**FLAT SLAB TOP JOINT CONFIGURATIONS**

*Shown at access hole*

**SECTION PARALLEL TO PIPE**
(WITHOUT CONICAL TOP RISER)

**SECTION PERPENDICULAR TO PIPE**
(WITH CONICAL TOP RISER)

**GEOMETRIC LIMITS FOR PIPE PENETRATION HOLES**

1. A minimum of 9 (220) of monolithic reinforced concrete shall be placed above pipe penetration holes ≥ 24 (600).
2. A minimum of 12 (300) inside arc length of reinforced concrete shall be maintained between pipe penetration holes ≥ 15 (380).
3. A minimum of 60 percent of the inside perimeter of the reinforced concrete manhole walls may be removed.
4. Horizontal joints that intersect pipe penetration holes ≥ 15 (380) shall have one joint space 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.
5. The recommended pipe penetration hole is equal to the O.D. of the pipe plus 4 (100).
6. Only pipe penetration holes ≥ 15 (380) are allowed in riser sections.

**GENERAL NOTES**

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

Standard 602701 for details of manhole steps.

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, except as noted.

See Standard 602701 for details of manhole steps.

**BASE SLAB JOINT CONFIGURATIONS**

*Optional Joint*

**SHEAR KEY GEOMETRY**

(Reinforcement not shown for clarity)

**DATES AND REVISIONS**

<table>
<thead>
<tr>
<th>DATE</th>
<th>REVISIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-1-19</td>
<td>Moved wall reinforcement from inside face to middle</td>
</tr>
<tr>
<td>1-1-19</td>
<td>Expanded/revised reinforcement options, increased manhole depths</td>
</tr>
</tbody>
</table>
**PLAN - FLAT SLAB TOP**

*Showing layout of reinforcement bars and c bars*

- Bar c #5: (16), 6'-10" (2.08 m) length, 26 (660) radius bottom

**PLATE**

- 1/8 (6) Tie E

**JOINT SPLICE**

- Connection angle

**BASE SLAB**

- Bottom wall: 4'-10" (1.47 m) diameter

**Wall Reinforcement**

<table>
<thead>
<tr>
<th>Location</th>
<th>Orientation</th>
<th>WWR (min.)</th>
<th>Spacing (max.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Riser</td>
<td>Circumferential</td>
<td>0.12 sq. in./ft.</td>
<td>(339 sq. mm/m)</td>
</tr>
<tr>
<td></td>
<td>Vertical</td>
<td>0.005 sq. in./ft.</td>
<td>(150 sq. mm/m)</td>
</tr>
<tr>
<td>Barrel</td>
<td>Circumferential</td>
<td>0.04 sq. in./ft.</td>
<td>(100 sq. mm/m)</td>
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<tr>
<td></td>
<td>Vertical</td>
<td>0.002 sq. in./ft.</td>
<td>(50 sq. mm/m)</td>
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</tbody>
</table>

**Flat Slab Top Reinforcement**

<table>
<thead>
<tr>
<th>Location</th>
<th>WWR (each direction)</th>
<th>Bar Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bottom</td>
<td>0.62 sq. in./ft.</td>
<td>#5 (#16)</td>
</tr>
</tbody>
</table>

**Notes:**

1. All nuts shall be brought to a snug tight condition.
2. Holes in the walls may be drilled using core bits in lieu of formed holes.
3. **Only one layer of WWR permitted to avoid congestion.**
4. Hole depth and spacing for ties and c bars shall be in accordance with the table for bar size.