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

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

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

- C-01.10, Sht 1 of 4: changed the order of the various boundary and jurisdictional lines
- C-02.20 and C-02.30: changed the steepest allowable slope for 1-1/2:1 to 2:1
- C-04.10, Sht 2 of 2: new drawing for double inlet in sag condition
- C-04.20, Sht 2 of 2: new drawing for double inlet in sag condition
- C-04.30 and C-04.40: revised tables as a result of slope changes in C-02.20 and C-02.30, and guidance on spillway and downdrain usage from the RDG
- C-05.10: added General Note 7 reading, "Place AB under single curb, valley gutter, and curb & gutter when shown on plans."
- C-05.20, Sht 1 of 2: added General Note 5 reading, "Place AB under driveways when shown on plans."
- C-05.20, Sht 2 of 2: added General Note 5 reading, "Place AB under sidewalks when shown on plans."
- C-05.30, Sht 1 of 7: changed slope rate in Sections A-A and C-C to 15:1; changed maximum ramp length at 15:1 slope to 15 feet
- C-05.30, Shts 2 - 5 of 7: changed maximum ramp length at 15:1 slope to 15 feet
- C-07.02: revised General Note 1 to read, "Load transfer dowel assemblies shall be used with non-skewed, mainline PCCP joints"
- C-10.00: revised graphics to match Bridge Group's Transition, SD 1.03; thrie-beam approach and departure transitions are now the same
- C-10.30, Sht 2 of 2: added anchor hardware drawings formerly shown on concrete barrier transition drawings
- C-10.32: deleted
- C-10.54 and C-10.55, Shts 1 & 2 of 3: added concrete cap to Section A-A; revised General Note 3 to read, "Longitudinal rebar shall extend 12" past the construction joint at the completion of each incremental pour."
- C-10.70, C-10.71, C-10.72, and C-10.73: removed Thrie-Beam Guardrail Transition System hardware details and added references to Std Dwg C-10.30
- C-11.10, Sht 1 - 4 of 4: re-issued drawing with additional sheet detailing the clamp
- C-18.10, Sht 1 of 3: added "NOTE TO DESIGNERS" reading, "Per OSHA requirements, special treatments are required for heights exceeding 30 ft."
Design personnel should incorporate the new edition of the C-Stds into their project plans. For projects at or near completion, where the inclusion of all new standard drawings is not practical, the 1A Sheet must accurately reflect the drawings' correct revision date. Construction personnel should review the drawing revisions for possible implementation on construction projects.

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

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

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

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

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

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

     Regional Traffic Engineers (4)
     Materials Group
     Local Government Section
     Engineering Consultant Section
     District Permits Office (9)
     Engineering Records
     Sam Elters
     Dan Lance
     Sam Maroufkhani
     Doug Forstie
NOTICE TO READERS: REVISION DATES

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

The format changes include font style and size, line weights and terminators, and placing information on the same levels as specified for plan sheets. These changes are universal for all the sheets and are not noted. The revision date for all the format changes is 5/07 and is noted in the title block. This is the revision date shown on the 1A sheet.

Engineering changes have been made to some of the drawings since the last edition was issued in October 2004. These numbered changes are noted in the revision block in the upper left-hand corner of the affected sheets and referenced by circled numbers on the drawings.

Future engineering revisions will be noted in the revision and title blocks, and the 1A sheet.
Standard Names with an asterisk (*) have recommended Special Provisions associated with them that can be found here. Be sure to review the recommended Special Provisions if you are using any of those drawings.
C-STANDARDS FEEDBACK FORM

* Required Information

PROJECT: *Project Name/No.: ___________________________________________________

Route: _________  Milepost: _________  District: _________________

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

*COMMENT OR QUESTION: Use back of form for additional space
_____________________________________________________________________________
_____________________________________________________________________________
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_____________________________________________________________________________

CONTACT INFORMATION: *Name: ______________________________   *Mail Drop.: ______
*Phone No.: ____________________ Constr./Maint./Design ORG No.: __________________
*E-mail Address: _______________________________________
_____________________________________________________________________________

For Office Use Only

ANALYSIS/EVALUATION: Use back of form for additional space
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RECOMMENDATION/ACTION: Use back of form for additional space
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Return forms to Ken Cooper, MD 615E, or fax: 602-712-3075
<table>
<thead>
<tr>
<th>DRAWING NO.</th>
<th>TITLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>C-01.10</td>
<td>SYMBOL LEGEND (4 SHEETS)</td>
</tr>
<tr>
<td>C-01.30</td>
<td>GENERAL ABBREVIATIONS (13 SHEETS)</td>
</tr>
<tr>
<td>C-02.10</td>
<td>SLOPES, RURAL DIVIDED HIGHWAYS</td>
</tr>
<tr>
<td>C-02.20</td>
<td>SLOPES, RURAL UNDIVIDED AND FRINGE-URBAN HIGHWAYS</td>
</tr>
<tr>
<td>C-02.30</td>
<td>SLOPES, MISCELLANEOUS ROADWAYS</td>
</tr>
<tr>
<td>C-03.10</td>
<td>DITCHES, CHANNELS, DIES AND BERRMS (5 SHEETS)</td>
</tr>
<tr>
<td>C-03.10</td>
<td>SPILLWAY, EMBANKMENT (2 SHEETS)</td>
</tr>
<tr>
<td>C-04.10</td>
<td>SPILLWAY LENGTH TABLE</td>
</tr>
<tr>
<td>C-04.40</td>
<td>DOWNDRAIN LENGTH TABLE</td>
</tr>
<tr>
<td>C-04.50</td>
<td>DOWNDRAIN ENERGY DISSIPATOR</td>
</tr>
<tr>
<td>C-05.10</td>
<td>CURB &amp; GUTTER, CURB, AND GUTTER</td>
</tr>
<tr>
<td>C-05.12</td>
<td>CURB &amp; GUTTER TRANSITIONS (3 SHEETS)</td>
</tr>
<tr>
<td>C-05.20</td>
<td>CONCRETE DRIVEWAYS &amp; SIDEWALKS (2 SHEETS)</td>
</tr>
<tr>
<td>C-05.30</td>
<td>MEDIAN PAVING AND NOSE TAPER</td>
</tr>
<tr>
<td>C-05.40</td>
<td>CONCRETE BUS BAY</td>
</tr>
<tr>
<td>C-06.10</td>
<td>DRIVEWAY &amp; TURNOUT LAYOUTS (2 SHEETS)</td>
</tr>
<tr>
<td>C-07.01</td>
<td>PECP JOINT LOCATIONS, MAINLINE (8 SHEETS)</td>
</tr>
<tr>
<td>C-07.04</td>
<td>PECP JOINT LOCATIONS, RAMPS &amp; CROSSROADS (5 SHEETS)</td>
</tr>
<tr>
<td>C-07.06</td>
<td>TRENCH BACKFILL AND PAVEMENT REPLACEMENT</td>
</tr>
<tr>
<td>C-08.20</td>
<td>PAVED GORE AREA</td>
</tr>
<tr>
<td>C-09.10</td>
<td>CONSTRUCTION STANDARD DRAWINGS - INDEX</td>
</tr>
<tr>
<td>C-10.00</td>
<td>GUARDRAIL MEASUREMENT LIMITS</td>
</tr>
<tr>
<td>C-10.01</td>
<td>GUARDRAIL INSTALLATION, TYPE A AND REFLECTOR TAB</td>
</tr>
<tr>
<td>C-10.02</td>
<td>GUARDRAIL INSTALLATION, TYPE B AND REFLECTOR TAB</td>
</tr>
<tr>
<td>C-10.03</td>
<td>W-BEAM GUARDRAIL, 48&quot; AND 60&quot;, BLOCKED-OUT TIMBER POST</td>
</tr>
<tr>
<td>C-10.04</td>
<td>W-BEAM GUARDRAIL, 48&quot; SI, BLOCKED-OUT STEEL POST</td>
</tr>
<tr>
<td>C-10.05</td>
<td>W-BEAM GUARDRAIL, 48&quot; MODIFIED, WITH FREEWAY CURB &amp; GUTTER (2 SHEETS)</td>
</tr>
<tr>
<td>C-10.06</td>
<td>W-BEAM GUARDRAIL, NESTED (2 SHEETS)</td>
</tr>
<tr>
<td>C-10.07</td>
<td>W-BEAM GUARDRAIL, BOLTED ANCHOR (2 SHEETS)</td>
</tr>
<tr>
<td>C-10.08</td>
<td>W-BEAM GUARDRAIL, END ANCHOR</td>
</tr>
<tr>
<td>C-10.20</td>
<td>THREE-BEAM GUARDRAIL, 60&quot; BLOCKED-OUT STEEL POST</td>
</tr>
<tr>
<td>C-10.30</td>
<td>GUARDRAIL TRANSITION, W-BEAM TO CONCRETE HALF BARRIER, 32&quot; TYPE 'F'</td>
</tr>
<tr>
<td>C-10.40</td>
<td>CONCRETE MEDIAN BARRIER, 32&quot; TYPE 'F': CAST-IN-PLACE</td>
</tr>
<tr>
<td>C-10.41</td>
<td>CONCRETE MEDIAN BARRIER, 42&quot; TYPE 'F': CAST-IN-PLACE</td>
</tr>
<tr>
<td>C-10.42</td>
<td>CLEAR SCREEN, CONCRETE MEDIAN BARRIER (3 SHEETS)</td>
</tr>
<tr>
<td>C-10.50</td>
<td>CONCRETE HALF BARRIER, 32&quot; TYPE 'F' (2 SHEETS)</td>
</tr>
<tr>
<td>C-10.51</td>
<td>CONCRETE HALF BARRIER, 32&quot; TYPE 'F', WITH SIDEWALK</td>
</tr>
<tr>
<td>C-10.52</td>
<td>CONCRETE HALF BARRIER, 32&quot; TYPE 'F', WITH GUTTER</td>
</tr>
<tr>
<td>C-10.53</td>
<td>CONCRETE HALF BARRIER, 42&quot; TYPE 'F', WITH GUTTER</td>
</tr>
<tr>
<td>C-10.54</td>
<td>CONCRETE HALF BARRIER, 32&quot; TYPE 'F' AT PIERS (3 SHEETS)</td>
</tr>
<tr>
<td>C-10.55</td>
<td>CONCRETE HALF BARRIER, 42&quot; TYPE 'F' AT PIERS (3 SHEETS)</td>
</tr>
<tr>
<td>C-10.70</td>
<td>CONCRETE HALF-BARRIER TRANSITION TO VERTICAL, 32&quot; TYPE 'F' WITH CAISSONS (3 SHEETS)</td>
</tr>
<tr>
<td>C-10.71</td>
<td>CONCRETE HALF-BARRIER TRANSITION TO VERTICAL, 32&quot; TYPE 'F' WITH CURB &amp; GUTTER (2 SHEETS)</td>
</tr>
<tr>
<td>C-10.72</td>
<td>CONCRETE HALF-BARRIER TRANSITION TO VERTICAL, 42&quot; TO 32&quot; TYPE 'F' WITH CAISSONS (3 SHEETS)</td>
</tr>
<tr>
<td>C-10.73</td>
<td>CONCRETE HALF-BARRIER TRANSITION TO VERTICAL, 42&quot; TO 32&quot; TYPE 'F' WITH CURB &amp; GUTTER (2 SHEETS)</td>
</tr>
<tr>
<td>C-10.74</td>
<td>CONCRETE HALF-BARRIER TRANSITION, 42&quot; TO 32&quot; TYPE 'F'</td>
</tr>
<tr>
<td>C-10.75</td>
<td>CONCRETE HALF-BARRIER TRANSITION, TYPE 'F' TANGENT DEPARTURE (2 SHEETS)</td>
</tr>
<tr>
<td>C-10.76</td>
<td>CONCRETE HALF-BARRIER TRANSITION, TYPE 'F' AT RADIUS, 32&quot; TO 0&quot;</td>
</tr>
<tr>
<td>C-10.77</td>
<td>CONCRETE HALF-BARRIER TRANSITION, END TERMINAL, CURB AND GUTTER</td>
</tr>
<tr>
<td>C-11.10</td>
<td>ROADWAY CATTLE GUARD (4 SHEETS)</td>
</tr>
<tr>
<td>C-11.20</td>
<td>CATTLE GUARD, DRAINAGE</td>
</tr>
<tr>
<td>C-12.10</td>
<td>FENCE, WOVEN AND BARBED WIRE WITH GATES (5 SHEETS)</td>
</tr>
<tr>
<td>C-12.20</td>
<td>FENCE, CHAIN LINK TYPES 1 AND 2 WITH GATES (3 SHEETS)</td>
</tr>
<tr>
<td>C-12.30</td>
<td>FENCE, CHAIN LINK CABLE BARRIER (13 SHEETS)</td>
</tr>
</tbody>
</table>
### CONSTRUCTION STANDARD DRAWINGS - INDEX

<table>
<thead>
<tr>
<th>DRAWING NO.</th>
<th>TITLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>C-13.10</td>
<td>PIPE CULVERT INSTALLATION (2 SHEETS)</td>
</tr>
<tr>
<td>C-13.15</td>
<td>TYPICAL PIPE INSTALLATION</td>
</tr>
<tr>
<td>C-13.20</td>
<td>PIPE, REINFORCED CONCRETE END SECTION</td>
</tr>
<tr>
<td>C-13.25</td>
<td>PIPE, CORRUGATED METAL END SECTION</td>
</tr>
<tr>
<td>C-13.30</td>
<td>PIPE AND PIPE ARCH, CORRUGATED METAL CONCRETE, INVERT PAVING</td>
</tr>
<tr>
<td>C-13.55</td>
<td>PIPE, CATTLE-VEHICLE PASS, WITTERD END TREATMENT</td>
</tr>
<tr>
<td>C-13.60</td>
<td>SLOTED DRAIN DETAILS</td>
</tr>
<tr>
<td>C-13.65</td>
<td>SLOTED DRAIN, INSTALLATION DETAILS</td>
</tr>
<tr>
<td>C-13.70</td>
<td>STORM DRAIN, CONNECTION DETAILS</td>
</tr>
<tr>
<td>C-13.75</td>
<td>STORM DRAIN, OUTLET BARRIER GATE</td>
</tr>
<tr>
<td>C-13.76</td>
<td>STORM DRAIN OUTLET AND STORM DRAIN PLUG</td>
</tr>
<tr>
<td>C-13.80</td>
<td>PIPE COLLAR DETAILS</td>
</tr>
<tr>
<td>C-15.10</td>
<td>CATCH BASIN, TYPE 1</td>
</tr>
<tr>
<td>C-15.20</td>
<td>CATCH BASIN, TYPE 3 (3 SHEETS)</td>
</tr>
<tr>
<td>C-15.30</td>
<td>CATCH BASIN, TYPE 4</td>
</tr>
<tr>
<td>C-15.40</td>
<td>CATCH BASIN, TYPE 5 (2 SHEETS)</td>
</tr>
<tr>
<td>C-15.50</td>
<td>CATCH BASIN, FRAME AND GRATE</td>
</tr>
<tr>
<td>C-15.70</td>
<td>CATCH BASIN, MISCELLANEOUS DETAILS (2 SHEETS)</td>
</tr>
<tr>
<td>C-15.75</td>
<td>CATCH BASIN, DROP INLET</td>
</tr>
<tr>
<td>C-15.80</td>
<td>CATCH BASIN, PLUSH</td>
</tr>
<tr>
<td>C-15.81</td>
<td>CATCH BASIN, SIDE SLOPE</td>
</tr>
<tr>
<td>C-15.90</td>
<td>CATCH BASIN, MEDIAN Dike (PRECAST)</td>
</tr>
<tr>
<td>C-15.91</td>
<td>FREEWAY CATCH BASIN DETAILS (2 SHEETS)</td>
</tr>
<tr>
<td>C-15.92</td>
<td>CATCH BASIN WITH TYPE 'F' CONCRETE HALF BARRIER (2 SHEETS)</td>
</tr>
<tr>
<td>C-15.15</td>
<td>FREEWAY CATCH BASIN DETAILS (2 SHEETS)</td>
</tr>
<tr>
<td>C-16.40</td>
<td>IRRIGATION SLEEVES</td>
</tr>
<tr>
<td>C-17.10</td>
<td>RAIL BANK PROTECTION FOR DRAINAGEWAYS, TYPES 1, 2 &amp; 3</td>
</tr>
<tr>
<td>C-17.15</td>
<td>RAIL BANK PROTECTION AT ABUTMENTS, TYPES 4, 5 &amp; 6</td>
</tr>
<tr>
<td>C-17.20</td>
<td>RAIL BANK PROTECTION FOR DRAINAGEWAYS, TYPES 7, 8 &amp; 9</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DRAWING NO.</th>
<th>TITLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>C-18.10</td>
<td>MANHOLES (3 SHEETS)</td>
</tr>
<tr>
<td>C-19.10</td>
<td>FORD, CONCRETE WALLS (2 SHEETS)</td>
</tr>
<tr>
<td>C-21.10</td>
<td>SURVEY MONUMENT, FRAME AND COVER, RIGHT-OF-WAY MARKER</td>
</tr>
<tr>
<td>C-21.20</td>
<td>SURVEY MARKER</td>
</tr>
</tbody>
</table>

**REV. 5/07**
<table>
<thead>
<tr>
<th>CONSTRUCTION DRAWING SYMBOLS</th>
<th>NEW FEATURES</th>
<th>EXISTING FEATURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>National, State Boundary</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Forest or Reservation Boundary</td>
<td></td>
<td></td>
</tr>
<tr>
<td>County Line</td>
<td></td>
<td></td>
</tr>
<tr>
<td>City Limits</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Township or Range Line</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Section Line</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quarter or Mid-Section Line</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sixteenth-Section Line</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Right-of-Way Line</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Property Line</td>
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<td></td>
</tr>
<tr>
<td>Temporary Construction Easement</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Access Control</td>
<td></td>
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</tr>
<tr>
<td>Section Corner</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quarter Corner</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Survey Monument</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Right-of-Way Marker</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Angle Point or PI</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Survey Control Point
Bench Mark
Centerline, Station Marks
Mile Post Marker
Sidewalk, Curb & Gutter w/Depressed Curb (1"=50' or larger)
Curb & Gutter with Depressed Curb (1"=100')
Curb, Single with Depressed Area
Pavement and Sidewalk Edge
Turnout
Top of Cut
Toe of Fill
Transition, Cut to Fill
Railroad Track (1"=50' or larger)
Railroad Track (1"=100')
Bank Protection
Bridge
Building

REVISED ORDER OF FEATURES

NEW FEATURES | EXISTING FEATURES
--------------|------------------
1. National, State Boundary
2. Forest or Reservation Boundary
3. County Line
4. City Limits
5. Township or Range Line
6. Section Line
7. Quarter or Mid-Section Line
8. Sixteenth-Section Line
9. Right-of-Way Line
10. Property Line
11. Temporary Construction Easement
12. Access Control
13. Section Corner
14. Quarter Corner
15. Survey Monument
16. Right-of-Way Marker
17. Angle Point or PI
<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>FH</td>
<td>Fire Hydrant</td>
</tr>
<tr>
<td>SP</td>
<td>Sign, Single Post</td>
</tr>
<tr>
<td>P</td>
<td>Sign, Multiple Post</td>
</tr>
<tr>
<td>N</td>
<td>North Arrow</td>
</tr>
<tr>
<td>A</td>
<td>Dimensions</td>
</tr>
<tr>
<td>B</td>
<td>Visible Outlines, Sections, etc.</td>
</tr>
<tr>
<td>G</td>
<td>Grades, Profile</td>
</tr>
<tr>
<td>H</td>
<td>Hedge</td>
</tr>
<tr>
<td>T</td>
<td>Palm Tree</td>
</tr>
<tr>
<td>S</td>
<td>Shrubbery</td>
</tr>
<tr>
<td>U</td>
<td>Unclassified Tree</td>
</tr>
<tr>
<td>W</td>
<td>Windmill</td>
</tr>
<tr>
<td>M</td>
<td>Mail Box</td>
</tr>
<tr>
<td>F</td>
<td>Flag Pole</td>
</tr>
<tr>
<td>D</td>
<td>Depressed Index Contour Line</td>
</tr>
<tr>
<td>I</td>
<td>Depressed Intermediate Contour Line</td>
</tr>
<tr>
<td>B1</td>
<td>Block Wall (1&quot;=20')</td>
</tr>
<tr>
<td>B2</td>
<td>Median Barrier</td>
</tr>
<tr>
<td>F1</td>
<td>Fire Hydrant</td>
</tr>
<tr>
<td>F2</td>
<td>Standpipe</td>
</tr>
<tr>
<td>T1</td>
<td>Transmission Tower</td>
</tr>
<tr>
<td>Wind</td>
<td>Windmill</td>
</tr>
<tr>
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</tr>
<tr>
<td>Flag</td>
<td>Flag Pole</td>
</tr>
<tr>
<td>North</td>
<td>North Arrow</td>
</tr>
</tbody>
</table>

**Construction Drawing Symbols**

**New Features**

- Water Line
- Drainage Channel
- Drainage Ditch
- Major Wash
- Minor Wash
- E Grade, Profile
- Hedge
- Palm Tree
- Shrubbery
- Unclassified Tree
- Sign, Single Post
- Sign, Multiple Post
- Dimensions
- Visible Outlines, Sections, etc.
- Index Contour Line
- Intermediate Contour Line

**Existing Features**

- Depressed Index Contour Line
- Depressed Intermediate Contour Line
- Block Wall (1"=20')
- Median Barrier
- Fire Hydrant
- Standpipe
- Transmission Tower
- Windmill
- Mail Box
- Flag Pole
- North Arrow
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**GENERAL ABBREVIATIONS**

**RENAME STD DWG C-01.31 TO C-01.30, SHEET 2 OF 3**

**PROJECT NO.**

**APPROVED FOR DISTRIBUTION**

**APPROVED FOR DESIGN**

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GENERAL NOTES

1. Roadway width, cut ditch width, cross slope, and pavement structure section will be shown on project plans.
2. Pavement structure slope is nominal. Actual slope is controlled by (D). See Shoulder Wedge Detail.
3. Slopes beyond the pavement structure, such as embankment and embankment cut slopes, are relative to horizontal.
4. For slope controls within interchange areas, see project plans.
5. When median slopes intersect, see project plans for controls.
6. These slopes are intended to be used with new or reconstructed roadways.

NOTE TO DESIGNERS

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

MINIMUM SLOPES

INTERMEDIATE SLOPES

MAXIMUM SLOPES

MINIMUM DITCH CONDITIONS DETAIL

SLOPE ROUNDBING DETAIL

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

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

INTERMEDIATE SLOPES

MAXIMUM SLOPES

SUBGRADE/SLOPE HINGE TREATMENT DETAIL

SHOULDER WEDGE DETAIL

SLOPE ROUNDING DETAIL

NOTE TO DESIGNERS

GENERAL NOTES

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

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

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

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

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

Per Plans
Typical Section

Special Ditch When Specified

9' Minimum

W Roadway Width

D = Str Sct Depth (FT) Excluding ACFC
Subgrade = 2 x W + Roadway Width

W = D x Slope (6:1)

See Shoulder Wedge Detail

Subgrade

Horizontal

Varies
5' to 11'

Varies
5' to 11'

SLOPE ROUNDING DETAIL

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

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

INTERMEDIATE SLOPES

MAXIMUM SLOPES

MINIMUM DITCH CONDITIONS DETAIL

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
④ USAGE OF THIS STANDARD IS LIMITED IN ACCORDANCE WITH THE ROADWAY DESIGN GUIDELINES - CHAPTER 300.
⑤ Required when guardrail is present on the project. Treatment shall be uniform throughout the project length. The 9' requirement may be waived under special conditions on projects without guardrail.

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

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

2. Ditches and channels shall be constructed with a minimum grade to prevent erosion. Ditch outlet treatment shall be as provided on plans.
TYPICAL DIKE INSTALLATION AT STRUCTURE

TYPE A DIKE

CROWN DIKE

TYPE B TRANSVERSE MEDIAN DIKE

TYPICAL TRANSVERSE MEDIAN DIKE INSTALLATION
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.

4. 10:1 Desirable Slope

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

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

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

10:1 Desirable Slope
1. Berm construction shown is for pipe extensions. Berm construction similar for new pipe and multiple pipe installations. See Pipe Berm Requirement Detail.

2. If Point A is within the recovery area, then a pipe berm is required and Point B is set at the edge of the recovery area.

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

4. Single Pipe Installation: \( D = \text{Outside Diameter of Pipe} \)

5. Multiple Pipe Installation: \( D = \text{Outside Edge to Outside Edge of Pipes} \)

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

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.

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

Single Pipe Installation: \( D = \text{Outside Diameter of Pipe} \)

Multiple Pipe Installation: \( D = \text{Outside Edge to Outside Edge of Pipes} \)
1. Berm construction similar for box culvert and pipe with headwall.
2. Berm construction shown is for extension of existing facilities. Berm construction similar for new facilities.
3. See C-Standards and B-Standards for pipe and structure backfill limits.
   - Very slope, slope shall match to top of wing wall.
   - Slope shall match wing wall design slope (2:1, 4:1, or 6:1)

GENERAL NOTES

Berm construction similar for box culvert and pipe with headwall. Berm construction shown is for extension of existing facilities. Berm construction similar for new facilities. See C-Standards and B-Standards for pipe and structure backfill limits.

- Very slope, slope shall match to top of wing walls.
- Slope shall match wing wall design slope (2:1, 4:1, or 6:1)

SKEWED HEADWALL PLAN

Existing Toe of Slope (Typ)

STRAIGHT HEADWALL PLAN

ELEVATION FOR PIPE

ELEVATION FOR CBC

SECTION A-A (FOR PIPE WITH HEADWALL)

SECTION A-A (FOR CBC)
GENERAL NOTES
1. Location may be adjusted to accommodate guardrail post layout.
2. All concrete shall be Class B. Embankment curb concrete shall be in accordance with the Std Specs.
3. Where rock is encountered the outlet may be omitted, as approved by the Engineer.
4. When outlet is used, the wire mesh shall extend through the joint into the outlet in lieu of bending into the key.
5. Spillway invert slope shall be uniformly downward from A to B. See Section B-B.
6. See Std Dwg C-04.30 for spillway length.
7. See Std Dwg C-10.06 for nested guardrail requirements.

SPILLWAY, EMBANKMENT
SINGLE INLET

SECTION A-A

SECTION B-B

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

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

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

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

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

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

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

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

GENERAL NOTES

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

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

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

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

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

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

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

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

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

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

3. Permissible couplings shall be mechanical, heat-shrinkable polyolefin sheet one-piece lap-type neoprene seal or slit seals, all minimum 12" width and minimum 18 gauge.

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

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

6. Round all exposed concrete corners.

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

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

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

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

Note:

- Steel to be Galvanized after Fabrication
- #9 Galvanized Wire Tie (Double-Wrapped)
- 72" Timber Post
- 12" Diameter x 6", 16 Gauge Annular CMP Stub

DELETED GENERAL NOTE 4 & REARRANGED NOTES 2 - 7

REVISED INLET PLAN VIEW AND SECTION A-A GRAPHICS
GENERAL NOTES

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

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

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

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

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

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

### Note to Designers

Use earthwork cross sections for more precise spillway lengths.

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

**Pavement Structural Section Thickness (In) 6i**

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**Spillway Length** = (Embankment Height + Pavement Structural Section Thickness) times 6

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

**Pavement Structural Section Thickness (In) 4i**

<table>
<thead>
<tr>
<th>Embankment Slop</th>
<th>3</th>
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<th>5</th>
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</tbody>
</table>

**Spillway Length** = (Embankment Height + Pavement Structural Section Thickness) times 2

### C-02.10 and C-02.20 SLOPES

- Spillways are not usually used for these slope conditions.

### C-02.30 SLOPES

- Spillways are not usually used for these slope conditions.

---

**Notes:**

- For spillway details, see Std Dwg C-04.10.
- Use earthwork cross sections for more precise spillway lengths.
- Spillways are not usually used for C-02.10 & C-02.20 slopes.
- Spillways are not usually used for C-02.30 slopes.

**Description of Revisions:**

- Made by: [Redacted]
- Date: 5/07

**State of Arizona Department of Transportation**

**Roadway Standard Drawings**

**Approved for Distribution**

**Approved for Design**

**Spillway Length Table**

**C-04.30**
GENERAL NOTES

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

NOTE TO DESIGNERS
Use earthwork cross sections for more precise downdrain lengths.

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

<table>
<thead>
<tr>
<th>EMBANKMENT SLOPE</th>
<th>6h1</th>
<th>VARES FROM 6h1 TO 2h1</th>
<th>2h1</th>
</tr>
</thead>
<tbody>
<tr>
<td>EMBANKMENT HEIGHT (FT)</td>
<td>5</td>
<td>6</td>
<td>7</td>
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<tr>
<td>5</td>
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<tr>
<td>8</td>
<td>72</td>
<td>69</td>
<td>66</td>
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</tbody>
</table>
| EMBANKMENT CURB AND DOWNDRAINS ARE NOT USUALLY USED FOR THIS SLOPE CONDITION. USE THE FOLLOWING EQUATION WHEN EMBANKMENT CURB AND DOWNDRAINS ARE INSTALLED:
APPROXIMATE DOWNDRAIN LENGTH (IN FEET) = PAVEMENT STRUCTURAL SECTION AND EMBANKMENT HEIGHT MINUS 2 TIMES 6

C-02.10 AND C-02.20 SLOPES
GENERAL NOTES

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

2. Couplings shall be mechanical heat-shrinkable polyolefin sheets. One piece lap-type neoprene sheet or slip liner all 12" minimum width and 18 gauge minimum.

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

4. Concrete shall be Class B.
### GENERAL NOTES

**SINGLE CURB AND CURB & GUTTER**

1. Single curb and curb & gutter may be constructed by the use of forms or the concrete may be extruded.

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

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

4. Expansion joints shall be located at tangent points in curb returns, of structures and at maximum 60' intervals. The 1/2" joint filler shall extend the full depth of the concrete.

5. Concrete shall be finished with a steel trowel followed by brushing with a fine brush along the length of the curb and gutter.

6. All exposed edges and hand-tooled joints shall be finished with a tool having a 1/4" radius, or as noted on the plans.

7. Place AB under single curb, valley gutter, and curb & gutter when shown on plans.

### EMBANKMENT CURB

1. No additional finishing will be required after extrusion or removal of the forms when the curb presents a neat appearance and the surface is uniform in texture and color.

2. The curb shall conform to the cross section as shown except that the horizontal dimensions shall not vary more than 1/2".

<table>
<thead>
<tr>
<th>Curb &amp; Gutter Type</th>
<th>Curb Height (In)</th>
<th>Gutter Width (Ft-In)</th>
<th>Gutter Depression (In)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
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<tr>
<td>A-1</td>
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<td>N/A</td>
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<tr>
<td>D</td>
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<td>1/8</td>
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<tr>
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<td>2-0</td>
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<td>1/2</td>
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<td>G</td>
<td>2-0</td>
<td>N/A</td>
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</table>

### EXPANSION JOINT DETAIL

1. Expansion joints shall be placed at tangent points in curb returns, of structures and at maximum 60' intervals. The 1/2" joint filler shall extend the full depth of the concrete.

2. Concrete shall be finished with a steel trowel followed by brushing with a fine brush along the length of the curb and gutter.

3. All exposed edges and hand-tooled joints shall be finished with a tool having a 1/4" radius, or as noted on the plans.

4. Place AB under single curb, valley gutter, and curb & gutter when shown on plans.

### URBAN FREEWAY CURB & GUTTER

<table>
<thead>
<tr>
<th>Curb &amp; Gutter Type</th>
<th>Curb Height (In)</th>
<th>Slope</th>
<th>Gutter Depression (In)</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>6</td>
<td>3:1</td>
<td>2</td>
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<td>C</td>
<td>3</td>
<td>6:1</td>
<td>1/8</td>
</tr>
<tr>
<td>C-1</td>
<td>3</td>
<td>6:1</td>
<td>N/A</td>
</tr>
</tbody>
</table>

### VALLEY GUTTER

- Flush Transition at Flowline
- See Expansion Joint Detail

### Curb Terminal Section

- See Expansion Joint Detail

---

**Description of Revisions**

- Made by: [Redacted]
- Date: 5/07

**State of Arizona**

**Department of Transportation**

**Roadway Standard Drawings**

- Approved for Distribution
- Approved for Design
GENERAL NOTES
1. All gutter flow lines shall be constructed to an accurate grade.
2. See Slotted Drain Std Dwgs C-13.60 and C-15.91 for curb & gutter with slotted drain.
3. See Std Dwg C-05.10 for additional general notes and dimensions.
4. See Std Dwg C-07.04 for typical curb and gutter transition locations.
5. Dimension may vary where transition occurs on curves, see plans

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

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

<table>
<thead>
<tr>
<th>1.</th>
<th>2.</th>
<th>3.</th>
<th>4.</th>
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<tbody>
<tr>
<td>All gutter flow lines shall be constructed to an accurate grade.</td>
<td>See Slotted Drain Std Dwgs C-13.60 and C-15.91 for curb &amp; gutter with slotted drain.</td>
<td>See Std Dwg C-05.10 for additional general notes and dimensions.</td>
<td>See Std Dwg C-07.04 for typical curb and gutter transition locations.</td>
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</table>

Dimension may vary where transition occurs on curves, see plans

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

Curb & Gutter - Type B, C or C-1, Std Dwg C-05.10
**DESCRIPTION OF REVISIONS**

MADE BY: RLF  
DATE: 7/05

**ROADWAY STANDARD DRAWINGS**

APPROVED FOR DISTRIBUTION  
APPROVED FOR DESIGN  
5/07

**SECTION A-A**

**CURB & GUTTER TRANSITIONS**

**PERSPECTIVE VIEW**

**ELEVATION**

**PLAN VIEW**

**REISSUED STANDARD DRAWING**

C-05.12

Sheet 2 of 3

**TYPE 4 - CURB & GUTTER TRANSITION**

Roadway Width

Gutter Line

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

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

15' Transition

Top of Curb

**SECTION B-B**

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

15' Transition

Top of Curb

**TYPE 3 - CURB & GUTTER TRANSITION**

AT PAVED GORE

**PLAN VIEW**

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

Roadway Width

Gore Area

Gutter Line

**TYPE 2 - CURB & GUTTER TRANSITION**

**PLAN VIEW**

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

15' Transition

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

Roadway Width

Gutter Line

**STATE OF ARIZONA**

DEPARTMENT OF TRANSPORTATION

ROADWAY STANDARD DRAWINGS

5/07

CURB & GUTTER TRANSITIONS

C-05.12

Sheet 2 of 3
**TYPE 5 - CURB & GUTTER TRANSITION**

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

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

**TYPE 7 - CURB & GUTTER TRANSITION**

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

1/2" Gutter Depression

**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 B, A-1 or G,
Std Dwg C-05.10
or Non-C Std
See Plans

AC Pavement (Typ)
Single Curb,
Curb & Gutter
or Non-C Std
See Plans

PCC Pavement (Typ)
Sidewalk Ramp
Type C
Std Dwg C-05.30

Sidewalk
Std Dwg C-05.20

Sidewalk
Std Dwg C-05.20

Type C

Std Dwg C-05.20

Curb & Gutter Type D Series
Std Dwg C-05.10

Curb & Gutter Type D Series
Std Dwg C-05.10

Varies - See Plans
Varies - See Plans

**DESCRIPTION OF REVISIONS**

MADE BY

DATE

APPROVED FOR DISTRIBUTION

APPROVED FOR DESIGN

5/07
GENERAL NOTES

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

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

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

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

5. Place AB under driveways when shown on plans.

LEGEND

- Minimum slope = 0.01 %
- Maximum slope = 0.02 %
- Straight grade with downward slope

Driveway with Sidewalk Setback

Depressed Curb & Gutter

Expansion Joint Required if Driveway Width Over 20'

Contraction Joint Required if Driveway is Concrete

Driveway with Sidewalk Adjacent to Curb

Depressed Curb & Gutter

Expansion Joint Required if Driveway is Concrete

Control Point See Std Dwg C-06.10 Sheet 2 of 2

Width as Shown on Project Plans

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

Expansion Joint

Control Point See Std Dwg C-06.10 Sheet 2 of 2

Width as Shown on Project Plans

Depressed Curb and Gutter Std Dwg C-05.10

Gutter Control Grade When Shown on Plans

Depressed Curb and Gutter Std Dwg C-05.10

Gutter Control Grade When Shown on Plans

Section A-A

Section B-B

ADDED GENERAL NOTE FOR AB REQUIREMENT

Place AB under driveways when shown on plans.
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 curbs and gutters. If the sidewalk is over 7', in width, a 2" deep longitudinal contraction joint shall be placed in the center of the sidewalk. The maximum area of sidewalk without contraction joints or scoring lines shall be approximately 36 square feet. Joints shall be either formed or sawn. Formed joints shall be finished with a tool having a 1/4" radius.
3. Score marks shall be 1/4" in depth. They shall be placed at 5' spacing when the contraction joint interval is 15', and at 6' spacing when the contraction joint interval is 12'.
4. Expansion joints shall be located between sidewalks and driveways and all abutting structures. Expansion joints shall match the joints in the adjacent concrete pavement or existing concrete curb and sidewalk. Maximum length of sidewalk without an expansion joint shall be 60 transverse feet. The 1/2" joint filler shall extend the full depth of the concrete.
5. Concrete shall be finished by means of a float, then steel troweled and then broomed with a fine brush in a transverse direction.
6. Place AB under sidewalks when shown on plans.

**GENERAL NOTES**

**LEGEND**

- Minimum slope = 0.01
- Maximum slope = 0.02

**CONCRETE SIDEWALK ADJACENT TO CURB**

**CONCRETE SIDEWALK SETBACK FROM CURB**

**CONTRACTION JOINT DETAIL**

**EXPANSION JOINT DETAIL**
Ramp Shall Be Laid Out Radially from the Back of the 5' Wide Detectable Warning Strips, Except That In No Case Shall It Be Less Than 4' Wide at the Back of the Sidewalk.

GENERAL NOTES

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

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

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

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

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

6. See Note 2

7. 10" Maximum to Face of Pedestrian Push Button


LEGEND

Minimum Slope = 100:1 (0.01 H/V)
Maximum Slope = 50:1 (0.02 H/V)

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.

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

Concrete shall receive a rough broom finish as shown.

See Note 2

10" Maximum to Face of Pedestrian Push Button

Pedestrian Push Button Pole When Shown on Traffic Plans, See Traffic Signal Plans for Additional Information

STATE OF ARIZONA
DEPARTMENT OF TRANSPORTATION
ROADWAY STANDARD DRAWINGS

APPROVED FOR DISTRIBUTION
APPROVED FOR DESIGN
5/07
GENERAL NOTES

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

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

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

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

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

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

LEVEND

LEGEND

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

1. 10" Maximum to Face of Pedestrian Push Button

DELETED GENERAL NOTE 7

REVISED GENERAL NOTE 2

REVISED CALLOUT: ADDED (TYP)

REVISED NOTE: REMOVED REFERENCE TO NOTE 3

DELETED GENERAL NOTE 7

STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION ROADWAY STANDARD DRAWINGS

APPORVED FOR DISTRIBUTION

APPORVED FOR DESIGN

5/07

SIDEWALK RAMP TYPE B

C-05.30 SHEET 2 OF 7
**GENERAL NOTES**

1. For use where sidewalk is not continuous.
2. Ramp centerline shall be radial from the face of the curb at the Sidewalk Ramp Control Point.
3. For ramps 15'-1" long or less, the 15:1 slope governs. If a 15:1 slope results in a ramp length longer than 15'-1", the 15:1 slope may be waived and the ramp length held at 15'-1", regardless of the slope.
4. The top of the Ramp Curb along the back of the Sidewalk Ramp shall match the elevation of the adjacent back of sidewalk and run parallel to the Sidewalk Ramp. The Ramp Curb along the side of the Sidewalk Ramp shall match the elevation at the back of the Curb & Gutter and the back of Ramp Curb.
5. Drainage inlets should not be located within the marked crosswalks, or if crosswalks aren’t marked, within the area a standard marked crosswalk would enclose.
6. Concrete shall receive a rough broom finish as shown.
7. See Std Dwgs C-05.10 and C-05.20 for joint details.
9. 10" Maximum to Face of Pedestrian Push Button

**LEGEND**

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

**ELEVATION**

**DEPRESSED CURB AT SIDEWALK RAMP**

**SECTION A-A**

**PERSPECTIVE**

**SIDEWALK RAMP AT SIDEWALK TERMINUS**

**PLAN**

- **Detectable Warning Strip**
  - See Sheet 7 of 7
- **Curb & Gutter**
  - See Plans
- **Sidewalk**
  - Std Dwg C-05.20
- **Curb & Gutter Transition**
  - Type 9
  - Std Dwg C-05.12

**ELEVATION**

- **Detectable Warning Strip**
  - See Sheet 7 of 7
- **Ramp Curb**
  - See Ramp Curb Detail Sheet 1 of 7
- **Detectable Warning Strip**
  - See Sheet 7 of 7

**SECTION A-A**

- **Detectable Warning Strip**
  - See Sheet 7 of 7
- **Location**
  - See Plans
- **Detachable Warning Strip**
  - See Sheet 7 of 7
- **Ramp Curb**
  - See Ramp Curb Detail Sheet 1 of 7

**Perspective**

- **Rough Broom Finish**
- **Ramp Curb**
  - See Ramp Curb Detail Sheet 1 of 7
- **Depressed Curb**
  - See Ramp Curb Detail Sheet 1 of 7
- **Detectable Warning Strip**
  - See Sheet 7 of 7
- **No Sidewalk**
  - See Plans
GENERAL NOTES

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

Section A-A

- Ramp shall be laid out radially from the back of the 3' wide detectable warning strip, except that in no case shall it be less than 4' wide at the back of the sidewalk.
- Detectable Warning Strip (Type D) when shown on Plans, See Std Dwg C-05.10.
- Curb & Gutter Transition, See Ramp Curb Detail Sheet 1 of 7.
- Barrier Transition, Std Dwg C-10.76.

Section B-B

- Roadway Width
- Sidewalk Ramp
- Depressed Curb & Gutter (Typ) Std Dwg C-05.10
- Ramp Curb, See Ramp Curb Detail Sheet 1 of 7
- Rough Broom Finish
- Minimum Slope = 100:1 (0.01 '/ft)
- Maximum Slope = 50:1 (0.02 '/ft)
- Concrete shall receive a rough broom finish as shown.
- Drainage inlets should not be located within marked crosswalks, or if crosswalks aren't marked, within the area a standard marked crosswalk would enclose.

LEGEND

- Minimum Slope = 100:1 (0.01 '/ft)
- Maximum Slope = 50:1 (0.02 '/ft)
- 10" Maximum to Face of Pedestrian Push Button

STATE OF ARIZONA
DEPARTMENT OF TRANSPORTATION
ROADWAY STANDARD DRAWINGS

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5/07
1. For use at mid-block locations.
2. Ramp centerline shall be perpendicular to the face of the curb at the Sidewalk Ramp Control Point.
3. For ramps 15-ft long or less, the 15:1 slope governs. If a 15:1 slope results in a ramp length longer than 15-ft; the 15:1 slope may be waived and the ramp length held at 15-ft, regardless of the slope.
4. For sidewalk widths greater than shown on C-05.20, the overall Sidewalk Ramp depth shall match the sidewalk width.
5. Ramp curb height to match elevation at back of adjacent sidewalk.
6. Drainage inlets should not be located within the marked crosswalks, or if crosswalks aren’t marked, within the area a standard marked crosswalk would enclose.
7. Concrete shall receive a rough broom finish as shown. See Std Dwgs C-05.10 and C-05.20 for joint details.
8. Ramp curb height to match elevation at back of adjacent sidewalk.

Minimum slope = 100:1 (0.01 H/V)
Maximum slope = 50:1 (0.02 H/V)
GENERAL NOTES

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

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

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

1 Pedestrian Push Button Pole When Shown on Plans.

4. Use Traffic Signal Plans for Additional Information.

5. 10" Maximum to Face of Pedestrian Push Button.

DEPRESSED CURB AT SIDEWALK RAMP

For Median Widths Greater Than 5'-5"

For Median Widths 5'-5" And Less

See Note 1

DETECTED WARNING STRIP

4" AB (Class 2)
1" Sand

Concrete Pavers, Polymer Concrete or Composite Tiles

Match Slope on Median Pavement

4" AB (Class 2)

SECTION A-A

FOR MEDIAN WIDTHS GREATER THAN 5'-5"

SEE PLANS

SEE ELEVATION VIEW

SEE PLANS

SEE SHEET 7 OF 7
LEGEND

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

GENERAL NOTES

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

STATE OF ARIZONA
DEPARTMENT OF TRANSPORTATION
ROADWAY STANDARD DRAWINGS

PROJECT NO.

REVISED TITLE

ADDED PLAN & SECTION FOR BRICK OPTION

REVISED DRAWING NO.

ADDED LINE TO REPRESENT THICKNESS

DESCRIPTION OF REVISIONS

MADE BY

DATE

APPROVED FOR DISTRIBUTION

APPROVED FOR DESIGN
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 in a median island on a structure.

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

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

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

8. Median paving shall be Class B concrete.

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

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

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

See Bridge Group Plans for raised median on structures.

Median paving shall be Class B concrete.
The PCCP surfaces within the bus bay area shall be textured transversely. Surface texturing to conform to Std Spec 401.

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

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

For 1/2" expansion joint with preformed joint fillers, see Detail A.

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

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

See Plans: match the adjacent gutter depression.
Driveway types:

**Residential** - one providing access to a single family residence, to a duplex, or to an apartment building containing five or fewer dwelling units.

**Commercial** - one providing access to an office, retail or institutional building or to an apartment building having more than five dwelling units.

**Industrial** - one directly serving a substantial number of truck movements to and from loading docks of an industrial facility, warehouse, or truck terminal.

1. Joint-use driveways may become desirable for landowners of adjacent properties to service both properties. If this is the case, only one of the two adjacent landowners need apply for the access permit, but a recorded joint-use easement shall be prepared by all parties involved, and determined by the application form. The property line can be located anywhere. In reference to the driveway, and the road, the two parties involved agree.

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

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

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

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

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

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

**RURAL DEVELOPMENTS**

- See Proper City or County Regulation

**URBAN DEVELOPMENTS**

- See Proper City or County Regulation

GENERAL NOTES

1. Driveway types:

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

2. Joint-use driveways may become desirable for landowners of adjacent properties to service both properties. If this is the case, only one of the two adjacent landowners need apply for the access permit, but a recorded joint-use easement shall be prepared by all parties involved, and determined by the application form. The property line can be located anywhere. In reference to the driveway, the two parties involved agree.

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 and plan notations will be W X L, surface material, type and standards. Examples: 20’ X 30’ ACTO, Type A, Std Dwg C-50-00. Show radius (R) graphically.

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

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

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

1. Grade as shown on plans or as negotiated between property owner and Engineer.
2. When field conditions require modifications to plans, contact design engineer for assistance.
3. See Sheet 1 of 2 for all other General Notes. 
   a. Break angle greater than 6% requires a vertical curve, L=10' minimum. Vertical curve shall not encroach on roadway or sidewalk.

   **GENERAL NOTES**

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

- Driveway Surface
- TCE or R/W Line

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

- Driveway Surface
- TCE or R/W Line

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

- Driveway Surface
- TCE or R/W Line

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

- Driveway Surface
- TCE or R/W Line

Desirable Urban Cross Section

Commercial & Industrial:
20'-40' Desirable
Residential:
10' Minimum Desirable

See General Notes

COMMERCIAL & INDUSTRIAL:

- 2% to -5% Desirable

RESIDENTIAL:

- 0'-10' Minimum Desirable

See Plans Typical Section
1. When load transfer dowel assemblies are required, use dimensions shown in ( ). See Assembly Placement And Edge Clearance Detail. Std Dwg C-07.02.

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

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

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

**General Notes**

**Joint Abbreviations**

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

**Description of Revisions**

- Made by: [Redacted]
- Date: 5/07

**Revision Details**

- [Redacted]
GENERAL NOTES

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

JOINT ABBREVIATIONS

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

LONGITUDINAL CONSTRUCTION JOINT DETAIL (WITH AR-ACFC)

Curb & Gutter Joint
G Joint

Median Barrier Joint
B Joint
PCCP on Both Sides of Barrier

SINGLE CURB JOINT
A Joint

WEakened-Plane Joint DETAIL
(BWITH AR-ACFC)
Load transfer dowel assemblies shall be used with non-skewed, mainline PCCP joints.

Load transfer dowel assemblies are to be placed at each transverse weakened plane joint on the traveled lanes as shown on the plans.

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

Load transfer dowel assembly shall be assembled from the following materials:

- **Dowel bars**: 1 1/2" diameter x 1'-6" plain round bars with coating. See Special Provisions.
- **Intermediate legs**: 2 gauge or W-5.5 wire.
- **End legs**: 2 gauge or W-5.5 wire.
- **Upper space bar**: 2 gauge or W-5.5 wire x .
  (See Dimension Table)
- **Lower space bar**: 2 gauge or W-5.5 wire x .
  (See Dimension Table)
- **Tie bars**: W-1.5 wire x 16".
- **Anchor strap**: 1"x3" steel strap, 0.079 thick. Place with a 1 1/2" minimum length steel nail for LCB, 4" minimum length steel nail for ACB or AB, 0.145 diameter ASTM A227 Class 1 with 1/4" head or washer.

- **Joint** Center Transverse Weakened-Plane Joint Within 1 1/2" of Center of Load Transfer Dowel

**GENERAL NOTES**

1. Load transfer dowel assemblies shall be used with non-skewed, mainline PCCP joints.
2. Load transfer dowel assemblies are to be placed at each transverse weakened plane joint on the traveled lanes as shown on the plans.
3. See Std Dwgs C-07.01 through C-07.04 for additional information.
4. See plans or Std Dwgs C-07.03 through C-07.04 for transverse joint spacing.
5. See plans for pavement thickness less than 12" or greater than 14".

**LOAD TRANSFER DOWEL ASSEMBLY**

- **PLAN VIEW**
  - Load Transfer Dowel Assembly (Typ)
  - PCCP Side
  - Shoulder
  - Lane
  - Lane
  - Lane
  - Lane
  - Structural Base See Plans
  - LWP or LC Joint
  - See Note 1 Std Dwg C-07.01 Sheet 1 of 2

- **ISOMETRIC**
  - Dowel Welds at Alternate Ends of Bars

- **END AND INTERMEDIATE LEG DETAIL**
  - Joint
  - Center Transverse Weakened-Plane Joint Within 1 1/2" of Center of Load Transfer Dowel

- **ANCHOR STRAP DETAIL**
  - 1 1/2" Maximum

**TRANSVERSE WEAKENED-PLANE JOINT WITH LOAD TRANSFER DOWEL ASSEMBLY**

- **DIMENSION TABLE**
  - Lane Width (Ft)
  - 12 14 16
  - 10" 14" 16"
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 401-3.0 of the Standard Specifications.

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

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

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

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

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

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

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

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

Transverse construction joint (TC) allowable limits (Typ):

- Large Concrete PCCP (PCCP):
  - 60' Maximum

- Curb and Gutter:
  - No greater than 1'-3" from the TC joint.
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 401-3.0 of the Standard Specifications.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

9. LC and LWP joints shall be placed no greater than 1'-3" from the TC joint.

10. Transverse Construction Joint (TC) Allowable Limits (Typ)
1. LC and LWP joint locations shown are typical. The actual paving pour plan with joint locations shall be based upon the project paving plan submitted by the contractor and approved by the Engineer in accordance with Subsection 401-3.01 of the Standard Specifications.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

GENERAL NOTES

- See Std Dwg C-05.10 for curb and gutter joint requirements.
- The rebars in the LWP & LC joints shall be placed no greater than 1'-3" from the TC joint.
- Transverse weakened-plane joint shall be constructed at least 6'-0" from a transverse construction joint.
- LC and LWP joints shall be located on the edge of traffic lanes unless otherwise shown on the project plans.
GENERAL NOTES

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

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

3. See plans for ramp dimensions.

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

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

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GENERAL NOTES

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

1. **NEW STANDARD DRAWING: CONVERTED FROM DETAIL X7053**
GENERAL NOTES

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

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

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

4. See plans for ramp dimensions.

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

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

- Transition, See Std Dwg C-05.12
- LC or LWP joints shall be located on the edge of traffic lanes unless otherwise shown on the project plans.

- Mainline Structural Section
- See Plans

- Ramp Structural Section
- See Plans

- Gore Structural Section
- See Plans

- RAMP WITHOUT CURB & GUTTER

- RAMP WITH CURB & GUTTER

- SECTION A-A
- RAMP TAPER

- SECTION B-B
- GORE AREA
GENERAL NOTES

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

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

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

4. See plans for ramp dimensions.

- Transition, See Std Dwg C-05.12
- 20' Face of Curb to Face of Curb on Exit Ramp
- Mainline Structural Section
- See Plans
- Ramp Structural Section
- See Plans
- Gore Structural Section
- See Plans

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

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

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

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

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

5. See Plans for Crossroad Paving Type E or H Joint if PCC Paving
   - 5 Joint if AC Paving

6. Transverse Joint shall be perpendicular (90°) to the longitudinal joints, except as shown at the ramp terminal.
   - G Minimum
   - Varies - 18' Maximum
   - 11' Minimum
   - Varies - 12' when adjacent gutter widths are 2' or less
   - 15' when adjacent gutter widths are greater than 2'
   - Without curb and gutter
   - Transition, See Std Dwg C-05.12
   - Varies - 12' Typical or As Shown on Plans
   - 1' Maximum

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

Additional notes:
- See Std Dwg C-07.01 for joint information.
- LC and LWP joints shall be located on the edge of traffic lanes unless otherwise shown on the project plans.
- Transverse Joint shall be perpendicular (90°) to the longitudinal joints, except as shown at the ramp terminal.
- G Minimum
- Varies - 18' Maximum
- 11' Minimum
- Varies - 12' when adjacent gutter widths are 2' or less
- 15' when adjacent gutter widths are greater than 2'
- Without curb and gutter
- Transition, See Std Dwg C-05.12
- Varies - 12' Typical or As Shown on Plans
- 1' Maximum

Transverse joint control points are shown for reference. All joint locations shown are typical. The actual paving pour plans with joint locations shall be based upon the project paving plan submitted by the contractor and approved by the Engineer in accordance with Subsection 401-3.01 of the Standard Specifications.
TRENCH BACKFILL AND PAVEMENT REPLACEMENT

**GENERAL NOTES**

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

**LEGEND**

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

**DESCRIPTION OF REVISIONS**

**MADE BY**

**DATE**

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**ROADWAY STANDARD DRAWINGS**

APPROVED FOR DISTRIBUTION

APPROVED FOR DESIGN

5/07
GENERAL NOTES

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

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

CONCRETE GORE AREA
WITH ABUTTING CONCRETE PAVEMENT

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

SECTION A-A

8") Concrete

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

Structural Section
See Plans

AC GORE AREA WITH
ABUTTING AC PAVEMENT

2") AC
Compacted Subgrade
or AB as Shown on Plans

Tack Coat

Structural Section
See Plans

SECTION B-B

Compacted Subgrade
or AB as Shown on Plans

Structural Section
See Plans
GENERAL NOTES

1. Lengths as shown unless otherwise indicated on project plans.
2. Post type (timber or steel) for transitions shall match post type of adjoining guardrail.
3. Shown for one-way traffic. For two-way traffic, departure requires approach end treatment when located within the clear zone of opposing traffic.
4. See Std Specs for nested guardrail pay item.

CONCRETE HALF-BARRIER TRANSITION

- POST TYPE: TIMBER OR STEEL
-護欄接合部分的柱子應與相鄰護欄的柱子類型相符。

CONCRETE BARRIER TRANSITIONS

- 構造於側翼墙上

CONCRETE HALF-BARRIER TRANSITION ON STRUCTURE

Concrete Barrier Transitions
Built on Top of Wingwalls

REVISED SYSTEM LIMIT TO INCLUDE END SHOE
GENERAL NOTES

1. All embankment curb shall be protected by guardrail.
2. Guardrail shall extend beyond the limits of embankment curb.
3. See Std Dwg C-10.00 for measurement limits.
4. See Std Specs 703, 905 and 1012-3 for reflector tab and snow marker materials, reflective sheeting, and spacing requirements.

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

1. USE APPROPRIATE END TREATMENT

2. Use Appropriate End Treatment

3. USE APPROPRIATE END TREATMENT

4. Use Appropriate End Treatment

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TYPE A SECTO

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REFLECTOR TAB DETAIL

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PROJECT NO.

STATE OF ARIZONA
DEPARTMENT OF TRANSPORTATION
ROADWAY STANDARD DRAWINGS

GUARDRAIL INSTALLATION
TYPE A AND REFLECTOR TAB
GENERAL NOTES

1. All embankment curb shall be protected by guardrail.
2. Guardrail shall extend beyond the limits of embankment curb.
3. See Std Dwg C-10.00 for measurement limits.
4. See Std Spec 703, 905 and 1012-3 for reflector tab and snow marker materials, reflective sheeting, and spacing requirements.

**Guardrail Installation**

- **Type B**
  - Use Appropriate End Treatment
  - Normal Shoulder Width
  - 2' Widening
  - See Subgrade/Slope Hinge Treatment Detail Std Dwg C-02.10, C-02.20, or C-02.30
  - 2' Widening Normal Shoulder Width
  - See Reflector Tab Detail
  - Embankment Curb (Typ)
  - See Plans
  - Subgrade
  - Embankment Slope

**Reflective Sheeting**
- Top of Rail = 28"
- See General Note 1 Std Dwg C-10.03

**Type B Section**

- See Plans
- Embankment Curb (Typ)
- Subgrade
- Embankment Slope
- Normal Slope
- See Subgrade/Slope Hinge Treatment Detail

- Use Appropriate End Treatment
- Normal Roadway Shoulder
- 2' Widening
- Traffic
1. The control height for guardrail system is 28" to the top of rail, measured at the face of rail from the normal finished shoulder elevation.

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

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

**GENERAL NOTES**

**DESCRIPTION OF REVISIONS**

**PLAN**

**ELEVATION**

**SECTION G4(1W)**

**SECTION G4(2W)**
GENERAL NOTES

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

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

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

Section G4(1S)

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

Section G4(1S)

W-Beam, 12 Gauge

3/4" Diameter Hole

Roadway Width

5/8" - 11 UNCx9" Button Head Bolt (●) and Recess Nut (●) With Plain Round Washer (●) Under Nut (Typ)

Roadway Width

5/8" - 11 UNCx9" Button Head Bolt (●) and Recess Nut (●) With Plain Round Washer (●) Under Nut (Typ)

Curb as Shown on Plans

Wood Block

W6x8.5x72" or W6x9x72" Structural Shape Post

W6x8.5x72" or W6x9x72" Structural Shape Post

WOOD BLOCK DETAIL

FRONT VIEW

TOP VIEW

SECTION G4(1S)

SHOWN WITHOUT CURB

SECTION G4(1S)

SHOWN WITH CURB

REVISED DESIGNATION

9/04

NOTE

REMOVED 29 INCH DIMENSION

REMOVED 29 INCH DIMENSION

STATE OF ARIZONA

DEPARTMENT OF TRANSPORTATION

ROADWAY STANDARD DRAWINGS

APPROVED FOR DISTRIBUTION

APPROVED FOR DESIGN

5/07
GENERAL NOTES

1. Height of curb shall not exceed 4 inches.
2. Guardrail shall be lapped in the direction of adjacent traffic.
3. Indicates AASHTO, AGC & ARTBA Task Force 13 Report designation

W-BEAM BACK-UP PLATE DETAIL

W-Beam Guardrail

Curb & Gutter

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

See W-Beam Back-up Plate Detail

Traffic

ELEVATION

G4(1S-MODIFIED)

SECTION
GENERAL NOTES

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

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

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

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

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

6. 72" Timber Post

SECTION A-A

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

ELEVATION

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

SYSTEM POST

Bolt Nested W-Beams Together
Std Splice Connection (Typ)

ELEVATION

W-BEAM GUARDRAIL
NESTED TYPES 1 AND 2

Bolt nested Steel W-Beams Together
5/8"-11 UNCa1/4" Button Head Bolt (●)
and Recess Nut ( ) (Typ)
8 Required
1. Use Type 3 Nested W-Beam to span downspout or spillway inlets as shown in the plan view.
2. Use Type 3 Nested W-Beam to span multiple obstructions as shown in the elevation view.
3. Guardrail shall be lapped in the direction of adjacent traffic.
4. For Type 3, a maximum of two posts may be eliminated within a span of nested guardrail.

**NOTES**

- Indicates AASHTO, AGC & ARTBA Test Force 13 Report designation
- Indicates 72" Timber Post
- Indicates 2" Steel Post

Use Type 3 Nested W-Beam to span downspout or spillway inlets as shown in the plan view.
Use Type 3 Nested W-Beam to span multiple obstructions as shown in the elevation view.

**GENERAL NOTES**

- Use Type 3 Nested W-Beam to span downspout or spillway inlets as shown in the plan view.
- Use Type 3 Nested W-Beam to span multiple obstructions as shown in the elevation view.
- Guardrail shall be lapped in the direction of adjacent traffic.
- For Type 3, a maximum of two posts may be eliminated within a span of nested guardrail.

**PLAN**

37'-6" Nested W-Beam

**ELEVATION**

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

Box Culvert - Width Varies

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

Traffic

W-Beam

Plan
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.

③ - Indicates AASHTO, AGC & ARTBA Task Force 13 Report designation

**INSTALLATION DETAIL**

**BOLTED ANCHOR**

**TIMBER POST INSTALLATION DETAIL**

- 1 1/4"-7 UNCx1 1/2" Hex Bolt (Ø) and Hex Nut (Ø) with Plain Round Washer (Ø) Under Nut (Typ)

- 3/4"-10 UNCx(T+2 1/2) Hex Bolt (Ø) and Two Hex Nuts (Ø) with One Plain Round Washer (Ø) Under Nuts (Typ)

- 13/16 Diameter 2 Holes

- 1 5/16 Diameter 3 Holes

**INSTALLATION DETAIL**

**BOLTED ANCHOR**

**STEEL POST INSTALLATION DETAIL**

- 1 1/2" R (Maximum)

- 1" R (Maximum)

- 2'-5" (Maximum)

- 2'-11" (Maximum)

- 3'-7" (Maximum)

- 5 1/2" (Maximum)

- 7" (Maximum)

- 1 1/4" R (Maximum)

- 1/2" R (Maximum)

- 9/04

- REVISED DESIGNATION

- RENAMED STD DWG FROM C-10.29, 2 OF 2 & REVISED TITLE
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.

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

The cable assembly shall be tightened to remove slack.

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

See Std Dwg C-10.00 for measurement limits.

- Indicates AASHTO, AGC & ARTBA Task Force 13 Report designation
1. Curbing is not required when drainage flows transversely away from barrier.

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

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

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

GENERAL NOTES

**ELEVATION**

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

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

18'-9"
3'-1\1/2"
3'-1\1/2"
3'-1\1/2"
3'-1\1/2"
3'-1\1/2"

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

Wood Post

8"x8"x6'-0" Wood Post
8"x8"x2'2" Wood Block

8"x8"x6'-0" Wood Post
8"x8"x1'7" Wood Block

8"x8"x6'0" Wood Post
8"x8"x1'4" Wood Block

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

Two Sections of Thrie-Beam
Guardrail Transition System (●)
1. Anchor Plate shall conform to ASTM specification A36. Bolts, washers and Anchor Plate shall be galvanized or, at the contractor's option, stainless steel bolts and washers may be used.

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

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

GENERAL NOTES
### GENERAL NOTES

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

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

3. Concrete shall be Class S, f<sub>c</sub> < 4000 PSI.

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

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

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

▲ Depth to match adjacent PCCP thickness 18" 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 S, f_c <= 4000 PSI.

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

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

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

7. Depth to match adjacent PCCP thickness 18" minimum.
GENERAL NOTES

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

2. Hex head bolt shall conform to ASTM A193, galvanized in accordance with ASTM A153 Class C.

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

4. Tension wires: AWG number 9 (0.148") galvanized in accordance with ASTM A16 Class 2.

5. Hog ring: AWG number 12 (0.105") galvanized in accordance with ASTM A16 Class 2. Fasten glare screen to top and bottom tension wire spaced approximately 2' apart.

6. Glare Screen: 16 gauge steel, ASTM A536, galvanized in accordance with ASTM A536, expanded to the following dimensions: 1.33" shortway of diamond and 4.40" longway of diamond (center to center of bridges) with a strand width of 0.250" angled at approximately 20° to the plane of the original sheet. Top edge to be shop curled and crimped on 12" center to center. Glare screen shall be installed such that flat portion of screen blocks light from headlights. See Direction Detail, Sheet 2 of 2.

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

8. Glare screen shall be constructed without interruption to the greatest degree possible.
CROSS-BRACE POST DETAIL

INTERMEDIATE POST DETAIL

TYPICAL POST DETAIL

SECTION A-A

DIRECTION DETAIL

1 1/8 " x 28 5/8 "

4" x 6" x 3/8 "

Steel Plate

Traffic

TOP VIEW SECTION

ELEVATION

TYPE A WIRE TIE

TYPE B WIRE TIE

TYPE C WIRE TIE

See Intermediate Post Detail

See Typical Post Detail

See Bottom Bolt Detail Sheet 3 of 3

See Typical Post Detail

Top Tension Wire See Note 4 Sheet 1 of 3

See Typical Post Detail

Type C Wire Tie

Hog Ring Fasteners 2" Center to Center (Typ)

See Note 5 Sheet 1 of 3

Traffic

3/4 " Diameter Hole 2 Places

9/16 " Diameter Hole 2 Places

1/2 " x 5 1/4 " Expansion Bolt ( )

With Hex Nut ( ) and Plain Round Washer ( )

1/8 " x 5 1/8 " Wire Tie ( )

GLARE SCREEN

Traffic

4" x 6" x 3/8 " Steel Plate

1 1/8 " Diameter Hole 2 Places

4" x 6" x 3/8 " Steel Plate

1 1/8 " Diameter Hole 2 Places

1/8 " x 5 1/8 " Expansion Bolt ( )

With Hex Nut ( ) and Plain Round Washer ( )

1/8 " x 5 1/8 " Wire Tie ( )
GENERAL NOTES

1. Half barrier shall be constructed by the slip or fixed form method.
2. When obstacles prevent the use of slip form equipment, stationary forms shall be used.
3. Concrete shall be Class S, (≤4000 PSI).
4. If the footing and barrier are cast monolithically, #6 S shape rebar will not be required.
5. 4" rebar shall extend 12" past the construction joint at the completion of the day's pour.
6. Weep holes shall be placed whenever barrier is backfilled unless otherwise indicated on the plans.

Depth to match adjacent PCCP thickness (8" Minimum).
GENERAL NOTES

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

CONCRETE HALF BARRIER
32" TYPE 'F'
PRECAST

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

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

Concrete shall be Class S, f_c = 4000 PSI.

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

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

Concrete shall be Class S, f_c = 4000 PSI.

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

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

1. Concrete shall be Class C, f'c=4000 PSI.
2. Rebar shall conform to Std Spec 1003.
3. Rebar shall have 2" minimum clear cover unless otherwise noted.
4. See drainage sheets for slotted drain and catch basin details.
5. Departure termination may be substituted for Std Dwg C-10.76 barrier transition under departure conditions.
6. See Std Dwg C-05.20 for sidewalk construction.
7. All bend dimensions for rebar are cut-to-out of rebar.

ELEVATION

DEPARTURE TERMINATION WITHOUT GUARDRAIL

ELEVATION

PLAN VIEW

SECTION B-B

AT CATCH BASINS

SECTION A-A

BARRIER GUTTER DETAIL

Traffic

Traffic
**GENERAL NOTES**

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

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**ELEVATION**

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

---

**SECTION A-A**

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

---

**BARRIER GUTTER DETAIL**

- Horizontal Line
- See Plans

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**DEPARTURE TERMINATION WITHOUT GUARDRAIL**

- See Plans

---

**CONCRETE HALF BARRIER**

- 10'-0" TYPE 'T'

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**STATE OF ARIZONA**

**DEPARTMENT OF TRANSPORTATION**

**ROADWAY STANDARD DRAWINGS**

**CONCRETE HALF BARRIER**

**10'-0" TYPE 'T'**

**WITH GUTTER**

**C-10.52**

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GENERAL NOTES

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

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

3. Concrete shall be Class S, f_c \leq 4000 \text{ PSI}.

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

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

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

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

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

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

When obstacles prevent the use of slip form equipment, stationary forms shall be used. Concrete shall be Class S, f_c \leq 4000 \text{ PSI}.

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

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

1. Concrete shall be Class S, \( f_{ck} \leq 4000 \) PSI.

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

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

Concrete shall be Class S, \( f_{ck} \leq 4000 \) PSI.

REVISED GENERAL NOTE 3

REVISED SECTION A-A: ADDED CONCRETE CAP & NOTES

ADDED (Typ)
GENERAL NOTES

1. Concrete shall be Class S, f_c≤4000 PSI.
2. The Hord Barrier shall be placed upon a bed of grout in order to provide a uniform bearing.
3. Dowelled Joints shall be grouted under pressure until all of the openings and the joints are filled.
4. All bend dimensions for rebar are out-to-out of rebars.
1. Transition median paving cross slope to meet level foundation pad. See plans for length and location.

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

3. Slope as shown on Plans

**GENERAL NOTES**

**SECTION A-A**

- Match Roadway Cross Slope
- Edge of Normal Shoulder
- Bridge Column See Bridge Group Plans
- Median Pavement See Plans (Typ)
- Match Roadway Cross Slope

**SECTION B-B**

- Match Roadway Cross Slope
- Edge of Normal Shoulder
- Bridge Column
- Compacted Backfill
- Edge of Normal Shoulder
- Bridge Column

**SECTION C-C**

- Bridge Pier (Typ)
- Concrete Half Barrier
- Edge of Normal Shoulder
- 20:1 Slope Transition See Plans (Typ)
- Median Pavement (Typ)
- Measurement Limits - Concrete Half Barrier
- 20:1 Slope Transition See Plans (Typ)

**CONCRETE HALF BARRIER**

- 32" Type 'F' At Piers

**CONCRETE HALF BARRIER LAYOUT**

- 3" Compacted Bituminous Mixture or 3" Concrete Foundation Pad (Typ) See Plans for Width
- Slope Transition See Plans (Typ)
- Sand-Barrel Array or Other Impact Attenuator as Shown on Plans (Typ)
- 40' Bridge Pier (Typ)
- Continuous Concrete Barrier See Plans

**STATE OF ARIZONA**

**DEPARTMENT OF TRANSPORTATION**

**ROADWAY STANDARD DRAWINGS**

**APPROVED FOR DISTRIBUTION**

**APPROVED FOR DESIGN**

**5/07**
GENERAL NOTES

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

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

CONCRETE HALF BARRIER

42" TYPE 'F' AT PIERS

CAST-IN-PLACE

See Sheet 3 of 3 (Typ)

REF: C-07.01

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Rebar shall have 2" minimum clear cover unless otherwise noted.
Concrete shall be Class S, \( f_{c} \leq 4000 \) PSI.

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

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

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

Optional Construction Joint
See Optional Construction Joint Detail Sheet 3 of 3

BARRIER END DETAIL

Thrie-Beam Terminal Connector
For Anchor Plate and Hardware
See Std Dwg C-10.30

1'-6"
2'-0"
6'-1" Transition
20'-10"

BARRIER WITHOUT CURB

ELEVATION

PLAN

GENERAL NOTES

1. Concrete shall be Class S, \( f_{c} \leq 4000 \) PSI.

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

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

4. 1'-0" Minimum or Match Thickness of Adjacent PCCP

5. Optional Construction Joint
See Optional Construction Joint Detail Sheet 3 of 3

REVISED TERMINAL CONNECTOR NOTE

REVISED TRANSITION SYSTEM NOTE

REVISED SYSTEM LIMIT TO INCLUDE END SHOE

5/07

ROADWAY STANDARD DRAWINGS
APPROVED FOR DISTRIBUTION
APPROVED FOR DESIGN

STATE OF ARIZONA
DEPARTMENT OF TRANSPORTATION

CONCRETE HALF-BARRIER TRANSITION
TO VERTICAL
32° " Type Y WITH CAISSONS

C-10.70
Sheet 2 of 3
1. See Section B-B for caisson reinforcement.
2. See Optional Construction Joint Detail, Sheet 3 of 3
3. 1'-0" Minimum or Match Thickness of Adjacent PCCP

SECTION A-A
7 *4 Rebars
3" Center to Center
7 *4 Rebar Ties
3" Center to Center
4 3/4 " Diameter Sleeve (Typ)
For Anchor Plate and Hardware
See Std Dwg C-10.30

SECTION B-B
27 *4 Rebars
3" Center to Center
7 #4 Rebars (Continuous)

SECTION C-C
19 #4 Rebars
9" Center to Center
16 #5 Rebars
9" Center to Center

GENERAL NOTES

C-10.70
Sheet 2 of 3

CONCRETE HALF-BARRIER TRANSITION
TO VERTICAL 32" TYPE 'F' WITH CAISSONS
**Construction Joint Detail** (Optional)

**Joint Assembly**
- Existing Concrete Barrier
- 3/8" Bituminous Joint Filler
- Epoxy Grout (Typ)

**Dowel Locations**
- 1" Diameter x 18" Dowel (Typ)

**Concrete Half-Barrier Transition**
- 3/4" Rebar Tie
- 12" Center to Center

**Caisson Reinforcement**
- 6 #8 Rebars
- 9'

**Dimensions**
- 2 1/2" x 2 1/2"
- 4" x 1 1/2"
CONCRETE HALF-BARRIER TRANSITION
TO VERTICAL
32" TYPE 'F' WITH CURB & GUTTER

1. Concrete shall be Class S, f_c = 4000 PSI.
2. All rebar shall have 2" minimum clear cover unless otherwise noted.
3. All bend dimensions for rebar are end to end of bars.
4. Two-inch deep contraction joints shall be placed in the gutter at locations which match the joints in adjacent PCCP and at approximately 15' centers when adjacent to AC pavement. Joints shall be either hand tooled or sawn.

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

BARREL END DETAIL

ELEVATION
BARRIER WITH CURB AND GUTTER

GENERAL NOTES

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<th>DESCRIPTION OF REVISIONS</th>
<th>MADE BY</th>
<th>DATE</th>
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APPROVED FOR DISTRIBUTION
APPROVED FOR DESIGN

ROADWAY STANDARD DRAWINGS

STATE OF ARIZONA
DEPARTMENT OF TRANSPORTATION

PROJECT NO.

CONCRETE HALF-BARRIER TRANSITION
TO VERTICAL
32" TYPE 'F' WITH CURB & GUTTER

Sheet 1 of 2

Sheet 2 of 2
CONCRETE HALF-BARRIER TRANSITION
TO VERTICAL 32" TYPE 'F' WITH CURB & GUTTER

SECTION A-A
8' * 4 Rebars
9" Center to Center
5" Clear of Bottom
7' * 4 Rebars
(Continuous)
1' - 3 1/8"

SECTION B-B
19 * 4 Rebars
9" Center to Center
4 1/2"

SECTION C-C
3 "5 Rebars
9" Center to Center
1' - 3 1/8"

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

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

3 #5 Rebars
9" Center to Center
4 3/4 

7 #4 Rebars
9" Center to Center
3" Clear of Bottom
4 1/2 

14 #4x18" Rebars
18" Center to Center

7 #4 Rebars
9" Center to Center
3" Clear of Bottom
4 1/2 

3 #5 Rebars
9" Center to Center
4 3/4 

27 * 4 Rebars
9" Center to Center

2'-6" to 4'-6" (Typ)
See Plans

B Joint
Std Dwg C-07.01

Roadway Width
1' - 0"

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

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

Concrete Half-Barrier Transition
To Vertical 32" Type 'F' with Curb & Gutter

Roadway Width
1' - 0"

1" Diameter
18" Dowel (Typ)
Epoxy Grout (Typ)

1/2" Blown In Joint Filler
Existing Concrete Barrier

Optional Construction Joint
1' - 3 1/8"
1. Concrete shall be Class S, f_c = 4000 PSI.
2. All rebar shall have 2" minimum clear cover unless otherwise noted.
3. All bend dimensions for rebar are out-to-out of rebars.
   - 1"-0" Minimum or Match Thickness of Adjacent PCCP

**GENERAL NOTES**

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

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

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

SECTION A-A

Without Curb

Roadway Width + Offset (2' Typ)

8" 9' Center to Center

14 #4x18" Rebars
18" Center to Center

8 #4 Rebars
9" Center to Center

8 #4 Rebars
9" Center to Center
3" Clear of Bottom

1 #6 Rebar
(Continuous)

7 #4 Rebars
12" Center to Center
(All Caissons) See Caisson Reinforcement Detail
Sheet 3 of 3

6 #8 Rebars (All Caissons) See Caisson Reinforcement Detail
Sheet 3 of 3

Optional Construction Joint (Typ)

Roadway Width + Offset (2' Typ)

1" R

SECTION B-B

Without Curb

Roadway Width + Offset (2' Typ)

8" 9' Center to Center

17 #4 Rebars
9" Center to Center

3 #5 Rebars
9" Center to Center
9" Center to Center

1 #6 Rebar
(Continuous)

14 #4x18" Rebars
18" Center to Center

8 #4 Rebars
9" Center to Center

1" Diameter

Sleeve (Typ)

For Anchor Plate and Hardware
See Std Dwg C-10.30
Sheet 2 of 3

Thrie-Beam Terminal Connector
See Std Dwg C-10.30

Roadway Width + Offset (2' Typ)

3'-1 1/2"

3 #5 Rebars
9" Center to Center

1" Diameter

Sleeve (Typ)

SECTION C-C

Without Curb

Roadway Width + Offset (2' Typ)

8" 9' Center to Center

10 #4 Rebars
9" Center to Center

3 #5 Rebars
9" Center to Center
9" Center to Center

1" Diameter

Sleeve (Typ)

For Anchor Plate and Hardware
See Std Dwg C-10.30
Sheet 2 of 3

Thrie-Beam Terminal Connector
See Std Dwg C-10.30

Roadway Width + Offset (2' Typ)

3'-1 1/2"

3 #5 Rebars
9" Center to Center

1" Diameter

Sleeve (Typ)

SECTION D-D

Without Curb

Roadway Width + Offset (2' Typ)

8" 9' Center to Center

16 #5 Rebars
9" Center to Center

19 #4 Rebars
9" Center to Center

16 #5 Rebars
9" Center to Center
9" Center to Center

1" Diameter

Sleeve (Typ)

For Anchor Plate and Hardware
See Std Dwg C-10.30
Sheet 2 of 3

Thrie-Beam Terminal Connector
See Std Dwg C-10.30

Roadway Width + Offset (2' Typ)

3'-1 1/2"

3 #5 Rebars
9" Center to Center

1" Diameter

Sleeve (Typ)
CONSTRUCTION JOINT DETAIL
(Optional)

Epoxy Grout (Typ)

Joint Assembly

Dowel Locations

Caisson Reinforcement

1/2" Bituminous Joint Filler

Existing Concrete Barrier

Concrete Half-Barrier Transition
1" Diameter x 1/8" Dowel (Typ)

2 1/2" 2 1/2"

Epoxy Grout (Typ)

3" 3" 42"

4 1/2" 2 1/2"

11 1/8"

4"

2 1/2" 2 1/2"

6 #8 Rebars

#4 Rebar Tie 12" Center to Center

3" 3" 3"
1. Concrete shall be Class S, \( f_{c} = 4000 \) PSI.
2. All rebar shall have 2" minimum clear cover unless otherwise noted.
3. All bend dimensions for rebar are out-to-out of rebars.
4. Two-inch deep contraction joints shall be placed in the gutter at locations which match the joints in adjacent PCCP and at approximate 15' centers when adjacent to AC pavement. Joints shall be either hand-tooled or sawn.

**ELEVATION**

**BARRIER WITH CURB AND GUTTER**

**GENERAL NOTES**

**PLAN**

**BARRIER END DETAIL**

**ELEVATION**

**BARRIER WITH CURB AND GUTTER**
1. Half-barrier Transition shall be constructed by the formed cast-in-place method.
2. Concrete shall be Class S, f<sub>2</sub>=4000 PSI.
3. If the footing and barrier are cast monolithically, #6 S shape rebars are not required.
4. Barrier width shall not exceed the barrier footing width nor overhang the adjacent pavement.
5. #4 rebar shall extend 12" past the construction joint at the completion of the day's pour.
6. Gutter thickness can be adjusted to match the PCCP thickness, as approved by the Engineer.
7. Two-inch deep construction joints shall be placed in the gutter at locations which match the joints in adjacent PCCP and at approximate 15' centers when adjacent to AC pavement. Joints shall be either hand tooled or sawn.

Concrete Half Barrier
42" Type 'F' With Gutter
Std Dwg C-10.53 or as Shown on Plans

Concrete Half Barrier
32" Type 'F' With Gutter
Std Dwg C-10.52 or as Shown on Plans

General Notes

Plan

Elevation

Construction Joint
See Note 5

Epoxy Grout (Typ)

#4 Rebar
Continuous

#6 Rebar
S Shape

#6 Rebar
S Shape (Typ)

Construction Joint
See Note 5

PCCP

See Plans

AB

Base Material
See Plans

Topsoil Plating

3" Diameter
+ 18" Dowel (Typ)

Optional Construction Joint

3" Minimum

B Joint
Std Dwg C-07.01

See Barrier
Gutter Detail

Section A-A

Constru...
GENERAL NOTES

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

SECTION A-A

BARRIER GUTTER DETAIL

Concrete Curb and Gutter See Plans

Outside Edge of Sidewalk Std Dwg C-05.20

Sidewalk Cross Slope = 0.010 In/5' Toward the Curb

Sidewalk Cross Slope = 0.010 In/5' Toward the Outside

Sidewalk Width in 5'

Concrete Half Barrier

See Construction Joint Detail Std Dwg C-10.71 Sheet 2 of 2

Transition Top of Sidewalk in 10'-0"

Transition Sidewalk Slope to Match in 5', Std Dwg C-05.20

PLAN

Traffic

SECTION B-B

SECTION C-C

TRANSITION TO VERTICAL TYPE CURB

Varies From 1'-4" to 3'-6"

SECTION A-A

Gutter Line

Top of Curb

Top of Sidewalk

ELEVATION

Varies to 1'-8"

1/2" Preformed Expansion Joint Filler

3" 8" 4 7/8" 10 1/4"

2'-0"

2'-3"

1'-7 1/2"

Varies" 1'-3 1/8"

1" R

8 1/2" 2'-0"

8"

29"

Varies to 1'-8"

1'-3 1/8"

2'-0"

10 3/8"

1'-7 1/2"

Varies From 1'-4" to 3'-6"

10 3/8"

Varies From 1'-4" to 3'-6"

10 3/8"

4 7/8"

2 1/4"

8"

1'-10"

2 1/2"

Varies From 1'-4" to 3'-6"

1'-3"

Varies From 1'-4" to 3'-6"

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Varies From 1'-4" to 3'-6"

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Varies From 1'-4" to 3'-6"

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1'-3"

Varies From 1'-4" to 3'-6"

1'-3"
GENERAL NOTES

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

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3. All rebar shall have 2" minimum clear cover unless otherwise noted.
4. See drainage sheets for slotted drain and catch basin details.
5. Barrier transition shall match the adjoining concrete half barrier.
6. See Std Dwg C-05.20 for sidewalk construction.
7. All bend dimensions for rebar are out-to-out of bars.
   - VARIES 10 1/4" to 1'-0 5/8" to 1'-3 1/8"
GENERAL NOTES

1. See plans and barrier summary sheets for location and type of guardrail and end treatments. Timber post installation shown.
2. See Std Dwgs C-05.10, 05.12, 10.01 and 10.02 for dimensions and details not shown.
3. Type B guardrail installation shown. For Type A guardrail installation, use Type D-1 Curb and Gutter instead of the Type D-2 Curb and Gutter shown.
4. See plans for type and location of drainage facilities.
5. Bitumen joint filler (1/2") shall be placed when the curb & gutter or concrete widening abuts slotted drains, catch basins, ditches, barrier, etc. Scored joints, 2" in depth, shall be placed to match adjacent joints in PCCP or at 15' intervals when adjacent to AC or continuously reinforced concrete pavement.

To Top of W-Beam Guardrail

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

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

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

See plans for type and location of drainage facilities.

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Curb & Gutter Type B, C or Cl Curb With Variable Width Gutter
Gutter Depression Varies See Std Dwg C-05.10

1. See plans and barrier summary sheets for location and type of guardrail and end treatments. Timber post installation shown.
2. See Std Dwgs C-05.10, 05.12, 10.01 and 10.02 for dimensions and details not shown.
3. Type B guardrail installation shown. For Type A guardrail installation, use Type D-1 Curb and Gutter instead of the Type D-2 Curb and Gutter shown.
4. See plans for type and location of drainage facilities.
5. Bitumen joint filler (1/2") shall be placed when the curb & gutter or concrete widening abuts slotted drains, catch basins, ditches, barrier, etc. Scored joints, 2" in depth, shall be placed to match adjacent joints in PCCP or at 15' intervals when adjacent to AC or continuously reinforced concrete pavement.

To Top of W-Beam Guardrail

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

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

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

See plans for type and location of drainage facilities.

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

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

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

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

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

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

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

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

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

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

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

### UNIT TABLE

<table>
<thead>
<tr>
<th>Roadway Width (ft)</th>
<th>Grill Units Required</th>
<th>Concrete (Cu Yd)</th>
<th>Rebar (Lbs)</th>
</tr>
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<tbody>
<tr>
<td>12</td>
<td>2</td>
<td>5.8</td>
<td>175</td>
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<tr>
<td>16</td>
<td>3</td>
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<td>20</td>
<td>4</td>
<td>10.3</td>
<td>310</td>
</tr>
<tr>
<td>24</td>
<td>5</td>
<td>12.5</td>
<td>375</td>
</tr>
<tr>
<td>28</td>
<td>6</td>
<td>14.7</td>
<td>445</td>
</tr>
<tr>
<td>32</td>
<td>6</td>
<td>16.9</td>
<td>510</td>
</tr>
<tr>
<td>36</td>
<td>7</td>
<td>16.9</td>
<td>510</td>
</tr>
</tbody>
</table>

### GENERAL NOTES

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

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

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

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

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

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

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

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

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

Cattle guard beams shall be HS-20 loading unless otherwise shown on the plans.
Material for shoulder transition shall be placed to the finished roadway elevation for the entire length of the transition. When the roadway is paved, aggregate subbase or AB shall be used. When the roadway is unpaved, a material equivalent to the existing roadway shall be used.

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

- Indicates AASHTO, AGC & ARTBA Task Force 13 designation

GENERAL NOTES

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

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GENERAL NOTES

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

- Indicates AASHTO, AGC & ARTBA Task Force 13 designation
1. Apply a heavy duty, high-strength anaerobic thread-locking compound to the threads before installing the double nuts.
GENERAL NOTES

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

CATTLE GUARD, DRAINAGE

1. This standard shall be used in embankment or where highly erodable soil is found.
2. All concrete shall be Class B.

CATTLE GUARD OPEN BOTH ENDS

6x6-W1.4xW1.4 Galvanized Wire Mesh

SECTION A-A

SECTION B-B
**GENERAL NOTES**

1. Length of post and braces shall not be less than 7'-0".
2. Woven wire fence fabric shall be attached to the post at the top, bottom, and intermediate wires.
3. Intermediate Post Assemblies shall be located as shown and at intervals to utilize standard rolls to minimize cutting and waste.
4. A twisted wire stay shall be centered between posts.

**ADDED ASTM CALLOUT**

- **PNB 7/94**

**FENCE FABRIC DIMENSIONS AND DESIGN NUMBERS**

- **Type 1**
  - 7'-0" Stay Per Panel (Typ) 1 - 4'-2" Stay Per Panel (Typ)

- **Type 2**
  - 1'-0"x1'-0"x1'-6" Concrete Footing (Typ)
  - 16'-0" Maximum (Typ)

- **Type 3**
  - 10" Diameter x 3'-0" Concrete Footing (Typ)
  - 16'-0" Maximum (Typ)

- **Type 4**
  - 1'-0"x1'-0"x1'-6" Concrete Footing (Typ)
  - 16'-0" Maximum (Typ)

---

**TYPICAL WOVEN WIRE FENCE INSTALLATION—TYPE 1 WW SHOWN**

- Intermediate Post Assembly
  - Detail D Sheet 5 of 5
  - Line Post
  - Detail B Sheet 5 of 5
  - Intermediate Post Assembly
  - Detail B Sheet 5 of 5

---

**FENCE**

- **WOVEN WIRE**

---

**STATE OF ARIZONA**

**DEPARTMENT OF TRANSPORTATION**

**ROADWAY STANDARD DRAWINGS**

**REV. 5/07**

**NO. S-1047**

**FENCE WOVEN WIRE**

---
GENERAL NOTES

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

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

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

TYPICAL BARBED WIRE FENCE INSTALLATION-TYPE 2 BW SHOWN

TYPE 1 BARBED WIRE (BW) (4 WIRE)

TYPE 2 BARBED WIRE (BW) (5 WIRE)

BARBED WIRE GAME FENCE (GF)
FLOOD GATE

TYPE 1 SINGLE GATE

TYPE 1 DOUBLE GATE

TYPE 2 GATE
1. Post assemblies shall consist of an upright angle 2\(\frac{1}{2}\)" x 2\(\frac{1}{2}\)" x \(\frac{1}{4}\)" at 4.10 lbs/ft, and brace angles 2\(\frac{1}{2}\)" x 2\(\frac{1}{2}\)" x \(\frac{1}{4}\)" at 3.19 lbs/ft.

**GENERAL NOTES**

**DETAIL A**

**TYPICAL CROSS SECTIONS OF LINE POST SHAPES**

**DETAIL B**

**INTERMEDIATE POST ASSEMBLY**

**DETAIL C**

**END POST ASSEMBLY**

**DETAIL D**

**CORNER POST ASSEMBLY**

**DETAIL E**

**FENCE CONNECTION TO WINGWALL**

**TYPICAL FENCE LOCATION**

**TYPICAL FENCE LOCATION AT CATTLE GUARD**

**ABUTTING FENCE**

**ABUTTING FENCE AT POST**

**NEW FENCE**

**EXISTING FENCE**

**NEW FENCE**

**TEE**

**CHANNEL OR U**

**TYPICAL FENCE LOCATION**

**ROADWAY CORRIDOR**

**WINGWALL**

**LINE POST**

End Post Assembly Detail C

Intermediate Post Assembly

Corner Post Assembly

End Post Assembly

Section C-10.11

Post assemblies shall consist of an upright angle 2\(\frac{1}{2}\)" x 2\(\frac{1}{2}\)" x \(\frac{1}{4}\)" at 4.10 lbs/ft, and brace angles 2\(\frac{1}{2}\)" x 2\(\frac{1}{2}\)" x \(\frac{1}{4}\)" at 3.19 lbs/ft.

**GENERAL NOTES**

1. Post assemblies shall consist of an upright angle 2\(\frac{1}{2}\)" x 2\(\frac{1}{2}\)" x \(\frac{1}{4}\)" at 4.10 lbs/ft, and brace angles 2\(\frac{1}{2}\)" x 2\(\frac{1}{2}\)" x \(\frac{1}{4}\)" at 3.19 lbs/ft.
### TYPICAL CHAIN LINK FENCE INSTALLATION - TYPE 1 SHOWN

#### TYPICAL POST DIMENSIONS

<table>
<thead>
<tr>
<th>Fabric Height (ft)</th>
<th>Length (Ft-In)</th>
<th>Round (In)</th>
<th>Roll Formed (In)</th>
<th>Line Posts</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>D</td>
<td></td>
<td>Roll</td>
</tr>
<tr>
<td>36</td>
<td>6-Ft-0</td>
<td>2.375</td>
<td>3.50 x 3.50</td>
<td>2.25 x 1.70</td>
</tr>
<tr>
<td></td>
<td>7-Ft-0</td>
<td>2.375</td>
<td>3.50 x 3.50</td>
<td>2.25 x 1.70</td>
</tr>
<tr>
<td></td>
<td>8-Ft-0</td>
<td>2.375</td>
<td>3.50 x 3.50</td>
<td>2.25 x 1.70</td>
</tr>
<tr>
<td>72</td>
<td>9-Ft-0</td>
<td>2.375</td>
<td>3.50 x 3.50</td>
<td>2.25 x 1.70</td>
</tr>
<tr>
<td></td>
<td>Over 72, Height &gt; 9-Ft</td>
<td>2.875</td>
<td>3.50 x 3.50</td>
<td>2.50 x 2.50</td>
</tr>
</tbody>
</table>

#### GENERAL NOTES

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

2. Chain link fabric shall be either zinc-coated or aluminum-coated steel wire fence fabric. Zinc-coated steel fabric shall conform to the requirements of ASTM A392, Class I coating. Aluminum-coated steel fabric shall conform to the requirements of ASTM A490, with a minimum weight of coating of 0.40 ounces per square foot of wire surface area. Fabric shall be 11 gauge for all fence fabric 60" or less in height and shall be 9 gauge for fabric greater than 60" in height.

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

4. Truss rods shall be 3/8" diameter adjustable rods. Truss tighteners shall have a strap thickness of not less than 0.125".

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

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

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

8. See Sheet 3 of 3 for typical fence location.
Barbed wire for use with Type 2 chain link fence shall be 12 gauge steel wire with 4 point 14 gauge barbs spaced 5" apart and shall be either zinc-coated or aluminum-coated. Inc-coated steel wire shall conform to the requirements of ASTM A121, Class I coating. Aluminum-coated steel wire shall conform to the requirements of ASTM 1585, Type 1, Class I coating.

2. Barbed wire support arm shall be of the type shown on the plans, shall be fabricated from commercial quality steel, and shall be zinc-coated in accordance with the requirements of AASHTO M111.

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

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

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

Typical Chain Link Fence Installation - Type 2 Shown

Typical Post Dimensions

<table>
<thead>
<tr>
<th>Fabric Height (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-in)</td>
<td>Round</td>
</tr>
<tr>
<td></td>
<td>(OD) (in)</td>
<td>(ID) (in)</td>
</tr>
<tr>
<td>72</td>
<td>8-6</td>
<td>2.375</td>
</tr>
</tbody>
</table>

Detail G
Barbed Wire Support Arm

As Required By Engineer

Both Sides of Gate
**TYPICAL GATE DIMENSIONS**

### SINGLE GATE

<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' Ht or Less</td>
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<td>2.875</td>
<td>0</td>
<td>2.875</td>
<td>6 to 13</td>
</tr>
<tr>
<td>3 to 8</td>
<td>0</td>
<td>2.875</td>
<td>3 to 8</td>
<td>0</td>
<td>2.875</td>
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<td>8 to 16</td>
<td>1</td>
<td>4.000</td>
<td>8 to 16</td>
<td>1</td>
<td>4.000</td>
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<tr>
<td>16 to 18</td>
<td>2</td>
<td>4.000</td>
<td>16 to 21</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>21 to 27</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>27 and Larger</td>
<td>3</td>
<td>1</td>
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### DOUBLE GATE

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<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>
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<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>2.875</td>
<td>1</td>
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<td>4.000</td>
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<td></td>
<td></td>
<td></td>
<td>3</td>
<td>4.000</td>
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**ROLLING GATES**

<table>
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<tr>
<th>Gate Width (Ft)</th>
<th>Vertical Braces</th>
<th>Gate Post Size</th>
<th>Gate Width (Ft)</th>
<th>Vertical Braces</th>
<th>Gate Post Size</th>
<th>Number of Equally Spaced Vertical Braces</th>
<th>Tension Rods Per Braced Panel</th>
<th>Gate Post Size</th>
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</thead>
<tbody>
<tr>
<td>6 to 13</td>
<td>1</td>
<td>2.875</td>
<td>1</td>
<td>2.875</td>
<td>1</td>
<td>2.875</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13 to 16</td>
<td>1</td>
<td>4.000</td>
<td>1</td>
<td>4.000</td>
<td>2</td>
<td>1</td>
<td>2.875</td>
<td></td>
</tr>
<tr>
<td>16 to 21</td>
<td>2</td>
<td>4.000</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>1.900 OD x 10&quot; Pipe Sleeve</td>
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</tr>
<tr>
<td>21 to 27</td>
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<td>4.000</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>2.875</td>
<td></td>
</tr>
<tr>
<td>27 and Larger</td>
<td>3</td>
<td>4.000</td>
<td>4</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>2.875</td>
<td></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 A153.
4. The 3/4" galvanized wire rope shall conform to AASHTO M30 Class B, Type 2.
5. The wire fabric, flas, stretchers, bars, and other fittings and hardware shall conform to AASHTO M181.
6. The wire fabric fence shall follow contour of the graded median.
7. The excavation for the concrete anchor blocks shall be to the line. Maximum excess shall be 3".
8. Perforated posts shall be square tube formed from 0.105" USS gauge ASTM A36/A36M cold rolled carbon steel. The square tubes shall be welded directly in the corner by high frequency resistance welding or equal. The posts to be externally scarfed to agree with standard corner radii of 5/32" 1/16".
9. Perforated posts shall be galvanized to the requirements of ASTM A655/A655M. Coating designator shall be Z275.
10. The cables shall have enough tension to prevent sagging. The location of the concrete anchor blocks may also be varied to provide enough tension to help prevent sagging.
11. Two interior U-bolt and clamp bars shall be spaced at 1/3 of the distance between posts.
13. An alternate to rectangular concrete anchor blocks shall be a 36" diameter round footing with an additional depth of 4".
14. The median approach grade within 100' of the Chain Line Cable Barrier should not exceed a grade of 10 percent.

Perforated posts shall be galvanized to the requirements of ASTM A655/A655M. Coating designator shall be Z275.

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

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


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

The median approach grade within 100' of the Chain Line Cable Barrier should not exceed a grade of 10 percent.
U-BOLT AND CLAMP BAR

CABLE CLAMP ASSEMBLY

ANCHOR PLATE

STRETCHER BAR BAND ASSEMBLY

SWAGED CABLE ASSEMBLY
GENERAL NOTES

1. See plans for any required inlet and/or outlet protection.

2. Depth E dimension applies to both non-trench and trench conditions.

3. Minimum cover over pipe culverts shall be 1', measured from the top of pipe.

4. See Pipe Berm Requirement Details for pipe berm requirements and Std Dwg C-03.15 for Installation. If Point A is within the recovery area, then a pipe berm is required and Point B is set at the edge of the recovery area.

5. Slope plating shall conform to Std Spec 501.

<table>
<thead>
<tr>
<th>Diameter or Span (in)</th>
<th>E (Ft-In)</th>
</tr>
</thead>
<tbody>
<tr>
<td>18</td>
<td>2-6</td>
</tr>
<tr>
<td>24</td>
<td>3-0</td>
</tr>
<tr>
<td>30</td>
<td>3-9</td>
</tr>
<tr>
<td>36</td>
<td>4-6</td>
</tr>
<tr>
<td>42</td>
<td>5-3</td>
</tr>
<tr>
<td>48 to 66</td>
<td>GO + 3-0</td>
</tr>
<tr>
<td>72 and Over</td>
<td>GO + 3-0</td>
</tr>
</tbody>
</table>
GENERAL NOTES

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

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

SPECIAL MULTIPLE PIPE END SECTION DETAIL FOR PIPE CULVERT EXTENSIONS ONLY

PIPE AND CATCH BASIN INSTALLATION
AT SAG CONDITION OF CUT DITCH

PIPE AND CATCH BASIN INSTALLATION
AT BASE OF TRANSVERSE DIKE

PIPE AND CATCH BASIN INSTALLATION
AT FACE OF TRANSVERSE DIKE
Pipes shall be installed either in a trench condition or in a non-trench condition in natural ground or in embankment.

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

2. Bracing and sloping shall conform to OSHA requirements.

3. Pipe backfill may be bedding material.

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

D - Outside diameter of full circle pipe or outside dimension (span or rise) of arch, arch pipe, elliptical pipe.  
T - Minimum wall thickness for NRCIPCP; See Plans.

1. For D < than 4: D + 6" each side, minimum D + 3" each side, maximum

2. For D > than 4: D + 1" each side, minimum D + 3" each side, maximum

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

<table>
<thead>
<tr>
<th>Top of Embankment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Embankment</td>
</tr>
<tr>
<td>Minimum Width for Pipe Stability</td>
</tr>
<tr>
<td>Trench or Non-Trench Condition</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Embankment for Pipe Stability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Existing Ground Line</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Proposed Subgrade or Existing Ground Line</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trench Form - 210° Minimum</td>
</tr>
<tr>
<td>Vertical Limits</td>
</tr>
<tr>
<td>Horizontal Limits</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Proposed Subgrade or Existing Ground Line</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slope or Brace Per OSHA Requirements</td>
</tr>
<tr>
<td>Vertical Limits</td>
</tr>
<tr>
<td>Horizontal Limits</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Proposed Subgrade or Existing Ground Line</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slope or Brace Per OSHA Requirements</td>
</tr>
<tr>
<td>Vertical Limits</td>
</tr>
<tr>
<td>Horizontal Limits</td>
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</table>

<table>
<thead>
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1. End section joint type shall match the pipe joint type.

2. Embankment slope shall be warped to match slope of end section.

**General Notes**

**Plan Section A-A**

**Front Elevation**

**Spacing for Multiple Skewed Culvert**

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<tr>
<th>Pipe Diameter (In)</th>
<th>Approximate Weight (Lbs)</th>
<th>T</th>
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<th>B</th>
<th>C</th>
<th>E</th>
<th>F</th>
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**Embankment Slope**

- Diameter Approximate Weight (Lbs)
- Culvert Length as Shown on Plans
- Culvert Length as Shown on Plans

**Right-Angle Culvert**

**Skewed Culvert**

**Normal Toe of Slope**

**Embankment Slope**

**Culvert Length as Shown on Plans**

**Culvert Length as Shown on Plans**

**State of Arizona**

**Department of Transportation**

**Roadway Standard Drawings**

**NEW GENERAL NOTE 1**

**PIPE REINFORCED CONCRETE END SECTION**

**No. - PIPE**

**REINFORCED CONCRETE END SECTION**

**C-13.20**
**GENERAL NOTES**

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

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

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

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

5. All steel end section components shall be galvanized.

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

7. A berm shall be added to abnormal projections per Std Dwg C-13-10.

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

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### PIPE ARCH

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**RIGHT ANGLE CULVERT**

**SKewed CULVERT**

**THREADED ROD CONNECTIONS**

**DIMPLED BAND CONNECTIONS**

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GENERAL NOTES

1. For lateral dimensions of invert paving, use 72° control for CMP and span for CMPA.
2. Pavement shall be scored laterally at 1'-6" minimum intervals along the length of the pipe.
3. Use bevel on inlet headwall only.
4. Wire mesh shall be fastened or welded to corrugation crests at intervals and in a manner approved by the Engineer. Laps shall be 6" minimum.
5. Pavement shall not be placed until backfilling is completed.
6. Concrete shall be Class B.
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 pass course and 6" of concrete may be used in the 144" diameter pipe.

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

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

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

6. For installation normal to roadway centerline only.

**MODIFIED TABLE & MEASUREMENT FORMAT**

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**REVIEWED WIRE MESH DESIGNATION**

1. 6x6-W1.4xW1.4 Galvanized Wire Mesh

**STATE OF ARIZONA**
**DEPARTMENT OF TRANSPORTATION**
**ROADWAY STANDARD DRAWINGS**
APPROVED FOR DISTRIBUTION
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5/07
Slotted Drain Pipe shall be 2"x1/2" corrugated steel pipe with a minimum wall thickness of 0.064" and shall conform to the requirements of AASHTO M36. All concrete shall be Class B. Rebar shall conform to Std Spec 1003-2. Structural steel shall conform to ASTM A36. Concrete anchors shall conform to ASTM A307 and hex nuts shall conform to ASTM A563 Grade A. All slotted drain pipe hardware except anchor bolts and rebar shall be given two coats of Number 1 paint. When annular pipe is used, apply waterproof sealer before attaching coupling band. When helical pipe is used, it shall be formed with at least one annular corrugation at each end of each pipe section. Water proof sealer shall be applied to the annular corrugation prior to attachment of coupling band. Cover slot during construction with removable tape or other acceptable substitute. Joints in concrete curb & gutter shall match adjoining PCCP and slotted drain bands. All welding shall be in accordance with Std Spec 604-3.06. Bolts or rebar may be used for concrete anchoring. The 18"x1'-0" or 24"x1'-0" CMP stub shall be included in the price of respective catch basins. Slotted drain pipe shall be clean at the time of final acceptance. Concrete curb and gutter shall be paid for under the curb and gutter items. See Std Dwg C-05.10 for curb and gutter details.
GENERAL NOTES

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

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

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

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

Main Drainage Trunk Line
Gutter Line
8'-0" Minimum
Roadway Width

Catch Basin
With Frame and Grate
Std Dwg C-13.91

TYPICAL CONNECTION BETWEEN CATCH BASIN AND MANHOLE

Pipe Cross Connection

Main Storm Drain
Pipe Diameter
See Plans

Median Catch Basin with Apron

TYPICAL SLOTTED DRAIN AND CATCH BASIN INSTALLATION WITH MANHOLE

8'-0" Minimum
Roadway Width

Catch Basin
With Frame and Grate
Std Dwg C-13.91

TYPICAL CONNECTION BETWEEN CATCH BASIN AND MAIN STORM DRAIN

Concrete Pipe Collar
Std Dwg C-13.80

TYPICAL SLOTTED DRAIN AND CATCH BASIN INSTALLATION WITHOUT MANHOLE

8'-0" Minimum
Roadway Width

Main Storm Drain
Pipe Diameter
See Plans

Median Catch Basin with Apron
GENERAL NOTES

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

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

3. If L is 45° or less, Type 1 connection shall be used.

4. All concrete shall be Class B.

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

6. Rebar shall have 2" minimum cover.

---

**STORM DRAIN CONNECTION DETAILS**

**SECTION A-A**

**SIDE INLET TYPE 1**

**CATCH BASIN ABOVE STORM DRAIN TYPE 2**

**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 pin.
3. Both ends of the shear pins shall be peened after installation.
4. Shear pin material shall be commercially pure aluminum alloy 1100, Temper D, Federal Spec QQ-A411.
5. Galvanize 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 evenly spaced.
9. Hinge pin material shall be bolt stock and threaded on both ends so nut and lock washer are flush with the lower angle. Cover pin with waterproof grease prior to installation. Upset or damage exposed threads after installation.
10. All welding shall be in accordance with Std Spec E605-3.08.

INSTALLATION DETAIL FOR DOUBLE GATES

During Construction of Concrete Walls

STATE OF ARIZONA
DEPARTMENT OF TRANSPORTATION ROADWAY STANDARD DRAWINGS

STORM DRAIN OUTLET BARRIER GATE
DRAINAGE OUTLET INTO CHANNEL

STORM DRAIN PLUG

GENERAL NOTES
1. Compact soil at end of pipe plug to 95% of maximum density.
2. If depth of cover is less than 5' or greater than 10', increase plug thickness a minimum of 4".

Outlet Collar
Std Dwg C-13.80

Concrete Lined Channel
See Channel Plans

For joint details
See Channel Plans

24"

2"

Bevel End of Pipe
to match side slope of channel
typ.

Ground line

Outlet Collar
Std Dwg C-13.80

See Plans for
Top of Channel Elevation

See Plans for
Top of Channel Elevation

Flow

2:1

24"

2"

1/2" Layer Cement Plaster (Watertight)

Block or Brick and Mortar Plug
See Notes

Compact soil at end of pipe plug to 95% of maximum density.
If depth of cover is less than 5' or greater than 10', increase plug thickness a minimum of 4".
GENERAL NOTES

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

PIPE COLLAR TABLE

<table>
<thead>
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<th>Pipe Size (In)</th>
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<th>3&quot; Clear (In)</th>
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**CONCRETE PIPE COLLAR**

**TYPICAL LATERAL CONNECTIONS TO CATCH BASINS WITH CONCRETE COLLARS**

**OUTLET COLLAR DETAIL**
GENERAL NOTES

1. Catch basin used at roadway sag.
2. Pipes can be placed in any wall.
3. Sump floor shall be a wood troweled finish with a minimum 4:1 slope in all directions to outlet.
4. All rebar shall be ASTM A36.
5. All welding shall be in accordance with Std Spec 604-3.06.
6. Grate frame, beam and nose plate shall be given one shop coat of Number 1 paint.
7. All concrete shall be Class C.
8. Construction joints and repairs shall be placed to meet field conditions. See Std Dwg C-15.70.
9. Any specified inlet depression shall be warped to opening according to Std Dwg C-15.70.
10. Silicone sealant shall be placed between the grate frame and PCCP, recessed 1/4" from the pavement surface.
11. Curb opening areas, for i, for Type 1-single and Type 1-double equal 0.35 and 0.54, respectively, for each inch of "h" + inlet depression - 2.35".
12. See Std Dwg C-15.50 for grate and frame details and grate opening areas.
13. i = 6" when H is 6' or less
   = 9" when pavement is AC match pavement thickness
   = 8" when H is greater than 8'
   See Section B-B

CATCH BASIN TYPE 1

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

Dimensions are Common to Catch Basin Type 1-Single Except as Shown

PLAN - CATCH BASIN TYPE 1 - SINGLE

PLAN - CATCH BASIN TYPE 1 - DOUBLE

SECTION A-A

USE THIS SECTION WHEN T=8"

SECTION B-B

DETAIL 1

DETAIL 2

DETIAL FOR WIDE GUTTER (SEE STD DWG C-05.10)
GENERAL NOTES

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

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

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

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

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

6. All rebar shall be ASTM A36.

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

8. All concrete shall be Class B.

9. Curb opening area (sq ft) per inch of curb
   \[ h + \text{gutter depression} = \text{curb opening length (ft)} \times 0.0833. \]

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

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

12. \( \theta_1 = 5^\circ \) when \( H \) is \( 6' \) or less.

   \( 8^\circ \) when \( H \) is greater than \( 6' \).

NOTES:

- No Rebar in Bottom
- Construction Joint (Typ)
- Gutter Width
- No Rebar in Bottom
- Construction Joint (Typ)
- Gutter Width
- No Rebar in Bottom
- Construction Joint (Typ)
GENERAL NOTES

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

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

SECTION A-A

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

Curb Support Anchor
4' Maximum Anchor Spacing
See Detail 2

Catch Basin Sump
Length = 3'-6", 7'-6", 11'-6", or 19'-6"

Nose Plate
8" x 8" Bent Plate
Lengths: 2'-11 1/2", 2'-11 1/2" + (L + 6')

Anchor *4 Rebar
6" Center to Center

#1 Rebar
3" Center to Center
See Detail 3

Catch Basin Sump
Length = 3'-6", 7'-6", 11'-6", or 19'-6"

Construction Joint (Typ)

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

No Rebar In Bottom

Construction Joint (Typ)

Detail 1

Legend:
1" x 8" UNC x 15"
Hex Head Bolt
With 3" of Thread

Detail 2
CURB SUPPORT ANCHOR

Detail 3
CURB SUPPORT ANCHOR

Detail 4

Construction Joint (Typ)

No Rebar In Bottom

Construction Joint (Typ)

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

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

1. Catch basin can be used on grade or at roadway sag.
2. Pipes can be placed in any wall.
3. Floor shall be a wood troweled finish with a minimum 4:1 slope along the axis of the pipe.
4. Curb over catch basin shall not be constructed until catch basin concrete has set for a minimum of 24 hours.
5. Catch basin can be used with curb and gutter (as shown) or without.
6. See Std Dwg C-15.50 for grate and frame details and opening areas.
7. Any specified inlet depression shall be warped to opening according to Std Dwg C-15.70.
8. All rebar shall be ASTM A36.
9. Grate, frame, and beam shall be given one shop coat of Number 1 primer.
10. All concrete shall be Class B.
11. Construction joints and drains shall be placed to meet field conditions. See Std Dwg C-15.70.
12. Silicone sealant shall be placed between the grate frame and PCCP, recessed 1/4" from the pavement surface.
13. See Detail 2 for catch basin with wide gutter.
14. \( t \) = 6" when \( H \) is 8' or less.
\[ \text{or} \]
6" when \( H \) is greater than 8'.
See Section B-B.
15. 9" when pavement is AC.
16. Match pavement thickness when pavement is PC.

Dimensions are Common to Catch Basin Type 4 - Single Except as Shown

Curb and Gutter

See Catch Basin Type 4 - Single and Section A-A for Rebar Details

Location as Shown on Plans

PLAN - CATCH BASIN TYPE 4 - SINGLE

PLAN - CATCH BASIN TYPE 4 - DOUBLE

SECTION A-A

SECTION B-B

SECTION C-C

DETAIL 1

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

Catch basin has three configurations:
1. Sump-only sump portion of catch basin,
2. Single wing (illustrated)—sump with wing basin upstream, and
3. Double wing—sump with symmetrical wing basins each side.

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

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

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

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

All concrete shall be Class B.

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

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

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

When pavement is AC, match pavement thickness when pavement is PCCP.

Construction joints (Typ)
SECTION A-A
USE THIS SECTION WHEN H IS GREATER THAN 5'

GENERAL NOTES
1. See Sheet 1 of 2 for other dimensions, notes and rebar.
2. \( h \geq 6" \) when \( H \) is 8' or less
\( h \geq 8" \) when \( H \) is greater than 8'

PLAN

Curb Support Anchor
*4 Max. Anchor Spacing
See Detail 2

CATCH BASIN SUMP

6" Minimum

Catch Basin Sump

Wing Basin

Construction Joint (Typ)

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

No Rebar in Bottom

Construction Joint (Typ)

DETAIL 1

Nose Plate
8"/2" Bent Plate
Lengths: 2'-11 3/4" + 2 1/2" + (L + 6")

Anchor #4 Rebar
6" Center to Center
See Detail 3

DETAIL 2

CURB SUPPORT ANCHOR

6" Center to Center

*3 Rebar (Typ)

DETAL 3

*3 Rebar

DETAIL 4

Inlet Depression

See Plans
GENERAL NOTES

1. Grating units and frames shall be fabricated from structural steel ASTM A36 except as noted.
2. All welding shall be in accordance with Std Spec 604.3.06.
3. The completed assembly shall be given one shop coat of Number 1 paint.
4. Frames and grates shall fit to a maximum rock of 1/8" at any point.
5. Grate opening is 3.60 sq ft.
6. Bracing of frame is recommended for handling and placement purposes.
7. Frames and Grate to be used with Std Dwgs C-15.10, C-15.30 and C-15.40.
8. Grate may be used with Std Dwg C-15.92 Frame.

Temporary Brace
See General Note 6

SECTION A-A

Beveled Side of Grate Toward Curb

SECTION B-B

REVISED GRATE DIMENSIONS AND REISSUED STANDARD

TYPICAL INSTALLATION

C-15.10 Catch Basin Shown Similar for C-15.30 and C-15.40

3 1/2 "x 1/2 
1 7/8 " Center to Center

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

3/8 " Anchors

When Used With
I-beam Support
or Slotted Drain

2 1/2 "x 3/8 
End Bars

1/2 "x 3 
Rebar

1/4 " Anchors

Diamter at Any Point.

3/32 " of " at Any Point.

Frame and Grate to be used with Std Dwgs C-15.10, C-15.30 and C-15.40.
1. Construction drain may be deleted at the option of the Engineer.

**LEGEND**

- Normal pavement or gutter flow line elevation.

**SECTION**

**CATCH BASIN CONSTRUCTION DRAIN**

**TYPE 4 CATCH BASIN WITHOUT CURB**
### GENERAL NOTES

1. See also Std Dwg C-13.10.
2. High point of headwall shall not project more than 12" above slope.
3. All concrete shall be Class B.
4. All rebar shall be 4" I.D. center to center, with 3" minimum clear to inside of walls and floor.

### PIPE

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<th>ID (in)</th>
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<th>Double</th>
<th>A</th>
<th>B</th>
<th>E</th>
<th>F</th>
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### QUANTITIES (Based on CMP Installation)

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**GENERAL NOTES**

1. All concrete shall be Class B.
2. Grate and frame shall be fabricated of structural steel in accordance with ASTM A36.
3. All welding shall be in accordance with Std Spec 604-3.06.
4. Grate assembly shall be given one shop coat of number 1 paint.
5. Apron slopes shall match the natural flow line of the ditch. No additional depression will be allowed.
6. Apron slopes shall match the natural flow line of the ditch. No additional depression will be allowed.
7. Apron slopes shall match the natural flow line of the ditch. No additional depression will be allowed.
8. Apron slopes shall match the natural flow line of the ditch. No additional depression will be allowed.

**DITCH GRADE DETAIL**

- Concrete Apron Required
  - Unless otherwise indicated on the project plans
  - Grade to Drain Ditch
  - Match Grate Elevation
- #4 Rebar (Typical)
  - 1'-0" Center to Center
  - 6" when H is 8' or less
  - 8" when H is greater than 8'
- 4-1/2" x 4" Bolt Anchors
  - Bend 45°
  - 2" Clear

**DETAIL 1**

- 4-1/2" x 4" Bolt Anchors
  - Bend 45°
  - 2-1/2" x 1/2" Bar
  - 2-1/2" Clear

**SUMP WALL**

- 2" x 3" x 3" Zee, 12.5 ft/ft or Details 1 Alternate
- 4-1/2" Diameter Holes (Typical)

**DRAWING NO.**

- STATE OF ARIZONA
  - DEPARTMENT OF TRANSPORTATION
  - ROADWAY STANDARD DRAWINGS
  - APPROVED FOR DISTRIBUTION
  - APPROVED FOR DESIGN
  - 5/07

**STATE OF ARIZONA**

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**CATCH BASIN**

- Flush

**REVISED CLEAR COVER**

- Concrete Apron Required
  - Unless otherwise indicated on the project plans
  - Grade to Drain Ditch
  - Match Grate Elevation

**REVISED THICKNESS SPECIFICATION**

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

**PROJECT NO.**

- STATE OF ARIZONA
  - DEPARTMENT OF TRANSPORTATION
  - ROADWAY STANDARD DRAWINGS
  - APPROVED FOR DISTRIBUTION
  - APPROVED FOR DESIGN
  - 5/07
GENERAL NOTES

1. All concrete shall be Class B.
2. Grate and frame shall be fabricated of structural steel in accordance with ASTM A36.
3. All welding shall be in accordance with Std Spec 604-3.06.
4. Grate assembly shall be given one shop coat of Number 1 paint.
   • Apron slopes shall match the natural flow line of the ditch. No additional depression will be allowed.
   • Area - 6” when H is 8’ or less
   • 8” when H is greater than 8’
5. All concrete shall be Class B.
6. Apron slopes shall match the natural flow line of the ditch. No additional depression will be allowed.
7. See Grate Detail
   • Grate and frame shall be fabricated of structural steel in accordance with ASTM A36.
   • Grate assembly shall be given one shop coat of Number 1 paint.
8. Concrete Apron Required Unless Otherwise Indicated on Project Plans
9. Rev. Clear Cover
   - 6” when H is 8’ or less
   - 8” when H is greater than 8’
10. Grate assembly shall be given one shop coat of Number 1 paint.

REVISED CLEAR COVER

ADDED CONCRETE REQUIREMENT

STATE OF ARIZONA
DEPARTMENT OF TRANSPORTATION
ROADWAY STANDARD DRAWINGS

APPROVED FOR DISTRIBUTION
APPROVED FOR DESIGN

ROADWAY STANDARD DRAWINGS

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ROADWAY STANDARD DRAWINGS

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APPROVED FOR DESIGN

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

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

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

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

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

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

NOTE: Two Layers of 4"x4" Timbers

18" or 24" Diameter Slotted Drain

Grate & Frame
Std Dwg C-13.61
Sheet 2 of 2

Grate & Frame
Std Dwg C-13.62
Sheet 2 of 2

Remove Base for Placement of Special Catch Basin

1'-0" Minimum

1'-0" Minimum

Invert Elevation

Invert Elevation

SECTION A-A

SECTION B-B

Temporary Timber Cap Detail

Roadway Width

Gutter Flow Line

Location Control Point

Location Marker on Structure

Fill to Subgrade

NOTE:

Bend Rebars and Cover with Two Layers of 4"x4" Timbers

1. Variable 6" when H is 8' or less
2. Variable 8" when H is greater than 8'
### GENERAL NOTES

1. All structural steel shall be in accordance with ASTM A36.
2. All welding shall be in accordance with Std 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.

### GRATE AND FRAME DIMENSIONS

<table>
<thead>
<tr>
<th>Type</th>
<th>Curb Height (In)</th>
<th>Gutter Width (Ft-In)</th>
<th>Catch Basin Frame</th>
<th>Catch Basin Grate</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>6</td>
<td>2-6</td>
<td>26'-57'-40</td>
<td>26'-57'-40</td>
</tr>
<tr>
<td>C</td>
<td>3</td>
<td>2-6</td>
<td>15'-37'-49</td>
<td>15'-37'-49</td>
</tr>
</tbody>
</table>

### SECTION B-B

- **3 1/2" x 1/2" Bars (Typ)**
- **3 1/2" x 1/2" x 10" Bar**

### SECTION A-A

- **3 1/2" x 1/2" Bars**
- **3 1/2" x 1/2" x 10" Bar**

### BRACE PLATE DETAIL

- **3 1/2" x 1/2" x 10" Bar**
- **3 1/2" Bars (Typ)**

### NOTES

- **hl**: 3'-6 1/2"
- **h**: 3'-5 1/4"
- **L**: 4" x 3" x 1/2"

---

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

1. All structural steel shall be in accordance with ASTM A36.
2. All welding shall be in accordance with Std 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.

1. All structural steel shall be in accordance with ASTM A36.
2. All welding shall be in accordance with Std 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.
NORMAL GUTTER SLOPE

GUTTER DEPRESSION AT SLOTTED DRAIN LOCATIONS

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

GENERAL NOTES
1. See Std Dwg C-15.91 for dimensions, sizes and details not shown for construction of catch basin.
2. See Std Dwgs C-10.52 and C-10.53 for dimensions, sizes and details not shown for construction of barrier.
3. See Std Dwg C-13.60 for dimensions, sizes and details not shown for construction of 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.

NOTE TO DESIGNERS
Grate design shown is not suitable for locations subject to bicycle traffic. Use Std Dwg C-15.50 grate with Std Dwg C-15.92 frame (Sheet 2 of 2) for locations with bicycle traffic.

GENERAL NOTES
1. 32" or 42" Slotted Drain when Shown on Plans
2. Normal Gutter Slope

NOTE TO DESIGNERS
Grate design shown is not suitable for locations subject to bicycle traffic. Use Std Dwg C-15.50 grate with Std Dwg C-15.92 frame (Sheet 2 of 2) for locations with bicycle traffic.

GENERAL NOTES
1. See Std Dwg C-15.91 for dimensions, sizes and details not shown for construction of catch basin.
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NOTE TO DESIGNERS
Grate design shown is not suitable for locations subject to bicycle traffic. Use Std Dwg C-15.50 grate with Std Dwg C-15.92 frame (Sheet 2 of 2) for locations with bicycle traffic.
GENERAL NOTES

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

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

\[ \text{Beveled side of grate toward barrier} \]

NOTE TO DESIGNERS

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

1. Grate openings for grate shown is 4.75 Sq Ft.

\[ \text{Beveled side of grate toward barrier} \]
**GENERAL NOTES**

1. All welding shall be in accordance with Std Spec 604-3.06.
2. Grate opening for grate shown is 4.75 Sq Ft.

4. Beveled side of grate toward barrier

**NOTE TO DESIGNERS**

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

1. Irrigation sleeves shall be installed in a trench condition. See Std Dwg C-13.15.
2. Bedding and backfill material shall be Class 2 AB.
3. Pipe installation shall conform to Section 501 of Std Specs.
4. The contractor shall imprint a 4" high letter "S" on the face of all curbs at sleeve locations. The width of the letter shall be 1/2" and shall penetrate the concrete surface 1/2".
5. For non-continuous sleeves under crossroads, Std Dwg C-05.10 Type "A-1" curb shall be required where median is irrigated. See plans for locations. Dumbell waterstop shall be at all expansion joints.
6. Materials used for caps or plugs shall be as recommended by the pipe supplier and approved by the Engineer.

Sleeves shall be installed parallel to the roadway subgrade. Slope may vary in super-elevated sections. Minimum slope nominal to drain.

2'-0" Back of Curb Median

Bedding and backfill material shall be Class 2 AB.

Hinge Point

1/2" Expansion Joint

Dumbell Waterstop

(Butyl Rubber)

See Note 5

Pipe installation shall conform to Section 501 of Std Specs.

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

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.

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 to drain.

2'-0" Back of Curb Median

Bedding and backfill material shall be Class 2 AB.

Hinge Point

1/2" Expansion Joint

Dumbell Waterstop

(Butyl Rubber)

See Note 5

Pipe installation shall conform to Section 501 of Std Specs.

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

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.

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 to drain.

2'-0" Back of Curb Median

Bedding and backfill material shall be Class 2 AB.

Hinge Point

1/2" Expansion Joint
1. Rock shall conform to Std Spec 913-2.01(A). The rock shall have a minimum nominal diameter no smaller than the mesh opening, and a maximum nominal diameter of 12".
2. All mesh wire, tie wire, cable, bolts, washers and nuts shall be galvanized.
3. When other embankment slope rates are encountered, warp to 1 1/2:1 or 2:1.
4. High survivability filter fabric shall conform to Section 913-2.05 of the Standard Specifications.
5. All wire mesh on a single project shall have the same mesh opening.
### General Notes

1. Rock fill shall conform to Section 913-2.01(A) of the Standard Specifications. The rock fill shall have a minimum nominal diameter no smaller than the mesh opening, and a maximum nominal diameter of 12".

2. All mesh wire, tie wire, cable, bolts, washers and nuts shall be galvanized.

3. When other embankment slope rates are encountered, warp to 1 1/2 :1 or 2:1.

4. High survivability filter fabric shall conform to Section 913-2.05 of the Standard Specifications.

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

### Typical Section

See Perspective Std Dwg C-17.10

### Elevation On Straight Section

4" Minimum Lap

2 Strands #9 Galvanized Wire

### Plan Of Bank Protection At Abutment

Construct on Two-Panel Chords Around Curves

### TYPICAL SECTION

See Perspective Std Dwg C-17.10

### ELEVATION AT CHORD POINT ON CURVE

### ELEVATION ON STRAIGHT SECTION

### Wire Mesh Splice Details

### RAIL CONNECTION DETAIL

Burn Holes Through Rails in Field and Bolt Together as Shown

### Description Of Revisions

Made By

Date

Roadway Standard Drawings

State of Arizona

Department of Transportation

PROJ.

STATE OF ARIZONA

DEPARTMENT OF TRANSPORTATION

ROADWAY STANDARD DRAWINGS

APPROVED FOR DISTRIBUTION

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5/07

5/07

C-17.25
PLAN

TYPE 7 AND 8 BANK PROTECTION

Thread Cable Through Wire Fabric and Wrap One Turn on Each Rail
Loop Cable Around Rails as Shown
Rail Heads Face Out

A
A

Manufacturer's Standard Galvanized Cable Clamp

6x19 Galvanized Plow Steel Preformed Fibercore Cable

4'-0" (Typ)
4'-0" (Typ)

Rail (Typ)

Type
MIN RAIL LENGTH (Ft)
MIN RAIL WT (lbs/ft)
MESH
A (Ft-1ft)
B (Ft-1ft)
D (Ft)
Y (In)

7
15
50
3"x3"-W1.4/W1.4
4 - 0
2 - 0
4
6

8
18
50
4"x4"-W1.4/W1.4
7 - 0
3 - 0
5
6

9
10
15
N/A
2 - 2
N/A
N/A
3

GENERAL NOTES

1. Rock shell conform to Std Spec 913-2.01A. The rock shell have a minimum nominal diameter no smaller than the mesh opening, and a maximum nominal diameter of 12".

2. All mesh wire, tie wire, cable, bolts, washers and nuts shall be galvanized.

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

REISSUED STANDARD DRAWING

STATE OF ARIZONA
DEPARTMENT OF TRANSPORTATION
ROADWAY STANDARD DRAWINGS
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RAIL BANK PROTECTION
FOR DRAINAGEWAYS TYPES 7, 8 & 9

D

C

C

D

ELEVATION

SECTION A-A

SECTION B-B

SECTION C-C

WIRE MESH SPLICE DETAILS

End Panel

8'-4" (Typ)

Intermediate Panel

4" Minimum Lap

2 Strands #9 Galvanized Wire

Mesh (See Table) Placed Above Basket

Attach Mesh to Rails With 3 Strands of #9 Galvanized Wire, 12" Center to Center (Typ)

3/4 " Diameter Cable Placed Above Basket

Attach Mesh to Rails With 3 Strands of #9 Galvanized Wire, 12" Center to Center (Typ)

Elevation

See Plans

Rock Backfill

3/8 " Diameter Cable Placed Under Basket

Mesh (See Table) Placed as Shown to Enclose the Rock Backfill (Typ)

.attach Mesh to Rails

Tension Wire

See General Note 3

2 Strands #9 Galvanized Wire Twisted Taut


Type
MIN RAIL LENGTH (Ft)
MIN RAIL WT (lbs/ft)
MESH
A (Ft-1ft)
B (Ft-1ft)
D (Ft)
Y (In)

7
15
50
3"x3"-W1.4/W1.4
4 - 0
2 - 0
4
6

8
18
50
4"x4"-W1.4/W1.4
7 - 0
3 - 0
5
6

9
10
15
N/A
2 - 2
N/A
N/A
3

Tension Wire

See General Note 3
GENERAL NOTES

1. Pipe sizes and elevations are shown on plans.

2. 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. Manholes deeper than 56 inches shall have steps. Manhole steps shall be constructed in accordance with AASHTO M199. Where precast manholes are used, the steps shall be installed at the same time sections are cast.

5. Precast manhole sections shall be manufactured in accordance with AASHTO M199, except that the compressive strength of each section shall be determined and accepted in accordance with Std Spec 1006-7.

6. Manhole size, location, and elevation shall be as shown on plans.

7. Backfill material shall be compacted to at least 95 percent of the maximum density per the applicable test method of the ADOT Materials Testing Manual.

NOTE TO DESIGNERS

Per OSHA requirements, special treatments are required for heights exceeding 30 ft.
1. All frames, grates, and covers shall support HS20 loading, minimum.

2. Casting weights shown are minimum weights and are either for cast-iron or ductile-iron castings. Casting weight shall not exceed 1.2 times the weights shown.

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

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

Casting weights shown are minimum weights and are either for cast-iron or ductile-iron castings. Casting weight shall not exceed 1.2 times the weights shown.

G Knob should be 2 inches in height and raised 1/8-inch above the plane of the cover.

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

GENERAL NOTES

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   C. Letters and words to be equally spaced; and
   D. Letter font and layout shall be as approved by the Engineer.

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

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

SECTION
CONCRETE SURFACE ROAD
WITH CONCRETE WALLS

ROADWAY WIDTH

1 Cu Ft Coarse AB
(AASHTO No. 43 Size 7)

Security Tied In Burlap

3" Diameter Weep Holes

2-4 Rebars
Top and Bottom

Slope 0.015/hr.

Backfill Material
See Plans

2" Concrete
Class B

3" Rebars
Top and Bottom

JOINT DETAIL

FINISHED ROADWAY

3" Weep Holes

1'-0"

3% Maximum

Minimum

REISSUED STUD AS C-19.10, SHEET 1 OF 2
9/04

ADDED GENERAL NOTE 4

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DEPTHC GAUGE DETAIL

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

Downstream Wall

Wall May Be Constructed To This Line

3" Diameter Weep Hole

Typ 20 Center to Center

3" Weep Holes

Slope 0.015/hr.

FINISHED ROADWAY

2" Concrete

Class B

2" Rebars
Top and Bottom

Slope 0.015/hr.

BASE MATERIAL
See Plans

CONCRETE SURFACE ROAD
WITH CONCRETE WALLS

SECTION

BITUMINOUS SURFACE ROAD
WITH CONCRETE WALLS

ROADWAY WIDTH

1 Cu Ft Coarse AB
(AASHTO No. 43 Size 7)

Security Tied In Burlap

3" Diameter Weep Hole

Typ 20' Center to Center

2-4 Rebars
Top and Bottom

Slope 0.015/hr.

Pedestrian Surface
See Plans

2" Concrete
Class B

2" Rebars
Top and Bottom

ELEVATION LOOKING UPSTREAM

Depth Gauge (2)

Wall to be Built To
One Foot Above
High Water Level

3" Maximum

3% Maximum

Minimum
GENERAL NOTES

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

TYPE 1
BITUMINOUS SURFACE ROAD

- Width of Seal Coat
- Roadway Width
- Finished E Grade
- Slope 0.015 th

- 3-2"x12" Planks
- 2-2"x12" Planks
- 4"x4"x5'-0" Post 5' Center to Center

- 1'-0" Rock Fill
- 4" Minimum Size

- 20d Galvanized Spike 3 Per Board (Typ)
- 2" OD x 7'-0" Pipes 8 Center to Center

DETAIL A

- Optional Rock Basket Down Stream from Cutoff Wall Detail A
- 3x3-W1, 4xW1, 4 Welded-Wire Fabric, Tie With 2 Strands of #9 Gauge Galvanized Wire 2" Center to Center. Each Wire, Tie Top and Bottom of Basket to Top 2"x12" Plank at 5'-0" Intervals and at Each End. Tie by Encircling Plank With Two Strands of #9 Wire

TYPE 2
BITUMINOUS SURFACE FORD
TIMBER CUTOFF WALLS

- High Water Level
- Depth Gauge
- Option Rock Basket

ELEVATION - TYPE 2

1'-0" Wall to be Built to One Foot Above High Water Level

3-2"x12" Planks

3% Maximum

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

A Right-of-Way marker, consisting of a survey monument and a reference marker, complete-in-place, shall be considered a unit.

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

Frames may be either Type A or Type B. Frames shall weigh at least 53 pounds.

Covers shall weigh at least 16 pounds.

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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 lettering format may vary.

3. When used to define section lines, the marker shall be stamped in accordance with the BLM "Manual of Surveying Instructions."

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 walls 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 field, as approved by the Engineer.

8. Survey marker shall be made of brass.

9. Shank cross-sectional area shall be a minimum of 0.31 square inches and a maximum of 0.60 square inches. Shank cross-section may vary and is not a critical feature of this standard.

10. Shank geometry shall provide for secure anchorage in concrete.

11. Text shall not obscure survey point.

A Right-of-Way plan number

B Point Number

C Registered Land Surveyor Number - See General Note 5

D Year

DETAIL A

R/W MARKER INFORMATION

Shank cross-sectional area shall be a minimum of 0.31 square inches and a maximum of 0.60 square inches. Shank cross-section may vary and is not a critical feature of this standard.