GENERAL NOTES

1. Class II concrete shall be used for all reinforced and plain (nonreinforced) concrete barrier walls; except, in moderately and extremely aggressive environments, Class IV concrete shall be used. All reinforcing steels with un-designated size shall be #4 bars. Exposed concrete surfaces shall have a Class 3 surface finish in accordance with Section 521 of the Standard Specifications, unless other finish called for in plans.

2. Concrete barrier wall terminal ends shall be marked by Type 3 Object Markers.

3. Expansion joints in wall required only at bridge ends and/or at locations where wall is adjacent to existing or proposed concrete slab, wall joints are to match an existing or proposed expansion joint.

4. When the barrier is installed adjacent to the pavement the top 12" of the subgrade shall be compacted to at least 98% of the maximum density determined by FM 1-T 180, Method D.

5. For cast-in-place barrier wall segments constructed with the slip form method, score slice joints every 8' to 10' in the transverse direction. Every 10 feet on center, a transverse construction joint shall be constructed at 90 degrees to the longitudinal axis of the wall.

6. Precast construction is allowed as an alternate to cast-in-place construction.

7. On roadways designated for reverse lane operation, ends that are not shielded or outside the clear zone shall be marked by Type 3 Object Markers.

8. Cost of reinforcing steel and barrier delineators shall be included in the contract unit price for concrete barrier wall. See individual details for pay item information.

9. For barrier wall inlet details see Indexes Nos. 217, 218, and 219.

10. Concrete barrier walls with New Jersey Safety Shape may not be substituted for the Standard F Shape Barrier.

WALL FACE SAFETY SHAPES

1. Standard F Shape
2. New Jersey Shape
3. Symmetrical About E (See Standard Wall Detail)
4. Barrier Delineators Required On Top Of Concrete Barrier Walls (Per Section 521 of Standard Specifications, unless other finish called for in plans).

Standard Barrier Wall Sections

1. Standard F Shape
2. New Jersey Shape
3. Symmetrical About E (See Standard Wall Detail)
4. Barrier Delineators Required On Top Of Concrete Barrier Walls (Per Section 521 of Standard Specifications, unless other finish called for in plans).

Concrete Barrier Wall Terminal For Narrow Median

1. Design speed 45 MPH or less
2. Precast construction is allowed as an alternate to cast-in-place construction.
3. Joined to bridge by a transverse joint in accordance with Details C & D on Sheet 2. The minimum segment length is 20'.
4. Bonding of the precast sections shall be facilitated by the use of sand-cement grout or equal method to assure uniform bonding.
5. Reinforcement may be required for bending stresses.
M e d i a n  O r  O u t s i d e  S h o u l d e r  A n d  S l o p e

APPROACH CLEAR ZONE OR HORIZONTAL CLEARANCE

NARROW MEDIANS WHEN BARRIER WALL END LOCATED OUTSIDE CONCRETE BARRIER WALL TRANSITION BETWEEN WIDE AND WALL END LOCATED INSIDE APPROACH CLEAR ZONE OR HORIZONTAL CLEARANCE

SHOULDER TREATMENT WHEN CRASH CUSHIONS SHIELDING CONCRETE BARRIER WALL END LOCATED INSIDE APPROACH CLEAR ZONE OR HORIZONTAL CLEARANCE

CONCRETE BARRIER WALL TRANSITION BETWEEN WIDE AND NARROW MEDIANS WHEN BARRIER WALL END LOCATED OUTSIDE APPROACH CLEAR ZONE OR HORIZONTAL CLEARANCE

CONCRETE BARRIER WALL CONNECTION TO CONCRETE BARRIER WALL TRAILING ENDS

NOTE:
1. End of wall flush mounted connections are not applicable to two-lane two-way facilities. See Sheets 20, 24, and 25 for trailing end connections on two-lane two-way facilities and for approach guardrail connections.
2. Trailing guardrail connections to double face safety shaped walls will be under one of the following traffic conditions and mounting methods:
   (a) Two-way traffic trailing condition both sides - flush mount with flat sheet back-up plate on back side.
   (b) One-way traffic trailing condition both sides - flush mount both sides.
   (c) One-way traffic trailing condition one side only - flush mount with flat sheet back-up plate on back side - see "Median Barrier Wall" mounting, Sheet 25.

W-BEAM GUARDRAIL CONNECTION TO CONCRETE BARRIER WALL TRAILING ENDS

This Length Will Be Required For All Free End Reinforcing.
F-SHAPE MEDIAN BARRIER
WHEN Y IS LESS THAN OR EQUAL TO 6 INCHES

Vert. Bars 4B
@ 10" O.C. (See Bending Diagram)

Vert. Bars 4D
@ 8" O.C. (See Bending Diagram)

Vert. Bars 4E
@ 8" O.C. (See Bending Diagram)

Vert. Bars 4A
@ 8" O.C.

No. 4 Horiz. Bars
@ 12" O.C.

Const. Joint @ 8" O.C.

Const. Joint @ 12" O.C.

SUPERELEVATED SECTION

Design Criteria:
This barrier wall has been structurally evaluated to be equivalent or greater in strength to other safety shapes which have been crash tested to NCHRP Report 350 TL-4 criteria.

Unless the plans stipulate a specific wall type, either the Cantilever wall or the "L" wall may be constructed at the Contractor's option.

Cost of the footing to be included in the contract unit price for Median Concrete Barrier Wall, LF.

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<td>36</td>
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Note: All bar dimensions in the Bending Diagram are out to out.
Lap splices are 1'-5" Minimum.

MEDIAN BARRIER WALL FOR SUPERELEVATED SECTIONS OR FOR VARIABLE ROADWAY PROFILE GRADES

INDEX
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CONCRETE BARRIER WALL

INDEX
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CONCRETE MEDIAN BARRIER WALL TRANSITIONS AT BRIDGE PIERS

To Be Paid For As Median Concrete Barrier Wall, LF
(Cost To Include Thin Walls, Fill, Cap And Transition)

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Fill To Be Free Of Deleterious And Cementitious Material

4" Concrete Cap

Granular Fill In Wall Cavity

Std. Half Barrier Wall (Thin Wall)

Roadway Or Shoulder Pavement

Pier (P)

2" Expansion Material

Over Granular Fill

SECTION AA

SECTION BB

BRIDGE PIERS

Fill To Be Free Of Deleterious And Cementitious Material
* See Plans For Additional Project Specific Reinforcement For Sign Support Foundation.

**Plan**

- **Gutter Line**
- **Symmetric About**
- **Excess Index 410 Reinforcing (Typ.)**

**Elevation**

- **Foundation (Drilled Shaft shown, Spread Footing similar)**
- **Spacing of #4 Stirrup Bars**
- **Transition from 32" to 54" Barrier Height**
- **15'-0"**
- **V-Curve Joint**

**Section A-A**

- **2" Cover (Min.)**
- **#4 Stirrup Bars**

**Section B-B**

- **6 #4 Bars**
- **ELEVATION**

**Section C-C**

- **2" Cover (Min.)**
- **Design Standards Index 410**

**Section D-D**

- **0'-0"**
- **Overhead Sign Support (Project Specific Design)**

**Description:**

**LARGE SIGN MEDIAN BARRIER MOUNTED SIGN SUPPORT TRANSITION (OPTION 1)**

- **32" F-Shape Median Barrier**
- **Transition from 32" to 34" Barrier Height**
- **Varyes**
- **32" F-Shape Median Barrier**
- **Transition from 32" to 54" Barrier Height**

**Design Standards Index 410**

**FDOT 2014 DESIGN STANDARDS**

**CONCRETE BARRIER WALL**

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**LAST REVISION 07/01/13**

**DESCRIPTION:**
LARGE SIGN MEDIAN BARRIER MOUNTED SIGN SUPPORT TRANSITION (OPTION 2)
**DESCRIPTION:**

**LARGE SIGN MEDIAN BARRIER MOUNTED SIGN SUPPORT TRANSITION (OPTION 3)**

**PLAN**

- **Gutter Line**
- **Symmetric About $\xi$**
- **Reduced Shoulder**
- **Extend Index 410 Reinforcing (Typ.)**

**SECTION A-A**

- **2' Cover (Min.)**
- **# 4 Stirrup Bars**

**SECTION B-B**

- **2' Cover (Min.)**
- **6 #4 Bars**

**SECTION C-C**

- **7'-0"**
- **0" Setback Distance (Min.)**
- **Overhead Sign Support (Project Specific Design)**

**SECTION D-D**

- **7'-0"**
- **Variety**

**ELEVATION**

- **Variety**
- **# 4 Stirrup Bars @ 3'-0" Spacing**
- **Max. Shift to Clear Project Specific Sign Support Foundation**

**Design Standards Index 410**

- **32" T-Shape Median Barrier**
- **Varies (15'-0" Min.)**
- *** Transition from 32" to 54" Barrier Height**
- **3'-0" Max.**

**SECTION C-C**

- **7'-0"**
- **Variety**

**Sign Support Foundation**

- **Max. Shift To Clear Project Specific**
- **#4 Stirrup Bars @ 1'-0" Spacing**

**Foundation** (Spread Footing shown, Drilled Shaft similar)

* See Plans For Additional Project Specific Reinforcement For Sign Support Foundation.
SPREAD FOOTING AND CYLINDRICAL NOTES

The Reinforcement Details And Dimensions For Both The Spread Footing And Cylindrical Foundations Can Be Found In Index 17511.

EMBEDDED JUNCTION BOX NOTES

1. Embedded junction boxes are to be fabricated from steel conforming to ASTM A36 and be hot-dip galvanized after fabrication. All seams shall be continuously welded and ground smooth. A neoprene gasket shall be attached to the box to provide a watertight cover. The cover screws shall be fully galvanized.

2. Remove excess concrete while green and hand form chamfers.

3. Embedded junction box complete and conduit risers are incidental to the construction and cost of the barrier wall; there is to be no separate compensation for the box, risers or installation unless specifically called for in the plans.
GENERAL NOTES:

PLAN VIEW

TRANSITION AT INLETS

BARRIER WALL FOOTING

CANTILEVER WALL

AT BARRIER WALL INLETS (INDEX NO. 218)

REINFORCING STEEL MODIFICATIONS

DIMENSIONS AND QUANTITIES

CANTILEVER WALL

REINFORCED CONCRETE BARRIER WALL (SHOULDER)

NOTE: All longitudinal reinforcement #4 bars.

WALL AND FOOTING

FRONT FACE BARRIER

TIME BENDING DIAGRAM

NO. 218 FOR

INDEX

SEE INDEX

_NO_ 218

SEE Index

(See Bending Diagram)

Bars 4G @ 8" O.C. (Max.)

No. 4 Bars, 10' in Length Centered on Inlet

Permitted

Bars 4F @ 8" O.C. (Max.)

Bars 4G @ 8" O.C. (Max.)

No. 4 Bars, 10' in Length Centered on Inlet

Permitted

Bars 4F @ 8" O.C. (Max.)

NOTE: All longitudinal reinforcement #4 bars.
**DESCRIPTION:**

Require Localized Omission Of Toe For Use In Areas Where Obstructions

**REVISIO N:**

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**NO. SHEET NO. INDEX**

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**DESCRIPTION:**

REVISION LAST

FDOT 2014 DESIGN STANDARDS

**CONCRETE BARRIER WALL**

QUANTITIES: Class II Concrete 0.29 CY/LF
Reinforcing Steel (Bar 4H) 28.6 LBS/LF
Reinforcing Steel (Bar 4J) 26.8 LBS/LF

For Use In Areas Where Obstructions Require Localized Omission Of Toe

**BENDING DIAGRAMS**

Note: D = 3"
EITHER REINFORCED CONCRETE BARRIER WALL (SHOULDER) OR RETAINING WALL WITH CONCRETE TRAFFIC RAILING

Concrete Barrier Wall (Shoulder)

Varies (Deflected Barrier Wall)

Approach End Anchorage Assembly (MELT Shown)

Approach Slab

1:50

Reinforced Concrete Barrier Wall on Shoulder

Concrete Traffic Railing on Retaining Wall or Reinforced Concrete Barrier Wall (Shoulder)

Varies (See Plans)

Concrete Barrier Wall (Shoulder)

68.75' Min. Approach Guardrail Except When Plans Call For Attenuator In lieu Of Guardrail, For Additional Details See Index No. 400

Concrete Barrier Walls on Approaches to Bridges

Design Standards

DESCRIPTION:

To be deleted on trailing ends except for 2-lane 2-way facilities. The tangent guardrail shall be anchored by End Anchorage Type II, Index No. 400.

End measurement for guardrail payment when guardrail connected to shoulder barrier walls. See Index No. 400, Detail J for end measurement when guardrail connected to concrete traffic rails constructed with approach slab or on retaining walls.

Views show approach roadside barriers when length of need exceeds the length of either retaining walls with concrete traffic railings or Reinforced Concrete Barrier Wall (Shoulder) on shoulders. When either of these rigid barriers alone satisfies the approach length of need, the wall ends shall be shielded by crash cushions, or, by guardrail the same as for bridge traffic rails, as detailed in Index No. 400. See other flagged notes for trailing end treatments. Miscellaneous asphalt paving under guardrail not shown.

Guardrail connection to concrete traffic railings on retaining walls shall be in accordance with the Structures Design office Standard Drawings and the plans. Approach guardrail connections to shoulder concrete barrier walls shall be in accordance with the details shown on Sheets 2, 24 and 25 of this Index and Index No. 400, Detail J.

See shoulder Note Left

Approach End Anchorage Assembly (MELT Shown)

Approach Slab

Shoulder Pavement

Normal Shoulder For Extended Guardrail

Paved Shoulder (See Plans)

Grassed

Shoulder Pavement

Approach Slab

Roadway Shoulder (Width Same As For Bridge)

Approach Slab

Shoulder Pavement

Shoulder Line

Transition To Suit Barrier Wall Terminal Configuration

15' Shoulder Gutter

WITH CONCRETE BARRIER WALL (SHOULDER)

Guardrail (For Additional Details See Index No. 400)

Transition Section

2 Panels

Approach End Anchorage Assembly (MELT Shown)

Approach Slab

Shoulder Pavement

Shoulder Line

Transition Section

2 Panels

Approach End Anchorage Assembly (MELT Shown)

Approach Slab

Shoulder Pavement

Shoulder Line

Transition Section

2 Panels

Approach End Anchorage Assembly (MELT Shown)

Approach Slab

Shoulder Pavement

Shoulder Line

Transition Section

2 Panels

Approach End Anchorage Assembly (MELT Shown)

Approach Slab

Shoulder Pavement

Shoulder Line

WITH SHOULDER GUTTER AND GUARDRAIL

Guardrail (For Additional Details See Index No. 400)

WITH GRASSED OR PAVED SHOULDERS AND GUARDRAIL

*Guardrail connection to concrete traffic railings on retaining walls shall be in accordance with the Structures Design Office Standard Drawings and the plans. Approach guardrail connections to shoulder concrete barrier walls shall be in accordance with the details shown on Sheets 2, 24 and 25 of this Index and Index No. 400, Detail J.

CONCRETE BARRIER WALLS ON APPROACHES TO BRIDGES

07/01/00

07/01/00

FDOT 2014

DESIGN STANDARDS

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SHEET

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NOTE:
X = Length of advancement in feet for near and opposing approach lanes. See Sheet 14.
For locations without utility strips see Sheet 11.
For transition and sidewalk details see Sheets 12 & 13 and for sectional details see Sheet 14.
The 1.5' offsets to toe of barrier wall cannot be reduced to accommodate hazards; however, hazards located in the stem of the wall may be accommodated by the details on Sheets 22 & 23.
Sidewalk Alignment Varies To Suit Conditions Around Hazard

Tactile Surface

Sidewalk (6' Std.)

Type F Curb & Gutter (2')

End Barrier Wall (Rigid) (Curb & Gutter)

Bridge

10' Transition

X (Length Of Advancement, Ft.)

Tactile Surface

(Sidewalk & Gutter)

Type F Curb & Gutter (2')

End Barrier Wall (Rigid) (Curb & Gutter)

10' Transition

X (Length Of Advancement, Ft.)

Bridge

10' Transition

X (Length Of Advancement, Ft.)

Bridge

10' Transition

Hazard 4' or less from face of curb

Concrete Barrier Wall (Rigid) (Curb & Gutter)

Curb and Gutter Without Utility Strip and With Adjacent Bicycle Lane

NOTE:

1. Length of advancement in feet for near and opposing approach lanes. See Sheet 14.

2. For locations with utility strips see Sheet 10. For transition and sidewalk see Sheets 12 & 13, for sectional details see Sheet 14.

3. The 1.5' offsets to toe of barrier wall cannot be reduced to accommodate hazards; however, hazards located in the stem of the wall may be accommodated by the detail on Sheets 22 & 23.
WITH OR WITHOUT UTILITY STRIP
NEAT LINE PICTORIAL VIEW

• Transition Segments Shall be Dowelled into the End of the Barrier Wall. In the Following Manner:
  Four 1" diameter holes 6" deep on 8" centers shall be drilled in the end of the barrier and #6 bars 15" long set in an Adhesive Bonded Material System. The ends of the dowels extending into the transition segment shall be wrapped with one layer of 13 lb Type 1 asphalt-saturated roofing felt with the ends crimped.

• When Construction Joints Are Utilized For Transition Segment Construction, The Stem shall be Dowelled To The Footing In The Following Manner:
  Five #5 bars 15" long shall be embedded 7" into the footing. The dowels shall be spaced 15" on centers with the first dowel located 12" from the barrier wall. Dowels may be placed within or adjacent to the keyway.

NOTE: Drainage slots shall be located at all low points along the sidewalk, and, unless otherwise shown in the plans, slots shall be spaced at intervals not exceeding 50' in fill sections and 20' in cut sections. Slots shall be located such that only one bar is cut away or deleted in front and back lines of vertical reinforcement.

SIDEWALK DRAINAGE SLOT FOR BARRIER WALL (RIGID) (CURB & GUTTER)

PLAN
WITH UTILITY STRIP
RIGHT SIDE SHOWN, LEFT SIDE OPPOSITE HAND
ONE-WAY AND TWO-WAY TRAFFIC (NEAR LANE APPROACH)
CONCRETE BARRIER WALL (RIGID) (CURB & GUTTER) • TRANSITION SEGMENT • WITH ADJACENT BICYCLE LANE
The contract unit price for Shoulder Concrete Barrier Wall (Rigid-Curb & Gutter), LF.

For barrier wall inlet details see Index No. 219. Inlet extends into bicycle lane 12". Wall to be paid for under intervals so that spacing will not exceed 100’.

Transverse expansion joints are to be constructed at the juncture of wall transitions and curb and gutter, and at be doweled in the manner described for ‘Transition Segments’ on Sheet 13.

Note: All longitudinal reinforcement No. 4 bars. Shorter segments due to construction or expansion joint shall be detailed in the manner described for Transition Segments on Sheet 13.

Note: D = Distance in feet from near edge of the near approach traffic lane to back of hazard or clear zone width whichever is less. For left side hazards and clear zones on two-way undivided facilities D is measured from the inside edge of the near approach traffic lane.

d = Distance in feet from near edge of the near approach traffic lane to the face of barrier (at offset control point). For left side hazards on two-way undivided facilities d is measured from the inside edge of the nearest opposing traffic lane.

LENGTH OF ADVANCEMENT

Equation Variables:

\[ X = \text{Length of Advancement, Ft. (X)} \]
\[ D = \text{Distance in feet from near edge of the near approach traffic lane to back of hazard or clear zone width whichever is less. For left side hazards and clear zones on two-way undivided facilities D is measured from the inside edge of the near approach traffic lane.} \]
\[ d = \text{Distance in feet from near edge of the near approach traffic lane to the face of barrier (at offset control point). For left side hazards on two-way undivided facilities d is measured from the inside edge of the nearest opposing traffic lane.} \]

FOR HIGH SIDE SECTION TT

FOR LOW SIDE SECTION TT

Note: All longitudinal reinforcement No. 4 bars. Shorter segments due to construction or expansion joint shall be detailed in the manner described for Transition Segments on Sheet 13.

Transverse expansion joints are to be constructed at the juncture of wall transitions and curb and gutter, and at intervals so that spacing will not exceed 100’.

For barrier wall inlet details see Index No. 219. Inlet extends into bicycle lane 12”. Wall to be paid for under the contract unit price for Shoulder Concrete Barrier Wall (Rigid-Curb & Gutter), LF.
TWO-WAY TRAFFIC (UNDIVIDED)

Bridge

X (Length Of Advancement, Ft.)

10' Transition

End Barrier Wall (Rigid) (Curb & Gutter)

Sidewalk (5' Std.)

Utility Strip (Varies)

Type F Curb & Gutter (2')

2.5' Barrier Wall

Tactile Surface

TWO-WAY TRAFFIC (UNDIVIDED)

Bridge

X (Length Of Advancement, Ft.)

10' Transition

End Barrier Wall (Rigid) (Curb & Gutter)

Sidewalk (5' Std.)

Utility Strip (Varies)

Type F Curb & Gutter (2')

2.5' Barrier Wall

Tactile Surface

ONE-WAY TRAFFIC

BRIDGE END HAZARD

X (Length Of Advancement, Ft.)

10' Transition

End Barrier Wall (Rigid) (Curb & Gutter)

Sidewalk (5' Std.)

Utility Strip (Varies)

Type F Curb & Gutter (2')

2.5' Barrier Wall

Tactile Surface

ONE-WAY TRAFFIC

HAZARD 4' OR LESS FROM FACE OF CURB

CONCRETE BARRIER WALL (RIGID) (CURB & GUTTER)
CURB AND GUTTER WITH UTILITY STRIP AND WITHOUT ADJACENT BICYCLE LANE

NOTE:
X = Length of advancement in feet for near and opposing approach lanes. See Sheet 19.
For locations without utility strips see Sheet 16.
For transition and sidewalk see Sheets 17 & 18 and for sectional details see Sheet 19.
The 2.5' offsets to toe of barrier wall cannot be reduced to accommodate hazards; however, hazards located in the stem of the wall may be accommodated by the details on Sheets 22 & 23.
ONE-WAY TRAFFIC

HAZARD 4' OR LESS FROM FACE OF CURB

CONCRETE BARRIER WALL (RIGID) (CURB & GUTTER)
CURB AND GUTTER WITHOUT UTILITY STRIP AND WITHOUT ADJACENT BICYCLE LANE

NOTE:
X=Length of advancement in feet for near and opposing approach lanes. See Sheet 19.

For locations with utility strips see Sheet 15. For transition and sidewalk see Sheets 17 & 18 and for sectional details see Sheet 19.

The 2.5' offsets to toe of barrier wall cannot be reduced to accommodate hazards; however, hazards located in the stem of the wall may be accommodated by the detail on Sheets 22 & 23.
CONCRETE BARRIER WALL (RIGID) (CURB & GUTTER) • TRANSITION SEGMENTS • WITHOUT ADJACENT BICYCLE LANE

PLAN

WITH UTILITY STRIP

NEAT LINE PICTORIAL VIEW

SECTION AA

SEGMENT

SECTION CC

ONE-WAY TRAFFIC (TRAILING END)

NEAT LINE PICTORIAL VIEW

SECTION BB

SEGMENT

TWO-WAY TRAFFIC (OPPOSING LANE APPROACH)

CONCRETE BARRIER WALL
Transition Segments Shall Be Doweled Into The End Of The Barrier Wall In The Following Manner:

- Four 1" diameter holes 6' deep on 12' centers shall be drilled in the end of the barrier and #6 bars 15" long set in an Adhesive Bonded Material System. The ends of the dowels extending into the transition segment shall be wrapped with one layer of 15 lb. Type I asphalt-saturated roofing felt with the ends crimped.

When Construction Joints Are Utilized For Transition Segment Construction the Stem Shall Be Doweled To The Footing In The Following Manner:

- Five #5 bars 15" long shall be embedded 7" into the footing. The dowels shall be spaced 15" on centers with the first dowel located 12" from the barrier wall. Dowels may be placed within or adjacent to the keyway.

NOTE: Drainage slots shall be located at all low points along the sidewalk, and, unless otherwise shown in the plans, slots shall be spaced at intervals not exceeding 50' in fill sections and 20' in cut sections. Slots shall be located such that only one bar is cut away or deleted in front and back lines of vertical reinforcement.

SIDEWALK DRAINAGE SLOT FOR BARRIER WALL (RIGID) (CURB & GUTTER)
RIGHT SIDE APPROACH SHOWN - LEFT SIDE OPPOSITE HAND

NEAR LANE APPROACH

End Of Bridge Rail Or Other Hazard That Requires Shielding

X (Length Of Advancement, Ft.)

Begin Concrete Barrier Wall (Rigid) (Curb & Gutter)

Face Of Barrier Wall

Edge Of Pavement

Offset Control Point

Departure Line

Beginning Of Barrier Wall Need

OPPOSING LANE APPROACH

WITH OR WITHOUT UTILITY STRIP - UTILITY STRIP SHOWN SEE SHEET 15 & 16 FOR APPLICATIONS

Equation Variables:

D = Distance in feet from near edge of the near approach traffic lane to back of hazard or clear zone width whichever is lesser. For left side hazards and clear zones on two-way undivided facilities D is measured from the inside edge of the near approach traffic lane.

D = Distance in feet from near edge of the near approach traffic lane to the face of curb (at offset control point). For left side hazards and clear zones on two-way undivided facilities D is measured from the inside edge of the nearest opposing traffic lane.

LENGTH OF ADVANCEMENT

FOR HIGH SIDE SECTION QQ

QUANTITIES

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<td>6'-0&quot;</td>
<td>0.31</td>
<td>34</td>
</tr>
<tr>
<td>4'-9&quot; to 5'-6&quot;</td>
<td>7'-0&quot;</td>
<td>0.33</td>
<td>37</td>
</tr>
<tr>
<td>3'-2 1/2&quot; to 4'-9&quot;</td>
<td>8'-0&quot;</td>
<td>0.25</td>
<td>39</td>
</tr>
<tr>
<td>2'-8&quot; to 3'-2 1/2&quot;</td>
<td>8'-0&quot;</td>
<td>0.30</td>
<td>42</td>
</tr>
</tbody>
</table>

FOR LOW SIDE SECTION QQ

Note: D = 3'

BENDING DIAGRAM

#4 Bar

Note: All longitudinal reinforcement #4 bars. Shorter segments due to construction or expansion joint shall be dowelled in the manner described for Transition Segments on Sheet 18.

Transverse expansion joints are to be constructed at the juncture of wall transitions and curb and gutter, and at intervals so that spacing will not exceed 100'.

For barrier wall joint details see Index No. 219. Wall to be paid for under the contract unit price for Shoulder Concrete Barrier Wall (Rigid-Curb & Gutter), LF.
Concrete Barrier Wall (Rigid-Shoulder), LF.

4. Wall to be paid for under the contract unit price for Shoulder hazards and their guardrail connections, see Sheet 24 & 25. Sheet 1 may be used. For walls with normal offsets from two-way multilane and one-way facilities the end connection on ends of two-lane two-way facilities. On trailing ends of to one-way approaches and to the approaching and trailing facilities. The guardrail connections shown on this sheet apply approach and trailing ends of both one-way and two-way.

2. The barrier wall radial segments are intended for use on approach and trailing ends of both one-way and two-way facilities. The guardrail connections shown on this sheet apply to one-way approaches and to the approaching and trailing ends of two-lane two-way facilities. On trailing ends of two-way multilane and one-way facilities the end connection on Sheet 1 may be used. For walls with normal offsets from hazards and their guardrail connections, see Sheet 24 & 25.

3. Refer to Index No. 400 for additional guardrail information.

4. Wall to be paid for under the contract unit price for Shoulder Concrete Barrier Wall (Rigid-Shoulder), LF.

** Attach thrie-beam terminal connector to shoulder barrier wall with a 21"x12"x½" thrie beam terminal connector plate and 5-½"x12" long HS hex bolts and nuts with ½" plain round washers under heads and nuts.

** Attach thrie-beam terminal connector to shoulder barrier wall with a 21"x12"x½" thrie beam terminal connector plate and 5-½"x12" long HS hex bolts and nuts with ½" plain round washers under heads and nuts.

** Attach thrie-beam terminal connector to shoulder barrier wall with a 21"x12"x½" thrie beam terminal connector plate and 5-½"x12" long HS hex bolts and nuts with ½" plain round washers under heads and nuts.

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** Attach thrie-beam terminal connector to shoulder barrier wall with a 21"x12"x½" thrie beam terminal connector plate and 5-½"x12" long HS hex bolts and nuts with ½" plain round washers under heads and nuts.

PLAN FOR DESIGN SPEED = 45 MPH

NOTE:
For details at Rigid Hazard see Sheet 21.

PLAN FOR DESIGN SPEED = 50 MPH

Note: For continuous barrier between independent bents or single pier columns see Sheets 21-23.

SHOULDER BARRIER WALL AT ABOVE GROUND RIGID HAZARDS
WHEN GUARDRAIL OFFSET FROM HAZARD LESS THAN 3'

<table>
<thead>
<tr>
<th>ARC LENGTH (FT)</th>
<th>DISTANCE (x) (FT)</th>
<th>OFFSETS (y) (FT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>0.00</td>
<td>0.06</td>
</tr>
<tr>
<td>8</td>
<td>0.99</td>
<td>0.26</td>
</tr>
<tr>
<td>12</td>
<td>1.98</td>
<td>0.58</td>
</tr>
<tr>
<td>16</td>
<td>15.96</td>
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<td>2.30</td>
</tr>
<tr>
<td>28</td>
<td>27.83</td>
<td>2.99</td>
</tr>
</tbody>
</table>

Note: Wall may be constructed in chords having lengths ≤ 4 feet.

* 12"x12"x½" galvanized steel back-up plate with ½" post bolts (either 14" or 18" long) and nuts with ½" plain round washers under nuts.

** Attach thrie-beam terminal connector to shoulder barrier wall with a 21"x12"x½" thrie beam terminal connector plate and 5-½"x12" long HS hex bolts and nuts with ½" plain round washers under heads and nuts.
All horizontal reinforcement #5 bars.
All vertical reinforcement #4 bars at 12" centers.

TO BE CONSTRUCTED IN LIEU OF SECTION AA WHEN THRU DRAINAGE REQUIRED

Maintenance Apron

6" Concrete Pad And
2'-3" Const. Joint

3"x12" Drain Slot

Shldr. Pavt.

10" R

Face Of Rigid Hazard

NOTE:
All vertical reinforcement #4 bars at 12" centers.
All horizontal reinforcement #5 bars.

SHOULDER BARRIER WALL AT ABOVE GROUND RIGID HAZARDS WHEN GUARDRAIL OFFSET FROM HAZARD LESS THAN 3'
In Accordance With Sheet Nos. 24 & 25.

Connect Guardrail To Wall With Transition Rails
Construct Curb & Gutter Flare At End Of Wall With Full Height Curb, Index No. 300; And, When Approach Shielding Is Guardrail And Curb & Gutter, Construct 13' (Min.) Of Concrete Barrier Wall, Section 'TT' Or Section 'QQ'; Construct Curb & Gutter Flare At End Of Wall With Full Height Curb, Index No. 300; And, Connect Guardrail To Wall With Transition Rails (Section 'TT' Or Section 'QQ' With Curb & Gutter Approach) In Accordance With Sheet Nos. 24 & 25.

Surface Against Hazard.
To Maintain Walls Full Bearing Fillets Are To Be Adjusted Front Of Hazard Face The When Back Of Wall Located In "4 3 7" Expansion Material Or Pile Shown) (Square Bridge Pier Rigid Hazard See 'DETAIL B' Sheet 2 Doweled Transverse Joint For Applications See Table Below Reinforced Concrete Barrier Wall (Shoulder) With Flush Shoulders; Or, Section 'TT' Or Section 'QQ' With Curb & Gutter (Round Bridge Pier Or Pile Shown)

When Approach Shielding Is Guardrail And Curb & Gutter, Construct 13' (Min.) Of Concrete Barrier Wall, Section 'TT' Or Section 'QQ'; Construct Curb & Gutter Flare At End Of Wall With Full Height Curb, Index No. 300; And, Connect Guardrail To Wall With Transition Rails In Accordance With Sheet Nos. 24 & 25.

CONCRETE BARRIER WALL WHEN GUARDRAIL OFFSET FROM BENT OR PIER LESS THAN 3 FEET OR WHERE WALL STEM ABUTS SUPPORTS OR PIER COLUMN

Barrier wall footings that conflict with bent or pier foundations shall be modified as described in the plans.

CONCRETE BARRIER WALL WHEN SPAN BETWEEN BENT SUPPORTS OR PIER COLUMNS EXCEEDS 13'

When Back Of Wall Located In Front Of Hazard Face The Fillets Are To Be Adjusted To Maintain Walls Full Bearing Surface Against Hazard.

Construct Wall Same As Approach Treatment Beyond Last Bent Support Or Pier (Where Guardrail Continues, Same As Approach Except On One Way Trailing End Omit Rail Transition).

When Approach Shielding Is Guardrail And Curb & Gutter, Construct 13' (Min.) Of Concrete Barrier Wall, Section 'TT' Or Section 'QQ'; Construct Curb & Gutter Flare At End Of Wall With Full Height Curb, Index No. 300; And, Connect Guardrail To Wall With Transition Rails In Accordance With Sheet Nos. 24 & 25.
HAZARD PENETRATING STEM OF RIGID CONCRETE BARRIER WALLS

The details on sheets 22 & 23 are treatments to the F-shape concrete barrier walls depicted on Sheet Nos. 9 through 19, where site conditions impose reduced clearances between above ground hazards and the walls. Bridge bent supports and piers are shown. These treatments are not applicable to hazards that cannot provide lateral support for the walls. See the plans for limits of wall sections applied and other associated wall treatments.
7. For additional guardrail information refer to Index No. 400.

6. On the trailing side of MEDIAN BARRIER WALL, offset blocks may be omitted at posts numbers (1), (3) and (5).

5. The nested beams shall not be bolted to blocks and posts at posts numbers (1), (3) and (5).

4. Either steel or timber guardrail post may be used, timber posts shown.

3. Where reaming is necessary to fit nested beams the reamed surfaces shall be metalized in accordance with Section 562 of the Standard Specifications.

2. W-beam elements do not apply to these transition schemes. For barrier wall trailing end guardrail connections for one-way lanes, see Sheet 2.

1. The longitudinal dimensions and payment limits shown for median concrete barrier wall also apply to shoulder concrete barrier walls.

STANDARD GUARDRAIL APPROACH TO SHOULDER BARRIER

TRANSITION SECTION NOTES

1. The longitudinal dimensions and payment limits shown for median concrete barrier wall also apply to shoulder concrete barrier walls.

2. W-beam elements do not apply to these transition schemes. For barrier wall trailing end guardrail connections for one-way lanes, see Sheet 2.

3. Where reaming is necessary to fit nested beams the reamed surfaces shall be metalized in accordance with Section 562 of the Standard Specifications.

4. Either steel or timber guardrail post may be used, timber posts shown.

5. The nested beams shall not be bolted to blocks and posts at posts numbers (1), (3) and (5).

6. On the trailing side of MEDIAN BARRIER WALL, offset blocks may be omitted at posts numbers (1), (2), (3), (5), (6) and (8) (See Sheet 2).

7. For additional guardrail information refer to Index No. 400.
Attach thrie-beam terminal connector to median barrier wall with a 21"x12"x8" thrie-beam terminal connector plate and 5-3/4"x12" long HS hex bolts and nuts with 9/16 plain round washers under heads and nuts.

Attach to shoulder barrier wall with a 21"x12"x8" thrie-beam terminal connector plate and 5-3/4"x12" long HS hex bolts and nuts with 9/16 plain round washers under heads and nuts.