SUPPLEMENTARY DETAILS FOR MANHOLES & INLETS

WEIGHT OF CASTINGS (lb)

<table>
<thead>
<tr>
<th>Frame Type</th>
<th>2' Opening</th>
<th>3' Opening</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frame</td>
<td>Cover (Std.)</td>
</tr>
<tr>
<td></td>
<td>Inside</td>
<td>Outside</td>
</tr>
<tr>
<td>I</td>
<td>155</td>
<td>190</td>
</tr>
<tr>
<td>II</td>
<td>145</td>
<td>190</td>
</tr>
<tr>
<td>III</td>
<td>90</td>
<td>190</td>
</tr>
</tbody>
</table>

* Includes Type I Adjustable

NOTES (FRAMES AND COVER)

1. The standard cover is to be used for all frames Types I, II, III, and the 2-piece cover, and is the replacement cover for all previous frames with 18" deep seats (traffic type). The 185 lb. cover (non-traffic type), 1984 Roadway and Traffic Design Standards Index No. 201, is the replacement cover for existing frames with 1/2” deep seats. Installation of frame with 1/2” deep seats is not permitted.

2. Use the 2'-0" cover, unless the 2-piece cover is called for in the plans, except at inlets and manholes with sump bottoms use the 2-piece cover when the sump depth exceeds 2', unless otherwise noted.

DESIGNER NOTE:

Consider using the 2-piece cover where depths exceed 5' and manual entry may be required for cleaning. Clearly note the requirement for a 2-piece cover on the Drainage Structure sheets in the plans.

COVER FOR ALL FRAMES

For Use With Types 1, 11 And III Frames With 7'-9" Opening

2-PIECE COVER

FDOT 2014 DESIGN STANDARDS

SUPPLEMENTARY DETAILS FOR MANHOLES & INLETS

INDEX NO. 201

REVISION 1

1 of 5
SUPPLEMENTARY DETAILS FOR MANHOLES & INLETS

TOP SLABS TO WALLS

BOTTOM SLABS TO WALLS

WALL JOINTS

OPTIONAL CONSTRUCTION JOINTS

SEPARATE RISER SEGMENTS WITH CONSTRUCTION JOINTS OTHER THAN DOWEL OPTION

SEGMENTS FOR SLAB TO WALL DOWEL CONSTRUCTION JOINTS OR MONOLITHICALLY CAST SEGMENTS

COMPARATIVE SIDE VIEWS

MINIMUM DIMENSIONS FOR BOX AND RISER SEGMENTS

REBAR STRAIGHT END EMBEDMENT FOR TOP AND BOTTOM SLABS

WALL REINFORCING SPLICE DETAILS

NOTE: h may be less than 6" when approved by the Engineer, but not for inlet segments at finish grade elevation.

NOTE: NOT APPLICABLE AROUND MANHOLE AND RISER OPENINGS

Approved product inserts may be used in lieu of dowel embedment.

Minimum cover on dowel reinforcing bars is 2" to outside face of structure.

Joint dowels are to be #4 bars, 12" long with a minimum of 6 bars per joint approximately evenly spaced for circular structures or at maximum 12" spacing for rectangular structures. Bars may be either Adhesive Bonded Dowels in accordance with Specification Section 416, or placed approximately 6" into fresh concrete leaving the remainder to extend into the secondary cast. Welded wire fabric may be substituted for the dowel bar in accordance with the equivalent steel area table on Sheet 4.

Joint dowels are to be #4 bars, 12" long with a minimum of 6 bars per joint approximately evenly spaced for circular structures or at maximum 12" spacing for rectangular structures. Bars may be either Adhesive Bonded Dowels in accordance with Specification Section 416, or placed approximately 6" into fresh concrete leaving the remainder to extend into the secondary cast. Welded wire fabric may be substituted for the dowel bar in accordance with the equivalent steel area table on Sheet 4.

Minimum cover on dowel reinforcing bars is 2" to outside face of structure.

Joints between wall segments and between wall segments and top or bottom slabs may be sealed either by preformed plastic gasket material using the procedures given in Section 3026 or with non-shrink grout, in accordance with Section 3025. Welded wire fabric may be substituted for the dowel bar in accordance with the equivalent steel area table on Sheet 4.

1. One or more types of joints may be used in a single structure, except brick wall structure. Brick wall construction is permitted on circular units only.

2. All grouted joints are to have a maximum thickness of 1".

3. Keyways are to be a minimum of 1" deep.

4. Minimum cover on dowel reinforcing bars is 2" to outside face of structure.

5. Minimum cover on dowel reinforcing bars is 2" to outside face of structure.

6. Minimum cover on dowel reinforcing bars is 2" to outside face of structure.

7. Approved product inserts may be used in lieu of dowel embedment.

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When

6" ≤ h < 0.75H (min.)

h = H (min.)

h ≤ 0.4H

h ≤ H (min.)

h = H (min.)

h = 0.4H

h ≤ H (min.)

h = H (min.)

h = H (min.)

Then (Reqd.)

h = H (min.)

h = H (min.)

h = H (min.)

h = H (min.)

Opposite

NOTE: h may be less than 6" when approved by the Engineer, but not for inlet segments at finish grade elevation.
### NOTES FOR PRECAST OPTIONS & EQUIVALENT REINFORCEMENT SUBSTITUTION

1. Details for optional precast inlet construction up to depths of 15' are shown on the inlet indexes.

2. When precast units are used in conjunction with Alt. "B" Structure Bottoms, Index No. 200, the interior dimensions of an Alt. "B" Bottom can be adjusted to reflect these inlet interior dimensions.

3. Concrete which meets the requirements of ASTM C478 or Class IV must be used for precast items manufactured in plants which meet the requirements of Section 449 of the Specifications.

4. Reinforcement can be either deformed bar reinforcement or welded wire reinforcement. Bar reinforcement other than 60 ksi may be used, however only two grades are recognized. Grade 40 and Grade 60. Smooth welded wire reinforcement, will be recognized as having a desing strength of 65 ksi and deformed welded wire reinforcement will be recognized as having a design strength of 70 ksi. The area of reinforcement required may be adjusted in accordance with the Equivalent Steel Area Table provided. For bars and spacings not given, the steel area required can be determined by the following equations:

\[
\text{Grade 40 Steel Area} = A_{40} = 60 \times A_{60} \\
\text{Smooth Welded Wire Reinforcement Steel Area} = A_{65} = 60 \times A_{60} \\
\text{Deformed Welded Wire Reinforcement Steel Area} = A_{70} = 60 \times A_{60}
\]

5. For pay item purposes, the height used to determine if a drainage structure is greater than 10 feet shall be computed using:
   - a) the elevation of the top of the manhole lid,
   - b) the grade elevation or the theoretical gutter grade elevation of an inlet, or
   - c) the grate elevation or the theoretical gutter grade elevation of a junction box less the flow line elevation of the lowest pipe or to top of sump floor.

### EXAMPLE TABLE OF EQUIVALENT STEEL AREA

<table>
<thead>
<tr>
<th>Style Designation</th>
<th>Min. Steel Area (in²/ft)</th>
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<tbody>
<tr>
<td>A</td>
<td>0.20</td>
<td>0.30</td>
<td>0.1846</td>
</tr>
<tr>
<td>B</td>
<td>0.24</td>
<td>0.36</td>
<td>0.2215</td>
</tr>
<tr>
<td>Special 1</td>
<td>0.267</td>
<td>0.40</td>
<td>0.2465</td>
</tr>
<tr>
<td>C</td>
<td>0.37</td>
<td>0.555</td>
<td>0.3915</td>
</tr>
<tr>
<td>D</td>
<td>0.53</td>
<td>0.795</td>
<td>0.4892</td>
</tr>
<tr>
<td>E</td>
<td>0.73</td>
<td>1.095</td>
<td>0.6730</td>
</tr>
<tr>
<td>Special 2</td>
<td>1.24</td>
<td>1.86</td>
<td>1.1446</td>
</tr>
<tr>
<td>G</td>
<td>1.46</td>
<td>2.19</td>
<td>1.3477</td>
</tr>
</tbody>
</table>

### GENERAL NOTES

1. For square or rectangular precast drainage structures, either deformed or smooth welded wire reinforcement in accordance with Specification Section 931:
   - a) Width and length of the unit is four times the spacing of the cross wires.
   - b) Wire reinforcement shall be continuous around the box, and lapped in accordance with Option 1 or 2 as shown in the Wall Reinforcing Splice Details.
   - c) Welding of splices and laps is permitted. The requirements and restrictions placed on welding in ASTM F229 shall apply.

2. Horizontal steel in the walls of rectangular structures shall be lap spliced in accordance with Option 1, 2 or 3 as shown in the Reinforcing Splice Details.

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4. Hand straight end embossment of peripheral reinforcement may be used in lieu of ACI standard hooks for top and bottom slabs except when hooks are specifically called for in the plans or standard drawings.

5. Concrete as specified in ASTM C478, (4000 psi) may be used in lieu of Class II concrete in precast items manufactured in plants which meet the requirements of Section 449 of the Specifications.

6. Precast opening for pipe shall be the pipe OD plus 6" (± 2" tolerance) Mortar used to seal the pipe into the opening will be of such a mix that shrinkage will not cause leakage into or out of the structure. Dry-patch mortar may be used in lieu of brick and mortar construction to seal openings less than 26" wide.

### NOTES

- a) the elevation of the top of the manhole lid,
- b) the grade elevation or the theoretical gutter grade elevation of an inlet, or
- c) the grate elevation or the theoretical gutter grade elevation of a junction box less the flow line elevation of the lowest pipe or to top of sump floor.

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<td>G</td>
<td>1.46</td>
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</table>
SUPPLEMENTARY DETAILS FOR MANHOLES & INLETS

DESIGNER NOTE: Use only when round structures are not practical, engineer of record approval required.

NOTE:
1. Submit Shop Drawings of corner openings for approval by the Engineer of Record.
2. $h_2$ may be less than 1'-0" when a minimum 1'-0" deep segment, 8" slab or curb inlet is provided above the corner opening.
3. For inlet segments at finish grade elevation substitute a #8 Bar for the top corner bar when 1'-0" $< h_2 < 2'-0$.

RECTANGULAR SEGMENT WITH PIPE OPENING AT CORNER

PICTORIAL VIEW

NOTE: 1. Submit Shop Drawings of corner openings for approval by the Engineer of Record.
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DETAILS FOR SKEWED PIPES IN RECTANGULAR STRUCTURES

PLAN VIEW FOR SKEWS $\leq 45^\circ$
(Not Centered)

PLAN VIEW FOR SKEWS $> 45^\circ$
(Not Centered)