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**General Abbreviations**

- **STATE OF ARIZONA**
- **DEPARTMENT OF TRANSPORTATION**
- **ROADWAY STANDARD DRAWINGS**
- **C-DL30**
- **Sheet 2 of 3**
<table>
<thead>
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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 ID. See Shoulder Wedge Detail.
3. Slopes beyond the pavement structure, such as embankment and cut slopes, are relative to horizontal.
4. For slope controls within interchange areas, see project plans.
5. When median slopes intersect, see project plans for controls.
6. These slopes are intended to be used with new or reconstructed roadways.

NOTE TO DESIGNERS
- Required when guardrail is present on the project. Treatment shall be uniform throughout the project length. The 8" requirement may be waived under special conditions on projects without guardrail.

SLOPE ROUNDOVER DETAIL
- Except in solid rock, or as directed by the Engineer, the intersection of roadway cut slopes with the ground surfaces shall be rounded.
- For cuts up to 6", use 5" semi-tangents for slope rounding. For each additional foot of cut add 1" to semi-tangent to 11" maximum.
GENERAL NOTES

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

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

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

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

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

NOTE TO DESIGNERS

1. 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.

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

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

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

NOTE TO DESIGNERS

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

- Required when guardrail is present on the project. Treatment shall be uniform throughout the project length. The 6' requirement may be waived under 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 surface shall be rounded. For cuts up to 6', use 5' semi-tangents for slope rounding. For each additional foot of cut add 1/ to semi-tangent to 11' maximum.
1. Dimensions of ditches and channels shall be shown on the plans as bottom width, depth and length.

2. Ditches and channels shall be constructed with a minimum grade to prevent erosion. Ditch 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.
   - Slope as Shown on Plans (Not Desirable)
   - Slope as Shown on Plans

TYPE B TRANSVERSE MEDIAN DIKE

TYPICAL TRANSVERSE MEDIAN DIKE INSTALLATION
GENERAL NOTES

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

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

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

4. 1:10 = Desirable Slope

SECTION B-B

CUT DITCH WIDENING DETAIL

SECTION A-A

SECTION C-C
**GENERAL NOTES**

1. Berm construction shown is for pipe extensions. Berm construction shall 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.


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

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**SKewed PIPE PLAN**

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**STRAIGHT PIPE PLAN**

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**ELEVATION STRAIGHT PIPE**
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 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 bedding into the key.
5. Splitway invert slope shall be uniformly downward from A to B. See Section B-B.
7. All posts within the inlet shall have a leaveout for the full depth of concrete. Leaveouts shall be filled flush to top of pavement with 3" of CLSM grout having a 28 day compressive strength between 40 and 120 psi.
8. Round off exposed concrete corners. Transition slopes linearly from edge to center.

SECTION A-A

SECTION B-B

OUTLET DETAIL

LEAVEOUT DETAIL

SPILLWAY SECTION
### GENERAL NOTES

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

### NOTE TO DESIGNERS

Use earthwork cross sections for more precise spillway lengths.

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#### Approximate Length of Spillway (ft) -- C-02.10 & C-02.20 SLOPES

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

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C-02.10 AND C-02.20 SLOPES

C-02.30 SLOPES

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Spillways are not usually used for these stage conditions.
## GENERAL NOTES

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

## NOTE TO DESIGNERS

*Use earthwork cross sections for more precise downspout lengths*

### APPROXIMATE DOWNSPIKE LENGTH (FT) -- C-02.10 & C-02.20 SLOPES

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**C-02.10 AND C-02.20 SLOPES**

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**C-02.30 SLOPES**

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Downspouts are not usually used for these slope conditions.
GENERAL NOTES

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

2. Couplings shall be mechanical heat-shrinkable polyolefin sheets one piece lap-type reapprent steel or slip seams all 18" minimum width and 18 gauge minimum.

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

4. Concrete shall be Class B.

PLAN

SECTION A-A
GENERAL NOTES

1. All gutter flow areas shall be constructed to an accurate grade.
2. See Std Dwgs C-13, 60 and C-15, 51 for curb & gutter with slotted drain.
3. See Std Dwg C-05, 10 for additional General Notes and dimensions.
4. See Std Dwg C-05, 04 for typical curb and gutter transition locations.
   - Dimension may vary where transition occurs on curve. 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, C-1, E or E-1 Std Dwg C-05, 00

SECTION
CURB & GUTTER APPLICATION

EXIT

Ramp Gutter Line
Radius Varies
See Plans

Ramp Gutter Line
50ft Taper

Traffic

Mainline PCCP

2'-0"

Ramp Gutter Line
Radius Varies
See Plans

Traffic

Mainline PCCP

2'-0"

ENTRANCE

TYPE I - PARALLEL-TYPE GUTTER TRANSITIONS AT RAMPS

PLAN VIEW

STATE OF ARIZONA
DEPARTMENT OF TRANSPORTATION
ROADWAY STANDARD DRAWINGS

NL

5/12

CURB & GUTTER TRANSITIONS

C-05, 02
Sheet 1 of 3
TYPE 5 - CURB & GUTTER TRANSITION

Curb & Gutter
Type B, C, C-1, E or E-1
Gutter Width = 4'-6"
Std Dwg C-05.10

TYPE 6 - SINGLE CURB OR CURB & GUTTER TRANSITION (Curb & Gutter Shown)

Single Curb or Curb & Gutter
Type G or D
Std Dwg C-05.10
See Plans

TYPE 7 - CURB & GUTTER TRANSITION

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

TYPE 8 - CURB & GUTTER TRANSITION

Curb & Gutter
Type C, C-1, E or E-1
3/4" Gutters in Pads
5" or 4" Curb Height per Plan
3° or 4° Curb Depression
or Match roadway cross slope
Std Dwg C-05.10

TYPE 9 - CURB & GUTTER TRANSITION

Curb & Gutter
Type D Series
Std Dwg C-05.10

Sidewalk Ramp
Type C
Std Dwg C-05.30

Sidewalk
Std Dwg C-05.20
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 1/4", where t is the thickness of the driveway. Joints shall be either formed or sawn. Formed joints shall be finished with a trowel having a \( \frac{1}{4}" \) radius. See Sheet 2 of 2 for the Contraction Joint Details.

3. Expansion joints shall be located between driveways and sidewalks and on abutting structures. The \( \frac{1}{4}" \) Joint filler shall extend the full depth of the concrete. See Sheet 2 of 2 for the Expansion Joint Detail.

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

5. Place AB under driveways when shown on plans.

Legend

- **Minimum slope = 0.01 ft**
- **Maximum slope = 0.02 ft**
- **Straight grade with downward slope**

**SECTION A-A**

**SECTION B-B**

**DRIVEWAY WITH SIDEWALK ADJACENT TO CURB**

**DRIVEWAY WITH SIDEWALK SETBACK**
GENERAL NOTES

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

2. One-inch deep transverse contraction joints shall be placed on sidewalks at intervals of approximately 15’ or at a spacing that matches adjacent curb and gutter. If the sidewalk is over 1’ in width, a 2" deep longitudinal contraction joint shall be placed in the center of the sidewalk. The maximum area of sidewalk without contraction joints or scoring lines shall be approximately 56 square feet. Joints shall be either formed or sawn. Formed joints shall be finished with a tool having a 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 adjoining 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 AG under sidewalks when shown on plans.

LEGEND

Minimum slope = 0.01 ft

Maximum slope = 0.02 ft

CONCRETE SIDEWALK ADJACENT TO CURB

Width as shown on Project Plans

CONCRETE SIDEWALK SETBACK FROM CURB

Width as shown on Project Plans

CONTRACTION JOINT DETAIL

EXPANSION JOINT DETAIL
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° slope governs. If a 15° slope results in a ramp length larger than 15 ft., the 15° 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 Dwg C-05.10 and C-05.22 for Joint details.

LEGEND
- Minimum Slope = 10° (0.01 in/hr)

- Maximum Slope = 5° (0.02 in/hr)

- Maximum Slope = 20° (0.05 in/hr)
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. The side slope wings do not receive a broom finish.

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

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


LEGEND

○ Minimum Slope: 100x1 (0.01 in)
○ Maximum Slope: 50x1 (0.02 in)
○ Maximum Slope: 20x1 (0.05 in)

Gero 10° Maximum to Face of Pedestrian Push Button

SECTION A-A

PERPENDICULAR CURB RAMP
GENERAL NOTES

1. For use where sidewalk is not continuous.

2. Ramp centerline shall be radially from 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 15'1" slope results in a ramp length longer than 15'-11", the 15'1" slope may be walked and the ramp length held at 15'-11", regardless of the slope.

4. The top of the Ramp Curb along the back of the Sidewalk Ramp shall match the elevation of the adjacent back of sidewalk and run parallel to the Sidewalk Ramp. The Ramp Curb along the side of the Sidewalk Ramp shall match the elevation at the back of the Curb & Gutter and the back of Ramp Curb.

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

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

7. See Slw Dwg C-05.30 and C-05.20 for joint details.


LEGEND

Minimum Slope = 100'1" (0.011"")

Maximum Slope = 20'1" (0.02"")

No Sidewalk

Depressed Curb & Gutter

5'1" Maximum Gutter Cross-slope

Depressed Curb & Gutter

ELEVATION DEPRESSED CURB AT SIDEWALK RAMP

PLAN

SECTION A-A

SIDEWALK RAMP AT SIDEWALK TERMINUS

STATE OF ARIZONA
DEPARTMENT OF TRANSPORTATION
ROADWAY STANDARD DRAWINGS

SHEET 2 OF 2
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 side of the Sidewalk Ramp shall match the elevation at the back of the Curb & Gutter and the back of Ramp Curb.
4. Drainage inlets should not be located within marked crosswalks, or if crosswalks aren’t marked, within the area a standard marked crosswalk would encounter.
5. Concrete shell receive a rough broom finish as shown.
6. See Std Dwg C-05.10 and C-05.20 for joint details.
   - Pedestrian Push Button Post when shown on Traffic Plans. See Traffic Signal Plans for Additional Information
   - 10" Maximum to Face of Pedestrian Push Button

LEGEND

Minimum Slope = 100\(\frac{\text{in}}{\text{ft}}\)
Maximum Slope = 50\(\frac{\text{in}}{\text{ft}}\)
Maximum Slope = 20\(\frac{\text{in}}{\text{ft}}\)

DEDICATED STANDARD DRAWINGS

STATE OF ARIZONA
DEPARTMENT OF TRANSPORTATION
ROADWAY STANDARD DRAWINGS

SIDEWALK RAMP AT SIDEWALK TERMINUS
SIDEWALK BEHIND BARRIER

SECTION A-A

SECTION B-B
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'-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.

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 ditches 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.

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

LEGEND

- Minimum slope = 100'1 (0.01%)
- Maximum slope = 500'1 (0.02%)
- Maximum Slope = 200'1 (0.05%)

STATE OF ARIZONA
DEPARTMENT OF TRANSPORTATION
ROADWAY STANDARD DRAWINGS

RAMP CURB Dwg C-05.10
See Ramp Curb Detail
Sheet 1 of 7

DEPRESSED CURB Dwg C-05.20
See Depressed Curb Detail
Sheet 1 of 7

PERSPECTIVE
GENERAL NOTES

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 the surface.

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

3. Single curb shown on plans for Curb & Gutter application.

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

ELEVATION
DEPRESSED CURB AT SIDEWALK RAMP

SECTION A-A
(For Median Widths Greater Than 5'-5"

SECTION A-A
(For Median Widths Less Than 5'-5"

SIDEWALK RAMP AT MEDIAN ISLAND CROSSING

DEPARTMENT OF TRANSPORTATION ROADWAY STANDARD DRAWING

STATE OF ARIZONA

5/12

C-05.30
Sheet 6 of 7
GENERAL NOTES
1. Gravel shall be placed in low corner and filled with coarse aggregate (AASHTO No. 75 Size T) securely fasted in a long-life geotextile sack.

LEGEND
• 3/8" Minimum (Typ) (0.65 in, Minimum ADA Actual)
• 1/2" to 2 1/4" (Typ) (1.6 in. to 2.4 in, ADA Actual)
• 1/2" to 3/4" (Typ) (1.6 in. to 1.4 in, ADA Actual)
• 2" to 5" (Typ) (5.0 in. to 1.25 in, ADA Actual)
• 50% to 65% of 

TEXTURE PATTERN DETAIL

SECTION A-A

DETECTABLE WARNING STRIP

DETECTABLE WARNING STRIP DETAIL

TRUNCATED DOME DETAIL

STATE OF ARIZONA
DEPARTMENT OF TRANSPORTATION
ROADWAY STANDARD DRAWINGS

5/12

C-0530
DETECTABLE WARNING STRIP

DETECTABLE WARNING STRIP

DETECTABLE WARNING STRIP BRICK OPTION

SECTION
GENERAL NOTES

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

2. See Std Dwg C-05,10 and C-05,20 for joint requirements.

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

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

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

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

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

8. Median paving shall be Class B concrete.

SECTION A-A

SECTION B-B

WIDTH AS SHOWN ON PLANS

CONCRETE PAVERS
See Note 3

4" STAMPED CONCRETE
See Note 3

1" SAND

4" AB (Class 2)

SECTION A-A

SECTION B-B

STATE OF ARIZONA
DEPARTMENT OF TRANSPORTATION
ROADWAY STANDARD DRAWINGS

5/12

MEDIAN PAVING AND
NOSE TAPER

C-05,40
1. Driveway types:
   - Residential: providing access to a single family residence, to a
     duplex, or to an apartment building containing five or
     fewer dwelling units.
   - Commercial: providing access to an office, retail or institutional
     building or to an apartment building having more than
     five dwelling units.
   - Industrial: directly serving a substantial number of truck move-
     ments 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 applicable, one of the
   two adjacent property owners shall sign the necessary form, and
   the property line can be located as directed by the Engineer.

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 directed by the
   Engineer.

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

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

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

9. Paved turnouts & paver patios shall be 8x11, surface material, type
   and standard. Examples 25x30 pavers, Type A, Std. Osw C-0610, show
   radius (R) graphically.

10. Construction of curb, gutter, sidewalk, and drainage facilities in urban
    areas by the permittee along that portion of the highway frontage
    under permit application, may be a stipulation of the permit if
    it appears to be reasonable need.

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

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

GENERAL NOTES

1. When load transfer dowel assemblies are required, use dimensions shown in Figure 1. See Assembly Placement and Edge Clearance Details, SJD DWG C-07-02.

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

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

4. Miscellaneous structures include, but are not limited to, catch basins, sign structure foundations, piers, abutments, barrier transitions, slotted drains and other concrete facillities, 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 Sealant
T - PCCP Thickness
PE - Polyethylene

CONSTRUCTION JOINT

SAW AND SEAL DETAIL

WEAKENED-PLANE JOINT

SAW AND SEAL DETAIL
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
F - Barrier Footing Concrete Thickness
(Full-depth Concrete Shown)

HALF BARRIER JOINT

B Joint

SINGLE CURB JOINT

A Joint

AC Pavement on Back Side of Barrier

MEDIAN BARRIER JOINT

B Joint

PCCP on Both Sides of Barrier

LONGITUIONAL CONSTRUCTION

JOINT DETAIL

(WITH AR-ACFC)

AR-Sealant

1/8" Minimum Diameter
Decker Rod

1/4" R (Typ)

Varieties

Varieties

Gutter

New PCCP

1'-0"

1'-0"

1'-0"

1'-0"

Silicone Sealant

Recess 1/4" from
Pavement Surface

Type A or

Type G Curb

Type A-1 Curb

4" R

1/4" R (Typ)

Varieties

Varieties

New PCCP

New PCCP

10"

10"

1'-0"

1'-0"

1'-0"

1'-0"

New AC

Pavement

Footing

New PCCP

New PCCP

#5 Rebar

5'-0" Center to Center

Varieties

Varieties

New PCCP

New PCCP

#5 Rebar

5'-0" Center to Center

1'-0"

1'-0"

1'-0"

1'-0"
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-slabbed, mill joint PCP joints.

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

4. See Std Dwgs C-07.01 through C-07.04 for additional information.

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

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

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

- Dowel bars - 1/2" diameter x 1'-6" plain round bars with coating. See Special Provisions.
- Intermediate legs - 2 gauge or W-5.5 wire.
- End legs - 2 gauge or W-5.5 wire.
- Upper space bar - 2 gauge or W-5.5 wire x 0.1". (See Dimension Table)
- Lower space bar - 2 gauge or W-5.5 wire x 0.1". (See Dimension Table)
- Tie bars - W-1.5 wire x 16".
- Anchor strap - 1/8" x 3" steel strap, 0.079 thick.
- Place with a 1/2" minimum length steel nail for LCB, 4" minimum length steel nail for ACP or AB, 0.145 diameter ASTM A227 Class 1 with 1/4" head or washer.

QUANTITY TABLE

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DIMENSION TABLE

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<td>10-4</td>
<td>12-6</td>
<td>14-6</td>
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</tbody>
</table>
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. Stamped 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 slab.

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 repairs 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 TIC Allowable Limits (Typ)
GENERAL NOTES

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

2. Stewed PCPP 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 PCPP 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 radius 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 area 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. Stamped PCP joints shall be used when load transfer dowel assemblies are not required.

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

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

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

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

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

8. The returns 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)

   - Concrete Median Barrier

   - PLAN 72.25' PCCP

   - PLAN 84.25' PCCP

   - 96.25' PCCP

   - 60° Maximum Joints (TWP Joints)
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-stacked 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 return in the LWP & LC Joints shall be placed no greater than 1'-0" 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 be perpendicular (90°) to the longitudinal joints.

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

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

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

8. Transverse weakened-plane joint shall be constructed of 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 H03-3.01 of the Standard Specifications.

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

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

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

5. At intersections 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-05.30 for curb and gutter joint requirements.

7. The bars in the LWP & LC joints shall be placed no greater than 1 3/8" from the TC joint.

8. Transverse weakend-plane joint shall be constructed at least 6 0/16” from a transverse construction joint.

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

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 402-3.01 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 rebar in the LWP & LC Joints shall be placed no greater than 1'-3" from the TC Joint.

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

9. LC and LWP Joints shall be located on the edge of traffic lanes unless otherwise shown on the project plans.
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 40-3.01 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.

SECTION A-A
MID-RAMP

SECTION C-C
RAMP TAPER

SECTION B-B
GORE AREA

SECTION D-D
MAINLINE

STATE OF ARIZONA
DEPARTMENT OF TRANSPORTATION
ROADWAY STANDARD DRAWINGS

PCCP JOINT LOCATIONS
PARALLEL-TYPE ENTRANCE RAMP
WITH AUXILIARY LANE

5/12
GENERAL NOTES

1. All joint locations shown are typical. The actual paving yard 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.

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**SECTION A-A MAINLINE**

- Inside Shoulder Structural Section
- Mainline Structural Section
- Inside Shoulder Structural Section
- Mainline Structural Section

**SECTION B-B RAMP TAPER**

- Inside Shoulder Structural Section
- Mainline Structural Section
- Inside Shoulder Structural Section
- Mainline Structural Section

**SECTION C-C GORE AREA**

- Shoulder
- LC or LWP
- Ramp
- Structural Section

**SECTION D-D MID-RAMP**

- Shoulder
- LC or LWP
- Ramp
- Structural Section

---

**TRANSLATION**

- See Std C-05.12

**CONSTRUCTION NOTES**

- Super Breakover Point (Cross Section)
- Super Breakover Point (Plan View)
- Curb Transition, See Std C-05.12
- Spacing Varies - 18' Maximum, 11' Minimum

---

**STATE OF ARIZONA**

DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN DRAWINGS

5/12

PCPP JOINT LOCATIONS
PARALLEL-TYPE EXIT RAMP
WITH AUXILIARY LANE

C-07.01
Sheet 1/2
GENERAL NOTES

1. All joint locations shown are typical. The actual paving pour plans with joint locations shall be based upon the project paving plan submitted by the contractor and approved by the Engineer in accordance with Subsection 407-3.01 of the Standard Specifications.

2. Dimensions with a tolerance may be adjusted to align to the nearest transverse weakened-plan 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.

    a. Transition, See Std Dwg C-05.12

    b. 12' Face of Curb to Face of Curb on Entrance Ramp

STATE OF ARIZONA
DEPARTMENT OF TRANSPORTATION
ROADWAY STANDARD DRAWINGS

5/12

PCP JOIN LOCATIONS
TAPER-TYPE ENTRANCE RAMP

C-07.04
Sheet 3 of 5
GENERAL NOTES

1. All joint locations shown are typical. The actual placing pour plans with joint locations shall be based upon the project placing 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
- 20° 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

TYPICAL TRANSVERSE WEAKENED-PLANE
JOINT LAYOUT AT GORE AREAS
Exit Ramp Shown

RAMP WITHOUT CURB & CUTTER

RAMP WITH CURB & CUTTER
GENERAL NOTES

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

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

3. The ratio of transverse to longitudinal joint spacing shall be greater than 7:2 but not more than 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
   S 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 - IB Maximum
   • Varies - 12' Maximum
   - IB 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
   • IB Maximum


STATE OF ARIZONA
DEPARTMENT OF TRANSPORTATION
ROADWAY STANDARD DRAWINGS

PEEP JOINT LOCATIONS
CROSSROAD AND RAMP TERMINI

C-07.04
Sheet 3 of 3
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

Type A: AC Pavement
Type B: AC Pavement
Type C: Wet Thoroughly and Paint With Grout
Type D: AC Pavement
Type E: Class P Concrete
Type F: Surface Outside of Trench Lanes Damaged During Construction Shall Be Restored to Original Thickness and Condition
Type G: Sawcut Line (Typ)
Type H: Sawcut Line (Typ)

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

STATE OF ARIZONA
DEPARTMENT OF TRANSPORTATION
ROADWAY STANDARD DRAWINGS
5/12

TRENCH BACKFILL AND PAVEMENT REPLACEMENT
C-07-06
GENERAL NOTES

1. Paved gore area shall be Class 5 Concrete, f'c = 4000 PSI or AC as shown on plans.

2. See Slid Dwg's C-07.01 and C-07.04 for joint layout and details.

SECTION A-A

\[ \frac{1}{4} " \] Joint & Preformed Joint Filler (Typ)

Ramp Structural Section

Structural Section See Plans

SECTION B-B

Tack Coat

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

Structural Section See Plans

STATE OF ARIZONA
DEPARTMENT OF TRANSPORTATION
ROADWAY STANDARD DRAWINGS

C-08.20

5/12

Paved Core Area
GENERAL NOTES

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

2. See Std C-10.02 for measurement limits.

3. See Std Specs 703, 905, and 102-3 for guardrail material, reflective sheathing, and spacing requirements.

4. See Std C-10.03 or C-10.04 for guardrail system details.

5. Construct widening adjacent to AC pavement with 3” thick AC. Construct widening adjacent to PCC with 6” thick PCC.
   - Widen 2'-8" unless otherwise noted on plans.
   - Match roadway cross slope.

PLAN

SECTION

SECTION WITH EMBANKMENT CURB
GENERAL NOTES

1. The control height for guardrail system is 3′ in the cap of rail, measured at the face of rail from the normal finished shoulder elevation.

2. Guardrail shall be spaced to adjacent traffic.

3. Wood blockout may be one 12′ deep blockout, or a combination of two 6′ deep blockouts and one 4′ deep blockout (PB61B). If two blockouts are used, they must be nailed together by two 16d galvanized nails.

4. Manufacturer components according to the AASHTO-ASC-ARTBA Guide to Standardized Highway Barrier Hardware. Visit the Roadway Engineering web site to view the drawings referenced in parenthesis.

5. Maintain a distance of 59° between W-beam face and right objects.

D. Use 6′ maximum curb height.

A. Default value is 0°. May vary up to 7° if shown on plans or directed by the Engineer.

B. Shall meet the same material requirements as PB61B with the noted length.
GENERAL NOTES

1. The control height for guardrail system is 31" to the top of rail measured at the face of rail from the normal finished shoulder elevation.

2. Guardrail shall be rolled to the direction of adjacent traffic.

3. Wood blockout may be either 12" deep blockout or a combination of one 8" deep blockout and one 4" deep blockout [POB(R)]. If two blockouts are used, they must be bolted together by two 16d galvanized nails.

4. Manufacturer components according to the AASHTO-MC-02-ARTBA guide to standardized Highway Barrier Hardware. Visit the Roadway Engineering website to view the drawings referenced in parentheses.

5. Maintain a distance of 50" between w-beam face and rigid objects.

   - Use 6" maximum curb height.
   - Default value is 0", may vary up to 1" if shown on plans or directed by the Engineer.
   - An additional ½" diameter hole may be provided at the same location on the opposite side of web.
   - The ¾" diameter hole may be eliminated when composite or routed wood blockouts are installed.

SECTION

SHOWN WITHOUT CURB

SHOWN WITH CURB
GENERAL NOTES

1. Height of curb shall not exceed 4 inches.

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

3. Manufactured components according to AASHTO A60-ARTBA Guide to Standardized Highway Guardrail Hardware. Visit the Roadway Engineering website to view the drawings referenced in parentheses.

4. Maintain a distance of 59" between w-beam face and right objects.

5. For Type C curb and gutter, 32" diameter is at 60" of gutter.

6. For Type C-II curb and gutter, 32" diameter is at 60" of gutter.

7. Guardrail shall meet the same material requirements as FRRB05 with the noted length.

PLAN

ELEVATION

BLOCKOUT DETAIL

SECTION WITH CURB & GUTTER TYPE C

SECTION WITH CURB & GUTTER TYPE C-I

RETAINER STRAP DETAIL
GENERAL NOTES

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

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

3. Manufacturer components according to the AASHTO-AGC-ARTBA Guide to Standardized Highway Barrier Hardware. Visit the Roadway Engineering web site to view the drawings referenced in parenthesis.
GENERAL NOTES

1. See Std. Dwg C-10.03 and C-10.04 for additional information and dimensions.
2. Guardrail shall be lapped in the direction of adjacent traffic.
3. Where bolting through the top of box culvert is not practicable, the bolts may be attached to the top of the box culvert using epoxy. The bolts shall be embedded a minimum of 6 inches into the concrete.

BOX CULVERT GUARDRAIL POST DETAIL

INSTALLATION DETAIL
GENERAL NOTES
1. The Cable Anchor Assembly shall be tightened to remove slack.
2. See Std Dwg C-10.00 for measurement limits.

- Match adjacent W-Beam Guardrail post type.
GENERAL NOTES

1. Use case 1 when overturning soil depth is less than 16".
   Use case 2 when overturning soil depth is between 16" and 40".

2. A 21⁄2" circular hole for wood posts or a 21⁄2" circular hole for steel posts may be substituted for drilling holes shown.

3. Use coarse aggregate similar to ASTM C33 Size No. 57.

4. Use case 2 or 3 for 72" long transition post in C-10.30 and C-10.31 applications. For 60" to 90" transition posts, drill 14" diameter by 40" deep hole and backfill with coarse aggregate.
   For M145 transition posts, drill 10" diameter by 54" deep hole and backfill with coarse aggregate.

5. Drill 8" diameter by 70" deep hole for C-10.08 foundation tubes.

6. Follow manufacturers guidance for treatment of end teratinal posts in rock.

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ELEVATION
CASE 1

ELEVATION
CASE 2

ELEVATION
CASE 3

PLAN VIEW
WOOD POST

PLAN VIEW
STEEL POST

See Case 1 plan view for drill dimensions to 16" deep.
See Case 2 plan view for drill dimensions 16" to 40" deep.
GENERAL NOTES

1. This drawing is for roadway layout only.
2. The SoftStop shall be installed in accordance with the manufacturer's specifications and current approved drawings, including all details, hardware, hardware quantities, and other information. Visit the Roadway Engineering website to view the manufacturer's drawing.
4. Posts 3 - 8 shall be steel (the posts, Posts 0 - 2 are proprietary).
5. No rigid objects are allowed within the terminal pad footprint.
6. The terminal shall be installed tangent to roadway, without taper or flare.

PLAN

Guardrail Measurement Limit (In Ft)  
End Terminal Measurement Limit (In Ft)

System Post

ELEVATION
GENERAL NOTES

1. Use 3" of AC for terminal pavement adjacent to AC roadway pavement. Use 6" of Class B concrete for terminal pavement adjacent to PCP roadway pavement.

2. PCP terminal pavement shall include 2" deep scored joints aligned with adjacent PCP roadway pavement.

3. This drawing shows pavement treatment for pads without curb. See Std Dwg C-10,77 for pavement treatment with curb.

4. Leaveouts shall be provided in the pavement around guardrail posts O and 1. Leaveouts shall be filled flush to top of pavement with 3" of 0.5M grout having a 90 day compressive strength between 40 and 120 psi.

Guardrail markers (delineators) shall be installed on pads 2, 4, 6, 8 and as indicated in the Standard Specifications.
GENERAL NOTES

1. This drawing is for roadway layout only.
2. The WSH shall be installed in accordance with the manufacturer's specifications and current approved drawing including all details, hardware, hardware quantities, and other information. The current manufacturer's approved drawing number is WSH-SP-0008. Visit the Roadway Engineering website to view the manufacturer's drawing.
4. Posts 3 - 9 shall be steel line posts. Posts 1 and 2 are proprietary.
5. No rigid objects are allowed within the terminal pad footprint.
6. The terminal shall be installed tangent to roadway, without taper or flare.
GENERAL NOTES
1. Use 3" of AC for terminal pavement adjacent to AC roadway pavement. Use 6" of Class B concrete for terminal pavement adjacent to PCP roadway pavement.
2. PCP terminal pavement shall include 2" deep scored joints aligned with adjacent PCP roadway pavement.
3. This drawing shows pavement treatment for posts without curb. See Std Dwg C-10.77 for pavement treatment with curbs.
4. Leaveouts shall be provided in the pavement around guardrail posts 1 and 2. Leaveouts shall be filled flush to top of pavement with 3" of CLSM granular having a 28 day compressive strength between 40 and 120 psi.
   ▲ Guardrail markers (delineators) shall be installed on posts 2, 4, 6, 8 and as indicated in the Standard Specifications.

LEAVEOUT DETAIL

GUARDRAIL INSTALLATION

SECTION B - B

SECTION A - A
1. This drawing is for roadway layout only.
2. The Max-Tension shall be installed in accordance with the manufacturer's specifications and current approved drawings including all details, hardware, hardware quantities, and other information. The current manufacturer's approved drawing number is MT135001A. Visit the Roadway Engineering website to view the manufacturer's drawing.
4. Posts 2 - 9 shall be steel tee posts. Posts 1 and Anchor are proprietary.
5. No rigid objects are allowed within the terminal pad footprint.
6. The terminal shall be installed tangent to the roadway, without taper or flare.
GENERAL NOTES

1. Use 3" of AC for terminal pavement adjacent to AC roadway pavement. Use 6" of Class B concrete for terminal pavement adjacent to PCCP roadway pavement.

2. PCCP terminal pavement shall include 2" deep scored joints aligned with adjacent PCCP roadway pavement.

3. This drawing shows pavement treatment for pads without curb. See Std Dwg C-10.77 for pavement treatment with curb.

4. Leaveouts shall be provided in the pavement around guardrail posts 1 and Anchor. Leaveouts shall be filled flush to top of pavement with 3" of CSGM grout having a 28 day compressive strength between 40 and 120 psi.

Guardrail markers (if required) shall be installed on posts 2, 4, 6, 8 and as indicated in the Standard Specifications.

LEAVEOUT DETAIL

GUARDRAIL INSTALLATION

SECTION B - B

SECTION A - A
GENERAL NOTES

1. This drawing is for roadway layout only.

2. The MFLEAT shall be installed in accordance with the manufacturer's specifications and current approved drawings including all details, hardware, hardware quantities, and other information. The current manufacturer's approved drawing name is MFLEAT. Visit the Roadway Engineering website to view the manufacturer's drawing.


4. Posts 4 through 9 shall be steel line posts. Posts 1 through 3 are proprietary.

5. No rigid objects are allowed within the terminal pad footprint.

---

PLAN

- Begin/End Station
- Length of Need
- 32'-2½"
- 19'-4"
- 39'-7" Straight Flare
- Guardrail End Terminal (See Note 2)
- Proprietary Rail
- 10'-5" Proprietary Rail
- 8" Blockouts (Typ)
- Impact Head
- Traffic
- Leaveouts Post 1 through 3 (Round Terminal Shown) See Leaveout Detail Sheet 2 of 2

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ELEVATION

- System Post
- Post 1
- Post 2
- Post 3
- Post 4
- Post 5
- Post 6
- Post 7
- Post 8
- Post 9
- Guardrail Measurement Limit (Each)
- End Terminal Measurement Limit (Each)
- Length of Need
- Impact Head Delineator
- See Note 3
GENERAL NOTES
1. Use 3" of AC for terminal pavement adjacent to AC roadway pavement. Use 6" of Class B concrete for terminal pavement adjacent to PCCP roadway pavement.
2. PCCP terminal pavement shall include 2" deep scored joints aligned with adjacent PCCP roadway pavement.
3. Leaveouts shall be provided in the pavement around guardrail posts 1 through 3. Leaveouts shall be filled flush to top of pavement with 3" of CLSM grout having a 28 day compressive strength between 40 and 120 psi.
4. Guardrail markers (medallions) shall be installed on posts 2, 4, 6, 8 and as indicated in the Standard Specifications.
5. Layout shown is for Guardrail face at normal shoulder width. When Guardrail is offset by 2' from normal shoulder width, increase pad approach taper length to 86' and pad width to 12'.

LEAVEOUT DETAIL

GUARDRAIL INSTALLATION

SECTION B - B

SECTION A - A
GENERAL NOTES

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

2. Manufacture components according to the AASHTO-AGC-ARTBA Guide to Standardized Highway Barrier Hardware. Visit the Roadway Engineering website to view the drawings referenced in parentheses.

PLAN

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

Begin/End Station

THREE-BEAM GUARDRAIL TRANSITION SYSTEM

ELEVATION

Two 12'-6" Sections
Thrie-Beam Guardrail (Nested)
Quarter Post Spacing
AASHTO M 180
UZ Gauge

One 6'-3" Section
Thrie-Beam Guardrail Quarter Post Spacing
AASHTO M 180
UZ Gauge

One 6'-3" Section
W-Beam to Thrie-Beam Transition
AASHTO M 180
UZ Gauge

Two 12'-6" Sections
W-Beam Guardrail (Nested)
(ARMOW)

SIGNED:

D. R. HENRY

GUARDRAIL TRANSITION
TO CONCRETE BARRIER
TIMBER POST

ARIZONA DEPARTMENT OF TRANSPORTATION
INFRASTRUCTURE DELIVERY AND OPERATIONS DIVISION
ROADWAY GROUP STANDARD DRAWING

C-10.30
Sheet 1 of 2
GENERAL NOTES
1. Curbing is not required when drainage flows transparently away from barrier.
2. Treatment at back of lip curb modified for constructibility purposes. Front slope and height of lip curb shall not be exceed.
3. Three-beam terminal connector to three-beam splice shall be lapped in the direction of adjacent traffic.
4. Manufacture components according to the AASHTO-ASC-ARTBA Guide to Standardized Highway Barrier Hardware. Visit the Roadway Engineering web site to view the drawings referenced in parentheses.

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

Three Beam Terminal Connector (BTEQ100),
Connector Plates, and Hardware
See Sheet 2 of 2

Plan

Three Beam Guardrail Transition System
See Plans

Elevation

Begin/End Station

Two 12'-6" Sections
Three Beam Guardrail (Nested)
Quarter Post Spacing
AASHTO M 180
12 Gauge

One 6'-3" Section
W-Beam to Three Beam
Transition
AASHTO M 180
10 Gauge

One 6'-3" Section
W-Beam to Three Beam
Transition
AASHTO M 180
10 Gauge

Two 12'-6" Sections
W-Beam Guardrail (Nested)
(AA18046)

Begin/End Station

See Plans

W-Beam Guardrail

Up Curb Transition

See Std C-05.12

Up Curb (When Called for on Plans)
See Up Curb Detail
Sheet 2 of 2

W6x8x84" Steel Posts
6"x6x9" Blockouts

W6x8.5x72" Steel Posts
6"x12x19" Blockouts

W6x8.5x72" Steel Posts
6"x12x14 1/2" Blockouts
GENERAL NOTES

1. Post type (timber or steel) for tapers shall match post type of adjoining guardrail.
2. See Std Dwg C-10.03 and C-10.04 for additional information and dimensions.
3. Guardrail shall be lapped in the direction of adjacent traffic.
   - Extend taper length to 37'-6" when existing guardrail height is less than 28 inches.

PLAN

ELEVATION

Existing G4 Guardrail

25'-0" G4 Guardrail to 31" W-Beam Guardrail Taper

31" W-Beam Guardrail

12'-6" W-Beam Rail

6'-3" 6'-3" 6'-3" 6'-3" 3'-1½" 6'-3" 6'-3" 3'-1½"

12'-6" W-Beam Rail

24' W-Beam Post

Arizona Department of Transportation
Infrastructure Delivery and Operations Division
Roadway Group Standard Drawing

D. R. Henry

Guardrail Taper C-10.38

24 to 31" W-Beam

WITH STACKED POSTS

Sheet 1 of 2
GENERAL NOTES

1. Post type (timber or steel) for tees shall match post type of edging guardrail.

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

3. Guardrail shall be tagged in the direction of adjacent traffic.
   - Extend ledge length to 3’-6” when existing guardrail height is less than 28 inches.

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**PLAN**

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**ELEVATION**
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. Barrier concrete shall be Class S, T: 4500 PSI.
4. Rebar shall be Grade 60.
5. If the footing and barrier are cast monolithically, 6 S shape rebars are not required.
6. Barrier width shall not exceed the barrier footing width nor overlap the adjacent pavement.
7. 6 C bars shall extend 12" past the construction joint at the completion of the day’s pour.
   ▲ Depth to match adjacent PCCP thickness.
   □ Footing depth shall match adjacent PCCP thickness and shall consist of either:
     a) full-depth concrete, or
     b) 8" concrete over compacted AB (Class 2).

See Special Provisions for measurement and payment.
GENERAL NOTES

1. Median barrier shall be constructed by the slip form or the formed cast-in-place method.
2. When obstacles prevent the use of slip form equipment, stationary forms shall be used.
3. Barrier concrete shall be Class S, fck=4500 PSI.
4. Rebar shall be Grade 60.
5. If the footing and barrier are cast monolithically, #5 S shape rebars are not required.
6. Barrier width shall not exceed the barrier footing width nor overlapping the adjacent pavement.
7. #4 rebar shall extend 12" past the construction joint at the completion of the day's pour.

\[ \text{Depth to match adjacent PCPP thickness.} \]

\\( \text{Footing depth shall match adjacent PCPP thickness and shall consist of either:} \)

a) Full-depth concrete, or
b) 8" concrete over compacted AB (Class 2).

See Special Provisions for measurement and payment.
### General Notes

2. Barrier concrete shall be Class S, $f_c=4500$ PSI.
3. All rebar shall be Grade 60.
4. All bands and hooks shall meet the requirements of AASHTO LRFD Article 5.10. All band dimensions for rebar shall be out-of-round bars. All placement dimensions shall be to center of bars unless noted otherwise.
5. All rebar shall have 2-inch clear cover unless noted otherwise.
6. Longitudinal rebar shall extend 12" past the construction joint at the completion of each incremental pour.
7. Median Barrier shall be constructed by the slip form or formed cast-in-place methods only.
8. Where obstacles prevent slip forming, stationary forms shall be used.
9. The terminology 'Low Side' and 'High Side' are used for reference purposes only. The barrier details shall be mirrored if required by the adjacent pavement elevations.
10. Backfilling and/or embankment placement on the High Side shall not commence until the RCCP is constructed on the Low Side.
11. The Median Barrier has been designed to accommodate a maximum of 2 - 3" * conduits. Locate conduits as required to make connection to pull boxes and appurtenances.
   - If footing and barrier are constructed monolithically, #6 S-Shape rebar is not required.
   - The contractor shall provide Control Line offsets to the Engineer prior to construction of the Median Barrier. The offsets shall be provided at sufficient intervals to control the location of the barrier construction equipment and forms.
   - W/2 - Bottom faces of Median Barrier shall be equivalent from Median $E$.
   - Footing depth shall match adjacent RCCP thickness and shall consist of either:
     a) full-depth concrete as shown, or
     b) 8" concrete over compacted AB (Class 2).
   - See Special Provisions for measurement and payment.

### Partial Vertical Face Section

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X - Indicates #4 Rebar To Be Included
GENERAL NOTES

1. Barrier concrete shall be Class S, f_c = 4500 PSI.
2. All rebar shall be Grade 60.
3. All bands and monks shall meet the requirements of AASHTO LRFD Article 5.10. All band dimensions for rebar shall be out-to-out of bars. All placement dimensions shall be to center of bars unless noted otherwise.
4. All rebar shall have 2-inch clear cover unless noted otherwise.
5. Longitudinal rebar shall extend 12" past the construction joint at the end of each incremental pour.
6. Median Barrier shall be constructed by the slip form or formed cast-in-place methods only.
7. Where obstacles prevent slip forming, stationary forms shall be used.
8. The terminology 'Low Side' and 'High Side' are used for reference purposes only. The barrier details shall be mirrored if required by the adjacent pavement elevations.
9. Backfilling and/or embankment placement on the High Side shall not commence until the RCCP is constructed on the Low Side.
10. The Median Barrier has been designed to accommodate a maximum of 2 - 3" * conduits. Locate conduits as required to make connection to pull boxes and appurtenances.
   a. If foating and barrier are constructed monolithically, 6 S-Shape rebar is not required.
   b. The contractor shall provide Control Line offsets to the Engineer prior to construction of the Median Barrier. The offsets shall be provided at sufficient intervals to control the location of the barrier construction equipment and forms.
   c. W (lbs) = 24/5 + (h/8) + 3/50 * h (lbs)
      Dimension X = Dimension Y = 1-1/2" + W/2
      W/2 - Bottom faces of Median Barrier shall be equidistant from Median 6.
   d. Foating depth shall match adjacent RCCP thickness and shall consist of either:
      a) full-depth concrete as shown, or
      b) 8" concrete over compacted AB (Class 2).
      See Special Provisions for measurement and payment.

SLOPED FACE ALTERNATIVE SECTION

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</table>

X - indicates 4" Rebar To Be Included
GENERAL NOTES

2. Barrier concrete shall be Class S, f'c=4500 psi.
3. All rebar shall be Grade 60.
4. All bends and hooks shall meet the requirements of AASHTO LRFD Article 5.10. All bend dimensions for rebar shall be cut-to-cut of bars. All placement dimensions shall be to center of bars unless noted otherwise.
5. All rebar shall have 2-inch clear cover unless noted otherwise.
6. Longitudinal rebar shall extend 12" past the construction joint at the completion of each incremental pour.
7. Widetop Barrier shall be constructed by the slipform or formed cast-in-place methods only.
8. Where obstructions prevent slip forming, stationary forms shall be used.
9. The terminology ‘Low Side’ and ‘High Side’ are used for reference purposes only.
10. The barrier details shall be mirrored if required by the adjacent pavement elevations.
11. Backfilling and/or embankment placement on the High Side shall not commence until the PCCP is constructed on the Low Side.

The Widetop Barrier has been designed to accommodate a maximum of 2-3" conduits. Locate conduits as required to make connection to pull boxes and appurtenances.
   - *5 Rebar may be used for H = 48" to 60".
   - Rebar shall be cast into PCCP or drilled and epoxied using an approved epoxy adhesive. The embedment shall be sufficient to develop the full yield strength of the rebar, but shall not be less than 1'-0". The length of the rebar shall be adjusted to maintain a minimum of 1'-0" embedment into the barrier.
   - A lap splice may be introduced into the bar leg of this bar set. The lap splice shall be a minimum of 1'-0".
   - The contractor shall provide Control Line offsets to the Engineer prior to construction of the Widetop Barrier. The offsets shall be provided at sufficient intervals to control the location of the barrier construction equipment and forms.
   - Space evenly between adjacent longitudinal rebar.

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<tr>
<td>Number of bars f</td>
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<td>1</td>
<td>2</td>
</tr>
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</table>
GENERAL NOTES


2. Barrier concrete shall be Class 'S' (f_c = 4000 psi).

3. All rebar shall be Grade 60.

4. All bars and hooks shall meet the requirements of AASHTO LRFD Article 5.10. All bend dimensions for rebar shall be out-to-out of bars. All placement dimensions shall be to center of bars unless noted otherwise.

5. All rebar shall have 2 inch clear cover unless noted otherwise.

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

7. Median Barrier shall be constructed by the slip form or formed cast-in-place methods only.

8. Where obstacles prevent slip forming, stationery forms shall be used.

9. The terminology 'Low Side' and 'High Side' are used for reference purposes only. The barrier details shall be mirrored if required by the adjacent pavement elevations.

10. Backfilling and/ or embankment placement on the High Side shall not commence until the PCCP is constructed on the Low Side.

11. The Median Barrier has been designed to accommodate a maximum of 2 - 3" conduits. Locate conduits as required to make connection to utility boxes and appurtenances.

"5 Rebar may be used for H = 48" to 60".

Rebar shall be cast into PCCP or drilled and expaded using an approved epoxy adhesive. The embedment shall be sufficient to develop the full yield strength of the rebar, but shall be no less than 12". The length of the rebar shall be adjusted to maintain a minimum of 12" embedment into the barrier.

A lap splice may be introduced into the Ver of this barrier set. The lap splice shall be a minimum of 1.4".

The contractor shall provide Control Line offsets to the Engineer prior to construction of the Median Barrier. The offsets shall be provided at sufficient intervals to control the location of the barrier construction equipment and forms.

W (lot) = 2515 ft. (200 ft.)

Dimension X = Dimension Y = 1 - 4½" + W/2

W/2 - Bottom faces of Median Barrier shall be equivalent from Median E.

Space evenly between adjacent longitudinal rebar.

SECTION

SLOPED FACE ALTERNATIVE

<table>
<thead>
<tr>
<th>Dimension H</th>
<th>26&quot; to 30&quot;</th>
<th>36&quot; to 48&quot;</th>
<th>48&quot; to 60&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bond Dimension a</td>
<td>7&quot;</td>
<td>7&quot;</td>
<td>12&quot;</td>
</tr>
<tr>
<td>Bond Dimension b</td>
<td>12&quot;</td>
<td>12&quot;</td>
<td>18&quot;</td>
</tr>
<tr>
<td>Dimension c</td>
<td>12&quot;</td>
<td>12&quot;</td>
<td>18&quot;</td>
</tr>
<tr>
<td>Number of bars d</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Number of bars e</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>
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. Barrier concrete shall be Class S, f'_c=4500 PSI.
4. Rebar shall be Grade 60.
5. If the footing and barrier are cast monolithically, #6 S shape rebar will not be required.
6. #4 rebar shall extend 12" past the construction joint at the completion of the day's pour.
7. Weep holes shall be placed whenever barrier is backfilled unless otherwise indicated on the plans.

A. Depth to match adjacent PCCP thickness.

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

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

1. Concrete half barrier shall be precast.
2. Barrier concrete shall be Class S, f'c = 4500 PSI.
3. Rebar shall be Grade 60.
4. Pavement thickness adjacent to half barrier shall be 3/8" minimum.
5. The half barrier shall be placed upon a bed of grout in order to provide a uniform bearing.
6. Dowel joints shall be grouted under pressure until all of the openings and the joints are filled.
7. All bend dimensions for rebar are cut-to-cut or rebars.
8. Weep holes shall be placed wherever half barrier is backfilled unless otherwise indicated on the plans.
GENERAL NOTES

1. Barrier concrete shall be Class S, F'c=4500 PSI.
2. Rebar shall be Grade 60.
3. Rebar shall have 2" minimum clear cover unless otherwise noted.
4. See drainage sheets for sloped drain and catch basin details.
5. Departure termination 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 out-to-out of rebars.
8. See Std Dwg C-10.54 for Kerfey Details.
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. Barrier concrete shall be Class S, f' = 4500 PSI.
4. Rebar shall be Grade 60.
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 FCP thickness, as approved by the Engineer.
7. 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.
8. At bridges, the cross slope of the gutter shall transition to match the cross slope of the bridge. Length of the transition is 15'.
9. Two-inch deep contraction joints shall be placed in the gutter at locations which match the joints in adjacent FCP. Joints shall be hard-faced or sawn.
10. Whenever Half Barrier is backfilled, see Std. Spec C-10.50 for weep hole details, unless otherwise specified on the plans.
GENERAL NOTES

1. Halt 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. Barrier concrete shall be Class S, f'c=4500 PSI.
4. Reinforcement shall be Grade 60.
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 PCP thickness, as approved by the Engineer.
7. 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.
8. At bridges, the cross slope of the gutter shall transition to match the cross slope of the bridge. Length of the transition is 15'.
9. Two-Inch deep contraction joints shall be placed in the gutter at locations which match the joints in adjacent PCP. Joints shall be hot foamed or sawn.
10. Whenever half barrier is backfilled, see Std Dwg C-10.50 for weep hole details, unless otherwise indicated on the plans.

BARRIER GUTTER DETAIL

DEPARTURE TERMINATION WITHOUT GUARDRAIL
GENERAL NOTES

1. Barrier concrete shall be Class S, f'c = 4500 PSI.
2. Rebar shall be Grade 60.
3. If the footing and Half Barrier are cast monolithically, use 6” S shape rebars are not required.
4. longitudinal rebar shall extend 12” past the construction joint at the completion of each incremental pour.

**GENERAL NOTES**

1. Barrier concrete shall be Class S, f'c = 4500 PSI.
2. Rebar shall be Grade 60.
3. If the footing and Half Barrier are cast monolithically, use 6” S shape rebars are not required.
4. longitudinal rebar shall extend 12” past the construction joint at the completion of each incremental pour.

**KEYWAY DETAIL**

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

**SECTION A-A**

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

**WITH PCCP**

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

**COMPONENT**

CONCRETE HALF BARRIER

**SIZE**

22" TYPE Y' AT PIERS

**MATERIAL**

CAST-IN-PLACE

**DESIGNER**

J. C. COOPER

**SUPERVISOR**

D. R. HENRY

**DRAWING NO.**

C-10.54
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.
   o Slope as shown on plans

PLAN

SECTION C-C

SECTION A-A

SECTION B-B
GENERAL NOTES

1. Barrier concrete shall be Class S, f'c=4500 PSI.
2. Rebar shall be Grade 60.
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 overlap the adjacent pavement.
5. Longitudinal rebar shall extend 12" past the construction joint at the completion of each incremental pour.

WITH AC

SECTION A-A

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

1. Barrier concrete shell be Class 5, f_c=4500 PSI.

2. Rebar shall be Grade 60.

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

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

5. All bend dimensions for rebars are out-to-out of bars.

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

1. Concrete shall be Class S, f'c=4000 PSI.
2. Reber shall be Grade 60.
3. All reber shall have 2" minimum clear cover unless otherwise noted.
4. All bend dimensions for reber are out-to-out of reber.

ELEVATION
BARRIER WITHOUT CURB

BARRIER END DETAIL
GENERAL NOTES
1. Concrete shall be Class C, f'c = 4500 PSI.
2. Rebar shall be Grade 60.
3. All rebar shall have 2" minimum clear cover unless otherwise noted.
4. All bend dimensions for rebar are out-to-out of bars.
5. Two-inch deep contraction joints shall be placed in the gutter at locations which match the joints in adjacent PCCP and at approximately 15" centers when adjacent to AC pavement. Joints shall be either hand troweled or sawn.

ELEVATION
BARRIER WITH CURB AND GUTTER

PLAN
Traffic

BARRIER END DETAIL
GENERAL NOTES

1. Concrete shall be Class S, f_c=4500 PSI.
2. Rebar shall be Grade 60.
3. All rebar shall have 2" minimum clear cover unless otherwise noted.
4. All bend dimensions for rebar are cut-to-cut of rebar.

ELEVATION
BARRIER WITHOUT CURB

PLAN

ELEVATION
BARRIER WITHOUT CURB
GENERAL NOTES

1. Concrete shall be Class 5, f'c=4500 PSI.
2. Rebar shall be Grade 60.
3. All rebar shall have 6" minimum clear cover unless otherwise noted.
4. All bend dimensions for rebar are out-to-out of rebars.
5. Two-inch deep contraction joints shall be placed in the gutter at locations which match the joints in the adjacent PCCP ends at approximately 15" centers when adjacent to AC pavement. Joints shall be either hand-filled or sawn.

PLAN

ELEVATION
BARRIER WITH CURB AND GUTTER
GENERAL NOTES

1. Half-barrier Transition shall be constructed by the formed cast-in-place method.

2. Barrier concrete shall be Class S, f' = 4500 PSI.

3. Rebar shall be Grade 60.

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

8. Two-inch deep construction joints shall be placed in the gutter at locations which match the joints in adjacent PCPP and at approximate 15' centers when adjacent to AC pavement. Joints shall be either hand tooled or sawn.
GENERAL NOTES

1. Barrier concrete shall be Class S, F’c=4500 PSI.
2. Rebar shall be Grade 60.
3. All rebar shall have a minimum clear cover unless otherwise noted.
4. See drainage sheets for offset drain and catch basin details.
5. Barrier transition shall match both adjoining curb and gutter and concrete half-barrier.
7. All bend dimensions for rebar are out-to-out of rebar.
8. Two-inch deep contraction joints shall be placed in the gutter at locations which match the joints in adjacent PCPP and at approximate 15° centers when adjacent to AC pavement. Joints shall be either hand troweled or sawn.

SECTION C-C
TRANSITION TO VERTICAL TYPE CURB

SECTION A-A

SECTION B-B
GENERAL NOTES

1. Barrier concrete shall be Class 5 (c=4600 PSI).
2. Rebar shall be Grade 60.
3. All rebar shall have 2" minimum clear cover unless otherwise noted.
4. See drainage sheets for selected drain and catch basin details.
5. Barrier transition shall match both adjoining curb and gutter and concrete half barrier.
6. All bend fulments for rebar are cut-to-cut of bars.
7. Two-inch deep contraction joints shall be placed in the gutter at locations which match the joints in the adjacent PCP and at approximately 15' centers when adjacent to AC pavement. Joints shall be either hand-holed or sawn.
GENERAL NOTES
1. Barrier concrete shall be Class S, F’c=4500 PSI.
2. Rebar shall be Grade 60.
3. All rebar shall have 3” minimum clear cover unless otherwise noted.
4. See drainage sheet 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.
   □ Verless 10½" to 1'-0½" to 1'-3½"
GENERAL NOTES

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

2. See Std Dwg C-05.10, 05.18, and 10.01 for dimensions and details not shown.

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

4. Bituminous joint filler (1½") shall be placed when the curb & gutter or concrete widening abuts slotted drains, catch basins, ditches, berms, etc. Soaked joints, 2" in depth, shall be sealed with joint adjacent to AC or continuously reinforced concrete pavement.

5. "Leavesouts" shall be provided around all guardrail posts located in concrete. "Leavesouts" shall be filled flush to top of pavement with 3" of CLSM or concrete of a 28 day compressive strength between 40 and 120 psi.

6. The guardrail and terminal shall be installed tangent to roadway, without taper or flare. See Std Dwg C-10.20, 10.21, or 10.22 for end terminal system details.

Vvary as required to maintain gutter flow. Match roadway cross slope when roadway slopes away from the gutter.

To Top of Beam

PLAN

LEAVEOUT DETAIL

SECTION A-A

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

Concrete Half Barrier

Curb & Gutter Transition, Type 5
Std Dwg C-05.12

Concrete Gutter

Curb & Gutter
Std Dwg C-05.10
Sheet 2 of 2

Guardrail Transition to Concrete Barrier
Std Dwg C-10.31

Traffic

Guardrail Ends Terminal

Concrete Barrier Transition

5' Transition

Curb & Gutter
Std Dwg C-10.31

Gutter Flowline

Pavement Edge
GENERAL NOTES

1. Barrier concrete shall be Class S, f's = 4500 PSI.
2. Rebar shall be Grade 60.
3. All rebar shall have 2" minimum clear cover unless otherwise noted.
4. See drainage sheets for sloped 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 diameters for rebar shall be cut-out of bars.
8. Two-inch deep contraction joints shall be placed in the gutters at locations which match the joints in adjacent PCCP and at approximate 15-foot centers when adjacent to AC pavement. Joints shall be either hand trowel or saw cut.

SECTION A-A

**Notes:**
- Varies - 2'-6", 4'-6" or width as shown on plans.
GENERAL NOTES

1. Cattle guard shall include two (2) clamps per Sheet 4 at each gap between two (2) grill units, one at each end. Clamps shall be adjusted to provide a 3/8" inch plus or minus 1/8" inch gap between adjacent grill units.

2. Grill units shall be set on an angle iron assembly consisting of one piece of 6"x3½"x½" 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"x½" 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 4½"x4½"x½" angle iron and studs, one 2x2½"x½" angle iron, and connected with studs. 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 cut-out on the plans.

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

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

UNIT TABLE

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<thead>
<tr>
<th>Roadway Width (ft)</th>
<th>Grill Units Required</th>
<th>Concrete (Cu Yd)</th>
<th>Rebar (lbs)</th>
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<tbody>
<tr>
<td>12</td>
<td>2</td>
<td>5.8</td>
<td>175</td>
</tr>
<tr>
<td>16</td>
<td>3</td>
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<td>20</td>
<td>4</td>
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<td>34</td>
<td>6</td>
<td>14.7</td>
<td>445</td>
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</tr>
<tr>
<td>40</td>
<td>7</td>
<td>16.9</td>
<td>510</td>
</tr>
</tbody>
</table>

STATE OF ARIZONA
DEPARTMENT OF TRANSPORTATION
ROADWAY STANDARD DRAWINGS

ROADWAY CATTLE GUARD
C-IIUD
Sheet 1 of 4

(approval signature)
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 A-1 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

SHOULDER TRANSITION AT CATTLE GUARDS

POST AND BRACE ASSEMBLY

SECTION E-E

SECTION D-D
GENERAL NOTES

1. Apply a heavy duty, high-strength anaerobic thread-locking compound to the threads before installing the double nuts.
1. See Std Dwg C-11.10 for all other Cattle Guard details.
2. This standard shall be used in embankment or where highly erodible soil is found.
3. All concrete shall be Class B.
GENERAL NOTES

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

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

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

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

② ASTM designation

TYPICAL FENCE LOCATION

FENCE FABRIC DIMENSIONS AND DESIGN NUMBERS

STATE OF ARIZONA
DEPARTMENT OF TRANSPORTATION
ROADWAY STANDARD DRAWINGS

DESIGN NO.
5/12

FENCE
WOVEN WIRE

C-1244
Sheet 1 of 5
GENERAL NOTES

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

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

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

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

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

TYPE 1 BARBED WIRE (BW) (4 WIRE)

BARBED WIRE GAME FENCE (GF)

TYPICAL FENCE LOCATION
TYPICAL FENCE LOCATION AT CATTLE GUARD

ABUTTING FENCE

ABUTTING FENCE AT POST

TYPICAL CROSS SECTIONS OF LINE POST SHAPES

DETAIL B
INTERMEDIATE POST ASSEMBLY

DETAIL C
END POST ASSEMBLY

DETAIL D
CORNER POST ASSEMBLY

DETAIL E
FENCE CONNECTION TO WINGWALL

GENERAL NOTES
1. Post assemblies shall consist of an upright angle 2 1/2" x 2 1/2" x 1/4" at 4,10 lbs/ft, and brace angles 2" x 2" x 1/4" at 3,19 lbs/ft.
GENERAL NOTES

1. Posts shall be round, H-section, or rail-formed and shall conform to the nominal dimensional requirements shown on the plans. Dimension tolerances for all shapes shall be according to ASTM A550. In addition, the material of which posts are fabricated shall have a nominal thickness, before galing/Coating, of not less than 0.125" for line posts and 0.130" for terminal posts.

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

3. Chain link fabric shall be either zinc-coated or aluminum-coated steel wire fence fabric. Zinc-coated steel fabric shall conform to the requirements of ASTM A359, Class 1 coating. Aluminum-coated steel fabric shall conform to the requirements of ASTM A153, 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.

4. Tension wires shall have a diameter of 0.177" and shall have a minimum tensile strength of 75,000 PSI and shall be zinc-coated or aluminum-coated.

5. Truss rods shall be 4/4" diameter adjustable rods. Truss tighteners shall have a strap thickness of not less than 0.34".

6. Stretcher bars shall be 3/4" x 3/4" steel fit in bars. Stretcher bar bend shall be 12/2" x 1" preformed steel bands.

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

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

TYPICAL POST DIMENSIONS

<table>
<thead>
<tr>
<th>Fabric Height (ft)</th>
<th>Corr. En., Intermediate, Gate, Latch &amp; Pull Posts</th>
<th>Line Posts</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Length (ft/ln)</td>
<td>Round (ODI) (ln)</td>
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<tr>
<td>36</td>
<td>6-0</td>
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<td></td>
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<tr>
<td></td>
<td>90</td>
<td>2.375</td>
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<tr>
<td>Over 72</td>
<td>2.375</td>
<td>3.50 x 3.50</td>
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</tbody>
</table>

TYPICAL FENCE LOCATION
GENERAL NOTES

1. Barbed wire for use with Type 2 chain link fence shall be 12 gauge steel wire with 4 point 14-gauge barbs spaced 5" apart and shall be either zinc-coated or aluminum-coated. Zinc-coated steel wire shall conform to the requirements of ASTM A121, Class I coating. Aluminum-coated steel wire shall conform to the requirements of ASTM F555, 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 M117.

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, Steel 1 of 3.

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

TYPICAL CHAIN LINK FENCE INSTALLATION - TYPE 2 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></td>
<td>Length (ft1-in)</td>
<td>Round</td>
</tr>
<tr>
<td>12</td>
<td>8-6</td>
<td>2.375</td>
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DETAILED DRAWING

BARBED WIRE SUPPORT ARM
**ROLLING GATE**

- Vertical Brace (Typical)
- Rear Wheel (Typical)
- Rolling Gate Pipe Track (Typical)
- End Track Bracket (Typical)
- Double Wheel

**SINGLE GATE**

- Vertical Brace
- Hinge
- Latch

**DOUBLE GATE**

- Vertical Brace (Typical)
- Hinge
- Vertical Brace (Typical)

**TYPICAL GATE DIMENSIONS**

<table>
<thead>
<tr>
<th>Gate Width (Ft)</th>
<th>Gate Post Size (In)</th>
<th>Gate Width (Ft)</th>
<th>Gate Post Size (In)</th>
<th>Gate Width (Ft)</th>
<th>Number of Equally Spaced Vertical Brace (Ft)</th>
<th>Tension Rods Per Breaded Panel</th>
<th>Gate Post Size (In)</th>
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<tbody>
<tr>
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<td>2.875</td>
<td>3' to 8'</td>
<td>0</td>
<td>2.875</td>
<td>6 to 13</td>
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<tr>
<td>8' to 16'</td>
<td>1</td>
<td>4.000</td>
<td>8' to 16'</td>
<td>1</td>
<td>4.000</td>
<td>13 to 16</td>
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<tr>
<td>16' to 20'</td>
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<td>4.000</td>
<td>21' to 27</td>
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<td>2.875</td>
<td>27</td>
<td>1</td>
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</table>

**GATES FOR CHAIN LINK FENCE - Type 1 Shown**

*Type 2, With Barbed Wire Typical*
GENERAL NOTES

1. All concrete shall be Class S, F't-4000 PSI.

2. All nuts, bolts, 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 ASHHTO M30 Class B, Type 2.

5. The wire fabric, ties, bands, stretcher bars, and other fittings and hardware shall conform to ASHHTO M110.

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 0.065" USS gauge ASTM A36/6/A36M cold rolled carbon steel. The square tubes shall be welded directly to the collar by high frequency resistance welding or equivalent. The posts to be externally painted to agree with standard color of 91-1.5.

9. Perforated posts shall be galvanized to the requirements of ASTM A653/A653M. Coating thickness shall be 275μm.

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 2/3 of the distance between posts.


13. An alternate to rectangular concrete anchor block shall be a 36" diameter round footing with an additional depth of 4'.

14. The median approach grade within 100' of the Chain Link Cable Barrier shall not exceed a grade break of 10 percent.
CULVERT INSTALLATION WITH END SECTION

CULVERT INSTALLATION WITH HEADWALL

PIPE WITH BERM REQUIREMENT DETAIL
See General Note 4

MINIMUM SPACING FOR MULTIPLE PIPES WITH HEADWALL

<table>
<thead>
<tr>
<th>Diameter or Span (in)</th>
<th>E (Fe- in)</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td>2.6</td>
</tr>
<tr>
<td>24</td>
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</tr>
<tr>
<td>42</td>
<td>5.3</td>
</tr>
<tr>
<td>48 to 65</td>
<td>60 + 3.0</td>
</tr>
<tr>
<td>72 and Over</td>
<td>60 + 3.0</td>
</tr>
</tbody>
</table>

MINIMUM SPACING FOR MULTIPLE PIPES WITH END SECTIONS

SLOPE PLATING FOR PIPE WITH END SECTIONS

GENERAL NOTES
1. See plans for any required field end/or outlet protection.
2. E dimension applies to both non-trench and trench conditions.
3. Minimum cover over pipe culverts shall be 1', measured from the top of pipe.
4. See Pipe Berm Requirements (NREL) for pipe berm requirements and Std. Dwg C-03.12 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.
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.

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

<table>
<thead>
<tr>
<th>Pipe Diameter (in)</th>
<th>Approximate Weight (lb/ft)</th>
<th>Dimensions (in)</th>
<th>Approximate Slope</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>T A B C E F</td>
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<tr>
<td>24</td>
<td>1590</td>
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<td>3 7/8 10 1/2 49 1/2 24 7 1/2 54</td>
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<td>30</td>
<td>2190</td>
<td>3 1/2 12 54 19 1/2 73 1/2 60</td>
<td>3</td>
</tr>
<tr>
<td>36</td>
<td>4100</td>
<td>4 15 63 34 1/2 97 1/2 72</td>
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</tr>
<tr>
<td>42</td>
<td>5380</td>
<td>4 1/2 21 63 35 98 78</td>
<td>3</td>
</tr>
</tbody>
</table>

PLAN

SECTION A-A

SPACING FOR MULTIPLE INSTALLATION

FRONT ELEVATION

RIGHT-ANGLE CULVERT

SKewed CULVERT
GENERAL NOTES

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

2. The Type 1 connector is bolted or riveted. Maximum circumferential fastener spacing shall be 12" and with a minimum of 4 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 suitable number of annular corrugations.

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

5. All steel end section components shall be galvanized.

6. 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 foregoing applies to all cross-section configurations.

<table>
<thead>
<tr>
<th>Circular Pipe</th>
<th>Dimensions (in)</th>
<th>Approximate</th>
<th>Connection</th>
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</thead>
<tbody>
<tr>
<td>Diameter (in)</td>
<td>A t1 B Maximum</td>
<td>H t1 I t1/2</td>
<td>W +2</td>
</tr>
<tr>
<td>18</td>
<td>16</td>
<td>8</td>
<td>31</td>
</tr>
<tr>
<td>24</td>
<td>16</td>
<td>10</td>
<td>41</td>
</tr>
<tr>
<td>30</td>
<td>14</td>
<td>121/4</td>
<td>51</td>
</tr>
<tr>
<td>36</td>
<td>14</td>
<td>141/2</td>
<td>60</td>
</tr>
<tr>
<td>42</td>
<td>12</td>
<td>17</td>
<td>69</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Pipe Arch</th>
<th>Dimensions (in)</th>
<th>Approximate</th>
<th>Connection</th>
</tr>
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<tbody>
<tr>
<td>Span (in)</td>
<td>Rise (in) Gauge</td>
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<td>7 1/2 6 24</td>
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<td>10 16 6 39</td>
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<td>14</td>
<td>12 12 7 1/2</td>
</tr>
<tr>
<td>49</td>
<td>33</td>
<td>12</td>
<td>15 20 9 53</td>
</tr>
</tbody>
</table>

Pipe Corrugated Metal End Section (C-13.25)
GENERAL NOTES

1. For lateral dimensions of invert paving, use 72° control for CMP and span for CMF.

2. Pavement shall be scored laterally at 1'-6" minimum intervals along the length of the pipe.

3. Use bevel on first 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. Paving shall not be placed until backfilling is completed.

6. Concrete shell be Class B.

HEADCORE INSTALLATION
(SEE STANDARD DRAWING B-11.12)

PROJECTING INSTALLATION

SECTION A-A

SECTION B-B

HEAD ASphalt Damping
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 relined in a horizontal position during pour with final tightening a minimum of 7 days after pour.

4. Pipe shall be backfilled before concrete bend 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.
GENERAL NOTES

1. Slotted drain pipe shall be 2½" x 1½" corrugated plastic pipe with a minimum wall thickness of 0.024" 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 A56.

5. Concrete anchor 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.

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

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. Balls or rebar may be used for concrete anchoring.

The 18½" x 1½" or 24½" x 1½" 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.
GENERAL NOTES

1. Prefabricated tee shall be used when the outside diameter of the inlet pipe exceeds one half of the inside diameter of the main storm drain, except when the terminals are shown on plans.

2. Centerline of the inlet pipe shall intersect the centerline of the main storm drain except when elevation "S" is shown on plans.

3. If L is 45° or less, Type 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.

SECTION A-A

CATCH BASIN ABOVE STORM DRAIN
TYPE 2

SIDE INLET
TYPE 1

CONNECTION DETAIL
TYPE 2
GENERAL NOTES

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

2. If depth of cover is less than 15' or greater than 10', increase plug thickness a minimum of 4'.

DRAINAGE OUTLET INTO CHANNEL

STORM DRAIN PLUG
GENERAL NOTES

1. All concrete shall be Class B.

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

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

4. A concrete collar shall be required where pipes of different diameters or materials are joined or where the design change in alignment or grade 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 tiles shall be the outside diameter of pipe + T.

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

CONCRETE PIPE COLLAR

TYPICAL LATERAL CONNECTIONS TO CATCH BASINS WITH CONCRETE COLLARS

OUTLET COLLAR DETAIL

PIPE COLLAR TABLE

<table>
<thead>
<tr>
<th>Pipe Size</th>
<th>L (in)</th>
<th>(2&quot;)</th>
<th>(in)</th>
<th># of Ties</th>
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<tr>
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<td></td>
</tr>
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<td>72</td>
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<td>78</td>
<td>2-0</td>
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<td>5</td>
<td></td>
</tr>
<tr>
<td>96</td>
<td>2-3</td>
<td>16</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>
GENERAL NOTES

1. Catch basin used at roadway sep.
2. Pipes can be placed in any way.
3. Sump floor shall be a wood troweled finish with a minimum 4x1 slope in all directions to outlet.
4. All rebar shall be ASTM A36.
5. All welding shall be in accordance with Std Spec 624-3.06.
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 J joint depression shall be warped to opening according to Std Dwg C-15.70.
10. Silicone sealant shall be placed between the grate frame and FCP, resewed 1/4" from the pavement surface.
11. Curb opening areas, sq ft, for Type I-single and Type I-double equal 0.25 and 0.54, respectively, for each inch of "A" joint depression = 0.95. See Std Dwg C-15.70.
12. See Std Dwg C-15.50 for grate and frame details and grate opening areas.
13. B = 6" when H is 8' or less 8" when H is greater than 8' See Section B-B
   ■ = 9" when pavement is AC Match pavement thickness when pavement is FCP

STATE OF ARIZONA
DEPARTMENT OF TRANSPORTATION
ROADWAY STANDARD DRAWINGS
5/12
CATCH BASIN TYPE 1
C-05-10

SECTION A-A

USE THIS SECTION WHEN 1=8'

SECTION B-B

DETAILED 1

DETAILED 3

DETAILED FOR WIDE GUTTER
(SEE STD Dwg C-05-10)
GENERAL NOTES

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

2. $d = 6''$ when $H$ is 6'' or less
   $d = 8''$ when $H$ is greater than 6''

DETAIL 1

SECTION A-A

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

No Rebar in Bottom

Construction Joint (Typ)

Catch Basin Sump

Length: 3'-6'', 7'-6'', 11'-6'', or 15'-6''

PLAN

Catch Basin Sump

Curb Support Anchor

4'' Maximum Anchor Spacing

See Detail 2

Detail 2

CURB SUPPORT ANCHOR

Nose Plate

8'' x 8'' x 4'' Bent Plate

Length = $2\times\frac{11}{2}'' + 2\times (L + 6'')$

Anchor: 4 Rebar

6'' Center to Center

See Detail 3

Detail 3

Catch Basin Sump

Wing Basin

Construction Joint (Typ)

$\phi 1$

No Rebar in Bottom

Sheet 2 of 3
GENERAL NOTES

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

PLAN

SECTION A-A FRAME

SECTION B-B COVER

\( \frac{3}{8} \)" Diameter

Lifting Hole

Concrete Filler
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 trowel finish with a minimum 4x1 slope along the axis of the pipe toward the pipe.
4. Curb over catch basin shall not be constructed until catch basin concrete has set for a minimum of 24 hours.
5. Catch basin can be used with curb and gutter as shown or without.
6. See Std Dwg C-15.50 for grate and frame details and opening areas.
7. Any specified grate 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 shop coat of number 1 paint.
10. All concrete shall be Class B.
11. Construction joints and drains shall be placed to meet field conditions. See Std Dwg C-15.70.
12. Silicone sealant shall be placed between the grate frame and FCP, released ⅛" from the pavement surface.
13. See Detail 2 for catch basin with wide gutter.
14. \( d = 6" \) when \( H \) is 8" or less, 8" when \( H \) is greater than 8".
   - See Section B-B.
   - 9" when pavement is AC.
   - Match pavement thickness when pavement is FCP.

DETAILED FOR WIDE GUTTER
(SEE STD DWG C-05.10)

SECTION A-A

SECTION B-B

SECTION C-C
GENERAL NOTES

1. Catch basin can be used on grade or at roadway sag.
2. Catch basin has three configurations:
   - Sump only/sump portion of catch basin
   - Single wing illustrated/sump with wing basin upstream and
   - Double wing-sump with symmetrical wing basins
3. Pipes can be placed in any well except wall adjacent to a wing basin.
4. Floor shall be a wood traveled finish. Slope of the sump portion of the catch basin along the axis of the pipe shall be 4:1.
5. Any specified inset depression shall be warped to opening according to Std Dwg C-15.70.
6. Top rebar shall be ASTM A36.
7. No plate shall be given one shop coat of Number 1 paint.
8. All concrete shall be Class B.
9. Curb opening area 1.014 in. x 11/8 in. x inset depression + curb opening length (ft) x 0.0833.
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. See Std Dwg C-15.70.
13. Silicone sealant shall be placed between the gasket frame and PCCP, recessed ¼" from the pavement surface.
14. Maximum combination thickness of pavement shall be 6" when H is 8" or less.
15. [Note: when pavement is AC.

SECTION A-A
USE THIS SECTION WHEN H < 8" OR LESS

SECTION B-B

SECTION C-C
USE THIS SECTION WHEN T < B

SECTION D-D

STATE OF ARIZONA
DEPARTMENT OF TRANSPORTATION
ROADWAY STANDARD DRAWINGS
C-15.40
CATCH BASIN
TYPE 5
Sheet 1 of 2
GENERAL NOTES
1. See Sheet 1 of 2 for other dimensions, notes and rebar.
2. $\theta_1 = 6''$ when $H$ is 8' or less
   8' when $H$ is greater than 8'

DETAIL 1

ANCHOR #4 REBAR
6'' Center to Center
See Detail 3

DETAIL 3

ANCHOR #3 REBAR
6'' Center to Center
See Detail 3

DETAIL 4

NOTE: REBARS SHOWN ARE FOR FLOOR
OF WING AND WALL ONLY
See Sections on Sheet 1 of 2 for
Other Reinforcement

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

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

PLAN

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

Catch Basin Sump

Wing Basin

Construction Joint (Typ)

No Rebar In Bottom

Construction Joint (Typ)
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 1/8" at any point.
5. Grate opening is 3.60 Sq Ft.
6. Bending of frame is recommended for handling and placement purposes.
7. Frame and Grate to be used with Std Dwg C-15.30 and C-15.40.
8. Grate may be used with Std Dwg C-15.92 Frame.

PLAN

SECTION A-A

TYPICAL INSTALLATION
C-15,10 Catch Basin Shown
Similar for C-15.30 and C-15.40

SECTION B-B

GRATE

STATE OF ARIZONA
DEPARTMENT OF TRANSPORTATION
ROADWAY STANDARD DRAWINGS
CATCH BASIN
FRAME AND GRATE
C-15.50
5/12
GENERAL NOTES

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

LEGEND

O - Normal pavement or gutter flow line elevation.
■ - Depressed elevation.
□ - Straight grade with downward slope.
W - Normal gutter width per Std Dwg C-05.10.
 ■ - For Types I, 3, & 5 Catch Basins.
 ■ - For Type 4 Catch Basin & Std Dwg C-15.91.

INLET DEPRESSION

CATCH BASIN WITH SLOTTED DRAIN

SECTION B-B
(Type D Curb & Gutter Shown)

SECTION A-A
(Type D Curb & Gutter Shown)
GENERAL NOTES
1. Construction drain may be deleted at the option of the Engineer.

LEGEND
O - Normal pavement or gutter flow line elevation.

CATCH BASIN CONSTRUCTION DRAIN

TYPE 4 CATCH BASIN WITHOUT CURB
GENERAL NOTES

1. See also Sht 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.

PLAN

ELEVATION

SECTION Y-Y

SECTION Z-Z

PIPE

DIMENSIONS (Ft-In)

<table>
<thead>
<tr>
<th>ID (In)</th>
<th>W</th>
<th>A</th>
<th>B</th>
<th>E</th>
<th>F</th>
<th>H</th>
<th>J</th>
<th>K</th>
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<td>3-10½</td>
<td>4-4</td>
<td>1-6</td>
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QUANTITIES (Based on CMP Installation)

Concrete (CF)

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<th>Double</th>
<th>Single</th>
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Reinforcing Steel (LRB)

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<tr>
<th>Reinforcing Steel (LRB)</th>
<th>Single</th>
<th>Double</th>
<th>Single</th>
<th>Double</th>
</tr>
</thead>
</table>

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STATE OF ARIZONA
DEPARTMENT OF TRANSPORTATION
ROADWAY STANDARD DRAWINGS
5/12

CATCH BASIN
DROP INLET
C-15.15
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 Std Spec 604-3.06.

4. Grate assembly shall be given one shop coat of Number 1 paint.

5. Apron slopes shall match the natural flow line of the ditch. No additional depression will be allowed.

   - $d_1 = 6^\circ$ when $H$ is $8^\circ$ or less
   - $8^\circ$ when $H$ is greater than $8^\circ$

SECTION B-B

LOCATION CONTROL POINT ELEVATION

Location Control Point

Concrete Apron Required Unless Otherwise Indicated on Project Plans

Mach Cross Slope (Typ)

Elevation Controlled by Sides of the Apron

GRADE TO DRAINAGE DITCH Match Grate Elevation

SECTION A-A

Elevation For Grate Details

GRADE TO DRAINAGE DITCH Match Grate Elevation

SECTION C-C

Elevation Controlled by Sides of the Apron

SECTION D-D

WALL HEIGHT DETAIL

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CATCH BASIN
SIDE SLOPE

C-15.81
GENERAL NOTES

1. Concrete shell conformance to the requirements for Class C 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 shell shall be given one shop coat of Number 1 paint.

5. Foundation, sills, and backfill shell 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. *All rebar shall be placed 12" center to center horizontal & vertical to 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

① $d = 6"$ when $H$ is 8' or less
     $8"$ when $H$ is greater than 8'

1. Model Number 6.002
2. Dimensions are approximate and subject to minor adjustments during construction.
3. Check with Plans for exact dimensions.
4. Curb Type B, C, or E as shown on Plans.

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Sheet 1 of 2

FREeway CATCH BASIN DETAILS

C-15.94

5/12
GENERAL NOTES

1. All structural steel shall be in accordance with ASTM A36.
2. All welding shall be in accordance with Std Spec 504-3.06.
3. The completed grate assembly (frame & grate) shall be given two step 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 (in)</th>
<th>Catch Basin Frame</th>
<th>Catch Basin Grate</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>6</td>
<td>2-6</td>
<td>13%</td>
<td>96°-57°-40°</td>
</tr>
<tr>
<td>C</td>
<td>3</td>
<td>2-6</td>
<td>15°-37°-45°</td>
<td>11%</td>
</tr>
<tr>
<td>E</td>
<td>4</td>
<td>2-6</td>
<td>15°-37°-45°</td>
<td>11%</td>
</tr>
</tbody>
</table>

BRACE PLATE DETAIL
GENERAL NOTES

1. See Std Dwg C-15.91 for dimensions, sizes and details not shown for construction of catch basin.
2. See Std Dwg C-10.52 and C-10.53 for dimensions, sizes and details not shown for construction of barrier.
3. See Std Dwg C-13.60 for dimensions, sizes and details not shown for construction of slotted drain.
4. Only longitudinal reinforcing steel shall be placed in half barrier within 1' of catch basin frame. S-shape bars shall not be placed in the rear wall of the catch basin.
   - 1'-3" for 18" diameter slotted drain
   - 1'-6" for 24" diameter slotted drain
   - Angle vertex, approximately 45°
   - Verify increased height over catch basin and slotted drain inlet depression
   - Depressed elevation.
   - Normal pavement or gutter flow line elevation.
   - Match adjacent gutter depression. Additional inlet depression as specified
   - Straight grade with downward slope.

NOTE TO DESIGNERS

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

① Beveled side of grate toward barrier

① 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-15.96 Frame (Sheet 2 of 2) for locations with bicycle traffic.

SECTION A-A

SECTION B-B FRAME

SECTION C-C GRATE

View A
GENERAL NOTES

1. Irrigation sleeves shall be installed in a trench condition. See Std Dwg C-15.15.
2. Backfill 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” to high letter “S” on the face of all curbs at sleeve locations. The width of the letter shall be ½” and shall penetrate the concrete surface ½”.
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.

Sleeves shall be installed parallel to the roadway subgrade. Slope may vary in superlevelled sections. Minimum slope required to drain.

- 2’-0” Back of Curb Median

TYPICAL INSTALLATION

DUMBELL WATERSTOP

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IRRIGATION SLEEVES

C-16.40
GENERAL NOTES

1. Rock shell conform to Section 913-2.03(A) of the Standard Specifications. The rock shell have a minimum nominal diameter of 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, vary to 1/3rds 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.

TYPICAL SECTION

See Perspective Std Dwg C-17.10

<table>
<thead>
<tr>
<th>Type</th>
<th>X (Ft-In)</th>
<th>Minimum Rail Length (Ft)</th>
<th>Minimum Rail Weight (Lb/ft)</th>
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</thead>
<tbody>
<tr>
<td>4</td>
<td>5-6</td>
<td>22</td>
<td>10</td>
</tr>
<tr>
<td>5</td>
<td>7-6</td>
<td>25</td>
<td>13</td>
</tr>
<tr>
<td>6</td>
<td>10-0</td>
<td>28</td>
<td>16</td>
</tr>
</tbody>
</table>

ELEVATION AT CHORD POINT ON CURVE

ELEVATION ON STRAIGHT SECTION

SECTION A-A
WIRE MESH SPLICE DETAILS

Rail Connection Detail
Burn holes through rails in field and bolt together as shown.

Wire Mesh Splice Details

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RAIL BANK PROTECTION AT ABUTMENTS
TYPES 4, 5 & 6

C-17.15

APPENDIX 1: Diagrams
APPENDIX 2: Tables
APPENDIX 3: Textual Notes
APPENDIX 4: References
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.
   - 4", 6", 8" or 12" (30° Inside Diameter) Grade Rings
   - 1/4"/ft
   - See Sheet 2 of 3

NOTE TO DESIGNERS

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

1. The 30" minimum spooling shall be required. Other frame and cover dimensions shown are nominal and vary by manufacturer.

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

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

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

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

SECTION A-A
FRAME, COVER & COLLAR PAVEMENT INSTALLATION

SECTION B-B

SECTION C-C
36' NOMINAL CMP FRAME & GRATE
Approximate Weight: Frame 120 Lbs
Cover 167 Lbs
GENERAL NOTES

1. Ford wells 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.

JOINT DETAIL

DEPTH GAUGE DETAIL

ELEVATION LOOKING UPSTREAM

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FORD
C-191JD
Sheet 1 of 2

5/12
**GENERAL NOTES**

1. All timber shall be rough, pressure treated and unpainted.
2. Rock berm, full length of structure, shall be included only when called for on plans.
3. See plans for finished surface and base material details.

---

**DETAIL A**

- **Rock Fill**
  - 4" Minimum Size

- **3x3-WL, 4x4-WL, 4 Wire-Wire Fabric**
  - Tied with 2 Strands of #9 Gauge Galvanized Wire 2" Center to Center
  - Each Way.
  - The top and bottom of basket to Top 2"x12" Planks at 5'-0" Intervals and at each end.
  - Tied by Encircling Planks with Two Strands of #9 Wire

---

**ELEVATION - TYPE 2**

- **Depth Gauge**
  - (Typ) 2 Required

- **Optional Rock Basket**
  - See Detail A and Plans

---

**TYPE 1**

**BITUMINOUS SURFACE ROAD**

- **Seal Coat Width**
- **Width of Seal Coat**
- **Roadway Width**

**WITH TREATED BASE**

---

**TYPE 2**

**BITUMINOUS SURFACE FORD**

- **Timber Cutoff Walls**

- **Optional Rock Basket**
  - Downstream from Cutoff Wall
  - See Detail A

- **4"x4"x5'-0" Post**
  - 5'-0" Center to Center

- **2-2"x12" Planks**

- **20ga Galvanized Spike**
  - 3 per Board (Typ)

- **4"x4"x5'-0" Post**
  - 5'-0" Center to Center
  - See Detail A

- **3-2"x12" Planks**

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**ROADWAY STANDARDS DRAWING**

**FORD**

**TYPES 1 AND 2**

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. Machined portions of the frame and cover are shown by the symbol "". The allowable tolerance for machined areas is ± 1/16". Concrete shall conform to Std Spec 305.
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.

10" or pavement structure thickness, whichever is greater.
GENERAL NOTES

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