The Roadway Construction Standard Drawings have been revised and updated, and printed in a new, complete set. Users should obtain the new Construction Standard Drawings (October 2004 cover) from Engineering Records. Numerous revisions, additions, and deletions have occurred that are listed in the front of the new standards. Some of the significant changes include the following:

1. Removal of the Superelevation Distribution sheet, C-02.50, which is now found in the Roadway Design Guidelines;
2. Update of the Sidewalk Ramp sheets, C-05.30, to reflect current ADA guidelines;
3. Reorganization of the PCCP Joint series (C-07.xx), and addition of parallel entrance and exit ramp joint location sheets;
4. Reorganization of the Guardrail and Barrier series (C-10.xx), including the update of the Thrie Beam to Concrete Half-Barrier Transition, C-10.30 and C-10.31, and deletion of C-10.68;
5. Removal of the cage reinforcement from the half barrier adjacent to slotted drains and catch basins (C-15.92) to facilitate slip forming;
6. Reorganization of the Rail Bank series (C-17.xx), and inclusion of a Rail Bank Protection at Abutments standard drawing;
7. Consolidation of the C-18.xx series into one standard, Manhole, C-18.10;
8. Redesign of the Standard Marker, C-21.20;
9. Deletion of the Utilities series (C-22.xx and C-23.xx). These series were adopted from the Maricopa Association of Government (MAG) standards and hadn't been updated in over a decade. Designers can use the current MAG utility standards, or convert the deleted sheets into plan details, which must be sealed and signed. The deleted sheets can be found at the web address listed below; and
10. Development of special provisions for use in conjunction with many of the standard drawing. These special provisions are on the Roadway Design web site with links from and to the applicable drawings.

Design personnel should implement the updated drawings and incorporate the updates into their project plans. For projects at or near completion, where the inclusion of all new standard drawings is not practical, the 1A Sheet must accurately reflect the correct revision dates for the design. Construction personnel should review the drawing revisions for possible implementation on construction projects.

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

An updated List of Standards (1A Sheet) is available either from the Roadway Support Desk (602-712-8667 or 602-712-8491) or on-line at the following address:
http://www.dot.state.az.us/ROADS/Rdwyeng/updates/viewable_drawings.html
Updated Summary Sheets are available on-line at the address shown above.

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

MAV/KRC/krc

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

    Regional Traffic Engineers (4)
    Materials Group
    Local Government Section
    Engineering Consultant Services
    District Permits Office (9)
    Engineering Records
    Michael Ortega
    Dan Lance
    Sam Maroufkhani
    Doug Forstie
    John Louis
CONSTRUCTION DRAWING SYMBOLS

NEW FEATURES

EXISTING FEATURES

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GENERAL NOTES

1. Roadway widths, cut ditch widths, cross slopes, and pavement structures 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 horizontals.
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

The 9\(^{\circ}\) minimum is required when guardrail is utilized on the project. Treatment shall be uniform throughout the project length. The 9\(^{\circ}\) requirement may be waived under special conditions where guardrail is not utilized.

\[ W = D \times \text{Slope (S)} \times \text{Slope Dep. (SF)} \times \text{Excluding ADFC} \]
\[ \text{Subgrade} = 2 \times W + \text{Roadway Width} \]

\[ W = 9 \times \text{Slope (S)} \times \text{Slope Dep. (SF)} \times \text{Excluding ADFC} \]
\[ \text{Subgrade} = 2 \times W + \text{Roadway Width} \]

SLOPE ROUNDED DETAIL

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

For cuts up to 10\(^{\circ}\), use 5\(^{\circ}\) semi-tangents for slope rounding. For each additional foot of cut add 5\(^{\circ}\) to semi-tangent to 11\(^{\circ}\) maximum.
GENERAL NOTES

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

2. Pavement structure slope is nominal. Actual slope is controlled by (G). 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.

MINIMUM SLOPES

SUBGRADE/SLOPE HINGE TREATMENT DETAIL

W = 0 x Slope grad
D = Str Cut Depth (ft) Excluding ACFC
Subgrade + 2 x W = Roadway Width

SHOULDER WEDGE DETAIL

SLOPE ROUNDED DETAIL

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

For cuts up to 6', use 5' semi-tangents for slope rounding. For each additional foot of cut slope to semi-tangent to 11' maximum.
GENERAL NOTES
1. Roadway width, cut ditch width, cross slope, and pavement structure section will be shown on project plans.
2. Pavement structure slope is nominal. Actual slope is controlled by (D). See Shoulder Wedge Detail.
3. Slopes beyond the pavement structure, such as embankment and cut slopes, are relative to horizontal.

NOTE TO DESIGNERS
The 6' minimum is required when guardrail is utilized on the project. Treatment shall be uniform throughout the project length. The 6' requirement may be waived under special conditions where guardrail is not utilized.

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 10' maximum.
GENERAL NOTES

1. Dimensions of ditches and channels shall be shown on the plans as bottom width, depth and length.

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

CROWN DITCH

GRADER DITCH

CHANNEL

DITCH AND DIKE
GENERAL NOTES

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

2. Slope as shown on Plans (Old Desirable).

3. Slope as shown on Plans

TYPE B TRANSVERSE MEDIAN DIKE

TYPICAL TRANSVERSE MEDIAN DIKE INSTALLATION

TYPICAL DIKE INSTALLATION AT STRUCTURE
GENERAL NOTES

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

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

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

SECTION B-B

SECTION C-C

SECTION A-A
GENERAL NOTES

1. Pipe berms not required when pipe projection is protected by guardrail.

2. Berm construction similar for multiple pipe installations and for pipes without end sections.

3. Berm construction shown is for pipe installations. Berm construction shown for new pipe installation. See Pipe Berm Requirement Detail. For Point A is within the recovery area, then a single berm is required. For Point B is set at the edge of the recovery area.

NOTE:
Single pipe installation D = Outside Diameter of Pipe
Multiple pipe installations D = Outside Edge to Outside Edge of Pipes
For Pipe Backfill and Backing material limits See Std Dep C-1315

SECTION A-A (WITH END SECTION)

SECTION A-A (WITHOUT END SECTION)

STRAIGHT PIPE PLAN

ELEVATION

SKEWED PIPE PLAN
GENERAL NOTES

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

2. Where rock is encountered, the outlet may be omitted.

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

4. Spillway invert slope shall be uniformly downward from A to B.

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

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

Indicates Inlet

Indicates Spillway

SECTION A-A

SECTION B-B

OUTLET DETAIL
### GENERAL NOTES

1. For C-02.10 slopes with embankment height over 24, use length for 24 embankment height from Table 1.

2. For C-02.20 slopes with embankment height over 32, use length for 32 embankment height from Table 2.

3. For C-02.30 slopes with embankment height over 15, use length for 15 embankment height from Table 2.

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

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#### LENGTH OF SPILLWAY (Ft)

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#### LENGTH OF SPILLWAY (Ft)

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

**C-02.30 SLOPES**
### General Notes

1. For C-02.10 slopes with embankment height over 26, use length for 24 embankment height from Table 1.2.

2. For C-02.20 slopes with embankment height over 35, use length for 32 embankment height from Table 1.2.

3. For C-02.30 slopes with embankment height over 35, use length for 32 embankment height from Table 1.2.

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

### Length of Downdrain (ft)

#### Thickness

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### Downdrain Length Table

- **C-02.10 and C-02.20 Slopes**
- **C-02.30 Slopes**
GENERAL NOTES

1. Stub shall have annular corrugation. Downspouts placed beyond stub may be either annular or helical.

2. Couplings shall be mechanical heat-shrinkable polyethylene sheath; one piece U type neoprene sheet or slip seal at 12" minimum width and 18 gauge minimum.

3. Maximum D Allowable = 8 cfs
   Minimum Y Allowable = 1 fps

4. Concrete shall be Class B.
GENERAL NOTES

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

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

3. See Std Dwg C-05.03 for additional general notes and dimensions.

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

* Dimension May Vary. Where Exit Occurs on Curves, See Plans.

SECTION A-A
CONCRETE BARRIER APPLICATION

For Barrier Details See Plans

SECTION A-A
CURB & GUTTER APPLICATION

50° Taper (Entrance Ramp)

4" (Exit Ramp)

Entrance Ramp - 100'- Exit Ramp - 28.6'

Length Varies - See Plans

Gutter Line

Type 1 - Gutter Transition - At Ramp Tapers

SECTION B-B
CURB & GUTTER TRANSITION

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

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

Type 2 - Curb & Gutter Transition
Curb Height Varies 0" to 7" Maximum in
Decreased Curb Area Beyond the End of
Barrier. See Plans for Curb Height.

SECTION A-A

PLAN VIEW
TYPE 3 - CURB & GUTTER TRANSITION
AT PAVED GORE

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

Gutter Line

Type 4 - CURB & GUTTER TRANSITION
TYPE 5 - CURB & GUTTER TRANSITION

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

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

S Transition

AC Pavement (Typ)

PCC Pavement (Typ)

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

Curb & Gutter
Type C or C-1
Std Dwg C-05.10
See Plans

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

S Transition

TYPE 7 - CURB & GUTTER TRANSITION

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 B
6" Curb Height
2" Gutter Depression
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-05.10

S Transition

Length Series

Length Series
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 1/3 where t is the thickness of the driveway, joints shall be either formed or sawn. Formed joints shall be finished with a tool having a 1/2" radius. See Sheet 2 of 2 for the Contraction Joint Details.

3. Expansion joints shall be located between driveways and sidewalks and at abutting structures. The 1/2" 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 fine brush in a transverse direction.

LEGEND

- Minimum slope = 0.50' Per Ft
- Maximum slope = 0.05' Per Ft
- Straight grade with downward slope

STATE OF ARIZONA
DEPARTMENT OF TRANSPORTATION
ROADWAY STANDARDS DRAWINGS

CONCRETE DRIVEWAYS & SIDEWALKS

Drawn: 9/04

Sheet 1 of 2
GENERAL NOTES

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

2. One-inch deep transverse contraction joints shall be placed in sidewalks at intervals of approximately 15' or at a spacing that matches adjacent curb and gutter, if the sidewalk is over 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 ties shall be approximately 18 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 6" 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 at existing structures. Expansion joints shall meet the joints in the adjacent concrete pavement or existing concrete curb and sidewalk. Maximum length of sidewalk without an expansion joint shall be 50 transverse feet. The 1/4" joint filler shall extend the full depth of the concrete.

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

SIDEWALK ADJACENT TO CURB

SIDEWALK SETBACK FROM CURB

CONTRACTION JOINT DETAIL

EXPANSION JOINT DETAIL

CONCRETE SIDEWALK ADJACENT TO CURB

CONCRETE SIDEWALK SETBACK FROM CURB
Ramp Shall Be Laid Out Radially from the Back of the Sidewalk, Except That in No Case Shall It Be Less Than 4' Wide at the Back of the Sidewalk.

Face of Curb

1. Ramp centerline shall be radial from the face of the curb at the Sidewalk Ramp Control Point.
2. The ramp slopes as shown are the steepest allowed, except as provided for under Note 3.
3. Ramp lengths shall not exceed 10' for any installation. Ten-foot long ramps may be steeper than the slopes shown in Note 2.
4. 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.
5. Concrete shall receive a rough broom finish as shown.
6. See Std. Dwg C-05.10 and C-05.20 for joint details.

Legend:
- Minimum Slope = 10% (0.01' / ft)
- Maximum Slope = 5% (0.02' / ft)

GENERAL NOTES

ONE CROSSING DIRECTION AT CORNER

TWO CROSSING DIRECTIONS AT CORNER

SECTION A-A

SECTION B-B

SECTION C-C

PARALLEL SIDEWALK RAMP

RAMP CURB DETAIL
GENERAL NOTES

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

2. The 10° wing and 15° ramp slopes are the steepest allowed, except as provided for under Note 3.

3. Ramps lengths shall not exceed 10' for any installation. Ten-foot long ramps may be steeper than the slope shown in Note 2.

4. 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.

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

6. 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.

7. See Std Dwg C-05.30 for joint details.

Pedestrian Push Button Pole when shown on Traffic Plans. See Traffic Signal Plans for Additional Information

9" Maximum to Face of Pedestrian Push Button

SECTION B-B

PERPENDICULAR CURB RAMP

STATE OF ARIZONA
DEPARTMENT OF TRANSPORTATION
ROADWAY STANDARD DRAWINGS

APPROVED FOR DESIGN
9/04

APPROVED FOR CONSTRUCTION

S-05.30
Sheet 3 of 7
Ramp Shall Be Laid Out Radially from the Back of the 5' Wide Detectable Warning Strip. Except that in No Case Shall It Be Less Than 4' Wide at the Back of the Sidewalk.

**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 15% ramp slope measured at the back of sidewalk is the steepest allowed, except as provided for under Note 4.
4. Ramp lengths shall not exceed 10' for any installation. Ten-foot long ramps may be steeper than the slope shown in Note 3.
5. 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.
6. Drainage areas 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-0510 and C-0920 for joint details.

**DEPRESSED CURB AT SIDEWALK RAMP**

**SIDEWALK RAMP AT SIDEWALK TERMINUS**

**LEGEND**

Minimum Slope = 100' (1.00) (1/41)
Maximum Slope = 50' (0.02) (1/51)

**SECTION A-A**
**GENERAL NOTES**

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

**LEGEND**

- Minimum Slope = 100d 10.01 /ft
- Maximum Slope = 50d 10.02 /ft

**SIDEWALK RAMP AT SIDEWALK TERMINUS**

**SIDEWALK BEHIND BARRIER**

**SECTION B-B**

**SECTION A-A**
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. The 15° ramp slope is the steepest allowed, except as provided for under Note 4.

4. Ramp lengths shall not exceed 10' for any installation. Ten-foot long ramps may be steeper than the slope shown in Note 3.

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

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

7. Drainage inlets should not be located within the marked crosswalk, or if crosswalk drain marked, within the area a standard marked crosswalk would enclose.

8. Concrete shall receive a rough brome finish as shown.

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

LEGEND

- Minimum slope = 100' (0.10 /ft)
- Maximum slope = 500' (0.02 /ft)

DEPRESSED CURB AT SIDEWALK RAMP

ELEVATION
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. Particles come at the edge of the strip shall be ground flush with the brick or tile surface.

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

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

- Pedestrian Push Button Pole When Shown on Plans see Traffic Signal Plans for Additional Information
- 10' Maximum to Face of Pedestrian Push Button

PERSPECTIVE (For Median Widths Greater Than 5'-5")

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

ELEVATION DEPRESSED CURB AT SIDEWALK RAMP

PERSPECTIVE (For Median Widths 5'-5" And Less) See Note 1

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

SIDEWALK RAMP AT MEDIAN ISLAND CROSSING
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 where 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

- 2'-0" RWD Line
- 8" Curb & Gutter
- Optional Construction Joint

Section B-B

- 1'-3" x 1'-9" 0.02/ft
- Cement Treated Slurry

Section C-C

- Curb and Gutter Transition 0'-0" to 2'-0"

General Notes

1. The RCCP surfaces within the bus bay area shall be textured transversely. Surface texturing to conform to Std Spec 403.51.
2. Transverse weakened plane joints shall be constructed at a maximum spacing of 15' and shall align with joints in the concrete curb and gutter.
3. For additional data on slotted drains, see Std Dwg C-13.50.
4. For ¾" expansion joint with preformed joint "Mars", see detail A.
5. Concrete pad to be poured separately from concrete bus bay pavement.
6. For sidewalk construction details, see Std Dwg C-05.20.

See Plans: match the adjacent gutter depression.
GENERAL NOTES

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

2. Joint-use driveways may become desirable for landowners of adjacent
   properties if the joint-use easement, signed by all parties involved, must
   accompany the application form. The property line can be located
   anywhere in reference to the driveway, depending on mutual agreement.

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

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

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

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

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

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

9. Paved turnouts & plan notations will be N X 5", surface material, type
   and standards. Examples: C30 X 3", AG50, Type A, 1st Aug 06.00. Show
   radius & graphic designs.

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 stipulated by the permit approval
    if there appears to be a 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 roadway, unless
    otherwise noted.


RURAL DEVELOPMENTS

URBAN DEVELOPMENTS
GENERAL NOTES

1. When load transfer dowel assemblies are required, use dimensions shown in LTP, See Assembly Placement And Edge Clearance Details, Sd 2 Swg C-07.23.

2. In all form type pavement construction, LMP joints shall be used. In fixed form construction either LMP 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, silos, abutments, barrier transitions, settled drains and other concrete facilities, constructed within the right-of-way.

JOINT ABBREVIATIONS

LMP - Longitudinal Weakened Plane Joint
TWP - Transverse Weakened Plane Joint
LC - Longitudinal Construction Joint
TC - Transverse Construction Joint
E, K, X - Expansion Joints
S - AC/PCCP Edge Seal Joint
T - PCCP Thickness
PE - Polyethylene

CONSTRUCTION JOINT
Saw and Seal Saw and Seal Detail

WEAKENED PLANE JOINT
Saw and Seal Saw and Seal Detail

EXPANSION JOINT

EXPANSION JOINT

EXPANSION JOINT

EXPANSION JOINT

EXPANSION JOINT
GENERAL NOTES

1. LC and LMP 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. The joint locations shall be indicated in accordance with Subsection 401-3.01 of the Standard Specifications.

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

3. 'A' shall equal 4 minimum (Typical Joints)
   'B' shall equal 2 minimum (Typical Joints)
   'C' shall equal 2 minimum (Typical Joints)

4. See Std Desg C-07-01 for PCPP joints and additional notes.

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

6. See Std Desg C-07-010 for curb and gutter joint requirements.

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

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

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

TRANSVERSE CONSTRUCTION JOINT (TC) ALLOWABLE LIMITS (Typical)

PLAN

46' PCCP

43.5' PCCP

24' PCCP

WIDENING
GENERAL NOTES

1. LC and LMP joint locations shown are typical. The actual paving pour pads with joint locations shall be determined by the awarding agency. Pour pads and joints are to be spaced as required by the contractor and approved by the Engineer in accordance with Subsection 401-3.3.1 of the Standard Specifications.

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

3. "A" shall equal 4 minimum (Typ)
   "B" shall equal 7 minimum (Typ)
   "C" shall equal 10 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 panels.

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 fills in the LMP & LC joints shall be placed no greater than 1'-3" from the TC joint.

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

   Transverse Construction Joint (TC) Allowable Limits (Typ)

PLAN
55° PCPP

PLPAN
55.5° PCPP
1. LC and LWP joint locations shown are typical. The actual paving pour plan with joint locations and transfer dowel assemblies are to be provided by the contractor and approved by the Engineer in accordance with Subsection 401-1.01 of the Standard Specifications.

2. Skewed PCCP Joints shall be used when needed. Transfer dowel assemblies are not required.

3. 'B' shall equal 4' minimum (Type 1)
   'B' shall equal 3' minimum (Type 2)
   'C' shall equal 2' minimum (Type 3)

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

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

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

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

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

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

Transverse Construction Joint (TC) Allowable Limits (Type 2)

PLAN
70° PCCP

PLAN
67.5° PCCP
PLAN ① 96.25° PCCP

GENERAL NOTES

1. LC and LWP joint locations shown are typical. The actual paving pour plan with joint locations shall be based upon the project paving plan submitted by the contractor and approved by the Engineer in accordance with Subsection 401.3.2.1 of the Standard Specifications.

2. Skewed PCCP joints shall be used when local transfer beam assemblies are not required.

3. "A" shall equal 1 minimum (Typ)
   "B" shall equal 1/2 minimum (Typ)
   "C" shall equal 2 minimum (Typ)

4. See Fig 6.12B for PCCP joints and additional notes.

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

6. See Fig 6.12C 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 curb section of the intersecting road or street.

8. The rebars in the LWP & LC joints shall be placed no greater than 3" from the LC joint.

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

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

PLAN ② 84.25° PCCP

PLAN ③ 72.25° PCCP
GENERAL NOTES

1. LC and LWP joint locations shown are typical. The actual paving pour plan with joint locations shall be based upon the project paving plans submitted by the contractor and approved by the Engineer in accordance with Subsection 404.3.0 of the Standard Specifications.

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

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

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

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

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

7. The rebars in the LWP & LC joints shall be placed no greater than 1-3" from the LC 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(i) of the Standard Specifications.

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

3. See Std Dwg C-07.03 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 LC joint.

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

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

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-skewer PCCP joints shall be used with load transfer dowel assemblies.

3. See Std Dwg C-035.01 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.

GENERAL NOTES

6. See Std Dwg C-051.02 for curb and gutter joint requirements.

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

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

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

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

2. See Std Draw 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 LMP 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

See Ramp Super Sheets.
GENERAL NOTES

1. As 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 E02-1.301 of the Standard Specifications.

2. See Std DWG C-07.01 for Joint Information.

3. See plans for ramp dimensions.

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

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

1. All joint locations shown are typical. The actual paving pour plan with joint locations shall be based upon the project paving plan submitted by the contractor and approved by the Engineer in accordance with Subsection 40-1.301 of the Standard Specifications.

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

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

4. See plans for ramp dimensions.

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

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

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

   - Mainline Structural Section See Plans
   - Ramp Structural Section See Plans
   - Gore Structural Section See Plans

SECTION A-A RAMP TAPER

SECTION B-B GORE AREA
GENERAL NOTES

1. All joint locations shown are typical. The actual paving pour plans with joint locations shall be based upon the project paving plans submitted by the contractor and approved by the Engineer in accordance with Subsection 401-3.301 of the Standard Specifications.

2. Dimensions with a tolerance may be adjusted to align with 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.

TYPICAL TRANSVERSE WEAKENED PLANE

JOINT LAYOUT AT GORE AREAS

Exit Ramp Shown
Entrance Ramp Similar

RAMP WITHOUT CURB & GUTTER

RAMP WITH CURB & GUTTER
GENERAL NOTES

1. All joint locations shown are typical. The actual paving pour plan with joint locations shall be based upon the project paving plan submitted by the contractor and approved by the Engineer in accordance with Subsection 401-3.1(f) of the Standard Specifications.

2. See Std Dwg C-07G1 for joint information.

3. The ratio of transverse to longitudinal joint spacing shall be greater than 1/2 but not more than 1/3.

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 Dropedge Paving Type A or F Joint TP RCC Pavement S Joint TF AC Pavement.

6. Transverse joints shall be perpendicular (90°) to the longitudinal joints, except as shown at the ramp terminals.
   - G Minimum
   - Various - 18' Maximum
   - Various - 12' when alternate gutter widths are 2 or less
   - Various - 15' when alternate gutter widths are greater than 2
   - Without curb and gutter
   - Transition, See Std Dwg C-05J2
   - Various - 12' Typical or As Shown on Plans
   - 18' Minimum

AC Pavement
GENERAL NOTES

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

2. See Std Sheet C-01,01 and C-01,04 for joint layout and details.

PLAN

CONCRETE GORE AREA
WITH ABUTTING CONCRETE PAVEMENT

SECTION A-A

Structural Section
See Plans

8" Concrete

1/8" Joint &
Prefabricated
Joint Filler (Typ)

PLAN

AC GORE AREA WITH
ABUTTING AC PAVEMENT

SECTION B-B

Compact Subgrade
or AB as shown on plans.

Structural Section
See Plans

Task Coats
GENERAL NOTES

1. All embankment curb shall be protected by guardrail.

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

3. See Std Dwg C-10-00 for measurement limits.

4. See Std Spec 103, 905 and 1003-3 for reflector tab and snow marker materials, reflective sheeting, and spacing requirements.

PLAN

SECTION

TYPE A GUARD RAIL INSTALLATION

REFLECTOR TAB DETAIL
GENERAL NOTES

1. All embankment curbs shall be protected by guardrail.

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

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

4. See Std Specs 703, 905 and 1012-3 for reflector tab and snow marker materials, reflective sheeting, and spacing requirements.

FIG.

SECTION

TYPE B GUARD RAIL INSTALLATION
GENERAL NOTES

1. Height of curb shall not exceed 4 inches.

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

- indicates AASHTO, AGC & ARTBA Task Force 13 report designation.

PLAN

ELEVATION

G4115 (MODIFIED)

W-BEAM BACK-UP PLATE DETAIL

See W-Beam Back-up Plate Detail

Curb & Gutter
Type B, C or C-1
Std Deg C-0510 or
as Shown on Plans

5/8"-11 UNCx5/8" Button Head Bolt (1)
and Recess Nut (1) with Plain Round Washer (1) (Type)

5/8" x 5/8" Splice Bolt (3) (Type)

9/16" UNC 3/8" Hex Bolt (1) and Hex Nut (1) with Plain Round Washer (1) (Type)

2" 8 1/2" 2" 8 1/2"

W-Beam, 12 Gauge
Roadway Width

6" 6"

18"

11/4"

5/8"

W6x9.5x78" or W6x9x78"
Structural Shape Post

5/8" x 5/8" Structural Shape Post
GENERAL NOTES

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

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

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

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

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

72' Timber Post

ELEVATION
NESTED STEEL W-BEAM - TYPE 1 = SHORT SPAN
(SPLICE CONNECTION INSIDE SPAN) LENGTH = 25'-0''

PLAN

NESTED STEEL W-BEAM - TYPE 2 = SHORT SPAN
(SPLICE CONNECTION OUTSIDE SPAN) LENGTH = 37'-6''

SECTION A-A

Bolt Nested Steel W-Beams
Together with 4"-1/2 UNCa 1/4"
Rear Nut (1) (Typ) &
Recess Nut (1) (Typ)
9 Required

SECTION B-B

Bolt Nested Steel W-Beams
Together with 4"-1/2 UNCa 1/4"
Button Head Bolt (1)

Normal W-Beam
12 Gauge
GENERAL NOTES

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

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

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

4. For Type 3, a maximum of two posts may be extended within a span of nested guardrails.

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

72" Timber Post

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

ELEVATION

NESTED STEEL W-BEAM - TYPE 3 - LONG SPAN
LENGTH = 37'-6"

PLAN

37'-6" Nested W-Beam

6'-3"  6'-3"  10'-9"  6'-3"  6'-3"

System Post

Bolt Nested W-Beams Together
Side Splice Connection Type C

Pipe Culvert

Various

Bolt Nested W-Beams Together
External Button Head Bolt (•)

Other

Approved for Design

9/04

STATE OF ARIZONA
DEPARTMENT OF TRANSPORTATION
ROADWAY STANDARD DRAWINGS

C-10.06
Sheet 2 of 2
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.

# Beam

72" Timber Post

PLAN

Traffic

6'-3'  6'-3'  6'-3'  6'-3'  6'-3'  6'-3'

System Post

Bolted Anchor (Typ)
See Timber or Steel Post Installation Detail Sheet 2 of 2

Box Culvert - Width Varies

ELEVATION

BOLTED ANCHOR

BOX CULVERT INSTALLATION
GENERAL NOTES

1. Bracket may be made of one piece hot bent, or two pieces welded together.

2. Short timber posts anchored to box culvert roof shall be 8" x 8" only.

● Indicates AASHTO, AASHTO Task Force 13 report designation

INSTALLATION DETAIL

BOLTED ANCHOR

TIMBER POST INSTALLATION DETAIL

BOLTED ANCHOR

STEEL POST INSTALLATION DETAIL

GRADING OF SHEETS

PLAN NO. 9/04

STATE OF ARIZONA

DEPARTMENT OF TRANSPORTATION

ROADWAY STANDARD DRAWINGS

C-10.07

Sheet 2 of 2
GENERAL NOTES

1. The cable assembly shall be tightened to remove slack.

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

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


PLAN

ELEVATION

ANCHOR PLATE DETAIL

BEARING PLATE DETAIL

FRONT VIEW

SIDE VIEW
GENERAL NOTES

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

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

3. Thrie-beam terminal connector to thrie-beam guardrail notice shall be lapped in the direction of adjacent traffic.

Ω - Indicates AASHTO, AGC & ARTBA Task Force 83 Report designation

Concrete Barrier Transition
Type 1" to Thrie Beam
See Std Det C-10,J1.1, C-10,J1.2, C-10,J2 & C-10,J2.1

Thrie-Beam Guardrail Transition System

LIP CURB DETAIL
1. Two-inch deep contraction joints shall be placed in the curb and the gutter at locations which match the joints in adjacent PCC and at approximate ID centers when adjacent to AC pavement. Joints shall be either hand turned or sawn.

2. Curbing is required when drainage flows transversely away from barrier.

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

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

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**LIP CURB DETAIL**

- 2.5"x5" Lip Curb
- See Lip Curb Detail

**SECTION A-A**

- Thrie-Beam Guardrail Transition System
- Standard Guardrail System
- See Plans

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**GENERAL NOTES**

- Two-inch deep contraction joints shall be placed in the curb and the gutter at locations which match the joints in adjacent PCC and at approximate ID centers when adjacent to AC pavement. Joints shall be either hand turned or sawn.

- Curbing is required when drainage flows transversely away from barrier.

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

- Indicates AASHTO, AGC & ARTBA Task Force 13 report designation.
GENERAL NOTES

1. For use with one-way traffic or with two-way traffic outside the clear zone.
2. Thrie-beam terminal connector to thrie-beam splice shall be lapped in the direction of adjacent traffic.
3. Anchor Plate shall conform to ASTM specification A 36. Bolts, washers and anchor plate shall be gavanized or, at the contractor's option, stainless steel bolts and washers may be used.


PLAN

Concrete Barrier Transition
Type 1 to H-Beam
See Std Dwg C-10.7H, C-10.7I, C-10.7J, C-10.7K or Bridge Concrete Barrier Transition

Thrie-Beam Terminal Connector

6"x8"x64" Wood Post
6"x8"x22" Wood Block

6"x8"x64" Wood Post
6"x8"x22" Wood Block

3/8"-8 UNC x 14" Hex Bolt (A325) (Ø)
and Hex Nut A350 (φ) with Plain Round Washer. (Ø) Under Nut (Typ) is Required

1/2" Diameter Sleeve (Typ)

No Washer Under Bolt Head (Typ)

Roadway Width

Anchor Plate
See Detail A

SECTION A-A

ANCHOR PLATE - DETAIL A

ELEVATION

3/4" 3/4" 3/4" 3/4"

2-2" 2-2" 2-2" 2-2"

1/4" 1/4" 1/4" 1/4"

1/4" 1/4" 1/4" 1/4"

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1/4" 1/4" 1/4" 1/4"

1/4" 1/4" 1/4" 1/4"
1. Median Barrier shall be constructed by the slip form or formed cast-in-place method.

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

3. Concrete shall be Class 5, f_s=4000 PSI.

4. If the footing and barrier are cast monolithically, #6 5 Shape rebars are not required.

5. Barrier width shall not exceed the barrier footing width nor overhang the adjacent pavement.

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

7. Depth to match adjacent PCPP thickness (8" minimum).
GENERAL NOTES

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

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

3. Concrete shall be Class 5, f'c=4000 psi.

4. If the footing and barrier are cast monolithically, #6 5' shape rebar is not required.

5. Barrier width shall not exceed the barrier footing width nor overhang the adjacent pavement.

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

Depth to match adjacent PCPP thickness (8" minimum).
GENERAL NOTES

1. Posts shall be 12'-6" Center to Center. Structural steel shall conform to ASTM A572, galvanized in conformance with ASTM A123.

2. Hex head bolt shall conform to ASTM A563 Class B, galvanized in conformance with ASTM A153 Class C.

3. Helical spring lock washer shall conform to ASTM A303, galvanized in conformance with ASTM A153 Class C.

4. Tension Wire AMG number B01481, galvanized in conformance with ASTM A616 Class 2.

5. Hog ring AMG number 12 101051, galvanized in conformance with ASTM A105 Class 2. Fasten glare screen to top and bottom tension wire spaced approximately 3" apart.

6. Glare Screen 18 gauge steel, ASTM A526, galvanized in accordance with ASTM A526/G235, expanded to the following dimensions: 133" length of diamond and 4.0" length of diamond (center to center) of bridge, with a string width of 0.25" and spaced at approximately 20" on the plane of the original sheet. Top edge to be shop cut and clipped on 12" center to center. Glare screen shall be installed such that flat portion of screen blocks light from headlights. See Direction Details.

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

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

ELEVATION

TENSION WIRE ROUTING DETAIL
1. Half barrier shall be constructed by the slip or fixed form method.
2. When obstacles prevent the use of slip form equipment, stationary forms shall be used.
3. Concrete shall be Class S, f'c=4000 PSI.
4. If the footing and barrier are cast monolithically, #6 5 shape rebar will not be required.
5. #4 rebar shall extend 1/2 past the construction joint at the completion of the day's pour.
6. Weep holes shall be placed whenever barrier is backfilled unless otherwise indicated on the plans.

Depth to match adjacent PCCP thickness is 8" minimum.

Optional Construction Joint

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

1. Concrete half barrier shall be precast.
2. Concrete shall be Class 5, f'c=4000 psi.
3. Pavement thickness adjacent to half barrier shall be 3' minimum.
4. The half barrier shall be placed upon a bed of grout in order to provide a uniform bearing.
5. Dowel joints shall be grouted under pressure until all of the openings and the joints are filled.
6. All bond dimensions for rebar are out-to-out of rebars.
7. Weep holes shall be placed whenever half barrier is backfilled unless otherwise indicated on the plans.
GENERAL NOTES

1. Concrete shall be Class S, PC=1500 PSI.
2. Rebar shall conform to Std Spec 1003.
3. Rebar shall have 2" minimum clear cover unless otherwise noted.
4. See drainage sheets for swale drain and catch basin details.
5. Depature termination may be substituted for Std Dwg C-10.67 barrier transition under departure conditions.
6. See Std Dwg C-05.03 for sidewalk construction.
7. All bend dimensions for rebar are cut-to-cut. out of rebar.

ELEVATION

DEPARTURE TERMINATION DETAIL

SECTION A-A

SECTION B-B
AT CATCH BASINS

BARRIER GUTTER DETAIL

STATE OF ARIZONA
DEPARTMENT OF TRANSPORTATION
ROADWAY STANDARD DRAWINGS

CONCRETE HALF BARRIER
2'-TYPE "H"
WITH SIDEWALK

C-10.01

DRAWN
M. Wilson

APPROVED FOR CONSTRUCTION
9/04

APPROVED FOR PRINTING
9/04
1. Half Barrier shall be constructed by the slip or fixed form method.

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

3. Concrete shall be Class 5, f' = 4000 PSI.

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

5. Thickness of gutter, "B" can be adjusted to match the PCP thickness, as approved by the Engineer.

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

7. At bridges, the cross slope of the gutter shell transition to match the cross-slope of the bridge. Length of the transition is 10'.

8. Two-inch deep contraction joints shall be placed in the gutter at locations which match the joints in adjacent PCP. Joints shall be hand-formed or sawn.

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

SECTION A-A

STATE OF ARIZONA
DEPARTMENT OF TRANSPORTATION
ROADWAY STANDARD DRAWINGS

CONCRETE HALF BARRIER
32" TYPE 3
WITH GUTTER

C-10.52
GENERAL NOTES

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

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

3. Concrete shall be Class C, Ty 4000 PSI.

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

5. Thickness of gutter, 10" can be adjusted to match the PCP thickness, as approved by the Engineer.

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

7. At bridges, the cross slope of the gutter shall transition to match the cross slope of the bridge. Length of the transition is 15'.

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

9. Whenever half barrier is backfilled, see Std Dwg C-1053 for weep hole details, unless otherwise indicated on the plans.
GENERAL NOTES

1. Concrete shall be Class S, f' = 4000 PSI.
2. If the footing and half barrier are cast monolithically, #6 S shape rebar is not required.
3. #4 rebar shall extend 12" past the construction joint at the completion of the day's pour.
GENERAL NOTES

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

2. The half barrier shall be placed upon a bed of grout in order to provide a uniform bearing.

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

4. All bend dimensions for rebar are out-to-out of rebars.
GENERAL NOTES

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

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

3. Slope as shown on Plans

---

PLAN

SECTION C-C

SECTION A-A

SECTION B-B
GENERAL NOTES

1. Concrete shall be Class S, (f)=4000 psi.
2. If the footing and barrier are cast monolithically, #6 shape rebar are not required.
3. Barrier width shall not exceed the barrier footing width nor overhang the adjacent pavement.
4. #4 rebar shall extend 12" past the construction joint at the completion of the day's pour.

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

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

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

ELEVATION

PLAN

# 6 Rebar
S Shape (Typ)

# 4 Rebar
Continuous

8''
5''
5''
18''

A

Median Pavement

Top of Pavement

5 1/2''
4 1/4''
2 1/2''
2 1/8''
1 1/4''
1/2''

SEE Sheet 3 of 3

A

 seesheet of 3 of 3

SEE Keyway DETAIL (Typ)
GENERAL NOTES:

1. Concrete shall be Class S, T34000 PSI.

2. The half barrier shall be placed upon a bed of grout in order to provide a uniform bearing.

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

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

5. Steel shall have 2" minimum clear cover unless otherwise noted.

ELEVATION

SECTION A-A

WITH AC

SECTION B-B

KEYWAY DETAIL

AT REBAR - WITH PCCP

See Construction Joint Detail

PLAN

See Construction Joint Detail

PLAN

ELEVATION CONSTRUCTION JOINT DETAIL
GENERAL NOTES

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

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

   Slope as shown on Plans

PLAN

SECTION C-C

SECTION A-A

SECTION B-B
GENERAL NOTES

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

CROSS-SECTION DETAILS

1. 6# Rebar (Continuous)
2. 8# Rebar (Continuous)
3. 12# Center to Center
4. 10# Center to Center

ROADWAY WIDTH + Offset (2" Typ)

1. 6# Rebar (Continuous)
2. 8# Rebar (Continuous)
3. 12# Center to Center
4. 10# Center to Center

7# Rebar Tile
12# Center to Center
All Caissons See Caisson Reinforcement Detail
Sheet 3 of 3

6# Rebar (All Caissons)
See Caisson Reinforcement Detail
Sheet 3 of 3

Optional Construction Joint (Typ)
Roadway Width + Offset (2" Typ)

For Anchor Plate and Hardware
See Std. Dwg C-10,32

Tie-Beam Terminal Connector
See Std. Dwg C-10,32
C-10,31 and C-10,30

CONSTRUCTION AND ELEVATION DETAILS

Without Curb
Section A-A

Without Curb
Section B-B

Without Curb
Section C-C

STATE OF ARIZONA
DEPARTMENT OF TRANSPORTATION
ROADWAY STANDARD DRAWINGS
CONCRETE HALF-BARRIER TRANSITION
TO VERTICAL
32" TYPE 9" WITH CAISSONS
C-10,70
Sheet 2 of 3

APPROVED FOR PRINTING
APPROVED FOR конструкции
9/04
9/04
9/04
CONSTRUCTION JOINT DETAIL (OPTIONAL)

EXISTING CONCRETE BARRIER

EPOXY GROUT (TYPE)

Concrete Half-Banner Transition

10" Diameter x 8" Dowel (Type)

CONCRETE HALF-BARRIER TRANSITION

DOWEL LOCATIONS

6 # 8 Bars

CAISSON REINFORCEMENT

# 4 Rebar Tie
12" Center to Center

3" 3" 3"
GENERAL NOTES

1. Concrete shall be Class C, f'k=4000 PSI.

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

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

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

5. 1" minimum or Match Thickness of Adjacent PCP

ELEVATION
BARRIER WITH CURB AND GUTTER

BARRIER END DETAIL

See Optional Construction Joint Detail Sheet 2 of 3

PLAN
Traffic

See Barrier End Detail

Thrie-Beam Terminal Connector
For Anchor Plate and Hardware
See Std Dwg C-10.32
1. Concrete shall be Class 5, f'c=4000 psi.
2. All rebar shall have 3" minimum clear cover unless otherwise noted.
3. All bend dimensions for rebar are cut-to-cut of rebar.
4. Two-inch deep connection joints shall be placed in the gutter at locations which match the joints in adjacent PCP and at approximately 15 feet centers when adjacent to AC pavement. Joints shall be either hand raked or sawed.

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

ELEVATION
BARRETER WITH CURB AND GUTTER
GENERAL NOTES

1. See Section B-B for caisson reinforcement.
2. See Optional Construction Joint Detail.
   1.07 Minimum or Match Thickness of Adjacent PCCP.

WITHOUT CURB
SECTION A-A

WITHOUT CURB
SECTION B-B
**GENERAL NOTES**

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

2. All rebar shall have 3" minimum clear cover unless otherwise noted.

3. All bend dimensions for rebar are cut-to-cut rebar.

4. Two-inch deep construction joints shall be placed in the gutter at locations which match the joints in adjacent PCP and at approximate 15 centers when adjacent to AC pavement. Joints shall be either hand-loomed or sawed.

   1/4" Minimum or Match Thickness of Adjacent PCP

---

**ELEVATION**

**BARRIER WITH CURB AND GUTTER**
GENERAL NOTES

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

2. Concrete shall be Class 5, f'c=4000 PSI.

3. If the footing and barrier are cast monolithically, #6 S shape rebar is not required.

4. Barrier width shall not exceed the barrier footing width nor overhang the adjacent pavement.

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

6. Thickness of gutter, 'G' can be adjusted to match the PCP thickness, as approved by the Engineer.

7. Two-inch deep construction joints shall be placed in the gutter at locations which match the joints in adjacent PCP and at approximate 10 centers when adjacent to HD pavement. Joints shall be either hand tooled or sawn.

SECTION A-A

CONSTRUCTION JOINT DETAIL

BARRIER GUTTER DETAIL

ELEVATION

PLAN
GENERAL NOTES
1. All concrete shall be Class S, f'c=4000 PSL.
2. All rebar shall conform to Std 500.1.00.
3. All rebar shall have 0.01 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 band dimensions for rebar are cut-out to rebar.
8. Two-inch deep contraction joints shall be placed in the gutter at locations which match the joints in the adjoining curbs. The maximum length of the joints shall be limited to 10'.}

SECTION C-C
TRANSITION TO VERTICAL TYPE CURB

SECTION A-A

SECTION B-B
GENERAL NOTES

1. All concrete shall be Class 5, f'c=4000 PSI.
2. All rebar shall conform to Std Spec 1003.
3. All rebar shall have 2" minimum clear cover unless otherwise noted.
4. See drainage sheets for slotted drain and catch basin details.
5. Barrier transition shall match the adjoining concrete half barrier.
6. See Std Dwg C-05.20 for sidewalk construction.
7. All bend dimensions for rebar are cut-out to cut-out of bends.
   - 3'" 0" to 8"'
   - 0" 0" to 10'

SECTION A-A

SECTION B-B

SECTION C-C

BARRIER GUTTER DETAIL

ELEVATION

PLAN VIEW

CONCRETE HALF BARRIER TRANSITION TYPE "A" AT RADIUS 32" TO 0"

STATE OF ARIZONA
DEPARTMENT OF TRANSPORTATION
ROADWAY STANDARD DRAWINGS

DRAWN BY:
CHECKED BY:
APPROVED FOR PRINT:
APPROVED FOR CONSTRUCTION:
SIGNATURE:
DATE:

Dwg No.:

Sheet 3 of 3

See plans.
GENERAL NOTES

1. Posts shall be 12'10" Center to Center. Structural steel shall conform to ASTM A36, galvanized in conformance with ASTM A523.

2. Hex head bolt shall conform to ASTM A325, galvanized in conformance with ASTM A53, Class C.

3. Heliarc spring lock washer shall conform to ASTM A325, galvanized in conformance with ASTM A53, Class C.


5. Hog rings: ANG number 12 J0.060" galvanized in conformance with ASTM A53, Class 2. Fasten glare screen to top and bottom tension wire spaced approximately 2' apart.

6. Glare Screen: 18 gauge steel. ASTM A525, galvanized in accordance with ASTM A525/A525M, expanded to the following dimensional Loch shortway of diaphragm and cracks. The top tension wire shall pass through a 3/4" hole in the top edge of the glare screen, with a strand width of 0.250" angled at approximately 20° to the plane of the original sheet. Top edge to be shop curved and trimmed on 12° center to center. Glare screen shall be installed such that flat portion of screen blocks light from headlights. See Directional Detail.

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

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

ELEVATION

TENSION WIRE ROUTING DETAIL

Cross Brace Post
Top Tension Wire
Bottom Tension Wire

Cross Brace Post
Top Tension Wire
Bottom Tension Wire
GENERAL NOTES

1. See Std Dwg C-11L20 for all other Cattle Guard details.
2. This standard shall be used in embankment or where highly erodable soil is found.
3. All concrete shall be Class B.

SECTION A-A

Transition to Std Dwg C-0A10
Spillway is symmetrical
About Subgrade/Slope Hinge Point

SECTION C-C

IN EMBANKMENT

SECTION C-C

WHERE USED FOR THROUGH DRAINAGE-
CATTLE GUARD OPEN BOTH ENDS

SECTION B-B

6'-0½"

Flow Line

6'-0½"

Flow Line

6½x6x4 Welded
Galvanized Wire Mesh
GENERAL NOTES

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

2. Woven wire fabric shall be attached to the post at the top, bottom, and intermediate wires.

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

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

(1) ASTM design number

TYPICAL WOVEN WIRE FENCE INSTALLATION-TYPE 1 WW SHOWN

TYPE 1 WOVEN WIRE (WW)

TYPE 2 WOVEN WIRE (WW)

TYPE 3 WOVEN WIRE (WW)

TYPE 4 WOVEN WIRE (WW)

FENCE FABRIC DIMENSIONS AND DESIGN NUMBERS
GENERAL NOTES

1. Intermediate Post Assemblies shall be located as shown and at intervals not to exceed 500', 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.

TYPICAL BARBED WIRE FENCE INSTALLATION-TYPE 2 BW SHOWN

TYPE 1 BARBED WIRE (BW) (4 WIRE)

BARBED WIRE GAME FENCE (GF)

TYPE 2 BARBED WIRE (BW) (5 WIRE)
TYPICAL FENCE LOCATION AT CATTLE GUARD

TYPICAL CROSS SECTIONS OF LINE POST SHAPES

DETAIL A

TEA Channel or U at 1.33 lbs/ft

Y-BAR

DETAIL B

ABUTTING FENCE

ABUTTING FENCE AT POST

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 7/8" x 2 7/8" x 1/4" at 410 lbs/ft, and brace angles 2 7/8" x 2 7/8" x 1/8" at 319 lbs/ft.
### GENERAL NOTES

1. Posts shall be round, in section, or re-formed and shall conform to the nominal dimensions requirements shown on the plans. Dimensional tolerances for all shapes shall be in accordance with ASTM A500. In addition, the material of which posts are fabricated shall have a nominal thickness of not less than 0.112" for line posts and 0.135" for terminal posts.

2. Chain link fabric shall be either zinc-coated or aluminum-coated steel wire fence fabric. Zinc-coated steel fabric shall conform to the requirements of ASTM A320, Class I coating. Aluminum-coated steel fabric shall conform to the requirements of ASTM A475, with a minimum weight of coating of 5.40 ounces per square foot of wire surface area. Fabric shall be 11 gauge for all fence fabric over 6 feet in height and shall be 8 gauge for fabric greater than 60" in height.

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

4. Truss rods shall be 1/2" diameter adjustable rods. Truss tightening bars shall have a strap thickness of not less than 1/8".

5. Stretched bars shall be 3/4" by 3/4" steel flat bars. Stretched bar welds shall be 3/8" by 1/8" preformed steel bends.

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

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

8. See Sheet 3 of 3 for typical fence location.

---

### TYPICAL CHAIN LINK FENCE INSTALLATION - TYPE I SHOWN

#### TYPICAL POST DIMENSIONS

<table>
<thead>
<tr>
<th>Fabric Height (in)</th>
<th>Corner, End, Intermediate, Gate, Latch and Pull Posts</th>
<th>Line Posts</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Length (ft-in)</td>
<td>Round</td>
</tr>
<tr>
<td>26</td>
<td>6-0</td>
<td>2.975</td>
</tr>
<tr>
<td>48</td>
<td>7-0</td>
<td>2.975</td>
</tr>
<tr>
<td>60</td>
<td>8-0</td>
<td>2.975</td>
</tr>
<tr>
<td>72</td>
<td>9-0</td>
<td>2.975</td>
</tr>
<tr>
<td>Over</td>
<td>Height +5&quot;</td>
<td>2.975</td>
</tr>
<tr>
<td></td>
<td>Height +6&quot;</td>
<td>2.975</td>
</tr>
</tbody>
</table>
GENERAL NOTES

1. Barbed wire for use with Type 2 chain link fence shall be 12 gauge steel wire with 4 point 16 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 A62, Class 1 coating. Aluminum-coated steel wire shall conform to the requirements of ASTM A851, Type 1, Class 1 coating.

2. Barbed wire support arm shall be of the type shown on the plans, and shall be fabricated from commercial quality steel, and shall be zinc-coated in accordance with the requirements of AASHO M119.

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

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

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

TYPICAL CHAIN LINK FENCE INSTALLATION - TYPE 2 SHOWN

TYPICAL POST DIMENSIONS

<table>
<thead>
<tr>
<th>Fabric Height (ft)</th>
<th>Corner, End, Intermediate, Gate, Latch and Pull Posts</th>
<th>Line Posts</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Length (ft-lin)</td>
<td>Round</td>
</tr>
<tr>
<td></td>
<td>1000 lin</td>
<td>3 1/2 lin</td>
</tr>
<tr>
<td>T2</td>
<td>8-6</td>
<td>2.375</td>
</tr>
</tbody>
</table>

DETAIL 2
BARBED WIRE SUPPORT ARM
### TYPICAL GATE DIMENSIONS

#### SINGLE AND DOUBLE SWING GATES

<table>
<thead>
<tr>
<th>Gate Width (FT)</th>
<th>Vertical Braces</th>
<th>Gate Post Size</th>
<th>Gate Width (FT)</th>
<th>Vertical Braces</th>
<th>Gate Post Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>6' to 8'</td>
<td>0</td>
<td>2.875</td>
<td>3 to 8</td>
<td>0</td>
<td>2.875</td>
</tr>
<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>
</tr>
<tr>
<td>16 to 24</td>
<td>2</td>
<td>4.000</td>
<td>16 to 24</td>
<td>2</td>
<td>4.000</td>
</tr>
</tbody>
</table>

#### ROLLING GATES

<table>
<thead>
<tr>
<th>Gate Width (FT)</th>
<th>Vertical Braces</th>
<th>Gate Post Size</th>
<th>Gate Width (FT)</th>
<th>Number of Equally Spaced Vertical Braces</th>
<th>Tension Rods Per Braced Panel</th>
<th>Gate Post Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 to 6</td>
<td>0</td>
<td>2.875</td>
<td>6</td>
<td>0</td>
<td>0</td>
<td>2.875</td>
</tr>
<tr>
<td>6 to 12</td>
<td>1</td>
<td>4.000</td>
<td>12</td>
<td>1</td>
<td>1</td>
<td>2.875</td>
</tr>
<tr>
<td>12 to 24</td>
<td>2</td>
<td>4.000</td>
<td>24</td>
<td>2</td>
<td>1</td>
<td>2.875</td>
</tr>
</tbody>
</table>

#### GATES FOR CHAIN LINK FENCE - TYPE 1 SHOWN

*Type 2, With Barbed Wire Typical*
1. All concrete shall be Class S, f'c=4000 PSI.
2. All bolts, nuts, washers and fittings shall meet the dimensional requirements of the American National Standards Institute, unless otherwise designated, and shall be galvanized in accordance with ASTM A53.
3. Galvanized swaged fittings and U-Bolt shall conform to ASTM A499.
4. The 3/4" galvanized wire rope shall conform to AASHTO A314 Class B, Type 1.
5. The wire fabric, ties, bands, stretcher bars, and other fittings and hardware shall conform to AASHTO M144.
6. The wire fabric fence shall follow contour of the graded median.
7. The excauation for the concrete anchor blocks shall be to neat lines. Maximum excess shall be 3".
8. Perforated posts shall be square tube formed from 0.090" USS gauge ASTM A500/A500M cold rolled carbon steel. The square tubes shall be enclosed in the corner of the post. The corner shall be form to be galvanized to conform to general requirements of ASTM A653/A653M. Coating thickness shall be 225.
9. The cables shall have enough tension to prevent sagging. The location of the cable anchor blocks may also be varied to provide enough tension to prevent sagging.
10. Two interior U-Bolt and clamp bars shall be spaced at 1/3 of the distance between posts.
12. An alternate to rectangular concrete anchor blocks shall be a 1/2" diameter round footing with an additional depth of 4/".
13. The median approach grade within 100' of the chain link cable barrier should not exceed a grade break of 10 percent.
### GENERAL NOTES

1. See plans for any required inlet and/or outlet protection.
2. Dimensions \( W \) and \( E \) apply to both non-trench and trench conditions.
3. Minimum cover over pipe culverts shall be 12" measured from the top of pipe.
4. See Pipe Berm Requirement Detail for pipe berm requirements and Std Deg C-0330 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. Plating of slopes at pipe locations similar for pipes without end sections and for multiple pipe installations.

### MINIMUM SPACING FOR MULTIPLE INSTALLATIONS WITHOUT END SECTIONS

<table>
<thead>
<tr>
<th>Diameter or Span (in)</th>
<th>Installation Type</th>
<th>Freeway (in)</th>
<th>Headwall (ft) (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>18</td>
<td>12</td>
<td>2-6</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>12</td>
<td>3-0</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>15</td>
<td>3-9</td>
<td></td>
</tr>
<tr>
<td>36</td>
<td>18</td>
<td>4-6</td>
<td></td>
</tr>
<tr>
<td>42</td>
<td>21</td>
<td>5-3</td>
<td></td>
</tr>
<tr>
<td>48 to 66</td>
<td>10 or 5/2</td>
<td>00 + 3-0</td>
<td></td>
</tr>
<tr>
<td>72 and Over</td>
<td>36</td>
<td>00 + 3-0</td>
<td></td>
</tr>
</tbody>
</table>

### CULVERT INSTALLATION WITHOUT END TREATMENT

- Culvert Length without End Treatment
- Recovery Area
- Lane Edge

### CULVERT INSTALLATION WITH END SECTION

- Culvert Length with End Section
- Recovery Area
- Lane Edge
- End Section: Std Deg C-13.20 or C-13.25 See Plans

### CULVERT INSTALLATION WITH HEADWALL

- Culvert Length with Headwall
- Recovery Area
- Lane Edge
- Headwall: See Bridge Group Std Digs

### PIPE WITH BERM REQUIREMENT DETAIL

- See General Note 4

### MULTIPLE INSTALLATIONS WITH END SECTIONS

- State of Arizona
- Department of Transportation
- Roadway Standard Drawings
- PIPE CULVERT INSTALLATION

### PLAN

- Recovery Area
- Slope Slope See Plans
- Parking See Plans

### ELEVATION WITHOUT END SECTION

- Minimum Thickness 2" of Impervious Material
- See Std Spec

### ELEVATION WITH END SECTION

- Minimum Thickness 2" of Impervious Material
- See Std Spec

### PLATING SLOPES AT PIPE LOCATIONS

- 12" Minimum
- End Sections
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.
GENERAL NOTES

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

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

3. Bracing and soil shall conform to OSHA requirements.

4. Pipe backfill may be bedding material.

5. In a non-trench condition, the embankment for pipe stability shall be constructed in fits to the limits shown in the detail simultaneously with the bedding material and pipe backfill. If the contractor chooses to construct it as a trench condition, the embankment shall be constructed before excavating the trench.

D - Outside diameter of full circle pipe or outside dimension taken or rise of arch pipe, ellipsoidal pipe.

T - Minimum wall thickness for MCIPCP. See Plans.

D - 6 inches except when on ungraded or unstable material. See 5th Spec.

- Trench backfill
- Pipe backfill
- Bedding

NON-TRENCH CONDITION

TRENCH CONDITION
IN NATURAL GROUND OR IN EMBANKMENT

TRENCH CONDITION
IN NATURAL GROUND OR IN EMBANKMENT WITHOUT BRACING

TRENCH CONDITION
IN NATURAL GROUND OR IN EMBANKMENT WITH BRACING SHOWN
### 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 (lbs)</th>
<th>Approximate Slope</th>
</tr>
</thead>
<tbody>
<tr>
<td>T</td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>24</td>
<td>1530</td>
<td>3</td>
</tr>
<tr>
<td>27</td>
<td>1930</td>
<td>3 2/3</td>
</tr>
<tr>
<td>30</td>
<td>2190</td>
<td>3 2/3</td>
</tr>
<tr>
<td>36</td>
<td>4100</td>
<td>4</td>
</tr>
<tr>
<td>42</td>
<td>5360</td>
<td>4 2/3</td>
</tr>
</tbody>
</table>

![Diagram of Culvert Length as shown on plans](image)

**RIGHT ANGLE CULVERT**

**SPACING FOR MULTIPLE INSTALLATION**

**FRONT ELEVATION**

**SKEWED CULVERT**

---

**PLAN**

**SECTION A-A**

---

**Culvert Length as shown on plans**

**Embarkment Slope**

**Normal Toe of Slope**

---

**C**

**B**

---

**A**

---

**C**

**B**

---

**A**

---

**C**

**B**

---

**A**

---
**GENERAL NOTES**

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

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

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

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

5. All steel end section components shall be galvanized.

6. Toe of embankment shall be warranted to toe of skews end section.

7. A term shall be added to abnormal projections per SDR 00300 C-13.7.0.

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

---

### Table: Circular Pipe Dimensions (in)

<table>
<thead>
<tr>
<th>Diameter (in)</th>
<th>Gauge</th>
<th>A</th>
<th>B</th>
<th>H</th>
<th>L</th>
<th>W</th>
<th>N</th>
<th>Approximate Slope</th>
<th>Connection Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td>16</td>
<td>8</td>
<td>8</td>
<td>6</td>
<td>31</td>
<td>36</td>
<td></td>
<td>22f</td>
<td>2, 3, 4</td>
</tr>
<tr>
<td>24</td>
<td>16</td>
<td>10</td>
<td>13</td>
<td>6</td>
<td>41</td>
<td>49</td>
<td>22f</td>
<td></td>
<td>2, 3, 4</td>
</tr>
<tr>
<td>30</td>
<td>14</td>
<td>12</td>
<td>8</td>
<td>6</td>
<td>31</td>
<td>57</td>
<td>22f</td>
<td></td>
<td>2, 4</td>
</tr>
<tr>
<td>36</td>
<td>14</td>
<td>14</td>
<td>8</td>
<td>6</td>
<td>60</td>
<td>72</td>
<td>22f</td>
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<td>2, 4</td>
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<td>42</td>
<td>12</td>
<td>17</td>
<td>11</td>
<td>10</td>
<td>69</td>
<td>84</td>
<td>22f</td>
<td></td>
<td>3</td>
</tr>
</tbody>
</table>

---

### Table: Pipe Arch Dimensions (in)

<table>
<thead>
<tr>
<th>Span (ft)</th>
<th>Rise (ft)</th>
<th>A</th>
<th>B</th>
<th>H</th>
<th>L</th>
<th>W</th>
<th>N</th>
<th>Approximate Slope</th>
<th>Connection Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>21</td>
<td>15</td>
<td>16</td>
<td>11</td>
<td>6</td>
<td>24</td>
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<td></td>
</tr>
<tr>
<td>28</td>
<td>20</td>
<td>16</td>
<td>16</td>
<td>6</td>
<td>32</td>
<td>48</td>
<td>22f</td>
<td>2, 3, 4</td>
<td></td>
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<tr>
<td>35</td>
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<td>14</td>
<td>12</td>
<td>12</td>
<td>46</td>
<td>75</td>
<td>22f</td>
<td>2, 4</td>
<td></td>
</tr>
<tr>
<td>49</td>
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<td>20</td>
<td>9</td>
<td>53</td>
<td>84</td>
<td>22f</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>
GENERAL NOTES

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

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

3. Use bevel on inlet headwall only.

4. Wire mesh shall be fastened or welded to corrugation crests at intervals and in a manner approved by the Engineer. Laps shall be 6" minimum.

5. Paving shall be placed until becketting is completed.

6. Concrete shall be Class B.

HEADWALL INSTALLATION
(SEE STANDARD DRAWING B-11.12)

PROJECTING INSTALLATION

SECTION A-A

SECTION B-B
GENERAL NOTES

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

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

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

4. Pipe shall be backfilled before concrete bond beam is constructed. Minimum footing 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 61.

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

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

2. "1" connections direct to the main drainage trunk line should be avoided and used only where manhole connections are impractical.

SECTION A-A
TYPICAL CONNECTION BETWEEN CATCH BASIN AND MANHOLE

SECTION B-B
Pipe Cross Connection

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

SECTION D-D

PLAN
TYPICAL SLOTTED DRAIN AND CATCH BASIN INSTALLATION WITH MANHOLE

PLAN
TYPICAL SLOTTED DRAIN AND CATCH BASIN INSTALLATION WITHOUT MANHOLE
GENERAL NOTES

1. Prefabricatedtees 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 memoirs are shown on plans.

2. Centerline of the inlet pipe shall intersect the centerline of the main storm drain except when elevation "5" is shown on plans.

3. If θ is 45° or less, Type I connection shall be used.

4. All concrete shall be Class B.

5. All rebar shall conform to Std Specs 1003-1 & 2.

6. Rebar shall have 2" minimum cover.

SECTION A-A

CATCH BASIN ABOVE STORM DRAIN
TYPE 2

SIDE INLET
TYPE I

CONNECTION DETAIL
TYPE 2
GENERAL NOTES

1. All shear pin angles shall fit snug and true to face. Cover with waterproof grease prior to installation of pin.
2. Shear pin holes in the angle shall be drilled for a tight fit of the pins.
3. Both ends of the shear pins shall be peened after installation.
4. Shear pin material shall be corrosion-resistant aluminum wire (500, per ASME, Standard A35).
5. Generalize all ferrous parts after fabrication.
6. Frame and hinge angles shall have the outstanding legs cut.
7. All steel shall be in accordance with ASTM A36.
8. Barrier bars shall be equally spaced.
9. Hinge pin material shall be bolt stock and threaded on both ends so not and lock washer are flush with the lower angle. Cover pin with waterproof grease. Do not overtighten to prevent rusting or damage exposed threads after installation.
10. All welding shall be in accordance with A36 Spec 604-306.

PIPE ACCESS BARRIER FRONT ELEVATION

ACCESS BARRIER GATE DIMENSION SCHEDULE

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GENERAL NOTES

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

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

DRAINAGE OUTLET INTO CHANNEL

STORM DRAIN PLUG
GENERAL NOTES

1. All concrete shall be Class B.
2. All rebar shall conform to Std Spec 1003-1.2.
3. All rebar shall have 3" minimum clear cover.
4. A concrete collar shall be required where pipes of different diameters or materials are joined or where the design change in alignment or grade exceeds that allowed for a standard joint.
5. When pipes of different diameters are joined with a concrete collar, "L" & "N" shall be those of the larger diameter.
6. The diameter of the circular ties shall be the outside diameter of pipe + 1.5.
7. Pipe ends to be trimmed such that the maximum distance between pipes at any point is 2".

TYPICAL LATERAL CONNECTIONS TO CATCH BASINS WITH CONCRETE COLLARS

OUTLET COLLAR DETAIL

PIPE COLLAR TABLE

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GENERAL NOTES

1. Catch basin used at roadway end.
2. Pipes can be placed in any way.
3. Sump floor shall be a wood troweled finish with a minimum 4 inch slope in all directions to outlet.
4. All rebar shall be ASTM A36.
5. All welding shall be in accordance with Std Spec 604-3.09.
6. Grate, frame, beam and nose plate shall be given one shop coat of primer No. 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-1570.
9. Any specified inlet depression shall be verified to opening according to Std Dwg C-1570.
10. Silicone sealant shall be placed between the grate frame and PCP, recessed 1/4" from the pavement surface.
11. Curb opening areas, sq ft, for Type 1 Single and Type 1 Double equal 0.25 and 0.54, respectively. For each inch of "H" + inlet depression - 0.375. See Std Dwg C-1570.
12. See Std Dwg C-1570 for grate and frame details and grate opening areas.
13. \[ h = \begin{cases} 6\text{"} & \text{if } H \leq 8\text{"} \\ 8\text{"} & \text{if } H > 8\text{"} \end{cases} \]

SECTION A-A

- Nose Plate and Anchor
- See Detail 1
- Inlet Depression
- See Plans
- Grate Support for Catch Basin
- Type 1 Double Only
- See Detail 2
- Construction Joint (Typ)

SECTION B-B

- Use this section when 1-8" 
- Anchor #4 Rebar

DETIAL 1

- Nose Plate 8" x 6" Bent Plate Lengths 2-10' + 21' for CB 1-Single 6-1/2' + 21' for CB 1-Double
- 1/4" Stove Bolt per Frame, Avoid Conflict with Grate
- N x 5/8 x 5/8 or N x 3/8 x 3/8
- Lengths 1-23'9"

DETIAL 2

- Inlet Depression
- See Plans
- Veres - 2-6" or 4-6" (Typ)

DETIAL 3

- Nose Plate
- Anchor #4 Rebar
- #3 Rebar
- 2-6" Gutter Slope
- Normal Gutter Slope
- Gutter Control Grade

DETAIL FOR WIDE GUTTER

(SEE STD DWG C-0510)
GENERAL NOTES

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

2. Catch basin has three configurations:
   - Sump only: Sump portion of catch basin
     (See detail 4, Sheet 2 of 2).
   - Single Wing: Single wing catch basin upstream.
   - Double Wing: Sump and symmetrical wing basins each side.

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

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

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

6. All rebar shall be ASTM A36.

7. Nose plate, access frame and cover shall be given one shop coat of Number 0 paint.

8. All concrete shall be Class B.

9. Curb opening area is 5 ft² per inch of curb on "l" and gutter depression curb opening length ("l" + 0.055).

10. All welding shall be in accordance with Std Spec 064-3.06.

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

12. G = 6" when h is 8" or less, 8" when h is greater than 8."
GENERAL NOTES

1. Cover shall be non-locking.
2. Frame and cover shall be cast iron or structure steel.
3. Catch basin access frame and cover is for use in sidewalk area only.
4. Cover shall be fitted with concrete and broom finished.
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 3/8" at any point.
5. Grate opening is 3.60 sq ft.
6. Bracing of frame is recommended for handling and placement purposes.
7. Frame and Grate to be used with Std Dwg C-15,30 and C-15,40.
8. Grate may be used with Std Dwg C-15,92 Frame.

SECTION A-A

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

SECTION B-B
GRATE
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 S10 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 "+, 1/2" center to center, with 3" minimum clear to inside of wall and floor.
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 Spec 604-3.06.
4. Grate assembly shall be given one shop coat of Number 1 paint.
   Apron slopes shall match the natural flow line of the ditch. No additional depression will be allowed.

   91° = 6° when it is 8' or less.
   8° when it is greater than 8'.

SECTION B-B

DITCH GRADE DETAIL

DETAILED DESIGN

STATE OF ARIZONA
DEPARTMENT OF TRANSPORTATION
ROADWAY STANDARD DRAWINGS

REVISIONS:
- Date: 9/04
- Category: C-15.80

APPROVED FOR CONSTRUCTION
5/24

DRAWING NO.
C-15.80

PROJECT:
CATCH BASIN

FLASH

4 1/2" x 4" Bolt Anchors
Bend: 45°
GENERAL NOTES

1. All concrete shall be Class B.
2. All rebar shall have 2' minimum clear cover unless otherwise noted.
3. No rebar shall be placed 12" center to center. Horizontal & Vertical in walls.
4. Pipes may be placed in any wall.
5. See Std Dwg. C-13.60 and C-13.65 for more information and dimensions of slotted drains.

Includes 1" Inlet Depression

- 6" when H is 6' or less
- 8" when H is greater than 8'

NOOTES: Bend Rebars and Cover with Two Layers of 4 x 4 Timber

SECTION A-A

SECTION B-B

STATE OF ARIZONA
DEPARTMENT OF TRANSPORTATION
ROADWAY STANDARD DRAWINGS

FREEMAY CATCH BASIN DETAILS

C-13.54
Sheet 1 of 2
1. All structural steel shall be in accordance with ASTM A36.
2. All welding shall be in accordance with 5th Spec 604-3.06.
3. The completed grate assembly (frame & grate) shall be given two shop coats of Number 1 paint.

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

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<th>GRADE AND FRAME DIMENSIONS</th>
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<tr>
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<tr>
<td>B</td>
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<td>C</td>
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3/8"x5/16" Bar See Brace Plate Detail

3/8"x1/2" Concrete Anchor Studs (Typ.)

SECTION A-A

SECTION B-B
GENERAL NOTES

1. See Std Dwg C-15.31 for dimensions, sizes and details not shown for construction of catch basin.
2. See Std Dwgs C-15.32 and C-15.33 for dimensions, sizes and details not shown for construction of barrier.
3. See Std Dwg C-15.60 for dimensions, sizes and details not shown for construction of slotted drain.
4. Only longitudinal reinforcing steel shall be placed in half barrier within 1' of catch basin frame. S-shape bars shall not be placed in the rear wall of the catch basin.

   a. 1'-3" for 18" diameter slotted drain
   b. 1'-6" for 24" diameter slotted drain
   c. Angle varies, approximately 45°
   d. Varies in increased height over catch basin and slotted drain inlet depression
   e. Depressed elevation.
   f. Normal pavement or gutter flow line elevation.
   g. Match adjacent gutter depression, additional inlet depression as specified.
   h. 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 frame (Sheet 2 of 2) for locations with bicycle traffic.

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

HALF BARRIER INSTALLATION
AT SLOTTED DRAIN LOCATIONS

CATCH BASIN WITH HALF BARRIER

GUTTER DEPRESSION
AT SLOTTED DRAIN LOCATIONS

STATE OF ARIZONA
DEPARTMENT OF TRANSPORTATION
ROADWAY STANDARD DRAWINGS

CATCH BASIN
WITH
TYPE 9" CONCRETE HALF BARRIER

1'-3"

4'-6"

6'

3'-0"
GENERAL NOTES
1. All grading shall be in accordance with 
   Std Spec 604-3.06.
2. Grate opening for grate shown is 4.75 sq ft.
3. All grading shall be in accordance with Std 
   Spec 604-3.06.
4. Beveled side of grate toward barrier

NOTE TO DESIGNERS
Grate design shown is not suitable for locations subject 
   to bicycle traffic. See Std Spec C-15-50 grate with Std 
   Spec C-15-52 frame (Sheet 2 of 2) for locations with 
   bicycle traffic.

SECTION A-A

SECTION C-C

GRATE

SECTION B-B

FRAME
GENERAL NOTES

1. Irrigation sleeves shall be installed in a trench condition. See Std Dwg C-1301.
2. Bedding and backfill material shall be Class 2 AB.
3. Pipe installation shall conform to Section 501 of Std Specs.
4. The contractor shall install a 4" high letter "S" on the face of all curbs at sleeve locations. The width of the letter shall be ¾" 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 super-elevated sections. Minimum slope nominal 0.6%.

▲ 2'-0" Back of Curb Median

TYPICAL INSTALLATION

DUMBELL WATERSTOP

IRRIGATION SLEEVES

C-1640

STATE OF ARIZONA
DEPARTMENT OF TRANSPORTATION
ROADWAY STANDARD DRAWINGS

REV.
9/04

Approved for Construction
By:...

Approved for Use
By:...

Drawn by:...

Approved for Print
By:...

Scale: 1/4" = 1'-0"
**GENERAL NOTES**

1. Rock shall conform to Section 9.3.3.0.1(A) of the Standard Specifications. The rock shall have a minimum nominal diameter no smaller than the mean opening, and a maximum nominal diameter of 12".

2. At any wire, tie wire, cable, bolts, washers and nuts shall be galvanized.

3. When other embankment slope rates are encountered, refer to 12" or 24".

4. High survivability filter fabric shall conform to Section 9.3.2.0.5 of the Standard Specifications.

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

---

**TYPICAL SECTION**

See Perspective Std Dev C-11.10

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**ELEVATION AT CHORD POINT ON CURVE**

**ELEVATION ON STRAIGHT SECTION**

**SECTION**

**WIRE MESH SPlice DETAILS**
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 32 inches shall have steps. Manhole steps shall be constructed in accordance with ASHTO M190. Where precast manholes are used, the steps shall be installed at the same time sections are cast.

5. Per OSHA requirements, special treatments to include landings are required for heights exceeding 30 ft.

6. Precast manhole sections shall be manufactured in accordance with ASHTO M190, except that the compressive strength of each section shall be determined and accepted in accordance with Std Spec 1006-T.

7. Manhole location and elevation shall be as shown on plans. See Sheet 1 of 3 for station location reference point.

8. Backfill connection shall conform to Std Spec 302-2 and 306.

- 4", 6", 8", or 12" (30" Inside Diameter) Grade Rings
  - ½"/ft
  - See Sheet 2 of 3
GENERAL NOTES

1. Ford walls shall be Class B concrete.

2. Depth gauge tubing shall be protected against concrete entering through bottom or perforations.

3. Depth gauge tubing and both sides of numerals tabs shall be painted with two coats of black enamel. Numerals and markers shall be painted with one coat of gloss black enamel.

4. Depth gauge foundation may be utility concrete.

CONCRETE SURFACE ROAD
CONCRETE WALLS

• Min Distance Below Stream Bed

See Depth Gauge Detail
See Joint Detail
Roadway Width
Roadway
Finished 5% Grade
See Joint Detail
Slope 0.015/ft

1 Cu Ft Coarse AB (MAX 0.05 N3 Size 7)
Security Tied In Burlap

2-4 Rebars Top and Bottom
3" Rebar Hole

2-3/8"x4"x18 Gauge Sheet Metal Number Tabs, Both Sides, Fastened with Two 2-3/8" Bolts Through Tube

1-1/8"x3-10" Perforated Telescoping Square Tube 12 Gauge, 1/4" Holes, 1 Center to Center 4 Sides

2"x2-1/2"x1/2" Numeral

JUNCTON DETAIL

DEPTGH GAUGE DETAIL

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

3" Rebar Hole
20" Center to Center

BITUMINOUS SURFACE ROAD
CONCRETE WALLS

See Depth Gauge Detail
See Joint Detail
Roadway Width
Roadway
Finished 5% Grade
See Joint Detail
Slope 0.015/ft

1 Cu Ft Coarse AB (MAX 0.05 N3 Size 7)
Security Tied In Burlap

2-4 Rebars Top and Bottom
3" Rebar Hole

2-3/8"x4"x18 Gauge Sheet Metal Number Tabs, Both Sides, Fastened with Two 2-3/8" Bolts Through Tube

1-1/8"x3-10" Perforated Telescoping Square Tube 12 Gauge, 1/4" Holes, 1 Center to Center 4 Sides

2"x2-1/2"x1/2" Numeral

ELEVATION LOOKING UPSTREAM

Wall to be Built to One Foot Above High Water Level
Wall May Be Built to this Line
3" Rebar Hole
20" Center to Center
**GENERAL NOTES**

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

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**DETAIL A**

![Diagram of Detail A](image)

- 12" Diameter x 12" Deep Concrete Foundation for Depth Gauge
- Full Circle for Type 1
- Half Circle for Type 2

---

**ELEVATION - TYPE 2**

![Diagram of Elevation - Type 2](image)

- 32 Maximum
- 32 Maximum
- Optional Rock Basket
- Full Length of Structure
- See Detail A and Plans

---

**TYPE 2 BITUMINOUS SURFACE FORD TIMBER CUTOFF WALLS**

- 4x4x5'-0" Post
  - 5' Center to Center
- 2-2'x12' Planks
- 2-2'x12' Planks

---

**TYPE 1 BITUMINOUS SURFACE ROAD**

- Depth Gauge
- Roadway Width
- Roadway
- Roadway Width
- Slope 0.095%/ft
- 3-2'x12' Planks
- 4x4x5'-0" Post
  - 3' Center to Center
- 3-2'x12' Planks
- 4x4x5'-0" Post
  - 3' Center to Center
- Mail to be Built to One Foot Above High Water Level
- 4' Minimum

---

**WITH TREATED BASE**

- Depth Gauge
- See Depth Gauge Detail Sheet 1 of 2
- Width of Seal Coat
- Roadway Width
- Roadway
- Roadway
- Slope 0.019%/ft
- Flow
- 6ft
- 6ft
- Seal Coat Width

---

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

- **DATE**: 9/04
- **DRAWING NO.**: C-18310
- **SHEET**: 2 of 2
1. A survey monument and frame & cover, complete-in-place, shall be considered a unit.
2. A Right-of-Way marker, consisting of a survey monument and a reference marker, complete-in-place, shall be considered a unit.
3. All markers shall be placed as shown on the plans or as directed by the Engineer.
4. Frames may be either Type A or Type B.
5. Frames shall weigh at least 55 pounds.
6. Covers shall weigh at least 16 pounds.
7. Machined portions of the frame and cover are shown by the symbol "." The allowable tolerance for machined areas is 1/32. Concrete shall conform to Std Spec 922.
8. Survey monuments shall be magnetically detectable.

Survey monuments shall be 3" Series E in Conformance with MTCO.

1/2" or pavement structure thickness, whichever is greater.

Survey Monument:
PC 10 + 43.82

Frame and Cover:
Survey Monument

Right-of-Way Marker:
Elevation Reference Marker

Elevation Survey Monument

Hallmark

6" Diameter Minimum

May be poured to nearest lines below grades

3'-0"

Two Coats With Epoxy

Lettering shall be 2" Series E

Chamber 1/2"

11 1/2"

Diameter

10 1/2"

Diameter

8"

Diameter

8"

Diameter

15" Diameter

15" Diameter

16" Diameter

16" Diameter

Cast Iron Frame

"No Cut" Minimum

12" Minimum

#4 Rebar 15" Long

New or Existing Pavement

1/2"

7 1/2"

10"

COVER SECTION

STATE OF ARIZONA
DEPARTMENT OF TRANSPORTATION
ROADWAY STANDARD DRAWINGS

9/04

Survey Monument
Frame and Cover
Right-of-Way Marker

C-20.10

APPROVED FOR DESIGN
APPROVED FOR CONSTRUCTION
GENERAL NOTES

1. Survey marker may be used with survey monument, and as bench or R/W markers.
2. Survey marker will be furnished by the Department. Cast-in-littering format may vary.
3. When used to define section lines, the marker shall be stamped in accordance with the BLM "Manual of Surveying Instructions."
4. When used to define R/W not consisting of section lines, the marker shall be stamped in accordance with Detail A, R/W Marker Information.
5. When used as a R/W marker or to define a section line, the land surveyor's registration number shall be stamped on the marker.
6. Bench marks shall be established on headwalls, bridge wails and other permanent structures, as shown on plans or as directed by the Engineer.
7. Station, elevation, year, and/or other information shall be hand stamped in steel, as approved by the Engineer.
8. Survey marker shall be made of brass.
9. Shank cross-sectional area shall be a minimum of 0.5 square inches and a maximum of 0.60 square inches. Shank cross-section may vary and is not a critical feature of this standard.
10. Shank geometry shall provide for secure anchorage in concrete.
11. Text shall not obscure survey point.

- Right-of-Way plan number
- Point Number
- Registered Land Surveyor Number – see General Note 9
- Year
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REV. 9/07/04