
ORIGINATION FORM

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

Contact Information:

Date: July 26, 2020
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, 16, and 20
Index Title: Concrete Barrier

Summary of the changes:

Sheet 1: Table of Contents: Added Drainage Slots for Shoulder Barriers; Note 17: Updated 4.5" bending radius to allow for smaller radius too. Provided verbiage to allow for alternate reinforcing configuration, so long as splice lengths are maintained along barrier sides and bottom.

Sheet 2: Changed guardrail sketch to only show thru-bolt locations

Sheet 13: Changed guardrail sketch to only show thru-bolt locations

Sheet 16: Added drainage slot options

Sheet 20: Placed minimum spacing on drainage slot. Changed guardrail sketch to only show thru-bolt locations.

Commentary / Background:

Added clarifications and drainage slots at the request of the Drainage Section and TPE.

**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:

(Email or hand deliver package to Rick Jenkins)

- | Yes | N/A | |
|-------------------------------------|--------------------------|------------------------------------------|
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Redline Mark-ups |
| <input type="checkbox"/> | <input type="checkbox"/> | Proposed Standard Plan Instruction (SPI) |
| <input type="checkbox"/> | <input type="checkbox"/> | Revised 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 checked="" type="checkbox"/> | FY-Standard Plans (Next Release) |

Contact the Roadway Design Office for assistance in completing this form

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 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.

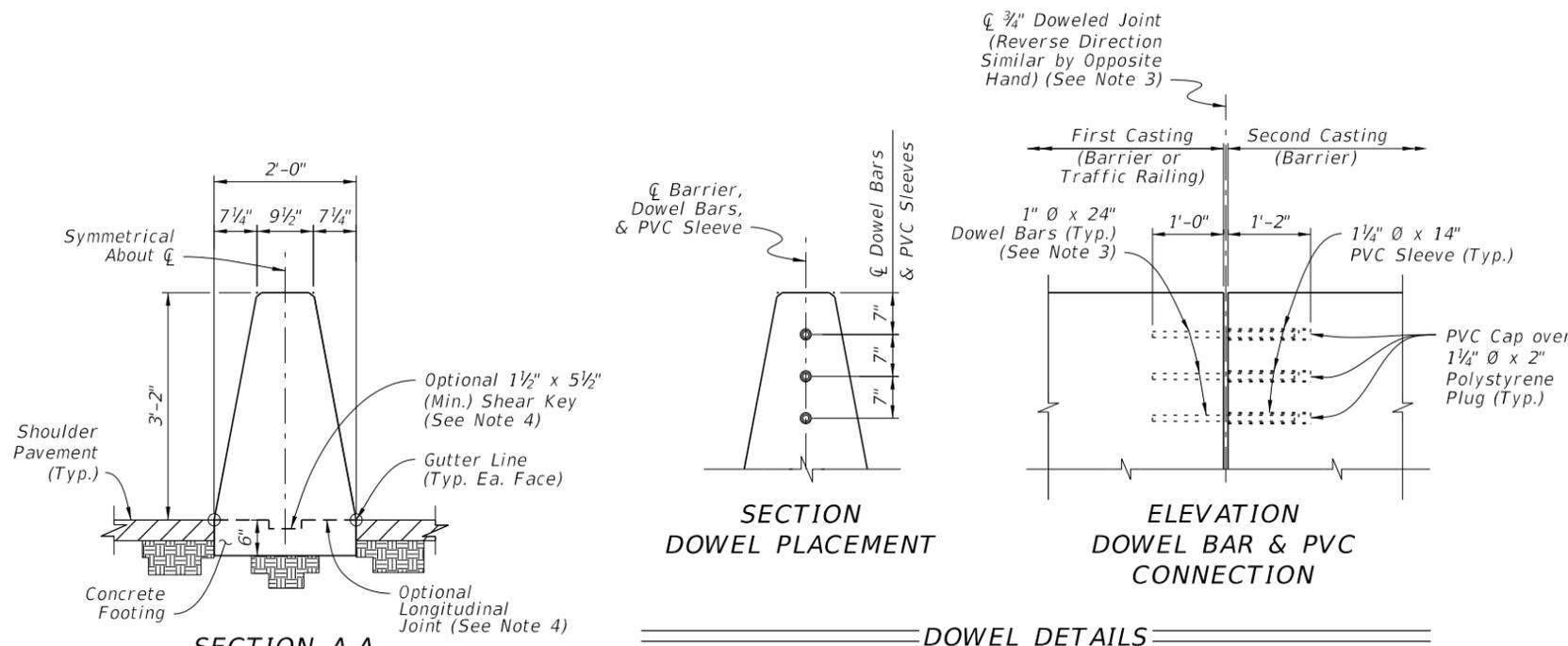
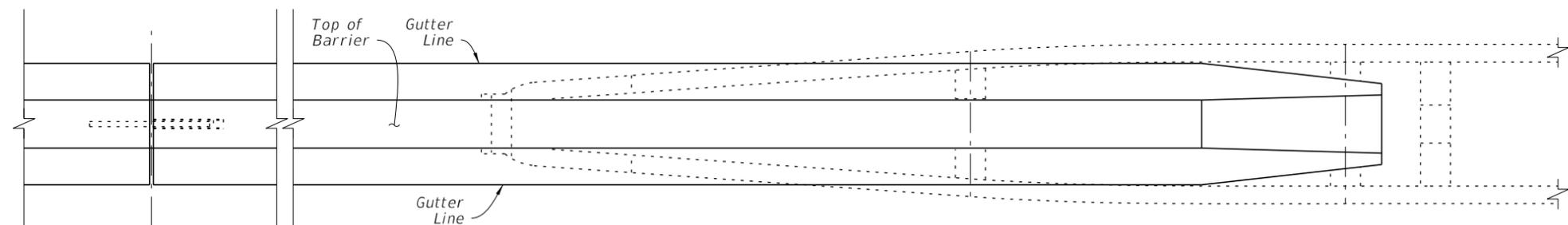
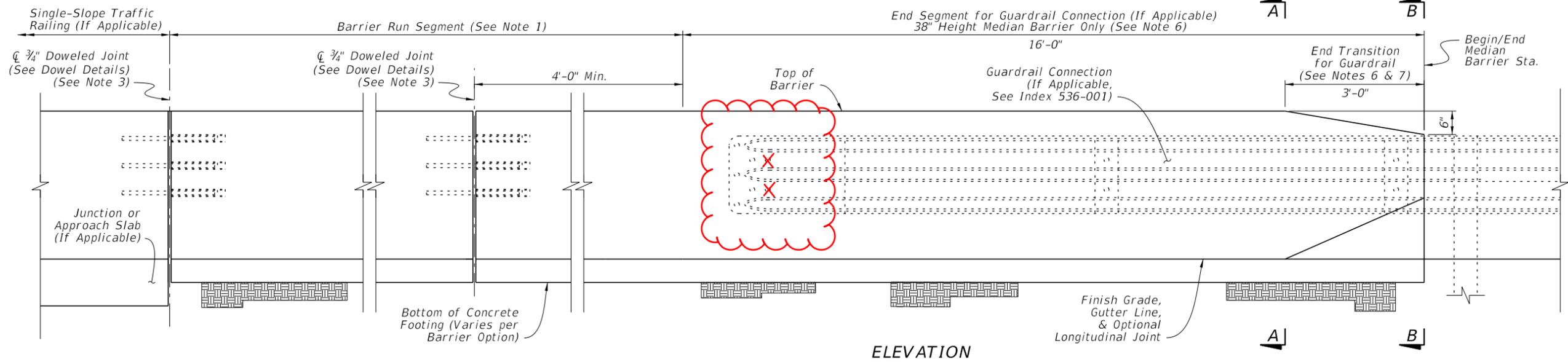
Longitudinal Joints are only permitted where indicated in the following details and notes, with a vertical position tolerance of ± 1½" from the locations shown.
- DOWELED JOINTS:** As shown in the Dowel Details on Sheets 2 & 13, install ¾" Doweled Joints for Concrete Barrier connections to Pier Protection 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 12 inches of the subgrade to at least 98% of the maximum density determined by FM 1-T 180, Method D.
- 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 4½" inner diameter for bar bends. 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 language for bar bend radius and alternate bar bending details

10/14/2019 11:07:41 AM

LAST REVISION 11/01/18	DESCRIPTION: 11/01/20	 FY 2020-21 STANDARD PLANS	CONCRETE BARRIER	INDEX 521-001	SHEET 1 of 26
--------------------------------------	---------------------------------	----------------------------------------------------------------------------------------------------------------------------	-------------------------	-------------------------	-------------------------



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:

- 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. 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 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.

MEDIAN BARRIER

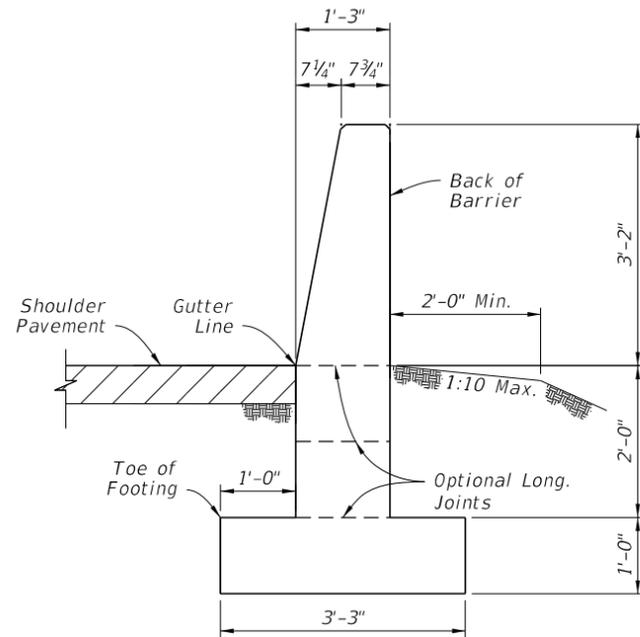
10/14/2019 11:07:42 AM

LAST REVISION	DESCRIPTION:
11/01/18	11/01/20

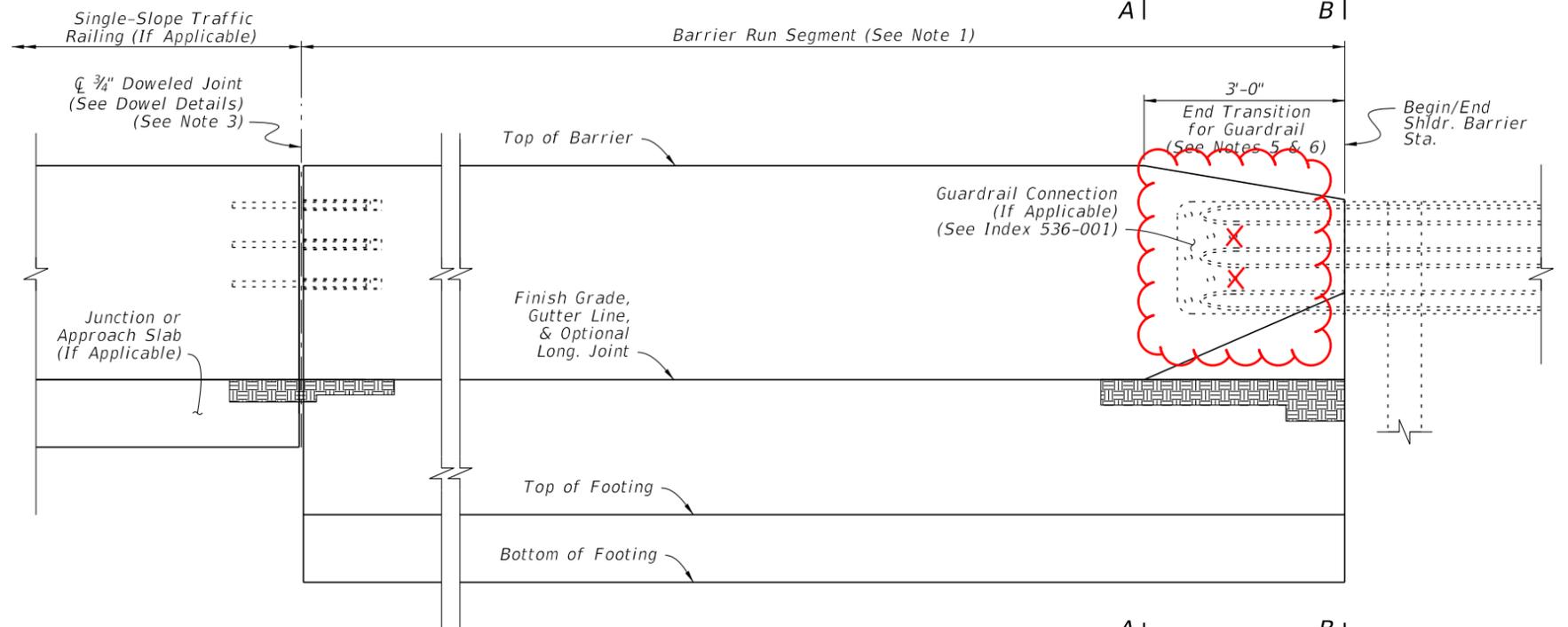

FY 2020-21
STANDARD PLANS

CONCRETE BARRIER

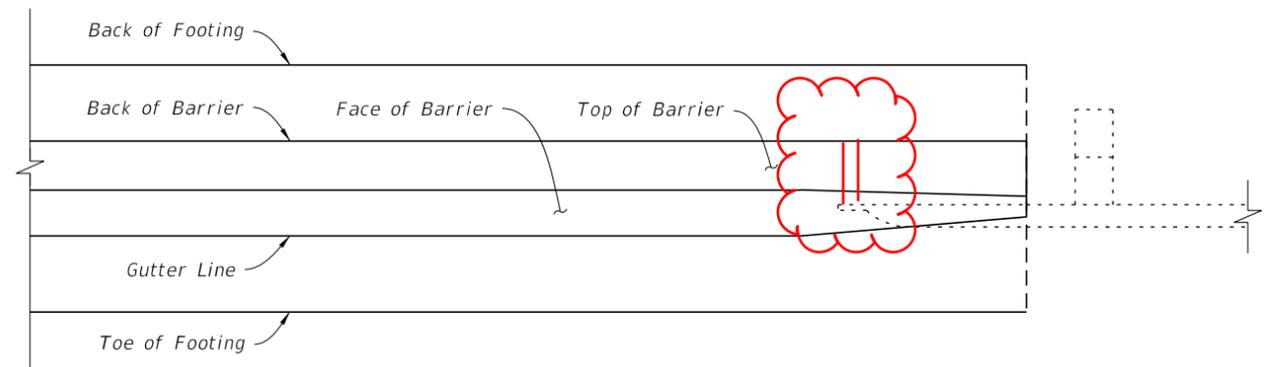
INDEX	SHEET
521-001	2 of 26



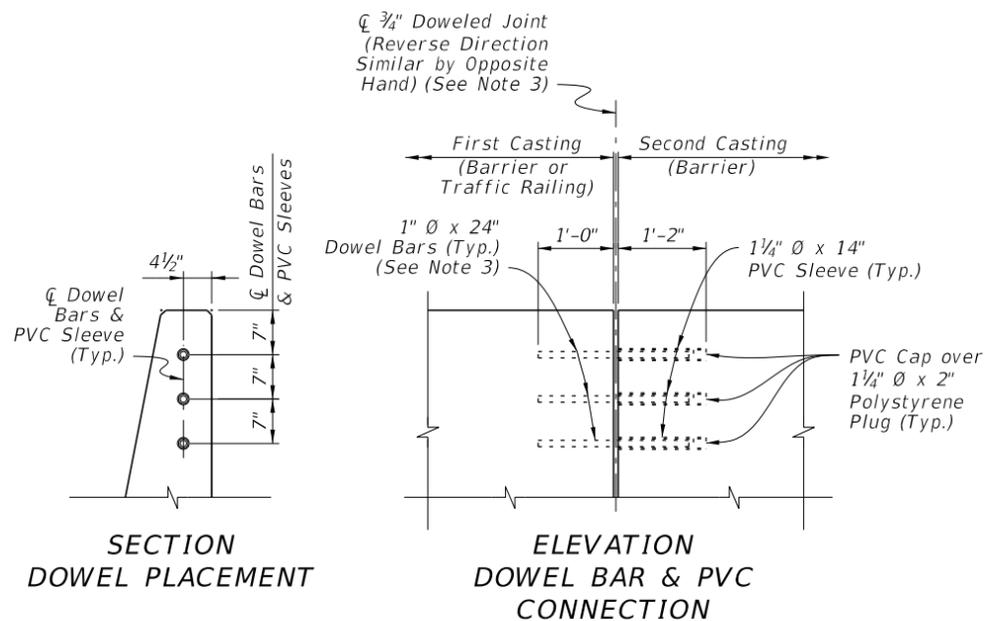
SECTION A-A
38" HEIGHT SHOULDER BARRIER
 (See Sheet 14 for
 Reinforcing Steel Details)



ELEVATION



PLAN



DOWEL DETAILS

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

10/14/2019 11:07:52 AM

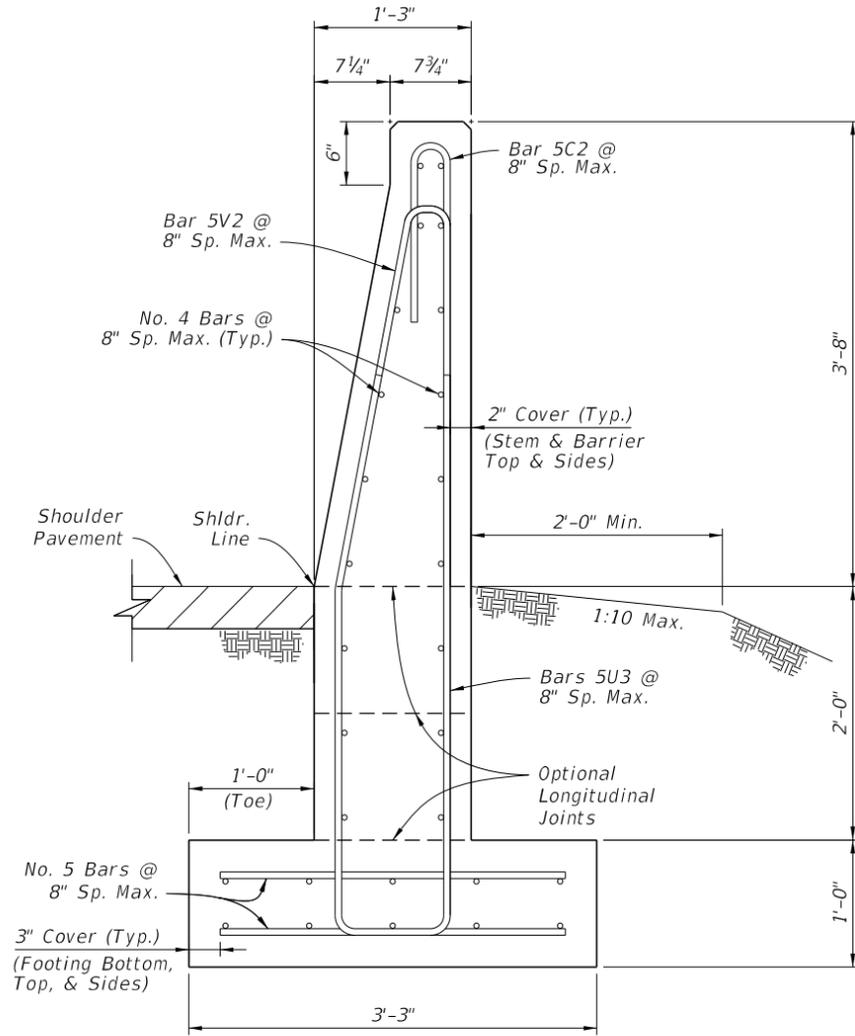
LAST REVISION	DESCRIPTION:
11/01/18	11/01/20



FY 2020-21
 STANDARD PLANS

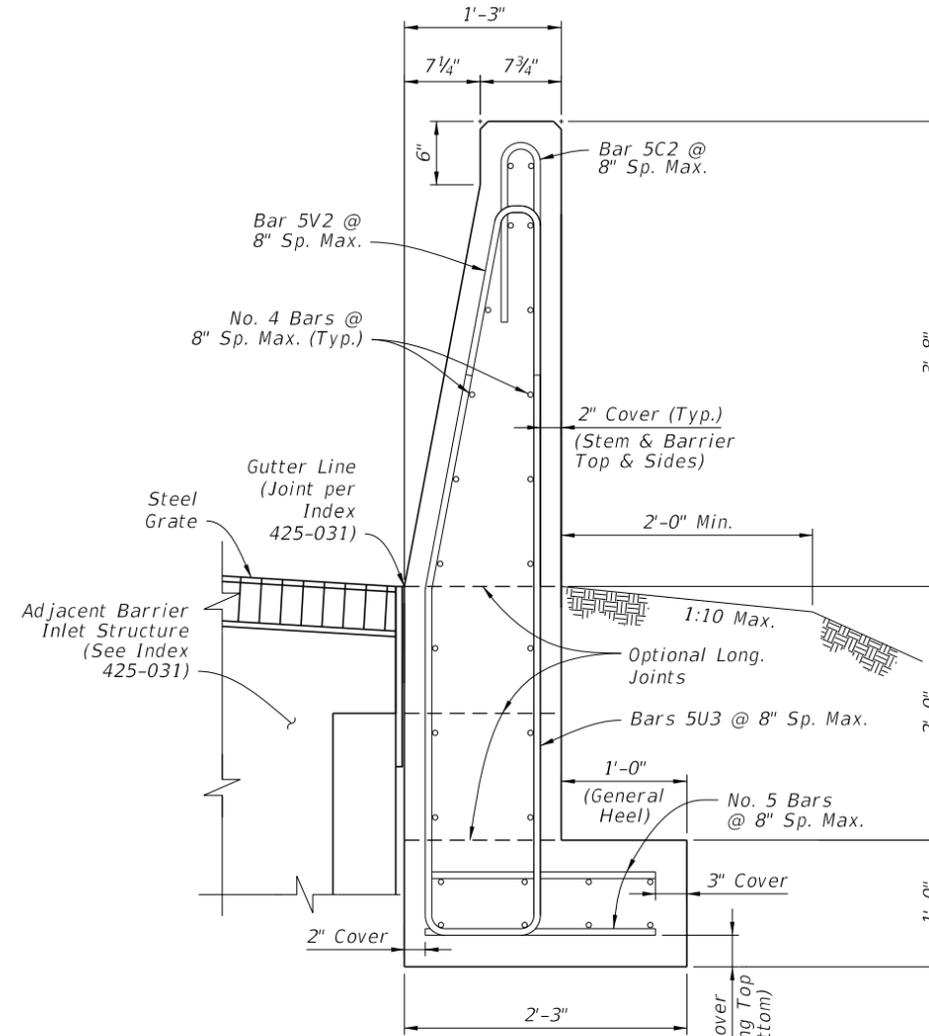
CONCRETE BARRIER

INDEX	SHEET
521-001	13 of 26



44" HEIGHT SECTION
(For Use Adjacent to Rear-Flush Section on Sheet 18)

Concrete Qty. = 0.34 CY/FT
Steel Qty. = 56.8 LB/FT



44" HEIGHT FRONT-FLUSH SECTION
(For Use Adjacent to Rear-Flush Section on Sheet 18, 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 15.

Added Note 2 for
Drainage Slots

Added Drainage Slot Option Details...

SHOULDER BARRIER - SECTION OPTIONS (CONTINUED)

10/14/2019 11:07:54 AM

LAST REVISION	DESCRIPTION:
11/01/19	11/01/19
11/01/20	

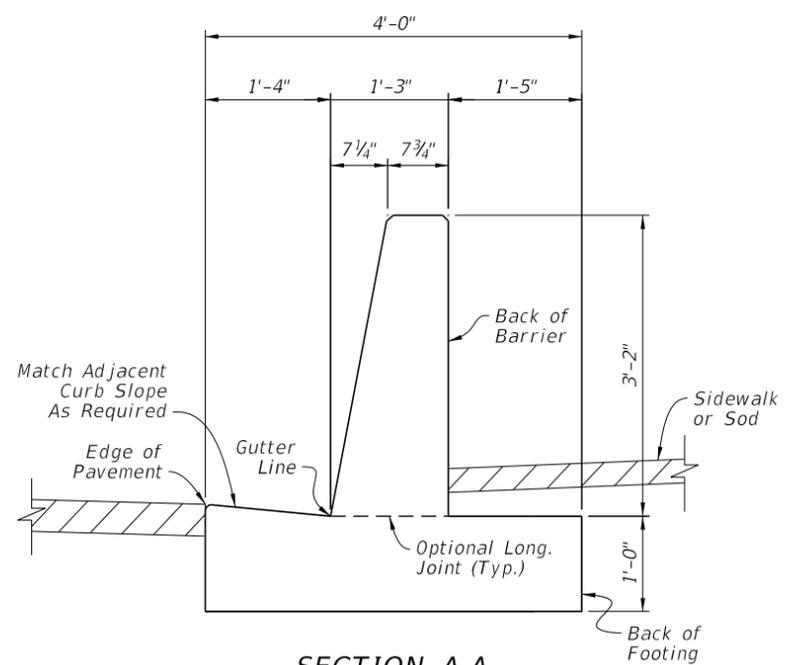


FY 2020-21
STANDARD PLANS

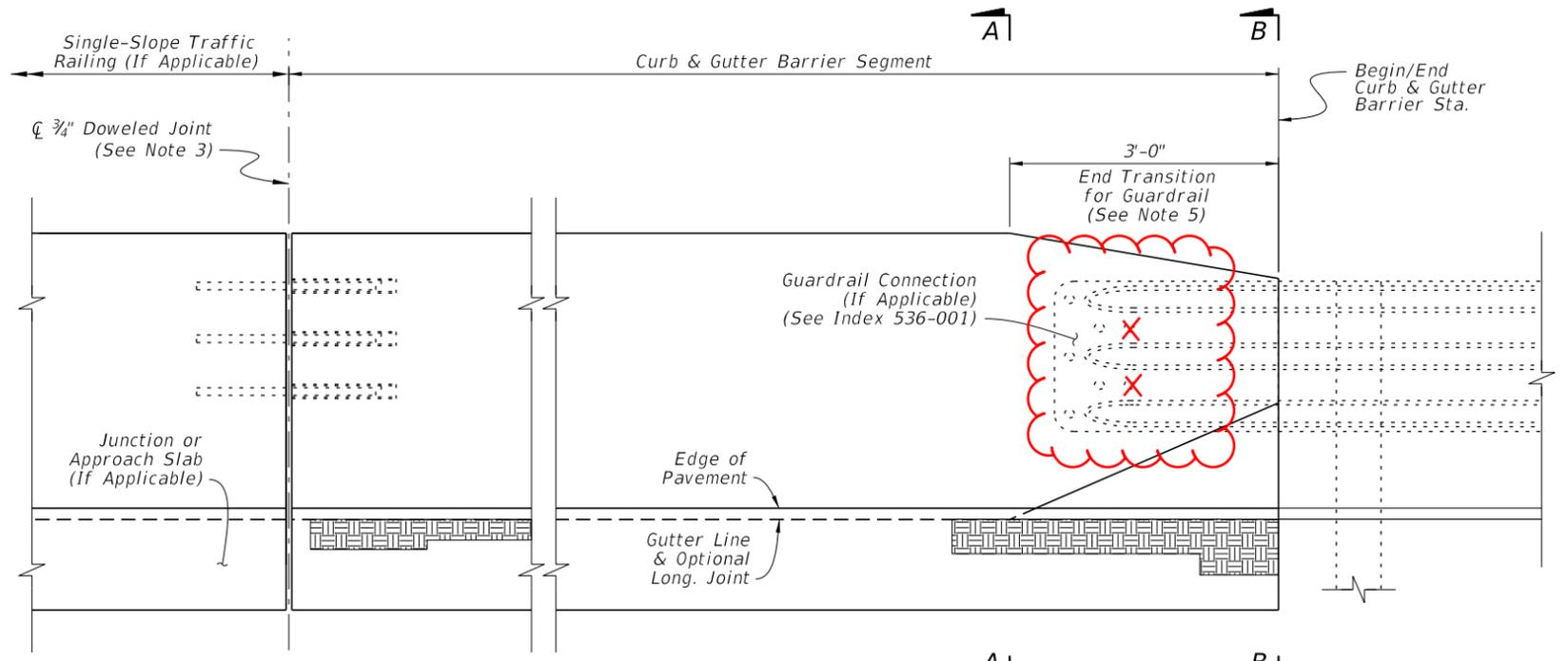
CONCRETE BARRIER

INDEX
521-001

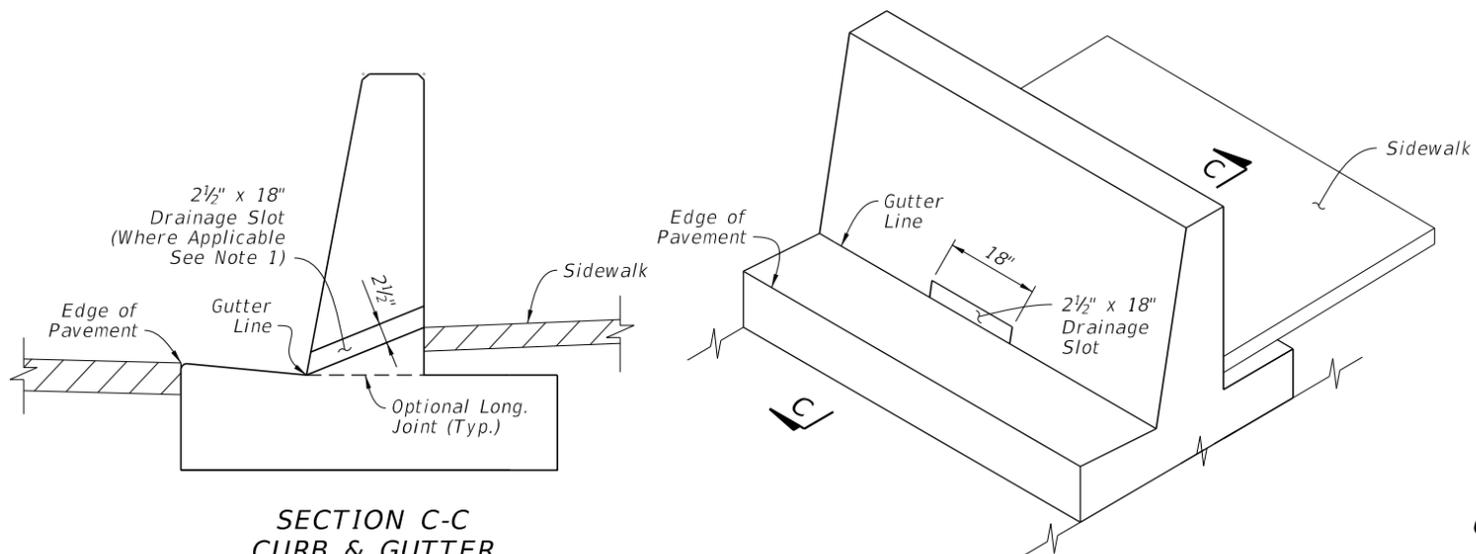
SHEET
16 of 26



SECTION A-A
CURB & GUTTER
BARRIER

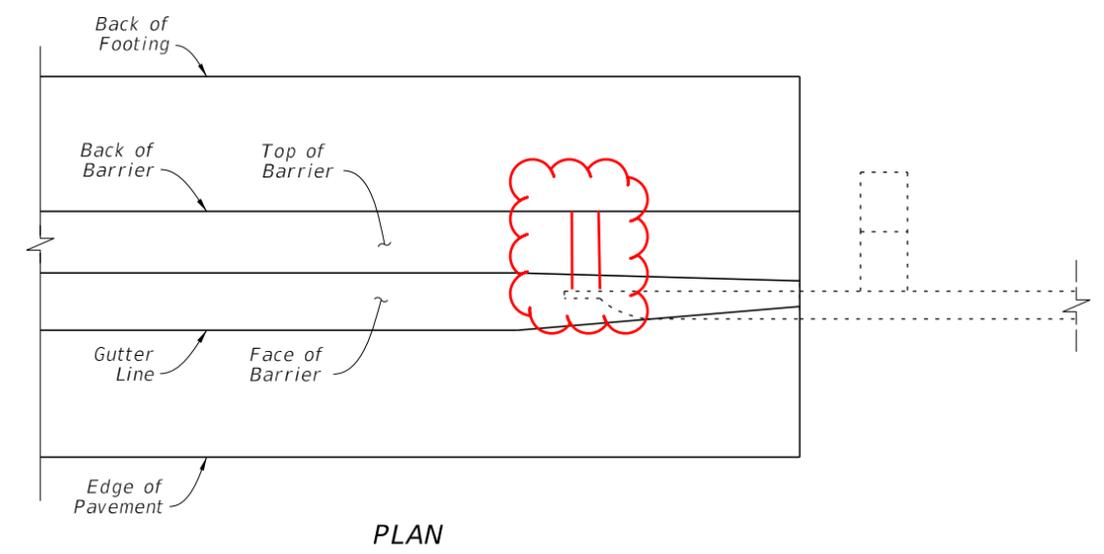


ELEVATION



SECTION C-C
CURB & GUTTER
BARRIER WITH
DRAINAGE SLOT

ISOMETRIC VIEW
CURB GUTTER BARRIER
WITH DRAINAGE SLOT



PLAN

CURB AND GUTTER BARRIER NOTES:

- SECTION VIEWS: For additional Views A-A and B-B, see Sheet 21.
- 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.
- 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.
- TRAFFIC RAILING CONNECTIONS: Align the barrier and Traffic Railing faces and connect with the 3/4" Doweled Joint per Sheet 13.
- 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.
- 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.

DRAINAGE SLOT NOTES:

- GENERAL: Place 2 1/2" x 18" Drainage Slots at locations and/or spacing called for in the Plans. ← Added Min. Spacing Language
- 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).

DRAINAGE SLOT DETAILS

CURB AND GUTTER BARRIER

10/14/2019 11:07:58 AM

LAST REVISION	DESCRIPTION:		FY 2020-21 STANDARD PLANS	CONCRETE BARRIER	INDEX	SHEET
11/01/18	11/01/20				521-001	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 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.

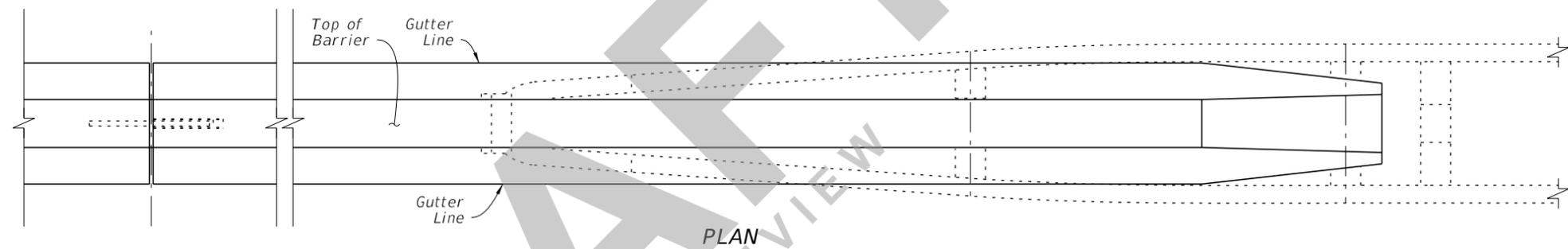
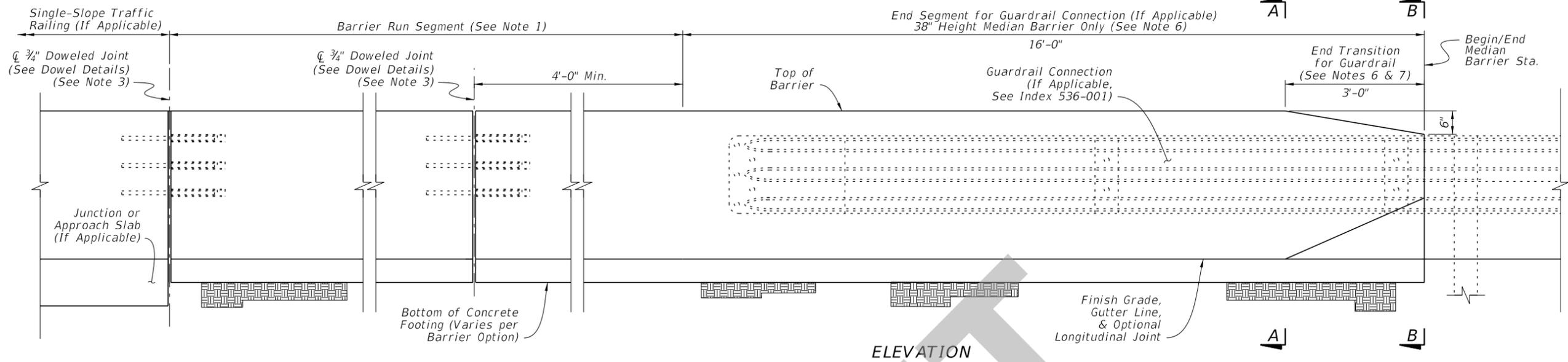
Transverse Joints are permitted at 20-foot or greater intervals along the barrier. For Tall Grade-Separated Sections, see Sheet 5 for additional Transverse Joint requirements.

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 12 inches of the subgrade to at least 98% of the maximum density determined by FM 1-T 180, Method D.
- 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.

8/7/2020 4:59:40 PM

LAST REVISION 11/01/20	REVISION	DESCRIPTION:	 FY 2021-22 STANDARD PLANS	CONCRETE BARRIER	INDEX 521-001	SHEET 1 of 26
---------------------------	----------	--------------	-------------------------------------------------------------------------------------------------------------------------------	-------------------------	-------------------------	-------------------------



ELEVATION

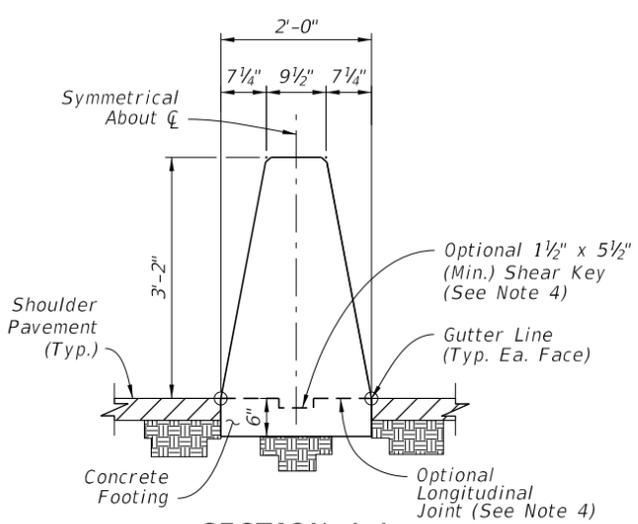
PLAN

NOTES:

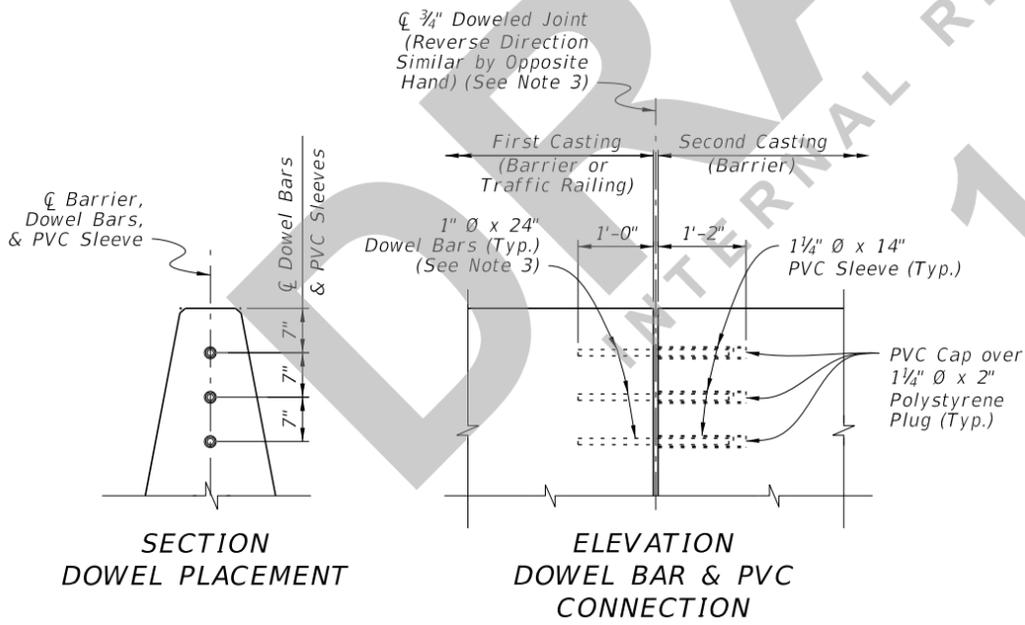
- BARRIER RUN SEGMENT:** Within the Barrier Run Segment, either the 38" Height Median Barrier or the differing Median Barrier sections shown throughout the Index may be placed as required per the Plans.
- SECTION VIEWS:** For additional Views A-A and B-B, see Sheet 3.
- DOWELED JOINTS:** See the General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



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



SECTION DOWEL PLACEMENT

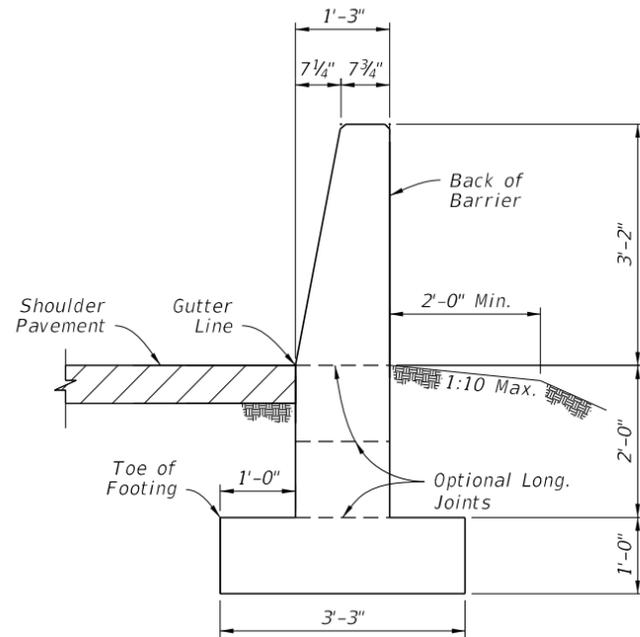
ELEVATION DOWEL BAR & PVC CONNECTION

DOWEL DETAILS

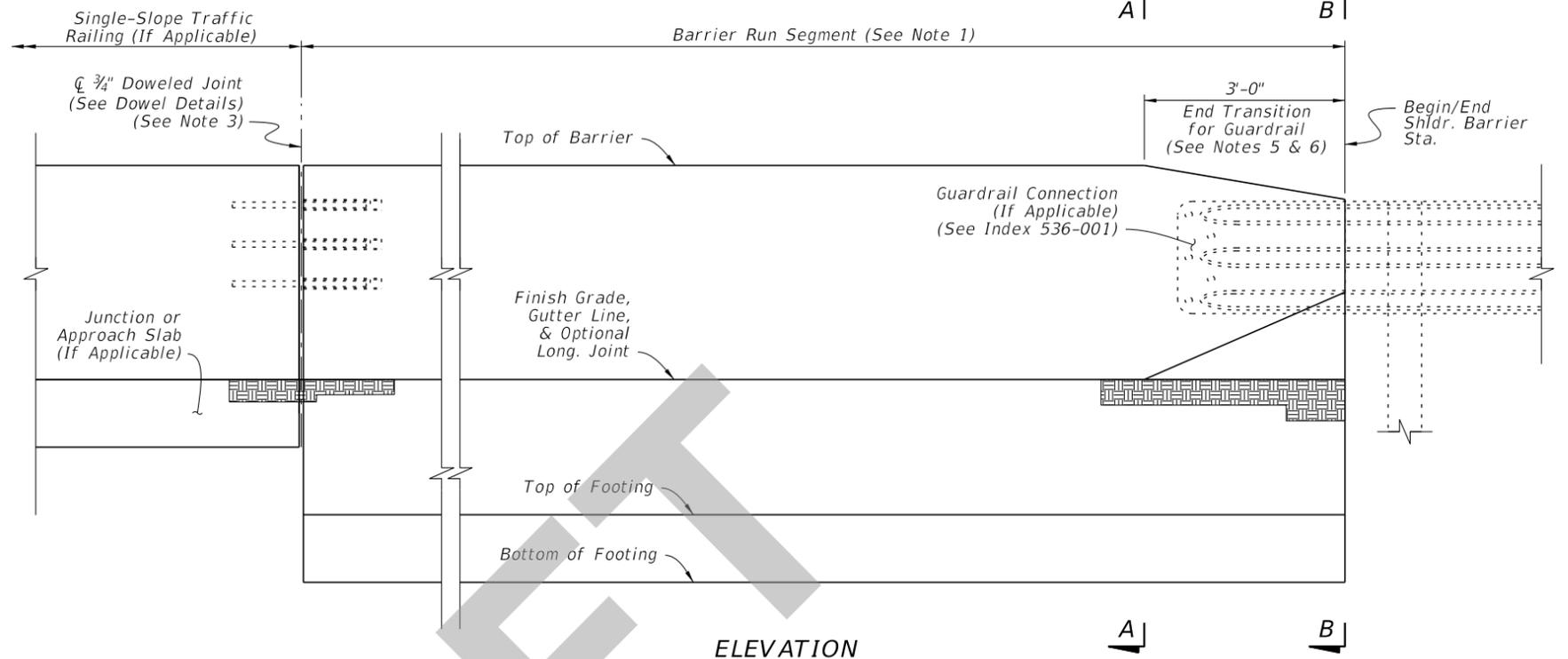
8/7/2020 4:59:42 PM

LAST REVISION 11/01/20	DESCRIPTION:	 FY 2021-22 STANDARD PLANS	CONCRETE BARRIER	INDEX 521-001	SHEET 2 of 26
---------------------------	--------------	----------------------------------------------------------------------------------------------------------------------	-------------------------	------------------	------------------

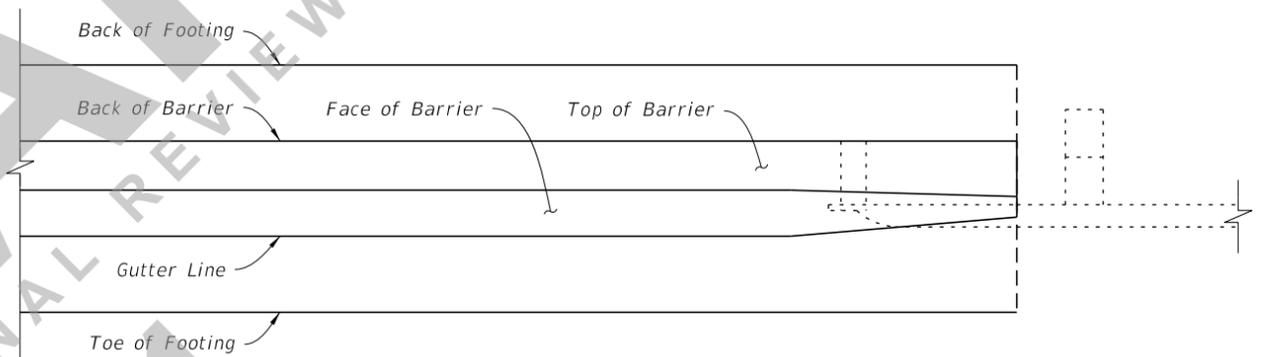
MEDIAN BARRIER



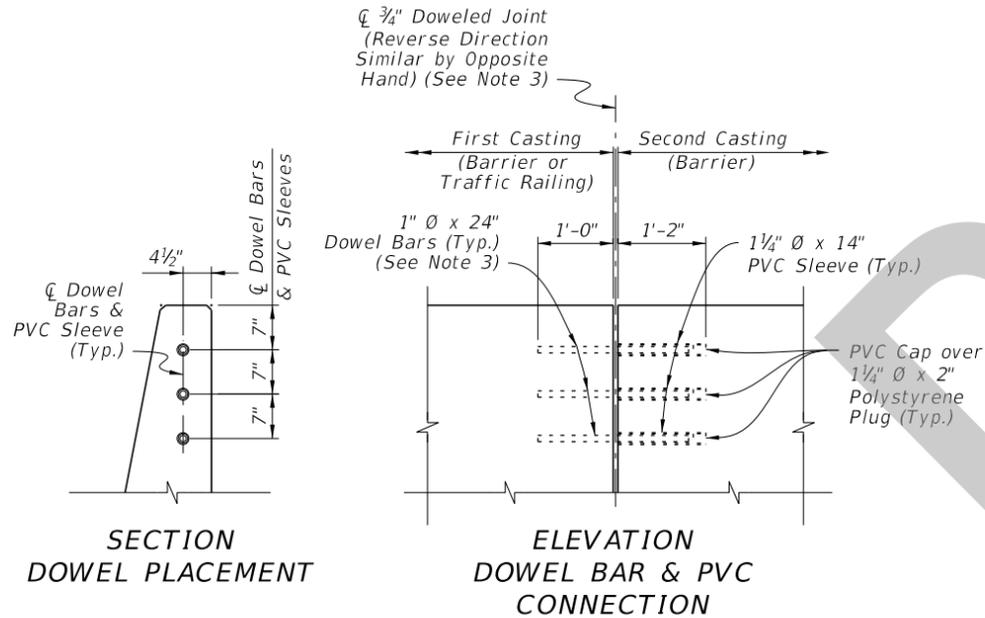
SECTION A-A
38" HEIGHT SHOULDER BARRIER
 (See Sheet 14 for
 Reinforcing Steel Details)



ELEVATION



PLAN



SECTION
DOWEL PLACEMENT

ELEVATION
DOWEL BAR & PVC CONNECTION

DOWEL DETAILS

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" 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.
- 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.

8/7/2020 4:59:44 PM

SHOULDER BARRIER

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



FY 2021-22
STANDARD PLANS

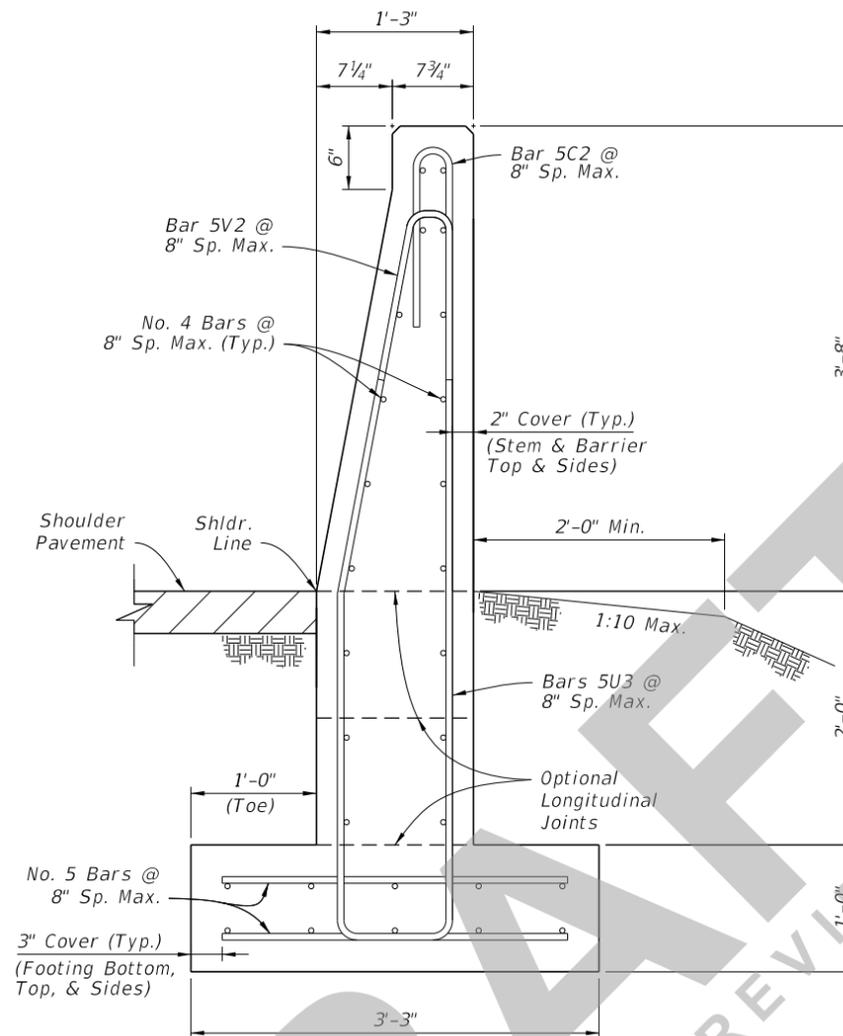
CONCRETE BARRIER

INDEX 521-001	SHEET 13 of 26
------------------	-------------------

NOTES:

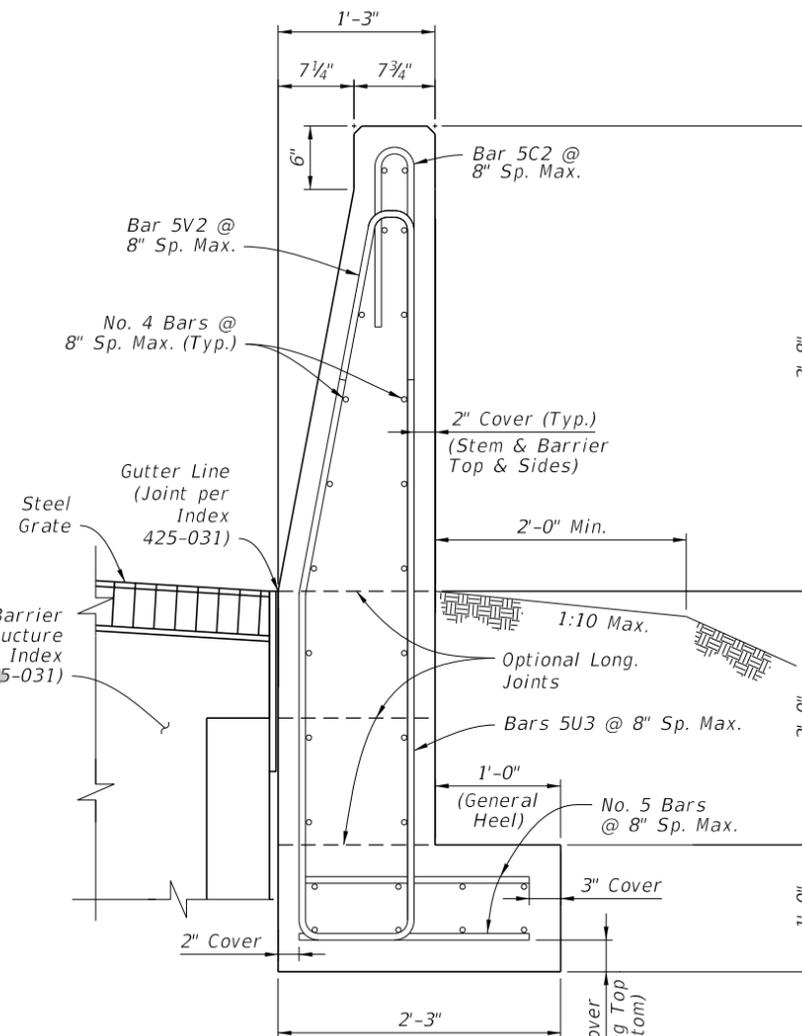
1. GENERAL: See the applicable Notes on Sheet 15.
2. DRAINAGE SLOT OPTION: Use only where called for in the Plans. Drainage Slots may be used for all Shoulder Barrier types except for the Trench Footing Section.

Bars 5V2 and 5U3 may exceed 8 inch spacing to accommodate Drainage Slots as shown. Bars 5U3 require pairing on both sides of slots.



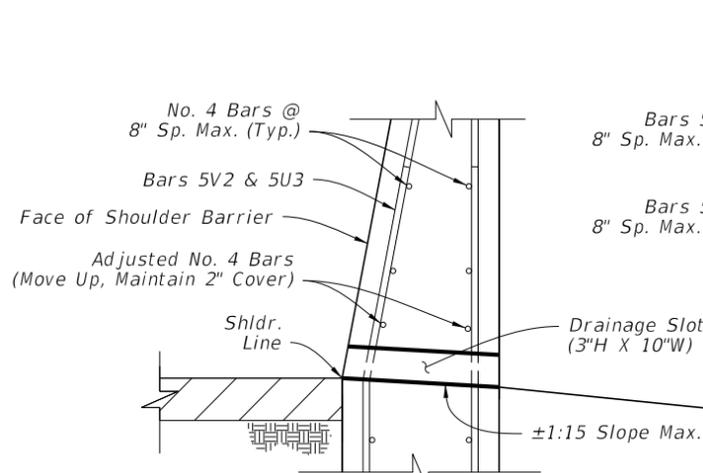
44" HEIGHT SECTION
(For Use Adjacent to Rear-Flush Section on Sheet 18)

Concrete Qty. = 0.34 CY/FT
Steel Qty. = 56.8 LB/FT

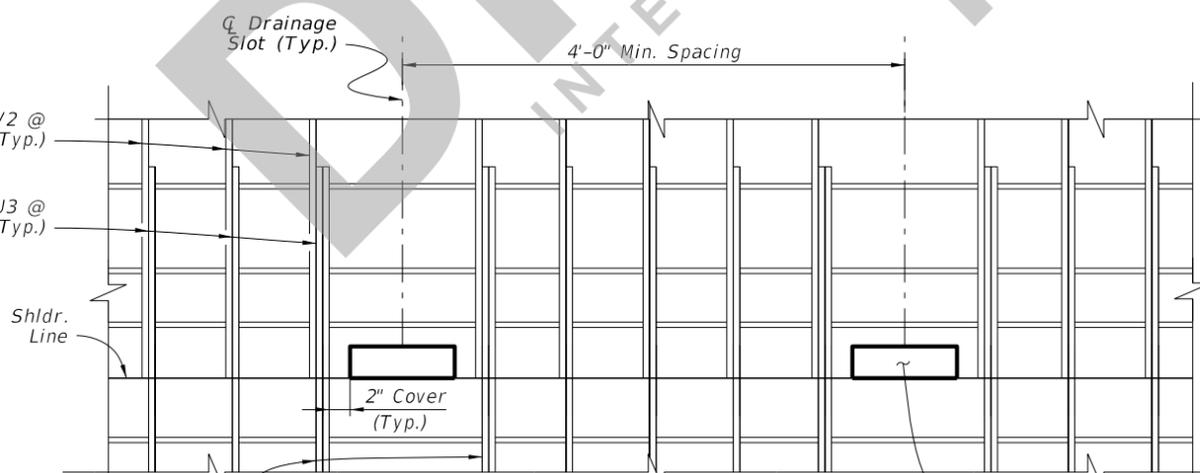


44" HEIGHT FRONT-FLUSH SECTION
(For Use Adjacent to Rear-Flush Section on Sheet 18, as Required for Barrier Inlets)

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



DRAINAGE SLOT SECTION
(See Note 2)



DRAINAGE SLOT ELEVATION
(See Note 2)

SHOULDER BARRIER - SECTION OPTIONS (CONTINUED)

8/7/2020 4:59:50 PM

LAST REVISION	DESCRIPTION:
11/01/20	

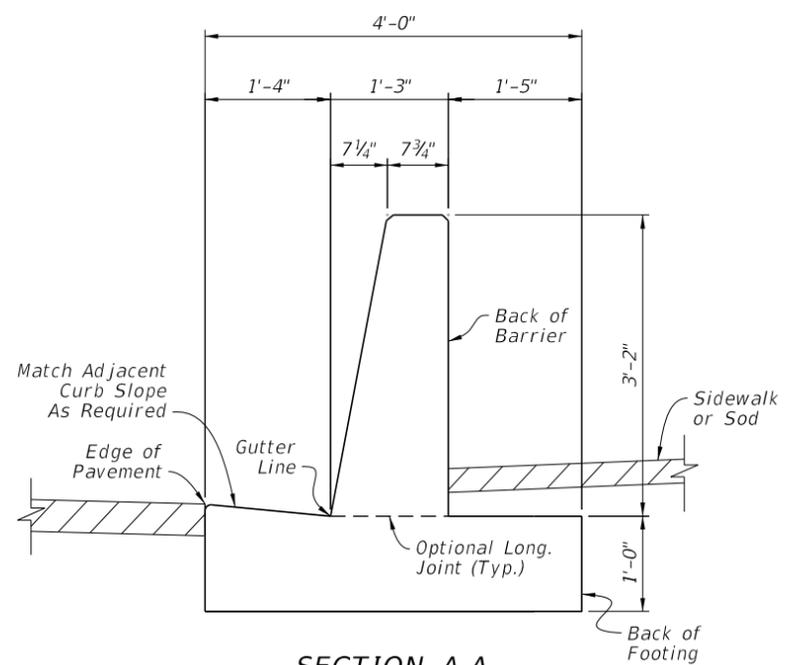


FY 2021-22
STANDARD PLANS

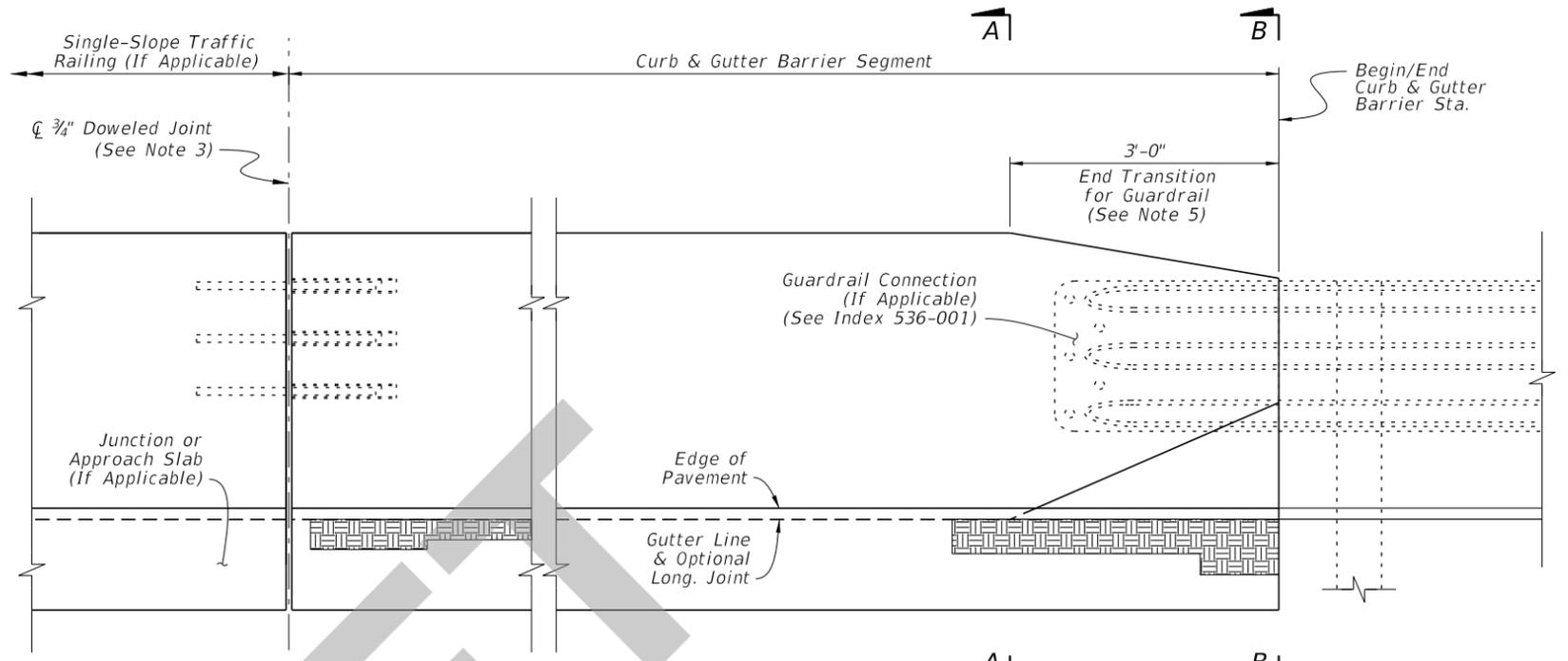
CONCRETE BARRIER

INDEX
521-001

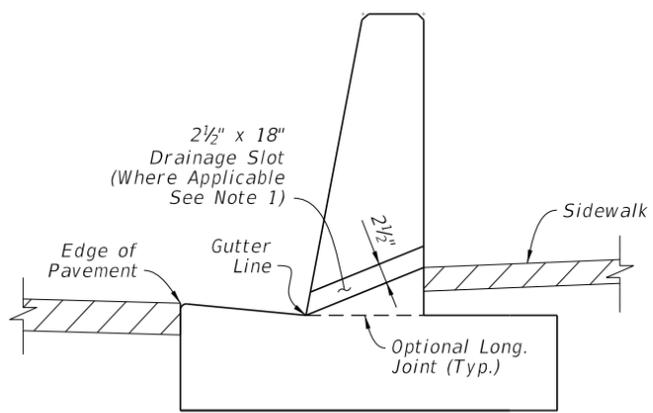
SHEET
16 of 26



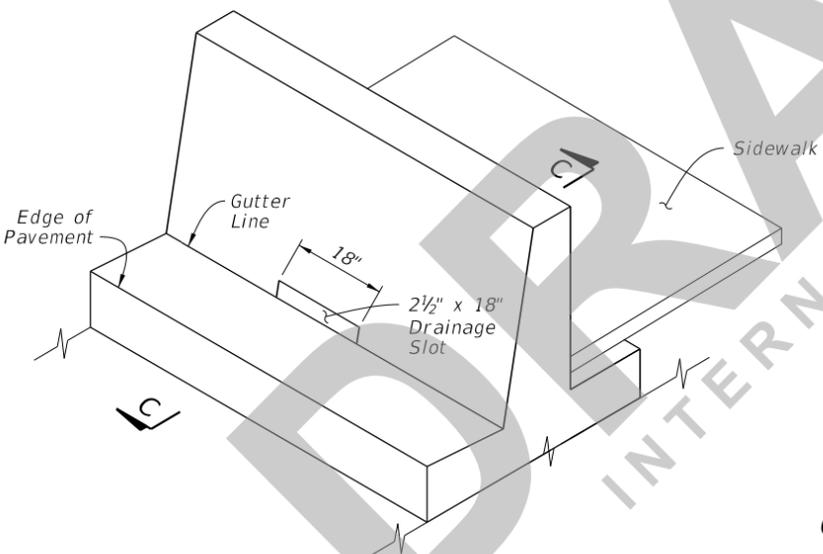
**SECTION A-A
CURB & GUTTER
BARRIER**



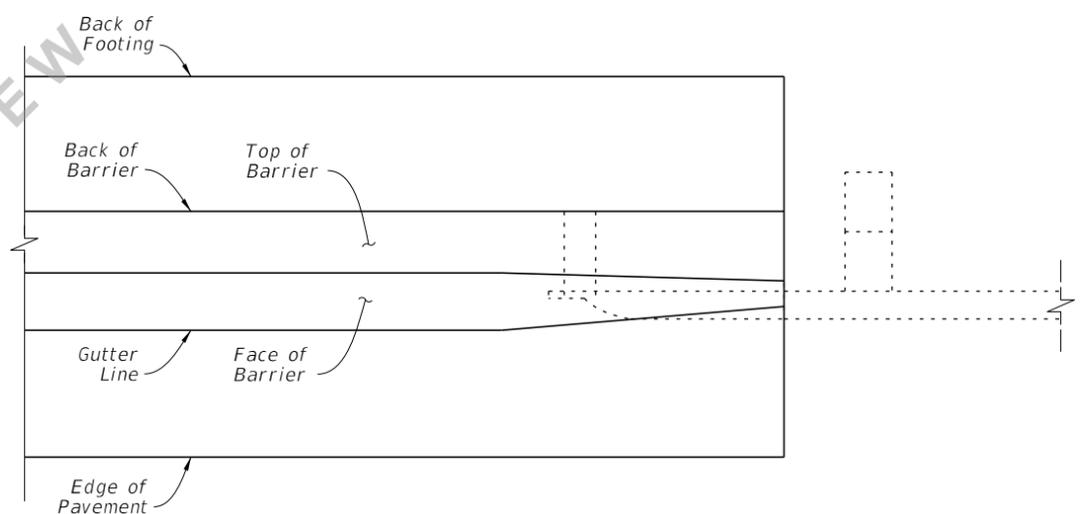
ELEVATION



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



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



PLAN

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.

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).

DRAINAGE SLOT DETAILS

CURB AND GUTTER BARRIER

8/7/2020 4:59:52 PM

LAST REVISION 11/01/20	REVISION	DESCRIPTION:	 FY 2021-22 STANDARD PLANS	CONCRETE BARRIER	INDEX 521-001	SHEET 20 of 26
---------------------------	----------	--------------	------------------------------------------------------------------------------------------------------------------------------	-------------------------	------------------	-------------------