SUPPLEMENTARY DETAILS FOR MANHOLES AND 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>Cover (Std.)</td>
<td>2-Piece Cover</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 15/8' deep seats (traffic type). The 185 lb. cover (nontraffic type), 1984 Roadway and Traffic Design Standards Index 201, is the replacement cover for existing frames with 15/8' deep seats. Installation of frame with 15/8' deep seats is not permitted.

2. Use the 3'-2" cover, unless the 3-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 5', 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.

For Use With Types I, II, and III Frames With 3'-0" Opening
2-Piece Cover

For Manholes

TYPE I ADJUSTABLE

For Curb Inlets Types 1, 2, 3, & 4

TYPE II

For Curb Inlets Types 7 & 8

TYPE III
### EYEBOLT AND CHAIN REQUIREMENTS

<table>
<thead>
<tr>
<th>Index</th>
<th>Type</th>
<th>Number</th>
<th>Length of Chain</th>
<th>Handling &amp; Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>425-028</td>
<td>3/8</td>
<td>1-2 @ 3'-6&quot;</td>
<td>Slide &amp; Spin</td>
<td></td>
</tr>
<tr>
<td>425-029</td>
<td>1/2</td>
<td>1-2 @ 4'-0&quot;</td>
<td>Slide &amp; Spin</td>
<td></td>
</tr>
<tr>
<td>425-030</td>
<td>3/4</td>
<td>1-2 @ 4'-0&quot;</td>
<td>Slide &amp; Spin</td>
<td></td>
</tr>
<tr>
<td>425-031</td>
<td>1-1/2</td>
<td>1-2 @ 4'-0&quot;</td>
<td>Slide &amp; Spin</td>
<td></td>
</tr>
<tr>
<td>425-032</td>
<td>2</td>
<td>1-2 @ 4'-0&quot;</td>
<td>Slide &amp; Spin</td>
<td></td>
</tr>
</tbody>
</table>

**EYEBOLT AND CHAIN FOR LOCKING GRATES TO INLETS**

- **Bolts**: 1 @ 3'-6" | Slide & Spin
- **Bayonet**: 2 @ 4'-0" | Slide & Spin
- **Lifting Loop**: 2 @ 4'-0" | Slide & Spin
- **Center Grate**: 2 @ 4'-0" | Slide & Spin
- **Nipple**: 1-2 @ 7'-0" | Slide & Spin

**FILTER FABRIC WRAP ON GROUTED PIPE TO STRUCTURE JOINT**

- **Grout Seal or Integral Cast**: 8" PVC Pipe, 45° Lateral and Shus
- **Grout Seal**: 6" Cold Shut, 3/8" Cold Shots

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**MANHOLE TOPS**

**TYPE 7**

- **NOTES (TOPS)**
  1. Manhole top Type 7 slabs shall be of Class II concrete. Concrete specified in ASTM C494 shall be used for precast units; see General Note 3.
  2. Manhole top Type 7 slabs may be in-place or precast concrete. The optional key is for precast tops and in lieu of dowels. Frame and slab openings are to be omitted when top is used over a joint box.
  3. Manhole top Type 8 may be in-place or precast concrete or concrete block. Concrete for construction, the concrete and steel reinforcement shall be the same as the supporting wall unit. An eccentric cone may be used.
  4. Manhole tops shall be secured to structures by optional construction base units. An eccentric cone may be used.
  5. Frames may be adjusted a maximum 12" height with brick or precast concrete. Frames can be adjusted a maximum 12" height with brick or precast concrete.
  6. Substitution of manhole top Type 7 for Type 8 is allowed if the minimum dimensions shown above are not reduced.
  7. Substitution of manhole top Type 7 for Type 8 is allowed if the minimum thickness (t) above pipe opening cannot be maintained with manhole top Type 8.

**DESIGN NOTES**

1. Manhole top Type 7 should be specified in the plans when depths shown above can be maintained.

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**TEMPORARY DRAINS FOR SUBGRADE AND BASE**

**SUPPLEMENTARY DETAILS FOR MANHOLES AND INLETS**

**FY 2019-20**

**STANDARD PLANS**

**INDEX**

**INDEX**

**SHEET**

**LAST REVISION 01/01/17**

**DESCRIPTION:**

**SUPPLEMENTARY DETAILS FOR MANHOLES AND INLETS**

**INDEX**

**SHEET**

2 of 5
1. One or more types of joints may be used in a single structure, except brick wall structure. Brick wall construction is permitted in circular units only.

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

3. Keyways are to be a minimum of 1/2" deep.

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 reinforcement may be substituted for the dowel bar in accordance with the equivalent steel area table on Sheet 4.

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

6. 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 430 of the Specifications or by non-shrink grout, in accordance with Section 934 of the Specifications.

7. Insert products approved by the Engineer may be used in lieu of dowel embedment.

**OPTIONAL CONSTRUCTION JOINTS**

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**MINIMUM DIMENSIONS FOR BOX AND RISER SEGMENTS**

<table>
<thead>
<tr>
<th>Box Or Riser Diameter</th>
<th>Minimum Value For H</th>
</tr>
</thead>
<tbody>
<tr>
<td>1'-0&quot;</td>
<td>10&quot;</td>
</tr>
<tr>
<td>1'-6&quot;</td>
<td>18&quot;</td>
</tr>
<tr>
<td>2'-0&quot;</td>
<td>26&quot;</td>
</tr>
<tr>
<td>3'-6&quot; &amp; 4'-0&quot;</td>
<td>34&quot;</td>
</tr>
<tr>
<td>5'-0&quot; &amp; 6'-0&quot;</td>
<td>42&quot;</td>
</tr>
<tr>
<td>&gt;6'-0&quot;</td>
<td>50&quot;</td>
</tr>
</tbody>
</table>

**COMPARATIVE SIDE VIEWS**

**REBAR STRAIGHT END EMBEDMENT FOR TOP AND BOTTOM SLABS**

**SEPARATE RISER SEGMENTS WITH CONSTRUCTION JOINTS OTHER THAN DOWEL OPTION**

**STEPS TO FOLLOW**

1. **Joint Details**
   - Dowel construction or monolithic casting may be used.
   - 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 430 of the Specifications or by non-shrink grout, in accordance with Section 934 of the Specifications.
   - Insert products approved by the Engineer may be used in lieu of dowel embedment.

2. **Rebar Straight End Embedment**
   - For top and bottom slabs
   - Minimum cover on dowel reinforcing bars is 2" to outside face of structure.

---

**SEPARATE RISER SEGMENTS WITH CONSTRUCTION JOINTS OTHER THAN DOWEL OPTION**

**SEPARATE RISER SEGMENTS WITH CONSTRUCTION JOINTS OTHER THAN DOWEL OPTION**

1. **Joint Details**
   - Dowel construction or monolithic casting may be used.
   - 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 430 of the Specifications or by non-shrink grout, in accordance with Section 934 of the Specifications.
   - Insert products approved by the Engineer may be used in lieu of dowel embedment.

2. **Rebar Straight End Embedment**
   - For top and bottom slabs
   - Minimum cover on dowel reinforcing bars is 2" to outside face of structure.

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**WALL REINFORCING SPLICE DETAILS**

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**REV ISIO N DESCRIPTION:**

**REV ISIO N SHEET:**

**REV IS IO N INDEX:**

**REV IS IO N LAST:**

**REV IS IO N 01/17:**

**REV IS IO N STANDARD PLANS:**

**REV IS IO N SUPPLEMENTARY DETAILS FOR MANHOLES AND INLETS:**

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**REV IS IO N 01/17:**

**REV IS IO N STANDARD PLANS:**

**REV IS IO N SUPPLEMENTARY DETAILS FOR MANHOLES AND INLETS:**
Section 931, WWR shall be continuous around the box and lapped in accordance with Option 1 or 3 as shown in the Wall Reinforcing Details.

Horizontal steel in the walls of rectangular structures shall be lap spliced in accordance with Option 1, 2 or 3 as shown in the Wall Reinforcing Details. For square or rectangular precast drainage structures, using either deformed or smooth WWR meeting the requirements of Specification Section 931, the number of bars in each section shall not be less than the number required by the requirements of Specification Section 931, Table 930.1.

When precast units are used in conjunction with Alt. "B" Structure Bottoms, Index 425-010, the reinforcement dimensions shall be permitted as required by the requirements of the Structure Bottoms, Index 425-010, with a minimum increase of 12" in the bar spacing in the interior dimensions of an Alt. "B" Bottom can be adjusted to reflect these inlet interior dimensions.

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**PICTORIAL VIEW**

**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**

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

**SUPPLEMENTARY DETAILS FOR SKEWED PIPES IN RECTANGULAR STRUCTURES**

**SECTION AA**

- **PLAN VIEW FOR SKEWS ≤ 45°**
  - (Not Centered)

- **PLAN VIEW FOR SKEWS > 45°**
  - (Not Centered)