GENERAL NOTES:

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

2. STEEL BAR REINFORCEMENT: Where required to maintain continuity, provide lap splices of at least 18 inches for No. 4 bars and 20 inches for No. 5 bars, unless otherwise shown herein (including shorter splices as provided by the default bar bending diagrams). The default reinforcing details shown herein, including bar shapes and lap splice positions, are intended to show required steel locations and provide for a constructible design. However, with the approval of the Engineer, alternate steel configurations may be used in the same locations shown herein, given that the equivalent strength reinforcement 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 minimum cover of 40 inches 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 Tilt Grade-Separated Sections, see Sheet 3 for additional Transverse Joint requirements.

7. DOWELED JOINTS: As shown in the Dowel Details on Sheets 2 & 13, install 1/2” Doweled Joints for Concrete Barrier connections to Pier Protection Barrier and Traffic Railings. Doweled Joints are also required for expansion mitigation in Median Barrier as defined per Sheets 2 & 5. Doweled Joints are not permitted within Grade-Separated Median Barrier.

8. CRACK CONTROL V-GROOVES: At 20-foot intervals, place 1/8” deep 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 12 inches of the subgrade to at least 98% of the maximum density determined by FM 1-1-180, Method D.

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 ± 1 inch, measured from the top face of the barrier.

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


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 to the face of the barrier per Spec 703.

16. BARRIER DELINATORS: Install Barrier Delinators in accordance with Specification 703. For median barriers, mount the delinators on the top of the barrier, at the centerline of barrier, with reflective facing facing traffic on both approaches. For shoulder barriers and split sections, mount the delinators on the top of the barrier, with the roadway side of the delinators located 2 feet from the 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 FRP reinforcing bars of the same size. Construct FRP reinforcing bars in accordance with Specification 932, and use a 40” inner diameter for bar bends. Where required to fit pull boxes while maintaining bar spacing and concrete cover, trim FRP 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.
**NOTES:**

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

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

3. **DOWELED JOINTS:** See the General Notes on Sheet 1 for usage of joint types. Space Dowelled Joints at 100-foot maximum intervals. Place steel reinforcing with a longitudinal 3" cover adjacent to the joint faces in the barrier. Use ASTM A36 smooth round bars with hot-dip galvanization.

4. **OPTIONAL LONGITUDINAL JOINT:** When a longitudinal joint is placed above the footing, use the Optional 1/2" x 3/4" (Min.) 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 4" depth longitudinal grooves, distributed evenly and approved by the Engineer.

5. **TRAFFIC RAILING CONNECTIONS:** Align the barrier and Traffic Railing faces and connect with the 1/4" Dowelled Joint.

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

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

8. **FREE ENDS:** When the barrier end does not terminate with a Traffic Railing Connection, Guardrail Connection, Crash Cushion Connection, or Sloped End Treatment as called for in the Plans, terminate in accordance with the Free End Reinforcing detail on Sheet 3.
PLAN VIEW - 38" HEIGHT MEDIAN BARRIER
FREE END REINFORCING (See Note 3)

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

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

SECTION A-A
38" HEIGHT MEDIAN BARRIER
Concrete Qty. = 0.20 CY/FT
Steel Qty. = 11.8 LB/FT

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

MEDIAN BARRIER - REINFORCING DETAILS
DESCRIPTION:

REVISION 10/18

CONCRETE BARRIER

FY 2020-21
STANDARD PLANS

1. GENERAL: Install Sloped End Treatment only where called for in the plans.

2. JOINTS: Construction or Doweled Joints are not permitted within the Sloped End Treatment segment.

NOTES:

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

SECTION D-D
INTERMEDIATE TRANSITION
REINFORCING
(Height Varies Linearly per Elevation View)

VIEW E-E
END TRANSITION

38' Height Median Barrier
(See Sheet 2)

Sloped End Treatment (Linear Transition)
25'-0'

Begin/End Median Barrier Sta.

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

ELEVATION - SLOPED END TREATMENT

3'-2"
6"
3"
3" Clear

6" Cover (Typ.)
(All Sides)

Symmetrical About & (Typ.)

Bars 4U1 (Typ.)

Bars 4U1 (Typ.)

(18' Sp. Max.)

Bars 4U1 @
18" Sp. Max.

Bars 4U1 @
18" Sp. Max.

No. 4 Bars

No. 4 Bars

No. 4 Bars

Match Slope of 38'
Height Median Barrier
(Typ.) @ Face

Match Slope of 38'
Height Median Barrier
(Typ.) @ Face

Fields Cut as Reqd.

Fields Cut as Reqd.

Tapering No. 4 Bars

Tapering No. 4 Bars

Bars 4U1 (Typ.)

Bars 4U1 (Typ.)

顶尖 of Barrier
(Constant Slope -
Linear Transition)

Top of Barrier
(Constant Slope -
Linear Transition)

No. 4 Bars

(All Sides)

Shoulder
Pavement
(Typ.)

Pavement
Shoulder

1' Clear

2'-0"

2'-0"

2'-0"

1' Clear

E" Clear

SLOPED END TREATMENT
MEDIAN BARRIER -
SLOPED END TREATMENT

3'-9" (±3")

No. 4 Bars

No. 4 Bars

No. 4 Bars

(18' Sp. Max.)

Bars 4U1 @
18" Sp. Max.

Bars 4U1 @
18" Sp. Max.

Bars 4U1 @
18" Sp. Max.

Bars 4U1 @
18" Sp. Max.

Bars 4U1 @
18" Sp. Max.

Bars 4U1 @
18" Sp. Max.

Bars 4U1 @
18" Sp. Max.

Bars 4U1 @
18" Sp. Max.

Bars 4U1 @
18" Sp. Max.

Bars 4U1 @
18" Sp. Max.

Bars 4U1 @
18" Sp. Max.

Bars 4U1 @
18" Sp. Max.

Bars 4U1 @
18" Sp. Max.

Bars 4U1 @
18" Sp. Max.

Bars 4U1 @
18" Sp. Max.

Bars 4U1 @
18" Sp. Max.

Bars 4U1 @
18" Sp. Max.

Bars 4U1 @
18" Sp. Max.

Bars 4U1 @
18" Sp. Max.

Bars 4U1 @
18" Sp. Max.

Bars 4U1 @
18" Sp. Max.
SHOR NGRADE-SEPARATED SECTION FOR Y ≤ 9"

**NOTES:**

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

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

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

2. BARRIER REINFORCING: Maintain the 38' Height Median Barrier's longitudinal steel reinforcing continuously through the barrier height transition and pedestal. Provide the Additional No. 4 Bars and taper as required to maintain a 40' maximum cover from the top of the barrier.

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

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

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

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

CONCRETE BARRIER

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Sheet 6 of 26
For all longitudinal reinforcing locations, see the Section Views.

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

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

2. BARRIER REINFORCING: Maintain the 38' Height Median Barrier's longitudinal steel reinforcing continuously through the barrier height transition and pedestal. Provide the Additional No. 4 Bars and taper as required to maintain a 4'-0" maximum cover from the top of the barrier.

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

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

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

MEDIAN BARRIER - 56' HEIGHT SECTION FOR BARRIER-MOUNTED SIGN SUPPORT SHIELDING - ASYMMETRICAL
NOTES:

1. PROJECT SPECIFIC DESIGN: For the base plate, anchor bolts, foundation design, and additional reinforcing required for the barrier, see the project-specific design in the Plans.

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

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

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

MEDIAN BARRIER - 56" HEIGHT SECTION FOR BARRIER-MOUNTED DUAL SIGN SUPPORT SHIELDING - MINIMUM WIDTH
NOTES:

1. OVERHEAD SIGN SUPPORT: The overhead sign support shown is an example only; see the Plans for the project-specific dimensions and requirements. The overall length and width of the barrier's taper and parallel segments is governed by the overhead sign support dimensions as defined in the Plans.

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

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

4. STIRRUP BARS: For the vertical and transverse reinforcement requirements shown in Sections A-A, 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.

5. CONCRETE OR FLOWABLE FILL: Use Class NS Concrete in accordance with Specification 347 or Non-Excavatable Flowable Fill in accordance with Specification 121.
**DESCRIPTION:**

**REVISION:** FY 2020-21 Standard Plans

**INDEX:** 521-001

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**NOTE:**

1. SECTION VIEWS: See Sheet 11 for Section Views A-A through D-D and corresponding reinforcing steel details.

2. PIER: The round pier shown is an example only, and project-specific pier shapes may vary. For actual dimensions and requirements, see the Plans. The overall length and width of the split barrier system is governed by the project-specific pier dimensions, as defined in the Plans.

3. MULTIPLE PIERS: The parallel segment may be lengthened to accommodate multiple consecutive piers, with the approach and trailing tapers located 1 foot, measured longitudinally, upstream and downstream from the first and last piers, respectively.

**ELEVATION**

**PLAN**

(See Section Views on Sheet II for All Longitudinal Steel Locations)
NOTES:

1. GENERAL: Work with the Plan and Elevation views on Sheet 10.

2. LONGITUDINAL REINFORCING CONTINUITY: Maintain all longitudinal steel reinforcing shown in Section C-C continuously into Section D-D (spliced where required). The additional longitudinal reinforcing shown in Section D-D does not require continuity into Section C-C, and it starts 3' from the construction joint or edge of concrete per the details on Sheet 10.

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

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

**SECTION B-B**
END HEIGHT TRANSITION

**SECTION C-C**
BEGIN WIDTH TRANSITION
END WIDTH TRANSITION

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

**CONCRETE BARRIER**

**MEDIAN BARRIER - 44" HEIGHT**

**SPLIT SECTION FOR PIER SHIELDING - DETAILS**

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**DESCRIPTION:**
FY 2020-21
STANDARD PLANS

**INDEX:**
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**SHEET:**
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NOTES:

1. GENERAL: Construct the Connection Segment as required per the Plans to connect existing F-Shape sections to Single-Slope Median Barrier or Traffic Railing sections. Construct Option 'A' or 'B' as required to match the heights of the connecting sections.

2. DOWELED JOINT: Install Dowel Bars per the Dowel Details on Sheet 2.

3. TRAFFIC RAILING CONNECTION: For the Option 'B' connection, use a Doweled Joint per Sheet 2 and the additional Free End Reinforcing with reduced bar spacing per Sheet 3.

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

MEDIAN BARRIER - CONNECTION TO F-SHAPE

CONCRETE BARRIER

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STANDARD PLANS

DESCRIPTION:
CONCRETE BARRIER

LAST REVISION
11/01/18

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

**LAST REV/ED:** 01/01/18

**DESCRIPTION:**

**FY 2020-21 STANDARD PLANS**

**INDEX:** 521-001

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**SECTION A-A**

38" HEIGHT SHOULDER BARRIER

(See Sheet 14 for Reinforcing Steel Details)

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**ELEVATION**

Dowel Details

Dowel Bar & PVC Connection

---

**NOTES:**

1. BARRIER RUN SEGMENT: Either the 38" Height Shoulder Barrier or the differing Shoulder Barrier sections shown throughout the Index may be placed within this segment as required per the Plans.

2. SECTION VIEWS: For additional Views A-A and B-B, see Sheet 14.

3. DOWELED JOINTS: See the General Notes on Sheet 1 for usage of joint types. Place steel reinforcing with a longitudinal 3" cover adjacent to the joint face in the barrier. Use ASTM A36 smooth round bars with hot-dip galvanization.

4. TRAFFIC RAILING CONNECTIONS: Align the barrier and Traffic Railing faces and connect with the ½" Doweled Joint.

5. GUARDRAIL CONNECTIONS: Connect Guardrail using the Transition Connections to Rigid Barrier per Index 536-001.

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

7. FREE ENDS: When the barrier end does not terminate with a Traffic Railing Connection, Guardrail Connection, or Crash Cushion Connection as called for in the Plans, terminate in accordance with the Free End Reinforcing Note on Sheet 14.
SECTIONS A-A
38" HEIGHT SHOULDER BARRIER

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

NOTES:
1. GENERAL: Work with the Plan and Elevation Views on Sheet 13. The Section Option Footings shown on Sheet 15 may be substituted where called for in the Plans.
2. FREE END REINFORCING: Where shown in the Plan views, terminate the 38" height Barrier section with a transverse vertical end face. Reduce the spacing of Bars SV2 and SV3 to 6" for 5 Spans, placed with 3" cover from the barrier's end face.
3. BAR BENDING DIAGRAMS: For additional details for Bars SV2 and U3, see the Bar Bending Diagrams on Sheet 26.

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

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

SHOULDER BARRIER - REINFORCING DETAILS
FRONT-FLUSH SECTION
(Where Required For Barrier Inlet Locations)
Concrete Qty. = 0.20 CF/FT
Steel Qty. = 46.6 LB/FT

RETAINING SECTION
Concrete Qty. = 0.20 CF/FT
Steel Qty. = 46.6 LB/FT

TRENCH FOOTING SECTION
Concrete Qty. = 0.18 CF/FT
Steel Qty. = 46.2 LB/FT

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 Joints 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 2-1IP length to maintain the cover shown.

SHOULDER BARRIER - SECTION OPTIONS

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

SHOULDER BARRIER - SECTION OPTIONS (CONTINUED)

NOTE:

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

SHOULDER BARRIER - SECTION OPTIONS (CONTINUED)

44" HEIGHT SECTION
(For Use Adjacent to Rear-Flush Section on Sheet 1B)

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

NOTE:

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

SHOULDER BARRIER - SECTION OPTIONS (CONTINUED)

44" HEIGHT FRONT-FLUSH SECTION
(For Use Adjacent to Rear-Flush Section on Sheet 1B, as Required for Barrier Inlets)

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

NOTE:

1. GENERAL: See the applicable Notes on Sheet 15.
**SHOULDER BARRIER - 38" HEIGHT REAR-FLUSH SECTION**

For reduced setback pier shielding, see the Plans for the project-specific dimensions. The details shown herein are only for use when piers do not require protection per the AASHTO LRFD requirements. For piers requiring protection, see Index 521-002.

**SECTION A-A**
38" HEIGHT REAR-FLUSH SECTION
ABOVE-GROUND HAZARD
EMBEDDED IN FOOTING

**SECTION A-A**
38" Height Rear-Flush Section
(See Section View for All Longitudinal Steel Locations)

**SECTION B-B**
38" Height Rear-Flush Section with 3" Width Reduction
(See Section View for All Longitudinal Steel Locations)

**NOTE:**
1. **PIERS:** The piers shown herein are example shapes only; see the Plans for the project-specific dimensions. The details shown herein are only for use when piers do not require protection per the AASHTO LRFD requirements. For piers requiring protection, see Index 521-002.
**SHOULDER BARRIER - 44" HEIGHT REAR-FLUSH SECTION FOR REDUCED SETBACK PIER SHIELDING**

**DESCRIPTION:**

> NOTE:

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

**ELEVATION - ROUND PIERS EXAMPLE (SQUARE PIERS SIMILAR)**

**PLAN - ROUND PIERS EXAMPLE (SQUARE PIERS SIMILAR)**

(For All Longitudinal Steel Locations, See the Section Views)
**CONCRETE BARRIER**

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

**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 Dowelled 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.

**Dowel Details**

- **Dowel Bars:** To position the reinforcement with the same cover, spacing, continuity, and equivalent strength shown herein, as approved by the Engineer.

**Connection Segment**

- **Option A:** Continue Single-Slope 38" Height Shoulder Barrier
- **Option B:** Connect Single-Slope 36" Height Traffic Railing (Option 'A' or 'B')

**ELEVATION**

- **3'-3" Height Shoulder Barrier**
- **10'-0" Min. Linear Transition to F-Shape**
- **2'-6" Min. to Single-Slope 36" Height Traffic Railing**

**Sheet Details**

- **Sheets:** 1, 2, 3, 4
- **Dimensions:** 1188.0x763.2
- **Revision:** 01/01/19
- **Index:** 521-001

**Plan Details**

- **38" HEIGHT SHOULDER BARRIER**
- **10'-0" Min. Linear Transition to F-Shape**
- **2'-6" Min. to Single-Slope 36" Height Traffic Railing**

**Specific Requirements**

- **Sp. Max. (Typ.):** No. 4 Bars @ 8" Sp. Max.
- **Cover (Typ.):** 2" Min., 4" Max.
- **Joints (Typ.):** Optional Longitudinal
- **Line Gutter:** Maintain 1'-6" Min.

**Dowel Placement**

- **Dowel Bars & PVC Sleeve**
- **4" PVC Sleeve**
- **Dowel Joint:** 1/2" Doweled Joint (See Note 2)

**Matching Sections**

- **Section A-A**
- **Section A-A**
- **Section B-B**
- **Section C-C**

**Special Notes**

- **Notes:**
  - 1.
  - 2.
  - 3.
  - 4.
**SECTION A-A**

**Curb & Gutter Barrier**

- Single-Slope Traffic Railing (If Applicable)
- 4" Doweled Joint (See Note 3)
- Edge of Barrier
- Back of Footing
- Optional Long. Joint (Typ.)
- Gutter Line
- Sidewalk
- Pavement Edge of Line
- Gutter

**SECTION C-C**

**Curb & Gutter Barrier with Drainage Slot**

- Isometric View
- Curb Gutter Barrier
- Drainage Slot Details

**DRAINAGE SLOT NOTES:**

1. GENERAL: Place 20" x 18" Drainage Slots at locations and/or spacing called for in the Plans.

2. STEEL REINFORCEMENT CONFLICT: When the Drainage Slot encounters a conflict with reinforcing steel, shift or cut the reinforcing steel to provide 20" x 18" 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 to 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).

3. DOWELED JOINTS: See the General Notes on Sheet 1 for usage of joint types. Where required, install 1/2" Doweled Joints as defined on Sheet 13.

4. TRAFFIC RAILING CONNECTIONS: Align the barrier and Traffic Railing faces and connect with the 1/2" 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 NOTES:**

1. SECTION VIEWS: For additional Views A-A and B-B, see Sheet 21.

2. EXPANSION JOINTS: Place 8" with 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 1/2" Doweled Joints as defined on Sheet 13.

4. TRAFFIC RAILING CONNECTIONS: Align the barrier and Traffic Railing faces and connect with the 1/2" 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.
NOTES:

1. GENERAL: Work with the Plan and Elevation Views on Sheet 20.

2. FREE END REINFORCING: Where shown in the Plans, terminate the 38" Curb & Gutter Barrier section with a transverse vertical end face. Reduce the spacing of Bars SV2 and SV4 to 9" for 5 Spaces, placed with 3" cover from the barrier's end face.

3. BAR BENDING DIAGRAMS: For additional details for bars SV2 and SV4, see the Bar Bending Diagrams on Sheet 20.

CONCRETE BARRIER - REINFORCING DETAILS

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

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

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

CURB AND GUTTER BARRIER - SLOPED END TREATMENT

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

2. BAR BENDING DIAGRAMS: For additional details on Bars 5U4 & 5V2, see the Bar Bending Diagrams on Sheet 26.
NOTES:

1. TAPER SEGMENTS AND OFFSET SEGMENT: The plan view shown is an example only, showing general geometry for the taper segments and offset segment. For the actual segment lengths and corresponding taper rates required, see the barrier placement information in the Plans.

2. OVERHEAD SIGN SUPPORT: The overhead sign support shown is an example only; see the Plans for the project-specific dimensions and requirements if applicable.

3. CONNECTION TO SHOULDER BARRIER SECTIONS: Connect to Shoulder Barrier sections using a continuous pour or Transverse Joint, where longitudinal steel that aligns within the adjacent section is maintained continuously between sections or has a full lap splice with the adjacent section’s longitudinal steel.

4. FREE ENDS: Where shown in the Plans, terminate the Single-Faced Section with a taper rate. Place a stirrup bar with a 3" cover from the end face. Place longitudinal bars with a 3" cover from the end face.

5. CONCRETE OR FLOWABLE FILL: Use Class NS Concrete in accordance with Specification 347 or Non-Excavatable Flowable Fill in accordance with Specification 121.

WALL SHIELDING BARRIER - 38" HEIGHT SECTION - APPROACH & TRAILING TRANSITION
1. TAPER SEGMENTS AND OFFSET SEGMENT: The plan view shown is an example only, showing general geometry for the taper segments and offset segment. For the actual segment lengths and corresponding taper rates required, see the barrier placement information in the Plans.

2. OVERHEAD SIGN SUPPORT: The overhead sign support shown is an example only; see the Plans for the project-specific dimensions and requirements if applicable.

3. CONNECTIONS TO DIFFERENT CONCRETE BARRIER SECTIONS: Connect to aligning barrier sections using a continuous pour or Transverse Joint, where longitudinal steel that aligns within the adjacent section is maintained continuously between sections or has a full lap splice with the adjacent section's longitudinal steel.

4. FREE ENDS: Where shown in the Plans, terminate the Single-Faced Section with a transverse cut, and place end distance from the end face. Place longitudinal bars with a 3" cover from the end face.

5. GUARDRAIL CONNECTIONS: Within the Shoulder Barrier Segment for Guardrail, install Shoulder Barrier as shown per Sheet 3, including the corresponding End Connections for Guardrail. Connect Guardrail using the Transition Connections to Rigid Barrier per Index 536-001.

6. CONCRETE OR FLOWABLE FILL: Use Class NS Concrete in accordance with Specification 347 or Non-Excavatable Flowable Fill in accordance with Specification 123. Use only concrete fill behind the Shoulder Barrier Segment, do not use flowable fill at this location.

WALL SHIELDING BARRIER - 38" HEIGHT SECTION - GUARDRAIL CONNECTION

NOTES:
SECTION A-A
BEGIN TRANSITION

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

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

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

NOTES:
1. PROJECT-SPECIFIC REINFORCING: For footing and barrier reinforcing required for the overhead sign support, see the project-specific design in the Plans.
2. BARRIER REINFORCING: Maintain the 38" Height Median Barrier's longitudinal steel reinforcing continuously through the barrier height transition and pedestal. Provide the additional No. 4 bars and raper as required to maintain a 4½" maximum cover from the top of the barrier.

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

3. PROJECT-SPECIFIC PEDESTAL WIDTH & SETBACK: The pedestal width is governed by the size requirements of the overhead sign support as detailed in the Plans. Likewise, the setback distance from the sign support base to the barrier face is governed by the anchor bolt cover requirements, as defined in the Plans.

4. TRANSITION SEGMENTS: The Transition Segments shown are examples only. For the actual approach and trailing transition taper rate, length, and width, see the details in the Plans.

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

WALL SHIELDING BARRIER - 56" HEIGHT SECTION FOR BARRIER-MOUNTED SIGN SUPPORT SHIELDING
**BILL OF REINFORCING STEEL**

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<th>MARK</th>
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<tr>
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**NOTES:**

1. Work with the Standard Bar Bending Details per Index 415-001.
2. All bar dimensions in the bending diagrams are out to out.
3. Use standard inner diameters for bar bending unless otherwise shown.

**REINFORCING BAR BENDING DIAGRAMS**