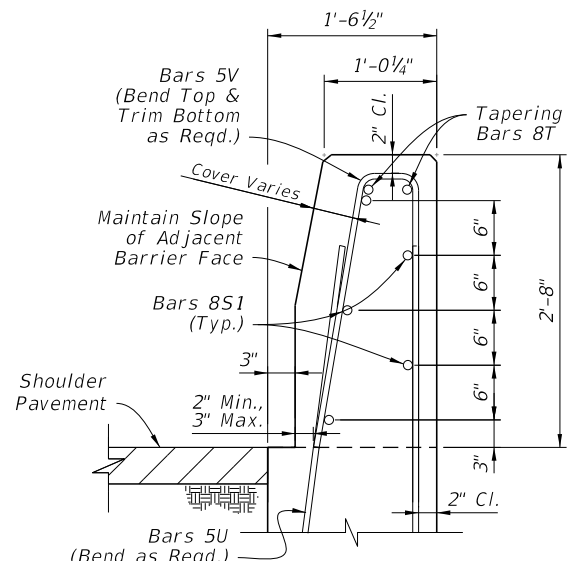
Concrete Qty. = 0.19 CY/FT (Above Gutter Line)  
Steel Qty. = 35.7 LB/FT (Excluding Bars 5U & 8T)



**PLAN**  
(Details Not Shown Below Gutter Line, See Sheet 6 for Footing and Stem Details) (Only Top & Bottom Longitudinal Steel Shown, See Section Views for All Steel Locations)



**END VIEW C-C**  
(Begin Tapered Toe for Guardrail)



**END VIEW D-D**  
(End Tapered Toe for Guardrail)

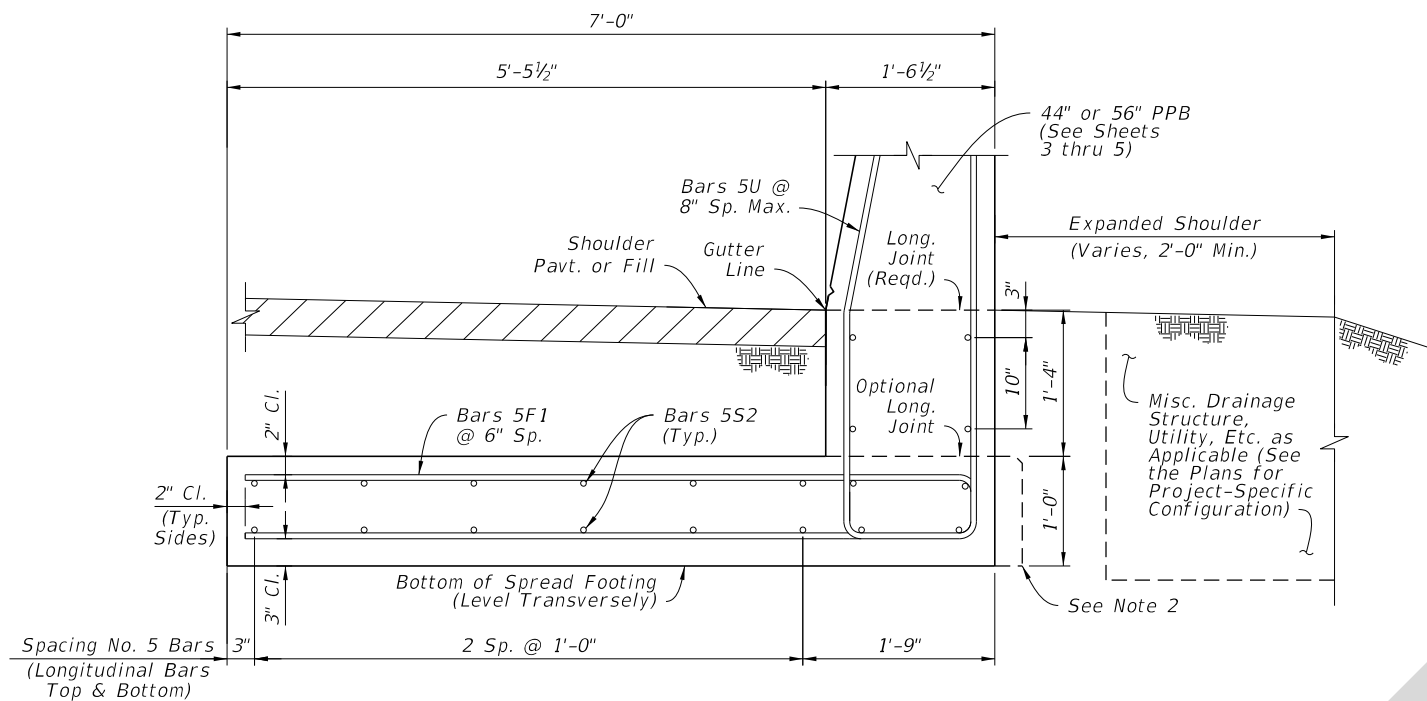
**NOTES:**

1. GENERAL: Construct either the 56" PPB or the 44" PPB height as called for in the Plans. See Sheets 2 & 3 for additional plan and elevation details.
2. FOOTING OPTIONS: See Sheet 6 for the supporting stem and footing details.

**BARRIER DETAILS - CONNECTION TO GUARDRAIL**

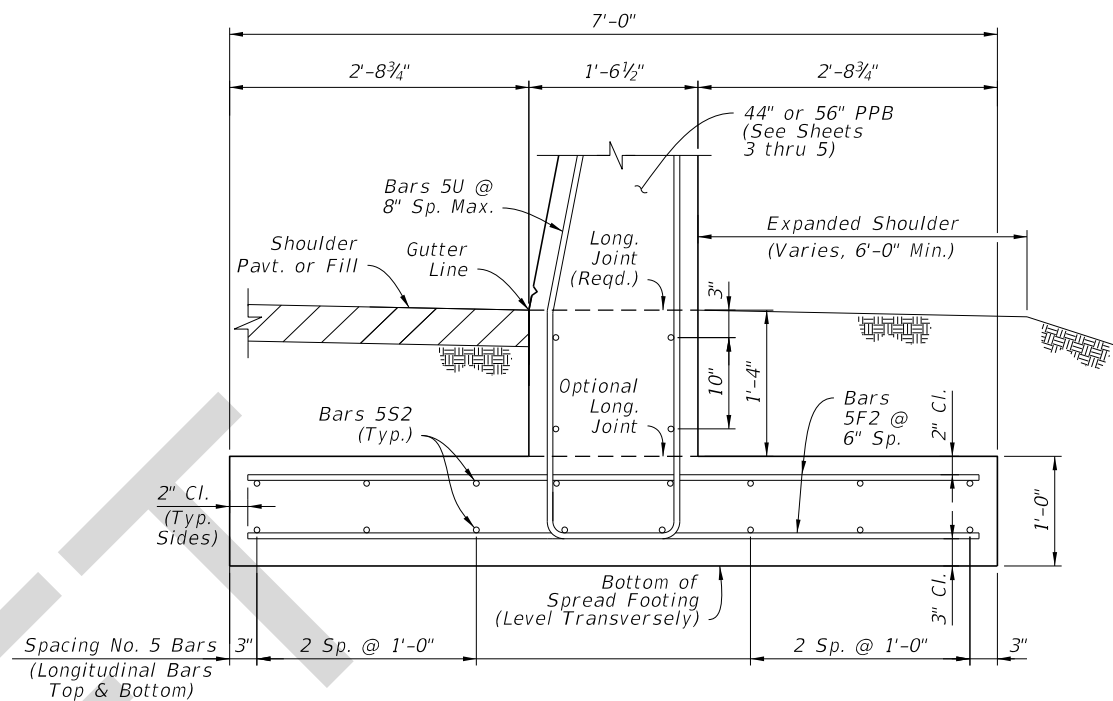
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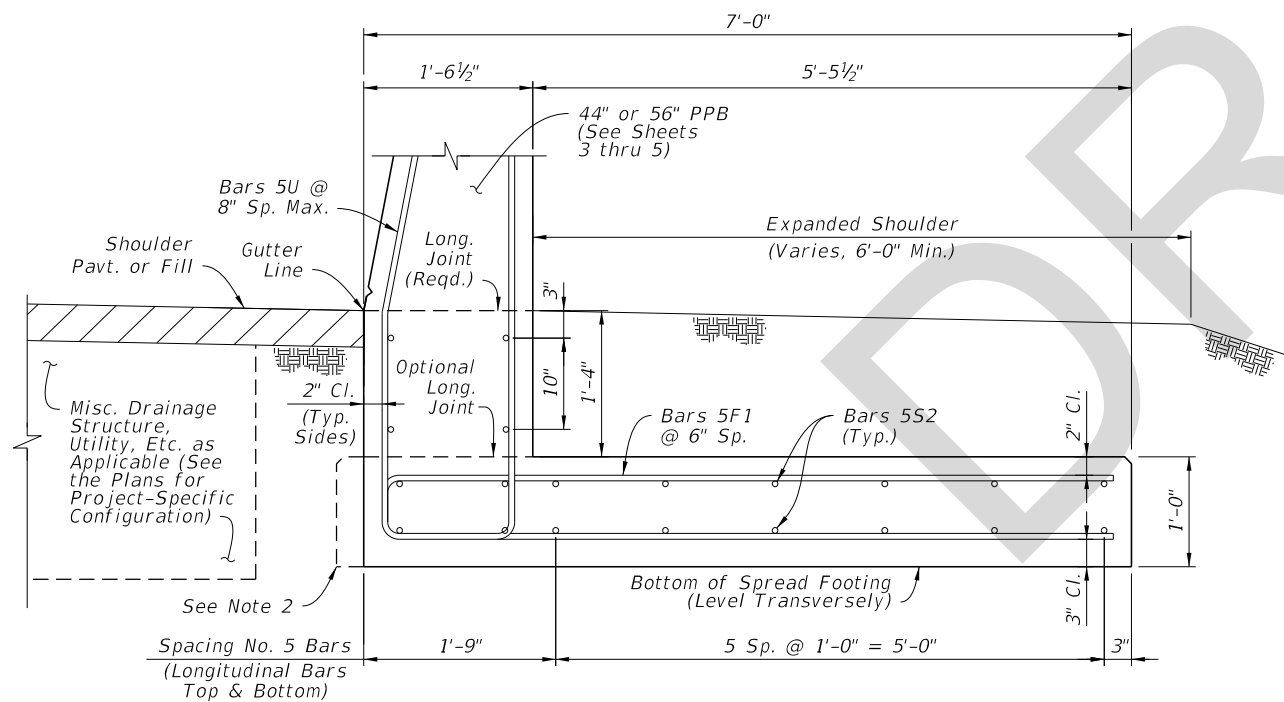
**SECTION E-E  
FRONT-FLUSH FOOTING OPTION**

Concrete Qty. = 0.34 CY/FT (Below Gutter Line)  
Steel Qty. = 63.0 LB/FT (Including Bars 5U)



**SECTION F-F  
SYMMETRICAL FOOTING OPTION**

Concrete Qty. = 0.34 CY/FT (Below Gutter Line)  
Steel Qty. = 62.3 LB/FT (Including Bars 5U)



**SECTION G-G  
REAR-FLUSH FOOTING OPTION**

Concrete Qty. = 0.34 CY/FT (Below Gutter Line)  
Steel Qty. = 63.0 LB/FT (Including Bars 5U)

**NOTES:**

1. GENERAL: Install the footing options per project-specific requirements, as defined on Sheet 2 and specified per the Plans.  
  
Work with the supported 44" PPB and 56" PPB as shown on Sheets 3, 4, & 5.
2. OPTIONAL SLIP FORMING SUPPORT: The 1'-0" depth spread footing may be extended by 3" laterally beyond the face of the stem to provide support for a subsequent slip forming operation above. Do not adjust the steel reinforcement location for the additional concrete.
3. GUARDRAIL CONNECTION TAPERED TOE: For tapering the barrier as shown on Sheet 5, View D-D, bend Bars U away from the stem face as required. For this case, the cover requirement is variable for one side of the stem (only at the tapered toe locations).

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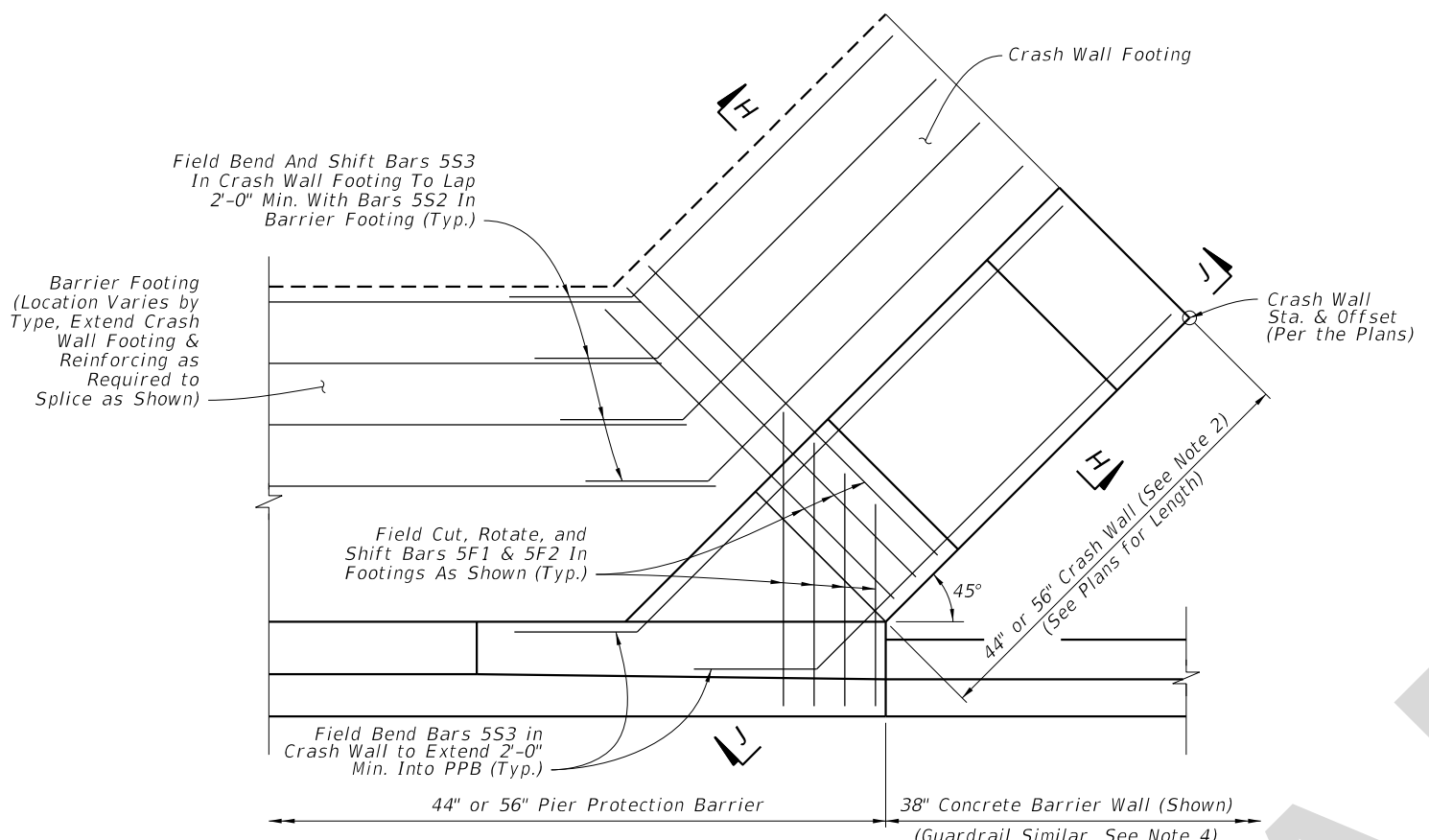
FY 2018-19  
STANDARD PLANS

PIER PROTECTION BARRIER

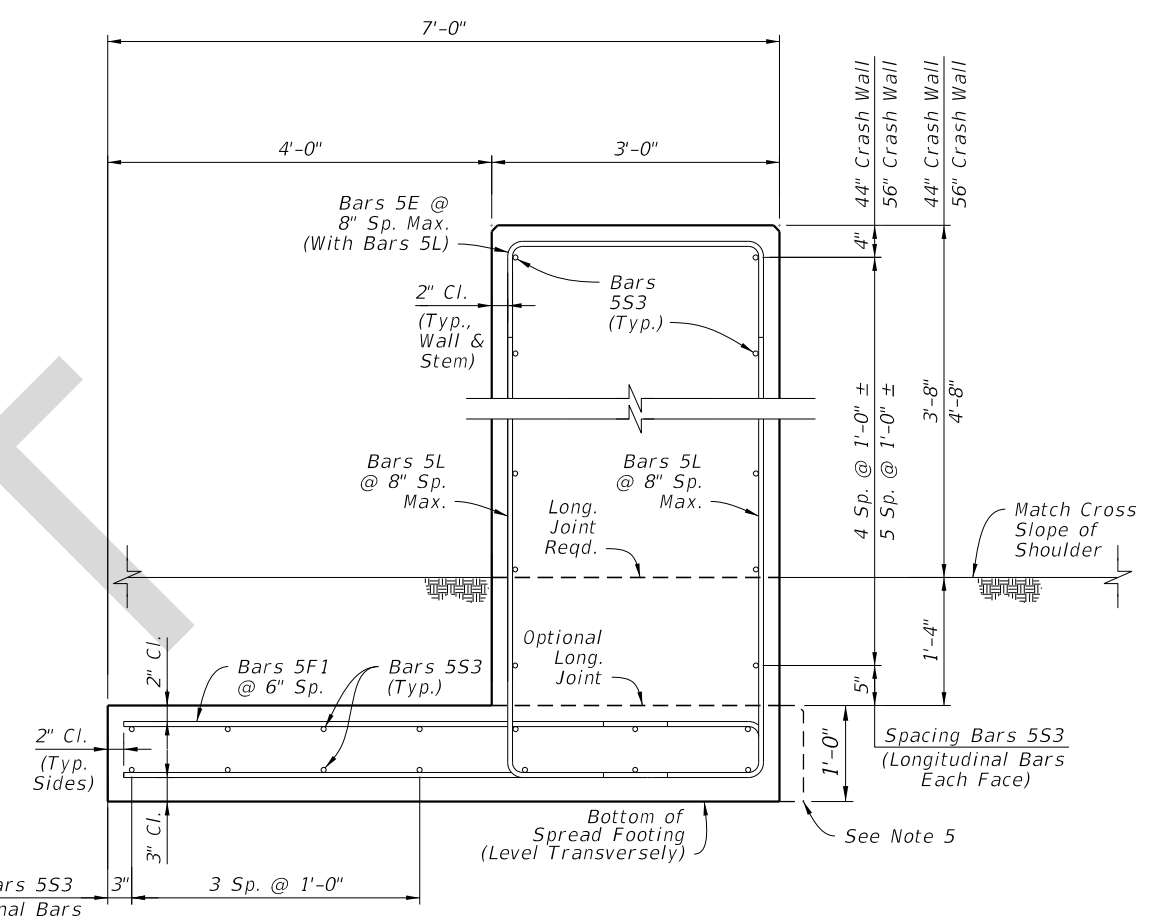
INDEX  
521-002

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BARRIER FOOTING OPTIONS



PLAN  
(Schematic View - See Note 3)

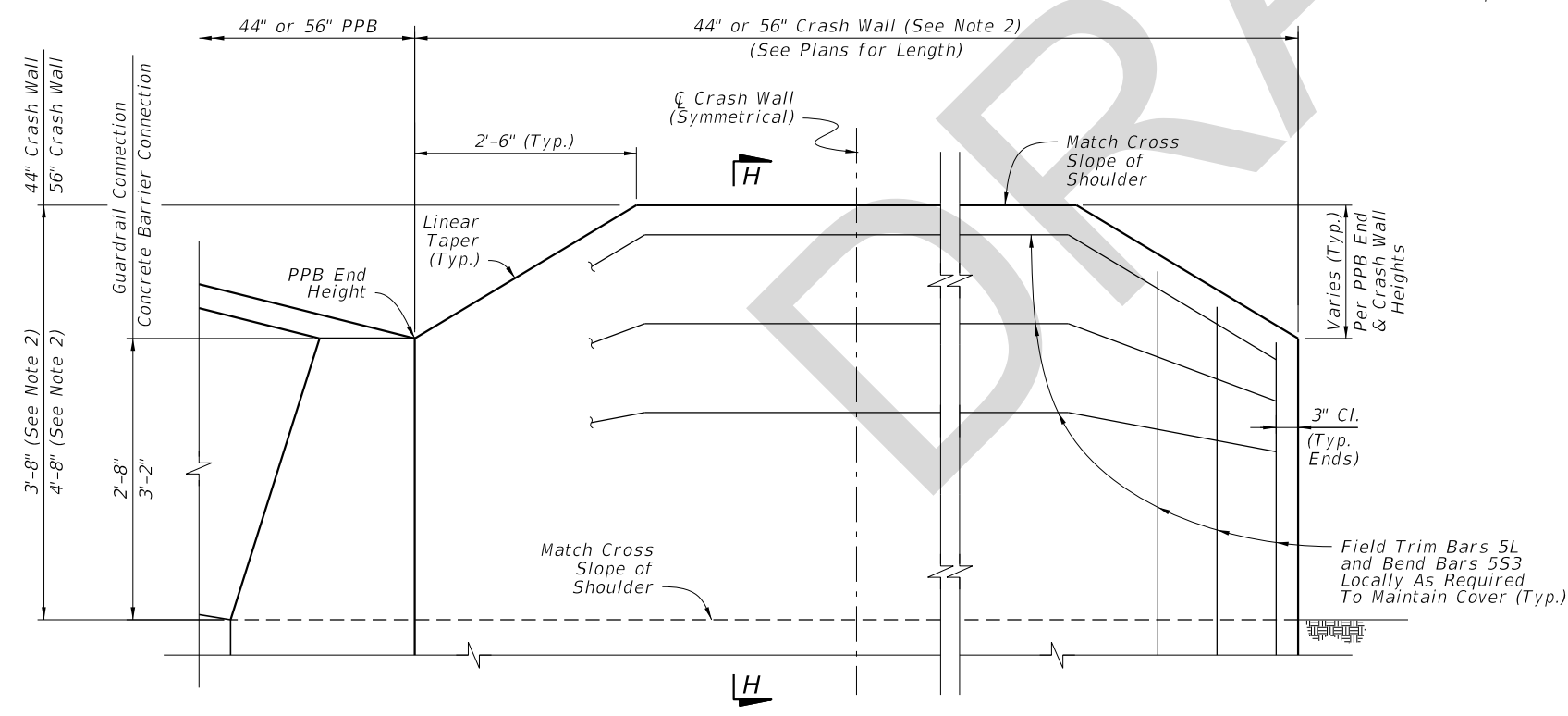


SECTION H-H  
CRASH WALL

Concrete Qty. = 0.81 CY/FT (44" Crash Wall) or 0.93 CY/FT (56" Crash Wall)  
Steel Qty. = 74.5 LB/FT (44" Crash Wall) or 76.6 LB/FT (56" Crash Wall)

NOTES:

1. GENERAL: Only where called for in the Plans, install the Crash Wall as a supplement for PPB. If applicable, see the Plans for the corresponding Station and Offset required.  
For additional layout details, see Sheets 2 & 3.
2. CRASH WALL HEIGHT: Install the Crash Wall at a height which matches the adjacent PPB (either 44" or 56").
3. SCHEMATIC VIEWS: Only partial reinforcing is shown in the Schematic Views to establish a trend while keeping clarity. For all reinforcing steel locations and spacing requirements, see Section H-H.
4. GUARDRAIL CONNECTIONS: To facilitate guardrail connections, shift the Crash Wall 3 feet from the end of the PPB as shown on Sheets 2 & 3.
5. OPTIONAL SLIP FORMING SUPPORT: The 1'-0" depth spread footing may be extended by 3" laterally beyond the face of the wall to provide support for a subsequent slip forming operation above. Do not adjust the steel reinforcement location for the additional concrete.



VIEW J-J CRASH WALL ELEVATION  
(Schematic View - See Note 3)

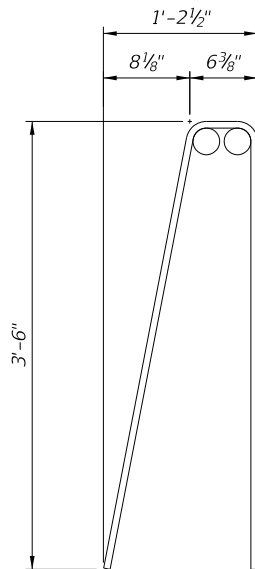
CRASH WALL DETAILS

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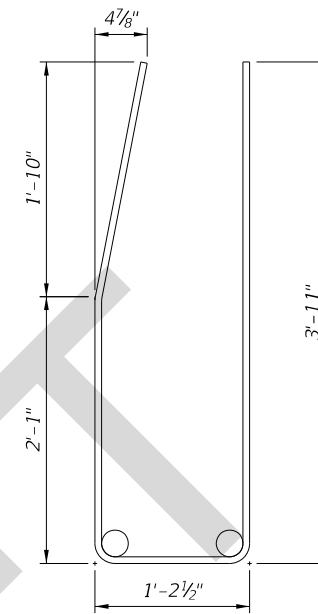
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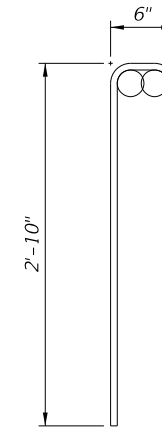
BILL OF REINFORCING STEEL		
MARK	SIZE	LENGTH
V	5	7'-5"
U	5	8'-11"
R	5	6'-0"
F1	5	13'-9"
F2	5	Varies (Straight)
L	5	6'-5" / 7'-5"
E	5	4'-6"
S1	8	Varies (Straight)
S2, S3	5	Varies (Straight)



BARS 5V



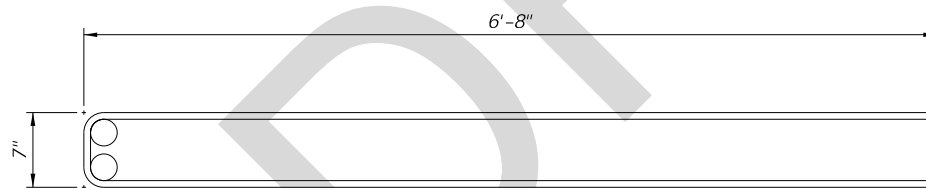
BARS 5U



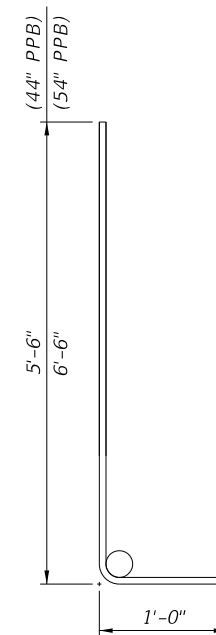
BARS 5R

**NOTES:**

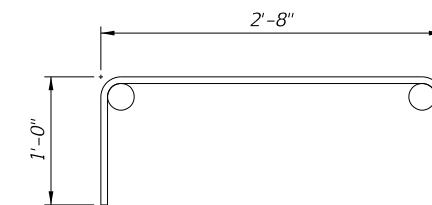
1. Work with the Standard Bar Bending Details per Index 415-001.
2. All bar dimensions in the bending diagrams are out to out.



BARS 5F1



BARS 5L



BARS 5E

**BAR BENDING DIAGRAMS**

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