**BASE SLAB JOINT CONFIGURATIONS**

**SECTION PARALLEL TO PIPE**

(Without conical top riser)

**SECTION PERPENDICULAR TO PIPE**

(With conical top riser)

**GEOMETRIC LIMITS FOR PIPE PENETRATION HOLES**

Note 1: A minimum of 12 (300) of monolithic reinforced concrete shall be maintained above pipe penetration holes > 4'-0" (1.22 m).

Note 2: A minimum 12 (300) inside arc length of reinforced concrete shall be maintained between pipe penetration holes > 15 (380).

Note 3: A maximum of 60 percent of the inside perimeter of the reinforced concrete manhole walls may be removed.

Note 4: Horizontal joints that intersect pipe penetration holes > 15 (380) shall have one joint splice for every location around the perimeter of the joint where the inside arc length between pipe penetration holes is > 24 (600). See joint splice detail.

Note 5: The recommended pipe penetration hole is equal to the O.D. of the pipe plus 4 (100).

**GENERAL NOTES**

Pipe holes shall be formed to facilitate proper placement of hole reinforcement.

The manufacturer shall ensure that all precast manhole sections are additionally reinforced where required to resist damage from handling, shipping and installation stresses.

Lifting holes shall be located in the sections as per the manufacturer's recommendations.

See Standard 602701 for details of manhole steps.

All dimensions are in inches (millimeters) unless otherwise noted.

**DATE**

1-1-21 Revised Note 1.

3-1-19 Moved wall reinforcement of 4'-0" (1.22 m) rise from inside face to middle.

**STANDARD 602426-03**

(Sheet 1 of 3)
**PLAN - FLAT SLAB TOP**
(Showing layout of bottom reinforcement bars and c bars)

- Diameter 10' (3.05 m)
- #6 bars bottom
- #8 bars top
- Bundles of 600 MSA at each face
- 10 ½" (2.67 m) slabs

**PLAN - FLAT SLAB TOP**
(Showing layout of welded wire reinforcement and c bars)

- Diameter 10' (3.05 m)
- #6 bars bottom
- #8 bars top
- Bundles of 600 MSA at each face
- 10 ½" (2.67 m) slabs

**STANDARD 602426-03**

* #6 (4.09) bars bottom, bundle first bar with closest WWR bar to the opening and place second bar ±3 (75) away.
**FLAT SLAB TOP REINFORCEMENT**

<table>
<thead>
<tr>
<th>Location</th>
<th>Orientation</th>
<th>WWR or Rebar</th>
<th>Spacing (Max.)</th>
<th>Bar Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top</td>
<td>Circumferential</td>
<td>0.12 sq. in./ft.</td>
<td>8</td>
<td>#4</td>
</tr>
<tr>
<td></td>
<td>Vertical</td>
<td>0.045 sq. in./ft.</td>
<td>8</td>
<td>#4</td>
</tr>
<tr>
<td>Bottom</td>
<td>Circumferential</td>
<td>0.045 sq. in./ft.</td>
<td>8</td>
<td>#4</td>
</tr>
<tr>
<td></td>
<td>Vertical</td>
<td>0.045 sq. in./ft.</td>
<td>8</td>
<td>#4</td>
</tr>
</tbody>
</table>

**WALL REINFORCEMENT**

<table>
<thead>
<tr>
<th>Location</th>
<th>Orientation</th>
<th>WWR or Rebar</th>
<th>A_s (min.)</th>
<th>Spacing (Max.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 ft. (1.22 m) Ø Riser</td>
<td>Circumferential</td>
<td>0.12 sq. in./ft.</td>
<td>6</td>
<td>(1.06)</td>
</tr>
<tr>
<td></td>
<td>Vertical</td>
<td>0.045 sq. in./ft.</td>
<td>8</td>
<td>(200)</td>
</tr>
<tr>
<td>10 ft. (3.05 m) Ø Barrel Inside Mat</td>
<td>Circumferential</td>
<td>0.11 sq. in/ft.</td>
<td>6</td>
<td>(150)</td>
</tr>
<tr>
<td></td>
<td>Vertical</td>
<td>0.045 sq. in./ft.</td>
<td>8</td>
<td>(200)</td>
</tr>
<tr>
<td>10 ft. (3.05 m) Ø Barrel Outside Mat</td>
<td>Circumferential</td>
<td>0.11 sq. in/ft.</td>
<td>6</td>
<td>(150)</td>
</tr>
<tr>
<td></td>
<td>Vertical</td>
<td>0.045 sq. in./ft.</td>
<td>8</td>
<td>(200)</td>
</tr>
</tbody>
</table>

**BASE SLAB REINFORCEMENT**

<table>
<thead>
<tr>
<th>Location</th>
<th>Riser Height (RH)/ Total Height (TH)</th>
<th>WWR or Rebar (each direction)</th>
<th>A_s (min.)</th>
<th>Spacing (Max.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top</td>
<td>RH = 10 ft. (3.05 m) or TH = 20 ft. (6.10 m)</td>
<td>0.48 sq. in./ft.</td>
<td>6</td>
<td>(150)</td>
</tr>
<tr>
<td>Bottom</td>
<td>All</td>
<td>0.33 sq. in./ft.</td>
<td>6</td>
<td>(150)</td>
</tr>
</tbody>
</table>

**PRECAST MANHOLE TYPE A**

10' (3.05 m) DIAMETER

(Sheet 3 of 3)

**RISER PLACEMENT**

- RH ≤ 10 ft. (3.05 m)
- RH > 10 ft. (3.05 m)

**JOINT SPLICE**

- Connection angle
- Joint
- Inside of manhole wall
- 1½ (45) Tie Ø

**TIE PLATE**

- 1½ (45) Tie Ø
- Holes

**CONNECTION ANGLE**

- 2½ (65) Tie Ø
- Slotted hole, typ.
- 2½ (65) Tie Ø
- Holes

**SPACING AND ALIGNMENT**

- All nuts shall be brought to a snug tight condition.
- Hole in the walls may be drilled using core bits in lieu of formed holes.
- All washers under each nut.