Illinois Department of Transportation

Memorandum

To: Highway Standards Users
From: Maureen M. Addis
Subject: Revision #220
Date: October 6, 2017

Revision #220 of the Highway Standards, effective January 1, 2018, is now available on the department's website.

The revisions are as follows:

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<tr>
<td>353001-04</td>
<td>353001-05</td>
<td>Changed tie bar spacing to 36 in. (900 mm) centers.</td>
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<tr>
<td>420001-08</td>
<td>420001-09</td>
<td>Changed tie bar spacing to 36 in. (900 mm) centers. Revised DOWEL BAR TABLE.</td>
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<tr>
<td>420101-05</td>
<td>420101-06</td>
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<tr>
<td>420106-05</td>
<td>420106-06</td>
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</tr>
<tr>
<td>420111-03</td>
<td>420111-04</td>
<td>Changed tie bar spacing to 36 in. (900 mm) centers. Revised second note of General Notes.</td>
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<tr>
<td>420201-10</td>
<td>420201-11</td>
<td>Changed tie bar spacing to 36 in. (900 mm) centers.</td>
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<td>420206-11</td>
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<tr>
<td>424001-09</td>
<td>424001-10</td>
<td>Omitted diagonal slope at turning spaces and lower landings.</td>
</tr>
<tr>
<td>424006-02</td>
<td>424006-03</td>
<td>Omitted diagonal slope at turning spaces.</td>
</tr>
<tr>
<td>424016-03</td>
<td>424016-04</td>
<td>Omitted diagonal slope at turning spaces and upper landings.</td>
</tr>
<tr>
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<td>Omitted diagonal slopes at turning spaces and upper landings.</td>
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<td>Omitted diagonal slopes at upper landings.</td>
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<td>442101-08</td>
<td>Revised DOWEL BAR TABLE.</td>
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<td>Modified PLAN view. Changed tie bar spacing to 36 in. (900 mm) centers.</td>
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<td>542311-06</td>
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<td>Corrected value in elliptical pipe table. Renamed standard.</td>
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<td>542401-03</td>
<td>Renamed standard.</td>
</tr>
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<td>542406-02</td>
<td>542406-03</td>
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<td>542411</td>
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<td>New standard.</td>
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<tr>
<td>542416</td>
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<td>602401-03</td>
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<td>Completely revised standard for LRFD. Renamed Standard. Moved 5' (1.5m) manhole to new standard.</td>
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<td>602406-08</td>
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<td>602411-06</td>
<td>Completely revised standard for LRFD. Renamed standard.</td>
</tr>
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<td>Completely revised standard for LRFD. Renamed standard.</td>
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<tr>
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<td>602421-06</td>
<td>Completely revised standard for LRFD. Renamed standard.</td>
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<tr>
<td>602501-02</td>
<td>602501-03</td>
<td>Completely revised standard for LRFD. Renamed standard. Moved 5' (1.5m) valve vault to new standard.</td>
</tr>
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<td>602506</td>
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<td>New standard.</td>
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<td>602601-04</td>
<td>602601-05</td>
<td>Revised for compliance with</td>
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<td>Remarks</td>
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<tr>
<td>--------------</td>
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<tr>
<td>606001-06</td>
<td>606001-07</td>
<td>Revised general note for tie bar spacing to 36 in. (900 mm) centers.</td>
</tr>
<tr>
<td>60606-03</td>
<td>60606-04</td>
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<td>606106-04</td>
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<tr>
<td>606201-03</td>
<td>606201-04</td>
<td>Deleted first general note to avoid conflict with second general note.</td>
</tr>
<tr>
<td>606206-03</td>
<td>606206-04</td>
<td>Deleted second general note to avoid conflict with first general note.</td>
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<tr>
<td>606211-03</td>
<td>606211-04</td>
<td>Revised tie bar notes to be consistent with other gutter highway standards.</td>
</tr>
<tr>
<td>610001-07</td>
<td>610001-08</td>
<td>Changed tie bar spacing to 36 in. (900 mm) centers.</td>
</tr>
<tr>
<td>630001-11</td>
<td>630001-12</td>
<td>Revised steel post to have four holes in each flange.</td>
</tr>
<tr>
<td>630301-07</td>
<td>630301-08</td>
<td>Omitted posts from ‘pay limits of other type’.</td>
</tr>
</tbody>
</table>

**Division 700 Index**

**January 1, 2017**

**January 1, 2018**

**Updated.**

<p>| 701206-03    | 701206-04     | Omitted steady burn lights in tangent.                                 |
| 701306-03    | 701306-04     | Revised lower speed limit to ½ mph.                                   |
| 701316-11    | 701316-12     | Omitted lights in tangents. Changed lights in tapers to steady burn, bi-directional. |
| 701321-16    | 701321-17     | Omitted lights in tangent.                                            |</p>
<table>
<thead>
<tr>
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<tbody>
<tr>
<td>701331-04</td>
<td>701331-05</td>
<td>Changed lights on drums to bidirectional.</td>
</tr>
<tr>
<td>701401-10</td>
<td>701401-11</td>
<td>Omitted lights in tangent.</td>
</tr>
<tr>
<td>701416-10</td>
<td>701416-11</td>
<td>Omitted lights on drums for the ‘3xL’ tangent.</td>
</tr>
<tr>
<td>701422-09</td>
<td>701422-10</td>
<td>Omitted lights in tangent.</td>
</tr>
<tr>
<td>701431-12</td>
<td>701431-13</td>
<td>Omitted lights on drums in tangents for west bound traffic (assuming top of page North), and in work areas.</td>
</tr>
<tr>
<td>701446-08</td>
<td>701446-09</td>
<td>Omitted lights in tangent near work area.</td>
</tr>
<tr>
<td>701451-04</td>
<td>701451-05</td>
<td>Omitted lights on drums.</td>
</tr>
<tr>
<td>701456-04</td>
<td>701456-05</td>
<td>Omitted lights on drums in tangent.</td>
</tr>
<tr>
<td>701502-07</td>
<td>701502-08</td>
<td>Corrected sign number for two way traffic sign for CASE II.</td>
</tr>
<tr>
<td>701602-08</td>
<td>701602-09</td>
<td>Moved arrow boards into closed lanes for CASE I.</td>
</tr>
<tr>
<td>701901-06</td>
<td>701901-07</td>
<td>Revised END WORK ZONE SPEED LIMIT sign from orange to white background.</td>
</tr>
<tr>
<td>702016-03</td>
<td>702016-04</td>
<td>Revised MOUNTING LOCATION detail.</td>
</tr>
</tbody>
</table>

**Division 800 Index**

- **January 1, 2017**
- **Division 800 Index**
- **January 1, 2018**

- 836001-02    | 836001-03    | Replaced rod hooks with nuts.                                           |
- 838001       | 838001-01    | Revised to show rodent shield installation for aluminum poles.         |
- 877001-06    | 877001-07    | Revised table for LRFD requirements. Revised general notes for sign location. Replaced |
Removed  Inserted  Remarks
877002-03  877002-04  Revised hand hole location.
            Revised general notes for sign location. Replaced rod hooks with nuts.
877006-05  877006-06  Revised for LRFD requirements.
            Revised general notes for sign location. Revised ANCHOR ROD DETAIL.
877011-08  877011-09  Revised for LRFD requirements.
            Revised general notes for sign location. Revised ANCHOR ROD DETAIL.
877012-05  877012-06  Revised hand hole location.
            Revised general notes for sign location. Replaced rod hooks with nuts.

Division 000 Index
January 1, 2017  Division 000 Index
January 1, 2018  Updated.

Division BLR Index
January 1, 2017  Division BLR Index
January 1, 2018  Updated.

B.L.R. 10-6  B.L.R. 10-7  Changed No. 6 (No. 19) bars to No. 5 (No. 16) bars.
B.L.R. 14-11  B.L.R. 14-12  Revised dowel and tie bar sizes.
            Increased tie bar spacing.
            Eliminated skewed joint.
B.L.R. 28  New standard.

If you have any questions pertaining to the Highway Standards, please contact the Policy and Procedures Section in the Bureau of Design and Environment at (217) 524-9311.
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Division 700 Index  
January 1, 2017  
Division 700 Index  
January 1, 2018  
Updated.

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701306-03       | 701306-04        | Revised lower speed limit to ½ mph.                                                                                                    |
701316-11       | 701316-12        | Omitted lights in tangents. Changed lights in tapers to steady burn, bi-directional.                                                    |
701321-16       | 701321-17        | Omitted lights in tangent.                                                                                                              |
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836001-02 836001-03 Replaced rod hooks with nuts.

838001 838001-01 Revised to show rodent shield installation for aluminum poles.

877001-06 877001-07 Revised table for LRFD requirements. Revised general notes for sign location. Replaced
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<td></td>
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</tr>
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Division 000 Index
January 1, 2017

Division 000 Index
January 1, 2018

Updated.

Division BLR Index
January 1, 2017

Division BLR Index
January 1, 2018

Updated.

B.L.R. 10-6    | B.L.R. 10-7    | Changed No. 6 (No. 19) bars to No. 5 (No. 16) bars. |

B.L.R. 14-11   | B.L.R. 14-12   | Revised dowel and tie bar sizes.               |
|              |               | Increased tie bar spacing.                      |
|              |               | Eliminated skewed joint.                        |

B.L.R. 28      |               | New standard.                                   |

If you have any questions pertaining to the Highway Standards, please contact the Policy and Procedures Section in the Bureau of Design and Environment at (217) 524-9311.
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<thead>
<tr>
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<th>STD. NO.</th>
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<tr>
<td>Abbreviations, Symbols and Patterns</td>
<td>000001</td>
</tr>
<tr>
<td>Barricade, Type 1A for Non-NHS Routes</td>
<td>BLR 25</td>
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<tr>
<td>Barrier, Concrete, 32 in. (815 mm)</td>
<td>637001</td>
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<td>Barrier, Concrete, 42 in. (1065 mm)</td>
<td>637006</td>
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<td>Barrier, Concrete, Temporary</td>
<td>704001</td>
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<td>Base Course, PCC with HMA Binder and Surface Courses</td>
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<td>Benchmarks, Method of Resetting</td>
<td>668001</td>
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<td>Cable, Road Guard, Single Strand</td>
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<td>602001</td>
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<td>602006</td>
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<td>Catch Basin, Type C</td>
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<td>Catch Basin, Type D</td>
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<td>Curb Type B and Combination Curb and Gutter, Concrete</td>
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<td>Curb Ramps for Sidewalks, Corner Parallel</td>
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<td>Curb Ramps for Sidewalks, Diagonal</td>
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<td>Curb Ramps for Sidewalks, Mid-block</td>
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<td>Curb Ramps for Sidewalks, Perpendicular</td>
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<td>Decimal Equivalents of an Inch and Foot</td>
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<td>Delineators</td>
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<td>Depressed Corner for Sidewalks</td>
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<td>Detection Loops, Typical Layout</td>
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<td>Detector Loop Installations</td>
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<td>Ditch, Paved</td>
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<td>Ditch Check, Earth Median</td>
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<td>Drainage Structures, Type 1, 2 and 3</td>
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<td>Lighting Controller, Base Mounted, 240V</td>
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<tr>
<td>825026-03</td>
<td>Lighting Controller, Base Mounted, 480V</td>
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<tr>
<td>826001-01</td>
<td>Navigation Obstruction Lighting Controller, 240V</td>
</tr>
<tr>
<td>826006-01</td>
<td>Navigation Obstruction Lighting Controller, 480V</td>
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### LIGHTING – POLES

<table>
<thead>
<tr>
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<tr>
<td>830001-03</td>
<td>Light Pole Aluminum Mast Arm</td>
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<tr>
<td>830006-04</td>
<td>Light Pole Aluminum Davit Arm</td>
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<td>830011-02</td>
<td>Light Pole Steel Mast Arm</td>
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<td>830016-02</td>
<td>Light Pole Steel Davit Arm</td>
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<td>830021-02</td>
<td>Light Pole Steel Tenon Top</td>
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<td>830026</td>
<td>Temporary Roadway Lighting</td>
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### LIGHTING – TOWERS

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<tr>
<td>835001-01</td>
<td>Light Tower</td>
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### LIGHTING – FOUNDATIONS

<table>
<thead>
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<tr>
<td>836001-03</td>
<td>Light Pole Foundation</td>
</tr>
<tr>
<td>836006-01</td>
<td>Light Pole Foundation with 32 in. (815 mm) Concrete Median Barrier</td>
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<tr>
<td>836011-01</td>
<td>Light Pole Foundation with 42 in. (1065 mm) Concrete Median Barrier</td>
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<tr>
<td>837001-04</td>
<td>Light Tower Foundation</td>
</tr>
<tr>
<td>LIGHTING – BREAKAWAY DEVICES</td>
<td></td>
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<td>-----------------------------</td>
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<tr>
<td>838001-01  Breakaway Devices</td>
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**TRAFFIC SIGNALS - CONTROLLERS AND EQUIPMENT**

| 857001-01  | Standard Phase Designation Diagrams and Phase Sequences |
| 857006-01  | Supervised Railroad Interconnect Circuit |
| 862001-01  | Uninterruptable Power Supply (UPS) |

**TRAFFIC SIGNALS - WIRE AND CABLE**

| 873001-02  | Traffic Signal Grounding & Bonding |

**TRAFFIC SIGNALS - POSTS AND FOUNDATIONS**

| 876001-04  | Pedestrian Push Button Post |
| 877001-07  | Steel Mast Arm Assembly and Pole 16' Through 55' |
| 877002-04  | Steel Mast Arm Assembly and Pole 56' Through 75' |
| 877006-06  | Steel Mast Arm Assembly and Pole with Dual Mast Arms |
| 877011-09  | Steel Combination Mast Arm Assembly and Pole 16' Through 55' |
| 877012-06  | Steel Combination Mast Arm Assembly and Pole 56' Through 75' |
| 878001-10  | Concrete Foundation Details |

**TRAFFIC SIGNALS - SIGNAL HEADS**

| 880001-01  | Span Wire Mounted Signals and Flashing Beacon Installation |
| 880006-01  | Traffic Signal Mounting Details |

**TRAFFIC SIGNALS - DETECTION**

| 886001-01  | Detector Loop Installations |
| 886006-01  | Typical Layout for Detection Loops |
### DIVISION 000 MISCELLANEOUS TABLES

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<thead>
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<td>Standard Symbols, Abbreviations and Patterns</td>
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<td>Areas of Reinforcement Bars</td>
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<td>Decimal of an Inch and of a Foot</td>
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<td>PCC Pavement Special</td>
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<td>Portland Cement Concrete Pavement (Nonreinforced)</td>
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<td>Traffic Control Devices - Day Labor Construction</td>
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<td>BLR 18-6</td>
<td>Traffic Control Devices - Day Labor Maintenance</td>
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<td>BLR 20-7</td>
<td>Traffic Barrier Terminal - Type 5R</td>
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<td>BLR 21-9</td>
<td>Typical Application of Traffic Control Devices for Construction on Rural Local Highways</td>
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<td>BLR 22-7</td>
<td>Typ. Appl. of T.C.D. for Rural Loc. Hwys. (2-Lane 2 Way Rural Traff.) (Rd. Closed to Thru Traff.)</td>
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<td>BLR 23-4</td>
<td>Traffic Barrier Terminal Type 1</td>
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<td>Mailbox Turnout for Local Roads</td>
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<tr>
<td>BLR 25-1</td>
<td>Type 1A Barricade for Non-NHS Routes</td>
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<td>BLR 26-3</td>
<td>Steel Plate Beam Guardrail 29 in. (731 mm) Height</td>
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<tr>
<td>BLR 27-1</td>
<td>Traffic Barrier Terminal Type 5A</td>
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<tr>
<td>BLR 28</td>
<td>Concrete Curb Type B and Combination Concrete Curb and Gutter</td>
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### ADJUSTMENT ITEMS
- Structure To Be Adjusted
- Structure To Be Cleaned
- Main Structure To Be Filed
- Structure To Be Filed
- Structure To Be Filed Special
- Structure To Be Removed
- Structure To Be Reconstructed
- Structure To Be Reconstructed Special

### ALIGNMENT ITEMS
- Baseline
- Centerline
- Centerline Break Circle
- Baseline Symbol
- Centerline Symbol
- PI Indicator
- Point Indicator
- Horizontal Curve Data (Half Size)

### BOUNDARIES ITEMS
- Dashed Property Line
- Solid Property/Lot Line
- Section/Grant Line
- Quarter Section Line
- Quarter/Quarter Section Line
- County/Township Line
- State Line
- Iron Pipe Found
- Iron Pipe Set
- Survey Marker
- Property Line Symbol
- Same Ownership Symbol (Half Size)
- Northwest Quarter Corner (Half Size)
- Section Corner (Half Size)
- Southeast Quarter Corner (Half Size)

### STANDARD SYMBOLS, ABBREVIATIONS AND PATTERNS
- Approx. Index Line
- Approx. Intermediate Line
- Index Contour
- Intermediate Contour
- Channel or Stream Line
- Grading & Shaping Ditches
- Pavement Boundary Line
- Aggregate Ditch
- Pipe Underdrain
- Storm Sewer
- Flowline
- Ditch Check
- Headwall
- View
- Manhole
- Summit
- Roadway Ditch Flow
- Swale
- Catch Basin
- Culvert End Section
- Water Surface Indicator
- Riprap

---

Illinois Department of Transportation

January 1, 2011

ENGINEER OF POLICY AND PROCEDURES

APPROVED

January 1, 2011

ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED

1-1-97

PASSED

1-1-97

STANDARD SYMBOLS, ABBREVIATIONS AND PATTERNS

STANDARD 000001-06
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<th>PR</th>
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<td>Erosion Control Fence</td>
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<td>Perimeter Erosion Control Fence</td>
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<td>Temporary Fence</td>
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<td>Ditch Check Temporary</td>
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<tr>
<td>Ditch Check Permanent</td>
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<td>Inlet &amp; Pipe Protection</td>
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<td>Sediment Basin</td>
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<td>Erosion Control Blanket</td>
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<td>Fabric Formed Concrete Revetment Mat</td>
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<tr>
<td>Turf Reinforcement Mat</td>
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<td>Mulch Temporary</td>
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<tr>
<td>Mulch Method 1</td>
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<td>Fence</td>
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<tr>
<td>Base of Levee</td>
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<tr>
<td>Mailbox</td>
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<tr>
<td>Multiple Mailboxes</td>
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<tr>
<td>Pay Telephone</td>
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<tr>
<td>Advertising Sign</td>
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**LANDSCAPING ITEMS**

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<thead>
<tr>
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<tr>
<td>Contour Mounding Line</td>
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<td>Fence</td>
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<tr>
<td>Fence Post</td>
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<td>Shrubs</td>
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<td>Mowline</td>
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<td>Perennial Plants</td>
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<td>Seeding Class 2</td>
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<td>Seeding Class 2A</td>
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<tr>
<td>Seeding Class 4</td>
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<td>Seeding Class 4 &amp; 5 Combined</td>
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**EXISTING LANDSCAPING ITEMS**

<table>
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<tr>
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<td>Seeding</td>
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<td>Mailbox w/Sign</td>
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<td>Shade Tree</td>
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**LIGHTING**

<table>
<thead>
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<td>Conduit</td>
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<td>Electrical Buried Cable</td>
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<td>Controller</td>
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<tr>
<td>Underpass Luminaire</td>
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<td>Power Pole</td>
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### Right of Way Items (contd.)

<table>
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<tr>
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<td>Access Control Line &amp; ROW</td>
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### Roadway Profiles

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<td>Earthworks Balance Point</td>
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<td>Begin Point</td>
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### Sign Items (contd.)

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<thead>
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<tr>
<td>Reverse Left W1-4L</td>
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<tr>
<td>Reverse Right W1-4R</td>
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<tr>
<td>Two Way Traffic Sign W6-3</td>
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### Right of Way Items

- Cable Barrier
- Concrete Barrier
- Edge of Pavement
- Bit Shoulders, Medians and C&G Line
- Aggregate Shoulder
- Sidewalks, Driveways
- Guardrail
- Guardrail Post
- Traffic Sign
- Corrugated Median
- Impact Attenuator
- North Arrow with District Office (Half Size)
- Match Line
- Slope Limit Line
- Typical Cross-Section Line

### Roadway Profiles

- STATION 45+00

### Sign Items

- Cone, Drum or Barricade
- Barricade Type II
- Barricade Type III
- Barricade with Edge Line
- Flashing Light Sign
- Panels I
- Panels II
- Direction of Traffic
- Sign Flag (Half Size)

---

**Illinois Department of Transportation**

**January 1, 2011**

**Engineer of Policy and Procedures**

**APPROVED January 1, 2011**

**Engineer of Design and Environment**

**ISSUED 1-1-97**

**PASSED AND PATTERNS ABBREVIATIONS STANDARD SYMBOLS, AND PATTERNS**

**STANDARD 000001-06**
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<td>-</td>
<td>←</td>
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<td>(Half Size)</td>
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<tr>
<td>Two Way Arrow Large W1-7-(O)</td>
<td>-</td>
<td>←</td>
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<tr>
<td>(Half Size)</td>
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<tr>
<td>Detour M4-10L-(O)</td>
<td>←</td>
<td></td>
</tr>
<tr>
<td>(Half Size)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Detour M4-10R-(O)</td>
<td>←</td>
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<tr>
<td>(Half Size)</td>
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<td></td>
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<tr>
<td>One Way Left R5-3L</td>
<td>←</td>
<td>←</td>
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<tr>
<td>(Half Size)</td>
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<tr>
<td>One Way Right R5-3R</td>
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<td>←</td>
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<td>(Half Size)</td>
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<tr>
<td>Left Turn Lane R3-1100L</td>
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<tr>
<td>Keep Left R4-7AL</td>
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<td>←</td>
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<tr>
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<tr>
<td>Keep Left R4-7BL</td>
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<td>←</td>
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<td>(Half Size)</td>
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<tr>
<td>Stop Here On Red R10-6-AL</td>
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<td>←</td>
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<td>(Half Size)</td>
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<tr>
<td>Stop Here On Red R10-6-AR</td>
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<td>Road Closed R11-2</td>
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<td>(Half Size)</td>
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<tr>
<td>Road Closed Thru Traffic R11-2</td>
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<tr>
<th><strong>STRUCTURES ITEMS</strong></th>
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<td>Box Culvert Headwall</td>
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<tr>
<td>Bridge</td>
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<td>←</td>
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<tr>
<td>Bridge</td>
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<td>←</td>
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<td>Retaining Wall</td>
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<td>Temporary Sheet Piling</td>
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<td>Left Turn Yellow</td>
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<tr>
<td>Signal Backplate</td>
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<tr>
<td>Signal Section 8&quot; (200 mm)</td>
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<tr>
<td>Signal Section 12&quot; (300 mm)</td>
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<tr>
<td>Walk/Don't Walk Letters</td>
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<tbody>
<tr>
<td>Galv. Steel Conduit</td>
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<tr>
<td>Underground Cable</td>
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<td>Detector Loop Line</td>
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<tr>
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<tr>
<td>Detector Loop Quadrupole</td>
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<td>←</td>
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**STANDARD SYMBOLS, ABBREVIATIONS AND PATTERNS**

**STANDARD 000001-06**
### REINFORCEMENT BARS - ENGLISH (METRIC)

<table>
<thead>
<tr>
<th>Bar Size (Metric)</th>
<th>Dia. (mm)</th>
<th>Cross-Sectional Area (sq. mm)</th>
<th>Weight (lbs/ft) (kg/m)</th>
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<tbody>
<tr>
<td>3</td>
<td>(12)</td>
<td>5.664 (0.944)</td>
<td>0.018 (0.00003)</td>
</tr>
<tr>
<td>4</td>
<td>(12)</td>
<td>7.633 (1.290)</td>
<td>0.020 (0.00003)</td>
</tr>
<tr>
<td>5</td>
<td>(15)</td>
<td>9.601 (1.561)</td>
<td>0.022 (0.00003)</td>
</tr>
<tr>
<td>6</td>
<td>(19)</td>
<td>11.570 (1.937)</td>
<td>0.024 (0.00003)</td>
</tr>
<tr>
<td>7</td>
<td>(22)</td>
<td>13.538 (2.353)</td>
<td>0.026 (0.00003)</td>
</tr>
<tr>
<td>8</td>
<td>(25)</td>
<td>15.506 (2.973)</td>
<td>0.028 (0.00003)</td>
</tr>
<tr>
<td>9</td>
<td>(28)</td>
<td>17.474 (3.658)</td>
<td>0.030 (0.00003)</td>
</tr>
<tr>
<td>10</td>
<td>(32)</td>
<td>19.442 (4.346)</td>
<td>0.032 (0.00003)</td>
</tr>
<tr>
<td>11</td>
<td>(36)</td>
<td>21.410 (5.040)</td>
<td>0.034 (0.00003)</td>
</tr>
</tbody>
</table>

### AREA OF REINFORCEMENT BARS

**Areas of Steel per Foot (Meter), sq. in. (sq. mm):**

<table>
<thead>
<tr>
<th>Bar Size</th>
<th>Dia. (mm)</th>
<th>Cross-Sectional Area (sq. mm)</th>
<th>Weight (lbs/ft) (kg/m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>(12)</td>
<td>5.664 (0.944)</td>
<td>0.018 (0.00003)</td>
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<tr>
<td>4</td>
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<tr>
<td>11</td>
<td>(36)</td>
<td>21.410 (5.040)</td>
<td>0.034 (0.00003)</td>
</tr>
<tr>
<td>A</td>
<td>B</td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>---------</td>
<td>---------</td>
<td>-------</td>
<td>-------</td>
</tr>
<tr>
<td>0.0052</td>
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<td>0.0104</td>
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</tr>
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<td>%</td>
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<td>0.03125</td>
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<td>%</td>
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<tr>
<td>0.0365</td>
<td></td>
<td>%</td>
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</tr>
<tr>
<td>0.0417</td>
<td></td>
<td>%</td>
<td>%</td>
</tr>
</tbody>
</table>

**A = Fractions of Inch or Foot**

**B = Inch Equivalents to Foot Fractions**
All dimensions are in inches (millimeters) unless otherwise shown. A switch from English (metric) units to English (metric) units was made on 1-1-97

DITCH CHECK FOR NARROW MEDIAN

VIEW OF NARROW MEDIAN

DITCH CHECK FOR WIDE MEDIAN

VIEW OF WIDE MEDIAN

GENERAL NOTES

All slope ratios are expressed as units of horizontal displacement to units of vertical displacement (V:H). All dimensions are in inches (millimeters) unless otherwise shown.
STEP 1

Place end-post (stake) of first silt fence adjacent to end-post (stake) of second silt fence with fabric positioned as shown.

Rotate posts (stakes) together 180° clockwise and drive both posts (stakes) 18 (450) into ground.

STEP 2

ATTACHING TWO SILT FILTER FENCES

(Not applicable for J-hooks)

ATTACHING TWO SILT FILTER FENCES

(Not applicable for J-hooks)

Place posts (stakes) adjacent and bind at top with wire.

SILT FILTER J-HOOK PLACEMENT

Sheet flow

J-HOOK

Wood or metal stake

Fence fabric

SECTION A-A

GENERAL NOTES

The installation details and dimensions shown for perimeter erosion barriers shall also apply for inlet and pipe protection.

All dimensions are in inches (millimeters) unless otherwise shown.
Flow or rolled excelsior
Straw or hay bales
Flow
Spacers
fence
Silt filter
30' (9.0 m)
20' (6.0 m) to
6' (1.8 m)
24 (600) to
m in.
will improve if put into a series.
The performance of the basin
directed by Engineer.
Outlet type as
removed anytime the basins become 75% filled.
The long dimension should be parallel with the
accumulated silt shall be
control systems
TYPICAL CUT CROSS-SECTION
TYPICAL FILL CROSS-SECTION
TYPICAL DITCHES FOR
CUT & FILL SECTIONS
TEMPORARY EROSION
CONTROL SYSTEMS
STANDARD 28000-1-07
Illinois Department of Transportation
January 1, 2013
ENGINEER OF POLICY AND PROCEDURES
APPROVED
January 1, 2013
ENGINEER OF DESIGN AND ENVIRONMENT
ISSUED
1-1-97
PASSED
Width to be measured along the slope of the top surface of the fabric formed concrete revetment mat in place from end to end.

Locate field seam joint midway between mortar stops. Lay seams down for best appearance.

Dimensions given with minimum limits shall be adjusted for field conditions as directed by the Engineer.

All anchor walls on side slopes be installed at the upstream and downstream ends.

Seams between mill widths of fabric shall be generally perpendicular to waterway.

1. In placing inserts through fabric use care to avoid breaking drop stitches.
2. Indicates sequence of pour.

Seams between mill widths of fabric shall be generally perpendicular to waterway.

GENERAL NOTES
Dimensions given with minimum limits shall be adjusted for field conditions as directed by the Engineer.

All anchor walls on side slopes and at lap joints, as well as cut off walls, shall be installed in trenches.

Cut off walls shall be installed at the upstream and downstream ends.

All dimensions are in inches (millimeters) unless otherwise shown.

INSTALLATION DETAILS

1. In placing inserts through fabric use care to avoid breaking drop stitches.
2. Indicates sequence of pour.

Seams between mill widths of fabric shall be generally perpendicular to waterway.

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INSTALLATION DETAILS

1. In placing inserts through fabric use care to avoid breaking drop stitches.
2. Indicates sequence of pour.

Seams between mill widths of fabric shall be generally perpendicular to waterway.
SECTION A-A
(TYPICAL 2 LANE WITH SHOULDERS)

LONGITUDINAL SECTION SHOWING
CONSTRUCTION ADJACENT TO EXISTING PAVEMENT

GENERAL NOTES

The longitudinal sawed joint shall be as detailed on Standard 420001 except the sawed groove does not require sealing.

All dimensions are in inches (millimeters) unless otherwise shown.

ALTERNATE SECTION A-A
(TYPICAL 2 LANE WITH SHOULDERS)

PCC BASE COURSE
WITH HMA BINDER
AND SURFACE COURSES

STANDARD 353001-05

Illinois Department of Transportation
January 1, 2018
ENGINEER OF POLICY AND PROCEDURES
APPROVED
January 1, 2018
ENGINEER OF DESIGN AND ENVIRONMENT
ISSUED
1-1-97
PASSED
DATE
REVISIONS
1-1-18 Changed tie bar spacing to 36 (900) cts.
1-1-08 Switched units to English (metric)
GENERAL NOTES

With a mainline horizontal curve to the left, keep the gore nose dimensions at Sections C-C and D-D as shown. From Section C-C to Section B-B, construct the ramp as a tangent section, and the gore nose at Section B-B shall be a variable width dependent on the radius of the mainline curve. Show a special cross-section on the plans for Section B-B.

With a mainline horizontal curve to the right, keep the gore nose dimensions at Sections D-D, C-C, and B-B as shown, and the edge of the ramp between Sections C-C and B-B shall be constructed as a compound curve lying Section C-C.

The indicated "A" and "B" grades for the ramp terminal are based on an assumed mainline grade of 0.00%.

See plans for actual grades.

See Standard 482001 for ramp shoulder details.

Between Sections A-A and B-B (shaded area), provide a drainage swale and flush inlet to enhance drainage.

When using grades expressed in %, the grade value shall be divided by 100 to obtain vertical offsets.

When using a radius R1 less then the minimum, verify the required acceleration length will be provided.

All dimensions are in inches (millimeters) unless otherwise shown.
to their intersection.

Ramp and mainline edge lines of the Project the shoulder shoulders.

Stub 12 (300) Stub

Stub 12 (300)

3° 3' 26" (typ.)

Edge of bit. Edge of HMA

300'-0"

100'-0"

Pavement in the ramp taper (shaded area) for a distance at 400 (120 m) shall be the same thickness as the mainline.

Vertical offset range for ramp right edge when mainline is curved to the left

Min. cross slope allowed is 1.5%

Max. cross slope allowed is 4%

Min. cross slope allowed is 1.5%

Max. cross slope allowed is 5%

Vertical offset range for ramp right edge when mainline is curved to the right

Left edge of ramp when mainline is on tangent

Right edge of ramp when mainline is on tangent

G %

G %

G %

G %

P.I.

51'-0"

210'-0"

P.I.

Range of initial ramp grades when mainline is curved to the right and G = 8% for R1.

Refer to sheet 3 for vertical offsets using e = 8%

See Sheet 3 for GENERAL NOTES

STANDARD 406101-05

EXIT RAMP TERMINAL

(FLEXIBLE RAMP PAVEMENT ADJACENT TO FLEXIBLE MAINLINE PAVEMENT)

(Sheet 1 of 3)
DETAILS FOR DRAINAGE IN NEUTRAL AREA

<table>
<thead>
<tr>
<th>Sections</th>
<th>1.5% Curve Right</th>
<th>1.5% Curve Left</th>
<th>1.5% Curve Tangent</th>
<th>Vertical Offset in inches for right edge of ramp, when ( e = 8% )</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>0.18</td>
<td>5.0 % ML x 12</td>
<td>5.0 % ML x 12</td>
<td>- 0.18</td>
</tr>
<tr>
<td>B</td>
<td>- 3.0</td>
<td>5.0 % ML x 150</td>
<td>5.0 % ML x 150</td>
<td>- 3.0</td>
</tr>
<tr>
<td>C</td>
<td>- 15.4</td>
<td>15.6</td>
<td>15.6</td>
<td>- 15.4</td>
</tr>
<tr>
<td>D</td>
<td>- 392</td>
<td>- 392</td>
<td>- 392</td>
<td>- 392</td>
</tr>
</tbody>
</table>

1. Vertical offset values are calculated and based on the right edge of mainline pavement at 0.0 % grade.
2. The vertical offsets of these points are above the mainline pavement and lie on an upgrade in relationship to the mainline grade.
3. S.E. = Superelevation Rate

GENERAL NOTES

The initial ramp grade (G) is based on the line generated through the PI that is 105 ft. (32 m) past Section C-C and the point created by the vertical offset at Section D-D.

See plans for actual grades.

In the neutral area, provide a swale and flush inlet to enhance drainage.

When using grades expressed in %, the grade values shall be divided by 100 to obtain vertical offsets.

Where an exit ramp terminal is proposed adjacent to a mainline horizontal curve, construct the edge of the terminal by using offset widths, and for the terminal segment downstream from Section C-C to R, construct the ramp as a 140 ft. (43 m) tangent section.

All dimensions are in inches (millimeters) unless otherwise shown.
**Mailbox Turnout**

**Mailbox on Nearside of Entrance**

**Mailbox on Farside of Entrance**

**Dimensions**

<table>
<thead>
<tr>
<th>Width of Shoulder (ft)</th>
<th>4-8</th>
<th>8-10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Width of Turnout (ft)</td>
<td>2.4</td>
<td>2.4-3.0</td>
</tr>
<tr>
<td>L₁</td>
<td>32 (9.5)</td>
<td>32 (9.5)</td>
</tr>
<tr>
<td>L₂</td>
<td>20 (6.0)</td>
<td>20 (6.0)</td>
</tr>
</tbody>
</table>

All dimensions are in inches (millimeters) unless otherwise shown.

**General Notes**

Mailboxes shall be mounted such that the face of the mailbox is 8’ (2400) to 12’ (3600), and the post a minimum of 24” (600), from the edge of the turnout surfacing.

All dimensions are in inches (millimeters) unless otherwise shown.

**DATE**

1-1-97

**REVISIONS**

Selected note regarding Township & Dist. roads

**STANDARD 406201-01**
LONGITUDINAL SAWED JOINT

Type C metal joint or approved equal

Sheet steel of suitable thickness to form keyway as detailed or approved equal.

No. 6x3D (No. 19x750) Tie bars at 36 (900) cts.

Sawed groove \( \frac{1}{2} \text{ (3) min. x } \frac{1}{2} \text{ (3) } \)

Hot poured joint sealer

LONGITUDINAL KEYED JOINT

* No. 6x24 (No. 19x600) Tie bars at 36 (900) cts.

Tie bars at 36 (900) cts. No. 6x30 (No. 19x750)

LONGITUDINAL CONSTRUCTION JOINT

(TIE BAR FORMED IN PLACE OR MECANICALLY INSERTED)

LONGITUDINAL CONSTRUCTION JOINT

(TIE BAR GROUTED IN PLACE)

GENERAL NOTES

All slope ratios are expressed as units of vertical displacement to units of horizontal displacement (V:H).

All dimensions are in inches (millimeters) unless otherwise shown.

DATE

REVISIONS

STANDARD 420001-09

PAVEMENT JOINTS

(Sheet 1 of 2)

ENGINEER OF POLICY AND PROCEDURES

APPROVED

January 1, 2018

ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED

1-1-97

PASSED

DATE

REVISIONS

1-1-18

Changed tie bar spacing from 36 (900) cts. Revised

Dowel bar table

Switched units to English (metric)

1-1-08

unless otherwise shown.
**TRANSVERSE EXPANSION JOINT**
(for pavements with unequal thickness)

*Expansion caps shall be installed on the exposed end of each dowel bar once the header has been removed and the joint filler material has been installed.

**TRANSVERSE CONTRACTION JOINT**

**SEALING DETAIL**

**DOWEL BAR TABLE**

<table>
<thead>
<tr>
<th>PAVEMENT BAR THICKNESS</th>
<th>DOWEL BAR DIAMETER</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 (250) or greater</td>
<td>16 (138)</td>
</tr>
<tr>
<td>8 (200) thru 9.99 (249)</td>
<td>16 (132)</td>
</tr>
<tr>
<td>Less than 8 (200)</td>
<td>12 (102)</td>
</tr>
</tbody>
</table>
24' (7.2 m) JOINTED PCC PAVEMENT

PAVEMENT PLAN

SECTION A-A
(TYPICAL 2-LANE WITH SHOULDERS)

- Transverse sawed joint
- Improved subgrade
- Longitudinal sawed joint

Pavement

12' (3.6 m)
Slope 1.5%
18 (450)

12' (3.6 m)
Slope 1.5%
Stabilized subbase

Header board drilled for bars
Bar supports

18 (450) Long dowel bars at 12 (300) cts.

TRANSVERSE CONSTRUCTION JOINT

- Lane edge or edge of pavement
- Longitudinal keyed joint (typ.)
- ** Casting outside limits
- ** Place casting to grade and fill with full depth concrete after pavement has cured.

DETAIL OF ADDED REINFORCEMENT FOR PAVEMENT BLOCKS-OUTS

GENERAL NOTES
See Standard 420001 for details of joints not shown.
All dimensions are in inches (millimeters) unless otherwise shown.

DATE
REVISIONS
1-1-18 Changed spacing of tie bars to 36 (900)
1-1-15 Added dimension of tie bar dowels from transverse contraction joints

STANDARD 420101-06
**SECTION A-A**
(TYPICAL 3-LANE, 1-WAY WITH SHOULDERS)

- **Improved subgrade**
- **Median side of pavement**
- **Longitudinal construction joint**
- **Slope 2.0%**
- **Longitudinal sawed joint**
- **Slope 1.5%**
- **Key joint (typ.)**
- **Lane edge or edge of pavement**

**PAVEMENT PLAN**

- **18' (5.5 m) max. when placed adjacent to existing pcc pavement structure**
- **Adjusted to 12' (3.6 m) min. to 18' (4.5 m) max. when placed adjacent to existing pcc pavement structure so that the joints are in prolongation. Adjust the tie bar spacing to maintain a clearance of 6 (150) from dowel bars.**

**DETAIL OF ADDED REINFORCEMENT FOR PAVEMENT BLOCK-OUTS**

- **12 Dowel bars at 12 (300) cts.**
- **18 (450) Long dowel bars at 12 (300) cts.**

**GENERAL NOTES**

See Standard 420106 for details of joints not shown. All dimensions are in inches (millimeters) unless otherwise shown.

**DATE**

**REVISIONS**

1-1-15  Changed spacing of tie bars to 36 (900) cts.
1-1-15  Added dimension of tie bars from Transverse construction joints.

**STANDARD 420106-06**

**36' (10.8 m) JOINTED PCC PAVEMENT**
**GENERAL NOTES**

- Transverse joints may be moved to accommodate roundout. Edge of circular joint shall be minimum 24 (600) from transverse joint. Relocated transverse joint shall be continuous from edge of pavement to edge of pavement.

- The transverse joint spacing should be adjusted to use the DETAIL NEAR TRANSVERSE JOINT. If the joint cannot be adjusted to give the 12 (300) min offset, use the DETAIL AT TRANSVERSE JOINT and ensure the joint is centered in the structure as shown.

- Circular form shall be removed prior to drill and grout of tie bars.

- Drill and grout is preferred, however tie bars can be poured in place if clearance is provided to outer edge of frame. Minimum 2 (50) clearance.

- Shims shall be used to adjust all frames. After adjusting mortar has cured, the shims shall be removed and the voids under the frames filled with nonshrink grout.

- Hoop reinforcement shall be one piece construction having a minimum lap length of 24 (600).

- All situations not shown and may require combination of details.

- When using cast in place, frame shall be anchored to the structure to prevent movement during the paving operation.

- All dimensions are in inches (millimeters) unless otherwise shown.

- The transverse joint spacing shall be adjusted to use the DETAIL NEAR TRANSVERSE JOINT. If the joint cannot be adjusted to give the 12 (300) min offset, use the DETAIL AT TRANSVERSE JOINT and ensure the joint is centered in the structure as shown.

- Circular form shall be removed prior to drill and grout of tie bars.

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- All dimensions are in inches (millimeters) unless otherwise shown.

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- Shims shall be used to adjust all frames. After adjusting mortar has cured, the shims shall be removed and the voids under the frames filled with nonshrink grout.

- Hoop reinforcement shall be one piece construction having a minimum lap length of 24 (600).

- All situations not shown and may require combination of details.

- When using cast in place, frame shall be anchored to the structure to prevent movement during the paving operation.

- All dimensions are in inches (millimeters) unless otherwise shown.
CAST IN PLACE DETAIL

ROUNDOUT FOR SQUARE FRAME & GRATE
AND MANHOLES

Drill and Grout No. 6 (19) Tie Bar 24 (600)
No. 6 (19) Outer loop rein.
No. 6 (19) Inner loop rein.
Prop. Class SI concrete (higher strength concrete may be used if no detrimental shrinkage cracks occur.)

Note: Type I or Type 5 Frame and Grate may be used

DETAIL OF REINFORCEMENT
FOR PAVEMENT ROUNDOUT

Illinois Department of Transportation
January 1, 2018
ENGINEER OF POLICY AND PROCEDURES
APPROVED
January 1, 2018
ENGINEER OF DESIGN AND ENVIRONMENT
ISSUED 1-1-97
PASSED

PCC PAVEMENT ROUNDOUTS
(Sheet 2 of 2)
STANDARD 420111-04
The indicated "A" and "B" grades for the ramp terminal are based on an assumed mainline grade of 0.00%.

See plans for actual grades.

All pavement joints shall be detailed as shown on Standards 420001 and 483001. See Standard 483001 for ramp shoulder details.

Between Sections A-A and B-B (shaded area), provide a drainage swale and flush inlet to enhance drainage.

When using grades expressed in %, the grade value shall be divided by 100 to obtain vertical offsets.

When using radius R1 less than the minimum, verify the required acceleration length will be provided.

With a mainline horizontal curve to the left, keep the gore nose dimensions at Sections C-C and D-D as shown. From Section C-C to Section B-B, construct the ramp as a tangent section, and the gore nose at Section B-B shall be a variable width dependent on the radius of the mainline curve. Show a special cross-section on the plans for Section B-B.

With a mainline horizontal curve to the right, keep the gore nose dimensions at Sections D-D, C-C, and B-B as shown; and the edge of the ramp between Sections C-C and B-B is constructed as a compound curve tying Section C-C.

All dimensions are in inches (millimeters) unless otherwise shown.

GENERAL NOTES

P.O. Box 19436
Springfield, IL 62794-9436

(217) 782-6100

www.idot.illinois.gov

Illinois Department of Transportation

WORK NO. 068-00-000-1805-01

STANDARD 420201-11

DATE

REVISIONS

1-1-18

1-1-19

1-1-18

JOINTED PCC RAMP PAVEMENT ADJACENT TO

JOINTED PCC MAINLINE PAVEMENT

(Entire Sheet)

January 1, 2018

APPROVED

E. M. M. Lee

PASSED

1-1-97

DATE

REVISIONS

1-1-18

1-1-19

1-1-18

Illinois Department of Transportation

WORK NO. 068-00-000-1805-01

STANDARD 420201-11

DATE

REVISIONS

1-1-18

1-1-19

1-1-18
CROSS SECTIONS WHEN MAINLINE IS ON TANGENT OR CURVED TO THE RIGHT

CROSS SECTIONS WHEN MAINLINE IS CURVED TO THE LEFT

ENTRANCE RAMP TERMINAL

(JOINTED PCC RAMP PAVEMENT ADJACENT TO JOINTED PCC MAINLINE PAVEMENT)
ADJACENT TO CRC MAINLINE PAVEMENT

JOINTED PCC RAMP PAVEMENT

SECTION B-B

CROSS SECTIONS WHEN MAINLINE IS ON TANGENT OR CURVED TO THE RIGHT

SECTION C-C

SECTION D-D

CROSS SECTIONS WHEN MAINLINE IS CURVED TO THE LEFT

DETIAL A

DETIAL B

ENTRANCE RAMP TERMINAL
JOINTED PCC RAMP PAVEMENT
ADJACENT TO CRC MAINLINE PAVEMENTS

STANDARD 420206-12

Illinois Department of Transportation

ENGINEER OF POLICY AND PROCEDURES
APPROVED

ENGINEER OF DESIGN AND ENVIRONMENT
ISSUED

PASSED
When curved to the left:
- Vertical offset range for ramp right edge when mainline is curved to the left
- Vertical offset range for ramp right edge when mainline is curved to the right
- Max. cross slope allowed is 4%
- Min. cross slope allowed is 1.5%

When on tangent or curved to the right:
- Min. cross slope allowed is 1.5%
- Max. cross slope allowed is 5%

Vertical offset range for ramp right edge when mainline is curved to the right:
- Vertical offset range for ramp right edge when mainline is on tangent
- Vertical offset range for ramp right edge when mainline is curved to the right
- Right edge of ramp is parallel to mainline grade

Range of initial ramp grades when mainline is curved to the right and e = 8%:
- Refer to sheet 3 for vertical offsets using e = 8%

See sheet 3 for GENERAL NOTES

Exit Ramp Terminal
Jointed PCC Pavement
Adjacent to Jointed PCC Mainline Pavement

Date: 1-1-18
Revisions:
- Changed tie bar spacing to 36 (900) cts.

Date: 1-1-17
Revisions:
- Added longitudinal sawed joint to middle of ramp pavement.

Illinois Department of Transportation
January 1, 2018
Engineer of Policy and Procedures
APPROVED
January 1, 2018
Engineer of Design and Environment
ISSUED
1-1-97
Passed

STANDARD 420301-08

DATE
1-1-18
Revisions
Changed tie bar spacing to 36 (900) cts.

1-1-17
Revisions
Added longitudinal sawed joint to middle of ramp pavement.

EXIT RAMP TERMINAL
JOINTED PCC RAMP PAVEMENT
ADJACENT TO JOINTED PCC MAINLINE PAVEMENT

(Sheet 1 of 3)
WHEN MAINLINE IS ON TANGENT OR CURVED TO THE RIGHT

WHEN MAINLINE IS CURVED TO THE LEFT

SECTION B-B

SECTION CAH - CAH

SECTION CBK - CBK

DETAIL A

STANDARD 420301-08
EXIT RAMP TERMINAL
ADJACENT TO JOINTED PCC MAINLINE PAVEMENT

Illinois Department of Transportation
January 1, 2018
ENGINEER OF POLICY AND PROCEDURES
APPROVED
January 1, 2018
ENGINEER OF DESIGN AND ENVIRONMENT
ISSUED
1-1-97
PASSED
DETAILS FOR DRAINAGE IN NEUTRAL AREA

<table>
<thead>
<tr>
<th>Sections</th>
<th>Machine on Tangent</th>
<th>Machine Curved Right</th>
<th>Machine Curved Left</th>
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<tbody>
<tr>
<td>A</td>
<td>- 0.18</td>
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<tr>
<td>B</td>
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<td>S.E. % ML x 192</td>
<td>S.E. % ML x 192</td>
</tr>
<tr>
<td>C</td>
<td>- 3.0</td>
<td>S.E. % ML x 192</td>
<td>- 3.0</td>
</tr>
<tr>
<td>D</td>
<td>- 15.4</td>
<td>- 15.4</td>
<td>- 15.4</td>
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</tbody>
</table>

<table>
<thead>
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<th>Machine on Tangent</th>
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</thead>
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<td>S.E. % ML x 300</td>
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<td>S.E. % ML x 4900</td>
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<tr>
<td>C</td>
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<td>- 74</td>
</tr>
<tr>
<td>D</td>
<td>- 392</td>
<td>- 392</td>
<td>392</td>
</tr>
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</table>

1. Vertical offset values are calculated and based on the right edge of mainline pavement at 0.0 % grade.
2. The vertical offsets of these points are above the mainline pavement and lie on an upgrade in relationship to the mainline grade.
3. S.E. = Superelevation Rate

GENERAL NOTES

- The initial ramp grade (G) is based on the line generated through the PI that is 105'-32 m) past Section C-C and the point created by the vertical offset at Section D-D.
- See plans for actual grades.
- All pavement joints shall be detailed as shown on Standards 420001 and 483001.
- See Standard 483001 for ramp shoulder details.
- In the neutral area, provide a swale and flush inlet to enhance drainage.
- When using grades expressed in %, the grade values shall be divided by 100 to obtain vertical offsets.
- Where an exit ramp terminal is proposed adjacent to a mainline horizontal curve, construct the edge of the terminal by using offset widths, and for the terminal segment downstream from Section C-C to R, construct the ramp as a 141'-43 m) tangent section.
- All dimensions are in inches (millimeters) unless otherwise shown.

EXIT RAMP TERMINAL

( JOINTED PCC RAMP PAVEMENT ADJACENT TO JOINTED PCC MAINLINE PAVEMENT )

STANDARD 420301-08
Joint line is parallel to ramp baseline. For a distance of 100' (30 m) beginning at the 12 (300) stub joint line is parallel to ramp baseline.

Joint spacing (typ.)

- 15'-0" (4.5 m)
- 20'-0" (6.0 m)

Pavement and reinforcement in the ramp taper shall be the same as the mainline. Reinforcement shall be placed parallel and perpendicular to the mainline pavement.

Reinforcement placed parallel to and perpendicular to ramp baseline.

Max. cross slope allowed is 4%
Min. cross slope allowed is 1.5%

Vertical offset range for ramp right edge when mainline is curved to the left

Vertical offset range for ramp right edge when mainline is curved to the right

When mainline is on tangent or curved to the left

When mainline is on tangent or curved to the right

Min. cross slope allowed is 1.5%
Max. cross slope allowed is 5%

Refer to Sheet 3 for vertical offsets using e = 8%
DETAILS FOR DRAINAGE IN NEUTRAL AREA

<table>
<thead>
<tr>
<th>Sections</th>
<th>Mainline on Tangent</th>
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<tr>
<td>B</td>
<td>3.0</td>
<td>S.E. % ML x 192</td>
<td>S.E. % ML x 192</td>
</tr>
<tr>
<td>C</td>
<td>-3.0</td>
<td>-3.0</td>
<td>-3.0</td>
</tr>
<tr>
<td>D</td>
<td>-15.4</td>
<td>-15.4</td>
<td>-15.4</td>
</tr>
</tbody>
</table>

Vertical offsets in inches for right edge of ramp, when e = 8%.

<table>
<thead>
<tr>
<th>Sections</th>
<th>Mainline on Tangent</th>
<th>Mainline Curved Right</th>
<th>Mainline Curved Left</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>-5</td>
<td>S.E. % ML x 200</td>
<td>S.E. % ML x 300</td>
</tr>
<tr>
<td>B</td>
<td>-74</td>
<td>S.E. % ML x 4900</td>
<td>S.E. % ML x 4900</td>
</tr>
<tr>
<td>C</td>
<td>-74</td>
<td>-74</td>
<td>-74</td>
</tr>
<tr>
<td>D</td>
<td>-392</td>
<td>-392</td>
<td>-392</td>
</tr>
</tbody>
</table>

Vertical offsets in mm for right edge of ramp, when e = 8%.

1. Vertical offset values are calculated and based on the right edge of mainline pavement at 0.0 % grade.
2. The vertical offsets of these points are above the mainline pavement and lie on an upgrade in relationship to the mainline grade.
3. S.E. = Superelevation Rate

GENERAL NOTES

The initial ramp grade (G) is based on the line generated through the PI that is 105' (32 m) past Section C-C and the point created by the vertical offset at Section D-D. See plans for actual grades.

In the neutral area, provide a swale and flush inlet to enhance drainage. See plans for actual grades. When using grades expressed in %, the grade values shall be divided by 100 to obtain vertical offsets. Where an exit ramp terminal is proposed adjacent to a mainline horizontal curve, construct the edge of the terminal by using offset widths, and for the terminal segment downstream from Section C-C to R, construct the ramp as a 141' (43 m) tangent section.

All dimensions are in inches (millimeters) unless otherwise shown.
new pavement

improved subgrade, see roadway plans.

See Bridge Plans for details.

improved subgrade, see roadway plans.

See Bridge Plans for details.

improved subgrade, see roadway plans.

See Bridge Plans for details.

improved subgrade, see roadway plans.

See Bridge Plans for details.

improved subgrade, see roadway plans.

See Bridge Plans for details.

improved subgrade, see roadway plans.

See Bridge Plans for details.
Limit of pavement connector for bridge approach slab
Variable: 10'-0" (3.00 m) min.

SECTION A-A

PLAN
(New or existing construction)

GENERAL NOTES
THICKNESS: "t" = Thickness of Pavement.

See Standard 610001 for shoulder inlet with curb when required.

See plans for details of bridge approach slab and approach footing.

All dimensions are in inches (millimeters) unless otherwise shown.

DATE
4-1-16

REVISIONS
New standard

PAVEMENT CONNECTOR (HMA)
FOR BRIDGE APPROACH SLAB

STANDARD 420406
**General Notes**

See Standard 420001 for joint details not shown. All dimensions are in inches (millimeters) unless otherwise shown.

- **SECTION A-A**
  - For PCC Pavement
  - Thickness same as adjacent pavement
  - Welded wire reinforcement

- **SECTION B-B**
  - For PCC Base Course with HMA Surface
  - Thickness same as adjacent pavement
  - Welded wire reinforcement

- **DATE**
- **REVISIONS**
  - 1-1-18: Revised standard to reflect change of tie bar spacing to 12 (300) cts.
  - 4-1-16: Changed terminology to welded wire reinforcement.

**PCC Pavement and PCC Base Course Adjacent to Railroad Grade Crossing**

**STANDARD 420501-07**
Approximately 63 lbs./100 sq. ft. (3.07 kg/m²)

When clipped bar mats are used, each bar intersection shall be clipped with W1.7 (3.74) wire.

* When the 12 (300) minimum cannot be achieved, the transverse joints shall be extended to either the longitudinal joint or edge of pavement.

** 12 (300) min. lap

---

** DETAIL OF ADDED REINFORCEMENT FOR PAVEMENT BLOCKS-OUTS **

---

** GENERAL NOTES **

Pavement block-outs shall be at least 24 (600) from contraction joints.

Welded wire reinforcement which is lapped longitudinally shall have a minimum lap of 6 (150).

Welded wire reinforcement may be positioned with the transverse wires on top or bottom of the longitudinal wires.

All dimensions are in inches (millimeters) unless otherwise shown.

---

** ENGINEER OF POLICY AND PROCEDURES **

APPROVED

1-1-08

Illinois Department of Transportation

2016

ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED

1-1-97

DATE

REVISIONS

6-1-16

Changed terminology to 'welded wire reinforcement'.

Renamed standard.

1-1-08

Switched units to English (metric).

---

** PAVEMENT WELDED WIRE REINFORCEMENT **

STANDARD 420701-03
**PCC Pavement**

**GENERAL NOTES**

Sealant components for the wide flange beam terminal joint shall be as follows:

- The sealant shall be Dow Corning 888 Silicone Highway Joint Sealant. The tape shall be Polyethylene Tape No. 40. The primer, used on the metal only, shall be Dow Corning 1300. At the Contractor's option the joint may be sealed as shown in the optional groove detail.

- See Standards 420001 and 420401 for joint details not shown.

- See Standard 421001 for details of pavement reinforcement.

All dimensions are in inches (millimeters) unless otherwise shown.

---

**TRANSVERSE TERMINAL JOINT**

**SECTION B-B**

1. Lap reinforcing steel 36 (900) when pavement is extended
2. 3 (75) cl., when t ≤ 8 (200)
3. 2 (50) Transverse expansion joint
4. 4 (100) Preformed joint complete
5. Sleeper slab
6. Wide flange beam terminal joint complete
7. Wide flange beam terminal joint in mainline pavement only
8. Conventional reinforced pcc pavement
9. 3 (75) Expansion joint in shoulder, both sides
10. Continuous reinforcement of pcc pavement

---

**TRANSVERSE CONSTRUCTION JOINT**

**WITH WIDE FLANGE BEAM TERMINAL JOINT**

**TYPICAL 2-LANE WITH SHOULDERS**

**DATE**

1-1-18 Changed tie bar spacing to 36 (900) cts.
1-1-14 Added exp. jnts. in shlds. & omitted bars, cnst. jnt. over wide flange beam slpr slab.

**STANDARD 421101-10**

**CRC PAVEMENT**

**24' (7.2 m)**
**Engineer of Design and Environment**

**Engineer of Policy and Procedures**

**Illinois Department of Transportation**

**WIDE FLANGE BEAM TERMINAL JOINT**

**DETAIL AT BEAM**

- Bend top flange of beam.
- Cut and remove sufficient material from web and bottom flange of beam to attain the required pavement cross slope.

**DETAIL OF CUTTING AND WELDING BEAM**

- Bend flange to fit.
- Stud shear connectors @ 6 (150) cts. @ 12 (300) from end of beam.
- Steel beam and concrete sleeper shall match pavement slope.

**VIEW OF GROOVE AT EDGE OF PAVEMENT**

1. Pavement
2. Steel beam

**OPTIONAL ADJUSTABLE CHAIR**

**MATERIALS REQUIRED FOR ONE WIDE FLANGE BEAM TERMINAL JOINT**

- Concrete, cu. yds. (m³): 11.1 (8.1)
- Reinforcement bars, lbs. (kg): 523 (236)
- Pavement reinforcement, sq. yds. (m²): 20 (16.7)

**MATERIALS REQUIRED FOR ONE TRANSVERSE TERMINAL JOINT COMPLETE**

<table>
<thead>
<tr>
<th>Bar No.</th>
<th>Size</th>
<th>Length</th>
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<tbody>
<tr>
<td>16</td>
<td>No. 4 (No. 11)</td>
<td>19'-0'' (5.8 m)</td>
</tr>
<tr>
<td>29</td>
<td>No. 5 (No. 16)</td>
<td>35'-8'' (10.7 m)</td>
</tr>
<tr>
<td>72</td>
<td>7/16 (11.5)</td>
<td>8'-6'' (2.6 m)</td>
</tr>
</tbody>
</table>

Concrete, cu. yds. (m³): 11.1 (8.1)
Reinforcement bars, lbs. (kg): 523 (236)
Structural steel, lbs. (kg): W14X82 (1200)
W14X82 (1200) (Continued)

*Weight includes beam, end plates, stiffener plates and studs.

Pavement, sq. yds. (m²): 400 (324)
Pavement reinforcement, sq. yds. (m²): 4 (100)
Improved subgrade, sq. yds. (m²): 411.6 (333.5)

36'-0'' (10.8 m)

**CRC PAVEMENT**

**STANDARD 421106-10**

*Sheet 2 of 2*
GENERAL NOTES
See Standard 421001 for details of pavement reinforcement. See Standards 420001 and 420401 for joint details not shown. All dimensions are in inches (millimeters) unless otherwise shown.

24' (7.2 m)

CRC PAVEMENT
(WITH LUG SYSTEM)

SECTION A-A
(TYPICAL 2-LANE WITH SHOULDERS)

TRANSVERSE CONSTRUCTION JOINT

TRANSVERSE TERMINAL JOINT

PLAN

SECTION B-B
**GENERAL NOTES**

See Standards 420001 and 420401 for joint reinforcement.

See Standard 421001 for details of pavement details not shown.

All dimensions are in inches (millimeters) unless otherwise shown.

---

**SECTION A-A**

(TYPICAL 3-LANE, 1-WAY WITH SHOULDERS)

**SECTION B-B**

**TRANSVERSE CONSTRUCTION JOINT**

**TRANSVERSE TERMINAL JOINT**

**CRC PAVEMENT**

(WITH LUG SYSTEM)

**DATE**

1-1-97

1-1-08

1-1-98

**REVISIONS**

Switched units to English (metric). Revised

Lug Sys. Table.

---

**STANDARD 421206-07**

Illinois Department of Transportation

January 1, 2018

ENGINEER OF POLICY AND PROCEDURES

APPROVED

January 1, 2018

ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED

PASSED

DATE

REVISIONS

1-1-97

1-1-08

1-1-98

36' (10.8 m)
MATERIALS REQUIRED FOR (1) ONE LUG SYSTEM
(Excluding Pavement Concrete and Pavement Reinforcement)

<table>
<thead>
<tr>
<th>Bar</th>
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<th>Size</th>
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<tbody>
<tr>
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<td>18</td>
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<tr>
<td>c</td>
<td>18</td>
<td>No. 9 (18)</td>
<td>20'-0'' (6.09 m)</td>
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</tr>
<tr>
<td>d</td>
<td>22</td>
<td>No. 9 (18)</td>
<td>35'-6'' (10.82 m)</td>
<td></td>
</tr>
</tbody>
</table>

Concrete, cu. yds. (m³): 96.0 (73.41)
Reinforcing Bars, lbs. (kg): 12,550 (5,695)
Concrete Pad, cu. yds. (m³): 96.0 (73.41)
Improved Subgrade, sq. yds. (m²): 208 (174)
Ramps in Landscaped Area

Setback ≤ 5'

- The running slope of the curb ramp shall not require the ramp length to exceed 15' (4.5 m).

Ramps in Paved Area

Setback ≤ 5'

- The running slope of the curb ramp shall not require the ramp length to exceed 15' (4.5 m).

SECTION A-A

- The running slope of the curb ramp shall not require the ramp length to exceed 15' (4.5 m).

SECTION B-B

- The running slope of the curb ramp shall not require the ramp length to exceed 15' (4.5 m).

DETAIL A

- Variable
- Expansion joint
- Ramp thickness
- 6" (150)

SIDE CURB DETAIL

PERPENDICULAR CURB RAMPS FOR SIDEWALKS

STANDARD 424001-10

Sheet 1 of 2

See Sheet 2 for GENERAL NOTES.

DATE

REVISIONS

1-1-16

- Omitted diagonal slope at turning spaces and corner landings.
- Added 2' dimension to detectable warning for setback greater than 5'.

1-1-17

- Added 2' dimension to detectable warning for setback greater than 5'.

Illinois Department of Transportation

APPROVED

January 1, 2018

ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED

January 1, 2018

PASSED

ENGINEER OF POLICY AND PROCEDURES
RAMP IN LANDSCAPED AREA
SETBACK > 5'

RAMP IN PAVED AREA
SETBACK > 5'

GENERAL NOTES
All slope ratios are expressed as units of vertical displacement to units of horizontal displacement (V:H).
Where the turning space is constrained on a side opposite a ramp, the minimum length of the turning space in the direction of the ramp-run shall be 5' (1.52 m).

Where 1:50 maximum slope is shown, 1:64 is preferred.
See Standard 606001 for details of depressed curb adjacent to curb ramp.

All dimensions are in inches (millimeters) unless otherwise shown.

PERPENDICULAR CURB RAMPS FOR SIDEWALKS

STANDARD 424001-10

ILLINOIS DEPARTMENT OF TRANSPORTATION
ENGINEER OF DESIGN AND ENVIRONMENT
ISSUED 1-1-97
PASSED ENGINEER OF POLICY AND PROCEDURES
APPROVED 1-1-18

(610) 24
(610) 24

Sheet 2 of 2
### RAMP IN LANDSCAPED AREA

- **Ramp with 5' (1.52 m) typical, 4' (1.22 m) min.**
- **Turning space 5'x5' (1.52x1.52 m) typical, 4'x4' (1.22x1.22 m) min.**
- **Clear space 4'x4' (1.22x1.22 m) min.**
- **Depressed curb and gutter**
- **Detectable warning**
- **Crosswalk marking (typ.)**
- **Face of roadway curb**
- **Edge of gutter**
- **Flush with top of roadway curb and top of sidewalk**
- **Expansion joint**
- **Variable ramp thickness**
- **Ramp width 5' (1.52 m) typical, 4' (1.22 m) min.**
- **Sidewalk width 5' (1.52 m) typical, 4' (1.22 m) min.**

### RAMP IN PAVED AREA

- **Ramp width 5' (1.52 m) typical, 4' (1.22 m) min.**
- **Turning space 5'x5' (1.52x1.52 m) typical, 4'x4' (1.22x1.22 m) min.**
- **Clear space 4'x4' (1.22x1.22 m) min.**
- **Depressed curb and gutter**
- **Detectable warning**
- **Crosswalk marking (typ.)**
- **Face of roadway curb**
- **Edge of gutter**
- **Flush with top of roadway curb and top of sidewalk**
- **Expansion joint**
- **Variable ramp thickness**
- **Ramp width 5' (1.52 m) typical, 4' (1.22 m) min.**
- **Sidewalk width 5' (1.52 m) typical, 4' (1.22 m) min.**

### GENERAL NOTES

This Standard shall only be used for curb radii of 20 ft. (6.1 m) or greater.

Where the turning space is constrained on a side opposite a ramp, the minimum length of the turning space in the direction of the ramp-run shall be 5' (1.52 m).

Where the turning space is constrained on a side opposite a ramp, the minimum length of the turning space in the direction of the ramp-run shall be 5' (1.52 m).

All slope ratios are expressed as units of vertical displacement to units of horizontal displacement (V: H).

See Standard 606001 for details of depressed curb adjacent to curb ramp.

All dimensions are in inches (millimeters) unless otherwise shown.
**CORNER PARALLEL CURB RAMP**

**SIDE CURB DETAIL**

**SECTION A-A**

2. The running slope of the curb ramp shall not require the ramp length to exceed 15° (4.5 m).

**SECTION B-B**

- All dimensions are in inches (millimeters).
- GENERAL NOTES
  - All slope ratios are expressed as units of vertical displacement to units of horizontal displacement (V:H).
  - Where the turning space is constrained on a side opposite a ramp, the minimum length of the turning space in the direction of the ramp-run shall be 5' (1.5 m).
  - Where 1:50 maximum slope is shown, 1:64 is preferred.
  - See Standard 606001 for details of depressed curb adjacent to curb ramp.
  - All dimensions are in inches (millimeters) unless otherwise shown.

**CORNER PARALLEL CURB RAMPS FOR SIDEWALKS**

STANDARD 424011-03
**GENERAL NOTES**

All slope ratios are expressed as units of vertical displacement to units of horizontal displacement (V:H).

Where the turning space is constrained on a side opposite a ramp, the minimum length of the turning space in the direction of the ramp-run shall be 5' (152 mm).

Where 1:50 maximum slope is shown, 1:64 is preferred.

See Standard 606001 for details of depressed curb adjacent to curb ramp.

All dimensions are in inches (millimeters) unless otherwise shown.

---

**SECTION A-A**

2. The running slope of the curb ramp shall not require the ramp length to exceed 15' (4.5 m).

**SECTION B-B**

- Upper landings are required for ramp slopes flatter than 1:20.
- The running slope of the curb ramp shall not require the ramp length to exceed 15' (4.5 m).

**SECTION C-C**

- Upper landings are required for ramp slopes flatter than 1:20.
- The running slope of the curb ramp shall not require the ramp length to exceed 15' (4.5 m).

---

**TIME LINE**

- **DATE:**
  - Mid-Block Curbs
    - 1-1-16: Revised sidewalk width to include 24 (610) buffer behind curb
    - 1-1-17: Revised sidewalk width to include 24 (610) buffer behind curb

---

**MID-BLOCK CURB RAMPS FOR SIDEWALKS**

**STANDARD 424016-04**
Expansion joint required

Side curb where warning Detectable

See DETAIL A

Variable thickness Ramp

1:50 max.

Top of sidewalk roadway curb and Flush with top of
top of sidewalk sidewalk

1:50 max.

Corner Depressed

Depressed and gutter curb

Face of roadway curb
detectable warning

Ramp

1:50 max.

1:50 max.

1:50 max.

1:50 max.

1:50 max.

1:50 max.

1:50 max.

1:50 max.

1:50 max.

1:50 max.

1:50 max.

1:50 max.

Flatter than 1:20.

Upper landing(s) not required for ramp slopes

6 ft. (1.83 m) or greater.

This standard shall only be used for curb radii of 6 ft. (1.83 m) or greater.

All slope ratios are expressed as units of vertical displacement to units of horizontal displacement (V:H).

Where 1:50 maximum slope is shown, 1:64 is preferred.

See Standard 606001 for details of depressed curb and gutter.

All dimensions are in inches (millimeters) unless otherwise shown.

DEPRESSED CORNER

A

B

SECTION A-A

1 Upper landing not required for ramp slopes flatter than 1:20.

2 The running slope of the curb ramp shall not require the ramp length to exceed 15' (4.5 m).

DETAIL A

SIDE Curb DETAIL

DEPRESSED CORNER FOR SIDEWALKS

STANDARD 424021-04
Detectable warning shall only be installed at entrances/alleys with permanent traffic control devices (i.e., stop signs, signals).

Where possible, maintain the grade of the sidewalk across the entrance/ality to avoid the need for ramps and upper landings.

All dimensions are in inches (millimeters). Where 1:50 maximum slope is shown, 1:64 is preferred. All slope ratios are expressed as units of vertical displacement to units of horizontal displacement (V:H).

Where 1:50 maximum slope is shown, 1:64 is preferred.

All dimensions are in inches (millimeters) unless otherwise shown.
**SIDE CURB DETAIL**

- Variable
- Ramp
- Expansion joint

**DETAILED A**

- Depressed curb and gutter
- Detectable warning

**SECTION A-A**

- Variable
- Detectable warning

**MEDIAN PEDESTRIAN CROSSING**

- Face of roadway curb, typical
- Depressed curb and gutter, typical
- Edge of gutter, typical

**GENERAL NOTES**

- All slope ratios are expressed as units of vertical displacement to units of horizontal displacement (V:H).
- Where 1:50 maximum slope is shown, 1:64 is preferred.
- See Standard 606001 for details of depressed curb adjacent to curb ramp.
- All dimensions are in inches (millimeters) unless otherwise shown.

**DATE**

- 1-1-12

**REVISIONS**

- Revised General Notes
- New standard
**PAVEMENT REINFORCEMENT DETAIL**

- No. 6 (No. 19) rebar will be tied to longitudinal rebar.
- Transverse rebar will extend to outer longitudinal rebar while providing a minimum 3 (75) clearance from existing pavement edge.

**PATCHING DETAIL**

- Every 3rd intersection must be tied.
- When the minimum clearance cannot be obtained with the transverse bar on top then the transverse rebar shall be tied to the bottom of the longitudinal rebar.

*** Variable: Where $S_1$ and $S_2$ are 2 (50) min. and 12 (300) max. $D_1 = 2S_1$ and $D_2 = 2S_2$. 

---

**CLASS A PATCHES**

*STANDARD 442001-04*

Illinois Department of Transportation

January 1, 2008

ENGINEER OF POLICY AND PROCEDURES

APPROVED

January 1, 2008

ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED

1-1-97

PASSED
See sealing details

**METHOD I**

(Without Resurfacing)

- 3 (50) Joint filler
- 18 (450) Long dowel bars anchored into existing pavement at 12 (300) cts
- Expansion Cap
- No. 10x18 (No. 32x450) Tie bars anchored into existing pavement at 12 (300) cts

**METHOD II**

(With Resurfacing)

- 3 (50) Joint filler
- 18 (450) Long dowel bars anchored into existing pavement at 12 (300) cts
- Expansion Cap
- Full depth saw cut

**SEALING DETAIL**

- Hot poured joint sealer
- Preformed flexible foam expansion joint filler

**CLASS B PATCHES**

STANDARD 442101-08

*When re-establishing a transverse expansion joint on a two-lane, two-way road, reverse the orientation of the dowel bars with respect to traffic for one of the patches such that the joint will be continuous across both lanes.*
Longitudinal joints shall be as detailed on Standard 420001, except:

- Existing longitudinal joints shall be either cut or removed.
- Marginal bars shall be cut.
- Marginal ties are not required for patches 20'-0" (6.0 m) or less in length.

Note:

- Longitudinal joints shall be as detailed on Standard 420001, except:
  - Existing longitudinal joint
  - Angles not less than 60°
  - Existing pavement
  - 3'-0" (0.9 m) to 5'-0" (1.5 m)
  - 6'-0" (1.8 m) to 8'-0" (2.4 m)
  - 9'-0" (2.7 m) to 10'-0" (3.0 m)

GENERAL NOTES

- All dimensions are in inches (millimeters) unless otherwise shown.
- Existing tie bars shall be either cut or removed. Marginal bars shall be cut.

CLASS C and D PATCHES

STANDARD 442201-03

ENGINEER OF POLICY AND PROCEDURES
APPROVED
January 1, 2008

REVISIONS
1-1-08
Switched units to English measuring.

1-1-07
Revised Notes for Class C patches.

CLASS C

SECTION A-A
(Built in two operations)

SECTION B-B

SECTION C-C

SECTION D-D

SECTION E-E

SECTION F-F
(Built in two operations)

SECTION G-G
**SHOULDER FOR TANGENT PAVEMENT**

When the superelevation rate of the pavement is between 0% and 4%, the shoulder shall be sloped at 4%.

When the superelevation rate of the pavement exceeds 4%, the shoulder shall be sloped so that the algebraic difference between pavement and shoulder will not be greater than 8%.

**SHOULDER FOR SUPERELEVATED PAVEMENT**

*(OUTSIDE OF CURVE)*

Slope shall be the same as the superelevation rate but not less than 4%.

**SHOULDER FOR SUPERELEVATED PAVEMENT**

*(INSIDE OF CURVE)*

GENERAL NOTES

Except as noted or shown the dimensions and notes specified for the shoulder of tangent pavement are typical for the shoulder of super-elevated pavement.

All dimensions are in inches (millimeters) unless otherwise shown.

DATE | REVISIONS
---|---
1-1-08 | Switched units to English (metric)
1-1-07 | Switched to Hot-Mix Asphalt (HMA) technology

HMA SHOULDER ADJACENT TO FLEXIBLE PAVEMENT

STANDARD 482001-02
SHOULDER FOR TANGENT PAVEMENT

When the superelevation rate of the pavement is between 0% and 4%, the shoulder shall be sloped at 4%.

When the superelevation rate of the pavement exceeds 4%, the shoulder shall be sloped so that the algebraic difference between the pavement and shoulder will not be greater than 8%.

SHOULDER FOR SUPERELEVATED PAVEMENT

(OUTSIDE OF CURVE)

Slope shall be the same as the superelevation rate but not less than 4%.

SHOULDER FOR SUPERELEVATED PAVEMENT

(INSIDE OF CURVE)

GENERAL NOTES

Except as noted or shown the dimensions and notes specified for the shoulder of tangent pavement are typical for the shoulders of superelevated pavement.

All slope ratios are expressed as units of vertical displacement to units of horizontal displacement (V:H).

All dimensions are in inches (millimeters) unless otherwise shown.

HMA SHOULDER ADJACENT TO RIGID PAVEMENT

STANDARD 482006-03
HMA SHOULDER STRIP AND AGGREGATE WEDGE WITH WIDENING

(Cross-section A)

HMA SHOULDER STRIP AND AGGREGATE WEDGE WITH RESURFACING

(Cross-section B)

COLD MILLING AND/OR RESURFACING OF EXISTING PAVEMENT WITH SHOULDER STRIPS

(Cross-section C)

COLD MILLING AND/OR RESURFACING OF EXISTING PAVEMENT WITH SHOULDER STRIPS

(Cross-section D)

All dimensions are in inches (millimeters) unless otherwise shown.
**SHOULDER FOR TANGENT PAVEMENT**

- **Shoulder width**
- **Paved width**
- **Wedge portion**
- **Shoulder slope**

**SHOULDER FOR SUPERELEVATED PAVEMENT**

(The outside of curve)

- **Shoulder slope** shall be the same as the superelevation rate but not less than 4%.

(The inside of curve)

**NOTES**

1. Does not apply when sub-surface drains are installed.
2. When the subbase is not removed, this thickness will vary with the thickness of pavement, extended length of subbase, and the grade of pavement. When this thickness is less than 6 (150), the paved shoulder shall be stepped down at this line to provide a 6 (150) minimum thickness.
3. When the superelevation rate of the pavement is between 0% and 4%, the shoulder shall be sloped at 4%. When the superelevation rate of the pavement exceeds 4%, the shoulder shall be sloped so that the algebraic difference between the pavement and shoulder slopes will not be greater than 8%.

**GENERAL NOTES**

- Except as noted or shown, the dimensions and notes specified for the shoulder of the tangent pavement are typical for the shoulders of super-elevated pavement.
- Transverse expansion joints shall be as detailed on Standard 420001 except that dowel bars will not be required.
- See Standard 420001 for details not shown.

All dimensions are in inches (millimeters) unless otherwise shown.
FOR MULTI-SPAN CULVERTS

(Unless otherwise noted on the plans, name plates are not required for structures less than 20' (6.1 m) in length)

FOR PARAPET AND END POST MOUNTED

(When Dog Ear Wing is used)

FOR STEEL RAILS

FOR TRUSSES

FOR PARAPET

FOR PIERS ON FAI ROUTES

GENERAL NOTES

On one-way traffic structures, place name plate on right side of approach end. On two-way traffic structures, place name plate on right side of approach end while looking in the direction of increasing stationing.

All dimensions are in inches (millimeters) unless otherwise shown.
SEE DESIGN PLANS
FOR
LETTERING

Center of 3⁄4 (12) dia. holes for bolts when required

NOTE:
Border and lettering:
Raised 3⁄4 (13), square cut and not tapered.
PIPE CULVERT END SECTION DIMENSIONS

<table>
<thead>
<tr>
<th>Plane No.</th>
<th>A</th>
<th>R</th>
<th>S</th>
<th>T</th>
</tr>
</thead>
<tbody>
<tr>
<td>10' (305)</td>
<td>(98)</td>
<td>(39)</td>
<td>(177)</td>
<td>(950)</td>
</tr>
<tr>
<td>16' (400)</td>
<td>(240)</td>
<td>(100)</td>
<td>(110)</td>
<td>(1950)</td>
</tr>
</tbody>
</table>

This dimension shall be increased by 1" (25) for multi-pipe culvert installations. For multi-pipe culvert installations, place the end sections side-by-side leaving a 3" (75) space between adjacent end section walls and fill the space with Class SI concrete.

GENERAL NOTES

This Standard is for use with single pipe culverts and multi-pipe culvert installations. For multi-pipe culvert installations, place the end sections side-by-side leaving a 3" (75) space between adjacent end section walls and fill the space with Class SI concrete.

The number of segments shown in elevation is for example only. The length and number of precast sections required to construct the end section shall be determined by the Contractor.

See roadway plans for slope (V:H) and pipe inside diameter.

End section may be installed up to ±15 degrees skewed with roadway.

2½ x 2½ x 62-½ x 62-½ plate washers shall be provided under each lug required for the anchor rods. Holes in the wall for the culvert tie assembly may be drilled using core bits in lieu of formed holes.

See Standard 542301 for end sections having irreversible pipe grate.

All slope ratios are expressed as units of vertical displacement to units of horizontal displacement (V/H).

All dimensions are in inches (millimeters) unless otherwise shown.

CONCRETE END SECTIONS FOR PIPE CULVERTS
15" (375 mm) THRU 84" (2100 mm) DIA.
LONGITUDINAL SECTION
(Showing bottom slab and backwall reinforcement)

SECTION B-B
(Showing backwall reinforcement only)
Pipe omitted for clarity)

SECTION C-C

REINFORCEMENT SCHEDULE

<table>
<thead>
<tr>
<th>Pipe Dia (mm)</th>
<th>Bar Size</th>
<th>Bar Spacing</th>
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<td>84</td>
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CONCRETE END SECTIONS FOR PIPE CULVERTS
15" (375 mm) THRU 84" (2100 mm) Dia.

STANDARD 542001-06

(State Department of Transportation)

APPROVED
ISSUED
STANDARD 542001-06

LAP DIMENSION
*4 @ 131 @ 12 (300) cts., for pipe diameter > 48 (1200), typ. each face
2@5 @ 166 bars of 12 (300) cts., for pipe diameter > 48 (1200), typ. each face
3@6 @ 136 bar for pipe diameter > 48 (1200), typ. each face
2@5 @ 166 bars of 12 (300) cts., for pipe diameter > 48 (1200), typ. each face
For cast-in-place construction, increase concrete volumes by approximately 12%.

### Pipe I.D.

<table>
<thead>
<tr>
<th>Pipe I.D.</th>
<th>Concrete yd/ft²</th>
<th>Reinforcement Without Lap lbs (kg)</th>
<th>Reinforcement With Lap lbs (kg)</th>
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<td>15</td>
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**Concrete End Sections for Pipe Culverts**

15" (375 mm) THRU 84" (2100 mm) DIA.

**Standard 542001-06**

(Sheet 3 of 3)
**PIPE CULVERT END SECTION DIMENSIONS**

<table>
<thead>
<tr>
<th>Equivalent Pipe Size</th>
<th>Pipe Span</th>
<th>Pipe Rise</th>
<th>A</th>
<th>R</th>
<th>S</th>
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<tbody>
<tr>
<td>12&quot; (300)</td>
<td>14</td>
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<td>16&quot; (400)</td>
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<td>24&quot; (600)</td>
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<td>70</td>
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**PIPING DESIGN**

- Fill the pipe and backwall with Class SI concrete.
- Placed 3" (75 mm) maximum bed of granular bedding.
- Restraint angle and tie plate between multiple end sections.
- Culvert End Section Length (L)

**END VIEW**

- Notched area indicates void between the pipe and the backwall to be filled with Class SI concrete.
- Hatched area indicates void between CIP field construction.
- Drain holes:
  - 8' (2.40 m) cts. max., 3 (75) typ.
  - Culvert End Section Length (L)

**PLAN**

- Culvert End Section ties at mid-height of end section joint, typ.
- Pipe size 12" (300 mm) JDF for CIP field construction.
- This dimension shall be increased by 1/4 (38) for CIP field construction.
- Restraint angle with tie plate, typ.

**ELEVATION**

- Min. 6 (150) thick.
LONGITUDINAL SECTION
(Showing bottom slab and backwall reinforcement.)

SECTION B-B
(Showing backwall reinforcement only.)

SECTION C-C

SECTION D-D

RESTRAINT ANGLE DETAIL

TIE PLATE DETAIL

REINFORCEMENT SCHEDULE
### Concrete End Sections for Elliptical Pipe Culverts 15" (375 mm) THRU 72" (1800 mm) EQUIVALENT DIAMETER

#### Standard S401-82

| Diameter (mm) | Round Size | 66 | 72 | 6.3 | 3.6 | 5.4 | 4.8 | 2.5 | 3.1 | 1.3 | 1.1 | 4.7 | 2.7 | 2.5 | 2.2 | 2.2 | 525 | 375 | 31.0 | 25.0 | 25.0 |
|---------------|------------|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1460.0        | 1:6        | 4.7 | 2.7 | 2.5 | 4.8 | 1.3 | 1.1 | 525 | 375 | 31.0 | 25.0 | 25.0 |
| 1410.0        | 1:4        | 4.7 | 2.7 | 2.5 | 4.8 | 1.3 | 1.1 | 525 | 375 | 31.0 | 25.0 | 25.0 |
| 1360.0        | 1:4        | 4.7 | 2.7 | 2.5 | 4.8 | 1.3 | 1.1 | 525 | 375 | 31.0 | 25.0 | 25.0 |
| 1310.0        | 1:3        | 4.7 | 2.7 | 2.5 | 4.8 | 1.3 | 1.1 | 525 | 375 | 31.0 | 25.0 | 25.0 |

#### Quantities

**Reinforcement Without Lap lbs. (kg)**

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<th>672.8</th>
<th>882.2</th>
<th>423.4</th>
<th>285.2</th>
<th>1670</th>
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</table>

**Slope of End Section**

| Diameter (mm) | 66 | 72 | 6.3 | 3.6 | 5.4 | 4.8 | 2.5 | 3.1 | 1.3 | 1.1 | 4.7 | 2.7 | 2.5 | 2.2 | 2.2 | 525 | 375 | 31.0 | 25.0 | 25.0 |
|---------------|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1460.0        | 7.3 | 2.1 | 11.1 | 9.6 | 6.2 | 8.5 | 4.4 | 3.2 | 2.8 |    |    |    |    |    |    |    |    |    |    |    |    |
| 1410.0        | 7.3 | 2.1 | 11.1 | 9.6 | 6.2 | 8.5 | 4.4 | 3.2 | 2.8 |    |    |    |    |    |    |    |    |    |    |    |    |
| 1360.0        | 7.3 | 2.1 | 11.1 | 9.6 | 6.2 | 8.5 | 4.4 | 3.2 | 2.8 |    |    |    |    |    |    |    |    |    |    |    |    |
| 1310.0        | 7.3 | 2.1 | 11.1 | 9.6 | 6.2 | 8.5 | 4.4 | 3.2 | 2.8 |    |    |    |    |    |    |    |    |    |    |    |    |

### General Notes

- All dimensions are in inches (millimeters) unless otherwise shown.
- All dimensions are in horsetrack formulas.
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- All dimensions are in horsetrack formulas.
- All dimensions are in horsetrack formulas.
2 - No. 5 (No. 16) h1 bars.

\( \beta \) = 12 \( (300) \) cts.

No. 4 (No. 13) v bars
at 12 \( (300) \) cts.

* If the embankment slope above the headwall is flatter than 1:2, provide wings for a 1:2 slope.

Headwall is flatter than 1:2, provide

* Slope 1:2 or 1:2

No. 4 (No. 13) v bars
at 12 \( (300) \) cts.

No. 4 (No. 13) v bars
at 18 \( (460) \) cts.

No. 4 (No. 13) v bars
at 12 \( (300) \) cts.

No. 4 (No. 13) v bars
at 18 \( (460) \) cts.

No. 4 (No. 13) v bars
at 12 \( (300) \) cts.

1.25 \( (150) \) cm

2.5 \( (626) \) cm

3.0 \( (765) \) cm

3.5 \( (917) \) cm

3.75 \( (952) \) cm

4.0 \( (1.08 m) \) cm

BAR - h1
Bent in field, two
req. for each headwall.

BAR - h
Bent in field, one
req. for each headwall.

SECTION A-A

END VIEW

BAR - h1
Bent in field, two
req. for each headwall.

BAR - h
Bent in field, one
req. for each headwall.

GENERAL NOTES

Build tops of headwalls parallel to grade line.

All slope ratios are expressed as units of vertical displacement to units of horizontal displacement (V:H). All dimensions are in inches (millimeters) unless otherwise shown.

REINFORCED CONCRETE END SECTIONS
FOR PIPE CULVERTS

15" (375 mm) THRU 36" (900 mm) DIA.
SKewed WITH ROADWAY

STANDARD 542201-02

DATE

REVISIONS

1-1-09
Switched units to
English (metric).

1-1-07
Soft converted metric
reinforcement bars.

Added h. bars
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<tr>
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<th>Design No.</th>
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<th>C</th>
<th>D</th>
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<th>F</th>
<th>G</th>
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<th>J</th>
<th>K</th>
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<td>28</td>
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DIMENSIONS FOR CONCRETE

APPROVED

Skew 20° (DS 600-1

Concrete

Rein' Bars 2 End Sections

DS 18-1

Concrete

Rein' Bars 2 End Sections

DS 18-1

Dimensions for reinforced concrete end sections for pipe culverts 15° (375 mm) thru 36° (900 mm) Dia. Skewed with roadway. STANDARD 542201-02

(Footnotes)

A = 3/8" Dd 10.0 Dd 10.0 Dd 10.0 Dd 10.0

B = 1/4" Dd 8.0 Dd 8.0 Dd 8.0 Dd 8.0

C = 3/16" Dd 6.3 Dd 6.3 Dd 6.3 Dd 6.3

D = 1/8" Dd 3.2 Dd 3.2 Dd 3.2 Dd 3.2

E = 1/16" Dd 1.6 Dd 1.6 Dd 1.6 Dd 1.6

F = 1/32" Dd 0.8 Dd 0.8 Dd 0.8 Dd 0.8

G = 1/64" Dd 0.4 Dd 0.4 Dd 0.4 Dd 0.4

H = 3/64" Dd 0.12 Dd 0.12 Dd 0.12 Dd 0.12

J = 3/32" Dd 0.06 Dd 0.06 Dd 0.06 Dd 0.06

K = 1/32" Dd 0.03 Dd 0.03 Dd 0.03 Dd 0.03

M = 1/16" Dd 0.015 Dd 0.015 Dd 0.015 Dd 0.015

N = 1/64" Dd 0.0075 Dd 0.0075 Dd 0.0075 Dd 0.0075

R = 1/32" Dd 0.00375 Dd 0.00375 Dd 0.00375 Dd 0.00375
**WINGS FOR 1:1½ SLOPE**

- **Sheet Angle**: 35°
- **Design No.**: DS 15-1, DS 15-2, DS 15-3, DS 15-4
  - **Nominal Pipe Diag.**: 12, 14, 16, 19
  - **Pipe**: 24, 36, 36, 24
  - **Concrete**: 1, 2, 3, 4
  - **Rein. Bars**: 2, 2, 2, 2

**DIMENSIONS FOR CONCRETE**

| A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R |
| 28 | 10 | 29 | 233 | 3.8 | 3.8 | 5.0 | 3.1 | 7 | 4.0 | 6.7 | 3 | 1 | 5 | 1.5 | 2.0 | 1.0 | 3.0 | 1.0 |
| 38 | 13 | 37 | 277 | 6.7 | 8.7 | 5.0 | 3.1 | 7 | 4.0 | 6.7 | 3 | 1 | 5 | 1.5 | 2.0 | 1.0 | 3.0 | 1.0 |
| 48 | 16 | 39 | 306 | 9.3 | 11.6 | 6.6 | 4.3 | 7 | 4.9 | 7.8 | 3 | 1 | 5 | 1.5 | 2.0 | 1.0 | 3.0 | 1.0 |
| 58 | 19 | 42 | 336 | 11.2 | 13.1 | 8.6 | 6.4 | 7 | 4.9 | 7.8 | 3 | 1 | 5 | 1.5 | 2.0 | 1.0 | 3.0 | 1.0 |
| 68 | 22 | 44 | 366 | 13.0 | 14.7 | 10.6 | 8.4 | 7 | 6.0 | 8.7 | 3 | 1 | 5 | 1.5 | 2.0 | 1.0 | 3.0 | 1.0 |

**Concrete Sections (inches)**

- **A**: 1
- **B**: 2
- **C**: 3
- **D**: 4
- **E**: 5
- **F**: 6
- **G**: 7
- **H**: 8
- **I**: 9
- **J**: 10
- **K**: 11
- **L**: 12
- **M**: 13
- **N**: 14
- **O**: 15
- **P**: 16
- **Q**: 17
- **R**: 18

**Rein. Bars**: 2

- **Bars**: 1
- **Bars**: 2

**Bars for End Sections**: 3

---

**REINFORCED CONCRETE END SECTIONS FOR PIPE CULVERTS**

15° (375 mm) THRU 36° (900 mm) DIA.  SKEWED WITH ROADWAY

*Sheet 3 of 5*

**STANDARD 54201-02**
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**WINGS FOR 1:2 SLOPE**

- Reinf. Bars - 2 End Sections
- Bars for 2 End Sections (lb.)
- **Sheet 4 of 5**
### Dimensions for Concrete

#### Concrete Valve Chamber Sections

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**Notes:**

- DS 24-2 refers to Design Specifications 24-2.
- DS 36-2 refers to Design Specifications 36-2.
- DS 900-2 refers to Design Specifications 900-2.
- WINGS FOR 1:2 SLOPE indicates sections for a 1:2 slope.
- STANDARD 542201-02 refers to standard specifications.

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**Reinforced Concrete Valve Chamber Sections**

- FOR PIPE CULVERTS
- 15° (375 mm) THRU 36° (900 mm) DIA.
- SKewed WITH ROADWAY

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**Sheet 9 of 15**
Use two layers of welded wire reinforcement in back face of wingwalls. 

Build tops of headwalls parallel to grade line.

When lapping sheets of welded wire reinforcement, the overlap measured between the outermost cross wires of each reinforcement sheet shall not be less than 8 (200).

All slope ratios are expressed as units of vertical displacement to units of horizontal displacement (V:H).

All dimensions are in inches (millimeters) unless otherwise shown.
<table>
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<tr>
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REINFORCED CONCRETE END SECTIONS
FOR PIPE CULVERTS
42" (1060 mm) THRU 60" (1500 mm) DIA.
SKEWED WITH ROADWAY

STANDARD 542206-04
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<td>26'-10&quot;</td>
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### Dimensions for Concrete

<table>
<thead>
<tr>
<th>Skew Angle</th>
<th>Nominal Pipe Dia.</th>
<th>Dimension for Concrete</th>
<th>Concrete End Secs.</th>
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</thead>
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<tr>
<td></td>
<td></td>
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<td>2 End Secs. ca. yd.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>sq. yd.</td>
</tr>
<tr>
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<tr>
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<td>45°</td>
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</tr>
<tr>
<td>50°</td>
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</tr>
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<td>55°</td>
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</tr>
<tr>
<td>60°</td>
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</tr>
</tbody>
</table>
**SECTION A-A**

- **Same reinforcement as** *inner cage, class HE-II*
- **2 - No. 4 (No. 13) bars**
- **Same reinforcement as** *outer cage, class HE-II*
- **Precast or cast in place end block.**

**OPTIONAL WELDED WIRE REINFORCEMENT LAP**

- **Terra-Flared End Section**
- **Standard 542306-03**

**GENERAL NOTES**

All slope ratios are expressed as units of vertical displacement to units of horizontal displacement (V:H).

All dimensions are in inches (millimeters) unless otherwise shown.

**DATE**

04-01-16

**PRECAST REINFORCED CONCRETE ELLIPTICAL FLARED END SECTION**

**STANDARD 542306-03**
Steel anchor pipe
details not shown.

(See Detail A for dimensions and
top:

\[
\begin{align*}
\text{Ø hole} & = 8
\end{align*}
\]

Longitudinal Section

* Provide intermediate support
for grate pipe lengths > 20'-0" (6.00 m)

General Notes

This standard shall only be used on concrete end sections
not skewed more than ± 15 degrees with roadway.

The minimum distance from the center of a hole to the free
edge of a structural shape or plate shall be ≥ 2½ (64)
unless noted otherwise.

All dimensions are in inches (millimeters) unless otherwise
noted.

TRAVERSABLE PIPE GRATE
FOR CONCRETE END
SECTIONS

(See Detail A for dimensions and
details not shown.)

SECTION B-B

SECTION D-D

** Measured perpendicular to top of culvert wall. In addition,
formed hole shall be located a minimum of 6 (150)
measured horizontally from any vertical joints necessary
for construction of the culvert end section.

General Notes

This standard shall only be used on concrete end sections
not skewed more than ± 15 degrees with roadway.

The minimum distance from the center of a hole to the free
edge of a structural shape or plate shall be ≥ 2½ (64)
unless noted otherwise.

All dimensions are in inches (millimeters) unless otherwise
noted.

TRAVERSABLE PIPE GRATE
FOR CONCRETE END
SECTIONS

(See Sheet A for dimensions and
details not shown.)

SECTION B-B

SECTION D-D

** Measured perpendicular to top of culvert wall. In addition,
formed hole shall be located a minimum of 6 (150)
measured horizontally from any vertical joints necessary
for construction of the culvert end section.

General Notes

This standard shall only be used on concrete end sections
not skewed more than ± 15 degrees with roadway.

The minimum distance from the center of a hole to the free
edge of a structural shape or plate shall be ≥ 2½ (64)
unless noted otherwise.

All dimensions are in inches (millimeters) unless otherwise
noted.

TRAVERSABLE PIPE GRATE
FOR CONCRETE END
SECTIONS

(See Sheet A for dimensions and
details not shown.)

SECTION B-B

SECTION D-D

** Measured perpendicular to top of culvert wall. In addition,
formed hole shall be located a minimum of 6 (150)
measured horizontally from any vertical joints necessary
for construction of the culvert end section.

General Notes

This standard shall only be used on concrete end sections
not skewed more than ± 15 degrees with roadway.

The minimum distance from the center of a hole to the free
edge of a structural shape or plate shall be ≥ 2½ (64)
unless noted otherwise.

All dimensions are in inches (millimeters) unless otherwise
noted.

TRAVERSABLE PIPE GRATE
FOR CONCRETE END
SECTIONS
### PIPE-GRATE SCHEDULE FOR PIPE CULVERT END SECTIONS

<table>
<thead>
<tr>
<th>No.</th>
<th>Int. Support</th>
<th>Main Pipe No.</th>
<th>Main Pipe Length</th>
<th>Main Pipe Int. Support</th>
<th>Total Length of Pipe</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2/4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2/6</td>
<td></td>
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</tr>
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**Pipe ID:** (Sheet 2 of 2)

### PIPE-GRATE SCHEDULE FOR ELLIPTICAL PIPE CULVERT END SECTIONS

<table>
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<tr>
<th>No.</th>
<th>Int. Support</th>
<th>Main Pipe No.</th>
<th>Main Pipe Length</th>
<th>Main Pipe Int. Support</th>
<th>Total Length of Pipe</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2/4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2/6</td>
<td></td>
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**Pipe ID:**
### Table: Dimensions

<table>
<thead>
<tr>
<th>Pipe Dia</th>
<th>Thick</th>
<th>NESS</th>
<th>A</th>
<th>B</th>
<th>h</th>
<th>L</th>
<th>W</th>
</tr>
</thead>
<tbody>
<tr>
<td>(400)</td>
<td>(2.01)</td>
<td>(510)</td>
<td>22</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>(305)</td>
<td>(2.01)</td>
<td>(510)</td>
<td>28</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>(280)</td>
<td>(2.01)</td>
<td>(510)</td>
<td>34</td>
<td>34</td>
<td>34</td>
<td>34</td>
<td>34</td>
</tr>
<tr>
<td>(265)</td>
<td>(2.01)</td>
<td>(510)</td>
<td>41</td>
<td>41</td>
<td>41</td>
<td>41</td>
<td>41</td>
</tr>
<tr>
<td>(255)</td>
<td>(2.01)</td>
<td>(510)</td>
<td>46</td>
<td>46</td>
<td>46</td>
<td>46</td>
<td>46</td>
</tr>
</tbody>
</table>

### Notes

1. Type 1 connection may be used for all pipe sizes and includes 12 (300) of the pipe length. The connector section shall be attached to the end section by rivets or bolts and shall be the same metal thickness as the end section. Sub shall be either (8) (6.4) (75x25) or (4) (75x25) depth annular corrugated pipe.

2. Type 2 connection may be used for all pipe sizes. Coupler shall be (8) (6.4) (75x25) dimple, hugger, or annular band of 3 (75x25). The dimple, hugger, or annular band may be used with corrugated metal pipes having annular ends. For corrugated metal pipes having holical ends, only the dimple band will be allowed.

3. Type 4 connection can be used for all pipe sizes. Coupler shall be (51x51x6.4) (8x125). Dimple, hugger, or annular band may be used with corrugated metal pipes having annular ends. For corrugated metal pipes having holical ends, only the dimple band will be allowed.

### Connections of End Sections

- **Type 1**
  - For 22 (550) thru 24 (600) only
  - See Note 3

- **Type 2**
  - For 30 (750) and 36 (900) only
  - See Note 3

- **Type 3**
  - For all pipes
  - See Note 3

- **Type 4**
  - For all pipes
  - See Note 3

### Alternate Strap Connector

- For Type 1 only
- (25) wide, 0.109 (2.77) thick strap with standard H46 (M12x150) band bolt and nut.
# METAL FLARED END

## SECTIONS FOR PIPE ARCHES

### CONNECTIONS OF END SECTIONS

<table>
<thead>
<tr>
<th>Type</th>
<th>Dimensions</th>
<th>Thicker ness</th>
<th>A</th>
<th>B</th>
<th>H</th>
<th>I</th>
<th>W</th>
<th>Body</th>
</tr>
</thead>
<tbody>
<tr>
<td>TYPE 1</td>
<td>For 17x13 (432x330) thru 28x20 (711x460) only</td>
<td>(1.00) (25) wide, 0.109 (2.77) thick strap with standard M12x150 band bolt and nut</td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

### NOTES

1. Type 1 and 2 connection shall be used only with pipes with annular ends.

2. Type 3 connection can be used with all pipe arch sizes and includes 12 (300) of the pipe length. The annular connector section shall be attached to the end section by rings or bolts and shall be the same metal thickness as the end section. When coupling the type 3 end section to a pipe with helical ends, only the dimple type coupling band shall be used.

3. Type 4 connection can be used with all pipe arch sizes. The end section band shall either be a dimple, hugger, or annular band and can be used with pipes having annular ends. For pipes having helical ends, only the dimple end section band will be allowed.

All dimensions are in inches (millimeters) unless otherwise shown.

---

**DATE REVISIONS**

1-1-18 Renamed standard

4-1-18 Revised THICKNESS values in table

---

Illinois Department of Transportation

ENGINEER OF POLICY AND PROCEDURES

**2018**

*ALTERNATE STRAP CONNECTOR (For Type 1 only)*

*END VIEW*

*SIDE VIEW*

*CONNECTIONS OF END SECTIONS*
**Figure 1:** Diagram of Metal Flared End Sections for Pipe Arches (Standard 542406-03)

**Table 1:** Pipe Arch Dimensions

<table>
<thead>
<tr>
<th>Span</th>
<th>Thick. (in)</th>
<th>A</th>
<th>B</th>
<th>H</th>
<th>L</th>
<th>W</th>
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<td>17</td>
<td>13</td>
<td>1.094</td>
<td>1.580</td>
<td>2.380</td>
<td>3.965</td>
<td>5.760</td>
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<td>13</td>
<td>1.094</td>
<td>1.580</td>
<td>2.380</td>
<td>3.965</td>
<td>5.760</td>
</tr>
<tr>
<td>26</td>
<td>10</td>
<td>0.877</td>
<td>1.265</td>
<td>1.945</td>
<td>2.935</td>
<td>4.725</td>
</tr>
<tr>
<td>30</td>
<td>10</td>
<td>0.877</td>
<td>1.265</td>
<td>1.945</td>
<td>2.935</td>
<td>4.725</td>
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<tr>
<td>45</td>
<td>24</td>
<td>0.705</td>
<td>1.065</td>
<td>1.745</td>
<td>2.735</td>
<td>4.525</td>
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</tbody>
</table>

**Notes:***

1. Type 1 and 2 connection shall be used only with pipes with annular ends.
2. Type 3 connection can be used with all pipe arch sizes and includes 12 (300) of the pipe length. The annular connector section shall be attached to the end section by rivets or bolts and shall be the same metal thickness as the end section. When coupling the type 3 end section to a pipe with helical ends, the dimple type coupling ban shall be used.
3. Type 4 connection can be used with all pipe arch sizes. The end section band shall be either a dimple, hugger, or annular band and can be used with pipes having annular ends. For pipes having helical ends, only the dimple end section band will be allowed.

All dimensions are in inches (millimeters) unless otherwise shown.
Typical of both sides.

**Metal End Sections for Round Pipe Culvert**

<table>
<thead>
<tr>
<th>Pipe Dia. (in.)</th>
<th>Metal Thick. (mm)</th>
<th>A</th>
<th>B</th>
<th>Overall Width (in.)</th>
<th>L</th>
<th>Slope 1:4</th>
<th>Slope 1:6</th>
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</thead>
<tbody>
<tr>
<td>15 (375)</td>
<td>0.004 (0.109)</td>
<td>6</td>
<td>6</td>
<td>21</td>
<td>37</td>
<td>(500)</td>
<td>(750)</td>
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<tr>
<td>16</td>
<td>0.004 (0.109)</td>
<td>8</td>
<td>6</td>
<td>24</td>
<td>40</td>
<td>(600)</td>
<td>(900)</td>
</tr>
<tr>
<td>21</td>
<td>0.004 (0.109)</td>
<td>8</td>
<td>6</td>
<td>27</td>
<td>43</td>
<td>(600)</td>
<td>(900)</td>
</tr>
<tr>
<td>24</td>
<td>0.004 (0.109)</td>
<td>8</td>
<td>6</td>
<td>30</td>
<td>46</td>
<td>(600)</td>
<td>(900)</td>
</tr>
<tr>
<td>30</td>
<td>0.010 (0.125)</td>
<td>12</td>
<td>9</td>
<td>36</td>
<td>60</td>
<td>(600)</td>
<td>(900)</td>
</tr>
<tr>
<td>36</td>
<td>0.010 (0.125)</td>
<td>12</td>
<td>9</td>
<td>36</td>
<td>60</td>
<td>(600)</td>
<td>(900)</td>
</tr>
<tr>
<td>42</td>
<td>0.010 (0.125)</td>
<td>16</td>
<td>12</td>
<td>48</td>
<td>60</td>
<td>(600)</td>
<td>(900)</td>
</tr>
<tr>
<td>48</td>
<td>0.010 (0.125)</td>
<td>16</td>
<td>12</td>
<td>48</td>
<td>60</td>
<td>(600)</td>
<td>(900)</td>
</tr>
<tr>
<td>54</td>
<td>0.010 (0.125)</td>
<td>16</td>
<td>12</td>
<td>48</td>
<td>60</td>
<td>(600)</td>
<td>(900)</td>
</tr>
<tr>
<td>60</td>
<td>0.010 (0.125)</td>
<td>16</td>
<td>12</td>
<td>48</td>
<td>60</td>
<td>(600)</td>
<td>(900)</td>
</tr>
</tbody>
</table>

**General Notes**

- See roadway plans for slope (V:H) and pipe diameter.
- Provide traversable pipe grate when specified.
- All slope ratios are expressed as units of vertical displacement to units of horizontal displacement (V:H).

All dimensions are in inches (millimeters) unless otherwise shown.

**SLOPED METAL END SECTIONS**

For pipe culverts 15" (375 mm) thru 60" (1500 mm) dia.

** STANDARD 542411**
SLOPED METAL END SECTIONS
FOR PIPE CULVERTS 15" (375 mm) THRU 60" (1500 mm) DIA.
STANDARD 542411

CROSS DRAINAGE END SECTION - ELEVATION

PARALLEL DRAINAGE END SECTION - ELEVATION

CROSS DRAINAGE END SECTION

PARALLEL DRAINAGE END SECTION

LONGITUDINAL DRAINAGE BAR

PARALLEL BARS

SAFETY BAR DETAILS

TYPICAL INSTALLATION

1. Provide (longitudinal bars) when the span exceeds 30 (750).
Provide additional longitudinal bars as needed so that spacing does not exceed 30 (750) for larger end sections.
**SLOPED METAL END SECTIONS FOR PIPE ARCH CULVERTS 15" (375 mm) THRU 72" (1800 mm) EQUIVALENT DIA.**

**GENERAL NOTES**

See roadway plans for slope (V:H) and pipe diameter.

Provide traversable pipe grate when specified.

All slope ratios are expressed as units of vertical displacement to units of horizontal displacement (V:H).

All dimensions are in inches (millimeters) unless otherwise shown.

**DIMENSIONS**

<table>
<thead>
<tr>
<th>PIPE EQUIV.</th>
<th>METAL THICK.</th>
<th>A</th>
<th>H</th>
<th>W</th>
<th>OVERALL WIDTH</th>
<th>CONGREGATION 2 1/2 x 2 1/2</th>
<th>CONGREGATION 3 x 1 OR 5 x 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>0.064</td>
<td>8</td>
<td>6</td>
<td>46</td>
<td>70</td>
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<td>16</td>
</tr>
<tr>
<td>16</td>
<td>0.064</td>
<td>8</td>
<td>6</td>
<td>46</td>
<td>70</td>
<td>12</td>
<td>16</td>
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<tr>
<td>18</td>
<td>0.064</td>
<td>8</td>
<td>6</td>
<td>46</td>
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<td>12</td>
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</tr>
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<td>20</td>
<td>0.064</td>
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<td>6</td>
<td>46</td>
<td>70</td>
<td>12</td>
<td>16</td>
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<td>24</td>
<td>0.09</td>
<td>12</td>
<td>9</td>
<td>66</td>
<td>100</td>
<td>18</td>
<td>24</td>
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<td>30</td>
<td>0.10</td>
<td>12</td>
<td>9</td>
<td>66</td>
<td>100</td>
<td>18</td>
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<td>36</td>
<td>0.10</td>
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<td>9</td>
<td>66</td>
<td>100</td>
<td>18</td>
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</tr>
<tr>
<td>42</td>
<td>0.10</td>
<td>16</td>
<td>12</td>
<td>94</td>
<td>125</td>
<td>24</td>
<td>32</td>
</tr>
<tr>
<td>48</td>
<td>0.10</td>
<td>16</td>
<td>12</td>
<td>94</td>
<td>125</td>
<td>24</td>
<td>32</td>
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<tr>
<td>54</td>
<td>0.10</td>
<td>16</td>
<td>12</td>
<td>94</td>
<td>125</td>
<td>24</td>
<td>32</td>
</tr>
<tr>
<td>60</td>
<td>0.10</td>
<td>16</td>
<td>12</td>
<td>94</td>
<td>125</td>
<td>24</td>
<td>32</td>
</tr>
<tr>
<td>66</td>
<td>0.10</td>
<td>16</td>
<td>12</td>
<td>94</td>
<td>125</td>
<td>24</td>
<td>32</td>
</tr>
<tr>
<td>72</td>
<td>0.10</td>
<td>16</td>
<td>12</td>
<td>94</td>
<td>125</td>
<td>24</td>
<td>32</td>
</tr>
</tbody>
</table>

**GENERAL NOTES**

See roadway plans for slope (V:H) and pipe diameter.

Provide traversable pipe grate when specified.

All slope ratios are expressed as units of vertical displacement to units of horizontal displacement (V:H).

All dimensions are in inches (millimeters) unless otherwise shown.

**DATE**

1-1-18 New standard

**STANDARD 542416**
Provide longitudinal bars when the span exceeds 30 (750). Provide additional longitudinal bars as needed so that spacing does not exceed 30 (750) for larger end sections.

**LONGITUDINAL DRAINAGE BAR**

1 x 1/8 (25 x 16)

3 (75) galvanized steel pipe:
- Flatten end; then bend outside 4 (100) to match end section sides.

**SAFETY BAR DETAILS**

**CROSS DRAINAGE END SECTION**

**PARALLEL DRAINAGE END SECTION - ELEVATION**

**PRELIMINARY DRAINAGE BARS**

**SAFETY BARS**

**LONGITUDINAL DRAINAGE BARS**

**PARALLEL BARS**

**TYPICAL INSTALLATION**

**SLOPED METAL END SECTIONS FOR PIPE**

**ARCH CULVERTS 15" (375 mm) THRU 72" (1800 mm) EQUIVALENT DIA.**

**STANDARD 542416**
Sketch showing location and direction of box in relation to median.

Material required for one inlet box

<table>
<thead>
<tr>
<th>Bar</th>
<th>Qty.</th>
<th>Size</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>h</td>
<td>10</td>
<td>No. 6</td>
<td>9'-5&quot;</td>
</tr>
<tr>
<td>w</td>
<td>10</td>
<td>No. 6</td>
<td>6'-3&quot;</td>
</tr>
<tr>
<td>u1</td>
<td>1</td>
<td>No. 6</td>
<td>3'-8&quot;</td>
</tr>
<tr>
<td>v</td>
<td>6</td>
<td>No. 6</td>
<td>2'-5&quot;</td>
</tr>
<tr>
<td>v1</td>
<td>4</td>
<td>No. 6</td>
<td>2'-4&quot;</td>
</tr>
<tr>
<td>v2</td>
<td>2</td>
<td>No. 6</td>
<td>1'-8&quot;</td>
</tr>
<tr>
<td>Galv. Steel Pipe</td>
<td>8'-0&quot;</td>
<td>O.D.</td>
<td>2 1/2</td>
</tr>
<tr>
<td>Concrete</td>
<td>cu. yds.</td>
<td>(m³)</td>
<td>1.2</td>
</tr>
<tr>
<td>Reinf. Bars</td>
<td>lbs. (kg)</td>
<td>115 (52.2)</td>
<td></td>
</tr>
</tbody>
</table>

Bars u & u1

All slope ratios are expressed as units of vertical displacement to units of horizontal displacement (V/H).

All dimensions are in inches (millimeters) unless otherwise shown.

GENERAL NOTES

Switched units to English (metric).

Soft converted metric reinforcement bars.
### Material required for one inlet box

<table>
<thead>
<tr>
<th>Bar</th>
<th>Qty</th>
<th>Size</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>h</td>
<td>4</td>
<td>No. 4</td>
<td>12'-4&quot; (3.76 m)</td>
</tr>
<tr>
<td>v1</td>
<td>2</td>
<td>No. 4</td>
<td>9'-4&quot; (2.84 m)</td>
</tr>
<tr>
<td>v2</td>
<td>2</td>
<td>No. 4</td>
<td>12'-8&quot; (3.86 m)</td>
</tr>
<tr>
<td>h1</td>
<td>2</td>
<td>No. 4</td>
<td>2'-0&quot; (0.60 m)</td>
</tr>
<tr>
<td>u</td>
<td>5</td>
<td>No. 4</td>
<td>6'-5&quot; (1.95 m)</td>
</tr>
<tr>
<td>u1</td>
<td>5</td>
<td>No. 4</td>
<td>5'-11&quot; (1.80 m)</td>
</tr>
<tr>
<td>u2</td>
<td>5</td>
<td>No. 4</td>
<td>5'-10&quot; (1.75 m)</td>
</tr>
</tbody>
</table>

- v bars at 12 (300) cts

### PLAN OF REINFORCEMENT

- Bars u, u1 & u2
- u bars: Top & Bottom

### GENERAL NOTES

- All slope ratios are expressed as units of vertical displacement to units of horizontal displacement (V/H).
- All dimensions are in inches (millimeters) unless otherwise shown.

### INLET BOX

**TYPE 24 (600) B**

**STANDARD 542506-03**

**DATE**
- 1-1-97: Issued
- 1-1-16: Passed

**REVISIONS**
- 1-1-09: Switched units to English (metric).
- 1-1-16: Increased length of inlet box to provide clearance for top u-bolt.

**ILLINOIS DEPARTMENT OF TRANSPORTATION**

**ENGINEER OF POLICY AND PROCEDURES**

**APPROVED**

**ENGINEER OF DESIGN AND ENVIRONMENT**

**ISSUED**

**PASSED**

**DATE**

**REVISIONS**

- 1-1-16: Increased length of inlet box to provide clearance for top u-bolt.

- 1-1-09: Switched units to English (metric).
SECTION A-A

PLAN

BAR

QTY

SIZE

LENGTH

h 10 No. 4 (No. 13) 3'-6" (1.05 m)

v 13 No. 4 (No. 13) 6'-5" (1.95 m)

u1 3 No. 4 (No. 13) 3'-11" (1.20 m)

u2 2 No. 4 (No. 13) 3'-10" (1.20 m)

v 8 No. 4 (No. 13) 6'-0" (1.80 m)

v1 6 No. 4 (No. 13) 6'-0" (1.80 m)

v2 6 No. 4 (No. 13) 6'-0" (1.80 m)

Concrete Reinf. Bars

Galv. Steel Pipe

cu. yds. (m³)

lbs. (kg)

1.11

1.45

1.9

1.83

12'-2" (3.65 m)

6'-6" (2.00 m)

5'-11" (1.80 m)

5'-9" (1.75 m)

30

24

18

Concrete Reinf. Bars

Galv. Steel Pipe

cu. yds. (m³)

lbs. (kg)

1.11

1.45

1.9

1.83

12'-2" (3.65 m)

6'-6" (2.00 m)

5'-11" (1.80 m)

5'-9" (1.75 m)

30

24

18

GENERAL NOTES

All slope ratios are expressed as units of vertical displacement to units of horizontal displacement (V:H).

All dimensions are in inches (millimeters) unless otherwise shown.

INLET BOX

TYPE 24 (600) C

STANDARD 542511-02

DATE

REVISIONS

1-1-09

Switched units to English (metric).

1-1-07

Soft converted metric

ENGINEER OF DESIGN AND ENVIRONMENT

Issued 1-1-97

Passed 1-1-97

Engineer of Policy and Procedures

Jan 1, 2009

Jan 1, 2009

ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED

1-1-97

PASSED

DATE

REVISIONS

1-1-09

Switched units to English (metric).

1-1-07

Soft converted metric

reinforcement bars

3'-0" (1.00 m) u2

3'-5" (1.05 m) u1 & u2

10 (250)

18 (450)

15 (375)

22 (555)

22 (555)

3'-8" (1.11 m)

o. -15 (175)

o. -15 (175)

175 (4.50 m)

20 (500)

24 (610)

18 (460)

30 (760)

12'-0" (3.65 m)

6'-5" (1.95 m)

5'-11" (1.80 m)

5'-10" (1.75 m)

3'-4" (1.00 m) u2

3'-5" (1.05 m) u1 & u2

15 (375) u1 & u2

18 (450) u

0.4 (100)

0.4 (100)

0.4 (100)

0.4 (100)

0.4 (100)

0.4 (100)
GENERAL NOTES

All slope ratios are expressed as units of vertical displacement to units of horizontal displacement (V/H).

All dimensions are in inches (millimeters) unless otherwise shown.

INLET BOX

TYPE 24 (600) D

STANDARD 542516-03

Bar h1

Bar u & u1

SECTION A-A

PLAN

PLAN OF REINFORCEMENT

Traffic

Sketch showing location and direction of box in relation to ditch.
3 (75) Below normal slope

Bars u, u1 & u2

SECTION A-A

SECTION B-B

GENERAL NOTES

All slope ratios are expressed as units of vertical displacement to units of horizontal displacement (V/H).

All dimensions are in inches (millimeters) unless otherwise shown.

Material required for one inlet box

<table>
<thead>
<tr>
<th>Bar</th>
<th>Qty.</th>
<th>Size</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>h</td>
<td>8</td>
<td>No. 6 (No. 13)</td>
<td>3'-0&quot; (0.91 m)</td>
</tr>
<tr>
<td>h1</td>
<td>2</td>
<td>No. 6 (No. 13)</td>
<td>9'-0&quot; (2.75 m)</td>
</tr>
<tr>
<td>v</td>
<td>5</td>
<td>No. 6 (No. 13)</td>
<td>5'-0&quot; (1.50 m)</td>
</tr>
<tr>
<td>u</td>
<td>9</td>
<td>No. 6 (No. 13)</td>
<td>6'-0&quot; (1.83 m)</td>
</tr>
<tr>
<td>u1</td>
<td>3</td>
<td>No. 6 (No. 13)</td>
<td>5'-11&quot; (1.80 m)</td>
</tr>
<tr>
<td>u2</td>
<td>2</td>
<td>No. 6 (No. 13)</td>
<td>5'-10&quot; (1.78 m)</td>
</tr>
<tr>
<td>v1</td>
<td>6</td>
<td>No. 6 (No. 13)</td>
<td>2'-11&quot; (0.70 m)</td>
</tr>
<tr>
<td>v2</td>
<td>6</td>
<td>No. 6 (No. 13)</td>
<td>1'-11&quot; (0.35 m)</td>
</tr>
</tbody>
</table>

Concrete

cu. yds. (m³)

5

lbs. (kg)

175

Galv. Steel Pipe

35 (89)
0.6

4

2'-11" (0.70 m)

Inlet Box

TYPE 24 (600) E

STANDARD 542521-02

1-1-07

Soft converted metric
reinforcement bars

1-1-09

Switched units to
English (metric)

1-1-09

Polymer conversion

1-1-09

Reducer

1-1-09

English (metric)

1-1-09

Inlet Box

1-1-09

Type 24

1-1-09

Polymer conversion

1-1-09

Reducer

1-1-09

English (metric)
Steel plate
(1/6) O.D. hex
lock nut & washer

SECTION D-D

SECTION C-C

TOP ANCHOR PLATE
(1 - required)

Traffic
1 : 6 Slope

Sketch showing location and direction of box in relation to 6 Medians.

Traffic

1/2 (M12) U BOLT
(2 - required)

INLET BOX
TYPE 24 (600) E

DETAIL AT BLOCKOUTS

35/8" O.D. galv. steel pipe
GENERAL NOTES

If field conditions permit, the bottom of the inlet box shall have a 2 (50) slope.

All close tolerances are expressed as units of vertical displacement to units of horizontal displacement (V:H).

All dimensions are in inches (millimeters) unless otherwise shown.
TYPICAL STEEL GRATING

Concrete
Reinf. Bars
Grating

Material Required for One Inlet Box

<table>
<thead>
<tr>
<th>Bar No.</th>
<th>Size</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>h</td>
<td>No. 6</td>
<td>22'9&quot;</td>
</tr>
<tr>
<td>u1</td>
<td>No. 13</td>
<td>11'0&quot;</td>
</tr>
<tr>
<td>l</td>
<td>No. 6</td>
<td>24&quot;</td>
</tr>
<tr>
<td>u</td>
<td>No. 13</td>
<td>6'9&quot;</td>
</tr>
<tr>
<td>u1</td>
<td>No. 13</td>
<td>5'11&quot;</td>
</tr>
<tr>
<td>u2</td>
<td>No. 13</td>
<td>5'10&quot;</td>
</tr>
<tr>
<td>v</td>
<td>No. 6</td>
<td>30&quot;</td>
</tr>
<tr>
<td>u1</td>
<td>No. 13</td>
<td>27&quot;</td>
</tr>
<tr>
<td>v2</td>
<td>No. 13</td>
<td>24&quot;</td>
</tr>
<tr>
<td>v3</td>
<td>No. 13</td>
<td>18&quot;</td>
</tr>
<tr>
<td>Concrete</td>
<td>cu. yds.</td>
<td>3.4</td>
</tr>
<tr>
<td>Reinf. Bars</td>
<td>lbs.</td>
<td>250</td>
</tr>
<tr>
<td>Grating</td>
<td>sq. ft.</td>
<td>70.4</td>
</tr>
</tbody>
</table>

SECTION B-B

TYPICAL CORNER OF STEEL GRATING FRAME

3 x 6 (76 x 150)
support bar, each end

4 x 3 x 6
(1102 x 76 x 150)
single frame

1/2 x 2 x 6
(33 x 50 x 150)
bent bars

INLET BOX
TYPE 24 (600) F

DETAIL B

DETAIL C

SECTION D-D

TYPICAL CAST GRATING

Illinois Department of Transportation

ENGINEER OF POLICY AND PROCEDURES
APPROVED

January 1, 2011

PROJECT MANAGER

APPROVED

January 1, 2011

ENGINEER OF DESIGN AND ENVIRONMENT
ISSUED

1-1-97

PASSED

STANDARD 542526-03
SECTION A-A

NOTE:
Culvert pipe may exit from the side (or sides) by changing reinforcement bars in that area and in the headwall end of box.

Traffic

INLET BOX
TYPE 24 (600) G

DATE
REVISIONS
1-1-11
Added 36 (910) dimension to plan view. Corrected weld symbols on Sheet 2.
1-1-09
Revised units to English (metric). Revised General Notes.

INLET BOX
TYPE 24 (600) G

GENERAL NOTES
If field conditions will permit, bottom of inlet box shall have 1:10 slope.

All slope ratios are expressed as units of vertical displacement to units of horizontal displacement (V:H).

All dimensions are in inches (millimeters) unless otherwise shown.

Detail showing exit from side (or sides)
Material Required for One Inlet Box

<table>
<thead>
<tr>
<th>Bar</th>
<th>No.</th>
<th>Size</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>h</td>
<td>10</td>
<td>No. 4 (No. 13)</td>
<td>20'-8&quot; (6.20 m)</td>
</tr>
<tr>
<td>u</td>
<td>17</td>
<td>No. 4 (No. 13)</td>
<td>5'-9&quot; (1.76 m)</td>
</tr>
<tr>
<td>u1</td>
<td>6</td>
<td>No. 4 (No. 13)</td>
<td>0'-13&quot; (1.00 m)</td>
</tr>
<tr>
<td>u2</td>
<td>1</td>
<td>No. 4 (No. 13)</td>
<td>5'-6&quot; (1.68 m)</td>
</tr>
<tr>
<td>v</td>
<td>2</td>
<td>No. 4 (No. 13)</td>
<td>3'-3&quot; (1.00 m)</td>
</tr>
<tr>
<td>v1</td>
<td>6</td>
<td>No. 4 (No. 13)</td>
<td>1'-0&quot; (0.30 m)</td>
</tr>
<tr>
<td>v2</td>
<td>10</td>
<td>No. 4 (No. 13)</td>
<td>1'-0&quot; (0.30 m)</td>
</tr>
<tr>
<td>v3</td>
<td>10</td>
<td>No. 4 (No. 13)</td>
<td>1'-0&quot; (0.30 m)</td>
</tr>
</tbody>
</table>

Concrete
Cu. YDS (m³) 3.2 (0.24)

Reinf. Bars
lbs (kg) 270 (122)

Grating
(sq. ft.) 56.6 (3.29)

SECTION B-B

TYPICAL STEEL GRATING

TYPICAL CORNER OF STEEL GRATING FRAME

TYPICAL CAST GRATING

DETAIL B

SECTION C-C

DETAIL C

SECTION D-D

INLET BOX
TYPE 24 (600) G

STANDARD 542531-04
Traffic

1:6 Slope

\( \text{Ditch} \)

Sketch showing location and direction of box in relation to \( \text{Ditch} \).

**GENERAL NOTES**

All slope ratios are expressed as units of vertical displacement to units of horizontal displacement (V:H).

All dimensions are in inches (millimeters) unless otherwise shown.

**INLET BOX**

**TYPE 36 (900) A**

**PLAN**

**SECTION A-A**

**SECTION D-D**

**PLAN OF REINFORCEMENT**

**Material required for one inlet box**

<table>
<thead>
<tr>
<th>Bar</th>
<th>Qty.</th>
<th>Size</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>h</td>
<td>9</td>
<td>No. 4</td>
<td>12'-10&quot;</td>
</tr>
<tr>
<td>h1</td>
<td>4</td>
<td>No. 13</td>
<td>9'-3&quot;</td>
</tr>
<tr>
<td>h2</td>
<td>6</td>
<td>No. 4</td>
<td>9'-3&quot;</td>
</tr>
<tr>
<td>h3</td>
<td>10</td>
<td>No. 4</td>
<td>30&quot;</td>
</tr>
<tr>
<td>v1</td>
<td>14</td>
<td>No. 13</td>
<td>30&quot;</td>
</tr>
<tr>
<td>v2</td>
<td>8</td>
<td>No. 13</td>
<td>18&quot;</td>
</tr>
<tr>
<td>v3</td>
<td>10</td>
<td>No. 4</td>
<td>18&quot;</td>
</tr>
<tr>
<td>Concrete</td>
<td>cu. yds.</td>
<td>3' 9&quot;</td>
<td></td>
</tr>
<tr>
<td>Reinf. Bars</td>
<td>lbs.</td>
<td>119 (545)</td>
<td></td>
</tr>
<tr>
<td>Galv. Steel Pipe</td>
<td>O.D.</td>
<td>2 at 18'-10&quot; (5.50 m)</td>
<td></td>
</tr>
<tr>
<td>Galv. Steel Angle</td>
<td>3x2x2x (51x51x9.5)</td>
<td>2 at 12'-10&quot; (3.90 m)</td>
<td></td>
</tr>
</tbody>
</table>

**Concrete Reinf. Bars**

**Galv. Steel Pipe**

**Galv. Steel Angle**

**No. 4 (No. 13)**

**Section A-A.**

Corrected 3'-11" vertical dimension line in English (metric).

**INLET BOX**

**TYPE 36 (900) A**

**Sheets of 2**
TOP ANCHOR PLATE
(2 required)

SECTION B-B

END VIEW

SECTION C-C

DETAIL AT BLOCKOUTS

INLET BOX
TYPE 36 (900) A

STANDARD 542536-03

Illinois Department of Transportation
January 1, 2010
ENGINEER OF POLICY AND PROCEDURES
APPROVED
January 1, 2010
ENGINEER OF DESIGN AND ENVIRONMENT
ISSUED
1-1-97
PASSED
Material required for one inlet box:

<table>
<thead>
<tr>
<th>Bar</th>
<th>Qty</th>
<th>Size</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>h</td>
<td>21</td>
<td>No. 4 (No. 13)</td>
<td>3'-9&quot; (4.65 m)</td>
</tr>
<tr>
<td>h2</td>
<td>8</td>
<td>No. 4 (No. 13)</td>
<td>4'-8&quot; (1.46 m)</td>
</tr>
<tr>
<td>h3</td>
<td>2</td>
<td>No. 4 (No. 13)</td>
<td>4'-9&quot; (1.47 m)</td>
</tr>
<tr>
<td>v</td>
<td>6</td>
<td>No. 4 (No. 13)</td>
<td>2'-2&quot; (0.66 m)</td>
</tr>
<tr>
<td>u</td>
<td>16</td>
<td>No. 4 (No. 13)</td>
<td>8'-9&quot; (2.66 m)</td>
</tr>
<tr>
<td>u1</td>
<td>2</td>
<td>No. 4 (No. 13)</td>
<td>2'-9&quot; (0.84 m)</td>
</tr>
<tr>
<td>v</td>
<td>8</td>
<td>No. 4 (No. 13)</td>
<td>4'-9&quot; (1.47 m)</td>
</tr>
<tr>
<td>v1</td>
<td>6</td>
<td>No. 4 (No. 13)</td>
<td>3'-6&quot; (1.04 m)</td>
</tr>
<tr>
<td>v2</td>
<td>13</td>
<td>No. 4 (No. 13)</td>
<td>3'-9&quot; (1.14 m)</td>
</tr>
<tr>
<td>v3</td>
<td>18</td>
<td>No. 4 (No. 13)</td>
<td>4'-8&quot; (1.46 m)</td>
</tr>
<tr>
<td>Concrete</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rein. Bars</td>
<td>lbs.</td>
<td>324</td>
<td>(147)</td>
</tr>
<tr>
<td>Galv. Steel Pipe</td>
<td>cu. yds.</td>
<td>5.0</td>
<td>(3.80)</td>
</tr>
</tbody>
</table>

**GENERAL NOTES**

All slope ratios are expressed as units of vertical displacement to units of horizontal displacement (V:H).

All dimensions are in inches (millimeters) unless otherwise shown.

**INLET BOX**

**TYPE 48 (1200) A**

**PLAN**

Sketch showing location and direction of box in relation to Q of ditch.
Remove concrete along these lines. Clean reinforcement for either tied or welded laps of longitudinal and circumferential reinforcement.

21 (530) min.

8 (200)

16 (40) min., 25 (65) max. (Tied lap)
16 (40) min., 8 (120) max. (Welded lap)

1/8 (3) in.

See DETAIL A for laps.

2. Each reinforcement shall have a minimum of 0.049 sq. in. (0.3161 sq. mm) nominal area when opening is greater than 25 (65). Mortar shall be flush with pipe.

All dimensions are in inches (millimeters) unless otherwise shown.

2-1-11 - Corr. weld sym. on WELDED
LAP det. Added pipe dia. to
G1 line. Set elbows to 15° max.

3-1-10 - Corrected pipe diameter
dimension lines

DATE
REVISIONS
2-1-11
LAP det. Added pipe dia. to
G1 line. Set elbows to 15° max.
3-1-10
Corrected pipe diameter
dimension lines

REINFORCED CONCRETE PIPE
ELBOW 24°, 30° OR 36°
(600 mm, 750 mm OR 900 mm)

STANDARD 542601-03
Inner cage circumferential reinforcement = 0.01 sq. in./ft. (212 mm²/m) (min.) longitudinal reinforcement is same as for 36 (900) riser.

End connection to fit pipe used.

Longitudinal reinforcement = 0.049 sq. in./ft. (104 mm²/m) (min.) spaced at 6 (150) cts. or equivalent to W2.5 (4.496) spaced at 6 (150) cts.

For 24 (600) pipe riser, weld outer reinforcement cage of barrel to outer reinforcement cage of riser.

For 36 (900) pipe riser, weld outer reinforcement cage of barrel to outer reinforcement cage of riser.

Remove concrete in existing pipe along this line. Clean reinforcement for either tied or welded laps of longitudinal and circumferential reinforcement per detail.

All dimensions are in inches (millimeters) unless otherwise shown.

REINFORCED CONCRETE PIPE TEE

STANDARD 542606-02
Grout headwall Back of headwall

Rodent shield inserted 4 - 6 (100-150) into pipe.

Optional handling hole No. 4 (No. 13) bar h

No. 4 (No. 13) reinf. bar and 24 (600) long No. 4 (No. 13) reinf. bar

Concrete headwall for pipe underdrains

GENERAL NOTES

An alternate paved invert meeting the approval of the Engineer may be substituted for that shown in side view.

All dimensions are in inches (millimeters) unless otherwise shown.

REFERENCES

PASSED April 1, 2016

ENGINEER OF DESIGN AND ENVIRONMENT

APPROVED

ENGINEER OF POLICY AND PROCEDURES

Issued

Switched units to English (metric).

Renamed standard to be consistent with specs and other standards.
**MATERIALS FOR WALLS**

<table>
<thead>
<tr>
<th>ALTERNATE</th>
<th>D</th>
<th>C*</th>
<th>T (min.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concrete Masonry</td>
<td>4'-0&quot; (1.2 m)</td>
<td>30 (750)</td>
<td>5 (125)</td>
</tr>
<tr>
<td>Brick Masonry</td>
<td>5'-0&quot; (1.5 m)</td>
<td>9'-0&quot; (2.7 m)</td>
<td>8 (200)</td>
</tr>
<tr>
<td>Precast Reinforced</td>
<td>4'-0&quot; (1.2 m)</td>
<td>30 (750)</td>
<td>4 (100)</td>
</tr>
<tr>
<td>Concrete Section</td>
<td>5'-0&quot; (1.5 m)</td>
<td>9'-0&quot; (2.7 m)</td>
<td>5 (125)</td>
</tr>
<tr>
<td>Cast-in-place Concrete</td>
<td>4'-0&quot; (1.2 m)</td>
<td>30 (750)</td>
<td>6 (150)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ALTERNATE BOTTOM SLAB</th>
</tr>
</thead>
</table>

- For precast reinforced concrete sections, dimension "C" may vary from the dimension given to plus 6 (150).

**GENERAL NOTES**

Bottom slabs shall be reinforced with a minimum of 0.20 sq. in./ft (420 sq. mm/m) in both directions with a maximum spacing of 12 (300).

Bottom slabs may be connected to the riser as determined by the fabricator; however, only a single row of reinforcement around the perimeter may be utilized.

See Standard 602601 for optional precast reinforced concrete flat slab top.

See Standard 602701 for details of steps.

All dimensions are in inches (millimeters) unless otherwise shown.

**CATCH BASIN**

**TYPE A**

**STANDARD 602001-02**
MATERIALS REQUIRED FOR ONE (1)

**TYPE B CATCH BASIN**

<table>
<thead>
<tr>
<th>Bar</th>
<th>Qty</th>
<th>Size</th>
<th>Shape</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>h</td>
<td>1</td>
<td>No. 4</td>
<td>(No. 13)</td>
<td>3'-5&quot; (1.02 m)</td>
</tr>
<tr>
<td>u</td>
<td>14</td>
<td>No. 4</td>
<td>(No. 13)</td>
<td>6'-9&quot; (2.07 m)</td>
</tr>
<tr>
<td>x</td>
<td>16</td>
<td>No. 4</td>
<td>(No. 13)</td>
<td>6'-9&quot; (2.07 m)</td>
</tr>
</tbody>
</table>

Concrete: 2.5 (1.90) cu. yd. (m³)

Reinforcement bars: 210 (95) lbs. (kg)

All bars shall be at 12 (300) centers unless otherwise shown. Reinforcement bar clearance shall be 16 (40).

GENERAL NOTES

See Standard 602006-04 for details of steps.

All dimensions are in inches (millimeters) unless otherwise shown.
**ALTERNATE MATERIALS FOR WALLS**

<table>
<thead>
<tr>
<th>Material</th>
<th>T (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Precast Reinforced Concrete Section</td>
<td>3 (75)</td>
</tr>
<tr>
<td>Concrete Masonry Unit</td>
<td>5 (125)</td>
</tr>
<tr>
<td>Cast-in-Place Concrete</td>
<td>6 (150)</td>
</tr>
<tr>
<td>Brick Masonry</td>
<td>8 (200)</td>
</tr>
</tbody>
</table>

**Alternate Bottom Slab**

- **Precast Reinforced Concrete Slab**
- **Prefabricated concrete slabs, when the precast reinforced concrete sections alternate is used.**
- **Sand cushion** sections alternate is used.

**ELEVATION**

- **Top of masonry**
- **Reinforced cast-in-place concrete**
- **Sand cushion**

**GENERAL NOTES**

- Bottom slabs shall be reinforced with a minimum of 0.27 sq. in./ft. (570 sq. mm/m) in both directions with a maximum spacing of 9 (230).
- Bottom slabs may be connected to the riser as determined by the fabricator; however, only a single row of reinforcement around the perimeter may be utilized.

All dimensions are in inches (millimeters) unless otherwise shown.

**DATE**

- **REVISIONS**
  - 1/1/11: Detailed view in slabs
  - Added max. limit to height
  - Added general notes
  - 1/1/09: Switched units to English (metric)

**CATCH BASIN TYPE C**

**STANDARD 602011-02**
**GENERAL NOTES**

Bottom slabs shall be reinforced with a minimum of 0.20 sq. in./ft. (420 sq. mm/m) in both directions with a maximum spacing of 12 (300).

Bottom slabs may be connected to the riser as determined by the fabricator; however, only a single row of reinforcement around the perimeter may be utilized.

See Standard 602701 for details of steps.

See Standard 602701 for optional precast reinforced concrete flat slab top.

All dimensions are in inches (millimeters) unless otherwise shown.

---

**ALTERNATE BOTTOM SLAB**

**MATERIALS FOR WALLS**

<table>
<thead>
<tr>
<th>ALTERNATE</th>
<th>D (in)</th>
<th>C* (in)</th>
<th>T (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concrete Masonry Unit</td>
<td>36 (900)</td>
<td>15 (380)</td>
<td>5 (125)</td>
</tr>
<tr>
<td></td>
<td>4&quot; (100)</td>
<td>30 (760)</td>
<td>5 (125)</td>
</tr>
<tr>
<td>Brick Masonry</td>
<td>36 (900)</td>
<td>15 (380)</td>
<td>8 (200)</td>
</tr>
<tr>
<td></td>
<td>4&quot; (100)</td>
<td>30 (760)</td>
<td>8 (200)</td>
</tr>
<tr>
<td>Precast Reinforced Concrete Section</td>
<td>36 (900)</td>
<td>15 (380)</td>
<td>3 (75)</td>
</tr>
<tr>
<td></td>
<td>4&quot; (100)</td>
<td>30 (760)</td>
<td>4 (100)</td>
</tr>
<tr>
<td>Cast-in-Place Concrete</td>
<td>36 (900)</td>
<td>15 (380)</td>
<td>6 (150)</td>
</tr>
<tr>
<td></td>
<td>4&quot; (100)</td>
<td>30 (760)</td>
<td>6 (150)</td>
</tr>
</tbody>
</table>

* For precast reinforced concrete sections, dimension "C*" may vary from the dimension given to plus 6 (150).

---

**DATE**

1-1-11

**REVISES**

1-1-11

Dated: 1-1-11

Illinois Department of Transportation

**PASSED**

January 1, 2011

**APPROVED**

January 1, 2011

**ENGINEER OF POLICY AND PROCEDURES**

---

**CATCH BASIN**

**TYPE D**

**STANDARD 602016-02**
These structures are for use with concrete barrier, double face, 32 (815) height (Standard 637001). The reinforcement shown in the front elevation of the Type 2 is typical for both elevations of all types. See Standard 602101 for details of steps. Exposed edges shall be beveled 45°. All dimensions are in inches (millimeters) unless otherwise shown.
REINFORCED LID - TYPE 1 & 2

REINFORCED LID - TYPE 3

No. 4 (No. 13) Bar h
No. 3 (No. 10) Bar s
No. 6 (No. 19) Bar t
No. 5 (No. 16) Bar t1

DRAINAGE STRUCTURES TYPES 1, 2 & 3

STANDARD 602101-02
Type 20 frame & grate

Flow

Concrete barrier

Steps at 12:16
(300-400) cts.

For locations & elevations see plans.

Optional cond., pl.

Type 21 frame & grate

Flow

Concrete barrier

Use mortar or sealer (typ.)

For locations and elevations see plans.

GENERAL NOTES

These structures are for use with concrete barrier, double face, 42 (1065) height (Standard 637006).

The reinforcement shown in the front elevation of the Type 5 is typical for both elevations of all types.

See Standard 602701 for details of steps.

Exposed edges shall be beveled 1:19.

All dimensions are in inches (millimeters) unless otherwise shown.
### ALTERNATE MATERIALS FOR WALLS

<table>
<thead>
<tr>
<th>Material</th>
<th>Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>BRICK MASONRY</td>
<td>8 (200)</td>
</tr>
<tr>
<td>CAST-IN-PLACE CONCRETE</td>
<td>6 (150)</td>
</tr>
<tr>
<td>CONCRETE MASONRY UNIT</td>
<td>3 (125)</td>
</tr>
<tr>
<td>PRECAST REINFORCED CONCRETE SECTION</td>
<td>3 (75)</td>
</tr>
</tbody>
</table>

---

**PLAN**

- Top of masonry
- Concrete fill, 4%
- Diameter 24 (600)
- Pipe to be laid on a minimum grade of 1%
- Reinforced cast-in-place concrete

**ELEVATION**

- Precast reinforced concrete slab
- Sand cushion
- Bottom slabs may be connected to the riser as determined by the fabricator; however, only a single row of reinforcement around the perimeter may be utilized.

---

**GENERAL NOTES**

- Bottom slabs shall be reinforced with a minimum of 0.24 sq. in./ft. (0.10 sq. mm/m) in both directions with a maximum spacing of 10 (250).

---

**ALTERNATE METHODS**

- Increased height to 72 (1800) maximum.
- Detailed Rein. in slabs.
- Added max. limit to height.
- Added general notes.

---

**DATE** | **REVISIONS**
---|---
1-1-14 | Increased height to 72 (1800) maximum.
1-1-11 | Detailed Rein. in slabs.
| Added max. limit to height.
| Added general notes.
For precast reinforced concrete sections, this dimension may vary from the dimension given to plus 6 (150).

**Materials for Walls**

<table>
<thead>
<tr>
<th>ALTERNATE MATERIALS FOR WALLS</th>
<th>T (min.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concrete Masonry Unit</td>
<td>5 (175)</td>
</tr>
<tr>
<td>Brick Masonry</td>
<td>8 (200)</td>
</tr>
<tr>
<td>Precast Reinforced Concrete Section</td>
<td>3 (75)</td>
</tr>
<tr>
<td>Cast-in-Place Concrete</td>
<td>6 (150)</td>
</tr>
</tbody>
</table>

**General Notes**

Bottom slabs shall be reinforced with a minimum of 0.20 sq. in./ft. (0.42 sq. mm/m) in both directions with a maximum spacing of 12 (300).

Bottom slabs may be connected to the river as determined by the fabricator; however, only a single row of reinforcement around the perimeter may be utilized.

See Standard 602601 for optional Precast Reinforced Concrete Flat Slab Top.

All dimensions are in inches (millimeters) unless otherwise shown.

**Alternate Bottom Slab**

- Precast reinf. conc. slab when the precast reinf. conc. sections alternate is used.
- Precast reinforced concrete slab

**Elevation - Eccentric**

- Top of masonry
- Reinforced cast-in-place concrete

**Elevation - Concentric**

- Top of masonry
- Reinforced cast-in-place concrete

**Inlet - Type B**

**Date**

<table>
<thead>
<tr>
<th>1-1-11</th>
<th>Detailed view in slabs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-1-09</td>
<td>Revised notes.</td>
</tr>
<tr>
<td>1-1-97</td>
<td>Switched units to English (metric).</td>
</tr>
</tbody>
</table>

Illinois Department of Transportation

January 1, 2011

Engineer of Policy and Procedures

Approved

January 1, 2011

Engineer of Design and Environment

Issued
**SECTION THRU MANHOLE**

*With flat slab top only*

- **Flat slab top**
- **Concrete fill** 2% max.
- **Sand cushion**

**Top Slab Joint Configurations**

- Bar c'
- Mortar or sealer

**Bottom Slab Joint Configurations**

- Mortar or sealer

---

**GEOMETRIC LIMITS**

Oversized holes, as necessary for constructability, shall satisfy the following requirements:

1. A minimum of 9 (230) of monolithic reinforced concrete shall be maintained above the fabricated pipe hole.
2. A minimum 9 (230) inside arc length of reinforced concrete, extending vertically from bottom slab to top slab, shall be maintained between the fabricated pipe holes.
3. A maximum of 60 percent of the inside perimeter of the reinforced concrete manhole walls may be removed.
4. Horizontal joints through pipe holes shall be spliced when the remaining column between holes, measured along inside arc length, is less than 24 (600). See detail.
5. The recommended oversized hole is equal to the O.D. of the pipe plus 4 (100).

---

**Shear Key Geometry**

- (Reinforcement not shown for clarity)

---

**Concrete Fill**

- Concrete fill

---

**Mortar or Sealer**

- Mortar or sealer

---

**Revisions**

- Added max. limit to height.
- Revised general notes.

---

**DATE**

- 1-1-18: Completely revised std. for LRFD. Renamed std. Moved
- 1-1-11: Revised general notes.

---

**ENGINEER OF DESIGN AND ENVIRONMENT**

- Issued

---

**Illinois Department of Transportation**

- Approved January 1, 2018

---

**STANDARD 602401-04**

**4' (1.22 m) DIAMETER**

See Sheet 2 for General Notes.
**GENERAL NOTES**

Joint configuration and dimensions of flat slab shall match and fit the riser joint detail.

The manufacturer shall ensure that all precast manhole sections are additionally reinforced where required to resist damage from handling, shipping and installation stresses. Lifting holes shall be located in the sections as per the manufacturer's recommendations and grouted prior to backfilling.

See Standard 602701 for details of manhole steps.

All dimensions are in inches (millimeters) unless otherwise noted.

---

**PRECAST MANHOLE TYPE A**

4' (1.22 m) DIAMETER

**STANDARD 602401-04**

---

**PLAN**

(Showing Layout of Reinforcement Bars)

- Bar c #5 (16) 5'-0" (1.52 m) length, 26 (660) radius bottom.
- #6 (10) bars bottom, typ.

- #5 (18) bars at 3 (75) cts. bottom.
- #5 (18) bars at 3 (75) cts. 36 (910) long bottom.
- Bundle first bar with closest WWR bar to the opening.

---

**JOINT SPLICE**

- Joint
- ½ (13) Ø Threaded rods with 2½x2½x£ (65x65x8) washers under each nut.
- Holes in the walls may be drilled using core bits in lieu of formed holes.

---

**TIE PLATE**

- ½ (13) Ø Threaded rods with 2¼x2¼x£ (55x55x8) washers under each nut.
- Drilled using core bits in lieu of formed holes.
- Holes in the walls may be drilled using core bits in lieu of formed holes.
- Ø 6x4x½ (13) holes.

---

**CONNECTION ANGLE**

- Connection angle
- 1¾ (45)
- 4 ¼ (105) holes.
- Ø 1¼x2½ (32x65) Slotted hole, typ.
- Ø ½ (13) ¢ washers under each nut.

---

**4'-10" (1.47 m) Dia.**

- Inside of manhole wall
- ½ (60) Tie Ø

---

**PLAN**

(Showing Layout of Welded Wire Reinforcement)

- 4x4-D30x30 (100x100-MD194xMD194)
**SERVICE LT THRU MANHOLE**

**GEOMETRIC LIMITS**

Oversized holes, as necessary for constructability, shall satisfy the following requirements:

1. A minimum of 9 (230) of monolithic reinforced concrete shall be maintained above the fabricated pipe hole.
2. A minimum 9 (230) inside arc length of reinforced concrete, extending vertically from bottom slab to top slab, shall be maintained between the fabricated pipe holes.
3. A maximum of 60 percent of the inside perimeter of the reinforced concrete manhole walls may be removed.
4. Horizontal joints through pipe holes shall be spaced when the remaining column between holes, measured along inside arc length, is less than 24 (600). See detail.
5. The recommended oversized hole is equal to the O.D. of the pipe plus 4 (100).

**TOP SLAB JOINT CONFIGURATIONS**

* Typical for top and bottom slabs.

**SECTION THRU MANHOLE**

* With flat slab top only

**SHEAR KEY GEOMETRY**

(Reinforcement not shown for clarity)

**BOTTOM SLAB JOINT CONFIGURATIONS**

See Sheet 2 for General Notes.

**PRECAST MANHOLE TYPE A**

5' (1.52 m) DIAMETER
**GENERAL NOTES**

Joint configuration and dimensions of flat slab shall match and fit the riser joint detail.

The manufacturer shall ensure that all precast manhole sections are additionally reinforced where required to resist damage from handling, shipping and installation stresses.

Lifting holes shall be located in the sections as per the manufacturer’s recommendations and grouted prior to backfilling.

See Standard 602701 for details of manhole steps.

All dimensions are in inches (millimeters) unless otherwise noted.

---

**PLAN**

(Showing Layout of Reinforcement Bars)

---

**PLAN**

(Showing Layout of Welded Wire Reinforcement)

---

**GENERAL NOTES**

Joint configuration and dimensions of flat slab shall match and fit the riser joint detail.

The manufacturer shall ensure that all precast manhole sections are additionally reinforced where required to resist damage from handling, shipping and installation stresses.

Lifting holes shall be located in the sections as per the manufacturer’s recommendations and grouted prior to backfilling.

See Standard 602701 for details of manhole steps.

All dimensions are in inches (millimeters) unless otherwise noted.
TOP SLAB JOINT CONFIGURATIONS
(Shown at access hole)

Mortar or sealer

Steps spaced at 12 (300) to 16 (400) cts.

Concrete fill, 1.5 % max.

Sand cushion

1.5 % max.

SECTION THRU MANHOLE
(With flat slab top only)

GEOMETRIC LIMITS

Oversized holes, as necessary for constructability, shall satisfy the following requirements:

1. A minimum of 9 (230) of monolithic reinforced concrete shall be maintained above the fabricated pipe hole.
2. A minimum 9 (230) inside arc length of reinforced concrete, extending vertically from bottom slab to top slab, shall be maintained between the fabricated pipe holes.
3. A maximum of 60 percent of the inside perimeter of the reinforced concrete manhole walls may be removed.
4. Horizontal joints through pipe holes shall be spliced when the remaining column between holes, measured along inside arc length, is less than 24 (600). See detail.
5. The recommended oversized hole is equal to the O.D. of the pipe plus 4 (230).

BOTTOM SLAB JOINT CONFIGURATIONS

Mortar or sealer

SAND CUSHION

SECTION THRU MANHOLE
(With flat slab top and riser)

GEOMETRIC LIMITS

SHEAR KEY GEOMETRY
(Reinforcement not Shown for Clarity)

See Sheet 3 for General Notes.

PRECAST MANHOLE TYPE A
6' (1.83 m) DIAMETER

STANDARD 602406-08

DATE
1-1-18

REVISIONS
Completely revised standard for LRFD. Renamed standard.

See Sheet 3 for General Notes.
**PLAN**

*Showing Layout of Reinforcement Bars*

- Bar c #5 (#16), 9'-0" (2.74 m) length, 38 (965) radius top and bottom
- #6 (#19) bars bottom, typ.
- #4 (#13) bars top, typ.

**PLAN**

*Showing Layout of Welded Wire Reinforcement*

- Bar c #5 (#16), 6'-0" (1.83 m) length, 38 (965) radius top and bottom
- #6 (#19) bars bottom, typ.
- #4 (#13) bars top, typ.

**PRECAST MANHOLE TYPE A**

6' (1.83 m) DIAMETER

(Showing Layout of Reinforcement Bars)

- #6 (#19) bars at 3 (75) cts. top and bottom.
- #6 (#19) bars at 3 (75) cts. 6' (1.83 m) long top and bottom. Bundle first bar with closest WWR bar to the opening.
- #6 (#19) bars at 3 (75) cts. 4'-9" (1.45 m) long top and bottom.
  - Bundle first bar with closed WWR bar to the opening.
Joint configuration and dimensions of flat slab shall match and fit the riser joint detail.

Pipe holes shall be formed to facilitate proper placement of hole reinforcement.

The manufacturer shall ensure that all precast manhole sections are additionally reinforced where required to resist damage from handling, shipping, and installation stresses.

Lifting holes shall be located in the sections as per the manufacturer's recommendations and grouted prior to backfilling.

See Standard 602701 for details of manhole steps.

All dimensions are in inches (millimeters) unless otherwise noted.
**TOP SLAB JOINT CONFIGURATIONS**

(Shown at access hole)

- #5 (#16) bars at 6 (150) cts. or 4x4-D22xD22 (100x100-MD65xMD65)
- 2x4-W3.5xW3.5 (50x100-MW23xMW23)

**SECTION THRU MANHOLE**

(With flat slab top only)

- 4½ (#10) radius bars each face placed above each hole.
- Length shall be sufficient to reach the vertical #3 bars as shown.

**GEOMETRIC LIMITS**

Oversized holes, as necessary for constructability, shall satisfy the following requirements:

1. A minimum of 12 (300) of monolithic reinforced concrete shall be maintained above the fabricated pipe hole.
2. A minimum 12 (300) inside arc length of reinforced concrete, extending vertically from bottom slab to top slab, shall be maintained between the fabricated pipe holes.
3. A maximum of 60 percent of the inside perimeter of the reinforced concrete manhole walls may be removed.
4. Horizontal joints through pipe holes shall be spliced when the remaining column between holes, measured along inside arc length, is less than 24 (600). See detail.
5. The recommended oversized hole is equal to the O.D. of the pipe plus 4 inches.

**BOTTOM SLAB JOINT CONFIGURATIONS**

(With flat slab top and riser)

**SHEAR KEY GEOMETRY**

(Reinforcement not shown for Clarity)

See Sheet 3 for General Notes.
Joint configuration and dimensions of flat slab shall match and fit the joint detail.

Pipe holes shall be formed to facilitate proper placement of hole reinforcement.

The manufacturer shall ensure that all precast manhole sections are additionally reinforced where required to resist damage from handling, shipping and installation stresses.

Lifting holes shall be located in the sections as per the manufacturer's recommendations and grouted prior to backfilling.

See Standard 602701 for details of manhole steps.

All dimensions are in inches (millimeters) unless otherwise noted.

GENERAL NOTES
**GEOMETRIC LIMITS**

Oversized holes, as necessary for constructability, shall satisfy the following requirements:

1. A minimum of 12 (300) of monolithic reinforced concrete shall be maintained above the fabricated pipe hole.
2. A minimum 12 (300) inside arc length of reinforced concrete, extending vertically from bottom slab to top slab, shall be maintained between the fabricated pipe holes.
3. A maximum of 60 percent of the inside perimeter of the reinforced concrete manhole walls may be removed.
4. Horizontal joints through pipe holes shall be spliced when the remaining column between holes, measured along inside arc length, is less than 24 (600). See detail.
5. The recommended oversized hole is equal to the O.D. of the pipe plus 4 inches.
(Showing Layout of Reinforcement Bars)

**束第一根与最近的WWR钢筋的开口。** #7 (#22)钢筋在3 (75) cts. 4'-0" (1.22 m) 长度，顶部和底部。

***束第一根与最近的WWR钢筋的开口。** #7 (#22)钢筋在3 (75) cts. 4'-0" (1.22 m) 长度，顶部和底部。
Joint configuration and dimensions of flat slab shall match and fit the riser joint detail.

Pipe holes shall be formed to facilitate proper placement of hole reinforcement.

The manufacturer shall ensure that all precast manhole sections are additionally reinforced where required to resist damage from handling, shipping and installation stresses.

Lifting holes shall be located in the sections as per the manufacturer's recommendations and grouted prior to backfilling.

See Standard 603701 for details of manhole steps.

All dimensions are in inches (millimeters) unless otherwise noted.
**PRECAST MANHOLE TYPE A**

9' (2.74 m) DIAMETER

---

**TOP SLAB JOINT CONFIGURATIONS**

(Shown at access hole)

- *Typical for top and bottom slabs.

**SECTION THRU MANHOLE**

(With flat slab top only)

- #6 (#19) bars at 6 (150) cts. or 6x6-D10xD10 (100x100-MD19xMD19)

- #4 (#13) bars at 12 (300) cts. or 6x6-D10xD10 (150x150-MD13xMD13)

- Concrete fill, 1.5 % max.

---

**GEOMETRIC LIMITS**

Over-sized holes, as necessary for constructability, shall satisfy the following requirements:

1. A minimum of 12 (300) of monolithic reinforced concrete shall be maintained above the fabricated pipe hole.

2. A minimum 12 (300) inside arc length of reinforced concrete, extending vertically from bottom slab to top slab, shall be maintained between the fabricated pipe holes.

3. A maximum of 60 percent of the inside perimeter of the reinforced concrete manhole walls may be removed.

4. Horizontal joints through pipe holes shall be spliced when the remaining column between holes, measured along inside arc length, is less than 24 (600). See detail.

5. The recommended oversized hole is equal to the O.D. of the pipe plus 4 inches.

---

**BOTTOM SLAB JOINT CONFIGURATIONS**

(Shown at access hole)

- Single-element shear key at center of slab

**SHEAR KEY GEOMETRY**

(Reinforcement not shown for clarity)

---

**DATE**

1-1-18

**REVISIONS**

1-1-18 Completely revised standard

- for LRFD. Renamed standard.

4-1-06 Changed terminology to 'welded wire reinforcement'.

---

**PRECAST MANHOLE TYPE A**

9' (2.74 m) DIAMETER

(STANDARD 602421-06)
PRECAST MANHOLE TYPE A
9' (2.74 m) DIAMETER

Plan (Showing Layout of Reinforcement Bars)

- Bar c #5 (4/16), 14'-6" (4.32 m) radius top and bottom
- #4 (#21) bars top, typ.
- #8 (#25) bars bottom, typ.

Plan (Showing Layout of Welded Wire Reinforcement)

- #8 (#25) bars at 3 (75) cts. top and bottom.
- #8 (#25) bars at 3 (75) cts. 4'-0" (1.22 m) long top and bottom Bundle first bar with closest WWR bar to the opening.
- #8 (#25) bars at 3 (75) cts. 4'-0" (1.22 m) long top and bottom Bundle first bar with closest WWR bar to the opening.
- 6x6 0.60x0.60 top (150x150-MD194xMD194) 2 sheets 4x6 0.30x0.30 bottom (100x100-MD30xMD30)

Details:
- Bar c #5 (16), 14'-6" (4.32 m) radius top and bottom
- #4 (#21) bars top, typ.
- #8 (#25) bars bottom, typ.

Details:
- Bar c #5 (4/16), 9'-6" (2.90 m) radius top and bottom
- #4 (#21) bars top, typ.
- #8 (#25) bars bottom, typ.

Details:
- Bar c #5 (16), 14'-2" (4.32 m) radius top and bottom
- #8 (#25) bars bottom, typ.
- #4 (#21) bars top, typ.

Details:
- 6x6 0.60x0.60 top (150x150-MD194xMD194) 2 sheets 4x6 0.30x0.30 bottom (100x100-MD30xMD30)

Note:
- Bundle first bar with closest WWR bar to the opening.
GENERAL NOTES

* Illinois Department of Transportation
* January 1, 2018

APPROVED January 1, 2018

ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 4-1-06

PASSED

ENGINEER OF POLICY AND PROCEDURES

STANDARD 602421-06

9' (2.74 m) DIAMETER PRECAST MANHOLE TYPE A

(Sheet 3 of 3)

Joint configuration and dimensions of flat slab shall match and fit the riser joint detail.

Pipe holes shall be formed to facilitate proper placement of hole reinforcement.

The manufacturer shall ensure that all precast manhole sections are additionally reinforced where required to resist damage from handling, shipping and installation stresses.

Lifting holes shall be located in the sections as per the manufacturer's recommendations and grouted prior to backfilling.

See Standard 602701 for details of manhole steps.

All dimensions are in inches (millimeters) unless otherwise noted.

PRECAST MANHOLE TYPE A
9' (2.74 m) DIAMETER

STANDARD 602421-06
**Top Slab Joint Configurations**

- **Concrete Fill**: 1.5% max.
- **Sand Cushion**: With flat slab top only.
- **Top Slab Joint Configurations**
  - **Concrete Fill**: 1.5% max.
  - **Sand Cushion**: With flat slab top only.

**Section Thru Manhole**

- **Cl. typ.**: 2 (50)
- **#6 (#19) bars at 6 (150) cts. of #4 (#13) bars**
- **Concrete Fill**: 1.5% max.
- **Sand Cushion**: With flat slab top only.

**Geometric Limits**

- **Oversized hole**: See Geometric Limits.
- **Concrete Fill**: 1.5% max.
- **Sand Cushion**: With flat slab top only.

**Bottom Slab Joint Configurations**

- **Concrete Fill**: 1.5% max.
- **Sand Cushion**: With flat slab top and riser.

**Shear Key Geometry**

- **Reinforcement not Shown for Clarity**
- **First two wires of Width shall be placed near shear key as shown**

**GEOMETRIC LIMITS**

Oversized holes, as necessary for constructability, shall satisfy the following requirements:

1. A minimum of 12 (300) cts. of monolithic reinforced concrete shall be maintained above the fabricated pipe hole.
2. A minimum 12 (300) inside arc length of reinforced concrete, extending vertically from bottom slab to top slab, shall be maintained between the fabricated pipe holes.
3. A maximum of 60 percent of the inside perimeter of the reinforced concrete manhole walls may be removed.
4. Horizontal joints through pipe holes shall be spliced when the remaining column between holes, measured along inside arc length, is less than 24 (600). See detail.
5. The recommended oversized hole is equal to the O.D. of the pipe plus 4 inches.
### PLAN

Showing Layout of Reinforcement Bars

- **Bar c #5 (#36)**
  - 15'-6" (4.73 m) length
  - 62 (1.57 m) radius top and bottom
- **#4 (#13) bars top, typ.**
- **#8 (#25) bars bottom, typ.**

### PLAN

Showing Layout of Welded Wire Reinfocement

- **6x6-010x010 top**
  - 150x150 MD194 MD65 MD63
  - 2 sheets 4x4-030x030 bottom
  - 100x100 MD194 MD194 MD194 MD194

### Specifications

- **Top Slab Dia.** 11'-8" (3.56 m)
- **Top Slab Dia.** 15'-6" (4.73 m)

#### Notes:

- **#8 (#25) bars at 3 (75) cts. 4'-0" (1.22 m) long top and bottom.**
- **Bundle first bar with closest WWR bar to the opening.**
- **#8 (#25) bars at 3 (75) cts. 6'-0" (1.83 m) long top and bottom.**
- **Bundle first bar with closest WWR bar to the opening.**

---

PRECAST MANHOLE TYPE A
10' (3.05 m) DIAMETER

STANDARD 602426
The manufacturer shall ensure that all precast manhole sections are additionally reinforced where required to resist damage from handling, shipping and installation stresses. Lifting holes shall be located in the sections as per the manufacturer's recommendations and grouted prior to backfilling.

See Standard 602701 for details of manhole steps.

All dimensions are in inches (millimeters) unless otherwise noted.

PRECAST MANHOLE TYPE A

10' (3.05 m) DIAMETER

STANDARD 602426
**GENERAL NOTES**

**CONFIGURATIONS**

**BOTTOM SLAB JOINT**

**TOP SLAB JOINT CONFIGURATIONS**

**SHEAR KEY GEOMETRY**

*Typical for top and bottom slabs.*

**SECTION THRU VALVE VAULT**

*With flat slab top only*

**SECTION THRU VALVE VAULT**

*With riser*

**TOP SLAB JOINT CONFIGURATIONS**

**SHEAR KEY GEOMETRY**

(Reinforcement not shown for clarity)

**BOTTOM SLAB JOINT CONFIGURATIONS**

**GENERAL NOTES**

Joint configuration and dimensions of flat slab shall match and fit the riser joint detail.

The manufacturer shall ensure that all precast manhole sections are additionally reinforced where required to resist damage from handling, shipping and installation stresses.

Lifting holes shall be located in the sections as per the manufacturer’s recommendations and grouted prior to backfilling.

A drain for the valve vault shall be provided when shown on the plans.

See Standard 602701 for details of manhole steps.

All dimensions are in inches (millimeters) unless otherwise noted.
**PLAN**

(Showing Layout of Reinforcement Bars)

- #5 (#16) bars at 3 (75) cts. top and bottom.
- #5 (#16) bars at 3 (75) cts. 36 (910) long top and bottom.
  Bundle first bar with closest WWR bar to the opening.

**PLAN**

(Showing Layout of Welded Wire Reinforcement)
**TOP SLAB JOINT CONFIGURATIONS**

- **Flat slab top**
  - #6 (#13) bars at 20 (500) cts. or 6x6-012x032 (150x150-MD77xMD77)
  - Cushion: Sand

- **Conical riser**
  - Top of precast sections
  - #4 (13) bars at 10 (250) cts. or 6x6-012x032 (150x150-MD77xMD77)
  - Mortar or sealer

* Typical for top and bottom slabs.

---

**BOTTOM SLAB JOINT CONFIGURATIONS**

- **Single element shear key at center of slab**
  - First two wires of WWR shall be placed near shear key as shown

---

**GENERAL NOTES**

Joint configuration and dimensions of flat slab shall match and fit the riser joint detail.

The manufacturer shall ensure that all precast manhole sections are additionally reinforced where required to resist damage from handling, shipping and installation stresses.

Lifting holes shall be located in the sections as per the manufacturer's recommendations and grouted prior to backfilling.

A drain for the valve vault shall be provided when shown on the plans.

See Standard 602701 for details of manhole steps.

All dimensions are in inches (millimeters) unless otherwise noted.

---

**PRECAST VALVE VAULT TYPE A**

**5' (1.52 m) DIAMETER**
(Showing Layout of Reinforcement Bars)

Bar c: #5 (#16)
5'-6" (1.68 m)
length, 32 (815)
radius top and bottom

#4 (#13) bars top, typ.
#5 (#16) bars bottom, typ.

(Showing Layout of Welded Wire Reinforcement)

6x6:10x10 top
(150x150-MD65xMD65)
4x4:12x12 bottom
(100x100-MD42xMD42)

* #5 (#16) bars at 3 (75) cts. top and bottom.
** #5 (#16) bars at 3 (75) cts. 36 (910) long top and bottom. Bundle first bar with closest WWR bar to the opening.
**TOP SLAB JOINT CONFIGURATIONS**

**FOR D = 36 (900) AND D = 4'-0" (1.22 m)**

(Shown at access hole)

**TOP SLAB JOINT CONFIGURATIONS**

**FOR D = 5'-0" (1.52 m)**

(Shown at access hole)

**TOP SECTION THRU INLET OR CATCH BASIN**

**FOR D = 36 (900) AND D = 4'-0" (1.22 m)**

**TOP SECTION THRU CATCH BASIN**

**FOR D = 5'-0" (1.52 m)**

**PLAN FOR D = 36 (900)**

(Showing Layout of Reinforcement Bars)

**PLAN FOR D = 36 (900)**

(Showing Layout of Welded Wire Reinforcement)

* #4 (#13) bars bottom. Bundle first bar with WWR bar closest to the opening.

**GENERAL NOTES**

The flat slab top may be used in lieu of the tapered tops shown on Standards 602001, 602016, or 602306 at the option of the Contractor or when field conditions prohibit the use of tapered tops.

Lifting holes shall be located in the sections as per the manufacturer’s recommendations and grouted prior to backfilling.

All dimensions are in inches (millimeters) unless otherwise shown.

**TABLE**

<table>
<thead>
<tr>
<th>D (in)</th>
<th>T (in)</th>
<th>D2 (min)</th>
<th>t (in)</th>
</tr>
</thead>
<tbody>
<tr>
<td>36 (900)</td>
<td>4'-0&quot; (1.22 m)</td>
<td>4 (50)</td>
<td>6 (150)</td>
</tr>
<tr>
<td>4'-0&quot; (1.22 m)</td>
<td></td>
<td>8 (150)</td>
<td></td>
</tr>
<tr>
<td>5'-0&quot; (1.52 m)</td>
<td></td>
<td>8 (200)</td>
<td></td>
</tr>
</tbody>
</table>
PLAN FOR D = 4'-0" (1.22 m)
(Showing Layout of Reinforcement Bars)

** #5 (#16) bars bottom. For WWR, bundle first bar with WWR bar closest to the opening.

PLAN FOR D = 5'-0" (1.52 m)
(Showing Layout of Reinforcement Bars)

*** #5 (#16) bars top and bottom. For WWR, bundle first bar with WWR bar closest to the opening.

** #5 (#16) bars bottom. For WWR, bundle first bar with WWR bar closest to the opening.
PLAN VIEW

ELEVATION VIEW

SECTION A-A
CAST FRAME

CAST OPEN LID

CAST CLOSED LID

SECTION A-A

Gray Iron

SECTION B-B

SECTION C-C

SECTION D-D

SECTION E-E

SECTION F-F

ADA COMPLIANT
CAST OPEN LID

6 Gussets shown
16 permitted

All dimensions are in inches (millimeters) unless otherwise shown.
CAST FRAME

SECTION B-B

Curb box adjustable from 5\% (135) to 9 (225).

CAST GRATE

ALTERNATE CURB BOX

SECTION E-E

All dimensions are in inches (millimeters) unless otherwise shown.

FRAME AND GRATE

TYPE 3

STANDARD 604006-05

Illinois Department of Transportation

DATE

REVISIONS

1-1-15

Revised all drawing

1-1-15

frame and alternate curb box.

1-1-09

Switched units to English (metric).

ENGINEER OF POLICY AND PROCEDURES

APPROVED

January 1, 2015

ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED

January 1, 2015

PASSED

DATE

REVISIONS
CAST FRAME

SECTION A-A

CAST GRATE

SECTION B-B

ALTERNATE CURB BOX

SECTION C-C

SECTION D-D

CAST GRADE

SECTION E-E

VANE DETAIL

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

DATE
REVISIONS

January 1, 2015

January 1, 2015

January 1, 2015

January 1, 2015

January 1, 2015

ENGINEER OF POLICY AND PROCEDURES
APPROVED

ENGINEER OF DESIGN AND ENVIRONMENT
ISSUED

PASSED

FRAME AND GRATE

TYPE 3V

STANDARD 604011-05
All dimensions are in inches (millimeters) unless otherwise shown.
NOTE: Bolts shall be removed after pavement has been placed.

The four holes in the cast base may be rotated 45° from the position shown in section A-A.

All dimensions are in inches (millimeters) unless otherwise shown.
All dimensions are in inches (millimeters) unless otherwise shown.
6 lugs shown, 3 permitted.

SECTION A-A

CAST GRATE

All dimensions are in inches (millimeters) unless otherwise shown.

GRATE TYPE 8

STANDARD 604036-03
All dimensions are in inches (millimeters) unless otherwise shown.
SECTION A-A

CAST FRAME

SECTION B-B

SECTION C-C

SECTION D-D

CAST GRATE

All dimensions are in inches (millimeters) unless otherwise shown.

FRAME AND GRATE

TYPE 10

STANDARD 604046-03
SECTION A-A

SECTION B-B

SECTION C-C

SECTION D-D

CAST FRAME

CAST GRATE

Illinois Department of Transportation

January 1, 2015

APPROVED

DATE

REVISIONS

1-1-15 Revised dimensions of frame and grate

1-1-09 Switched units to English (metric)

STANDARD 604061-03
NOTE:
Warp sloping face of curbs in a distance of 5 (1.5 m)
to the cross section shown at the frame.

No. 6 x 36 (No. 10 x 900)
re-bar required when
X = 5 (125) or more

Slope pavement or gutter flag
12% at inlet.

See DETAIL E

All dimensions are in inches (millimeters)
unless otherwise shown.
$\frac{1}{2}$ (13) Dia. tapped holes for bolting down grate, four places.

$\frac{1}{2}$ (14) Dia. holes for grate alignment, two places.

Safety bar (225x9x1) (572x19x25)

One gusset shown each side, two permitted.

$\frac{1}{2}$ (13) Dia. stainless steel bolts with washers, through counterbored holes or slots, four places.

All dimensions are in inches (millimeters) unless otherwise shown.
\[ \frac{3}{16} \text{ (M16) Galv. bolt, nut & washer.} \]

\[ \frac{3}{16} \text{ (13) DIA. Galv. bolt, through counter bored holes or slots, four places.} \]

\[ \frac{3}{16} \text{ (13) DIA. stainless steel bolts with washers, through counter bored holes or slots, four places.} \]

\[ \frac{3}{16} \text{ (13) DIA. tapped holes for bolting down grate, four places.} \]

\[ \frac{3}{16} \text{ (13) DIA. stainless steel bolts with washers, through counter bored holes or slots, four places.} \]

\[ \frac{3}{16} \text{ (13) DIA. stainless steel bolts with washers, through counter bored holes or slots, four places.} \]
Each frame.

Bolting down grate, four places each frame.

Dia. tapped holes for grate alignment, two places each frame.

Dia. holes for safety bar, 16 places each grate.

(229) x 1
(572 x 9 x 25)

Safety bar

(13) Dia.

"D" changed to a bolt down grate w/ deeper vanes.

All dimensions are in inches (millimeters) unless otherwise shown.

Switched units to English (metric)

Illinois Department of Transportation

1-1-97

ENGINEER OF POLICY AND PROCEDURES

APPROVED

1-1-09

ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED

1-1-09

PASSED

REVISIONS

DATE

FRAMES AND GRATES

TYPE 22

STANDARD 604081-04

Three 5/16 x 2 1/2 (M16 x 64) galv. hex. head bolt & nut with galv. washers.
DETAIL A

DETAIL B

SECTION A-A

SECTION B-B

SECTION C-C

FRAME AND GRATE

TYPE 23

STANDARD 604086-03

Illinois Department of Transportation

January 1, 2015

ENGINEER OF POLICY AND PROCEDURES
APPROVED
January 1, 2015

ENGINEER OF DESIGN AND ENVIRONMENT
ISSUED

DATE
REVISIONS

1-1-15 Revised dimensions of frame

1-1-69 Switched units to English (metric)

All dimensions are in inches (millimeters) unless otherwise shown.
All slope ratios are expressed as units of vertical displacement to units of horizontal displacement (V:H).

All dimensions are in inches (millimeters) unless otherwise shown.

General Notes:

Traffic

Concrete apron, 4 (100) thick

LOCATION SKETCH - PLAN

GENERAL NOTES

DATE
REVISIONS
1-1-99
Switched units to
English (metric)
1-1-97

MEDIAN INLET for 24" (600 mm)
REINFORCED CONCRETE PIPE

STANDARD 604101-01

Illinois Department of Transportation
January 1, 2009
ENGINEER OF POLICY AND PROCEDURES
APPROVED
January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT
ISSUED

SECTION A-A

SECTION B-B

Frame
Grate
Welded wire fabric

1:4 or 1:6

13'
(444)

15%
(13)

Rib (typ.)

8
(200)

Traffic

SECTION B-B

SECTION A-A

Riser pipe joint

24
(600)

1 :4 or 1 :6

1:4 or 1:6

Concrete apron,
4 (100) thick

1:4 or 1:6

1:4 or 1:6

Concrete apron,
4 (100) thick

1:4 or 1:6

Concrete apron,
4 (100) thick

1:4 or 1:6

Concrete apron,
4 (100) thick
Short radius curve

Placement of construction joints:
1. Form with 1/8" (3) thick steel template
2. Saw 2 (50) deep at 4 to 24 hours, and seal.
3. Insert 2 (20) thick preformed joint filler full depth and width.

Undoweled contraction joint (typ.) construction options:
- Place 2-No. 4 (No. 13) bars placed at mid-depth (when space permits).

Construction joint:
- 2-No. 4 (No. 13) bars with 2 (50) min. cl.
- Place 2-No. 4 (No. 13) bars placed at mid-depth (when space permits).

Drainage casting:
- With curb box
- Without curb box

Back of curb:
- Drainage casting

Edge of pavement:
- Full depth and width.

5'-0" (1.5 m)

Pavement:
- Edge of pavement

Mountable curb shown:
- (other types permitted)

HMA surfacing:
- Base course
GENERAL NOTES

Tie bars shall be No. 6 (No. 19) at 36 (900) centers unless otherwise shown.

Gutter outlet shall be tied to the pavement in accordance with details for longitudinal construction joint shown on Standard 420001.

If the average grade of pavement for the distance from Section A-A to D-D exceeds 2%, this distance shall be increased 6' (1.8 m) for each 1% increase in grade.

All dimensions are in inches (millimeters) unless otherwise shown.

QUANTITIES

For Section A-A to E-E and curtain wall =
2.38 cu. yds. (1.82 m³) for 9 (225) pav't.
2.42 cu. yds. (1.84 m³) for 10 (250) pav't.

For Section F-F =
0.069 cu. yds. (0.17 m³) concrete per ft. (m)

OUTLETS FOR CONCRETE CURB AND GUTTER

TYPE B-6.24 (B-15.60)
QUANTITIES

1.98 cu. yds. (1.51 m³) concrete for 10 (250) pav't.
2.01 cu. yds. (1.54 m³) concrete for 9 (225) pav't.

OUTLETS FOR CONCRETE CURB AND GUTTER

TYPE B-6.24 (B-15.60)

Sheets 2 (of 2)

STANDARD 606006-04
shoulder paved

Edge of casting

Drainage joint

Expansion joint

Contraction joints

(300)

12

3' (1 m)

min.

3x18 (25x450) dowel bars

placed in prolongation

with pcc shoulder joints or at 25' (7.6 m) cts.

with HMA shoulders

No. 4 (No. 13) rebar

dowel bars

1x18 (25x450) min.

1 (25)

3' (1 m)

min.

with HMA shoulders

or at 25' (7.6 m)

Placed in prolongation

Contraction joints

See plans

Shoulder edge

Rolled

Shld.

3(75)

3(75)

6(150)

6(150)

6(450)

6(450)

4(125)

Shld.

Edge of paved shoulder

Flow line

QUANTITY OF CONCRETE

Section A-A to C-C

0.93 cu. yd. (0.71 m³)

All dimensions are in inches (millimeters) unless otherwise shown.

DATE

REVISIONS

4-1-16

Changed terminology to

welded wire reinforcement.

1-1-09

Switched units to

English (metric). Changed

radius, adjusted qty's.

ENGINEER OF DESIGN AND ENVIRONMENT

 ISSUED

1-1-97

PASSED

April 1,

2016

ENGINEER OF POLICY AND PROCEDURES

APPROVED

2016

STANDARD 606101-05

TYPE A GUTTER

(INLET, OUTLET & ENTRANCE)

(Sheet 1 of 3)
**QUANTITIES OF CONCRETE**

**Commercial Entrances:**
- Section B-B to C-C = 0.25 cu. yd./ft. (0.50 m³/m).
- Section (A-A to B-B) + (C-C to D-D) = 2.26 cu. yd. (1.73 m³).

**All Other Entrances:**
- Section B-B to C-C = 0.20 cu. yd./ft. (0.50 m³/m).
- Section (A-A to B-B) + (C-C to D-D) = 1.79 cu. yd. (1.37 m³).

**NOTE:**
Welded wire reinforcement shall be installed at mid-depth from Section A-A to D-D.

6'-0" (1.8 m)  4'-0" (1.2 m)

*8 (200) for commercial entrances and 6 (150) for all others.*

**SECTION A-A & D-D**

**SECTION B-B & C-C**

**Welded wire reinforcement:**

**STANDARD 606101-05**

**TYPE A GUTTER**

(INLET, OUTLET & ENTRANCE)

(Sheet 2 of 3)
NOTE
If the average grade of pavement for the distance A-E exceeds 3%, this distance shall be increased 6 ft. (1.8 m) for each 1% increase in grade.

NOTE
(3.6 m)
12'-0" (3.6 m)
12'-0" (3.6 m)

FOR TYPE A GUTTER
OUTLETS TYPE 2
STANDARD 606111-03

GRATE AND COVER TYPE 2A

PLAN - SINGLE OUTLET

SECTION A-A

SECTION B-B

SECTION C-C

SECTION D-D

SECTION E-E

SECTION F-F

SECTION H-H

SECTION G-G

Illinois Department of Transportation

ENGINEER OF POLICY AND PROCEDURES
APPROVED

ENGINEER OF DESIGN AND ENVIRONMENT
ISSUED

DATE
REVISIONS

1-1-09
Switched unit to English (metric).

1-1-97
Removed weight of grate and cover.

GENERAL NOTES
The gutter outlet shall be tied to the pavement in accordance with details for longitudinal construction joint shown on Standard 420001.

All dimensions are in inches (millimeters) unless otherwise shown.

QUANTITIES

<table>
<thead>
<tr>
<th>Material</th>
<th>Single</th>
<th>Double</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concrete - cu. yd. (m³)</td>
<td>3.07 (2.35)</td>
<td>4.33 (3.31)</td>
</tr>
<tr>
<td>Cast Iron Grate - Ea.</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Cast Iron Cover - Ea.</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Pipe Drain - Dia. in. (mm)</td>
<td>15 (375)</td>
<td>18 (450)</td>
</tr>
</tbody>
</table>
GENERAL NOTES

Gutter, gutter inlet, gutter outlet and gutter entrance shall be tied to the pavement in accordance with details for longitudinal construction joint shown on Standard 420001.

Two 1-1/4 x 18 (32 x 450) dowel bars shall be installed in all joints when the gutter is constructed adjacent to flexible pavement.

All dimensions are in inches (millimeters) unless otherwise shown.

DATE
1-1-18
1-1-18
1-1-18
0-2-16

REVISIONS
Deleted first General Note to avoid conflict with second General Note.

Based on your request.

Tie bars
Edge of pavement
Flow line
SECTION A-A
SECTION B-B
SECTION C-C
INLET
SECTIONS A-A & C-C
SECTIONS B-B & B'-B'

QUANTITY OF CONCRETE
Section A-A to C-C = 0.64 cu. yd. (0.49 m³)

QUANTITY OF CONCRETE
Section (C-C to B'-B') + (B-B to A-A) = 0.44 cu. yd. (0.34 m³)

QUANTITY OF CONCRETE
Section B'-B' to B-B = 0.076 cu. yd./ft. (0.19 m³/m)
**GENERAL NOTES**

If the average grade of pavement for the distance A-E exceeds 2 percent, this distance shall be increased 6 ft. (1.8 m) for each 1 percent increase in grade.

The gutter outlet shall be tied to the pavement in accordance with details for longitudinal construction joint shown on Standard 420001.

All dimensions are in inches (millimeters) unless otherwise shown.

---

**QUANTITIES**

<table>
<thead>
<tr>
<th>Material</th>
<th>Single</th>
<th>Double</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concrete - cu. yd. (m³)</td>
<td>1.45</td>
<td>2.18</td>
</tr>
<tr>
<td>Cast Iron Grate - Ea.</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Cast Iron Cover - Ea.</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Pipe Drain - Dia. in. (mm)</td>
<td>17</td>
<td>15</td>
</tr>
</tbody>
</table>

---

**OUTLETS TYPE 2 FOR TYPE B GUTTER**

**STANDARD 606211-04**

---

**Illinois Department of Transportation**

**January 1, 2018**

**ENGINEER OF POLICY AND PROCEDURES**

**APPROVED**

**January 1, 2018**

**ENGINEER OF DESIGN AND ENVIRONMENT**

**ISSUED**

1-1-97

**PASSED**

**DATE**

**REVISIONS**

1-1-18

Revised tie bar notes to be consistent with other gutter Highway Standards

1-1-09

Switched units to English (metric)
Curb and gutter

See DETAIL II

Grooves

(SEE SHEET 2 FOR DETAILS OF RAMPED NOSES)

24 (600) max.

Var. radius

Grooves

Face of curb

24 (600) Offset for urban conditions

LARGE ISLAND

(FREE FLOW DESIGN)

24 (600) Offset for urban conditions

INTERMEDIATE ISLAND

(FOR RIGHT TURN LANE DESIGN)

TYPICAL PLAN OF MEDIAN ISLAND

(SEE SHEET 2 FOR DETAILS OF RAMPED NOSES)

2: 4

[0.6 - 1.2 m]

TYPICAL PLANS OF CORNER ISLANDS

(SEE SHEET 2 FOR DETAILS OF RAMPED NOSES)

2: 4

[0.6 - 1.2 m]

NOTE:
The blockouts B for the islands shall be extended so that the termination will line up with proposed or existing pavement joint.

Noses 1 and 2 shall be ramped unless noted otherwise on the plans. (See sheet 2 for length)

NOTE: The blockouts F or G for the islands shall be extended so that the termination will line up with proposed or existing pavement joint.

Noses 1 and 2 shall be ramped unless noted otherwise on the plans. (See sheet 2 for length)

SECTION D-D

SECTION E-E

PC CONCRETE ISLANDS AND MEDIANS

STANDARD 606301-04

Illinois Department of Transportation

January 1, 2009

ENGINEER OF POLICY AND PROCEDURES

APPROVED

January 1, 2009

ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED

1-1-97

PASSED

1-1-07

REVISIONS

1-1-09

Switched units to English (metric).

Switched to Hot-Mix terminology.

NOTE:

PEJF = Preformed expansion joint filler.

Median layout and radii shall be as shown on the plans.

Keyed longitudinal construction joints shall be constructed without tie bars.

See Standard 620001 and 606001 for details not shown.

* ½ (20) PEJF conforming to the full cross section of the curb, gutter and median surface.

X = PCC base course plus HMA thickness.

t = Pavement or pcc base course thickness.

All dimensions are in inches (millimeters) unless otherwise shown.
**TABLE OF DIMENSIONS**

### TYPE M AND SM MEDIANS

<table>
<thead>
<tr>
<th>TYPE</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>R1</th>
</tr>
</thead>
<tbody>
<tr>
<td>M-2,SM</td>
<td>6</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>M-1,SM</td>
<td>6</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>M-4</td>
<td>6</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>2</td>
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<tr>
<td>M-4</td>
<td>6</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>M-4</td>
<td>6</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>M-4</td>
<td>6</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

### TYPE SB MEDIANS

<table>
<thead>
<tr>
<th>TYPE</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>R1</th>
</tr>
</thead>
<tbody>
<tr>
<td>SB-6.06</td>
<td>6</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>SB-6.12</td>
<td>6</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>SB-6.18</td>
<td>6</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>SB-6.24</td>
<td>6</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>SB-6.30</td>
<td>6</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

### TABLE OF RAMPED NOSE LENGTHS

<table>
<thead>
<tr>
<th>TYPE</th>
<th>L</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median</td>
<td>6' (1.8 m)</td>
</tr>
<tr>
<td>Small Island</td>
<td>24' (600)</td>
</tr>
<tr>
<td>Intermediate Island</td>
<td>4' (1.2 m)</td>
</tr>
<tr>
<td>Large Island</td>
<td>6' (1.8 m)</td>
</tr>
</tbody>
</table>

**SECTION H-H**

- **SECTION FOR PCC PAVEMENT**
  - PCC base course
  - Improved subgrade
  - Optional keyed const. joint
  - HMA surfacing
  - Same slope as subbase or gutter flag for distance A
  - 1.5% Slope min.

- **SECTION FOR PCC BASE COURSE**
  - PCC base course
  - Improved subgrade (when required)
  - Optional keyed const. joint

**HALF SECTION FOR FLEXIBLE PAVEMENT**

- Optional keyed const. joint
- HMA
- Place keyway at midpoint
- 1.5% Slope min.

**PC CONCRETE ISLANDS AND MEDIANS**

(Sheet 2 of 2)

STANDARD 606301-04
Median layout and radii shall be as shown on the plans.

Keyed longitudinal construction joints shall be constructed without tie bars.

X = PCC base course plus HMA thickness.

t = Pavement or pcc base course thickness.

Welded wire reinforcement required for medians built contiguous to reinforced pcc pavement only.

See Standards 420001 and 420701 for details not shown.

All dimensions are in inches (millimeters) unless otherwise shown.
shoulder
PCC or HMA
PCC slab
shoulder
PCC or HMA
of pavement
Outside edge
pavements.
with existing joints in
Joints in prolongation
with existing joints in
pavements.

No. 6 (No. 19) Tie bars
or expansion anchor
ties at 36 (900) cts.

Slope (Std. 483001 or 482001)
SECTION C-C

Limits of normal
sh o u ld e r

Edge of PCC
shoulder

Edge of HMA
shoulder

Pipe drain
12 (300)

Limits of normal
shoulder

Slope

Same slope as
roadway foreslope

End section
(see Standard 542401):

CAST IN PLACE CONCRETE
THRU BOLT 24X24X24
(600x600x600).

ANCHOR BOLT
(Used to tie pipe to
concrete collar)

6

1/2 (M20)

Hex bolt

GENERAL NOTES

See Standard 430001 for joint details not shown.

See Standard 630001 for details of guardrail not
shown.

All exposed edges of the inlet, except the upper
perimeter, shall be beveled 1/2 (20).

For placement of drainage elements on existing
construction with existing rigid pavement,
substitute expansion anchor ties for tie bars.
For nonrigid pavements or monolithic construction
of PCC slab and shoulder, omit tie bars.

All dimensions are in inches (millimeters)
unless otherwise shown.

GENERAL NOTES

See Standard 430001 for joint details not shown.

See Standard 630001 for details of guardrail not
shown.

All exposed edges of the inlet, except the upper
perimeter, shall be beveled 1/2 (20).

For placement of drainage elements on existing
construction with existing rigid pavement,
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For nonrigid pavements or monolithic construction
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unless otherwise shown.

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unless otherwise shown.

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unless otherwise shown.

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See Standard 630001 for details of guardrail not
shown.

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perimeter, shall be beveled 1/2 (20).

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construction with existing rigid pavement,
substitute expansion anchor ties for tie bars.
For nonrigid pavements or monolithic construction
of PCC slab and shoulder, omit tie bars.

All dimensions are in inches (millimeters)
unless otherwise shown.

GENERAL NOTES

See Standard 430001 for joint details not shown.

See Standard 630001 for details of guardrail not
shown.

All exposed edges of the inlet, except the upper
perimeter, shall be beveled 1/2 (20).

For placement of drainage elements on existing
construction with existing rigid pavement,
substitute expansion anchor ties for tie bars.
For nonrigid pavements or monolithic construction
of PCC slab and shoulder, omit tie bars.

All dimensions are in inches (millimeters)
unless otherwise shown.

GENERAL NOTES

See Standard 430001 for joint details not shown.

See Standard 630001 for details of guardrail not
shown.

All exposed edges of the inlet, except the upper
perimeter, shall be beveled 1/2 (20).

For placement of drainage elements on existing
construction with existing rigid pavement,
substitute expansion anchor ties for tie bars.
For nonrigid pavements or monolithic construction
of PCC slab and shoulder, omit tie bars.

All dimensions are in inches (millimeters)
unless otherwise shown.

GENERAL NOTES

See Standard 430001 for joint details not shown.

See Standard 630001 for details of guardrail not
shown.

All exposed edges of the inlet, except the upper
perimeter, shall be beveled 1/2 (20).

For placement of drainage elements on existing
construction with existing rigid pavement,
substitute expansion anchor ties for tie bars.
For nonrigid pavements or monolithic construction
of PCC slab and shoulder, omit tie bars.

All dimensions are in inches (millimeters)
unless otherwise shown.

GENERAL NOTES

See Standard 430001 for joint details not shown.

See Standard 630001 for details of guardrail not
shown.

All exposed edges of the inlet, except the upper
perimeter, shall be beveled 1/2 (20).

For placement of drainage elements on existing
construction with existing rigid pavement,
substitute expansion anchor ties for tie bars.
For nonrigid pavements or monolithic construction
of PCC slab and shoulder, omit tie bars.

All dimensions are in inches (millimeters)
unless otherwise shown.

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See Standard 430001 for joint details not shown.

See Standard 630001 for details of guardrail not
shown.

All exposed edges of the inlet, except the upper
perimeter, shall be beveled 1/2 (20).

For placement of drainage elements on existing
construction with existing rigid pavement,
substitute expansion anchor ties for tie bars.
For nonrigid pavements or monolithic construction
of PCC slab and shoulder, omit tie bars.

All dimensions are in inches (millimeters)
unless otherwise shown.
### Inlet Box

**REQUIRED MATERIAL**

<table>
<thead>
<tr>
<th>Bar</th>
<th>Qty</th>
<th>Size</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>u</td>
<td>8</td>
<td>No. 4</td>
<td>9'-9&quot;</td>
</tr>
<tr>
<td>u2</td>
<td>3</td>
<td>No. 4</td>
<td>14'-0&quot;</td>
</tr>
<tr>
<td>u3</td>
<td>6</td>
<td>No. 4</td>
<td>18'-3&quot;</td>
</tr>
<tr>
<td>Concrete</td>
<td>1</td>
<td>cu. yds.</td>
<td></td>
</tr>
<tr>
<td>Reinf. bars</td>
<td>1</td>
<td>lbs.</td>
<td></td>
</tr>
<tr>
<td>Grating</td>
<td>1</td>
<td>cu. ft.</td>
<td></td>
</tr>
</tbody>
</table>

**Type G**

<table>
<thead>
<tr>
<th>Bar</th>
<th>Qty</th>
<th>Size</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>u</td>
<td>4</td>
<td>No. 4</td>
<td>5'-0&quot;</td>
</tr>
<tr>
<td>u3</td>
<td>3</td>
<td>No. 4</td>
<td>9'-9&quot;</td>
</tr>
<tr>
<td>u4</td>
<td>4</td>
<td>No. 4</td>
<td>11'-6&quot;</td>
</tr>
<tr>
<td>Concrete</td>
<td>1</td>
<td>cu. yds.</td>
<td></td>
</tr>
<tr>
<td>Reinf. bars</td>
<td>1</td>
<td>lbs.</td>
<td></td>
</tr>
<tr>
<td>Grating</td>
<td>1</td>
<td>cu. ft.</td>
<td></td>
</tr>
</tbody>
</table>

**Type F**

<table>
<thead>
<tr>
<th>Bar</th>
<th>Qty</th>
<th>Size</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>u</td>
<td>6</td>
<td>5'-0&quot;</td>
<td></td>
</tr>
<tr>
<td>u3</td>
<td>3</td>
<td>10'-0&quot;</td>
<td></td>
</tr>
<tr>
<td>u4</td>
<td>6</td>
<td>14'-0&quot;</td>
<td></td>
</tr>
<tr>
<td>Concrete</td>
<td>1</td>
<td>cu. yds.</td>
<td></td>
</tr>
<tr>
<td>Reinf. bars</td>
<td>1</td>
<td>lbs.</td>
<td></td>
</tr>
<tr>
<td>Grating</td>
<td>1</td>
<td>cu. ft.</td>
<td></td>
</tr>
</tbody>
</table>

**Section D-D**

- 1/4 (13) Dia. stainless steel bolts with washers (typ.), through slot.

**Section C-C**

- 1/4 (13) Dia. tapped hole for bolting down grate, four places each frame.

**Section F-F**

- 27 (690) Type G, 4'-4" (1.325 m) Type E or 6'-0" (1.829 m) Type F

**Section E-E**

- 1/4 (13) Dia. tapped hole for bolting down grate, four places each frame.

**Detail of Cast Grate**

- Type G requires 1 grate
- Type E requires 2 grates
- Type F requires 3 grates

**Detail of Cast Frame**

- 12 (300) Type E & F
- 12 (300) Type G
- 12 (300) Type E & F
- 13 (340) Type G

**Shoulder Inlet**

**With Curb**

---

*Illinois Department of Transportation*

*Standard 610001-08*
Rail element splice (See Detail)

6'-3" (1.905 m) Typical post spacing

SECTION A-A

* When "S" is less than 3 and the distance from the back of post is less than 24 (610), the post shall be steel and the embedment shall be 76% (1.93 m) and the minimum top of rail height shall be 31 (787).

SECTION B-B

** When connecting Type D guardrail to an impact attenuator, adjust this dimension to match over a distance of 26'-0" (7.92 m) from point of connection if necessary.

GENERAL NOTES

All slope ratios are expressed as units of vertical displacement to units of horizontal displacement (V:H).

All dimensions are in inches (millimeters) unless otherwise shown.

STEEL PLATE BEAM GUARDRAIL

STANDARD 630001-12

(Sheet 1 of 4)
STEEL POST CONSTRUCTION

W6x8 (W50x12.75) or W6x8.5 (W50x12.75) steel post.

Post bolt with std. hex nut.

STANDARD 630001-12
GUARDRAIL

WOOD POST CONSTRUCTION

12x6 (305x152) Rough sawn timber blockout toenailed to post with 160 nails

Red (200x150) Rough sawn timber post

Bolt not to extend more than 6 (6) past nut.

WOOD BLOCK-OUT AND STEEL POST DETAILS

POST OR SPLICE BOLT & NUT

Four holes each flange

W250x13.3 or W250x12 fsi.

STEEL PLATE BEAM

TWO-PIECE WOOD BLOCKOUT OPTION

Std. flat washer

Tie nut w/ 16D nail.

All holes 1/4 (22) dia.

Illinois Department of Transportation
APPROVED
2018
ENGINEER OF DESIGN AND ENVIRONMENT
ISSUED
1-1-97
ENGINEER OF POLICY AND PROCEDURES
NOTE
Anchor plate T shall be used to attach cable assembly to guardrail when required on traffic barrier terminals.

NOTE
When end shoe is attached to a bridge parapet which has an expansion joint, the bolts shall be provided with a locknut or double nut and shall be tightened only to a point that will allow guardrail movement. The standard end shoe shall be attached to the concrete with pre-drilled or self-drilling anchor bolts. The anchor cone shall be set flush with the surface of the concrete. Extremally threaded studs protruding from the surface of the concrete will not be permitted.
**GUARDRAIL PLACED BEHIND CURB**

Note: "D" shall not exceed 6 (150 m) for design speeds greater than 45 mph.

**FOOTING FOR POST WHEN IMPERVIOUS MATERIAL IS ENCOUNTERED**

<table>
<thead>
<tr>
<th>MATERIAL IS ENCOUNTERED</th>
<th>FOOTING FOR POST WHEN IMPERVIOUS MATERIAL IS ENCOUNTERED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steel or wood post: (steel shown)</td>
<td>Steel or wood post: (steel shown)</td>
</tr>
<tr>
<td>Aggregate backfill (CA 11)</td>
<td>Aggregate backfill (CA 11)</td>
</tr>
<tr>
<td>HMA or PCC pavement</td>
<td>HMA or PCC pavement</td>
</tr>
</tbody>
</table>

**LEAVE-OUT FOR POST WHEN PAVED MATERIAL IS ENCOUNTERED**

<table>
<thead>
<tr>
<th>D</th>
<th>D (150) max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 6 - 18</td>
<td>16 (458) - (468) - (496)</td>
</tr>
<tr>
<td>&gt; 18 - 31</td>
<td>12 (305) - 8 (203) - (250)</td>
</tr>
<tr>
<td>&gt; 31 - 40</td>
<td>12 (305) - 0 (203) - (250)</td>
</tr>
</tbody>
</table>

**Steel or wood post**

10 (250) min. for wood post
8 (200) min. for steel post

**Wood Post**

10 (250) min. for wood post
8 (200) min. for steel post

**Steel Post**

20 (510) min. for wood post
18 (460) min. for steel post

**HMA or Controlled Low-Strength Material (CLSM)**

Low-strength HMA or PCC pavement

**LEAVE-OUT FOR POST WHEN PAVED**

If greater than 8 (200) apply FOOTING FOR POST WHEN IMPERVIOUS MATERIAL IS ENCOUNTERED, but do not shorten post.

**ELEVATION**

**PLAN**
When connecting to long-span guardrail over culvert, the next post may be the third (farthest from culvert) CRT wood post (See Standard 630106).

All dimensions are in inches (millimeters) unless otherwise shown.
The diagram illustrates the construction details for a non-blocked steel plate beam guardrail. It shows the plan and elevation views, indicating the use of aggregate backfill (CA 11) and finished ground line. The table outlines the material requirements for different Ledge thicknesses:

<table>
<thead>
<tr>
<th>V</th>
<th>W</th>
<th>L</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 - 6</td>
<td>24</td>
<td>21</td>
</tr>
<tr>
<td>(0 - 152)</td>
<td>(610)</td>
<td>(510)</td>
</tr>
<tr>
<td>&gt; 6 - 18</td>
<td>18</td>
<td>149</td>
</tr>
<tr>
<td>(&gt; 152 - 458)</td>
<td>(458)</td>
<td>(368)</td>
</tr>
<tr>
<td>&gt; 18 - 31</td>
<td>12</td>
<td>8</td>
</tr>
<tr>
<td>(&gt; 458 - 787)</td>
<td>(355)</td>
<td>(200)</td>
</tr>
<tr>
<td>&gt; 33 - 40</td>
<td>12</td>
<td>6</td>
</tr>
<tr>
<td>(&gt; 787 - 1,024)</td>
<td>(1055)</td>
<td>(200)</td>
</tr>
</tbody>
</table>

Footnotes include:
- Leave-out or overlapping cored holes with sides smoothed
- If greater than 8 (200) apply footing for post when impervious material is encountered, but do not shorten post.
for Case IV.

Revised weld detail unless otherwise shown.

All dimensions are in inches (millimeters) unless otherwise shown.

All threaded rods shall be installed with heavy hex nuts and standard washers.

For details of guardrail elements not shown, see Standard 630001.

All threaded rods shall be installed with heavy hex nuts and standard washers.

All dimensions are in inches (millimeters) unless otherwise shown.

GENERAL NOTES

For details of guardrail elements not shown, see Standard 630001.

All threaded rods shall be installed with heavy hex nuts and standard washers.

All dimensions are in inches (millimeters) unless otherwise shown.
**Pay limits of other type**

- **LONG-SPAN GUARDRAIL OVER CULVERT**

- **ELEVATION**

- **GENERAL NOTES**

  See Standard 630001 for details of guardrail not shown.

  Blockouts shown at steel posts shall be omitted when NON-BLOCKED STEEL PLATE BEAM GUARDRAIL is specified. See Standard 630006 for details not shown.

  All dimensions are in inches (millimeters) unless otherwise shown.

**PLAN**

- 62'-6" (19.05 m) min. of other type of guardrail (May include terminal)
- 6'-3" (1.905 m)
- 6'-3" (1.905 m)
- 12'-6", 18'-9" or 25'-0"

**Steel posts**

**CRT wood posts**

**Top of culvert.**

**SECTION A-A**

- 6 (152)
- 8 (203)

**FRONT**

- 6 (152)

**SIDE**

- 8 (203)

**CRT WOOD POST**

- 3" (79)
dia. hole

- 6'-0" (181)

**STANDARD 630106-02**

**OVER CULVERT**

**DATE**

- 1-1-17

**REVISIONS**

- Revised general notes for non-blocked guardrail option.

- Revised pay limits.

- 1-1-13

  - Added min. dim. from guardrail to headwall. Added dim.

  - To section A-A.
Pay limits of Guardrail Attached to Culvert

50' (15.24 m) min. of other guardrail type required prior to barrier terminal.

See DETAIL A for attachment to post.

Steel socket. See Cases I - VI for assembly and mounting details

GENERAL NOTES

See Standard 630001 for details of guardrail not shown.

See Standard 630006 for details of non-blocked guardrail not shown.

All threaded rods and bolts shall be installed with heavy hex nuts and standard washers unless noted otherwise.

All dimensions are in inches (millimeters) unless otherwise shown.

WEAK POST GUARDRAIL ATTACHED TO CULVERT

STANDARD 630111
GUSSET B

PLATE E

(6 4)

2 1 2

(6 4)

2 1 2

(10)

8 3

70 xx

PLATE C

(51)

2

(51)

2

(102)

4

(51)

2

Steel post

1/4 x 5

(M16 x 127)

hex bolt and nut

Socket assembly

2 1/2 x 2

(M13 x 50) hex bolts and nuts

Greater of 3/4 (140) or H x 2 1/2 (H x 64)

* R varies between 0 to 6 (152)

CROSS SECTION

CASE I, (H+T-R) < 18 (457), TOP MOUNT

ELEVATION

For R greater than 3 (76) provide BRACKET A. For R less than or equal to 3 (76) provide BRACKET B.

(BRACKET A shown)

TOP VIEW

SIDE VIEW

FRONT VIEW

WEAK POST GUARDRAIL
ATTACHED TO CULVERT

STANDARD 630111
post Steel assembly Socket min. 

W + 4 (102) 

SQUARE WASHER B 

Two % (19) threaded rods. Length shall be W + 4 (102). 

For R greater than 3 (76) provide BRACKET A. For R less than or equal to 3 (76) provide BRACKET B. (BRACKET A shown) 

R varies between 0 to 6 (152) 

Two % (19) expansion bolt 

Steel post: 

% x 5 (M16 x 127) hex bolt and nut 

Socket assembly 

Two % x 2 (M13 x 50) hex bolts 

Greater of 5\(\frac{1}{2}\) (140) or R+2\(\frac{1}{2}\) (R+64) 

% (19) expansion bolt 

Two % x 11 (M19 x 279) threaded rods secured with chemical adhesive 

% (6) 

One % (19) expansion bolt 

Steel post: 

% x 5 (M16 x 127) hex bolt and nut 

% (10) 

W + 4 (102). Length shall be W + 4 (102). 

For R greater than 3 (76) provide BRACKET A. For R less than or equal to 3 (76) provide BRACKET B. (BRACKET A shown) 

R varies between 0 to 6 (152) 

Cross Section CASE II (H+T-R) < 18 (457), Side-Mount Through-Bolt 

Elevation CASE II (H+T-R) < 18 (457), Side-Mount Through-Bolt 

Cross Section CASE III (H+T-R) < 18 (457), Side-Mount Anchored 

Elevation CASE III (H+T-R) < 18 (457), Side-Mount Anchored 

Socket Assembly FOR CASES II & III
CROSS SECTION
CASE IV, (H+T-R) > 18 (457), TOP MOUNT

ELEVATION

TOP VIEW

SIDE VIEW

FRONT VIEW

SOCKET ASSEMBLY
FOR CASE IV

Steel post

\% x 5 (M16 x 127)

hex bolt and nut

Socket assembly

Two \% x 7 (M19 x 178)

threaded rods secured

with chemical adhesive

* R varies between 0 to 6 (152)

2

12 (305)

5

Two \% x 7 (M19 x 178)

threaded rods secured

with chemical adhesive

WEAK POST GUARDRAIL
ATTACHED TO CULVERT

STANDARD 630111
Steel post

\( \frac{3}{8} \times 5 \) (M16 x 127)
hex bolt and nut

Socket assembly

Two \( \frac{3}{16} \) x 7 (M13 x 178) threaded rods secured with chemical adhesive

* R varies between 0 to 6 (152)

**R**

**CASE V**, \((H+T-R) > 18\) (457), SIDE-MOUNT, THROUGH-BOLT

Two \( \frac{3}{8} \) (19) threaded rods secured with chemical adhesive.
Length shall be \( W + 4 \) (302).

SQUARE WASHER B

**CASE VI**, \((H+T-R) \geq 18\) (457), SIDE-MOUNT ANCHORED

Two \( \frac{3}{8} \) (19) x 379 threaded rods secured with chemical adhesive.

**TOP VIEW**

PLATE D

PLATE A

GUSSET C

GUSSET C

SOCKET ASSEMBLY

FOR CASES V & VI

**SIDE VIEW**

**FRONT VIEW**

WEAK POST GUARDRAIL
ATTACHED TO CULVERT

STANDARD 630111
New standard. Boards meet gap where board. Only two bolts shown where post.

ELEVATION WITH W-BEAM GUARDRAIL

ELEVATION WITH THRIE-BEAM GUARDRAIL

Top of post and timber

Four bolts shown where boards meet. Only two required for continuous board.

VIEW A-A

VIEW B-B

GENERAL NOTES
For details of guardrail elements not shown, see Standard 6300001.

All dimensions are in inches (millimeters) unless otherwise shown.

STANDARD 630116
**PLAN**

- **Variable width beam guardrail**
- **Variable shoulder paving width**
- **Proposed standard PCC/HMA shoulder paved width**
- **Transition to normal shoulder slope**

**RESURFACING**

- **Proposed HMA stabilization 36 (900) & var**
- **Proposed PCC/HMA stabilization 36 (900) & var** (material same as shoulder)

**NEW CONSTRUCTION**

- **Proposed HMA shoulder surface**
- **Proposed PCC/HMA shoulder**

**GENERAL NOTES**

See Standard 630001 for details not shown.

- All dimensions are in inches (millimeters) unless otherwise shown.
- Switched units to English (metric).
GENERAL NOTES

50:1 Taper required to the guardrail head will not encroach on the shoulder.

All slope ratios are expressed as units of vertical displacement to units of horizontal displacement (V/H).

All dimensions are in inches (millimeters) unless otherwise shown.

SHOULDER WIDENING TRANSITION
FOR TANGENT TERMINAL

SECTION A-A
(Impact Head omitted for clarity.)
Edge of pavement

Edge of shoulder

Slope 1:10
or Flatter

Type 1 (Special), length varies by manufacturer

Flare according to manufacturer's specifications

Pay limits of
other type

35'-0" (10.0 m) min.
100'-0" (30.0 m) desirable

30 (762) to 4'-0" (1.2 m)
Variable

5'-0" (1.5 m)

30' (4572) to 4'-0" (1.2 m)

250'-0" (7.5 m) min.

5'-0" (1.5 m) max.

5'-0" (1.5 m)

22'-0" (7.0 m)

25'-0" (7.5 m) min.

22'-6" (7.0 m)

10'-0" (3.0 m)

5'-0" (1.5 m)

1:4 desirable

Top of tube

Type 1 (Special), length varies by manufacturer

Flare according to manufacturer's specifications

Pay limits of
other type

Length of need point
set by manufacturer
instructions

SHOULDER WIDENING TRANSITION
FOR FLARED TERMINAL

SECTION B-B

Impact Head omitted for clarity.

SHOULD WIDENING FOR
TYPE 1 (SPECIAL)
GUARDRAIL TERMINALS

Illinois Department of Transportation
January 1, 2018
APPROVED
January 1, 2018
ENGINEER OF DESIGN AND ENVIRONMENT
ISSUED
ENGINEER OF POLICY AND PROCEDURES

STANDARD 630301-08
TRAFFIC BARRIER TERMINAL TYPE 2 (1 each)

GUARDRAIL TYPE A or TYPE B

This post required for all types

6'-3" (1.905 m)

Pay limits of STEEL PLATE BEAM

6'-3" (1.905 m)

according to type

PLAN

To center of first bolt-hole in anchor plate.

Lap the rail element in the direction of traffic.

ELEVATION

Finished

ground line

GENERAL NOTES

See Standard 630001 for details of guardrail not shown.

The bearing plate K shall be held in position by two eight penny nails driven into the post and bent over the top of the plate.

All dimensions are in inches (millimeters) unless otherwise shown.

TRAFFIC FLOW

TRAFFIC BARRIER TERMINAL, TYPE 2

STEEL TUBE

WOOD POST

YOKE

STEEL STRUT

SLOT

1/4 (29) Dia. hole

5 1/2

140

5/16

1.25 m

1/4 (20) Dia. hole

2 1/4 (51) Dia. std. pipe in 2 1/2 (60) dia. hole

SYMMETRICAL

CABLE STRUT

1/4 Ø x 2 (22 x 51)

Slot
Plates G placed between ground line and finished traffic plate washer D under nut.

When rail element is placed adjacent to a tapered surface, use timber wedge M between the concrete and plate G. Post bolt with plate washer F placed under head and nut.

Install plate washer D so the 1 (25) projection fills the remainder of the slotted holes in the 1 (25) end plate on plate G after the 1 (M24) dia. bolts are in place.

GENERAL NOTES
Install plate washer D so the 1 (25) projection fills the remainder of the slotted holes in the 1 (25) end plate on plate G after the 1 (M24) dia. bolts are in place.

When an expansion joint exists below the connector, bolts shall be provided with a locknut or double nuts and shall be tightened only to a point that will allow plate G to be free to move.

See Standard 631026-06 for details of guardrail not shown.

All dimensions are in inches (millimeters) unless otherwise shown.

DATE REVISIONS
1-1-15 Revised post spacing
1-1-09 Switched units to English (metric).
Five 1/8" (M20) anchor bolts secured with chemical adhesive and five standard washers. After tightening, cut the anchor bolts flush with the nuts, and damage the nuts to prevent them from loosening.

Pay limits of TRAFFIC BARRIER TERMINAL TYPE 6 (1 each)

Approach curb, see plans for details.

Two sections of w-beam, one set inside the other

9'-8 1/2" (2.96 m) single section of w-beam

6 spaces at 2'-6 1/2" (770)

Transition section (see detail) included in TRAFFIC BARRIER TERMINAL TYPE 6

Single section of w-beam when no curb is present within this limit. Two sections of w-beam, one set inside the other when curb is present within this limit.

Pay limits of other type

No beginning or ending of curb within this limit.

Concrete structure

Thrie beam end shoe

Slope 1:10 or flatter

Steel post W6x9.0 (W150x13.5)

Section B-B

24 (610) min

Wood Blockout

Slope 1:10 or flatter

Begin 6' (1.83 m) min.

Posts

1 2 3 4 5 6 7 8 9 10 11 12 13

OTHER CONCRETE STRUCTURE

TRAFFIC BARRIER TERMINAL, TYPE 6

ILLINOIS DEPARTMENT OF TRANSPORTATION

ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2017

ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

PASSED

MARCH 2017

TRAFFIC BARRIER TERMINAL, TYPE 6

STANDARD 631031-15

(Sheet 2 of 3)
**GENERAL NOTES**

This standard shows attachment to curb mounted bridge rail. Attachment to side mounted bridge rail is similar.

See Standard 630001 for details of guardrail not shown.

Thrie beam rail shall be bolted to block-out at all posts.

All slope ratios are expressed as units of vertical displacement to units of horizontal displacement (V/H).

All dimensions are in inches (millimeters) unless otherwise shown.
Guardrail connection plate assembly

* Bolt 3/4" x 4" (22x127)
** Bolts 3/8" x 2" (22x31)

Bolts (A307) with washers and self-locking nut or nut and jam nut. Top bolt 3/4" x 4" (22x127). Bottom bolt 3/8" x 2" (22x127) for curb mount or 3/8" x 2" (22x31) for side mount.

Note: Side mounted rail similar as to connection details.

Finished surface

<table>
<thead>
<tr>
<th>SECTION C-C</th>
</tr>
</thead>
<tbody>
<tr>
<td>POSTS 1-9 WOOD BLOCKOUT DETAIL</td>
</tr>
<tr>
<td>POST 10 WOOD BLOCKOUT DETAIL</td>
</tr>
</tbody>
</table>

(See Standard 630001 for post 11-15 blockouts.)

MODIFIED THRIE BEAM END SHOE DETAIL

TRAFFIC BARRIER
TERMINAL, TYPE 6A

STANDARD 631032-09
GUARDRAIL CONNECTION PLATE ASSEMBLY DETAILS

(Mirror for opposite end)

VIEW D-D

SECTION E-E

DEPARTURE END VIEW

APPROACH END VIEW

CONNECTION ANGLES:

(Install angles to rail caps using 19 slotted holes and jam nuts, to be provided by others)
With standard washers. After tightening, cut the anchor bolts flush with the nuts and damage the nuts to prevent them from loosening.

Single section of thrie beam

8'-6" (2.59 m) single
section of thrie beam

Two sections of thrie beam

Concrete structure

4 spaces at 3'-6" (8.57 m)

6 spaces at 3'-1" (8.57 m)

8'-6" (2.59 m) single section of thrie beam

5 spaces at 6'-1" (1.85 m)

1 space at 9'-6" (2.89 m)

3'-12" (0.97 m) single section of thrie beam

9 spaces at 3'-15" (953)

No starting or ending of curbs within this limit.

GENERAL NOTES

See Standard 630001 for details of guardrail not shown.

Thrie beam rail shall be bolted to block-out at all posts.

All slope ratios are expressed as units of horizontal displacement to units of vertical displacement (V/H).

All dimensions are in inches (millimeters) unless otherwise shown.

STATEMENT OF REVISIONS

Date: 1-1-17

Revised length of thrie beam. Revised lengths of posts.

Date: 1-1-15

Revised notes for attachment to concrete structure.

PASSED

DATE

REVISIONS

1-1-2003

ENGINEER OF POLICY AND PROCEDURES

APPROVED

1-1-2017

ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED

1-1-15

ILLINOIS DEPARTMENT OF TRANSPORTATION
4-2 Unit expanding, or self-drilling anchors for 1/4 (M16) bolts with standard washers.

24 (M24x120) Machine bolts with plate washer D and locknut.

See plans

TRAFFIC BARRIER TERMINAL TYPE 11

TEMPORARY CONCRETE BARRIER

% (M16) Button head bolt with hex nut and washer recessed in wood block.

ELEVATION

PLATE G

(Place between the rail element and Plate E)

PLATE WASHER D

GENERAL NOTES

For details of guardrail not shown, see Standard 630001.

Install the face of the guardrail flush with the face of the temporary bridge rail. Install plate washer D so that the 1 (25) projection fills the remainder of the slotted holes in the 1 (25) end plate on the 1 (M24) diameter bolts are in place.

* Bolts shall be provided with a lock nut or double nut and shall be tightened only to a point that will allow plate G to be free to move.

** After tightening, cut the anchor bolts flush with nuts, and damage the bolt head to prevent them from loosening.

All dimensions are in inches (millimeters) unless otherwise shown.

TRAFFIC BARRIER TERMINAL TYPE 11

STANDARD 631051-03

DATE: 1-1-11

REVISIONS:

1-1-11 - Corrected weld symbol on PLATE D detail

1-1-99 - Switched units to English (metric)
Delineators shall be placed 24 (600) from break point on all interchange ramps and wherever pavement superelevation exceeds 6% and whenever pavement on all interchange ramps 24 (600) from break point.

Delineators shall be placed at a maximum of 400' (120 m) on tangent sections of main line roadways.

Delineators on ramps and acceleration and deceleration lanes shall be placed at a maximum of 400' (120 m) spacing.

Delineators on tangent sections of main line roadways shall be placed at a maximum of 400' (120 m) spacing.

Delineators shall be used on outside of all acceleration and deceleration lanes.

Double reflector units shall be used on the outside of all acceleration and deceleration lanes. Single reflector units shall be used on outside of hazardous curves.

Provide when double reflector unit is required.

Refer to Standard 720011 for details of metal post.

Double reflector units shall be used on the outside of all acceleration and deceleration lanes. Single reflector units shall be used on outside of all curved sections of ramps.

All dimensions are in inches (millimeters) unless otherwise shown.
**NOTES**

V + W shall not exceed 39 (990). When V is 6 (150) or less, post hole shall be filled to ground line with concrete. When V is 6 (150) or less, W = 24 (610), and posts shall be shortened as required. When V exceeds 15 (380), W shall be shortened correspondingly.

T = 15 (380) when U is 33 (840) or less. When U exceeds 33 (840), the impervious material shall be removed and the standard anchor shall be used.

Timber blocks shall be nailed to each wood post on the concave side of curve for curves having a radius of less than 600' (180 m).

**GENERAL NOTES**

The Engineer will determine the stability of the impervious material for anchoring.

All slope ratios are expressed as units of vertical displacement to units of horizontal displacement (V:H).

All dimensions are in inches (millimeters) unless otherwise shown.

**TYPICAL FOOTINGS FOR POST AND ANCHOR WHEN IMPERVIOUS MATERIAL IS ENCOUNTERED**

**INTERMEDIATE ANCHOR ARRANGEMENT**

**DEAD END ANCHOR ARRANGEMENT**

**VIEW X-X**

**GENERAL NOTES**

The Engineer will determine the stability of the impervious material for anchoring.

All slope ratios are expressed as units of vertical displacement to units of horizontal displacement (V:H).

All dimensions are in inches (millimeters) unless otherwise shown.
**TYPICAL CROSS-SECTION**

- **New Monolithic PCC Base**
- **New or Existing BIT / PCC Base with Overlay Confinement**
- **New or Existing PCC Base**
- **Existing PCC Base with Longitudinal Joint**

**VARIABLE CROSS-SECTION**

- **NEW MONOLITHIC PCC BASE**
  - *This dimension shall be 10 (250) minimum when the barrier is confined by earth.*

- **NEW OR EXISTING BIT / PCC BASE**
  - WITH OVERLAY CONFINEMENT

- **NEW OR EXISTING PCC BASE**

- **EXISTING PCC BASE**
  - WITH LONGITUDINAL JOINT
  - **6 mils (0.15) Polyethylene bond breaker**

**GENERAL NOTES**

- **The Variable Cross-Section shall be used when there is a difference in elevation between the two sides of the barrier.**
- See standard 836006 for light pole foundation details where required in concrete barrier.
- All dimensions are in inches (millimeters) unless otherwise shown.

**CONCRETE BARRIER, DOUBLE FACE,**
32 in. (815 mm) **HEIGHT**

**DATE**

- 1-1-13

**REVISIONS**

- Revised general note to reference standard 836006 for light pole foundation
- Switched units to English (metric)

---

**Illinois Department of Transportation**

- **PASSED DATE**
- 1-1-97
- **APPROVED DATE**
- 1-1-13
- **ENGINEER OF POLICY AND PROCEDURES**
- 1-1-09
- **ENGINEER OF DESIGN AND ENVIRONMENT**
- 1-1-97

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**STANDARD 637001-05**
**EXPANSION JOINT**

- Preformed expansion joint filler
- 136x18 (32x450) Dowel bar w/ plastic cups

**CONSTRUCTION JOINT**

- Smooth header drilled for bars
- 156x18 (32x450) Dowel bars

**PLAN AT LIGHTING FOUNDATION**

- Conduit
- Anchor rod

**ELEVATION AT LIGHTING FOUNDATION**

- 20 (500) (65)
- 6 (50)

**CONCRETE BARRIER, DOUBLE FACE, 32 in. (815 mm) HEIGHT**

<table>
<thead>
<tr>
<th>Illinois Department of Transportation</th>
</tr>
</thead>
<tbody>
<tr>
<td>January 1, 2013</td>
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</table>

**APPROVED January 1, 2013**

**ENGINEER OF DESIGN AND ENVIRONMENT**

**ISSUED 1-1-97**

**PASSED ENGINEER OF POLICY AND PROCEDURES**

**STANDARD 637001-05**
The Variable Cross-Section shall be used when there is a difference in elevation between the two sides of the barrier. See standard 836011 for light pole foundation details where required in concrete barrier. All dimensions are in inches (millimeters) unless otherwise shown.

Anchoring Methods

TYPICAL CROSS-SECTION

NEW MONOLITHIC
PCC BASE

NEW OR EXISTING
BIT. / PCC BASE
WITH OVERLAY CONFINEMENT

ANCHORING METHODS

EXISTING PCC BASE
WITH LONGITUDINAL JOINT

VARIABLE CROSS-SECTION

No. 6 (No. 19) Tie bars at 30 (760) cts. (staggered side to side)

No. 6 (No. 19) Tie bars at 30 (760) cts.

6 mils (0.15) Polyethylene bond breaker

GENERAL NOTES

The Variable Cross-Section shall be used when there is a difference in elevation between the two sides of the barrier. See standard 836011 for light pole foundation details where required in concrete barrier. All dimensions are in inches (millimeters) unless otherwise shown.

CONCRETE BARRIER,
DOUBLE FACE,
42 in. (1065 mm) HEIGHT

STANDARD 637006-03
**ELEVATION**

Concrete glare screen

Conduit barrier

Bend in field

**TYPICAL APPLICATION AT MEDIAN OBSTRUCTIONS**

Glare Screen

Expansion Joint

All dimensions are in inches (millimeters) unless otherwise shown.

**DATE**

1:104

Switched units to English (metric)

**REVISIONS**

1:109

Revised for F shape barrier

**CONCRETE GLARE SCREEN**

STANDARD 638101-02
Each alternate pair of panels shall have a textured surface finish as shown, and shall be alternated with pairs having a smooth finish. The intersection of every two panels having the same finish shall point toward the road as shown.

**PLAN**

Face of wall toward road

**ELEVATION**

Top of wall

36 (900) min. embankment at low point of finished grade (typ.)

- **SECTION A-A**
  - Coarse aggregate backfill
  - 15 (380) min. (inches)

- **SECTION B-B**
  - Threaded inserts for 1/2 (M12) bolts, precut or field drilled, as necessary, into panels.
  - Showing typical metal band connector dimensions
  - Showing typical shear key dimensions

**GENERAL NOTES**

- Loading for 80 mph (130 km/h) wind with 30% gust factor, normal to wall.

**ALLOWABLE STRESSES**

- Concrete:
  - \( f_c = 3,300 \) psi (24 MPa)
  - \( f_{cs} = 3,250 \) psi (22 MPa)
- Prestressing Steel:
  - \( f_y = 270,000 \) psi (1880 MPa)
  - \( f_{ps} = 169,000 \) psi (1160 MPa)
- Reinforcing Steel:
  - \( f_y = 40,000 \) psi minimum (270 MPa)
  - \( f_{ps} = 20,000 \) psi (138 MPa)
  - Minimum allowable soil bearing pressure: \( = 1.25 \) tf/sf (120 kPa)

All dimensions are in inches (millimeters) unless otherwise shown.

**SIGHT SCREEN**

- PRECAST PRESTRESSED
- CONCRETE PANEL WALL

**DATE**

- 1-1-97
- 1-1-07
- 1-1-09

**REVISIONS**

- Switched units to English (metric).
- Soft converted metric reinforcement bars & corrected dimensions.
**Nominal Panel Size**

<table>
<thead>
<tr>
<th>Size</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>M</th>
</tr>
</thead>
<tbody>
<tr>
<td>8'-0&quot; x 9'-0&quot;</td>
<td>6</td>
<td>8</td>
<td>9</td>
<td>6</td>
</tr>
<tr>
<td>(2.4 m x 2.7 m)</td>
<td>(150)</td>
<td>(180)</td>
<td>(225)</td>
<td>6</td>
</tr>
<tr>
<td>8'-0&quot; x 11'-0&quot;</td>
<td>3</td>
<td>6</td>
<td>9</td>
<td>6</td>
</tr>
<tr>
<td>(2.4 m x 3.3 m)</td>
<td>(75)</td>
<td>(105)</td>
<td>(114)</td>
<td>6</td>
</tr>
<tr>
<td>8'-0&quot; x 13'-0&quot;</td>
<td>3</td>
<td>6</td>
<td>9</td>
<td>6</td>
</tr>
<tr>
<td>(2.4 m x 3.9 m)</td>
<td>(75)</td>
<td>(105)</td>
<td>(114)</td>
<td>6</td>
</tr>
</tbody>
</table>
Terminal pull post
Dome type caps on pull posts
Loop type caps on line posts

Tops of all footings shall be rounded

Tension cable shall be provided with one turn buckle between each pair of pull posts.

Fence fabric shall be tied to all line posts, tension cable and brace rails with 9 ga. (3.76) wire tied at 12 (300) cts.

Post sizes other than those shown may be used subject to approval by the Engineer.

All dimensions are in inches (millimeters) unless otherwise shown.

Loading for wind 80 mph (130 km/h)
with 30% gust factor. Minimum allowable soil pressure = 1.25 tsf (120 kPa).

GENERAL NOTES

SIGHT SCREEN
CHAIN LINK FENCE

Sheet 1 of 2

STANDARD 640001-01

Illinois Department of Transportation
APPROVED January 1, 2009
ENGINEER OF BRIDGES AND STRUCTURES
APPROVED January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT

1-1-97
REVISIONS

1-1-97
Revised General Notes.

1-1-09
Switched units to English (metric).

ELEVATION - 6' (1.83 m) FENCE
(Looking toward Highway)

ELEVATION - 8' (2.43 m) & 10' (3.05 m) FENCES
(Looking toward Highway)
**SECTION A-A**

(Shewing method of fasening bottom tension cable and fence fabric to pull posts.)

**DETAIL B**

(Shewing typical method of attaching middle brace rails to posts.)

**DETAIL A**

**DetaiL OF FABRIC**

(Looking from highway)

**DETAIL C**

(Looking toward highway)

**FENCE INSTALLATION ON SLOPES**

**PROTECTIVE ELECTRICAL GROUND**

**PLAN**

**DETAIL**

**OR**

Illinois Department of Transportation

APPROVED January 1, 2009

ENGINEER OF BRIDGES AND STRUCTURES

APPROVED January 1, 2009

ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

SIGHT SCREEN

CHAIN LINK FENCE

(STANDARD 640001-01)
**DETAIL A**

Facing Highway

3x4 (75 x 100) Rails

Cedar pickets

**Spacing (typ.)**

7'-4" (2.2 m)

**DETAIL B**

**Fence Height**

6'-0" (1.8 m)

8'-0" (2.4 m)

**Post Size**

6x6 (150 x 150)

8x8 (200 x 200)

**Post Length**

10'-0" (3.0 m)

14'-0" (4.3 m)

**Post Embedment**

4'-0" (1.2 m)

6'-0" (1.8 m)

A

B

C

D

15 (380)

16 (400)

33 (870)

33 (870)

15 (380)

15 (380)

15 (380)

15 (380)

**Aggregate for post**

15 (380) Dia. hole

15 (380) Dia. hole

15 (380) Dia. hole

15 (380) Dia. hole

**Slope rails parallel to grade**

**Vertical posts (typ.)**

**Pickets vertical with fine across tops parallel to grade**

**GENERAL NOTES**

Loading is based on 80 mph (130 km/h) with 30% gust factor. Minimum allowable soil pressure = 1.25 tcf (120 kPa).

All dimensions are in inches (millimeters) unless otherwise shown.

**DATE**

1-1-09

**REVISIONS**

1-1-09 Switched units to English (metric); Changed

Sec. B-B to Detail B

1-1-97 Revised Standard 2367-3

Deleted DN Symbol

Illinois Department of Transportation

APPROVED

January 1, 2009

ENGINEER OF BRIDGES AND STRUCTURES

APPROVED

January 1, 2009

ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED

1-1-97
**SIGHT SCREEN**

**WOOD PLANK FENCE**

**TYPE P**

**STANDARD 641006-01**

**GENERAL NOTES**

Loading was based on 80 mph (130 km/h) with 50% gust factor. Minimum allowable soil pressure = 1.25 t/ft² (120 kPa).

All dimensions are in inches (millimeters) unless otherwise shown.

**DATE**

1-1-09

**REVISIONS**

Switched units to English (metric). Deleted DN Symbol. Switched units to English (metric). Changed Section B-B to Detail B. Renum. Standard 2367-3.

**ENGINEER OF DESIGN AND ENVIRONMENT**

APPROVED January 1, 2009

**ENGINEER OF BRIDGES AND STRUCTURES**

APPROVED January 1, 2009

**Illinois Department of Transportation**

APPROVED January 1, 2009

**SECTION B-B**

DETAIL B

(Showing typical plank to post connection details)

DETAIL A

(Showing typical plank to rail attachment each rail)

**ELEVATION**

(Showing treatment with sloping ground)

**ELEVATION**

(Side of rail)

Clinch nails on back side of rail

Galvanized common wire nails of sufficient length to have a minimum of three (3) projection to clinch nails in back.

**FENCE HEIGHT**

<table>
<thead>
<tr>
<th>Fence Height</th>
<th>6'-0&quot; (1.8 m)</th>
<th>8'-0&quot; (2.4 m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post Size (nominal dim.)</td>
<td>3x6 (50x200)</td>
<td>8x8 (200x200)</td>
</tr>
<tr>
<td>Post Length</td>
<td>9'-0&quot; (2.7 m)</td>
<td>10'-0&quot; (3.0 m)</td>
</tr>
<tr>
<td>Post Embedment</td>
<td>3'-0&quot; (0.9 m)</td>
<td>4'-0&quot; (1.2 m)</td>
</tr>
</tbody>
</table>

**DETAIL B**

(Surface of plank)

1.25 tsf (120 kPa).

All dimensions are in inches (millimeters) unless otherwise shown.

**DETAIL A**

(Showing treatment with sloping ground)

**PLAN**

(Facing highway)

**ELEVATION**

(Side of rail)

Clinch nails on back side of rail

Galvanized common wire nails of sufficient length to have a minimum of three (3) projection to clinch nails in back.

**GENERAL NOTES**

Loading was based on 80 mph (130 km/h) with 50% gust factor. Minimum allowable soil pressure = 1.25 t/ft² (120 kPa).

All dimensions are in inches (millimeters) unless otherwise shown.

**DATE**

1-1-09

**REVISIONS**

Switched units to English (metric). Deleted DN Symbol. Switched units to English (metric). Changed Section B-B to Detail B. Renum. Standard 2367-3.

**ENGINEER OF DESIGN AND ENVIRONMENT**

APPROVED January 1, 2009

**ENGINEER OF BRIDGES AND STRUCTURES**

APPROVED January 1, 2009

**Illinois Department of Transportation**

APPROVED January 1, 2009

**SECTION B-B**

DETAIL B

(Showing typical plank to post connection details)

DETAIL A

(Showing typical plank to rail attachment each rail)

**ELEVATION**

(Showing treatment with sloping ground)

**ELEVATION**

(Side of rail)

Clinch nails on back side of rail

Galvanized common wire nails of sufficient length to have a minimum of three (3) projection to clinch nails in back.

**FENCE HEIGHT**

<table>
<thead>
<tr>
<th>Fence Height</th>
<th>6'-0&quot; (1.8 m)</th>
<th>8'-0&quot; (2.4 m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post Size (nominal dim.)</td>
<td>3x6 (50x200)</td>
<td>8x8 (200x200)</td>
</tr>
<tr>
<td>Post Length</td>
<td>9'-0&quot; (2.7 m)</td>
<td>10'-0&quot; (3.0 m)</td>
</tr>
<tr>
<td>Post Embedment</td>
<td>3'-0&quot; (0.9 m)</td>
<td>4'-0&quot; (1.2 m)</td>
</tr>
</tbody>
</table>

**DETAIL B**

(Surface of plank)

1.25 tsf (120 kPa).

All dimensions are in inches (millimeters) unless otherwise shown.

**DETAIL A**

(Showing treatment with sloping ground)

**PLAN**

(Facing highway)

**ELEVATION**

(Side of rail)

Clinch nails on back side of rail

Galvanized common wire nails of sufficient length to have a minimum of three (3) projection to clinch nails in back.

**FENCE HEIGHT**

<table>
<thead>
<tr>
<th>Fence Height</th>
<th>6'-0&quot; (1.8 m)</th>
<th>8'-0&quot; (2.4 m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post Size (nominal dim.)</td>
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<td>8x8 (200x200)</td>
</tr>
<tr>
<td>Post Length</td>
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<td>10'-0&quot; (3.0 m)</td>
</tr>
<tr>
<td>Post Embedment</td>
<td>3'-0&quot; (0.9 m)</td>
<td>4'-0&quot; (1.2 m)</td>
</tr>
</tbody>
</table>

**DETAIL B**

(Surface of plank)

1.25 tsf (120 kPa).

All dimensions are in inches (millimeters) unless otherwise shown.

**DETAIL A**

(Showing treatment with sloping ground)

**PLAN**

(Facing highway)

**ELEVATION**

(Side of rail)

Clinch nails on back side of rail

Galvanized common wire nails of sufficient length to have a minimum of three (3) projection to clinch nails in back.

**FENCE HEIGHT**

<table>
<thead>
<tr>
<th>Fence Height</th>
<th>6'-0&quot; (1.8 m)</th>
<th>8'-0&quot; (2.4 m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post Size (nominal dim.)</td>
<td>3x6 (50x200)</td>
<td>8x8 (200x200)</td>
</tr>
<tr>
<td>Post Length</td>
<td>9'-0&quot; (2.7 m)</td>
<td>10'-0&quot; (3.0 m)</td>
</tr>
<tr>
<td>Post Embedment</td>
<td>3'-0&quot; (0.9 m)</td>
<td>4'-0&quot; (1.2 m)</td>
</tr>
</tbody>
</table>

**DETAIL B**

(Surface of plank)

1.25 tsf (120 kPa).

All dimensions are in inches (millimeters) unless otherwise shown.

**DETAIL A**

(Showing treatment with sloping ground)
**GENERAL NOTES**

Omit shoulder rumble strips across structures and at mailbox turnouts.

All dimensions are in inches (millimeters) unless otherwise shown.

**TYPICAL APPLICATION AT AN INTERSECTION OR ENTRANCE**

1. See Section A-A.
**GORE INSTALLATION**
(Traffic approaches on both sides)
(Test Level 2 array shown)

**ROADSIDE INSTALLATION**
(Traffic approaches on one side)
(Test Level 2 array shown)

**SAND MODULE**

1. **Hazard**
2. **Direction of traffic flow**
   - Preferred: 10° relative to traffic flow

**TEST LEVEL 2 ARRAY**
(for design speed less than or equal to 45 mph)
(Numbers inside sand modules indicate sand weight in pounds)

**TEST LEVEL 3 ARRAY**
(for design speed greater than 45 mph)
(Numbers inside sand modules indicate sand weight in pounds)

**GENERAL NOTES**
All dimensions are in inches (millimeters) unless otherwise shown.

**DATE**

**REVISIONS**
1-1-14 Revised distance from barriers to hazard
1-1-13 Changed posted speed to "design speed"
**CHAIN LINK FENCE**

**LINE POST**

<table>
<thead>
<tr>
<th>Section</th>
<th>M/ft. (kg/m)</th>
<th>lbs./ft. (lbs./ft.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pipe Type A 1.90 (48.3) O.D.</td>
<td>2.77 (4.05)</td>
<td>2.77 (4.05)</td>
</tr>
<tr>
<td>Pipe Type B 1.90 (48.3) O.D.</td>
<td>2.86 (3.30)</td>
<td>2.86 (3.30)</td>
</tr>
<tr>
<td>Pipe Type C 1.90 (48.3) O.D.</td>
<td>2.93 (3.50)</td>
<td>2.93 (3.50)</td>
</tr>
<tr>
<td>H 1.875x1.625 (47.6x41.3)</td>
<td>2.92 (4.05)</td>
<td>2.92 (4.05)</td>
</tr>
<tr>
<td>C</td>
<td>1.90 (2.88)</td>
<td>1.90 (2.88)</td>
</tr>
<tr>
<td>I</td>
<td>2.20 (3.42)</td>
<td>2.20 (3.42)</td>
</tr>
</tbody>
</table>

**TERMINAL POST**

<table>
<thead>
<tr>
<th>Section</th>
<th>M/ft. (kg/m)</th>
<th>lbs./ft. (lbs./ft.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pipe Type A 2.575 (65.6) O.D.</td>
<td>3.65 (5.43)</td>
<td>3.65 (5.43)</td>
</tr>
<tr>
<td>Pipe Type B 2.575 (65.6) O.D.</td>
<td>3.65 (5.43)</td>
<td>3.65 (5.43)</td>
</tr>
<tr>
<td>Pipe Type C 2.575 (65.6) O.D.</td>
<td>3.75 (5.46)</td>
<td>3.75 (5.46)</td>
</tr>
<tr>
<td>Roll Formed 35x35 (89.0x89.0)</td>
<td>3.60 (5.40)</td>
<td>3.60 (5.40)</td>
</tr>
<tr>
<td>50.42x50.42 (63.5x63.5)</td>
<td>4.32 (6.43)</td>
<td>4.32 (6.43)</td>
</tr>
</tbody>
</table>

**HORIZONTAL BRACES**

<table>
<thead>
<tr>
<th>Section</th>
<th>M/ft. (kg/m)</th>
<th>lbs./ft. (lbs./ft.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pipe Type A 1.66 (42.2) O.D.</td>
<td>2.27 (3.30)</td>
<td>2.27 (3.30)</td>
</tr>
<tr>
<td>Pipe Type B 1.66 (42.2) O.D.</td>
<td>2.84 (4.22)</td>
<td>2.84 (4.22)</td>
</tr>
<tr>
<td>Pipe Type C 1.66 (42.2) O.D.</td>
<td>3.34 (4.89)</td>
<td>3.34 (4.89)</td>
</tr>
<tr>
<td>H 1.25x1.5 (32.7x38.1)</td>
<td>2.43 (3.55)</td>
<td>2.43 (3.55)</td>
</tr>
<tr>
<td>Roll Formed 35x35 (89.0x89.0)</td>
<td>See detail</td>
<td>See detail</td>
</tr>
</tbody>
</table>

**GATE POSTS**

<table>
<thead>
<tr>
<th>Gate Opening * (ft. (m))</th>
<th>Pipe Type A</th>
<th>Pipe Type B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size (in.)</td>
<td>M/ft. (kg/m)</td>
<td>lbs./ft. (lbs./ft.)</td>
</tr>
<tr>
<td>Single</td>
<td>Double</td>
<td>Single</td>
</tr>
<tr>
<td>Up to 4 (1.2)</td>
<td>Up to 8 (2.4)</td>
<td>2.37 (60.3)</td>
</tr>
<tr>
<td>Over 4 (1.2) to 8 (2.4)</td>
<td>Over 8 (2.4) to 16 (5.0)</td>
<td>2.87 (73.0)</td>
</tr>
<tr>
<td>Over 8 (2.4) to 12 (3.6)</td>
<td>Over 12 (3.6) to 24 (7.4)</td>
<td>3.5 (89.0)</td>
</tr>
</tbody>
</table>

* The 35x35 (89.0x89.0) roll formed section as detailed may be used as gate posts for single gate up to 6' (1.8 m) and double gate up to 12' (3.6 m).
**STANDARD GROUND**

**COUNTERPOISE GROUND** (ALTERNATE)

**PROTECTIVE ELECTRICAL GROUNDS**

**INSTALLATION ON SLOPES**

**INSTALLATION AT CORNERS**

**INSTALLATION OVER STREAM**

**INSTALLATION AROUND HEADWALL**

The chain link fabric shall be replaced by barbed wire strands at 12 (300) maximum centers between the double posts shown on DETAIL A when shown on the plans.

When fence line has a change in direction of 15° or more, a terminal post shall be placed as shown above.

Where angle is less than 15° and existing conditions require a terminal post, they shall be placed as directed by the Engineer.

**DETAIL A**

When the width of the culvert makes it necessary to anchor a post to the top of the culvert, a cast iron shoe or other device approved by the Engineer shall be used.
FENCE USING METAL POSTS

SINGLE GATE

DOUBLE GATE

PULL POST

LINE POST

CORNER OR END POST

NOTES

Barbed wires shall be tied to each post. Top and bottom wires of woven fence shall be fed to each post. Tie every other wire between, alternating on successive posts.

Barbed wires and line wires of woven fence shall be be fastened to the corner, end, pull, and gate posts by wrapping the wires around the post and tying back on itself with not less than 3 twists tightly wrapped.

GENERAL NOTES

Pull posts shall be placed at the locations determined by the Engineer. They shall be placed at 660' (200 m) intervals between posts to which the ends of the fabric and barbed wires are fastened or midway between such posts when the distance is less than 1320' (400 m) and greater than 660' (200 m).

Bracing for gate posts shall be the same type used for end posts.

The clearance between the bottom fence wire and the ground may be up to 3 (75) for a maximum distance of 8' (2.4 m) when uneven ground is encountered.

All dimensions are in inches (millimeters) unless otherwise shown.

DATE REVISIONS
1-1-09 Switched units to English (metric).
1-1-02 Corrected dimensions on sheet 3 and 4.

STANDARD 665001-02
FENCE USING WOOD POSTS

SINGLE OR DOUBLE GATE

Details of the double and single gates are the same as those for metal posts.

Wood blocks nailed to post (typ.)

Brace post

Ground line

Pull post

Fence shall be overlapped for a distance of 5'-6" (1.67 m) of Wood brace

Brace wire stapled to posts on 3 sides.

One bay of bracing for run of fence less than 300' (92 m) to corner, end or gate post.

Two bays of bracing for run of fence 300' (92 m) or more to corner, end, or gate post.

Three bays of bracing for run of fence 360' (110 m) or more to corner, end, gate or pull post.

PULL POST

Corner or end post

Barbed wires shall be stapled to each post. Top and bottom wire of woven fence shall be stapled to each post. Staple every other wire between, alternating on successive posts.

Metal line posts may be used in lieu of wood line posts.

NOTES

LINE POST

Corner or end post

Pull post

Brace post

Wood brace

Brace wires stapled to posts on 3 sides.

Corner or end post

One bay of bracing for run of fence less than 150' (46 m) to corner, end or gate post.

Two bays of bracing for run of fence 150' (46 m) or more to corner, end or gate post.

Three bays of bracing for run of fence 180' (54 m) or more to corner, end, gate or pull post.

CORNER OR END POST

Barbed wire

Line post

Wood brace

Wood post

Wood blocks

Corner or end post

Brace wire

Wood blocks

Brace post

Ground line

Pull post

Fence shall be overlapped for a distance of 5'-6" (1.67 m) of Wood brace

Details of the double and single gates are the same as those for metal posts.

Wood blocks nailed to post (typ.)

Brace post

SECTION X-X

Illinois Department of Transportation

January 1, 2009
ENGINEER OF POLICY AND PROCEDURES
APPROVED
January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT
ISSUED
1-1-97
PASSED

STANDARD 665001-02

WOVEN WIRE FENCE

(Sheet 2 of 8)
### Metal Items

#### Gate Frames

<table>
<thead>
<tr>
<th>Section</th>
<th>lbs./ft. (kg/m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type A: Pipe 1.66 (42.2) O.D.</td>
<td>2.27 (3.38)</td>
</tr>
<tr>
<td>Type B: Pipe 1.66 (42.2) O.D.</td>
<td>1.83 (2.72)</td>
</tr>
<tr>
<td>Type C: Pipe 1.66 (42.2) O.D.</td>
<td>1.82 (2.71)</td>
</tr>
</tbody>
</table>

#### Corner, End or Pull Posts

<table>
<thead>
<tr>
<th>Section</th>
<th>lbs./ft. (kg/m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type A: Pipe 2.375 (60.3) O.D.</td>
<td>3.65 (5.43)</td>
</tr>
<tr>
<td>Type C: Pipe 2.375 (60.3) O.D.</td>
<td>3.09 (4.60)</td>
</tr>
<tr>
<td>Tubing 2.5 (63.5) Sq.</td>
<td>4.37 (6.43)</td>
</tr>
<tr>
<td>M. I. U. structural shapes</td>
<td>4.1 (6.10) min.</td>
</tr>
</tbody>
</table>

#### Line Posts

<table>
<thead>
<tr>
<th>Section</th>
<th>lbs./ft. (kg/m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type A: Pipe 3.15 (33.4) O.D.</td>
<td>1.68 (2.50)</td>
</tr>
<tr>
<td>Type B: Pipe 3.15 (33.4) O.D.</td>
<td>1.34 (1.99)</td>
</tr>
<tr>
<td>Type C: Pipe 3.15 (33.4) O.D.</td>
<td>1.33 (1.98)</td>
</tr>
</tbody>
</table>

#### Braces

<table>
<thead>
<tr>
<th>Section</th>
<th>lbs./ft. (kg/m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type A: Pipe 3.500 (88.9) O.D.</td>
<td>7.58 (11.28)</td>
</tr>
</tbody>
</table>

### Wood Items

#### Gate, Corner, End or Pull Posts

<table>
<thead>
<tr>
<th>Section</th>
<th>Top dia.</th>
<th>lbs./ft. (kg/m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 to 7 (150 to 175)</td>
<td>6x6 (150x150)</td>
<td>2x8x18 (50x200x450)</td>
</tr>
</tbody>
</table>

#### Braces and Line Posts

<table>
<thead>
<tr>
<th>Section</th>
<th>Top dia.</th>
<th>lbs./ft. (kg/m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 to 5 (120 to 150)</td>
<td>4x4 (100x100)</td>
<td>2x8x18 (50x200x450)</td>
</tr>
</tbody>
</table>

#### Blocks

<table>
<thead>
<tr>
<th>Section</th>
<th>Top dia.</th>
<th>lbs./ft. (kg/m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 to 7 (175)</td>
<td>6x6 (150x150)</td>
<td>2x8x18 (50x200x450)</td>
</tr>
</tbody>
</table>
Concrete Ledge

When X exceeds 12 (300), 18 (450), or 30 (760), Y shall be decreased correspondingly. When X is 0 to 12 (300), 18 (450), or 30 (760), X + Y shall not exceed 27 (685), 33 (840), or 3'-9" (1.14 m) max.

NOTE

Post dimension
Grout

Dia. min.
12 (300)

X max.

Y max.
15 (380)

NOTE

Shallow V cut in brace when round post is used.

Brace nailed to post with at least 3-16d common galvanized nails.

NOTE

The woven wire fabric shall be replaced by Barbed wire strands at 12 (300) maximum centers between the double posts shown on DETAIL A when shown on the plans.

INSTALLATION OVER STREAM

NOTE

Where grade line has a change in slope of 15° or more, a corner post with bracing as required shall be placed as shown above. Where angle is less than 15° and existing conditions require a corner post, they shall be placed as directed by the Engineer.

INSTALLATION AROUND HEADWALL

Wood or metal line post

8'-0" (2.44 m)

Mete end post not centered in concrete.

NOTE

When the tension of the fence tends to pull the posts from the ground, the line posts shall be anchored with the applicable concrete or wood anchorage specified for corner posts.

PROTECTIVE ELECTRICAL GROUNDING

FOR WOOD POST FENCE INSTALLATION

INSTALLATION ON SLOPES

When the tension of the fence tends to pull the posts from the ground, the line posts shall be anchored with the applicable concrete or wood anchorage specified for corner posts.
METHOD A

METHOD B

GENERAL NOTE

Reinforcement bars shall be No. 3 (No. 10) unless otherwise specified.

A 25x12.5 (70x310) shadow box with beveled edges, and a 3/8 (10 mm) thick indentation may be used with the standard lettering shown.

All dimensions are in inches (millimeters) unless otherwise shown.

DATE
1-1-97

REVISIONS

RIGHT OF WAY MARKERS

STANDARD 666001-01
All dimensions are in inches (millimeters) unless otherwise shown.
Magnet when required
\( \frac{3}{8} \) (13) Dia.
\( \frac{3}{16} \) (6) thick

Use cement and water or product from approved list of chemical adhesives to seal marker tablet in rock ledge, concrete pavement or structure. Hole shall be 1½ (40) in diameter.

Tablet constructed in rock ledge or concrete.

ALUMINUM TABLET

CAP

Cement or approved chemical adhesive

PRECAST MARKER

CAST-IN-PLACE MARKER

DETAIL A

No. 3 (No. 10) Bars

No. 3 (No. 10) Bars

Concrete or rock ledge or concrete.

All dimensions are in inches (millimeters) unless otherwise shown.

DATE
REVISIONS
1-1-12 Changed epoxy references to chemical adhesives.
1-1-09 Switched units to English (metric).

PERMANENT SURVEY MARKERS

STANDARD 667101-02
DETAIL A

Ground surface

Concrete

ELEVATION

Dia. 10 (250)

Dia. 14 (350)

10 (250)

14 (350)

12 (300)

12-0'-0" (1.2 m) min. in dist. 1, 2, 3 & 4.

To be 6'-0" (1.8 m) min. in dist. 5, 6, 7, 8 & 9.

All dimensions are in inches (millimeters) unless otherwise shown.
TYPICAL APPLICATIONS

- Landscaping work
- Utility work
- Fencing contracts and maintenance
- Clearing culverts

GENERAL NOTES

This Standard is used where at all times all vehicles, equipment, workers or their activities are more than 15' (4.5 m) from the edge of pavement.

When the work operation requires that two or more work vehicles cross the 15' (4.5 m) clear zone in any one hour, traffic control shall be according to Standard 701006.

All dimensions are in inches (millimeters) unless otherwise shown.
When the work operation exceeds one hour, cones, drums or barricades shall be placed at 25' (7.5 m) centers for L/3 distance, and at 50' (15 m) centers through the remainder of the work area.
AHEAD
ROAD AHEAD
WORK
ROAD AHEAD
CONSTRUCTION
projects
For contract
and utility
maintenance
For
W20-I103(0)-48
Or
W20-1(0)-48
W21-I101(0)-48
1000’ (300 m) max.
500’ (150 m) min.
Varies
Utility operations
Shoulder work
Varies
(4.5 m)
15’
W21-1(0)-48
W20-I103(0)-48
1000’ (300 m) max.
500’ (150 m) min.
Minimum distance is 200’ (60 m). Maximum distance to be determined by the Engineer but should not exceed ½ the length required for one normal working day’s operation, or 4 miles (6.4 km) whichever is less.

SYMBOLS

- Work area
- Sign
- Flagger with traffic control sign when required

TYPICAL APPLICATIONS
Shoulder work
Utility operations

GENERAL NOTES
This Standard is used where at any time, any vehicle, equipment, workers or their activities require an intermittent or continuous moving operation on the shoulder, where the average speed is 1 mph (2 km/h) or less.

When the work operation does not exceed 60 minutes, traffic control may be according to current MUTCD.

All dimensions are in inches (millimeters) unless otherwise shown.

OFF-RD MOVING OPERATIONS, 2L, 2W, DAY ONLY

STANDARD 70101-04
**GENERAL NOTES**

This Standard is used where any vehicles, equipment, workers or their activities will encroach in the area 15' (4.5 m) to 24' (600) from the edge of pavement.

Calculate L as follows:

**FORMULAS**

\[ L = \begin{cases} \frac{W^2}{60} & \text{for } W \leq 60 \text{ (feet)} \\ \frac{W^2}{85} & \text{for } W > 60 \text{ (feet)} \end{cases} \]

Adjust speed limit for posted speed limit. All dimensions are in inches (millimeters) unless otherwise shown.

**TYPICAL APPLICATIONS**

Utility operations
- Culvert extensions
- Side slope changes
- General installation and maintenance
- Delineator installation
- Landscaping operations
- Shoulder repair
- Sign installation and maintenance

When the work operation exceeds one hour, cones, drums or barricades shall be placed at 25' (8 m) centers for L/3 distance, and at 50' (15 m) centers through the remainder of the work area.

**SYMBOLS**

- Work area
- Sign
- Cone, drum or barricade

**DATE**

6-3-16 Corrected typo in title.

1-1-14 Revised workers sign.

**REVISIONS**

number to agree with current MUTCD
This Standard is used where at all times all vehicles, equipment, workers or their activities are more than 15' (4.5 m) from the edge of pavement.

When the work operation requires that two or more work vehicles cross the 15' (4.5 m) clear zone in any one hour, traffic control shall be according to Standard 701101.

This Standard also applies to work performed in the median more than 15' (4.5 m) from either pavement.

All dimensions are in inches (millimeters) unless otherwise shown.

TYPICAL APPLICATIONS
Landscaping work
Utility work
Fencing contracts

GENERAL NOTES

Steady units to
English (metric)

DATE
1-1-05

REVISIONS
Switched units to

DATE
1-1-09

ENGINEER OF DESIGN AND ENVIRONMENT

APPROVED

DATE
1-1-09

ENGINEER OF OPERATIONS

REVISIONS
Revised title.

STANDARD 701106-02
Cones at 25' (8 m) centers for 250' (75 m). Additional cones may be placed at 50' (15 m) centers. When drums or barricades are used, the interval between devices may be doubled.

For contract projects and utility operations for isolated patching.

General Notes:

This Standard is used where at any time, any vehicles, equipment, workers or their activities will encroach in the area between the center line and a line 24 (600) outside the edge of pavement for daylight operation.

When the distance between successive work areas exceeds 2000' (600 m), additional warning signs, flaggers, and taper shall be placed as shown. All dimensions are in inches (millimeters) unless otherwise shown.

Symbols:

- Work area
- Sign
- Barricade or drum
- Cone, drum or barricade
- Flagger with traffic control sign

Typical Applications:

- Isolated patching
- Utility operations
- Storm sewer
- Culverts
- Cable placement

Lane Closure, 2L, 2W, Day Only, For Speeds ≥ 45 MPH

Standard 701201-04
Barricades at 50' (15 m) centers for the first 250' (75 m) and at no greater than 100' (30 m) centers through the remainder of the work area.

---

### TYPICAL APPLICATIONS

- **Isolated patch**
- **Installation of drainage structure**
- **Utility operations**

### SYMBOLS

- Work area
- Sign
- Flagger with traffic control sign
- Barricade or drum
- Barricade or drum with flashing light
- Barricade or drum with steady burning light

---

### GENERAL NOTES

This Standard is used where at any time, any vehicle, equipment, workers or their activities will encroach in the area between the center line and a line 24' (6000 mm) from the edge of pavement for nighttime operation.

All dimensions are in inches (millimeters) unless otherwise shown.
For any operation that encroaches in the area between the centerline and a line 24 (600) outside the edge of the pavement for a period of less than 15 minutes.

Vehicle with dual flashers or flashing amber dome light operating.

For any operation that encroaches in the area between the centerline and a line 24 (600) outside the edge of the pavement for a period of less than 60 minutes.

Vehicle with dual flashers or flashing amber dome light operating.

For any operation that encroaches in the area between the centerline and a line 24 (600) outside the edge of the pavement for a period in excess of 15 minutes but less than 60 minutes.

Vehicle with dual flashers or flashing amber dome light operating.

TYPICAL APPLICATIONS
- Marking patches
- Field survey
- String line
- Utility operations
- Cleaning up debris on pavement

SYMBOLS
- Work area
- Sign on portable or permanent support
- Flagger with traffic control sign

SIGN SPACING

<table>
<thead>
<tr>
<th>Speed</th>
<th>Sign Spacing</th>
</tr>
</thead>
<tbody>
<tr>
<td>45</td>
<td>350 (100 m)</td>
</tr>
<tr>
<td>50-45</td>
<td>350 (100 m)</td>
</tr>
<tr>
<td>&lt;45</td>
<td>200 (60 m)</td>
</tr>
</tbody>
</table>

\[1\] Refer to SIGN SPACING table for distances.

All dimensions are in inches (millimeters) unless otherwise shown.

LANE CLOSURE, 2L, 2W, SHORT TIME OPERATIONS

STANDARD 701301-04

Illinois Department of Transportation

January 1, 2011

APPROVED

ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED

DATE

REVISIONS

1-1-11 Revised flagger sign

1-1-09 Switched units to English (metric)
TYPICAL APPLICATIONS

- Bituminous resurfacing
- Milling operations
- Utility operations
- Shoulder operations

SYMBOLS

- Work area
- Sign on portable or permanent support
- Flagger with traffic control sign

GENERAL NOTES

This Standard is used where at any time, any vehicle, equipment, workers or their activities require an intermittent or continuous moving operation on the pavement where the average speed of movement is greater than 0.5 mph (1 km/h) and less than 4 mph (6 km/h).

When the operation does not exceed 60 minutes, traffic control may be according to Standard 701301.

All dimensions are in inches (millimeters) unless otherwise shown.

LONE CLOSER, 2L, 2W, SLOW
MOVING OPERATIONS DAY ONLY,
FOR SPEEDS ≥ 45 MPH

STANDARD 701306-04
**TYPICAL APPLICATIONS**

- Landscaping work
- Utility work
- Pavement marking
- Weed spraying
- Roadometer measurements
- Debris cleanup
- Crack pouring

**SYMBOLS**

- Arrow board (Hazard Mode only)
- Truck with headlights, emergency flashers and flashing amber light (visible from all directions)
- 18x18 (450x450) mm. orange flag (use when guide wheel is used)
- Truck mounted attenuator

**GENERAL NOTES**

This Standard is used where any vehicle, equipment, workers or their activities will require a continuous moving operation where the average speed is greater than 3 mph (5 km/h).

For shoulder operations not encroaching on the pavement, use DETAIL A, Standard 701426.

All dimensions are in inches (millimeters) unless otherwise shown.

**LANE CLOSURE 2L, 2W MOVING OPERATIONS - DAY ONLY**

**STANDARD 701311-03**

**DATE**

- 1-1-97
- 1-1-00
- 1-1-09

**REVISIONS**

- Switched units to English (metric) : Omitted
- Elim. speed restrictions
- Pass With Care sign
- In Standard title

**APPROVED**

- January 1, 2009

**ISSUED**

- Illinois Department of Transportation

**ENGINEER OF DESIGN AND ENVIRONMENT**

- 1-1-97
- 1-1-09

**ENGINEER OF OPERATIONS**

- 1-1-97
- 1-1-09

**DATE**

- 1-1-97
- 1-1-09
Type III barricade to be placed when no work is being performed.
- Guardrail/barrier wall reflectors at 25' (7.6 m) cts. See Standards T04003 & 782006.
- Vertical panels at 25' (7.6 m) cts. Throughout lane shift. These devices may be omitted when the guardrail, worker, extends to at least this point on the taper.
- The edge of the post mounted signal head shall be between 24’ (7.3) and 6’ (1.8 m) from edge of shoulder.

SYMBOLS

- Work area
- Sign
- Traffic signal
- Detector loops
- Double vertical panel (see detail)
- Crystal, bidirectional guardrail/barrier wall reflector
- Type III barricade with flashing lights
- Drum with steady burn bi-directional light
- Temporary rumble strip (when specified)
- Drum

DATE REVISIONS

1-1-16 Changed lights in tangents
1-1-17 Replaced note 3
1-1-18 Omitted lights in tangents
3-17-06 In steady burn bi-dir.

See Sheet 2 for GENERAL NOTES.
**TRAFFIC SIGNAL SEQUENCE**

<table>
<thead>
<tr>
<th>PHASE</th>
<th>INTERVAL</th>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>EASTBOUND</td>
<td>1 2 3 4 5 R</td>
<td>55 - 45 mph</td>
<td>35 mph</td>
</tr>
<tr>
<td>SOUTHBOUND</td>
<td>R R G Y R</td>
<td>40 mph</td>
<td>30 mph</td>
</tr>
</tbody>
</table>

**ADVISORY SPEED LIMIT**

<table>
<thead>
<tr>
<th>NORMAL POSTED SPEED</th>
<th>ADVISORY SPEED</th>
</tr>
</thead>
<tbody>
<tr>
<td>35 - 30 mph</td>
<td>30 mph</td>
</tr>
<tr>
<td>40 mph</td>
<td>40 mph</td>
</tr>
<tr>
<td>55 - 45 mph</td>
<td>45 mph</td>
</tr>
</tbody>
</table>

**GENERAL NOTES**

This Standard is used where, at any time any vehicle, equipment, workers or their activities will encroach on one lane of a bridge and traffic signals are required.

When traffic signals are not in operation, flaggers shall be used and traffic control devices shall conform to Standard 701201 or 701206.

Existing or temporary pavement markings shall be on both sides of open lane from stop bar to stop bar.

All dimensions are in inches (millimeters) unless otherwise shown.
**Traffic Signal Sequence**

<table>
<thead>
<tr>
<th>Phase</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Northbound or Eastbound</td>
<td>G</td>
<td>Y</td>
<td>R</td>
<td>G</td>
<td>Y</td>
<td>R</td>
</tr>
<tr>
<td>Southbound or Westbound</td>
<td>G</td>
<td>Y</td>
<td>R</td>
<td>G</td>
<td>Y</td>
<td>R</td>
</tr>
</tbody>
</table>

**Temporary Concrete Barrier**

<table>
<thead>
<tr>
<th>Interval</th>
<th>Posted Speed</th>
<th>Taper Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>40 mph and above</td>
<td>12:1</td>
<td></td>
</tr>
<tr>
<td>Below 40 mph</td>
<td>8:1</td>
<td></td>
</tr>
</tbody>
</table>

**Advisory Speed Limit**

<table>
<thead>
<tr>
<th>Normal Speed Limit</th>
<th>Advisory Speed Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>55 - 45 mph</td>
<td>45 mph</td>
</tr>
<tr>
<td>40 mph</td>
<td>35 mph</td>
</tr>
<tr>
<td>35 - 30 mph</td>
<td>30 mph</td>
</tr>
</tbody>
</table>

**General Notes**

This Standard is used where, at any time, any vehicle, equipment, workers, or their activities will encroach on one lane of a bridge. Traffic signals and a positive barrier are required.

Traffic signals shall be operational only when all traffic controls are in place. When traffic signals are not in operation, flaggers shall be used and traffic control shall conform to Standard 701201 or 701206.

Temporary concrete barrier shall be according to Standard 704001.

Existing or temporary pavement markings shall be on both sides of open lane from stop bar to stop bar.

All dimensions are in inches (millimeters) unless otherwise shown.

**Illinois Department of Transportation**

**January 1, 2018**

**APPROVED**

**January 1, 2018**

**ENGINEER OF DESIGN AND ENVIRONMENT**

**ISSUED**

**PASSED**

**ENGINEER OF SAFETY PROG. AND ENGINEERING**
1. Minimum distance is 200' (60 m). Maximum distance to be determined by the Engineer but in no case to exceed the length of 1/2 day's normal operation or 2 miles (3200 m) whichever is less.

2. Signs are not required if distance between work operations is less than 2000' (600 m) unless restricted sight distance exists.

GENERAL NOTES

This Standard is used where at any time, any vehicle, equipment, workers or their activities will encroach on the pavement during widening operations.

Two flaggers are required for each separate operation.

All dimensions are in inches (millimeters) unless otherwise shown.

LANE CLOSURE, 2L, 2W, PAVEMENT WIDENING, FOR SPEEDS ≥ 45 MPH

STANDARD 701326-04

SYMBOLS

Work area
Active Work area
Sign
Barricade, drum, or vertical panels
Flagger with traffic control sign

DATE
REVISIONS
1-1-11 Revised flagger sign
1-1-09 Switched units to English Impr.;
Corrected sign No.'s

Illinois Department of Transportation

APPROVED January 1, 2011
ENGINEER OF DESIGN AND ENVIRONMENT

PASSED
ENGINEER OF SAFETY ENGINEERING

ISSUED

1-1-97

STANDARD 701326-04

REVISED 7-97 (English only)
REVISED 1-11-11 (Metric only)

STANDARD 701326-04
ROAD AHEAD
CONSTRUCTION

MPH

ROAD AHEAD
WORK

pavement marking - centerline

Double yellow reflectorized
delimited at 50' (15 m) centers

White reflectorized pavement
marking - edge line

500'
(150 m)

Vehicles 500' (150 m) min.
1000' (300 m) max.

500' (150 m)

W20-I103(0)-48
W20-1(0)-48

W1-4(0)-48
W13-1(0)-2424

W1-6L(0)-6030
W1-6R(0)-6030

W1-4L(0)-48
W13-1(0)-2424

W1-3R(0)-48
W13-1(0)-2424

W1-4R(0)-48
W13-1(0)-2424

W1-3L(0)-48
W13-1(0)-2424

W1-4R(0)-48
W13-1(0)-2424

500'
(150 m)

100'
(30 m)

1000' (300 m) max.

W1-4R(0)-48
W13-1(0)-2424

GENERAL NOTES
This Standard is used where at any time, any vehicle, equipment, workers or their activities require the closure of both lanes and a temporary run-around is constructed.

Barricades or drums at 50' (15 m) centers shall be used in lieu of vertical panels on the detour where they are to be placed on new or existing pavement.

Where the tangent distance on the temporary run-around exceeds 600' (180 m), crystal delineator shall be used for the vertical panels, or the spacing between vertical panels may be increased to 600' (180 m) within the limits of the tangent.

All dimensions are in inches (millimeters) unless otherwise shown.

TYPICAL APPLICATIONS
Bridge construction
Culvert construction

SYMBOLS
Work area

Signs

Barricade or drum with
steady burn bi-directional light
Double vertical panel
Type III barricade

The advisory speed to be shown below the reverse curve (turn) signs shall be determined at the site and approved by the Engineer.

These signs are not required when T is less than 500' (150 m).

DATE
1-1-18
1-1-11

REVISIONS
Changes signs on drums to bi-directional.
Changes vertical panel to double vertical panel.

LANE CLOSURE, 2L, 2W, WITH RUN-AROUND, FOR SPEEDS ≥ 45 MPH

STANDARD 701331-05
This Standard is used where at any time, any vehicle, equipment, workers or their activities will encroach in the area between the center line and a line 24 (600) outside the edge of the pavement.

Two flaggers shall be required for each separate lane closure. The flagger shall be a minimum of 200' (60 m) and a maximum of 500' (150 m) away from the farthest project on the same side.

For maintenance and utility projects, barricades/drums shall be placed at intervals not greater than 500' (150 m) centers throughout the work zone. When the spacing between open holes is greater than 500' (150 m), two barricades/drums shall be placed in front of each open hole and one on the backside close to the centerline. When the open hole is greater than 10' (3 m) parallel to the centerline, one barricade/drum shall be placed in each hole. Each hole, barricades/drums shall be spaced at 50' (15 m) centers.

For work areas in series, lane closure, 2L, 2W, 1000' (300 m) maximum, and 500' (150 m) minimum. Additional flaggers, warning signs, and tapers shall be placed as shown.

Barricades/drums shall be placed at intervals not greater than 100' (30 m) or cones shall be placed at intervals not greater than 500' (150 m) centers throughout the work zone. When the spacing between open holes is greater than 500' (150 m), two barricades/drums shall be placed in front of each open hole and one on the backside close to the centerline. When the open hole is greater than 10' (3 m) parallel to the centerline, one barricade/drum shall be placed in each hole. Each hole, barricades/drums shall be spaced at 50' (15 m) centers.

All dimensions are in inches (millimeters) unless otherwise shown.

GENERAL NOTES

This Standard is used where at any time, any vehicle, equipment, workers or their activities will encroach in the area between the center line and a line 24 (600) outside the edge of the pavement.

Two flaggers shall be required for each separate lane closure. The flagger shall be a minimum of 200' (60 m) and a maximum of 500' (150 m) away from the farthest project on the same side.

For maintenance and utility projects, barricades/drums shall be placed at intervals not greater than 500' (150 m) centers throughout the work zone. When the spacing between open holes is greater than 500' (150 m), two barricades/drums shall be placed in front of each open hole and one on the backside close to the centerline. When the open hole is greater than 10' (3 m) parallel to the centerline, one barricade/drum shall be placed in each hole. Each hole, barricades/drums shall be spaced at 50' (15 m) centers.

For work areas in series, lane closure, 2L, 2W, 1000' (300 m) maximum, and 500' (150 m) minimum. Additional flaggers, warning signs, and tapers shall be placed as shown.

Barricades/drums shall be placed at intervals not greater than 100' (30 m) or cones shall be placed at intervals not greater than 500' (150 m) centers throughout the work zone. When the spacing between open holes is greater than 500' (150 m), two barricades/drums shall be placed in front of each open hole and one on the backside close to the centerline. When the open hole is greater than 10' (3 m) parallel to the centerline, one barricade/drum shall be placed in each hole. Each hole, barricades/drums shall be spaced at 50' (15 m) centers.

All dimensions are in inches (millimeters) unless otherwise shown.

GENERAL NOTES

This Standard is used where at any time, any vehicle, equipment, workers or their activities will encroach in the area between the center line and a line 24 (600) outside the edge of the pavement.

Two flaggers shall be required for each separate lane closure. The flagger shall be a minimum of 200' (60 m) and a maximum of 500' (150 m) away from the farthest project on the same side.

For maintenance and utility projects, barricades/drums shall be placed at intervals not greater than 500' (150 m) centers throughout the work zone. When the spacing between open holes is greater than 500' (150 m), two barricades/drums shall be placed in front of each open hole and one on the backside close to the centerline. When the open hole is greater than 10' (3 m) parallel to the centerline, one barricade/drum shall be placed in each hole. Each hole, barricades/drums shall be spaced at 50' (15 m) centers.

All dimensions are in inches (millimeters) unless otherwise shown.

GENERAL NOTES

This Standard is used where at any time, any vehicle, equipment, workers or their activities will encroach in the area between the center line and a line 24 (600) outside the edge of the pavement.

Two flaggers shall be required for each separate lane closure. The flagger shall be a minimum of 200' (60 m) and a maximum of 500' (150 m) away from the farthest project on the same side.

For maintenance and utility projects, barricades/drums shall be placed at intervals not greater than 500' (150 m) centers throughout the work zone. When the spacing between open holes is greater than 500' (150 m), two barricades/drums shall be placed in front of each open hole and one on the backside close to the centerline. When the open hole is greater than 10' (3 m) parallel to the centerline, one barricade/drum shall be placed in each hole. Each hole, barricades/drums shall be spaced at 50' (15 m) centers.

All dimensions are in inches (millimeters) unless otherwise shown.

GENERAL NOTES

This Standard is used where at any time, any vehicle, equipment, workers or their activities will encroach in the area between the center line and a line 24 (600) outside the edge of the pavement.

Two flaggers shall be required for each separate lane closure. The flagger shall be a minimum of 200' (60 m) and a maximum of 500' (150 m) away from the farthest project on the same side.

For maintenance and utility projects, barricades/drums shall be placed at intervals not greater than 500' (150 m) centers throughout the work zone. When the spacing between open holes is greater than 500' (150 m), two barricades/drums shall be placed in front of each open hole and one on the backside close to the centerline. When the open hole is greater than 10' (3 m) parallel to the centerline, one barricade/drum shall be placed in each hole. Each hole, barricades/drums shall be spaced at 50' (15 m) centers.

All dimensions are in inches (millimeters) unless otherwise shown.

GENERAL NOTES

This Standard is used where at any time, any vehicle, equipment, workers or their activities will encroach in the area between the center line and a line 24 (600) outside the edge of the pavement.

Two flaggers shall be required for each separate lane closure. The flagger shall be a minimum of 200' (60 m) and a maximum of 500' (150 m) away from the farthest project on the same side.

For maintenance and utility projects, barricades/drums shall be placed at intervals not greater than 500' (150 m) centers throughout the work zone. When the spacing between open holes is greater than 500' (150 m), two barricades/drums shall be placed in front of each open hole and one on the backside close to the centerline. When the open hole is greater than 10' (3 m) parallel to the centerline, one barricade/drum shall be placed in each hole. Each hole, barricades/drums shall be spaced at 50' (15 m) centers.

All dimensions are in inches (millimeters) unless otherwise shown.

GENERAL NOTES

This Standard is used where at any time, any vehicle, equipment, workers or their activities will encroach in the area between the center line and a line 24 (600) outside the edge of the pavement.

Two flaggers shall be required for each separate lane closure. The flagger shall be a minimum of 200' (60 m) and a maximum of 500' (150 m) away from the farthest project on the same side.

For maintenance and utility projects, barricades/drums shall be placed at intervals not greater than 500' (150 m) centers throughout the work zone. When the spacing between open holes is greater than 500' (150 m), two barricades/drums shall be placed in front of each open hole and one on the backside close to the centerline. When the open hole is greater than 10' (3 m) parallel to the centerline, one barricade/drum shall be placed in each hole. Each hole, barricades/drums shall be spaced at 50' (15 m) centers.

All dimensions are in inches (millimeters) unless otherwise shown.

GENERAL NOTES

This Standard is used where at any time, any vehicle, equipment, workers or their activities will encroach in the area between the center line and a line 24 (600) outside the edge of the pavement.

Two flaggers shall be required for each separate lane closure. The flagger shall be a minimum of 200' (60 m) and a maximum of 500' (150 m) away from the farthest project on the same side.

For maintenance and utility projects, barricades/drums shall be placed at intervals not greater than 500' (150 m) centers throughout the work zone. When the spacing between open holes is greater than 500' (150 m), two barricades/drums shall be placed in front of each open hole and one on the backside close to the centerline. When the open hole is greater than 10' (3 m) parallel to the centerline, one barricade/drum shall be placed in each hole. Each hole, barricades/drums shall be spaced at 50' (15 m) centers.

All dimensions are in inches (millimeters) unless otherwise shown.

GENERAL NOTES

This Standard is used where at any time, any vehicle, equipment, workers or their activities will encroach in the area between the center line and a line 24 (600) outside the edge of the pavement.

Two flaggers shall be required for each separate lane closure. The flagger shall be a minimum of 200' (60 m) and a maximum of 500' (150 m) away from the farthest project on the same side.

For maintenance and utility projects, barricades/drums shall be placed at intervals not greater than 500' (150 m) centers throughout the work zone. When the spacing between open holes is greater than 500' (150 m), two barricades/drums shall be placed in front of each open hole and one on the backside close to the centerline. When the open hole is greater than 10' (3 m) parallel to the centerline, one barricade/drum shall be placed in each hole. Each hole, barricades/drums shall be spaced at 50' (15 m) centers.

All dimensions are in inches (millimeters) unless otherwise shown.
**SYMBOLS**

- Arrow board
- Work area
- Sign
- Direction indicator barricade with steady burn monodirectional light
- Type II barricade, drum, or vertical barricade
- Flagger with traffic control sign

① ReflectORIZED temporary pavement marking tape shall be applied throughout the taper and for 200' (60 m) alongside the work area when the closure time is greater than fourteen days. The edge line shall be white for right lane closure and yellow for left lane closures.

② Work Zone speed limit signs and FLA GGER signs shall be moved as necessary to maintain the required spacing between the signs and the workers in each separate work activity. Work Zone Speed Limit 55 Photo Enforced sign shall be omitted when the work area dictates placement of the sign array within 500' (150 m) of the End Work Zone Speed Limit Sign.

**GENERAL NOTES**

This Standard is used where at any time any vehicle, equipment, workers or their activities will encroach on the lane adjacent to the shoulder, or on the shoulder within 24 (600) of the edge of pavement.

This Standard must always be used in combination with Standard 701400.

This Standard also applies when work is being performed in the left lane. Under these conditions, the setup would be a mirror image to what is shown.

A check barricade shall be placed in the middle of the closed lane and at the shoulder at 1000' (300 m) centers.

All dimensions are in inches (millimeters) unless otherwise shown.

**DATE** | **REVISIONS**
--- | ---
1-1-18 | Deleted lights in tangent
1-1-17 | Revised End Work Zone Speed Limit Sign from orange to white background

**LANE CLOSURE,**

**FREEWAY / EXPRESSWAY**

**STANDARD 701401-11**

Illinois Department of Transportation

APPROVED January 1, 2018

ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED January 1, 2018

PASSED ENGINEER OF SAFETY PROG. AND ENGINEERING

DATE REVISIONS

1-1-18 Deleted lights in tangent

1-1-17 Revised END WORK ZONE SPEED LIMIT sign from orange to white background
**SYMBOLES**

- **Arrow board**
- **Work area**
- **Sign**
- **Direction indicator barricade with steady burn monodirectional light**
- **Type II barricade, drum, or vertical barricade with steady burn monodirectional light**
- **Temporary concrete barrier**
- **Monodirectional guardrail/barrier wall reflector**
- **Impact attenuator**

1. Temporary pavement marking tape shall be placed throughout the taper and alongside the work area. The right edge line shall be white and the left edge line shall be yellow.

2. Guardrail/barrier wall reflectors at 25' (7.6 m).

3. Markers on right shall be shall be crystal and markers on left shall be amber. See Standards 704001 and 782006.

4. Vertical barricades shall not be used in lane shift tape.

**GENERAL NOTES**

This standard is used where at any time any vehicle, equipment, workers or their activities will encroach on the pavement or on the shoulder within 24 (600) of the edge of pavement for daylight operation exceeding one day and where temporary concrete barrier is utilized.

This Standard must always be used in combination with Standard 701400.

When work is being performed in the left lane, the set up would be a mirror image to what is shown.

Temporary concrete barrier shall be according to Standard 704001.

Calculate L as follows:

**FORMULAS**

\[
L = \frac{W(S)}{0.65} \quad \text{or more}
\]

**NORMAL POSTED SPEED**

<table>
<thead>
<tr>
<th>English</th>
<th>Metric</th>
</tr>
</thead>
<tbody>
<tr>
<td>45 mph (80 kmh) or more</td>
<td>L=(W(S))</td>
</tr>
<tr>
<td>W = Width of offset in feet (meters)</td>
<td>(L=0.65W(S))</td>
</tr>
<tr>
<td>S = Normal posted speed in mph (kmh)</td>
<td></td>
</tr>
</tbody>
</table>

All dimensions are in inches (millimeters) unless otherwise shown.

**LANE CLOSURE, FREEWAY/EXPRESSWAY, WITH BARRIER**

**STANDARD 701402-12**
This Standard is used where at any time, any vehicle, equipment, workers or their activities will encroach on the lane adjacent to the shoulder, or on the shoulder within 24 (600) of the edge of pavement for daylight operation.

This Standard must always be used in combination with Standard 701400.

This Standard also applies when work is being performed in the left lane. Under these conditions, the set up would be a mirror image to what is shown.

All dimensions are in inches (millimeters) unless otherwise shown.

GENERAL NOTES

SYMBOLS

Arrow board

Work area

Sign

Direction indicator barricade

Cone, drum or barricade

Flagger with traffic control sign

TYPICAL APPLICATIONS

Pavement patch

Utility operations

Bituminous overlaid

TYPICAL APPLICATIONS

Pavement patch

Utility operations

Bituminous overlaid
**APPLICATION NO. 1**

App. No. 1 depicts a modified entrance ramp. This method shall be utilized whenever existing entrance tapers cannot be retained due to the close proximity of the work zone. The entrance location may be shifted, with the approval of the Engineer, to perform work in the entrance area. Application No. 2 shall be put into effect as soon as possible.

**APPLICATION NO. 2**

App. No. 2 depicts a shortening of the normal entrance ramp. This method shall be used whenever the existing geometrics can be retained. Consideration should be given to the entering motorists’ line of sight, through, between, or over the delineation devices.
within limits of gore
Min. 240' (75 m) unobstructed
160' (50 m) min. opening
500' (150 m)
minimum of 300' (90 m) from mainline
Barricades at 25' (8 m) centers a minimum of 300' (90 m) from mainline
Drums at 50' (15 m) cts.
White reflectorized pavement marking tape
EXIT
OPEN AHEAD
D4-I102(G)-3648

APPLICATION NO. 3
Application No. 3 depicts a modified exit ramp. The channelizing devices shall provide a clearly defined path for the exiting motorists. The minimum dimensions shown shall be increased as soon as the progress of the work will permit. The open portion of the ramp may be shifted, with the approval of the Engineer, to perform work in stages on the area adjacent to the ramp exit. Application No. 4 shall be put into effect as soon as possible.

APPLICATION NO. 4
Application No. 4 depicts an extension of the normal exit ramp. This method shall be used whenever existing geometrics can be retained. Consideration should be given to the exiting motorists's line of sight through, between or over the delineation devices.
LANE CLOSURE, FREEWAY / EXPRESSWAY, WITH CROSSOVER AND BARRIER

STANDARD 701416-11

GENERAL NOTES

This Standard is used where at any time, any vehicle, equipment, workers or their activities require the closure of two adjacent lanes and a temporary crossover is provided by making use of one lane of pavement normally used by opposing flow of traffic. The concrete barrier is used to separate the opposing traffic.

This Standard must always be used in combination with Standard 701400.

All barricades, drums, and vertical panels shall be at 50 ft. (15 m) centers.

Temporary concrete barrier shall be according to Standard 704001.

All dimensions are in inches (millimeters) unless otherwise shown.

SYMBOLS

- Arrow board
- Work area
- Sign
- Direction indicator barricade with steady burn monodirectional light
- Type II barricade with steady burn monodirectional light
- Drum with steady burn monodirectional light
- Vertical Panel
- Type III barricade with flashing lights
- Temporary concrete barrier
- Drum

“L” and “T” shall be as shown on the plan details.

DATE

REVISIONS

1-1-18
Omitted lights on drums for the ‘3 x L’ tangent

1-1-17
Revised END WORK ZONE SPEED LIMIT sign from orange to white background
**LANE CLOSURE, MULTILANE, FOR SPEEDS ≥ 45 MPH TO 55 MPH**

**STANDARD 701422-10**

**GENERAL NOTES**

This standard is used where at any time any vehicle, equipment, workers or their activities will encroach on the lane adjacent to the shoulder, or on the shoulder within 2400' (300 m) of the edge of pavement for daylight operation exceeding one day.

This standard also applies when work is being performed in the left lane. Under these conditions LEFT LANE CLOSED signs shall be substituted for RIGHT LANE CLOSED signs. On undivided highways, signs shall be added in the opposite direction as shown.

A check barricade shall be placed in the middle of the closed lane and at the shoulder at 1000' (300 m) centers.

All dimensions are in inches (millimeters) unless otherwise shown.

---

**SYMBOLS**

- Arrow board
- Work area
- Sign
- Direction indicator barricade with steady burn monodirectional light
- Type II barricade, drum, or vertical barricade
- Flagger with traffic control sign
- Worker
- Type II barricade, drum, or vertical barricade with monodirectional flashing light

---

**L = lane width × taper ratio**

<table>
<thead>
<tr>
<th>Normal Posted Speed</th>
<th>Taper Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>45</td>
<td>55/1</td>
</tr>
<tr>
<td>55</td>
<td>45/1</td>
</tr>
</tbody>
</table>

**END WORK ZONE SPEED LIMIT**

- 45
- 55

---

**REV. END WORK ZONE SPEED LIMIT**

- 1-1-17

**DATE**

- 1-1-16

**REVISIONS**

- Omitted signs on tangent

---

**1-1-17**

- 450-100-48
- 500-100-48
- 600-100-48
- 700-100-48
- 800-100-48

---

**For contract construction projects**

**For maintenance and utility projects**

---

**For contract construction projects**

**For maintenance and utility projects**

---

**For contract construction projects**

**For maintenance and utility projects**

---

**For contract construction projects**

**For maintenance and utility projects**

---
GENERAL NOTES

This standard is used where at any time any vehicle, equipment, workers, or their activities will encroach on the pavement or on the shoulder within 24 (600) of the edge of pavement for daylight operation exceeding one day and where temporary concrete barrier is utilized.

When work is being performed in the left lane, the set up would be a mirror image to what is shown.

Calculate L as follows:

\[
L = \frac{0.65(W)(S)}{W}
\]

English (Metric) FORMULAS

45 mph (80 km/h) or more

\[
W = \text{Width of offset}
\]

\[
S = \text{Normal posted speed in mph (km/h)}
\]

All dimensions are in inches (millimeters) unless otherwise shown.

Lane closure, multilane, with barrier, for speeds ≥ 45 mph to 55 mph

STANDARD 701423-10
When a shoulder does not exist or is narrow, use Detail B.

NOTE

Flagger(s) are required when workers are on the pavement.

For striping operations only. See sign arrow detail on this standard.

For stationary operations which are on the roadway or shoulder greater than 15 minutes and up to 1 hour.

The distance between the work and the lead truck may vary according to terrain or paint/crack sealing drying time.

General Notes:

This Standard is used where any vehicle, equipment, workers or their activities will require:

1) stationary operations up to 1 hour, or 2) a continuous or intermittent moving operation where the average speed of movement is greater than 1 mph (2 km/h).

This Standard is also applicable when work is being performed in the left lane(s) or on the median shoulder. Under these conditions, KEEP RIGHT signs shall be substituted for KEEP LEFT signs and arrow board indications shall be directed to the right.

All dimensions are in inches (millimeters) unless otherwise shown.

LANE CLOSURE, MULTILANE, INTERMITTENT OR MOVING OPER., FOR SPEEDS ≥ 45 MPH

STANDARD 701426-09

This Standard is also applicable when work is being performed in the left lane(s) or on the median shoulder. Under these conditions, KEEP RIGHT signs shall be substituted for KEEP LEFT signs and arrow board indications shall be directed to the right.

All dimensions are in inches (millimeters) unless otherwise shown.

LANE CLOSURE, MULTILANE, INTERMITTENT OR MOVING OPER., FOR SPEEDS ≥ 45 MPH

STANDARD 701426-09

This Standard is used where any vehicle, equipment, workers or their activities will require:

1) stationary operations up to 1 hour, or 2) a continuous or intermittent moving operation where the average speed of movement is greater than 1 mph (2 km/h).

This Standard is also applicable when work is being performed in the left lane(s) or on the median shoulder. Under these conditions, KEEP RIGHT signs shall be substituted for KEEP LEFT signs and arrow board indications shall be directed to the right.

All dimensions are in inches (millimeters) unless otherwise shown.

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1) stationary operations up to 1 hour, or 2) a continuous or intermittent moving operation where the average speed of movement is greater than 1 mph (2 km/h).

This Standard is also applicable when work is being performed in the left lane(s) or on the median shoulder. Under these conditions, KEEP RIGHT signs shall be substituted for KEEP LEFT signs and arrow board indications shall be directed to the right.

All dimensions are in inches (millimeters) unless otherwise shown.

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1) stationary operations up to 1 hour, or 2) a continuous or intermittent moving operation where the average speed of movement is greater than 1 mph (2 km/h).

This Standard is also applicable when work is being performed in the left lane(s) or on the median shoulder. Under these conditions, KEEP RIGHT signs shall be substituted for KEEP LEFT signs and arrow board indications shall be directed to the right.

All dimensions are in inches (millimeters) unless otherwise shown.

LANE CLOSURE, MULTILANE, INTERMITTENT OR MOVING OPER., FOR SPEEDS ≥ 45 MPH

STANDARD 701426-09

This Standard is used where any vehicle, equipment, workers or their activities will require:

1) stationary operations up to 1 hour, or 2) a continuous or intermittent moving operation where the average speed of movement is greater than 1 mph (2 km/h).

This Standard is also applicable when work is being performed in the left lane(s) or on the median shoulder. Under these conditions, KEEP RIGHT signs shall be substituted for KEEP LEFT signs and arrow board indications shall be directed to the right.

All dimensions are in inches (millimeters) unless otherwise shown.
**TYPICAL APPLICATIONS**
- Anticavitation work
- Utility work
- Pavement marking
- Weed spraying
- Roadometer measurements
- Detours cleanup
- Crack pouring

**GENERAL NOTES**
This Standard is used where any vehicle, equipment, workers or their activities will require:
1) Stationary operations up to 1 hour, or 2) a continuous or intermittent moving operation where the average speed of movement is greater than 1 mph (2 km/h).

This Standard is also applicable when work is being performed in the left lane(s) or on the median shoulder. Under these conditions, KEEP RIGHT signs shall be substituted for KEEP LEFT signs and arrow board indications shall be directed to the right.

All dimensions are in inches (millimeters) unless otherwise shown.

**SYMBOLS**
- Arrow board
- Work area
- Truck with flashing amber light
- Truck/Trailer mounted attenuator
- Flagger with traffic control sign
- Sign

**DATE**
1-1-17

**REVISIONS**
- Revised 'NOTE' on DETAIL A to use DETAIL B in lieu of DETAIL C.
- Note (5): Rev. gen. notes. Added
- Rev. dist. between work and lead truck.
- Rev. gen. notes. Added

**LANE CLOSURE, MULTILANE, INTERMITTENT OR MOVING OPER., FOR SPEEDS ≤ 40 MPH**

**STANDARD 701427-05**
CASE I

CASE I depicts the setup of delineating devices for a single outside lane closure. The single lane closure taper will be performed prior to the setup for the second lane closure.

CASE II

CASE II depicts the setup of delineating devices for a two lane closure. The single lane closure device setup as depicted in CASE I shall be performed prior to the setup for the second lane closure.

GENERAL NOTES

This Standard is used for setup and removal of lane closures on freeways/expressways having ADT greater than 25,000.

Trucks with arrow boards and truck-mounted attenuators shall be in place as shown for the setup and removal of the lane closure taper(s) and the first 100' (30 m) of channelizing devices in the tangent(s).

This Standard is also applicable when work is being performed in the left lane(s) or on the median shoulder. Under these conditions arrow board indications shall be directed to the right.

All dimensions are in inches (millimeters) unless otherwise shown.

SYMBOLS

- Arrow board
- Truck with flashing amber light
- Truck/Trailer mounted attenuator
- Devices in lane closure taper
- Devices in tangent

See plans or appropriate Standard for delineating devices, spacing and length of taper/tangent.

This Standard is also applicable when work is being performed in the left lane(s) or on the median shoulder. Under these conditions arrow board indications shall be directed to the right.

All dimensions are in inches (millimeters) unless otherwise shown.

TRAFFIC CONTROL
SETUP AND REMOVAL
FREEWAY/EXPRESSWAY

STANDARD 701428-01

DATE    REVISIONS
4-1-16    Added trailer option for attenuator symbol
2-1-14    New Standard

ILLINOIS DEPARTMENT OF TRANSPORTATION

RESOLVED   APR 1, 2016
APPROVED   APR 1, 2016
ISSUED   APR 1, 1997
PASSED   APR 1, 2016

ENGINEER OF DESIGN AND ENVIRONMENT
ENGINEER OF SAFETY ENGINEERING

APPROVED: 1-1-14
NEW STANDARD.

TRAFFIC CONTROL
SETUP AND REMOVAL
FREEWAY/EXPRESSWAY

STANDARD 701428-01

DATE    REVISIONS
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ILLINOIS DEPARTMENT OF TRANSPORTATION

RESOLVED   APR 1, 2016
APPROVED   APR 1, 2016
ISSUED   APR 1, 1997
PASSED   APR 1, 2016

ENGINEER OF DESIGN AND ENVIRONMENT
ENGINEER OF SAFETY ENGINEERING

APPROVED: 1-1-14
NEW STANDARD.
This Standard is used where at any time, any vehicle, equipment, workers or their activities require the closure of two adjacent lanes and a temporary crossover is provided by making use of one lane of pavement normally used by opposing traffic, unless concrete barrier is used.

Cone's may be substituted for flexible delineators during daytime operations at half the spacing.

All dimensions are in inches (millimeters) unless otherwise shown.

**GENERAL NOTES**

**SYMBOLS**

- Arrow board
- Work area
- Sign
- Drum with steady burn monodirectional light
- Direction indicator barricade with steady burn monodirectional light
- Type II barricade with steady burn monodirectional light
- Type II barricade, drum or vertical barricade with monodirectional flashing light
- Tubular marker
- Type III barricade with flashing monodirectional lights
- Drum

**DETAIL A**

- Illinois Department of Transportation
- January 1, 2018
- APPROVED
- Project Engineer of Design and Environment
- ISSUED
- PASSED
- Project Engineer of Safety Prog. and Engineering

**LANE CLOSURE, MULTILANE, UNDIV. WITH CROSSOVER, FOR SPEEDS ≥ 45 MPH TO 55 MPH**

**STANDARD 701431-13**
I

MINIMUM $XXX FINE
LIMIT SPEED 45 ZONE WORK ENFORCED PHOTO LIMIT SPEED 55 ZONE WORK ENFORCED PHOTO MINIMUM $XXX FINE END WORK ZONE SPEED LIMIT

I

300' (90 m) 1000' (300 m) 300' (90 m) 1000' (300 m) 300' (90 m) 1000' (300 m)

Direction indicator barricades
Type II barricades, drums, or vertical barricades at 50' (15 m) centers

The length of the tangent section shall be:

<table>
<thead>
<tr>
<th>Duration of Closure</th>
<th>Length of Tangent Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤ 14 Days</td>
<td>1000' (300 m)</td>
</tr>
<tr>
<td>&gt; 14 Days</td>
<td>2000' (600 m)</td>
</tr>
</tbody>
</table>

SYMBOLS

Arrow lovers
Work area
Sign
Direction indicator barricade with steady burn monodirectional light
Type II barricade, drum, or vertical barricade with steady burn monodirectional light
Flagger with traffic control sign
Type II barricade, drum, or vertical barricade

GENERAL NOTES

This Standard is used where at any time any vehicle, equipment, workers or their activities will encroach on two lanes of a freeway/expressway.

This Standard must always be used in combination with Standard 701400.

This Standard also applies when work is being performed in the left lanes. Under these conditions, the set up would be a mirror image to what is shown.

Check barricades shall be placed in the middle of the closed lanes at 1000' (300 m) centers. All dimensions are in inches (millimeters) unless otherwise shown.

DATE: 1-1-18

REVISIONS: 1-1-17

APPROVED

ENGINEER OF DESIGN AND ENVIRONMENT

PASSED

ENGINEER OF SAFETY PROG. AND ENGINEERING

ISSUED

1-1-05

STANDARD 701446-09

FREEWAY / EXPRESSWAY

TWO LANE CLOSURE,

SYMBOLS

Illinois Department of Transportation

January 1, 2018

REVISIONS

Omitted lights in tangent
close work area.
SPEED LIMIT sign from
orange to white background
Drums at 25' (7.6 m) cts.

End of gore area.

EXIT RAMP CLOSURE

Drums at 50' (15 m) cts.

Drums at 75' (22.8 m) cts.

Drums for entrance ramp closure shall be omitted if turn lanes are not present.

Omit this sign when median is less than 10' (3 m).

See sign spacing table.

Drums at 25' (7.6 m) cts.

ENTRANCE RAMP CLOSURE

Drums at 25' (7.6 m) cts.

EXIT RAMP CLOSURE

Subscribe to Illinois Department of Transportation "Roadwork" Newsletter.

All dimensions are in inches (millimeters) unless otherwise shown.
1-20 taper from edge of ramp to edge of work zone

Drums at 25 (7.6 m) cts.

500' (150 m)

500' (150 m)

1000' (300 m)

Drums at 25 (7.6 m) cts.

1-20 taper from edge of ramp to edge of work zone

8

11

Symbols:

Sign

Type III barricade with flashing lights

Drum with steady burning light

Work area

Flagger with traffic control sign

Drum

All dimensions are in inches (millimeters) unless otherwise shown.
ROAD AHEAD
CONSTRUCTION
ROAD AHEAD
WORK

ROAD CLOSED
ROAD CLOSED
AHEAD

ONE LANE ROAD AHEAD
ROAD AHEAD
CONSTRUCTION
ROAD AHEAD
WORK

100' (30 m)
W20-1(0)-48
For maintenance and utility projects
W20-1(0)-48
For contract construction projects

SIGN SPACING
Posted Speed
55
100' (30 m)
50-45
350' (100 m)<45
200' (60 m)

Work area
Cone, drum or barricade
(not required for moving operations)
Sign on portable or permanent support
Flagger with traffic control sign
Barricade or drum with flashing light
Type III barricade with flashing lights

Refer to SIGN SPACING TABLE for distances.
For approved side lane closures.
Cone at 25' (8 m) centers for 250'
(75 m). Additional cones may be placed
at 50' (15 m) centers. When drums or
Type I or Type II barricades are used,
the interval between devices
may be doubled.
Cones, drums or barricades at
20' (6 m) centers.

GENERAL NOTES
This Standard is used where at any time, day or
night, any vehicle, equipment, workers or their
activities encroach on the pavement requiring the closure
of one traffic lane in an urban area.
All dimensions are in inches (millimeters)
unless otherwise shown.

URBAN LANE CLOSURE,
2L, 2W, UNDIVIDED
STANDARD 701501-06

REVISED FLAGGER SIGN
1-1-11

REVISED UNITS TO
ENGLISH (METRIC)
1-1-09

CORRECTED SIGN NO.'S
1-1-11
CASE I (Signs required for both directions)

1. Refer to SIGN SPACING TABLE for distances.
2. Required for speeds > 40 mph (70 km/h).
3. Required if work exceeds 500' (164 m) or 1 block.
4. Cones at 25' (8 m) centers for 250' (75 m) on approach. Additional cones may be placed at 50' (15 m) centers. When drums or type I or II barricades are used, the interval between devices may be doubled.
5. For approved sideroad closures.
6. Cones, drums or barricades at 20' (6 m) centers in taper.
7. Use flagger sign only when flagger is present.

**SYMBOLS**
- Work area
- Barricade or drum with flashing light
- Flagger with traffic control sign
- Cone, drum or barricade (Cones for daytime use only)
- Sign on portable or permanent support
- Type III barricade with flashing lights

**SIGN SPACING**

<table>
<thead>
<tr>
<th>Posted Speed</th>
<th>Sign Spacing</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;45 mph</td>
<td>200' (60 m)</td>
</tr>
<tr>
<td>50-65 mph</td>
<td>350' (100 m)</td>
</tr>
<tr>
<td>&gt;65 mph</td>
<td>600' (180 m)</td>
</tr>
</tbody>
</table>

**FORMULAS**

For speeds > 40 mph (70 km/h),

\[ L = \frac{W^2}{40} \text{ feet} \]

\[ L = \frac{W^2}{15} \text{ meters} \]

For speeds ≤ 40 mph (70 km/h),

\[ L = 0.65(W)(S) \text{ feet} \]

\[ L = 0.2(W)(S) \text{ meters} \]

**GENERAL NOTES**

This Standard is used to close one lane of an urban, two lane, two way roadway with a bidirectional turn lane.

Case I applies when no workers are present. When workers are present, two lanes shall be closed and traffic control shall be according to Standard 701501.

Calculate \( L \) as follows:

**SPEED LIMIT**

- 40 mph (70 km/h) or less:
  \[ L = \frac{W^2}{40} \text{ feet} \]

- 45 mph (80 km/h) or greater:
  \[ L = 0.65(W)(S) \text{ feet} \]

**SYMBOLS**

- Work area
- Barricade or drum with flashing light
- Flagger with traffic control sign
- Cone, drum or barricade (Cones for daytime use only)
- Sign on portable or permanent support
- Type III barricade with flashing lights

**URBAN LANE CLOSURE, 2L, 2W, WITH BIDIRECTIONAL LEFT TURN LANE**

**STANDARD 701502-08**

**DATE**
1-1-18

**REVISIONS**
1-1-18 Corrected sign number for TWO WAY "TRAFFIC" sign for CASE I
1-1-17 Added flashing lights to Type III barricades, Revised dev. & sign spacing, TW LTL taper length
GENERAL NOTES

This Standard is used where at any time, day or night, any vehicle, equipment, workers or their activities encroach on the pavement during shoulder operations or where construction requires lane closures in urban areas.

Calculate L as follows:

- **SPEED LIMIT FORMULAS**
  - English (Miles)
  - Maximum speed
    - 40 mph (65 km/h)
    - \( L = \frac{W S^2}{60} \)
    - \( L = \frac{WS^2}{100} \)
  - 45 mph (70 km/h) or greater:
    - \( W = \text{Width of offset in feet (meters)} \)
    - \( S = \text{Normal posted speed in mph (km/h)} \)

- **FORMULAS**
  - \( L = (W)(S) \)
  - \( L = 0.65(W)(S) \)

All dimensions are in inches (millimeters) unless otherwise shown.

**URBAN LANE CLOSURE, MULTILANE, 1W OR 2W WITH NONTRaversable MEDIAN**

**STANDARD 701601-09**

1-1-14 Revised workers sign
number to agree with current MUTCD.

1-1-13 Deleted text WORKERS

**SYMBOLS**

- Arrow board
- Cone, drum or barricade
- Sign on portable or permanent support
- Work area
- Barricade or drum with flashing light
- Type II barricade with flashing lights
- Flagger with traffic control sign.

- Refer to SIGN SPACING TABLE for distances.
- Required for speeds > 40 MPH
- Cones at 25' (8 m) centers for 250' (75 m). Additional cones may be placed at 50' (15 m) centers. When drums or Type I or Type II barricades are used, the interval between devices may be doubled.
- Use flagger sign only when flagger is present.
- For approved sideroad closures.
- Cones, drums or barricades at 20' (6 m) in taper.

**PROJECTS**

- W20-10L(0)-48 for construction projects
- W20-10R(0)-48 for maintenance and utility projects
- W20-9R(0)-48
- W20-11R(0)-48
- W20-7R(0)-48

**SIGN SPACING**

<table>
<thead>
<tr>
<th>Posting Speed</th>
<th>Sign Spacing</th>
</tr>
</thead>
<tbody>
<tr>
<td>40-55</td>
<td>900 (150 m)</td>
</tr>
<tr>
<td>55-65</td>
<td>750 (120 m)</td>
</tr>
<tr>
<td>&lt;65</td>
<td>450 (75 m)</td>
</tr>
</tbody>
</table>

**STANDARD 701601-09**

1-1-14 Revised workers sign
number to agree with current MUTCD.

1-1-13 Deleted text WORKERS

**ENGINEER OF DESIGN AND ENVIRONMENT**

**ENGINEER OF SAFETY ENGINEERING**

**DATE**

**REVISIONS**

January 1, 2014

Illinois Department of Transportation

PASSED

Vehicular Traffic Control - Traffic Signs and Signals

1-1-97

1-1-13

1-1-14

1-1-14

1-1-14

1-1-14

1-1-14
Sign Spacing

<table>
<thead>
<tr>
<th>Posting Speed</th>
<th>Sign Spacing</th>
<th>L = \frac{60}{S^2}</th>
<th>L = \frac{150}{W S^2}</th>
</tr>
</thead>
<tbody>
<tr>
<td>20-35 mph (32-56 km/h)</td>
<td>100’ (30 m)</td>
<td>300’ (90 m)</td>
<td>750’ (225 m)</td>
</tr>
<tr>
<td>35-45 mph (56-72 km/h)</td>
<td>200’ (60 m)</td>
<td>500’ (150 m)</td>
<td>1000’ (300 m)</td>
</tr>
<tr>
<td>&gt;45 mph (72 km/h)</td>
<td>No sign spacing</td>
<td>No sign spacing</td>
<td>No sign spacing</td>
</tr>
</tbody>
</table>

Symbols:
- **Arrow board**
- **Work area**
- **Barricade or drum with steady burning monodirectional light**
- **Flagger with traffic control sign**
- **Cone, drum or barricade (Cones for daytime use only)**
- **Sign on portable or permanent support**
- **Type III barricade with flashing lights**

**Case I**

1. Refer to SIGN SPACING TABLE for instances.
2. Required for speeds > 40 mph (64 km/h).
3. Required if work exceeds 500’ (164 m)
or 1 block, repeat every 1 mile (1.6 km).
4. Cones at 25’ (8 m) centers for 250’ (75 m)
on approach. Additional cones may be placed at 50’ (15 m) centers. When drums
type I or II barricades are used, the interval between devices may be doubled.
5. For approved sideroad closures.
6. Cones, drums, or barricades at 20’ (6 m) centers in taper.
7. Use flagger signs only when flagger is present.

**Formulas**

**Speed Limit**

- English (Metric)
  - L = \frac{60}{W S^2}
  - L = \frac{200}{WS^2}

**General Notes**

This Standard is used where at any time, day or night, any vehicle, equipment, workers or their activities encroach on the pavement requiring the closure of one traffic lane in an Urban area.

If the work operation is performed between 9:00 a.m. and 3:00 p.m. and does not exceed 15 min. Traffic protection shall be as shown for Standard 701426.

Calculate L as follows:

**Calculation**

- For speeds > 40 mph (64 km/h).
- Required for speeds > 40 mph (64 km/h).
- For approved sideroad closures.
- Cones, drums, or barricades at 20’ (6 m) centers in taper.
- Use flagger signs only when flagger is present.

**Urbana Lane Closure, Multilane, 2W with Bidirectional Left Turn Lane**

- **Date:** January 1, 2018
- **Engineer of Design and Environment:**
- **Issued:** January 1, 2018
- **Passed:**

**Revisions**

- 1-1-18: Moved arrow boards into cleared areas for CASE I.
- 1-1-17: Added flashing signs to Type II.

**Standard 701602-09**
CASE IV

URBAN LANE CLOSURE, MULTILANE, 2W WITH BIDIRECTIONAL LEFT TURN LANE

STANDARD 701602-09

Illinois Department of Transportation

January 1, 2018

APPROVED

January 1, 2018

ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED

1-1-01

PASSED

ENGINEER OF SAFETY PROG. AND ENGINEERING

BIDIRECTIONAL LEFT TURN LANE

MULTILANE, 2W WITH URBAN LANE CLOSURE,
**ROAD AHEAD CONSTRUCTION**

**SIGN SPACING**

<table>
<thead>
<tr>
<th>Speed Limit</th>
<th>Sign Spacing</th>
<th>L =</th>
<th>WS²</th>
</tr>
</thead>
<tbody>
<tr>
<td>40 mph (65 km/h)</td>
<td>350' (100 m)</td>
<td>L = 0.65(W)(S)</td>
<td></td>
</tr>
<tr>
<td>45 mph (75 km/h)</td>
<td>350' (100 m)</td>
<td>L = 150(W)(S)</td>
<td></td>
</tr>
<tr>
<td>50 mph (80 km/h)</td>
<td>400' (120 m)</td>
<td>L = 150(W)(S)</td>
<td></td>
</tr>
<tr>
<td>55 mph (90 km/h)</td>
<td>450' (140 m)</td>
<td>L = 225(W)(S)</td>
<td></td>
</tr>
</tbody>
</table>

**FORMULAS**

\[ L = \frac{60^2}{W} \]

\[ L = \frac{150^2}{W} \]

\[ L = 0.65(W)(S) \]

\[ L = 150(W)(S) \]

\[ L = 225(W)(S) \]

\[ S = \text{Normal posted speed (mph or km/h)} \]

\[ W = \text{Width of offset (feet or meters)} \]

\[ L = \text{Distance in feet (meters)} \]

**SYMBOLES**

- **Arrow board**
- **Cone, drum or barricade**
- **Sign on portable or permanent support**
- **Work area**
- **Barricade or drum with flashing light**
- **Flagger with traffic control sign**

**GENERAL NOTES**

This Standard is used where at any time, day or night, any vehicle, equipment, workers or their activities encroach on the pavement requiring the closure of one traffic lane in an Urban area.

Calculate \( L \) as follows:

\[ L = \frac{WS^2}{60^2} \]

\[ L = \frac{WS^2}{150^2} \]

\[ L = 0.65(W)(S) \]

\[ L = 150(W)(S) \]

\[ L = 225(W)(S) \]

All dimensions are in inches (millimeters) unless otherwise shown.
**LEFT TURN LANE OR CENTER MEDIAN OPERATIONS**

1. Refer to SIGN SPACING TABLE for distance.
2. Required for speed > 40 mph.
3. Cones at 25' (8 m) centers for 500' (150 m). Additional cones may be placed at 50' (15 m) centers. When drums or Type I or Type II barricades are used, the interval between devices may be doubled.
4. Use flagger sign only when flagger is present.
5. Omit this sign when median is less than 10' (3 m) or for bi-directional turn lanes.
6. Cones, drums or barricades at 20' (6 m) centers in taper.
7. Advanced arrow board required for speeds > 45 mph.
8. Three Type II barricades, drums or vertical barricades at 50' (15 m) centers.

**SYMBOLS**

- Work area
- Cone, drum or barricade
- Sign on portable or permanent support
- Arrow board
- Barricade or drum with flashing light
- Flagger with traffic control sign
- 4-1-16: Corrected sign number for multilane operations
- 1-1-14: Revised devices at arrow
- 1-1-97: Revised workers sign number

**GENERAL NOTES**

This Standard is used where at any time, day or night, any vehicle, equipment, workers or their activities encroach on the pavement during shoulder operations or where construction requires lane closures in an urban area.

Calculate L as follows:

**FORMULAS**

\[
L = \frac{W(d + 5)(S - 5)}{100} \\
\]  

W = Width of offset in feet (meters)

S = Normal posted speed in mph (km/h)

All dimensions are in inches (millimeters) unless otherwise shown.
ROAD AHEAD CONSTRUCTION

ROAD AHEAD WORK

ROAD AHEAD CONSTRUCTION

SIDEWALK CLOSED
USE OTHER SIDE

SIDEWALK CLOSED
SIDEWALK CLOSED

SIDEWALK DIVERSION

PROJECTS construction contract W20-I103(0)-48 for projects and utility maintenance W20-I(0)-48 for R11-I101-2418 road work traffic control.

Omit whenever duplicated by road work traffic control.

10’ (3 m) Spacing
25’ (8 m) Spacing

Ordinary pedestrian sidewalk
Detachable pedestrian sidewalk
Portable or
Barricade or drum
Cone, drum or
Type III barricade

1.2 m
1.2 m

SYMBOLS

Work area
Sign on portable or
permanent support
Barricade or drum
Cone, drum or
barricade
Type III barricade
Detectable pedestrian
channelizing barricade

GENERAL NOTES

This Standard is used where, at any time, pedestrian traffic must be rerouted due to work being performed.

This Standard must be used in conjunction with other Traffic Control & Protection Standards when roadway traffic is affected.

Temporary facilities shall be detectable and accessible.

The temporary pedestrian facilities shall be provided on the same side of the closed facilities whenever possible.

The SIDEWALK CLOSED / USE OTHER SIDE sign shall be placed at the nearest crosswalk or intersection to each end of the closure. Where the closure occurs at a corner, the signs shall be erected on the corners across the street from the closure. The SIDEWALK CLOSED signs shall be used at the ends of the actual closures.

Type III barricades and R11-2-4830 signs shall be provided on the same side of the closed facilities whenever possible.

Temporary facilities shall be detectable and accessible.

This Standard is used where, at any time, pedestrian traffic must be rerouted due to work being performed.

This Standard is used where, at any time, pedestrian traffic must be rerouted due to work being performed.

This Standard is used where, at any time, pedestrian traffic must be rerouted due to work being performed.

All dimensions are in inches (millimeters) unless otherwise shown.

DATE
REVISIONS
4-1-16
Omitted orange safety fence.
From Standard as this is covered in the std. spec.
Modified appearance of plan views. Renamed Std.

STANDARD 701801-06
ROAD AHEAD CONSTRUCTION
ROAD AHEAD WORK
SIDEWALK CLOSED
SIDEWALK CLOSED
SIDEWALK CLOSED
SIDEWALK CLOSED
SIDEWALK CLOSED
SIDEWALK CLOSED
SIDEWALK CLOSED
SIDEWALK CLOSED
SIDEWALK CLOSED
SIDEWALK CLOSED
SIDEWALK CLOSED
OR
projects construction contract W20-I103(0)-48 for projects and utility maintenance W20-1(0)-48 for
R11-I101-2418
Spacing 10' (3 m)
R3-1-2424
R20-3(O)-48
STANDARD 701801-06
CROSSWALK CLOSURE
SIDEWALK, CORNER OR CROSSWALK CLOSURE (Sheet 2 of 2)
Warning lights (if required)
**POST MOUNTED SIGNS**

**When curb or paved shoulder are present**

This dimension shall be 24 (600) to the face of curb or 6' (1.8 m) to the outside edge of the paved shoulder.

**When edge of pavement is present**

This dimension shall be 24 (600) to the edge of pavement.

**POST MOUNTED SIGNS**

**When curb or paved shoulder are present**

This dimension shall be 24 (600) to the face of curb or 6' (1.8 m) to the outside edge of the paved shoulder.

**When edge of pavement is present**

This dimension shall be 24 (600) to the edge of pavement.

---

**MAX WIDTH XX' - XX" X MILES AHEAD**

**WIDTH RESTRICTION SIGN**

XX'-XX" width and X miles are variable.

---

**WARNING LIGHT (if required)**

Metal or wood post

6' (1.8 m) urban

5' (1.5 m) min. embedment

---

**SIGNS ON TEMPORARY SUPPORTS**

*** When work operations exceed four days, this dimension shall be 9' (2.7 m) min. If located behind other devices, the height shall be sufficient to be seen completely above the devices.

---

**HIGH LEVEL WARNING DEVICE**

---

**FLAGGER TRAFFIC CONTROL SIGN**

---

**STOP**

---

**SLOW**

---

**HIGHWAY CONSTRUCTION SPEED ZONE SIGNS**

---

**TRAFFIC CONTROL DEVICES**
ROAD CLOSED TO TRAFFIC

Weep holes

Min. 4' (1.2 m)

Min. 5' (1.5 m)

Min. 6' (1.8 m)

Min. 7' (2.1 m)

Min. 8' (2.4 m)

Min. 9' (2.7 m)

Min. 10' (3.0 m)

Min. 12' (3.6 m)

Min. 15' (4.5 m)

Min. 18' (5.4 m)

Min. 24' (7.2 m)

Min. 30' (9.0 m)

Weep holes

Traffic

Construction advance warning signs

Type A

Type B

Type C

ARROW BOARDS

Type A

Type B

Type C

PLAN

Fence may be stepped or smooth

Epoxy channels

Temporary Rumble Strips

Pavement

Type A

Type B

Type C

Typical Applications of Type III Barricades Closing a Road

Reflectorized striping may be omitted on the back side of the barricades. If a Type III barricade with an attached sign panel which meets NCHRP 350 is not available, the signs may be mounted directly in front of the barricade.
**GENERAL NOTES**

Each F-shape barrier shall be clearly marked with "ILLINOIS F SHAPE", the Producer's mark and the date of manufacture. The markings shall be indented on the barrier or painted thereon with waterproof paint/ink.

The insert for the ½ (M12) bolt shall be capable of 3,000 lb (13 kN) pull-out strength.

When barrier separates opposing flows of traffic, markers shall be on both sides of barrier.

See Standard 782006 for dimensions of Type C reflector.

All dimensions are in inches (millimeters) unless otherwise shown.

---

**TEMPORARY CONCRETE BARRIER**

**STANDARD 704001-08**

(Sheet 1 of 2)
TYPICAL INSTALLATIONS

Signs in any area shall be erected to a uniform height above the edge of the pavement.

POST SPACING FOR NON-FREeway SIGN PANELS

GROUND MOUNT SIGN POSITIONING

All dimensions are in inches (millimeters) unless otherwise shown.

SIGN PANEL
ERECTION DETAILS

STANDARD 720006-04
**GENERAL NOTES**

Dimensions shown for cross sections are minimum.

All holes are % (10).

S* in the minimum section modulus about the x-x axis of the post as shown. For posts in which holes are punched or drilled for more than half their length, S* shall be computed for the net section.

All dimensions are in inches (millimeters) unless otherwise shown.
**TYPICAL SIGN STYLES**

<table>
<thead>
<tr>
<th>SIGN STYLE</th>
<th>DIMENSIONS</th>
<th>LETTER SIZE ULC/C PRIMARY</th>
<th>BORDER</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
<td>B</td>
<td>C</td>
</tr>
<tr>
<td></td>
<td>19</td>
<td>26</td>
<td>26</td>
</tr>
<tr>
<td></td>
<td>19</td>
<td>24</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td>15</td>
<td>19</td>
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<tr>
<td></td>
<td>12</td>
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<td>12</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>4</td>
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<td>4</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

**GENERAL NOTES**

* Supplemental Messages

**MOUNTING LOCATION**

All signs shall have a white reflectorized legend and border on a green reflectorized background.

The sign panels shall be mounted as shown on Standard 720001 or as specified in the plans.

All dimensions are in inches (millimeters) unless otherwise shown.
(Provide two post clips top and bottom. Alternate at interior panel joints on ground-mounted signs, and provide two clips at all panel joints on overhead mounted signs.)

Color shall match sign facematerial. To be riveted to sign panel at 24 (600) O.C.

All dimensions are in inches (millimeters) unless otherwise shown.

STANDARD 720021-02
COLOR: Black / Yellow reflectorized

DIMENSION CASE I

CASE II

SHEETING POSITION: CASE II

OBJECT MARKER DETAILS

GENERAL NOTES

All dimensions are in inches (millimeters) unless otherwise shown.

TYPE 1 OR TYPE 4

TYPE 2

TERMINAL MARKERS

OBJECT AND TERMINAL MARKERS

STANDARD 725001-01

DATE REVISIONS
1-1-17

APPROVED: January 1, 2017

ENGINEER OF OPERATIONS
1-1-2016

ENGINEER OF DESIGN AND ENVIRONMENT
January 1, 2017

Illinois Department of Transportation

Figures Department of Transportation

DRAWN: January 1, 2017

APPROVED: January 1, 2017

Sheet 1 of 1

ILLINOIS DEPARTMENT OF TRANSPORTATION

OFFICE OF CIVIL ENGINEERING

Terminal marker shall be within approximately 1 (25) of the outer edge of the terminal end.

The width and height (a, b) of the terminal marker shall be within approximately 1 (25) of the outer edge of the terminal end.
A  Top
B  A
C  Base
D  Sleeve
E  Base

GROUND MOUNT DETAIL

PAVEMENT MOUNT DETAIL

SPlice DETAIL

GENERAL NOTES

All bolts 3/8 (M10) hex head zinc or cadmium plated.

All dimensions are in inches (millimeters) unless otherwise shown.

TELESCOPING STEEL
SIGN SUPPORT

STANDARD 728001-01
For diamond shaped sign with side S as shown, use required post size for a sign with W = 0.7S and D = 1.4S.

**APPLICATIONS OF TYPES A & B METAL POSTS**

(FOR SIGNS & MARKERS)

**DETAIL OF MOUNTING SIGN TO POST**

**GENERAL NOTES**

**DESIGN:** Current AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals.

**LOADING:** for 60 mph (95 km/h) wind velocity with 30% gust factor, normal to sign.

**SOIL PRESSURE:** Minimum allowable soil pressure 3.25 tsf (120 kPa).

See Standard 720011 for details of Types A and B posts.

All dimensions are in inches (millimeters) unless otherwise shown.

**STANDARD 729001-01**
Letters I, D, and H are 2 (50) wires D raised.

PLAN

SECTION A-A

ANCHOR BOLT DETAIL

POST ASSEMBLY DETAIL

Washer shim. Additional washers shall be used to level the base when necessary.

1/8 (3) Galvanized carriage bolt.

All dimensions are in inches (millimeters) unless otherwise shown.

DATE
1-1-09

REVIZIONS
Switched units to English units.

Engineer of Design and Environment

January 1, 2009

Passed

Issued

January 1, 2009

Engineer of Operations

BASE FOR TELESCOPING STEEL SIGN SUPPORT

STANDARD 731001-01

Switched units to English units.
LAME AND EDGE LINES

NOTE:
The transverse spread of the “X” may vary according to lane width.

On multi-lane roads, the stop lines shall extend across all approach lanes and separate RRX symbols shall be placed adjacent to each other in each lane.

When the pavement marking symbol is used, a portion of the symbol should be located directly adjacent to the Advance Warning Sign (W10-1) as placed by Table 2C-4, Condition B of the MUTCD.

PAVEMENT MARKINGS AT RAILROAD-HIGHWAY GRADE CROSSING

All dimensions are in inches (millimeters) unless otherwise shown.
The space between adjacent letters or numerals should be approximately 3 (75) for 6' (1.8 m) legend and 4 (100) for 8' (2.4 m) legend.

**LETTER AND ARROW GRID SCALE**

<table>
<thead>
<tr>
<th>Position</th>
<th>Legend Height</th>
<th>Arrow Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>6' (1.8 m)</td>
<td>Small 2.9 (74)</td>
</tr>
<tr>
<td>a</td>
<td>8' (2.4 m)</td>
<td>Large 3.8 (96)</td>
</tr>
</tbody>
</table>

Illinois Department of Transportation
January 1, 2015

APPROVED
January 1, 2015

ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

PASSED

ENGINEER OF OPERATIONS

TYPICAL PAVEMENT MARKINGS
(Sheet 2 of 3)

STANDARD 780001-05
Reduce to 40' (12.2 m) o.c. on curves where posted or advisory speeds are 45 mph (70 km/h) or less.

For lane marker notes.

See MULTI LANE DIVIDED detail for lane marker notes.

**\*\**

Where double lane line markers are specified, they shall be spaced as shown.

Where double lane line markers are specified, they shall be spaced as shown.

**\*\**

**\*\**

**\*\**

**\*\**
Curb reflectors shall be monodirectional and oriented with the reflective face toward approaching traffic.

All dimensions are in inches (millimeters) unless otherwise shown.
REFLECTOR TYPE A
(mono-directional shown)

REFLECTOR TYPE B
(bi-directional shown)

Adhesive weep slots or holes equally spaced on both sides

Metal rivet

Brass or plastic rivet

All dimensions are in inches (millimeters) unless otherwise shown.

GUARDRAIL AND BARRIER WALL REFLECTOR MOUNTING DETAILS

DATE
REVISIONS
4-1-16
Added reflector spacing
detail: Moved TERMINAL

MARKER to unit 725001:
1-1-09
Switched units to English (metric):

STANDARD 782006

Illinois Department of Transportation

APPROVED
ENGINEER OF DESIGN AND ENVIRONMENT
May 1, 2016
ENGINEER OF OPERATIONS
April 1, 2016

DATE
REVISIONS
1-1-2000

Sheet 1 of 3

REVISIONS
Reflective area may be rectangular or slight trapezoid.

Minimum total area of base 7.0 sq. in. (4516 mm²) or "L" shaped and may have side supports at ends.

3 min. adhesive weep holes or slots each side, variable spacing.

Cross section may be "T" type B or C shown.

Type B or C reflector marker (Type C shown)

STANDARD 782006

MOUNTING DETAILS

GUARDRAIL AND BARRIER WALL REFLECTOR

TYPICAL MOUNTING DETAIL FOR GUARDRAIL REFLECTOR

TYPICAL MOUNTING DETAIL FOR BRIDGE RAIL REFLECTOR

TYPICAL MOUNTING DETAIL FOR BARRIER WALL REFLECTOR

Illinois Department of Transportation

APPROVED ENGINEER OF DESIGN AND ENVIRONMENT

April 1, 2016

ENGINEER OF OPERATIONS

April 1, 1-1-2000
Terminal marker. See standard 725001.

Spacing 80 ft. (24 m) max. for first 400 ft. (122 m) or curve spacing shown in Standard 635001, whichever is less (min. 4 reflectors regardless of length).

After 400 ft. (122 m), transition to normal delineator spacing shown in Standard 635001, and continue as required.

Bidirectional silver/silver should be used in lieu of monodirectional silver on both sides of two-lane bridges where the pavement is less than 24 (610) wider than the pavement approaching the bridge.

One-Way Traffic

Two-Way Traffic

Guardrail / Barrier Wall

Reflection Placement Detail
The following equipment is to be furnished and installed on the TYPE C installation:

1. Cable must conduit (electric cable, No. 6, 2/C except where otherwise specified).
2. Galvanized steel conduit 1/4 (32) with bend.
4. Aluminum weatherproof box with gasketed cover. Weatherproof box shall be installed facing the adjacent property line. (See diagram for alternate installation.)
5. Ground stud for neutral connection.
7. Offset weatherproof fitting.
8. Circuit breaker.

The equipment listed above shall be furnished and installed facing the adjacent property line.

ALTERNATE INSTALLATION

(Installation when weatherproof box cannot be installed facing the adjacent property line.)

All dimensions are in inches (millimeters) unless otherwise shown.

ELECTRICAL SERVICE INSTALLATION DETAILS

STANDARD 805001-01

DATE
1-1-09
REVISIONS
1-1-09 Switched units to English measurements.
1-1-02 Renum. Standard 2373-1.
INTEGRAL/SEMI-INTEGRAL ABUTMENT WITH PARAPET ON APPROACH PAVEMENT

GENERAL NOTES

The barrel in the expansion fitting shall be fully embedded in the concrete on one side of the expansion joint. One half the length of the deflection fitting shall be embedded in the concrete on the other side of the expansion joint.

The Contractor shall install combination expansion/deflection fittings at all bridge expansion joints.

With the approval of the Engineer, the Contractor may substitute two 12 x 12 x 6 (300 x 300 x 150) mm stainless steel junction boxes attached to back of wall and connected with liquidtight flexible nonmetallic conduit for all expansion joints.

All dimensions are in inches (millimeters) unless otherwise shown.
ELEVATION

JOINTED ABUTMENT WITH PARAPET ENDING ON BRIDGE DECK
All dimensions are in inches (millimeters) unless otherwise shown.

Concrete yd³ (m³)

<table>
<thead>
<tr>
<th>Depth</th>
<th>Handhole</th>
<th>Heavy Duty Handhole</th>
</tr>
</thead>
<tbody>
<tr>
<td>90</td>
<td>0.44</td>
<td>0.48</td>
</tr>
<tr>
<td>88</td>
<td>0.43</td>
<td>0.47</td>
</tr>
<tr>
<td>86</td>
<td>0.73</td>
<td>1.00</td>
</tr>
</tbody>
</table>

Handhole sizes:
- 24 (610) min.
- 26 (660) min.
- 24 (610) min.
- 26 (660) min.
- 24 (610) min.
- 26 (660) min.

Concrete quantities table.

Corrected dimension on heavy duty handhole. Added metal conduits to concrete.

English (metric) switched units to metric (English).
Luminaire hanger assembly, four per luminaire required. See detail.

Underpass luminaire suspended from bridge deck. Route to adjacent pier if required.

Luminaire numbering decal bracket. See plans for size and conduits.

Conduit clamp as needed (typ.).

U-channel nut. Spring loaded damper assembly.

Stainless steel conduit to bridge deck. Route to adjacent pier if required.

Stainless steel conduit bushing, three required.

Stainless steel lock nut, lock washer and neoprene washer.

Stainless steel lock nut, washer and lock nut.

Stainless steel vibration damper assembly.

Stainless steel spring.

Luminaire mounting tab.

Branch circuits to luminaires shown routed from underground. Branch circuits may also be routed from bridge parapet above.

All dimensions are in inches (millimeters) unless otherwise shown.

GENERAL NOTES

See plans for underpass luminaire locations.

Underpass luminaires shall be centered between beams unless otherwise directed by the Engineer.

Optics of underpass luminaires shall be installed below the beams unless otherwise directed by the Engineer.

Underpass luminaires shall be centered between beams unless otherwise directed by the Engineer.

Rigid conduit may be used in lieu of flexible conduit.

Stainless steel conduit shall be used beneath any parts of the luminaire or attached conduit.
Conductors up to luminaire(s).

Conductor splice (typ.).

Surge arrester (typ.).

Breakaway fuse holder with fuses (typ.).

Light pole handhole with ground lug.

See plans for branch lighting circuit conductors.

Conductor splice (typ.).

Surge arrester (typ.).

Breakaway fuse holder with fuses (typ.).

Light pole handhole with ground lug.

See plans for branch lighting circuit conductors.

Green equipment grounding conductor. See plans for size.

Green equipment grounding conductor. See plans for size.

Transformer base, when used.

Transformer base, when used.

Concrete foundation.

Concrete foundation.

ELEVATION AT POLE BASE WITH CONCRETE FOUNDATION

ELEVATION AT POLE BASE WITH METAL FOUNDATION

RODENT Screen not shown

GENERAL NOTES

Wiring for twin luminaire installation shown. Omit one fuse holder and one surge arrester with connections for single luminaire installation.

All conductors originating in pole shall be No. 10 unless noted otherwise.

Conductors extended into light poles shall be of a length sufficient for splices to be withdrawn 18 (450) out of pole handle.

Any voids in the foundation shall be filled with fire aggregate.

See Standard 836001 for Light Pole Foundation and ground rod.

All dimensions are in inches (millimeters) unless otherwise shown.

DATE

REVISIONS

1-1-17

Renamed standard.

1-1-15

Changed ‘protector’ to ‘grounding nut.’
Electric Service Installation

- 3-wire, overhead service.
- 25' (7.5 m) Wood service pole.
- 3-No. 8 XLP cables in 1 (25) rigid steel conduit.
- Malleable iron conduit clamps at 5' (1.5 m) intervals.
- Meter (when required).
- Conduit hub.
- Service disconnect switch.
- Rigid steel conduit elbow.
- Insulated mounting board.
- Ground line.
- No. 6 bare copper wire.
- Ground rod.

**CONTROLLER ENCLOSURE**

- 3-channel or mounting bracket, two required.
- Photocell.
- Controller enclosure.
- Rigid steel conduit elbow.
- Rigid steel conduit.
- No. 8 Wire.
- Neutral bar.
- Equipment ground bar.
- Branch lighting circuits.

**GENERAL NOTES**

- Provide 12x9x1 (305x225x25) watertight pouch mounted inside controller door with as built plans and schematics.
- Provide engraved nameplate on front of enclosure reading “LIGHTING”.
- Enclosure shall be mounted to pole with pole-bands and lag-bolts.
- Work pad not shown.

**DATE**

- 1-1-15

**REVISIONS**

- Corrected connection at terminal block.
- Added notes (8) for 30A controller, (10) for 60A controller.
- 1/15

**LIGHTING CONTROLLER**

- POLE MOUNTED, 240V

**STANDARD 825001-03**
3-wire, overhead service.

120/240 V, 1-phase, 15 amp, 1-pole circuit breaker.

Weatherhead

25' (7.5 m) Wood service pole.

3 No. 6 XLP cables in 1 (25) rigid steel conduit.

Malleable iron conduit clamps at 5' (1.5 m) intervals.

Meter (when required).

Conduit hub.

Service disconnect switch.

Rigid steel conduit elbow.

Rigid steel conduit elbow.

Controller enclosure, minimum dimensions: 300 x 200 x 140* (760 x 510 x 355) 30H x 20W x 14D*

Insulated mounting board.

Conduit elbow.

Rigid steel conduit.

PVC conduit.

(13) Sch. 40 units.

Ground line.

No. 6 bare copper wire.

30Hide bar.

Equipment ground bar.

Branch lighting circuits.

Protocol with integral surge arrester.

HAND-OFF-AUTO selector switch.

100 amp*, electrically held contactor.

15 amp, 1-pole circuit breaker.

20 amp*, 2-pole circuit breaker (two spares required but not shown). Surge arrester.

GFI duplex receptacle.

Single-pole, single-throw switch.

Incandescent luminaire, enclosed and gasketed with 100 watt lamp.

Service disconnect switch - 2 pole, 3 wire, 60 amp*, fused at 60 amp*, solid neutral in NEMA 4X enclosure having lockable external handle.

Terminal block sized for conductors as shown on plans.

* Size larger as needed.

** Or as directed by Utility Company.
240/480 V, 3-phase, 3-wire, overhead service.

3-wire, 1-phase, 240/480 V, Weatherhead.

Downguy and anchor, as needed.

2" (7.5 mL) Wood service pole.

3 No. 6 XLP cables in 1 (25) rigid steel conduit.

Malleable iron conduit cぁnon at 5' (1.5 m) intervals.

Motor (when required), Conduit hub.

Conduit elbow.

Rigid steel conduit.

No. 6 bare copper wire.

Service disconnect switch.

Service disconnect and controller enclosure.

Neutral bar.*

Universal mounting bracket, as required.

Controller enclosure:

Controller enclosure, minimum dimensions:

30H x 20W x 24D = (760 x 510 x 355)

Controller enclosure, minimum dimensions:

30H x 20W x 24D = (760 x 510 x 355)

Conduit elbow.

Rigid steel conduit.

Rigid steel conduit elbow.

Controller enclosure.

Controller enclosure.

Neutral bar.

Equipment grounding bar.

#6 Wire.*

Branch lighting circuits in unit duct(s).

GENERAL NOTES

Provide (12 x 1) (360x295x25) watertight pouch mounted inside controller door with as-built plans and schematics.

Provide engraved nameplate on front of enclosure reading "LIGHTING".

Enclosure shall be mounted to pole with pole-bands and lag-bolts.

Work pad not shown.

All dimensions are in inches (millimeters) unless otherwise shown.

Surface mounted controller.

HAND-OFF-AUTO selector switch.

100 amp*, electrically held contactor.

15 amp, 1-pole circuit breaker.

20 amp*, 2-pole circuit breaker (two spares required but not shown).

Surge arrester.

Transformer - 360V*, 480V primary, 120/240V secondary, single-phase, 60Hz.

GFCI duplex receptacle.

Single-pole, single-throw switch.

Incandescent luminaire, enclosed and gasketed with 100 watt lamp.

Service disconnect switch - 3-pole, 3-wire, 60 amp*, fused at 60 amp*, solid neutral in NEMA 4X enclosure having lockable external handle.

15 amp, 2-pole circuit breaker.

Terminal block sized for conductors as shown on plans.

* Size larger as needed.

ELECTRIC SERVICE INSTALLATION

* Size larger as needed.

** Or as directed by Utility Company.

*** When cold sequencing is required, provide a motor disconnect switch as directed by Utility Company.

ILLINOIS DEPARTMENT OF TRANSPORTATION

APPROVED January 1, 2015

ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED January 1, 2015

PASSED

ENGINEER OF PRELIMINARY ENGINEERING

DATE  REVISIONS


LITI NG CONTROLLER

POLE MOUNTED, 480V

STANDARD 825006-02
ELECTRIC SERVICE INSTALLATION

- Use sizes as needed.
- Or as directed by Utility Company.

120/240 V, 1-phase, 3-wire, overhead service.

Down guy and anchor, as needed.

Service conductors in rigid steel conduit, sized as required.

Malleable iron conduit clamps at 5' (1.5 m) intervals.

Meter (when required).

Conduit hub.

Service disconnect switch.

5 (125) Sch. 40 PVC conduit.

1/4 (13) Sch. 40 PVC conduit.

No. 6 bare copper wire.

Ground rod.

FEEDER CONDUCTORS

- To service pole.
- In rigid conduit to lighting controller.

GROUND CONDUCTORS

- Service conductors.
- Ground line.

SERVICE CONDUCTORS IN INTERVALS

- Malleable iron conduit clamps at 5' (1.5 m) intervals.
- Conduit hub.
- Service disconnect switch.

SERVICE POLE

- Weatherproofed.
- Down guy and anchor, as needed.
- Service conductors in rigid steel conduit, sized as required.

MAKING CONNECTIONS

- Photocell with integral surge arrester.
- HAND-OFF-AUTO selector switch.
- 100 amp*, electrically held contactor.
- 15 amp, 1-pole circuit breaker.
- 20 amp*, 2-pole circuit breaker (two spares required but not shown).
- Surge arrester.
- GFCI duplex receptacle.

GROUND CONDUCTORS

- Ground rod in access well.
- Equipment ground bar.
- Neutral bar.
- Ground line.

LIGHTING CONTROLLER

- Photocell with integral surge arrester.
- HAND-OFF-AUTO selector switch.
- 100 amp*, electrically held contactor.
- 15 amp, single-pole circuit breaker.
- 30 amp*, 2-pole circuit breaker (two spares required but not shown).
- Surge arrester.
- GFCI duplex receptacle.

CONTROLLER ENCLOSURE

- Controller enclosure, minimum dimensions:
  - 30H x 20W x 14D (760 x 510 x 355)
  - Insulated mounting board.

TERMINAL BLOCK SIZED FOR CONDUCTORS

- Terminal block sized for conductors having lockable external handle.
- Single-pole, single-throw switch.
- Incandescent luminaire, enclosed and gasketted with 100 watt amp.
- Service disconnect switch - 2-pole, 3-wire, 60 amp*, fused at 60 amp*, solid neutral in NEMA 4X enclosure having lockable external handle.
- 60 amp*, 2-pole circuit breaker.
- Terminal block sized for conductors as shown on plans.
- Size larger as needed.

All dimensions are in inches (millimeters) unless otherwise shown.

ILLINOIS DEPARTMENT OF TRANSPORTATION

APPROVED

JANUARY 1, 2015

ENGINEER OF DESIGN AND ENVIRONMENT

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ENGINEER OF PRELIMINARY ENGINEERING

DATE

REVISIONS

1-1-15 - Revised notes.

1-1-12 - Revised feeder burial depths.

STANDARD 825011-03

LIGHTING CONTROLLER

PEDESTAL MOUNTED, 240V
LIGHTING SERVICE.

3-wire, overhead 240/480 V, 1-phase, Weatherhead.

Rigid steel conduit, service conductors in rigid steel conduit, sized as required.

Malleable iron conduit clamps at 5' (1.5 m) intervals.

Feeder conductors, insulated conductors. Service conductors in rigid conduit to lighting controller.

Controller enclosure, minimum dimensions: 30H x 20W x 14D (760 x 510 x 355) (Work pad not shown.)

Controller enclosure, minimum dimensions: 30H x 20W x 14D (760 x 510 x 355) (Work pad not shown.)

Neutral bar.

Equipment ground bar.

CONTROL SCHEMATIC

Incandescent luminaire, enclosed and gasketed with 100 watt lamp.

Service disconnect switch - 2-pole, 3-wire, 60 amp*, solid neutral in NEMA 4X enclosure having lockable external handle.

Transformer - 4KVA, 480V primary, 120/240V secondary, single-phase, 60Hz.

15 amp, 2-pole circuit breaker.

60 amp*, 2-pole circuit breaker.

Terminal block sized for conductors as shown on plans. All dimensions are in inches (millimeters) unless otherwise shown.

DEPOT 600 V, 50 Hz, 3-wire, overhead service.

3-wire, overhead 240/480 V, 1-phase, Weatherhead.

Conduit hub.

Service disconnect switch.

Service disconnect switch - 2 pole, single-throw switch as directed by Utility Company.

When cold sequencing is required, provide a meter disconnect switch as directed by Utility Company.

Size larger as needed.

All dimensions are in inches (millimeters) unless otherwise shown.

*** 4' 750x225x25

** 36

* Size larger as needed.

** Or as directed by Utility Company

*** When cold sequencing is required, provide a meter disconnect switch as directed by Utility Company.

60 amp*, 2-pole circuit breaker.

Terminal block sized for conductors as shown on plans. All dimensions are in inches (millimeters) unless otherwise shown.

HAND-OFF-AUTO selector switch.

35 amp, 1-pole circuit breaker.

20 amp*, 2-pole circuit breaker (two spares required but not shown).

Surge arrester.

GFCI duplex receptacle.

Single-pole, single-throw switch.

* Size larger as needed.

Incandescent luminaire, enclosed and gasketed with 100 watt lamp.

Service disconnect switch - 2-pole, 3-wire, 60 amp*, solid neutral in NEMA 4X enclosure having lockable external handle.

Transformer - 4KVA, 480V primary, 120/240V secondary, single-phase, 60Hz.

15 amp, 2-pole circuit breaker.

60 amp*, 2-pole circuit breaker.
LIGHTING

3-wire, overhead 120/240 V, 1-phase, Weatherhead needed. anchor, as

Downguy and cover overhang. in underside of Slotted ventilator service pole. *

25' (7.5 m) Wood as required. conduit, sized

in rigid steel Service conductors

intervals. Malleable iron conduit

required). Meter (when

Conduit hub.

switch.

disconnect

Service

PVC conduit. (13) Sch. 40

copper wire. No. 6 bare

rod.

Ground

(450)

18

(760)

5 '-6 "

(13) 5ch. 40

PVC conduit.

Ground line.

To service pole.

Foundation.

Concrete

anchor rod.

(16) dia.

(25) 45°

Chamfer.

(900)

(25)

(1.2m)

(600)

(2450)

(450)

(1000)

(20)

(25) 45°

(1.3m)

(1.5m)

(1.5m)

(1.5m)

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LIGHTING service.

3-wire, overhead 240/480 V, 1-phase, Weatherhead. needed.

anchor, as Downguy and cover overhang. in underside of Slotted ventilator service pole. *

25' (7.5 m) Wood as required.

Conduit, sized in rigid steel Service conductors intervals. 

Malleable iron conduit clamps at 5' (1.5 m) required). *** 

Meter (when Châtelier. 

(13) Sch. 40 ** 

Ground line.

Feeder conductors, sized as required. 

To service pole. 

Foundation (Plan) 
(Work pad not shown.) 

Additional wiring window as needed. 

5 (125) Sch. 40 PVC wiring window. 

GROUND ROD DETAIL 

* Size larger as needed. 

** Or as directed by Utility Company. 

*** When cold sequencing is required, provide a meter disconnect switch as directed by Utility Company.

ELECTRIC SERVICE INSTALLATION

240/480 V, 3-phase, 3-wire, overhead service.

25 (17.5 m) Wood service pole. *

Service conductors in rigid steel conduit, sized as required.

Malleable iron conduit clamps at 3' (1.5 m) intervals.

Meter (when required). ***

Conduit hub. 

Service disconnect switch. 

GROUND ROD DETAIL 

* Size larger as needed. 

** Or as directed by Utility Company. 

*** When cold sequencing is required, provide a meter disconnect switch as directed by Utility Company.

ELECTRIC SERVICE INSTALLATION

240/480 V, 3-phase, 3-wire, overhead service.

25 (17.5 m) Wood service pole. *

Service conductors in rigid steel conduit, sized as required.

Malleable iron conduit clamps at 3' (1.5 m) intervals.

Meter (when required). ***

Conduit hub. 

Service disconnect switch. 

GROUND ROD DETAIL 

* Size larger as needed. 

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ELECTRIC SERVICE INSTALLATION

240/480 V, 3-phase, 3-wire, overhead service.

25 (17.5 m) Wood service pole. *

Service conductors in rigid steel conduit, sized as required.

Malleable iron conduit clamps at 3' (1.5 m) intervals.

Meter (when required). ***

Conduit hub. 

Service disconnect switch. 

GROUND ROD DETAIL 

* Size larger as needed. 

** Or as directed by Utility Company. 

*** When cold sequencing is required, provide a meter disconnect switch as directed by Utility Company.

ELECTRIC SERVICE INSTALLATION

240/480 V, 3-phase, 3-wire, overhead service.

25 (17.5 m) Wood service pole. *

Service conductors in rigid steel conduit, sized as required.

Malleable iron conduit clamps at 3' (1.5 m) intervals.

Meter (when required). ***

Conduit hub. 

Service disconnect switch. 

GROUND ROD DETAIL 

* Size larger as needed. 

** Or as directed by Utility Company. 

*** When cold sequencing is required, provide a meter disconnect switch as directed by Utility Company.

ELECTRIC SERVICE INSTALLATION

240/480 V, 3-phase, 3-wire, overhead service.

25 (17.5 m) Wood service pole. *

Service conductors in rigid steel conduit, sized as required.

Malleable iron conduit clamps at 3' (1.5 m) intervals.

Meter (when required). ***

Conduit hub. 

Service disconnect switch. 

GROUND ROD DETAIL 

* Size larger as needed. 

** Or as directed by Utility Company. 

*** When cold sequencing is required, provide a meter disconnect switch as directed by Utility Company.

ELECTRIC SERVICE INSTALLATION

240/480 V, 3-phase, 3-wire, overhead service.

25 (17.5 m) Wood service pole. *

Service conductors in rigid steel conduit, sized as required.

Malleable iron conduit clamps at 3' (1.5 m) intervals.

Meter (when required). ***

Conduit hub. 

Service disconnect switch. 

GROUND ROD DETAIL 

* Size larger as needed. 

** Or as directed by Utility Company. 

*** When cold sequencing is required, provide a meter disconnect switch as directed by Utility Company.

ELECTRIC SERVICE INSTALLATION

240/480 V, 3-phase, 3-wire, overhead service.

25 (17.5 m) Wood service pole. *

Service conductors in rigid steel conduit, sized as required.

Malleable iron conduit clamps at 3' (1.5 m) intervals.

Meter (when required). ***

Conduit hub. 

Service disconnect switch. 

GROUND ROD DETAIL 

* Size larger as needed. 

** Or as directed by Utility Company. 

*** When cold sequencing is required, provide a meter disconnect switch as directed by Utility Company.

ELECTRIC SERVICE INSTALLATION

240/480 V, 3-phase, 3-wire, overhead service.

25 (17.5 m) Wood service pole. *

Service conductors in rigid steel conduit, sized as required.

Malleable iron conduit clamps at 3' (1.5 m) intervals.

Meter (when required). ***

Conduit hub. 

Service disconnect switch. 

GROUND ROD DETAIL 

* Size larger as needed. 

** Or as directed by Utility Company. 

*** When cold sequencing is required, provide a meter disconnect switch as directed by Utility Company.

ELECTRIC SERVICE INSTALLATION

240/480 V, 3-phase, 3-wire, overhead service.

25 (17.5 m) Wood service pole. *

Service conductors in rigid steel conduit, sized as required.

Malleable iron conduit clamps at 3' (1.5 m) intervals.

Meter (when required). ***

Conduit hub. 

Service disconnect switch. 

GROUND ROD DETAIL 

* Size larger as needed. 

** Or as directed by Utility Company. 

*** When cold sequencing is required, provide a meter disconnect switch as directed by Utility Company.

ELECTRIC SERVICE INSTALLATION

240/480 V, 3-phase, 3-wire, overhead service.

25 (17.5 m) Wood service pole. *

Service conductors in rigid steel conduit, sized as required.

Malleable iron conduit clamps at 3' (1.5 m) intervals.

Meter (when required). ***

Conduit hub. 

Service disconnect switch. 

GROUND ROD DETAIL 

* Size larger as needed. 

** Or as directed by Utility Company. 

*** When cold sequencing is required, provide a meter disconnect switch as directed by Utility Company.
LIGHTING CONTROLLER

**NAVIGATION OBSTRUCTION, 240V**

**LIGHTING**

120/240 V, 3-wire, overhead service.

**3-wire, overhead service.**

25' (7.5 m) Wood service pole. *

25' (7.5 m) Wood service pole. *

Service conductors in rigid steel conduit, sized as required.

Malleable iron conduit clamps at 5' (1.5 m) intervals.

Meter (when required).

Conduit hub.

Service disconnect switch.

% (13) Sch. 40 PVC conduit.

% (13) Sch. 40 PVC conduit.

No. 6 bare copper wire.

Ground rod.

Feeder conductors in rigid conduit to lighting controller.

**GROUND LINE.**

5'-6" (1.65 m) 20 Gauge copper wire.

No. 6 bare copper wire.

36 (900) 24 18 (75) 3

18 (450) 1 8 1-1/8" (25) 45° Chamfer.

8 (50) 2 (25) dia. anchor rod.

Controller enclosure.

Concrete foundation.

5 (125) Sch. 40 PVC wiring window.

Additional wiring window as needed.

(Work pad not shown.)

GROUND LINE (con’t)

**GROUND LINE.**

5'-6" (1.65 m) 20 Gauge copper wire.

No. 6 bare copper wire.

36 (900) 24 18 (75) 3

18 (450) 1 8 1-1/8" (25) 45° Chamfer.

8 (50) 2 (25) dia. anchor rod.

Controller enclosure.

Concrete foundation.

5 (125) Sch. 40 PVC wiring window.

Additional wiring window as needed.

(Work pad not shown.)

GROUND LINE (con’t)

5'-6" (1.65 m) 20 Gauge copper wire.

No. 6 bare copper wire.

36 (900) 24 18 (75) 3

18 (450) 1 8 1-1/8" (25) 45° Chamfer.

8 (50) 2 (25) dia. anchor rod.

Controller enclosure.

Concrete foundation.

5 (125) Sch. 40 PVC wiring window.

Additional wiring window as needed.

(Work pad not shown.)
- Photocell with integral surge arrester for roadway lighting.
- Photocell with integral surge arrester for navigation lighting.
- HAND-OFF-AUTO selector switch.
- 100 amp*, electrically held contactor.
- 60 amp*, electrically held contactor.
- 15 amp, 1-pole circuit breaker.
- 20 amp*, 2-pole circuit breaker (two spares required but not shown).
- 20 amp*, single-pole circuit breaker (two shown, quantity as required).
- Surge arrester.
- GFCI duplex receptacle.
- Single-pole, single-throw switch.
- Incandescent luminaire, enclosed and gasketed with 100 watt lamp.
- Service disconnect switch - 2-pole, 3-wire, 100 amp*, fused at 100 amp*, solid neutral in NEMA 4X enclosure having lockable external handle.
- 60 amp*, 2-pole circuit breaker.
- 30 amp*, 2-pole circuit breaker.
- Terminal block sized for conductors as shown on plans.

* Size larger as needed.
LIGHTING

3-wire, overhead 240/480 V, 1-phase, Weatherhead.

Anchor, as needed.

Service conductors in rigid steel conduit, sized as required.

Malleable iron conduit clamps at 5' (1.5 m) intervals.

Meter (when required).***

Conduit hub.

Service Disconnect switch.

9, (13) Sch. 40 PVC conduit.

No. 6 bare copper wire.

Ground rod.

Feeder conductors in rigid conduit to lighting controller.

ELECTRIC SERVICE INSTALLATION

* Sizes as needed.

** Or as directed by Utility Company.

*** When cold sequencing is required, provide a meter disconnect switch as directed by Utility Company.

Engraved name plate.

Stowed ventilator in underside of cover overhang.

Controller enclosure.

% (16) dia anchor rod.

1 (25) 45° Chamfer.

Concrete foundation.

Additional wiring window as needed.

Lighting controller.

12 x 9 x 1 (305 x 229 x 25) watertight pouch mounted inside door with as-built drawings and schematics.

Controller enclosure.

Concrete pole.

To service pole.

PVC wiring window.

Additional wiring window as needed.

Lighting controller.

FOUNDATION (PLAN)

(Work pad not shown.)

All dimensions are in inches (millimeters) unless otherwise shown.

DATE
1-1-10

REVISIONS
1-1-15 Added note 06
1-1-10 New Standard.

I I linois Department of Transportation

APPROVED
January 1, 2015

PASSED
January 1, 2015

ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED
1-1-12

ENGINEER OF PRELIMINARY ENGINEERING
Controller enclosure, minimum dimensions: 59 x 44 x 26 (1500 x 1120 x 660)

Service conductors sized as required.

Feeder conductors sized as required.

Neutral bar in access well.

Equipment grounding bar.

Photocell with integral surge arrester for roadway lighting.

Photocell with integral surge arrester for navigation lighting.

HAND-OFF-AUTO selector switch.

100 amp*, electrically held circuit breaker.

60 amp*, electrically held circuit breaker.

15 amp, 1-pole circuit breaker.

20 amp*, 2-pole circuit breaker (two spares required but not shown).

20 amp*, single-pole circuit breaker (two shown, quantity as required).

Surge arrester.

GFCI duplex receptacle.

Single-pole, single-throw switch.

Incandescent luminaire, enclosed and gasketted with 100 watt lamp.

Service disconnect switch - 2-pole, 3-wire, 150 amp*, fused at 100 amp*, solid neutral in NEMA 4X enclosure having lockable external handle.

60 amp*, 2-pole circuit breaker.

30 amp*, 2-pole circuit breaker.

Transformer - 1 KVA*, 480V primary, 120/240V secondary, single phase, 60 Hz.

15 amp, 2-pole circuit breaker.

Terminal block sized for conductors as shown on plans.

* Size larger as needed.
GENERAL NOTES
See Standard 836001 for Light Pole Foundation and grounding electrode.
See Standard 720001 for pole identification banding to pole.
Voids in light pole base shall be sealed to prevent rodent entry.
Provide breakaway devices where required.
Where anchor rods on existing bridge parapets are too short to mount poles as shown, install leveling plate directly on concrete and level with stainless steel washers.
All dimensions are in inches (millimeters) unless otherwise shown.

**MAST ARM LIGHT POLE**
(Single or twin mount)
* Unless directed otherwise by the Engineer.

**POLE**

<table>
<thead>
<tr>
<th>MOUNTING HEIGHT</th>
<th>MINIMUM SHAFT DIAMETER</th>
<th>MINIMUM WALL THICKNESS</th>
</tr>
</thead>
<tbody>
<tr>
<td>35' (10.7 m) or less</td>
<td>8 tapered to 4½ (200 to 114)</td>
<td>0.25 (6)</td>
</tr>
<tr>
<td>Greater than 35' (10.7 m) to 45' (13.7 m)</td>
<td>10 tapered to 6 (250 to 150)</td>
<td>0.25 (6)</td>
</tr>
<tr>
<td>Greater than 45' (13.7 m) to 50' (15.2 m)</td>
<td>10 tapered to 6 (250 to 150)</td>
<td>0.312 (8)</td>
</tr>
</tbody>
</table>

**POLE BASE**

<table>
<thead>
<tr>
<th>MOUNTING HEIGHT</th>
<th>BOLT CIRCLE DIAMETER</th>
</tr>
</thead>
<tbody>
<tr>
<td>35' (10.7 m) or less</td>
<td>1½ (380)</td>
</tr>
<tr>
<td>Greater than 35' (10.7 m) to 50' (15.2 m)</td>
<td>35 (880)</td>
</tr>
</tbody>
</table>

**LIGHT POLE ALUMINUM MAST ARM**

* Unless directed otherwise by the Engineer.
**DAVIT LIGHT POLE**
(Single or twin mount)

*Unless directed otherwise by the Engineer.*

**GENERAL NOTES**

See Standard 830006-04 for Light Pole Foundation and grounding electrode.

See Standard 720001 for pole identification banding to pole.

Voids in light pole base shall be sealed to prevent rodent entry.

Provide breakaway devices where required.

Where anchor rods on existing bridge parapets are too short to mount poles as shown, install leveling plate directly on concrete and level with stainless steel washers.

All dimensions are in inches (millimeters) unless otherwise shown.

<table>
<thead>
<tr>
<th>DATE</th>
<th>REVISIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-1-17</td>
<td>Added notes 3 and 4</td>
</tr>
<tr>
<td>1-1-15</td>
<td>Revised note on HANDHEOLE DETAIL</td>
</tr>
</tbody>
</table>

**STANDARD 830006-04**
Traffic flow

Handhole.

Pole identification.

Pole.

Traffic flow

Pole on median barrier wall.

Traffic flow

Pole on barrier wall, retaining wall or parapet.

Traffic flow

Pole on ground mounted foundation.

SECTION A-A

(dotted not shown)

Bolt circle.

Hex nut with washer. Washer shell cover entire shell (typ.). Nut covers required but not shown.

Screen wrapped around nuts and anchor rods between foundation and bottom of pole base. Provide 6 (130) minimum overlap and wire-tie with matching wire.

Concrete foundation, barrier or retaining wall.

DETAIL A

2½ 0.0 D. x ½ (64 x 7)
washers both sides of
2½ 0.0 D. x ½ (64 x 13)
m. Isolation washer

Pole base.

½ (13) min. isolation pad
scord to match pole base.

½ (13) min. isolation pad
scord to match pole base.

1 (25) leveling nut.

Screen wrapped around nuts and anchor rods between foundation and bottom of leveling plate. Provide 4 (150) minimum overlap and wire-tie with matching wire.

Handhole and cover. See orientation detail.

Leveling nut (typ.).

Hex nut and lock washer on fully threaded rod for metal foundation. Metal foundation.

Omit leveling nuts when breakaway devices are required.

ELEVATION AT CONCRETE FOUNDATION, METAL FOUNDATION OR RETAINING WALL

Handhole and cover. See orientation detail.

ELEVATION AT BRIDGE PARAPET

POLE BASE DETAILS

HANDHOLE / IDENTIFICATION

ORIENTATION DETAIL

HANDHOLE DETAIL
### Pole

<table>
<thead>
<tr>
<th>MOUNTING HEIGHT</th>
<th>MINIMUM MAST DIAMETER</th>
<th>MAXIMUM WALL THICKNESS</th>
</tr>
</thead>
<tbody>
<tr>
<td>35' (10.7 m) or less</td>
<td>4&quot; tapered to 4&quot;</td>
<td>25 gauges</td>
</tr>
<tr>
<td>Greater than 35' (10.7 m) to 50' (15.2 m)</td>
<td>2&quot; tapered to 4&quot;</td>
<td>7 gauges</td>
</tr>
<tr>
<td>Greater than 50' (15.2 m) to 60' (18.3 m)</td>
<td>2&quot; tapered to 4&quot;</td>
<td>5 gauges</td>
</tr>
</tbody>
</table>

### Base Plate

<table>
<thead>
<tr>
<th>MOUNTING HEIGHT</th>
<th>BOLT CIRCLE DIAMETER</th>
<th>BASE PLATE THICKNESS</th>
</tr>
</thead>
<tbody>
<tr>
<td>35' (10.7 m) or less</td>
<td>1½&quot; (290)</td>
<td>1&quot; (25)</td>
</tr>
<tr>
<td>Greater than 35' (10.7 m) to 50' (15.2 m)</td>
<td>1½&quot; (380)</td>
<td>1½&quot; (32)</td>
</tr>
<tr>
<td>Greater than 50' (15.2 m) to 60' (18.3 m)</td>
<td>1½&quot; (380)</td>
<td>1½&quot; (40)</td>
</tr>
</tbody>
</table>

### General Notes

See Standard 836001 for Light Pole Foundation and grounding electrode.

See Standard 720001 for pole identification banding to pole.

Provide breakaway devices where required.

Where anchor rods on existing bridge parapets are too short to mount poles as shown, install leveling plate directly on concrete and level with stainless steel washers.

All dimensions are in inches (millimeters) unless otherwise shown.

---

**Light Pole**

(Single or twin mount)

*Unless directed otherwise by the Engineer.*
Davit arm length
15' (4.57 m) max. for single
12'-11" (3.66 m) max. for double.

Davit arm. Minimum wall thickness 0.149 (3.8).

Taper to 2" thickness 0.149 (3.8).

Davit arm length
3'-9" (1.14 m) R.

89.

SECTION A-A

SECTION B-B

General Notes

See Standard 836001 for Light Pole Foundation and grounding electrode.

See Standard 720001 for pole identification banding to pole.

Provide breakaway devices where required.

Where anchor rods on existing bridge parapets are too short to mount poles as shown, install leveling plate directly on concrete and level with stainless steel washers.

All dimensions are in inches (millimeters) unless otherwise shown.

Light pole

Steel davit arm

DATE
REVISIONS
1/1/14
Added pole mounted on bridge parapet. Modified attachment of screen.

1/1/13
Added 'barrier or retaining wall' to POLE BASE DETAIL.

Illinois Department of Transportation
APPROVED January 1, 2014
ENGINEER OF PRELIMINARY ENGINEERING

January 1, 2014
ENGINEER OF DESIGN AND ENVIRONMENT

STANDARD 830016-02

LIGHT POLE
STEEL DAVIT ARM

(Single or twin mount)

* Unless directed otherwise by the Engineer.
**General Notes**

See Standard 836001 for Light Pole Foundation and grounding electrode.

See Standard 720001 for pole identification banding to pole.

Provide breakaway devices where required.

Where anchor rods on existing bridge parapets are too short to mount poles as shown, install leveling plate directly on concrete and level with stainless steel washers.

All dimensions are in inches (millimeters) unless otherwise shown.

---

**Light Pole**

**Steel Tenon Top**

* Unless directed otherwise by the Engineer.

---

**Table: Mounting Height, Bolt Circle Diameter, Base Plate Thickness**

<table>
<thead>
<tr>
<th>Mounting Height</th>
<th>Bolt Circle Diameter</th>
<th>Base Plate Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>35’ (10.7 m) or less</td>
<td>1½” (290)</td>
<td>1” (25)</td>
</tr>
<tr>
<td>Greater than 35’ (10.7 m) to 50’ (15.2 m)</td>
<td>1½” (290)</td>
<td>1½” (32)</td>
</tr>
<tr>
<td>Greater than 50’ (15.2 m) to 60’ (18.3 m)</td>
<td>1½” (290)</td>
<td>1½” (40)</td>
</tr>
</tbody>
</table>

---

**Diagram:**

- Twin tenon, see detail.
- Tenon top, see detail.
- Pole identification banded to pole. See orientation detail.
- See pole base and handhole detail.

---

**STEEL TENON TOP**

**LIGHT POLE**

**BASE PLATE**

<table>
<thead>
<tr>
<th>Mounting Height</th>
<th>Minimum Shaft Diameter</th>
<th>Minimum Wall Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>35’ (10.7 m) or less</td>
<td>8 tapered to 4” (200 to 100)</td>
<td>10 gauge</td>
</tr>
<tr>
<td>Greater than 35’ (10.7 m) to 50’ (15.2 m)</td>
<td>10 tapered to 4” (250 to 100)</td>
<td>7 gauge</td>
</tr>
<tr>
<td>Greater than 50’ (15.2 m) to 60’ (18.3 m)</td>
<td>10 tapered to 4” (250 to 100)</td>
<td>5 gauge</td>
</tr>
</tbody>
</table>

---

**GENERAL NOTES**

**POLE BASE DETAIL**

- Three 3½” (9x38) self tapping screws at 120°.
- Light pole with cap at top.

**TWIN TENON DETAIL**

- 2½” (66) I.D. schedule 40 pipe.
- 2½” (66) D.O.D. schedule 40 pipe tenon.

**TENON DETAIL**

- Pole identification banded to pole. See orientation detail.
- See pole base and handhole detail.
**GENERAL NOTES**

See plans for wire and unit duct sizes and pole locations not shown.

Provide guy wires with strain insulators and anchors, as needed.

All dimensions are in inches (millimeters) unless otherwise shown.

**LUMINAIRE MOUNTING DETAILS**

- **Twin**
- **Single**

MOUNTING BRACKET DETAILS

**LIGHT POLE WITH CIRCUIT ROUTED UNDERGROUND**

See standard 835001 for service installation.
**LUMINAIRE RING WIRING DIAGRAM**

- **Terminal box**: Fuse and fuse block, typ.
- **Fuse block**: Luminaires, qty. as req.
- **Power cable**: Screen banded to base plate.

**DETAIL A**

- **Light tower identification**: Height (1-1-11)
- **Foundation**: h = Anchor rod dia. + leveling nut and washer thickness.

---

**GENERAL NOTES**

- **Foundation and grounding electrode**: See Standard 837001 for High Mast Tower
- **Light tower identification**: Decal. Orient to be visible to oncoming traffic.

**LIGHT TOWER**

- **Anchor rod**: h = Anchor rod dia. + leveling nut and washer thickness.

---

**LIGHT TOWER**

- **Identification decal**: Orient to be visible to oncoming traffic.

---

**DATE**

- **REVISIONS**
- **1-2-15**: Added light tower identification decal.
- **1-1-15**: Modified Detail A.
- **1-1-11**: New Standard.

---

**STANDARD 835001-01**
### Metal Foundation

<table>
<thead>
<tr>
<th>Light Pole Mounting Height</th>
<th>Bolt Circle Diameter</th>
<th>Shaft Diameter</th>
<th>Shaft Depth</th>
<th>Top Plate (min)</th>
<th>Shaft Diameter</th>
<th>Shaft Depth</th>
<th>Anchor Rod Diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>4'-0&quot; (122) I.D.</td>
<td>115 (292) O.D.</td>
<td>16 (406) O.D.</td>
<td>20 (508) O.D.</td>
<td>2 (50)</td>
<td>14 (356) I.D.</td>
<td>1 (25) dia.</td>
<td>15 (381) or 17 (432) bolt circle</td>
</tr>
<tr>
<td>4'-6&quot; (138) I.D.</td>
<td>115 (292) O.D.</td>
<td>16 (406) O.D.</td>
<td>20 (508) O.D.</td>
<td>2 (50)</td>
<td>14 (356) I.D.</td>
<td>1 (25) dia.</td>
<td>15 (381) or 17 (432) bolt circle</td>
</tr>
<tr>
<td>5'-0&quot; (152) I.D.</td>
<td>127 (323) O.D.</td>
<td>18 (457) O.D.</td>
<td>22 (559) O.D.</td>
<td>2 (50)</td>
<td>15 (381) I.D.</td>
<td>1 (25) dia.</td>
<td>15 (381) or 17 (432) bolt circle</td>
</tr>
<tr>
<td>5'-6&quot; (168) I.D.</td>
<td>127 (323) O.D.</td>
<td>18 (457) O.D.</td>
<td>22 (559) O.D.</td>
<td>2 (50)</td>
<td>15 (381) I.D.</td>
<td>1 (25) dia.</td>
<td>15 (381) or 17 (432) bolt circle</td>
</tr>
<tr>
<td>6'-0&quot; (183) I.D.</td>
<td>139 (353) O.D.</td>
<td>20 (508) O.D.</td>
<td>24 (610) O.D.</td>
<td>2 (50)</td>
<td>16 (406) I.D.</td>
<td>1 (25) dia.</td>
<td>15 (381) or 17 (432) bolt circle</td>
</tr>
<tr>
<td>6'-6&quot; (198) I.D.</td>
<td>139 (353) O.D.</td>
<td>20 (508) O.D.</td>
<td>24 (610) O.D.</td>
<td>2 (50)</td>
<td>16 (406) I.D.</td>
<td>1 (25) dia.</td>
<td>15 (381) or 17 (432) bolt circle</td>
</tr>
</tbody>
</table>

**Note:** If the required anchor rod length above top of foundation is less than 3 (76), anchor rods may be lowered below 6 (152).

---

### General Notes

All foundations are designed to be located on slopes not exceeding 2:1 where soils have an undrained shear strength of at least 1.0 TSP. The contractor shall verify the soil strength during footing or concrete foundations, or by monitoring installation resistance of metal foundations and notify the Engineer if other conditions are encountered.

When rock is encountered, the foundation depth shall be increased 6 (150) for every 12 (300) of embedded in rock. The minimum foundation depth shall be 4'-6" (137 m) with cut anchor rods 6 (150) above bottom of excavated hole. See ring plate detail.

Anchor rods shall be increased in diameter as needed for 6" (152 m) mounting height or above. The Contractor shall match the breakaway device size or slotted hole size in the pole base plate to accommodate larger rod sizes.

Transformer bases shall not be used on metal foundations.

All dimensions are in inches (millimeters) unless otherwise noted.

---

**Concrete Foundation**

- Top of wiring window shall be flush with top of foundation.
- Anchor rod shall extend through nut 1 (25).
- For foundation behind barrier or guardrail, use self-locking nut and flat washer. Do not use lock washer.

**Light Pole Foundation Setback**

For multimount luminaries, setback shall be a minimum of 30' (9 m) from edge of pavement. Poles shall be located 5' (1.5 m) behind guardrail or other protective barriers, or as directed by the Engineer.
### GENERAL NOTES

**CONCRETE MEDIAN BARRIER WITH 32 in. (815 mm) LIGHT POLE FOUNDATION**

- **Date:** 1-1-13
- **Revisions:** Revised general notes.

**GENERAL NOTES**

- See standard 637001 for barrier wall details.

- Provide 2 (50) min. separation between all conduits.

- When rock is encountered the foundation depth may be reduced 6 (150) for every 12 (300) of embedment in rock. The minimum foundation depth shall be 30 (760) with cut anchor rods 6 (150) above bottom of excavated hole. See ring plate detail.

- All dimensions are in inches (millimeters) unless otherwise shown.

---

### FOUNDATION TABLE

<table>
<thead>
<tr>
<th>LIGHT POLE MOUNTING HEIGHT</th>
<th>SHAFT DIAMETER</th>
<th>SHAFT DEPTH</th>
<th>ANCHOR ROD LENGTH</th>
<th>ANCHOR ROD CIRCLE DIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.1 m</td>
<td>10 (25)</td>
<td>36</td>
<td>0.6 m</td>
<td>15°</td>
</tr>
<tr>
<td>9.4 m</td>
<td>12 (30)</td>
<td>36</td>
<td>0.8 m</td>
<td>15°</td>
</tr>
<tr>
<td>10.7 m</td>
<td>12 (30)</td>
<td>36</td>
<td>0.8 m</td>
<td>15°</td>
</tr>
<tr>
<td>11.4 m</td>
<td>15 (38)</td>
<td>36</td>
<td>1.1 m</td>
<td>15°</td>
</tr>
<tr>
<td>12.2 m</td>
<td>15 (38)</td>
<td>36</td>
<td>1.1 m</td>
<td>15°</td>
</tr>
<tr>
<td>13.7 m</td>
<td>18 (46)</td>
<td>36</td>
<td>1.4 m</td>
<td>15°</td>
</tr>
<tr>
<td>14.3 m</td>
<td>18 (46)</td>
<td>36</td>
<td>1.4 m</td>
<td>15°</td>
</tr>
<tr>
<td>15.2 m</td>
<td>21 (53)</td>
<td>36</td>
<td>1.7 m</td>
<td>15°</td>
</tr>
<tr>
<td>16.0 m</td>
<td>21 (53)</td>
<td>36</td>
<td>1.7 m</td>
<td>15°</td>
</tr>
</tbody>
</table>

---

### JUNCTION BOX ELEVATION

- 2 (50) PVC conduit, one or two required. (See lighting plans)

### PLAN

- Top of conduit 1 (25) below tops of anchor rods.
- Thread and cap

### ELEVATION

- 9 (22) threaded
- Two piece PVC expansion deflection coupling at expansion joint (typ.)

### LIGHT POLE FOUNDATION

- Anchor rod 1 (25) dia.
- See Ring Plate Detail when rock is encountered

---

### GENERAL NOTES

- See standard 637001 for barrier wall details.

- Provide 2 (50) min. separation between all conduits.

- When rock is encountered the foundation depth may be reduced 6 (150) for every 12 (300) of embedment in rock. The minimum foundation depth shall be 30 (760) with cut anchor rods 6 (150) above bottom of excavated hole. See ring plate detail.

- All dimensions are in inches (millimeters) unless otherwise shown.
## GENERAL NOTES

See standard 637006 for barrier wall details.

Provide 2 (50 mm) separation between all conduits.

When rock is encountered the foundation depth may be reduced 6 (150 mm) for every 12 (300 mm) of embedment in rock. The minimum foundation depth shall be 30 (760 mm) with cut anchor rods 6 (150 mm) above bottom of excavated hole. See ring plate detail.

All dimensions are in inches (millimeters) unless otherwise shown.
S H A F T  L E N G T H

**SECTION A-A**

- Shaft length: 6'-8" min. (2.03 m)
- V-bars: See Section A-A
- Three hoops min. top and bottom
- No. 4 (No. 13) spiral, 6 (150) pitch, (typ.)
- No. 4 (13) V-bars evenly spaced
- Anchor rods evenly spaced
- No. 14 (No. 35) V-bars evenly spaced
- 5 (125), 36 (915) sweep Sch. 40 PVC wiring window, 2 (50) min. projection above foundation.
- No. 8 (22) chamfer 5 (125), 36 (915) sweep Sch. 40 PVC sleeve.
- 6'-8" min. anchor rod cage 5 (125) 0
- After forms are removed, compact impervious material to a minimum of 18W x 18D (450 x 450) around foundation.
- Two (min.) 1/4 x 10' (16 x 3 m) connected (threaded) grounding electrodes in 1/2 (38) Sch. 40 PVC electrode sleeve.
- Ground line 12/2 (38) grounding electrodes in 1 (threaded) grounding electrode conductor.

**FOUNDATION ELEVATION**

- Shaft diameter
- Anchor rod cage
- Work pad
- Ground line

**SHAFT LENGTH TABLE**

<table>
<thead>
<tr>
<th>SOIL CONSISTENCY</th>
<th>QU in N (Qu in kPa)</th>
<th>80' (24 m)</th>
<th>90' (27 m)</th>
<th>100' (30 m)</th>
<th>105' (32 m)</th>
<th>110' (33 m)</th>
<th>115' (34 m)</th>
<th>120' (36 m)</th>
<th>125' (38 m)</th>
<th>130' (40 m)</th>
<th>135' (42 m)</th>
<th>140' (44 m)</th>
<th>145' (46 m)</th>
<th>150' (48 m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOFT</td>
<td>&lt; 0.5 (&lt; 50)</td>
<td>20'-6&quot;</td>
<td>21'-6&quot;</td>
<td>22'-6&quot;</td>
<td>24'-6&quot;</td>
<td>25'-6&quot;</td>
<td>26'-6&quot;</td>
<td>27'-6&quot;</td>
<td>28'-6&quot;</td>
<td>29'-6&quot;</td>
<td>30'-6&quot;</td>
<td>31'-6&quot;</td>
<td>32'-6&quot;</td>
<td>33'-6&quot;</td>
</tr>
<tr>
<td>MEDIUM</td>
<td>0.5 to 1 (50 to 100)</td>
<td>17'-0&quot;</td>
<td>17'-0&quot;</td>
<td>18'-6&quot;</td>
<td>18'-6&quot;</td>
<td>19'-6&quot;</td>
<td>20'-6&quot;</td>
<td>21'-6&quot;</td>
<td>22'-6&quot;</td>
<td>23'-0&quot;</td>
<td>24'-0&quot;</td>
<td>25'-0&quot;</td>
<td>26'-0&quot;</td>
<td>27'-0&quot;</td>
</tr>
<tr>
<td>STEEP</td>
<td>1 to 2 (100 to 200)</td>
<td>14'-0&quot;</td>
<td>14'-0&quot;</td>
<td>15'-6&quot;</td>
<td>16'-6&quot;</td>
<td>17'-6&quot;</td>
<td>18'-6&quot;</td>
<td>19'-6&quot;</td>
<td>20'-6&quot;</td>
<td>21'-0&quot;</td>
<td>22'-0&quot;</td>
<td>23'-0&quot;</td>
<td>24'-0&quot;</td>
<td>25'-0&quot;</td>
</tr>
<tr>
<td>VERY STEEP</td>
<td>2 to 4 (200 to 400)</td>
<td>12'-0&quot;</td>
<td>13'-0&quot;</td>
<td>13'-6&quot;</td>
<td>14'-6&quot;</td>
<td>15'-6&quot;</td>
<td>16'-6&quot;</td>
<td>17'-6&quot;</td>
<td>18'-6&quot;</td>
<td>19'-0&quot;</td>
<td>20'-0&quot;</td>
<td>21'-0&quot;</td>
<td>22'-0&quot;</td>
<td>23'-0&quot;</td>
</tr>
<tr>
<td>HARD</td>
<td>&gt; 4 (400)</td>
<td>11'-6&quot;</td>
<td>12'-0&quot;</td>
<td>12'-6&quot;</td>
<td>13'-6&quot;</td>
<td>14'-6&quot;</td>
<td>15'-6&quot;</td>
<td>16'-6&quot;</td>
<td>17'-6&quot;</td>
<td>18'-0&quot;</td>
<td>19'-0&quot;</td>
<td>20'-0&quot;</td>
<td>21'-0&quot;</td>
<td>22'-0&quot;</td>
</tr>
</tbody>
</table>

**AVERAGE STRENGTH**

- **Qu in N (Qu in kPa)**: 
  - Soft: < 0.5 (< 50)
  - Medium: 0.5 to 1 (50 to 100)
  - Steep: 1 to 2 (100 to 200)
  - Very steep: 2 to 4 (200 to 400)
  - Hard: > 4 (400)

**LIGHT TOWER HEIGHT**

- **80' to 120' (24 m to 36 m)**
  - Soft: 20'-6" (6.2 m)
  - Medium: 18'-6" (5.6 m)
  - Steep: 16'-6" (4.9 m)
  - Very steep: 14'-6" (4.4 m)
  - Hard: 13'-0" (3.9 m)

See Sheet 2 for GENERAL NOTES.
**GENERAL NOTES**

The shaft length(s) are based on soil borings in the plans. If different soils are encountered, the engineer shall be notified to provide a revised length.

Anchor rod quantity, diameter, and length shall be determined by the tower manufacturer and approved by the engineer. Each foundation shall have a minimum of 8 anchor rods.

All foundation reinforcement steel shall be epoxy coated.

The cost of reinforcement shall be included in the cost of the foundation.

Steel anchor rod forms shall not be removed for a minimum of 3 days after concrete is poured. The tower shall not be set for a minimum of 7 days or as approved by the engineer.

Coordinate the rod circle diameter of the tower with the diameter of the anchor rod cage.

The foundation shall be poured monolithically and shall have no construction joints.

Grounding electrodes shall be installed in an access well when there is a conflict in using the method shown.

All dimensions are in inches (millimeters) unless otherwise shown.
BREAKAWAY COUPLINGS ON CONCRETE
FOUNDATION FOR STEEL LIGHT POLE

(Provide pole base skirt around wire cloth when required.)

-Breakaway coupling-
-Washer-
-Washer-

Concrete foundation.

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GENERAL NOTES

See light pole standard for details not shown.

Use largest transformer base bolt circle possible.

Transformer bases shall not be installed on metal foundations.

Washers on top of pole base shall cover the entire bolt set.

See Standard 836001 for Light Pole Foundation.

Wire cloth shall be stainless steel, have a maximum opening of 6 (0.15) mm and tie together with stainless steel wire.

All dimensions are in inches (millimeters) unless otherwise shown.

BREAKAWAY COUPLINGS FOR ALUMINUM POLES

(Provide base skirt around wire cloth when required.)
Supervision Fail is Preempt No. 1, causing traffic signal controller to implement all red flash following track clearance phase.

Railroad Preempt is Preempt No. 2, causing traffic signal controller to implement railroad preemption routine following 1 second delay.

Preempt No. 1 and Preempt No. 2 shall have priority over all other preempts. The railroad preemption routine shall abbreviate each and all active pedestrian phases by immediately entering into flashing DON'T WALK and timing concurrently with the associated vehicle yellow change interval.
Note: The power transfer relay may be internal to the inverter/charger.
BONDING A HANDHOLE COVER & FRAME

Handhole Frame and cover

Heavy-duty compression terminal (typical)

⅜ x 1½ (13 x 31) stainless steel bolt with split lock washer and nylon insert lockout washered to frame and to cover (typical). Anti-corrosion compound shall be applied to each assembly.

BONDING AN EXISTING HANDHOLE COVER & FRAME

GROUNDING A MAST ARM POLE/POST

GROUNDING & BONDING

TRAFFIC SIGNAL

HEAVY-DUTY COMPRESSION TERMINAL

HEAVY-DUTY GROUND ROD CLAMP

All dimensions are in inches (millimeters) unless otherwise shown.

DATE REVISIONS
1-1-09 Switched units to English (metric)
1-1-07 Revised terminology

ILLINOIS DEPARTMENT OF TRANSPORTATION

APPROVED
January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED
4-1-06
ENGINEER OF OPERATIONS

REVISIONS

STANDARD 873001-02

GROUNDING & BONDING

TRAFFIC SIGNAL

HEAVY-DUTY COMPRESSION TERMINAL

HEAVY-DUTY GROUND ROD CLAMP

All dimensions are in inches (millimeters) unless otherwise shown.

DATE REVISIONS
1-1-09 Switched units to English (metric)
1-1-07 Revised terminology

ILLINOIS DEPARTMENT OF TRANSPORTATION

APPROVED
January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED
4-1-06
ENGINEER OF OPERATIONS

REVISIONS

STANDARD 873001-02
PEDESTRIAN PUSH BUTTON POST

- 36 (914) preferred

All dimensions are in inches (millimeters) unless otherwise shown.
### Permanent Steel Mast Arm Assembly and Pole

**16' THROUGH 55'**

#### Mast Arm Length

<table>
<thead>
<tr>
<th>Mast Arm Length</th>
<th>Anchor Rod Circle</th>
<th>Anchor Rod Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>16' thru 20' (4.87 m thru 6.10 m)</td>
<td>18 (450)</td>
<td>1 1/2 x 7' (44 x 2.10 m)</td>
</tr>
<tr>
<td>42' thru 55' (12.80 m thru 16.80 m)</td>
<td>21 (535)</td>
<td>1 1/2 x 7' (44 x 2.10 m)</td>
</tr>
</tbody>
</table>

**Anchor Rod Detail**

- Rod circle
- Mast arm length as specified on the plans
- Removable pole cap
- Ground lug opposite handhole
- Thread bottom of anchor rod 2 (55) and provide matching hex head nut fully seated, typ.

**General Notes**

Signal heads, sign panels, and other attachments are shown for minimum design loading purposes only. Each signal head shall weigh 80 lb (36 kg) and have a projected area of 14.7 sq. ft. (1.37 sq. m).

See Standard 720016 for location of sign panel or blankout sign closest to pole.

All dimensions are in inches (millimeters) unless otherwise shown.

---

**Revisions**

- Revised table for LRFD reqs.
- Modified dim. to outer signal.
Mast arm length as specified on the plans.

- Removable cap
- 36' (990) - Removable cap
- 56' thru 64' (17.07 m thru 19.51 m)
  - 24 (610)
  - 1½ x 7" (44 x 2.10 m)
- 65' thru 75' (19.81 m thru 22.86 m)
  - 27 (683)
  - 2 x 7½" (51 x 2.29 m)

**GENERAL NOTES**

- Signal heads, sign panels, and other attachments are shown for minimum design loading purposes only. Each signal head shall weigh 80 lbs (36 kg) and have a projected area of 14.7 sq. ft. (1.37 sq. m).
- See Standard 720016 for location of sign panel or blackout sign closest to pole.
- All dimensions are in inches (millimeters) unless otherwise shown.

**STEEL MAST ARM ASSEMBLY AND POLE**

56' THROUGH 75'

**STANDARD 877002-04**

**DATE**

1-1-18

**REVISIONS**


4-1-16 Changed sign panel to 36x36 and 100 lb max.

Illinois Department of Transportation

January 1, 2018

APPROVED

PASSED

ENGINEER OF OPERATIONS

ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED

1-1-08
Signal heads, sign panels, and other attachments are shown for minimum design loading purposes only. Each signal head shall weigh 80 lb (36 kg) and have a projected area of 14.7 sq. ft. (1.37 sq. m). See Standard 720016 for location of sign panels or blankout signs closest to pole.

All dimensions are in inches (millimeters) unless otherwise shown.

**STEEL MAST ARM ASSEMBLY AND POLE WITH DUAL MAST ARMS**

**STANDARD 877006-06**

**GENERAL NOTES**

- Signal heads, sign panels, and other attachments are shown for minimum design loading purposes only. Each signal head shall weigh 80 lb (36 kg) and have a projected area of 14.7 sq. ft. (1.37 sq. m). See Standard 720016 for location of sign panels or blankout signs closest to pole.

- All dimensions are in inches (millimeters) unless otherwise shown.

### MAST ARM LENGTH ANCHOR ROD CIRCLE ANCHOR ROD SIZE

<table>
<thead>
<tr>
<th>MAST ARM LENGTH</th>
<th>ANCHOR ROD CIRCLE</th>
<th>ANCHOR ROD SIZE</th>
</tr>
</thead>
<tbody>
<tr>
<td>16' thru 30'</td>
<td>18 (450)</td>
<td>1/8&quot; x 7&quot; (44 x 2.10 m)</td>
</tr>
<tr>
<td>32' thru 50'</td>
<td>21 (535)</td>
<td>2 x 7-6&quot; (51 x 2.29 m)</td>
</tr>
</tbody>
</table>

**DATE** | **REVISIONS**
--- | ---
1-1-18 | Revised for LRFD reqs., Revised GEN. NOTES for sign location.
4-1-16 | Revised ANCHOR ROD DETAIL.
--- | ---
30 lb (13.6 kg) | Added max weight of 100 lb.
30 lb (13.6 kg) | Modified dim. to outer signal.
**TENON TOP FOR VERTICAL MOUNTED LUMINAIRES**

Note: The tenon top shall support a bullhorn fitting with two (twin) vertically mounted luminaires (clamp-mounted bullhorn assembly with removable pole cap acceptable). Each luminaire shall weigh 100 lb (45 kg) max. and have an effective projected (EPA) area of 3.85 sq. ft. (0.36 sq. m) max.

Maximum 55 lb (25 kg), 1.6 sq. ft. (0.15 sq. m) EPA Luminaire

Mast arm length as specified on the plans

- 12' (3.6 m) typ.
- 8' (2.4 m) min.

Removable cap

36x36 (900x900) Sign panel or blankout sign 100 lb (45 kg) max.

This signal head only for arms 36' (10.97 m) and longer.

20 sq. ft. (1.86 sq. m) max. sign panel or blankout sign 100 lb (45 kg) max.

Removable pole cap

- 9.9 lb (4.5 kg), 1 sq. ft. (0.09 sq. m)
  - Camera or detector
- Provide second luminaire, arm and brackets at 90° when required. Luminaire and arm not shown for clarity.

**ANCHOR ROD DETAIL**

- 3x5 (75x125) Handhole with frame and cover
- 4x8 (100x200) Handhole with frame and cover located opposite of oncoming traffic

**GENERAL NOTES**

Signal heads, sign panels, and other attachments are shown for minimum design loading purposes only. Each signal head shall weigh 80 lb (36 kg) and have a projected area of 14.7 sq. ft. (1.37 sq. m). See Standard 720016 for location of sign panel or blankout sign closest to pole.

See standard 821101 for luminaire wiring diagram.

All dimensions are in inches (millimeters) unless otherwise shown.

---

**STEEL COMB. MAST ARM ASSEMBLY AND POLE 16' THROUGH 55'**

**DATE**

- 1-1-18 Revised for LIRFD reqs. Revised
- 1-1-17 Revised ANCHOR ROD DETAIL

**REVISIONS**

- Added "max." to luminaire weights and EPA's.

**STANDARD 877011-09**
The Bureau of Bridges & Structures should be contacted for a revised design if other conditions are encountered.

For standard dual mast arms with the longest arm length up to 55' (16.8 m), the foundation depth shall be increased by 1' (0.3 m) of that shown in the table.

These foundation depths are for sites which have cohesive soils (clayey silt, sandy clay, etc.) along the length of the shaft, with an average Unconfined Compressive Strength (Qu) > 1.0 tsf (100 kpa). This strength shall be verified by boring data prior to construction or with testing by the Engineer during foundation drilling. The Bureau of Bridges & Structures should be contacted for a revised design if other conditions are encountered.

For standard and combination mast arm assemblies, foundation depths shall be increased by 1' (0.3 m) of that shown in the table, based on the longer of the two arms.

Foundation depths shall be greater than or equal to 55' (16.8 m) shall be increased by 1' (0.3 m) of that shown in the table, based on the longer of the two arms.
POST MOUNTED
TRAFFIC SIGNAL HEAD

POST MOUNTED
PEDESTRIAN SIGNAL HEAD

POST MOUNTED
PEDESTRIAN SIGNAL HEAD

TWO WAY

STEEL MAST ARM MOUNTING

Terminal compartment

Traffic signal post

Steel or aluminum pole

Pole plate with stainless steel bands

STANDARD 880006-01

TRAFFIC SIGNAL MOUNTING DETAILS

DATE

REVISIONS

11-09

11-02

11-09

11-02

Engineer of Design and Environment

Engineer of Operations

January 1, 2009

January 1, 2009

APPROVED

PASSED

Illinois Department of Transportation

Omitted note regarding units of length.

11-09 Revised Standard 840006.
Detector Loop Lead-In

1. Insert conduit and fill with approved sealer.
2. Drill hole through pavement.
3. Handhole, junction box, signal base, or controller base.
4. Grade controller base, signal base, or handhole.
5. Approved sealer.

Detector Loop Installation

1. Sawed slot for detector loop.
2. Plastic tube retainer.
3. Loop wire in plastic tube.
4. Loop wire insulated conductor.
5. Loop wire in tube.
6. Twisted and resin soldered conductor.
7. Electrical tape insulated splice.
8. Rigid mold.
9. Waterproof and dielectric resin.

Note: Loop wire must follow saw cut to bottoms, forming slack section at joint.

Detector Loop at Pavement Joint or Pavement Crack

All dimensions are in inches (millimeters) unless otherwise shown.

DATE
1-1-09

REVISIONS
Switched units to English (metric)

STANDARD 886001-01
SECTION - 28' (8.4 m) OR LESS

SECTION - 28' (8.4 m) TO 35' (10.6 m) WIDTH

SECTION - 36' (10.8 m) TO 48' (14.4 m) WIDTH

See MANHOLE DETAIL
See CATCH BASIN DETAIL

PCC PAVEMENT SPECIAL
(NONREINFORCED)

All dimensions are in inches (millimeters) unless otherwise shown.

1-1-18

STANDARD B.L.R. 10-7
Type III Barricades with Standard Sign R1-2 or R1-4 mounted as shown.

Resident traffic and day labor forces' equipment to use road shoulder for passing barricade.

Use when shoulders are too narrow for passage of traffic.

**GENERAL NOTES**

Type III barricades to be width of pavement only.

Reflectorized striping shall appear on both sides of barricades. Barricades shall be positioned so that stripes slope downward toward the side on which traffic is to pass.

Although not shown, advance warning signs with minimum dimensions of 36x36 (900x900) and black legends on orange reflectorized backgrounds shall be utilized where needed.

This case is for use on rural local roads where the local authority considers this protection to be appropriate for the specific job conditions.

All dimensions are in inches (millimeters) unless otherwise shown.

**TWO-LANE, TWO-WAY TRAFFIC, RURAL OPERATIONS EXCEEDING ONE DAYLIGHT PERIOD**
GENERAL NOTES

Maintenance operations shall be confined to one traffic lane, leaving the opposite lane open to traffic. At least 500 (~150 m) of both traffic lanes shall be available for traffic movement between work areas at intervals not greater than 1000 (~300 m).

When operations are on the pavement and stationary or moving at a speed less than 4 mph (6 kph), a ONE LANE AHEAD, or other appropriate sign, shall be installed in each direction between the ROAD WORK AHEAD sign and the work area. The distance between this sign and the work area shall be a minimum of 400 (~120 m) but in no case to exceed the length of one-half day's operation or 4 miles (~6 km), whichever is less. The distance between the two signs shall be approximately 400 (~120 m).

All signs are to be removed at completion of the day's operation.

Any unattended obstacles, excavation, or pavement drop off greater than 3 (~75 mm) in the work area shall be protected by Type I or Type II barricades with flashing lights.

Longitudinal dimensions may be adjusted slightly to fit field conditions.

All vehicles, equipment, men, and their activities are restricted at all times to one side of the pavement.

Flashing lights or rotating beacons are required for all maintenance vehicles while in operation.

Applicable operations illustrated in Standard 701301 may be used when operations do not exceed 15 minutes on the pavement or 30 minutes on the shoulder respectively.

All warning signs shall have minimum dimensions of 36x36 (~900x900 mm) and have black legend on an orange reflectorized background.

When fluorescent signs are used, orange flags are required.

This case is for use on rural local roads where the local authority considers this protection to be appropriate for the specific job conditions.

All dimensions are in inches (millimeters) unless otherwise shown.

TRAFFIC CONTROL DEVICES-
DAY LABOR MAINTENANCE

STANDARD B.L.R. 18-6

SYMBOLS

- Work area
- Sign with 18x18 (~450x450 mm) min. orange flag attached.

TYPICAL APPLICATIONS

- Mowing
- Spraying aggregate
- Weed spraying
- Surface maintenance
- Bituminous resurfacing
- Crack sealing
- Shoulder repair
- Cleaning ditches

DATE

1-1-11

REVISIONS

Corrected RWA sign number.

1-1-09

Swapped signs to

Engel (metric). Moved

see General Note.
When rail element is placed adjacent to a tapered surface use timber wedge ‘M’ between the concrete and plate ‘G’.

1 (M25) Dia. anchor bolt with flat washer and lock nut (tested drilling or expanding anchors).

Plate ‘R-3’

Splice bolts with washer under nut.

1/4 (6) Thick soil plate ‘J’ on these 4 posts only

3/8 (15) Dia. holes typ.

Steel post (typ.) 6'-9" (2 m)

Finished ground line

Plate connection

ELEVATION-TRAFFIC BARRIER TERMINAL TYPE 5R

GENERAL NOTES

Install the face of the guardrail flush with the face of the parapet. Install plate washer ‘D’ so that the 1 (25) projection fills the remainder of the slotted holes in the 1 (25) end plate on plate ‘G’ after the 1 (25) bolts are in place.

When an expansion joint exists below the connector, bolts shall be provided with locknut or double nut shall be tightened only to a point that will allow plate ‘G’ to be free to move.

All dimensions are in inches (millimeters) unless otherwise shown.

TRAFFIC BARRIER TERMINAL-TYPE 5R

(1 25)

STANDARD B.L.R. 20-7

DATE

REVISIONS

1-1-12

1-1-12

1-1-09

1-1-97

1-1-97

1-1-12

1-1-12

APPROVED

ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED

PASSED

ENGINEER OF LOCAL ROADS AND STREETS

DATE

REVISIONS

1-1-12

1-1-12

1-1-09

1-1-97

1-1-97

1-1-12

1-1-12

Illinois Department of Transportation

ILLINOIS DEPARTMENT OF TRANSPORTATION

January 1, 2012

January 1, 2012

January 1, 2012

January 1, 2012
**Approximate Lengths Field Verify**

- **TREATED TIMBER BLOCKING**
- **ELEVATION**
- **END VIEW**
- **PLAN**

**RUB RAIL PLATE R-1**

- 1 (25) steel plate
- \(98\) \(17\) Square holes
  - Dia. hole
  - With \(98\) \(17\) Dia. hole in post

**PLATE E**

- Dia. hole
- With \(98\) \(17\) Dia. hole in post

**PLATE F**

- \(98\) \(17\) Square holes
- Dia. hole
- With \(98\) \(17\) Dia. hole in post

**PLATE G**

- Class B rail element
  - Dia. hole
  - With \(98\) \(17\) Dia. hole in plate

**PLATE WASHER F**

- \(98\) \(17\) Slot
  - Dia. hole

**PLATE WASHER D**

- \(98\) \(17\) Hole
  - Dia. hole

**WEDGE M**

- Tack weld

**TERMINAL-TYPE 5R**

**TRAFFIC BARRIER**

**STANDARD B.L.R. 20-7**

**ENGINEER OF DESIGN AND ENVIRONMENT**

**APPROVED**

**ISSUED**

**PASSED**

**Illinois Department of Transportation**

January 1, 2012

(Sheet 2 of 2)
**GENERAL NOTES**

Type III Barricades and W20-3(O)-36 signs shall be positioned as shown in "Road Closed To All Traffic" detail on Highway Standard 70/903.

Two Type A Low Intensity Flashing Lights shall be used on each approach in advance of the work area during hours of darkness. One light shall be installed above the barricades and the other above the first advance warning sign.

All warning signs shall have minimum dimensions of 36 x 36 (900 x 900) and have a black legend on an orange reflectorized background.

When fluorescent signs are used, orange flags are not required.

Longitudinal dimensions may be adjusted to fit field conditions.

When the distance between the barricade and the intersection is between 1500' (450 m) and 2000' (600 m), the advance sign shall be placed at the intersection. When the distance between the barricade and the intersection is over 2000' (600 m), an additional sign shall be placed at the intersection. The additional sign shall give the distance to the barricade in miles or fractions of a mile.

All dimensions are in inches (millimeters) unless otherwise shown.

**CONDITION I**

When distance from closure to crossroad is less than 1500' (450 m)

**CONDITION II**

When distance from closure to crossroad is greater than 1500' (450 m)

**SYMBOLS**

- **Work area**
- **Type III Barricade**
- **Sign with 18x18' (450x450) min. orange flag attached**

---

**DATE**

1-1-12

**REVISIONS**

1-1-12

**TYPICAL APPLICATION OF TRAFFIC CONTROL DEVICES FOR CONSTRUCTION ON RURAL LOCAL HIGHWAYS**

**STANDARD B.L.R. 21-9**
**GENERAL NOTES**

Type III Barricades and R11-4-6030 signs shall be positioned as shown in the "Road Closed To All Traffic" detail on Highway Standard 701901. If the distance "D" exceeds 2000' (600 m), an additional set of barricades and R11-4-6030 shall be placed at each end of the work area.

Two Type A Low Intensity Flashing lights shall be used on each approach in advance of the work area. One light shall be installed above each barricade. If only one barricade is required, the other light shall be installed above the first advance warning sign.

All warning signs shall have minimum dimensions of 36 x 36 (900 x 900) and have a black legend on an orange reflectorized background.

When fluorescent signs are used, orange flags are not required.

Longitudinal dimensions may be adjusted to fit field conditions.

All dimensions are in inches (millimeters) unless otherwise shown.

**TYPICAL APPLICATION OF TRAFFIC CONTROL DEVICES FOR CONSTRUCTION ON RURAL LOCAL HIGHWAYS**

(TWO LANE TWO WAY RURAL TRAFFIC)

(ROAD CLOSED TO TRAFFIC)

STANDARD B.L.R. 22-7
**SHOULDER WIDENING TRANSITION**

**WOOD BREAKAWAY POSTS**

**TUBULAR STEEL FOUNDATIONS**

**GENERAL NOTES**

See Standard B.L.R. 26 for details of guardrail not shown.

Posts at location 1 & 2 shall be wood breakaway posts. Posts other than 1 & 2 may be either standard wood posts or steel posts, at the option of the Contractor. If standard wood posts are used, one post shall be located midway between and in lieu of posts 4 & 5. The offset (Y) for this post shall be 12 (300).

A two-piece assembly may be substituted for the one piece nose shown above.

The bearing plate K shall be held in position by (2) two eightpenny nails driven into the post and bent over the top of the plate.

When this terminal is used with Standard B.L.R. 23, the guardrail shall transition down to the height of the terminal prior to post 8.

All slope ratios are expressed as units of vertical displacement to units of horizontal displacement (V:H).

All dimensions are in inches (millimeters) unless otherwise shown.

---

**OFFSET TO FACE OF RAIL**

<table>
<thead>
<tr>
<th>Post</th>
<th>X ft (m)</th>
<th>Y ft (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>9.41</td>
<td>0.00</td>
</tr>
<tr>
<td>1</td>
<td>12.72</td>
<td>0.00</td>
</tr>
<tr>
<td>2</td>
<td>15.93</td>
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**TRAFFIC BARRIER TERMINAL TYPE 1**

Revised barrier terminal

breakaway post

Switched uses to

English (metric)

STANDARD B.L.R. 23-4
TYPICAL APPLICATION

MAILBOX ON FARSIDE OF ENTRANCE

MAILBOX ON NEAR SIDE OF ENTRANCE

GENERAL NOTES

Mailboxes shall be mounted such that the face of the mailbox is 6 (150) to 12 (300) and the post a minimum of 24 (600) from the edge of the turnout surfacing.

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PLATE A

NOTE

Plate A shall be placed between rail element and block-out at non-spike mounting points only when steel block-outs are used.

STEEL BLOCK-OUT DETAIL

POST OR SPLICE BOLT & NUT

STEEL POST CONSTRUCTION

WOOD POST CONSTRUCTION

STEEL PLATE BEAM GUARDRAIL

29" (731mm) HEIGHT

ILLINOIS DEPARTMENT OF TRANSPORTATION

APPROVED: January 1, 2012

ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED: 1-1-08

PASSED: Engineer of Local Roads and Streets

STANDARD B.L.R. 26-3
STEEL PLATE BEAM GUARDRAIL
29" (731mm) HEIGHT

NOTE
When end shoe is attached to a bridge parapet which has an expansion joint, the bolts shall be provided with a locknut or double nut and shall be tightened only to a point that will allow guardrail movement.

The standard end shoe shall be attached to the concrete with pre-drilled or self-drilling anchor bolts. The anchor cone shall be set flush with the surface of the concrete.

Externally threaded studs protruding from the surface of the concrete will not be permitted.

ALTERNATE END SHOE
Optional round hole

9 (203) min. (Steel post)
10 (250) min. (Wood post)

Guardrail placed behind curb

(D = 0 desirable to 12 (300) maximum)

Note: If it is necessary for D to be more than 12 (300) and less than 19'/6' (5.8 m), Type M-2 (M-5) curb and gutter (Std. 499001) shall be used in front of and in advance of the guardrail.

Drilled Hole

Finished ground line

Note: Ledge line is top of rock, wash or hard slag fill.

Plan

Elevation

Footing for post when impervious material is encountered

Steel post details

Wood block-out and steel post details

Cable assembly

Steel plate beam guardrail

29' (731mm) height

Illinois Department of Transportation

January 1, 2012

APPROVED

ENGINEER OF DESIGN AND ENVIRONMENT

January 1, 2012

ENGINEER OF LOCAL ROADS AND STREETS

STANDARD B.L.R. 26-3

Sheet 4 of 4
PAY LIMITS OF STRUCTURE. USE PLATE WASHER D FURNISHED BY THE CONTRACTOR OF THE 1x4 (M24x200) MACHINE BOLT WITH LOCKNUT.

PLATE E PLACEMENT OF PLATE WASHER D

PLATE F

PLATE WASHER D

PLATE WASHER F

GENERAL NOTES

See Standard B.L.R. 26 for details of guardrail not shown.

Install plate washer D so the 1 (25) projection fills the remainder of the slotted holes in the 1 (25) end plate on plate G after the 1 (M24) dia. bolts are in place.

When an expansion joint exists below the connector, bolts shall be provided with a locknut or double nuts and shall be tightened only to a point that will allow plate G to be free to move.

The face of the guardrail shall be installed flush with the face of the bridge rail.

When this terminal is used with Standard 631026 prior to January 1, 2007, the guardrail shall transition down to the height of the terminal.

All dimensions are in inches (millimeters) unless otherwise shown.
Short radius curve

2-No. 4 (No. 13) bars placed at mid-depth (when space permits)

Undoweled contraction joint (typ.)

1. Form with 1/4 (3) thick steel template
   2 (50) deep, and seal.
2. Saw 2 (50) deep at 4 to 24 hours, and seal.
3. Insert 3 (20) thick preformed joint filler
   full depth and width.

Construction joint

2-No. 4 (No. 13) bars with 2 (50) min. cl.

2-No. 4 (No. 13) bars placed at mid-depth
(when space permits)

Drainage casting
with curb box
Back of curb

Drainage casting
without curb box
Back of curb

Mountable curb shown
(other types permitted)

HMA surfacing

Base course

ON DISTURBED SUBGRADE

ON UNDISTURBED SUBGRADE

ADJACENT TO FLEXIBLE PAVEMENT

CONCRETE CURB TYPE B

ADJACENT TO PCC PAVEMENT OR PCC BASE COURSE

DEPRESSED CURB

BARRIER CURB

DEPRESSED CURB

BARRIER CURB

ADJACENT TO FLEXIBLE PAVEMENT

CONCRETE CURB AND GUTTER

CONCRETE CURB TYPE B

AND COMBINATION

ILLINOIS DEPARTMENT OF TRANSPORTATION

PASSED
ENGINEER OF LOCAL ROADS AND STREETS

APPROVED
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED

B.L.R. 28
Short radius curve

2-No. 4 (No. 13) bars placed at mid-depth (when space permits)

(when space permits)

Contraction joints

at 75'-0" (2.3 m) max. cts. (typ.)

Back of curb

Drainage casting with curb box

5'-0" (1.5 m)

(1.5 m)

5'-0"

Edge of pavement

Construction joint

2-No. 4 (No. 13) bars with 2 (50) min. cl.

2-No. 4 (No. 13) bars placed at mid-depth (when space permits)

12 (300) (typ.)

Mountable curb shown (other types permitted)

HMA surfacing

Base course

HMA surfacing

Base course

ON DISTURBED SUBGRADE

ON UNDISTURBED SUBGRADE

CONCRETE CURB TYPE B

AND COMBINATION CONCRETE CURB AND GUTTER