<table>
<thead>
<tr>
<th>REVISION DATE</th>
<th>DETAIL NO.</th>
<th>TITLE</th>
<th>REVISION DATE</th>
<th>DETAIL NO.</th>
<th>TITLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>4/87</td>
<td>UC-01</td>
<td>Special Catch Basin Details</td>
<td>4/87</td>
<td>UC-45</td>
<td>PCC Joint Details</td>
</tr>
<tr>
<td>4/87</td>
<td>UC-02</td>
<td>Slotted Drain Details</td>
<td>4/87</td>
<td>UC-46</td>
<td>Rame Curb and Gutter Layout</td>
</tr>
<tr>
<td>4/87</td>
<td>UC-03</td>
<td>Slotted Drain Installation Details</td>
<td>4/87</td>
<td>UC-47</td>
<td>Barrier Details at Piers</td>
</tr>
<tr>
<td>4/87</td>
<td>UC-04</td>
<td>Storm Drain Connection Details</td>
<td>4/87</td>
<td>UC-48</td>
<td>Load Transfer Dowel Details</td>
</tr>
<tr>
<td>4/87</td>
<td>UC-05</td>
<td>Manhole Riser Details</td>
<td>4/87</td>
<td>UC-49</td>
<td>Guard Rail Assembly with Curb</td>
</tr>
<tr>
<td>4/87</td>
<td>UC-06</td>
<td>Storm Drain Outlet Details</td>
<td>4/87</td>
<td>UC-50</td>
<td>Concrete Bus Bay</td>
</tr>
<tr>
<td>4/87</td>
<td>UC-07</td>
<td>Special Catch Basin with Half Barrier</td>
<td>4/87</td>
<td>UC-51</td>
<td>Sidewalk Ramp</td>
</tr>
<tr>
<td>4/87</td>
<td>UC-08</td>
<td>Pipe Collar Details</td>
<td>4/87</td>
<td>UC-52</td>
<td>Curb &amp; Gutter Details</td>
</tr>
<tr>
<td></td>
<td>UC-20</td>
<td>Backfill-Pavement and Surface Treatment</td>
<td>4/87</td>
<td>UC-60</td>
<td>Sanitary Sewer Enclosure</td>
</tr>
<tr>
<td>4/87</td>
<td>UC-21</td>
<td>C12.20 Pavement</td>
<td>4/87</td>
<td>UC-61</td>
<td>Pipe Support Across Trenches Sheet 1 of 3</td>
</tr>
<tr>
<td>4/87</td>
<td>UC-22</td>
<td>Crossroad Median Paving and Irrigation Sleeve Details</td>
<td>4/87</td>
<td>UC-61</td>
<td>Pipe Support Across Trenches Sheet 2 of 3</td>
</tr>
<tr>
<td>4/87</td>
<td>UC-23</td>
<td>Frame and Cover with Grade Adjustment</td>
<td>4/87</td>
<td>UC-61</td>
<td>Alternate to Pipe Support Sheet 3 of 3</td>
</tr>
<tr>
<td>4/87</td>
<td>UC-24</td>
<td>Chain Link Cable Barrier Sheet 1 of 4</td>
<td>4/87</td>
<td>UC-62</td>
<td>Sewer Manhole and Cover Frame Adjustment</td>
</tr>
<tr>
<td>4/87</td>
<td>UC-24</td>
<td>Chain Link Cable Barrier Sheet 2 of 4</td>
<td>4/87</td>
<td>UC-63</td>
<td>24&quot; and 30&quot; Manhole Frame and Cover</td>
</tr>
<tr>
<td>4/87</td>
<td>UC-24</td>
<td>Chain Link Cable Barrier Sheet 3 of 4</td>
<td>4/87</td>
<td>UC-64</td>
<td>Manhole Steps</td>
</tr>
<tr>
<td>4/87</td>
<td>UC-24</td>
<td>Chain Link Cable Barrier Sheet 4 of 4</td>
<td>4/87</td>
<td>UC-65</td>
<td>Pre-Cast Concrete Sewer Manhole</td>
</tr>
<tr>
<td>4/87</td>
<td>UC-40</td>
<td>Curb and Gutter Transition Type &quot;A&quot; &amp; &quot;B&quot; Sheet 1 of 2</td>
<td>4/87</td>
<td>UC-80</td>
<td>Thrust Blocks for Water Lines</td>
</tr>
<tr>
<td>4/87</td>
<td>UC-41</td>
<td>Barrier Transition - Tangent Sheet 2 of 2</td>
<td>4/87</td>
<td>UC-81</td>
<td>Blocking for Water Valves Gate and Butterfly</td>
</tr>
<tr>
<td>4/87</td>
<td>UC-41</td>
<td>Barrier Transition - Tangent Sheet 2 of 2</td>
<td>4/87</td>
<td>UC-82</td>
<td>Anchor Block for Vertical Bends</td>
</tr>
<tr>
<td>4/87</td>
<td>UC-42</td>
<td>Barrier Transition - Curve Sheet 1 of 2</td>
<td>4/87</td>
<td>UC-83</td>
<td>Vertical Realignment for Water Main</td>
</tr>
<tr>
<td>4/87</td>
<td>UC-43</td>
<td>Ramp Construction Joints Sheet 2 of 2</td>
<td>4/87</td>
<td>UC-84</td>
<td>Valve Box Installation Sheet 1 of 3</td>
</tr>
<tr>
<td>4/87</td>
<td>UC-44</td>
<td>Mainline Construction Joints with Curb and Gutter Sheet 1 of 2</td>
<td>4/87</td>
<td>UC-84</td>
<td>Valve Box Installation Sheet 2 of 3</td>
</tr>
<tr>
<td>4/87</td>
<td>UC-44</td>
<td>Ramp Construction Joints with Curb and Gutter Sheet 2 of 2</td>
<td>4/87</td>
<td>UC-85</td>
<td>Tapning Sleeve and Valve Installation</td>
</tr>
<tr>
<td></td>
<td>UC-86</td>
<td>Joint Restraint with Tie Rods Sheet 1 of 2</td>
<td>4/87</td>
<td>UC-86</td>
<td>Joint Restraint with Tie Rods Sheet 1 of 2</td>
</tr>
</tbody>
</table>

**Additional Entries:**
- UC-01: Special Catch Basin Details
- UC-02: Slotted Drain Details
- UC-03: Slotted Drain Installation Details
- UC-04: Storm Drain Connection Details
- UC-05: Manhole Riser Details
- UC-06: Storm Drain Outlet Details
- UC-07: Special Catch Basin with Half Barrier
- UC-08: Pipe Collar Details
- UC-20: Backfill-Pavement and Surface Treatment
- UC-21: C12.20 Pavement
- UC-22: Crossroad Median Paving and Irrigation Sleeve Details
- UC-23: Frame and Cover with Grade Adjustment
- UC-24: Chain Link Cable Barrier Sheet 1 of 4
- UC-24: Chain Link Cable Barrier Sheet 2 of 4
- UC-24: Chain Link Cable Barrier Sheet 3 of 4
- UC-24: Chain Link Cable Barrier Sheet 4 of 4
- UC-40: Curb and Gutter Transition Type "A" & "B" Sheet 1 of 2
- UC-41: Barrier Transition - Tangent Sheet 2 of 2
- UC-42: Barrier Transition - Curve Sheet 1 of 2
- UC-43: Ramp Construction Joints Sheet 2 of 2
- UC-44: Mainline Construction Joints with Curb and Gutter Sheet 1 of 2
- UC-44: Ramp Construction Joints with Curb and Gutter Sheet 2 of 2
- UC-86: Joint Restraint with Tie Rods Sheet 1 of 2

**Additional Designations:**
- UC-86: Joint Restraint with Tie Rods Sheet 2 of 2
- UC-87: Concrete Water Meter Box
- UC-88: Steel Cover for Water Meter Box
- UC-89: Waterline-Cut and Plug
- UC-90: Hydrant Installation
- UB-01: Half Barrier Transition
- UB-02: Junction Box and Barrier Detail Sheet 1 of 2
- UB-02: Junction Box and Barrier Detail Sheet 2 of 2
- UB-03: Temporary Concrete Barrier
- UB-04: Anchor Slab Details
- UB-05: Curb Fence Details
- USM-01: Regulatory Signs
- USM-02: Regulatory Signs
- USM-03: Regulatory Signs
- USM-04: Regulatory Signs
- USM-05: Regulatory Signs for Overhead Structures
- USM-21: Warning Signs
- USM-22: Warning Signs
- USM-61: U.S. & State Route Shields For Independent Joint Mounting
- USM-62: U.S. & State Route Shield Guide Sign Mounting
- USM-63: Directional Signs For Marker Signs
- USM-64: Directional Signs for Interstate Marker Assemblies
- USM-65: Arrow & Legend Details for Crossroad Signing
- USM-66: Interstate Route and Shield Details
- USM-67: State Route Shield for Independent and Joint Mounting
**GENERAL NOTES**

1. Slotted drain pipe shall be 2½" or 3½" corrugated steel pipe with a minimum wall thickness of 0.064 and shall conform to the requirements of ASTM D 3436.
2. All concrete shall be Class "S" (f'c = 1500 psi).
3. Reinforcing steel shall conform to AASHTO M 148, Grade 40.
4. Structural steel shall conform to ASTM A 36.
5. Concrete anchors shall conform to ASTM A 327 and hex nuts shall conform to ASTM A 327 Grade B.
6. All slotted drain pipe hardware except anchor bolts and connecting steel shall be given two coats of bright paint.
7. When annular pipe is used, apply water proof sealer before attaching coupling band.
8. When flexible pipe is used, it shall be formed with at least one annular corrugation at each end of such pipe section. Water proof sealer shall be applied to the annular corrugation prior to attachment of coupling band.
9. Over sidewalk construction with removable tops or other acceptable substitutes.
10. Slotted drain pipe shall be clean at the time of final acceptance.
11. Concrete curb and gutter shall be flush with respective curb and gutter items.
12. Refer to curb and gutter details for dimensions and details not shown.

---

**Connection of Slotted Drain to Catch Basin and Slotted Drain End Cap**

The 1½" or 2½" coupling shall be included in the price of respective catch basins.
SECTION A-A
Typical Slotted Drain & Catch Basin
Installation Without Manhole

Concrete Pipe Collar
See Detail UC-04
See Plans for Location

SECTION A-A
Typical Slotted Drain & Catch Basin
Installation With Manhole

SECTION B-B
Typical Connection Between C.B. & Main Storm Drain

8'-0" Maximum
Roadway Width

Main Drainage
Trunk Line E
Gutter Line

Special Catch Basin
with Frame and Cover
See Detail UC-01

SECTION B-B
Typical Connection Between C.B. & Manhole

8'-0" Minimum
Roadway Width

Main Drainage
Trunk Line E
Gutter Line

Special Catch Basin
with Frame and Cover
See Detail UC-01
NOTES:

1. PREFABRICATED TEES SHALL BE USED WHEN THE OUTSIDE DIAMETER OF THE INLET PIPE EXCEEDS ONE HALF THE INSIDE DIAMETER OF THE MAIN STORM DRAIN, EXCEPT WHEN MANHOLES ARE SHOWN ON PLAN.

2. CENTERLINE OF INLET PIPE SHALL INTERSECT CENTERLINE OF MAIN STORM DRAIN EXCEPT WHEN ELEVATION 'S' IS SHOWN ON PLANS.

3. IF $\theta$ IS 45° OR LESS TYPE I SHALL BE USED.

4. ALL CONCRETE SHALL BE CLASS 'S' ($f_{c} = 2500$ psi).

5. ALL REINFORCING STEEL SHALL CONFORM TO 1003-1, 2, GRADE 40.

6. REINFORCING SHALL HAVE 2" MIN. COVER.
GENERAL NOTES:

1. For dimensions, sizes and details not shown for installation of special catch basin and half barrier, see detail UC-01.
2. For dimensions, sizes and details not shown for installation of slotted drain, see detail UC-02.
3. Unless otherwise noted, reinforcement steel for half barrier for installation with special catch basin and slotted drain, shall conform to sizes and number specified.
4. The installation and inspection of steel studs welded to steel acting as a connection device to the concrete shell conform to AWS D1.1 and Specifications A321-47.
5. Where applicable, see standard C-10.09 for weep hole placement.
6. For additional general notes, see detail UC-42.
Concrete Pipe Collar

Typical Laterale Connections To
Catch Basins With Concrete Collars

PIPE COLLAR TABLE

<table>
<thead>
<tr>
<th>Pipe Size</th>
<th>L</th>
<th>T</th>
<th>#4 Steel</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/2&quot;</td>
<td>1&quot;</td>
<td>6&quot;</td>
<td>3</td>
</tr>
<tr>
<td>1&quot;</td>
<td>1.25&quot;</td>
<td>6&quot;</td>
<td>3</td>
</tr>
<tr>
<td>2&quot;</td>
<td>1.5&quot;</td>
<td>6&quot;</td>
<td>3</td>
</tr>
<tr>
<td>3&quot;</td>
<td>1.5&quot;</td>
<td>8&quot;</td>
<td>3</td>
</tr>
<tr>
<td>4&quot;</td>
<td>1.75&quot;</td>
<td>8&quot;</td>
<td>4</td>
</tr>
<tr>
<td>5&quot;</td>
<td>1.75&quot;</td>
<td>10&quot;</td>
<td>4</td>
</tr>
<tr>
<td>6&quot;</td>
<td>2&quot;</td>
<td>10&quot;</td>
<td>4</td>
</tr>
<tr>
<td>7.5&quot;</td>
<td>2.25</td>
<td>12&quot;</td>
<td>5</td>
</tr>
<tr>
<td>9&quot;</td>
<td>2.25</td>
<td>14&quot;</td>
<td>5</td>
</tr>
</tbody>
</table>

GENERAL NOTES:

1. All concrete shall be Class 'B' (70-2500 psi).
2. All reinforcing steel shall conform to 605-2, Grade 60.
3. All reinforcing steel shall have 2" minimum clear cover.
4. Concrete collar shall be required at points of change in alignment or grade excess that
   allowed for a substantial joint.
5. Where pipes of different diameters are joined with a concrete collar, "L" shall be those of the
   larger diameter.
6. The diameter of the Circular Tee shall be the outside diameter of pipe + 1".
7. Pipe ends to be trimmed such that the maximum distance between pipe at any point is 2".
A.C. PAVEMENT: MATCH EXISTING PAVEMENT AND COURSE BY TYPE AND THICKNESS

TYPE A
A.B., GRANULAR BACKFILL, OR NATIVE BACKFILL PER SECT. 303-2 AND 501

TYPE B
12” A.B. OR EXISTING SUBGRADE WHICHEVER IS GREATER
A.B. PER SECT. 303-2 AND 501

"T" TOP (SEE NOTE 3)

A.C. SURFACE COURSE
A.C. BASE COURSE
VARIES
TOTAL THICKNESS TO MATCH EXISTING

TYPE C
EXISTING PORTLAND CEMENT CONCRETE PAVEMENT
CLASS 'S' CONCRETE
f'c = 3000 p.s.i.

TYPE D
A.B., GRANULAR BACKFILL, OR NATIVE BACKFILL PER SECT. 303-2 AND 501

TYPE E
COMPACTED BACKFILL DENSITY PER SECT. 501

TYPE F
SURFACE OUTSIDE OF TRENCH LINES DAMAGED DURING CONSTRUCTION SHALL BE RESTORED TO ORIGINAL THICKNESS AND CONDITION.

NOTES
1. BEDDING PER SECTION 501
2. ASPHALT CONCRETE SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF SECT 406
3. 12” LIP IS REQUIRED ON THE SIDES OF A TRENCH THAT ARE NOT PARALLEL TO THE CENTER LINE OF THE STREET.
4. TYPES D & E REQUIRE 9” OF A.B. AT TOP OF TRENCH WHEN THERE IS AN EXISTING BASE.
5. SEE STANDARD DRAWING C-13.15 FOR TYPICAL PIPE INSTALLATION.
GENERAL NOTES:
1) HORIZONTAL BRACE AND TRUSS ROD IN CORNER OR END PANEL SHALL BE LOCATED A MINIMUM OF 30 FEET AWAY FROM TRAVELED LANES ON RAMPS OR MAINLINE.
2) DIAGONAL BRACE SHALL BE USED IN CORNER OR END PANELS LESS THAN 30 FEET FROM TRAVELED LANES ON RAMPS OR MAINLINE.
3) FOR ADDITIONAL DETAILS ON FENCING AND GATES AND GENERAL NOTES SEE ADOT STANDARD DRAWING NO. C-12.20

CORNAR OR END PANEL
(TYPE 1 SHOWN, TYPE 2 SIMILAR)
LEAVE CONC COLLAR LOW AND SEAL WITH 1/2" A.C.S.C

EXISTING BITUMINOUS PAVEMENT

40" DIA

1/4" MAX

1/2" MIN, 1" MAX

CLASS 'C' CONC ALL AROUND FRAME f'c = 2500 p.s.i.

TOP OF SURVEY MONUMENT (BRASS CAP), WATER VALVE BOX (8" CONCRETE PIPE), SEWER PIPE (SIZE VARIES)

COMPACITION TO CONFORM TO SECT. 203 OR 501

SUBGRADE PREP AS REQUIRED

WATER VALVE, SURVEY MONUMENT, OR SEWER CLEAN OUT FRAME & GRADE ADJUSTMENT

1/2" ROUNDHEAD BOLT

2" LONG

1/8"

1/2"

1 1/32

2"

3/8" CHAIN

SPACERS, AS REQ'D

LOCK WASHER

FLATTEN BOLT END

CHAIN ATTACHMENT (AS REQUIRED)

LETTERS ON COVER TO BE AS FOLLOWS:
"SEWER", "WATER", OR "SURVEY" AS DIRECTED.
TOTAL WIDTH OF WORD "SEWER" OR "WATER" 3 3/4".
TOTAL WIDTH OF WORD "SURVEY" 4 1/8".
LETTER SIZE 5/6" X 3/4", RAISED 1/16" ABOVE LEVEL OF COVER, TYPE 1/2" OF LETTERS TO BE SUBMITTED FOR APPROVAL.

COVER SECTION A-A

MINIMUM WEIGHT 63#
GENERAL NOTES

1. All concrete shall be class S, 4000 psi.
2. All bolts, nuts, washers and fittings shall meet the dimensional requirements of the American National Standards Institute, unless otherwise designated and galvanized in accordance with ASTM A53.
3. All structural steel shapes and products fabricated from such shapes, bars, strip, etc., shall meet the dimensional requirements of the American Institute of Steel Construction, shall conform to the requirements of ASTM A36, and shall be galvanized in accordance with the requirements of ASTM A123.
4. Swaged swept fitting and U-bolt shall conform to ASTM A449.
5. The galvanized wire rope shall conform to AASHTO M50 Class B, Type II.
6. The wire fabric, ties, bands, stretchers, bars, and other fittings and hardware shall conform to AASHTO M50.
7. The wire fabric fence shall follow the contour of the finished grade.
8. The excavation for the concrete anchor blocks shall be to neat lines, Max excess is 3'-1".
9. Perforated posts shall be square tube formed from 0.105" U.S.S. gauge A.S.T.M. A366 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 sandblasted to agree with standard corner radii.
10. Perforated posts shall be galvanized to conform to the requirements of A.S.T.M. A525. Coating designation 0-90.
11. The cable shall have enough tension to prevent sagging.
12. Height of bottom cable shall not exceed 12" above ground.
13. Two interior U-Bolts & Clamps to be spaced at 1/2 of the distance between posts.
14. See plans for locations.
15. See detail UC-21 and UC-22G for 72" fence details.
DETAIL C
U-BOLT & CLAMP BAR

DETAIL D
CABLE CLAMP ASSEMBLY

DETAIL E
ANCHOR PLATE

DETAIL F
STRETCHER BAR BAND ASSEMBLY

DETAIL G
SWAGED CABLE ASSEMBLY
**Type A**

- **Markings:** Alternate red and white reflective stripes (sloping downward in the direction traffic is to pass).
- **Dimensions:**
  - 6" x 6" redwood post
  - Barricade rails bolted through posts
  - 8" min., 12" max.

**Type B**

- **Markings:** Alternate red and white stripes, paint all exposed surfaces. 1 white prime coat and 1 coat of white exterior enamel, red enamel, 1 coat of exterior red enamel.
- **Dimensions:**
  - 12" x 12" x 6" redwood plank

**Notes:**

1. Fasten with 1/2" x 8" lag screws with 2 flat washers or (2) 5/8" bolts, with 4 flat washers.
2. 3" x 10" Douglas fir plank (length to be determined on plans).
3. All exterior paint shall be reflectorized.

---

*Diagrams and specifications related to barricade details for safety and traffic control.*
GENERAL NOTES:
1. All concrete shall be Class B (115°F - 240°F air).
2. All gutter drop lips shall be molded in or accurate grade for
   proper drainage, and all gutters shall be finished immediately to a tight, smooth finish.
3. For Curb and Gutter with overtopped slope, see Section GPM-150.
4. For additional general notes and dimensions, see Detail UC-32.

TYPE 'A' CURB & GUTTER TRANSITION - AT RAMP TAPERS
* Dimension may vary where not occur on curves, see plans.

TYPE 'B' CURB AND GUTTER TRANSITION
Dimensions may vary.
See Detail UC-32, Type D, D-1, D-2 or D-3
or AASHTO Standard Manual.
General Notes
1. All concrete shall be Class "C" (FA-3,000 psi).
2. All reinforcing steel shall conform to Files 204 and 8 Grade 60.
3. All reinforcing steel shall have a minimum clear cover unless otherwise noted.
4. Transverse construction joints shall be made through the foundation slab and be
   located at intervals not to exceed 20 feet except for barrier transition.
5. The barrier gutter and barrier transition gutter shall be included in the
   cast of the barrier.
6. See drainage sheets for sighted grade and coping details.
7. See detail UC-42 for barrier gutter details.
GENERAL NOTES

1. Transverse construction joints shall be located within the allowable limits shown.

2. "A" shall equal 4 ft. minimum (typical).

"B" shall equal 3 ft. minimum (typical).
GENERAL NOTES:

1. Transverse construction joints shall be located within the allowable limits shown. (CC002).

2. "g" shall equal 4' ft. minimum (typical).
   "h" shall equal 3' ft. minimum (typical).
**General Notes:**
1. For transverse weakened plane joint with lead transfer dowel assembly see Item "LC-45.
2. Initial saw cut not required for longitudinal joints.

**Joint Abbreviations:**
- LWP = Longitudinal Weakened Plane Joint
- TWJP = Transverse Weakened Plane Joint
- LC = Longitudinal Centerline
- TC = Transverse Centerline
- E = Expansion Joint
- G = Gutter Joint

**Typical Transverse Weakened Plane Joint Layout at Ramps:**
Note: Dimensions with a tolerance may be adjusted to align with the nearest transverse weakened plane or construction joint as directed.
Section A-A
- Curb height varies (0') to (7') max. in designated curb area beyond the end of barrier.
- Gutter section only through limits of barrier.
Curb & Gutter

**Type A**
(Std. C-5.10)

- 1\' 6\' For 6\' Curb Height Or Over
- 4\' R
- 2\' 2\' For 6\' Curb Height Or Over
- 1\' 9\'
- 4\' R
- 2\' 6\'

**Curb & Gutter**

**Type D, D-18, D-2**
SEE TABLE 2

**Table 1**

<table>
<thead>
<tr>
<th>Curb &amp; Gutter Type</th>
<th>Curb Height ((h))</th>
<th>Gutter Width ((w))</th>
<th>SLOPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>6'</td>
<td>2' 6'</td>
<td>3.1</td>
</tr>
<tr>
<td>C</td>
<td>3'</td>
<td>2' 6'</td>
<td>6.1</td>
</tr>
</tbody>
</table>

**Curb & Gutter**

**Type D-3**
SEE TABLE 2

**Table 2**

<table>
<thead>
<tr>
<th>C &amp; G Type</th>
<th>Curb Height ((h))</th>
<th>Gutter Width ((w))</th>
</tr>
</thead>
<tbody>
<tr>
<td>D</td>
<td>2' 6'</td>
<td></td>
</tr>
<tr>
<td>D-1</td>
<td>2' 6'</td>
<td></td>
</tr>
<tr>
<td>D-2</td>
<td>4' 6'</td>
<td></td>
</tr>
<tr>
<td>D-3</td>
<td>2' 0'</td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**

1. All concrete shall be class "S" (f'c = 2500 psi).
2. Curb, and curb and gutter may be constructed by the use of forms or the concrete may be extruded.
3. When the roadway section slopes away from the gutter, the slope of the gutter shall match the roadway cross slope.
4. Two inch deep contraction joints shall be placed in the curb and the gutter at locations which match the joints in adjacent Portland cement concrete pavement and at approximately 15 foot centers when adjacent to asphaltic concrete pavement or CIP. Joints shall be either hand tooled or sawed.
5. One half inch thick expansion joints shall be located at tangent points in curb returns, at structures, and at maximum 60 foot intervals. The 1/2 inch joint filler shall extend the full depth of the concrete.
6. Concrete shall be finished with a steel trowel. Followed by brushing with a fine brush along the length of the curb and gutter.
7. All exposed edges and hand tooled joints shall be finished with a tool having a 1/4 inch radius unless a larger radius is indicated.

**Table 3**

<table>
<thead>
<tr>
<th>C &amp; G Type</th>
<th>Curb Height ((h))</th>
<th>Gutter Width ((w))</th>
</tr>
</thead>
<tbody>
<tr>
<td>D-1</td>
<td>2' 6'</td>
<td></td>
</tr>
<tr>
<td>D-2</td>
<td>4' 6'</td>
<td></td>
</tr>
<tr>
<td>D-3</td>
<td>2' 0'</td>
<td></td>
</tr>
</tbody>
</table>

\*See construction plans
TYPE 'A' ENCASEMENT - FOR SEWER LATERALS OR HOUSE CONNECTIONS BELOW WATERLINES.

TYPE 'B' ENCASEMENT - FOR SEWER LATERALS OR HOUSE CONNECTIONS ABOVE WATERLINES.

NOTES

1. THE ENCASEMENT SHALL EXTEND AT LEAST 6' ON EACH SIDE OF THE WATER LINE AND MUST INCLUDE THE NEAREST JOINT.

2. PROTECTION FOR TYPE 'A' REQUIRED WHEN DISTANCE FROM BOTTOM OF WATER TO TOP OF SEWER LINE IS 24' OR LESS EXCEPT WHEN SEWER IS 4' OR 6' HOUSE CONNECTION. NO PROTECTION IS REQUIRED IF DISTANCE IS MORE THAN 12'.

3. FOR TYPE A CROSSINGS, CLASS 150C.I.P. OR DUCTILE PIPE MAY BE USED AS AN ALTERNATE. FOR TYPE B CROSSING REINFORCED ENCASEMENT IS ALWAYS REQUIRED.

4. REINFORCED ENCASEMENT FOR TYPE 'B' IS REQUIRED IN ALL CASES WHERE A SANITARY SEWER CROSSES ABOVE THE WATER LINE.
NOTES

1. TYPE "A" PIPE SUPPORT MAY BE USED FOR ANY TYPE CROSSING CONDITION.
2. TYPE "C" PIPE SUPPORT MAY BE USED FOR CROSSING PIPES WITH A BELL DIAMETER OF 18" OR LESS IF SUFFICIENT CLEARANCE OVER STORM SEWER IS AVAILABLE AND TOTAL SPAN IS LESS THAN 34'.
3. INTERMEDIATE PIPE SUPPORT SHALL BE USED IN CONJUNCTION WITH TYPE "C" PIPE SUPPORT IF TOTAL SPAN EXCEEDS MAX. 'W' IN TABLE.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FURNISHING ALL SUPPORTS BOTH PERMANENT AND TEMPORARY. TEMPORARY SUPPORTS SHALL NOT BE A SEPARATE PAY ITEM.
5. PERMANENT PIPE SUPPORTS MAY BE DECREASED FROM PLAN QUANTITIES OR EXTENDED TO INCLUDE SOME LISTED BELOW AS TEMPORARY SUPPORTS IF CONDITIONS WARRANT THESE CHANGES AT THE TIME OF CONSTRUCTION. DECISION SHALL BE MADE BY THE ENGINEER.
6. WHEN TYPE "A" PIPE SUPPORT IS USED AND WHENEVER SO DIRECTED BY THE ENGINEER, THE CONTRACTOR SHALL PIERCE THE WALL WITH SUITABLE OPENINGS TO PREVENT UNEQUAL PRESSURE RESULTING FROM FLOODING OF THE BACKFILL.
7. USE TYPE "B" PIPE SUPPORT INSTEAD OF TYPE "C" WHEN CLEARANCE IS LESS THAN 'Y' IN TABLE, BETWEEN PIPES.

SCHEDULE OF REQUIRED SUPPORTS

<table>
<thead>
<tr>
<th>PERMANENT</th>
<th>TEMPORARY</th>
</tr>
</thead>
</table>
| SEWER LINES | CAST IRON PIPE
| CONCRETE STORM DRAIN | CONC. BOX CULVERT |
| BURIED TELEPHONE, TRAFFIC CONTROL CONDUIT | GAS PIPES, WATER & SEWER LINES |

NOTE: OTHER UTILITIES AS NOTED ON THE PLANS OR AS REQUIRED BY THE ENGINEER AT TIME OF CONSTRUCTION.
### Table

<table>
<thead>
<tr>
<th>'W'</th>
<th>Depth of Cover on Supports</th>
<th>0 to 8</th>
<th>8 to 16</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>BAR NO.</td>
<td>Y</td>
<td>BAR NO.</td>
</tr>
<tr>
<td>6'</td>
<td>5</td>
<td>8&quot;</td>
<td>6</td>
</tr>
<tr>
<td>7'</td>
<td>5</td>
<td>9&quot;</td>
<td>6</td>
</tr>
<tr>
<td>8'</td>
<td>5</td>
<td>10&quot;</td>
<td>6</td>
</tr>
<tr>
<td>9'</td>
<td>6</td>
<td>11&quot;</td>
<td>6</td>
</tr>
<tr>
<td>10'</td>
<td>6</td>
<td>12&quot;</td>
<td>7</td>
</tr>
<tr>
<td>11'</td>
<td>6</td>
<td>13&quot;</td>
<td>7</td>
</tr>
<tr>
<td>12'</td>
<td>6</td>
<td>14&quot;</td>
<td>7</td>
</tr>
<tr>
<td>13'</td>
<td>7</td>
<td>15&quot;</td>
<td>7</td>
</tr>
<tr>
<td>14'</td>
<td>7</td>
<td>16&quot;</td>
<td>8</td>
</tr>
<tr>
<td>15'</td>
<td>7</td>
<td>17&quot;</td>
<td>8</td>
</tr>
<tr>
<td>16'</td>
<td>7</td>
<td>18&quot;</td>
<td></td>
</tr>
<tr>
<td>17'</td>
<td>8</td>
<td>19&quot;</td>
<td></td>
</tr>
</tbody>
</table>

See Sect. 501 for backfill and compaction.

### Diagrams

#### Section C-C

- Provide 1/2 mortar bed with precast beam.
- Crossing pipe class 'S' conc. f'c = 3000 p.s.i.
- No. 2 ties 12" O.C.
- (4) No. 5 rebar (equal to beam reinforcement)

#### Section D-D

- Pipe O.D. + 2" see note 2.
- No. 6 rebar for precast beam only
- 4" O.C. spacing, see table for bar size
- Min. bearing shall be 1/2 O.D. of pipe.
M.H. FRAME AND COVER PER
SECT 505

FOUR STEEL SPACERS, 4"-2", THICKNESS AS REQUIRED FROM 1/2" TO 2". WHEN THICKNESS IS LESS THAN 1/2" USE MORTAR, WHEN GREATER THAN 2", USE BRICK.

NOTE: LOCATION & ELEVATION SHOWN ON PLANS.

SEWER MANHOLE

M.H. STEP IN 48" M.H. ONLY

PIPE SIZES AND ELEVATIONS
AS SHOWN ON PLANS

MANHOLE FRAME & COVER DETAIL UC-63

CLASS 'S' CONCRETE
f'c = 2500 p.s.i.

LEAVE CONC. COLLAR LOW AND SEAL WITH 3/8" FINE DENSE GRADED PLANT MIX MATERIAL. MIN THICKNESS 1/2", MAX 1".

EXISTING PAVEMENT

BRICK, SECT. 505

BASE COURSE

SUBGRADE

M.H. WALL THICKNESS AND MATERIAL VARIES

COMPACTION TO CONFORM TO SECT. 303-2 OR 501.

SUBGRADE PREP AS REQUIRED

ROWLOCK RADIAL COURSE

TROWEL SMOOTH

CLASS 'S' CONCRETE
f'c = 3000 p.s.i.

1:3 CEMENT PLASTER. COAT OUTSIDE WITH MEMBRANE-TYPE CURING COMPOUND AFTER PLASTER HAS BEENplaced & finished, "HUNT PROCESS" OR EQUAL.

12" FOR M.H. OVER 13' DP
24" MANHOLE FRAME & COVER
APPROX. WEIGHT - 205 LBS.

SECTION OF FRAME
BATTER 3/16" 31/16" 1/2" 2 5/8" 4" 3/4" 3/4"
BATTER 3/16" 3/32" 1/3/8" 13/16" 15/16" 2" 1 1/2" 3 1/16"

NOTE: LETTERING ON MANHOLE COVER TO CONTAIN NAME OF AGENCY AND UTILITY FOR WHICH MANHOLE IS NEEDED, (E.G., PHOENIX SANITARY SEWER), OR AS DIRECTED. THE TOTAL WIDTH OF INDIVIDUAL LETTERS TO BE SUCH THAT LETTERS AND WORDS ARE EQUALLY SPACED AND BALANCED TO FORM A COMPLETE CIRCLE WITH SPACERS BEFORE AND AFTER THE WORD IDENTIFYING THE AGENCY INVOLVED. LETTERS TO BE 1/8 IN HEIGHT AND RAISED 1/8" ABOVE LEVEL OF COVER. TYPE OF LETTERS TO BE SUBMITTED FOR APPROVAL. WEIGHT OF CASTINGS SHALL BE NO MORE THAN 2% LESS THAN THE APPROXIMATE WEIGHT SPECIFIED. CASTINGS SHALL CONFORM TO SECTIONS 1004-6 AND 505-2.05. CASTINGS SHALL BE PAINTED OR DIPPED IN COMMERCIAL - QUALITY ASPHALTUM PAINT, UNLESS OTHERWISE SPECIFIED.
CAST IRON MANHOLE STEP

NOTES:
1. ALL DIMENSIONS ARE MINIMUM EXCEPT WHERE NOTED.
2. CASTING AS PER SECTIONS 1004-6 AND 505-2.05.
3. CASTING SHALL BE PAINTED OR DIPPED IN COMMERCIAL-QUALITY ASPHALTUM PAINT, UNLESS OTHERWISE SPECIFIED.

POLYPROPYLENE MANHOLE STEP

NOTES:
1. STEPS SHALL BE PLACED INTO WET CONCRETE WALL DURING MANUFACTURE OR MORTARED INTO HOLES AFTER CONCRETE HAS SET.
2. POLYPROPYLENE MUST MEET REQUIREMENTS OF A.S.T.M. 2146, TYPE II, GRADE 16906.
NOTES

1. NOTE: COMPACT SOIL AT END OF PIPE TO 95% OF MAXIMUM DENSITY.
2. IF DEPTH OF COVER IS LESS THAN 5' OR GREATER THAN 10 INCREASE PLUG THICKNESS A MIN. OF 4''
# Typical Locations of Thrust Blocks

**Note:** Thrust blocks are to extend to undisturbed ground. Concrete to be Class 'S', \( f'c = 2500 \text{ p.s.i.} \)

## Minimum Thrust Block Area Required \((Y \times W)\)

<table>
<thead>
<tr>
<th>Pipe Size</th>
<th>Water Pipe</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Tee, Dead End, 90° Bend</td>
</tr>
<tr>
<td>4&quot; &amp; Less</td>
<td>3 SQ. FEET</td>
</tr>
<tr>
<td>6&quot;</td>
<td>4&quot; &quot; &quot;</td>
</tr>
<tr>
<td>8&quot;</td>
<td>6&quot; &quot; &quot;</td>
</tr>
<tr>
<td>10&quot;</td>
<td>9&quot; &quot; &quot;</td>
</tr>
<tr>
<td>12&quot;</td>
<td>13&quot; &quot; &quot;</td>
</tr>
<tr>
<td>16&quot;</td>
<td>23&quot; &quot; &quot;</td>
</tr>
</tbody>
</table>

### Notes:
1. Table is based on 3000#/SQ. FT soil. If conditions are found to indicate soil bearing is less, the areas shall be increased accordingly.
2. Areas for pipe larger than 18" shall be calculated for each project.
3. Form all non-bearing vertical surfaces.
CLASS 'S' CONCRETE $f'c = 2500$ p.s.i.
FORM AS REQUIRED TO KEEP CLEAR OF JOINTS.

NOTE

THIS DETAIL COVERS WATER GATE VALVES,
4" TO 16" INCLUSIVE, REGARDLESS OF TYPE
OF PIPE USED. LARGER LINES TO BE
dETAILED ON PLANS.

GATE VALVE

CONCRETE FOOTING
CLASS 'S' CONC.
$2500$ p.s.i.

WATER MAIN

TRENCH WALL

TRENCH WIDTH

6" MIN

HUB-END GATE VALVE

STANDARD JOINT

FINISH GRADE

$X + 4"$ MIN.

SIDE OPERATOR

BRICK PIER AS REQUIRED

X

WATER MAIN

TRENCH BOTTOM

$X + 4" OR$

12" MIN.

CEMENT GROUTING UNDER VALVE
(NON-SHRINKING)

NOTES

1. THIS DETAIL COVERS BUTTERFLY VALVE
INSTALLATION, 3" TO 12" INCLUSIVE, REGARDLESS
OF TYPE OF PIPE OR JOINT USED. LARGER
LINES TO BE DETAILED ON PLANS.

2. VALVE BOX AND COVER REQUIRED PER
DETAIL UC-84.

BUTTERFLY VALVE

CONC FOOTING EQUAL TO
TRENCH WIDTH

4" MIN.
NOTE

BARS TO CONCRETE THRUST BLOCK TO BE COATED WITH 2 COATS COAL TAR, EPOXY OR BY OTHER APPROVED METHOD. BARS TO HAVE 90° HOOK ON LOWER END, AS PER TABLE.

<table>
<thead>
<tr>
<th>PIPE SIZE</th>
<th>MIN. BAR SIZE</th>
<th>&quot;A&quot;-DIMENSION (HOOK)</th>
<th>MIN. BLOCK DIM.</th>
</tr>
</thead>
<tbody>
<tr>
<td>6&quot;</td>
<td>#6</td>
<td>6&quot;</td>
<td>3' x 3' x 3'</td>
</tr>
<tr>
<td>8&quot;</td>
<td>#6</td>
<td>9&quot;</td>
<td>4' x 4' x 2.5'</td>
</tr>
<tr>
<td>12&quot;</td>
<td>#8</td>
<td>9&quot;</td>
<td>4' x 5' x 5'</td>
</tr>
</tbody>
</table>

* FOR 125 PSI WORKING PRESSURE

NOTES

1. EITHER THIS DETAIL OR RESTRAINT RODS CAN BE USED WHEN IT IS ALLOWED TO RELOCATE A WATER LINE UPWARD TO CROSS OVER A CONFLICT.
2. DUCTILE IRON PIPE MAY BE USED.
CAST IRON

45° CAST IRON BENDS MAY BE USED IN PLACE OF CAST IRON OFFSETS, AS SHOWN.

CAST IRON MECHANICAL JOINT

6" MIN. CLEARANCE BACKFILLED WITH SELECTED FINE MATERIAL OR SAND.

DROP SECTION IS TO BE PREFABRICATED AND INSTALLED AS A SINGLE UNIT.

ASBESTOS CEMENT

6'-6" MAX.
1'-6" MIN

STATE OF ARIZONA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAY
URBAN HIGHWAY DETAILS

NOTES:
1. THIS DETAIL COVERS MOVING OF WATER MAINS, 2" TO 12" ONLY.
2. THRUST BLOCKING AS PER DETAIL NO. UC-80 AND UC-82.
3. IF OFFSET IS TO GO OVER OBSTRUCTION, JOINT RESTRAINTS MUST BE USED.
4. PIPE IS TO BE CAST IRON OR DUCTILE IRON.
**NOTES**

1. EXTENSION STEM: WITH SQUARE SOCKET ON BOTTOM TO FIT 2" SQUARE VALVE NUT. EXTENSION TO VALVE STEMS REQUIRED ON ALL VALVES INSTALLED WHERE OPERATING NUT IS OVER 5" BELOW SURFACE. LENGTH TO FIT EACH INSTALLATION. OPERATING NUT TO BE HELD ON TOP OF EXTENSION WITH STOP NUT.
2. IF TWO OR MORE JOINTS OF A.C.P. ARE USED TO MAKE RISER USE STANDARD A.C.P. RUBBER GASKET COUPLING TO JOIN PIPE, WHERE RISER LENGTH EXCEEDS 10' USE 12" A.C.P.
3. STEM PAINTING: ALL STEEL TO HAVE PRIME COAT OF PAINT NO. 4 AND ONE HEAVY APPLICATION (FINISH COAT) OF PAINT NO. 1002 - 4.06 AS PER SECT. 1002.
NOTES

4. VALVE BOX SHALL BE ADJUSTED TO THE FINISHED GRADE PRIOR TO PLACING OF THE ASPHALTIC CONCRETE SURFACE OR P.C.C.P.

5. GROUND BELOW CONCRETE PAD OR 3 BRICKS TO BE COMPACTED 95% OF MAX. DENSITY.

TYPE 'A-1'
(TO BE USED IN AREAS SUBJECT TO VEHICULAR TRAFFIC.)

TYPE 'A-2'
(TO BE USED WHEN VALVE BOX IS LOCATED WITHIN P.C.C. PAVEMENT)

TYPE 'B'
(ALTERNATE BRICKS
(NOT SUBJECT TO VEHICULAR TRAFFIC.)

SEE NOTE 3.

6" THICK 6 40" IN DIA.
FOR UNPAVED STREETS & ALLEYS.

8" CONC. PIPE; PIPE LENGTH CUT IN FIELD TO SUIT. (TYP.)
6. (a) TYPE "C-1" USE PARKSON, TYLER, APCO, OR EQUAL DEEP SKIRTED LID (4" OR MORE), TYPE SLIDING ADJUSTABLE CAST IRON VALVE BOX. C.I. MIN. T.S. 30,000 P.S.I.

(b) TYPE "C-2" SAME AS "C-1" EXCEPT USE TYLER OR RICH, ONLY.
NOTES

1. BLOCKS ARE TO EXTEND TO UNDISTURBED GROUND.
2. ALL TAPS SHALL BE MADE BY CITY CREWS AT PREVAILING RATES.
3. INSTALL PERMANENT BLOCKING UNDER VALVE BEFORE TAP IS MADE. ALL FLANGE BOLTS SHALL BE CLEAR OF FOOTING.
4. ALL TAPPING SLEEVES MUST BE PRESSURE TESTED PRIOR TO REQUESTS FOR TAP BY CITY.
5. CONTRACTOR SHALL EXCAVATE AS SHOWN AND SHALL SET TAPPING SLEEVE AND VALVE AND TIGHTEN ALL BOLTS PRIOR TO REQUESTING CITY TO MAKE TAP.
6. TAPPING SLEEVE TO BE PLACED A MINIMUM OF 18 INCHES FROM ANY BELL COUPLING, VALVE, OR OTHER OBSTRUCTION.

<table>
<thead>
<tr>
<th>SIZE OF PIPE BEING CONNECTED</th>
<th>MINIMUM THRUST AREA REQUIRED EQUALS (AXB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4&quot; &amp; LESS</td>
<td>3 SQUARE FEET</td>
</tr>
<tr>
<td>6&quot;</td>
<td>&quot;</td>
</tr>
<tr>
<td>8&quot;</td>
<td>&quot;</td>
</tr>
<tr>
<td>10&quot;</td>
<td>&quot;</td>
</tr>
<tr>
<td>12&quot;</td>
<td>9 &quot;</td>
</tr>
<tr>
<td>16&quot;</td>
<td>23 &quot;</td>
</tr>
</tbody>
</table>

CONCRETE: CLASS 'S' f'c = 2500 p.s.i. NORMALLY, CURE 24 HRS. BEFORE BACKFILLING.
OPTIONAL BLOCKING - 2"X8"X12"
SOLID CONCRETE MASONRY UNITS AS INDICATED.
RODS ARE ATTACHED TO LUGS CAST ON BELL OF HYDRANT. IF HYDRANT IS NOT FITTED WITH LUGS, RODS ARE ATTACHED AS SHOWN BY THE DOTTED LINES.

<table>
<thead>
<tr>
<th>PIPE SIZE</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>4&quot;</td>
<td>12 1/2&quot;</td>
<td>10 1/8&quot;</td>
<td>2 1/2&quot;</td>
<td>1 3/4&quot;</td>
</tr>
<tr>
<td>6&quot;</td>
<td>14 1/2&quot;</td>
<td>12 1/8&quot;</td>
<td>3 9/16&quot;</td>
<td>2 13/16&quot;</td>
</tr>
<tr>
<td>8&quot;</td>
<td>16 3/4&quot;</td>
<td>14 3/8&quot;</td>
<td>4 21/32&quot;</td>
<td>3 29/32&quot;</td>
</tr>
<tr>
<td>10&quot;</td>
<td>19 1/16&quot;</td>
<td>16 11/16&quot;</td>
<td>5 3/4&quot;</td>
<td>5&quot;</td>
</tr>
<tr>
<td>12&quot;</td>
<td>22 5/16&quot;</td>
<td>19 3/16&quot;</td>
<td>6 3/4&quot;</td>
<td>5 7/8&quot;</td>
</tr>
</tbody>
</table>
THIS DETAIL IS FOR USE ONLY ON UNDERGROUND INSTALLATIONS WHERE THE USE OF CONCRETE THRUST BLOCKING PER DETAIL NO. UC-80 CANNOT BE USED BECAUSE OF OBSTRUCTIONS, OR REQUIREMENTS OF THE SPECIFICATIONS...

CLAMPS SHALL BE 1/2 BY 2 INCHES FOR PIPE 4 AND 6 INCHES IN DIAMETER; 5/8 BY 2-1/2 INCHES FOR PIPE 8 AND 10 INCHES; 5/8 BY 3 INCHES FOR PIPE 12 INCHES. BOLT HOLES SHALL BE 1/16 INCH IN DIAMETER LARGER THAN BOLTS.

RODS SHALL BE 3/4 INCHES IN DIAMETER FOR PIPES 4, 6 AND 8 INCHES IN DIAMETER; 7/8 INCHES FOR PIPE 10 INCHES AND 1 INCH IN DIAMETER FOR PIPE 12 INCHES.

BOLTS SHALL BE 5/8 INCHES IN DIAMETER FOR PIPE 4, 6 AND 8 INCHES IN DIAMETER; 3/4 INCHES FOR PIPE 10 INCHES AND 7/8 INCHES IN DIAMETER FOR PIPE 12 INCHES.

WASHERS MAY BE CAST IRON OR STEEL, ROUND OR SQUARE. DIMENSIONS FOR CAST IRON WASHERS ARE 5/8 BY 3 INCHES FOR PIPE 4, 6, 8 AND 10 INCHES IN DIAMETER AND 5/8 BY 3 1/2 INCHES FOR PIPE 12 INCHES. DIMENSIONS FOR STEEL WASHERS ARE 1/2 BY 3 INCHES FOR PIPE 4, 6, 8 AND 10 INCHES IN DIAMETER AND 1/2 BY 3 1/2 INCHES FOR PIPE 12 INCHES. HOLES SHALL BE 1/8 INCH LARGER THAN THE RODS.

FOR PIPE LARGER THAN 12" IN DIAMETER, RESTRAINT DETAILS SHALL BE SUBMITTED FOR APPROVAL PRIOR TO INSTALLATION.


2. HIGH STRENGTH, HEAT TREATED CAST IRON TEE-HEAD BOLTS WITH HEXAGON NUTS, ALL IN ACCORDANCE WITH THE STRENGTH REQUIREMENTS OF A.W.W.A. C-111, MAY BE USED IN LIEU OF THE CADMIUM PLATED BOLTS AND NUTS.

3. THE SKETCHES IN THIS SERIES OF FIGURES SHOW ACCEPTABLE METHODS OF PROVIDING ANCHORAGE. THERE IS NO PARTICULAR SIGNIFICANCE TO BE ATTACHED TO WHETHER THE SKETCH SHOWS A BELL AND SPIGOT JOINT OR A STANDARD MECHANICAL JOINT. THE ANCHORING PROCEDURE ILLUSTRATED APPLIES IN MOST CASES TO EITHER TYPE OF JOINT. IN SOME CASES, DIMENSIONS OF THE PARTICULAR PIPE OR HUB AND SPACE AVAILABLE FOR WORKING AROUND THE PARTICULAR JOINT WILL INFLUENCE THE CHOICE OF METHODS USED.

4. IN CERTAIN ASSEMBLIES OF RODS AND CLAMPS SHOWN, RODS RUN FROM A LUG ON THE FITTING (OR A CLAMP BEHIND THE HUB OF A BELL) TO A CLAMP AGAINST A FACE OF A BELL. NOTE THAT THIS ARRANGEMENT ANCHORS ONLY ONE JOINT. THE STABILITY OF THE JOINT WHERE THE CLAMP IS AGAINST THE FACE OF THE BELL DEPENDS ON HAVING SOIL ABOVE A RELATIVELY LONG PIECE OF PIPE ON BOTH SIDES OF THE JOINT.

Consequently, if the distance between the first and second joints is less than 12 FEET, the second joint shown shall be anchored by a clamp behind the hub of the bell and rods to a clamp at the face of the next bell.

5. COATING TYPE: A.H.D ASPHALTIC PRIMER 907-2.02 - ALL EXPOSED METAL.
CAST IRON WATER METE
BOX LID FITTING BOX NO
I, 2, 3, OR 4 AS REQUIRED

PLAN VIEW

SECTION A-A

BREAK OUT IF NECESSARY TO
SET BOX TO PROPER GRADE

SECTION B-B

METER BOX DIMENSIONS

<table>
<thead>
<tr>
<th>DIM.</th>
<th>BOX NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td>A</td>
<td>19&quot;</td>
</tr>
<tr>
<td>B</td>
<td>12&quot;</td>
</tr>
<tr>
<td>C</td>
<td>11&quot;</td>
</tr>
<tr>
<td>D</td>
<td>14&quot;</td>
</tr>
<tr>
<td>E</td>
<td>16&quot;</td>
</tr>
<tr>
<td>F</td>
<td>9&quot;</td>
</tr>
<tr>
<td>G</td>
<td>7&quot;</td>
</tr>
<tr>
<td>H</td>
<td>9&quot;</td>
</tr>
<tr>
<td>I</td>
<td>6&quot;</td>
</tr>
<tr>
<td>J</td>
<td>1 1/2&quot;</td>
</tr>
<tr>
<td>K</td>
<td>3/4&quot;</td>
</tr>
<tr>
<td>L</td>
<td>1/4&quot;</td>
</tr>
<tr>
<td>M</td>
<td>16&quot;</td>
</tr>
<tr>
<td>N</td>
<td>2 1/2&quot;</td>
</tr>
<tr>
<td>I 1/2&quot; &quot;METER&quot;</td>
<td>1&quot; METER</td>
</tr>
</tbody>
</table>

NOTES

1. THE METER BOXES SHALL CONFORM TO THE DIMENSIONS AS SHOWN AND SHALL BE
MADE OF PORTLAND CEMENT CONCRETE Poured AND TAMPEd (OR VIBRATED) IN TRUE
FORMS.

2. USE CLASS 'S' CONCRETE, f'c = 4000 p.s.i.
### Specifications

<table>
<thead>
<tr>
<th>NO.</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>BRACES</th>
<th>WEIGHT</th>
<th>MATERIAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>9&quot;</td>
<td>15 7/8&quot;</td>
<td>1 3/8&quot;</td>
<td>NONE</td>
<td>NONE</td>
<td>NONE</td>
<td>5 1/4 lbs.</td>
<td>14 GAGE</td>
</tr>
<tr>
<td>2</td>
<td>14 1/8&quot;</td>
<td>21 3/4&quot;</td>
<td>1 1/2&quot;</td>
<td>6 1/2&quot;</td>
<td>3/16&quot; X 1 1/4&quot; X 13 1/8&quot;</td>
<td>DETAIL 1</td>
<td>12 3/4 lbs.</td>
<td>12 GAGE</td>
</tr>
<tr>
<td>3</td>
<td>15 1/4&quot;</td>
<td>26 1/4&quot;</td>
<td>1 1/2&quot;</td>
<td>8 1/4&quot;</td>
<td>3/16&quot; X 1 1/4&quot; X 14 1/4&quot;</td>
<td>DETAIL 1</td>
<td>19 1/4 lbs.</td>
<td>12 GAGE</td>
</tr>
<tr>
<td>4</td>
<td>19 1/2&quot;</td>
<td>30&quot;</td>
<td>1 1/2&quot;</td>
<td>7 1/8&quot;</td>
<td>3/16&quot; X 1 1/4&quot; X 18 3/4&quot;</td>
<td>DETAIL 2</td>
<td>33 lbs.</td>
<td>11 GAGE</td>
</tr>
</tbody>
</table>
NOTES

1. CUT AND PLUGS MUST BE ADEQUATELY "DRY BLOCKED".

2. DRY BLOCKS SHALL BE STANDARD SIZE SOLID MASONRY CONCRETE BLOCKS. (ASTM C-139)

3. THE QUANTITY AND ARRANGEMENT OF THE BLOCKING MUST WITHSTAND LINE PRESSURE BY HOLDING THE CAP OR PLUG IN POSITION.

4. DRY BLOCKING SHALL BE PROPERLY SHIMMED TIGHT AND SECURE AGAINST THE CAP BEFORE LINE PRESSURE IS RESTORED.

5. CONCRETE THRUST BLOCKS SHALL NOT BE Poured UNTIL LINE PRESSURE IS RESTORED AND THE CAP OR PLUG IS INSPECTED FOR LEAKAGE.

6. CONCRETE SHALL NOT BE Poured OVER ANY PORTION OF THE ABANDONED PIPE.

7. MINIMUM THRUST BLOCK AREA PER DETAIL UC-80.

8. WHERE A 4" OR LARGER LINE IS SPECIFIED TO BE ABANDONED, THE CUT AND PLUG SHOULD OCCUR AT THE SUPPLY MAIN TO AVOID CREATING AN UNUSED DEADEND LINE.
NOTES:
1. ALL JOINTS IN HYDRANT RUN-OUT TO BE MECHANICAL JOINTS.
2. HYDRANT TEE: CLOW OR APPROVED EQUAL MAY BE USED IN PLACE OF TEE AND 90° BEND.
3. 90° BEND NOT REQUIRED IF SUFFICIENT ROOM FOR PERPENDICULAR INSTALLATION.
4. FOR CONCRETE THRUST BLOCKS SEE STD. DETAIL.
5. A FLANGE BY MECHANICAL JOINT SHUTOFF VALVE CONNECTING DIRECTLY TO THE TEE OR ELBOW AT THE MAIN SHALL BE USED.
6. FIRE HYDRANT, FIRE HYDRANT THREADS, VALVE AND VALVE BOXES PER MUNICIPALITY REQUIREMENTS.
NOTES
All Concrete shall be Class 'S'. F's = 3,000 psi.
All Reinforcing Steel dimensions shall be to center of bar, unless noted otherwise. All Reinforcing Steel shall have 3' clear cover unless noted otherwise.
Reinforcing Steel shall conform to ASTM Spec A615. Bar sizes #8 and smaller are designated as Grade 40, and numbered as Grade 60. Bars #8 and larger shall be Grade 60. F's = 20,000 psi. Anchor lug to be cast in precompacted roadway embankment or formed and compacted to embankment requirements prior to the casting of Anchor Slab.
NOTES:

1) COLOR OF SIGNS SHALL BE AS FOLLOWS:
   a) R8-3a, R3-1, R3-2 & R3-4
      CIRCLE & DIAGONAL
      RED (REFLECTORIZED)
      SYMBOL, BORDER, LEGEND - BLACK (NON-REFLECTORIZED)
      BACKGROUND - WHITE (REFLECTORIZED)
   b) R1-1, R1-2 & R5-1
      LEGEND - RED (REFLECTORIZED)
      BACKGROUND - WHITE (REFLECTORIZED)

2) DIMENSIONS ARE NOMINAL

3) SIGNS SHALL BE REFERENCED BY SIZE, EXAMPLE: R1-1 (2')
RIGHT LANE MUST TURN RIGHT

ONE WAY

PEDESTRIANS, BICYCLES, MOTOR-DRIVEN CYCLES PROHIBITED

LEFT LANE MUST TURN LEFT

ONE WAY

COLORS:

LEGEND - BLACK (NON-REFLECTORIZED)
ARROW & BORDER - WHITE REFLECTORIZED
BACKGROUND - BLACK (NON-REFLECTORIZED)

NOTES:

1) COLOR OF ALL SIGNS SHALL BE AS FOLLOWS, EXCEPT AS NOTED OTHERWISE
   LEGEND - BLACK (NON-REFLECTORIZED)
   BACKGROUND - WHITE (REFLECTORIZED)

2) DIMENSIONS ARE NOMINAL

3) SIGNS SHALL BE REFERENCED BY SIZE, EXAMPLE - R6-2R (3" x 6")

4) ARROW DIMENSIONS ARE OPPOSITE HAND.
NOTES:
1) COLOR OF ALL SIGNS SHALL BE AS FOLLOWS:
   LEGEND & BORDER - BLACK
   BACKGROUND - WHITE REFLECTORIZED
2) DIMENSIONS ARE NOMINAL
3) SIGNS SHALL BE REFERENCED BY SIZE;
   EXAMPLE - R2-1 (A x B')
4) *DENOTES O'POPOSITE HAND DIMENSIONS.
**BOLT SPACING DETAIL**

4' x 5' SIGN PANELS

**NOTE**

1. COLOR OF ALL SIGNS SHALL BE AS FOLLOWS, EXCEPT WHERE NOTED OTHERWISE:
   - LEGEND & BORDER - BLACK NON-REFLECTORIZED BACKGROUND - WHITE REFLECTORIZED
2. DIMENSIONS ARE NOMINAL.
3. SIGNS SHALL BE REFERENCED BY SIZE, EXAMPLE - R3-5L (48'' x 60'').
4. ARROW DIMENSIONS ARE OPPOSITE HAND.

---

**COLORS**

- REFLECTORIZED RED BACKGROUND
- REFLECTORIZED WHITE LEGEND AND BORDER.
NOTES:

1) COLOR OF SIGNS SHALL BE AS FOLLOWS:
   a) W3-1a
      BORDER & ARROW - BLACK NON-REFLECTORIZED
      SYMBOL - WHITE BORDER ON RED BACKGROUND
      BACKGROUND - YELLOW REFLECTORIZED
   b) W3-2a
      BORDER & ARROW - BLACK NON-REFLECTORIZED
      SYMBOL - RED BORDER ON WHITE BACKGROUND
      BACKGROUND - YELLOW REFLECTORIZED
   c) W3-3
      SYMBOL & LEGEND - BLACK NON-REFLECTORIZED
      TOP CIRCLE - RED REFLECTORIZED
      BOTTOM CIRCLE - GREEN REFLECTORIZED
      BACKGROUND - YELLOW REFLECTORIZED
   d) W1-7R, W1-6R, W1-6L, W2-7R & W2-8L
      LEGEND - BLACK NON-REFLECTORIZED
      BACKGROUND - YELLOW REFLECTORIZED

2) DIMENSIONS ARE NOMINAL

3) SIGNS SHALL BE REFERENCED BY SIZE
   EXAMPLE: W3-3 (A)\(\text{A} \times \text{B}\)
   W1-6L \(\text{A} \times \text{B}\)

4) * DENOTES OPPOSITE MAIN DIMENSIONS.
NOTES:
1) COLOR OF ALL SIGNS SHALL BE AS FOLLOWS:
   LEGEND & BORDER - BLACK (NON-REFLECTORIZED)
   BACKGROUND - YELLOW (REFLECTORIZED)

2) DIMENSIONS ARE NOMINAL.

3) SIGNS SHALL BE REFERENCED BY SIZE,
   EXAMPLE - WI-1L (48" x 48")
   W-4 (6" x 6")

4) # DENOTES OPPOSITE HAND DIMENSIONS.
M1-6A
STATE ROUTE SHIELD
Signs with 2 digits are "C" Series.
Signs with 3 digits are "C" Series.

NOTE:
Numerals are to be optically spaced
about vertical centerline.

ARIZONA

STATE ROUTE SHIELD DETAIL

<table>
<thead>
<tr>
<th>SIZE</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>J</th>
<th>K</th>
<th>L</th>
<th>M</th>
<th>N</th>
<th>P</th>
<th>Series &quot;D&quot; Radius</th>
</tr>
</thead>
<tbody>
<tr>
<td>24&quot;x24&quot;</td>
<td>4-1/8</td>
<td>3</td>
<td>3-3/8</td>
<td>1-1/2</td>
<td>7-1/2</td>
<td>5</td>
<td>12</td>
<td>3-7/8</td>
<td>15-3/16</td>
<td>3-7/8</td>
<td>2-1/2</td>
<td>4-1/2</td>
<td>10-1/2</td>
<td>1-3/4</td>
<td>2-1/2</td>
</tr>
</tbody>
</table>

Note: All dimensions are inches.
U.S. & State Route Shields shall be 0.03" sheet aluminum with high intensity silver reflective sheathing adhered to the face side, with black opaque silk screened numerals.

**MI-4 (C and D)**

**U.S. ROUTE SHIELD DETAILS**

<table>
<thead>
<tr>
<th>Shield Size</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>J</th>
</tr>
</thead>
<tbody>
<tr>
<td>30x44</td>
<td>5</td>
<td>10</td>
<td>9</td>
<td>2</td>
<td>7</td>
<td>4</td>
<td>12</td>
<td>5/2</td>
<td>6/2</td>
</tr>
<tr>
<td>36x48</td>
<td>7/2</td>
<td>10</td>
<td>1/2</td>
<td>3</td>
<td>10x9</td>
<td>11/2</td>
<td>180</td>
<td>8/4</td>
<td>8/2</td>
</tr>
<tr>
<td>45x56</td>
<td>7/2</td>
<td>15</td>
<td>13/7</td>
<td>3</td>
<td>10x9</td>
<td>11/2</td>
<td>180</td>
<td>8/4</td>
<td>8/2</td>
</tr>
<tr>
<td>48x48</td>
<td>10</td>
<td>14</td>
<td>10</td>
<td>4</td>
<td>14</td>
<td>2</td>
<td>240</td>
<td>11</td>
<td>13</td>
</tr>
<tr>
<td>60x48</td>
<td>10</td>
<td>20</td>
<td>18</td>
<td>4</td>
<td>14</td>
<td>8</td>
<td>240</td>
<td>11</td>
<td>13</td>
</tr>
</tbody>
</table>

**MI-6 (C and D)**

**STATE ROUTE SHIELD DETAILS**

<table>
<thead>
<tr>
<th>Num</th>
<th>Series</th>
<th>Digits</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>J</th>
<th>K</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>D</td>
<td>2</td>
<td>44</td>
<td>21/2</td>
<td>9 1/2</td>
<td>4</td>
<td>3</td>
<td>3 1/2</td>
<td>8 1/2</td>
<td>5 1/2</td>
<td>12 1/2</td>
<td>6 1/2</td>
</tr>
<tr>
<td>12</td>
<td>C</td>
<td>3</td>
<td>24</td>
<td>21/2</td>
<td>10 1/2</td>
<td>4</td>
<td>3</td>
<td>3 1/2</td>
<td>12 1/2</td>
<td>5 1/2</td>
<td>12 1/2</td>
<td>6 1/2</td>
</tr>
<tr>
<td>18</td>
<td>D</td>
<td>2</td>
<td>36</td>
<td>3 1/2</td>
<td>14 1/2</td>
<td>5 1/2</td>
<td>4</td>
<td>3 1/2</td>
<td>12 1/2</td>
<td>5 1/2</td>
<td>8 1/4</td>
<td>18 1/2</td>
</tr>
<tr>
<td>18</td>
<td>C</td>
<td>3</td>
<td>39</td>
<td>3 1/2</td>
<td>19 1/2</td>
<td>5 1/2</td>
<td>4</td>
<td>3 1/2</td>
<td>18 1/2</td>
<td>8 1/4</td>
<td>8 1/4</td>
<td>18 1/2</td>
</tr>
<tr>
<td>24</td>
<td>D</td>
<td>2</td>
<td>48</td>
<td>3 1/2</td>
<td>19 1/4</td>
<td>7 1/2</td>
<td>6 1/4</td>
<td>7 1/4</td>
<td>10 1/2</td>
<td>11</td>
<td>240</td>
<td>13</td>
</tr>
<tr>
<td>24</td>
<td>C</td>
<td>3</td>
<td>52</td>
<td>3 1/2</td>
<td>34 1/2</td>
<td>7 1/4</td>
<td>6 1/4</td>
<td>9 3/4</td>
<td>11</td>
<td>240</td>
<td>13</td>
<td></td>
</tr>
</tbody>
</table>

**NOTE:**

All dimensions are in inches.
NOTES:
1) COLOR OF ALL SIGNS SHALL BE AS FOLLOWS:
   LEGEND AND BORDER - BLACK (NON-REFLECTORIZED)
   BACKGROUND - WHITE (REFLECTORIZED)
   OR AS NOTED IN PLANS
2) DIMENSIONS ARE NOMINAL
3) SIGNS SHALL BE REFERENCED BY SIZE, EXAMPLE: M3-4 (A' x B')
**NOTE**

1. **COLOR OF ALL SIGNS SHALL BE AS FOLLOWS:**
   - Legend & Border: White
   - Reflectors: Blue

2. **DIMENSIONS ARE NOMINAL**

3. **SIGNS SHALL BE REFERENCED BY SIZE.**
   - Example: M3-4 (INTERSTATE) (4' X 8')
RIGHT LANE MUST TURN RIGHT

ONE WAY

PEDESTRIANS BICYCLES MOTOR-DRIVEN CYCLES PROHIBITED

LEFT LANE MUST TURN LEFT

COLORS:
LEGEND - BLACK (NON-REFLECTORIZED)
ARROW & BORDER - WHITE REFLECTORIZED
BACKGROUND - BLACK (NON-REFLECTORIZED)

NOTES:
1) COLOR OF ALL SIGNS SHALL BE AS FOLLOWS, EXCEPT AS NOTED OTHERWISE:
   LEGEND - BLACK (NON-REFLECTORIZED)
   BACKGROUND - WHITE (REFLECTORIZED)

2) DIMENSIONS ARE NOMINAL

3) SIGNS SHALL BE REFERENCED BY SIZE, EXAMPLE: R6-2R (18'' x 36'')

4) ARROW DIMENSIONS ARE OPPOSITE MIND.

R3-7R  R6-2R  R5-10a
*R6-2L

R3-7L  R6-1R  R6-1L
### R3-10

**Restricting Signage Designs**

- **Sign Type:** Restricted Lane Ahead
- **Designation:** R3-10

<table>
<thead>
<tr>
<th>Design</th>
<th>Color</th>
<th>Symbol</th>
<th>Legend</th>
</tr>
</thead>
<tbody>
<tr>
<td>R3-10</td>
<td>White</td>
<td>Reflect</td>
<td>Black</td>
</tr>
</tbody>
</table>

### R3-12

**Restricting Signage Designs**

- **Sign Type:** Restricted Lane Ends
- **Designation:** R3-12

<table>
<thead>
<tr>
<th>Design</th>
<th>Color</th>
<th>Symbol</th>
<th>Legend</th>
</tr>
</thead>
<tbody>
<tr>
<td>R3-12</td>
<td>White</td>
<td>Reflect</td>
<td>Black</td>
</tr>
</tbody>
</table>

### R3-13

**Restricting Signage Designs**

- **Sign Type:** Reduced Speed Ahead
- **Designation:** R3-13

<table>
<thead>
<tr>
<th>Design</th>
<th>Color</th>
<th>Symbol</th>
<th>Legend</th>
</tr>
</thead>
<tbody>
<tr>
<td>R3-13</td>
<td>White</td>
<td>Reflect</td>
<td>Black</td>
</tr>
</tbody>
</table>

### R3-14

**Restricting Signage Designs**

- **Sign Type:** Buses and Car Pools Only
- **Designation:** R3-14

<table>
<thead>
<tr>
<th>Design</th>
<th>Color</th>
<th>Symbol</th>
<th>Legend</th>
</tr>
</thead>
<tbody>
<tr>
<td>R3-14</td>
<td>White</td>
<td>Reflect</td>
<td>Black</td>
</tr>
</tbody>
</table>

### R3-15

**Restricting Signage Designs**

- **Sign Type:** Center Lane
- **Designation:** R3-15

<table>
<thead>
<tr>
<th>Design</th>
<th>Color</th>
<th>Symbol</th>
<th>Legend</th>
</tr>
</thead>
<tbody>
<tr>
<td>R3-15</td>
<td>White</td>
<td>Reflect</td>
<td>Black</td>
</tr>
</tbody>
</table>

### Notes
1. Color of all signs shall be as follows, except where noted otherwise:
   - **Legend - Black** (non-reflective)
   - **Background - White** (reflective)
   - **Symbol - Reflective** on Black
2. Dimensions are nominal.
3. Signs shall be referenced by size, example - R3-10 (4" x 8")
NOTES:
1. COLOR OF ALL SIGNS SHALL BE AS FOLLOWS:
   - LEGEND & BORDER - BLACK (NON-REFLECTORIZED)
   - BACKGROUND - YELLOW (REFLECTORIZED)
2. DIMENSIONS ARE NOMINAL.
3. SIGNS SHALL BE REFERENCED BY SIZE,
   EXAMPLE - WI-1L (4")
   - W4-2L (8" x 8")
4. *DENOTES OPPOSITE HAND DIMENSIONS.
M 1-6 A
STATE ROUTE SHIELD
Signs with 2 digits are "C" Series.
Signs with 3 digits are "C" Series.

NOTE:
Numerals are to be optically spaced about vertical centerline.

M 1-4 (A) (24")
U.S. ROUTE SHIELD
Signs with 2 digits are "C" Series
Signs with 3 digits are "C" Series

STATE ROUTE SHIELD DETAIL

<table>
<thead>
<tr>
<th>SIZE</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>J</th>
<th>K</th>
<th>L</th>
<th>M</th>
<th>N</th>
<th>P</th>
<th>Series &quot;D&quot;</th>
<th>Radius</th>
</tr>
</thead>
<tbody>
<tr>
<td>24&quot; x 24&quot;</td>
<td>4-1/8</td>
<td>3</td>
<td>3-3/8</td>
<td>1-1/2</td>
<td>7-1/2</td>
<td>3</td>
<td>12</td>
<td>3-7/8</td>
<td>5-3/16</td>
<td>3-7/8</td>
<td>2-1/2</td>
<td>4-1/2</td>
<td>10-1/2</td>
<td>1-3/4</td>
<td>1-1/2</td>
<td></td>
</tr>
<tr>
<td>36&quot; x 36&quot;</td>
<td>6-3/16</td>
<td>4-1/2</td>
<td>5-1/16</td>
<td>2-1/4</td>
<td>11-1/4</td>
<td>4-1/2</td>
<td>8</td>
<td>5-5/32</td>
<td>20/32</td>
<td>5-15/16</td>
<td>5-3/4</td>
<td>6-3/4</td>
<td>15-3/4</td>
<td>2-5/8</td>
<td>3</td>
<td>2-1/4</td>
</tr>
</tbody>
</table>

Note: All dimensions are inches.
U.S. & State Route Shields shall be 0.032" sheet aluminum with high intensity silver reflective sheathing adhered to the face side, with black opaque silk screened numerals.

MI-4 (C and D)
U.S. ROUTE SHIELD DETAILS

<table>
<thead>
<tr>
<th>Shield Size</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>J</th>
</tr>
</thead>
<tbody>
<tr>
<td>30x24</td>
<td>5</td>
<td>10</td>
<td>9</td>
<td>2</td>
<td>7</td>
<td>4</td>
<td>12</td>
<td>5/4</td>
<td>6/4</td>
</tr>
<tr>
<td>36x36</td>
<td>7/2</td>
<td>10/2</td>
<td>7/2</td>
<td>3</td>
<td>10 1/2</td>
<td>120</td>
<td>50</td>
<td>5/4</td>
<td>6/4</td>
</tr>
<tr>
<td>45x36</td>
<td>7/2</td>
<td>15</td>
<td>10 1/2</td>
<td>120</td>
<td>50</td>
<td>5/4</td>
<td>6/4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>48x48</td>
<td>10</td>
<td>14</td>
<td>10</td>
<td>4</td>
<td>14</td>
<td>2</td>
<td>24 1/4</td>
<td>11</td>
<td>13</td>
</tr>
<tr>
<td>60x48</td>
<td>10</td>
<td>20</td>
<td>18</td>
<td>4</td>
<td>14</td>
<td>8</td>
<td>24 1/4</td>
<td>11</td>
<td>13</td>
</tr>
</tbody>
</table>

NOTE: All dimensions are in inches
NOTES:
1) COLOR OF ALL SIGNS SHALL BE AS FOLLOWS:
   LEGEND AND BORDER - BLACK (NON-REFLECTORIZED)
   BACKGROUND - WHITE (REFLECTORIZED)
   OR AS NOTED IN PLANS
2) DIMENSIONS ARE NOMINAL
3) SIGNS SHALL BE REFERENCED BY SIZE,
   EXAMPLE: M3-4 (4' x 6')
NOTE:
1) COLOR OF ALL SIGNS SHALL BE AS FOLLOWS:
   LEGEND & BORDER - WHITE REFLECTORIZED
   BACKGROUND - BLUE REFLECTORIZED

2) DIMENSIONS ARE NOMINAL

3) SIGNS SHALL BE REFERENCED BY SIZE.
   EXAMPLE - M3-4 (INTERSTATE) (A x B)

* Increase spacing 25%

** Use 30" x 48" size with 30" x 24" frame or with 36" x 36" frame
**MI-IA SERIES**
(for independent mounting)

**MI-2A SERIES**
(for use on guide signs or independent mounting)

**MI-IC SERIES**
(for use on guide signs)

---

**NOTES:**

1. **SHOP DRILL 5/16" HOLES IN INDEPENDENT PANELS, DO NOT DRILL IN LETTER OR NUMERALS.**
2. **ALL DIMENSIONS IN INCHES.**
3. **DIMENSIONS ARE NOMINAL.**
4. **SIGNS SHALL BE REFERENCED BY SIZE EXAMPLE - MI-IC 06’ DI**
5. **SIGNS COLORS SHALL BE AS SPECIFIED ABOVE LEGEND AND BORDER SHALL BE WHITE**
6. **OPTICALLY SPACE NUMERALS ABOUT CENTER LINE.**

---

**TABLE:**

| Numerical Size | Digits | A   | B   | C   | D   | E   | F   | G   | H   | J   | K   | L   | M   | N   |
|----------------|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 12 0           | 2      | 2   | 4   | 4   | 1   | 7   | 15  | 1   | 2   | 2   | 1   | 1   | 1   | 1   | 1   |
| 18 0           | 2      | 2   | 4   | 4   | 1   | 7   | 15  | 1   | 2   | 2   | 1   | 1   | 1   | 1   | 1   |
| 24 0           | 2      | 2   | 4   | 4   | 1   | 7   | 15  | 1   | 2   | 2   | 1   | 1   | 1   | 1   | 1   |

---

**STATE OF ARIZONA**

**DEPARTMENT OF TRANSPORTATION**

**DIVISION OF HIGHWAY**

**URBAN HIGHWAY DETAILS**

**DETAIL NO.** USM-66

**REV.** 4/67
**OPTICALLY SPACED NUMERALS ABOUT VERTICAL CENTERLINE**

<table>
<thead>
<tr>
<th>SIGNS</th>
<th>NOMINAL DIMENSIONS (INCHES)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>STD.</td>
<td>10</td>
</tr>
<tr>
<td>EXPWY.</td>
<td>13</td>
</tr>
<tr>
<td>FWY.</td>
<td>45</td>
</tr>
<tr>
<td>SPECIAL</td>
<td>60</td>
</tr>
</tbody>
</table>

**NOTE:**
COLOR OF SIGN SHALL BE AS FOLLOWS:
LEGEND AND BORDER - SILVER-WHITE
BACKGROUND - INTERSTATE-BLUE

MI-5e