# Tollway Standard Drawing Revisions

## Section B  Drainage Structures, Curbs, Curbs & Gutter and Ditches

<table>
<thead>
<tr>
<th>Standard</th>
<th>Modification Summary</th>
<th>Effective 03/01/2013</th>
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</thead>
<tbody>
<tr>
<td>All Sheets</td>
<td>Illinois Tollway Standard Logo Inserted In Title Block.</td>
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</table>
| B28 | **Gutter Transition at Traffic Barrier Terminal Type T1 (Special).**  
Gutter Transition Revised from 10'-0" to 6'-0".  
Type G2 and G3 Modified Gutter Revised from 90'-0" to 87'-0". | |
| B29 | **Gutter Transition at Traffic Barrier Terminal Type T1-A (Special).**  
Gutter Transition Revised from 10'-0" to 6'-0".  
Type G2 Modified Gutter Revised from 65'-0" to 62'-0". | |

New Sheet
GUTTER TRANSITION AT ENTRANCE RAMP TERMINALS

GUTTER TRANSITION AT EXIT RAMP TERMINALS

GUTTER TRANSITION NOTES:
1. PROVIDE 1'-0" EXPANSION JOINT WITH A MORTAR JOINT FILLER BETWEEN TRANSITION SECTION AND RAMP.
2. SEE STANDARD B3 FOR GUTTER TRANSITIONS AT BRIDGE APPROACH.
3. ALL SLOPES ARE EXPRESSED IN UNITS OF HORIZONTAL DISPLACEMENT TO 3 UNITS OF HORIZONTAL DISPLACEMENT EARTH.
4. REINFORCEMENT STEEL MUST BE ACCURATELY PLACED AND FINALLY HELD IN THE REQUIRED位置 USING WIRE COATED CHAPS. CHAP SPACING SHALL NOT EXCEED 6'-0".
5. GUTTER REINFORCEMENT SHALL BE PLACED 3" ABOVE BOTTOM OF GUTTER FOLLOWING SUBGRADE SLOPE.
6. CONTINUOUS MORTAR SHALL BE LAPPED A MINIMUM OF 3"-0" IN ACCORDANCE WITH THE LATEST HOT MANUAL.
TYPE G-3 GUTTER TRANSITION AT BRIDGE DEPARTURE

PLAN

SECTION A-A

SECTION B-B

SECTION C-C
NORMAL TYPE G-3 GUTTER

TYPE G-2 GUTTER AT BRIDGE DEPARTURE

SECTION D-D
NORMAL TYPE G-2 GUTTER

NOTE:
SEE SHEET 1 OF THIS SERIES FOR NOTES.

 Illinois Tollway

TYPE G-2 AND G-3 GUTTER TRANSITIONS

STANDARD B2-04
SODDED DITCH

EMBANKMENT UNDER 20 FEET IN HEIGHT
TOE OF EMBANKMENT DITCHES

EMBANKMENT
OVER 20 FEET IN HEIGHT

NOTES FOR EMBANKMENT DITCHES:
1. Trench and slope may vary depending on soil condition or fill requirements.
2. These settings apply to a composite of fills with the exception of fill over fill.
3. All slopes are composite as units of vertical placement to units of horizontal placement.
## Reinforcing Bar Schedule for One Headwall

### Type III 1/4 Slope

| Dim. | Type | ID | X | Y | Z | L | T | R | u | v | w | x | y | z | L | T | R | u | v | w | x | y | z |
| 12"  | 1    | 1  | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 14"  | 2    | 2  | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 16"  | 3    | 3  | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |

### Type III 1/8 Slope

| Dim. | Type | ID | X | Y | Z | L | T | R | u | v | w | x | y | z | L | T | R | u | v | w | x | y | z | L | T | R | u | v | w | x | y | z |
| 12"  | 1    | 1  | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 14"  | 2    | 2  | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 16"  | 3    | 3  | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |

### Type III 1/2 Slope

| Dim. | Type | ID | X | Y | Z | L | T | R | u | v | w | x | y | z | L | T | R | u | v | w | x | y | z | L | T | R | u | v | w | x | y | z |
| 12"  | 1    | 1  | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 14"  | 2    | 2  | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 16"  | 3    | 3  | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |

**Notes:**
1. The Y bars, Type 3, shall be spaced full length and cut in the field. The reinforcing portion of the Y bars shall be used in the other wall.
2. The long leg of the Y and V bars shall be vertical.
3. Quantities on this drawing are based on the cast-in-place design.
5. All slopes are expressed as units of vertical displacement to units of horizontal displacement.

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**Sheet 2 of 3**

**Illinois Railway**

**Headwall Type III**

**18" 24" 30" 42"**

**For 1/4, 1/8, and 1/2 Slopes**

**Standard B6-03**

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**B6-03.DGN 2/18/2013 10:21:20 AM**
### Grate Dimensions and Quantities

#### One Headwall Type III End Entrance 1:6 Slope

<table>
<thead>
<tr>
<th>Slope Degree</th>
<th>Grate Type</th>
<th>Grates Required</th>
<th>Type A</th>
<th>Type B</th>
<th>Length</th>
<th>Depth</th>
<th>Max. Length</th>
<th>Max. Depth</th>
<th>Total</th>
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<td>20°</td>
<td>4</td>
<td>2</td>
<td>A</td>
<td>B</td>
<td>4</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>12</td>
</tr>
<tr>
<td>45°</td>
<td>4</td>
<td>2</td>
<td>A</td>
<td>B</td>
<td>4</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>12</td>
</tr>
<tr>
<td>60°</td>
<td>4</td>
<td>2</td>
<td>A</td>
<td>B</td>
<td>4</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>12</td>
</tr>
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</table>

#### Notes:

1. The structural steel shall be ASTM A992, grade 50.
2. Dimensions shall be in accordance with the standard specifications.
3. Non-reinforcement of grates is shown in the sketch.
4. All table dimensions and quantities are for single-type grates headwalls.
5. All shapes are expressed as units of vertical displacement to units of horizontal displacement (ft).
NOTE:
SEE SHEET 1 OF THIS SERIES FOR NOTES.
NOTES:

1. Outlet pipes and preformed channel inverts shall be sloped at 1/4", or steeper toward outlet regardless of the surface slope.

2. Trench drain may be stubbed obliquely into drainage structures. Outlet pipes may be used to connect trench drain to drainage structures.

3. A clean-out port compatible with the manufactured system shall be provided for trench drains at the upstream end at intervals not to exceed 100 feet. The clean-out shall have a removable load resistant cover or grate.

4. Trench excavation must allow for a minimum of 12 inches of concrete to be placed under and alongside the trench drain channel system.

5. The finished level of concrete must be approximately 1/8" above the top of the drain channel.

6. Trench drains shall be in accordance with the manufacturer's details and specifications.

7. Provide 1X expansion joint with preformed joint filler between paved shoulder and trench drain encasement.

8. All slopes are expressed as units of vertical displacement to units of horizontal placement (IV/H). 

9. Where the concrete encasement for trench drain is within 6' of the pavement, replace the cone surfacing with Class 3A concrete 9" setting pay (item 13) Portland cement concrete shoulder (item).
### Pipe Arch and Elliptical Pipe Culverts

For pipe arch or elliptical pipe culverts, select appropriate "C" & "S" from sizes shown. Add the following additional bars:

<table>
<thead>
<tr>
<th>Diameter</th>
<th>L</th>
<th>W</th>
<th>T</th>
<th>M</th>
<th>D</th>
<th>C</th>
<th>S</th>
<th>E</th>
<th>F</th>
<th>L1</th>
<th>L2</th>
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<tr>
<td>4 x 1.5</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 x 3.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

**Notes:**
- The weight of the additional bars and the additional quantity of concrete in the culvert should be added to the quantities shown.

### Table of Reinforcing Steel for One End

<table>
<thead>
<tr>
<th>Class</th>
<th>Size</th>
<th>No. of Bars</th>
<th>Length</th>
<th>No. of Bars</th>
<th>Length</th>
<th>No. of Bars</th>
<th>Length</th>
<th>No. of Bars</th>
<th>Length</th>
<th>No. of Bars</th>
<th>Length</th>
<th>No. of Bars</th>
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<th>No. of Bars</th>
<th>Length</th>
<th>No. of Bars</th>
<th>Length</th>
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<td>4</td>
<td>12’0”</td>
<td>4</td>
<td>12’0”</td>
<td>4</td>
<td>12’0”</td>
<td>4</td>
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<td>4</td>
<td>12’0”</td>
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<td>12’0”</td>
<td>1</td>
<td>12’0”</td>
</tr>
</tbody>
</table>

**Notes:**
- Reinforcement bars bending dimensions are out to out.
### Table of Reinforcing Steel for Reinforced Concrete

<table>
<thead>
<tr>
<th>Type of Bars</th>
<th>Size (mm)</th>
<th>Length (m)</th>
<th>Grade</th>
<th>Section (mm²)</th>
<th>Stress (MPa)</th>
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<tbody>
<tr>
<td>Type A</td>
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<td>500</td>
<td>188</td>
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<tr>
<td>Type B</td>
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<td>500</td>
<td>312</td>
<td>350</td>
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<tr>
<td>Type C</td>
<td>12</td>
<td>14</td>
<td>500</td>
<td>453</td>
<td>350</td>
</tr>
</tbody>
</table>

### Notes:
- All dimensions are in millimeters.
- Stress values apply to the specified grade of reinforcing steel.

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### Safety End Treatment for Single and Multiple Culverts

- All single span posts will be provided with safety end treatment.
- For multiple span posts, each segment will have safety end treatment.

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**Standard B14-03**

[Diagram of safety end treatment for single and multiple culverts]
### Table of Diameters

<table>
<thead>
<tr>
<th>Size</th>
<th>Diameter (in)</th>
<th>Length (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>8</td>
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### Table of Reinforcing Steel for One End

<table>
<thead>
<tr>
<th>Size</th>
<th>Reinforcing Steel</th>
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<tbody>
<tr>
<td>1</td>
<td>1/4 in. 10</td>
</tr>
<tr>
<td>2</td>
<td>1/2 in. 12</td>
</tr>
<tr>
<td>3</td>
<td>3/4 in. 14</td>
</tr>
</tbody>
</table>

### Notes

- Reinforcement bars exceeding 3/4 in. are not to be bought.
- For pipe of 12 in. or less, bending may be done on site.
- The weight of the reinforcing bars and the addition of the quantity of concrete in the manwells shall be added to the quantities shown.

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**ILLINOIS RAILWAY**

**SHEET 2 OF 2**

**SAFETY END TREATMENT FOR SINGLE CULVERTS**

1/2 IN. SKEW 1H SLOPE H = 4'

**STANDARD B15-03**
### Table of Dimensions

<table>
<thead>
<tr>
<th>Diameter (In)</th>
<th>Length (ft)</th>
<th>Width (In)</th>
<th>Height (In)</th>
<th>Cover (In)</th>
<th>Spacing (In)</th>
<th>Unit Weight (lb/ft)</th>
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<td>10</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>100</td>
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<td>10</td>
<td>12</td>
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<td>12</td>
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<td>200</td>
</tr>
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<td>54</td>
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<td>12</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>300</td>
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</tbody>
</table>

### Pipe Runner Layout

![Pipe Runner Layout Diagram](diagram.png)

### Table of Reinforcing Steel for One End

<table>
<thead>
<tr>
<th>Diameter (In)</th>
<th>Length (ft)</th>
<th>Width (In)</th>
<th>Height (In)</th>
<th>Cover (In)</th>
<th>Spacing (In)</th>
<th>Unit Weight (lb/ft)</th>
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<td>10</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>300</td>
</tr>
</tbody>
</table>

### Note:
- Reinforcement is boxed dimensions are not to scale.
- 4" wall
- 6" wall

### Elliptical Pipe Culverts

- Pipe arch and elliptical pipe culverts
- For full details, see the Illinois Department of Transportation's manual.
- Ti bags

### Sheet 2 of 2

**Safety End Treatment**

For single culverts, 30° skew & slope H = 4'
PLAN-O' SKEW, H = 4'

PLAN-O' SKEW, H = 8'

SECTION A-A

SECTION AT HEADWALL

SECTION B-B

NOTES:
1. The proposed method for achieving erosion protection at the sections should be through the use of products that promote sedimentation within the area of concern.
2. Thickness of filter will be determined by the manufacturer's recommendation for the product used. Stone riprap shall be in accordance with the standard specifications.
3. Erosion protection placement shall be installed flush with adjacent grade.
4. For use with standard B19-01.
NOTES:
1. ALL FRAMES AND GRATES SHALL CONFORM TO THE REQUIREMENTS OF ART. 1006.14 FOR GRAY IRON CASTINGS AND TO ART. 1006.15 FOR DUCTILE IRON CASTINGS.
2. FRAME AND GRATE TO BE NEENAH FOUNDRY COMPANY, NEENAH NO. R-3528-V OR APPROVED EQUAL.
3. GRATE SHALL NOT BE BOLTED TO FRAME.
NOTES:
1. ALL FRAMES AND GRATES SHALL CONFORM TO THE REQUIREMENTS OF ART. 1006.14 FOR GRAY IRON CASTINGS AND TO ART. 1006.15 FOR DUCTILE IRON CASTINGS.
2. FRAME AND GRATE TO BE NEENAH FOUNDRY COMPANY, NEENAH NO. H-3527-VP OR APPROVED EQUAL.
3. GRATE SHALL NOT BE BOLTED TO FRAME.
4. CURB BOX SHALL BE BOLTED TO FRAME WITH 9/16" GALVANIZED HEX. HD. BOLT AND NUT WITH GALV. WASHER.
5. CURB BOXES SHALL ONLY BE USED AT SAG LOCATIONS.
NOTES:

1. ALL FRAMES AND GRATES SHALL CONFORM TO THE REQUIREMENTS OF ART. 1006.14 FOR GRAY IRON CASTINGS AND TO ART. 1006.25 FOR DUCTILE IRON CASTINGS.

2. FRAME AND GRATE TO BE NEENAH FOUNDRY COMPANY, NEENAH NO. R-3529-V OR APPROVED EQUAL.

3. GRATE SHALL NOT BE BOLTED TO FRAME.
NOTE:
Gutter transitions will be paid for per foot as Type G-2 gutter.

TYPE G-2 CUTTER TRANSITION AT TRAFFIC BARRIER TERMINAL, TYPE T1 (SPECIAL)