
A listing of all of the revisions since the 2007 Edition can be reviewed at the above website. Some of the more significant revisions included with the May updates that should be reviewed prior to design and construction are:

- **C-04.20** Downdrain Inlets require leaveouts around posts in concrete.
- **C-05.10** Curb and Gutter – new 4” high Type E freeway curb added.
- **C-05.30** Sidewalk Ramps - gutter pan to be transitioned to 5% max. at ramp entrance to meet ADA slope requirements.

Design personnel should incorporate the new C-Stds into their project plans. For projects at or near completion where the inclusion of the new standard drawings is not practical, the 1A Sheet must accurately reflect the drawings correct revision date. Construction personnel should review the drawing revisions for possible implementation on their projects.

Any questions regarding the updated standards may be directed to Chris Cooper (602-712-8493) or Terry Otterness (-4285) in the Roadway Group.

C: Roadway Engineering Group
   Valley Project Management
   Statewide Project Management
   Construction Group
   Districts (10) – Construction Orgs, Permits, Development, Traffic
   Bridge Group
   Materials Group
   Maintenance Group
   Local Government Section
   Engineering Technical Group
   Contracts and Specifications Section
   Engineering Consultants Section
   FHWA
   State Engineer Office

2 of 2
NOTICE TO READERS: REVISION DATES

This edition of the Roadway Construction Standard Drawings contains both format and engineering changes.

The format changes include font style and size, line weights and terminators, and placing information on the same levels as specified for plan sheets. These changes are universal for all sheets and are not noted. This edition is updated to 5/12 and is noted in the title block of each sheet.

Engineering changes have been made to some of the drawings since the last edition was issued in May 2007. These numbered changes are noted in the revision block in the upper left-hand corner of the affected sheets and referenced by circled numbers on the drawings.

Future engineering revisions will be noted in the revision and title blocks, and the 1A sheet.
Updates to the May, 2007 Construction Standard Drawings

1. November 1, 2007 Revised Standard Drawings C-07.02, C-21.10 and C-21.20
2. November 2, 2009 Revised Standard Drawings C-10.06, Sheets 1 and 2 of 2.
5. May 24, 2010 Revised Standard Drawing C-08.20; revised Section A-A and Section B-B.

May 2012 Updates to the Construction Standard Drawings

1. C-01.10, Sheet 3 of 4, Symbol Legend: deleted Sanitary Sewer (1"=20’) and Storm Drain (1”=20’) and (1”=50’).
2. C-01.10, Sheet 4 of 4, Symbol Legend: deleted Depressed Index and Intermediate Contour Lines.
3. C-01.30, Sheet 3 of 3, General Abbreviations: added Sight Distance, headlight.
4. C-03.10, Sheet 5 of 5, Ditches, Channels, Dikes and Berms, Headwall Berms: eliminated the 1’ buffer zone between back of headwalls and the clear zone. Revised the Plan, Elevation, and Section Views to accurately display berm and slope graphics.
5. C-04.10, Sheet 2 of 2: revised “Leaveout” graphics in ‘Plan View’ and revised General Note 7 by adding non-cohesive material.
6. C-04.20, Sheet 1 of 2: revised General Note number (9) and reference in Section A-A.
7. C-04.20, Sheet 2 of 2, Downdrain, Embankment Double Inlet: revised “Leaveout” graphics in ‘Inlet Plan View’ and revised General Note 2 by adding non-cohesive material.
8. C-05.10, Curb & Gutter, Curb, Gutter: revised Curb & Gutter view for Types B, C, C-1 by adding Types E and E-1; revised Urban Freeway Curb & Gutter Table to include Types E and E-1 and added new column for Curb Width “c”. Rearranged the Standard Drawing graphics.
9. C-05.12, Sheet 1 of 3, Curb & gutter Transitions: revised Section (Curb Width) for Curb & Gutter Application and in General Notes, revised Note to include Types E or E-1.
10. C-05.12, Sheet 2 of 3, Curb & gutter Transitions: revised Type 2 - Curb & Gutter Transition Plan View gutter width designation to “c”, and added “See Plans”. This corresponds to the revision in the Table in C-05.10. Revised Note at upper-right of sheet to include Types E and E-1 curb & gutter.

11. C-05.12, Sheet 3 of 3, Curb & gutter Transitions: revised Types 5 & 8 – Curb & Gutter Transitions to include Type E or E-1 Curb and Gutter.

12. C-05.30, Sheets 1 through 7 of 7, Sidewalk Ramps: revised “Depressed Curb and Gutter” slope/depth criteria at ADA ramp.

13. C-07.01, Sheet 2 of 2, PCCP Joints: revised “Median Barrier Joint” (AC Pavement on Back Side of Barrier) by adding dashed line in view and added Barrier Footing Concrete Thickness note (in General Notes) by adding ‘F’ notation.

14. C-10.05, Sheets 1 and 2 of 2, W-Beam Guardrail, G4(Modified) With Freeway Curb and Gutter: revised Elevation and Section Views from 28 2/3” to 28 5/8” dimensions. This corresponds to the 5/8” gutter depression value listed in the Table in C-05.10 (not 2/3”).

15. C-10.20, Thrie-Beam Guardrail, G9, Blocked-out Steel Post, revised location of upper extension line for 20” dimension in Elevation View for G9 System.

16. C-10.40, Concrete Median Barrier, 32” Type ‘F’, Cast-in-Place: revised Section A-A by adding filled square symbol and adding footing depth notes at end of General Notes.

17. C-10.41, Concrete Median Barrier, 42” Type ‘F’, Cast-in-Place: revised Section A-A by adding filled square symbol and adding footing depth notes at end of General Notes.

18. C-10.50, Sheet 1 of 2, Concrete Half Barrier, 32” Type ‘F’, Cast-in-Place: revised note defining footing depth in General Notes by removing 8” minimum requirement and adding ‘match adjacent PCCP thickness’.

19. C-10.55, Sheet 2 of 3, Concrete Half Barrier, 42” Type ‘F’ at Piers, Precast: in Section A-A, revised 3” dimension to 6”.


22. C-12.10, Fence, Sheet 2 of 5, Barbed Wire: added new General Note regarding fence wire placement and added Typical Fence Location View.
23. C-12.10, Fence, Sheet 3 of 5, Types 1 and 2, Flood Gate: minor revisions to drawing graphics.

24. C-12.10, Fence, Sheet 4 of 5, Flood Gate Installation: revised drawing graphics to view as if from the roadway centerline.

25. C-12.10, Fence, Sheet 5 of 5, Miscellaneous Details: Moved Typical Fence Location View to Sheets 1 and 2 of 5, and additional graphical changes to ‘Abutting Fence’ views; revised graphics to view as if from the roadway centerline.

26. C-12.20, Fence, Sheet 1 of 3, Fence, Chain Link, Type 1: New General Note 2 and added Typical Fence Location view.

27. C-12.20, Fence, Sheet 2 of 3, Fence, Chain Link, Type 2: revised General Note 5.

28. C-12.20, Fence, Sheet 3 of 3, Fence, Chain Link Gates: moved Typical Fence Location View to Sheet 1 of 3 and additional minor graphical changes.


30. C-15.91, Sheet 2 of 2, Freeway Catch Basin Details: revised Table information to include Type E Curb.

31. C-17.10, Rail Bank Protection for Drainageways, Types 1, 2 and 3: revised bolt specification in Rail Connection Detail by adding thread number and type.

32. C-17.15, Rail Bank Protection at Abutments, Types 4, 5 and 6: revised bolt specification in Rail Connection Detail by adding thread number and type.

33. C-17.20, Rail Bank Protection for Drainageways, Types 7, 8 and 9: revised wire gauge specification in ‘Type 9 Bank Protection Elevation’ view.

34. C-18.10, Sheet 3 of 3, Manhole, Frame and Cover Details: modified Section A-A graphics for manhole cover seat. Modified Section of Frame dimensions and graphics. Modified Section B-B dimensions and graphics. Modified dimension and graphics in ‘Bottom/Top View’. Revised bevel size from 1/8” to 3/16” per manufacturer’s specifications.
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**CONSTRUCTION DRAWING SYMBOLS**

- Straight 8” w/End Sct, Pipe (1”=20’) (All Dia) ______
- Straight 8” w/End Sct, Pipe (1”=50’ or smaller) (Dia=42” and larger) ______
- Straight 8” w/End Sct, Pipe (1”=50’ or smaller) (Dia=36” and smaller) ______
- "U" 8” w/End Sct, Pipe (1”=20”) (All Dia) ______
- "U" 8” w/End Sct, Pipe (1”=50’ or smaller) (Dia=42” and larger) ______
- "U" 8” w/End Sct, Pipe (1”=50’ or smaller) (Dia=36” and smaller) ______
- Wing 8” w/End Sct, Pipe (1”=20”) (All Dia) ______
- Wing 8” w/End Sct, Pipe (1”=50’ or smaller) (Dia=42” and larger) ______
- Wing 8” w/End Sct, Pipe (1”=50’ or smaller) (Dia=36” and smaller) ______
- "L" 8” w/End Sct, Pipe (1”=20”) (All Dia) ______
- "L" 8” w/End Sct, Pipe (1”=50’ or smaller) (Dia=42” and larger) ______
- "L" 8” w/End Sct, Pipe (1”=50’ or smaller) (Dia=36” and smaller) ______
- Pipe Ext W/End Sct & Barm (1”=20”) (All Dia) ______
- Pipe Ext W/End Sct & Barm (1”=50’ or smaller) (Dia=42” and larger) ______
- Pipe Ext W/End Sct & Barm (1”=50’ or smaller) (Dia=36” and smaller) ______
- Pipe Ext W/End Sct Roadway Widening (1”=20”) ______
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**STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION ROADWAY STANDARD DRAWINGS**

**GENERAL ABBREVIATIONS**

**5/12**

**C-01,30**

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<td>Rubber Gasket Reinforced Concrete Pipe</td>
<td>RGRCP</td>
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</table>
**GENERAL NOTES**

1. Roadway width, cut ditch width, cross slope, and pavement structure section will be shown on project plans.

2. Pavement structure slope is nominal. Actual slope is controlled by ID. See Shoulder Wedge Detail.

3. Slopes beyond the pavement structure, such as embankment and cut slopes, are relative to horizontal.

4. For slope controls within interchange areas, see project plans.

5. When median slopes intersect, see project plans for controls.

6. These slopes are intended to be used with new or reconstructed roadways.

**NOTE TO DESIGNERS**

- Required when guardrail is present on the project. Treatment shall be uniform throughout the project length. The 9' requirement may be waived under special conditions on projects without guardrail.

**SLOPE Rounding DETAIL**

- Except in solid rock, or as directed by the Engineer, the intersection of roadway cut slopes with the ground surfaces shall be rounded.

For cuts up to 6', use 5' semi-tangents for slope rounding. For each additional foot of cut and 1' to 5' semi-tangent to 11' maximum.
**GENERAL NOTES**

1. Roadway width, cut ditch width, cross slope, and pavement structure section will be shown on project plans.

2. Pavement structure slope is nominal. Actual slope is controlled by ID. See Shoulder Wedge Detail.

3. Slopes beyond the pavement structure, such as embankment and cut slopes, are relative to horizontal.

4. When median slopes intersect, see project plans for controls.

5. These slopes are intended to be used with new or reconstructed roadways.

**NOTE TO DESIGNERS**

- Required when guardrail is present on the project. Treatment shall be uniform throughout the project length. The 9' requirement may be waived under special conditions on projects without guardrail.

**SLOPE Rounding Detail**

- Except in solid rock, or as directed by the Engineer, the intersection of roadway cut slopes with the ground surfaces shall be rounded.

  For cuts up to 6', use 5' semi-tangents for slope rounding. For each additional foot of cut add 1' to semi-tangent to 11' maximum.
GENERAL NOTES

1. Roadway width, cut ditch width, cross slopes, and pavement structure section will be shown on project plans.

2. Pavement structure slope is nominal. Actual slope is controlled by (d). See Shoulder Wedge Detail.

3. Slopes beyond the pavement structure, such as embankment and cut slopes, are relative to horizontal.

NOTE TO DESIGNERS

Usage of this standard is limited in accordance with the roadway design guidelines - chapter 300.

Required when guardrail is present on the project. Treatment shall be uniform throughout the project length. The 6° requirement may be waived under certain conditions on projects without guardrail.

MINIMUM SLOPES

INTERMEDIATE SLOPES

MAXIMUM SLOPES

MINIMUM DITCH CONDITIONS DETAIL

SHOULDER WEDGE DETAIL

SLOPE ROUNDED DETAIL

Except in solid rock, or as directed by the Engineer, the intersection of roadway cut slopes with the ground surfaces shall be rounded.

For cuts up to 6°, use 5° semi-tangents for slope rounding. For each additional foot of cut add 1° to semi-tangent to 11° maximum.
1. Dimensions of ditches and channels shall be shown on the plans as bottom width, depth, and length.

2. Ditches and channels shall be constructed with a minimum grade to prevent erosion. Ditch and channel treatment shall be as provided on plans.
GENERAL NOTES

1. Dimensions for ditch dikes shall be shown on the plans as dikes delineation, height, length, dikes back slope and top of dikes elevation.

2. Dimensions for cut ditch widening shall be shown on the plans as beginning and ending stations.

3. All slopes are given relative to the grade of the cut ditch at the tee intersection.

SECTION B-B

SECTION A-A

SECTION C-C
GENERAL NOTES

1. Berm construction similar for box culvert and pipe with headwall.

2. Berm construction shown is for extension of existing facilities. Berm construction similar for new facilities.

3. See C-Standards and B-Standards for pipe and structure bedfill limits.
   - Slope shall match to top of wing walls.
   - Slope shall match wing walls design slope (2:1, 4:1, or 6:1).

STRAIGHT HEADWALL PLAN
CBC or PIPE WITH HEADWALL

ELEVATION FOR PIPE

ELEVATION FOR CBC

SECTION A-A (FOR PIPE WITH HEADWALL)

SECTION A-A (FOR CBC)
GENERAL NOTES

1. Location may be adjusted to accommodate guardrail post layout.

2. All concrete shall be Class B. Embankment cti concrete shall be in accordance with the Std. Spec.

3. Where rock is encountered the outlet may be omitted, as approved by the Engineer.

4. When outlet is used, the wire mesh shall extend through the joint into the outlet in lieu of bedding into the key.

5. Spillway invert slope shall be uniformly downward from A to B. See Section B-B.


7. See Std. Dwg C-10.06 for needed guardrail requirements.

8. 72" Timber Post

SECTION A-A

OUTLET DETAIL

SECTION B-B
GENERAL NOTES

1. Location may be adjusted to accommodate guardrail post layout.

2. All concrete shall be Class B. Embankment curb concrete shall be in accordance with the Standard Specifications.

3. Where rock is encountered the outlet may be modified, as approved by the Engineer.

4. When outlet is used, the wire mesh shall extend through the joint into the outlet instead of bending into the key.

5. Spillway invert slope shall be uniformly downward from A to B. See Section B-B.

6. See Std Dwg C-04.30 for spillway length.

7. All posts within the inlet shall have a “leaveout” for the full depth of the concrete. The “leaveout” shall measure a minimum of 1½ inch in front and ½ inch on the sides, and extend back to the toe of the curb. After guardrail installation, the “leaveout” shall be filled with a one-sack gun mix or alternate non-cohesive material as approved by the Engineer.

   **Length may be 4'-6" or 5'-0".**
GENERAL NOTES

1. Location may be adjusted to accommodate guardrail post layout.

2. All posts within the inlet shall have a "leaveout" for the full depth of the concrete. The "leaveout" shall measure a minimum of 1/2 Inch in front and 1/2 Inch on the sides, and extend in back to the toe of the curb. After guardrail installation, the "leaveout" shall be filled with a one-pack grout mix or alternate non-cohesive material as approved by the Engineer.

3. See Std Dwg C-10.06 for restored guardrail requirements.

   • Indicates AASHTO, AWC & ARTBA Task Force 13 Report designation
   • Varies with subgrade slope and pavement structural thickness
   • Varies with fill slope and pipe cover
   • 72" Timber post
   • Length may be 4’-0" or 5’-0"
   • 12" Diameter x 6", 16 Gauge Annular CMP Stub

OUTLET HEADWALL
AND CONCRETE APRON

POST SLEEVE DETAIL

"LEAVEOUT" DETAIL

SECTION A-A
### Approximate Length of Spillway (ft) -- C-02.10 & C-02.20 Slopes

<table>
<thead>
<tr>
<th>Pavement Structural Section Thickness (in)</th>
<th>Embankment Slope</th>
<th>Varies from 6(\frac{1}{8}) to 2(\frac{1}{8})</th>
<th>2(\frac{1}{4})</th>
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**Spillways are not usually used for this slope condition.**

### Approximate Length of Spillway (ft) -- C-02.30 Slopes

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<th>Pavement Structural Section Thickness (in)</th>
<th>Embankment Slope</th>
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**Spillways are not usually used for this slope condition.**

---

**C-02.10 and C-02.20 Slopes**

Spillways are not usually used for these slope conditions.

---

**C-02.30 Slopes**

Spillways are not usually used for these slope conditions.
### Approximate Down Drain Length (ft) - C-02.10 & C-02.20 Slopes

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**Note to designers:**

Use earthwork cross sections for more precise down drain lengths.

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**General Notes:**

1. For down drain details, see Std. Dwg C-04.20.
GENERAL NOTES

1. Stub shall have annular corrugation. Downdrain piping beyond stub may be either annular or helical.

2. Couplings shall be mechanical耐久性フライヤー polyethylene sheet, one place lap-type neoprene sheet or slip seam all 12" minimum width and 18 gauge minimum.

3. Maximum Q Allowable = 8 cfs
   Minimum V Allowable = 1 fps

4. Concrete shall be Class B.

STATE OF ARIZONA
DEPARTMENT OF TRANSPORTATION
ROADWAY STANDARD DRAWINGS

DOWNRAIN ENERGY DISSIPATOR

C-0450
GENERAL NOTES

1. All gutter flow lines shall be constructed to an accurate grade.

2. See Slotted Drain Std Dwg C-13.60 and C-15.91 for curb & gutter with slotted drain.

3. See Std Dwg C-05.10 for additional General Notes and dimensions.

4. See Std Dwg C-07.04 for typical curb and gutter transition locations.

5. Dimension may vary where transition occurs on curves; see plans.

Type 1 - Gutter Transition at Roadway Edge
With Angle Point 15' Applicable to Concrete Half Barrier and Curb & Gutter Applications. Curved & Gutter Alternative is Shown.

Curb & Gutter - Type B, C, C-1, E or E-1
Std Dwg C-05.10

TYPE 1 - PARALLEL-TYPE GUTTER TRANSITIONS AT RAMPS

PLAN VIEW
Curb Height Varies 0" to 7" Maximum In
Decreased Curb Area Beyond the End of
Barrier. See Plans for Curb Height.

| Curb & Gutter Type B, C, E-1, D-1, D-2, D-3
| E or E-1.

Type 2 - Curb & Gutter Transition
PLAN VIEW

Dimensions May Vary
Type D, D-1, D-2 or D-3
Std Dwg C-05.10

Curb & Gutter
Type B, C, E-1, E or E-1
Std Dwg C-05.10

Type 3 - Curb & Gutter Transition
AT PAVED GORE
PLAN VIEW

Dimensions May Vary
Type D, D-1, D-2 or D-3
Std Dwg C-05.10

Type 4 - Curb & Gutter Transition

Dimensions Vary

Type B, C, E-1

Elevation

Section A-A

Section B-B

Perspective View

Perspective View
**Type 5 - Curb & Gutter Transition**

Curb & Gutter
Type B, C, C-1, E or E-1
Gutter Width = 4'-0""
Std Dwg C-05.10

**Type 6 - Single Curb or Curb & Gutter Transition**
(Curb & Gutter Shown)

Single Curb
Curb & Gutter
or Non-C Std
See Plans

**Type 7 - Curb & Gutter Transition**

Single Curb
Type A, A-1 or C
Std Dwg C-05.10
or Non-C Std
See Plans

**Type 8 - Curb & Gutter Transition**

Curb & Gutter
Type B
5'-0" Curb Height
Gutter Depress
Std Dwg C-05.10

**Type 9 - Curb & Gutter Transition**

Curb & Gutter
Type D Series
Std Dwg C-05.10
GENERAL NOTES

1. Unless otherwise specified, driveways shall be 6" thick.

2. Two-inch deep transverse contraction joints shall be placed in driveways if the driveway width is over 20'. If the driveway thickness is greater than 6", then the contraction joint depth shall be T/3, where T is the thickness of the driveway. Joints shall be either formed or sawn. Formed joints shall be finished with a butt having a 1/4" radius. See Sheet 2 of 2 for the Contraction Joint Detail.

3. Expansion Joints shall be located between driveways and sidewalks and all abutting structures. The 1/2" Joint Tilter shall extend the full depth of the concrete. See Sheet 2 of 2 for the Expansion Joint Detail.

4. Concrete shall be finished by means of a Float, then steel troweled and then broomed with a fire brush in a transverse direction.

5. Place AB under driveways when shown on plans.

LEGEND

Minimum slope = 0.01 "
Maximum slope = 0.02 "
Straight grade with downward slope

SECTION A-A

SECTION B-B
GENERAL NOTES

1. Unless otherwise specified, sidewalks shall be 4" thick.

2. One inch deep transverse contraction joints shall be placed in sidewalks at intervals of approximately 15' or at a spacing that matches adjacent curb and gutter. If the sidewalk is over 7' in width, a 2" deep longitudinal contraction joint shall be placed in the center of the sidewalk. The maximum area of sidewalk without contraction joints or scoring lines shall be approximately 56 square feet. Joints shall be either formed or sawn. Formed joints shall be finished with a tool having a ¼" radius.

3. Score marks shall be ½" in depth. They shall be placed at 5' spacing when the contraction joint interval is 15' and at 6' spacing when the contraction joint interval is 12'.

4. Expansion joints shall be located between sidewalks and driveways and all abutting structures. Expansion joints shall match the joints in the adjacent concrete pavement or existing concrete curb and sidewalk. Maximum length of sidewalk without an expansion joint shall be 60 transverse feet. The ½" joint filler shall extend the full depth of the concrete.

5. Concrete shall be finished by means of a float, then steel troweled and then broomed with a fine brush in a transverse direction.

6. Place AB under sidewalks when shown on plans.

LEGEND

- Minimum slope = 0.01
- Maximum slope = 0.02

CONCRETE SIDEWALK ADJACENT TO CURB

CONCRETE SIDEWALK SETBACK FROM CURB

CONTRACTION JOINT DETAIL

EXPANSION JOINT DETAIL
GENERAL NOTES

1. Ramp centerline shall be radial from the face of the curb of the Sidewalk Ramp Control Point.

2. For ramps 15'-1 ft or less, the 15'-1 ft slope governs. If a 15'-1 ft slope results in a ramp length longer than 15'-1 ft, the 15'-1 ft slope may be waived and the ramp length held at 15'-1 ft, regardless of the slope.

3. Drainage inlets should not be located within the marked crosswalks, or in crosswalks marked, within the area a standard marked crosswalk would enclose.

4. Concrete shall receive a rough brush finish as shown.

5. See Std Dwg C-05.30 and C-05.40 for joint details.

- See Note 2
- 30° Maximum to Face of Pedestrian Push Button
- Pedestrian Push Button Pole when shown on Traffic Plans.

LEGEND

Minimum Slope = 100 feet (0.01%)

Maximum Slope = 50 feet (0.02%)

Maximum Slope = 20 feet (0.05%)

RAMP CURB DETAIL

SECTION A-A

SECTION C-C

PARALLEL SIDEWALK RAMP

STATE OF ARIZONA
DEPARTMENT OF TRANSPORTATION
ROADWAY STANDARD DRAWINGS

SIDEWALK RAMP
TYPE A

C-05.30
Sheet 1 of 1

5/12
GENERAL NOTES

1. Ramp centerline shall be radial from the face of the curb at the sidewalk ramp control point.

2. For ramps 15-ft long or less, the 1/5% slope governs. If a 1/5% slope results in a ramp length longer than 15-ft, the 1/5% slope may be waived and the ramp length held at 15-ft, regardless of the slope.

3. Drainage inlets should not be located within the marked crosswalks, or if crosswalks aren’t marked, within an area a standard marked crosswalk would enclose.

4. Concrete shall receive a rough-broom finish as shown. The side slope wings do not receive a broom finish.

5. The Engineer may approve replacing the side slope wing with a curb at a location where access to the side of a ramp run is blocked by a pole, utility box, other obstruction, or by a non-accessible surface such as a dirt parking strip.

6. See Std Dwg C-05.10 and C-05.20 for joint details.

LEGEND

- **Minimum Slope = 100% (0.01 'in)***
- **Maximum Slope = 50% (0.02 'in)***
- **Maximum Slope = 20% (0.05 'in)***

DETECTABLE WARNING STRIP

- See Sheet 7 of 7

SECTION

A-A

PERPENDICULAR CURB RAMP

STATE OF ARIZONA
DEPARTMENT OF TRANSPORTATION
ROADWAY STANDARD DRAWINGS

5/12
GENERAL NOTES

1. For use where sidewalk is not continuous.
2. Ramp centerline shall be radial from the face of the curb at the Sidewalk Ramp Control Point.
3. For ramps 15-ft long or less, the 15-ft slope governs. If a 15-ft slope results in a ramp length longer than 15-ft, the 15-ft slope may be walked and the ramp length held at 15-ft, regardless of the slope.
4. The top of the Ramp Curb along the back of the Sidewalk Ramp shall match the elevation of the adjacent back of sidewalk and run parallel to the Sidewalk Ramp. The Ramp Curb along the side of the Sidewalk Ramp shall match the elevation at the back of the Curb & Gutter and the back of Ramp Curb.
5. Drainage inlets should not be located within the marked crosswalks, or if crosswalks aren’t marked, within the area a standard marked crosswalk would occupy.
6. Concrete shall receive a rough broom finish as shown.
7. See Std Dwg C-05.10 and C-05.20 for joint details.

LEGEND

- Minimum Slope = 100:1 (0.01 ft/ft)
- Maximum Slope = 50:1 (0.02 ft/ft)
- Maximum Slope = 20:1 (0.05 ft/ft)

SIDEWALK RAMP AT SIDEWALK TERMINUS

DEPRESSED CURB AT SIDEWALK RAMP
GENERAL NOTES

1. For uses where sidewalk is not continuous.
2. Ramp centerline shall be radial from the face of the curb at the Sidewalk Ramp Control Point.
3. The top of the Ramp Curb along the back of the Sidewalk Ramp shall match the elevation of the adjacent back of sidewalk and run parallel to the Sidewalk Ramp. The Ramp Curb along the side of the Sidewalk Ramp shall match the elevation of the back of the Curb & Gutter and the back of Ramp Curb.
4. Drainage inlets should not be located within marked crosswalks, or if crosswalks aren't marked, within the area a standard marked crosswalk would enclose.
5. Concrete shall receive a rough broom finish as shown.
6. See Std Dwg C-05.10 and C-05.20 for joint details.

Pedestrian Push Button Post When Shown on Traffic Plans. See Traffic Signal Plans for Additional Information

10" Maximum to Face of Pedestrian Push Button

LEGEND

Minimum Slope = 1:20 (0.05"/ft)  
Maximum Slope = 1:10 (0.10"/ft)

Minimum Slope = 1:20 (0.05"/ft)  
Maximum Slope = 1:10 (0.10"/ft)

SECTION B-B

SECTION A-A
GENERAL NOTES

1. For use at end-block locations.

2. Ramp centerline shall be perpendicular to the face of the curb at the Sidewalk Ramp Control Point.

3. For ramps 15'-1" long or less, the 15% slope governs. If a 15% slope results in a ramp length greater than 15'-1", the 15% slope may be waived and the ramp length held at 15'-1", regardless of the slope.

4. For sidewalk widths greater than shown on C-05.20, the overall Sidewalk Ramp depth shall match the sidewalk width.

5. Ramp curb height to match elevation at back of adjacent sidewalk.

6. Drainage inlets should not be located within the marked crosswalks. If crosswalks aren’t marked, within the area, a standard marked crosswalk would enclose.

7. Concrete shall receive a rough broom finish as shown.

8. See Std Dwg C-05.10 and C-05.20 for joint details.

LEGEND

Minimum slope = 100% (0.01 in/hr)
Maximum slope = 50% (0.02 in/hr)
Maximum slope = 20% (0.05 in/hr)

ELEVATION
DEPRESSED CURB AT SIDEWALK RAMP

SECTION A-A

PERSPECTIVE

DEPRESSED CURB & GUTTER
Std Dwg C-05.10

Ramp Curb
See Ramp Curb Detail
Sheet 1 of 7

Detectable Warning Strip
See Sheet 7 of 7

Ramp Payment Limit
Curb & Gutter
Std Dwg C-05.10

Sidewalk
Std Dwg C-05.20

Location
See Plans

Ramp Width

Roadway Width

4'-8-1/2"
5'-0"

DEPRESSED CURB AT SIDEWALK RAMP

ELEVATION
GENERAL NOTES

1. Traffic signal foundations, traffic sign foundations and pull boxes for traffic signs and traffic signals shall be installed prior to placement of median paving.

2. See Std Dwg C-05.10 and C-05.20 for joint requirements.

3. Decorative median paving may be stamped concrete, concrete pavers, or as specified on the project plans.

4. Decorative median paving shall not be placed on a median nose transition or on a median island on a structure.

5. A 4"x6" concrete header shall be used to end decorative paving at locations when concrete sidewalk ramps are not present.

6. Median nose transitions shall not be placed on departure ends of raised medians.

7. See Bridge Group Plans for raised median on structures.

8. Median paving shall be Class B concrete.

SECTION A-A

Width as Shown on Plans

Concrete Pavers
See Note 3

4" Stamped Concrete
See Note 3

1" Sand

4" AB (Class 2)

SECTION B-B

5'

2.5'

A

PLAN

Radius
See Plans

A

Median Paving
See Plans (Typ)

Single Curb
Std Dwg C-05.10

NOSE LAYOUT

Median Paving
See Plans (Typ)

Single Curb or
Curb & Gutter (Typ)
See Plans

A

B
GENERAL NOTES

1. Driveway types:
   - Residential - one providing access to a single family residence, to a duplex, or to an apartment building containing five or fewer dwelling units.
   - Commercial - one providing access to an office, retail or institutional building or to an apartment building having more than five dwelling units.
   - Industrial - one directly serving a substantial number of truck movements to and from loading docks of an industrial facility, warehouse or truck terminal.

2. Joint-use driveways may become desirable for landowners of adjacent properties to service both properties. If this is the case, only one of the two adjacent landowners need apply for the access permit, but a recorded joint-use easement, signed by all parties involved, must accompany the application form. The property line can be located anywhere in reference to the driveway, depending on mutual agreement.

3. Driveways for high volume traffic generators shall be approved individually by Regional Traffic Engineering or the Traffic Engineering Group.

4. Driveways with curb returns in urban areas shall be installed only with the approval of Regional Traffic Engineering or the Traffic Engineering Group.

5. Driveways and depressed curbs shall be located as noted on plans or as directed by the Engineer.

6. Drainage structures shall be provided under driveways where necessary.

7. Dimensions indicated as minimum shall be avoided whenever possible in favor of those indicated as desirable.

RURAL DEVELOPMENTS

(1) 10' Minimum, 20' Desirable
(2) 15' Minimum
(3) 25' Minimum, 40' Desirable
(4) 40' Minimum

(5) 7.5' Minimum Industrial Setback Line
(6) P/L

URBAN DEVELOPMENTS

(1) 10' Minimum, 20' Desirable
(2) 15' Minimum
(3) 25' Minimum, 40' Desirable
(4) 40' Minimum
(5) One-Way Couplet for Use Only on One-Way Roadways

(6) Residential - 10' Minimum, 30' Maximum
(7) Commercial - One-Way 15' Minimum, 30' Maximum
(8) Two-Ways 25' Minimum, 40' Maximum
(9) Industrial - 20' Minimum, 40' Maximum

Driveway & Turnout Layouts

STATE OF ARIZONA
DEPARTMENT OF TRANSPORTATION
ROADWAY STANDARD DRAWINGS

Print No. C-0610
Sheet 1 of 2

R - 1 = 20' Minimum, 30' Desirable
R - 2 = 25' Minimum, 40' Desirable
R - 3 = 80'
R - 4 = 20' Minimum
W = 25' Minimum, 40' Maximum

- See Proper City or County Regulation
GENERAL NOTES
1. Grade as shown on plans or as negotiated between property owner and Engineer.
2. When field conditions require modifications to plans, contact design engineer for assistance.
3. See Sheet 1 of 2 for all other General Notes.

**URBAN CROSS SECTION (UP-GRADE)**

![Diagram of urban cross section up-grade]

**URBAN CROSS SECTION (DOWN-GRADE)**

![Diagram of urban cross section down-grade]

**RURAL CROSS SECTION (UP-GRADE)**

![Diagram of rural cross section up-grade]

**RURAL CROSS SECTION (DOWN-GRADE)**

![Diagram of rural cross section down-grade]

**DESIRABLE URBAN CROSS SECTION**

![Diagram of desirable urban cross section]
GENERAL NOTES

1. When load transfer dowel assemblies are required, use dimensions shown in 1" x 1", see Assembly Placement and Edge Clearance Details, Std. Dwg. C-07.06.

2. In slip form type pavement construction, LWP Joints shall be used. In fixed form construction either LWP or LC Joints may be used.

3. LC Joints shall be constructed around the complete perimeter of miscellaneous structures, or as directed by the Engineer.

4. Miscellaneous structures include, but are not limited to, catch basins, sign structure foundations, plers, abutments, barrier transitions, scoured ditches and other concrete facilities, constructed within the right-of-way.

JOINT ABBREVIATIONS

LWP - Longitudinal Weakened-Plane Joint
TWP - Transverse Weakened-Plane Joint
LC - Longitudinal Construction Joint
TC - Transverse Construction Joint
E, H, K - Expansion Joints
S - AC/PCCP Edge Seal Joint
T - PCCP Thickness
P - Polyethylene
**GENERAL NOTES**

1. Joints are generally shown with pavement sloping toward the joint.

**JOINT ABBREVIATIONS**

- G - Gutter Joint
- T - PCP Thickness
- D - Gutter Thickness
- B - Barrier Joint
- F - Barrier Footing Concrete Thickness (Full-depth Concrete Shown)

**WEAKENED-PLANE JOINT DETAIL (WITH AR-ACFC)**

**HALF BARRIER JOINT**

- B Joint

**SINGLE CURB JOINT**

- A Joint

**MEDIAN BARRIER JOINT**

- B Joint

- AC Pavement on Back Side of Barrier
GENERAL NOTES

1. Load transfer dowel assemblies may be used when permitted in the project specifications.

2. Load transfer dowel assemblies are used with non-swept, mainline PCPP joints.

3. When used, load transfer dowel assemblies are to be placed at each transverse weakened-plane joint on the traveled lanes as shown on the plans.

4. See Std. Dwg C-07.00 through C-07.04 for additional information.

5. See plans or Std. Dwg C-07.03 through C-07.04 for transverse joint spacing.

6. See plans for pavement thickness less than 12" or greater than 14".

Load transfer dowel assembly shall be assembled from the following materials (see Quantity Table):

- Dowel bars - 1-1/4" diameter x 1'-6" plain round bars with coating. See Special Provisions.
- Intermediate legs - 2 gauge or W-5.5 wire.
- End legs - 2 gauge or W-5.5 wire.
- Upper space bar - 2 gauge or W-5.5 wire x 0.079" (see Dimension Table).
- Lower space bar - 2 gauge or W-5.5 wire x 0.079" (see Dimension Table).
- Tie bars - W-1.5 wire x 16".
- Anchor strap - 1-3/4" x 3" steel strap. Place with a 1/2" minimum length steel ball for LDP, 0.25 minimum length steel ball for ADB or ABS. 0.145 diameter ASTM A227 Class 1 with 1/4" head or washer.

QUANTITY TABLE

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STATE OF ARIZONA
DEPARTMENT OF TRANSPORTATION
ROADWAY STANDARD DRAWINGS

LOAD TRANSFER DOWEL ASSEMBLY

5/12
GENERAL NOTES

1. LC and LWP joint locations shown are typical. The actual paving joint plan with joint locations shall be based upon the project paving plan submitted by the contractor and approved by the Engineer in accordance with Subsection 401-3.01 of the Standard Specifications.

2. Skewed PCP joints shall be used when load transfer dowel assemblies are not required.

3. "A" shall equal 4' minimum (Typ)
   "B" shall equal 3' minimum (Typ)
   "C" shall equal 2' minimum (Typ)

4. See Std Dwg C-07,01 for PCP joints and additional notes.

5. All transverse joints shall align with joints in adjacent slabs.

6. See Std Dwg C-05,10 for curb and gutter joint requirements.

7. At intersection of side roads or streets, joints shall be placed to give the intersection a symmetrical appearance while conforming to the cross section of the intersecting road or street.

8. The rebar in the LWP & LC joints shall be placed no greater than 1'-3" from the TC joint.

9. LC and LWP joints shall be located on the edge of traffic lanes unless otherwise shown on the project plans.

   - Transverse Construction Joint (TC) Allowable Limits (Typ)
GENERAL NOTES

1. LC and LWP joint locations shown are typical. The actual paving pour plan with joint locations shall be based upon the project paving plan submitted by the contractor and approved by the Engineer in accordance with Subsection 401-3.5.01 of the Standard Specifications.

2. Sawcut PCP joints shall be used when load transfer dowel assemblies are not required.

3. "A" shall equal 4" minimum (Typ).
   "B" shall equal 3" minimum (Typ).
   "C" shall equal 2" minimum (Typ).

4. See Std Dwg C-07.01 for PCP Joints and additional notes.

5. All transverse joints shall align with joints in adjacent slabs.

6. See Std Dwg C-05.10 for curb and gutter joint requirements.

7. At intersection of side roads or streets, joints shall be placed to give the intersection a symmetrical appearance while conforming to the cross section of the intersecting road or street.

8. The rebar in the LWP & LC joints shall be placed no greater than 1'-3" from the TC joint.

9. LC and LWP joints shall be located on the edge of traffic lanes unless otherwise shown on the project plans.

   Transverse Construction Joint (TC) Allowable Limits (Typ)
GENERAL NOTES

1. LC and LWP joint locations shown are typical. The actual paving pour plan with joint locations shall be based upon the project paving plan submitted by the contractor and approved by the Engineer in accordance with Subsection 401-3.01 of the Standard Specifications.

2. Non-staggered PCCP joints shall be used with load transfer dowel assemblies.

3. See Std Dwg C-07.01 for PCCP Joints and additional notes.

4. All traverse joints shall align with joints in adjacent slabs and are perpendicular (90°) to the longitudinal joints.

5. At intersection of side roads or streets, joints shall be spaced to give the intersection a symmetrical appearance while conforming to the cross section of the intersecting road or street.

6. See Std Dwg C-05.10 for curb and gutter joint requirements.

7. The rebar in the LWP & LC joints shall be placed no greater than 1'-3" from the TC joint.

8. Traverse weakened-plane joint shall be constructed at least 6'-0" from a transverse construction joint.

9. LC and LWP joints shall be located on the edge of traffic lanes unless otherwise shown on the project plans.
GENERAL NOTES

1. LC and LWP joint locations shown are typical. The actual paving pour plan with joint locations shall be based upon the project paving plan submitted by the contractor and approved by the Engineer in accordance with Subsection 401-3.01 of the Standard Specifications.

2. Non-stressed PCPP joints shall be used with load transfer dowel assemblies.

3. See Std Dwg C-07.01 for PCPP joints and additional notes.

4. All transverse joints shall align with joints in adjacent slabs and are perpendicular (90°) to the longitudinal joints.

5. At intersection of side roads or streets, joints shall be placed to give the intersection a symmetrical appearance while conforming to the cross section of the intersecting road or street.

6. See Std Dwg C-05.10 for curb and gutter joint requirements.

7. The rebar in the LWP & LC joints shall be placed no greater than 1'-3" from the TC joint.

8. Transverse weakened-plug joint shall be constructed at least 6'-0" from a transverse construction joint.

9. LC and LWP joints shall be located on the edge of traffic lanes unless otherwise shown on the project plans.
1. LC and LWP joint locations shown are typical. The actual paving pour plan with joint locations shall be based upon the project paving plan submitted by the contractor and approved by the Engineer in accordance with Subsection 401-3.01 of the Standard Specifications.

2. Non-skewered PCCP joints shall be used with load transfer dowels assemblies.

3. See Std Dwg C-O7.01 for PCCP joints and additional notes.

4. All transverse joints shall align with joints in adjacent slabs and are perpendicular (90°) to the longitudinal joints.

5. At intersection of side roads or streets, joints shall be placed to give the intersection a symmetrical appearance while conforming to the cross section of the intersecting road or street.

6. See Std Dwg C-O5.10 for curb and gutter joint requirements.

7. The rebar in the LWP & LC joints shall be placed no greater than 1'-3" from the TC joint.

8. Transverse weakened-plane joint shall be constructed at least 6'-0" from a transverse construction joint.

9. LC and LWP joints shall be located on the edge of traffic lanes unless otherwise shown on the project plans.
PLAN 96.25' PCCP

GENERAL NOTES

1. LC and LWP joint locations shown are typical. The actual paving pour plan with joint locations shall be based upon the project paving plan submitted by the contractor and approved by the Engineer in accordance with Subsection 401-5.01 of the Standard Specifications.

2. Non-stressed PCCP joints shall be used with load transfer dowel assemblies.

3. See Std Dwg C-07.01 for PCCP Joints and additional notes.

4. All transverse joints shall align with joints in adjacent slabs and are perpendicular (90°) to the longitudinal joints.

5. At Intersection of side roads or streets, Joints shall be placed to give the intersection a symmetrical appearance while conforming to the cross section of the intersecting road or street.

6. See Std Dwg C-05.10 for curb and gutter joint requirements.

7. The reveals in the LWP & LC joints shall be placed no greater than 1'-3" from the TC joint.

8. Transverse weakened-plane joint shall be constructed at least 6'-0" from a transverse construction joint.

9. LC and LWP joints shall be located on the edge of traffic lanes unless otherwise shown on the project plans.
GENERAL NOTES

1. All joint locations shown are typical. The actual paving pour plan with joint locations shall be based upon the project paving plan submitted by the contractor and approved by the Engineer in accordance with Subsection 401-3.01 of the Standard Specifications.
2. See Std Dwg C-07.01 for joint information.
3. See plans for ramp dimensions.
4. For ramp joint spacing sequence, see Sheet 4 of 5.
5. LC and LWP joints shall be located on the edge of traffic lanes unless otherwise shown on the plans.
GENERAL NOTES

1. All joint locations shown are typical. The actual paving pour plan with joint locations shall be based upon the project paving plan submitted by the contractor and approved by the engineer in accordance with Subsection 401-3.01 of the Standard Specifications.

2. See Std Dwg C-07.01 for joint information.

3. See plans for ramp dimensions.

4. For ramp joint spacing sequence, see ramp.

5. LC and LWP joints shall be located on the edge of traffic lanes unless otherwise shown on the project plans.

Transition
See Std C-05.12

TL Travel Lane
▲ Super Breakover Point (Cross Section)
--- Super Breakover Point (Plan View)
■ Curb Transition, See Std C-05.12
● Spacing Vertes - 18" Maximum, 11" Minimum

STATE OF ARIZONA
DEPARTMENT OF TRANSPORTATION
ROADWAY STANDARD DRAWINGS

PCGJ JOINT LOCATIONS
PARALLEL-TYPE EXIT RAMP
WITH AUXILIARY LANE
GENERAL NOTES

1. All joint locations shown are typical. The actual paving joint plan with joint locations shall be based upon the project paving plan submitted by the contractor and approved by the Engineer in accordance with Subsection 400-3.01 of the Standard Specifications.

2. Dimensions with a tolerance may be adjusted to align to the nearest Transverse Weakened-Plane construction joint as directed.

3. See Std Dwg C-07.01 for Joint Information.

4. See plans for ramp dimensions.

- Transition, See Std Dwg C-05.12
- 90° Face of Curb to Face of Curb on Exit Ramp
- Mainline Structural Section
  - See Plans
- Ramp Structural Section
  - See Plans
- Gored Structural Section
  - See Plans

TYPICAL TRANSVERSE WEAKENED-PLANE
J O I N T L A Y O U T AT G O R E A R E A S

Exit Ramp Shown
Entrance Ramp Similar

RAMP WITHOUT CURB & GUTTER

RAMP WITH CURB & GUTTER
GENERAL NOTES

1. All joint locations shown are typical. The actual paving pour plan with joint locations shall be based upon the project paving plan submitted by the contractor and approved by the Engineer in accordance with Subsection 401-3.01 of the Standard Specifications.

2. See Std. Dwg C-07.01 for joint information.

3. The ratio of transverse to longitudinal joint spacing shall be greater than \( \frac{1}{3} \) but not more than \( \frac{1}{2} \).

4. LC and LWP joints shall be located on the edge of traffic lanes unless otherwise shown on the project plans.

5. See Plans for Crossroad Pavement Type E or H joint if PCC Pavement S joint if AC Pavement.

6. Transverse joints shall be perpendicular (90°) to the longitudinal joints, except as shown at the ramp terminal.

- 6' Minimum
- 6' Minimum
- 12' Minimum

- 12' when adjacent gutter widths are 2" or less
- 15' when adjacent gutter widths are greater than 2"

- Without curb and gutter
- Transition, See Std. Dwg C-05.12
- 12' Typical or As Shown on Plans, 15' Maximum
GENERAL NOTES

1. Bedding per Section 501 of the Standard Specifications.
2. Asphalt concrete shall be in accordance with the requirements of the Standard Specifications.
3. 12" AB is required on the sides of trenches that are not parallel to the center line of the street.
4. Type D requires 9" of AB at top of trench when there is an existing base.
5. See Std Dwg C-13.15 for typical pipe installation.

LEGEND

1. Compacted Backfill or Slurry Per Section 501 of the Standard Specifications
2. AB, Granular Backfill or Native Backfill Per Sections 303 and 501 of the Standard Specifications
3. AB Per Sections 303 and 501 of the Standard Specifications
4. AB or Decomposed Granite Per Section 303 or 803 of the Standard Specifications

AC Pavement
Match Existing Pavement
by Type and Thickness

Type A

AC Pavement
Match Existing Pavement
by Type and Thickness

Type B

AC Pavement
Match Existing Pavement
by Type and Thickness

Type D

Surface Outside of Trench Lines
Damaged During Construction shall
Be Restored to Original Thickness
and Condition

Type C

Sawcut Line (Typ)

AC Surface Course

Type G

Sawcut Line (Typ)

AC Base Course

Type H
GENERAL NOTES

1. Paved gore area shall be Class S Concrete, fc = 4000 PSI or AC as shown on plans.

2. See Std Dwgs C-07.01 and C-07.04 for joint layout and details.

SECTION A-A

SECTION B-B

Ramp Structural Section
Unless Otherwise Shown
On The Plans

Structural Section
See Plans

AC GORE AREA WITH
ABUTTING AC PAVEMENT

CONCRETE GORE AREA
WITH ABUTTING CONCRETE PAVEMENT

Length as Shown on Plans

Length as Shown on Plans

Width as Shown on Plans

Width as Shown on Plans

1/2" joint &
Preformed
joint filler (Typ)

4" AB (Class 2) Unless
Otherwise Shown On
The Plans

Tack Coat

STATE OF ARIZONA
DEPARTMENT OF TRANSPORTATION
ROADWAY STANDARD DRAWINGS

APPROVED FOR USE

PAVED GORE AREA
C-08.20

APPROVED FOR USE
DEPARTMENT OF TRANSPORTATION ROADWAY STANDARD DRAWINGS

PAVED GORE AREA
C-08.20
1. Lengths as shown unless otherwise indicated on project plans.

2. Post type timber or steel for transitions shall match post type of adjoining guardrail.

3. Shown for one-way traffic. For two-way traffic, departure requires approach and treatment when located within the clear zone of opposing traffic.

4. See Std. Specs for nested guardrail pay item.
GENERAL NOTES

1. All embankment curb shall be protected by guardrail.

2. Guardrail shall extend beyond the limits of embankment curb.

3. See Std Dwg C-10.00 for measurement limits.

4. See Std Specs 701, 905 and 1012-3 for reflector tab and snow marker materials, reflective sheathing, and spacing requirements.

▲ Top of Rail = 28°
See General Note 1
Std Dwg C-10.03

REFLECTOR TAB DETAIL

TYPE A SECTION

PROJECT NO.:

STATE OF ARIZONA
DEPARTMENT OF TRANSPORTATION
ROADWAY STANDARD DRAWINGS

GUARDRAIL INSTALLATION
TYPE A AND REFLECTOR TAB

C-10.01

5/12

SIGNATURES:

APPROVED FOR USE:

APPROVED FOR PRINT:

APPROVED FOR PUBLICATION:
GENERAL NOTES

1. All embankment curb shall be protected by guardrail.

2. Guardrail shall extend beyond the limits of embankment curb.

3. See Std Dwg C-10.00 for measurement limits.

4. See Std Specs 703, 905 and 1032-3 for reflector tab and snow marker materials, reflective sheeting, and spacing requirements.

▲ Top of Rail = 28°
See General Note 1
Std Dwg C-10.03

PLAN

Use Appropriate End Treatment
Normal Roadway Shoulder

Traffic
Use Appropriate End Treatment

REFLECTOR TAB DETAIL

Reflective Sheeting
2½°
90°
6°
2°

TYPE B SECTION

See Subgrade/Slip Hinge Treatment Details Std Dwggs C-02.10, C-02.20, or C-02.30
2° Widening Normal Shoulder Width

See Reflector Tab Detail

Hedge Point
Embarkment Curb
See Plans

Normal Slope
Slip as Required

Embankment Slope
Subgrade
GENERAL NOTES

1. The control height for guardrail system is 28" to the top of rail, measured at the face of rail from the normal finished shoulder elevation.

2. Guardrail shall be lapped in the direction of adjacent traffic.

- Indicates AASHTO, ACC & ARTBA Task Force 13 Report designation

STATE OF ARIZONA
DEPARTMENT OF TRANSPORTATION
ROADWAY STANDARD DRAWINGS

STATE OF ARIZONA
DEPARTMENT OF TRANSPORTATION
ROADWAY STANDARD DRAWINGS
GENERAL NOTES

1. The control height for guardrail system is 28" to the top of rail, measured at the face of rail from the normal finished shoulder elevation.

2. Guardrail shall be lapped in the direction of adjacent traffic.

3. • Indicates AASHTO, AGC & ARTBA Task Force 13 report designation.

ELEVATION
G41(S) SYSTEM

SECTION G41(S) SHOWN WITHOUT CURB

ROADWAY WIDTHS

ROADWAY WIDTHS

G41(S) SYSTEM

SECTION G41(S) SHOWN WITH CURB

ROADWAY WIDTHS

W-Beam, 12 Gauge

3/4" Diameter Hole

WOOD BLOCK DETAIL

Curb as shown on plans

Wood Block

W6x8.5x72" or W6x9x72"
Structural Shape Post

STATE OF ARIZONA
DEPARTMENT OF TRANSPORTATION
ROADWAY STANDARD DRAWINGS

W-BEAM GUARDRAIL
G41(S)
BLOCKED-OUT STEEL POST

C-10104
GENERAL NOTES

1. Construct either Type 1 or Type 2 for 12'-6" span.
2. For Type 1 and Type 2, a maximum of one post may be eliminated within a span of nested guardrail.
3. Minimum length of nested guardrail is one 6'-3" post spanning on each side of maximum span.
4. See Std Dwg C-10.03 and C-10.04 for additional information and dimensions.
5. Guardrail shall be kept in the direction of adjacent traffic.

- Indicates AASHTO, AGC & ARTBA Task Force 13 Report designation

72" Timber Post

SECTION A-A

Bolt Nested Steel W-Beams Together with 5/8"-11 UNC x 1 1/4" Button Head Bolt (*•) and Recess Nut (•) Required

SECTION B-B

Bolt Nested Steel W-Beams Together with 5/8"-11 UNC x 1 1/4" Button Head Bolt (*•) and Recess Nut (•) Required

ELEVATION

TYPE 1 (SPlice CONNECTION INSIDE 12'-6" SPAN)

PLAN

25'-0" Nested W-Beam (Pay Limit)

SYSTEM POST

Nested W-Beam

Ec

6'-3"

12'-6"

6'-3"

MAXIMUM SPAN

VARIES

Pipe Culvert

Bolt Nested W-Beams Together

Std Splice Connection (As Needed)

Bolt Nested W-Beams Together

Std Splice Connection (Type)

Splice Not Required When Using 25'-Long Nested Rail Elements

ELEVATION

TYPE 2 (SPlice CONNECTION OUTSIDE 12'-6" SPAN)

PLAN

37'-6" Nested W-Beam (Pay Limit)

SYSTEM POST

6'-3"

6'-3"

12'-6"

6'-3"

6'-3"

MAXIMUM SPAN

VARIES

Pipe Culvert

Bolt Nested W-Beams Together

STATE OF ARIZONA
DEPARTMENT OF TRANSPORTATION
ROADWAY STANDARD DRAWINGS

W-BEAM GUARDRAIL
NESTED
TYPES 1 AND 2

NO. 5/12

STATE NO.

C-10.06

Drawing List: 2
GENERAL NOTES

1. Use Type 3 Nested W-Beam to span downdrain or spillway inlets as shown in the plan view.

2. Use Type 3 Nested W-Beam to span multiple obstructions as shown in the elevation view.

3. For Type 3, a maximum of two posts may be eliminated within a span of nested guardrail.

4. Minimum length of nested guardrail is one 6' - 3" post spacing on each side of maximum span.

5. Guardrail shall be lapped in the direction of adjacent traffic.

- Indicates AASHTO, AGC & ARTBA Task Force 13 Report designation

72" Timber Post

See Sheet 1 of 2 for Sections A-A and B-B

PLAN

37'-6" Nested W-Beam (25'-0" and/or 12'-6" Rail Elements) (Pay 1lnH)

ELEVATION

TYPE 3 (18'-9" SPAN)
GENERAL NOTES

1. See Std Dwg C-10.03 and C-10.04 for additional information and dimensions.

2. Guardrail shall be lapped in the direction of adjacent traffic.

72" Timber Post

PLAN

Traffic

ELEVATION

BOLTED ANCHOR

BOX CULVERT INSTALLATION
GENERAL NOTES

1. The cable assembly shall be tightened to remove slack.
2. One wrap of 14 gauge galvanized steel wire shall be wrapped around the terminal post near the top of the bearing plate.
3. See Std. Dwg C-10.00 for measurement limits.

GENERAL NOTES

1. Curbing is not required when drainage flows transversely away from barrier.

2. Treatment at back of lip curb modified for constructability purposes. Front slope and height of lip curb shall not be exceeded.

3. Thrie-beam terminal connector to thrie-beam splice shall be tapered in the direction of adjacent traffic.

- Indicates AASHTO, AGC & ARTBA Task Force 13 Report designation

THRIE-BEAM GUARDRAIL TRANSITION SYSTEM

PLAN

ELEVATION

2.5"x5" Lip Curb
See Lip Curb Detail

Two Sections of Thrie-Beam Guardrail (Nested) (●)

Concrete Barrier Transition
Type "F" to Thrie Beam
See Std Dwg C-10.70, C-10.71, C-10.72 & C-10.73

2.5"x5" Lip Curb
See Lip Curb Detail

One Section
W-Beam to Thrie-Beam Transition Section (●)

Embankment Curb
When Shown on Plans
See Std Dwg C-10.01 or C-10.02

Embankment Curb
When Shown on Plans
See Std Dwg C-10.01 or C-10.02

Standard Guardrail System
See Plans

3.5-1/2" W-Beam to Thrie-Beam Transition Section (●)

2.5"x5" Lip Curb
See Lip Curb Detail

Two Sections of Thrie-Beam Guardrail (Nested) (●)

LIP CURB DETAIL

Wood Post

Gutter Flow Line

3"

5"

3-1/2"
3-1/2"
3-1/2"
3-1/2"
3-1/2"
18'-9"
1'-6"
10-/6"
GENERAL NOTES

1. Anchor Plate shall conform to ASTM specification A356. Bolts, washers and Anchor Plate shall be galvanized or, at the contractor's option, stainless steel bolts and washers may be used.

2. Two-inch deep contraction joints shall be placed in the curb and the gutter at locations which match the joints in adjacent RCCP and at approximate 15' centers when adjacent to AC pavement. Joints shall be either hand-tapped or scoured.

- Indicates AASHTO, AGC & ARTBA Task Force 13
- Report designation

SECTION A-A
AC OPTION

SECTION B-B

ANCHOR PLATE - DETAIL A

SECTION A-A
CONCRETE OPTION
GENERAL NOTES

1. Median Barrier shall be constructed by the slip form or formed cast-in-place method.
2. When obstructions prevent the use of slip form equipment, stationary forms shall be used.
3. Concrete shall be Class S, f'c = 4000 PSI.
4. If the footings and barrier are cast monolithically, #6 S shape rebar are not required.
5. Barrier width shall not exceed the barrier footing width nor overlap the adjacent pavement.
6. #4 Rebar shall extend 12" past the construction joint at the completion of the day’s pour.
7. Depth to match adjacent PCCP thickness.
   - Footing depth shall match adjacent PCCP thickness and shall consist of either:
     a) full-depth concrete, or
     b) 8" concrete over compacted AB (Class E).

See Special Provisions for measurement and payment.
GENERAL NOTES

1. Median Barrier shall be constructed by the slip form or by the formed cast-in-place method.

2. When obstructions prevent the use of slip form equipment, stationary forms shall be used.

3. Concrete shall be Class S, f'c = 4000 PSI.

4. If the footing and barrier are cast monolithically, #6 S shape rebars are not required.

5. Barrier width shall not exceed the barrier footing width for overlapping the adjacent pavement.

6. #4 rebar shall extend 12" past the construction joint at the completion of the day's pour.

7. Depth to match adjacent PCP Thickness.

8. Footing depth shall match adjacent PCP thickness and shall consist of either:
   a) Full-depth concrete, or
   b) 8" concrete over compacted AB (Class 2).

See Special Provisions for measurement and payment.
GENERAL NOTES

1. Posts shall be 12' 6" center to center. Structural steel shall conform to ASTM A572, galvanized in accordance with ASTM A653.

2. Hex head bolt shall conform to ASTM A325, galvanized in accordance with ASTM A533 Class C.

3. Helical spring lock washer shall conform to ASTM 1333, galvanized in accordance with ASTM A533 Class C.

4. Tension wire AWG number 9 (0.148") galvanized in accordance with ASTM A168 Class 2.

5. Hog ring AWG number 12 10.25' galvanized in accordance with ASTM A168 Class 2. Positive glare screen to top and bottom tension wire spaced approximately 2' apart.

6. Glare Screens (8 gauge steel, ASTM A526, galvanized in accordance with ASTM A526/10235S, expanded to the following dimensions: 0.133" shortway of diamond and 0.25" longway of diamond (center to center of bridge) with a strand width of 0.250" angled at approximately 20° to the plane of the original sheet. Top edge to be stapled and crimped on 12" center to center. Glare screen shall be installed such that flat portion of screen blocks light from headlights. See Elevation Detail, Sheet 2 of 2.

7. Splices allowed in glare screen at posts only, with one full diamond overlap.

8. Glare screen shall be constructed without interruption to the greatest degree possible.

---

ELEVATION

TENSION WIRE ROUTING DETAIL
CROSS-BRACE POST DETAIL

INTERMEDIATE POST DETAIL

TYPICAL POST DETAIL

SECTION A-A

DIRECTION DETAIL

- Indicates AASHTO, ASC & ARTEA Task Force 13 Report designation

TYPE A WIRE TIE

TYPE B WIRE TIE

TYPE C WIRE TIE
GENERAL NOTES

1. Half barrier shall be constructed by the slip or fixed form method.

2. When obstacles prevent the use of slip form equipment, stationary forms shall be used.

3. Concrete shall be Class S, T1±4000 PSI.

4. If the footing and barrier are cast monolithically, *6 S shape rebar will not be required.

5. *4 rebar shall extend 12" past the construction joint at the completion of the day's pour.

6. Weep holes shall be placed whenever barrier is backfilled unless otherwise indicated on the plans.

7. Depth to match adjacent PCCP thickness.

---

WITH PCCP
BARRIER WITH GUTTER
(SEE STD DWG C-10.52)

---

WITH AC
SECTION B-B
SEE SECTION A-A FOR
TYPICAL REBAR PLACEMENT

---

WITH AC
SECTION A-A

---

STATE OF ARIZONA
DEPARTMENT OF TRANSPORTATION
ROADWAY STANDARD DRAWINGS

CONCRETE HALF BARRIER
32" TYPE F
CAS1-N-PLACE

5/12
GENERAL NOTES

1. Concrete half barrier shall be precast.
2. Concrete shall be Class 5, f'_c=4000 PSI.
3. Pavement thickness adjacent to half barrier shall be 3" minimum.
4. The half barrier shall be placed upon a bed of grout in order to provide a uniform bearing.
5. Dowel joints shall be grouted under pressure until all of the openings and the joints are filled.
6. All bend dimensions for rebar are out-to-out of rebars.
7. Weep holes shall be placed whenever half barrier is backfilled unless otherwise indicated on the plans.
GENERAL NOTES
1. Concrete shall be Class S, f'c=4000 PSI.
2. Rebar shall conform to Std Spec 2003.
3. Rebar shall have 2" minimum clear cover unless otherwise noted.
4. See drainage sheets for sloped drains and catch basin details.
5. Departure transition may be substituted for Std Dwg C-10.76 barrier transition under departure conditions.
6. See Std Dwg C-05.20 for sidewalk construction.
7. All bend dimensions for rebar are cut-to-cut of rebars.

PLAN VIEW

SECTION B-B AT CATCH BASINS

BARRIER GUTTER DETAIL

ELEVATION

DEPARTURE TERMINATION WITHOUT GUARDRAIL

STATE OF ARIZONA
DEPARTMENT OF TRANSPORTATION
ROADWAY STANDARD DRAWINGS

TYP. NO.
5/12

CONCRETE HALF BARRIER
32" TYPE F
WITH SIDEWALK

C-10.51
GENERAL NOTES
1. Half Barrier shall be constructed by the slip or fixed form method.
2. When obstacles prevent the use of slip form equipment, stationary forms shall be used.
3. Concrete shall be Class S, f'c=4000 PSI.
4. "A" Rebar shall extend 12" past the construction joint at the completion of the day's pour.
5. Gutter thickness can be adjusted to match the PCCP thickness, as approved by the Engineer.
6. When the pavement section slopes away from the gutter, the slope of the gutter shall match the pavement cross slope. Therefore, the 2" gutter depression is not applicable.
7. At bridges, the cross slope of the gutter shall transition to match the cross-slope of the bridge. Length of the transition is 15'.
8. Two-inch deep contraction joints shall be placed in the gutter at locations which match the joints in adjacent PCCP. Joints shall be hand-tooled or sawn.
9. Whenever Half Barrier is backfilled, see Std Dwg C-10.50 for weep hole details, unless otherwise specified on the plans.

PLAN

ELEVATION

SECTION A-A

DEPARTURE TERMINATION WITHOUT GUARDRAIL

BARRIER GUTTER DETAIL

Horizontal Line

Gutter WidthVaries
2'-0" or 4'-6" (Typ)
See Plans

Traffic

Topsoil Plating

PCCP
See Plans

CONSTRUCTION JOINT

3'-0" (Typ)
for Power Track

Base Material
See Plans

See Barrier Gutter Detail

Varies

B Joint
Std Dwg C-07.01

H Joist
Gutter WidthVaries
2'-6" or 4'-6" (Typ)
See Plans

2'-0"

4'-6"

3'-3½"

4'-0"

4'-6"

10'-R

1'-R

4'-6"

2'-0"

Gutter WidthVaries
2'-0" or 4'-6" (Typ)
See Plans

Pavement

STATE OF ARIZONA
DEPARTMENT OF TRANSPORTATION
ROADWAY STANDARD DRAWINGS

CONCRETE HALF BARRIER
3'-0" TYPE F
WITH GUTTER

C-10.52
GENERAL NOTES

1. Half barrier shall be constructed by the slip or fixed form method.

2. When obstacles prevent the use of slip form equipment, stationary forms shall be used.

3. Concrete shall be Class S, f_\text{c}{\text{c}} = 4000 \text{ PSI}.

4. *4 Rebar shall extend 12" past the construction joint at the completion of the deck's pour.

5. Gutter thickness can be adjusted to match the PCCP thickness, as approved by the Engineer.

6. When the pavement section slopes away from the gutter, the slope of the gutter shall match the pavement cross slope. Therefore, the 2" gutter depression is not applicable.

7. At bridges, the cross slope of the gutter shall transition to match the cross slope of the bridge. Length of the transition is 25'.

8. Two-inch deep construction joints shall be placed in the gutter at locations which match the joints in adjacent PCCP. Joints shall be hand tooled or sawn.

9. Whenever half barrier is backfilled, see Std Dwg C-10.50 for weep hole details, unless otherwise indicated on the plans.
GENERAL NOTES
1. Concrete shall be Class S, f_c = 4000 PSI.
2. If the footing and Half Barrier are cast monolithically, #6 S shape rebars are not required.
3. Longitudinal rebars shall extend 12" past the construction joint at the completion of each incremental pour.

KEYWAY DETAIL
SEE SECTION A-A (WITH AC) FOR TYPICAL REBAR PLACEMENT

WITH PCCP
SECTION A-A
SEE SECTION A-A (WITH AC) FOR TYPICAL REBAR PLACEMENT

ELEVATION

PLAN

WITH AC
SECTION A-A

STATE OF ARIZONA
DEPARTMENT OF TRANSPORTATION
ROADWAY STANDARD DRAWINGS

CONCRETE HALF BARRIER
32" TYPE 1 CAST-IN-PLACE

C-10546
Sheet 1 of 3
GENERAL NOTES

1. Concrete shall be Class S, T2=4000 PSI.
2. The Hef Barrier shall be placed upon a bed of grout in order to provide a uniform bearing.
3. Dowelled joints shall be grouted under pressure until all of the openings and the joints are filled.
4. All bend dimensions for rebar are out-to-out of rebar.
GENERAL NOTES

1. Concrete shell be Class S, f'c=4000 PSI.
2. If the footing and barrier are cast monolithically, *6 S shape rebars are not required.
3. Barrier width shall not exceed the barrier footing width nor overlapping the adjacent pavement.
4. Longitudinal rebar shall extend 12" past the construction joint at the completion of each incremental pour.

ELEVATION

KEYWAY DETAIL
SEE SECTION A-A (WITH AC) FOR TYPICAL REBAR PLACEMENT

WITH PCPP
SECTION A-A
SEE SECTION A-A (WITH AC) FOR TYPICAL REBAR PLACEMENT

WITH AC
SECTION A-A
GENERAL NOTES

1. Concrete shall be Class C, f'c=4000 PSI.
2. The Half Barrier shall be placed upon a bed of grout in order to provide a uniform bearing.
3. Dowelled joints shall be grouted under pressure until all of the openings and the joints are filled.
4. All bend dimensions for rebar are out-to-out of bars.
5. Rebar shall have 2" minimum clear cover unless otherwise noted.

PLAN

ELEVATION

KEYWAY DETAIL

CONSTRUCTION JOINT DETAIL
GENERAL NOTES

1. Transition median paving cross slope to meet level foundation pad. See plans for length and location.

2. Compacted backfill and Class B concrete shall be placed between bridge columns or piers only.

   a) Slope as shown on Plans

PLAN

SECTION C-C

SECTION A-A

SECTION B-B
GENERAL NOTES

1. Concrete shall be Class S, f'c=4000 PSI.
2. All rebar shall have 2" minimum clear cover unless otherwise noted.
3. All bend dimensions for rebar are out-to-out of rebars.

BARRIER END DETAIL

ELEVATION BARRIER WITHOUT CURB

STATE OF ARIZONA
DEPARTMENT OF TRANSPORTATION
ROADWAY STANDARD DRAWINGS

CONCRETE HALF-BARRIER TRANSITION TO VERTICAL 32' TYPE F WITH CAISSONS

C-10.70
Sheet 1 of 3
CONSTRUCTION JOINT DETAIL (OPTIONAL)

JOINT ASSEMBLY

Dowel Locations

Concrete Half-Banner Transition

Epoxy Grout (Type)

1/2" Bituminous Joint Filler

Existing Concrete Barrier

1" Diameter x 10" Dowel (Typ)

CAISSON REINFORCEMENT

*4 Rein. Tie 12" Center to Center

6 *8 Rebars

3" 3" 3"
GENERAL NOTES

1. Concrete shall be Class S, f'c=4000 PSI.

2. All rebar shall have 2" minimum clear cover unless otherwise noted.

3. All bend dimensions for rebar are cut-to-out-of-bar.

4. Two-inch deep contraction joints shall be placed in the gutter at locations which match the joints in adjacent PCCP and at approximately 15' centers when adjacent to AC pavement. Joints shall be either hand hooked or sawn.

5. Minimum or Match Thickness of Adjacent PCCP

BARRIER END DETAIL

ELEVATION
BARRIER WITH CURB AND GUTTER
JOINT ASSEMBLY

CONSTRUCTION JOINT DETAIL (OPTIONAL)

DOWEL LOCATIONS

CAISSON REINFORCEMENT

1/2" Bitumenous Bond Filler

Existing Concrete Barrier

Concrete Half-Barrier Transition

1" Diameter x 18" Dowel (Typ)

3" 3" 3"

Epoxy Grout (Typ)

4" 11-1/2"

2-1/2" 2-1/2"

6 #8 Rebars

*4 Rebar Tie

12" Center to Center

3" 3" 3"
GENERAL NOTES
1. Concrete shall be Class 5, f_{c,c} = 4000 PSI.
2. All rebar shall have 2" minimum clear cover unless otherwise noted.
3. All bend dimensions for rebar are out-to-out of rebars.
4. Two-inch deep contraction joints shall be placed in the gutter at locations which match the joints in adjacent PCP and HDPE pavement. Joints shall be either hand-tapped or sawn.

1"-0" Minimum or Match Thickness of Adjacent PCP

ELEVATION
BARRIER WITH CURB AND GUTTER
GENERAL NOTES

1. Half-barrier Transition shall be constructed by the formed cast-in-place method.
2. Concrete shall be Class S, 4000 PSI.
3. If the footing and barrier are cast monolithically, #5 S shape rebars are not required.
4. Barrier width shall not exceed the barrier footing width nor overlapping the adjacent pavement.
5. #4 rebar shall extend 10" past the construction joint at the completion of the day’s pour.
6. Gutter thickness can be adjusted to match the PCCP thickness, as approved by the Engineer.
7. Two-inch deep construction joints shall be placed in the gutter at locations which match the joints in adjacent PCCP and at approximate 15° corners when adjacent to AC pavement. Joints shall be either hand taped or sawn.

PLAN

ELEVATION

CONSTRUCTION JOINT DETAIL (OPTIONAL)
GENERAL NOTES

1. All concrete shall be Class S, 1'c=4000 PSI.
2. All rebar shall conform to Std Spec 1003.
3. All rebar shall have 2" minimum clear cover unless otherwise noted.
4. See drainage sheets for sloped areas and catch basin details.
5. Barrier transition shall match both adjoining curb and gutter and concrete Half Barrier.
6. See Std Dwg C-05.20 for sidewalk construction.
7. All bend dimensions for rebar are cut-out of rebar.
8. Two-inch deep contraction joints shall be placed in the gutter at locations which match the joints in adjacent PCCP and at approximate 15' centers when adjacent to AC pavement. Joints shall be either hand tooled or sawn.

BARRIER GUTTER DETAIL

SECTION A-A

SECTION B-B

TRANSITION TO VERTICAL TYPE CURB

STATE OF ARIZONA
DEPARTMENT OF TRANSPORTATION
ROADWAY STANDARD DRAWINGS

CONCRETE HALF-BARRIER TRANSITION
TYPE 1, TANGENT DEPARTURE TYPE I

SHEET 15" 5/12

DRAWN CHECKED BY

C-10.75

SHR"T 3"
GENERAL NOTES
1. All concrete shall be Class 5 f'c=4000 PSI.
2. All rebar shall conform to Std Spec 1003.
3. All rebar shall have 2" minimum clear cover unless otherwise noted.
4. See drainage sheets for slotted drain and catch basin details.
5. Barrier transition shall match both adjoining curb and gutter and concrete half barrier.
6. All bend dimensions for rebar are cut-to-cut of bars.
7. Two-inch deep connection joints shall be placed in the gutter at locations which match the joints in adjacent RCCP and at approximate 15° centers when adjacent to AC pavement, joints shall be either hand-tossed or sawn.
GENERAL NOTES

1. See plans and barrier summary sheets for location and type of guardrail and end treatments. Timber post installation shown.

2. See Std Dwg C-05.10, 05.12, 10.01 and 10.02 for dimensions and details not shown.

3. Type B guardrail installation shown. For Type A guardrail installation, use Type C-1 Curb and Gutter instead of the Type D-2 Curb and Gutter shown.

4. See plans for type and location of drainage facilities.

5. Bituminous joint filler (1/2") shall be placed when the curb & gutter or concrete widening slabs or paved drains, catch basins, ditches, barrier, etc. Scoured joints, 2" in depth, shall be placed to match adjacent joints in PCCP or at J5: Intervals when adjacent to AC or continuously reinforced concrete pavement.

- To Top of Beam

SECTION A-A

Concrete Barrier Transition, Type 2
Std Dwg C-10.75
Sheet 1 of 2

Curb & Gutter Transition
Std Dwg C-05.12

Concrete Half Barrier

Concrete Gutter

Up of Gutter

Edge of Traffic Lane

SECTION B-B

Concrete Half Barrier Transition To Vertical
Std Dwg C-10.71

Curb & Gutter Transition

Concrete Half Barrier
Std Dwg C-10.30

Guardrail Transition

Concrete Half Barrier
Std Dwg C-05.10

Curb & Gutter Transition Three-beam to
Concrete Half Barrier
Std Dwg C-10.30

Curb & Gutter
Type B, C or CI
Std Dwg C-05.10

Payment Limits for Variable-Width Gutter
See Appropriate End Treatment Details

Gutter Flowline

PLAN

Traffic
GENERAL NOTES

1. Cattle guard shall include two (2) clamps per Sheet 4 or at each gap between two (2) grill units, one at each end. Clamps shall be adjusted to provide a ¾-inch plus or minus ¼-inch gap between adjacent grill units.

2. Grill units shall be set on an angle iron assembly consisting of one piece of 20x3½x5/8, angle iron, and studs with a head. The studs shall be placed on 1½" alternate centers. See Angle Assembly Detail 1.

3. Cattle guard shall be sloped to conform to the roadway grade and cross-section, except that where an odd number of grill units is specified in a crowned roadway, the center grill unit shall have a lower cross slope.

4. Where the adjacent roadway is paved, an angle iron assembly shall consist of one piece of 4½x4½x1¾ angle iron and studs with a head. The studs shall be placed on 1-½" alternate centers. See Angle Assembly Detail 1.

5. Where the adjacent roadway is unpaved, an angle iron assembly shall consist of one 4½x4½x1¾ angle iron, one 2½x2½x1¾ angle iron, and connected with studs. The assembly shall be canted on the centerline and constructed with a bevel cut and welded. The studs shall be bent 90° and placed on 1½" centers. See Angle Assembly Detail 3.

6. Each angle iron end and angle iron assembly shall be fabricated to form a single piece for the full length of the cattle guard.

7. Quantities shown for concrete and rebar are approximations for informational purposes only.

8. When a gate is to be installed, it shall be called out on the plans.

9. All rebar shall have a minimum cover of 3", or as shown on the plans.

10. Cattle guard beams shall be HS-20 loading unless otherwise shown on the plans.

UNIT TABLE

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<tr>
<th>Roadway Width (ft)</th>
<th>Grill Units Required (Cu Ft)</th>
<th>Concrete (cu ft)</th>
<th>Rebar (lbs)</th>
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<tr>
<td>15</td>
<td>2</td>
<td>5.8</td>
<td>175</td>
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<tr>
<td>16</td>
<td>3</td>
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<td>249</td>
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<td>20</td>
<td>4</td>
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<td>510</td>
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<tr>
<td>25</td>
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<td>40</td>
<td>1</td>
<td>16.9</td>
<td>510</td>
</tr>
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</table>

DEPARTMENT OF TRANSPORTATION
ROADWAY STANDARD DRAWINGS

STATE OF ARIZONA

SIGNED:

5/12

C-112C

Sheet 1 of 4
GENERAL NOTES

1. Material for shoulder transition shall be placed to the finished roadway elevation for the entire length of the transition. When the roadway is paved, aggregate subbase or AB shall be used. When the roadway is unpaved, a material equivalent to the existing roadway shall be used.

2. On steeper grades, the post shall be installed plumb to align with adjacent fencing. The brace assembly may be modified as necessary to support the post.

○ - Indicates AASHTO, AGC & ARTBA Task Force 13 designation

END VIEW

SECTION D-D

SHOULDER TRANSITION AT CATTLE GUARDS
GENERAL NOTES

1. Apply a heavy duty, high-strength anaerobic thread-locking compound to the threads before installing the double nuts.
GENERAL NOTES

1. See Std Dwg C-11.10 for all other Cattle Guard details.
2. This standard shall be used in embankment or where highly erodable soil is found.
3. All concrete shall be Class B.
GENERAL NOTES

1. Length of post and braces shall not be less than 7'-0".

2. Woven wire fence fabric shall be attached to the line posts at the top, bottom, and intermediate wires, and shall be placed on the side of the posts away from the main roadway.

3. Intermediate Post Assemblies shall be located as shown and at intervals to utilize standard rails to minimize cutting and waste.

4. A twisted wire stay shall be centered between posts.

Roadway Corridor

Typical Fence Location

Fence Fabric Dimensions and Design Numbers

State of Arizona
Department of Transportation
Roadway Standard Drawings

9/12

Fence Woven Wire

C-1220
Sheet 1 of 3
GENERAL NOTES

1. Intermediate Post Assemblies shall be located as shown and at intervals not to exceed 650', or midway between all braced posts.

2. For game fence the bottom wire shall be barbless.

3. The stays on game fence shall have their ends turned up to prevent injuries to game.

4. Fence Wire shall be placed on the side of the line posts away from the main roadway except in sharper curve areas where it should be moved to the side with tension against the posts.

TYPICAL BARBED WIRE FENCE INSTALLATION-TYPE 2 (BW) SHOWN

TYPICAL FENCE LOCATION

STATE OF ARIZONA
DEPARTMENT OF TRANSPORTATION
ROADWAY STANDARD DRAWINGS

FENCE
BARBED WIRE

C-1240
Sheet 2 of 3
GENERAL NOTES
1. Post assemblies shall consist of an upright angle 2\(\frac{1}{2}\)\(\times\)2\(\frac{1}{2}\) \(\times\)4' at 4.00 lbs/ft, and brace angles 2\(\frac{3}{4}\)\(\times\)2\(\frac{3}{4}\) \(\times\)16' at 3.19 lbs/ft.

TYPICAL FENCE LOCATION AT CATTLE GUARD

NEW FENCE

END POST ASSEMBLY DETAIL C

NEW FENCE

End Post Assembly Detal C

ABUTTING FENCE

ABUTTING FENCE AT POST

TYPICAL CROSS SECTIONS OF LINE POST SHAPES

DETAIL A

DETAIL B
INTERMEDIATE POST ASSEMBLY

DETAIL C
END POST ASSEMBLY

DETAIL D
CORNER POST ASSEMBLY

DETAIL E
FENCE CONNECTION TO WINGWALL
GENERAL NOTES

1. Posts shall be round, H-section, or rail-formed and shell conform to the nominal dimensional requirements shown on the plans. Dimensional tolerances for all shapes shall be according to ASTM A491. In addition, the material of which posts are fabricated shall have a nominal thickness, before gasketing, of not less than 0.11" for line posts and 0.130" for terminal posts.

2. Chain link fabric shall be attached on the inside of the line posts away from the main roadway.

3. Chain link fabric shall be either zinc-coated or aluminum-coated steel wire fence fabric. Zinc-coated or aluminum-coated fabric shall conform to the requirements of ASTM A576. Class 1 coating. Aluminum-coated steel fabric shall conform to the requirements of ASTM A491, with a minimum weight of coating of 0.05 ounce per square foot of wire surface area. Fabric shall be 11 gauge for all fence fabric 60" or less in height and shall be 9 gauge for fabrics greater than 60" in height.

4. Tension wires shall be 7-gauge (0.177" diameter) cold-drawn steel wire with a minimum tensile strength of 15,000 FPS and shall be zinc-coated or aluminum-coated.

5. Truss rods shall be ⅜" diameter adjustable rods. Truss fasteners shall have a strand thickness of not less than 7/8".

6. Stretcher bars shall be ⅜" x 1/8" steel flat bars. Stretcher bar bands shall be ⅛" x 1" preformed steel bands.

7. Bottom tension wire shall be 3" from top of crown on concrete foundations.

8. Intermediate post assemblies shall be spaced at 500" intervals or midway between pull posts when the distance between such posts is less than 1,000" and more than 500".

TYPICAL CHAIN LINK FENCE INSTALLATION - TYPE I SHOWN

TYPICAL POST DIMENSIONS

<table>
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<th>Fabric Height (ft)</th>
<th>Corner, End, Intermediate, Gate, Latch and Pull Posts</th>
<th>Line Posts</th>
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<td>Round (ft)</td>
<td>Rail Formed (ft)</td>
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<tr>
<td>36</td>
<td>6-0</td>
<td>2.375 x 3.50 x 2.25 x 1.70</td>
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<tr>
<td>48</td>
<td>7-0</td>
<td>2.375 x 3.50 x 2.25 x 1.70</td>
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<tr>
<td>60</td>
<td>8-0</td>
<td>2.375 x 3.50 x 2.25 x 1.70</td>
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<tr>
<td>72</td>
<td>9-0</td>
<td>2.375 x 3.50 x 2.25 x 1.70</td>
</tr>
<tr>
<td>Over</td>
<td>10-0</td>
<td>2.875 x 3.50 x 2.50 x 2.50</td>
</tr>
</tbody>
</table>

TYPICAL FENCE LOCATION
GENERAL NOTES

1. Barbed wire for use with Type 2 chain link fence shall be 12 gauge steel wire with 4 point 14 gauge barbs spaced 5' apart and shall be either zinc-coated or aluminum-coated. zinc-coated steel wire shall conform to the requirements of ASTM A123, Class 1 coating. Aluminum-coated steel wire shall conform to the requirements of ASTM 1565, Type 1, Class 1 coating.

2. Barbed wire support arm shall be of the type shown on the plans, shall be fabricated from commercial quality steel, and shall be zinc-coated in accordance with the requirements of AASHTO M211.

3. Bottom tension wire shall just clear top of crown on concrete footings.

4. For details and notes not shown, see chain link fence, Type 1, Sheet 1 of 3.

5. See Sheet 1 of 3 for typical fence location.

TYPICAL CHAIN LINK FENCE INSTALLATION - TYPE 2 SHOWN

<table>
<thead>
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<th>TYPICAL POST DIMENSIONS</th>
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<td>Fabric Height (ft)</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Corner, End, Intermediate, Gate, Latch and Pull Posts</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Length (ft)</td>
<td></td>
<td></td>
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<td>Round (in)</td>
<td>2.5</td>
<td>3.50 x 3.50</td>
<td>2.50 x 2.50</td>
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<tr>
<td>H-Section (in)</td>
<td>1.900</td>
<td>1.875 x 1.875</td>
<td>1.625 x 1.625</td>
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<tr>
<td>Barbed Wire Support Arm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vertical Brace</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>as Required by Engineer</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
GENERAL NOTES

1. All concrete shall be Class C, 4500 PSI.

2. All bolts, nuts, washers, and fittings shall meet the dimensional requirements of the American National Standards Institute, unless otherwise designated and shall be galvanized in accordance with ASTM A53.

3. Galvanized swaged fittings shall conform to ASTM A440.

4. The 3/8" galvanized wire rope shall conform to AASHTO M30 Class B, Type 2.

5. The wire fabric, hens, stretchers, and other fittings and hardware shall conform to AASHTO M181.

6. The wire fabric fence shall follow contour of the graded median.

7. The excavation for the concrete anchor blocks shall be to line marks. Maximum excess shall be 3".

8. Perforated posts shall be square tube formed from 0.105" USS gauge ASTM 4366/A252M cold rolled carbon steel. The square tubes shall be welded directly in the corner by high frequency resistance welding or equal. The posts to be externally scored to agree with standard corner radius of 1/8".

9. Perforated posts shall be galvanized to conform to the requirements of ASTM A653/A653M. Coating designator shall be Z855.

10. The fence shall have enough tension to prevent sagging. The location of the concrete anchor blocks may also be varied to provide enough tension to help prevent sagging.

11. Two interior U-bolt and clamp bars shall be spaced at 1/3 the distance between posts.


13. An alternate to rectangular concrete anchor blocks shall be a 36" diameter round traffic barrier with an additional depth of 4".

14. The median approach grade within 100' of the Chain Link cable barrier should not exceed a grade break of 10 percent.
GENERAL NOTES
1. See plans for any required inlet end/or outlet protection.
2. E dimension applies to both non-trench and trench conditions.
3. Minimum cover over pipe culverts shall be 1', measured from the top of pipe.
4. See Pipe Berm Requirement Details for pipe berm requirements and Std Dwg C-03,10 for installation. If Point A is within the recovery area, then a pipe berm is required and Point B is set at the edge of the recovery area.
5. Slope plating shall conform to Std Spec 501.

MINIMUM SPACING FOR
MULTIPLE PIPES WITH HEADWALL

<table>
<thead>
<tr>
<th>Diameter or Span (ft)</th>
<th>E (ft-in)</th>
</tr>
</thead>
<tbody>
<tr>
<td>28</td>
<td>2-6</td>
</tr>
<tr>
<td>24</td>
<td>3-0</td>
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<tr>
<td>30</td>
<td>3-9</td>
</tr>
<tr>
<td>35</td>
<td>4-6</td>
</tr>
<tr>
<td>42</td>
<td>5-3</td>
</tr>
<tr>
<td>48 to 66</td>
<td>00 + 3-0</td>
</tr>
<tr>
<td>72 and Over</td>
<td>00 + 3-0</td>
</tr>
</tbody>
</table>

MINIMUM SPACING FOR
MULTIPLE PIPES WITH END SECTIONS

<table>
<thead>
<tr>
<th>Diameter</th>
<th>E (ft-in)</th>
</tr>
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<tbody>
<tr>
<td>28</td>
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<tr>
<td>24</td>
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<td>30</td>
<td>3-9</td>
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<tr>
<td>35</td>
<td>4-6</td>
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<tr>
<td>42</td>
<td>5-3</td>
</tr>
<tr>
<td>48 to 66</td>
<td>00 + 3-0</td>
</tr>
<tr>
<td>72 and Over</td>
<td>00 + 3-0</td>
</tr>
</tbody>
</table>

PIPE WITH BERM REQUIREMENT DETAIL
See General Note 4

MINIMUM SPACING FOR
MULTIPLE PIPES WITH HEADWALL

Outside (OD) Diameter

MINIMUM SPACING FOR
MULTIPLE PIPES WITH END SECTIONS

End Section (Typ)
GENERAL NOTES

1. Minimum cover over pipe culverts shall be 12", measured from the top of pipe.

2. After welding, the damaged coating shall be cleaned by a wire brush and painted with at least one full coat of Paint Number 4, or given two coats of an approved hot asphalt paint, as directed by the Engineer.

PERFORATED CMP INSTALLATION

SPECIAL MULTIPLE PIPE END SECTION DETAIL FOR PIPE CULVERT EXTENSIONS ONLY

PIPE AND CATCH BASIN INSTALLATION
AT SAG CONDITION OF CUT DITCH

PIPE AND CATCH BASIN INSTALLATION
AT BASE OF TRANSVERSE DIKE

PIPE AND CATCH BASIN INSTALLATION
AT FACE OF TRANSVERSE DIKE
GENERAL NOTES

1. Pipes shall be installed either in a trench condition or in a non-trench condition in natural ground or in embankment.

2. In a trench condition, the vertical and horizontal limits shall be maintained. If horizontal limits are exceeded or the vertical limits are not maintained, a non-trench condition exists.

3. Bracing and sagging shall conform to OSHA requirements.

4. Pipe backfill may be backfill material.

5. In a non-trench condition, the embankment for pipe stability shall be constructed in lifts to the limits shown in the detail. Simultaneously, with the backfilling and pipe backfill, if the contractor chooses to construct it as a trench condition, the embankment shall be constructed before excavating the trench.

6. Outside diameter of full circle pipe or outside dimension (open or riser) of arch pipe, elliptical pipe.


8. For D > 4", D = 6" each side, minimum D = 2" each side, maximum D = 3" each side, maximum

9. 6" inches except when on unyielding or unstable material, See Std Specs.

---

TRENCH CONDITION
IN NATURAL GROUND OR IN EMBANKMENT
WITHOUT BRACING

---

TRENCH CONDITION
IN NATURAL GROUND OR IN EMBANKMENT
WITH BRACING SHOWN

---

TRENCH CONDITION
NRPICP IN NATURAL GROUND OR IN EMBANKMENT

---

TRENCH BACKFILL
PIPE BACKFILL
BEDDING

---

NON-TRENCH CONDITION

---

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TYPICAL PIPE INSTALLATION

[Diagram of trench conditions and embankment stability]
GENERAL NOTES

1. End section joint type shall match the pipe joint type.
2. Embankment slope shall be warped to match slope of end section.

<table>
<thead>
<tr>
<th>Pipe Diameter (ft)</th>
<th>Approximate Weight (lbs)</th>
<th>Dimensions (in)</th>
<th>Approximate Slope</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>T   A   B   C  E   F</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>1200</td>
<td>3   9.5  43   30  73   48  3</td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>1930</td>
<td>3.5  10   49   24  73   54  3</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>2100</td>
<td>3.5  12   54  19   73   60  3</td>
<td></td>
</tr>
<tr>
<td>36</td>
<td>4000</td>
<td>4   15   63  34   73   90  3</td>
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</tr>
<tr>
<td>42</td>
<td>5500</td>
<td>4.5  21   63  35   90   78  3</td>
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</table>

PLAN

SECTION A-A

SPACING FOR MULTIPLE INSTALLATION

FRONT ELEVATION

RIGHT-ANGLE CULVERT

SKewed CULVERT
GENERAL NOTES

1. The end section may be joined to the pipe or connector section by bolts, rivets, dimpled bands, slip-seam bands or threaded rod type fasteners. For allowable connector types, see table.

2. The Type 1 connector is bolted or riveted. Maximum circumferential fastener spacing shall be 12" and with a minimum of 8 fasteners per joint. The Type 1 joint may be used with either annular or helical corrugations.

3. Type 2 and 3 connectors shall only be used with annular or helical pipe with a requisite number of annular corrugations.

4. Type 4 connector shall only be used with helical pipe.

5. All steel end section components shall be galvanized.

6. Top of embankment shell shall be warped to match toe of embankment and section.

7. A bell shall be added to abnormal projections per Std. Dwg C-13.10.

8. The foregoing applies to all cross-section configurations.

<table>
<thead>
<tr>
<th>Diameter (in)</th>
<th>Gauge A</th>
<th>B Maximum</th>
<th>H</th>
<th>l1/2</th>
<th>W</th>
<th>Approximate Slope</th>
<th>Connection Type</th>
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<tbody>
<tr>
<td>18</td>
<td>16</td>
<td>8</td>
<td>8</td>
<td>6</td>
<td>31</td>
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<td>2 3, 4</td>
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<td>2 3, 4</td>
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<td>60</td>
<td>72</td>
<td>2 3, 4</td>
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<td>42</td>
<td>12</td>
<td>17</td>
<td>11</td>
<td>10 1/2</td>
<td>69</td>
<td>84</td>
<td>2 3, 4</td>
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</table>

<table>
<thead>
<tr>
<th>Pipe Arch</th>
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<tbody>
<tr>
<td>Span (in)</td>
<td>Rise (in)</td>
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<td>42</td>
<td>29</td>
</tr>
<tr>
<td>49</td>
<td>33</td>
</tr>
</tbody>
</table>
GENERAL NOTES

1. For lateral dimensions of invert paving, use 72° control for CMP and span for CMPP.
2. Paving shall be scored laterally at 1'-6" minimum intervals along the length of the pipe.
3. Use bevel on inlet headwall only.
4. Wire mesh shall be fastened or welded to corrugation crests of intervals and in a manner approved by the Engineer. Laps shall be 6" minimum.
5. Paving shall not be placed until backfilling is completed.
6. Concrete shall be Class B.

HEADWALL INSTALLATION
SEE STANDARD DRAWING B-1121

PROJECTING INSTALLATION

SECTION A-A

SECTION B-B

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ROADWAY STANDARD DRAWINGS

PIPE AND PIPE ARCH
CORRUGATED METAL
CONCRETE INVERT PAVING

C-15.30
GENERAL NOTES

1. This end treatment is to be used only for those cattle and/or vehicle passes not used for drainage.

2. All concrete shall be Class B. An optional 12" AB invert paving base course and 6" of concrete may be used in the 144" diameter pipes.

3. Anchor bolts shall be retained in a horizontal position during pour with final tightening a minimum of 7 days after pour.

4. Pipe shall be backfilled before concrete bond beam is constructed. Minimum compacting may be used.

5. Edges of wire mesh shall be fastened or welded to corrugation crests at intervals and in a manner approved by the Engineer. laps shall be a minimum of 6".

6. For installation normal to roadway centerline only.
GENERAL NOTES

1. Slotted drain pipe shall be 2 1/2" x 1 1/2" corrugated steel pipe with a minimum wall thickness of 0.054" and shall conform to the requirements of AASHTO M 38.

2. All concrete shall be Class B.

3. Rebar shall conform to Std Spec 1003-2.

4. Structural steel shall conform to ASTM A36.

5. Concrete anchors shall conform to ASTM A307 and hex nuts shall conform to ASTM A563 Grade A.

6. All slotted drain pipe hardware except anchor bolts and rebar shall be given two coats of No. 1 paint.

7. When angular pipe is used, apply water proof sealer before attaching coupling band.

8. When helical pipe is used, it shall be formed with at least one angular corrugation at each end of each pipe section. Water proof sealer shall be applied to the angular corrugation prior to attachment of coupling band.

9. Cover slot during construction with removable tape or other acceptable substitute.

10. Slotted drain pipe shall be clean at the time of final acceptance.

11. Concrete curb and gutter shall be placed under the curb and gutter limits.

12. See Std Dwg C-05.10 for curb and gutter details.


14. All welding shall be in accordance with Std Spec 604-3.06.

15. Bolts or rebar may be used for concrete anchoring.

The 18" x 1" or 24" x 1" O.D. CMP stub shall be included in the price of respective catch basins.
GENERAL NOTES

1. Pipe collars are not required where direct catch basin connections can be made within 7° of a normal 90° installation, either horizontally or vertically.

2. "T" connections direct to the main drainage trunk line should be avoided and used only where manhole connections are impractical.

SECTION A-A
TYPICAL CONNECTION BETWEEN CATCH BASIN AND MANHOLE

SECTION C-C
TYPICAL CONNECTION BETWEEN CATCH BASIN AND MAIN STORM DRAIN

SECTION B-B
PIPE CROSS CONNECTION

SECTION D-D

PLAN
TYPICAL SLOTTED DRAIN AND CATCH BASIN INSTALLATION WITH MANHOLE

TYPICAL SLOTTED DRAIN AND CATCH BASIN INSTALLATION WITHOUT MANHOLE
1. Prefabricated tee shall be used when the outside diameter of the inlet pipe exceeds one half of the inside diameter of the main storm drain, except when the connections are shown on plans.
2. Centerline of the inlet pipe shall intersect the centerline of the main storm drain except when elevation "S" is shown on plans.
3. If L is 45° or less, Type I connection shall be used.
4. All concrete shall be Class B.
5. All rebar shall conform to Std Specs 3003-1 & 2.
6. Rebar shall have 2" minimum cover.
GENERAL NOTES

1. Compact soil at end of pipe plug to 95% of maximum density.

2. If depth of cover is less than 5' or greater than 10', increase plug thickness a minimum of 4'.

DRAINAGE OUTLET INTO CHANNEL

STORM DRAIN PLUG
GENERAL NOTES

1. All concrete shall be Class B.

2. All rebar shall conform to Std Spec 1003-1.2.

3. All rebar shall have 3" minimum clear cover.

4. A concrete collar shall be required where pipes of different diameters or materials are joined or where the design change in alignment or grade exceed the allowed for a standard joint.

5. When pipes of different diameters are joined with a concrete collar, "L" & "T" shall be those of the larger diameter.

6. The diameter of the circular ties shall be the outside diameter of pipe + 1".

7. Pipe ends to be trimmed such that the maximum distance between pipes at any point is 2".

CROSS CONNECTION
Storm Drain Pipe Diameter See Plans

TYPICAL LATERAL CONNECTIONS TO CATCH BASINS WITH CONCRETE COLLARS

OUTLET COLLAR DETAIL
GENERAL NOTES

1. Catch basin used at roadway sag.
2. Pipes can be placed in any wall.
3. Sump floor shall be a wood troweled finish with a minimum 4 in slope in all directions to outlet.
4. Grate shell shall be ASTM A36.
5. All welding shall be in accordance with Std Spec 604-3.06.
6. Grate, frame, beam and nose plate shall be given one shop coat of Number 1 paint.
7. All concrete shall be Class B.
8. Construction joints and drains shall be placed to meet field conditions. See Std Dwg C-15.70.
9. Any specified integral depression shall be warped to opening according to Std Dwg C-15.70.
10. Silicate cement shall be placed between the grate frame and PCPP, recessed 1/4" from the pavement surface.
11. Curb opening areas, as ft, for Type 1 single and Type 1 double equal 0.25 and 0.54, respectively, for each inch of "h" + integral depression - 2.35. See Std Dwg C-15.70.
12. See Std Dwg C-15.50 for grate and frame details and grate opening areas.
13. h = 6" when h is 6' or less
   h = 9" when h is greater than 8'
   See Section D-13
   = 9" when pavement is AC
   Match pavement thickness when pavement is PCPP

PLAN - CATCH BASIN TYPE 1 - SINGLE

PLAN - CATCH BASIN TYPE 1 - DOUBLE

SECTION A-A

USE THIS SECTION WHEN 1:6"
GENERAL NOTES

1. Catch basin can be used on grade or at roadway sag.

2. Catch basin has three configurations:
   - Sump Only - Sump portion of catch basin
   - See Detail 4, Sheet 2 of 3.
   - Single Wing (Illustrated) - Sump with wing basin upstream,
   - Double Wing - Sump with symmetrical wing basins each side.

3. Pipes can be placed in any wall except wall adjacent to wing basin.

4. Floor shall be a wood troweled finish. Slope of the sump portion of the catch basin along the axis of the pipe shall be 4%.  

5. Any specified level depression shall bewarped to opening according to Std Dwg C-15.70.

6. All rebar shall be ASTM A36.

7. Nose plate, access frame and cover shall be given one shop coat of number 1 paint.

8. All concrete shall be Class B.

9. Curb opening area is (W x D) per inch of curb
   - W x H = curb depression + curb opening length
   - W x 0.0833.

10. All welding shall be in accordance with
    - See Std Dwg C-15.70.

11. Construction joints and drains shall be placed to meet field conditions. See Std Dwg C-15.70.

12. t = 6" when H is 8" or less,
    - 8" when H is greater than 8".

SECTION A-A

USE THIS SECTION WHEN H<5" OR LESS

SECTION C-C

SECTION B-B

STATE OF ARIZONA
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ROADWAY STANDARD DRAWINGS

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CATCH BASIN
TYPE 3

Sheet 1 of 3
GENERAL NOTES

1. Cover shall be non-locking.
2. Frame and cover shall be cast iron or structural steel.
3. Catch basin access frame and cover is for use in sidewalk area only.
4. Cover shall be filled with concrete and broom finished.

SECTION A-A
FRAME

SECTION B-B
COVER
GENERAL NOTES

1. Catch basin can be used on grade or at roadway sag.
2. Pipes can be placed in any wall.
3. Floor shall be a wood troweled finish with a minimum 4° slope along the axis of the pipe toward the pipe.
4. Curb over catch basin shall not be constructed until catch basin concrete has set for a minimum of 24 hours.
5. Catch basin can be used with curb and gutter as shown or without.
6. See Std Dwg C-15.50 for grate and frame details and opening areas.
7. Any specified inlet depression shall be bermed to opening according to Std Dwg C-15.70.
8. All rebar shall be ASTM A36.
9. Grate, frame and beam shall be given one shop coat of Number 1 paint.
10. All concrete shall be Class B.
11. Construction joints and drains shall be placed to meet field conditions. See Std Dwg C-15.70.
12. Silicone sealant shall be placed between the grate frame and PCPP, recessed 1/4" from the pavement surface.
13. See Detail 2 for catch basin with wide gutter.
14. (b) = 6" when H is 8' or less, 8' when H is greater than 8'.
   See Section B-3.
   □ 9" when pavement is AC. Match pavement thickness when pavement is PCPP.

DETAIL FOR WIDE GUTTER
(See Std Dwg C-05.10)

USE THIS SECTION WHEN H<18'

DETAILED CATCH BASIN TYPE 4

DEPARTMENT OF TRANSPORTATION ROADWAY STANDARD DRAWINGS
STATE OF ARIZONA
C-15.50

CATCH BASIN TYPE 4

SECTION A-A
SECTION B-B
SECTION C-C
GENERAL NOTES

1. Catch basin can be used on grade or at roadway sag.

2. Catch basin has three configurations:
   - Pump only-sump portion of catch basins
   - Single wing (illustrated)-sump with wing basin upstreams and downstreams
   - Double wing-sump with symmetric wing basins each side.

3. Pipes can be placed in any wall except well adjacent to a wing basin.

4. Floor shall be a wood traveled finish. Slope of the sump portion of the catch basin along the axis of the pipe shall be 4:1.

5. Any specified inlet depression shall be warped to opening according to Std Dwg C-15.70.

6. All rebar shall be ASTM A36.

7. Nose plate shall be given one shop coat of Number 1 paint.

8. All concrete shall be Class B.

9. Curb opening area (sq ft) per inch of curb "H" + Inlet depression. Curb opening length (ft) x 0.0833.

10. All welding shall be in accordance with Std Spec 604-M-306.

11. See Std Dwg C-15.50 for grate and frame details and opening areas.

12. Construction joints and drains shall be placed to meet fluid conditions. See Std Dwg C-15.70.

13. Silicone sealant shall be placed between the grate frame and FCPC, recessed 1/4" from the pavement surface.

14. **H** = 6" when *H* is 8" or less. 8" when *H* is greater than 8". See Section C-C.

15. **B** = 5" when pavement is AC. Match pavement thickness when pavement is FCPC.
GENERAL NOTES
1. See Sheet 1 of 2 for other dimensions, notes and rebar.
2. \( f_1 = 6" \) when \( H \leq 8" \) or less
\( 8" \) when \( H \) is greater than 8"

PLAN

DETAIL 1

DETAIL 3

DETAIL 4

SECTION A-A
USE THIS SECTION WHEN \( H \) IS GREATER THAN 5'

CURB SUPPORT ANCHOR
GENERAL NOTES

1. Grating units and frames shall be fabricated from structural steel ASTM A36 except as noted.
2. All welding shall be in accordance with Std Spec 604-3.06.
3. The completed assembly shall be given one shop coat of number 1 paint.
4. Frames and grates shall fit to a maximum rack of 1/16" at any point.
5. Grate opening is 3.60 Sq Ft.
6. Boring of frame is recommended for handling and placement purposes.
7. Frame and Grate to be used with Std Dwg C-15, 10, C-15, 30 and C-15, 40.
8. Grate may be used with Std Dwg C-15, 92 Frame.

SECTION A-A

Typ 3/8" Diameter Cross Bars May Be Filled Welded, Resistance Welded or Electroforged to Bearing Bars

BEVELED SIDE OF GRATE TOWARD CURB

TYPICAL INSTALLATION
C-15,10 Catch Basin Shown Similar for C-15,30 and C-15,40
GENERAL NOTES

1. No Inlet depression shall extend into a traffic lane.
2. Maximum combined Inlet and gutter depression is 3'. See Section A-A.
3. Maximum distance along curb between catch basins where full gutter depression is used is 10'.
4. See Std Dwg C-15.80 for aprons used with Std Dwg C-15.80 Catch Basin.

LEGEND
- Normal pavement or gutter flow line elevation.
- Gutter Control Grade.
- Straight grade with downward slope.
- Normal gutter width per Std Dwg C-05.10.
- For Types 1, 3, & 5 Catch Basin.
- For Type 4 Catch Basin & Std Dwg C-15.91.

CATCH BASIN SPACING AT ROADWAY SAG CONDITION

INLET DEPRESSION

CATCH BASIN WITH SLOTTED DRAIN

SECTION A-A

SECTION B-B

Type D Curb & Gutter Shown)
GENERAL NOTES

1. Construction drain may be deleted at the option of the Engineer.

LEGEND

O - Normal pavement or gutter flow line elevation.

CATCH BASIN CONSTRUCTION DRAIN

6" Diameter Drain Pipe
Length as Required

Catch Basin Wall

Plug With Concrete
Upon Completion
of Paving

Remove Stud Prior
to Paving Operation

Slope to Drain

CATCH BASIN CONSTRUCTION DRAIN

TYPE 4 CATCH BASIN WITHOUT CURB
GENERAL NOTES

1. See also Std. Dwg C-13.10.
2. High point of headwall shall not project more than 3" above slope.
3. All concrete shall be Class B.
4. All rebar shall be #4, 1'-0" center to center, with 3" minimum clear to inside of walls and floor.

PIPE DIMENSIONS (Ft-In) QUANTITIES (Based on CMP Installation)

<table>
<thead>
<tr>
<th>ID (In)</th>
<th>Pressure Zone</th>
<th>A</th>
<th>B</th>
<th>E</th>
<th>F</th>
<th>H</th>
<th>J</th>
<th>K</th>
<th>Concrete (CY)</th>
<th>Reinforcing Steel (Lbs) Single Double Single Double</th>
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<tbody>
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</table>

STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION ROADWAY STANDARD DRAWINGS

5/12

CATCH BASIN DROP PILET

C-1575
GENERAL NOTES

1. All concrete shall be Class B.
2. Grate and Frame shall be fabricated of structural steel in accordance with ASTM A96.
3. All welding shall be in accordance with STD Spec 604-I-106.
4. Grate assembly shall be given one shop cost of Number 1 grade.

5. Apron slopes shall match the natural flow line of the ditch. No additional depressions will be allowed.
   (1) $\phi = 6^\circ \text{ when } H = 8' \text{ or less}$
   (2) $\phi = 8^\circ \text{ when } H > 8'$

SECTION C-C

SECTION B-B

SECTION A-A

SECTION D-D

WALL HEIGHT DETAIL

DIMENSION TABLE

<table>
<thead>
<tr>
<th>Slope Angle</th>
<th>Value</th>
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<tbody>
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<tr>
<td>8°</td>
<td>4.5</td>
</tr>
<tr>
<td>6°</td>
<td>5.0</td>
</tr>
<tr>
<td>4°</td>
<td>9.0</td>
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GENERAL NOTES

1. Concrete shell conform to the requirements for Class 5 Concrete. The minimum strength shall be 4000 PSI.

2. Grout shall be in accordance with the Std Spec except water content shall be such that the consistency is proper for smooth troweling.

3. All welding shall be in accordance with Std Spec 504-3.06.

4. The completed grate shall be given one shop coat of Number 1 paint.

5. Foundation slab and backfill shall be in accordance with Std Spec 203-5.
GENERAL NOTES

1. All concrete shall be Class B.
2. All rebar shall have 2" minimum clear cover unless otherwise noted.
3. "4" rebar shall be placed 12" center to center horizontal & vertical in walls.
4. Pipe may be placed in any wall.
5. See Std Dwgs C-13.60 and C-13.65 for more information and dimensions of slotted drains.
   ▲ Includes 1" Inlet Depression
6. H: 6" when H is 8" or less
   8" when H is greater than 8"

STATE OF ARIZONA
DEPARTMENT OF TRANSPORTATION
ROADWAY STANDARD DRAWINGS

FREeway CATCH BAsin DETAILS

DRAWING NO.
C-15.21
Sheet 1 of 2

5/12

Approved For: 

1. 4" x 4" Timbers or as Approved by the Engineer
2. Location Markers on Structure
3. Roadway Height
4. Slotted Drain
5. Grate Elevation
6. Plan View
7. Section A-A
8. Section B-B
9. 18" or 24" Diameter Slotted Drain
10. Curb Type B, C, or E
11. As Shown on Plans
12. Trim Base for Placement of Special Catch Basin
13. Insert Elevation
14. Flow Line
15. CMP Coupling Bend
16. 3" Type B Curb
17. 1/2" Type C & E Curb
18. Slotted Drain
GENERAL NOTES
1. All structural steel shall be in accordance with ASTM A36.
2. All welding shall be in accordance with Std Spec 504-3,06.
3. The completed grate assembly (frame & grate) shall be given two shop coats of No. 1 paint.

NOTE TO DESIGNERS
Grate design is not suitable for locations subject to bicycle traffic.

<table>
<thead>
<tr>
<th>GRATE AND FRAME DIMENSIONS</th>
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<tbody>
<tr>
<td>Type</td>
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<tr>
<td>------</td>
</tr>
<tr>
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<tr>
<td></td>
</tr>
<tr>
<td>C</td>
</tr>
<tr>
<td>E</td>
</tr>
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BRACE PLATE DETAIL

SECTION A-A

SECTION B-B
GENERAL NOTES

1. See Std Dwg C-15.91 for dimensions, sizes and details not shown for construction of catch basin.
2. See Std Dwg C-10.52 and C-10.53 for dimensions, sizes and details not shown for construction of barrier.
3. See Std Dwg C-15.60 for dimensions, sizes and details not shown for construction of slotted drain.
4. Only longitudinal reinforcing steel shall be placed in half barrier within 1" of catch basin. S-shape bars shall not be placed in the rear wall of the catch basin.
   - 1"-3" for 18" diameter slotted drain
   - 1"-6" for 24" diameter slotted drain
   - Angle varies, approximately 45°
   - Vertical in increased height over catch basin and slotted drain inlet depression
   - Depressed elevation.
   - Normal pavement or gutter flow line elevation.
   - Match adjacent gutter depression. Additional inlet depression as specified
   - Straight grade with downward slope.

NOTE TO DESIGNERS

Grate design shown is not suitable for locations subject to bicycle traffic. Use Std Dwg C-15.50 grate with Std Dwg C-15.92 frame (Sheet 1 of 2) for locations with bicycle traffic.
1. All welding shall be in accordance with Std Spec 604-3.06.
2. Grate opening for grate shown is 4.75 Sq Ft.

▲ Elevated side of grate toward barrier

**NOTE TO DESIGNERS**

Grate design shown is not suitable for locations with bicycle traffic. Use Std Dwg C-15.52 grate with Std Dwg C-15.96 frame (Sheet 2 of 2) for locations with bicycle traffic.
GENERAL NOTES

1. All welding shall be in accordance with Std Spec 604-3.06.

2. Grate opening for grate shown is 4.75 Sq Ft.

3. Elevated side of grate toward barrier

NOTE TO DESIGNERS

Grate design shown is not suitable for locations with bicycle traffic. Use Std Dwg C-15.50 grate with Std Dwg C-15.92 frame (Sheet 2 of 2) for locations with bicycle traffic.
GENERAL NOTES

1. Irrigation sleeves shall be installed in a trench condition. See Std. Dwg. C-15.15.

2. Bedding and backfill material shall be Class 2 AB.

3. Pipe installation shall conform to Section 502 of Std. Specs.

4. The contractor shall imprint a 4" x 8" block letter "5" on the face of all curbs at sleeve locations. The width of the letter shall be 1/2" and shall penetrate the concrete surface 1/8".

5. For non-continuous sleeves under crossroads, Std. Dwg. C-05.10 Type "A-1" curb shall be required where median is irrigated. See plans for locations. Dumbell waterstop shall be at all expansion joints.

6. Materials used for caps or plugs shall be as recommended by the pipe supplier and approved by the Engineer.

**Sleeve Marker:**
- 4" x 8" Pebber with Aluminum Cap Stamped "Sleeve"

**Berm:**
- 1' - 0" Minimum
- 1' - 0" Maximum

**Sleeve under Crossroad**

**Sleeve under Mainline**

**Sleeve under Ramp**

**Typical Installation**

**Dumbell Waterstop**

**Detail C**

**Sleeve Termination at Elevated Roadway**
TYPICAL SECTION
See Perspective Std Dwg C-17.10

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<tr>
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<td>10-0</td>
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ELEVATION AT CHORD POINT ON CURVE

ELEVATION ON STRAIGHT SECTION

WIRE MESH SPLICE DETAILS

SECTION A-A

PLATE 1

GENERAL NOTES
1. Rock shall conform to Section 913.2.01(a) of the Standard Specifications. The rock shall have a minimum nominal diameter no smaller than the mesh opening, and a maximum nominal diameter of 12".
2. All mesh wire, tie wire, cable, bolts, washers and nuts shall be galvanized.
3. When other embankment slope rates are encountered, wrap to 1/3 of 2 x 1/3.
4. High survivability filter fabric shall conform to Section 913.2.05 of the Standard Specifications.
5. All wire mesh on a single project shall have the same mesh opening.

计划细节

计划图

1/3 x 12G x 6" Bolt, Washer & Nut

1/3 x 10G x 4 1/2" Bolt, Washer & Nut

1/3 x 12G x 1/2" Galvanized Iron Pipe Spacer

计划图

ELEVATION AT CHORD POINT ON CURVE

ELEVATION ON STRAIGHT SECTION

WIRE MESH SPLICE DETAILS

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计划图

ELEVATION AT CHORD POINT ON CURVE

ELEVATION ON STRAIGHT SECTION

WIRE MESH SPLICE DETAILS

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计划细节

计划图

1/3 x 12G x 6" Bolt, Washer & Nut

1/3 x 10G x 4 1/2" Bolt, Washer & Nut

1/3 x 12G x 1/2" Galvanized Iron Pipe Spacer

计划图

ELEVATION AT CHORD POINT ON CURVE

ELEVATION ON STRAIGHT SECTION

WIRE MESH SPLICE DETAILS

SECTION A-A
**TYPE 7 AND 8 BANK PROTECTION**

**PLAN**
- 6x19 Galvanized Flow Steel Preformed Fibercore Cable
- Loop Cable Around Rail as Shown
- Rail Heads Face Out
- Manufacturer’s Standard Galvanized Cable Clamp

**SECTION A-A**
- ¾" Diameter Cable Placed Above Basket
- Mesh (See Table) Placed as Shown to Enclose the Rock Backfill (Typ)
- Attach Mesh to Rails With 3 Strands of #9 Galvanized Wire, 10" Center to Center (Typ)
- Elevation See Plans
- Rock Backfill
- ¾" Diameter Cable Placed Under Basket

**SECTION B-B**

**TYPE 9 BANK PROTECTION**

**ELEVATION**
- 2"x4" Galvanized Wire Fabric
- Horizontally Wrapped Wire Shall Be 2 Strands Twisted, Minimum 12 Gauge; Diagonal Wires Minimum 14 Gauge

**SECTION C-C**

**WIRE MESH SPLICE DETAILS**

**GENERAL NOTES**
1. Rock shall conform to Std Spec 913-2,07/A. The rock shall have a minimum nominal diameter no smaller than the mesh opening, and a maximum nominal diameter of 12".
2. All mesh wire, tie wire, cable, bolts, washers and nuts shall be galvanized.
3. Tension wires shall be 7 gauge (0.117 in diameter) cold-rolled steel wire with a minimum tensile strength of 75,000 pounds per square inch and shall be zinc-coated or aluminum-coated.

---

**TABLE**

<table>
<thead>
<tr>
<th>Type</th>
<th>MIN. RAIL LENGTH (ft)</th>
<th>MIN. RAIL WT (lbs/ft)</th>
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<th>A (ft²/ft)</th>
<th>B (ft²/ft)</th>
<th>C</th>
<th>D (ft²)</th>
<th>T (lbs)</th>
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</table>
GENERAL NOTES

1. Pipe sizes and elevations are shown on plans.
2. The manhole height, H, shall be measured from the lowest invert elevation to the top of the manhole frame.
3. Concrete for cast-in-piece manholes shall be Class B.
4. All manholes deeper than 56 inches shall have shops. Manhole shops shall be constructed in accordance with AASHTO M199, where precast manholes are used, the shops shall be installed at the same time sections are cast.
5. Precast manhole sections shall be manufactured in accordance with AASHTO M199, except that the compressive strength of each section shall be determined and accepted in accordance with Std Spec 1068-7.
6. Manhole size, location and elevation shall be as shown on plans.
7. Backfill material shall be compacted to at least 95 percent of the maximum density per the applicable test method of the AASHTO Materials Testing Manual.

NOTE TO DESIGNERS

Per OSHA requirements, special treatments are required for heights exceeding 30 ft.
GENERAL NOTES

1. The 30" minimum opening shall be required. Other Frames and Covers dimensions shown are nominal and vary by manufacturer.

2. All frames, grates, and covers shall support HS20 loading, minimum.

3. Casting weights shown are minimum weights and are either for cast-iron or ductile-iron castings. Casting weight shall not exceed 10% of the weights shown.

4. Covers (excluding grates) shall conform to the following:
   a. Manhole covers to contain the agency name and utility, as directed.
   b. Letters shall be 2 inches in height and raised 1/8-inch above the plane of the cover.
   c. Letters and words to be equally spaced and
   d. Letter font and layout shall be as approved by the Engineer.

5. Details shown are typical. Alternative designs of manhole frames and covers may be used upon approval of the Engineer, as long as the minimum loading and weight criteria (as above) are met.

SECTION C-C
36" NOMINAL CMP FRAME & GRATE
Approximate Weight: Frame 125 Lbs
Cover 161 Lbs

SECTION B-B
30" MANHOLE FRAME & COVER
Approximate Weight: Frame 204 Lbs
Cover 209 Lbs

SECTION A-A
FRAME, COVER & COLLAR
PAVEMENT INSTALLATION

4 Steel Spacers, 4"x2"x thickness as required from 1/2" to 2". When thickness is less than 2", use Precast Adjusting Rings.

*6 Rebar (Typ) Circular Band 2" Minimum Clear Cover

Wet Thoroughly and Paint With Grout

Two #2 Hoops for 4" Ring Ties With *4 A5.75# Gauge Wire. 6" & 8" Ring Requires Four #2 Hoops
GENERAL NOTES

1. All timber shall be rough, pressure treated and unpainted.

2. Rock basket, full length of structure, shall be included only when called for on plans.

3. See plans for bituminous surface and base material details.

TYPE 1
BITUMINOUS SURFACE ROAD

12" Diameter x 12" Deep Concrete Foundation For Depth Gauge
Full Circle for Type 1
Half Circle for Type 2
See Note 4
Sheet 1 of 2

DETAIL A

WITH TREATED BASE

WORD COUNT: 0
GENERAL NOTES

1. A survey monument and frame & cover, complete-in-place, shall be considered a unit.

2. All markers shall be placed as shown on the plan or as directed by the Engineer.

3. Frames may be either Type A or Type B.

4. Frames shall weigh at least 53 pounds.

5. Covers shall weigh at least 16 pounds.

6. Machined portions of the frame and cover are shown by the symbol "\[ ]". The allowable tolerance for machined areas is ±1/8". Concrete shall conform to Std Spec 902.

7. Survey monuments shall be magnetically detectable.

8. For R/W monumentation, see ADOT R/W Plans Section Right-of-Way Monumentation Procedures and Standards.

△ 12" or pavement structure thickness, whichever is greater.

SURVEY MONUMENT FRAME AND COVER

COVER SECTION

COVER PLAN
GENERAL NOTES

1. Survey marker may be used with survey monument, and as bench or survey control marker.
2. Survey marker shall be made of brass and will be furnished by the Department. Cast-in lettering format may vary.
3. When used to define section lines, the marker shall be stamped in accordance with the OLM "Manual of Surveying Instructions" including the land surveyor's registration number.
4. For R/W marker information, refer to current ADOT R/W Plans Section R/W Monumentation Procedures and Standards.
5. Bench marks shall be established on headwalls, bridge walls and other permanent structures as directed by the Engineer.
6. Bench mark station, elevation, year, and/or other information shall be hand stamped in field, as approved by the Engineer.
7. Shank cross-sectional area shall be a minimum of 0.31 square inches and a maximum of 0.60 square inches. Shank cross-section may vary and is not a critical feature of this standard.
8. Shank geometry shall provide for secure anchorage in concrete.
9. Text shall not obscure survey point.