## General Notes:

If Design Fill is between tabulated design fills, use the next greater tabulated design fill. Except for design fills between 2 and 4 feet, use the numerical fill values tabulated. Use the greater member thicknesses, area of reinforcement and bar dimensions from the 2 and 4 feet tabulated design fills. Area of reinforcement equals bar area per foot spacing. Special designs are required when the design fill is less than 1 foot or greater than 50 feet.

Dimensions are in inches unless otherwise specified.

Design fills are measured from the top of top slab to the top of earth fill or roadway.

Culverts meet strength and serviceability requirements for the design vehicle minus the lane load and 18 inch plus the lane load.

### Member Thickness

**Concrete Single Box Culvert**

**Member Thickness**

<table>
<thead>
<tr>
<th>Size</th>
<th>Bar</th>
<th>Spacing &amp; Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 FT</td>
<td>A1</td>
<td>BARS &amp; J3 BARS may be used when the distance between the ends of J3 bars in the top slab is less than 2' - 0&quot;. Dimension L1 is the distance from the top of top slab to the bottom of culvert. Area of reinforcement is equal to 1 bar per foot spacing.</td>
</tr>
<tr>
<td>4 FT</td>
<td>A1</td>
<td>BARS &amp; J3 BARS may be used when the distance between the ends of J3 bars in the top slab is less than 2' - 0&quot;. Dimension L1 is the distance from the top of top slab to the bottom of culvert. Area of reinforcement is equal to 1 bar per foot spacing.</td>
</tr>
<tr>
<td>5 FT</td>
<td>A1</td>
<td>BARS &amp; J3 BARS may be used when the distance between the ends of J3 bars in the top slab is less than 2' - 0&quot;. Dimension L1 is the distance from the top of top slab to the bottom of culvert. Area of reinforcement is equal to 1 bar per foot spacing.</td>
</tr>
</tbody>
</table>

### Member Total Thickness

**Concrete Single Box Culvert**

**Member Total Thickness**

<table>
<thead>
<tr>
<th>Size</th>
<th>Bar</th>
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<tbody>
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**Concrete Single Box Culvert**

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**Concrete Single Box Culvert**

**Member Total Thickness**

<table>
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<tr>
<th>Size</th>
<th>Bar</th>
<th>Spacing &amp; Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
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<td>A1</td>
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<td>A1</td>
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</tr>
</tbody>
</table>
### Design Thickness

<table>
<thead>
<tr>
<th>BAR</th>
<th>2&quot; FT</th>
<th>3&quot; FT</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>48</td>
<td>60</td>
</tr>
<tr>
<td>A2</td>
<td>36</td>
<td>48</td>
</tr>
<tr>
<td>J1</td>
<td>36</td>
<td>48</td>
</tr>
<tr>
<td>J2</td>
<td>24</td>
<td>36</td>
</tr>
</tbody>
</table>

### Height (Ht) = 2 FT or 3 FT

<table>
<thead>
<tr>
<th>BAR</th>
<th>A1</th>
<th>A2</th>
<th>J1</th>
<th>J2</th>
<th>F1</th>
<th>F2</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>48</td>
<td>60</td>
<td>36</td>
<td>48</td>
<td>24</td>
<td>36</td>
</tr>
<tr>
<td>A2</td>
<td>36</td>
<td>48</td>
<td>24</td>
<td>36</td>
<td>18</td>
<td>24</td>
</tr>
<tr>
<td>J1</td>
<td>36</td>
<td>48</td>
<td>24</td>
<td>36</td>
<td>18</td>
<td>24</td>
</tr>
<tr>
<td>J2</td>
<td>24</td>
<td>36</td>
<td>18</td>
<td>24</td>
<td>12</td>
<td>18</td>
</tr>
<tr>
<td>F1</td>
<td>18</td>
<td>24</td>
<td>12</td>
<td>18</td>
<td>10</td>
<td>12</td>
</tr>
<tr>
<td>F2</td>
<td>12</td>
<td>18</td>
<td>10</td>
<td>12</td>
<td>7</td>
<td>10</td>
</tr>
</tbody>
</table>

### Height (Ht) = 4 FT

<table>
<thead>
<tr>
<th>BAR</th>
<th>2&quot; FT</th>
<th>3&quot; FT</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>48</td>
<td>60</td>
</tr>
<tr>
<td>A2</td>
<td>36</td>
<td>48</td>
</tr>
<tr>
<td>J1</td>
<td>36</td>
<td>48</td>
</tr>
<tr>
<td>J2</td>
<td>24</td>
<td>36</td>
</tr>
</tbody>
</table>

### Height (Ht) = 5 FT

<table>
<thead>
<tr>
<th>BAR</th>
<th>2&quot; FT</th>
<th>3&quot; FT</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>48</td>
<td>60</td>
</tr>
<tr>
<td>A2</td>
<td>36</td>
<td>48</td>
</tr>
<tr>
<td>J1</td>
<td>36</td>
<td>48</td>
</tr>
<tr>
<td>J2</td>
<td>24</td>
<td>36</td>
</tr>
</tbody>
</table>

### General Notes:
- If design fill is between tabulated design fills, use the next greater tabulated design fill. For design fills between 2 and 50 feet, use the smaller tabulated design fill. Use the greater member thickness, size of reinforcement, and bar spacing required from the top of top slab to the top of earth fill or roadway.
- Special designs are required when the design fill is less than 1 foot or greater than 50 feet.
- Dimensions are in inches unless otherwise specified.

### Cutoffs
- Missourl Highways and Transportation Commission
- 105 West Capitol
- Jefferson City, MO 65102
- 1-800-338-MODOT
- 417-324-5341
<table>
<thead>
<tr>
<th>SPAN (S)</th>
<th>J3 BAR 1 SYMMETRICAL ABOUT</th>
<th>A1 BAR</th>
<th>J3 BARS</th>
<th>BOTTOM SLAB BARS WALL BARS</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
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</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**GENERAL NOTES:**

- EARTH FILL OR ROADWAY.
- THE GREATER MEMBER THICKNESS.
- AREA OF REINFORCEMENT AND BAR FOOT OR GREATER THAN 50 FEET.
- AREA OF REINFORCEMENT EQUALS BAR AREA PER FOOT SPACING.

**DATE PREPARED:**

31.8

**SINGLE BOX CULVERT CONCRETE**

- BAR SIZE: 5" & 8" FEET
- SPACING & DIMENSIONS

---

**DESIGN THICKNESS A1 BARS**

- 24 FT
- 24 FT 8
- 42 FT 12
- 12 FT 8

---

**ALTERNATE J3 BAR**

- Bar Dimensions Diagram

---

**IF A SEAL IS PRESENT OR THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.**
### DESIGN THICKNESS A1 BARS

<table>
<thead>
<tr>
<th>Span (S)</th>
<th>50 ft</th>
<th>40 ft</th>
<th>36 ft</th>
<th>24 ft</th>
<th>18 ft</th>
<th>12 ft</th>
<th>8 ft</th>
</tr>
</thead>
<tbody>
<tr>
<td>J3 BARS</td>
<td>5.5</td>
<td>5.5</td>
<td>5.5</td>
<td>5.5</td>
<td>5.5</td>
<td>5.5</td>
<td>5.5</td>
</tr>
<tr>
<td>J4 BARS</td>
<td>4.5</td>
<td>5.5</td>
<td>5.5</td>
<td>5.5</td>
<td>5.5</td>
<td>5.5</td>
<td>5.5</td>
</tr>
<tr>
<td>SIZE SPA.</td>
<td>3.0</td>
<td>3.0</td>
<td>3.0</td>
<td>3.0</td>
<td>3.0</td>
<td>3.0</td>
<td>3.0</td>
</tr>
</tbody>
</table>

### DESIGN THICKNESS A2 BARS

<table>
<thead>
<tr>
<th>Span (S)</th>
<th>50 ft</th>
<th>40 ft</th>
<th>36 ft</th>
<th>24 ft</th>
<th>18 ft</th>
<th>12 ft</th>
<th>8 ft</th>
</tr>
</thead>
<tbody>
<tr>
<td>J3 BARS</td>
<td>8.5</td>
<td>8.5</td>
<td>8.5</td>
<td>8.5</td>
<td>8.5</td>
<td>8.5</td>
<td>8.5</td>
</tr>
<tr>
<td>J4 BARS</td>
<td>7.5</td>
<td>7.5</td>
<td>7.5</td>
<td>7.5</td>
<td>7.5</td>
<td>7.5</td>
<td>7.5</td>
</tr>
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<td>5.0</td>
<td>5.0</td>
<td>5.0</td>
<td>5.0</td>
<td>5.0</td>
<td>5.0</td>
</tr>
</tbody>
</table>

### SPAN (S) = 6 FT

<table>
<thead>
<tr>
<th>Member Thickness</th>
<th>A1 BARS</th>
<th>A2 BARS</th>
<th>J1 BARS</th>
<th>J2 BARS</th>
<th>J3 BARS</th>
<th>J4 BARS</th>
<th>K1 BARS</th>
<th>K2 BARS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top Side BARS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bottom Side BARS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WALL BARS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### GENERAL NOTES:

- If design fill is between tabulated design fills, use the next smaller tabulated design fill.
- If design fill is greater than 6 feet, use the next larger tabulated design fill.
- If design fill is less than 2 feet, use the next smaller tabulated design fill.
- If design fill is greater than 6 feet, use the next larger tabulated design fill.
- Special designs are required when the design fill is less than 1 foot or greater than 50 feet.
- Dimensions are in inches unless otherwise specified.
- Design fills were measured from the top of top slab to the top of earth fill or roadway.

### CONCRETE SINGLE BOX Culvert

- **Member Thickness**: 14 in.
- **Bar Size, Spacing & Dimensions**: 6 in. to 9 ft.
### GENERAL NOTES:

1. IF DESIGN FILL IS BETWEEN TABULATED DESIGN FILLS, USE THE NEXT GREATER DESIGN FILL. IF THE LOWER DESIGN FILL IS LESS THAN 2'-0" DIMENSION FILL, USE THE GREATER MEMBER THICKNESS AND AREA OF REINFORCEMENT AND BAR SPACING. USE THE NEXT GREATER BAR SIZE. SPACING & DIMENSIONS.

2. IF DESIGN FILL IS BETWEEN TABULATED DESIGN FILLS, USE THE NEXT GREATER DESIGN FILL. IF THE LOWER DESIGN FILL IS LESS THAN 2'-0" DIMENSION FILL, USE THE GREATER MEMBER THICKNESS AND AREA OF REINFORCEMENT AND BAR SPACING. USE THE NEXT GREATER BAR SIZE. SPACING & DIMENSIONS.

3. IN THE TOP SLAB IS LESS THAN 2'-0" DIMENSION FILL, USE THE NEXT GREATER DESIGN FILL. IF THE LOWER DESIGN FILL IS LESS THAN 2'-0" DIMENSION FILL, USE THE GREATER MEMBER THICKNESS AND AREA OF REINFORCEMENT AND BAR SPACING. USE THE NEXT GREATER BAR SIZE. SPACING & DIMENSIONS.

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### MEMBERS:

**HEIGHT (HT):** 11 FT

**SPAN (S):** 11 FT

<table>
<thead>
<tr>
<th>Design</th>
<th>Member Thickness</th>
<th>Top Slab Bars</th>
<th>J2 Bars</th>
<th>Bottom Slab Bars</th>
<th>Wall Bars</th>
</tr>
</thead>
<tbody>
<tr>
<td>T5 B5 T 12 18 24</td>
<td>1 6 8 10</td>
<td>6 8 10 12</td>
<td>6 8 10 12</td>
<td>6 8 10 12</td>
<td>6 8 10 12</td>
</tr>
<tr>
<td>T5 B5 T 12 18 24</td>
<td>1 6 8 10</td>
<td>6 8 10 12</td>
<td>6 8 10 12</td>
<td>6 8 10 12</td>
<td>6 8 10 12</td>
</tr>
</tbody>
</table>

### SINGLE BOX CULVERT

**MEMBER THICKNESS:**

**SPAN (S):** 11 FT

**HEIGHT (HT):** 6 FT OR 7 FT OR 8 FT

**SPAN (S):** 11 FT

**HEIGHT (HT):** 9 FT OR 10 FT OR 11 FT

### BAR DIMENSIONS DIAGRAM

**SYMMETRICAL ABOUT CULVERT.**

**ALTERNATE J3 BAR:**

AT CONTRACTOR'S OPTION: ALTERNATE J3 BARS MAY BE USED WHEN THE DISTANCE BETWEEN THE ENDS OF J3 BARS IN THE TOP SLAB IS LESS THAN 2'-0" DIMENSION 1. (CONT.) SHALL BE USED WITH ALTERNATE J3 BARS.

**WHERE L1 IS EQUAL TO 18" AND 22" FOR #4.**

**IN THE TOP SLAB IS LESS THAN 2'-0" DIMENSION FILL.**

**MEMBER THICKNESS:**

**SPAN (S):** 11 FT

**HEIGHT (HT):** 6 THRUS 14 FT

### CONCRETE SINGLE BOX CULVERT

**DATE EFFECTIVE:**

04/02/2022

**DATE PREPARED:**

04/02/2022

**SHEET NO:**

703.17

**9 OF 14**

**MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION**

105 WEST CAPITOL

JEFFERSON CITY, MO 65102

1-800-MODOT (663-6868)
### Design Details:

**Phase 1:**
- **Member Thickness:**
  - **SPA** (25 ft):
    - **SPA-1:** 600 x 110
    - **SPA-2:** 600 x 110
  - **SPA-0:** 600 x 110
  - **SPA-1:** 600 x 110
  - **SPA-2:** 600 x 110
  - **SPA-0:** 600 x 110

**Phase 2:**
- **Member Thickness:**
  - **SPA** (25 ft):
    - **SPA-1:** 600 x 110
    - **SPA-2:** 600 x 110
    - **SPA-0:** 600 x 110
  - **SPA-1:** 600 x 110
  - **SPA-2:** 600 x 110
  - **SPA-0:** 600 x 110

### General Notes:

- **Bar Size, Spacing & Dimensions:**
- **Design Fills:**
  - Use the next greater tabulated design fill for design fills between 2 feet and 4 feet.
  - Use the next greater tabulated design fill for design fills greater than 50 feet.

### Member Size:

- **Single Box Culvert:**
  - **Member Thickness:**
    - **SPA:** 600 x 110
    - **SPA-0:** 600 x 110
    - **SPA-1:** 600 x 110
    - **SPA-2:** 600 x 110

### Special Notes:

- **Design Fills:**
  - Design Fills are measured from the top of the top slab to the top of earth fill on roadway.
  - Culverts with Spacing and Spacing Requirements for the Design Vehicular Live Load (VLL) While the Lane Load.

### Import Notes:

- **Bar Size, Spacing & Dimensions:**
- **Design Fills:**
  - Use the next greater tabulated design fill for design fills between 2 feet and 4 feet.
  - Use the next greater tabulated design fill for design fills greater than 50 feet.

### Additional Information:

- **Date Prepared:**
  - **M DOT Commission:**
    - 1-888-ASK-MODOT (1-888-275-6636)

---

**Missouri Highways and Transportation Commission**

105 West Capitol
Jefferson City, MO 65102

**Concrete Single Box Culvert**

**Member Thickness:**

<table>
<thead>
<tr>
<th>BAR SIZE</th>
<th>SPA-0</th>
<th>SPA-1</th>
<th>SPA-2</th>
<th>SPA-0</th>
<th>SPA-1</th>
<th>SPA-2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bar Size</td>
<td>600 x 110</td>
<td>600 x 110</td>
<td>600 x 110</td>
<td>600 x 110</td>
<td>600 x 110</td>
<td>600 x 110</td>
</tr>
</tbody>
</table>

**Date Prepared:**

4/26/2011

**Date Effective:**

4/25/2011

**Sheet No.:**

703.17

**Page No.:**

10 of 14
### Table: Design Thickness

<table>
<thead>
<tr>
<th>SPAN (S)</th>
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<tr>
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### Table: Heights (H1, H2, H3)

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### General Notes

- **Concrete Box Culvert**
- **Member Thickness**
- **Bar Size**
- **Spacing & Dimensions**
- **Alternate J3 Bar**
- **Design Fills**
- **General Notes**
- **MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION**
- **Single Box Culvert**
- **J3 Bar**
- **Member Thickness**
- **Bar Size**
- **Spacing & Dimensions**
- **Alternate J3 Bar**
- **Design Fills**
- **General Notes**
- **MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION**

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**MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION**

**SINGLE BOX CULVERT**

**MEMBER THICKNESS**

**BAR SIZE**, **SPACING & DIMENSIONS**

**SPAN (S): 13 FEET**

**HEIGHT (H): 7 THRU 16 FEET**

**DATE EFFECTIVE:** 4/15/2010

**DATE PREPARED:** 4/18/2011

**SHEET NO.:** 703.17

**11 OF 14**
### Design Thickness

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### General Notes:

- If design fill is 15 between tabulated design fills, use the next greater design fill.
- Table values are equal to or greater than 50 feet.
- Design fill is used to design fill for the greater member thickness areas of reinforcement and bar dimensions from the 2 feet and 4 feet tabulated design fills.
- Design fill for the area of reinforcement equals bar area per foot spacing.

### Special Design Fill Requirements:

- Design fill for the area of reinforcement must be measured from the top of top slab to the top of earth fill or roadway.

### Missouri Highways and Transportation Commission

Jefferson City, MO 65102

**Concrete Single Box Culvert**

<table>
<thead>
<tr>
<th>Member Thickness</th>
<th>Bar Size, Spacing &amp; Dimensions</th>
<th>Span (s)</th>
<th>Height (h)</th>
</tr>
</thead>
<tbody>
<tr>
<td>15 FT</td>
<td>8 FT OR 9 FT OR 10 FT</td>
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### Date Effective:

04/15/2000

### Sheet Number:

703.17

13 OF 14
**GENERAL NOTES:**

If design fill is between tabulated design fills, use the next greater member thickness, area of reinforcement and bar spacing.

Dimensions in inches unless otherwise specified.

Design fill was measured from the top of top slab to the top of earth fill or roadway.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN WIND LOAD INDICATED IN SINGLE BOX CULVERT.

**CONCRETE SINGLE BOX CULVERT**

**MEMBER THICKNESS**

**BAR SIZE, SPACING & DIMENSIONS**

Date Effective: 04/01/2011

Date Prepared: 04/08/2011

Sheet No. 14 of 14