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
The Roadway Construction Standard Drawings (C-Std) have been revised and updated, and printed as a new, complete set. Users should obtain the new Construction Standard Drawings (May 2007 cover) from Engineering Records. The new edition has both format and engineering changes. The format change is the most obvious and affects all of the drawings. This change is as follows and is not noted individually in the revision block:

The drawings font size and style, and lines now conform to the ADOT CADD guidelines. Information is contained on the same levels as those prescribed for plan sheets.

Some of the significant engineering changes from the October 2004 edition are the following:

- C-01.10, Sht 1 of 4: changed the order of the various boundary and jurisdictional lines
- C-02.20 and C-02.30: changed the steepest allowable slope for 1-1/2:1 to 2:1
- C-04.10, Sht 2 of 2: new drawing for double inlet in sag condition
- C-04.20, Sht 2 of 2: new drawing for double inlet in sag condition
- C-04.30 and C-04.40: revised tables as a result of slope changes in C-02.20 and C-02.30, and guidance on spillway and downdrain usage from the RDG
- C-05.10: added General Note 7 reading, "Place AB under single curb, valley gutter, and curb & gutter when shown on plans."
- C-05.20, Sht 1 of 2: added General Note 5 reading, "Place AB under driveways when shown on plans."
- C-05.20, Sht 2 of 2: added General Note 5 reading, "Place AB under sidewalks when shown on plans."
- C-05.30, Sht 1 of 7: changed slope rate in Sections A-A and C-C to 15:1; changed maximum ramp length at 15:1 slope to 15 feet
- C-05.30, Shts 2 – 5 of 7: changed maximum ramp length at 15:1 slope to 15 feet
- C-07.02: revised General Note 1 to read, "Load transfer dowel assemblies shall be used with non-skewed, mainline PCCP joints"
- C-10.00: revised graphics to match Bridge Group's Transition, SD 1.03; thrie-beam approach and departure transitions are now the same
- C-10.30, Sht 2 of 2: added anchor hardware drawings formerly shown on concrete barrier transition drawings
- C-10.32: deleted
- C-10.54 and C-10.55, Shts 1 & 2 of 3: added concrete cap to Section A-A; revised General Note 3 to read, "Longitudinal rebar shall extend 12" past the construction joint at the completion of each incremental pour."
- C-10.70, C-10.71, C-10.72, and C-10.73: removed Thrie-Beam Guardrail Transition System hardware details and added references to Std Dwg C-10.30
- C-11.10, Shts 1 – 4 of 4: re-issued drawing with additional sheet detailing the clamp
- C-18.10, Sht 1 of 3: added "NOTE TO DESIGNERS" reading, "Per OSHA requirements, special treatments are required for heights exceeding 30 ft."
Design personnel should incorporate the new edition of the C-Stds into their project plans. For projects at or near completion, where the inclusion of all 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 construction projects.

Please arrange for additional copies of the new C-Stds for all users within your Group or District. Additional copies (8-1/2" x 11" or 11" x 17") may be obtained from Engineering Records located at 1655 West Jackson, Room 175, Phoenix, AZ 85007-3217 or by telephoning 602-712-8216.

An updated List of Standards (1A Sheet) is available either from the Roadway Support Desk (602-712-8667 or 602-712-8491) or on-line at the Roadway Design web site at the following address: http://www.azdot.gov/Highways/Rdwyeng/RoadwayDesign/Index.asp

Updated Summary Sheets are also available on-line at the address shown above.

Please distribute this memorandum to all design personnel, project managers, consultants, and other users in your respective Group, District, or Section.

Please direct questions regarding this memo or the updated standards to Kenneth Cooper, P.E., Roadway Standards Engineer, at 602-712-8674.

MAV/KRC/krc

c: Roadway Engineering Group
   Traffic Engineering Group
   Valley Project Management Group
   Environmental and Enhancement Group
   Districts (10)
   Statewide Project Management Group
   FHWA
   Contracts and Specifications Section
   Construction Group
   Bridge Group
   Maintenance Group

Regional Traffic Engineers (4)
   Materials Group
   Local Government Section
   Engineering Consultant Section
   District Permits Office (9)
   Engineering Records
   Sam Elters
   Dan Lance
   Sam Maroufkhani
   Doug Forstie
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 the sheets and are not noted. The revision date for all the format changes is 5/07 and is noted in the title block. This is the revision date shown on the 1A sheet.

Engineering changes have been made to some of the drawings since the last edition was issued in October 2004. 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.
Standard Names with an asterisk (*) have recommended Special Provisions associated with them that can be found here. Be sure to review the recommended Special Provisions if you are using any of those drawings.
C-STANDARDS FEEDBACK FORM
* Required Information

PROJECT: *Project Name/No.: ___________________________________________________

Route: ___________  Milepost: __________  District: _________________

C-STANDARD: *Number: _______________    *Sheet No.: _________ Edition Yr.: _________

*COMMENT OR QUESTION: Use back of form for additional space
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CONTACT INFORMATION: *Name: ______________________________   *Mail Drop.: ______
*Phone No.: ____________________ Constr./Maint./Design ORG No.: __________________
*E-mail Address: _______________________________________

For Office Use Only

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RECOMMENDATION/ACTION: Use back of form for additional space
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Return forms to Ken Cooper, MD 615E, or fax: 602-712-3075
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CONSTRUCTION DRAWING SYMBOLS

NEW FEATURES

EXISTING FEATURES

Plen View, Bituminous Pavement

Irrigation Ditch, Concrete

Plen View, Concrete Pavement

Irrigation Ditch, Earth

Plen View, Graded Surface

Irrigation Line (1"=20')

Plen View, Obiterate Pavement

Irrigation Line (1"=100')

Plen View, Wood

Overhead Power/Joint-Use Line

Section, Asphatc Concrete Friction Course

Overhead Telephone Line

Section, Bituminous Pavement

Sanitary Swwer (1"=20')

Section, Concrete

Sanitary Swwer (1"=100')

Section, Metal

Storm Drain (1"=20') & (1"=50')

Section, Wood

Storm Drain (1"=100')

Section, Aggregate Base

Street Light and with Mast Arm

Section, Ground Line

Telephone/Power Pedestal

Ground Line Profile

Utility Pole with Down Guy and Anchor

Barbed Wire Fence & Gate

Underground Power/Joint-Use Line

Chain Link Fence & Gate

Underground Telephone Line

Guardrail & Flared End Terminal

Water/Gas Meter Box

Guardrail & Tangent End Terminal

Water/Gas Valve

Gas Line
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**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 (D). 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 add 1' to semi-tangent to 11' maximum.
GENERAL NOTES

1. Roadway widths, cut ditch widths, cross slope, 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.

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

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

SUBGRADE/SLOPE HINGE TREATMENT DETAIL

MINIMUM DITCH CONDITIONS DETAIL

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 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 set 1" to 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 (D). See Shoulder Wedge Detail.

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

NOTE TO DESIGNERS

⑦ USAGE OF THIS STANDARD IS LIMITED IN ACCORDANCE WITH THE ROADWAY DESIGN GUIDELINES - CHAPTER 300.

⑩ 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.

MINIMUM SLOPES

**MINIMUM SLOPES**

**INTERMEDIATE SLOPES**

**MAXIMUM SLOPES**

**MINIMUM DITCH CONDITIONS DETAIL**

**SUBGRADE/SLOPE HINGE TREATMENT DETAIL**

**SHOULDER WEDGE DETAIL**

**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. 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 outlet treatment shall be as provided on plans.

Dimensions of ditches and channels shall be shown on the plans as bottom width, depth and length. Ditches and channels shall be constructed with a minimum grade to prevent erosion. Ditch outlet treatment shall be as provided on plans.
GENERAL NOTES
1. Dimensions of dikes shall be shown on the plans as top width, height, length and top of dike elevation.

2. Slope as shown on Plans (10:1 Desirable)
   - Slope as shown on Plans

Dimensions of dikes shall be shown on the plans as top width, height, length and top of dike elevation.

TYPICAL TRANSVERSE MEDIAN DIKE INSTALLATION

TYPICAL DIKE INSTALLATION AT STRUCTURE
GENERAL NOTES

1. Dimensions for ditch dikes shall be shown on the plans as dike stationing, height, length, dike back slope and top of dike 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 toe intersection.

- 10:1 Desirable Slope

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

1. Berm construction shown is for pipe extensions. Berm construction similar for new pipe and multiple pipe installations. See Pipe Berm Requirement Detail.

2. 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.

3. See Std Dwg C-13.15 for pipe backfill and bedding material limits.

4. Single Pipe Installation: D = Outside Diameter of Pipe
   Multiple Pipe Installation: D = Outside Edge to Outside Edge of Pipes

SECTION A-A

PIPE BERM REQUIREMENT DETAIL
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 backfill limits.
   - Vary slope. Slope shall match to top of wing walls.
   - Slope shall match wing walls design slope (2:1, 4:1, or 6:1)
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 Std Specs.
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 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. See Std Dwg C-10.06 for nested guardrail requirements.

72" Timber Post

3" Minimum

6x6-W1.4/W1.4 Wire Mesh

Fill Slope
Typ

4'-0"

2'-9"

6"}

Subgrade Shoulder
Slope Break

Section A-A

Spillway Section

Outlet

See General Notes 3 & 4

6x6-W1.4/W1.4 Wire Mesh In Apron

6x6-W1.4/W1.4 Wire Mesh Continuous Bottom & Sides

Outlet Detail

Spillway, Embankment
Single Inlet

Project No. E-04.30

State of Arizona

Department of Transportation

Roadway Standard Drawings

Approved for Distribution

Approved for Design

5/07

5/07

General Notes

Location may be adjusted to accommodate guardrail post layout.

All concrete shall be Class B. Embankment curb concrete shall be in accordance with the Std Specs.

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

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

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

See Std Dwg C-04.30 for spillway length.

See Std Dwg C-10.06 for nested guardrail requirements.

72" Timber Post
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 omitted, 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. Outlet invert slope shall be uniformly downward from A to B. See Section B-B.

6. See Std Dwg C-04-J0 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 1 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-sack grout mix or alternate material as approved by the Engineer.

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

**LEAVEOUT DETAIL**

Guardrail Post

- 1 1/2" Min

6"x8" Post Sleeve

- Install Nut On Traffic Side

**POST SLEEVE DETAIL**

Outlet

- See General Notes 3 & 4

**OUTLET DETAIL**

6x6-W1.4/W1.4 Wire Mesh

- Lap 12" and Tie

Outlet

- See General Notes 3 & 4

6x6-W1.4/W1.4 Wire Mesh In Apron

**SECTION B-B**

Subgrade Shoulder

- Slope Street

Normal or 2' Widened Shoulder Line

**PLAN**

Normal or 2' Widened Shoulder Line

POST SLEEVE DETAIL

Outlet

- See General Notes 3 & 4

6x6-W1.4/W1.4 Wire Mesh

- Lap 12" and Tie

Outlet

- See General Notes 3 & 4

6x6-W1.4/W1.4 Wire Mesh In Apron

**SECTION A-A**

Subgrade Shoulder

- Slope Street

Normal or 2' Widened Shoulder Line

**SPILLWAY SECTION**

6x6-W1.4/W1.4 Wire Mesh

- Continuous Bottom & Sides

6x6-W1.4/W1.4 Wire Mesh

- Lap 12" and Tie

Outlet

- See General Notes 3 & 4

6x6-W1.4/W1.4 Wire Mesh In Apron

**OUTLET DETAIL**

6"x8" Post Sleeve

- Install Nut On Traffic Side

5 1/2" Min

**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 omitted, 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. Outlet invert slope shall be uniformly downward from A to B. See Section B-B.

6. See Std Dwg C-04-J0 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 1 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-sack grout mix or alternate material as approved by the Engineer.

- Length may be 4'-6" or 5'-0".
1. Location may be adjusted to accommodate guardrail post location.

2. Tank, slab, trash rack and angle supports shall be shop fabricated, welded and galvanized in accordance with AASHTO M36.

3. Permissible couplings shall be mechanical, heat-shrinkable polyolefin sheet one-piece lap-type neoprene steel or skip seams, all minimum 1/2" width and minimum 18 gauge.

4. Inlet invert slope shall be uniformly downward from 1' inside of embankment curb base.

5. All concrete shall be Class B. Embankment curb concrete shall be in accordance with the Std Specs.

6. Round all exposed concrete corners.

7. See Std Dwg C-04.40 for downdrain length.

8. See Std Dwg C-10.06 for nested guardrail requirements.

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

10. Where rock is encountered the outlet may be omitted, as approved by the Engineer.
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 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-sack grout mix or alternate material as approved by the Engineer.

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

   - Indicate AASHTO, AGC & ARTBA Task Force 13 Report designation
   - Verifies with subgrade slope and pavement structural thickness
   ▲ Verifies with fill slope and pipe cover
   □ 72" Timber post
   □ Length may be 4'-6" or 5'-0"
   ■ 12" Diameter x 6", 16 Gauge Annular CMP Stub

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

   - Verifies with subgrade slope and pavement structural thickness

   ▲ Verifies with fill slope and pipe cover

   □ 72" Timber post

   □ Length may be 4'-6" or 5'-0"

   ■ 12" Diameter x 6", 16 Gauge Annular CMP Stub

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   - Verifies with subgrade slope and pavement structural thickness

   ▲ Verifies with fill slope and pipe cover

   □ 72" Timber post

   □ Length may be 4'-6" or 5'-0"

   ■ 12" Diameter x 6", 16 Gauge Annular CMP Stub

All posts within the inlet shall have a "leaveout" for the full depth of the concrete. The "leaveout" shall measure a minimum of 1 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-sack grout mix or alternate material as approved by the Engineer.
### GENERAL NOTES

1. For spillway details, see Std Dwg C-04.10.

### NOTE TO DESIGNERS

Use earthwork cross sections for more precise spillway lengths.

---

#### 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>6x1</th>
<th>Varies from 6x1 to 2x1</th>
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<td>6</td>
<td>7</td>
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</tr>
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</table>

- **Spillways are not usually used for these slope conditions.**
- Use the following equation when a spillway is required:
  - **Approximate Spillway Length in Feet = (Embankment Height + Pavement Structural Section Thickness) times 6**

### 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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<th>2x1</th>
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<td>32</td>
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<td>36</td>
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</tbody>
</table>

- **Spillways are not usually used for these slope conditions.**
- Use the following equation when a spillway is required:
  - **Approximate Spillway Length in Feet = (Embankment Height + Pavement Structural Section Thickness) times 2**

---
APPROXIMATE DOWNDRAIN LENGTH (FT) - C-02.10 & C-02.20 SLOPES

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<thead>
<tr>
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<th>Varies from 6:1 to 2:1</th>
<th>2:1</th>
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<td>72</td>
<td>68 66 64 62 60 59 58 54 52 50 48 46</td>
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</tr>
</tbody>
</table>

C-02.10 AND C-02.20 SLOPES

General Notes

1. For downdrain details, see Std Dwg C-04.20.

Note to Designers

Use earthwork cross sections for more precise downdrain lengths.
GENERAL NOTES

1. Stub shell have annular corrugation. Downtrain piping beyond stub may be either annular or helical.
2. Couplings shall be mechanical heat-shrinkable polyolefin sheet; one piece lap-type neoprene sheet or slip dam, all 12" minimum width and 16 gauge minimum.
3. Maximum Q Allowable = 8 cfs
   Minimum V Allowable = 1 fps
4. Concrete shall be Class B.
GENERAL NOTES

1. Single curb and curb & gutter may be constructed by the use of forms or the concrete may be extruded.
2. When the pavement section slopes away from the gutter, the slope of the gutter shall match the pavement cross slope. Therefore, the gutter depression is not applicable.
3. Twin-inch deep contraction joints shall be placed in the curb and the gutter at locations which match the joints in adjacent PCCP and at approximately 450 cm centers when adjacent to AC pavement. Joints shall be either hand-tooled or sawn.
4. Expansion joints shall be located at tangent points in curb returns, at structures and at maximum 60' intervals. The 1/2" joint filler shall extend the full depth of the concrete.
5. Concrete shall be finished with a steel trowel followed by brushing with a fine brush along the length of the curb and gutter.
6. All exposed edges and hand-tooled joints shall be finished with a tool having a 1/4" radius, or as noted on the plans.
7. Place AB under single curb, valley gutter, and curb & gutter when shown on plans.

CURB & GUTTER TYPE D, D-1, D-2 & D-3

SINGLE CURB TYPE A & A1

EXPANSION JOINT DETAIL

VALLEY GUTTER

EMBANKMENT CURB

CURB TERMINAL SECTION
GENERAL NOTES

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

2. See Slotted Drain Std Dwgs C-15.60 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.

Dimension May Vary Where Transition Occurs on Curves, See Plans

Type 1 - Gutter Transition at Roadway Edge With Angle Point Is Applicable With Concrete Half Barrier and Curb & Gutter Applications Curb & Gutter Alternative Is Shown

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

1. Type 1 - Parallel-Type Gutter Transitions At Ramps

2. Type 1 - Taper-Type Gutter Transitions At Ramps

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

4. See Slotted Drain Std Dwgs C-15.60 and C-15.91 for curb & gutter with slotted drain.

5. See Std Dwg C-05.10 for additional general notes and dimensions.

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

7. Dimension May Vary Where Transition Occurs on Curves, See Plans

8. Type 1 - Gutter Transition at Roadway Edge With Angle Point Is Applicable With Concrete Half Barrier and Curb & Gutter Applications Curb & Gutter Alternative Is Shown

9. Curb & Gutter - Type B, C or C-1, Std Dwg C-05.10
**Type 4 - Curb & Gutter Transition**

- Curb Height: Varies 0" to 7" maximum in depressed curb area beyond the end of barrier. See plans for curb height.
- Curb & Gutter Type B, C, C-1, D, D-1, D-2 or D-3

---

**Type 2 - Curb & Gutter Transition**

- Dimensions: May vary Type D, D-1, D-2 or D-3
- Curb & Gutter Type B or C

---

**Type 3 - Curb & Gutter Transition at Paved Gore**

- Dimensions: May vary Type D, D-1, D-2 or D-3
- Curb & Gutter Type B or C

---

**Section A-A**

- Gore Area
- Gutter Line
- Top of Curb

---

**Section B-B**

- Gore Area
- Gutter Line
- Top of Curb

---

**Elevation**

- Gore Area
- Gutter Line
- Radius Point

---

**Perspective View**

- Roadway Width
- Top of Curb

---

**Plan View**

- Roadway Width
- Gutter Line
- Top of Curb
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 tool having a 1/4" radius. See Sheet 2 for the Contraction Joint Detail.

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

4. Concrete shall be finished by means of a float, then steel troweled and then broomed with a fine 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
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' wide, 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 36 square feet. Joints shall be either formed or sawn. Formed joints shall be finished with a tool having a 1/4" radius.
3. Score marks shall be 1/4" 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 1/2" 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 \( \text{ft/ft} \)
- Maximum slope = 0.02 \( \text{ft/ft} \)

- Width as Shown on Project Plans
- 1" Maximum

**CONCRETE SIDEWALK ADJACENT TO CURB**

**CONCRETE SIDEWALK SETBACK FROM CURB**

**CONTRACTION JOINT DETAIL**

**EXPANSION JOINT DETAIL**

**STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION ROADWAY STANDARD DRAWINGS**

**CONCRETE DRIVEWAYS & SIDEWALKS**

**GENERAL NOTES**

- 1/4" R Maximum
- 1/4" Preformed Expansion Joint Material

- Width as Shown on Project Plans
- 1" Maximum

- **Veritas**
**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 15:1 slope governs. If a 15:1 slope results in a ramp length longer than 15-ft, the 15:1 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 the area a standard marked crosswalk would enclose.

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

5. See Std Dwgs C-05.10 and C-05.20 for joint details.

- See Note 2
- 10" Maximum to Face of Pedestrian Push Button
- Pedestrian Push Button Pole When Shown on Traffic Plans. See Traffic Signal Plans for Additional Information

**LEGEND**

- Minimum Slope = 100:1 (0.01 $)
- Maximum Slope = 50:1 (0.02 $)

**RAMP CURB DETAIL**

- Construction Joint
- See Plans

**SECTION A-A**

- Top of Sidewalk Ramp (Typ)
- Bottom of Sidewalk Ramp (Typ)
- 15:1

**SECTION C-C**

- Top of Sidewalk Ramp (Typ)
- Bottom of Sidewalk Ramp (Typ)
- 15:1

**SECTION B-B**

- See Ramp Curb Detail
- Detectable Warning Strip (Typ) See Sheet 7 of 7

**PARALLEL SIDEWALK RAMP**

- RAMP CURB DETAIL
- 15:1

**ROADWAY STANDARD DRAWINGS**

- APPROVED FOR DISTRIBUTION
- APPROVED FOR DESIGN

**STATE OF ARIZONA**

- DEPARTMENT OF TRANSPORTATION

- No. C-05.30
- Rev. 5/07

- 5/07
1. Ramp centerline shall be radial from the face of the curb at the sidewalk ramp control point.

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

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

4. Concrete shall receive a rough brown finish as shown. The side slope wings do not receive a brown 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 planter strip.

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


8. 10" Maximum to Face of Pedestrian Push Button

9. Minimum Slope = 100:1 (0.01 $)

10. Maximum Slope = 50:1 (0.02 $)

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

Legend:
- Minimum Slope = 100:1 (0.01 $)
- Maximum Slope = 50:1 (0.02 $)
- Pedestrian Push Button Pole When Shown on Traffic Plans. See Traffic Signal Plans for Additional Information
- 10" Maximum to Face of Pedestrian Push Button

DELETED GENERAL NOTE 7
DELETED GENERAL NOTE 7

REVISED NOTE: REMOVED REFERENCE TO NOTE 3
REVISED GENERAL NOTE 2

3. Top-Back of Sidewalk (Typ)
4. Location (Typ) See Sheet 7 of 7
5. Top of Sidewalk Ramp (Typ)
6. Bottom of Sidewalk Ramp (Typ)
7. Detectable Warning Strip See Sheet 7 of 7
8. See Plans
9. Maximum Slope = 50:1 (0.02 $)
10. 10" Maximum to Face of Pedestrian Push Button

General Notes:
- Ramp centerline shall be radial from the face of the curb at the sidewalk ramp control point.
- For ramps 15'-1 long or less, the 15:1 slope governs. If a 15:1 slope results in a ramp length longer than 15'-1, the 15:1 slope may be waived and the ramp length held at 15'-1, regardless of the slope.
- Drainage inlets should not be located within the marked crosswalks, or if crosswalks aren't marked, within the area a standard marked crosswalk would enclose.
- Concrete shall receive a rough brown finish as shown. The side slope wings do not receive a brown finish.
- 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 planter strip.
- See Std Dwgs C-05.10 and C-05.20 for joint details.
- Pedestrian Push Button Pole When Shown on Traffic Plans. See Traffic Signal Plans for Additional Information
- 10" Maximum to Face of Pedestrian Push Button

Legend:
- Minimum Slope = 100:1 (0.01 $)
- Maximum Slope = 50:1 (0.02 $)
- Pedestrian Push Button Pole When Shown on Traffic Plans. See Traffic Signal Plans for Additional Information
- 10" Maximum to Face of Pedestrian Push Button
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 15:1 slope governs. If a 15:1 slope results in a ramp length longer than 15-ft, the 15:1 slope may be waived 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 enclose.
6. Concrete shall receive a rough broom finish as shown.
7. See Std Dwgs C-05.10 and C-05.20 for joint details.
9. 10" Maximum to Face of Pedestrian Push Button

LEGEND
- Minimum Slope = 100:1 (0.01 $)
- Maximum Slope = 50:1 (0.02 $)

DEPRESSED CURB AT SIDEWALK RAMP

15:1

2'-6" 2'-6" 2'-6"
**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. 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 sides of the Sidewalk Ramp shall match the elevation at the back of the Curb & Gutter and the back of the 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.

**LEGEND**

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

- 10“ Maximum to Face of Pedestrian Push Button

**DRAWING NO.**

C-05.30

**STATE OF ARIZONA**

DEPARTMENT OF TRANSPORTATION

ROADWAY STANDARD DRAWINGS

APPROVED FOR DISTRIBUTION

APPROVED FOR DESIGN

5/07
GENERAL NOTES

1. For use at mid-block locations.

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

3. For ramps 15'-11" long or less, the 15:1 slope governs. If a higher slope results, the 15:1 slope may be used and the ramp length held at 15'-11".

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, or if crosswalks aren't marked, within the area a standard marked crosswalk would enclose.

7. Concrete shall receive a rough broom finish as shown. See Std Dwgs C-05.10 and C-05.20 for joint details.

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

LEGEND

Minimum slope = 100:1 (0.01 in)

Maximum slope = 50:1 (0.02 in)
1. For median widths 5'-5" and less, the Detectable Warning Strip shall be continuous from back-of-curb to back-of-curb. The Detectable Warning Strip shall not extend beyond the back of curb. Modular units such as bricks or tiles shall be used to construct the Detectable Warning Strip. Partial domes at the edge of the Strip shall be ground flush with the brick or tile surface.

2. Use Type A1 curb if median is to be landscaped.

3. Single curb shown, see plans for Curb & Gutter application.


5. 10" Maximum to face of Pedestrian Push Button.
GENERAL NOTES

1. Drain shall be placed in low corner and filled with coarse aggregate (AASHTO M43 Size 7) securely tied in a long-life geotextile sack.

LEGEND

- 1/4" Minimum (Typ) (0.65 in. Minimum ADA Actual)  
- 1/2" to 2 3/8" (Typ) (1.6 in. to 2.4 in. ADA Actual)  
- 5/8" to 1 7/16" (Typ) (0.9 in. to 1.4 in. ADA Actual)  
- 50% to 65% of [ ]

DETECTABLE WARNING STRIP DETAIL

- Sand Thickness Varies
- 4" Waste Slab
- Drain

SECTION A-A

DETECTABLE WARNING STRIP

BRICK OPTION

PLAN

SECTION

DETECTABLE WARNING STRIP

BRICK OPTION

TEXTURE PATTERN DETAIL

TRUNCATED DOME ELEVATION

DETECTABLE WARNING STRIP DETAIL
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 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.

4" Stamped Concrete
See Note 3

Concrete Pavers
See Note 3

4" AB (Class 2)

A 4"x6" concrete header shall be used to end decorative paving at locations when concrete sidewalk ramps are not present.
1. The PCCP surfaces within the bus bay area shall be textured transversely. Surface texturing to conform to Std Spec 401.

2. Transverse weakened-plane joints shall be constructed at a maximum spacing of 15' and shall align with joints in the concrete curb and gutter.

3. For additional data on slotted drains, see Std Dwg C-13.60.

4. For 1/4" expansion joint with preformed joint fillers, see Detail A.

5. Concrete pad to be poured separately from concrete bus bay pavement.

6. For sidewalk construction details, see Std Dwg C-05.20.

▲ See Plans: match the adjacent gutter depression
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.

8. The Type "A" turnout is the preferable turnout design. Type "B" shall only be used when absolutely necessary.

9. Paved turnouts & plan notations will be W X L, surface material, type and standards. Examples: 20' X 30' ACTO, Type A, Std Dwg C-06.10. Show radius (R) graphically.

10. Excavation or embankment for turnouts shall be included in quantities for main roadways.

11. Base material shall be the same as that shown for main roadway, unless otherwise noted.

12. Desirable sideslope for rural turnouts is 1:5.

RURAL DEVELOPMENTS

<table>
<thead>
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<th>No.</th>
<th>Dimensions</th>
<th>Notes</th>
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<td>(1)</td>
<td>10' Minimum, 20' Desirable</td>
<td>Residential - 10' Minimum, 30' Maximum</td>
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<tr>
<td>(2)</td>
<td>15' Minimum</td>
<td>Commercial - One-Ways 15' Minimum, 30' Maximum</td>
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<tr>
<td>(3)</td>
<td>25' Minimum, 40' Desirable</td>
<td>Driveways - Two-Ways 25' Minimum, 40' Maximum</td>
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<td>(4)</td>
<td>40' Minimum</td>
<td>Industrial - 20' Minimum, 40' Maximum</td>
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URBAN DEVELOPMENTS

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<tr>
<td>(4)</td>
<td>40' Minimum</td>
<td>Industrial - 20' Minimum, 40' Maximum</td>
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</table>
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.
   ① Break angle greater than 6% requires a vertical curve, L=10' minimum. Vertical curve shall not encroach on roadway or sidewalk.
   ② Commercial & Industrial: 20'-40' Desirable
   Residential: 10' Minimum Desirable

See General Notes
When load transfer dowel assemblies are required, use dimensions shown in ( )'s. See Assembly Placement And Edge Clearance Detail, Std Dwg C-07.02.

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

K joints shall be constructed around the complete perimeter of miscellaneous structures, or as directed by the Engineer.

Miscellaneous structures include, but are not limited to, catch basins, sign structure foundations, piers, abutments, barrier transitions, storm drains 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
- PE - Polyethylene
- AC - Concrete
- PCCP - Prestressed Concrete Cylinder Pipe

### Construction Joint Saw and Seal Detail
- Saw and Seal
- See Construction Joint Saw And Seal Detail
- 1/2" Diameter Epoxy Coated Smooth Dowels 2'-6" Center to Center
- See Notes 3 & 4

### Longitudinal Construction Joint
- LC Joint
- Saw and Seal
- 1/2" Diameter Epoxy Coated Smooth Dowels 1'-0" Center to Center

### Transverse Construction Joint
- TC Joint
- Non-Skewed & Skewed Joints
- Saw and Seal
- See Construction Joint Saw And Seal Detail
- 1/2" Diameter Epoxy Coated Smooth Dowels 1'-0" Center to Center

### Longitudinal Weakened-Plane Joint
- LWP Joint
- Saw and Seal
- See Weakened-Plane Joint Saw And Seal Detail
- 1/2" Diameter Epoxy Coated Smooth Dowels 1'-0" Center to Center

### Transverse Weakened-Plane Joint
- TWP Joint
- W/O Load Transfer Dowel Assemblies
- Saw and Seal
- See Weakened-Plane Joint Saw And Seal Detail
- 1/2" Diameter Epoxy Coated Smooth Dowel 1'-0" Center to Center

### Expansion Joint
- H Joint
- 1/2" Preformed Expansion Joint Material
- Silicone Sealant
- Recess 1/4" From Pavement Surface

- E Joint
- 1/2" Preformed Expansion Joint Material
- Silicone Sealant
- Recess 1/4" From Pavement Surface

- S Joint
- (Where Specified on Plans)
- 1/2" Minimum Saw Cut or Ral
- Clean Loosened Particles and Fill With AR Sealant
- Miscellaneous Structure See Notes 3 & 4

### AC/PCCP Edge-Seal Joint
- S Joint
- 1/2" Diameter Epoxy Coated Smooth Dowel 1'-0" Center to Center
- See Weakened-Plane Joint Saw And Seal Detail
- 1/2" Diameter Epoxy Coated Smooth Dowel 2'-6" Center to Center

### Miscellaneous Structure
- See Notes 3 & 4

---

Note: The above diagram shows various types of joints and details, including construction joints, weakened-plane joints, expansion joints, and AC/PCCP edge-seal joints, with specific dimensions and materials used. The diagram also indicates the use of rebar and dowels for structural integrity.
GENERAL NOTES
1. Joints are generally shown with pavement sloping toward the joint.

JOINT ABBREVIATIONS
G = Gutter Joint
T = PCCP Thickness
D = Gutter Thickness
B = Barrier Joint

LONGITUDINAL CONSTRUCTION JOINT DETAIL (WITH AR-ACFC)

WEAKENED-PLANE JOINT DETAIL (WITH AR-ACFC)

HALF BARRIER JOINT
B Joint
AC Pavement on Back Side of Barrier

MEDIAN BARRIER JOINT
B Joint
PCCP on Both Sides 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, melinite PCPP joints.
3. When used, load transfer dowel assemblies are to be placed at each transverse weakened-plan joint on the traveled lanes as shown on the plans.
4. See Std Dwg C-07.01 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:

Dowel bars - 1 1/4" diameter x 1'-0" plain round bars with coating, see Special Provisions.

END AND INTERMEDIATE LEG DETAIL

Center Transverse Weakened-Plane Joint Within 1 1/4" of Center of Load Transfer Dowel

7. Dowel bars - 1 1/4" diameter x 1'-0" plain round bars with coating. See Special Provisions.
8. Intermediate legs - 2 gauge or W-5.5 wire.
9. End legs - 2 gauge or W-5.5 wire.
10. Upper space bar - 2 gauge or W-5.5 wire x 0.079 mils. See Dimension Table.
11. Lower space bar - 2 gauge or W-5.5 wire x 0.079 mils. See Dimension Table.
12. Ties - W-1.5 wire x 16".
13. Anchor strap - 1" x 3" steel strap, 0.079 mils. Place with a 1 1/4" minimum length steel nail for LC or A2 or 0.75 diameter ASTM A241 Class 1 with 1/4" head or washer.

QUANTITY TABLE

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DIMENSION TABLE

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PLACEMENT AND EDGE CLEARANCE DETAIL

LOAD TRANSFER DOWEL ASSEMBLY
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. Skewed PCCP 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 PCCP 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 rebars 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.

10. LC or 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.

General Notes:
- Typical Joint Sequence (TWP Joints)
- Concrete Half Barrier or Concrete Curb & Gutter
- Direction of Pour & Traffic
- Per Plans
- Existing PCCP
- Existing LC or LWP
- Transverse Construction Joint (TC) Allowable Limits (Typ)
- Repeat Sequence
- 60' Maximum

Notes:
- "A" shall equal 4' minimum (Typ)
- "B" shall equal 3' minimum (Typ)
- "C" shall equal 2' minimum (Typ)

Addition Notes:
- "A" shall equal 4' minimum (Typ)
- "B" shall equal 3' minimum (Typ)
- "C" shall equal 2' minimum (Typ)

General Notes:
- Typical Joint Sequence (TWP Joints)
- Concrete Half Barrier or Concrete Curb & Gutter
- Direction of Pour & Traffic
- Per Plans
- Existing PCCP
- Existing LC or LWP
- Transverse Construction Joint (TC) Allowable Limits (Typ)
- Repeat Sequence
- 60' Maximum

Notes:
- "A" shall equal 4' minimum (Typ)
- "B" shall equal 3' minimum (Typ)
- "C" shall equal 2' minimum (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. Skewed PCCP 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 PCCP 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 rebars 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.

**Repeat Sequence**

- Typical Joint Sequence (TWP Joints)
- 60' Maximum

**Transverse Construction Joint (TC) Allowable Limits (Typ)**

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. Skewed PCCP 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 PCCP 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 rebars 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. Skewed PCCP 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 PCCP Joints and additional notes.

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

7. Concrete Half Barrier or Concrete Curb & Gutter

8. Skewed PCCP joints shall be used when load transfer dowel assemblies are not required.

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. Stewed PCCP joints shall be used when load transfer dowel assemblies are not required.

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

6. See Std Dwg C-05.01 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.

10. Transverse Construction Joint (TC) Allowable Limits (Typ)

11. See Std Dwg C-07.01 for PCCP joints and additional notes.

12. LC and LWP joint locations shown are typical.

13. 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.

14. Stewed PCCP joints shall be used when load transfer dowel assemblies are not required.

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

18. See Std Dwg C-05.01 for curb and gutter joint requirements.

19. 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.

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

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

22. Transverse Construction Joint (TC) Allowable Limits (Typ)

23. See Std Dwg C-07.01 for PCCP joints and additional notes.

24. LC and LWP joint locations shown are typical.
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-skewed 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 rebars 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. 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-skewed 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 sections of the intersecting road or street.

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

7. The rebars 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. 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-skewed 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 rebars 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.

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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-skewed 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 rebars in the LWP & LC joints shall be placed no greater than 1'-3" from the TC joints.

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 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 project plans.

1. 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. 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.

5. For ramp joint spacing sequence, see Sheet 4 of 5.

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

- Transition, See Std Dwg C-05.12
- 12" Face of Curb to Face of Curb on Entrance Ramp

Mainline Structural Section
See Plans

Gore Structural Section
See Plans

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

- Transition, See Std Dwg C-05.12
- 12" Face of Curb to Face of Curb on Entrance Ramp

Mainline Structural Section
See Plans

Gore Structural Section
See Plans

Dimensions with a tolerance may be adjusted to align to the nearest transverse weakened-plane construction joint as directed.

See Std Dwg C-07.01 for joint information.

See plans for ramp dimensions.

For ramp joint spacing sequence, see Sheet 4 of 5.
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. 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

12' Face of Curb to Face of Curb on Exit Ramp

Mainline Structural Section

See Plans

Ramp Structural Section

See Plans

Gore Structural Section

See Plans

Dimensions with a tolerance may be adjusted to align to the nearest transverse weakened-plane construction joint as directed.
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-05.01 for Joint information.

3. The ratio of transverse to longitudinal joint spacing shall be greater than $\frac{3}{4}$ but not more than $1\frac{1}{2}$.

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 Paving Type E or H Joint if PCC Paving
   or J Joint if AC Paving

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

   ▲ 6' Minimum
   ■ Varies - 18' Maximum
   □ 11' Minimum
   ● Varies - 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
   □ Varies - 12' Typical or As Shown on Plans
   ○ 17' Maximum

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.

See Plans for Crossroad Paving Type E or H Joint if PCC Paving
or J Joint if AC Paving

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

□ 6' Minimum
■ Varies - 18' Maximum
□ 11' Minimum
● Varies - 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
□ Varies - 12' Typical or As Shown on Plans
○ 17' Maximum

See Note 5

See Note 5

See Note 5
**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" lip is required on the sides of trenches that are not parallel at 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**

- Compacted Backfill or Slurry Per Section 501 of the Standard Specifications
- AB, Granular Backfill or Native Backfill Per Sections 503 and 501 of the Standard Specifications
- AB Per Sections 503 and 501 of the Standard Specifications
- AB or Decomposed Granite Per Section 303 or 803 of the Standard Specifications

**DESCRIPTION OF REVISIONS**

- **REVISED NOTE**
  - 10/95
  - DELETED TYPE E VIEW

**REV. DRAWING NO.**

- 5/07
- APPROVED FOR DISTRIBUTION
- APPROVED FOR DESIGN
1. Paved gore area shall be Class S Concrete.  
   f'c=4000 PSI or AC as shown on plans.

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

**GENERAL NOTES**

**SECTION A-A**

8" Concrete

1/2" Joint & Preformed Joint Filler (Typ)

Structural Section
See Plans

**SECTION B-B**

Length as Shown on Plans

1" Deep Longitudinal Scores in Sections Averaging Over 15" in Width

8" Concrete

Tack Coat

Compacted Subgrade or AB as Shown on Plans

Structural Section
See Plans
GENERAL NOTES

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-end treatment when located within the clear zone of opposing traffic.
4. See Std Specs for nested guardrail pay item.

CONCRETE HALF-BARRIER TRANSITION

- Transition to Concrete Half Barrier
- Caissons or Footings

- Concrete Barrier Transitions Constructed on Top of Wingwalls

See Bridge Sheets
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 1012-3 for reflector tab and snow marker materials, reflective sheeting, and spacing requirements.

5. Top of Rail = 28"

See General Note 1
Std Dwg C-10.03

ROADWAY STANDARD DRAWINGS

STATE OF ARIZONA
DEPARTMENT OF TRANSPORTATION

GUARDRAIL INSTALLATION

TYPE A AND REFLECTOR TAB

C-10.01

5/07

PROJECT NO.

SPEAKER RCV

DRAWING NO.

DEPARTMENT OF TRANSPORTATION
ROADWAY STANDARD DRAWINGS

APPROVED FOR DISTRIBUTION

APPROVED FOR DESIGN

5/07
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 Spec 703, 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
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, AGC & ARTBA Task Force 13 Report designation
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.

Guardrail shall be lagged in the direction of adjacent traffic.

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

**G4(1S) SYSTEM**

**ELEVATION**

- 7 5/8" Diameter Hole
- 5/8" - 11 UNC x 9" Button Head Bolt ( ) and Recess Nut ( ) With Plain Round Washer ( ) Under Nut (Typ)
- W-Beam, 12 Gauge
- 3/4" Diameter Hole
- Wood Block
- 6" Minimum
- Roadway Width

**SECTION G4(1S)**

- SHOWN WITHOUT CURB
- SHOWN WITH CURB

**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 lagged in the direction of adjacent traffic.

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

**WOOD BLOCK DETAIL**

- 3/4" Diameter Hole
- 5/8" - 11 UNC x 9" Button Head Bolt ( ) and Recess Nut ( ) With Plain Round Washer ( ) Under Nut (Typ)
- W-Beam, 12 Gauge
- 5/8" Diameter Hole
- Curb as Shown on Plans
- Wood Block
- 6" Minimum
- Roadway Width

**STATE OF ARIZONA**

**DEPARTMENT OF TRANSPORTATION**

**ROADWAY STANDARD DRAWINGS**

**APPROVED FOR DISTRIBUTION**

**APPROVED FOR DESIGN**

5/07
GENERAL NOTES

1. Height of curb shall not exceed 4 inches.

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

Indicates AASHTO, AGC & ARTBA Task Force 13 Report designation

Traffic

12 1/4" 2" 8 1/2 

8 1/2" 2" 12 1/4 

6" 6" 12 1/4 

Curb & Gutter
Type B, C or C-1
Std Dwg C-05.10 or as Shown on Plans

Curb & Gutter
Type B, C or C-1
Std Dwg C-05.10 or as Shown on Plans

Traffic

12 1/4" 2" 8 1/2 

8 1/2" 2" 12 1/4 

6" 6" 12 1/4 

Curb & Gutter
Type B, C or C-1
Std Dwg C-05.10 or as Shown on Plans

Curb & Gutter
Type B, C or C-1
Std Dwg C-05.10 or as Shown on Plans

Traffic

12 1/4" 2" 8 1/2 

8 1/2" 2" 12 1/4 

6" 6" 12 1/4 

Curb & Gutter
Type B, C or C-1
Std Dwg C-05.10 or as Shown on Plans

Curb & Gutter
Type B, C or C-1
Std Dwg C-05.10 or as Shown on Plans

Traffic

12 1/4" 2" 8 1/2 

8 1/2" 2" 12 1/4 

6" 6" 12 1/4 

Curb & Gutter
Type B, C or C-1
Std Dwg C-05.10 or as Shown on Plans

Curb & Gutter
Type B, C or C-1
Std Dwg C-05.10 or as Shown on Plans

Traffic

12 1/4" 2" 8 1/2 

8 1/2" 2" 12 1/4 

6" 6" 12 1/4 

Curb & Gutter
Type B, C or C-1
Std Dwg C-05.10 or as Shown on Plans

Curb & Gutter
Type B, C or C-1
Std Dwg C-05.10 or as Shown on Plans

Traffic

12 1/4" 2" 8 1/2 

8 1/2" 2" 12 1/4 

6" 6" 12 1/4 

Curb & Gutter
Type B, C or C-1
Std Dwg C-05.10 or as Shown on Plans

Curb & Gutter
Type B, C or C-1
Std Dwg C-05.10 or as Shown on Plans

Traffic

12 1/4" 2" 8 1/2 

8 1/2" 2" 12 1/4 

6" 6" 12 1/4 

Curb & Gutter
Type B, C or C-1
Std Dwg C-05.10 or as Shown on Plans

Curb & Gutter
Type B, C or C-1
Std Dwg C-05.10 or as Shown on Plans
GENERAL NOTES

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

2. Install Type 1 when splice connection location falls on object. Install Type 2 when non-splice post falls on object.

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

4. For Type 1 and Type 2, a maximum of one post may be eliminated within a span of nested guardrail.

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

6. 72" Timber Post

7. Bolt Nested W-Beams Together

8. Std Splice Connection (Typ)

9. Nested W-Beam

10. Pipe Culvert

11. 12 Gauge

12. Maximum Span

13. 25'-0" Nested W-Beam

14. 37'-6" Nested W-Beam

15. Normal W-Beam

16. 12 Gauge

17. 6'-3" Maximum Span

18. NESTED STEEL W-BEAM - TYPE 1 - SHORT SPAN

19. (splice connection inside span) Length = 25'-0"

20. NESTED STEEL W-BEAM - TYPE 2 - SHORT SPAN

21. (splice connection outside span) Length = 37'-6"
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. Guardrail shall be lapped in the direction of adjacent traffic.
4. For Type 3, a maximum of two posts may be eliminated within a span of nested guardrail.

For Type 3, a maximum of two posts may be eliminated within a span of nested guardrail.
1. See Std Dws C-10.03 and C-10.04 for additional information and dimensions.

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

Bolts Timber Post
1. Bracket may be made of one piece hot bent, or two pieces welded together.  
2. Short timber posts anchored to box culvert roof shall be 8" x 8" only.

- Indicates AASHTO, AGC & ARTBA Task Force 13 Report designation
The cable assembly shall be tightened to remove slack.

One wrap of 14 gauge galvanized steel wire shall be wrapped around the terminal post near the top of the bearing plate.

See Std Dwg C-10.00 for measurement limits.

The cable assembly shall be tightened to remove slack.

One wrap of 14 gauge galvanized steel wire shall be wrapped around the terminal post near the top of the bearing plate.

See Note 2

See Std Dwg C-10.00 for measurement limits.

The cable assembly shall be tightened to remove slack.

One wrap of 14 gauge galvanized steel wire shall be wrapped around the terminal post near the top of the bearing plate.

See Std Dwg C-10.00 for measurement limits.
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 lapped in the direction of adjacent traffic.

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

**General Notes**

**Description of Revisions**

**Plans**

- Thrie-Beam Transition System
- Standard Guardrail System

**Details**

- Lip Curb Detail
- Embankment Curb

**Elevation**

**Plan**

- Traffic Flow
- Thrie-Beam Guardrail Transition System
- Two Sections of Thrie-Beam Guardrail (Nested)
- One Section W-Beam to Thrie-Beam Transition Section
- Two Sections of Thrie-Beam Guardrail (Nested)

**Notes**

- Curbing is not required when drainage flows transversely away from barrier.
- Treatment at back of lip curb modified for constructability purposes. Front slope and height of lip curb shall not be exceeded.
- Thrie-beam terminal connector to thrie-beam splice shall be lapped in the direction of adjacent traffic.

**Figure References**

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

**Construction Details**

- Thrie-Beam Terminal Connector (●)
- See Anchor Plate and Hardware
- See Sheet 2 of 2

**Sheet References**

- Lip Curb
- Wood Post
- Gutter Flow Line

**Material Specifications**

- Wood Post
- Lip Curb

**Dimensions**

- 10"x10"x8'-0" Wood Post
- 8"x8"x22" Wood Block
- 8"x8"x6'-0" Wood Post
- 8"x8"x12" Wood Block
- Embankment Curb

**Construction Details**

- Thrie-Beam Guardrail Transition System
- Standard Guardrail System

**Notes**

- Curbing is not required when drainage flows transversely away from barrier.
- Treatment at back of lip curb modified for constructability purposes. Front slope and height of lip curb shall not be exceeded.
- Thrie-beam terminal connector to thrie-beam splice shall be lapped in the direction of adjacent traffic.

**Project Details**

- Thrie-Beam Transition, Thrie Beam to Concrete Half Barrier 32° Type 'F'
- State of Arizona Department of Transportation
- Roadway Standard Drawings
- Project No.
- Approvals:
  - Approved for Distribution
  - Approved for Design
- Date: 5/07
1. Anchor Plate shall conform to ASTM specification A36. 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 PCCP and at approximate 15' centers when adjacent to AC pavement. Joints shall be either hand-tooled or sawn.


SECTION A-A
AC OPTION

SECTION B-B

ANCHOR PLATE - DETAIL A
GENERAL NOTES

1. Median Barrier shall be constructed by the slip form or formed cast-in-place method.
2. When obstacles prevent the use of slip form equipment, stationary forms shall be used.
3. Concrete slab shall be Class S, 4000 PSI.
4. If the footing and barrier are cast monolithically, S shape rebars are not required.
5. Barrier width shall not exceed the barrier footing width nor overhang the adjacent pavement.
6. #4 Rebar shall extend 12" past the construction joint at the completion of the day's pour.

*Depth to match adjacent PCCP thickness 18" minimum.*

---

Plan

- "4 Rebar Continuous"
- "6 Rebar S Shape (Typ)"

Elevation

- "4 Rebar Continuous"
- Optional Construction Joint (Typ)
- B Joint (Typ) Std Dwg C-07.01

Section A-A

- "4 Rebar Continuous"
- "6 Rebar S Shape (Typ)"

WITH PCCP

- 6" Minimum (Typ)
- 2'-6"
GENERAL NOTES

1. Median Barrier shall be constructed by the slip form or by the formed cast-in-place method.
2. When obstacles prevent the use of slip form equipment, stationary forms shall be used.
3. Concrete shall be Class 5, 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 nor overhang 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 18" minimum.
GENERAL NOTES

1. Posts shall be 12'-6" center to center. Structural steel shall conform to ASTM A36, galvanized in accordance with ASTM A123.

2. Hex head bolt shall conform to ASTM A307, galvanized in accordance with ASTM A153 Class C.

3. Helical spring lock washer shall conform to ASTM A313, galvanized in accordance with ASTM A153 Class C.

4. Tension wire: AWG number 9 (0.148") galvanized in accordance with ASTM A116 Class 2.

5. Hog ring: AWG number 12 (0.105") galvanized in accordance with ASTM A116 Class 2. Fasten glare screen to top and bottom tension wire spaced approximately 2' apart.

6. Glare Screen: 18 gauge steel, ASTM A526, galvanized in accordance with ASTM A525/G235, expanded to the following dimensions: 1.33" short way of diamond and 4.0" long way of diamond (center to center of bridges) with a strand width of 0.250" angled at approximately 20° to the plane of the original sheet. Glare screen shall be installed such that flat portion of screen blocks light from headlights. See Direction 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.
CONCRETE MEDIAN BARRIER

Glare Screen

TOP BOLT DETAIL

BOTTOM BOLT DETAIL

Tension Wire

BOTTOM TENSION WIRE

TOP BOLT SECTION

TERMINATION DETAIL

OBSTRUCTION DETAIL

Hex Nut (●) With Regular Helical Spring Lock Washer (●)

1/2" Plain Round Washer (●)

1/2"x2 1/2" Hex Head Bolt (●)

Varies

1/2" Plain Round Washer (●)

1/2"x2 1/2" Hex Head Bolt (●)

See Cross-Brace Post Detail Sheet 2 of 3

See Cross-Brace Post Detail Sheet 2 of 3

See Cross-Brace Post Detail Sheet 2 of 3

Type A Wire Tie

Type A Wire Tie

Type B Wire Tie

Type B Wire Tie

Type A Wire Tie

Type A Wire Tie

Top Tension Wire

Top Tension Wire

Top Tension Wire

Type A Wire Tie

Type A Wire Tie

Type A Wire Tie

Median Barrier

Median Barrier

Median Barrier

No. 3

No. 2

No. 1

4

2" Minimum
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, (<=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.
   ▲ Depth to match adjacent PCCP thickness (6" Minimum).

SECTION A-A
SEE SECTION A-A FOR TYPICAL REBAR PLACEMENT

SECTION B-B
SEE SECTION B-B FOR TYPICAL REBAR PLACEMENT

ÉLEVATION

WITH PCCP

WITH AC

BARRIER WITH GUTTER
(SEE STD DWG C-10.52)
GENERAL NOTES

1. Concrete half barrier shall be precast.
2. Concrete shall be Class S, f'_c ≤ 4000 PSI.
3. Pavement thickness adjacent to half barrier shall be 3/4" 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. Dowel joints shall be grouted under pressure until all of the openings and the joints are filled.
7. Weep holes shall be placed whenever half barrier is backfilled unless otherwise indicated on the plans.

CONSTRUCTION JOINT DETAIL

Dowel Hole (Typ) See Construction Joint Detail

PLAN

ELEVATION

SECTION A-A

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

SECTION C-C
SEE SECTION C-C FOR TYPICAL REBAR PLACEMENT

AT REBAR

AT WEEP HOLE
GENERAL NOTES

1. Concrete shall be Class S, f'c=4000 PSI.
2. Rebar shall conform to Std Spec 1003.
3. Rebar shall have 2" minimum clear cover unless otherwise noted.
4. See drainage sheets for slotted drain and catch basin details.
5. Departure terminations 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-out of rebar.

MODIFIED TITLE

WAS 12 1/2" - IS NOW 1' & ADDED WITHOUT GUARDRAIL TO TITLE

REVISED HEIGHT DIMENSION FROM 32' TO 32"
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. *#4 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.

Whenever Half Barrier is backfilled, see Std Dwg C-10.50 for weep hole details, unless otherwise specified on the plans.

Traffic

Gutter Width Varies
2'-6" or 4'-6" (Typ)
See Plans

B Joint
Std Dwg C-07.01

Varies

Pavement

3'-0" (Typ)

Varies

for Paver Track

See Barrier Gutter Detail

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

Concrete shall be Class S, f'c=4000 PSI.
**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. "4" 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 indicated on the plans.

---

**PLAN**

- "4" Rebar
- "4" Rebar Continuous

**ELEVATION**

- Gutter Width Varies
- See Plans

**SECTION A-A**

- 2'-0" R
- 1'-4 1/4" R
- Gutter Width Varies
- See Plans

**DEPARTURE TERMINATION WITHOUT GUARDRAIL**

- PCCP
- See Plans

**BARRIER GUTTER DETAIL**

- Horizontal Line
- Varies

**BASE MATERIAL**

- See Plans

**CONSTRUCTION Joint**

- AB
- See Plant

- Pavement

**Traffic**

- Topsoil Plating

---

**STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION ROADWAY STANDARD DRAWINGS**

**CONCRETE HALF BARRIER**  **42" TYPE T**  **WITH GUTTER**

**DRAWING NO.**

- C-10.53
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 rebar shall extend 12" past the construction joint at the completion of each incremental pour.

If the footing and Half Barrier are cast monolithically, \#6 S shape rebars are not required.

Concrete shall be Class S, \( f_c = 4000 \) PSI.  

Longitudinal rebar shall extend 12" past the construction joint at the completion of each incremental pour.

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Longitudinal rebar shall extend 12" past the construction joint at the completion of each incremental pour.
1. Concrete shall be Class S, f_c = 4000 PSI.
2. The Half Barrier shall be placed upon a bed of grout in order to provide a uniform bearing.
3. Dowel 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 rebars.
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.

3. Slope as shown on Plans

---

**SECTION A-A**

- 3" Compacted Bituminous Mixture or 3" Concrete Foundation Pad (Typ) See Plans for Width
- Slope Transition See Plans (Typ)

**SECTION C-C**

- Concrete Half Barrier See Plans
- Measurement Limits - Concrete Half Barrier

**SECTION B-B**

- Edge of Travel Lane
- Edge of Normal Shoulder (Typ) See Plans
- Bridge Column
- Varies See Plans
- Match Roadway Cross Slope
- Edge of Normal Shoulder (Typ) See Bridge Group Plans
- Concrete Half Barrier See Plans
- Class B Concrete
- Varies See Plans
- Match Roadway Cross Slope
- Compact Backfill
- Median Paving (Typ)
- Varies - See Plans
- Bridge Column
- Varies - See Plans

---

**STATE OF ARIZONA**
**DEPARTMENT OF TRANSPORTATION**

**ROADWAY STANDARD DRAWINGS**

**APPROVED FOR DISTRIBUTION**

**APPROVED FOR DESIGN**

**5/07**

**NOTE:**

- \( \frac{1}{2}'' \) Expansion Joint Filler (Typ)
GENERAL NOTES

1. Concrete shall be Class S, f'=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 overhang the adjacent pavement.
4. Longitudinal rebar shall extend 12" past the construction joint at the completion of each incremental pour.
GENERAL NOTES

1. Concrete shall be Class S, f′c ≤ 4000 PSI.
2. The Half Barrier shall be placed upon a bed of grout in order to provide a uniform bearing.
3. Doweled 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.

Concrete shall be Class S, f′c ≤ 4000 PSI.

The Half Barrier shall be placed upon a bed of grout in order to provide a uniform bearing.

Doweled joints shall be grouted under pressure until all of the openings and the joints are filled.

All bend dimensions for rebar are out-to-out of bars.

Rebar shall have 2" minimum clear cover unless otherwise noted.
GENERAL NOTES

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

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

3. Slope as shown on Plans

SECTION A-A

SECTION B-B

SECTION C-C

PLAN

SECTION A-A

SECTION B-B

SECTION C-C

DEPARTMENT OF TRANSPORTATION
ROADWAY STANDARD DRAWINGS

5/07

STATE OF ARIZONA

APPROVED FOR DISTRIBUTION

APPROVED FOR DESIGN

NEW STANDARD DWG

CONCRETE HALF BARRIER

42" TYPE 'F' AT PIERS

LAYOUT
GENERAL NOTES

1. Concrete shall be Class S, \( f_{cu} \leq 4000 \) 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. 1'-0" Minimum or Match Thickness of Adjacent PCCP

OPTIONAL CONSTRUCTION JOINT

See Optional Construction Joint Detail Sheet 3 of 3

REVISED TERMINAL CONNECTOR NOTE

REVISED TRANSITION SYSTEM NOTE

REVISED SYSTEM LIMIT TO INCLUDE END SHOE

5/07
CONCRETE HALF-BARRIER TRANSITION
TO VERTICAL
32" TYPE 'F' WITH CAISSONS

1. See Optional Construction Joint Detail, Sheet 3 of 3
   - 1'-0" Minimum or Match Thickness of Adjacent PCCP

Optional Construction Joint (Typ)
Roadway Width + Offset (2' Typ)
1'-6" Rebar (Continuous)
14 #4 Rebars
6" Diameter Sleeve (Typ)
For Anchor Plate and Hardware
See Std Dwg C-10.30

Thrie Beam Terminal Connector
See Std Dwg C-10.30
3 #5 Rebars
9" Center to Center

Without Curb
Section A-A

Without Curb
Section B-B

Without Curb
Section C-C

General Notes
1. See Section B-B for caisson reinforcement.
   - See Optional Construction Joint Detail, Sheet 3 of 3
2. 1'-0" Minimum or Match Thickness of Adjacent PCCP
Dowel Locations

Concrete Half-Barrier Transition

Epoxy Grout (Typ)

Existing Concrete Barrier

1/2" Bituminous Joint Filler

Joint Assembly

Construction Joint Detail (Optional)

Caisson Reinforcement

12" Diameter x 18" Dowel (Typ)

6 #8 Rebars

11/2" Center to Center

9"

3"

3"
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 bars.
4. 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.

1'-0" Minimum or Match Thickness of Adjacent PCCP
CONCRETE HALF-BARRIER TRANSITION
TO VERTICAL 32" TYPE 'F' WITH CURB & GUTTER

SECTION A-A
1" Diameter Sleeve (Typ)
For Anchor Plate and Hardware
See Std Dwg C-10.30
Sheet 2 of 2

SECTION B-B
1 1/2" Blanchnous Joint Filler
Concrete Half-Barrrier Transition

SECTION C-C
1" Diameter Sleeve (Typ)
For Anchor Plate and Hardware
See Std Dwg C-10.30
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.

1'-0" Minimum or Match Thickness of Adjacent PCCP
GENERAL NOTES

1. See Section B-B for caisson reinforcement.
2. See Optional Construction Joint Detail, Sheet 3 of 3
3. 1'-0" Minimum or Match Thickness of Adjacent PCCP.

ROADWAY STANDARD DRAWINGS

STATE OF ARIZONA
DEPARTMENT OF TRANSPORTATION
ROADWAY STANDARD DRAWINGS

APPROVED FOR DISTRIBUTION
APPROVED FOR DESIGN

5/07

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

C-10.72
Sheet 3 of 3

1. See Section B-B for caisson reinforcement.
2. See Optional Construction Joint Detail, Sheet 3 of 3
3. 1'-0" Minimum or Match Thickness of Adjacent PCCP.
CONCRETE HALF-BARRIER TRANSITION TO VERTICAL 42" TO 32" TYPE 'F' WITH CAISSONS

- Existing Concrete Barrier
- Epoxy Grout (Typ)
- 1/2" Bituminous Joint Filler
- 1" Diameter x 18" Dowel (Typ)
- CONSTRUCTION JOINT DETAIL (OPTIONAL)
- Joint Assembly
- Dowel Locations
- CAISSON REINFORCEMENT

- 6 #8 Rebars
- #4 Rebar Tie 12" Center to Center
- 3" x 3" x 3"
- 11 1/8"
- 2 1/2" x 2 1/2"
- 4 1/2"
- 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 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 PCCP and at approximate 15' centers when adjacent to AC pavement. Joints shall be either hand-tooled or sawn.

B 1"-6" Minimum or Match Thickness of Adjacent PCCP

CONCRETE HALF-BARRIER TRANSITION TO VERTICAL 42° 10 32' TYPE 9" WITH GUTTER
1. Half-barrier Transition shall be constructed by the formed cast-in-place method.
2. Concrete shall be Class S, f_2=4000 PSI.
3. If the footing and barrier are cast monolithically, #6 S shape rebars are not required.
4. Barrier width shall not exceed the barrier footing width nor overhang the adjacent pavement.
5. #4 rebar shall extend 12" 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' centers when adjacent to AC pavement. Joints shall be either hand trowled or sawn.
GENERAL NOTES

1. All concrete shall be Class S, 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. See Std Dwg C-05.20 for sidewalk construction.
7. All bend dimensions for rebar are out-to-out of rebars.
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.

Traffic

All concrete shall be Class S, f'c=4000 PSI.
All rebar shall conform to Std Spec 1003.
All rebar shall have 2" minimum clear cover unless otherwise noted.
See drainage sheets for slotted drain and catch basin details.
Barrier transition shall match both adjoining curb and gutter and concrete Half Barrier.
See Std Dwg C-05.20 for sidewalk construction.
All bend dimensions for rebar are out-to-out of rebars.
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.
All concrete shall be Class S f'c=4000 PSI.
All rebar shall conform to Std Spec 1003.
All rebar shall have 2" minimum clear cover unless otherwise noted.
See drainage sheets for slotted drain and catch basin details.
Barrier transition shall match both adjoining curb and gutter and concrete half barrier.
All bend dimensions for rebar are out-to-out of bars.
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.
GENERAL NOTES
1. All concrete shall be Class S, 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 the adjoining concrete half barrier.
6. See Std Dwg C-05.20 for sidewalk construction.
7. All bend dimensions for rebar are out-to-out of bars.

All concrete shall be Class S, f'c=4000 PSI.
All rebar shall conform to Std Spec 1003.
All rebar shall have 2" minimum clear cover unless otherwise noted.
See drainage sheets for slotted drain and catch basin details.
Barrier transition shall match the adjoining concrete half barrier.
See Std Dwg C-05.20 for sidewalk construction.
All bend dimensions for rebar are out-to-out of bars.

VARIES TO 1'-8"
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 Dwgs C-05.10, C-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 D-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 abuts slotted drain, catch basins, ditches, barrier, etc. Scored joints, 2" in depth, shall be placed to match adjacent joints in PCCP or at 15' intervals when adjacent to AC or continuously reinforced concrete pavement.

   1. To Top of W-Beam Guardrail

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

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

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

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

   6. Bituminous joint filler (1/2") shall be placed when the curb & gutter or concrete widening abuts slotted drain, catch basins, ditches, barrier, etc. Scored joints, 2" in depth, shall be placed to match adjacent joints in PCCP or at 15' intervals when adjacent to AC or continuously reinforced concrete pavement.

   7. To Top of W-Beam Guardrail
1. Cattle guard shall include two (2) clamps per gap between two (2) grill units, one at each end. Clamps shall be adjusted to provide a 1/4-inch, plus or minus 1/16-inch gap between adjacent grill units.

2. Grill units shall be set on an angle iron assembly consisting of one piece of 6"x3 1/2"x 3/8" angle iron and studs with a head. The studs shall be placed on 1'-0" alternate centers. See Angle Assembly Detail 2.

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 level cross-slope.

4. Where the adjacent roadway is paved, an angle iron assembly shall consist of one piece of 4"x4"x 3/8" angle iron and studs with a head. The studs shall be placed on 1'-0" alternate centers. See Angle Assembly Detail 1.

5. Where the adjacent roadway is unpaved, an angle iron assembly shall consist of one 4"x4"x 3/8" angle iron, one 2"x2"x 3/8" angle iron, and connected with studs. The assembly shall be crowned at the centerline and constructed with a bevel cut and welded. The studs shall be bent 90° and placed on 1'-0" centers. See Angle Assembly Detail 3.

6. Each angle iron 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

<table>
<thead>
<tr>
<th>Roadway Width (ft)</th>
<th>Grill Units Required</th>
<th>Concrete (Cu Yd)</th>
<th>Rebar (Lbs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>1</td>
<td>5.8</td>
<td>175</td>
</tr>
<tr>
<td>16</td>
<td>2</td>
<td>8.0</td>
<td>240</td>
</tr>
<tr>
<td>20</td>
<td>3</td>
<td>10.3</td>
<td>310</td>
</tr>
<tr>
<td>28</td>
<td>4</td>
<td>12.5</td>
<td>375</td>
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<td>14.7</td>
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<tr>
<td>36</td>
<td>6</td>
<td>16.9</td>
<td>510</td>
</tr>
<tr>
<td>40</td>
<td>7</td>
<td>16.9</td>
<td>510</td>
</tr>
</tbody>
</table>
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

REISSUED STD DWG

4/06

ROADWAY STANDARD DRAWINGS

APPROVED FOR DISTRIBUTION

APPROVED FOR DESIGN

5/07
1. Apply a heavy duty, high-strength anaerobic thread-locking compound to the threads before installing the double nuts.

Spot Weld (Typ)

3/8" Hex Nut (1 Required) with Plain Round Washer, Grade 3 Under Nut (Typ)

3/8" Diameter All-Thread x 11 5/8"

3/8" Hex Nut (2 Required) with Plain Round Washer, Grade 3

GENERAL NOTES
GENERAL NOTES

1. See Std Dwgs 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.

SECTION C-C
IN EMBANKMENT

SECTION C-C
WHERE USED FOR THROUGH DRAINAGE
CATTLE GUARD OPEN BOTH ENDS

CATTLE GUARD, DRAINAGE

See Std Dwgs C-11.10 for all other Cattle Guard details.

This standard shall be used in embankment or where highly erodable soil is found.

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 post at the top, bottom, and intermediate wires.

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

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

5. ASTM design number

Typical Woven Wire Fence Installation-Type 1 WW Shown

Fence Fabric Dimensions and Design Numbers

Systematic Review

State of Arizona
Department of Transportation
Roadway Standard Drawings

Project No.
0-1234
Sheet 5 of 5

Rev.
0

5/07
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.
1. Post assemblies shall consist of an upright angle 2½"x2½"x1/4" at 4.10 lbs/ft, and brace angles 2"x2"x1/4" at 3.19 lbs/ft.
TYPICAL CHAIN LINK FENCE INSTALLATION - TYPE 1 SHOWN

TYPICAL POST DIMENSIONS

<table>
<thead>
<tr>
<th>Fabric Height (Ft)</th>
<th>Corner, End, Intermediate, Gate, Latch and Pull Posts</th>
<th>Line Posts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length (Ft-Ft)</td>
<td>Round</td>
<td>Roll Formed (In)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(In)</td>
</tr>
<tr>
<td>36</td>
<td>6-0</td>
<td>2.375 x 3.50</td>
</tr>
<tr>
<td>48</td>
<td>6-0</td>
<td>2.375 x 3.50</td>
</tr>
<tr>
<td>60</td>
<td>6-0</td>
<td>2.375 x 3.50</td>
</tr>
<tr>
<td>72</td>
<td>6-0</td>
<td>2.375 x 3.50</td>
</tr>
<tr>
<td>Over 72</td>
<td>Height</td>
<td>2.875 x 3.50</td>
</tr>
<tr>
<td></td>
<td>+3-0</td>
<td></td>
</tr>
</tbody>
</table>

GENERAL NOTES

1. Posts shall be round, H-section, or roll-formed and shall conform to the nominal dimensional requirements shown on the plans. Dimensional tolerances for all shapes shall be according to ASTM A500. In addition, the material of which posts are fabricated shall have a nominal thickness, before galvanizing, of not less than 0.111" for line posts and 0.130" for terminal posts.

2. Chain link fabric shall be either zinc-coated or aluminum-coated steel wire fence fabric. Zinc-coated steel fabric shall conform to the requirements of ASTM A392, Class I coating. Aluminum-coated steel fabric shall conform to the requirements of ASTM A491, with a minimum weight of coating of 0.40 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.

3. Tension wires shall be 7 gauge (0.177" diameter) coil spring steel wire with a minimum tensile strength of 75,000 PSI and shall be zinc-coated or aluminum-coated.

4. Truss rods shall be 3/8" diameter adjustable rods. Truss tighteners shall have a strap thickness of not less than 1/4".

5. Stretcher bars shall be 3/8" x 1/2" steel flat bars. Stretcher bar bands shall be 1/8" x 1" preformed steel bands.

6. Bottom tension wire shall be 3" from top of crown on concrete footings.

7. 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'.

8. See Sheet 3 of 3 for typical fence location.
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. Inc-coated steel wire shall conform to the requirements of ASTM A121, Class I coating. Aluminum-coated steel wire shall conform to the requirements of ASTM 1585, Type 1, Class I 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 M111.

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 3 of 3 for typical fence location.

TYPICAL CHAIN LINK FENCE INSTALLATION - TYPE 2 SHOWN

TYPICAL POST DIMENSIONS

<table>
<thead>
<tr>
<th>Fabric Height (In)</th>
<th>Corner, End, Intermediate, Gate, Latch and Pull Posts</th>
<th>Line Posts</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Length (Ft-In)</td>
<td>Round (OD)</td>
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<tr>
<td>72</td>
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<td>2.375</td>
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DETAIL C
BARBED WIRE SUPPORT ARM
SINGLE GATE

ROLLING GATE

As Shown on Plans

4" Minimum
14" Maximum

3" Clear Maximum
(Typ)

TYPICAL GATE DIMENSIONS

<table>
<thead>
<tr>
<th>Gate Width (FT)</th>
<th>Vertical Braces</th>
<th>Gate Post Size</th>
<th>Gate Width (FT)</th>
<th>Vertical Braces</th>
<th>Gate Post Size</th>
<th>Gate Width (FT)</th>
<th>Number of Equally Spaced Vertical Braces</th>
<th>Tension Rods Per Braced Panel</th>
<th>Gate Post Size</th>
<th>OD (In)</th>
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<tbody>
<tr>
<td>6' Ht or Less</td>
<td></td>
<td></td>
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<td>6 to 13</td>
<td>1</td>
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<td></td>
<td></td>
<td></td>
<td>8 to 16</td>
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<td>16 to 21</td>
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<td></td>
<td>2B and Larger</td>
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<td>2.875</td>
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ROLLOING GATE

Pipe Track

End Track Bracket (Typ)

VF (Typ)

ROLLING GATE

Pipe Track

End Track Bracket (Typ)

VF (Typ)

GATES FOR CHAIN LINK FENCE - TYPE 1 SHOWN [Type 2, With Barbed Wire Typical]
All concrete shall be Class S, f'c = 4000 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 A153.
3. Galvanized swaged fitting and U-Bolt shall conform to ASTM A449.
4. The 3/4" galvanized wire rope shall conform to AASHTO M30 Class B, Type 2.
5. The wire fabric, ties, bands, stretcher bars, 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 neat lines. Maximum excess shall be 3".
8. Perforated posts shall be square tube formed from 0.105" USS gauge ASTM A366/A366M 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 scarfed to agree with standard corner radii of 5/32" or 1/16".
9. Perforated posts shall be galvanized to the requirements of ASTM A555/A555M. Coating designator shall be Z275.
10. The cables 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 3 of the distance between posts.
13. An alternate to rectangular concrete anchor blocks shall be a 35" diameter round footing 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.
U-BOLT AND CLAMP BAR

CABLE CLAMP ASSEMBLY

ANCHOR PLATE

STRETCHER BAR BAND ASSEMBLY

SWAGED CABLE ASSEMBLY
PIPE CULVERT INSTALLATION

GENERAL NOTES

1. See plans for any required inlet and/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 Detail for pipe berm requirements and Std Dwgs 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

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<thead>
<tr>
<th>Diameter or Span (in)</th>
<th>E (Ft-In)</th>
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<tr>
<td>72 and Over</td>
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MINIMUM SPACING FOR MULTIPLE PIPES WITH END SECTIONS

MINIMUM SPACING FOR MULTIPLE PIPES WITH HEADWALL

MINIMUM SPACING FOR MULTIPLE PIPES WITH END SECTIONS

PIPE WITH BERM REQUIREMENT DETAIL

See General Note 4

ELEVATION
SLOPE PLATING FOR PIPE WITH END SECTIONS

MINIMUM SPACING FOR MULTIPLE PIPES WITH HEADWALL

MINIMUM SPACING FOR MULTIPLE PIPES WITH END SECTIONS
SPECIAL MULTIPLE PIPE END SECTION DETAIL
FOR PIPE CULVERT EXTENSIONS ONLY

PERFORATED CMP INSTALLATION

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. 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.
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 sloping shall conform to OSHA requirements.

4. Pipe backfill may be bedding 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 bedding material and pipe backfill. If the contractor chooses to construct it as a trench condition, the embankment shall be constructed before excavating the trench.

D - Outside diameter of full circle pipe or outside dimension upon or class of arch, arch pipe, elliptical pipe.

T - Minimum wall thickness for NRCIPCP; See Plans.

\[ D + 6' \text{ each side, minimum } D + 3' \text{ each side, maximum } \]

\[ D + 6' \text{ each side, minimum } D + 3' \text{ each side, maximum } \]

6. Outside diameter of full circle pipe or outside dimension upon or class of arch, arch pipe, elliptical pipe.

7. Minimum wall thickness for NRCIPCP; See Plans.

\[ D + 2' \text{ each side, minimum } D + 3' \text{ each side, maximum } \]

8. Outside diameter of full circle pipe or outside dimension upon or class of arch, arch pipe, elliptical pipe.

9. Minimum wall thickness for NRCIPCP; See Plans.

\[ D + 1' \text{ each side, minimum } D + 3' \text{ each side, maximum } \]
### 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.
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 tables.

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. The foregoing applies to all cross-section configurations.

5. All steel end section components shall be galvanized.

6. Toe of embankment shall be warped to match toe of skewed end section.

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

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

---

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<thead>
<tr>
<th>Diameter (in)</th>
<th>Gauge</th>
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<th>B</th>
<th>H</th>
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<table>
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<th>Rise (ft)</th>
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<th>B</th>
<th>H</th>
<th>L</th>
<th>W</th>
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<th>Connection Type</th>
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<td>84</td>
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<td>3</td>
</tr>
</tbody>
</table>
GENERAL NOTES

1. For lateral dimensions of invert paving, use 72° control for CMP and span for CMPA.
2. Pavement 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 at intervals and in a manner approved by the Engineer. Laps shall be 6" minimum.
5. Pavement shall not be placed until backfilling is completed.
6. Concrete shall be Class B.

---

HEADWALL INSTALLATION
(SEE STANDARD DRAWING B-11.12)

PROJECTING INSTALLATION

SECTION A-A

SECTION B-B

Concrete shall be Class B.
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 pipe.
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 forming 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.
1. Slotted drain pipe shall be 2"x1/2" corrugated steel pipe with a minimum wall thickness of 0.064" and shall conform to the requirements of AASHTO M36.

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 Number 1 paint.

7. When annular 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 annular corrugation at each end of each pipe section. Water proof sealer shall be applied to the annular corrugation prior to attachment of coupling band.

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


11. Concrete curb and gutter shall be paid for under the curb and gutter items.

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"x1'-0" or 24"x1'-0" CMP stub shall be included in the price of respective catch basins.

The 18"x1'-0" or 24"x1'-0" 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.

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STORM DRAIN CONNECTION DETAILS

SECTION A-A

CATCH BASIN ABOVE STORM DRAIN
TYPE 2

SIDE INLET
TYPE 1

GENERAL NOTES
1. Prefabricated tees 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 manholes 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 ≥ 45° or less, Type 1 connection shall be used.
4. All concrete shall be Class B.
5. All rebar shall conform to Std Specs 1003-1 & 2.
6. Rebar shall have 2" minimum cover.

Bone: 5/07

State of Arizona
Department of Transportation
Roadway Standard Drawings

REARRANGED STD DWG

NO

3

2

1

4
**GENERAL NOTES**

1. All shear pin angles shall fit snug and true to face. Cover with waterproof grease prior to installation of pin.
2. Shear pin holes in the angle shall be drilled for a tight fit of the pin.
3. Both ends of the shear pins shall be peened after installation.
5. Galvanize all ferrous parts after fabrication.
6. Frame and hinge angles shall have the outstanding legs out.
7. All steel shall be in accordance with ASTM A36.
8. Barrier bars shall be equally spaced.
9. Hinge pin material shall be bolt stock and threaded on both ends so nut and lock washer are flush with the lower angle. Cover pin with waterproof grease prior to installation. Upset or damage exposed threads after installation.
10. All welding shall be in accordance with Std Spec 604-3.08.

**PIPE ACCESS BARRIER FRONT ELEVATION**

**ACCESS BARRIER GATE DIMENSION SCHEDULE**

<table>
<thead>
<tr>
<th>Outfall Pipe Dia. (In)</th>
<th>Number of Barriers</th>
<th>Frame Angles</th>
<th>Shear Pin Angles</th>
<th>Hinge Pin Diameter (In)</th>
<th>Hinge Angles</th>
<th>Number &amp; Length of Vertical Bars</th>
<th>Number &amp; Length of Horizontal Bars</th>
<th>M (In)</th>
<th>W (In)</th>
<th>A (In)</th>
<th>B (In)</th>
<th>C (In)</th>
<th>D (In)</th>
<th>Structural Shear (lbs)</th>
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</table>

**INSTALLATION DETAIL FOR DOUBLE GATES**

**DEPARTMENT OF TRANSPORTATION ROADWAY STANDARD DRAWINGS**

**STORM DRAIN OUTLET BARRIER GATE**

**STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION STORM DRAIN OUTLET BARRIER GATE**

**DEPARTMENT OF TRANSPORTATION ROADWAY STANDARD DRAWINGS**

**STORM DRAIN OUTLET BARRIER GATE**
DRAINAGE OUTLET INTO CHANNEL

STORM DRAIN PLUG

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".

- Ground Line
- Outlet Collar: See Channel Plans
- Concrete Lined Channel: See Channel Plans
- Bevel End of Pipe to Match Side Slope of Channel (Typ)
- For Joint Details: See Channel Plans

Block or Brick and Mortar Plug: See Notes

1/2" Layer Cement Plaster (Watertight)
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 exceeds that 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 + T.
7. Pipe ends to be trimmed such that the maximum distance between pipes at any point is 2".

CONCRETE PIPE COLLAR

OUTLET COLLAR DETAIL

PIPE COLLAR TABLE

<table>
<thead>
<tr>
<th>Pipe Size (in)</th>
<th>#4 Rebars</th>
<th>L (in)</th>
<th>T (in)</th>
<th>#4 Ties</th>
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<td>2-3</td>
<td>16</td>
<td>5</td>
</tr>
</tbody>
</table>
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 4:1 slope in all directions to outlet.
4. All rebar 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 inlet depression shall be warped to opening according to Std Dwg C-15.70.
10. Silicone sealant shall be placed between the grate frame and PCCP, recessed 1/8" from the pavement surface.
11. Curb opening areas, see Fig. for Type I-single and Type I-double equal 0.25 and 0.54, respectively, for each inch of "h + inlet depression - 2.35".
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
   8" when H is greater than 8"
   See Section B-B

Curb opening areas, sq ft, for Type 1-single and Type 1-double equal 0.25 and 0.54, respectively, for each inch of "h + inlet depression - 2.35".

See Std Dwg C-15.70.

Curb opening areas, sq ft, for Type 1-single and Type 1-double equal 0.25 and 0.54, respectively, for each inch of "h + inlet depression - 2.35".

See Std Dwg C-15.70.

Silicone sealant shall be placed between the grate frame and PCCP, recessed 1/8" from the pavement surface.

Curb opening areas, see Fig. for Type I-single and Type I-double equal 0.25 and 0.54, respectively, for each inch of "h + inlet depression - 2.35".

See Std Dwg C-15.70.

Silicone sealant shall be placed between the grate frame and PCCP, recessed 1/8" from the pavement surface.

Curb opening areas, see Fig. for Type I-single and Type I-double equal 0.25 and 0.54, respectively, for each inch of "h + inlet depression - 2.35".

See Std Dwg C-15.70.
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 4:1.

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, 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 (sq ft) per inch of curb "h" + gutter depression = curb opening length (ft) x 0.0833.

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

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

12. #11 + 5\" when h is 6\" or less.
   8\" when h is greater than 8\".

DELETED GENERAL NOTE 9

REVISED NOTES 5, 10 & 11

REVISED SHEET NUMBER REFERENCE

CATCH BASIN

TYPE 3

STATE OF ARIZONA
DEPARTMENT OF TRANSPORTATION
ROADWAY STANDARD DRAWINGS

APPROVED FOR DISTRIBUTION

APPROVED FOR DESIGN

5/97

5/07
GENERAL NOTES

1. Use Sheet 1 of 3 for other dimensions, notes and rebar.

2. \( \theta_1 = 6'' \) when \( H \leq 8' \); or less
\( 8'' \) when \( H \) is greater than 8'

---

**SECTION A-A**

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

---

**DETAIL 1**

- Anchor \#4 Rebar
- 6'' Center to Center
- Length = 2'' - 11 3/4''

**DETAIL 2**

- Curb Support Anchor
- 4'' Maximum Anchor Spacing
- See Detail 2

**DETAIL 3**

- \( \theta_1 \) Rebar
- 6'' Center to Center
- See Detail 3

**DETAIL 4**

- Hex Head Bolt
- With 3'' of Thread

---

NOTES:
- Rebars Shown Are For Floor Of Wing And Wall Only
- See Sections On Sheet 1 of 3 for Other Reinforcing

No Rebar In Bottom
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.
**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 4:1 slope along the axis of 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-15.30 for grate and frame details and opening areas.
7. Any specified inlet depression shall be warped 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 diaphragms shall be placed to meet field conditions. See Std Dwg C-15.70.
12. Silica sealant shall be placed between the grate frame and PCCP, recessed 1/4" from the pavement surface.
13. See Detail 2 for catch basin with wide gutter.
14. \( \theta = 6" \) when \( H \) is 8" or less.
   \( \theta = 8" \) when \( H \) is greater than 8".
   See Section B-B.
   \[ \text{9" when pavement is AC.} \]
   Match pavement thickness when pavement is PCCP.

**PLAN - CATCH BASIN TYPE 4 - SINGLE**

**PLAN - CATCH BASIN TYPE 4 - DOUBLE**

**SECTION A-A**

**SECTION B-B**

**SECTION C-C**

**DETAIL 1**

**DETAIL FOR WIDE GUTTER**

(SEE STD DWG C-05.10)
Catch basin can be used on grade or at roadway sag. 

2. Catch basin has three configurations:
   - 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 a 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 4:1.

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 "t" + inlet depression = curb opening length (ft) x 0.0653.

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

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 field conditions. SeeStd Dwg C-15.70.

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

14. \( t = 6" \) when \( H \) is 8" or less, \( 6" \) when \( H \) is greater than 8".

15. \( t = 9" \) when pavement is AC, match pavement thickness when pavement is PCCP.
GENERAL NOTES
1. See Sheet 1 of 2 for other dimensions, notes and rebar.
2. $d_1 = 6''$ when $H$ is $8'$ or less
   $d_1 = 8''$ when $H$ is greater than $8'$

SECTION A-A
USE THIS SECTION WHEN $H$ IS GREATER THAN 5'

Curb Support Anchor
4" Maximum Anchor Spacing
See Detail 2

PLAN

No Rebar In Bottom

Construction Joint (Typ)

Notes:
Rebars Shown are for Floor
of Wing and Wall Only
See Sections on Sheet 1 of 2 for
Other Reinforcement

Crumb Support Anchor


DETAIL 1

Noose Plate
8" x 2 7/8" Bent Plate
Lengths $2' - 11 3/4'' - 20 7/8 + (L + 6'')$

Anchor #4 Rebar
6" Center to Center

See Detail 3

DETAIL 3

*3 Rebar
6" Center to Center

See Plans

DETAL 4

#3 Rebar

6" Center to Center

See Detail 3

#4 Rebar

6" Center to Center

See Plans

Catch Basin Sump

Length: 2'-11 3/4" + 2t + (L + 6"

20:1

Inlet Depression

See Plans

Inlet Depression

See Plans

#4 Rebar

8" when $H$ is greater than 8'

VERVES - 2'-6" or 4'-6" (Typ)

See Plans

Gutter Control Grade

Normal Gutter Slope

1" x 8 UNC x 15"

Hex Head Bolt With 3" of Thread

With 3" of Thread

1/2" R

See Plans

Normal Gutter Slope

h of Curb

2'-0"

2'-0"

h of Curb

5/07
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 rock of 1/2" of any point.
5. Grate opening is 3.60 Sq Ft.
6. Bracing of frame is recommended for handling and placement purposes.
7. Frame and Grate to be used with Std Dwgs C-15.10, C-15.30 and C-15.40.
8. Grate may be used with Std DWG C-15.32 Frame.

Grate opening is 3.60 Sq Ft.

Frame and Grate to be used with Std Dwgs C-15.10, C-15.30 and C-15.40.

Grate may be used with Std DWG C-15.32 Frame.
GENERAL NOTES
1. Construction drain may be deleted at the option of the Engineer.

LEGEND
○ Normal pavement or gutter flow line elevation.

CATCH BASIN CONSTRUCTION DRAIN

SECTION

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.

SECTION Y-Y

SECTION Z-Z

PIPE
DIMENSIONS (Ft-in)

<table>
<thead>
<tr>
<th>ID (In)</th>
<th>Single</th>
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<th>A</th>
<th>B</th>
<th>E</th>
<th>F</th>
<th>H</th>
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<td>1 - 7½</td>
<td>1 - 1½</td>
<td>0 - 0</td>
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<td>2 - 7½</td>
<td>3 - 9</td>
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CONCRETE (CFT)

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<td>105</td>
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REINFORCING STEEL (LBS)

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QUANTITIES (Based on CMP Installation)

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<th>Reinforcing Steel (LBS)</th>
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<tr>
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STATE OF ARIZONA
DEPARTMENT OF TRANSPORTATION
ROADWAY STANDARD DRAWINGS

CATCH BASIN DROP INLET

C-15.75

5/07

Rev. 01/05

Drawn by: M. K. Klass
Checked by: W. I. Montgomery

6° (Typ)
3/8" Chamfer
PERSPECTIVE

Grade to Drain Ditch

SECTION A-A

Location Control Point Elevation

Concrete Apron Required Unless Otherwise Indicated on Project Plans

SECTION B-B

Location Control Point Elevation

Match Cross Slope (Typ)

DITCH GRADE DETAIL

LOCATION

Control Point

Elevation

Grade to Drain Ditch

Match Grate Elevation

4-1/2" x 4" Bolt Anchors
Bend 45°

7-5/8" x 2-1/2" Bars
3" Center to Center (Typ)

4-5/8" Diameter Holes (Typ)

2" Clear (Typ)

24" Outlet Pipe (Typical Installation)

4-1/2" x 4" Bolt Anchors
Bend 45°

4-1/2" x 4" Bolt Anchors
Bend 45°

2-1/2" x 1/2" Bar

1/4" x 1-1/2" Zee, 12.6" / HI or Detail / Alternate

4-1/2" x 4" Bolt Anchors
Bend 45°

Sump Wall

GRATE DETAIL

DETAI I

NO

REVISED CLEAR COVER

3

6" when H is 8' or less

8" when H is greater than 8'

RLF

9/04

REVISED THICKNESS SPECIFICATION

2

6" when H is 8' or less

8" when H is greater than 8'

RLF

9/04

ADDED CONCRETE REQUIREMENT

1

Grade to Drain Ditch

Match Grate Elevation

24" Outlet Pipe (Typical Installation)

4-1/2" x 4" Bolt Anchors
Bend 45°

2" Clear (Typ)

2-1/2" x 1/2" Bar

1/4" x 1-1/2" Zee, 12.6" / HI or Detail / Alternate

2-1/2" x 1/2" Bar

Sump Wall
GENERAL NOTES

1. All concrete shall be Class B.
2. Grate and frame shall be fabricated of structural steel in accordance with ASTM A36.
3. All welding shall be in accordance with 5th Spec 604-3.06.
4. Grate assembly shall be given one shop coat of Number 1 paint.
   Apron slopes shall match the natural flow line of the ditch. No additional depression will be allowed.
   6" when H is 8' or less
   8" when H is greater than 8'

**Grate Detail**

**SECTION C-C**

**SECTION D-D**

**SECTION A-A**

**SECTION B-B**

**WALL HEIGHT DETAIL**

**DIMENSION TABLE**

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<thead>
<tr>
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<td>10:1</td>
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</tbody>
</table>

**STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION ROADWAY STANDARD DRAWINGS No. 5/07**

**CATCH BASIN SIDE SLOPE C-15JH**
GENERAL NOTES

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

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

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

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

5. Foundation soil and backfill shall be in accordance with Std Spec 203-5.

Concrete shall conform to the requirements for Class S Concrete. The minimum strength shall be 4000 PSI.

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

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

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

Foundation soil and backfill shall be in accordance with Std Spec 203-5.

Concrete shall conform to the requirements for Class S Concrete. The minimum strength shall be 4000 PSI.

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

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

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

Foundation soil and backfill shall be in accordance with Std Spec 203-5.

Concrete shall conform to the requirements for Class S Concrete. The minimum strength shall be 4000 PSI.

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

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

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

Foundation soil and backfill shall be in accordance with Std Spec 203-5.

Concrete shall conform to the requirements for Class S Concrete. The minimum strength shall be 4000 PSI.

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

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

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

Foundation soil and backfill shall be in accordance with Std Spec 203-5.

Concrete shall conform to the requirements for Class S Concrete. The minimum strength shall be 4000 PSI.

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

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

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

Foundation soil and backfill shall be in accordance with Std Spec 203-5.

Concrete shall conform to the requirements for Class S Concrete. The minimum strength shall be 4000 PSI.

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

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

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

Foundation soil and backfill shall be in accordance with Std Spec 203-5.

Concrete shall conform to the requirements for Class S Concrete. The minimum strength shall be 4000 PSI.

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

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

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

Foundation soil and backfill shall be in accordance with Std Spec 203-5.

Concrete shall conform to the requirements for Class S Concrete. The minimum strength shall be 4000 PSI.

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

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

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

Foundation soil and backfill shall be in accordance with Std Spec 203-5.

Concrete shall conform to the requirements for Class S Concrete. The minimum strength shall be 4000 PSI.

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

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

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

Foundation soil and backfill shall be in accordance with Std Spec 203-5.

Concrete shall conform to the requirements for Class S Concrete. The minimum strength shall be 4000 PSI.

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

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

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

Foundation soil and backfill shall be in accordance with Std Spec 203-5.

Concrete shall conform to the requirements for Class S Concrete. The minimum strength shall be 4000 PSI.

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

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

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

Foundation soil and backfill shall be in accordance with Std Spec 203-5.

Concrete shall conform to the requirements for Class S Concrete. The minimum strength shall be 4000 PSI.

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

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

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

Foundation soil and backfill shall be in accordance with Std Spec 203-5.

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

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

Foundation soil 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

NOTE: 6" when H is 8' or less
       8" when H is greater than 8'

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### GENERAL NOTES

1. All structural steel shall be in accordance with ASTM A36.
2. All welding shall be in accordance with Std Spec G04-3.06.
3. The completed grate assembly (frame & grate) shall be given two shop coats of Number 1 paint.

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

### GRATE AND FRAME DIMENSIONS

<table>
<thead>
<tr>
<th>Type</th>
<th>Curb Height (In)</th>
<th>Gutter Width (Ft-In)</th>
<th>Catch Basin Frame</th>
<th>Catch Basin Grate</th>
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<tr>
<td>B</td>
<td>6</td>
<td>2-6</td>
<td>26'-57'-40</td>
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<tr>
<td>C</td>
<td>3</td>
<td>2-6</td>
<td>15'-37'-42</td>
<td>117g</td>
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**BRACE PLATE DETAIL**

- 31/2"x1/2"x10" Bar
- Brace Plate
- Typ
- Typ
- Typ
- Typ

---

**SECTION A-A**

- L 4"x3"x1/2"
- 31/2"x1/2" Bar
- Typ

**SECTION B-B**

- 31/2"x1/2" Bars
- Typ
- Typ
- Typ
- Typ

---

**FRAME PLAN VIEW**

- L 4"x3"x1/2"
- 31/2"x1/2" Bar
- Typ

**GRATE PLAN VIEW**

- 31/2"x1/2"x10" Bar
- See Section B-B
- Typ

---

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INLET DEPRESSION
CONCRETE HALF BARRIER AND CATCH BASIN WITH SLOTTED DRAIN
(18" CMP AND 32" CONCRETE BARRIER SHOWN)

GUTTER DEPRESSION
AT SLOTTED DRAIN LOCATIONS

GENERAL NOTES
1. See Std Dwg C-15.91 for dimensions, sizes and details not shown for construction of catch basin.
2. See Std Dwgs C-10.52 and C-10.53 for dimensions, sizes and details not shown for construction of barrier.
3. See Std Dwg C-13.60 for dimensions, sizes and details not shown for construction of slopped drain.
4. Only longitudinal reinforcing steel shall be placed in half barrier within 1' of catch basin frame. S-shape bars shall not be placed in the rear wall of the catch basin.

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 2 of 2) for locations with bicycle traffic.

GENERAL NOTES
1. 3. 4.

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CATCH BASIN WITH HALF BARRIER

HALF BARRIER INSTALLATION
AT SLOTTED DRAIN LOCATIONS

CATCH BASIN WITH HALF BARRIER
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. Beveled 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.

See View A

Concrete Anchor Studs: 3 Required

Concrete Anchor Studs: 4 Required

Grate opening for grate shown is 4.75 Sq Ft.
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.

   ▲ Beveled side of grate toward barrier

3. 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.

NOTE TO DESIGNERS

Stepped side of grate toward barrier

Grate opening for grate shown is 4.75 Sq Ft.

▲ Beveled side of grate toward barrier

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-13.15.
2. Bedding and backfill material shall be Class 2 AB.
3. Pipe installation shall conform to Section 501 of Std Specs.
4. The contractor shall imprint a 4" high letter "S" on the face of all curbs at sleeve locations. The width of the letter shall be 1/2" and shall penetrate the concrete surface 1/2".
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.
7. Sleeves shall be installed parallel to the roadway subgrade. Slope may vary in super-elevated sections. Minimum slope nominal to drain.

DUMBELL WATERSTOP

(Butyl Rubber)

See Note 5

\[ 1/2 \] Expansion Joint

\[ 6'' \]

Dumbell Waterstop

See Std Dwg C-13.15.

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<th>MADE BY</th>
<th>DATE</th>
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1. Rock shall conform to Std Spec 913-2.01(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. When other embankment slopes are encountered, warp to 1 1/2 :1 or 2:1.

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.

**TOP OF BANK PROTECTION**

- **TYPE 1 BANK PROTECTION**
  - Long Rail – Railroad Rail or Approved Equal (See Table for Spacing)
  - Elevation: See Plans
  - Rock Backfill (Typ)
  - Single Wrap With 2 Strands *9 Galvanized Wire, 12" Center to Center

- **TYPE 2 AND 3 BANK PROTECTION**
  - Long Rail – Railroad Rail or Approved Equal (See Table for Spacing)
  - Elevation: See Plans
  - Rock Backfill (Typ)
  - Single Wrap With 2 Strands *9 Galvanized Wire, 12" Center to Center

**RAIL CONNECTION DETAIL**

- Burn Holes Through Rails In Field and Bolt Together As Shown
- 3/4" x 0'-4 1/2" Bolt, Washer & Nut

**WIRE MESH SPLICE DETAILS**

- SECTION A - A
  - 4" Minimum Lap
  - 2 Strands *9 Galvanized Wire

**GENERAL NOTES**

- All wire mesh on a single project shall have the same mesh opening.

**PLAN OF CHANNEL BANK PROTECTION**

- Double-Wrapped With 2 Strands *9 Galvanized Wire
- Single-Wrapped With 2 Strands *9 Galvanized Wire 12" Center to Center

**ELEVATION AT CHORD POINT ON CURVE**

**ELEVATION ON STRAIGHT SECTION**

**TERMINAL DRAFTER**

- 5/07

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**RAIL BANK PROTECTION FOR DRAINAGEWAYS TYPES 1, 2 & 3**

**DESCRIPTION OF REVISIONS**

- 5/07

**DRAWING NO.**

- 5/07
TYPICAL SECTION
See Perspective Std Dwg C-17.10

<table>
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<tr>
<th>Type</th>
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<th>Minimum Rail Weight (Lbs/Yd)</th>
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<td>5-0</td>
<td>22</td>
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<td>10</td>
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<td>5</td>
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<td>28</td>
</tr>
<tr>
<td></td>
<td>16</td>
<td>28</td>
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</tbody>
</table>

GENERAL NOTES

1. Rock shell conform to Section 913-2.01(A) of the Standard Specifications. The rock shell 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, warp to 1 1/2 :1 or 2:1.

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.

ELEVATION AT CHORD POINT ON CURVE

ELEVATION ON STRAIGHT SECTION

WIRE MESH SPLICE DETAILS
**PLAN**

**TYPE 7 AND 8 BANK PROTECTION**

- Thread Cable Through Wire Fabric and Wrap One Turn on Each Rail
- Rail Heads Face Out
- Manufacturer's Standard Galvanized Cable Clamp

**SECTION A-A**

**Rail (Typ)**
- See Table
- End Rail
- End Panel

**GENERAL NOTES**

1. Rock shall conform to Std Spec 913-2.01(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 (0.177 in diameter) coil-spring steel wire with a minimum tensile strength of 75,000 pounds per square inch and shall be zinc-coated or aluminum-coated.

**SECTION B-B**

**WIRE MESH SPLICE DETAILS**

- 2 Strands #9 Galvanized Wire
- 8'-4" (Typ)
- Intermediate Panel
- Tension Wire See General Note 3

**SECTION C-C**

**Wire Mesh Splice Details**

- 2 Strands #9 Galvanized Wire
- Horizontal Wires Shall Be 2 Strands Twisted, Minimum 12 Gauge; Diagonal Wires Minimum 14 Gauge

**ELEVATION**

- Type 9 Bank Protection
- See Table
- Attach Mesh to Rails With 3 Strands of #9 Galvanized Wire, 12" Center to Center (Typ)
- Tension Wire See General Note 3

**PLAN**

- Type 7 and 8 Bank Protection
- Loop Cable Around Rails as Shown
- 6x19 Galvanized Plow Steel Preformed Fibercore Cable

**DESCRIPTION OF REVISIONS**

- Made by
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**RAIL BANK PROTECTION FOR DRAINAGEWAYS TYPES 7, 8 & 9**

**DRAWING NO.**

- C-17,20

**REV.**

- 5/07
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-place manholes shall be Class B.
4. All manholes deeper than 56 inches shall have steps. Manhole steps shall be constructed in accordance with AASHTO M199. Where precast manholes are used, the steps 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 1006-7.
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 ADOT Materials Testing Manual.

NOTE TO DESIGNERS

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

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

2. Casting weights shown are minimum weights and are either for cast-iron or ductile-iron castings. Casting weight shall not exceed 110% of the weights shown.

3. 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.

4. 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 (see above) are met.

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 (see above) are met.
GENERAL NOTES

1. Ford walls shall be Class B concrete.
2. Depth gauge tubing shall be protected against concrete entering through bottom or perforations.
3. Depth gauge tubing and both sides of numeral tabs shall be painted with two coats of white enamel. Numerals and markers shall be painted with one coat of gloss black enamel.
4. Depth gauge foundation may be utility concrete.

SECTION

CONCRETE SURFACE ROAD WITH CONCRETE WALLS

Min Distance Below Stream Bed

Roadway Width

1 Cu F1 Coarse AB (AASHTO No. 43 Size 7) Security Tied In Burlap Sack at Each Weep Hole Location

2-#4 Rebars Top and Bottom

3" Diameter Weep Holes

3" Concrete Class B

Base Material See Plans

2-#4 Rebars Top and Bottom

Slope 0.015 ft.

Section (Typ)

Finished Roadway Grade

2 1/2"x4"x18 Gauge Sheet Metal Number Tabs, Both Sides. Fasten With Two 3/8"x3" Bolts Through Tube

1 3/4"x3"x10" Perforated Telescoping Square Tube 12 Gauge, 1/4" Holes 1" Center to Center 4 Sides

2 x 12 Gauge, 1/4" Holes 1" Center to Center 4 Sides

Finished Grade

3 Diameter Weep Hole (Typ) 20' Center to Center

Wall May Be Constructed To This Line.

3" Diameter Weep Hole 1" Center to Center

ELEVATION LOOKING UPSTREAM

Depth Gauge (2)

Nightly Alignment to be as Near Average Transverse Grade of Stream as Possible

Wall to be Built to One Foot Above High Water Level

1 Cu Ft Coarse AB (AASHTO N43 Size 7) Securely Tied In Burlap Sack at Each Weep Hole Location

ROADWAY STANDARD DRAWINGS

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C-19.10

Sheet 1 of 2
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.

DETAIL A

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

3x3-W1.4xW1.4 Welded-Wire Fabric,
Tie With 2 Strands of #9 Gauge
Galvanized Wire 2' Center to Center
Each Way. Tie Top and Bottom
of Basket to Top 2"x12" Planks at
5'-0" Intervals and at Each End.
Tie by Encircling Plank With Two
Strands of #9 Wire

Slope 0.015

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FORD
TYPES 1 AND 2
DELETED GENERAL NOTE

Sheet 2 of 2

STATE OF ARIZONA
DEPARTMENT OF TRANSPORTATION
C-19.10

REISSUED STD AS C-19.10, SHEET 2 OF 2
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 plans 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. Marked portions of the frame and cover are shown by the symbol "D". The allowable tolerance for marked areas is ±1/8". Concrete shall conform to Std Spec 362.

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.

▲ ("D" or pavement structure thickness, whichever is greater.)

COVER PLAN

SURVEY MONUMENT FRAME AND COVER
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. Coat-in lettering format may vary.

3. When used to define section lines, the marker shall be stamped in accordance with the BLM "Manual of Surveying Instructions" including the land surveyor's registration number.

4. Far R/W marker Information, refer to current ADOT R/W Plan 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. Shovel cross-sectional area shall be a minimum of 0.31 square inches and a maximum of 0.50 square inches. Shovel cross-section may vary and is not a critical feature of this standard.

8. Shovel geometry shall provide for secure anchorage in concrete.

9. Test shall not obscure survey point.