**Illinois Department of Transportation**

**DATE**

**REVISIONS**

**APPROVED**

**ENGINEER OF DESIGN AND ENVIRONMENT**

**ISSUED**

**PASSED**

**ENGINEER OF POLICY AND PROCEDURES**

**(300) to 16 (400) cts.**

Steps spaced at 12  (300)

4 - (1.22 m)

4'-0"  (300 )

4%  (1.22 m)

(1.22 m)

(200 )

30'-0" (9.14 m) max.

B ar c

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 12 (300) of monolithic reinforced concrete shall be maintained above pipe penetration holes > 3'-6" (1.12 m).

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

3. A maximum 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 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.

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.

**BASE SLAB JOINT CONFIGURATIONS**

See geometric limits for pipe penetration holes.

**SHEAR KEY GEOMETRY**

Single-element shear key at center of slab

**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, except as noted.

See Standard 602701 for details of manhole steps.

**DATE**

**REVISIONS**

1-1-19 Expanded / refined reinforcement options, increased manhole depths

1-1-19 Med wall reinforcement from inside face to middle

**PRECAST MANHOLE TYPE A**

**9' (2.74 m) DIAMETER**

**STANDARD 602421-08**

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

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

* #6 (419) bars bottom. Bundle first bar with closest WWR bar to the opening and place second bar ±3 (75) away.

WWR not permitted for riser heights > 12' (3.66 m).

PRECAST MANHOLE TYPE A
9' (2.74 m) DIAMETER
(Sheet 2 of 3)

STANDARD 602421-08
**FLAT SLAB TOP REINFORCEMENT**

<table>
<thead>
<tr>
<th>Location</th>
<th>Riser Height (ft)</th>
<th>WWR or Rebar (each direction)</th>
<th>Spacing (max.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top Mat</td>
<td>RH ≤ 10 ft. (3.05 m)</td>
<td>0.11 sq. in./ft. (223 sq. mm/m)</td>
<td>18 (450)</td>
</tr>
<tr>
<td>Bottom Mat</td>
<td>RH &gt; 10 ft. (3.05 m)</td>
<td>WWR not permitted</td>
<td>See plan view for rebar orientation and spacing and this table for bar size</td>
</tr>
</tbody>
</table>

**WALL REINFORCEMENT**

<table>
<thead>
<tr>
<th>Location</th>
<th>Orientation</th>
<th>WWR or Rebar (each direction)</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. (234 sq. mm/m)</td>
<td>6 (150)</td>
</tr>
<tr>
<td></td>
<td>Vertical:</td>
<td>0.055 sq. in./ft. (95 sq. mm/m)</td>
<td>8 (200)</td>
</tr>
<tr>
<td>9 ft. (2.74 m) Ø Barrel</td>
<td>Circumferential:</td>
<td>0.27 sq. in./ft. (472 sq. mm/m)</td>
<td>6 (150)</td>
</tr>
<tr>
<td></td>
<td>Vertical:</td>
<td>0.055 sq. in./ft. (95 sq. mm/m)</td>
<td>8 (200)</td>
</tr>
</tbody>
</table>

**BASE SLAB REINFORCEMENT**

<table>
<thead>
<tr>
<th>Location</th>
<th>Riser Height (ft)</th>
<th>Total Height (ft)</th>
<th>WWR or Rebar (each direction)</th>
<th>Spacing (max.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top Mat</td>
<td>RH ≤ 10 ft. (3.05 m) &amp; TH &lt; 20 ft. (6.10 m)</td>
<td></td>
<td>0.64 sq. in./ft. (150 sq. mm/m)</td>
<td>6 (150)</td>
</tr>
<tr>
<td></td>
<td>RH &gt; 10 ft. (3.05 m) or TH &gt; 20 ft. (6.10 m)</td>
<td></td>
<td>0.72 sq. in./ft. (152 sq. mm/m)</td>
<td>6 (150)</td>
</tr>
<tr>
<td>Bottom Mat</td>
<td>All</td>
<td></td>
<td>0.11 sq. in./ft. (223 sq. mm/m)</td>
<td>18 (450)</td>
</tr>
</tbody>
</table>

**PRECAST MANHOLE TYPE A**

9' (2.74 m) DIAMETER

**STANDARD 602421-08**