

---

## ORIGINATION FORM

---

### Proposed Revisions to a Standard Plans Index

(Please provide all information — Incomplete forms will be returned)

**Contact Information:**

Date: July 21, 2022

Originator: Richard Stepp

Phone: (850) 414-4313

Email: richard.stepp@dot.state.fl.us

**Standard Plans:**

Index Number: 521-001

Sheet Number (s): 1,2,13,19, and 20 of 26

Index Title: Concrete Barrier

**Summary of the changes:**

Sheet 1: Note 1 - Changed Concrete Surface Finish Class 3 to General Surface Finish; Note 7 - Clarified that doweled joint connection includes Wall Coping barriers.

Sheet 2: Changed "NOTES" heading to "MEDIAN BARRIER NOTES" to clarify applicability throughout Index; Note 2 - Changed wording of "Space joints" to "Place joints" to clarify need for joints; Elevation - Removed junction slab callout; Note 5 - Replaced existing redundant note with "Minor Grade Separation" note.

Sheet 13: Elevation - Added Wall Coping Barrier to callout at dowel connection; Changed "NOTES" heading to "SHOULDER BARRIER NOTES" to clarify applicability throughout Index.

Sheet 19: Section A-A Option 'B' - Corrected height callout of 36" Height Traffic Railing to remove 1/16" CADD error.

Sheet 20: Elevation - Added Wall Coping Barrier to callout at dowel connection.

**Commentary / Background:**

Miscellaneous clarifications were made based on District questions and feedback, described above.

The Structures Design Office determined that General Surface Finish was more appropriate for roadside Concrete Barriers, so this change was made in General Note 1.

To allow for more design flexibility when using symmetrical Median Barriers, a "Minor Grade Separation" option is being added per Sheet 2, Note 5. This allows for the shoulder pavement on one side of the barrier to be up to 2 inches lower without changes to the basic barrier shape.

**Other Affected Offices / Documents: (Provide name of person contacted)**

- | Yes                      | No                                  |                             |
|--------------------------|-------------------------------------|-----------------------------|
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Other Standard Plans –      |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | FDOT Design Manual –        |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Basis of Estimates Manual – |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Standard Specifications –   |
| <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:** (Submit package to Rick Jenkins)

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

**Implementation:**

- |                          |                                  |
|--------------------------|----------------------------------|
| <input type="checkbox"/> | Design Bulletin (Interim)        |
| <input type="checkbox"/> | DCE Memo                         |
| <input type="checkbox"/> | Program Mgmt. Bulletin           |
| <input type="checkbox"/> | FY-Standard Plans (Next Release) |

---

Contact the Roadway Design Office for assistance in completing this form

---

Email to: Rick Jenkins [rick.jenkins@dot.state.fl.us](mailto:rick.jenkins@dot.state.fl.us) and Darren Martin [darren.martin@dot.state.fl.us](mailto:darren.martin@dot.state.fl.us)

| SHEET | CONTENTS   |
|-------|--|
| 1     | Index Contents; General Notes  |
| 2     | Median Barrier   |
| 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 - 56" Height Section for Barrier-Mounted Dual Sign Support Shielding - Min. Width |
| 9     | Median Barrier - 38" Height Split Section for Stand-Alone Sign Support Shielding                 |
| 10    | Median Barrier - 44" Height Split Section for Pier Shielding                                     |
| 11    | Median Barrier - 44" Height Split Section for Pier Shielding - Details                           |
| 12    | Median Barrier - Connection to F-Shape   |
| 13    | Shoulder Barrier   |
| 14    | Shoulder Barrier - Reinforcing Details   |
| 15    | Shoulder Barrier - Section Options   |
| 16    | Shoulder Barrier - Section Options (Continued), Drainage Slot Option                             |
| 17    | Shoulder Barrier - 38" Height Rear-Flush Section for Reduced Setback Pier Shielding (Low-Speed)  |
| 18    | Shoulder Barrier - 44" Height Rear-Flush Section for Reduced Setback Pier Shielding              |
| 19    | Shoulder Barrier - Connection to F-Shape   |
| 20    | Curb and Gutter Barrier  |
| 21    | Curb and Gutter Barrier - Reinforcing Details  |
| 22    | Curb and Gutter Barrier - Sloped End Treatment   |
| 23    | Wall Shielding Barrier - 38" Height Section - Approach and Trailing Transition                   |
| 24    | Wall Shielding Barrier - 38" Height Section - Guardrail Connection                               |
| 25    | Wall Shielding Barrier - 56" Height Section for Barrier-Mounted Sign Support Shielding           |
| 26    | Reinforcing Bar Bending Diagrams   |

**GENERAL NOTES:**

**changed to "General Surface Finish"**

- BARRIER 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.
- 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.
- 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.

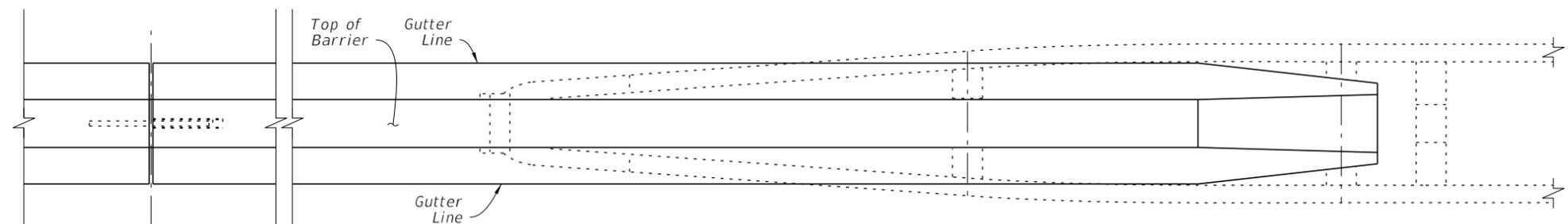
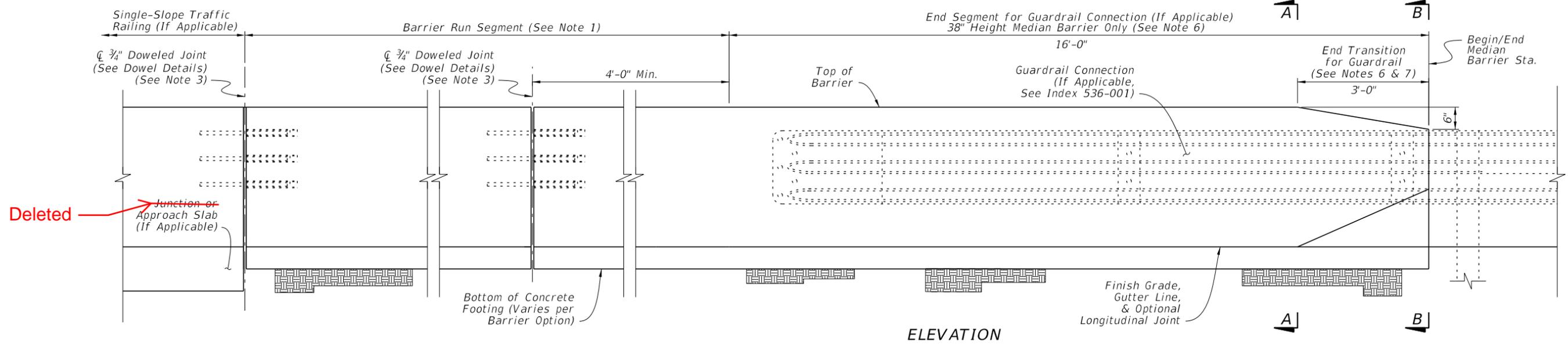
**GENERAL NOTES (CONTINUED):**

- 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.
- MINIMUM BARRIER LENGTH:** Unless otherwise shown in the Plans, the minimum Concrete Barrier length is 40 feet.
- 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.
- DOWELED JOINTS:** As shown in the Dowel Details on Sheets 2 & 13, 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.
- CRACK CONTROL V-GROOVES:** At 20-foot intervals, place ¾" 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.
- SUBGRADE:** Compact the top layer of subgrade with Type B Stabilization, LBR 40 (12 in.).
- 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.
- 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.
- DRAINAGE INLETS:** Where called for in the Plans, install corresponding inlets per Indexes 425-030 thru 425-032.
- LIGHT POLE MOUNTING:** Where called for in the Plans, install aluminum light poles per Index 715-002.
- OPAQUE VISUAL BARRIER:** Where called for in the Plans, install Opaque Visual Barrier per Index 521-010.
- 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.
- 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.
- TOLL SITES:** Where called for in the Plans, substitute the steel reinforcing bars shown herein with GFRP reinforcing bars of the same size. Construct GFRP reinforcing bars in accordance with Specification 932, and use a maximum 4½" inner diameter for bar bends. Alternative bar bending details and shapes may be used so long as the final location of the reinforcing is unchanged and the bars are either continuous or fully spliced at the side and bottom barrier locations. Where required to fit pull boxes while maintaining bar spacing and concrete cover, trim GFRP bars as defined in the Plans.  
  
At toll site locations, the use of Median Barriers on outside shoulders is permitted where called for in the Plans. Shoulder Pavement shown herein may be substituted with material for an alternate usage where defined in the Plans.

**Added "wall coping barrier"**

10/21/2021 1:07:21 PM

|                                      |                                   |   |                         |                         |                         |
|--------------------------------------|-----------------------------------|---|-------------------------|-------------------------|-------------------------|
| LAST REVISION<br><del>11/01/20</del> | DESCRIPTION:<br><b>11/01/2022</b> |  FY <del>2022-23</del> <b>2023-24</b><br><b>STANDARD PLANS</b> | <b>CONCRETE BARRIER</b> | INDEX<br><b>521-001</b> | SHEET<br><b>1 of 26</b> |
|--------------------------------------|-----------------------------------|---|-------------------------|-------------------------|-------------------------|

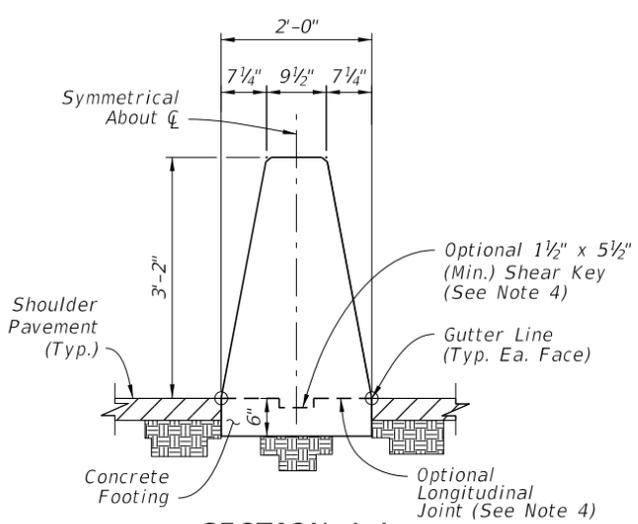


Deleted → Junction of Approach Slab (If Applicable)

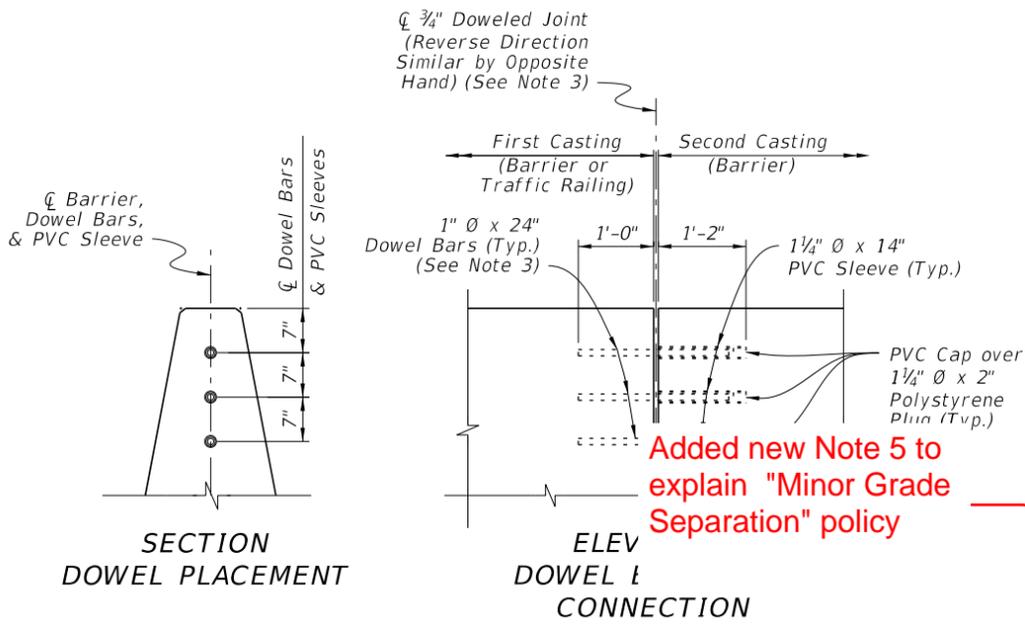
NOTES: → Changed to "MEDIAN BARRIER NOTES"

- 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.
- SECTION VIEWS:** For additional Views A-A and B-B, see Sheet 3. → Changed to "Place"
- DOWELED JOINTS:** See the General Notes on Sheet 1 for usage of joint types. ~~Place~~ 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 1 1/8"Ø x 13"(± 1/2") drilled hole for cured concrete. For drilled holes larger than 1 1/8"Ø, secure the dowel with adhesive in accordance with Specification 416. No load testing is required.  
  
For the dowel connection into the second casting, use a 1 1/4" NPS Schedule 80 PVC pipe with a sealed cap, cast-in-place as shown.
- OPTIONAL LONGITUDINAL JOINT:** When a longitudinal joint is placed above the footing, use the Optional 1 1/2" x 5 1/2" 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 1/4" depth longitudinal grooves, distributed evenly and approved by the Engineer.
- ~~TRAFFIC RAILING CONNECTIONS. Align the barrier and Traffic Railing faces and connect with the 3/4" Doweled Joint.~~
- 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.
- CRASH CUSHION CONNECTIONS:** Connect Crash Cushions per Index 544-001 in conjunction with the 3'-0" End Transition for Guardrail as shown herein.
- 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.

Added new Note 5 to explain "Minor Grade Separation" policy



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



**DOWEL DETAILS**

9/21/2021 2:41:03 PM

**MEDIAN BARRIER**

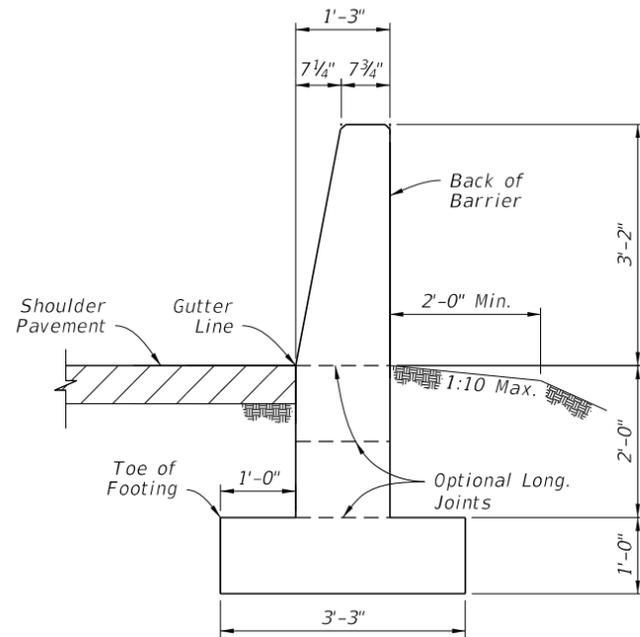
|               |              |
|---------------|--------------|
| LAST REVISION | DESCRIPTION: |
| 11/01/2022    |              |

FY ~~2022-23~~ 2023-24  
**STANDARD PLANS**

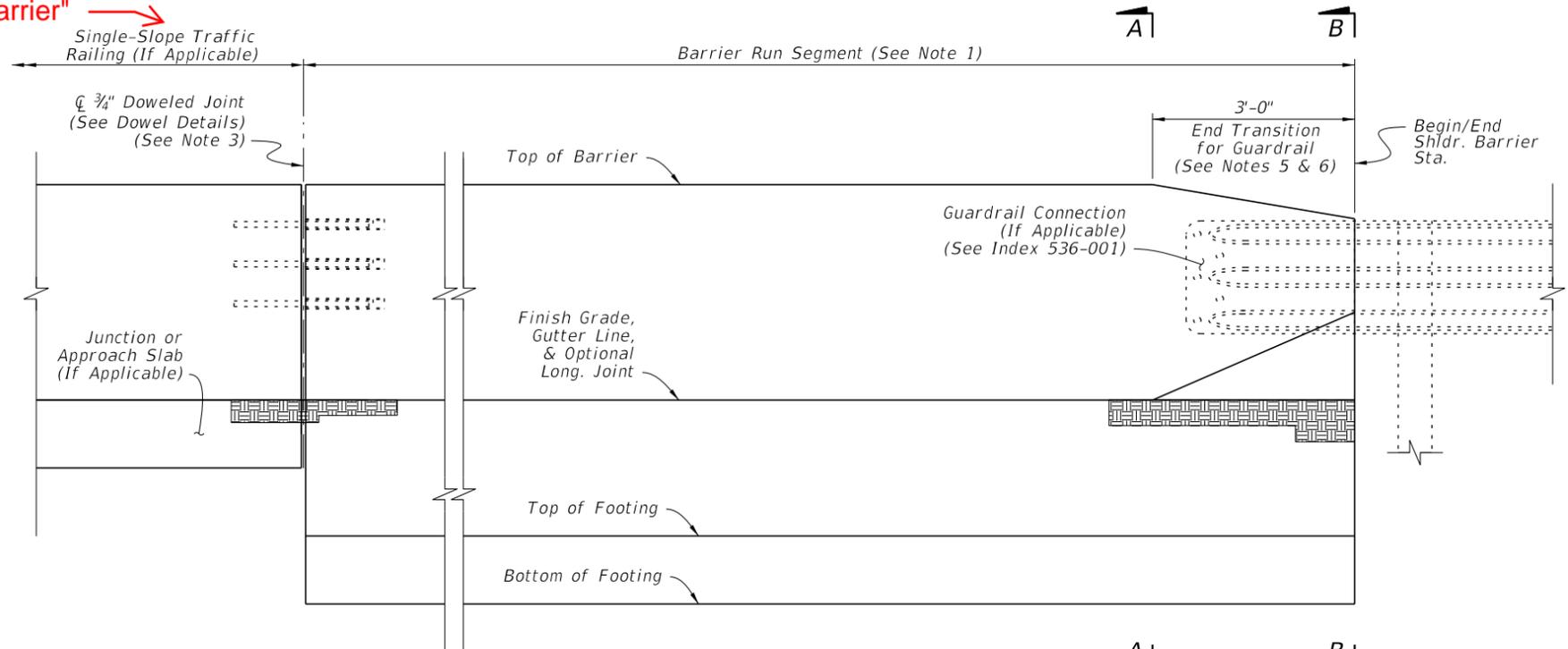
CONCRETE BARRIER

|         |         |
|---------|---------|
| INDEX   | SHEET   |
| 521-001 | 2 of 26 |

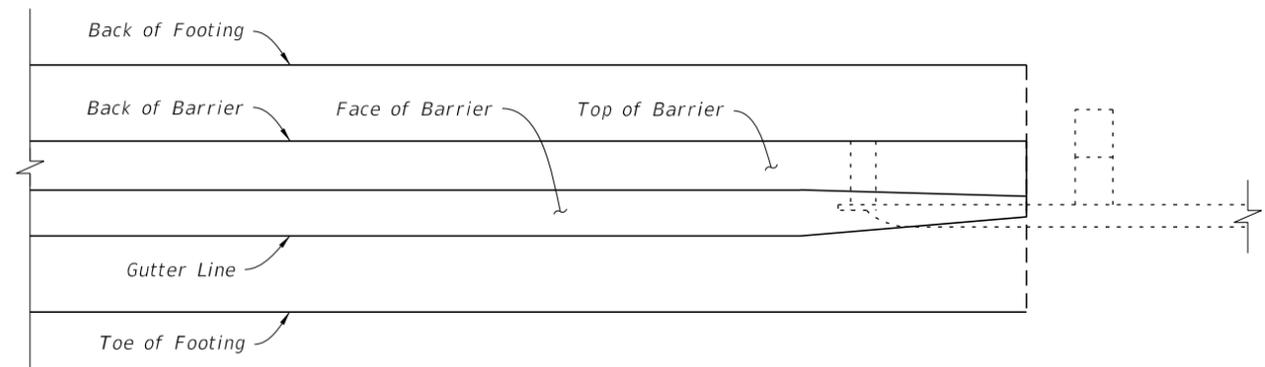
Added "Wall Coping Barrier" →



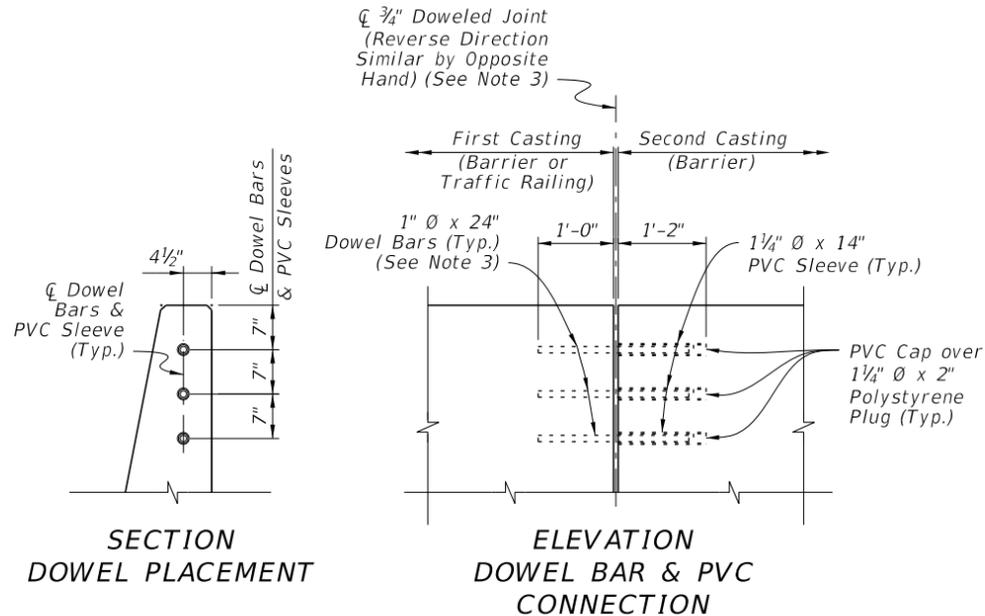
SECTION A-A  
38" HEIGHT SHOULDER BARRIER  
(See Sheet 14 for  
Reinforcing Steel Details)



ELEVATION



PLAN



DOWEL DETAILS

NOTES: ← Changed to "SHOULDER BARRIER NOTES"

- 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.
- SECTION VIEWS: For additional Views A-A and B-B, see Sheet 14.
- 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 1 1/8"Ø x 13"(± 1/2") drilled hole for cured concrete. For drilled holes larger than 1 1/8"Ø, secure the dowel with adhesive in accordance with Specification 416. No load testing is required.  
  
For the dowel connection into the second casting, use a 1 1/4" NPS Schedule 80 PVC pipe with a sealed cap, cast-in-place as shown.
- TRAFFIC RAILING CONNECTIONS: Align the barrier and Traffic Railing faces and connect with the 3/4" Doweled Joint.
- GUARDRAIL CONNECTIONS: Connect Guardrail using the Transition Connections to Rigid Barrier per Index 536-001.
- CRASH CUSHION CONNECTIONS: Connect Crash Cushions per Index 544-001 in conjunction with the 3'-0" End Transition for Guardrail as shown herein.
- 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 14.

SHOULDER BARRIER

9/21/2021 2:41:16 PM

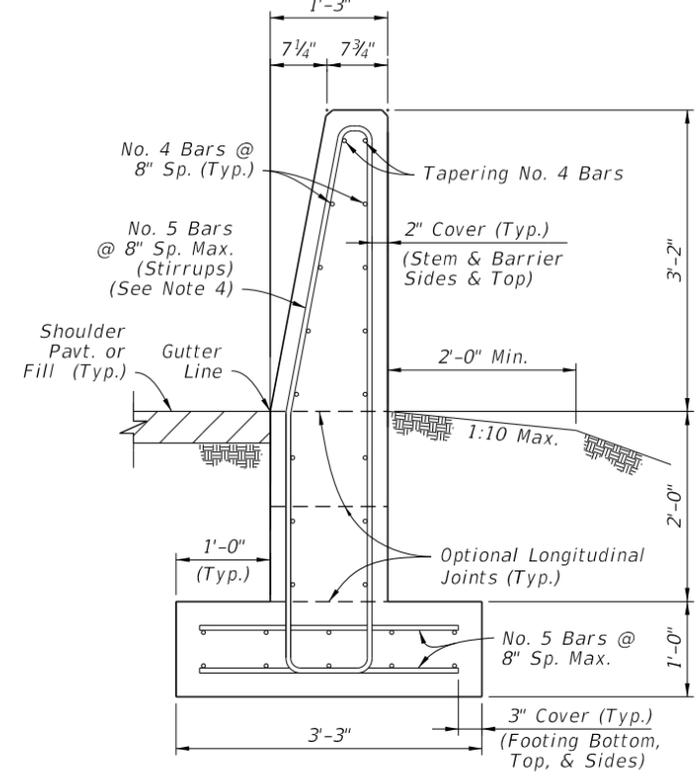
|               |              |
|---------------|--------------|
| LAST REVISION | DESCRIPTION: |
| 11/01/20      | 11/01/2022   |



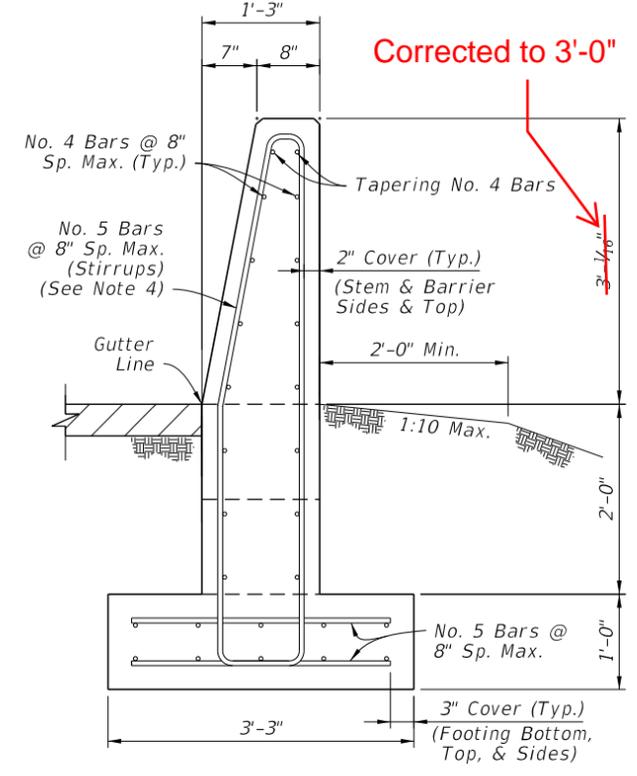
FY ~~2022-23~~ 2023-24  
STANDARD PLANS

CONCRETE BARRIER

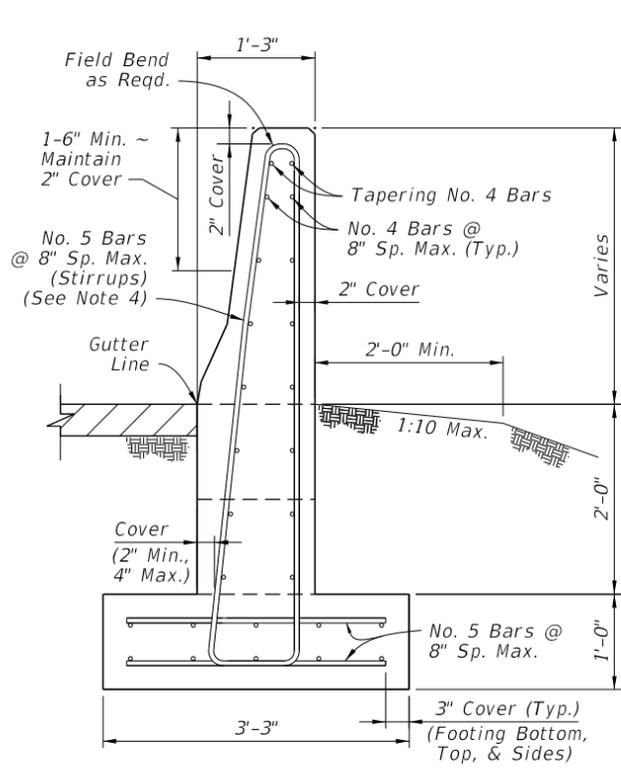
INDEX SHEET  
521-001 13 of 26



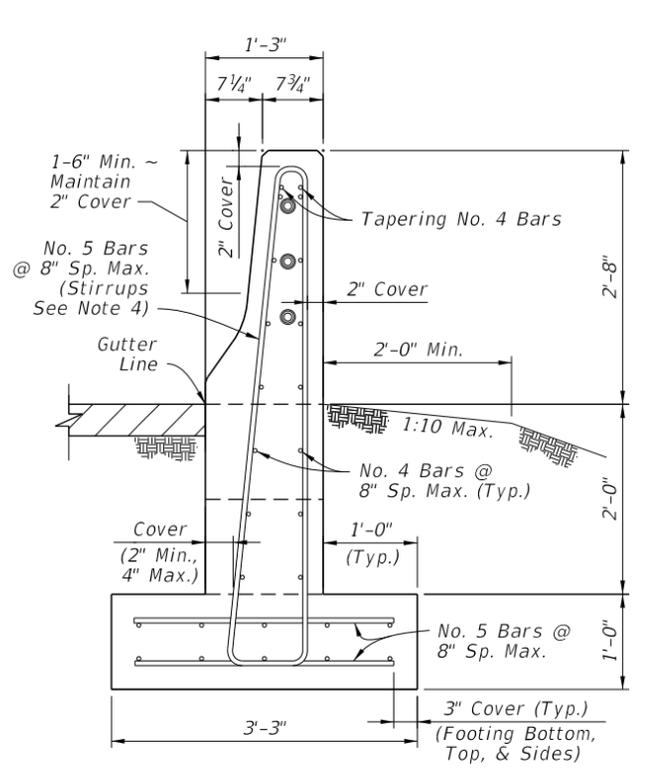
**SECTION A-A  
BEGIN TRANSITION - OPTION 'A'  
MATCH SINGLE-SLOPE  
38" HEIGHT SHOULDER BARRIER**



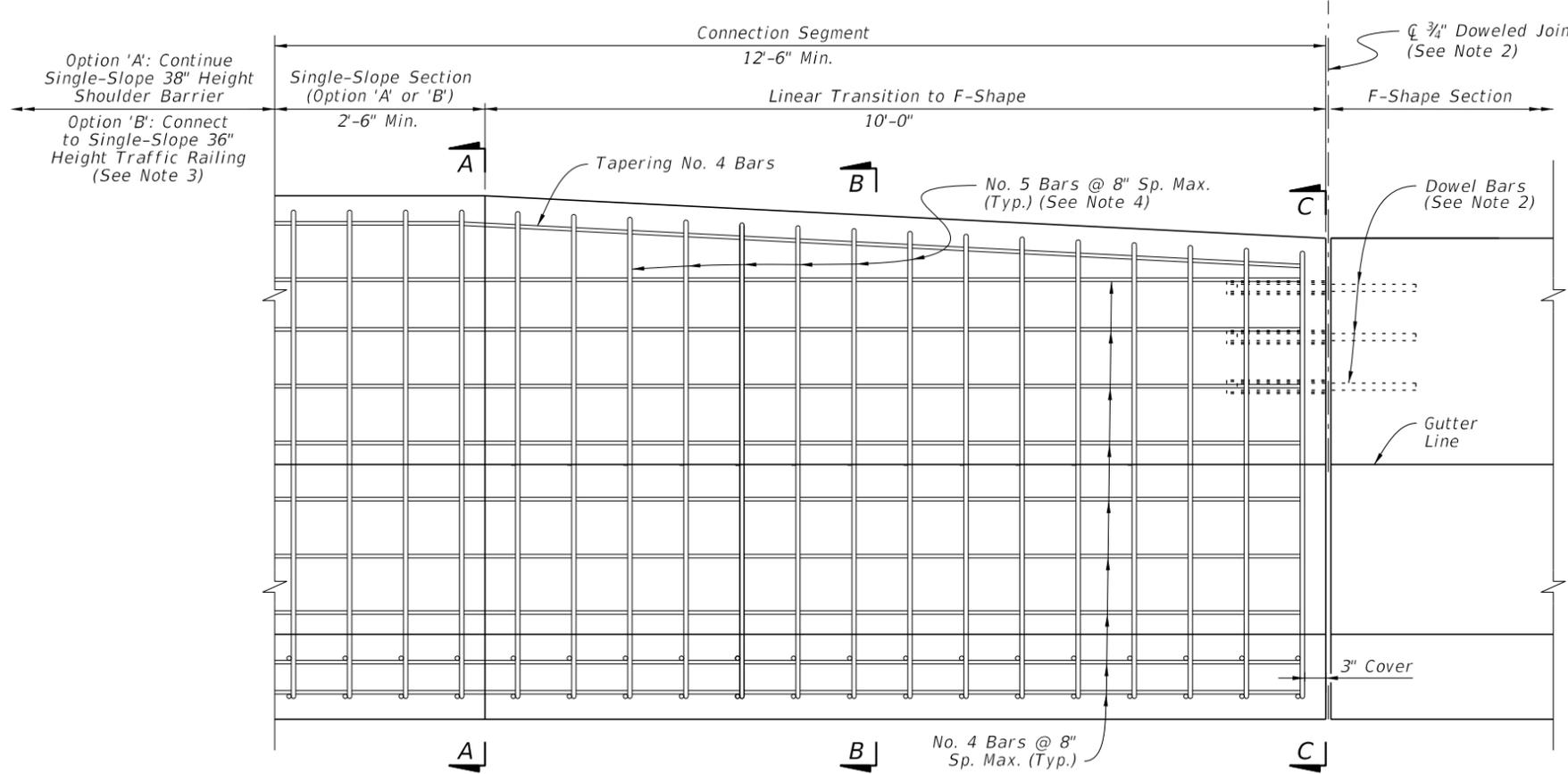
**SECTION A-A  
BEGIN TRANSITION - OPTION 'B'  
MATCH SINGLE-SLOPE  
36" HEIGHT TRAFFIC RAILING  
(Bridge Applications)**



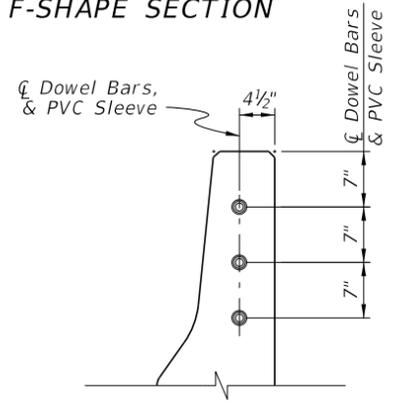
**SECTION B-B  
INTERMEDIATE SECTION  
OF LINEAR TRANSITION**



**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 13.
3. TRAFFIC RAILING CONNECTION: For the Option 'B' connection, use a Doweled Joint per Sheet 13 and the additional Free End Reinforcing with reduced bar spacing per Sheet 14.
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**

9/21/2021 2:41:22 PM

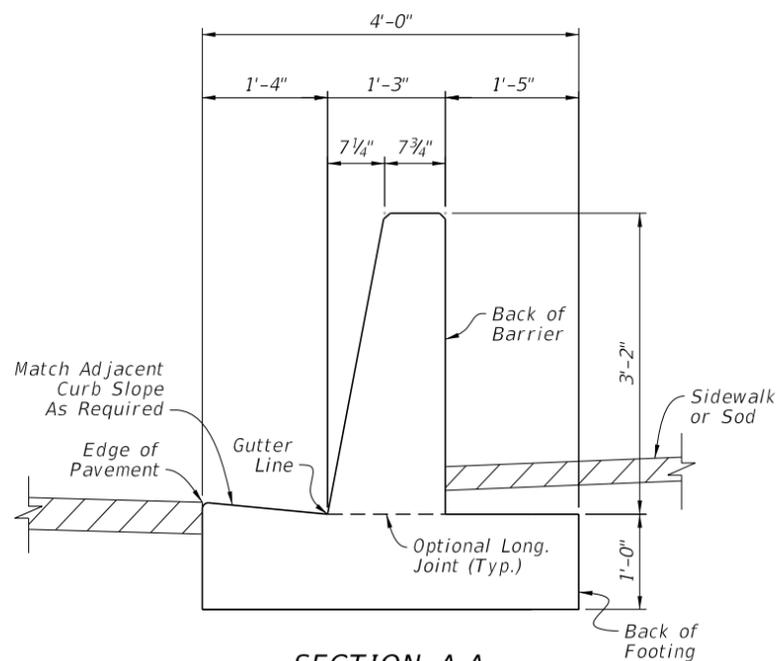
|               |              |
|---------------|--------------|
| LAST REVISION | DESCRIPTION: |
| 11/01/2022    |              |

FY ~~2022-23~~ 2023-24  
 STANDARD PLANS

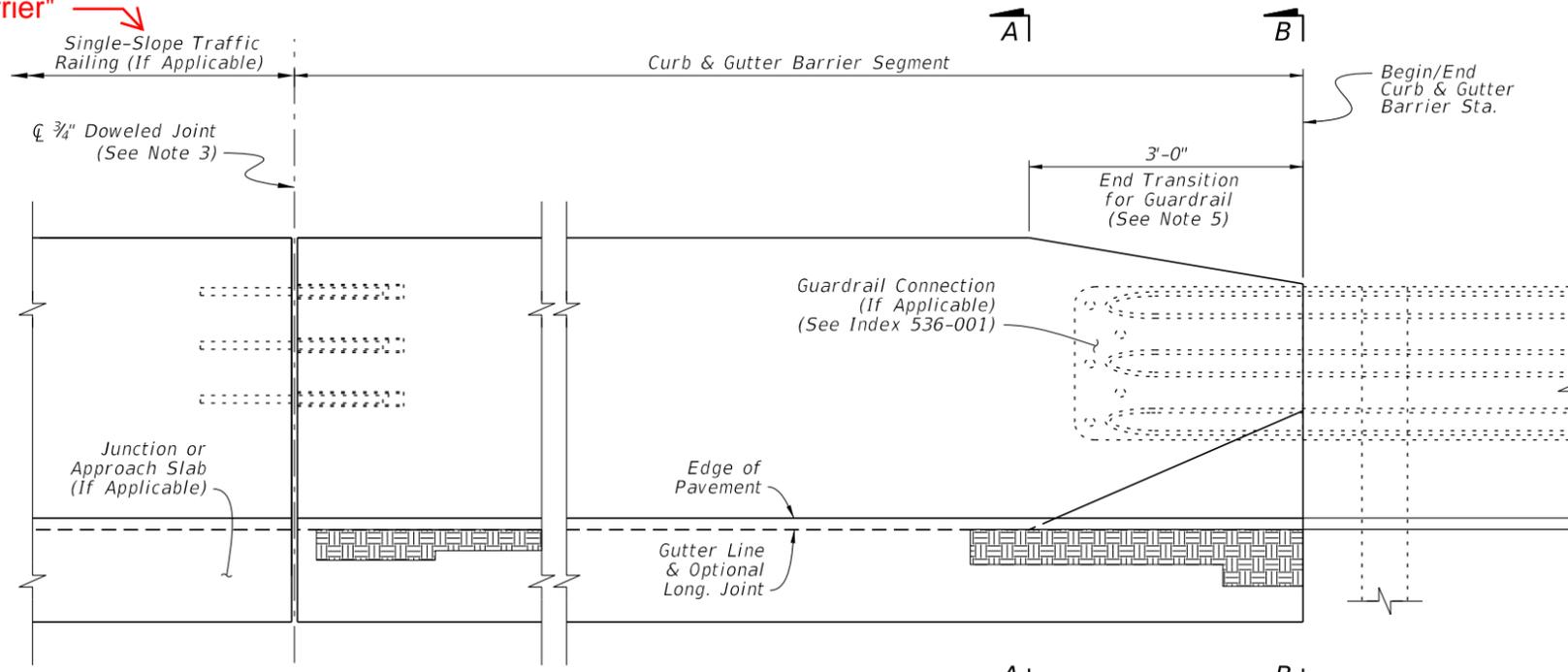
**CONCRETE BARRIER**

|         |          |
|---------|----------|
| INDEX   | SHEET    |
| 521-001 | 19 of 26 |

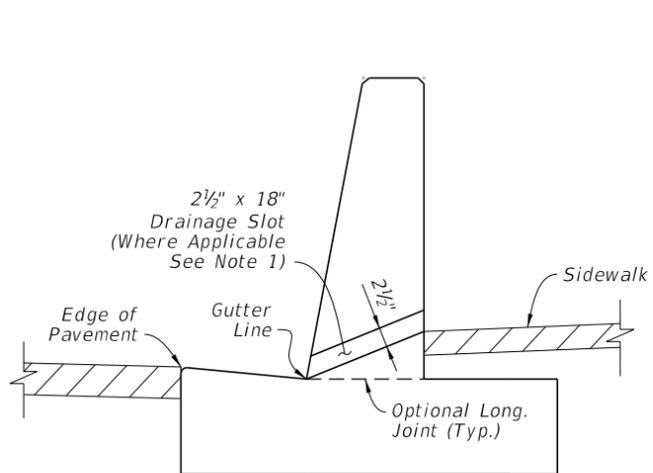
Added "Wall Coping Barrier" →



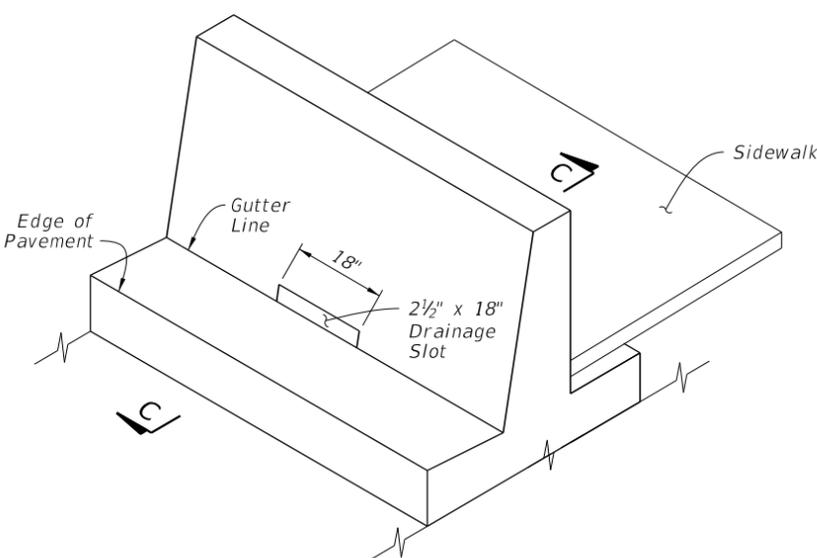
SECTION A-A  
CURB & GUTTER  
BARRIER



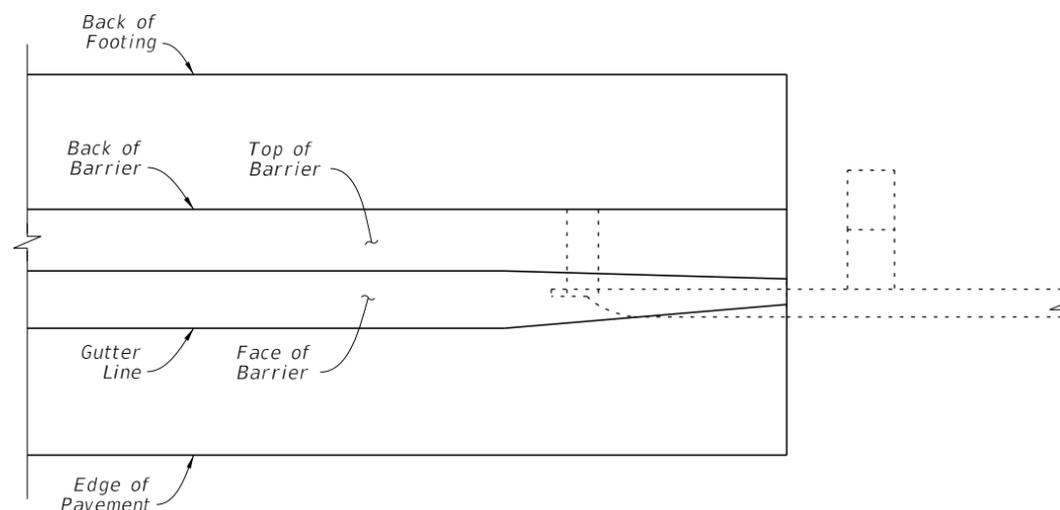
ELEVATION



SECTION C-C  
CURB & GUTTER  
BARRIER WITH  
DRAINAGE SLOT



ISOMETRIC VIEW  
CURB GUTTER BARRIER  
WITH DRAINAGE SLOT



PLAN

DRAINAGE SLOT DETAILS

DRAINAGE SLOT NOTES:

1. GENERAL: Place 2 1/2" x 18" Drainage Slots at locations and/or spacing called for in the Plans. The minimum spacing is 20 feet.
2. STEEL REINFORCEMENT CONFLICT: When the Drainage Slot encounters a conflict with reinforcing steel, shift or cut the reinforcing steel to provide 2 1/2" (± 1/2") 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 21.
2. EXPANSION JOINTS: Place 1/2" 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 21.
3. DOWELED JOINTS: See the General Notes on Sheet 1 for usage of joint types. Where required, install 3/4" Doweled Joints as defined on Sheet 13.
4. TRAFFIC RAILING CONNECTIONS: Align the barrier and Traffic Railing faces and connect with the 3/4" Doweled Joint per Sheet 13.
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 21.

CURB AND GUTTER BARRIER

9/21/2021 2:41:22 PM

|               |              |
|---------------|--------------|
| LAST REVISION | DESCRIPTION: |
| 11/01/2022    |              |



FY ~~2022-23~~ 2023-24  
STANDARD PLANS

CONCRETE BARRIER

INDEX  
521-001

SHEET  
20 of 26

| SHEET | CONTENTS   |
|-------|--|
| 1     | Index Contents; General Notes  |
| 2     | Median Barrier   |
| 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 - 56" Height Section for Barrier-Mounted Dual Sign Support Shielding - Min. Width |
| 9     | Median Barrier - 38" Height Split Section for Stand-Alone Sign Support Shielding                 |
| 10    | Median Barrier - 44" Height Split Section for Pier Shielding                                     |
| 11    | Median Barrier - 44" Height Split Section for Pier Shielding - Details                           |
| 12    | Median Barrier - Connection to F-Shape   |
| 13    | Shoulder Barrier   |
| 14    | Shoulder Barrier - Reinforcing Details   |
| 15    | Shoulder Barrier - Section Options   |
| 16    | Shoulder Barrier - Section Options (Continued), Drainage Slot Option                             |
| 17    | Shoulder Barrier - 38" Height Rear-Flush Section for Reduced Setback Pier Shielding (Low-Speed)  |
| 18    | Shoulder Barrier - 44" Height Rear-Flush Section for Reduced Setback Pier Shielding              |
| 19    | Shoulder Barrier - Connection to F-Shape   |
| 20    | Curb and Gutter Barrier  |
| 21    | Curb and Gutter Barrier - Reinforcing Details  |
| 22    | Curb and Gutter Barrier - Sloped End Treatment   |
| 23    | Wall Shielding Barrier - 38" Height Section - Approach and Trailing Transition                   |
| 24    | Wall Shielding Barrier - 38" Height Section - Guardrail Connection                               |
| 25    | Wall Shielding Barrier - 56" Height Section for Barrier-Mounted Sign Support Shielding           |
| 26    | Reinforcing Bar Bending Diagrams   |

**GENERAL NOTES:**

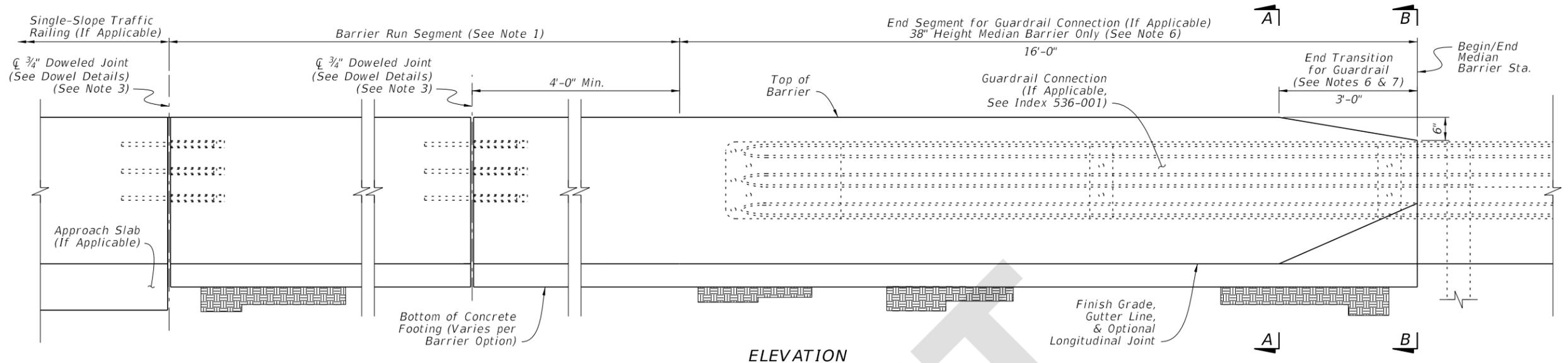
- BARRIER CONCRETE:** Use Class II concrete for all barriers constructed in slightly aggressive environments, and use Class IV Concrete for all barriers constructed in moderately or extremely aggressive environments. On all exposed surfaces, apply a General Surface Finish in accordance with Specification 400.
- 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.
- 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.

**GENERAL NOTES (CONTINUED):**

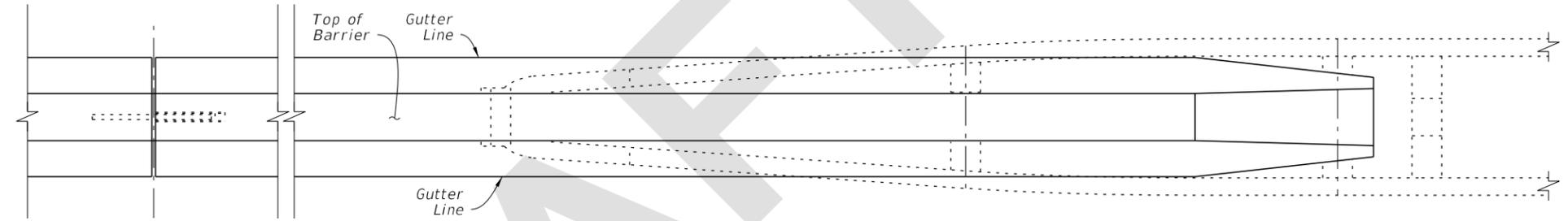
- TOP FACE LONGITUDINAL REINFORCEMENT:** Unless otherwise specified, the longitudinal reinforcement shown closest to the top face of the barrier has a maximum cover of 4½", measured from the top face of the barrier.
- MINIMUM BARRIER LENGTH:** Unless otherwise shown in the Plans, the minimum Concrete Barrier length is 40 feet.
- 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.
- DOWELED JOINTS:** As shown in the Dowel Details on Sheets 2 & 13, install ¾" Doweled Joints for Concrete Barrier connections to Wall Coping Barriers, Pier Protection Barriers, 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.
- CRACK CONTROL V-GROOVES:** At 20-foot intervals, place ¾" 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.
- SUBGRADE:** Compact the top layer of subgrade with Type B Stabilization, LBR 40 (12 in.).
- 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.
- FINISH GRADE ELEVATION:** At the barrier face location, the finish grade pavement has a vertical position tolerance of ± ½" from the nominal locations shown herein, relative to the barrier elevation. Maintain visually smooth and even pavement at the barrier face, per the approval of the Engineer.
- DRAINAGE INLETS:** Where called for in the Plans, install corresponding inlets per Indexes 425-030 thru 425-032.
- LIGHT POLE MOUNTING:** Where called for in the Plans, install aluminum light poles per Index 715-002.
- OPAQUE VISUAL BARRIER:** Where called for in the Plans, install Opaque Visual Barrier per Index 521-010.
- 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.
- 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.
- TOLL SITES:** Where called for in the Plans, substitute the steel reinforcing bars shown herein with GFRP reinforcing bars of the same size. Construct GFRP reinforcing bars in accordance with Specification 932, and use a maximum 4½" inner diameter for bar bends. Alternative bar bending details and shapes may be used so long as the final location of the reinforcing is unchanged and the bars are either continuous or fully spliced at the side and bottom barrier locations. Where required to fit pull boxes while maintaining bar spacing and concrete cover, trim GFRP bars as defined in the Plans.  
  
At toll site locations, the use of Median Barriers on outside shoulders is permitted where called for in the Plans. Shoulder Pavement shown herein may be substituted with material for an alternate usage where defined in the Plans.

7/26/2022 2:32:11 PM

|                           |          |              |   |                         |                  |                  |
|---------------------------|----------|--------------|---|-------------------------|------------------|------------------|
| LAST REVISION<br>11/01/22 | REVISION | DESCRIPTION: | <br><b>FY 2023-24<br/>STANDARD PLANS</b> | <b>CONCRETE BARRIER</b> | INDEX<br>521-001 | SHEET<br>1 of 26 |
|---------------------------|----------|--------------|---|-------------------------|------------------|------------------|



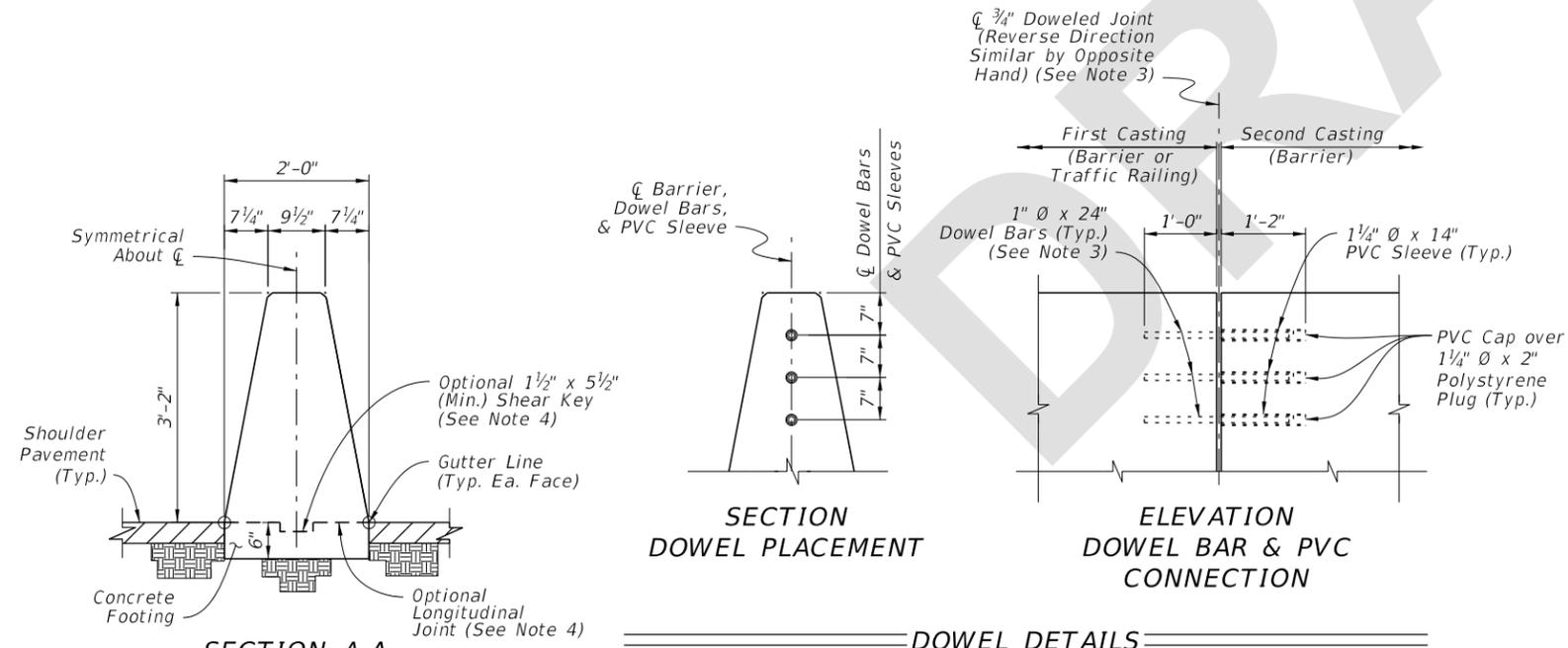
ELEVATION



PLAN

**MEDIAN BARRIER NOTES:**

- 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.
- SECTION VIEWS:** For additional Views A-A and B-B, see Sheet 3.
- DOWELED JOINTS:** See the General Notes on Sheet 1 for usage of joint types. Place 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 1 1/8" x 13" (± 1/2") drilled hole for cured concrete. For drilled holes larger than 1 1/8", secure the dowel with adhesive in accordance with Specification 416. No load testing is required.  
  
For the dowel connection into the second casting, use a 1 1/4" NPS Schedule 80 PVC pipe with a sealed cap, cast-in-place as shown.
- OPTIONAL LONGITUDINAL JOINT:** When a longitudinal joint is placed above the footing, use the Optional 1 1/2" x 5 1/2" 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 1/4" depth longitudinal grooves, distributed evenly and approved by the Engineer.
- MINOR GRADE SEPARATIONS:** Where called for in the Plans, the nominal shoulder pavement surface elevation may be placed 2" below the location shown herein on one side of the barrier. If applicable for variable section width barriers, extend the barrier's concrete lower across its entire section such that the barrier's concrete bottom remains embedded at least 1" below the lowered pavement surface.
- 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.
- CRASH CUSHION CONNECTIONS:** Connect Crash Cushions per Index 544-001 in conjunction with the 3'-0" End Transition for Guardrail as shown herein.
- 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.



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

**SECTION DOWEL PLACEMENT**

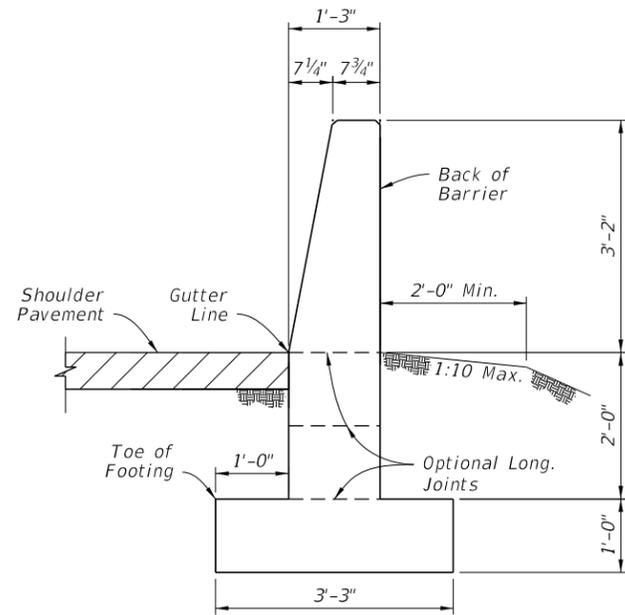
**ELEVATION DOWEL BAR & PVC CONNECTION**

**DOWEL DETAILS**

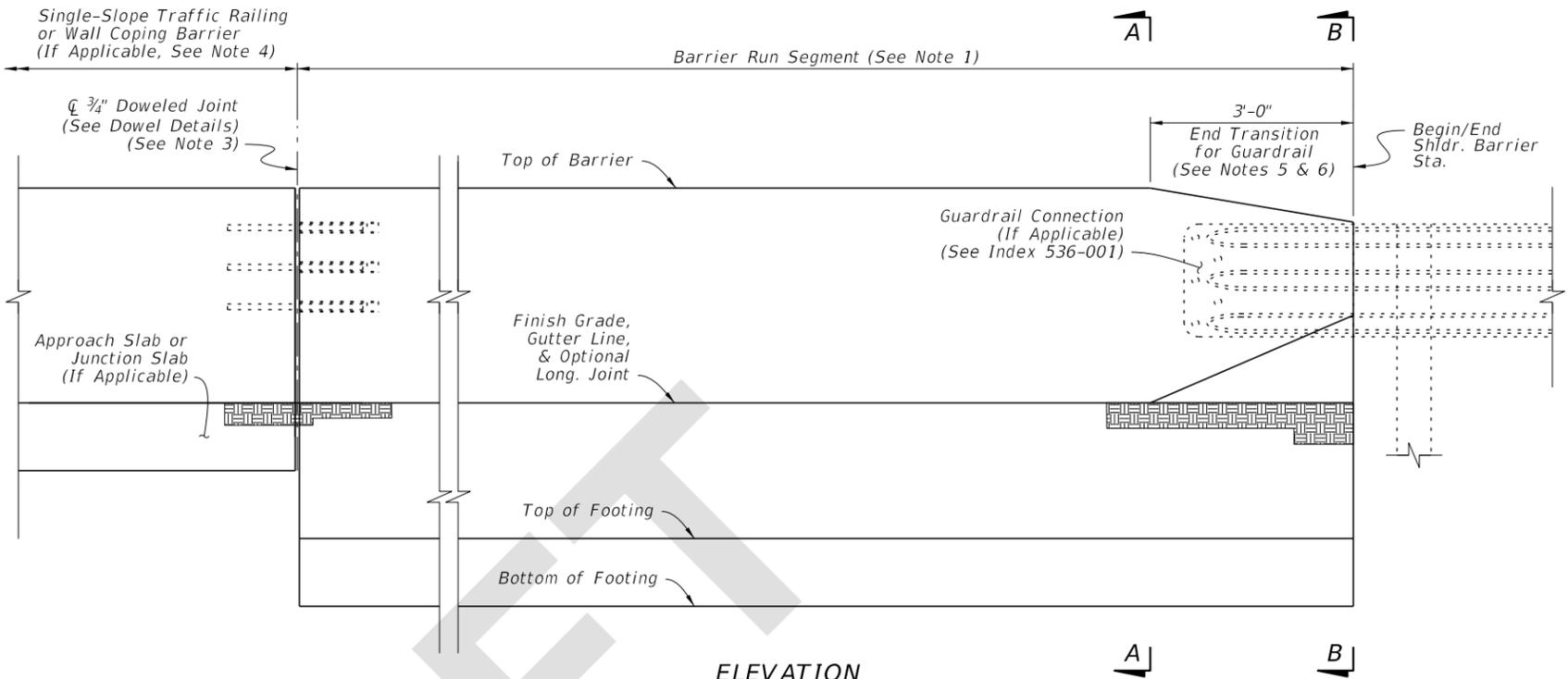
7/26/2022 2:32:12 PM

|                           |              |   |                         |                  |                  |
|---------------------------|--------------|---|-------------------------|------------------|------------------|
| LAST REVISION<br>11/01/22 | DESCRIPTION: | <br>FY 2023-24<br>STANDARD PLANS | <b>CONCRETE BARRIER</b> | INDEX<br>521-001 | SHEET<br>2 of 26 |
|---------------------------|--------------|---|-------------------------|------------------|------------------|

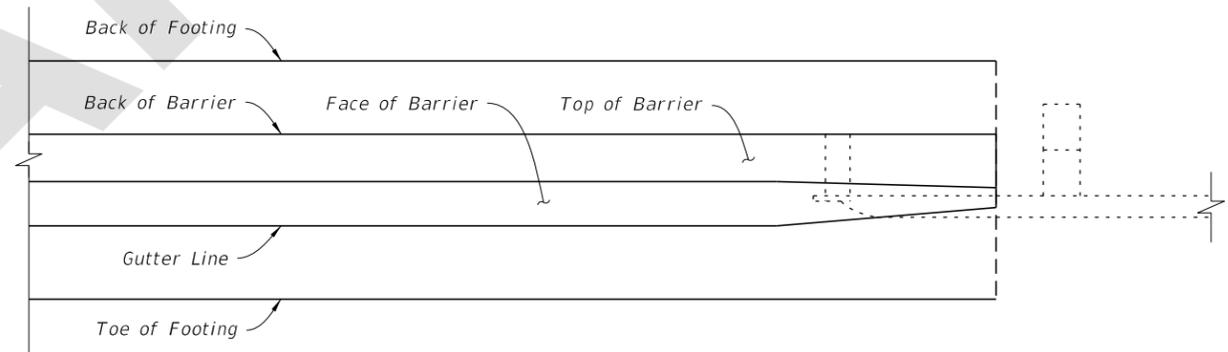
**MEDIAN BARRIER**



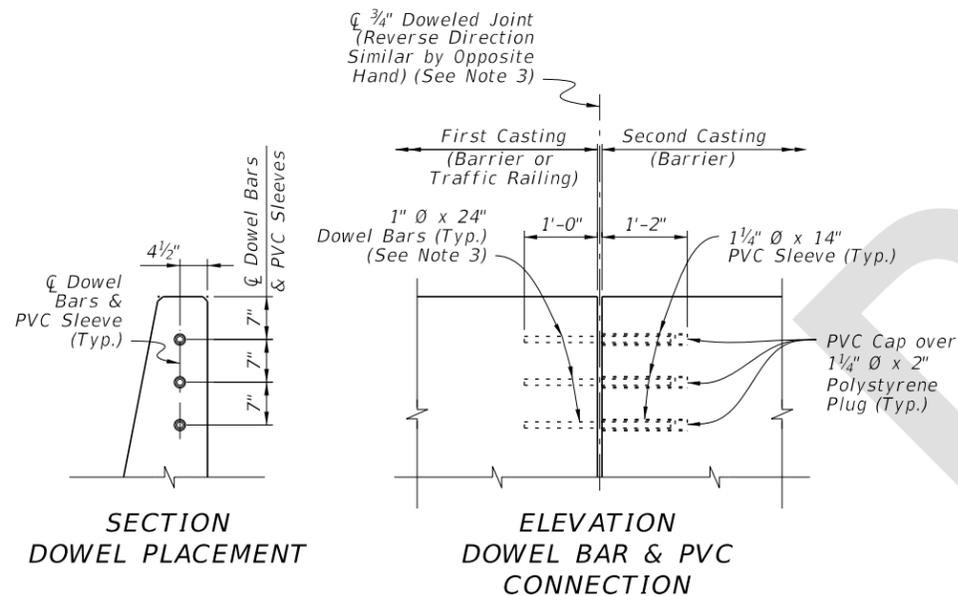
**SECTION A-A**  
**38" HEIGHT SHOULDER BARRIER**  
 (See Sheet 14 for  
 Reinforcing Steel Details)



**ELEVATION**



**PLAN**



**SECTION DOWEL PLACEMENT**

**ELEVATION DOWEL BAR & PVC CONNECTION**

**DOWEL DETAILS**

**SHOULDER BARRIER NOTES:**

- 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.
- SECTION VIEWS:** For additional Views A-A and B-B, see Sheet 14.
- 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 1 1/8"Ø x 13"(± 1/2") drilled hole for cured concrete. For drilled holes larger than 1 1/8"Ø, secure the dowel with adhesive in accordance with Specification 416. No load testing is required.  
  
For the dowel connection into the second casting, use a 1 1/4" NPS Schedule 80 PVC pipe with a sealed cap, cast-in-place as shown.
- TRAFFIC RAILING CONNECTIONS:** Align the barrier and Traffic Railing faces and connect with the 3/4" Doweled Joint.
- GUARDRAIL CONNECTIONS:** Connect Guardrail using the Transition Connections to Rigid Barrier per Index 536-001.
- CRASH CUSHION CONNECTIONS:** Connect Crash Cushions per Index 544-001 in conjunction with the 3'-0" End Transition for Guardrail as shown herein.
- 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 14.

**SHOULDER BARRIER**

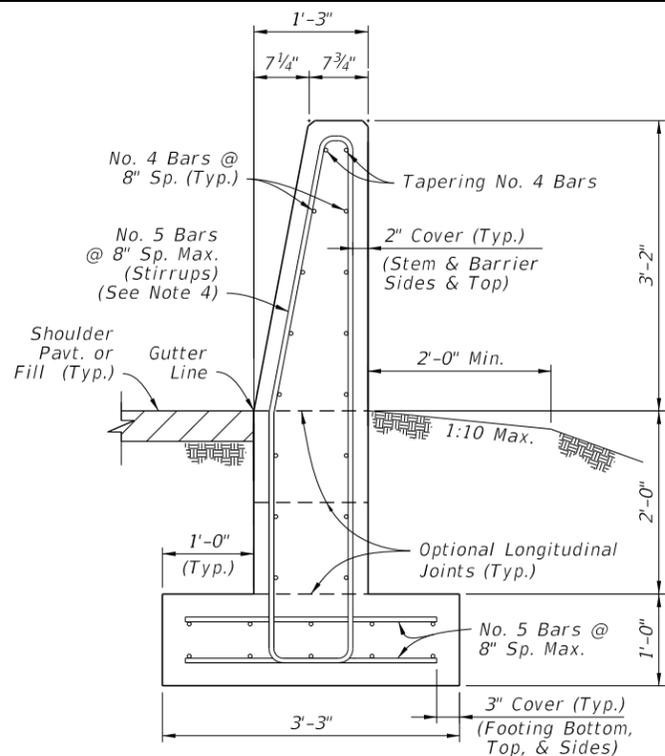
|                           |          |              |
|---------------------------|----------|--------------|
| LAST REVISION<br>11/01/22 | REVISION | DESCRIPTION: |
|---------------------------|----------|--------------|



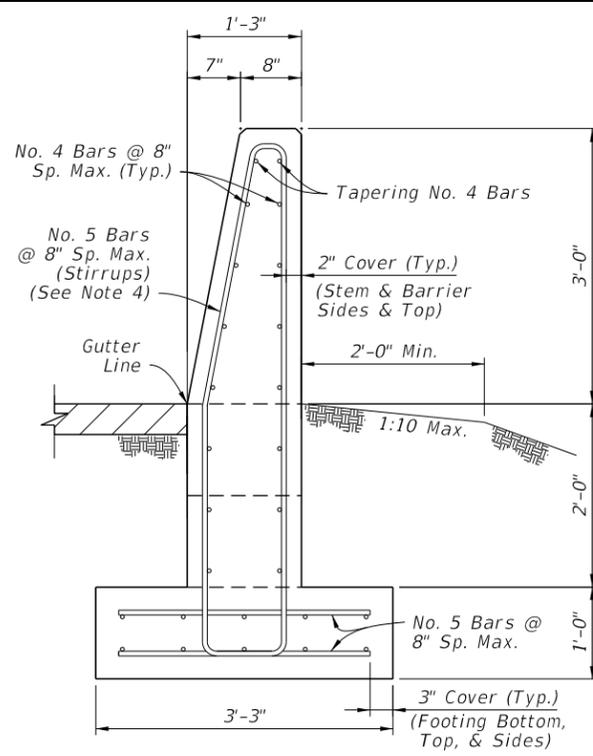
**FY 2023-24  
 STANDARD PLANS**

**CONCRETE BARRIER**

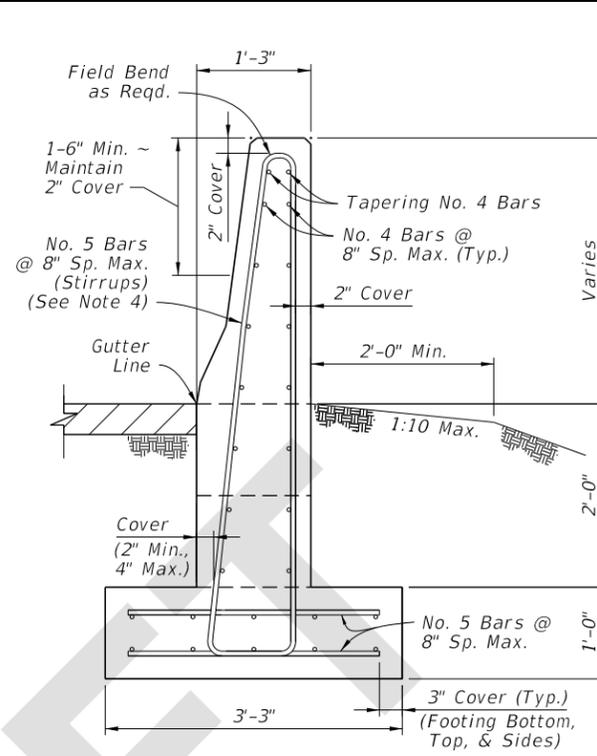
|                  |                   |
|------------------|-------------------|
| INDEX<br>521-001 | SHEET<br>13 of 26 |
|------------------|-------------------|



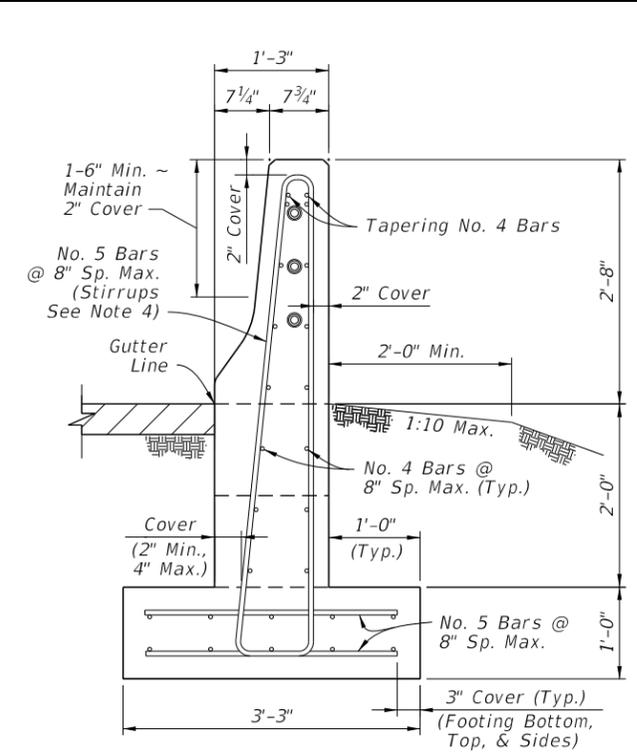
**SECTION A-A  
BEGIN TRANSITION - OPTION 'A'  
MATCH SINGLE-SLOPE  
38" HEIGHT SHOULDER BARRIER**



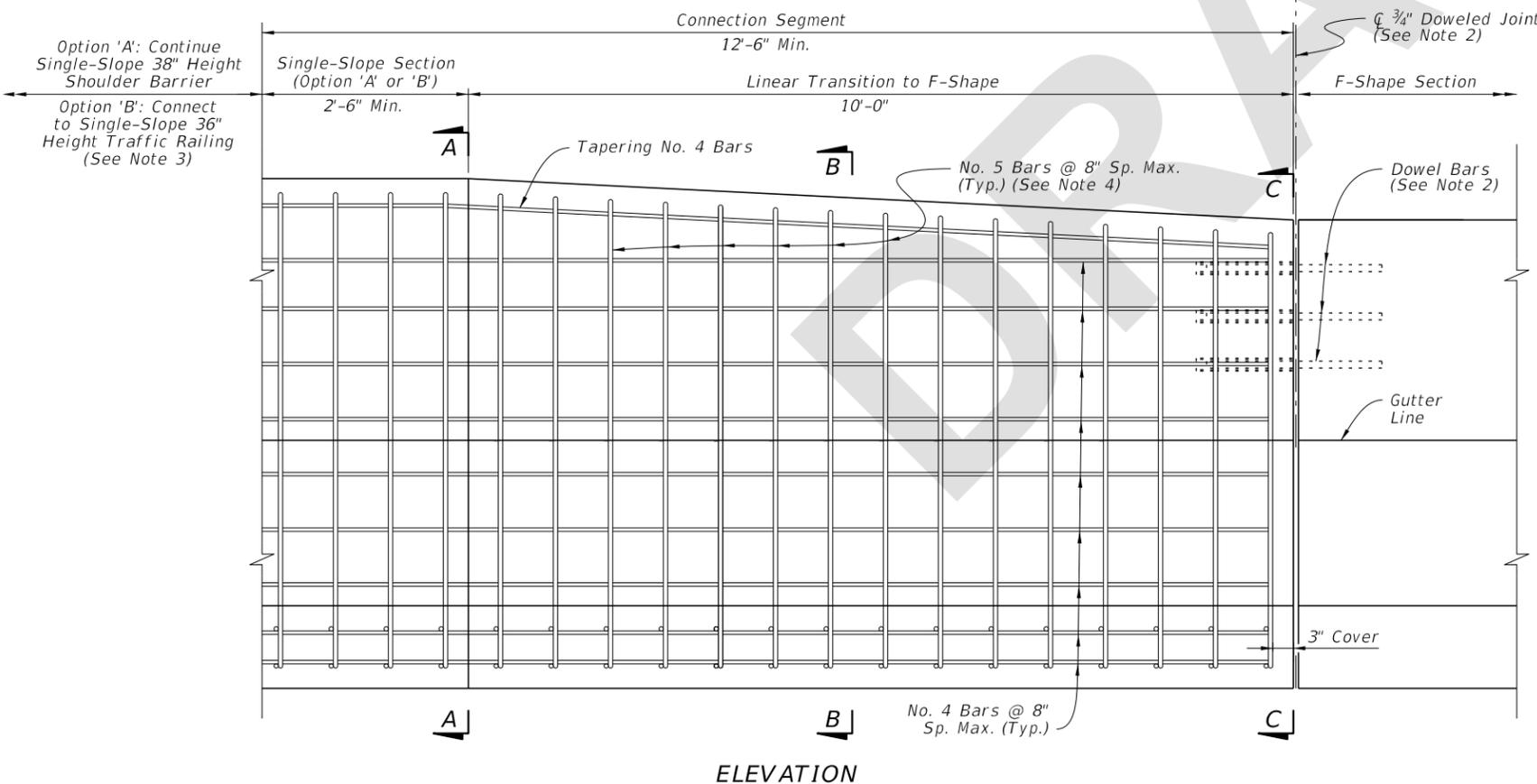
**SECTION A-A  
BEGIN TRANSITION - OPTION 'B'  
MATCH SINGLE-SLOPE  
36" HEIGHT TRAFFIC RAILING  
(Bridge Applications)**



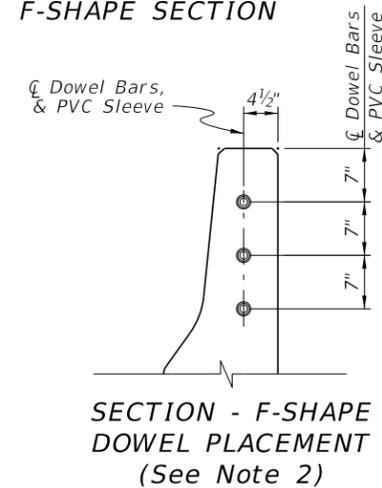
**SECTION B-B  
INTERMEDIATE SECTION  
OF LINEAR TRANSITION**



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



**ELEVATION**



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

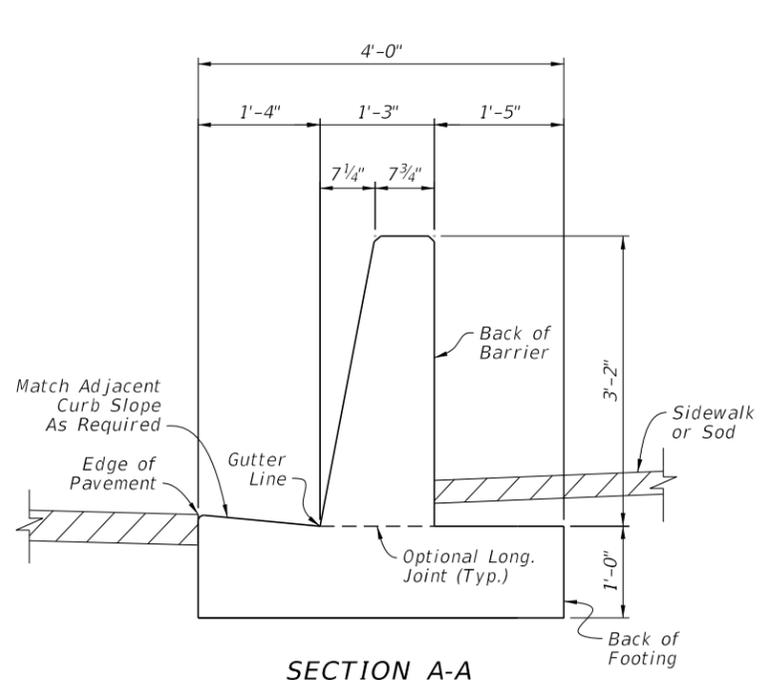
**NOTES:**

- 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.
- DOWELED JOINT:** Install Dowel Bars per the Dowel Details on Sheet 13.
- TRAFFIC RAILING CONNECTION:** For the Option 'B' connection, use a Doweled Joint per Sheet 13 and the additional Free End Reinforcing with reduced bar spacing per Sheet 14.
- 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.

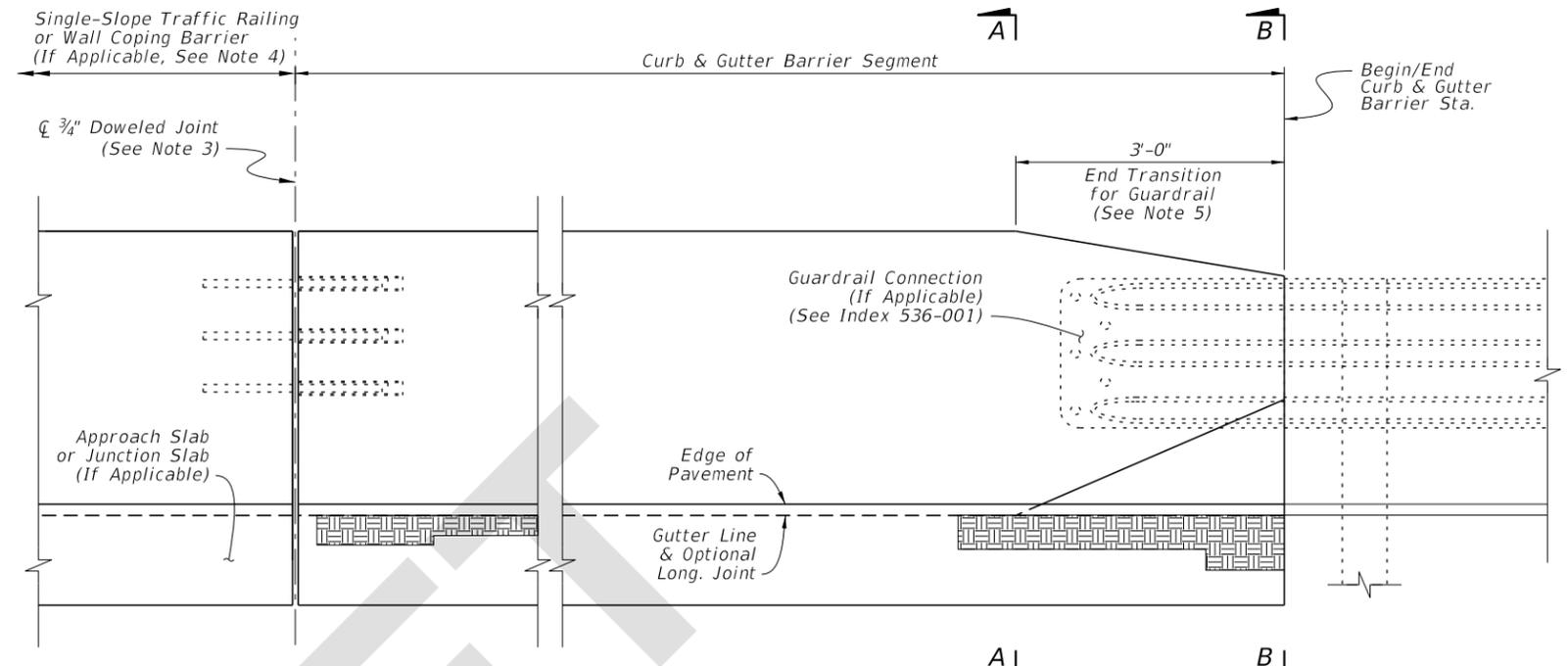
**SHOULDER BARRIER - CONNECTION TO F-SHAPE**

7/26/2022 2:32:14 PM

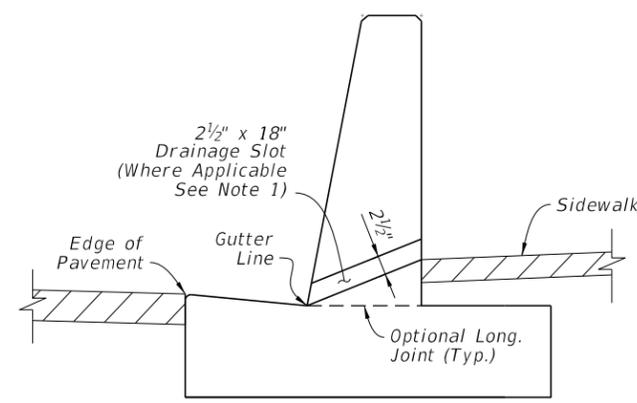
|                           |          |              |   |                         |                         |                          |
|---------------------------|----------|--------------|---|-------------------------|-------------------------|--------------------------|
| LAST REVISION<br>11/01/22 | REVISION | DESCRIPTION: | <br><b>FY 2023-24<br/>STANDARD PLANS</b> | <b>CONCRETE BARRIER</b> | INDEX<br><b>521-001</b> | SHEET<br><b>19 of 26</b> |
|---------------------------|----------|--------------|---|-------------------------|-------------------------|--------------------------|



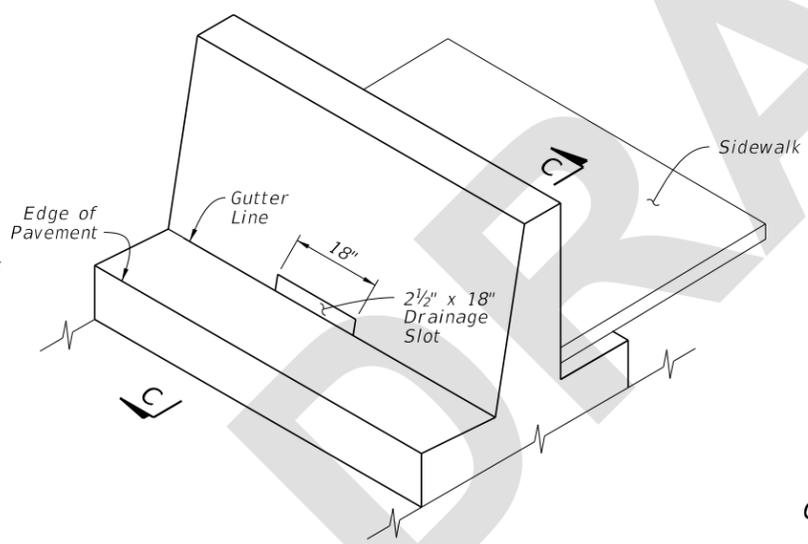
**SECTION A-A  
CURB & GUTTER  
BARRIER**



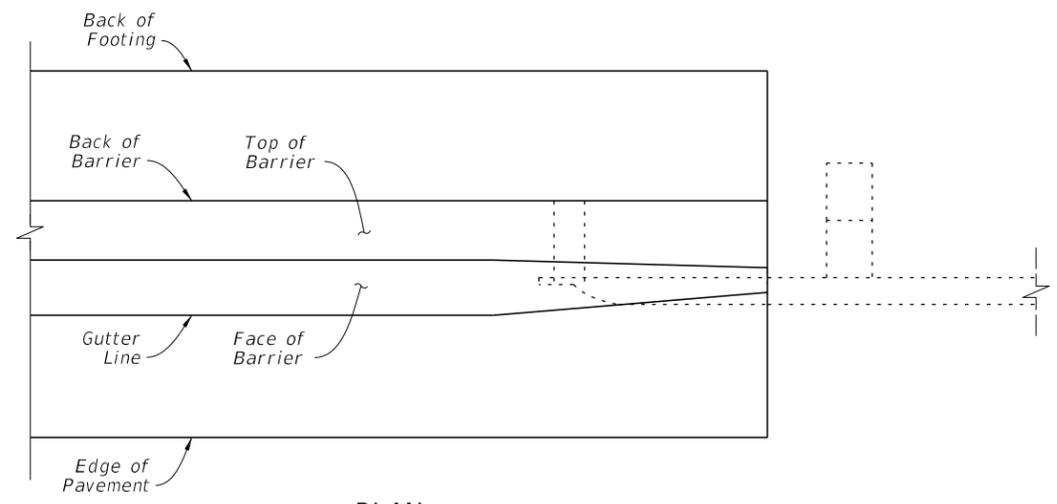
**ELEVATION**



**SECTION C-C  
CURB & GUTTER  
BARRIER WITH  
DRAINAGE SLOT**



**ISOMETRIC VIEW  
CURB GUTTER BARRIER  
WITH DRAINAGE SLOT**



**PLAN**

**DRAINAGE SLOT DETAILS**

**DRAINAGE SLOT NOTES:**

1. GENERAL: Place 2 1/2" x 18" Drainage Slots at locations and/or spacing called for in the Plans. The minimum spacing is 20 feet.
2. STEEL REINFORCEMENT CONFLICT: When the Drainage Slot encounters a conflict with reinforcing steel, shift or cut the reinforcing steel to provide 2 1/2" (± 1/2") 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 21.
2. EXPANSION JOINTS: Place 1/2" 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 21.
3. DOWELED JOINTS: See the General Notes on Sheet 1 for usage of joint types. Where required, install 3/4" Doweled Joints as defined on Sheet 13.
4. TRAFFIC RAILING CONNECTIONS: Align the barrier and Traffic Railing faces and connect with the 3/4" Doweled Joint per Sheet 13.
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 21.

**CURB AND GUTTER BARRIER**

|                           |              |  |                              |                  |         |          |
|---------------------------|--------------|--|------------------------------|------------------|---------|----------|
| LAST REVISION<br>11/01/22 | DESCRIPTION: |  | FY 2023-24<br>STANDARD PLANS | CONCRETE BARRIER | INDEX   | SHEET    |
|                           |              |  |                              |                  | 521-001 | 20 of 26 |

7/26/2022 2:32:15 PM