Plan (Shallow)

'E' Joint

'EE' Joint

Lid

4'-0"

8'-8"

28"

28"

8'-8"

7'-0" dia.

8''

7'-0" dia.

8''

12''

16.33

16.99

17.67

16.77

18.00

21.34

104-5B

PV-101

(EE Joint)

See Section A-A

Concrete Barrier

Possible Tabulation:

Barrier Intake, SW-548

Possible Contract Item:

104-58

SHALLOW

CIRCULAR

Standard Road Plan

SINGLE-GRATE BARRIER INTAKE,

REVISED 6 10-16-18

IOWA DOT

SHEET1 of 6

REVISIONS:

Grade Location' call out on Sheet 3 to be consistent with Sheet 1.

Changed the 'Form Grade Location' on Sheet 2 and removed the "Form

Grade Location" call out on Sheet 3 to be consistent with Sheet 1

APPROVED BY DESIGN METHODS ENGINEER

All plate and edge armor steel to be ASTM A 36, galvanized after

fabrication.

Remove cover plate before constructing concrete barrier.

Cast frames into intake top so tops of grates are \( \frac{3}{4} \) below Form

Grade Elevation. Bolt intake frames together on both sides with four

2\( \frac{1}{2} \)" x 4" bolts.

For joint details, refer to PV-101.

1. Trowel smooth and place two layers of 30 pound roofing felt to

prevent bond.

2. Match slope of top and grate to adjacent

pavement.

3. 12 inch minimum above all pipes.

Maximum Pipe Diameter for 2 Pipes

at 180° Separation

At 90° Separation

48 inches 36 inches

Shallow circular intake

H = 3'-0" to 15'-0"

7' barrel diameter

Deep circular option:

H = 15'-0" to 28'-0"

4' and 7' barrel diameters

PV-101.

Refer to PV-101 for joint details.

PV-101.

PV-101.

PV-101.

PV-101.

PV-101.

PV-101.

PV-101.

PV-101.

PV-101.
**DETAIL 'B'**

1. Trowel smooth and place two layers of 30-pound roofing felt to prevent bond.
2. Match slope of top and grate to adjacent pavement.

### Dimensions

<table>
<thead>
<tr>
<th></th>
<th>H1 (In.)</th>
<th>H2 (In.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>16.33</td>
<td>16.59</td>
</tr>
<tr>
<td>2</td>
<td>16.67</td>
<td>16.98</td>
</tr>
<tr>
<td>3</td>
<td>17.00</td>
<td>17.47</td>
</tr>
<tr>
<td>4</td>
<td>17.33</td>
<td>17.86</td>
</tr>
<tr>
<td>5</td>
<td>17.67</td>
<td>18.45</td>
</tr>
<tr>
<td>6</td>
<td>18.00</td>
<td>18.84</td>
</tr>
</tbody>
</table>

---

**SINGLE-GRATE BARRIER INTAKE, CIRCULAR**
LID REINFORCING BAR LIST

<table>
<thead>
<tr>
<th>BAR</th>
<th>LOCATION</th>
<th>SHAPE</th>
<th>LENGTH</th>
<th>WEIGHT</th>
</tr>
</thead>
<tbody>
<tr>
<td>4b1</td>
<td>Lid Hoop</td>
<td>8&quot;-8&quot;</td>
<td>4'-4&quot;</td>
<td>4b1</td>
</tr>
<tr>
<td>4b2</td>
<td>Ld Hoop</td>
<td>8&quot;-8&quot;</td>
<td>4'-4&quot;</td>
<td>4b2</td>
</tr>
<tr>
<td>4b3</td>
<td>Ld Hoop</td>
<td>8&quot;-8&quot;</td>
<td>4'-4&quot;</td>
<td>4b3</td>
</tr>
</tbody>
</table>

EPOXY-COATED REINFORCING STEEL - TOTAL: 346

LID BENT BAR DETAILS

Note: All dimensions shown out to out. D = Pin Diameter

WALL JOINT DETAIL

Frame Ring Edge Armor
2 x 6" galvanized H.S. bolt with two nuts and washers. Eight required per frame.

Shear Connector Studs

LID QUANTITY SUMMARY

<table>
<thead>
<tr>
<th>Description</th>
<th>(SHALLOW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Epoxy Coated Reinforcing Bar</td>
<td>346 LB</td>
</tr>
<tr>
<td>Concrete</td>
<td>3.2 CY</td>
</tr>
</tbody>
</table>

* Based on Minimum thickness = 16"

NOTE: ALL DIMENSIONS SHOWN OUT TO OUT. D = PIN DIAMETER
**LID REINFORCING BAR LIST**

<table>
<thead>
<tr>
<th>BAR LOCATION</th>
<th>LENGTH</th>
<th>WEIGHT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lid, Longitudinal</td>
<td>5'-2&quot;</td>
<td>51</td>
</tr>
<tr>
<td>Lid, Transverse</td>
<td>5'-2&quot;</td>
<td>47</td>
</tr>
<tr>
<td>Lid, Hoop</td>
<td>4'-9&quot;</td>
<td>13</td>
</tr>
<tr>
<td>Lid, Hoop</td>
<td>4'-0&quot;</td>
<td>18</td>
</tr>
<tr>
<td>Intermediate Lid</td>
<td>4'-9&quot;</td>
<td>9</td>
</tr>
<tr>
<td>Intermediate Lid</td>
<td>3'-9&quot;</td>
<td>7</td>
</tr>
<tr>
<td>Intermediate Lid</td>
<td>2'-9&quot;</td>
<td>7</td>
</tr>
<tr>
<td>Intermediate Lid</td>
<td>2'-3&quot;</td>
<td>9</td>
</tr>
<tr>
<td>Intermediate Lid</td>
<td>8'-0&quot;</td>
<td>9</td>
</tr>
<tr>
<td>Intermediate Lid</td>
<td>6'-0&quot;</td>
<td>9</td>
</tr>
<tr>
<td>Intermediate Lid</td>
<td>4'-0&quot;</td>
<td>4</td>
</tr>
<tr>
<td>Intermediate Lid</td>
<td>2'-3&quot;</td>
<td>4</td>
</tr>
<tr>
<td>Intermediate Lid</td>
<td>4'-9&quot;</td>
<td>3</td>
</tr>
<tr>
<td>Intermediate Lid</td>
<td>6'-0&quot;</td>
<td>2</td>
</tr>
<tr>
<td>Intermediate Lid</td>
<td>8'-0&quot;</td>
<td>2</td>
</tr>
</tbody>
</table>

**EPOXY-COATED REINFORCING STEEL TOTAL:** 229

---

**NOTE:** ALL DIMENSIONS SHOWN OUT TO OUT. D=PIN DIAMETER

---

**LID BENT BAR DETAILS**

**LID QUANTITY SUMMARY (DEEP)**

<table>
<thead>
<tr>
<th>Material Type</th>
<th>Quantity</th>
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<tbody>
<tr>
<td>Concrete - Lid</td>
<td>6.47 CY</td>
</tr>
<tr>
<td>Concrete - Intermediate Lid</td>
<td>5.18 CY</td>
</tr>
<tr>
<td>Epoxy Coated Reinforcing Steel</td>
<td>229 L.R.</td>
</tr>
</tbody>
</table>

---

**SINGLE-GRADE BARRIER INTAKE, CIRCULAR**

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**REVISION:** 10-16-18

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**APPROVED BY DESIGN METHODS ENGINEER**
**BASE REINFORCING BAR LIST**

<table>
<thead>
<tr>
<th>BAR</th>
<th>LOCATION</th>
<th>SHAPE/DIRECTION</th>
<th>LENGTH</th>
<th>WEIGHT</th>
</tr>
</thead>
<tbody>
<tr>
<td>5a6</td>
<td>Base, Long.</td>
<td>Transverse</td>
<td>8'-0&quot;</td>
<td>31 lb</td>
</tr>
<tr>
<td>5a5</td>
<td>Base, Long.</td>
<td>Transverse</td>
<td>8'-4&quot;</td>
<td>27 lb</td>
</tr>
<tr>
<td>5a4</td>
<td>Base, Long.</td>
<td>Transverse</td>
<td>8'-6&quot;</td>
<td>22 lb</td>
</tr>
<tr>
<td>5a3</td>
<td>Base, Long.</td>
<td>Transverse</td>
<td>9'-0&quot;</td>
<td>18 lb</td>
</tr>
<tr>
<td>5a2</td>
<td>Base, Long.</td>
<td>Transverse</td>
<td>9'-6&quot;</td>
<td>16 lb</td>
</tr>
<tr>
<td>5a1</td>
<td>Base, Long.</td>
<td>Transverse</td>
<td>10'-0&quot;</td>
<td>16 lb</td>
</tr>
</tbody>
</table>

**BASE QUANTITY SUMMARY**

<table>
<thead>
<tr>
<th>Concrete</th>
<th>2.37 CY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Epoxy Coated Reinforcing Steel</td>
<td>166 lb</td>
</tr>
</tbody>
</table>

* Based on Standard Base Shape

---

4 el bars at 8 inch centers each direction or equivalent welded wire fabric.

4 el bar length to be pipe diameter plus 12 inches. Place 4 el bar inside of vertical reinforcing. Shift main reinforcing bars as required for pipe entrance. Field cut bars to maintain 3 inch clearance from bottom. Maintain 2 inch clearance from face of walls. Four 4 el bars required per pipe entrance.

---

**BASE PROFILE**

8" dia.

3" clear

3" high

12" long

---

**BASE PLAN**

8'-0" dia.

Alternate Base Shape

Standard Base Shape

---

**NOTE:**

- #6 at 8 inch centers each direction or equivalent welded wire fabric.
- 4 el bar length to be pipe diameter plus 12 inches. Place 4 el bar inside of vertical reinforcing. Shift main reinforcing bars as required for pipe entrance. Field cut bars to maintain 3 inch clearance from bottom. Maintain 2 inch clearance from face of walls. Four 4 el bars required per pipe entrance.