Origination Form
Proposed Revisions to a Standard Plans Index

Originator:	Stepp, Richard and Jenn Johnson	**Index Number:**	521-001
Date:	10/1/2024	**Sheet Number(s):**	1, 2, 15, and 16
E-mail:	richard.stepp@dot.state.fl.us	**Index Title:**	Concrete Barrier

Summary of the changes:

Sheet 1: General Note 1 - Added reference to Specification 521, Added "single-slope" term to define the standard barrier shapes, General Note 7 - Added "Doweled Joints may not be substituted for Construction Joints..."; Sheet 2: Note 3 - Added a minimum doweled joint spacing of 40 Ft.; Elevation View - Removed 4'-0" Min. dimension to Doweled Joint; Sheet 15: Updated the 2" Dimension from the Grate elevation to the Gutter Line in the FRONT-FLUSH SECTION to match Index 425-031; Sheet 16: Updated the 2" Dimension from the Grate elevation to the Gutter Line in the 44" HEIGHT FRONT-FLUSH SECTION to match Index 425-031;

Commentary/Background:

Sheet 1: General Note 1 - Adding a reference to Specification 521 assists with comprehension and continuity of all construction requirements. Next, adding the "single-slope" term helps to better define the standard barrier shape as it's commonly referred to both nationally and by other FDOT publications; General Note 7 - Explaining that doweled joints may not be substituted for construction joints helps to clarify that the joint types have different usages and are not interchangeable. An issue with misunderstanding of doweled joint usage was reported by industry. Sheet 2: It was reported by industry that doweled joints were under consideration for combining very short barrier length segments, even though this is not the defined usage for doweled joints. Adding the "40 Min." spacing will prevent using doweled joints to divide barriers into segments that are too short. Sheets 15 & 16: This revision now shows the top of the drainage inlet at 2” below the barrier gutter line in order to match this year’s pending revision for Index 425-031.

Other Affected Documents/Offices	Person Contacted	Affected (Yes/No)
Other Standard Plans	Jenn Johnson	Yes
FDOT Design Manual		No
Standard Specifications		No
Basis of Estimates Manual		No
Approved Product List		No
Construction Office		No
Maintenance Office		No

Implementation

FY-Standard Plans (Next Release)

GENERAL NOTES:

Construct in accordance with Specification 521. The standard barrier face shape is single-slope.

1. ~~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.

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

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

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

GENERAL NOTES (CONTINUED):

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

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

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

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

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

7. DOWELED JOINTS: ~~As shown in~~ Per 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.

   Doweled Joints may not be substituted for Construction Joints as defined above.

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

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

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

11. FINISH GRADE ELEVATION: At the barrier face location, the finish grade pavement has a vertical position tolerance of ± ½" from the 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.

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

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

14. OPAQUE VISUAL BARRIER: Where called for in the Plans, install Opaque Visual Barrier per Index 521-010.

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

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

17. 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.

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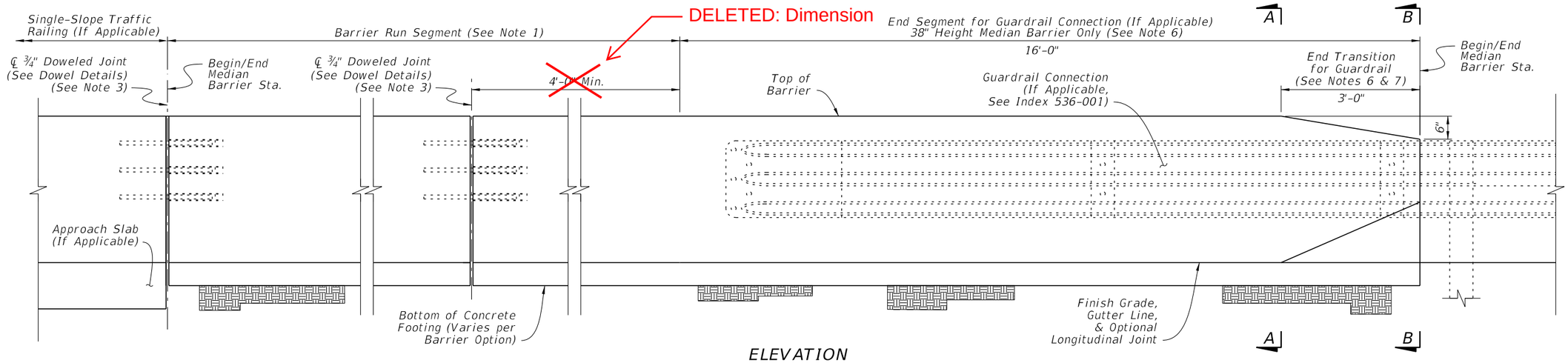
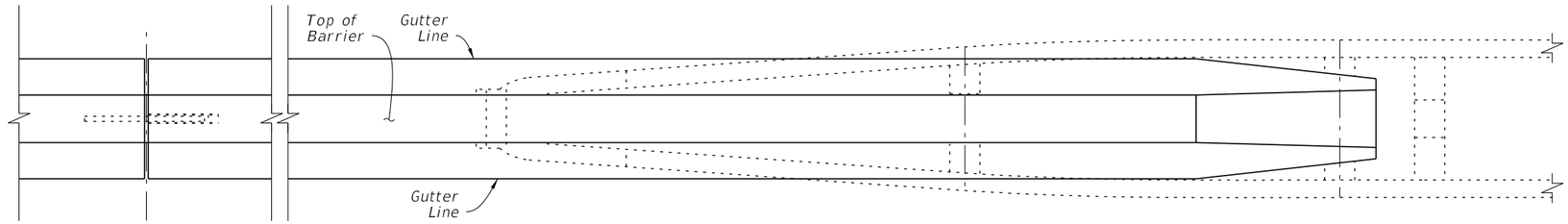
2026-27

LAST REVISION	REVISION	DESCRIPTION:	FDOT	FY ~~2025-26~~ STANDARD PLANS	CONCRETE BARRIER	INDEX	SHEET
~~11/01/22~~						521-001	1 of 26

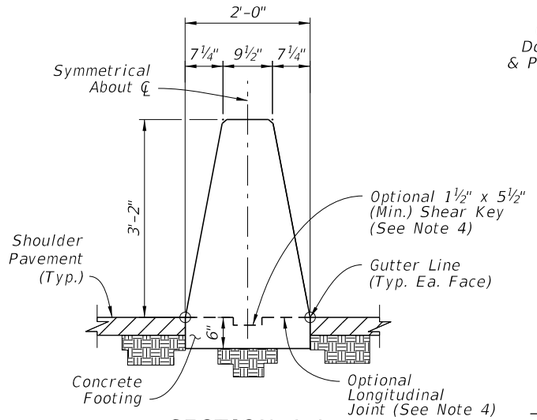
DELETED: Dimension



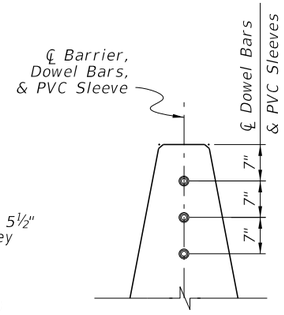
ELEVATION



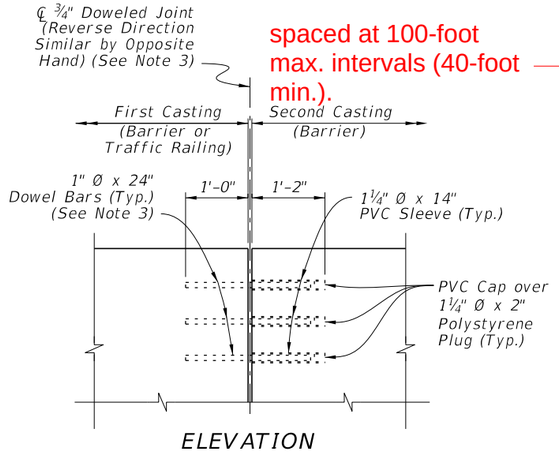
PLAN



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



SECTION
DOWEL PLACEMENT



ELEVATION
DOWEL BAR & PVC
CONNECTION

DOWEL DETAILS

spaced at 100-foot max. intervals (40-foot min.).

MEDIAN BARRIER NOTES:

1. BARRIER RUN SEGMENT: Within the Barrier Run Segment, either the 38" Height Median Barrier or the differing Median Barrier sections shown throughout the Index may be placed as required per the Plans.

2. SECTION VIEWS: For additional Views A-A and B-B, see Sheet 3.

3. DOWELED JOINTS: See the General Notes on Sheet 1 for usage of joint types. 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 1⅛"∅ x 13"(± ½") drilled hole for cured concrete. For drilled holes larger than 1⅛"∅, 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 1¼" NPS Schedule 80 PVC pipe with a sealed cap, cast-in-place as shown.

4. OPTIONAL LONGITUDINAL JOINT: When a longitudinal joint is placed above the concrete footing, use the Optional 1½" x 5½" Shear Key shown. As a substitute for the Shear Key, the footing's top surface may be raked to provide additional shear friction. Rake the fresh concrete surface so that about half the surface area has approximately ¼" depth longitudinal grooves, distributed evenly per the approval of the Engineer.

5. SHOULDER ROCKING OR MINOR GRADE SEPARATIONS: Where called for in the Plans, the nominal shoulder pavement surface elevation may be placed up to 3" below the location shown herein. For barriers with shallow embedments shown on Sheets 6 thru 9, 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.

6. GUARDRAIL CONNECTIONS: Connect Guardrail using the Transition Connections to Rigid Barrier per Index 536-001 in conjunction with the 16'-0" End Segment for Guardrail shown herein.

7. CRASH CUSHION CONNECTIONS: Connect Crash Cushions per Index 544-001 in conjunction with the 3'-0" End Transition for Guardrail as shown herein.

8. FREE ENDS: When the barrier end does not terminate with a Traffic Railing Connection, Guardrail Connection, Crash Cushion Connection, or Sloped End Treatment as called for in the Plans, terminate in accordance with the Free End Reinforcing detail on Sheet 3.

MEDIAN BARRIER

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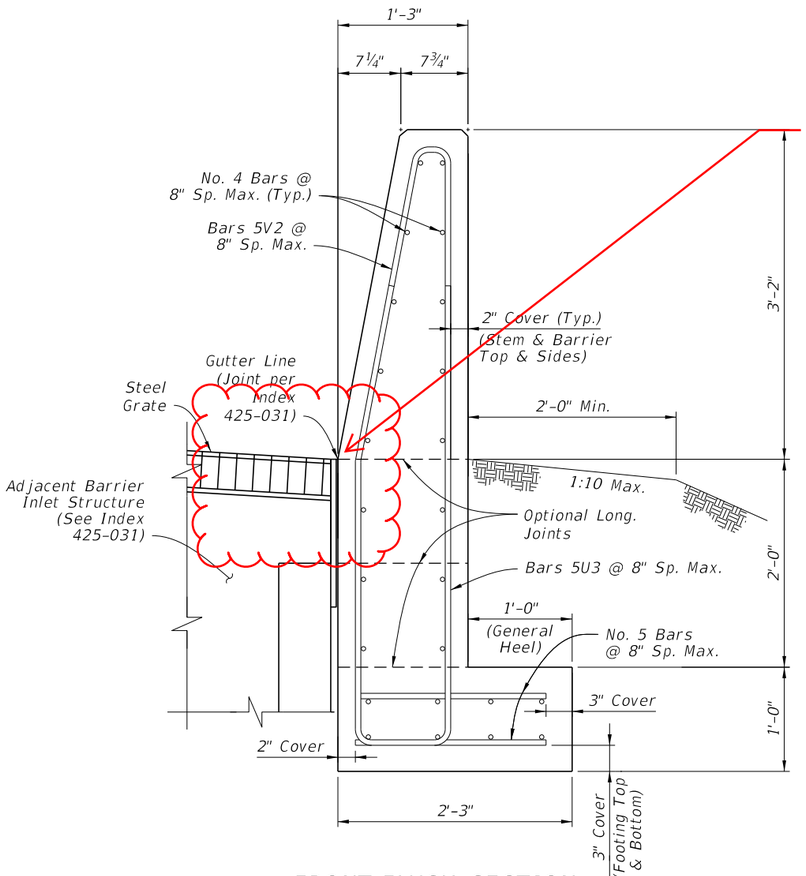
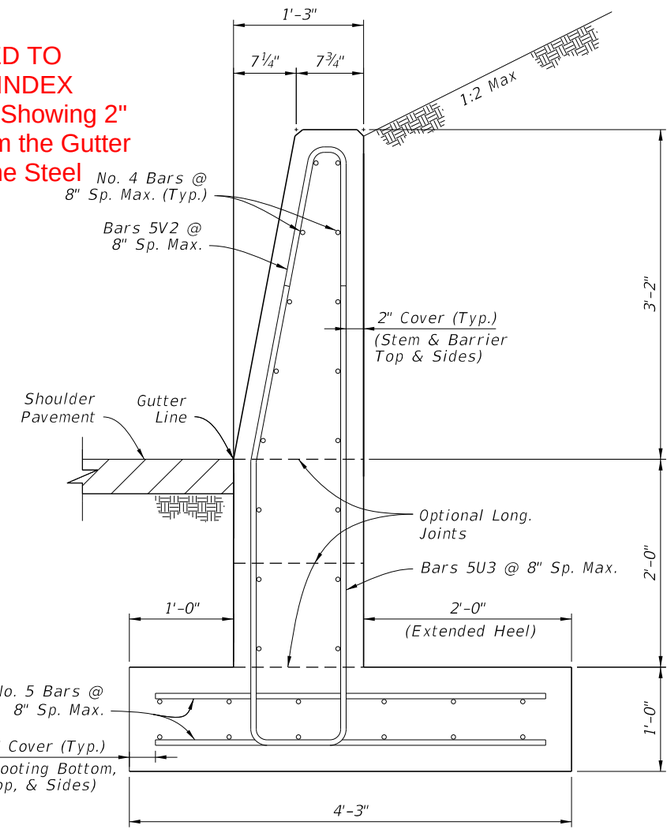
LAST REVISION	REVISION	DESCRIPTION:	FDOT	FY ~~2025-26~~ STANDARD PLANS	CONCRETE BARRIER	INDEX	SHEET
~~11/01/24~~ 11/01/25						521-001	2 of 26

UPDATED TO MATCH INDEX 425-031-Showing 2" Drop from the Gutter Line to the Steel Grate.



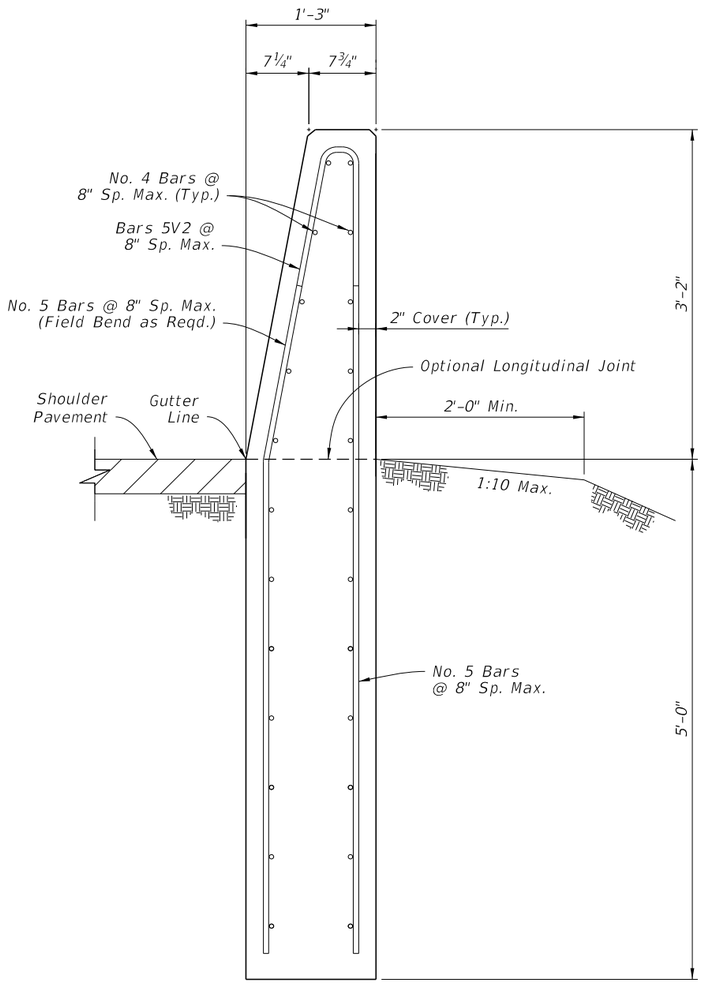
FRONT-FLUSH SECTION
(Where Required For Barrier Inlet Locations)

Concrete Qty. = 0.29 CY/FT
Steel Qty. = 46.6 LB/FT



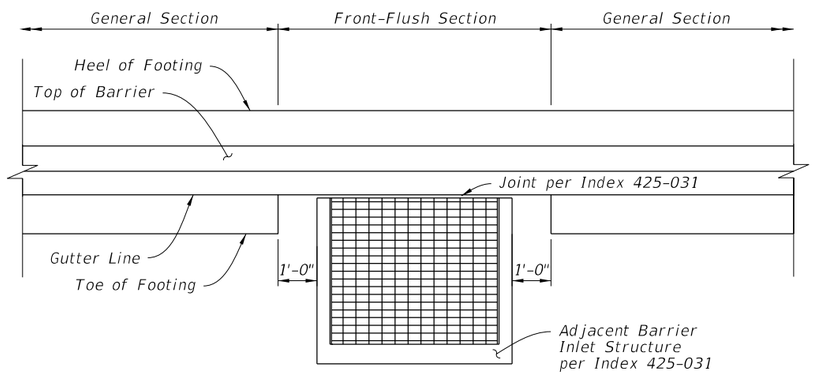
RETAINING SECTION

Concrete Qty. = 0.36 CY/FT
Steel Qty. = 55.3 LB/FT



TRENCH FOOTING SECTION

Concrete Qty. = 0.35 CY/FT
Steel Qty. = 46.2 LB/FT



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

NOTES:

1. *GENERAL: Install the differing Section Options as required per the Plans.*
2. *CONNECTIONS BETWEEN DIFFERENT SECTIONS: Connect differing Shoulder Barrier sections using a continuous pour or Transverse Joint, where longitudinal steel that aligns within the adjacent section is maintained continuously between sections. Alternatively, a Doweled Joint may be used as shown on Sheet 13.*
3. *FLUSH RETAINING SECTION COMBINATION: Where Barrier Inlets are required in retaining segments, install the Flush Section, except replace the 1'-0" General Heel with the 2'-0" Extended Heel as shown in the Retaining Section. Use longer lateral reinforcing bars of 2'-10" length to maintain the cover shown.*

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2026-27

SHOULDER BARRIER - SECTION OPTIONS

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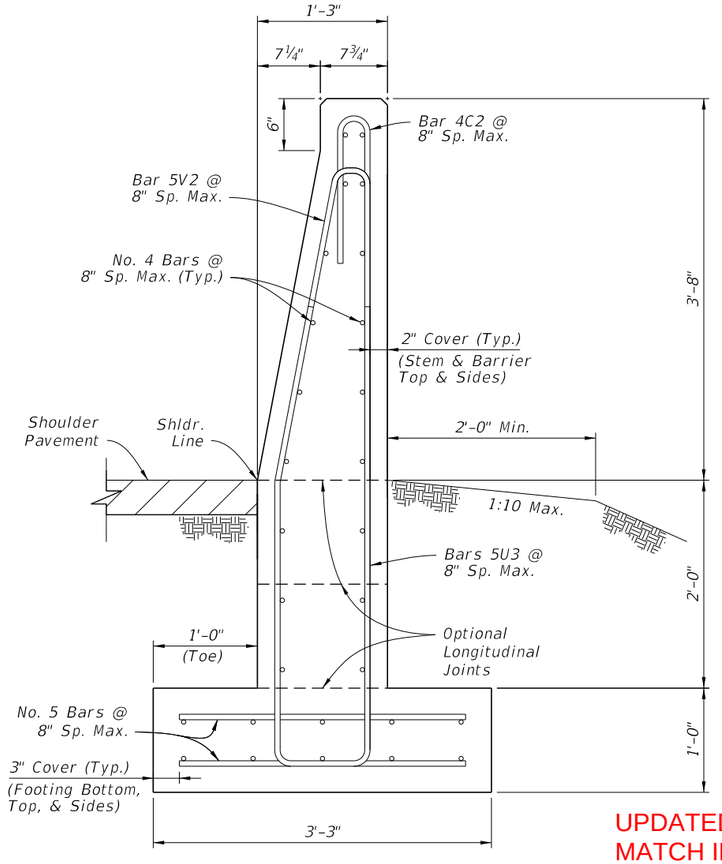
~~11/01/19~~						521-001	15 of 26

NOTES:

1. GENERAL: See the applicable Notes on Sheet 15.

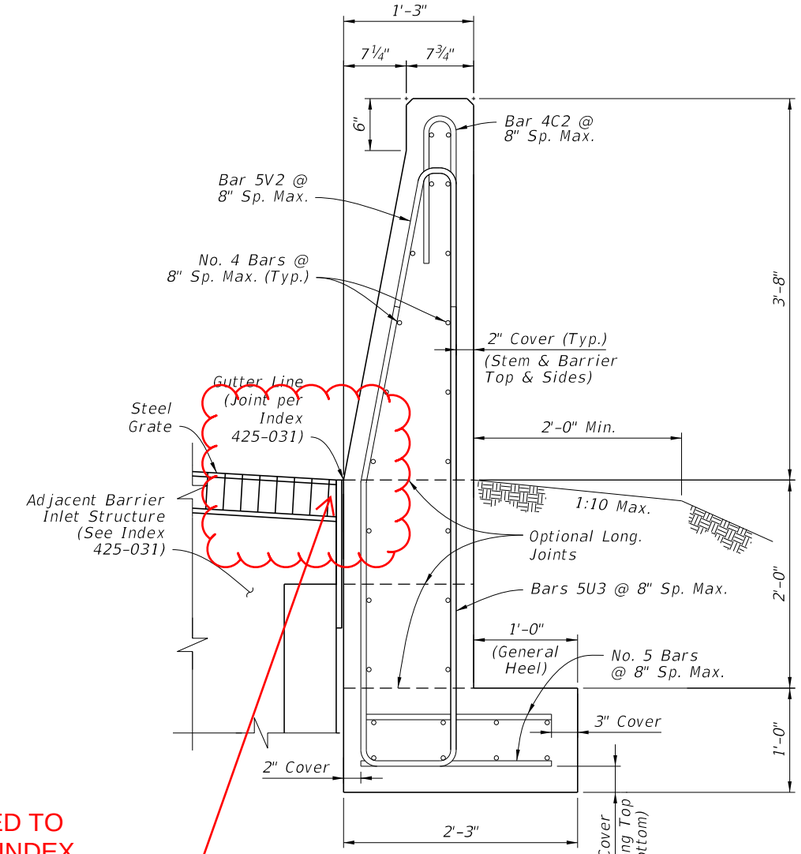
2. DRAINAGE SLOT OPTION: Use only where called for in the Plans. Drainage Slots may be used for all Shoulder Barrier types except for the Trench Footing Section.

   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)

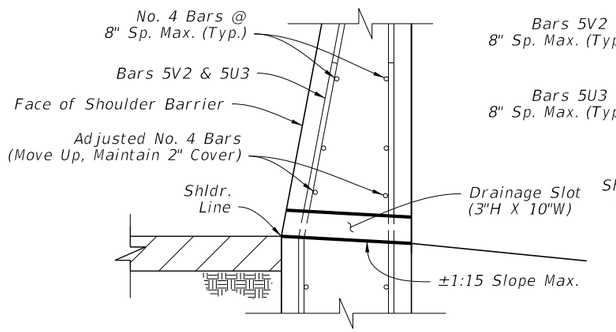
Concrete Qty. = 0.34 CY/FT
Steel Qty. = 56.8 LB/FT



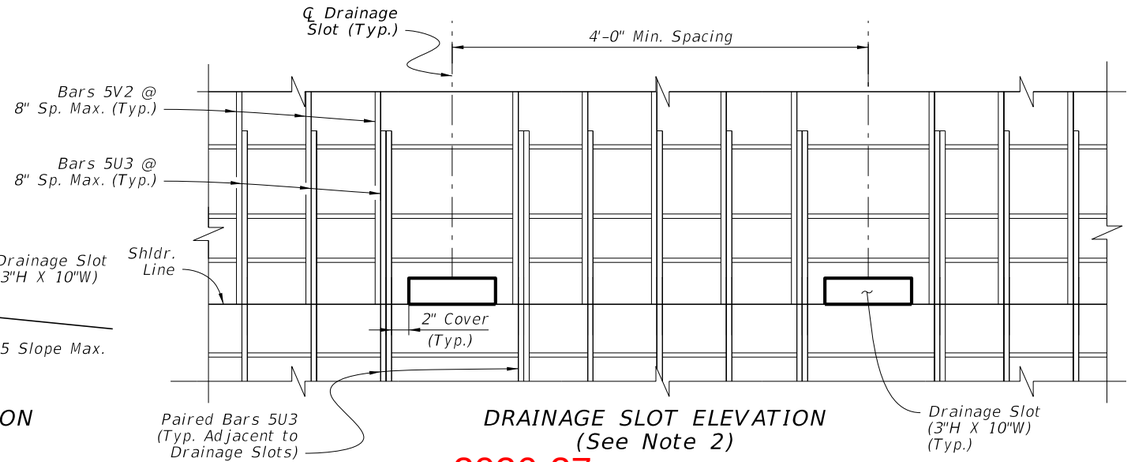
UPDATED TO MATCH INDEX 425-031-Showing 2" Drop from the Gutter Line to the Steel Grate.

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)

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2026-27

SHOULDER BARRIER - SECTION OPTIONS (CONTINUED)

LAST REVISION	REVISION	DESCRIPTION:	FDOT	FY ~~2025-26~~ STANDARD PLANS	CONCRETE BARRIER	INDEX	SHEET
~~11/01/24~~						521-001	16 of 26

GENERAL NOTES:

1. Construct in accordance with Specification 521. The standard barrier face shape is single-slope. Use Class II concrete for barriers constructed in slightly aggressive environments, and use Class IV Concrete for barriers constructed in moderately or extremely aggressive environments. On all exposed surfaces, apply a General Surface Finish in accordance with Specification 400.

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

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

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

GENERAL NOTES (CONTINUED):

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

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

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

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

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

7. DOWELED JOINTS: Per 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. Doweled Joints may not be substituted for Construction Joints as defined above.

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

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

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

11. FINISH GRADE ELEVATION: At the barrier face location, the finish grade pavement has a vertical position tolerance of ± ½" from the 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.

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

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

14. OPAQUE VISUAL BARRIER: Where called for in the Plans, install Opaque Visual Barrier per Index 521-010.

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

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

17. 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.

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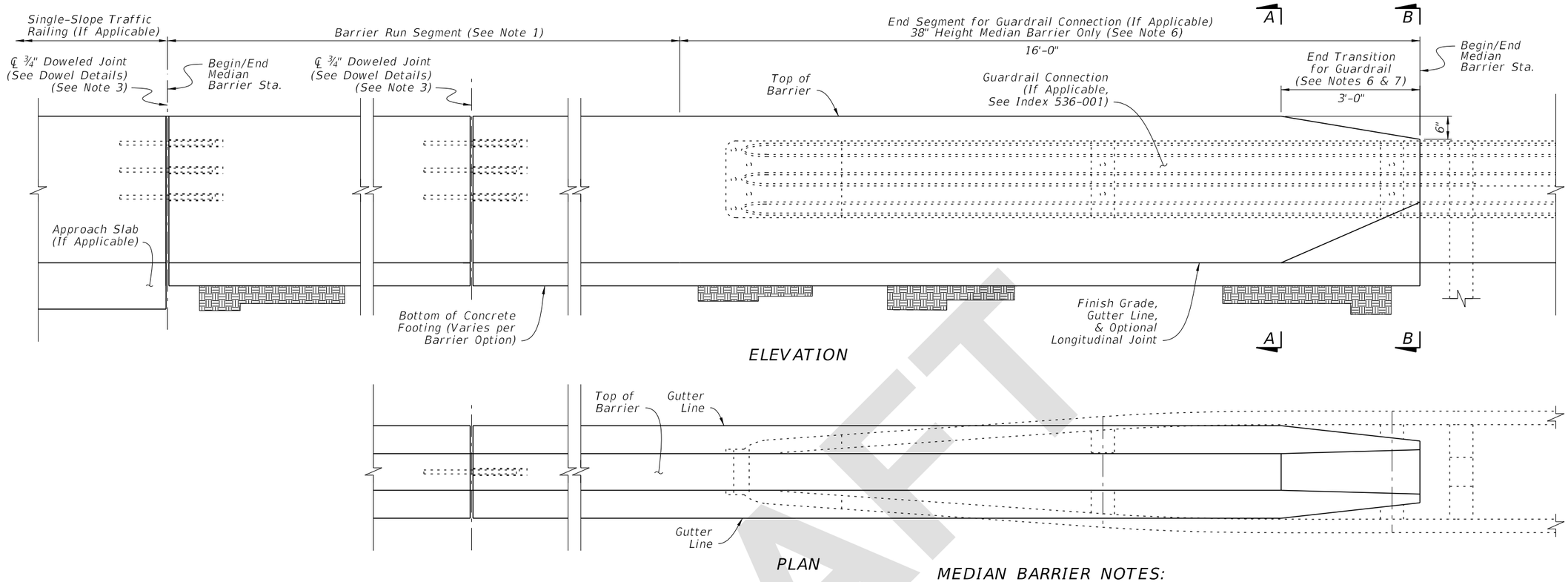
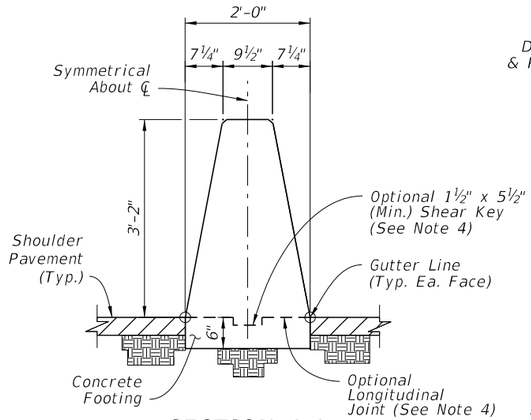
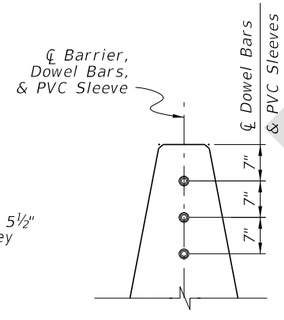
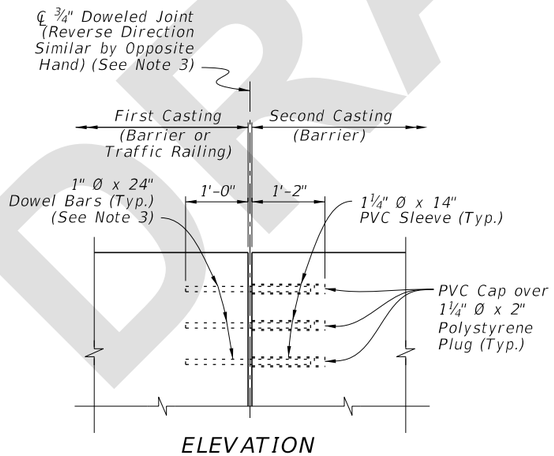




SECTION A-A
38" HEIGHT MEDIAN BARRIER
(See Sheet 3 for Steel Reinforcing Details)



SECTION
DOWEL PLACEMENT



ELEVATION
DOWEL BAR & PVC
CONNECTION

DOWEL DETAILS

MEDIAN BARRIER NOTES:

1. BARRIER RUN SEGMENT: Within the Barrier Run Segment, either the 38" Height Median Barrier or the differing Median Barrier sections shown throughout the Index may be placed as required per the Plans.

2. SECTION VIEWS: For additional Views A-A and B-B, see Sheet 3.

3. DOWELED JOINTS: See the General Notes on Sheet 1 for usage of joint types. Place Doweled Joints spaced at 100-foot maximum intervals (40-foot minimum). Place steel reinforcing with a longitudinal 3" cover adjacent to the joint face(s) in the barrier. Use ASTM A36 smooth round bars with hot-dip galvanization.

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

   For the dowel connection into the second casting, use a 1¼" NPS Schedule 80 PVC pipe with a sealed cap, cast-in-place as shown.

4. OPTIONAL LONGITUDINAL JOINT: When a longitudinal joint is placed above the concrete footing, use the Optional 1½" x 5½" Shear Key shown. As a substitute for the Shear Key, the footing's top surface may be raked to provide additional shear friction. Rake the fresh concrete surface so that about half the surface area has approximately ¼" depth longitudinal grooves, distributed evenly per the approval of the Engineer.

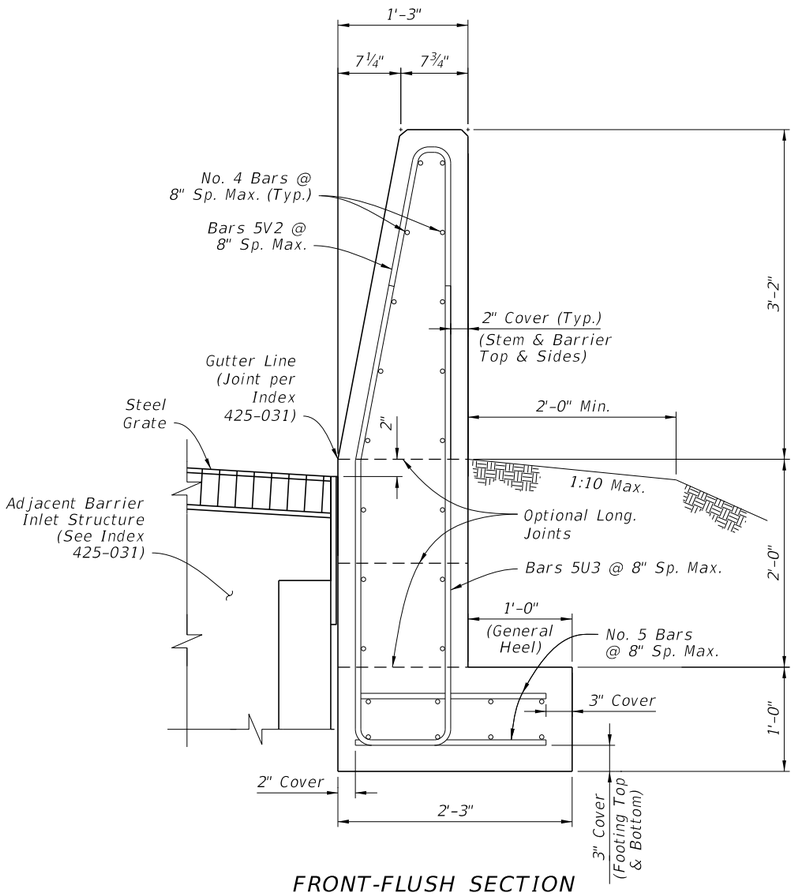
5. SHOULDER ROCKING OR MINOR GRADE SEPARATIONS: Where called for in the Plans, the nominal shoulder pavement surface elevation may be placed up to 3" below the location shown herein. For barriers with shallow embedments shown on Sheets 6 thru 9, extend the barrier's concrete lower across its entire section such that the barrier's concrete bottom remains embedded at least 1" below the lowered pavement surface.

6. GUARDRAIL CONNECTIONS: Connect Guardrail using the Transition Connections to Rigid Barrier per Index 536-001 in conjunction with the 16'-0" End Segment for Guardrail shown herein.

7. CRASH CUSHION CONNECTIONS: Connect Crash Cushions per Index 544-001 in conjunction with the 3'-0" End Transition for Guardrail as shown herein.

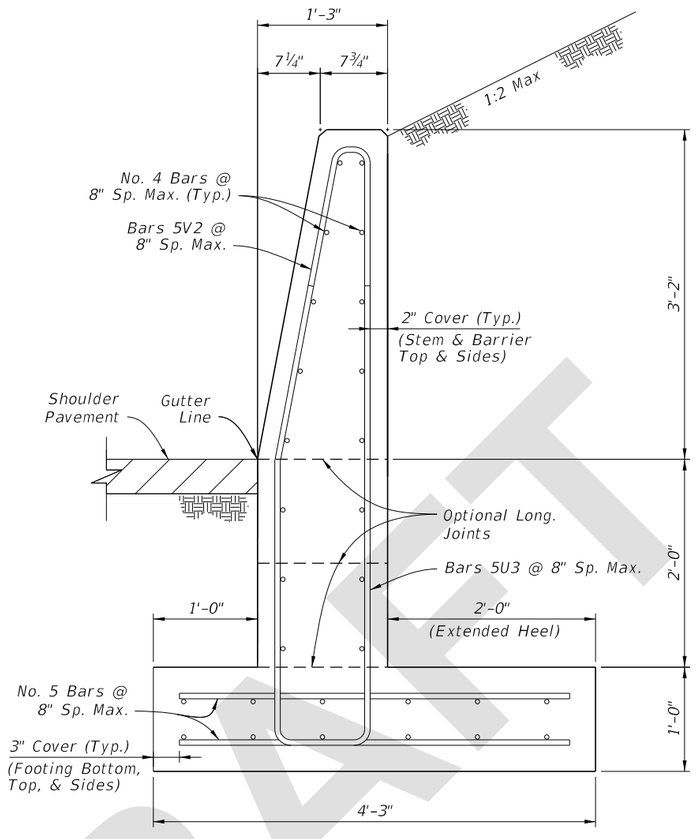
8. FREE ENDS: When the barrier end does not terminate with a Traffic Railing Connection, Guardrail Connection, Crash Cushion Connection, or Sloped End Treatment as called for in the Plans, terminate in accordance with the Free End Reinforcing detail on Sheet 3.

MEDIAN BARRIER



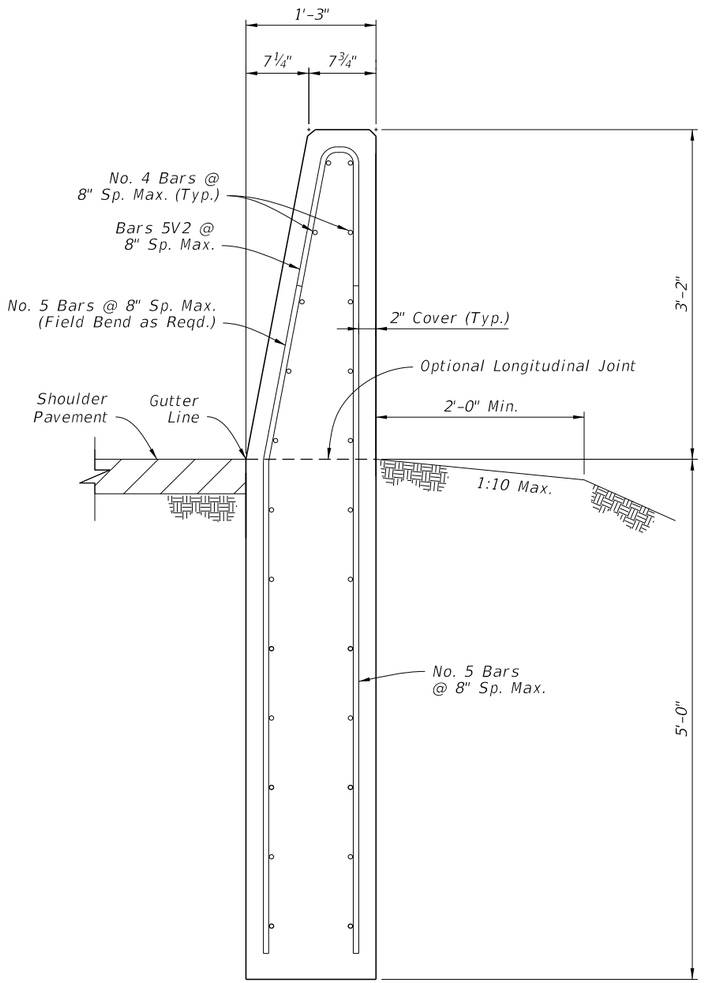
FRONT-FLUSH SECTION
(Where Required For Barrier Inlet Locations)

Concrete Qty. = 0.29 CY/FT
Steel Qty. = 46.6 LB/FT



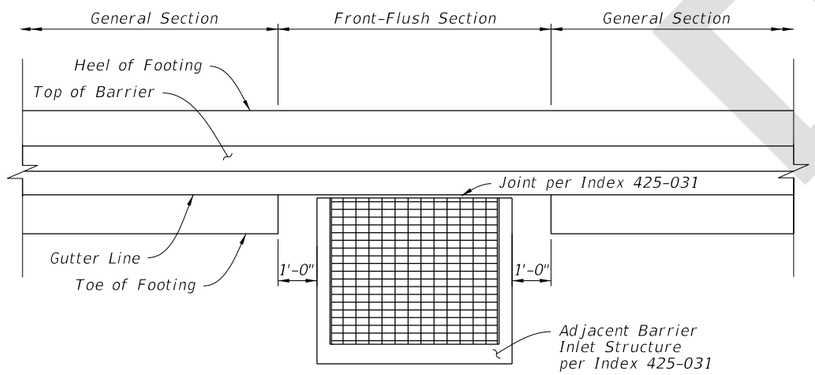
RETAINING SECTION

Concrete Qty. = 0.36 CY/FT
Steel Qty. = 55.3 LB/FT



TRENCH FOOTING SECTION

Concrete Qty. = 0.35 CY/FT
Steel Qty. = 46.2 LB/FT



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

NOTES:

1. *GENERAL: Install the differing Section Options as required per the Plans.*
2. *CONNECTIONS BETWEEN DIFFERENT SECTIONS: Connect differing Shoulder Barrier sections using a continuous pour or Transverse Joint, where longitudinal steel that aligns within the adjacent section is maintained continuously between sections. Alternatively, a Doweled Joint may be used as shown on Sheet 13.*
3. *FLUSH RETAINING SECTION COMBINATION: Where Barrier Inlets are required in retaining segments, install the Flush Section, except replace the 1'-0" General Heel with the 2'-0" Extended Heel as shown in the Retaining Section. Use longer lateral reinforcing bars of 2'-10" length to maintain the cover shown.*

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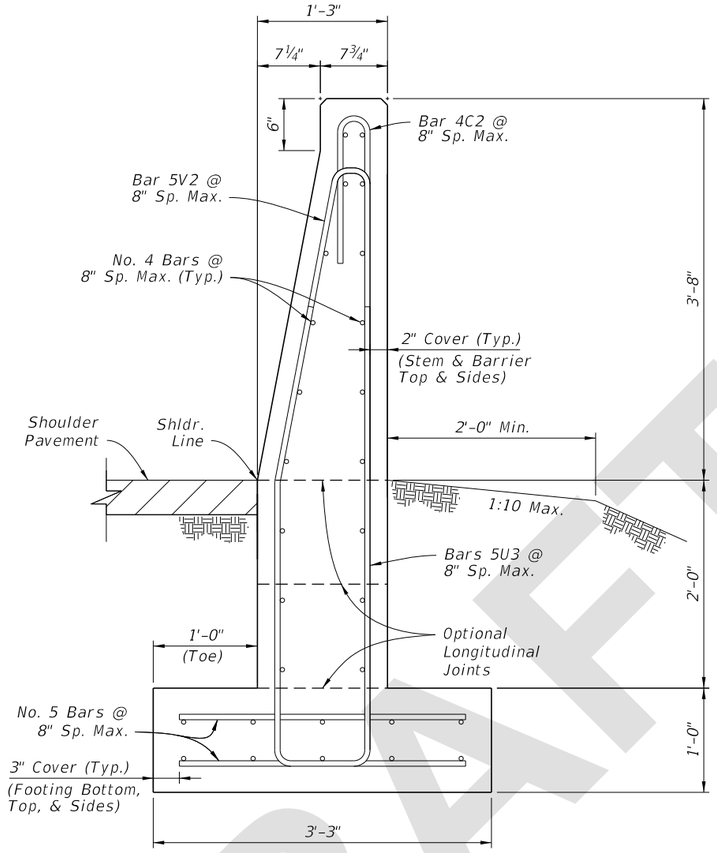
SHOULDER BARRIER - SECTION OPTIONS

NOTES:

1. GENERAL: See the applicable Notes on Sheet 15.

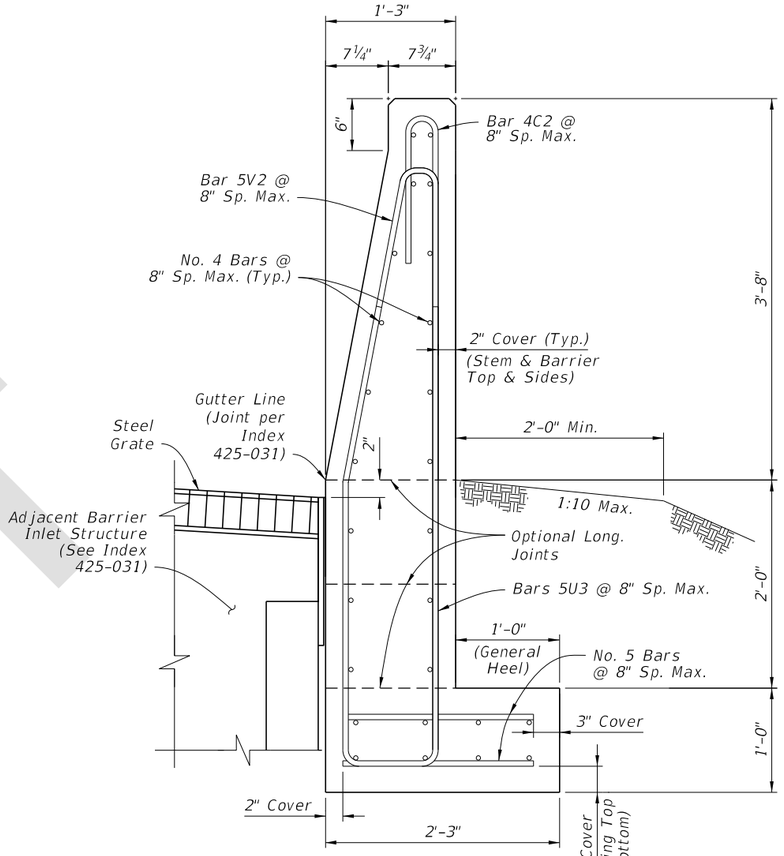
2. DRAINAGE SLOT OPTION: Use only where called for in the Plans. Drainage Slots may be used for all Shoulder Barrier types except for the Trench Footing Section.

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



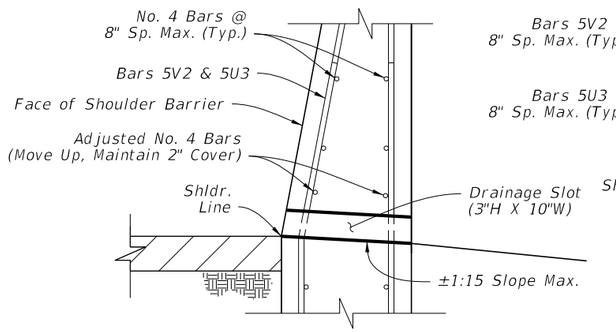
44" HEIGHT SECTION
(For Use Adjacent to Rear-Flush Section on Sheet 18)

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

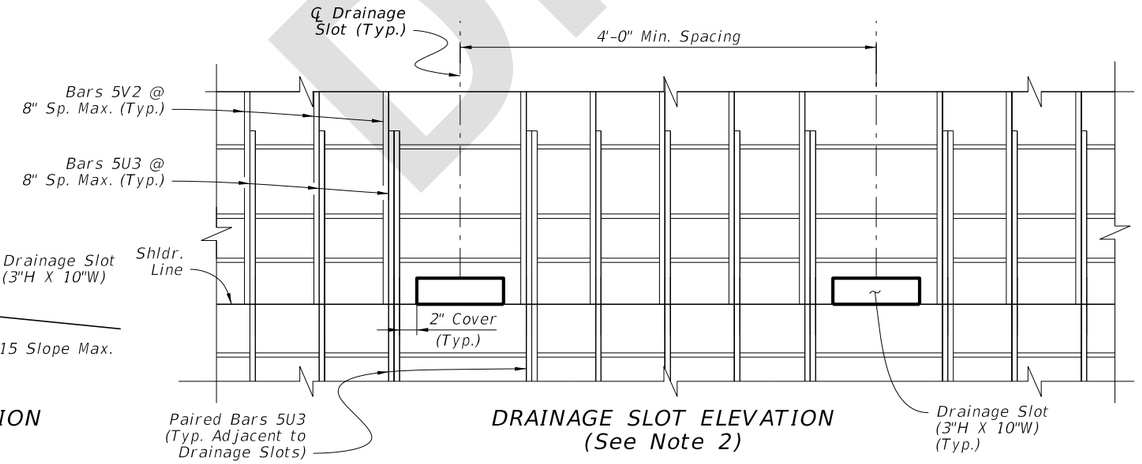


44" HEIGHT
FRONT-FLUSH SECTION
(For Use Adjacent to Rear-Flush Section on Sheet 18, as Required for Barrier Inlets)

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)

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LAST REVISION	REVISION	DESCRIPTION:	FDOT FY 2026-27 STANDARD PLANS	CONCRETE BARRIER	INDEX	SHEET
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