To: Highway Standards Users
From: Jack A. Elston
Subject: Revision #225
Date: September 3, 2021

Revision #225 of the Highway Standards, effective January 1, 2022, is now available on the department’s website.

The revisions are as follows:

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<td>701400-10</td>
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701401-12 | 701401-13 | Corrected work zone speed limit sign numbers.
701406-12 | 701406-13 | Corrected work zone speed limit sign numbers.
720021-02 | 720021-03 | Removed stainless steel clip option and minor typos.

Division 800 Index | Division 800 Index | Updated.
January 1, 2021 | January 1, 2022 |


Division B.L.R. Index | Division B.L.R. Index | Updated.
January 1, 2021 | January 1, 2022 |

B.L.R. 10-7 | B.L.R. 10-8 | Revised spacing of transverse joints in General Notes.
B.L.R. 14-12 | B.L.R. 14-13 | Revised spacing of transverse contraction joints, dowel bar table and header board callout.
B.L.R. 28 | B.L.R. 28-1 | Revised contraction joint spacing adjacent to PCC pavt. and DOWEL BAR TABLE.

Standards by Subject/Title | Standards by Subject/Title | Updated.
January 1, 2021 | January 1, 2022 |

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) 782-7651.
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U.S. Geological Survey and National Geodetic Survey Benchmarks, Resetting Method
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<td>Right-of-Way</td>
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<tr>
<td>Mast Arm Assembly and Pole 56' Through 75', Steel Combination</td>
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<td>Type 1, for Type B Gutter</td>
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<td>Type 2, for Type A Gutter</td>
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<td>Type 2, for Type B Gutter</td>
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<td>Type B-6.24 (B-15.60) for Concrete Curb and Gutter</td>
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<td>For Type B Gutter, Standard</td>
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<td>Patching, Class B</td>
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<td>Patching, Class C and D</td>
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<th>Type</th>
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<td>Type 1B</td>
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<td>Type 1 Special, Shoulder Widening for</td>
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<td>Type 2</td>
<td>631011</td>
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<td>Type 5A</td>
<td>BLR 27</td>
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<td>Type 5R</td>
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<td>Type 13</td>
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### Traffic Control:

#### Devices

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<tr>
<td>Day Labor Construction</td>
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<td>Day Labor Maintenance</td>
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<td>Typical Application of, for Construction on Rural Local Highways</td>
<td>BLR 21</td>
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<tr>
<td>Typical Application of, for Construction on Rural Local Highways (Two-Lane Two Way Rural Traffic) (Road Closed to Thru Traffic)</td>
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#### Lane Closure, 2L, 2W:

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<tr>
<td>Bridge Repair, for Speeds $\geq 45$ MPH</td>
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<td>Bridge Repair with Barrier</td>
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<td>Day Only, for Speeds $\geq 45$ MPH</td>
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<tr>
<td>Moving Operations - Day Only</td>
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<tr>
<td>Night Only, for Speeds $\geq 45$ MPH</td>
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<tr>
<td>Pavement Widening, for Speeds $\geq 45$ MPH</td>
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<td>Short Time Operations</td>
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<tr>
<td>Slow Moving Operations Day Only, for Speeds $\geq 45$ MPH</td>
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<tr>
<td>With Run-Around, for Speeds $\geq 45$ MPH</td>
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<td>Work Areas in Series, for Speeds $\geq 45$ MPH</td>
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<td>Lane Closure, Freeway/Expressway</td>
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#### Lane Closure, Freeway/Expressway:

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<td>Approach to</td>
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<td>Day Operations Only</td>
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January 1, 2022

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Approx. Intermediate Line
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Intermediate Contour

NON-HIGHWAY IMPROVEMENT ITEMS

Cleaning & Grading Limits
Erosion Control Fence
Perimeter Erosion Barrier
Temporary Fence
Ditch Check Temporary
Ditch Check Permanent
Inlet & Pipe Protection
Sediment Basin
Erosion Control Blanket
Fabric Formed Concrete
Revetment Mat
Tuft Reinforcement Mat
Mulch Temporary
Mulch Method 1
Mulch Method 2 Stabilized
Mulch Method 3 Hydraulic

CONTOUR ITEMS

Approx. Index Line
Approx. Intermediate Line
Index Contour
Intermediate Contour

NON-HIGHWAY IMPROVEMENT ITEMS

Cleaning & Grading Limits
Erosion Control Fence
Perimeter Erosion Barrier
Temporary Fence
Ditch Check Temporary
Ditch Check Permanent
Inlet & Pipe Protection
Sediment Basin
Erosion Control Blanket
Fabric Formed Concrete
Revetment Mat
Tuft Reinforcement Mat
Mulch Temporary
Mulch Method 1
Mulch Method 2 Stabilized
Mulch Method 3 Hydraulic

EXISTING LANDSCAPING ITEMS

Seeding Class 1
Seeding Class 2
Seeding Class 2A
Seeding Class 4
Seeding Class 4 & 5 Combined

STANDARD SYMBOLS, ABBREVIATIONS AND PATTERNS

ENGINEER OF POLICY AND PROCEDURES
APPROVED
1-1-97
1-1-2021

ILLINOIS DEPARTMENT OF TRANSPORTATION
**PAVEMENT MARKINGS**

(contd.)

- Urban U-Turn
- Urban Combined U-Turn
- Rural Combination Left
- Rural Combination Right
- Rural Left Turn Arrow
- Rural Right Turn Arrow
- Rural Left Turn Only
- Rural Right Turn Only
- Rural Thru Only
- Rural Thru Arrow
- Rural Lt & Rt Turn Arrow
- Bike Lane Symbol
- Bike Lane Text
- Bike Path Shared
- Bike Shared Roadway
- Lane Drop Symbol

---

**STANDARD SYMBOLS, ABBREVIATIONS AND PATTERNS**

Illinois Department of Transportation

January 1,

ENGINEER OF POLICY AND PROCEDURES

APPROVED

January 1,

ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

PASSED 2021

2021

Wrong Way Arrow

Bike Path Shared

Bike Shared Roadway

Lane Drop Symbol
### ROADWAY ITEMS

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<td>Access Control Line &amp; ROW</td>
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<td>Access Control Line &amp; ROW with Fence</td>
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<td>XS</td>
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### ROADWAY PLAN ITEMS

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<td>Concrete Barrier</td>
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<td>Edge of Pavement</td>
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<td>Bit Shoulders, Medians and C&amp;G Line</td>
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<td>Aggregate Shoulder</td>
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<td>Sidewalks, Driveways</td>
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<td>Guardrail</td>
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<td>Guardrail Post</td>
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<td>Traffic Sign</td>
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<td>Corrugated Median</td>
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<td>Impact Attenuator</td>
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<td>North Arrow with District Office (Half Size)</td>
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### ROADWAY PROFILES

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### SIGNING ITEMS

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<td>Barricade Type III</td>
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<td>Barricade With Edge Line</td>
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<td>Flashing Light Sign</td>
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<td>Panels II</td>
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<td>Direction of Traffic</td>
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### STANDARD SYMBOLS, ABBREVIATIONS AND PATTERNS

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<td>Right Lane Closed Ahead W20-59(D)</td>
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<td>Keep Left R4-7AL (Half Size)</td>
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<td>No Right Turn R3-1 (Half Size)</td>
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### STRUCTURES ITEMS

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<td>Box Culvert Headwall</td>
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<td>Bridge Pier</td>
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### TRAFFIC ITEMS

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<td>Walk/Don't Walk Letters</td>
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<td>Detector Loop Quadrapole</td>
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**STANDARD SYMBOLS, ABBREVIATIONS AND PATTERNS** (Sheet 8 of 9)
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**STANDARD SYMBOLS, ABBREVIATIONS AND PATTERNS**

STANDARD 000001-08
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<th>Gross Sectional Area sq. in. (sq. mm)</th>
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<th>Spacing, in. (1 mm)</th>
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REINFORCEMENT BARS - ENGLISH (METRIC)

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<th>Area of Steel per Foot (Meter), sq. in. (sq. mm)</th>
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SPACING, in. (1 mm)

| 1.873 (47.000) |
| 2.061 (52.200) |
| 2.204 (55.920) |
| 2.498 (63.200) |
| 2.767 (69.600) |
| 3.046 (72.400) |
| 3.342 (84.300) |
| 3.767 (95.600) |
| 4.267 (103.700) |
| 4.884 (123.800) |

DATE

1-1-09

REVISIONS

1-1-09

Switched units to English (metric).

Soft converted English table.

Deleted metric table.

Switched units to English (metric) table.

AREAS OF REINFORCEMENT BARS

STANDARD 001001-02

Illinois Department of Transportation

ENGINEER OF POLICY AND PROCEDURES

January 1, 1971

ISSUED

APPROVED

PASSED
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<td>0.99</td>
<td>0.00</td>
</tr>
<tr>
<td>1.00</td>
<td>0.00</td>
</tr>
</tbody>
</table>

A = Rounding of Inch or Foot
B = Inch Equivalents to Four Places
DITCH CHECK FOR NARROW MEDIAN

DITCH CHECK FOR WIDE MEDIAN

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.

VIEW OF NARROW MEDIAN

VIEW OF WIDE MEDIAN

EARTH MEDIAN
DITCH CHECK

STANDARD 202001-01
**STEP 1**

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

**STEP 2**

ATTACHING TWO SILT FILTER FENCES

(Not applicable for J-hooks)

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

---

J-HOOK

Sheet flow

**SILT FILTER J-HOOK PLACEMENT**

Wood post or metal stake (typical).

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

---

**SECTION B-B**

Aggregate Ditch Check

- When the ditch check is within the clear zone and the road is open to traffic, the traffic approach slope of the aggregate shall be 3:4 (V:H).

**ELEVATION**

- Top of bank.
- Securing pin.
- Filter fabric.
- Bottom of ditch.
- Securing pin.
- Filter fabric.
- Riprap

**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.

---

**TEMPORARY EROSION CONTROL SYSTEMS**

(Sheet 1 of 2)

STANDARD 280001-07

**DATE**

1-1-97

**REVISIONS**

1-1-13

Corrected notation for Traffic I/E on SEDIMENT

BASIN ELEVATION

Trench method

Corrected hay/straw perimeter barier. Added SLICE METHOD

To SECTION A-A
INLET AND PIPE PROTECTION

The performance of the basin will improve if put into a series.

SEDIMENT BASIN

The long dimension should be parallel with the direction of the flow. Accumulated silt shall be removed anytime the basins become 75% filled.

TYPICAL CUT CROSS-SECTION

TYPICAL FILL CROSS-SECTION

TEMPORARY DITCHES FOR CUT & FILL SECTIONS

STANDARD 280001-07

TEMPORARY EROSION CONTROL SYSTEMS

Illinois Department of Transportation

January 1, 2013
Width to be measured along the slope of the top surface of the fabric formed concrete revetment mat to place them end to end.

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

TYPICAL SECTION THRU FILTER POINT MAT

TYPICAL FABRIC FORMED CONCRETE REVETMENT MAT LINED DITCH

CUT OFF WALL DETAILS

TYPICAL LAP JOINTS W/ANCHOR WALL

INSTALLATION DETAILS

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

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.

Date: 1-1-08
Revisions:
1-1-08 Switched units from English (metric) to English (metric).
1-1-02 Revised second note.

Illinois Department of Transportation
January 1, 2008
ENGINEER OF POLICY AND PROCEDURES: APPROVED
January 1, 2008
ENGINEER OF DESIGN AND ENVIRONMENT: ISSUED

REVETMENT MATS

FABRIC FORMED CONCRETE
REVETMENT MATS

STANDARD 285001-02
SECTION A-A
(TYPICAL 2 LANE WITH SHOULDERS)

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

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.
Provide drainage swale in shaded area.

End full super-elevation

End of HMA shoulder

Flush inlet to enhance drainage.

Provide a drainage swale and end aggregate shoulder.

Edge lines of shoulders for ramp and mainline pre to be projected to point of intersection.

Pavement in the ramp taper (hatched area) for a distance of 950' (290 m) shall be the same thickness as the mainline.

GENERAL NOTES

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.

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.

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

ENGINEER OF POLICY AND PROCEDURES
APPROVED
January 1, 2015

ENGINEER OF DESIGN AND ENVIRONMENT
ISSUED
January 1, 2015

REVISIONS

1-1-97
PASSED

TOTAL SHEETS: 2
2015-03-18

STANDARD 406001-06

FLEXIBLE MAINLINE PAVEMENT

FLEXIBLE RAMP PAVEMENT ADJACENT TO FLEXIBLE MAINLINE PAVEMENT

(Shed 1 of 2)
to their intersection.

Ramp and mainline edge lines of the Project the shoulder.

Stub 12 (300) x \( \text{[cross slope\% or S.E.\%]} \) of mainline

Vertical offset to ramp edge = \( \frac{192 \times (4900)}{e} \) \( \text{[cross slope\% or S.E.\%]} \) of mainline

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

Right edge of mainline (ML)

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

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

L.V.C. (variable length)

Corrected divergence angle

Refer to sheet 3 for vertical offsets using \( \alpha = 8\% \)

Range of initial ramp grades when mainline is curved to the right and \( \alpha = 8\% \) for R1.

See Sheet 3 for GENERAL NOTES

Engineering of Policy and Procedures

APPROVED January 1, 2015

ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED January 1, 2015

PASSED

DATE

REVISIONS

1-1-15 Corrected divergence angle

an taper. Based profile at

e = max instead of R1.

ENGLISH (METRIC). Switched cross to

1-1-08

STANDARD 406101-05
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>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>0.18</td>
<td>3.0</td>
<td>-3.0</td>
</tr>
<tr>
<td>B</td>
<td>-3.0</td>
<td>3.0</td>
<td>-3.0</td>
</tr>
<tr>
<td>C</td>
<td>15.4</td>
<td>15.4</td>
<td>15.4</td>
</tr>
<tr>
<td>D</td>
<td>392</td>
<td>392</td>
<td>392</td>
</tr>
</tbody>
</table>

1. Vertical offsets are calculated and based on the right edge of mainline pavement at 0.0% grade.
2. 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 (GR) 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.

The initial ramp grade (GR) shall be designed to be equal to the mainline grade, rounded to the nearest 1.0%.

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 upstream from Section D-D, construct the ramp as a 340 ft. (103 m) tangent section.

Shaded area indicates shoulder transition zone from neutral area to design shoulder slope. In this area, the relative profile grade difference along the outside pavement edge and that along the outside shoulder edge shall not exceed 0.50%.

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

EXIT RAMP TERMINAL
(Flexible Ramp Pavement Adjacent to Flexible Mainline Pavement)
(Sheet 3 of 3)

STANDARD 406101-05
**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.

All dimensions are in inches (millimeters) 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**

- Hot poured joint sealer

**Transverse Expansion Joint**

(for pavements with equal thickness)

**Transverse Contraction Joint**

(for CAP, C/A and U/A base course mixtures)

**Sealing Detail**

Dowel bar assembly

- Hot poured joint sealer
- Finish corners with edge
- Preformed flexible joint filler
- Preformed closed cell plastic joint filler

**Dowel Bar Table**

<table>
<thead>
<tr>
<th>Pavement Thickness</th>
<th>Dowel Bar Diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 (250) and greater</td>
<td>16 (138)</td>
</tr>
<tr>
<td>8 (200) to 9.99 (249)</td>
<td>16 (132)</td>
</tr>
<tr>
<td>8 (200) and less</td>
<td>3 (25)</td>
</tr>
</tbody>
</table>
**SECTION A-A**

(TYPICAL 2-LANE WITH SHOULDERS)

**SLOPE 1.5%**

**Pavement Plan**

- **Transverse contraction joint**
- **Longitudinal sawed joint**
- **Pavement**

**GENERAL NOTES**

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

**PAVEMENT PLAN**

- **PCC Pavement**

**TRANSVERSE CONSTRUCTION JOINT**

- **Lane edge or edge of pavement**
- **Longitudinal keyed joint (typ.)**
- **** Casting outside limits
- **2 No. 5x4 (No. 16x1.2 m) reinforcement bars (8 total placed at pav't. mid-depth**

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

- **1 (25) Preformed expansion joint filler-full depth (typ.)**
- **6 (150) Tie bars**

**Pavement Thickness**

<table>
<thead>
<tr>
<th>Pavement Thickness</th>
<th>Spacing of Transverse Construction Joints</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 10 (250)</td>
<td>12 (3.6 m) *</td>
</tr>
<tr>
<td>10 (250) and greater</td>
<td>15 (4.5 m) *</td>
</tr>
</tbody>
</table>

*When placed adjacent to existing PCC pavement, use a spacing between 12' (3.6 m) and 18' (5.5 m) so the joints are in prolongation with existing transverse joints. Also adjust the spacing of tie bars in the longitudinal joint(s) to maintain a clearance of 9 (225) from the end of the dowel bars.

**TRANSVERSE CONSTRUCTION JOINT**

- **Lane edge or edge of pavement**
- **Longitudinal keyed joint (typ.)**
- **** Casting outside limits
- **2 No. 5x4 (No. 16x1.2 m) reinforcement bars (8 total placed at pav't. mid-depth**

When placed adjacent to existing PCC pavement, use a spacing between 12' (3.6 m) and 18' (5.5 m) so the joints are in prolongation with existing transverse joints. Also adjust the spacing of tie bars in the longitudinal joint(s) to maintain a clearance of 9 (225) from the end of the dowel bars.

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

- 1 (25) Preformed expansion joint filler-full depth (typ.)
- 6 (150) Tie bars

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

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

**PAVEMENT PLAN**

- Longitudinal construction joint
- Longitudinal sawed joint
- Transverse contraction joint

**GENERAL NOTES**

See Standard 420001 for details of joints not shown.

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

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

**STANDARD 420106-07**

<table>
<thead>
<tr>
<th>DATE</th>
<th>REVISIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-1-22</td>
<td>Revised spacing of transverse contraction joints and header board callout.</td>
</tr>
<tr>
<td>1-1-15</td>
<td>Changed spacing of tie bars to 18 (450).</td>
</tr>
</tbody>
</table>
Circular form 4'-0" (1.22 m) dia. to be removed before concrete added.

Tie bars 8 No. 6 (19) equally spaced and symmetrical about longitudinal joint drilled and grouted in place.

Concrete added to be removed before joint drilled and grouted approximately about longitudinal joint detail.

Circular form

Extend sawcut to edge of longitudinal joint.

Sawcut stops at suitable circular form.

Continuous No. 6 (19) outer hoop bar 18 (450) long to joint.

4 (100) clearance outer loop to joint (typ.)

Circular form

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

All situations not shown and may require combination of details.

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, maximum 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 dimensions are in inches (millimeters) unless otherwise shown.
CAST IN PLACE DETAIL

- Outer hoop rein. (typ.)
- Inner hoop rein. (typ.)

"Of Road"

12 (300) min.

24 (600) typ.

Provide clearance necessary to cut hoop when:

12 (300) min.

Varies 11' (3.3 m) to 12' (3.6 m)

Roundout to be used.

Less than 12 (300) formed roundout to be used.

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.)

Circular form

Circular Joint

Type 1 or Type 5 Frame and Grate may be used

DETAIL OF REINFORCEMENT FOR PAVEMENT ROUNDOUT

No. 5 (16) Support bar

Frame

24 (600)

PCC PAVEMENT ROUNDOUTS

(4.62 m)

(0.53 m)

(0.61 m)

(0.76 m)

2'-6"

2'-0"

3'-6"

5'-0"

SUB-BASE

PCC Pavement

STANDARD 420111-04

Illinois Department of Transportation

ENGINEER OF POLICY AND PROCEDURES

APPROVED

January 1, 2018

ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED

1-1-97

PASSED

January 1, 2018

Structure

Note:

Sub-Base

Type 1 or Type 5 Frame and Grate may be used
If the distance shall be adjusted to place the transverse expansion joint in prolongation with the existing joint in the mainline pavement.

**GENERAL NOTES**

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.

Pavement joints and joint spacing shall be as shown on Standards 420001, 420101 and 420106.

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 otherwise 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, sweep the gore nose dimensions at Sections B-B, 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.

**DATE**

01-01-97

**REVISIONS**

1-1-97 Revised General Note for joint and joint spacing.

1-1-18 Changed tie bar spacing.

01-01-22

**ENTRANCE RAMP TERMINAL**

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

**PLAN**

**PROFILE**

**DATE**

01-01-97

**REVISIONS**

1-1-97 Revised General Note for joint and joint spacing.

1-1-18 Changed tie bar spacing.

01-01-22

**STANDARD 420201-12**
GENERAL NOTES

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.

Pavement joints and joint spacings shall be as shown on Standards 420001, 420101 and 420106.

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 a radius R3 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 lying Section C-C.

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

DATE

REVISIONS

1-1-77 Revised General Note for
pavement and joint spacing.

1-1-18 Changed tie bar spacing
No. 6 (No. 19) tie bars at 36 (900) cts.

STANDARD 420206-13
ENTRANCE RAMP TERMINAL
JOINTED PCC RAMP PAVEMENT
ADJACENT TO CRC MAINLINE PAVEMENTS

STANDARD 420206-13
DETAILS FOR DRAINAGE IN NEUTRAL AREA

GENERAL NOTES

The initial ramp grade (S.E.) 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.

Pavement joints and joint spacings shall be as shown on Standards 420001, 420101, and 420106.

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 R1, construct the ramp as a 141' (43 m) tangent section.

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

EXIT RAMP TERMINAL

J O I N T E D  P C C R A M P P A V E M E N T

ADJACENT TO JOINTED PCC MAINLINE PAVEMENT

STANDARD 420301-09
Longitudinal sawed joint or a longitudinal construction joint with No. 6 (No. 19) tie bars spaced at 36 (900) cts. for a distance of 100' (30 m) from the 12 (300) stub. Joint line is parallel to ramp baseline.

Joint line is parallel to ramp baseline. for a distance of 100' (30 m) | beginning at the 12 (300) stub.

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

See Sheet 3 for GENERAL NOTES.
1.5% and greater Mainline pavement
Subbase (HMA required)
Improved subgrade

0.0% Slope
1.5% and greater Mainline pavement
Improved subgrade

4 (100) Stabilized Subbase (HMA required)

See DETAIL A

5 % max.
1.5% min.

24 (600) App.

SECTION B-B

SECTION CAH - CAH

WHEN MAINLINE IS ON TANGENT OR CURVED TO THE RIGHT

SECTION C-BK - C-BK

WHEN MAINLINE IS CURVED TO THE LEFT

SECTION CAH - CAH

SECTION C-BK - C-BK

Illinois Department of Transportation

ENGINEER OF POLICY AND PROCEDURES

APPROVED

January 1, 2022

ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED

1-1-97

PASSED

STANDARD 420306-11

EXIT RAMP TERMINAL

JOINTED PCC RAMP PAVEMENT
ADJACENT TO CRC MAINLINE PAVEMENT

See Sheet 3 for GENERAL NOTES
DETAILS FOR DRAINAGE IN NEUTRAL AREA

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>0.18</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>0.30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>-0.30</td>
<td></td>
<td></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%.

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.

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 CRC MAINLINE PAVEMENT

STANDARD 420306-11
For bridge approach slab

**Plan**

**NEW CONSTRUCTION**

- Limit of pavement connector
- Variable 15'-0" (4.57 m) min.

- Shoulder
- Approach Footing
- Longitudinal sawed joint
- Limit of pavement connector

**EXISTING CONSTRUCTION**

- Shoulder
- Approach Footing
- Longitudinal sawed joint
- 6 (150) from longitudinal joint (typ.)

- 3 (75) WWR

**SECTION A-A**

- See Bridge Plans for details.

**SECTION B-B**

- 3 (75) WWR

**GENERAL NOTES**

- Minimum lap distance shall be two cross wires.

- WWR shall be 0.11 sq. in./ft. (230 sq. mm/m) in both directions. Maximum wire spacing shall be 6 (150). Minimum lap distance shall be two cross wires.
PLAN

(Not or existing construction)

SECTION A-A

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.

PAVEMENT CONNECTOR (HMA) FOR BRIDGE APPROACH SLAB

STANDARD 420406
**General Notes**

See Standard 420501 for joint details not shown.

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

**Date and Revisions**

- **1-1-18**: Changed terminology to 'welded wire reinforcement'.
- **4-1-16**: Revised standard to reflect change of tie bar spacing to 36 (900) cts.
- **1-1-97**: Revised standard to reflect weld reinforcement.

**PLAN**

- **No. 7 (No. 22) bar**: 8'-6" (2.6 m) long (typ.)
- **Welded wire reinforcement**: (typ.)
- **No. 6 (No. 19) Tie bars at 36 (900) cts.**: (typ.)
- **Subbase (when used)**: 6'-0" (90 cm)
- **Ties**: 8'-6" (2.6 m) min.

**SECTION A-A**

- **(FOR PCC PAVEMENT)**
- **Crossing surface**: 6'-0" (1.8 m) min.
- **Transverse contraction joint**: 6'-0" (1.8 m) min.
- **Improved subgrade**: 6'-0" (1.8 m) min.
- **Welded wire reinforcement**: (typ.)
- **Thickness same as adjacent pavement**: 6'-0" (1.8 m) min.
- **Thickness of HMA surface**: 6'-0" (1.83 m) min.
- **Omit this bar when skew angle is less than 20°**
- **General Notes**

**SECTION B-B**

- **(FOR PCC BASE COURSE WITH HMA SURFACE)**
- **Crossing surface**: 6'-0" (1.8 m) min.
- **Tie**: 6'-0" (1.8 m)
- **Subbase (when used)**: 6'-0" (1.8 m)
- **Improved subgrade**: 6'-0" (1.8 m) min.
- **Thickness same as adjacent pavement**: 6'-0" (1.83 m) min.
- **Thickness of HMA surface**: 6'-0" (1.83 m) min.
- **Transverse construction joint or transverse contraction joint**
- **General Notes**
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.

DETAIL OF ADDED REINFORCEMENT FOR PAVEMENT BLOCKS-OUTS

**CASTING OUTSIDE LIMITS**

1. (2) Performed expansion joint full-depth (typ.)

2. No. 3 x 4 (No. 15 x 12 mm) Reinforcement bars (8 total) placed at joint: mid-depth

Place casting to grade and fill with full depth concrete after pavement has cured.

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.

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

**REVISIONS**

<table>
<thead>
<tr>
<th>DATE</th>
<th>REVISIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>6-1-16</td>
<td>Changed terminology to 'welded wire reinforcement'.</td>
</tr>
<tr>
<td>-</td>
<td>Renamed standard.</td>
</tr>
<tr>
<td>1-1-08</td>
<td>Switched units to English (metric).</td>
</tr>
</tbody>
</table>

**GENERAL NOTES**
**GENERAL NOTES**

Except as noted or shown, the dimensions and notes specified for LAP DETAIL I are typical for LAP DETAIL II and III.

The dimension and the distance from the end of the transverse bar to the edge of pavement may be increased by 1 (25) for slip form paving.

The minimum length of longitudinal bars shall be 30 (9 m) except as required to establish the lap arrangement selected.

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

**DATE**

4-1-16

**REVISIONS**

4-1-16 Revised general notes
1-1-08 Switched units to English (metric).
1-1-97

**BAR REINFORCEMENT FOR CRC PAVEMENT**

**STANDARD 421001-03**
### Standard 421101-10

**PCC Pavement**

**Half Section Adjacent to Bridge Approach Pavement**

**Typical 2-Lane with Shoulders**

**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 421101 for details of pavement reinforcement.

**PCC Pavement**

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

**PCC Pavement**

- The width of the new pavement shall be the same as the existing pavement.

**Concrete Pad**

- Concrete pad shall be placed between the normal longitudinal slope for transverse joints (typ.) and shall be extended for an additional 3'-6" (1.1 m) min. from the end of the nearest tie bar lap (typ.).

**END OF PAVEMENT**

- The end of the pavement shall be marked with a traffic redirect sign.

**EXTENDED PAVEMENT**

- Extended pavement shall be marked with a traffic redirect sign.

**PCC Shoulder**

- The PCC shoulder shall be constructed adjacent to the existing pavement.

**Consecutive reinforcing bars**

- Consecutive reinforcing bars shall be placed at a spacing of 3'-6" (1.1 m) min. from the end of the nearest tie bar lap (typ.).

**PCC Shoulder**

- The PCC shoulder shall be constructed adjacent to the existing pavement.

**Concrete Pad Slope**

- Concrete pad slope shall be extended to match the pavement slope.

**Plan and Section**

- Plan and section details shall be provided for each project.

---

**DATE**

- 1-1-97

**REVISIONS**

- 1-1-18
  - Changed tie bar spacing to 36 (900) cts.
  - Added expansion joints in shed.
  - Changed tie bar spacing to 36 (900) cts.

**STANDARD 421101-10**

**CRC PAVEMENT**

- With wide flange beam terminal joint

---

**End of Pavement**

- The end of the pavement shall be marked with a traffic redirect sign.

**Concrete Pad**

- Concrete pad shall be placed between the normal longitudinal slope for transverse joints (typ.) and shall be extended for an additional 3'-6" (1.1 m) min. from the end of the nearest tie bar lap (typ.).

**End of Shoulder**

- The end of the shoulder shall be marked with a traffic redirect sign.

**Concrete Pad (3.0 m)**

- Concrete pad shall be placed at 3'-6" (1.1 m) min. from the end of the nearest tie bar lap (typ.).

**Concrete Pad (10'-0' (3.0 m))**

- Concrete pad shall be placed at 10'-0' (3.0 m) min. from the end of the nearest tie bar lap (typ.).

**Concrete Pad (24'-0' (7.2 m))**

- Concrete pad shall be placed at 24'-0' (7.2 m) min. from the end of the nearest tie bar lap (typ.).

**Concrete Pad (7'-0' (2.1 m))**

- Concrete pad shall be placed at 7'-0' (2.1 m) min. from the end of the nearest tie bar lap (typ.).

**Concrete Pad (4'-0' (1.2 m))**

- Concrete pad shall be placed at 4'-0' (1.2 m) min. from the end of the nearest tie bar lap (typ.).

**Concrete Pad (2'-0' (0.6 m))**

- Concrete pad shall be placed at 2'-0' (0.6 m) min. from the end of the nearest tie bar lap (typ.).

**Concrete Pad (1'-0' (0.3 m))**

- Concrete pad shall be placed at 1'-0' (0.3 m) min. from the end of the nearest tie bar lap (typ.).

---

**Section B-B**

**Transverse Construction Joint**

- The transverse construction joint shall be placed at a spacing of 3'-6" (1.1 m) min. from the end of the nearest tie bar lap (typ.).

**Transverse Terminal Joint**

- The transverse terminal joint shall be placed at a spacing of 3'-6" (1.1 m) min. from the end of the nearest tie bar lap (typ.).

**Concrete Pad Slope**

- Concrete pad slope shall be extended to match the pavement slope.

---

**Section A-A**

**Plan**

- Plan details shall be provided for each project.

**Section**

- Section details shall be provided for each project.

---

**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 Standard 421101 for details of pavement reinforcement.

---

**DATE**

- 1-1-97

**REVISIONS**

- 1-1-18
  - Changed tie bar spacing to 36 (900) cts.
  - Added expansion joints in shed.
  - Changed tie bar spacing to 36 (900) cts.

**STANDARD 421101-10**

**CRC PAVEMENT**

- With wide flange beam terminal joint

---

**End of Pavement**

- The end of the pavement shall be marked with a traffic redirect sign.

**Concrete Pad**

- Concrete pad shall be placed between the normal longitudinal slope for transverse joints (typ.) and shall be extended for an additional 3'-6" (1.1 m) min. from the end of the nearest tie bar lap (typ.).

**End of Shoulder**

- The end of the shoulder shall be marked with a traffic redirect sign.

**Concrete Pad (3.0 m)**

- Concrete pad shall be placed at 3'-6" (1.1 m) min. from the end of the nearest tie bar lap (typ.).

**Concrete Pad (10'-0' (3.0 m))**

- Concrete pad shall be placed at 10'-0' (3.0 m) min. from the end of the nearest tie bar lap (typ.).

**Concrete Pad (24'-0' (7.2 m))**

- Concrete pad shall be placed at 24'-0' (7.2 m) min. from the end of the nearest tie bar lap (typ.).

**Concrete Pad (7'-0' (2.1 m))**

- Concrete pad shall be placed at 7'-0' (2.1 m) min. from the end of the nearest tie bar lap (typ.).

**Concrete Pad (4'-0' (1.2 m))**

- Concrete pad shall be placed at 4'-0' (1.2 m) min. from the end of the nearest tie bar lap (typ.).

**Concrete Pad (2'-0' (0.6 m))**

- Concrete pad shall be placed at 2'-0' (0.6 m) min. from the end of the nearest tie bar lap (typ.).

**Concrete Pad (1'-0' (0.3 m))**

- Concrete pad shall be placed at 1'-0' (0.3 m) min. from the end of the nearest tie bar lap (typ.).

---

**Section B-B**

**Transverse Construction Joint**

- The transverse construction joint shall be placed at a spacing of 3'-6" (1.1 m) min. from the end of the nearest tie bar lap (typ.).

---

**Section A-A**

**Plan**

- Plan details shall be provided for each project.

---

**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 Standard 421101 for details of pavement reinforcement.

---

**DATE**

- 1-1-97

**REVISIONS**

- 1-1-18
  - Changed tie bar spacing to 36 (900) cts.
  - Added expansion joints in shed.
  - Changed tie bar spacing to 36 (900) cts.

**STANDARD 421101-10**

**CRC PAVEMENT**

- With wide flange beam terminal joint

---
**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.
- Shall be Polyethylene Tape No. 40. The primer, used on the metal only, shall be Dow Corning 200. At the Contractor's option the joint may be sealed as shown in the optional groove detail.

See Standard 421001 for details of pavement reinforcement.

See Standards 420001 and 420401 for joint details not shown.

All dimensions shall be in inches (millimeters) unless otherwise shown.

---

**SECTION A-A**

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

- Lap reinforcing steel: 36 (900) cts. when pavement is extended.
- Entire top surface shall be steel trowel finished.

**TRANSVERSE TERMINAL JOINT**

**SECTION B-B**

**36' (10.8 m) CRC PAVEMENT**

(WITH WIDE FLANGE BEAM TERMINAL JOINT)

(Green: 3 at 2)
Bend in field to fit.

44 c bars at 6'/6" (165) cts. Bend in field to fit.

21 c bars at 6'/6" (165) cts.

SECTION AT LUG W

SECTION AT LUG X

SECTION AT LUG Y

MATERIALS REQUIRED FOR (1) ONE CRC PAVEMENT SYSTEM
(Excluding Pavement Concrete and Pavement Reinforcement)

<table>
<thead>
<tr>
<th>Bar</th>
<th>Qty</th>
<th>Size</th>
<th>Length</th>
<th>Shape</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>122</td>
<td>No. 8 (No. 25)</td>
<td>14'-0&quot; (4.25 m)</td>
<td></td>
</tr>
<tr>
<td>b</td>
<td>18</td>
<td>No. 5 (No. 16)</td>
<td>24'-9&quot; (7.43 m)</td>
<td></td>
</tr>
<tr>
<td>c</td>
<td>122</td>
<td>No. 5 (No. 16)</td>
<td>20'-0&quot; (6.09 m)</td>
<td></td>
</tr>
<tr>
<td>d</td>
<td>28</td>
<td>No. 4 (No. 13)</td>
<td>11'-9&quot; (3.52 m)</td>
<td></td>
</tr>
</tbody>
</table>

Concrete, cu. yds. (m³): 64.0 (48.9)
Reinforcing Bars, lbs. (kg): 8372 (3800)
Concrete Pad, sq. yds. (m²): 144 (120)
Improved Subgrade, sq. yds. (m²): 162 (135)

Improved subgrade

When applicable

10 mil (0.25) Polyethylene bond breaker

12 (300) Improved subgrade

10 (90) Stabilized subbase

20 (300) Concrete pad

Concrete pad

New construction only

Bend top portion in field as shown.
36'-0" (10.8 m) Continuously reinforced pcc pavement

PLAN

SECTION A-A

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

SECTION B-B

GENERAL NOTES

See Standard 421206-07 for details of pavement reinforcement.

See Standards 420001 and 420401 for joint details not shown.

All dimensions are in inches (millimeters) unless otherwise shown.
PERPENDICULAR CURB RAMPS FOR SIDEWALKS

SECTION A-A

1. The running slope of a curb ramp shall be 1:20 min. and 1:12 max. The running slope of a blended transition shall be 1:20 max.

SECTION B-B

1. The running slope of a curb ramp shall be 1:20 min. and 1:12 max. The running slope of a blended transition shall be 1:20 max.

RAMP IN LANDSCAPED AREA

SETBACK ≤ 5’

RAMP IN PAVED AREA

SETBACK ≤ 5’

DETAIL A

SIDE CURB DETAIL

See Sheet 2 for GENERAL NOTES.
**RAMP IN LANDSCAPED AREA**

**SETBACK > 5’**

1. Curb ramp or blended transition
   - 4’ (122 mm) min.
   - (no maximum length)

2. Turning space
   - 1:50 max.
   - 4’ (122 mm) min.

**RAMP IN PAVED AREA**

**SETBACK > 5’**

1. Curb ramp or blended transition
   - 1:50 max.

2. Turning space
   - 1:50 max.

**SECTION C-C**

- The turning space is not required for blended transitions.
- The running slope of a curb ramp shall be 1:20 min. and 1:12 max. The running slope of a blended transition shall be 1:20 max.

**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 3’ (1.52 m).

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

Detectable warnings are shown in their ideal locations but the following placement tolerances are allowed.

- **Side Border** - Detectable warnings should extend the full width of the walking surface (excluding flared sides) but a border along each side up to 2 in. (50 mm) in width is allowed.

- **Curb Set-Back** - Detectable warnings located at the back of curb should closely align with the curb but a gap up to 6 in. (150 mm) behind the curb is allowed.

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 424001-11)
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 1:50 maximum slope is shown, 1:64 is preferred.

Detectable warnings are shown in their ideal locations but the following placement tolerances are allowed.

Side Border — Detectable warnings should extend to the top of sidewalk and gutter.

Flush with top of roadway curb and gutter.

Variable

2 (50) ft.

2 (150) R

Ramp width
5'(1.52 m)
typical, 4'(1.22 m) min.

Clear space
4'x4' (1.22x1.22 m) min.

Turning space
5'x5' (1.52x1.52 m)
typical, 4'x4'
(1.22x1.22 m) min.

Depressed curb and gutter

SECTION A-A

1. The running slope of a curb ramp shall be 1:20 min. and 1:12 max. The running slope of a blended transition shall be 1:20 max.

DIAGONAL CURB RAMPS
FOR SIDEWALKS

STANDARD 424006-05

DATE

REVISIONS

1-1-21

Charnel minimum proposed width and locations.

1-1-19

Removed "13 foot rule", added "blended transitions" and placement tolerances for detectable warnings.
**SECTION A-A**

The running slope of a curb ramp shall be 1:20 min. and 1:12 max. The running slope of a blended transition shall be 1:20 max.

**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.
- Detectable warnings are shown in their ideal locations but the following placement tolerances are allowed:
  - **Side Border**: Detectable warnings should extend the full width of the walking surface (excluding flared sides) but a border along each side up to 2 in. (50 mm) in width is allowed.
  - **Curb Set-Back**: Detectable warnings located at the back of curb should closely align with the curb but a gap up to 6 in. (150 mm) behind the curb is allowed.
- See Standard 606001 for details of depressed curb adjacent to curb ramp.
- All dimensions are in inches (millimeters) unless otherwise shown.

**REVISIONS**

- 1-1-19: Removed upper landing, added blended transition and detectable warning tolerances.
- 1-1-19: Revised sidewalk width to include 24 (610) buffer behind curb.

**STANDARD 424011-04**

**SIDE CURB DETAIL**

**SECTION B-B**

Flush with top of roadway curb and top of sidewalk

**CORNER PARALLEL CURB RAMP**

- Sidewalk
- Curb ramp or blended transition (no maximum length)
- Turning space
- Curb ramp or blended transition (no maximum length)
- Sidewalk

**DETAILED A**

- Expansion joint
- Side curb where required
- Detectable warning
- Turning space
- Depressed curb and gutter
- See DETAIL A

**CORNER PARALLEL CURB RAMPS FOR SIDEWALKS**

- Illinois Department of Transportation
- January 1, 2019
- ENGINEER OF POLICY AND PROCEDURES
- APPROVED
- January 1, 2019
- ENGINEER OF DESIGN AND ENVIRONMENT
- ISSUED
### 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.

Detectable warnings are shown in their ideal locations but the following placement tolerances are allowed:

- **Side Border**: Detectable warning should extend the full width of the walking surface (excluding flared sides) but a border along each side up to 2 in. (50 mm) in width is allowed.
- **Curb Set-Back**: Detectable warnings located at the back of the curb should closely align with the curb but a gap up to 6 in. (150 mm) behind the curb is allowed.

See Standard 604001 for details of depressed curb transitions and detectable warning tolerances.

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

### MID-BLOCK CURB RAMPS FOR SIDEWALKS

**STANDARD 424016-05**

**SECTION A-A**

- The running slope of a curb ramp shall be 1:20 min. and 1:12 max. The running slope of a blended transition shall be 1:20 max.

**SECTION B-B**

- Curb ramp or blended transition (no maximum length)
- Turning space, 4' (1.22 m) min.
- Curb ramp or blended transition (no maximum length)
- Sidewalk

**SECTION C-C**

- Turning space
- Curb ramp or blended transition (no maximum length)
- Depressed curb and gutter
- See DETAIL A

**SIDE CURB DETAIL**

- Variable
- Ramp thickness
- Ramp
- Expansion joint
- 1:50 max.

**DETAIL A**

- Sidewalk
- Curb ramp or blended transition
- Turning space, 4' (1.22 m) min.
- Curb ramp or blended transition
- Sidewalk

**PERPENDICULAR MID-BLOCK CURB RAMP**

- Sidewalk width
- 5' (1.52 m) typical
- 4' (1.22 m) min.
- typical

**PARALLEL MID-BLOCK CURB RAMP**

- Sidewalk
- Curb ramp or blended transition
- Turning space
- Curved ramp or blended transition
- Sidewalk

**SECTION A-A**

- The running slope of a curb ramp shall be 1:20 min. and 1:12 max. The running slope of a blended transition shall be 1:20 max.

**SECTION B-B**

- Curb ramp or blended transition (no maximum length)
- Turning space, 4' (1.22 m) min.
- Curb ramp or blended transition (no maximum length)
- Sidewalk

**SECTION C-C**

- Turning space
- Curb ramp or blended transition (no maximum length)
- Depressed curb and gutter
- See DETAIL A

**SIDE CURB DETAIL**

- Variable
- Ramp thickness
- Ramp
- Expansion joint
- 1:50 max.

**DETAIL A**

- Sidewalk
- Curb ramp or blended transition
- Turning space, 4' (1.22 m) min.
- Curb ramp or blended transition
- Sidewalk

**PERPENDICULAR MID-BLOCK CURB RAMP**

- Sidewalk width
- 5' (1.52 m) typical
- 4' (1.22 m) min.
- typical

**PARALLEL MID-BLOCK CURB RAMP**

- Sidewalk
- Curb ramp or blended transition
- Turning space
- Curved ramp or blended transition
- Sidewalk

**SECTION A-A**

- The running slope of a curb ramp shall be 1:20 min. and 1:12 max. The running slope of a blended transition shall be 1:20 max.

**SECTION B-B**

- Curb ramp or blended transition (no maximum length)
- Turning space, 4' (1.22 m) min.
- Curb ramp or blended transition (no maximum length)
- Sidewalk

**SECTION C-C**

- Turning space
- Curb ramp or blended transition (no maximum length)
- Depressed curb and gutter
- See DETAIL A

**SIDE CURB DETAIL**

- Variable
- Ramp thickness
- Ramp
- Expansion joint
- 1:50 max.

**DETAIL A**

- Sidewalk
- Curb ramp or blended transition
- Turning space, 4' (1.22 m) min.
- Curb ramp or blended transition
- Sidewalk

**PERPENDICULAR MID-BLOCK CURB RAMP**

- Sidewalk width
- 5' (1.52 m) typical
- 4' (1.22 m) min.
- typical

**PARALLEL MID-BLOCK CURB RAMP**

- Sidewalk
- Curb ramp or blended transition
- Turning space
- Curved ramp or blended transition
- Sidewalk

**SECTION A-A**

- The running slope of a curb ramp shall be 1:20 min. and 1:12 max. The running slope of a blended transition shall be 1:20 max.

**SECTION B-B**

- Curb ramp or blended transition (no maximum length)
- Turning space, 4' (1.22 m) min.
- Curb ramp or blended transition (no maximum length)
- Sidewalk

**SECTION C-C**

- Turning space
- Curb ramp or blended transition (no maximum length)
- Depressed curb and gutter
- See DETAIL A

**SIDE CURB DETAIL**

- Variable
- Ramp thickness
- Ramp
- Expansion joint
- 1:50 max.

**DETAIL A**

- Sidewalk
- Curb ramp or blended transition
- Turning space, 4' (1.22 m) min.
- Curb ramp or blended transition
- Sidewalk

**PERPENDICULAR MID-BLOCK CURB RAMP**

- Sidewalk width
- 5' (1.52 m) typical
- 4' (1.22 m) min.
- typical

**PARALLEL MID-BLOCK CURB RAMP**

- Sidewalk
- Curb ramp or blended transition
- Turning space
- Curved ramp or blended transition
- Sidewalk

**SECTION A-A**

- The running slope of a curb ramp shall be 1:20 min. and 1:12 max. The running slope of a blended transition shall be 1:20 max.

**SECTION B-B**

- Curb ramp or blended transition (no maximum length)
- Turning space, 4' (1.22 m) min.
- Curb ramp or blended transition (no maximum length)
- Sidewalk

**SECTION C-C**

- Turning space
- Curb ramp or blended transition (no maximum length)
- Depressed curb and gutter
- See DETAIL A

**SIDE CURB DETAIL**

- Variable
- Ramp thickness
- Ramp
- Expansion joint
- 1:50 max.

**DETAIL A**

- Sidewalk
- Curb ramp or blended transition
- Turning space, 4' (1.22 m) min.
- Curb ramp or blended transition
- Sidewalk

**PERPENDICULAR MID-BLOCK CURB RAMP**

- Sidewalk width
- 5' (1.52 m) typical
- 4' (1.22 m) min.
- typical

**PARALLEL MID-BLOCK CURB RAMP**

- Sidewalk
- Curb ramp or blended transition
- Turning space
- Curved ramp or blended transition
- Sidewalk

**SECTION A-A**

- The running slope of a curb ramp shall be 1:20 min. and 1:12 max. The running slope of a blended transition shall be 1:20 max.

**SECTION B-B**

- Curb ramp or blended transition (no maximum length)
- Turning space, 4' (1.22 m) min.
- Curb ramp or blended transition (no maximum length)
- Sidewalk

**SECTION C-C**

- Turning space
- Curb ramp or blended transition (no maximum length)
- Depressed curb and gutter
- See DETAIL A

**SIDE CURB DETAIL**

- Variable
- Ramp thickness
- Ramp
- Expansion joint
- 1:50 max.
**DEPRESSED CORNER**

- Sidewalks ≥ 6 ft. (1.8 m) in width should have a buffer which is not part of the P.A.R. The buffer keeps pedestrians further from traffic and provides a place to install signs.

**SECTION A-A**

1. The running slope of a curb ramp shall be 1:20 min. and 1:12 max. The running slope of a blended transition shall be 1:20 max.

**GENERAL NOTES**

- 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.
- Detectable warnings are shown in their ideal tolerances but the following placement tolerances are allowed:
  - **Side Border**: Detectable warnings should extend the full width of the walking surface (excluding flared sides) but a border along each side up to 2 in. (50 mm) in width is allowed.
  - **Curb Set-Back**: Detectable warnings located at the back of curb should closely align with the curb but a gap up to 6 in. (150 mm) behind the curb is allowed.

- See Standard 606001 for details of depressed curb adjacent to curb ramp.
- All dimensions are in inches (millimeters) unless otherwise shown.

**STANDARD 424021-06**

**DEPRESSED CORNER FOR SIDEWALKS**

**DATE**

- 1-1-21: Added crosswalk striping and a "buffer" for wide sidewalks.
- 1-1-19: Removed upper landings, added blended transition and detectable warning tolerances.

**APPROVED**

- January 1, 2021

**ENGINEER OF DESIGN AND ENVIRONMENT**

- 1-1-12

**ISSUED**

- January 1, 2021

**ENGINEER OF POLICY AND PROCEDURES**

- January 1, 2021
1. Detachable warning shall only be installed at entrances/alleys with permanent traffic control devices (i.e. stop signs, signals).
2. Where possible, maintain the grade of the sidewalk across the entranceway to avoid the need for ramps and turning spaces.

**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.

Detectable warnings are shown in their ideal locations but the following placement tolerances are allowed:

- **Side border** - Detachable warnings should extend the full width of the walking surface (excluding flared sides) but a border along each side up to 2 in. (50 mm) in width is allowed.
- **Curb setback** - Detachable warnings located at the back of curb should closely align with the curb but a gap up to 6 in. (150 mm) behind the curb is allowed.

All dimensions are in inches (millimeters) unless otherwise shown.
1. Variable width of the walking surface (excluding flared sides) but a border along each side up to 2 in. (50 mm) in width is allowed.

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

3. Detectable warnings are shown in their ideal locations but the following placement tolerances are allowed.

   **Side border:** Detectable warnings should extend the full width of the walking surface (excluding flared sides) but a border along each side up to 2 in. (50 mm) in width is allowed.

   **Curb setback:** Detectable warnings located at the back of curb should closely align with the curb but a gap up to 6 in. (150 mm) behind the curb is allowed.

   See Standard 606001 for details of depressed curb and gutter.

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

---

**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.

Detectable warnings are shown in their ideal locations but the following placement tolerances are allowed.

**Side border:** Detectable warnings should extend the full width of the walking surface (excluding flared sides) but a border along each side up to 2 in. (50 mm) in width is allowed.

**Curb setback:** Detectable warnings located at the back of curb should closely align with the curb but a gap up to 6 in. (150 mm) behind the curb is allowed.

See Standard 606001 for details of depressed curb and gutter.

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

HALF-COMMON PAVEMENT (HMA SHOULD)BGER)

FULL DEPTH SAW CUT

INTERIOR SAW CUT

WHEEL SAW CUT (OPTIONAL)

TIGHT TRANSVERSE CRACK

EDGE OF PAVEMENT

Saw cut full length of patch

PAVEMENT SAWING DETAIL

HALF-COMMON PAVEMENT (PCC SHOULD)BGER)

FULL DEPTH SAW CUT

INTERIOR SAW CUT

WHEEL SAW CUT (OPTIONAL)

TIGHT TRANSVERSE CRACK

EDGE OF PAVEMENT

Saw cut full length of patch

ALTERNATE SAWING DETAIL

HALF-COMMON PAVEMENT (PCC SHOULD)BGER)

FULL DEPTH SAW CUT

INTERIOR SAW CUT

WHEEL SAW CUT (OPTIONAL)

TIGHT TRANSVERSE CRACK

EDGE OF PAVEMENT

Saw cut full length of patch

GENERAL NOTES

When patching two adjacent lanes in one operation, the longitudinal joint shall be a longitudinal sawed joint as detailed on Standard 420001; however, the groove may be either preformed or sawed.

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

CLASS A PATCHES

DATE

REVISIONS

1-1-08 Switched units to English (metric).

1-1-07 Revised General Notes.

STANDARD 442001-04

(Sheet 1 of 2)
Edge of lane

No. 6 (No. 19) rebar tied to longitudinal rebar.

Transverse rebar will be tied to longitudinal rebar while providing a minimum 5 (75) clearance from existing pavement edge.

Transverse rebar will extend to outer longitudinal rebar while providing a minimum 3 (75) clearance from existing pavement edge.

Shrout removal

PAVEMENT REINFORCEMENT DETAIL

Bars at 12 (300) cts.

Existing part

Patch

Support chair

Existing part

Subbase

** Every 3rd intersection must be tied.

When the minimum clearance cannot be obtained with the transverse bar on top then the transverse bar 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. $D_1 = 2(S_1)$ and $D_2 = 2(S_2)$.
GENERAL NOTES

The transverse joints for Class B patches shall align with joints or cracks in the adjacent lane whenever possible.

See Standard 420701 for details of welded wire reinforcement.

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

CLASS B PATCHES

PAVEMENT SAWING DETAIL

ALTERNATE SAWING DETAIL

PAVEMENT SAWING DETAIL

TRANSVERSE JOINT

Dowel Bar Table

<table>
<thead>
<tr>
<th>Pavement Thickness</th>
<th>Dowel Bar Diameter</th>
<th>Hole Diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 (250) or greater</td>
<td>1/4 (6.4)</td>
<td>3/16 (4.8)</td>
</tr>
<tr>
<td>8 (200) thru 9.99 (249)</td>
<td>1/8 (3.2)</td>
<td>1/16 (1.6)</td>
</tr>
<tr>
<td>Less than 8 (200)</td>
<td>3/32 (1.0)</td>
<td>1/32 (0.8)</td>
</tr>
</tbody>
</table>

CLASS B PATCHES

STANDARD 442101-09

(Sheet 1 of 2)
METHOD I
(WITHOUT RESURFACING)

18 (450) Long dowel bars anchored into existing pavement at 12 (300) cts.

METHOD II
(WITH RESURFACING)

18 (450) Long dowel bars anchored into existing pavement at 12 (300) cts.
Contraction joint

**CLASS C**

- Longitudinal joint - sawed (one operation) or formed (two operations)
- Angles not less than 60°
- 36 (900) min.
- Existing longitudinal joint
- Angles not less than 60°
- 6'-0'' (1.8 m) to 4'-0'' (1.2 m)

**SECTION A-A**

- Construction joint
- Existing pav't
- Varible
- Sawed groove
- 0'-10'' (0.3 m) to 6'-0'' (1.8 m)

**SECTION B-B**

- Construction joint
- Existing pav't
- Varible
- Sawed groove
- 0'-10'' (0.3 m) to 6'-0'' (1.8 m)

**SECTION C-C**

- Construction joint
- Existing pav't
- Varible
- Sawed groove
- 0'-10'' (0.3 m) to 6'-0'' (1.8 m)

**SECTION D-D**

- Construction joint
- Existing pav't
- Varible
- Sawed groove
- 0'-10'' (0.3 m) to 6'-0'' (1.8 m)

**SECTION E-E**

- Construction joint
- Existing pav't
- Varible
- Sawed groove
- 0'-10'' (0.3 m) to 6'-0'' (1.8 m)

**CLASS D**

- Longitudinal joint - sawed (one operation) or formed (two operations)
- Angles not less than 60°
- 36 (900) min.
- Existing longitudinal joint
- Angles not less than 45°
- 3'-0'' (0.9 m) to 5'-0'' (1.5 m)

**SECTION A-A**

- Construction joint
- Existing pav't
- Varible
- Sawed groove
- 0'-10'' (0.3 m) to 6'-0'' (1.8 m)

**SECTION B-B**

- Construction joint
- Existing pav't
- Varible
- Sawed groove
- 0'-10'' (0.3 m) to 6'-0'' (1.8 m)

**SECTION C-C**

- Construction joint
- Existing pav't
- Varible
- Sawed groove
- 0'-10'' (0.3 m) to 6'-0'' (1.8 m)

**SECTION D-D**

- Construction joint
- Existing pav't
- Varible
- Sawed groove
- 0'-10'' (0.3 m) to 6'-0'' (1.8 m)

**SECTION E-E**

- Construction joint
- Existing pav't
- Varible
- Sawed groove
- 0'-10'' (0.3 m) to 6'-0'' (1.8 m)

**GENERAL NOTES**

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

**STANDARD 442201-03**

- **DATE**
- **REVISIONS**

- **1-1-08**
  - Switched units to English (metric)

- **1-1-07**
  - Revised Note for Class C patches
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 shoulders of superelevated pavement.

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

When the plans specify the shoulder to be stabilized full width, the HMA shall be extended to this line.

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)

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

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 FOR SUPERELEVATED PAVEMENT (Outside of curve)

SHOULDER FOR SUPERELEVATED PAVEMENT (Inside of curve)

NOTES

Note 1: Does not apply when sub-surface drains are installed.

Note 2: When the subbase is not removed, this thickness will vary with the thickness of pavement, extended length of subbase, and the slope 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.

Note 3: When the super-elevation rate of the pavement is between 0% and 4%, the shoulder shall be sloped at 4%. When the super-elevation 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%.
MULTI-SPAN CULVERTS
(Unless otherwise noted on the plans, name plates are not required for structures less than 20' (6.1 m) in length)

PLATE NAME

STEEL RAILS

PARAPET
(Typical)

PIERS ON FAI ROUTES

GENERAL NOTES

On one-way traffic structures, place name plate on right side of approach end, facing approach. 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.

DATE
1-1-20
1-1-09
1-1-02
1-1-02

REVISIONS
Revised f-shape to constant slope
parapet
Switched units to English (metric)
Added pier detail
Removed Placing note on sht. 2
Added brace note on sht. 1

STANDARD 515001-04
Illinois Department of Transportation
APPROVED
January 1, 2020
ENGINEER OF BRIDGES AND STRUCTURES
APPROVED
January 1, 2020
ENGINEER OF DESIGN AND ENVIRONMENT
SEE DESIGN PLANS FOR LETTERING

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

NOTE:
Border and lettering. Raised 1/8 (3), square cut and not tapered.

SECTIONS A-A FOR BRIDGES
PIPE CULVERT END SECTION DIMENSIONS

<table>
<thead>
<tr>
<th>Pipe No.</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>T</th>
<th>L</th>
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<tr>
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<td>1480</td>
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<td>1960</td>
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<td>150</td>
<td>601</td>
<td>569</td>
<td>551</td>
<td>1550</td>
<td>2200</td>
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</table>

This Standard is for use with single pipe culverts and multiple culvert installations. For multiple culvert installations, place the end sections side-by-side leaving a 3 1/2' space between adjacent and section ends and fill the space with Class 51 concrete.

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

See roadway plans for slope VPM and pipe inside diameter.

End sections may be installed up to ±10 degrees skewed with roadway.

2' x 2' x 3' 106 x 106 x 91 plate washers shall be provided under each nut required for the anchor rods. Holes in the washers for the culvert tie assembly may be drilled using core bits in lieu of formed holes.

See Standard 542301 for end sections having traversable oblique grooves.

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

All dimensions are in inches unless otherwise shown.

CONCRETE END SECTIONS FOR PIPE CULVERTS
15" (375 mm) THRU 84" (2100 mm) DIA.

STANDARD 542001-06

(Shewing end section tie details)

GENERAL NOTES

This dimension shall be increased by 1/2" (12) for CIP field construction. See General Notes.

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

See roadway plans for slope VPM and pipe inside diameter.

End sections may be installed up to ±10 degrees skewed with roadway.

2' x 2' x 3' 106 x 106 x 91 plate washers shall be provided under each nut required for the anchor rods. Holes in the washers for the culvert tie assembly may be drilled using core bits in lieu of formed holes.

See Standard 542301 for end sections having traversable oblique grooves.

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

All dimensions are in inches unless otherwise shown.
LONGITUDINAL SECTION
(showing bottom slab and backwall reinforcement)

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

REINFORCEMENT SCHEDULE
Pipe I.D. Bar Size Bar Spacing
18 (450) 4 12
24 (600) 4 12
30 (750) 4 12
36 (900) 4 12
42 (1050) 4 12
48 (1200) 4 12
54 (1350) 4 12
60 (1500) 4 12
66 (1650) 4 12
72 (1800) 4 12
78 (1950) 4 12
84 (2100) 4 12

LAP DIMENSION
Pipe omitted for clarity

CONCRETE END SECTIONS FOR PIPE CULVERTS
15" (375 mm) THRU 84" (2100 mm) DIA.

STANDARD 542001-06
For cast-in-place construction, increase concrete volumes by approximately 12%.

<table>
<thead>
<tr>
<th>Pipe No.</th>
<th>Concrete yd</th>
<th>Reinforcement Without Lap Bag, kg</th>
<th>Reinforcement With Lap Bag, kg</th>
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</thead>
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<tr>
<td></td>
<td>Slope of End Section</td>
<td>Slope of End Section</td>
<td>Slope of End Section</td>
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<tr>
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<td>1.0</td>
<td>1.7</td>
<td>2.1</td>
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<tr>
<td>18</td>
<td>1.2</td>
<td>2.6</td>
<td>2.2</td>
</tr>
<tr>
<td>20</td>
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<tr>
<td>22</td>
<td>1.6</td>
<td>3.8</td>
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</table>

<table>
<thead>
<tr>
<th>Pipe No.</th>
<th>Concrete yd</th>
<th>Reinforcement Without Lap Bag, kg</th>
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<tr>
<td>36</td>
<td>3.6</td>
<td>5.6</td>
<td>6.3</td>
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</tbody>
</table>

For cast-in-place construction, increase concrete volumes by approximately 12%.
SECTION B-B

(Showing backwall reinforcement only)
Pipe omitted for clarity.

SECTION C-C

(Showing end section tie details)

SECTION D-D

(Showing bottom slab and backwall reinforcement.)

REINFORCEMENT SCHEDULE

Equivalent Round Size

<table>
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<tr>
<th>Pipe Size</th>
<th>Bar Size</th>
<th>Spacing</th>
</tr>
</thead>
<tbody>
<tr>
<td>15 (375)</td>
<td>13 (33)</td>
<td>32 (800)</td>
</tr>
<tr>
<td>18 (450)</td>
<td>13 (33)</td>
<td>32 (800)</td>
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<tr>
<td>21 (525)</td>
<td>13 (33)</td>
<td>32 (800)</td>
</tr>
<tr>
<td>24 (600)</td>
<td>13 (33)</td>
<td>32 (800)</td>
</tr>
<tr>
<td>27 (750)</td>
<td>13 (33)</td>
<td>32 (800)</td>
</tr>
<tr>
<td>30 (900)</td>
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<td>32 (800)</td>
</tr>
<tr>
<td>36 (900)</td>
<td>13 (33)</td>
<td>32 (800)</td>
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<td>48 (1200)</td>
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<tr>
<td>60 (1500)</td>
<td>13 (33)</td>
<td>32 (800)</td>
</tr>
<tr>
<td>72 (1800)</td>
<td>13 (33)</td>
<td>32 (800)</td>
</tr>
</tbody>
</table>

CONCRETE END SECTIONS FOR ELLIPTICAL PIPE CULVERTS 15" (375 mm) THRU 72" (1800 mm) EQUIVALENT DIAMETER

STANDARD 542011-02

(Sheet 2 of 3)
### Quantities

<table>
<thead>
<tr>
<th>Equivalent</th>
<th>Concrete yd³ m³</th>
<th>Reinforcement Without Lap lbs (kg)</th>
<th>Reinforcement With Lap lbs (kg)</th>
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<tr>
<td>Pipe ID</td>
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<tr>
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</table>

### General Notes

- This Standard is used with single pipe culverts and multi-pipe culvert installations. For multi-pipe culvert installations, the end sections shall be placed side-by-side leaving a 3 (75) space between adjacent sections and maintain accurate alignment and vertical alignment.

- 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.

- The end sections may be installed up to 15 degrees skewed with roadway.

- 2\(4\) x 2\(4\) x 3\(6\) (66 x 66 x 86) plate washers shall be provided under each nut required for the anchor heads. Holes in the wall for the anchor tie assembly may be drilled using core bits in lieu of assembled holes.

- See Standard 542011 for end sections having traversable pipe grate.

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

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.

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

GENERAL NOTES

ENGINEER OF DESIGN AND ENVIRONMENT

APPROVED

Issued 1-1-97

Revised 1-1-07

Replaced units to English (metric) standards

Soft converted metric to English units

reinforcement bars

Added h. bars

REINFORCED CONCRETE END SECTIONS

FOR PIPE CULVERTS

Sheet 1 of 5

STANDARD 542201-02
<table>
<thead>
<tr>
<th>Sheet Angle</th>
<th>Design No.</th>
<th>Nominal Pan Dia.</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
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**WINGS FOR 1 1/2 SLOPE**

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**REINFORCED CONCRETE END SECTIONS**

FOR PIPE CULVERTS

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

(Sheet 2 of 5)
|-------------|------------|------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 30°         | DS 15-1    |                  | 15 | 28 | 10 | 79 | 29 | 234 | 8-38 | 5-95 | 315 | 29 | 4-09 | 6-37 | 3 | 1%
| DS 18-1    | (DS 375-1) | (DS 900-1)      |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| DS 21-1    | (DS 450-1) | (DS 1350-1)     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| DS 24-1    | (DS 600-1) | (DS 1800-1)     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| DS 27-1    | (DS 750-1) | (DS 2250-1)     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| DS 30-1    | (DS 900-1) | (DS 3000-1)     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 40°         | DS 15-1    |                  | 15 | 28 | 10 | 79 | 29 | 234 | 8-38 | 5-95 | 315 | 29 | 4-09 | 6-37 | 3 | 1%
| DS 18-1    | (DS 375-1) | (DS 900-1)      |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| DS 21-1    | (DS 450-1) | (DS 1350-1)     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| DS 24-1    | (DS 600-1) | (DS 1800-1)     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| DS 27-1    | (DS 750-1) | (DS 2250-1)     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| DS 30-1    | (DS 900-1) | (DS 3000-1)     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |

**Reinforcement for Concrete End Sections**

For Pipe Culverts 15" (375 mm) THRU 36" (900 mm) Dia. Skewed with Roadway

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**WINGS FOR 1:2 SLOPE**

**FOR PIPE CULVERTS**

---

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**Concrete Rein. Bars: 2 End Sections**

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**Bars for 2 End Sections (in.)**

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<td>12-0</td>
<td>3-6</td>
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</table>
Provide wings for 1:2 slope. If the embankment slope above the headwall is flatter than 1:2, provide wings for 1:3 slope.

Use two layers of welded wire reinforcement in back face of wingwalls.

**GENERAL NOTES**

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.
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<th>Welded Wire Reinforcement 2 End Secs. (sq. yd.)</th>
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<td>(1250)</td>
<td>(1.25 m)</td>
<td>(3400)</td>
<td>(3.4 m)</td>
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**Notes:**
- All dimensions are in meters.
- For concrete volumes, use the appropriate conversion factor.
- Welded wire reinforcement is based on standard pipe culvert sizes.
## WINGS FOR 1:2 SLOPE

### Concrete Dimensions (mi) for 1-2 Slope

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<thead>
<tr>
<th>Slope Angle</th>
<th>Nominal Pipe Dia (in)</th>
<th>Concrete End Secs. 2 sq. yd. (sq ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5°</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10°</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15°</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20°</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30°</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Reinforced Concrete End Sections

- Standard 542206-04
- Skewed with roadway

### Reinforced Concrete End Sections for Pipe Culverts

42" (1060 mm) thru 60" (1500 mm) DIA Skewed with Roadway

**STANDARD 542206-04**
## WINGS FOR 1:1 1/2 SLOPE

### Dimensions for Concrete

<table>
<thead>
<tr>
<th>Slope Angle</th>
<th>Nominal Pipe Dia.</th>
<th>Dimensions for Concrete</th>
<th>Concrete 2 End Secs.</th>
<th>Welded Wire Reinforcement 2 End Secs.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>D</td>
</tr>
<tr>
<td>35°</td>
<td>42</td>
<td>(1500)</td>
<td>5'-9&quot;</td>
<td>4'-10&quot;</td>
</tr>
<tr>
<td>40°</td>
<td>54</td>
<td>(1500)</td>
<td>6'-7&quot;</td>
<td>6'-0&quot;</td>
</tr>
<tr>
<td>45°</td>
<td>60</td>
<td>(1500)</td>
<td>7'-10&quot;</td>
<td>6'-10&quot;</td>
</tr>
<tr>
<td>50°</td>
<td>66</td>
<td>(1500)</td>
<td>8'-3&quot;</td>
<td>7'-8&quot;</td>
</tr>
<tr>
<td>55°</td>
<td>72</td>
<td>(1500)</td>
<td>9'-5&quot;</td>
<td>8'-10&quot;</td>
</tr>
<tr>
<td>60°</td>
<td>78</td>
<td>(1500)</td>
<td>10'-0&quot;</td>
<td>9'-12&quot;</td>
</tr>
</tbody>
</table>
End connection to fit pipe used.

**PLAN**

- Same reinforcement as * inner cage, class HE-II
- Same reinforcement as * outer cage, class HE-II

**SECTION A-A**

- Precast or cast in place and block.

**OPTIONAL WELDED WIRE REINFORCEMENT LAP**

**END VIEW**

**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.

**TABLE**

<table>
<thead>
<tr>
<th>Span</th>
<th>Rise</th>
<th>EQUIV. DIA.</th>
<th>WALL THICKNESS</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>H</th>
<th>A₁</th>
<th>R₂</th>
<th>SLPE</th>
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<tbody>
<tr>
<td>73</td>
<td>16</td>
<td>18 (400)</td>
<td>35 (888)</td>
<td>25 (640)</td>
<td>8 (200)</td>
<td>22</td>
<td>7 (180)</td>
<td>3-9 (864)</td>
<td>3-1 (127)</td>
<td>6</td>
<td>1 (152)</td>
<td>26</td>
</tr>
<tr>
<td>30</td>
<td>19</td>
<td>24 (588)</td>
<td>35 (888)</td>
<td>35 (888)</td>
<td>20 (500)</td>
<td>20</td>
<td>7 (180)</td>
<td>6 (152)</td>
<td>1.25</td>
<td>9</td>
<td>0.5 (127)</td>
<td>26</td>
</tr>
<tr>
<td>16</td>
<td>22</td>
<td>16 (400)</td>
<td>35 (888)</td>
<td>20 (500)</td>
<td>8 (200)</td>
<td>18</td>
<td>7 (180)</td>
<td>6 (152)</td>
<td>1.25</td>
<td>9</td>
<td>0.5 (127)</td>
<td>26</td>
</tr>
<tr>
<td>53</td>
<td>34</td>
<td>40 (1000)</td>
<td>35 (888)</td>
<td>35 (888)</td>
<td>20 (500)</td>
<td>20</td>
<td>7 (180)</td>
<td>6 (152)</td>
<td>1.25</td>
<td>9</td>
<td>0.5 (127)</td>
<td>26</td>
</tr>
<tr>
<td>66</td>
<td>46</td>
<td>40 (1000)</td>
<td>35 (888)</td>
<td>20 (500)</td>
<td>8 (200)</td>
<td>18</td>
<td>7 (180)</td>
<td>6 (152)</td>
<td>1.25</td>
<td>9</td>
<td>0.5 (127)</td>
<td>26</td>
</tr>
<tr>
<td>66</td>
<td>46</td>
<td>40 (1000)</td>
<td>35 (888)</td>
<td>20 (500)</td>
<td>8 (200)</td>
<td>18</td>
<td>7 (180)</td>
<td>6 (152)</td>
<td>1.25</td>
<td>9</td>
<td>0.5 (127)</td>
<td>26</td>
</tr>
<tr>
<td>76</td>
<td>58</td>
<td>40 (1000)</td>
<td>35 (888)</td>
<td>20 (500)</td>
<td>8 (200)</td>
<td>18</td>
<td>7 (180)</td>
<td>6 (152)</td>
<td>1.25</td>
<td>9</td>
<td>0.5 (127)</td>
<td>26</td>
</tr>
</tbody>
</table>

**NOTES**

- 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.
- Switched units to English (metric) unless otherwise shown.
- Changed terminology to "welded wire reinforcement."
- Corrected min. lap dimension.
- Converted units to English (metric) unless otherwise shown.

**DATE**

<table>
<thead>
<tr>
<th>DATE</th>
<th>REVISIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-1-16</td>
<td>Changed terminology to &quot;welded wire reinforcement.&quot;</td>
</tr>
<tr>
<td>1-1-16</td>
<td>Corrected min. lap dimension.</td>
</tr>
<tr>
<td>1-1-09</td>
<td>Switched units to English (metric).</td>
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</table>

**STANDARD**

542306-03

**PRECAST REINFORCED CONCRETE ELLIPTICAL FLARED END SECTION**
Steel anchor pipe

See Detail A for dimensions and details not shown.

SECTION A-A

SECTION B-B

SECTION D-D

PLAN VIEW

DETAIL A

DETAIL B

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 25/64 (0.1969)

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

TRAVERSABLE PIPE GRATE FOR CONCRETE END SECTIONS
**Pipe-Grate Schedule for Pipe Culvert End Sections**

<table>
<thead>
<tr>
<th>Pipe ID</th>
<th>1/3</th>
<th>2/4</th>
<th>2/6</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. / Length</td>
<td>Int. Support</td>
<td>Total Length</td>
<td>Int. Support</td>
</tr>
<tr>
<td>27</td>
<td>1 @ (9.95 m)</td>
<td>N/A</td>
<td>1 @ (12.71 m)</td>
</tr>
<tr>
<td>30</td>
<td>1 @ (13.43 m)</td>
<td>N/A</td>
<td>1 @ (16.21 m)</td>
</tr>
<tr>
<td>35</td>
<td>1 @ (16.83 m)</td>
<td>N/A</td>
<td>1 @ (22.17 m)</td>
</tr>
<tr>
<td>36</td>
<td>1 @ (19.13 m)</td>
<td>N/A</td>
<td>1 @ (21.81 m)</td>
</tr>
<tr>
<td>37</td>
<td>2 @ (24.50 m)</td>
<td>N/A</td>
<td>2 @ (29.70 m)</td>
</tr>
<tr>
<td>40</td>
<td>2 @ (28.74 m)</td>
<td>N/A</td>
<td>2 @ (36.74 m)</td>
</tr>
<tr>
<td>46</td>
<td>3 @ (33.04 m)</td>
<td>N/A</td>
<td>3 @ (42.34 m)</td>
</tr>
<tr>
<td>66</td>
<td>2 @ (38.10 m)</td>
<td>N/A</td>
<td>2 @ (47.60 m)</td>
</tr>
<tr>
<td>68</td>
<td>2 @ (40.30 m)</td>
<td>N/A</td>
<td>2 @ (50.90 m)</td>
</tr>
<tr>
<td>95</td>
<td>2 @ (56.20 m)</td>
<td>N/A</td>
<td>2 @ (69.50 m)</td>
</tr>
<tr>
<td>110</td>
<td>2 @ (61.00 m)</td>
<td>N/A</td>
<td>2 @ (81.80 m)</td>
</tr>
</tbody>
</table>

**Pipe-Grate Schedule for Elliptical Pipe Culvert End Sections**

<table>
<thead>
<tr>
<th>Pipe ID (Equal, Round)</th>
<th>1/3</th>
<th>2/4</th>
<th>2/6</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. / Length</td>
<td>Int. Support</td>
<td>Total Length</td>
<td>Int. Support</td>
</tr>
<tr>
<td>21</td>
<td>1 @ (8.27 m)</td>
<td>N/A</td>
<td>1 @ (11.23 m)</td>
</tr>
<tr>
<td>24</td>
<td>1 @ (10.94 m)</td>
<td>N/A</td>
<td>1 @ (13.90 m)</td>
</tr>
<tr>
<td>27</td>
<td>1 @ (13.61 m)</td>
<td>N/A</td>
<td>1 @ (16.57 m)</td>
</tr>
<tr>
<td>30</td>
<td>1 @ (17.17 m)</td>
<td>N/A</td>
<td>1 @ (20.13 m)</td>
</tr>
<tr>
<td>35</td>
<td>1 @ (20.73 m)</td>
<td>N/A</td>
<td>1 @ (23.69 m)</td>
</tr>
<tr>
<td>36</td>
<td>1 @ (23.29 m)</td>
<td>N/A</td>
<td>1 @ (26.25 m)</td>
</tr>
<tr>
<td>37</td>
<td>2 @ (28.89 m)</td>
<td>N/A</td>
<td>2 @ (31.85 m)</td>
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<tr>
<td>40</td>
<td>3 @ (34.49 m)</td>
<td>N/A</td>
<td>3 @ (37.45 m)</td>
</tr>
<tr>
<td>46</td>
<td>3 @ (40.15 m)</td>
<td>N/A</td>
<td>3 @ (43.11 m)</td>
</tr>
<tr>
<td>66</td>
<td>2 @ (45.75 m)</td>
<td>N/A</td>
<td>2 @ (48.71 m)</td>
</tr>
<tr>
<td>68</td>
<td>2 @ (48.45 m)</td>
<td>N/A</td>
<td>2 @ (51.41 m)</td>
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<tr>
<td>95</td>
<td>2 @ (54.15 m)</td>
<td>N/A</td>
<td>2 @ (57.11 m)</td>
</tr>
<tr>
<td>110</td>
<td>2 @ (60.85 m)</td>
<td>N/A</td>
<td>2 @ (63.81 m)</td>
</tr>
<tr>
<td>PIPE DIA</td>
<td>THICKNESS</td>
<td>DIMENSIONS</td>
<td>SLOPE (Approx)</td>
</tr>
<tr>
<td>---------</td>
<td>-----------</td>
<td>------------</td>
<td>---------------</td>
</tr>
<tr>
<td>A</td>
<td>B</td>
<td>D</td>
<td>L</td>
</tr>
<tr>
<td>(max)</td>
<td>(max)</td>
<td>(max)</td>
<td>(max)</td>
</tr>
<tr>
<td>72</td>
<td>24</td>
<td>36</td>
<td>30</td>
</tr>
<tr>
<td>90</td>
<td>36</td>
<td>48</td>
<td>36</td>
</tr>
<tr>
<td>120</td>
<td>48</td>
<td>56</td>
<td>42</td>
</tr>
<tr>
<td>150</td>
<td>60</td>
<td>64</td>
<td>48</td>
</tr>
<tr>
<td>180</td>
<td>72</td>
<td>78</td>
<td>51</td>
</tr>
<tr>
<td>210</td>
<td>84</td>
<td>87</td>
<td>56</td>
</tr>
</tbody>
</table>

**NOTES**

1. Types 1 and 2 for pipes with annular ends only.

2. Type 3 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. Stub shall be either 2\(\times\)6 (51\(\times\)150) band bolt or annular band of 3\(\times\)1 (75\(\times\)25). The simple, hugger, or annular band may be used with corrugated metal pipes having annular ends. For corrugated metal pipes having holical ends, only the simple band will be allowed.

3. Type 4 connection can be used for all pipe sizes. Coupler shall be 2\(\times\)6 \(\times\) 3\(\times\)1 (90\(\times\)3\(\times\)25). The simple, hugger, or annular band may be used with corrugated metal pipes having annular ends. For corrugated metal pipes having holical ends, only the simple band will be allowed.

All dimensions are in inches (millimeters) unless otherwise shown.
FOR PIPE CULVERTS 15" (375 mm) THRU 60" (1500 mm) DIA.

Metal End Sections for Round Pipe Culvert

<table>
<thead>
<tr>
<th>Pipe Dia (in)</th>
<th>Metal End Section (in)</th>
<th>Overall Width (in)</th>
<th>Slope 1:4</th>
<th>Slope 1:6</th>
</tr>
</thead>
<tbody>
<tr>
<td>15 (1975)</td>
<td>0.064</td>
<td>12</td>
<td>39</td>
<td>39</td>
</tr>
<tr>
<td>16 (2000)</td>
<td>0.064</td>
<td>12</td>
<td>40</td>
<td>40</td>
</tr>
<tr>
<td>21 (2000)</td>
<td>0.064</td>
<td>12</td>
<td>43</td>
<td>43</td>
</tr>
<tr>
<td>24 (2400)</td>
<td>0.064</td>
<td>12</td>
<td>46</td>
<td>46</td>
</tr>
<tr>
<td>30 (3000)</td>
<td>0.109</td>
<td>12</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td>36 (3000)</td>
<td>0.109</td>
<td>12</td>
<td>79</td>
<td>79</td>
</tr>
<tr>
<td>42 (3000)</td>
<td>0.109</td>
<td>12</td>
<td>91</td>
<td>91</td>
</tr>
<tr>
<td>48 (3600)</td>
<td>0.109</td>
<td>12</td>
<td>102</td>
<td>102</td>
</tr>
<tr>
<td>54 (4200)</td>
<td>0.109</td>
<td>12</td>
<td>112</td>
<td>112</td>
</tr>
<tr>
<td>60 (4800)</td>
<td>0.109</td>
<td>12</td>
<td>124</td>
<td>124</td>
</tr>
<tr>
<td>(5000)</td>
<td>0.109</td>
<td>12</td>
<td>138</td>
<td>138</td>
</tr>
</tbody>
</table>

**SECTION A-A**

**SECTION B-B**

**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

**REVISIONS**

1-1-18 New standard

**SLOPED METAL END SECTIONS**

FOR PIPE CULVERTS 15" (375 mm) THRU 60" (1500 mm) DIA.

**STANDARD 542411**
**CROSS DRAINAGE END SECTION - ELEVATION**

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.

**PARALLEL DRAINAGE END SECTION - ELEVATION**

**SAFETY BAR DETAILS**

**LONGITUDINAL DRAINAGE BAR**

1 x 5/8 (25 x 16) inch 3 (75) galvanized steel pipe: flatten end, then bend outside 4 (100) to match end section sides.

**PARALLEL BARS**

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

**TYPICAL INSTALLATION**

**STANDARD 542411**
**Longitudinal Drainage Bar**

- 1 x 3/8 (25 x 16) gages.
- 3 (75) galvanized steel pipe: flatten end, then bend outside 4 (100) to match end section sides.

**Parallel Bars**

**Safety Bar Details**

**Typical Installation**

- 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.

**Slope or Rise (R)**

- Diameter (D) (typ.)

**Cross Drainage End Section**

**Parallel Drainage End Section**

**Safety Bars**

- Longitudinal bars
- Transverse slope
- Front slope
- Main line
- Pipe culvert
- Side road or driveway
- Main line
- Pipe culvert
- Front slope

---

**Illinois Department of Transportation**

January 1, 2018

APPROVED

January 1, 2018

ENGINEER OF DESIGN AND ENVIRONMENT

1-1-18

PASSED

ENGINEER OF POLICY AND PROCEDURES

---

**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. 8 (No. 13)</td>
<td>9'-5&quot;</td>
</tr>
<tr>
<td>w</td>
<td>10</td>
<td>No. 8 (No. 13)</td>
<td>6'-3&quot;</td>
</tr>
<tr>
<td>u1</td>
<td>1</td>
<td>No. 6 (No. 13)</td>
<td>5'-8&quot;</td>
</tr>
<tr>
<td>v</td>
<td>6</td>
<td>No. 6 (No. 13)</td>
<td>4'-0&quot;</td>
</tr>
<tr>
<td>v1</td>
<td>4</td>
<td>No. 4 (No. 13)</td>
<td>24</td>
</tr>
<tr>
<td>v2</td>
<td>2</td>
<td>No. 4 (No. 13)</td>
<td>18</td>
</tr>
<tr>
<td>Galv. Steel Pipe</td>
<td></td>
<td>O.D. 8&quot;</td>
<td>8'-6&quot;</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.</td>
<td>(kg)</td>
<td>115</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 24 (600) A

---

PLAN OF REINFORCEMENT

Bars u & u1

DATE REVISIONS
1-1-09 Switched units to English (metric).
1-1-07 Soft converted metric reinforcement bars.

STANDARD 542501-02
TOP ANCHOR PLATE

1/4 in. Dia. holes

SECTION B-B

1/4 in. Steel plate

1/4 (M12) hex lock nut & washer

SECTION C-C

3/8 (99) O.D. galv. steel pipe

DETAIL AT BLOCKOUTS

1/2 (M12) U BOLT

2 - required

INLET BOX

TYPE 24 (600) A

(STANDARD 542501-02)
**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**

**PLAN**

Sketch showing location and direction of box in relation to \( \xi \) median.

---

**SECTION A-A**

---

**TABLE 1**

<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 (No. 13)</td>
<td>12'-4&quot; (3.76 m)</td>
</tr>
<tr>
<td>h1</td>
<td>2</td>
<td>No. 4 (No. 13)</td>
<td>9'-4&quot; (2.84 m)</td>
</tr>
<tr>
<td>h2</td>
<td>2</td>
<td>No. 4 (No. 13)</td>
<td>12'-8&quot; (3.86 m)</td>
</tr>
<tr>
<td>u</td>
<td>7</td>
<td>No. 4 (No. 13)</td>
<td>6'-5&quot; (1.95 m)</td>
</tr>
<tr>
<td>u1</td>
<td>5</td>
<td>No. 4 (No. 13)</td>
<td>5'-11&quot; (1.80 m)</td>
</tr>
<tr>
<td>u2</td>
<td>2</td>
<td>No. 4 (No. 13)</td>
<td>5'-10&quot; (1.75 m)</td>
</tr>
<tr>
<td>v</td>
<td>2</td>
<td>No. 4 (No. 13)</td>
<td>3'-8&quot; (1.11 m)</td>
</tr>
<tr>
<td>v1</td>
<td>4</td>
<td>No. 4 (No. 13)</td>
<td>2'-0&quot; (0.60 m)</td>
</tr>
<tr>
<td>v2</td>
<td>6</td>
<td>No. 4 (No. 13)</td>
<td>1'-0&quot; (0.30 m)</td>
</tr>
</tbody>
</table>

**Concrete**

<table>
<thead>
<tr>
<th>Bar</th>
<th>Qty</th>
<th>Size</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/4 (69) O.D. galv. steel pipe</td>
<td>1.9 (1.5)</td>
<td>12'-39&quot; (3.86 m)</td>
<td></td>
</tr>
</tbody>
</table>

**Rein. Bars**

<table>
<thead>
<tr>
<th>Bar</th>
<th>Qty</th>
<th>Size</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/4 (69) O.D. galv. steel pipe</td>
<td>141 (64.0)</td>
<td>12'-8&quot; (3.86 m)</td>
<td></td>
</tr>
</tbody>
</table>

**Galv. Steel Pipe**

"8" 3" (25) 12'-5" (3.80 m) 89 (50)

**Material required for one inlet box**

**Bars**

<table>
<thead>
<tr>
<th>Bar</th>
<th>Qty</th>
<th>Size</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bars u, u1 &amp; u2</td>
<td>18 (450)</td>
<td>15 (375)</td>
<td>1 &amp; 2</td>
</tr>
</tbody>
</table>

**Inlet Box**

---

**Traffic**

---

**DATE**

**REVISIONS**

4-1-16

Increased length of unit box to provide clearance for top u-bolt.

1-1-09

Switched units to English (metric).
PLAN OF REINFORCEMENT

SECTION A-A

Bar h1

Bar u & u1

PLAN

INLET BOX
TYPE 24 (600) D

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.

BAR CHART

<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. 4 (13)</td>
<td>12'-0&quot; (3.66 m)</td>
</tr>
<tr>
<td>h1</td>
<td>8</td>
<td>No. 4 (13)</td>
<td>6'-5&quot; (1.94 m)</td>
</tr>
<tr>
<td>L</td>
<td>3</td>
<td>No. 4 (13)</td>
<td>22      (550)</td>
</tr>
<tr>
<td>u</td>
<td>14</td>
<td>No. 4 (13)</td>
<td>6'-5&quot; (1.94 m)</td>
</tr>
<tr>
<td>v</td>
<td>2</td>
<td>No. 4 (13)</td>
<td>7'-5&quot; (2.26 m)</td>
</tr>
<tr>
<td>v1</td>
<td>16</td>
<td>No. 4 (13)</td>
<td>30      (760)</td>
</tr>
<tr>
<td>v2</td>
<td>6</td>
<td>No. 4 (13)</td>
<td>24      (610)</td>
</tr>
<tr>
<td>v3</td>
<td>8</td>
<td>No. 4 (13)</td>
<td>18      (450)</td>
</tr>
</tbody>
</table>

Concrete

Reinf. Bars

Galv. Steel Pipe

cu. yds. (m³)

lbs. (kg)

2.2 (99.8)

11'-7" (3.55 m)

1.8 m

3'-8" (1.04 m)

Traffic

Sketch showing location and direction of box in relation to ditch.

Concrete required for one inlet box

Bar Qty. Size Length

Galv. Steel Pipe

2.2 (99.8)

11'-7" (3.55 m)

1.8 m

3'-8" (1.04 m)
3'-8" (1.11 m) u2

Concrete

<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. 4</td>
<td>3'-0&quot; (900)</td>
</tr>
<tr>
<td>h1</td>
<td>2</td>
<td>No. 4</td>
<td>9'-0&quot; (2700)</td>
</tr>
<tr>
<td>u</td>
<td>5</td>
<td>No. 4</td>
<td>5'-0&quot; (1500)</td>
</tr>
<tr>
<td>u1</td>
<td>3</td>
<td>No. 4</td>
<td>9'-10&quot; (2900)</td>
</tr>
<tr>
<td>u2</td>
<td>2</td>
<td>No. 4</td>
<td>5'-10&quot; (1575)</td>
</tr>
<tr>
<td>v</td>
<td>6</td>
<td>No. 4</td>
<td>3'-0&quot; (900)</td>
</tr>
<tr>
<td>v1</td>
<td>6</td>
<td>No. 4</td>
<td>9'-0&quot; (2700)</td>
</tr>
<tr>
<td>v2</td>
<td>6</td>
<td>No. 4</td>
<td>18'-0&quot; (5400)</td>
</tr>
<tr>
<td>Reinforcement Bars</td>
<td>lbs.</td>
<td>175 (79.4 kg)</td>
<td></td>
</tr>
<tr>
<td>Galv. Steel Pipe</td>
<td>cu. yds.</td>
<td>89 (1.11 m)</td>
<td></td>
</tr>
</tbody>
</table>

Material required for one inlet box

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.

INLET BOX

TYPE 24 (600) E

STANDARD 542521-02
TOP ANCHOR PLATE

SECTION D-D

SECTION C-C

DETAIL AT BLOCKOUTS

INLET BOX
TYPE 24 (600) E

ENGINEER OF POLICY AND PROCEDURES
APPROVED

ENGINEER OF DESIGN AND ENVIRONMENT
ISSUED

PASSED

Illinois Department of Transportation
January 1, 2009

STANDARD 542521-02
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.

SECTION A-A

PLAN

DETAIL A

INLET BOX
TYPE 24 (600) F

DATE
REVISIONS
1-1-11
Corrected weld symbols
on Sheet 2.

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

ENGINEER OF POLICY AND PROCEDURES
APPROVED

ENGINEER OF DESIGN AND ENVIRONMENT
ISSUED

PASSED

STANDARD 542526-03

(0.3 m)
(7.62 m)
(12.19 m)
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; (6.92 m)</td>
</tr>
<tr>
<td>h1</td>
<td>No. 13</td>
<td>13'-0&quot; (3.96 m)</td>
</tr>
<tr>
<td>l</td>
<td>No. 6</td>
<td>24&quot; (0.60 m)</td>
</tr>
<tr>
<td>u</td>
<td>No. 6</td>
<td>6'-9&quot; (2.06 m)</td>
</tr>
<tr>
<td>u1</td>
<td>No. 13</td>
<td>5'-11&quot; (1.80 m)</td>
</tr>
<tr>
<td>u2</td>
<td>No. 13</td>
<td>5'-10&quot; (1.78 m)</td>
</tr>
<tr>
<td>v</td>
<td>No. 6</td>
<td>30&quot; (0.76 m)</td>
</tr>
<tr>
<td>v1</td>
<td>No. 13</td>
<td>27&quot; (0.69 m)</td>
</tr>
<tr>
<td>v2</td>
<td>No. 13</td>
<td>24&quot; (0.61 m)</td>
</tr>
<tr>
<td>v3</td>
<td>No. 13</td>
<td>18&quot; (0.46 m)</td>
</tr>
</tbody>
</table>

Concrete

cu. yds. (m³) 3.4 (2.6)

Reinf. Bars

lbs. (kg) 250 (113)

Grating

sq. ft. (m²) 70.4 (6.54)
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.

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' 6&quot; (6.20 m)</td>
</tr>
<tr>
<td>u</td>
<td>17</td>
<td>No. 4 (No. 13)</td>
<td>8'-5&quot; (2.56 m)</td>
</tr>
<tr>
<td>u1</td>
<td>6</td>
<td>No. 4 (No. 13)</td>
<td>8'-3&quot; (2.51 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>33' (10.05 m)</td>
</tr>
<tr>
<td>v1</td>
<td>6</td>
<td>No. 4 (No. 13)</td>
<td>30' (9.14 m)</td>
</tr>
<tr>
<td>v2</td>
<td>10</td>
<td>No. 4 (No. 13)</td>
<td>24' (7.32 m)</td>
</tr>
<tr>
<td>v3</td>
<td>10</td>
<td>No. 4 (No. 13)</td>
<td>18' (5.48 m)</td>
</tr>
</tbody>
</table>

Concrete

- Cu. Yds. (m³): 3.2 (2.46)
- Lbs. (kg): 270 (122)
- (sq. ft.) (m²): 56.6 (5.20)

SECTIONS

- B-B
- C-C
- D-D

DETAILS

- B
- C
- D

GENERAL NOTES:

- C or G
- Beams and bars bent and gridded flush
- Material and fasteners as noted
- See DETAIL B
- See DETAIL C

ILLINOIS DEPARTMENT OF TRANSPORTATION

ENGINEER OF POLICY AND PROCEDURES
APPROVED

January 1, 2011

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>18'-5&quot; (5.58 m)</td>
</tr>
<tr>
<td>H2</td>
<td>8</td>
<td>No. 4 (No. 13)</td>
<td>4'-8&quot; (1.47 m)</td>
</tr>
<tr>
<td>h3</td>
<td>2</td>
<td>No. 4 (No. 13)</td>
<td>5'-6&quot; (1.68 m)</td>
</tr>
<tr>
<td>L</td>
<td>6</td>
<td>No. 4 (No. 13)</td>
<td>22&quot; (550)</td>
</tr>
<tr>
<td>v</td>
<td>16</td>
<td>No. 4 (No. 12)</td>
<td>8'-6&quot; (2.59 m)</td>
</tr>
<tr>
<td>u1</td>
<td>2</td>
<td>No. 4 (No. 13)</td>
<td>3'-9&quot; (1.14 m)</td>
</tr>
<tr>
<td>v</td>
<td>8</td>
<td>No. 4 (No. 13)</td>
<td>1'-30&quot; (0.39 m)</td>
</tr>
<tr>
<td>v3</td>
<td>6</td>
<td>No. 4 (No. 13)</td>
<td>6'-6&quot; (1.98 m)</td>
</tr>
<tr>
<td>v2</td>
<td>13</td>
<td>No. 4 (No. 13)</td>
<td>133 (3.42 m)</td>
</tr>
<tr>
<td>v3</td>
<td>10</td>
<td>No. 4 (No. 13)</td>
<td>6'-6&quot; (1.98 m)</td>
</tr>
</tbody>
</table>

Concrete
- 3000 psi (207 MPa)
- 6 cu. yds. (4.5 m³)

Rein. Bars
- 124 (471) lbs.
- 5.0 (89) cu. ft.
- 2 at 14'-1½" (4.35 m)

Galv. Steel Pipe
- 3½ (89) O.D. galv. steel pipe

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

STANDARD 542541-02
Remove concrete along these lines. Clean reinforcement for either tied or welded laps of longitudinal and circumferential reinforcement.

For wire dia. W14 - W6 (10.72 - 7.01), length of weld shall be \( \frac{1}{16} \) (20) min. For wire dia. W5.5 - W2.9 (6.73 - 4.88), length of weld shall be \( \frac{1}{16} \) (10) min. Other wire dia. shall be tied per detail.

WELDED LAP

For wire dia. W14 - W6 (10.72 - 7.01), length of weld shall be \( \frac{1}{16} \) (20) min. For wire dia. W5.5 - W2.9 (6.73 - 4.88), length of weld shall be \( \frac{1}{16} \) (10) min. Other wire dia. shall be tied per detail.

TIED LAP

21 (530) min.

6 (150) min.

\[ \text{Degree of elbow} + 2 \]

\[ \text{Degree of elbow} \div 2 \]

\[ \text{Standard reinforcement} \]

Mortar shall be flush with pipe.

\[ \text{WELDED LAP} \]

\[ \text{TIED LAP} \]

\[ \text{DETAIL A} \]

\[ \text{See DETAIL A for laps.} \]

\[ \text{PLAN (Reinforced concrete pipe elbow)} \]

\[ \text{PLAN (Reinforced concrete pipe)} \]

\[ \text{TRANSVERSE SECTION} \]

All dimensions are in inches (millimeters) unless otherwise shown.
End connection to fit pipe used

Inner cage circumferential reinforcement = 0.01 sq. in./ft. (212 mm²/m) (min.) longitudinal

Inner cage-circumference reinforcement = 0.17 sq. in./ft. (360 mm²/m) (min.)

For wire W5.5 thru W2 (10.008 thru 7.188), length of weld shall be 6 (150) min.

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

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

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

REINFORCED CONCRETE PIPE TEE
STANDARD 542606-02

ENGINEER OF POLICY AND PROCEDURES
APPROVED
January 1, 2011

ENGINEER OF DESIGN AND ENVIRONMENT
ISSUED
1-1-97

PASSED
DATE

REVISIONS
1-1-11 Corrected weld symbol on Welded Lap detail.
1-1-09 Switched units to English (metric).
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.

FRONT VIEW

SIDES VIEW

SECTION A-A

DETAIL OF RODENT SHIELD

No. 4 (No. 13) bar h

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

Back of headwall

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

GROUP (Typ.)

End of pipe

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.

FRONT VIEW

SIDES VIEW

SECTION A-A

DETAIL OF RODENT SHIELD

No. 4 (No. 13) bar h

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

Back of headwall

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

GROUP (Typ.)

End of pipe

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.

FRONT VIEW

SIDES VIEW

SECTION A-A

DETAIL OF RODENT SHIELD

No. 4 (No. 13) bar h

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

Back of headwall

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

GROUP (Typ.)

End of pipe

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.

FRONT VIEW

SIDES VIEW

SECTION A-A

DETAIL OF RODENT SHIELD

No. 4 (No. 13) bar h

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

Back of headwall

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

GROUP (Typ.)

End of pipe

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.

FRONT VIEW

SIDES VIEW

SECTION A-A

DETAIL OF RODENT SHIELD

No. 4 (No. 13) bar h

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

Back of headwall

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

GROUP (Typ.)

End of pipe

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.

FRONT VIEW

SIDES VIEW

SECTION A-A

DETAIL OF RODENT SHIELD

No. 4 (No. 13) bar h

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

Back of headwall

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

GROUP (Typ.)

End of pipe

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.

FRONT VIEW

SIDES VIEW

SECTION A-A

DETAIL OF RODENT SHIELD

No. 4 (No. 13) bar h

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

Back of headwall

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

GROUP (Typ.)

End of pipe

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.
Top of masonry when noted on the plans. Half trap to be used of 1%. A minimum grade Pipe to be laid on ground Undisturbed Outlet

<table>
<thead>
<tr>
<th>MATERIALS FOR WALLS</th>
<th>D</th>
<th>C*</th>
<th>T (min.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concrete Masonry Unit</td>
<td>4'-0&quot; (1.2 m)</td>
<td>30 (750)</td>
<td>5 (125)</td>
</tr>
<tr>
<td>Brick Masonry</td>
<td>4'-0&quot; (1.2 m)</td>
<td>30 (750)</td>
<td>8 (200)</td>
</tr>
<tr>
<td>Precast Reinforced Concrete Section</td>
<td>4'-0&quot; (1.2 m)</td>
<td>30 (750)</td>
<td>4 (100)</td>
</tr>
<tr>
<td>Cast-in-place Concrete</td>
<td>4'-0&quot; (1.2 m)</td>
<td>30 (750)</td>
<td>5 (125)</td>
</tr>
</tbody>
</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
ELEVATION

MATERIALS REQUIRED FOR ONE (1)

<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 (No. 13)</td>
<td>3'-5&quot; (1.02 m)</td>
<td></td>
</tr>
<tr>
<td>h1</td>
<td>3</td>
<td>No. 4 (No. 13)</td>
<td>5'-9&quot; (1.72 m)</td>
<td></td>
</tr>
<tr>
<td>v</td>
<td>14</td>
<td>No. 4 (No. 13)</td>
<td>7'-0&quot; (2.10 m)</td>
<td></td>
</tr>
<tr>
<td>w1</td>
<td>14</td>
<td>No. 4 (No. 13)</td>
<td>6'-6&quot; (1.98 m)</td>
<td></td>
</tr>
<tr>
<td>x</td>
<td>14</td>
<td>No. 4 (No. 13)</td>
<td>6'-9&quot; (2.06 m)</td>
<td></td>
</tr>
<tr>
<td>a</td>
<td>3</td>
<td>No. 4 (No. 13)</td>
<td>1'-11&quot; (0.58 m)</td>
<td></td>
</tr>
</tbody>
</table>

Concrete: cu. yd. (yd³): 2.5 (1.90)

Reinforcement bars: lbs. (kg): 230 (99)

All bars shall be at 12 (300) centers unless otherwise shown. Reinforcement bar clearance shall be 1/4 (A0).

SECTION A-A

See Standard 602701 for details of steps.

GENERAL NOTES

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>

**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.
**MATERIALS FOR WALLS**

<table>
<thead>
<tr>
<th>ALTERNATE WALLS</th>
<th>D</th>
<th>C*</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>4'-0&quot; (1.20 m)</td>
<td>36 (900)</td>
<td>15 (380)</td>
<td>5 (125)</td>
</tr>
<tr>
<td>4'-0&quot; (1.20 m)</td>
<td>36 (900)</td>
<td>15 (380)</td>
<td>5 (125)</td>
</tr>
<tr>
<td>4'-0&quot; (1.20 m)</td>
<td>36 (900)</td>
<td>15 (380)</td>
<td>5 (125)</td>
</tr>
</tbody>
</table>

* For precast reinforced concrete sections, dimension "C*" may vary from the dimension given to plus 6 (150).
Flow 10'-0" (3.05 m) max.
4'-0" (1.22 m) min.

No. 5 (No. 16) bars at 7 (175) cts. (all sides).
Over 8'-0" (2.44 m) to 10'-0" use No. 5 (No. 16) bars at 8 (200) cts. (all sides).
For 4'-0" (1.22 m) to 8'-0" (2.44 m) use No. 5 (No. 16) bars at 6 (150) cts. (all sides).

Exposed edges shall be beveled 45° (19).
See Standard 602701 for details of steps.

Types 4 and 5 to fit with 44 (1120) height, constant slope barrier.
Revised openings in lid to fit.

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

GENERAL NOTES
These structures are for use with concrete barrier, double face, 44 (1120) 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 45° (19).

DRAINAGE STRUCTURES TYPES 4 & 5
REINFORCED LID - TYPE 4 & 5

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 4 & 5

STANDARD 602106-03
**ALTERNATE MATERIALS FOR WALLS**

<table>
<thead>
<tr>
<th>Material</th>
<th>T</th>
</tr>
</thead>
<tbody>
<tr>
<td>BRICK MASONERY <strong>(B)</strong></td>
<td>8</td>
</tr>
<tr>
<td>CAST-IN-PLACE CONCRETE <strong>(A)</strong></td>
<td>6</td>
</tr>
<tr>
<td>CONCRETE MASONRY UNIT <strong>(C)</strong></td>
<td>3</td>
</tr>
<tr>
<td>PRECAST REINFORCED CONCRETE SECTION <strong>(S)</strong></td>
<td>3</td>
</tr>
</tbody>
</table>

**PLAN**

Top of masonry

Concrete fill, 4%

Pipe diameter 24 (600)

Pipe to be laid on a minimum grade of 1%

**ELEVATION**

Pipe to be laid on a minimum grade of 1%

Reinforced cast-in-place concrete

Precast reinforced concrete slab

Sand cushion

**GENERAL NOTES**

Bottom slabs shall be reinforced with a minimum of 0.24 sq. in./ft. (0.0 sq. mm/m) in both directions with a maximum spacing of 10 (250).

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.

**ALTERNATE METHODS**

Increased height to 72 (1800) maximum.

Added max. limit to height.

Added general notes.

**INLET - TYPE A**

Illinois Department of Transportation

January 1, 2014

ENGINEER OF POLICY AND PROCEDURES

APPROVED

January 1, 2014

ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED

DATE

REVISIONS

1-1-14

Passed general notes.

1-1-97

Increased height to 72 (1800) maximum.
For precast reinforced concrete sections, this dimension may vary from the dimension given to plus 6 (150).

Concrete fill, placed in-place concrete

Precast reinfl, conc. slab when the precast reinfl conc. sections alternate is used

Precast reinforced concrete slab

ALTERNATE BOTTOM SLAB

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 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.

INLET - TYPE B

STANDARD 602306-03
FLAT SLAB TOP JOINT CONFIGURATIONS
(Shown at access hole)

SECTION PARALLEL TO PIPE
(Without conical top riser)

SECTION PERPENDICULAR TO PIPE
(With conical top riser)

GEOMETRIC LIMITS FOR PIPE PENETRATION HOLES

Note 1: A minimum of 9 (230) of monolithic reinforced concrete shall be maintained above pipe penetration holes > 24 (600).

Note 2: A minimum 12 (300) inside arc length of reinforced concrete shall be maintained between pipe penetration holes > 15 (380).

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

Note 4: Horizontal joints that intersect pipe penetration holes > 15 (380) shall have one joint splice for every location around the perimeter of the joint where the inside arc length between pipe penetration holes is < 24 (600). See joint splice detail.

Note 5: The recommended pipe penetration hole is equal to the O.D. of the pipe plus 4 (100).

Note 6: Only pipe penetration holes ≤ 15 (380) are allowed in riser sections.

GENERAL NOTES

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.

See Standard 602701 for details of manhole steps.

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

DATE REVISIONS
1-1-21 Revised Note 1 and lifting hole
January 1, 2021 general note
3-1-19 Moved wall reinforcement from inside face to middle

Rinne Department of Transportation

Illinois Department of Transportation

DATE APPROVED
APPROVED
ENGINEER OF DESIGN AND ENVIRONMENT
ISSUED
ENGINEER OF POLICY AND PROCEDURES
2021 2021
PRECAST MANHOLE TYPE A
4' (1.22 m) DIAMETER

STANDARD 602401-07
(Sheet 1 of 2)
CONCRETE FILL, 2% MAX.

Note 1: A minimum of 9 (230) of monolithic reinforced concrete shall be maintained above pipe penetration holes > 32 (810).

Note 2: A minimum 12 (300) inside arc length of reinforced concrete shall be maintained between pipe penetration holes > 15 (380).

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

Note 4: Horizontal joints that intersect pipe penetration holes > 15 (380) shall have one joint splice for every location around the perimeter of the joint where the inside arc length between pipe penetration holes is < 24 (600). See joint splice detail.

Note 5: The recommended pipe penetration hole is equal to the O.D. of the pipe plus 4 (100).

Note 6: Only pipe penetration holes ≤ 15 (380) are allowed in riser sections.

GEOMETRIC LIMITS FOR PIPE PENETRATION HOLES

12-#4 (#13) bars or equivalent, evenly spaced around perimeter. Cut bars to fit.

Note: As an alternate, the barrel wall reinforcement may be reduced to riser wall reinforcement with #3 (#10) bars placed around the pipe penetration holes as shown. This option may be utilized when the pipe penetration holes are formed as opposed to cored.

* As an alternate, the barrel wall reinforcement may be reduced to riser wall reinforcement with #3 (#10) bars placed around the pipe penetration holes as shown. This option may be utilized when the pipe penetration holes are formed as opposed to cored.

GENERAL NOTES

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. See Standard 602701 for details of manhole steps.

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

See Standard 602701 for details of manhole steps.

Lifting holes shall be located in the sections as per the manufacturer's recommendations.

See Standard 602701 for details of manhole steps.

All dimensions are in inches (millimeters) unless otherwise noted.
**FLAT SLAB TOP REINFORCEMENT**

<table>
<thead>
<tr>
<th>Location</th>
<th>WWR (each direction)</th>
<th>Rebar (each direction except as noted)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Aυ (min.)</td>
<td>ς</td>
</tr>
<tr>
<td>Top Mat.</td>
<td>0.11 sq. in./ft.</td>
<td>18</td>
</tr>
<tr>
<td>Bottom Mat.</td>
<td>0.40 sq. in./ft.</td>
<td>6</td>
</tr>
</tbody>
</table>

**WALL REINFORCEMENT**

<table>
<thead>
<tr>
<th>Location</th>
<th>Orientation</th>
<th>WWR or Rebar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Riser Circumferential</td>
<td>0.15 sq. in./ft. (38 sq. mm/mm)</td>
<td>6</td>
</tr>
<tr>
<td>Vertical</td>
<td>0.04 sq. in./ft. (1 sq. mm/mm)</td>
<td>4</td>
</tr>
<tr>
<td>Barrel Circumferential</td>
<td>0.18 sq. in./ft. (46 sq. mm/mm)</td>
<td>6</td>
</tr>
<tr>
<td>Vertical</td>
<td>0.16 sq. in./ft. (40 sq. mm/mm)</td>
<td>4</td>
</tr>
</tbody>
</table>

**BASE SLAB REINFORCEMENT**

<table>
<thead>
<tr>
<th>Location</th>
<th>Total Height</th>
<th>WWR or Rebar (each direction)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top Mat.</td>
<td>&lt; 20 ft. (6.10 m)</td>
<td>0.24 sq. in./ft. (608 sq. mm/mm)</td>
</tr>
<tr>
<td></td>
<td>&gt; 20 ft. (6.10 m)</td>
<td>0.28 sq. in./ft. (705 sq. mm/mm)</td>
</tr>
<tr>
<td>Bottom Mat.</td>
<td>A 6</td>
<td>0.11 sq. in./ft. (232 sq. mm/mm)</td>
</tr>
</tbody>
</table>

**Only one layer of WWR permitted to avoid congestion.**

---

**PLAN - FLAT SLAB TOP**
(Showing layout of bottom reinforcement bars and c bars)

**JOINT SPlice**

**PLAN - FLAT SLAB TOP**
(Showing layout of welded wire reinforcement and c bars)

**TIE PLATE**

---

**STANDARD 602402-03**

**PRECAST MANHOLE TYPE A**

5' (1.52 m) DIAMETER

(Sheet 2 of 2)
**GEOMETRIC LIMITS FOR PIPE PENETRATION HOLES**

**Note 1:**  A minimum of 9 (230) of monolithic reinforced concrete shall be maintained above pipe penetration holes > 76 (190).

**Note 2:**  A minimum 12 (300) inside arc length of reinforced concrete shall be maintained between pipe penetration holes > 15 (380).

**Note 3:**  A maximum of 65 percent of the inside perimeter of the reinforced concrete manhole walls may be removed.

**Note 4:**  Horizontal joints that intersect pipe penetration holes > 15 (380) shall have one joint splice for every location around the perimeter of the joint where the inside arc length between pipe penetration holes is > 24 (600). See joint splice detail.

**Note 5:**  The recommended pipe penetration hole space for every location around the perimeter of the joint where the inside arc length between pipe penetration holes is < 24 (600).

**Note 6:**  Only pipe penetration holes ≤ 15 (380) are allowed in riser sections.

**GENERAL NOTES**

Pipe holes shall be located in the sections as per the manufacturer’s recommendations.

See Standard 602701 for details of manhole steps.

**DATE**

3-1-19  Moved wall reinforcement from inside face to middle.

**REVISIONS**

1-1-21  Revised Note 1, Note 2 and lifting hole general note.

**Sheet 1 of 3**

---

**PRECAST MANHOLE TYPE A**

6' (1.83 m) DIAMETER

**DATE**

3-1-19

**REVISIONS**

1-1-21  Revised Note 1, Note 2 and lifting hole general note.

**Sheet 1 of 3**

---

**PRECAST MANHOLE TYPE A**

6' (1.83 m) DIAMETER

**DATE**

3-1-19

**REVISIONS**

1-1-21  Revised Note 1, Note 2 and lifting hole general note.

**Sheet 1 of 3**

---

**PRECAST MANHOLE TYPE A**

6' (1.83 m) DIAMETER

**DATE**

3-1-19

**REVISIONS**

1-1-21  Revised Note 1, Note 2 and lifting hole general note.

**Sheet 1 of 3**
**FLAT SLAB TOP REINFORCEMENT**

<table>
<thead>
<tr>
<th>Location</th>
<th>Riser Height (RH)</th>
<th>WWR (each direction)</th>
<th>Rebar (each direction except as noted)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top</td>
<td>All</td>
<td>0.11 sq. in./ft.</td>
<td>0.11 sq. in./ft.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>18</td>
<td>18</td>
</tr>
<tr>
<td>Bottom</td>
<td>RH ≤ 10 ft. (3.05 m)</td>
<td>0.15 sq. in./ft.</td>
<td>0.15 sq. in./ft.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>RH &gt; 10 ft. (3.05 m)</td>
<td>0.30 sq. in./ft.</td>
<td>0.15 sq. in./ft.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6</td>
<td>6</td>
</tr>
</tbody>
</table>

See plot view for rebar orientation and spacing and this table for bar size.

**WALL REINFORCEMENT**

<table>
<thead>
<tr>
<th>Location</th>
<th>Orientation</th>
<th>WWR or Rebar (each direction)</th>
<th>A_s (min.)</th>
<th>Spacing (max.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 ft. (1.22 m) Ø Riser</td>
<td>Circumferential</td>
<td>0.12 sq. in./ft. (154 sq. mm²)</td>
<td>6</td>
<td>(200)</td>
</tr>
<tr>
<td></td>
<td>Vertical</td>
<td>0.065 sq. in./ft. (95 sq. mm²)</td>
<td>8</td>
<td>(200)</td>
</tr>
<tr>
<td>6 ft. (1.83 m) Ø Barrel</td>
<td>Circumferential</td>
<td>0.18 sq. in./ft. (249 sq. mm²)</td>
<td>6</td>
<td>(350)</td>
</tr>
<tr>
<td></td>
<td>Vertical</td>
<td>0.065 sq. in./ft. (95 sq. mm²)</td>
<td>8</td>
<td>(200)</td>
</tr>
</tbody>
</table>

**BASE SLAB REINFORCEMENT**

<table>
<thead>
<tr>
<th>Location</th>
<th>Riser Height (RH)</th>
<th>Total Height (TH)</th>
<th>WWR or Rebar (each direction)</th>
<th>A_s (min.)</th>
<th>Spacing (max.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top</td>
<td>RH ≤ 10 ft. (3.05 m)</td>
<td>TH ≤ 20 ft. (6.10 m)</td>
<td>0.10 sq. in./ft. (154 sq. mm²)</td>
<td>6</td>
<td>(150)</td>
</tr>
<tr>
<td>Bottom</td>
<td>All</td>
<td>TH &gt; 10 ft. (3.10 m) or TH &gt; 20 ft. (6.10 m)</td>
<td>0.15 sq. in./ft. (233 sq. mm²)</td>
<td>6</td>
<td>(150)</td>
</tr>
</tbody>
</table>

**BASE SLAB REINFORCEMENT**

*Only one layer of WWR permitted to avoid congestion.*

- **Only one layer of WWR permitted to avoid congestion.**

---

**Connections:**
- **Flat slab top reinforcement**
- **Wall reinforcement**
- **Base slab reinforcement**

---

**Joint Splice:**
- **Connection angle**
- **Tie Plate**

---

**Design Information:**
- **Illinois Department of Transportation**
- **Approved Engineer of Design and Environment**
- **Issued January 1, 1997**
- **Passed Engineer of Policy and Procedures**
- **Standard 602406-11**

---

**Dimensions:**
- **3 (75)**
- **3 (75)**
- **4 (100)**
- **6 (150)**
- **7 (180)**
- **1½ (32) Ø Tie Ø**
- **2½ (65)**
- **7 (180)**
PLAN - FLAT SLAB TOP
(Showing layout of bottom reinforcement bars and c bars)

PLAN - FLAT SLAB TOP
(Showing layout of Welded Wire Reinforcement and c bars)
WWR not permitted for riser heights > 10' (3.05 m).

* #5 (1/2) bars bottom. Bundle first bar with closest WWR bar to the opening and place second bar ±3 (75) away.
8' (2.44 m) DIAMETER

PRECAST MANHOLE TYPE A

SECTION PARALLEL TO PIPE
Without conical top riser

SECTION PERPENDICULAR TO PIPE
With conical top riser

GEOMETRIC LIMITS FOR PIPE PENETRATION HOLES

Note 1: A minimum of 12 (300) of monolithic reinforced concrete shall be maintained above pipe penetration holes > 3'-4" (1.02 m).

Note 2: A minimum 12 (300) inside arc length of reinforced concrete shall be maintained between pipe penetration holes > 15 (380).

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

Note 4: Horizontal joints that intersect pipe penetration holes > 15 (380) shall have one joint splice for every location around the perimeter of the joint where the inside arc length between pipe penetration holes is > 24 (600). See joint splice detail.

Note 5: The recommended pipe penetration hole is equal to the O.D. of the pipe plus 4 (100).

Note 6: Only pipe penetration holes > 15 (380) are allowed in riser sections.

GENERAL NOTES

Pipe holes shall be formed to facilitate proper placement of bar 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.

See Standard 602701 for details of manhole steps.

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

DATE
1-1-21
6-1-21
3-1-19

REVISIONS
Revised Note 1 and lifting hole
Moved wall reinforcement from inside face to middle

STANDARD 602416-09
(Sheet 1 of 3)
**PLAN - FLAT SLAB TOP**

(Showing layout of bottom reinforcement bars and c bars)

Bar c #5 (#16), 12'-4" (3.71 m) length, 4'-2" (1.27 m) radius top and bottom

Bar c #5 (#16), 9'-2" (2.79 m) length, 4'-2" (1.27 m) radius top and bottom

Bar c #5 (#16), 12'-4" (3.71 m) length, 4'-2" (1.27 m) radius top and bottom

Bar c #5 (#16), 9'-2" (2.79 m) length, 4'-2" (1.27 m) radius top and bottom

* #6 (#19) bars bottom. Bundle first bar with closest WWR bar to the opening and place second bar 3 (75) away.

**PLAN - FLAT SLAB TOP**

(Showing layout of Welded Wire Reinforcement and c bars)

WWR not permitted for riser heights > 10' (3.05 m).

**PRECAST MANHOLE TYPE A**

8' (2.44 m) DIAMETER

(Sheet 2 of 3)

STANDARD 602416-09

Illinois Department of Transportation
APPROVED
ENGINEER OF DESIGN AND ENVIRONMENT
ISSUED
ENGINEER OF POLICY AND PROCEDURES
4-1-06

8' (2.44 m) DIAMETER
PRECAST MANHOLE TYPE A

(5 0 )

9'-6" (2.90 m) typ.
3 (75)

6 (150)

D ia. 4 '-0 " (1 .2 2 m

D ia. 2 4 (6 0 0 )

D ia. 2 4 (6 0 0 )

2021
**FLAT SLAB TOP REINFORCEMENT**

<table>
<thead>
<tr>
<th>Location</th>
<th>Riser Height (RH)</th>
<th>WWR (each direction)</th>
<th>Rebar (each direction except as noted)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top Mat</td>
<td>All</td>
<td>0.12 sq. in./ft. (32 sq. mm/m)</td>
<td>6</td>
</tr>
<tr>
<td>Bottom Mat</td>
<td>RH ≤ 10 ft. (3.05 m)</td>
<td>0.045 sq. in./ft. (95 sq. mm/m)</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>RH &gt; 10 ft. (3.05 m)</td>
<td>0.045 sq. in./ft. (95 sq. mm/m)</td>
<td>6</td>
</tr>
</tbody>
</table>

**JOINT SPLICE**

- 24 (610) Ø Riser
- 6 (150) Ø Barrel
- 4 (100) Ø Joint
- 6 (150) Ø Joint

**BASE SLAB REINFORCEMENT**

<table>
<thead>
<tr>
<th>Location</th>
<th>Riser Height (RH)</th>
<th>Total Height (TH)</th>
<th>WWR or Rebar each direction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top Mat</td>
<td>All</td>
<td>0.13 sq. in./ft. (233 sq. mm/m)</td>
<td>6</td>
</tr>
<tr>
<td>Bottom Mat</td>
<td>All</td>
<td>0.11 sq. in./ft. (233 sq. mm/m)</td>
<td>6</td>
</tr>
</tbody>
</table>

**WALL REINFORCEMENT**

<table>
<thead>
<tr>
<th>Location</th>
<th>Orientation</th>
<th>WWR or Rebar</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 ft. (1.22 m) Ø Riser</td>
<td>Circumferential</td>
<td>0.12 sq. in./ft. (254 sq. mm/m)</td>
</tr>
<tr>
<td></td>
<td>Vertical</td>
<td>0.045 sq. in./ft. (95 sq. mm/m)</td>
</tr>
<tr>
<td>8 ft. (2.44 m) Ø Barrel</td>
<td>Circumferential</td>
<td>0.24 sq. in./ft. (508 sq. mm/m)</td>
</tr>
<tr>
<td></td>
<td>Vertical</td>
<td>0.045 sq. in./ft. (95 sq. mm/m)</td>
</tr>
</tbody>
</table>

**Mat Placement**

- **Top Mat**: 4 ft. (1.22 m)
- **Bottom Mat**: 8 ft. (2.44 m)

**Riser Height (RH)**

- **≤ 10 ft. (3.05 m)**
- **> 10 ft. (3.05 m)**

**Total Height (TH)**

- **≤ 20 ft. (6.10 m)**
- **> 20 ft. (6.10 m)**

**Reinforcement Details**

- **2½ (65) Ø Riser**
- **6 (150) Ø Barrel**
- **½ (13) Ø Tie Rod**
- **½ (13) Ø Screwed hole in wall, typ.**

**Notes**

- Only one layer of WWR permitted to avoid congestion.
- See plan view for rebar orientation and spacing and this table for bar size.
- Only one layer of WWR permitted to avoid congestion.
**Illinois Department of Transportation**

**DATE**: 1-1-21

**REVISIONS**: Revised Note 3 and lifting hole

**APPROVED**: general note

**ENGINEER OF DESIGN AND ENVIRONMENT**: 3-1-19

**ISSUED**: Moved wall reinforcement from inside face to middle

**PASSED**: 9' (2.74 m) DIAMETER

**ENGINEER OF POLICY AND PROCEDURES**: 9'-0" (2.74 m)

---

**PRECAST MANHOLE TYPE A**

9' (2.74 m) DIAMETER

**GENERAL NOTES**

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.

See Standard 602701 for details of manhole steps.

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

---

**SECTION PARALLEL TO PIPE**

**SECTION PERPENDICULAR TO PIPE**

**GEOMETRIC LIMITS FOR PIPE PENETRATION HOLES**

**Note 1:** A minimum of 12 (300) of monolithic reinforced concrete shall be maintained above pipe penetration holes ≥ 3'-8" (1.12 m).

**Note 2:** A minimum 12 (300) inside arc length of reinforced concrete shall be maintained between pipe penetration holes ≥ 3'-8" (380).

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

**Note 4:** Horizontal joints that intersect pipe penetration holes ≥ 15 (380) shall have one joint splice for every location around the perimeter of the joint where the inside arc length between pipe penetration holes is < 24 (600). See joint splice detail.

**Note 5:** The recommended pipe penetration hole is equal to the O.D. of the pipe plus 4 (100).

**Note 6:** Only pipe penetration holes ≤ 15 (380) are allowed in riser sections.

---

**BASE SLAB JOINT CONFIGURATIONS**

**SHEAR KEY GEOMETRY**

(Relacement not shown for clarity)

---

**FLAT SLAB TOP JOINT CONFIGURATIONS**

(Shown at access hole)

16-#5 (#16) bars or equivalent, evenly spaced around perimeter. Cut bars to fit.

2-#3 (#10) bars above holes greater than 3'-8" (1.12 m). Length shall be sufficient to intersect the vertical #3 (#10) bars as shown.

16-#3 (#16) bars or equivalent, evenly spaced around perimeter. Cut bars to fit.

---

**GENERAL NOTES**

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

Lifting holes shall be located in the sections as per the manufacturer's recommendations.

See Standard 602701 for details of manhole steps.

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

---

**DATE**: 1-1-21

**REVISIONS**: Revised Note 3 and lifting hole

**APPROVED**: general note

**ENGINEER OF DESIGN AND ENVIRONMENT**: 3-1-19

**ISSUED**: Moved wall reinforcement from inside face to middle

**PASSED**: 9' (2.74 m) DIAMETER

**ENGINEER OF POLICY AND PROCEDURES**: 9'-0" (2.74 m)
PLAN - FLAT SLAB TOP
(Showing layout of bottom reinforcement bars and c bars)

PLAN - FLAT SLAB TOP
(Showing layout of welded wire reinforcement and c bars)

* #6 (48) bars bottom. Bundle first bar with closest WWR bar in the opening and place second bar ±3 (75) away.
**GEOMETRIC LIMITS FOR PIPE PENETRATION HOLES**

Note 1: A minimum of 12 (300) of monolithic reinforced concrete shall be maintained above pipe penetration holes > 4'-0" (1.22 m).

Note 2: A minimum 12 (300) inside arc length of reinforced concrete shall be maintained between pipe penetration holes > 15 (380).

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

Note 4: Horizontal joints that intersect pipeline penetration holes > 15 (380) shall have one joint splice for every location around the perimeter of the joint where the inside arc length between pipe penetration holes < 24 (600). See joint splice detail.

Note 5: The recommended pipe penetration hole is equal to the O.D. of the pipe plus 4 (100).

Note 6: Only pipe penetration holes ≤ 15 (380) are allowed in riser sections.

**GENERAL NOTES**

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.

See Standard 602701 for details of manhole steps.

All dimensions are in inches (millimeters) unless otherwise noted.
PLAN - FLAT SLAB TOP
(Showing layout of bottom reinforcement bars and c bars)

PLAN - FLAT SLAB TOP
(Showing layout of welded wire reinforcement and c bars)

Bar c #5 (#16),
14'-0" (4.26 m)
length, 5'-2" (1.57 m)
radius top and bottom

Bar c #5 (#16),
10'-1" (3.07 m)
length, 5'-2" (1.57 m)
radius top and bottom

* #6 (#19) bars bottom. Bundle first bar with closest WWR bar to the opening and place second bar ±3 (75) away.
**FLAT SLAB TOP JOINT CONFIGURATIONS**

(Shown at access hole)

**GENERAL NOTES**

Use this standard for water mains ≤ 8 (200).

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.

See Standard 602701 for details of manhole steps.

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

**DATE**

1-1-21

**REVISIONS**

1-1-21 Revised lifting hole general note.

3-1-19 Moved wall reinforcement from inside face to middle.

**STANDARD 602501-06**
**PLAN - FLAT SLAB TOP**

(Showing layout of reinforcement bars and c bars)

**BASE SLAB REINFORCEMENT**

<table>
<thead>
<tr>
<th>Location</th>
<th>Total Height</th>
<th>WWR or Rebar (each direction)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>A (min.)</td>
</tr>
<tr>
<td>Top Mat.</td>
<td>± 20 ft. (6.09 m)</td>
<td>0.28 sq. in./ft. (508 sq. mm/m)</td>
</tr>
<tr>
<td></td>
<td>&gt; 20 ft. (6.10 m)</td>
<td>0.24 sq. in./ft. (508 sq. mm/m)</td>
</tr>
</tbody>
</table>

**WALL REINFORCEMENT**

<table>
<thead>
<tr>
<th>Orientation</th>
<th>WWR or Rebar</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A (min.)</td>
</tr>
<tr>
<td>Circumferential</td>
<td>0.12 sq. in./ft. (250 sq. mm/m)</td>
</tr>
<tr>
<td>Vertical</td>
<td>0.055 sq. in./ft. (99 sq. mm/m)</td>
</tr>
</tbody>
</table>

**FLAT SLAB TOP REINFORCEMENT**

<table>
<thead>
<tr>
<th>Location</th>
<th>WWR (each direction)</th>
<th>Bar Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bottom</td>
<td>1.22 sq. in./ft. (3.11 sq. mm/m)</td>
<td>#5</td>
</tr>
</tbody>
</table>

* Only one layer of WWR permitted to avoid compression.

**SHEAR KEY GEOMETRY**

(Reinforcement not shown for clarity)

**BASE SLAB JOINT CONFIGURATIONS**

- Optional Joint
- Cut bars to fit.
- Equally spaced around perimeter.
- 10-#4 (#13) bars or equivalent, evenly spaced around perimeter.
- Cut bars to fit.

**BASE SLAB REINFORCEMENT**

<table>
<thead>
<tr>
<th>Location</th>
<th>Total Height</th>
<th>WWR or Rebar (each direction)</th>
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<tr>
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<td>± 20 ft. (6.09 m)</td>
<td>0.28 sq. in./ft. (508 sq. mm/m)</td>
</tr>
<tr>
<td></td>
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**BASE SLAB JOINT CONFIGURATIONS**

- Optional Joint
- Cut bars to fit.
- Equally spaced around perimeter.
- 10-#4 (#13) bars or equivalent, evenly spaced around perimeter.
- Cut bars to fit.

**WALL REINFORCEMENT**

<table>
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<th>Orientation</th>
<th>WWR or Rebar</th>
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<tr>
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</tr>
<tr>
<td>Vertical</td>
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</tr>
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</table>

**FLAT SLAB TOP REINFORCEMENT**

<table>
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<tr>
<th>Location</th>
<th>WWR (each direction)</th>
<th>Bar Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bottom</td>
<td>1.22 sq. in./ft. (3.11 sq. mm/m)</td>
<td>#5</td>
</tr>
</tbody>
</table>

* Only one layer of WWR permitted to avoid compression.
GENERAL NOTES

Use this standard for water mains ≥ 10 (250).

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.

See Standard 602701 for details of manhole steps.

All dimensions are in inches (millimeters) unless otherwise noted.
**Illinois Department of Transportation**

**APPROVED**

**ENGINEER OF DESIGN AND ENVIRONMENT**

**ISSUED** 1-1-18

**PASSED**

**ENGINEER OF POLICY AND PROCEDURES**

---

**5' (1.52 m) DIAMETER PRECAST VALVE VAULT TYPE A**

---

**PLAN - FLAT SLAB TOP**

(Showing layout of bottom reinforcement bars and c bars)

---

**FLAT SLAB TOP REINFORCEMENT**

<table>
<thead>
<tr>
<th>Location</th>
<th>WW (each direction)</th>
<th>Rebar (each direction max as noted)</th>
<th>Bar Size</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A (mm²)</td>
<td>Spacing (max)</td>
<td>A (mm²)</td>
</tr>
<tr>
<td>Top</td>
<td>0.13 sq. in./ft.</td>
<td>18</td>
<td>0.13 sq. in./ft.</td>
</tr>
<tr>
<td>Mat</td>
<td>233 sq. in./mm²</td>
<td>(450)</td>
<td>233 sq. in./mm²</td>
</tr>
<tr>
<td>Bottom</td>
<td>0.40 sq. in./ft.</td>
<td>6</td>
<td>0.40 sq. in./ft.</td>
</tr>
<tr>
<td>Mat</td>
<td>367 sq. in./mm²</td>
<td>(110)</td>
<td>367 sq. in./mm²</td>
</tr>
</tbody>
</table>

See plan view for rebar orientation and spacing and this table for bar size.

---

**WALL REINFORCEMENT**

<table>
<thead>
<tr>
<th>Orientation</th>
<th>WW or Rebar</th>
<th>A (mm²)</th>
<th>Spacing (max)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Circumferential</td>
<td>0.35 sq. in./ft.</td>
<td>6</td>
<td>0.35 sq. in./ft.</td>
</tr>
<tr>
<td>Vertical</td>
<td>0.04 sq. in./ft.</td>
<td>6</td>
<td>0.04 sq. in./ft.</td>
</tr>
</tbody>
</table>

---

**BASE SLAB REINFORCEMENT**

<table>
<thead>
<tr>
<th>Location</th>
<th>Total Height</th>
<th>WW or Rebar (each direction)</th>
<th>A (mm²)</th>
<th>Spacing (max)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top Mat</td>
<td>≤ 20 ft. (6.10 m)</td>
<td>0.24 sq. in./ft.</td>
<td>10</td>
<td>0.24 sq. in./ft.</td>
</tr>
<tr>
<td></td>
<td>&gt; 20 ft. (6.10 m)</td>
<td>0.28 sq. in./ft.</td>
<td>10</td>
<td>0.28 sq. in./ft.</td>
</tr>
<tr>
<td>Bottom Mat</td>
<td>A1</td>
<td>0.13 sq. in./ft.</td>
<td>18</td>
<td>0.13 sq. in./ft.</td>
</tr>
</tbody>
</table>

---

**BASE SLAB JOINT CONFIGURATIONS**

---

**SHEAR KEY GEOMETRY**

(Reinforcement not shown for clarity)

---

**PRECAST VALVE VAULT TYPE A**

5' (1.52 m) DIAMETER

---

**STANDARD 602506-03**
FLAT SLAB TOP JOINT CONFIGURATIONS
FOR D = 36 (900) AND D = 4'-0" (1.22 m)
(Shown at access hole)

See Top Slab Joint Configurations for
D=36 (900) and
D=4'-0" (1.22 m)

FLAT SLAB TOP JOINT CONFIGURATIONS
D = 5'-0" (1.52 m)
(Shown at access hole)

SECTION THRU FLAT SLAB TOP
FOR D = 36 (900) AND D = 4'-0" (1.22 m)

SECTION THRU FLAT SLAB TOP
FOR D = 5'-0" (1.52 m)

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.

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

TABLE

<table>
<thead>
<tr>
<th>Q</th>
<th>T</th>
<th>D1 (in.)</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>36 (900)</td>
<td>4'-0&quot; (1.2 m)</td>
<td>8 (150)</td>
<td></td>
</tr>
<tr>
<td>4'-0&quot; (1.2 m)</td>
<td>5'-0&quot; (1.5 m)</td>
<td>8 (150)</td>
<td></td>
</tr>
</tbody>
</table>

DATE
1-1-19

REVISIONS
Prepared / revised reinforcement options.
FLAT SLAB TOP REINFORCEMENT FOR D = 36 (900)

<table>
<thead>
<tr>
<th>Location</th>
<th>WWR (each direction)</th>
<th>Spacing (max.)</th>
<th>A_s (min.)</th>
<th>Spacing (max.)</th>
<th>Bar Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bottom</td>
<td>1.60 sq. in./ft.</td>
<td>6</td>
<td>See plan view for rebar orientation and spacing and this table for bar size</td>
<td>#5</td>
<td></td>
</tr>
<tr>
<td>Mat.</td>
<td>1370 sq. mm/m</td>
<td>1150</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

FLAT SLAB TOP REINFORCEMENT FOR D = 4'-0" (1.22 m)

<table>
<thead>
<tr>
<th>Location</th>
<th>WWR (each direction)</th>
<th>Spacing (max.)</th>
<th>A_s (min.)</th>
<th>Spacing (max.)</th>
<th>Bar Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bottom</td>
<td>0.62 sq. in./ft.</td>
<td>6</td>
<td>See plan view for rebar orientation and spacing and this table for bar size</td>
<td>#5</td>
<td></td>
</tr>
<tr>
<td>Mat.</td>
<td>1312 sq. mm/m</td>
<td>1150</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

FLAT SLAB TOP REINFORCEMENT FOR D = 5'-0" (1.52 m)

<table>
<thead>
<tr>
<th>Location</th>
<th>WWR (each direction)</th>
<th>Spacing (max.)</th>
<th>A_s (min.)</th>
<th>Spacing (max.)</th>
<th>Bar Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top</td>
<td>0.11 sq. in./ft.</td>
<td>18</td>
<td>18</td>
<td>#3 or #4</td>
<td></td>
</tr>
<tr>
<td>Mat.</td>
<td>233 sq. mm/m</td>
<td>(450)</td>
<td>233 sq. mm/m</td>
<td>(450)</td>
<td>(4#10) (#13)</td>
</tr>
<tr>
<td>Bottom</td>
<td>0.60 sq. in./ft.</td>
<td>6</td>
<td>See plan view for rebar orientation and spacing and this table for bar size</td>
<td>#6</td>
<td></td>
</tr>
<tr>
<td>Mat.</td>
<td>3847 sq. mm/m</td>
<td>(150)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Only one layer of WWR permitted to avoid congestion.
CAST IRON STEPS

PLAN VIEW

SECTION A-A

ELEVATION VIEW

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

MANHOLE STEPS

STANDARD 602701-02
Inside face of structure

9 (13) Reinforcement bar

3 (75) mm embedment

A+7

PLAN VIEW

SECTION A-A

ELEVATION VIEW

MANHOLE STEPS

ILLINOIS DEPARTMENT OF TRANSPORTATION

ENGINEER OF POLICY AND PROCEDURES

APPROVED

ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED

January 1, 2009

PASSED

STANDARD 602701-02

(Sheet 2 of 2)
CAST FRAME

SECTION C-C

SECTION F-F

SECTION D-D

CAST CLOSED LID

Gray Iron Lid

CAST OPEN LID

ADA COMPLIANT
CAST OPEN LID

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

DATE REVISIONS
1-1-20 Revised dimension in Section B-B of cast open lid
1-1-15 Revised dimension of Frame. Added ADA compliant open lid
1-1-09 Switched units to English (metric)

FRAME AND LIDS
TYPE 1

STANDARD 604001-05
Curb box adjustable from 5\% (135) to 9 (225).

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 4

STANDARD 604016-04
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.

Switched units to English (metric).

1-1-97

1-1-09

1-1-15

BASE, FRAME AND LIDS TYPE 5
STANDARD 604021-04
SECTION A-A

CAST GRATE

SECTION B-B

GRATE TYPE 7

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

DATE | REVISIONS
-----|-------------
1-1-15 | Revised grate thickness.
1-1-09 | Switched units to English (metric).

STANDARD 604031-03
CAST GRATE

6 lugs shown, 3 permitted.

SECTION A-A

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

CAST GRATE

ALTERNATE CURB BOX

SECTION A-A

SECTION B-B

SECTION C-C

SECTION D-D

SECTION E-E

FRAME AND GRATE

TYPE 11

STANDARD 604051-04

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

Curb box adjustable from 4\% (113) to 9 (226)

SECTION B-B

SECTION A-A

ALTERNATE CURB BOX

SECTION E-E

CAST GRATE

FRONT VANE DETAIL

VANE DETAIL

SIDE RIB DETAIL

MIDDLE RIB DETAIL

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

Illinois Department of Transportation

ENGINEER OF POLICY AND PROCEDURES
APPROVED

DATE
REVISIONS
1-1-15 Revised dimensions of frame and alternate curb box
1-1-09 Switched units to English (metric)

FRAME AND GRATE
TYPE 11V

STANDARD 604056-04
SECTION A-A

CAST FRAME

SECTION B-B

SECTION C-C

CAST GRATE

SECTION D-D

FRAME AND GRATE

TYPE 12

STANDARD 604061-03

All dimensions are in inches (millimeters) unless otherwise shown.
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) reinforcing steel required when X = 5 (125) or more

Warp sloping face of curbs in a distance of 5' (1.5 m) to the cross section shown.

SECTION B-B
Slope pavement or gutter flag 12% at inlet.

SECTION Z-Z
Slope pavement or gutter flag 12% at inlet.

SECTION Y-Y

CASE II

SECTION D-D

CASE I

DETAIL E

All dimensions are in inches (millimeters) unless otherwise shown.
½ (13) Dia. tapped holes for bolting down grate, four places.

½ (14) Dia. holes for grate alignment, two places.

One gusset shown each side, two permitted.

½ (13) Dia. stainless steel bolts with washers, through counter bored holes or slots, four places.

All dimensions are in inches (millimeters) unless otherwise shown.
\( \frac{3}{8} \) (38) Holes for grate alignment, two places.

\( \frac{1}{2} \) (13) Dia. tapped holes for bolting down grate, four places.

\( \frac{3}{16} \) (48) Galv. bolt, nut & washer.

\( \frac{1}{4} \) (32) Stainless steel bolts with washers, through counter bored holes or slots, four places.

\( \frac{1}{4} \) (32) Thick strike, four places.

\( \frac{3}{16} \) (48) Stainless steel bolts with washers, through counter bored holes or slots, four places.

\( \frac{1}{4} \) (32) Thick strike, four places.

\( \frac{3}{8} \) (38) Counter bored holes or slots, four places.

\( \frac{1}{4} \) (32) Thick strike, four places.

\( \frac{3}{8} \) (38) Counter bored holes or slots, four places.

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\( \frac{3}{8} \) (38) Counter bored holes or slots, four places.

\( \frac{1}{4} \) (32) Thick strike, four places.

\( \frac{3}{8} \) (38) Counter bored holes or slots, four places.

\( \frac{1}{4} \) (32) Thick strike, four places.
% (13) Dia. tapped holes for bolting down grate, four places each frame.
% (14) Dia. holes for grate alignment, two places each frame.
% (19) Dia. holes, three places each frame.
% (13) Dia. stainless steel bolts with washers, through counter bored holes or slots, four places each grate.
3 ½ x 2½ (M16 x 64) galv. hex. head bolt & nut with galv. washers.

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

FRAME AND GRATES
TYPE 22

STANDARD 604081-06
All dimensions are in inches (millimeters) unless otherwise shown.

Architecture and Engineering

Illinois Department of Transportation
January 1, 2022

Engineer of Policy and Procedures

Approved: January 1, 2022

Engineer of Design and Environment

Issued: 1-1-97

PASSED

DATE

REVISIONS

1-1-22 Removed slots in frame which held the "safety bars".

1-1-21 Removed "safety bars" from frame.

FRAME AND GRATE

TYPE 23

STANDARD 604086-05
All dimensions are in inches (millimeters) unless otherwise shown.

Remove slots in frame which held the "safety bar".

Removed "safety bar" from frame.

FRAME AND GRATE
TYPE 24

STANDARD 604091-05

DATE
REVISIONS
1-1-27
Removed slots in frame which held the "safety bar".
1-1-21
Removed "safety bar" from frame.

Illinois Department of Transportation

January 1, 2022

ENGINEER OF POLICY AND PROCEDURES
APPROVED

January 1, 2022

ENGINEER OF DESIGN AND ENVIRONMENT
ISSUED

PASSED

DATE

REVISIONS

1-1-27

1-1-21

(D4)

(D4)

(D4)

(D4)
Frame 1:4 or 1:6
Grate 45°
Welded wire fabric
1/13 PIP (circumference of pipe)

LOCATION SKETCH - PLAN

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.
**Short radius curve**

- 2-No. 4 (No. 13) bars placed at mid-depth (when space permits)

**Back of curb**

- Drainage casting with curb box

**Construction joint**

- Full depth and width

- (20) thick preformed joint filler

- Saw 2 (50) deep at 4 to 24 hours, and seal.

- Insert 3 (20) thick preformed joint filler full depth and width.

**Undoweled contraction joint (typ.) construction options:**

1. Form with 1/2 (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.

**Mountable curb shown (other types permitted)**

**PLAN**

- **HMA surfacing**
- **Base course**
- **Pavement**

**ON DISTURBED SUBGRADE**

**ON UNDISTURBED SUBGRADE**

**DEPRESSED CURB**

- **BARRIER CURB**

**ADJACENT TO FLEXIBLE PAVEMENT**

**ADJACENT TO PCC PAVEMENT OR PCC BASE COURSE**

**CONCRETE CURB TYPE B**

**STANDARD 606001-08**

Illinois Department of Transportation

January 1, 2022

ENGINEER OF POLICY AND PROCEDURES

APPROVED

January 1, 2022

ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED

1-1-97

PASSED
Quantities
For Section A-A to E-E and curtain wall =
2.38 cu. yds. (1.82 m³) concrete for 9 (225) pavers.
2.41 cu. yds. (1.84 m³) concrete for 10 (250) pavers.
For Section F-F =
0.069 cu. yds. (0.17 m³) concrete per ft. (m)

General Notes
Tie bars shall be No. 6 (No. 19) at 36 (900) centers.
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.

OUTLETS FOR CONCRETE CURB AND GUTTER
TYPE B-6.24 (B-15.60)

STANDARD 606006-04

STANDARD OUTLET

Illinois Department of Transportation
ENGINEER OF DESIGN AND ENVIRONMENT
ISSUED
4-1-16
APPROVED
1-1-18
PASSED
1-1-97
REVISIONS
January 1, 2018
January 1, 2018

(150) R
530
21
3 (75) R
1350
1350
6
11350

(150) R
530
21
3 (75) R
1350
1350
6
11350

Welded wire reinforcement weighing not less than 58 lbs/100 sq. ft. (2.83 kg/m²) per ft begin here.

Flow line

Sec. 36 (900) centers.
2.01 cu. yds. (1.54 m³) concrete for 10 (250) pav't.
1.98 cu. yds. (1.51 m³) concrete for 9 (225) pav't.

### Quantities

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

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

OUTLETS FOR CONCRETE CURB AND GUTTER

TYPE B-6.24 (B-15.60)  

STANDARD 606006-04
No. 6 (No. 13) rebar placed at mid-depth (one each side of casting) placed full depth & width.

Preformed expansion joint placed in prolongation with pcc shoulder joints or at 25' (7.6 m) cts. with HMA shoulders.

Flow line min. 3' (1 m) with HMA shoulders or at 25' (7.6 m) cts.

Expansion joints

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 radii; adjusted qty's.

STANDARD 606101-05

ILLINOIS DEPARTMENT OF TRANSPORTATION

INLET, OUTLET & ENTRANCE
QUANTITIES OF CONCRETE

Commercial Entrances:
Section B-B to C-C = 0.25 cu. yd./ft. (0.82 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.
(58 lbs./100 sq. ft. (2.83 kg/m²))
Section A-A

Section B-B

Section C-C

Section D-D

Section E-E

Section F-F

Sections at End of Outlet

Type A Gutter (Inlet, Outlet & Entrance)

Illinois Department of Transportation

2016

Engineer of Policy and Procedures

Approved

Engineer of Design and Environment

Issued

PASSED

April 1,

STANDARD 606101-05

SECTION F-F

Plan

Edge of paved shld.

Edge of shoulder

Flow line

Welded wire reinforcement to begin here.

158 lbs./100 sq. ft. (2.83 kg/m²)

NOTE

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

Quantity of Concrete

Section A-A to Section E-E + curtain wall = 3.53 cu. yd. (2.70 m³) of concrete.
Section F-F = 0.079 cu. yd./ft. (0.2 m³/m).

Variable for each 1% increase in grade.

Distance shall be increased 6' (1.8 m) for the distance A-D exceeds 2%.
The gutter outlet shall be tied to the pavement in accordance with details for longitudinal construction joint shown on Standard 420001.

---

**GENERAL NOTES**

The gutter outlet shall be No. 6 (No. 19) at 36 (900) centers unless otherwise shown.

If the average grade of pavement for the distance A-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.

---

**PLAN-SINGLE OUTLET**

**GRATE TYPE A**

**SECTION D-D**

**SECTION E-E**

**SECTION F-F**

---

**OUTLET TYPE 1 FOR TYPE A GUTTER**

**STANDARD 606106-05**
NOTE
If the average grade of pavement for the distance A-E exceeds 2%, this distance shall be increased 6 ft. (1.8 m) for each 1% increase in grade.

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

NOTE

1-1-07
ENGINEER OF DESIGN AND ENVIRONMENT
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1-1-09
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PASSED
1-1-97
ISSUED

OUTLETS TYPE 2
FOR TYPE A GUTTER
STANDARD 606111-03

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.

UNIT 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</td>
<td>3.31</td>
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<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</td>
<td>18</td>
</tr>
</tbody>
</table>

1. Switched units to English (metric).
2. Removed weight of grate and cover.
QUANTITY OF CONCRETE
Section A-A to C-C
0.64 cu. yd. (0.49 m³)
Section (C-C to B'-B') + (B-B to A-A) = 0.44 cu. yd. (0.34 m³)
Section B'-B' to B-B = 0.076 cu. yd./ft. (0.19 m³/m)

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.

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.
**NOTE**

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

**QUANTITY OF CONCRETE**

- Section A-A to E-E and curtain wall 1.9 cu. yd. (1.45 m³) concrete.
- Section F-F = 0.068 cu. yd./ft. (0.17 m³/m).

**SECTION A-A**

- Rolled edge
- Shoulder
- Edge of outlet to conform to edge of shoulder
- Center line of outlet

- Welded wire reinforcement (not less than 58 lbs./100 sq. ft. (2.83 kg/m²)) to begin here.

**SECTION B-B**

- Rolled edge
- Shoulder
- Edge of outlet to conform to edge of shoulder

- Welded wire reinforcement

**SECTION C-C**

- Rolled edge
- Shoulder
- Edge of outlet to conform to edge of shoulder

- Welded wire reinforcement

**SECTION D-D**

- Rolled edge
- Shoulder
- Edge of outlet to conform to edge of shoulder

- Welded wire reinforcement

**SECTION F-F**

- Rolled edge
- Shoulder
- Edge of outlet to conform to edge of shoulder

- Welded wire reinforcement

**SECTION E-E**

- Rolled edge
- Shoulder
- Edge of outlet to conform to edge of shoulder

- Welded wire reinforcement

**SECTIONS AT END OF OUTLET**

- Rolled edge
- Shoulder
- Edge of outlet to conform to edge of shoulder

- Welded wire reinforcement

**TYPE B GUTTER**

(INLET, OUTLET & ENTRANCE)

STANDARD 606201-04

Illinois Department of Transportation

ENGINEER OF POLICY AND PROCEDURES

APPROVED

ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED

1-1-97

PASSED

January 1, 2018
**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>
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<td>Concrete - cu. yd. (m³)</td>
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<td>Cast Iron Cover - Ea.</td>
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<td>1</td>
</tr>
<tr>
<td>Pipe Drain - Dia. in. (mm)</td>
<td>1300</td>
<td>1370</td>
</tr>
</tbody>
</table>

**DATE**

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

Corner

angle

Typical detail when corner angle is less than 90° and for other corners with radius greater than 24 (600).

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

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

EXPLANATION:

1. Coarse aggregate fill to subgrade

2. Face of mountable curb

3. Pavement

4. PCC base course plus HMA thickness.

5. PEJF = Preformed expansion joint filler.

6. Keyed longitudinal construction joints shall be constructed without tie bars.

7. See Standard 420001 and 606001 for details not shown.

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

9. Pavement or pcc base course thickness.

10. X = PCC base course plus HMA thickness.

11. \( t \) = Pavement or pcc base course thickness.

12. Illinois Department of Transportation

13. ENGINEER OF POLICY AND PROCEDURES

14. APPROVED

15. ENGINEER OF DESIGN AND ENVIRONMENT

16. ISSUED

17. PASSED

18. DATE

19. REVISIONS

20. STANDARD 606301-04

21. PC CONCRETE ISLANDS AND MEDIANS (Sheet 1 of 2)
Align with joint in adjacent pavement.

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.

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.

PCC or HMA

Improved subgrade

R = 1/2 (13)

Improved subgrade (when required)

Width as shown on the plans

PCC base course

HMA surfacing

PCC or HMA (var. thickness)

R = 1/2 (13)

1.5% Slope min.

Slope 1:1

3.5% Slope min.

Welded wire reinforcement

Keyed longitudinal construction joint

Keyed longitudinal construction joint

Improved subgrade
TABLE FOR PAVED DITCH TYPE A

<table>
<thead>
<tr>
<th>TYPE</th>
<th>10</th>
<th>12</th>
<th>15</th>
<th>Flow Area</th>
<th>Conc. Area</th>
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<tr>
<td>A-12</td>
<td>6</td>
<td>5</td>
<td>18</td>
<td>1.95</td>
<td>0.278</td>
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<tr>
<td>A-22</td>
<td>9</td>
<td>6</td>
<td>28</td>
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<tr>
<td>A-32</td>
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<td>42</td>
<td>9.75</td>
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<td>A-37</td>
<td>18</td>
<td>10</td>
<td>54</td>
<td>13.27</td>
<td>2.301</td>
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<td>A-42</td>
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<td>A-62</td>
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<td>78</td>
<td>20.00</td>
<td>3.400</td>
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</table>

* = 10 + (6 x 150) x Earth slope

TABLE FOR PAVED DITCH TYPE B

<table>
<thead>
<tr>
<th>TYPE</th>
<th>10</th>
<th>12</th>
<th>15</th>
<th>Flow Area</th>
<th>Conc. Area</th>
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<tr>
<td>B-15</td>
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<td>B-25</td>
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<td>42</td>
<td>9.75</td>
<td>1.598</td>
</tr>
<tr>
<td>B-37</td>
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<td>10</td>
<td>54</td>
<td>13.27</td>
<td>2.301</td>
</tr>
<tr>
<td>B-42</td>
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<td>12</td>
<td>66</td>
<td>16.60</td>
<td>2.800</td>
</tr>
<tr>
<td>B-62</td>
<td>24</td>
<td>14</td>
<td>78</td>
<td>20.00</td>
<td>3.400</td>
</tr>
</tbody>
</table>

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

Location and Limits of Paved Ditch

Plan View

Detail of Upstream End

Detail of Downstream End

Elevation View

Section A-A

Section B-B

Section C-C

Ditch Type A

Ditch Type B

Engineer of Policy and Procedures

Issued

Paved Ditch

Illinois Department of Transportation

Standard 606401-02
### Type F

- **Grating**
  - Type G requires 1 grate
  - Type E requires 2 grates
  - Type F requires 3 grates

### Notes
- Welded wire reinforcement (WWR) may be used in lieu of reinforcement bars. Only one layer of WWR is permitted to avoid congestion.
**SECTION A-A**

When "S" is less than 3 and the distance from the back of post is less than 24 (600), the post shall be used 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 25'-0" (7.62 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 POST CONSTRUCTION

- Use W150x12.5 or W150x12.75 steel post.
- Post bolt with std. hex nut.
- 12x6 (305x152) Rough sawn timber blockout toenailed to post with 160 nails.

WOOD POST CONSTRUCTION

- Use 200x150 Rough sawn timber post.
- Bolt not to extend more than 1/4 (6) past nut.

TWO-PIECE WOOD BLOCKOUT OPTION

- Two-piece wood blockout.
- Post bolt with std. hex nut.
- Std. flat washer.

WOOD BLOCK-OUT AND STEEL POST DETAILS

- Four holes each flange.
- All holes 3/8 (20) dia.

POST OR SPLICE BOLT & NUT

- Dia. and depth of recess to suit bolt.
- As required.
CABLE ASSEMBLY

(42,800 lbs. (190 kN) min. breaking strength)
Tighten to taut tension.

NOTE
Anchor plate T shall be used to attach cable assembly to guardrail when required on traffic barrier terminals.

END SECTION

TERMINALS

1. M24 double nuts or locknuts and 6 (3) washer

Class A rail element

17 w/ (33) Dia. hole

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.

ANCHOR PLATE T DETAILS

RAIL ELEMENT SPLICE

NOTE

STANDARD 630001-12
GUARDRAIL
STEEL PLATE BEAM
END SHOE

ALTERNATE END SHOE
**GUARDRAIL PLACED BEHIND CURB**

Note: "D" shall not exceed 6 (152) for design speeds greater than 45 mph.

---

**FOOTING FOR POST WHEN IMPERVIOUS MATERIAL IS ENCOUNTERED**

- Ledge line is top of rock ledge or hard slag fill.
- Drilled hole
- Aggregate backfill (CA 11)
- Steel or wood post (steel shown)
- Finished ground line

**ELEVATION**

---

**LEAVE-OUT FOR POST WHEN PAVED MATERIAL IS ENCOUNTERED**

- Leave-out from paving or overlapping core holes with sides smoothed
- HMA or PCC pavement
- Steel or wood post (steel shown)
- Aggregate backfill (CA 11)

---

**MATERIAL IS ENCOUNTERED, BUT DO NOT SHORTEN POST.**

---

**STANDARD 630001-12**

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

For details of guardrail elements not shown, see Standard 630001.

All dimensions are in inches (millimeters) unless otherwise shown.
Note: Ledge line is top of rock ledge or hard slag fill.

FINISHED GROUND LINE

AGGREGATE BACKFILL (CA 11)

DRILLED HOLE

LEAVE-OUT OR OVERLAPPING CORED HOLES WITH SMOOTHED SMOOTHED CORED HOLES WITH SIDES

LEAVE-OUT FOR POST WHEN PAVED MATERIAL IS ENCOUNTERED

FOOTING FOR POST WHEN IMPERVIOUS MATERIAL IS ENCOUNTERED

HMA OR CONTROLLED LOW-STRENGTH MATERIAL (CLSM)

HAZARD: If greater than 8 (200) apply FOOTING FOR POST WHEN IMPERVIOUS MATERIAL IS ENCOUNTERED, but do not shorten post.

Steel post

Aggregate backfill (CA 11)

Finished ground line

Ledge

Drilled hole

V
W
L

0 - 6
(0 - 152)

24
21
(810)
(510)

> 6 - 28
(> 152 - 458)

18
145
(458)
(14

> 28 - 31
(> 458 - 787)

12
8
(305)
(200)

> 31 - 40
(> 787 - 1.02 m)

12 - 0
(100 - 0)
(200)

> 787 - 1.02 m

Steel post

Aggregate backfill (CA 11)

HMA or PCC pavement

LEAVE-OUT FOR POST WHEN PAVED MATERIAL IS ENCOUNTERED

FOOTING FOR POST WHEN IMPERVIOUS MATERIAL IS ENCOUNTERED

HMA or Controlled Low-Strength Material (CLSM)

8 (200) min.

18 (460) min.

2 (50)

media.png
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

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

<table>
<thead>
<tr>
<th>Pay Limits of Other Type</th>
<th>Pay Limits of LONG-SPAN GUARDRAIL OVER CULVERT</th>
<th>Pay Limits of Other Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>62'-6&quot; (19.05 m) min. of other type of guardrail (May include terminal)</td>
<td>6'-3&quot; (1.905 m)</td>
<td>6'-3&quot; (1.905 m)</td>
</tr>
<tr>
<td>12'-6&quot;, 18'-9&quot; or 25'-0&quot;</td>
<td>12'-6&quot;, 18'-9&quot; or 25'-0&quot;</td>
<td>62'-6&quot; (19.05 m) min. of other type of guardrail (May include terminal)</td>
</tr>
</tbody>
</table>

### Elevation

- **Steel Posts**
- **CRT Wood Posts**
- **Top of Culvert**

### Standards

- **STANDARD 630106-02**

### Sections

- **Section A-A**

### Diagram

- **Elevation**
- **Plan**
- **Front**
- **Side**
- **CRT Wood Post**
Pay limits of Guardrail Attached to Culvert

Steel post

Steel backup plate with $%\frac{1}{4}\text{ in. (6.35 mm)}$ dia. UNC, 1$\frac{1}{2}$ in. (38 mm) long hex bolt and nut.

SQUARE WASHER A

Steel plate beam guardrail

Steel post at culvert

SQUARE WASHER A

Post standoff

PLAN

POST STANDOFF

STEEL POST

SQUARE WASHER A

Post standoff

STEEL POST

SQUARE WASHER A

Post standoff

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.
**Gusset B**

**Plate E**

- Steel post
- $\frac{1}{8} \times 5$ (M16 x 123) hex bolt and nut
- Socket assembly
- Two $\frac{3}{4} \times 2$ (M13 x 50) hex bolts and nuts
- Greater of $\frac{3}{4} \times 2$ or $R \times 2 \frac{3}{4}$

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 I, (H+T-R) < 18 (457), Top Mount**

**Elevation**

**Front View**

**Side View**

**Socket Assembly**

**Top View**

**ILLINOIS DEPARTMENT OF TRANSPORTATION**

**January 1, 2020**

**Engineer of Policy and Procedures Approved January 1, 2020**

**Engineer of Design and Environment Issued 1-1-17**

**Passed**

**WEAK POST GUARDRAIL ATTACHED TO CULVERT**

**Standard 630111-01**

**Sheet 2 of 6**

**WEAK POST GUARDRAIL**
**WEAK POST GUARDRAIL ATTACHED TO CULVERT**

**CASE II, (H+T-R) < 18 (457), SIDE-MOUNT THROUGH-BOLT**

- **Steel post:**
  - 1½ x 5 (M16 x 127) hex bolt and nut
  - Socket assembly
  - Two ½ x 2 (M13 x 50) hex bolts
  - Greater of 5½ (140) or R+2½ (R=64)

**ELEVATION**

- Two ½ x (19) expansion bolts
- One ½ (19) expansion bolt
- For R greater than 3 (76) provide BRACKET A. For R less than or equal to 3 (76) provide BRACKET B. (BRACKET A shown)

**CASE III, (H+T-R) < 18 (457), SIDE-MOUNT ANCHORED**

- **Steel post:**
  - 1½ x 5 (M16 x 127) hex bolt and nut
  - Socket assembly
  - Two ½ x 2 (M13 x 50) hex bolts
  - Greater of 5½ (140) or R+2½ (R=64)

**ELEVATION**

- Two ½ x 11 (M19 x 279) threaded rods secured with chemical adhesive
- One ½ (19) expansion bolt
- For R greater than 3 (76) provide BRACKET A. For R less than or equal to 3 (76) provide BRACKET B. (BRACKET A shown)

---

**ILLINOIS DEPARTMENT OF TRANSPORTATION**

January 1, 2020

ENGINEER OF POLICY AND PROCEDURES

APPROVED

January 1, 2020

ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED

1-1-17

PASSED

ATTACHED TO CULVERT

**STANDARD 630111-01**
**CROSS SECTION**

**ELEVATION**

CASE IV, \((H+T-R) > 18\) (457), TOP MOUNT

Steel post

\(\% \times 5\)

(H16 x 127)

hex bolt and nut

Socket assembly

Two \(\% \times 7\) (M19 x 178)

threaded rods secured with chemical adhesive

**TOP VIEW**

HSS 4 x 4 x \(\%\)

**SIDE VIEW**

**FRONT VIEW**

**SOCKET ASSEMBLY**

FOR CASE IV

**ILLINOIS DEPARTMENT OF TRANSPORTATION**

**January 1, 2020**

**ENGINEER OF POLICY AND PROCEDURES**

**APPROVED**

**January 1, 2020**

**ENGINEER OF DESIGN AND ENVIRONMENT**

**ISSUED**

**1-1-17**

**PASSED**

**ATTACHED TO CULVERT**

WEAK POST GUARDRAIL

STANDARD 630111-01
New standard.

ELEVATION WITH
W-BEAM GUARDRAIL

ELEVATION WITH
THREE-BEAM GUARDRAIL

VIEW A-A

VIEW B-B

GENERAL NOTES
For details of guardrail elements not shown, see Standard 630001.

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

STANDARD 630116

BACK SIDE PROTECTION
OF GUARDRAIL

DATE REVISIONS
1-1-17 New standard
See Standard 630001 for detail of wave-out for guardrail line posts.

Variable slope

Proposed HMA stabilization 36 (900) & var

Variable width

New grade line of shoulder

Slope 1:2 max.

Transition to normal shoulder slope

Variable depending on end treatment and flare

Proposed PCC/HMA stabilization 36 (900) & var, (material same as shoulder)

Proposed standard shoulder paved width

Variable

Proposed HMA shoulder surface

Variable slope

Existing standard shoulder paved width

Proposed PCC/HMA shoulder

RESURFACING

NEW CONSTRUCTION

GENERAL NOTES

See Standard 482001, 482006, 483001 and 630001 for details not shown.

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

DATE

REVISIONS

1-1-09

Switched units to English (metric).

1-1-17

Revised leave-outs, moved for proprietary terminal sections, leave-outs shall be according to the manufacturer's specifications. For generic terminals, see Standard 630001.

For details not shown.
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.

STANDARD 630301-09

SHOULDER WIDENING FOR
TYPE 1 (SPECIAL)
GUARDRAIL TERMINALS
(Sheet 1 of 2)

DATE REVISIONS
1-1-19 Removed pay limits. Revised notes regarding the taper/flare and length of need point.
1-1-20 Omitted posts from Pay. Tolerances of other type.
Edge of pavement

Edge of shoulder

35'-0" (10.0 m) min.
100'-0" (30.0 m) desirable

35'-0" (10.0 m) min.

22'-0" (7.0 m) min.
25'-0" (7.5 m) min.

Flare according to manufacturer’s specifications

Beginning length of need point varies by manufacturer. Typically occurs between posts 1 and 3.

Variable

36'-0" (10.9 m) min.
38'-0" (11.5 m) max.

Slope 1:10 or flatter

Slope 1:3

Top of tube

Slope 1:2.5 max.

(If fill height exceeds 5'-0" (1.5 m) use 1:3 max.)

1:4 desirable

SHOULDER WIDENING FOR FLARED TERMINAL

SECTION B-B

(Impact Head omitted for clarity.)
**BEARING PLATE K**

- **Front View**
  - 14/5 (29) Día. hole
  - 13/4 (34) Hole

- **Side View**
  - 14/5 (34) Hole
  - 13/4 (34) Hole

**WOOD POST**
- 1 3/4 (45) Thick steel

**YOKE**
- 13/4 (34) Hole

**CABLE STRUT**
- 13/4 Ø x 2 (22 x 51) Slot

**STEEL TUBE**
- TS 8x6x.1875 (203 x 152 x 5)

**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.
Pay limits of other type

TRAFFIC BARRIER TERMINAL TYPE 5 (one each)

(1,905 m) Place G placed between plate E and rail element.

(523) (667)

Plate E

Plate G

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.

Plate E

* (25) Dia. hole

Plate G

(19x64)

(23x29)

PLATE WASHER D

(22) Dia. steel rod

1 1/8 (29) Dia. hole

(171) (432)

(159)

(108) (108)

(108) (108)

PLATE WASHER F

(17) (14)

(43)

(114)

1/8x1 (17x25)

Slotted hole

3x2x1/8 (19x64)

Slotted holes

3x2x1/8 (23x29)

Slotted holes

1/16x2x1/8 (32x57)

Slotted holes

1/16x2x1 (17x25)

Slotted hole

GENERAL NOTES

Install plate washer D so the 1/2 (25) projection fills the remainder of the slotted holes in the 1/2 (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 630001 for details of guardrail not shown.

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

DATE

REVISIONS

1-1-15

Revised post spacing

dimensions on elevation.

1-1-09

Switched units to English (metric).

ILLINOIS DEPARTMENT OF TRANSPORTATION

ENGINEER OF POLICY AND PROCEDURES
APPROVED

ENGINEER OF DESIGN AND ENVIRONMENT
ISSUED

PASSED

REVISIONS

ILLINOIS DEPARTMENT OF TRANSPORTATION

TRAFFIC BARRIER TERMINAL, TYPE 5

STANDARD 631026-06
**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 vertical displacement to units of horizontal displacement (V/H).

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

---

**TRAFFIC BARRIER TERMINAL, TYPE 6**

**SECTION A-A**

- Steel post, typ.
- Steel connector plate

**ELEVATION**

- Steel post, typ.
- Steel connector plate

**PLAN**

- Thrie beam end shoe bolted to parapet or wingwall
- Steel connector plate for constant-slope

**PARAPET OR WINGWALL**

- Steel bearing plate
- Wood Blockout

**TRAFFIC BARRIER TERMINAL, TYPE 6 (1 each)**

- Pay limits of TRAFFIC BARRIER TERMINAL, TYPE 6
- Steel post, typ.
- Steel connector plate

**STANDARD 631031-17**

**ENGINEER OF POLICY AND PROCEDURES**

**APPROVED**

**ENGINEER OF DESIGN AND ENVIRONMENT**

**ISSUED**

**PASSED**

**DATE**

**REVISIONS**

1-1-21 Added Detail A and revised plate dimensions on sheet 4
1-1-20 Revised F-Shape to constant slope parapet and added steel connector plate. Added two posts and revised post length.
FIVE % (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)

Five 6'-0" (1.83 m) W6x9.0 (W150x13.5) Steel posts

Approach curb, see plans for details.

Pay limits of other type

12'-6" (3.81 m) Two sections of thrie beam, one set inside the other

6'-3" (1.91 m) Single section of thrie beam

4'-3" (1.30 m) Single transition section of thrie beam

12'-6" (3.81 m) Single section of w-beam when no curb is present within this limit.

Two sections of w-beams, one set inside the other, when curb is present within this limit.

**PLAN**

73 7/16" (186.0 mm) Thrie beam end shoe

Concrete structure

11 spaces at 1'-6" (476)

21'-10 3/16" (6.67 m) Two sections of thrie beam, one set inside the other

15'-13 15/16" (4.76 m) Two sections of thrie beam

No beginning or ending of curb within this limit.

**ELEVATION**

24 (610) min. all posts

Wood Blockout

Slope 1:10 or flatter

W6x9.0 (W150x13.5) Steel post, typ.

6'-0" (1.83 m) W6x9.0 (W150x13.5) Steel posts

(1.83 m)

6'-0" (1.83 m) W6x9.0 (W150x13.5) Steel posts
THREE BEAM END SHOE DETAIL

POSTS 1-11 WOOD BLOCKOUT DETAIL

POST 12 WOOD BLOCKOUT DETAIL

(See Standard 630001 for post 13-17 blockouts.)

TRANSITION SECTION
(10 gauge (34) rail element)

PARAPET STEEL BEARING PLATE DETAIL

(Six each individual 5x3x5/8 (125x75x19) steel plates with centered 1 (25) holes may be substituted for the plate shown.)
STEEL CONNECTOR PLATE FOR CONSTANT SLOPE

**CONNECTOR PLATE DIMENSION (PER ASSEMBLY)**

<table>
<thead>
<tr>
<th>PLATE</th>
<th>QUANTITY</th>
<th>SHAPE</th>
<th>SIZE in x x x D x E</th>
<th>THICKNESS</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1</td>
<td>1</td>
<td></td>
<td>20 x 20 (508 x 508)</td>
<td>%</td>
</tr>
<tr>
<td>P2</td>
<td>1</td>
<td></td>
<td>19 1/6 x 20 x 27/32</td>
<td>%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(492 x 508 x 700)</td>
<td>(150)</td>
</tr>
<tr>
<td>P3</td>
<td>1</td>
<td></td>
<td>20 x 3/4 x 37/32 x 1/8</td>
<td>%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(508 x 95 x 956 x 6 x 456)</td>
<td>(100)</td>
</tr>
<tr>
<td>S1</td>
<td>4</td>
<td></td>
<td>18 1/8 x 1/4 x 28/32 x 3/4</td>
<td>%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(465 x 6 x 673 x 95)</td>
<td>(120)</td>
</tr>
<tr>
<td>S2</td>
<td>1</td>
<td></td>
<td>19 1/4 x 1 3/8 x 8 1/8 x 1/8</td>
<td>%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(133 x 44 x 205 x 10 x 175)</td>
<td>(100)</td>
</tr>
</tbody>
</table>

Steel connector plate shall be AASHTO M 270 Grade 36 (M 270M Grade 250) steel and galvanized according to AASHTO M 311. All dimensions are in inches (millimeters) unless otherwise shown.

**ENGINEER OF POLICY AND PROCEDURES**

**APPROVED**

**ENGINEER OF DESIGN AND ENVIRONMENT**

**ISSUED**

**PASSED**

**STANDARD 631031-17**

**ILLINOIS DEPARTMENT OF TRANSPORTATION**

**JANUARY 1, 2021**

**JANUARY 1, 2021**

**TRAFFIC BARRIER TERMINAL, TYPE 6**

(Sheet 4 of 4)
Bolts (A307) with washers and self-locking nut, or nut and jam nut. Top bolt 5/8 x 9 (22 x 229). Bottom bolt 3/8 x 5 (22 x 127) for curb mount or 3/8 x 7 (22 x 179) for side mount.

Note:
Side mounted rail similar as to connection details.

**MODIFIED THRIE BEAM END SHOE DETAIL**

1 (23) Dia. holes (typ.)

1x2 (25 x 51) slotted holes (typ.)

**POSTS 1-9 WOOD BLOCKOUT DETAIL**

(See Standard 630001 for post 11-15 blockouts.)

**POST 10 WOOD BLOCKOUT DETAIL**

(16-gauge 13.4 rail element)

**TRANSITION SECTION**

Illinois Department of Transportation

January 1, 2017

ENGINEER OF POLICY AND PROCEDURES

APPROVED

January 1, 2017

ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED

PASSED

1-1-2003

TRAFFIC BARRIER

TERMINAL, TYPE 6A

STANDARD 631032-09
GUARDRAIL CONNECTION PLATE ASSEMBLY DETAILS

(Mirror for opposite end)

SECTION E-E

LEGEND

\( \frac{3}{8} \) in (25) holes

Drill and tap 3 holes for 3/8 (22) H.S. bolts and nuts.

\( \frac{3}{8} \) in (25) holes in vert. leg of angle

Dimensions

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>For Curb Mounted Rail</td>
<td>884</td>
</tr>
<tr>
<td>For Side Mounted Rail</td>
<td>984</td>
</tr>
</tbody>
</table>

For Others:

Rail cap

washers and self-locking nuts or nuts and jam nuts, to be provided by others)

Illinois Department of Transportation

ENGINEER OF POLICY AND PROCEDURES

APPROVED

January 1, 2017

ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED

PASSED

1-1-2003

TRAFFIC BARRIER

TERMINAL, TYPE 6A

STANDARD 631032-09
4-2 Unit expanding, or self-drilling anchors for 1/2 (M16) bolts with standard washers.

(M16) bolts with 85 self-drilling anchors for 4-2 Unit expanding, or washer D and locknut.

2” x 4” (M24 x 102) Machine bolt with plate washer D and locknut.

(M22) anchor bolts with 874 Epoxy grouted

See plans end shoe

Standard in wood block.

(M16) Button head bolt with hex nut and washer recessed

TRAFFIC BARRIER TERMINAL TYPE 11
TEMPORARY CONCRETE BARRIER

Installing 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 plate G after the 1 (M24) diameter bolts are in place.

** Splice bolts

Install the face of the guardrail flush with the face of the temporary bridge rail. Install plate washer D 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.
This standard shows attachment to side mounted bridge railing, Type IL-OH.

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.

GENERAL NOTES
ANGLE CUT TUBE ASSEMBLY

**PLAN**

- Tube Assembly
- Angle Cut
- **ELEVATION**
- Middle Transition Rail
  - Assembly (Type IL-OH)
- Bottom Transition Rail
  - Assembly (Type IL-OH)
- 2 - ½ (19) dia. x 21 (533) Round head bolts
  - with heavy hex locknuts and flat washers

**SECTION C-C**

- End plate
- ½ (22) dia. thru (typ.)
- **ELEVATION**
- ½ (6) Radius
- **PLAN**

**BRIDGE RAIL CONNECTION DETAIL**

- 5 - ¾ (19) dia. x 7½ (191) Round head bolts
  - with heavy hex locknuts and flat washers

**TRAFFIC BARRIER**

**TERMINAL, TYPE 13**

**STANDARD 631061**

(Sheet 3 of 3)
Delineators shall be placed 24 (600) from break point on all interchange ramps and wherever pavement superelevation exceeds 6%.

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 ramps. Delineators shall be used on outside of all curved sections of ramps.

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

**GENERAL NOTES**

Delineators on tangent sections of main line roadways shall be placed at 400 (120) ft spacing. Delineators on ramps and acceleration and deceleration lanes shall be placed at a maximum spacing of 100 (30) ft.

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 ramps. Delineators 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, V shall be shortened as required. When V exceeds 15 (380), V 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).

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.
**GENERAL NOTES**

The Variable Cross-Section shall be used when there is a difference in base elevation between the two sides of the barrier. See standard 836011 for additional light pole foundation details where required in concrete barrier.

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

**TYPICAL CROSS-SECTION**

**VARIABLE CROSS-SECTION**

**NEW MONOLITHIC PCC BASE**

**NEW OR EXISTING HMA / PCC BASE** w/ HMA OVERLAY CONFINEMENT

**NEW OR EXISTING PCC BASE** w/ HOOK BARS

**EXISTING PCC BASE** w/ KEYWAY

**EXISTING PCC BASE** w/ LONGITUDINAL JOINT

**FIVE ANCHORING METHODS**

**HOO K B AR DETAIL**

**Sheet 1 of 2**

**CONCRETE BARRIER,**

**DOUB LE FACE,**

**44 in. (1120 mm) HEIGHT**
Expansion Joint

No. 4 (No. 13) Bar 18 (450) long (typ.)

Bend in field screen

Concrete glare (7 5/8"

Concrete barrier (750)

30 (2.1 m)

7'-0"

and spacing in concrete barrier)

No. 4 (No. 13) Bar

No. 4 (No. 13) Bar 18 (450) long (typ.)

Concrete glare screen

TYPICAL APPLICATION AT MEDIAN OBSTRUCTIONS

Glare Screen

SECTION A-A

CONCRETE GLARE SCREEN

STANDARD 638101-02

DATE

REVISIONS

1-1-09

Switched units to English (metric).

1-1-97

Revised for F shape barrier.

Illinois Department of Transportation

ENGINEER OF POLICY AND PROCEDURES

APPROVED

January 1, 2009

ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED

1-1-97

PASSED

DATE

REVISIONS

1-1-09

Switched units to English (metric).

1-1-97

Revised for F shape barrier.

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

**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 (22.4 MPa)
  - Prestressing Steel: $f_{ps} = 3,250$ psi (22.4 MPa)
  - Reinforcing Steel: $f_y = 40,000$ psi (275 MPa)
  - Structural Steel: $f_s = 20,000$ psi (138 MPa)
  - Minimum allowable soil bearing pressure: $= 1.25$ tf/sf (120 kPa)

  All dimensions are in inches (millimeters) unless otherwise shown.
Bars No. 4 (No. 13) strands (For panels with textured surface finish) 

No. 4 (No. 13) bars shall be alternated above and below prestressing strands.

Each prestressing strand shall be stressed to 16,000 lbs (71.2 kN) 

Strand and Reinforcement Layout 

SECTION E-E 
(For panels with smooth surface finish) 

NOTE 
Each prestressing strand shall be stressed to 16,000 lbs (71.2 kN) 

SECTION C-C 

Ribs shall be irregular, fractured or chipped. 

Vertical joint in wall 

NOTE 

t = thickness of form liner used to obtain surface finish.

TEXTURED SURFACE FINISH DETAIL 

SIGHT SCREEN 
PRECAST PRESTRESSED CONCRETE PANEL WALL 

Nominal Panel Size | A | B | C | M 
--- | --- | --- | --- | --- 
8'-0" x 8'-0" (2.4 m x 2.7 m) | 6 | 0 | 12 | 9 | 6 
8'-0" x 11'-0" (2.4 m x 3.3 m) | 3 | 1 | 11 | 3 | 6 
8'-0" x 13'-0" (2.4 m x 3.9 m) | (73) | 16 | (150) | (150) | (150)
**ELEVATION - 6' (1.83 m) FENCE**

(looking toward highway)

- 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.

**ELEVATION - 8' (2.43 m) & 10' (3.05 m) FENCES**

(looking toward highway)

**FENCE HEIGHT** | **POST SECTION (O.D.)** | **lbs./ft.** (kg/m)
---|---|---
6' (1.83 m) | 4 (102) | 9.11 (34)
8' (2.43 m) | 4 (102) | 12.51 (48)
10' (3.05 m) | 4 (102) | 22.85 (85)

Post sizes other than those shown may be used subject to approval by the Engineer.

**GENERAL NOTES**

- Loading for wind 80 mph (130 km/h) with 30% gust factor. Minimum allowable soil pressure = 1.25 tsf (120 kPa).
- Tension cable shall be provided with one turn buckle between each pair of pull posts.
- All dimensions are in inches (millimeters) unless otherwise shown.

**STANDARD 640001-01**
12 ga. (2.66) min. x ¼ (19) band

1/8 (M10) Carriage bolts

DETAIL B
(Showing typical method of attaching middle brace rails to posts.)

DETAIL A

DETAIL OF FABRIC
(Showing method of fastening bottom tension cable and fence fabric to pull posts.)

DETAIL C
(Showing method of attaching middle brace rails to posts.)

SIGHT SCREEN
CHAIN LINK FENCE
(Sheet 2 of 2)
DETAIL A
3x4 (75x100) Rails (nominal dim.)
Spacing (typ.)
7'-4" (2.2 m)
Posts
Cedar pickets

DETAIL B
Fence height
75 ± 50
3 ± 2
A
B
C
D

30° min.
Galvanized common wire nails.
(Showing typical picket to rail attachment)

ELEVATION
(Showing treatment with sloping ground)

SECTION B-B
(Notch pickets when required to clear washer and bolt head)

GENERAL NOTES

Loading is based on 80 mph (130 km/h) with 30% gust factor. Minimum allowable soil pressure = 1.25 tsf (120 kPa).
All dimensions are in inches (millimeters) unless otherwise shown.

DATE
REVISIONS
1-1-09
Switched units to English (metric). Changed
Sec. B-B to Detail B.
1-1-97
Issued
STANDARD 641001-01
CEDAR STOCKADE FENCE TYPE S
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
Delinted DA Symbol.
SIGHT SCREEN
WOOD PLANK FENCE
TYPE P

STANDARD 641006-01

GENERAL NOTES

Loading was based on 80 mph (130 km/h) with 30% gust factor. Minimum allowable soil pressure = 1.25 t/sf (120 kPa).

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

DETAIL B

(Showing typical panel to post connection details)

DETAIL A

(Showing typical plank to rail attachment each rail)

ELEVATION

(Showing treatment w/ sloping ground)
On Portland cement concrete shoulders, no shoulder rumble strip shall be located closer than 6 (150) to a transverse joint.

Omit shoulder rumble strips across structures.

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

See Section A-A.

Rumble strip over 48' (14.6 m) span
12' (3.6 m) gap
Rumble strip over 48' (14.6 m) span

Edge of pavement

Sideroad/Entrance

Sideroad

SECTION A-A

SECTION B-B

SHOULDER RUMBLE STRIPS, 8 in.

STANDARD 642006-01

DATE
REVISIONS

1-1-21
Added minimum width of paved shoulder for bicycle accommodations.

3-1-12
New standard.
**GENERAL NOTES**

Pull posts shall be placed at locations determined by the Engineer. They shall be placed at 660' (200 m) intervals between posts to which the ends of the fabric are clamped or midway between such posts when the distance is less than 1320' (400 m) and greater than 660' (200 m).

When X exceeds 9 (225), 15 (380), or 21 (525), then Y shall be shortened as required. When X exceeds 9 (225), 15 (380), or 21 (525), then Y shall be decreased correspondingly.

All dimensions are in inches (millimeters) unless otherwise shown.
**ROLL FORMED\nSECTION OF BRACE**

**ROLL FORMED SECTION OF\nTERMINAL & GATE POST**

**METHOD OF FASTENING\nSTRETCHER BAR TO POST**

**METHOD OF TYING\nFABRIC TO TENSION WIRES**

### Line Post

<table>
<thead>
<tr>
<th>Section</th>
<th>Wt./ft. (kg/m)</th>
<th>lbs./ft. (lbs./ft.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pipe Type A 1.90</td>
<td>2.26</td>
<td>3.36</td>
</tr>
<tr>
<td>Pipe Type B 1.90</td>
<td>2.28</td>
<td>3.39</td>
</tr>
<tr>
<td>Pipe Type C 1.90</td>
<td>2.26</td>
<td>3.36</td>
</tr>
<tr>
<td>H: 1.875x1.625</td>
<td>2.72</td>
<td>4.05</td>
</tr>
<tr>
<td>C</td>
<td>1.60</td>
<td>2.38</td>
</tr>
<tr>
<td>I</td>
<td>2.20</td>
<td>3.42</td>
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</tbody>
</table>

### Terminal Post

<table>
<thead>
<tr>
<th>Section</th>
<th>Wt./ft. (kg/m)</th>
<th>lbs./ft. (lbs./ft.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pipe Type A 2.375</td>
<td>3.11</td>
<td>(4.63)</td>
</tr>
<tr>
<td>Pipe Type B 2.375</td>
<td>3.11</td>
<td>(4.63)</td>
</tr>
<tr>
<td>Pipe Type C 2.375</td>
<td>3.09</td>
<td>(4.60)</td>
</tr>
<tr>
<td>Roll Formed 35x35</td>
<td>3.65</td>
<td>(5.40)</td>
</tr>
<tr>
<td>3x3 tubing 2inx2in</td>
<td>4.32</td>
<td>(6.43)</td>
</tr>
</tbody>
</table>

### Horizontal Braces

<table>
<thead>
<tr>
<th>Section</th>
<th>Wt./ft. (kg/m)</th>
<th>lbs./ft. (lbs./ft.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pipe Type A 1.66</td>
<td>1.84</td>
<td>(2.72)</td>
</tr>
<tr>
<td>Pipe Type B 1.66</td>
<td>1.82</td>
<td>(2.71)</td>
</tr>
<tr>
<td>Pipe Type C 1.66</td>
<td>1.82</td>
<td>(2.71)</td>
</tr>
<tr>
<td>H: 1.31x1.5</td>
<td>2.45</td>
<td>(3.55)</td>
</tr>
<tr>
<td>Roll Formed 35x35</td>
<td>3.5</td>
<td>(5.40)</td>
</tr>
</tbody>
</table>

### Gate Posts

<table>
<thead>
<tr>
<th>Gate Opening * R. (m)</th>
<th>Pipe Type A</th>
<th>Pipe Type B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Double</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Up to 4 (1.2)</td>
<td>2.373</td>
<td>2.373</td>
</tr>
<tr>
<td>Up to 8 (2.5)</td>
<td>2.373</td>
<td>2.373</td>
</tr>
<tr>
<td>Over 4 (1.2) to 8 (2.5)</td>
<td>2.373</td>
<td>2.373</td>
</tr>
<tr>
<td>Over 8 (2.5) to 16 (5.0)</td>
<td>2.373</td>
<td>2.373</td>
</tr>
</tbody>
</table>

* The 35x35 (89.0 x 89.0) 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**

**PLAN**

**INSTALLATION AT CORNERS**

**INSTALLATION OVER STREAM**

**ELEVATION**

**INSTALLATION AROUND HEADWALL**

**DETAIL A**

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.

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 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.

36 (900) for 4' (1.2 m) fence. 3'-6" (1.0 m) for over 4' (1.2 m) fence.
**FENCE USING METAL POSTS**

**NOTES**

Barbed wires shall be tied to each post. Top and bottom wires of woven fence shall be tied 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.
Brace post on 3 sides.
Brace wires stapled to posts on 3 sides.

Corner or end post

---

**NOTES**

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.
# 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>1.66 (2.71)</td>
</tr>
<tr>
<td>Type A Pipe 2.375 (60.3) O.D.</td>
<td>3.65 (5.43)</td>
</tr>
<tr>
<td>Type B Pipe 2.375 (60.3) O.D.</td>
<td>3.11 (4.63)</td>
</tr>
<tr>
<td>Type C Pipe 2.375 (60.3) O.D.</td>
<td>3.08 (4.60)</td>
</tr>
<tr>
<td>Tubing 2.5 (65.5) Sq.</td>
<td>4.39 (6.49)</td>
</tr>
<tr>
<td>Angle 2(\times)2(\times)\frac{3}{16}\ (64\times64\times6.4)</td>
<td>4.1 (6.10)</td>
</tr>
<tr>
<td>or structural shapes</td>
<td>4.1 (6.10) min.</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 1.315 (33.4) O.D.</td>
<td>1.68 (2.50)</td>
</tr>
<tr>
<td>Type B Pipe 1.315 (33.4) O.D.</td>
<td>1.34 (1.99)</td>
</tr>
<tr>
<td>Type C Pipe 1.315 (33.4) O.D.</td>
<td>1.33 (1.98)</td>
</tr>
<tr>
<td>Tubing 1 (25.4) Sq.</td>
<td>3.11 (4.63)</td>
</tr>
<tr>
<td>or structural shapes</td>
<td>3.1 (4.61) 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 2.375 (60.3) O.D.</td>
<td>4.32 (6.43)</td>
</tr>
<tr>
<td>Type B Pipe 2.375 (60.3) O.D.</td>
<td>3.09 (4.60)</td>
</tr>
<tr>
<td>Type C Pipe 2.375 (60.3) O.D.</td>
<td>3.11 (4.63)</td>
</tr>
<tr>
<td>Tubing 1 (25.4) Sq.</td>
<td>3.65 (5.43)</td>
</tr>
<tr>
<td>or structural shapes</td>
<td>1.33 (1.98) min.</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 1.66 (42.2) O.D.</td>
<td>4.1 (6.10)</td>
</tr>
<tr>
<td>Type B Pipe 1.66 (42.2) O.D.</td>
<td>4.1 (6.10)</td>
</tr>
<tr>
<td>Type C Pipe 1.66 (42.2) O.D.</td>
<td>4.1 (6.10)</td>
</tr>
<tr>
<td>Structural shapes</td>
<td>3.1 (4.61) min.</td>
</tr>
</tbody>
</table>

## Wood Items

### Gate, Corner, End, or Pull Posts

- 6 to 7 (150 to 175) Top dia. 4\(\times\)6 (150\times150)
- 4 to 5 (120 to 125) Top dia. 4\(\times\)4 (120\times120)

### Braces and Line Posts

- 2\(\times\)8 (50\times200x450)

### Blocks

- 2\(\times\)8 (50\times200x450)

---

The Illinois Department of Transportation

Department of Transportation

Engineer of Policy and Procedures

January 1, 2009

Issued: 1-1-97

Passed: January 1, 2009

Engineer of Design and Environment

Standard 665001-02

Woven Wire Fence

(Sheet 3 of 8)
**Concrete Ledge**

**Ground line**

---

**FOOTING FOR POSTS WHEN ROCK LEDGE IS ENCOUNTERED**

- Shallow V cut in brace when round post is used.
- Brace nailed to post with at least 3-16d common galvanized nails.

**ALTERNATE DETAILS FOR FASTENING WOOD BRACE TO WOOD POST**

- Wood or metal post substituted for wood brace when required.

**INSTALLATION AT CORNERS**

- Metal post substituted for wood line post.

**INSTALLATION ON SLOPES**

- Metal end post not centered in concrete.

---

**PROTECTIVE ELECTRICAL GROUNDING FOR WOOD POST FENCE INSTALLATION**

---

**PLAN AT STREAM CROSSING**

---

**PLAN AT HEADWALL**

---

**NOTE**

X + Y shall not exceed 27 (685), 33 (840), or 3'-9" (1.14 m) as applicable. When X is 0 to 12 (300), 18 (450), or 30 (760), Y shall be decreased correspondingly.

When X exceeds 12 (300), 18 (450), or 30 (760), Y shall be 15 (380), and the post shall be shortened as required.

X + Y shall not exceed 27 (685), 33 (840), or 3'-9" (1.14 m) max.

---

**DETAIL A**

---

**INSTALLATION OVER STREAM**

- 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° line posts may be used.

- 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.

---

**INSTALLATION AROUND HEADWALL**

- Wood or metal line post not centered in concrete.

---

**NOTE**

- 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.

- The woven wire fabric shall be replaced by Barbond wire strands at 12 (300) maximum centers between the double posts shown on DETAIL A when shown on the plans.
METHOD B

METHOD A

GENERAL NOTE

Reinforcement bars shall be No. 3 (No. 10) unless otherwise specified.

A 2½x12½ (70x310) shadow box with beveled edges, and a ⅛ (3) thick indentation may be used with the standard lettering shown.

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

SECTION A-A

SECTION B-B

DRAINAGE MARKERS

STANDARD 667001-01
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.

Magnet when required ¾ (19) dia. ¼ (6) thick

No. 3 (No. 10) bars to be 30 (750) for 36 (900) min. & 3'-6'' (1.1 m) for 4'-0'' (1.2 m) min. in dist. 1, 2, 3, & 4.

To be 4'-0'' (1.2 m) min. in dist. 5, 6, 7, 8, & 9.

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

Ground surface

Concrete

10 (250)

14 (350)

12 (300)

18 (450)

DETAIL A

ELEVATION

To be 6'-0" (1.2 m) min. in dist. 1, 2, 3, & 4.

To be 36" (900) min. in dist. 5, 6, 7, 8, & 9.

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

Switched units to English (metric).

Revised depth.

January 1, 2009

ENGINEER OF POLICY AND PROCEDURES

APPROVED

January 1, 2009

ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED

1-1-97

PASSED

DATE

REVISIONS

1-1-97

Amer. Standard 244B

Revised depth

3-1-09

Switched units to

English (metric)

U.S. GEOLOGICAL SURVEY AND
NATIONAL GEODETIC SURVEY
BENCHMARKS Resetting Method

STANDARD 668001-01
GENERAL NOTES

Typical Applications

This standard is used where all times all traffic control shall be

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

All dimensions are in inches (millimeters) according to Standard 701006.

These operations are limited to "off-road" operations. Under no circumstances shall these operations be conducted in a traffic lane or within the work zone. All traffic lanes shall be at least 12 ft. (3.0 m) from any work zone. Table 1-1-09 is not applicable where at all times all traffic lanes are more than 15' (4.5 m) from the edge of the pavement.
TYPICAL APPLICATIONS

- Utility operations
- Culvert extensions
- Side slope changes
- Guardrail installation and maintenance
- Delineator installation
- Landscaping operations
- Shoulder repair
- Sign installation and maintenance

SYMBOLS

- Work area
- Sign
- Cone, drum or barricade

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 mm) from the edge of pavement.

Calculate \( L \) as follows:

\[
L = \begin{cases} 
\frac{W}{40^2} & \text{if } 60 \text{ mph} \\
\frac{W}{45^2} & \text{if } 80 \text{ km/h}
\end{cases}
\]

or greater:

\[
L = 0.65 \times \left( \frac{W}{S} \right)
\]

\( W \) = Width of offset in feet (meters)

\( S \) = Normal posted speed in mph (km/h)

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

For contract projects and utility maintenance

W20-I103(0)-48
Or W20-1(0)-48 W21-I101(0)-48

1000' (300 m) max.
500' (150 m) min.

Varies 1

Utility operations

Shoulder work

Minimum distance is 200' (60 m). Maximum distance to be determined by the Engineer but should not exceed 1/3 the length required for one normal working day's operation, or 4 miles (6.4 km) whichever is less.

When the work operation does not exceed 60 minutes, traffic control may be according to the current MUTCD.

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.

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

TYPICAL APPLICATIONS

SYMBOLS

Work area

b Sign

Flagger with traffic control sign when required

W20-I101(0)-48 W21-I101(0)-48

1-1-14 Revised workers sign

1-1-13 Deleted text "WORKERS"

GENERAL NOTES

STANDARD 701011-04

OFF-RD MOVING OPERATIONS, 2L, 2W, DAY ONLY

ILLINOIS DEPARTMENT OF TRANSPORTATION

APPROVED PUBLISHED

REALIZED 1-1-97

ENGINEER OF SAFETY ENGINEERING

ENGINEER OF DESIGN AND ENVIRONMENT

REVISIONS
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

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>W</td>
<td>Work area</td>
</tr>
<tr>
<td>B</td>
<td>Sign</td>
</tr>
<tr>
<td>D</td>
<td>Cone, drum or barricade</td>
</tr>
</tbody>
</table>

FORMULAS

Calculate L as follows:

\[ L = \frac{W S^2}{60} \]  for speeds of 40 mph (60 km/h) or less.

\[ L = \frac{W S^2}{150} \]  for speeds of 45 mph (80 km/h) or greater.

Where:

- \( W \) = Width of offset in feet (meters).
- \( S \) = Normal posted speed in mph (km/h).

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

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 mm) from the edge of pavement.

Calculate L as follows:

\[ L = \frac{W S^2}{60} \]  for speeds of 40 mph (60 km/h) or less.

\[ L = \frac{W S^2}{150} \]  for speeds of 45 mph (80 km/h) or greater.

Where:

- \( W \) = Width of offset in feet (meters).
- \( S \) = Normal posted speed in mph (km/h).

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

For maintenance and utility projects

For contract construction projects

**SYMBOLS**

- W: Work area
- B: Sign
- D: Cone, drum or barricade
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
1. Devices at 20' (6 m) centers in the taper.
2. Cones at 25' (8 m) centers for the first 150' (45 m). Additional cones may be placed at 50' (15 m) centers. When drums or barricades are used, these intervals between devices may be doubled.

**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

**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.

**LANE CLOSURE, 2L, 2W, DAY ONLY, FOR SPEEDS ≥ 45 MPH**

**STANDARD 701201-05**
TYPICAL APPLICATIONS

- Isolated patch
- Installation of drainage structure
- Utility operations

SYMBOLS

- Work area
- Sign
- Flagger with traffic control sign
- Cone, drum or barricade
- 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 (600) from the edge of pavement for nighttime operation.

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

DATE | REVISIONS
--- | ---
1-1-19 | Revised device spacing in taper and added cones as an option
1-1-18 | Omitted steady burning lights in tangent

LANE CLOSURE, 2L, 2W,
NIGHT ONLY,
FOR SPEEDS ≥ 45 MPH

STANDARD 701206-05
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 35 minutes.

Vehicle with dual flashers or flashing amber dome light operating.

For any operation that is more than 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.

**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>Posted Speed</th>
<th>Sign Spacing</th>
</tr>
</thead>
<tbody>
<tr>
<td>45</td>
<td>50-45</td>
</tr>
<tr>
<td>≤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.

**DATE** | **REVISIONS**
--- | ---
1-1-11 | Revised flagger sign
1-1-09 | Switched units to English (metric).

**STANDARD 701301-04**
ROAD AHEAD
WORK
ROAD AHEAD
CONSTRUCTION
ONE LANE
ROAD AHEAD
CONSTRUCTION
1000' (300 m) max.
500' (150 m) min.

W20-I103(0)-48
W20-1(0)-48
W20-I103(0)-48
W20-7(0)-48
W20-4(0)-48

TYPICAL APPLICATIONS
Bituminous resurfacing
Milling operations
Utility operations
Shoulder operations

SYMBOLS
Work area
Ⅲ 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 15 mph (3 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.

LKE DEPARTMENTS OF TRANSPORTATION

DATE
1-1-18
1-1-11

REVISIONS
Revised lower speed limit
for operation to 15 mph.
Revised flagger sign.

STANDARD 701306-04
**TYPICAL APPLICATIONS**

- Landscaping work
- Utility work
- Pavement marking
- Weed spraying
- Asphalometer 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) min. 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.

**DATE**

- Revisions

**LANE CLOSURE 2L, 2W**

**MOVING OPERATIONS—DAY ONLY**

**STANDARD 701311-03**
**TRAFFIC SIGNAL SEQUENCE**

<table>
<thead>
<tr>
<th>PHASE</th>
<th>INTERVAL</th>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>G</td>
<td>Y</td>
</tr>
<tr>
<td>NORTHBOUND OR EASTBOUND</td>
<td>1-2-3-4-5-6</td>
<td>G</td>
<td>Y</td>
</tr>
<tr>
<td>SOUTHBOUND OR WESTBOUND</td>
<td>1-2-3-4-5-6</td>
<td>R</td>
<td>R</td>
</tr>
</tbody>
</table>

**ADVISORY SPEED LIMIT**

<table>
<thead>
<tr>
<th>NORMAL POSTED SPEED</th>
<th>ADVISORY SPEED</th>
</tr>
</thead>
<tbody>
<tr>
<td>55 - 45 mph</td>
<td>40 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 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.

**LANE CLOSURE, 2L, 2W, BRIDGE REPAIR, FOR SPEEDS ≥ 45 MPH**

**STANDARD 701316-13**
**TRAFFIC SIGNAL SEQUENCE**

<table>
<thead>
<tr>
<th>PHASE</th>
<th>INTERVAL</th>
<th>EASTBOUND</th>
<th>NORTHBOUND OR SOUTHBOUND</th>
<th>WESTBOUND</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1</td>
<td>G</td>
<td>Y</td>
<td>R</td>
</tr>
<tr>
<td>B</td>
<td>2</td>
<td>Y</td>
<td>R</td>
<td>G</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>R</td>
<td>G</td>
<td>Y</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>G</td>
<td>Y</td>
<td>R</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>Y</td>
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</tr>
<tr>
<td></td>
<td>6</td>
<td>R</td>
<td>G</td>
<td>Y</td>
</tr>
</tbody>
</table>

**TEMPORARY CONCRETE BARRIER**

<table>
<thead>
<tr>
<th>NORMAL POSTED SPEED</th>
<th>TAPER RATIO</th>
</tr>
</thead>
<tbody>
<tr>
<td>40 mph AND ABOVE</td>
<td>12:1</td>
</tr>
<tr>
<td>BELOW 40 mph</td>
<td>8:1</td>
</tr>
</tbody>
</table>

**ADVISORY SPEED LIMIT**

<table>
<thead>
<tr>
<th>NORMAL POSTED SPEED</th>
<th>ADVISORY SPEED</th>
</tr>
</thead>
<tbody>
<tr>
<td>55 - 45 mph</td>
<td>40 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.
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 delineators at 50' (15 m) centers may be substituted for the vertical panels, or the spacing between vertical panels may be increased to 100' (30 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

**GENERAL NOTES**
- The advisory speed to be shown below the reverse curve (rum) signs shall be determined at the site and approved by the Engineer.
- These signs are not required when T is less than 300' (90 m).

**LANE CLOSURE, 2L, 2W, WITH RUN-AROUND, FOR SPEEDS ≥ 45 MPH**

**STANDARD 701331-05**

**DATE**
- 1-1-18: Changed signs on drums to bi-directional
- 1-1-11: Changed vertical panel to double vertical panel
**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(s) shall be a minimum of 200' (60 m) and a maximum of ½ day's operation beyond the flagger sign. When the distance between successive patches exceeds 2000 (600 m), 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 50' (15 m) centers throughout the work zone. When the spacing between open holes is greater than 50' (15 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 100' (30 m) or cones shall be placed beyond the flagger sign. When the distance between succes- sive patches exceeds 2000 (600 m), 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 50' (15 m) centers throughout the work zone. When the spacing between open holes is greater than 50' (15 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 100' (30 m) or cones shall be placed beyond the flagger sign. When the distance between succes- sive patches exceeds 2000 (600 m), additional flaggers, warning signs, and tapers shall be placed as shown.

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

---

**SYMBOLS**

- Patches
- Sign
- Flagger with traffic control sign
- Barricade or drum
- Cone, barricade or drum

**TYPICAL APPLICATIONS**

- Patching

---

**LANE CLOSURE, 2L, 2W, WORK AREAS IN SERIES, FOR SPEEDS ≥ 45 MPH**

**STANDARD 701336-07**

<table>
<thead>
<tr>
<th>DATE</th>
<th>REVISIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-1-19</td>
<td>Revised device spacing in taper</td>
</tr>
<tr>
<td>1-1-11</td>
<td>Revised flagger sign</td>
</tr>
</tbody>
</table>

Illinois Department of Transportation

January 1, 2019

ENGINEER OF DESIGN AND ENVIRONMENT

APPROVED

January 1, 2019

ENGINEER OF SAFETY PROG. AND ENGINEERING

APPROVED
The Road Construction Ahead sign shall be located 3 to 5 miles in advance of the project limits.

The message board shall be used to display status of lanes within the project. The primary messages shall be:
- "Right Lane Closed / x Miles Ahead"
- "Left Lane Closed / x Miles Ahead"
- "All Lanes Open"

The last four signs and arrow board shall be moved as necessary to maintain the required distance from the start of the lane closure taper(s).

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

### GENERAL NOTES

This standard is used where at any time a lane is closed on a freeway/expressway. When the left lane is closed, LEFT LANE CLOSED signs shall be substituted for the RIGHT LANE CLOSED signs.

The first sign and the message board are stationary.

The last four signs and arrow board shall be moved as necessary to maintain the required distance from the start of the lane closure taper(s).

### APPROACH TO LANE CLOSURE, FREEWAY/EXPRESSWAY

**STANDARD 701400-11**

**DATE**

**REVISIONS**

1-1-22 Corrected work zone speed limit sign number.

1-1-23 Removed Work Zone Public Information sign and its note.

Revised stationary sign gen. note.
**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:

\[
L = 0.65W(S)
\]

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:

\[
L = 0.65W(S)
\]

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:

\[
L = 0.65W(S)
\]

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:

\[
L = 0.65W(S)
\]

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:

\[
L = 0.65W(S)
\]

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:

\[
L = 0.65W(S)
\]

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:

\[
L = 0.65W(S)
\]

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:

\[
L = 0.65W(S)
\]

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:

\[
L = 0.65W(S)
\]

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:

\[
L = 0.65W(S)
\]
**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 m) 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.

---

**SYMBOLS**

- Arrow board
- Work area
- Sign
- Direction indicator barricade
- Cone, drum or barricade
- Spotter

**TYPICAL APPLICATIONS**

- Pavement patch
- Utility operations
- Bituminous resurfacing

---

**SYSTEMS**

- Work zone speed limit 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.

---

**LANE CLOSURE, FREEWAY/EXPRESSWAY, DAY OPERATIONS ONLY**

**STANDARD 701406-13**

---

**DATE**

1-1-22 Corrected work zone speed limit sign numbers.
1-1-19 Replaced flagger with spotter.
1-1-17 Revised END WORK ZONE SPEED LIMIT sign from orange to white background.

---

**REVISIONS**

1-1-17 Revised END WORK ZONE SPEED LIMIT sign from orange to white background.
1-1-19 Replaced flagger with spotter.
1-1-22 Corrected work zone speed limit sign numbers.
1-1-17 Revised END WORK ZONE SPEED LIMIT sign from orange to white background.
APPLICATION NO. 1

Application 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

Application 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.
**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 motorist's line of sight through, between or over the delineation devices.
**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

**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 and 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.

**DATE**

**REVISIONS**

1-1-17 Revised END WORK ZONE SPEED LIMIT sign from orange to white background.

1-1-17 Revised END WORK ZONE SPEED LIMIT sign from orange to white background.

1-1-18 Drafted signs on drums for the "3 x L" tangent.

1-1-18 Drafted signs on drums for the "3 x L" tangent.
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 (2400) 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:

\[
L = \frac{W}{S} \times (S + 0.65 \times 1000)
\]

**FORMULAS**

In mph (km/h).

45 mph (80 km/h) or more

\[
W = \text{Width of offset in feet (meters)}
\]

\[
S = \text{Normal posted speed in mph (km/h)}
\]

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

**GENERAL NOTES**

- Undivided roadway with left lane closure in opposite direction.
- Sign in median may be omitted when median is less than 30' (3 m) wide.
- 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.
- Guardrail/barrier wall reflectors at 25' (7.6 m). Markers on right shall be crystal and markers on left shall be amber. See Standards 704001 and 782006.
- Vertical barricades shall not be used in lane shift taper.
- Three Type II barricades, drums, or vertical barricades at 25' (8 m) centers.

**SYMBOLS**

- Arrow board
- Work area
- Sign
- Direction indicator barrier 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
- Type II barricade, drum, or vertical barricade with monodirectional flashing light

**LANE CLOSURE, MULTILANE, WITH BARRIER, FOR SPEEDS ≥ 45 MPH TO 55 MPH**

**STANDARD 701423-10**

**APPROVED** January 1, 2017

**ENGINEER OF SAFETY PROG. AND ENGINEERING**

**DATE** January 1, 2017

**ISSUED** January 1, 2017

**PASSED** January 1, 2017

**ENGINEER OF DESIGN AND ENVIRONMENT**

**REVISIONS**

- 1-1-17 Revised END WORK ZONE SPEED LIMIT sign. Changed device spacing at first arr. brd.
- 4-1-16 Corrected reference to standard in note 4.
PAINT WET ROAD AHEAD CONSTRUCTION RIGHT LANE CLOSED AHEAD

NOTE
When a shoulder does not exist or is narrow, use Detail B.

DETAIL A

W20-I103-01-48
W20-701-01-48
W20-I103-01-48
W20-50a(0)-48

SYMBOLS

Arrow board
Work area

Truck with flashing amber light

Truck/Trailer mounted attenuator
Flagger with traffic control sign
Sign

TYPICAL APPLICATIONS

Anticavitation work
Utility work
Pavement marking
Weed spraying
Roadometer measurements
Dirt or 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 (millimeter) unless otherwise shown.

LANE CLOSURE, MULTILANE, INTERMITTENT OR MOVING OPER., FOR SPEEDS ≥ 45 MPH

STANDARD 701426-09
NOTE
When a shoulder does not exist or is narrow, use Detail B.

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

TYPICAL APPLICATIONS
Utililty work
Pavement marking
Weed spraying
Roadometer measurements
Dirt cleanup
Crack pouring

G20-101-2430
(appropriate arrow)

When striping only

GENERAL NOTES

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 ≤ 40 MPH

STANDARD 701427-05

ILLINOIS DEPARTMENT OF TRANSPORTATION

APPROVED
January 1, 2017

ISSUED

DATE

REVISIONS

2-7-17
Rev. gen. notes. Added
Detail C

4-1-16
Rev. gen. notes. Added
note 5. Rev. dist. between
work and lead truck.

ILLINOIS DEPARTMENT OF TRANSPORTATION
CASE I

CASE I depicts the setup of delineating devices for a single outside 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

DATE  REVISIONS
4-1-16  Added trailer option for attenuator symbol
2-1-14  New Standard
1-1-14  New Standard
1-1-97  Previous edition
4-1-96  Previous edition

### SYMBOLS

- **Arrow boxes**: Work area
- **Worker**: Sign
- **Direction indicator barricade with steady burn monodirectional light**: Type II barricade, drum, or vertical barricade with steady burn monodirectional light
- **Spotters**: 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 setup 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.

### TWO LANE CLOSURE, FREEWAY/EXPRESSWAY

**STANDARD 701446-11**

**DATE**

- 1-1-21: Corrected symbol for type II barricade with steady burn monodirectional light and altered device spacing callout.
- 1-1-20: Replaced flagger with spotter.

**REVISIONS**
Drums at 25' (7.6 m) cts.

1:20 taper from edge of ramp to edge of work zone

1-1-17 Added flashing lights to Type II barricade

1-1-18 Dimmed lights on drums

in tangent

SYMBOLS

⅃ Sign

Type III barricade with flashing lights

〇 Drum with steady burning light

□ Work area

● Flagger with traffic control sign

〇 Drum

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

DATE
REVISIONS
1-1-18 Dimmed lights on drums

in tangent

1-1-17 Added flashing lights to Type II barricade

PASSED
ENGINEER OF SAFETY PROG. AND ENGINEERING

APPROVED
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED
1-1-09

FREEWAY/EXPRESSWAY
PARTIAL EXIT RAMP CLOSURE

STANDARD 701456-05

Illinois Department of Transportation

January 1, 2018

January 1, 2018
**ROAD AHEAD CONSTRUCTION**

**ROAD AHEAD WORK**

**ONE LANE ROAD AHEAD**

**ROAD CLOSED AHEAD**

**SIGN SPACING**

<table>
<thead>
<tr>
<th>Posted Speed</th>
<th>Sign Spacing</th>
</tr>
</thead>
<tbody>
<tr>
<td>55</td>
<td>500' (150 m)</td>
</tr>
<tr>
<td>60-65</td>
<td>350' (100 m)</td>
</tr>
<tr>
<td>&lt;60</td>
<td>200' (60 m)</td>
</tr>
</tbody>
</table>

- **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

- **One way / one lane operation**

- **Type I or Type II Barricades**

- **Type III barricades**

- **Refer to SIGN SPACING TABLE** for distances.

- **For approved roadside closures**

- **Cone, drums or barricades 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.

- **Cone, drums or barricades at 20' (6 m) centers**.

- **Type III barricade with flashing lights**

- **Cones, drums or barricades 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.

- **Cone, 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.
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 lights
- Flagger with traffic control sign
- Cone, drum or barricade
- Sign on portable or permanent support
- Type III barricade with flashing lights

SIGN SPACING

<table>
<thead>
<tr>
<th>Posting Speed</th>
<th>Sign Spacing</th>
</tr>
</thead>
<tbody>
<tr>
<td>50-45 mph</td>
<td>200' (60 m)</td>
</tr>
<tr>
<td>&lt;45 mph</td>
<td>100' (30 m)</td>
</tr>
</tbody>
</table>

FOR FORMULAS

SPEED LIMIT

English (Metric)

40 mph (70 km/h) or less:

L = \( \frac{W^2}{90} \) in feet (meters)

L = \( \frac{W^2}{150} \) in meters (meters)

45 mph (80 km/h) or greater:

L = \( W/(5) \)

L = \( 0.45W/(5) \)

W = Width of offset in feet (meters).

S = Normal posted speed in mph (km/h).

CASE II

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:

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

FORMULAS

English (Metric)

40 mph (70 km/h) or less:

L = \( \frac{W^2}{90} \) in feet (meters)

L = \( \frac{W^2}{150} \) in meters (meters)

45 mph (80 km/h) or greater:

L = \( W/(5) \)

L = \( 0.45W/(5) \)

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 WORK
- **Left Lane Closed Ahead**
- **Right Lane Closed Ahead**

### SIGN SPACING

<table>
<thead>
<tr>
<th>Posting Speed</th>
<th>Sign Spacing</th>
</tr>
</thead>
<tbody>
<tr>
<td>55-65 mph</td>
<td>500' (150 m)</td>
</tr>
<tr>
<td>&lt;55 mph</td>
<td>350' (100 m)</td>
</tr>
</tbody>
</table>

#### English (Metric)
- **L** = \( \frac{60}{W^2} \)
- **L** = \( \frac{150}{W^2} \)

#### Formulas
- \( L = (W)(S) \)
- \( L = 0.65(W)(S) \)

#### Speed Limit
- 45 mph (70 km/h) or less:
  - \( L = (W)(S) \)
  - \( L = 0.65(W)(S) \)
- 40 mph (60 km/h) or greater:
  - \( W = \) Width of offset in feet (meters).
  - \( S = \) Normal posted speed in mph (km/h).

### 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:

### Symbols
- **Arrow board**
- **Cone, drum or barricade**
- **Sign on portable or permanent support**
- **Work area**
- **Barricade or drum with flashing light**
- **Type III barricade with flashing lights**
- **Flagger with traffic control sign.**

### Urban Lane Closure
- **Multilane, 1W or 2W with Nontraversable Median**
- **Revised workers sign number to agree with current MUTCD.**

**STANDARD 701601-09**

**DATE**
- 1-1-14: Revised workers sign
- 1-1-13: Omitted text "WORKERS"

**REVISIONS**
- 1-1-14: Revised workers sign number to agree with current MUTCD.
**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:

\[ L = \begin{cases} 
(0.65 \times W) \times S & \text{SPEED LIMIT for distances.} \\
0.65(\text{standard speed}) & \text{SPEED LIMIT} \\
40 \text{ mph} (70 \text{ km/h}) \\
45 \text{ mph} (80 \text{ km/h}) \\
\end{cases} \]

\[ L = \begin{cases} 
150 & \text{or less:} \\
130 & \text{or greater:} \\
\end{cases} \]

\[ W = \text{Width of offset in feet (meters)} \]

\[ S = \text{Normal posted speed in mph (km/h)} \]

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

---

**SYMBOLS**

- **Up Arrow board**
- **Arrow board**
- **Work area**
- **Barricade or drum with steady burning mondirectional light**
- **Flagger with traffic control sign**
- **Cone, drum or barricade**
- **Sign on portable or permanent support**
- **Type III barricade with flashing lights**

---

**SPEED LIMIT**

- 40 mph (70 km/h)
- 45 mph (80 km/h)
- or greater:

**FOR FORMULAS**

\[ L = \begin{cases} 
(0.65 \times W) \times S & \text{English} \\
L = 0.65(\text{standard speed}) & \text{Metric} \\
\end{cases} \]

---

**CASE I**

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, 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 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.

---

**STANDARD 701602-10**
CASE IV

URBAN LANE CLOSURE, MULTILANE, 2W WITH BIDIRECTIONAL LEFT TURN LANE

STANDARD 701602-10

Illinois Department of Transportation

January 1, 2019
APPROVED

January 1, 2019
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-13

ENGINEER OF SAFETY PROG. AND ENGINEERING

APPROVED

W20-3(0)-48
W20-3(0)-48
W20-3(0)-48
W20-3(0)-48

W21-10(0)-48
W21-10(0)-48
W21-10(0)-48
W21-10(0)-48

W20-5(0)-48
W20-5(0)-48
W20-5(0)-48
W20-5(0)-48

W20-1(0)-48
W20-1(0)-48
W20-1(0)-48
W20-1(0)-48

Barricade

R50-5
R50-5
R50-5
R50-5

Type I or Type II barricades

Type I Barricade

Type III Barricade

Type III Barricade

Type III Barricade
**ROAD AHEAD CONSTRUCTION**

**SIGN SPACING**

<table>
<thead>
<tr>
<th>Speed Limit</th>
<th>Sign Spacing</th>
</tr>
</thead>
<tbody>
<tr>
<td>55 mph (88 km/h)</td>
<td>100' (30 m)</td>
</tr>
<tr>
<td>45 mph (72 km/h)</td>
<td>150' (45 m)</td>
</tr>
<tr>
<td>40 mph (65 km/h)</td>
<td>200' (60 m)</td>
</tr>
</tbody>
</table>

**FORMULAS**

\[ L = \frac{W}{S^2} \]

\[ L = 0.65(W)(S) \]

*in feet (meters)*

**SYMBOLS**

- **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:

**SPEED LIMIT**

<table>
<thead>
<tr>
<th>English (Mph)</th>
<th>Metric (Km/h)</th>
</tr>
</thead>
<tbody>
<tr>
<td>40 mph (64 km/h) or less</td>
<td>( L = \frac{W}{S^2} )</td>
</tr>
</tbody>
</table>
| 45 mph (72 km/h) or greater | \( L = \frac{W}{S^2} \) or \( L = 0.65(W)(S) \)

\( W = \) Width of offset in feet (meters).

\( S = \) Normal posted speed in miles per hour (kilometers).

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

**Signs:**
- **Type I or Type II barricades**
- **Type III barricade with flashing lights**

**Symbol:**
- 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

**Table:**

<table>
<thead>
<tr>
<th>Posted Speed</th>
<th>Sign Spacing</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;45</td>
<td>550' (150 m)</td>
</tr>
<tr>
<td>45-55</td>
<td>350' (100 m)</td>
</tr>
<tr>
<td>55</td>
<td>200' (60 m)</td>
</tr>
</tbody>
</table>

**Formulas:**

- **L = \frac{W S^2}{400}**
- **L = 0.65(W)(S)**

**Notes:**
- Refer to **SIGN SPACING TABLE for distances.**
- Required for speeds > 40 mph.
- Use flagger sign only when flagger is present.
- For approved sideroad closures.

**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 more than one traffic lane in an Urban area.
- Calculate L as follows:
  - **SPEED LIMIT**
  - **English (Metric)**
    - 40 mph (70 km/h) or less: L = \frac{W S^2}{400} (W = 0.65(W)(S) or greater).
    - 45 mph (80 km/h) or greater: L = \frac{W S^2}{65000} (L = 0.65(W)(S)).
- W = Width of offset in feet (metres).
- S = Normal posted speed in mph (km/h).
- All dimensions are in inches (millimeters) unless otherwise shown.

**Urban Half Road Closure, Multilane, 2W with Mountable Median**

**ENGINEER OF DESIGN AND ENVIRONMENT**
April 1, 2016
**ENGINEER OF SAFETY ENGINEERING**
April 1, 2016

**DATE**
- 4-1-16 - Revised final revision
- 1-1-15 - New Standard

**STANDARD 701611-01**

**ILLINOIS DEPARTMENT OF TRANSPORTATION**
LEFT TURN LANE OR CENTER MEDIAN OPERATIONS

1. Refer to SIGN SPACING TABLE for distance.
2. Required for speed > 40 mph.
3. Cones at 20' (6 m) centers for 250'-750' (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.
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 > 40 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

CORNER ISLAND OPERATIONS

- For contract construction projects
- For maintenance and utility projects
- Added devices at arrow
- Removed 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:

SPEED LIMIT

- 40 mph (70 km/h) or less:
  \[ L = \frac{200}{W} \text{ ft} \]
- 45 mph (80 km/h) or greater:
  \[ L = \frac{200}{S} \text{ ft} \]

where:
- \( W \) = Width of offset in feet (meters)
- \( S \) = Normal posted speed in mph (km/h)

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

Type III barricades and R11-2-4830 signs 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 positioned as shown in "ROAD CLOSED TO ALL TRAFFIC" detail on Standard 701901.

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

<table>
<thead>
<tr>
<th>DATE</th>
<th>REVISIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-1-16</td>
<td>Omitted orange safety fence.</td>
</tr>
<tr>
<td></td>
<td>From Standard as this is</td>
</tr>
<tr>
<td></td>
<td>covered in the std. spec.</td>
</tr>
<tr>
<td>1-1-12</td>
<td>Added SIDEWALK DIVERSION.</td>
</tr>
<tr>
<td></td>
<td>Modified appearance of plan views. Renamed Side</td>
</tr>
</tbody>
</table>
ROAD CLOSED TO ALL TRAFFIC

Reflective striping may be omitted on the back side of the barricade. If a Type III barricade with an attached sign panel which meets NCHRP 350 is not available, the sign may be mounted on an NCHRP 350 temporary sign support directly in front of the barricade.

ROAD CLOSED TO THRU TRAFFIC

Reflective striping shall appear on both sides of the barricades. If a Type III barricade with an attached sign panel which meets NCHRP 350 is not available, the sign may be mounted on NCHRP 350 temporary sign supports directly in front of the barricade.

TYPICAL APPLICATIONS OF TYPE III BARRICADES CLOSING A ROAD

ARROW BOARDS

TYPE A
ROOF MOUNTED

TYPE B
ROOF OR TRAILER MOUNTED

TYPE C
TRAILER MOUNTED

SECTION A A

TRAFFIC CONTROL DEVICES

STANDARD 701901-08
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.

GENERAL NOTES

F SHAPE DESIGN

SECTION A-A

END VIEW

(Showing connecting loop bars and vertical panel bolt/insert)

LIFTING SLOT

ELEVATION

(Showing connecting loop bars and vertical panel bolt/insert)

PLAN

CONNECTING DETAIL

CONNECTING LOOP BAR

CONNECTING AND ANCHOR PINS

(End may be beveled ½ (10) max.)

TEMPORARY CONCRETE

DATE

REVISIONS

4-1-16

Rev. sheet; connect all
edges to ½ (25). Reference
to Std. 635011 now 782006.

I-1-12

Deleted: ALTERNATE item
connecting and anchoring
pins detail.

STANDARD 704001-08

(Sheet 1 of 2)

Illinois Department of Transportation

ENGINEER OF POLICY AND PROCEDURES
APPROVED

ENGINEER OF DESIGN AND ENVIRONMENT
ISSUED

April 1, 2016

April 1, 2016

PASS

REVISIONS
**SIGN PANEL MOUNTING DETAILS**

**WOOD OR TELESCOPING STEEL POSTS**

**LIGHT OR SIGNAL STANDARDS**

**BREAKAWAY STEEL TUBING POSTS**

(All sign panel sizes)

**SUPPORTING CHANNEL DETAILS**

**ROUTE MARKER ASSEMBLY**

---

**Section modulus (minimum)**

<table>
<thead>
<tr>
<th></th>
<th>Axis A</th>
<th>Axis B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steel</td>
<td>0.050 in.³ (819 mm³)</td>
<td>0.105 in.³ (1720 mm³)</td>
</tr>
<tr>
<td>Aluminum</td>
<td>0.150 in.³ (2456 mm³)</td>
<td>0.315 in.³ (5162 mm³)</td>
</tr>
</tbody>
</table>

---

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

---

**DATE**

1-1-97

**REVISIONS**


---

**ENGINEER OF DESIGN AND ENVIRONMENT**

Issued

PASSED

---

**ENGINEER OF OPERATIONS**

Approved

January 1, 2009

---

**ILLINOIS DEPARTMENT OF TRANSPORTATION**

January 1, 2009

---

**STANDARD 720001-01**
TYPICAL INSTALLATIONS

Signs in any area shall be erected to a uniform height above the edge of the pavement.
**Dimensions shown for cross sections are minimum.**

- All holes are 7/16" (10).
- $S_{x-x}$ is 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, $S_{x-x}$ shall be computed for the net cross section.
- All dimensions are in inches (millimeters) unless otherwise shown.

### Table

<table>
<thead>
<tr>
<th></th>
<th>$a$</th>
<th>$b$</th>
<th>$c$</th>
<th>$S_{x-x}$</th>
<th>lbs./ft. (kg/m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steel 1%</td>
<td>6% (16)</td>
<td>1% (15)</td>
<td>1% (15)</td>
<td>3.40 (56.04)</td>
<td>0.22 (3.59)</td>
</tr>
<tr>
<td>Aluminum 3%</td>
<td>4% (60)</td>
<td>1% (15)</td>
<td>1% (15)</td>
<td>6.49 (104.70)</td>
<td>0.98 (16.17)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>$a$</th>
<th>$b$</th>
<th>$c$</th>
<th>$S_{x-x}$</th>
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<td>0.22 (3.59)</td>
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<tr>
<td>Aluminum 3%</td>
<td>4% (60)</td>
<td>1% (15)</td>
<td>1% (15)</td>
<td>6.49 (104.70)</td>
<td>0.98 (16.17)</td>
</tr>
</tbody>
</table>

**GENERAL NOTES**

- Steel - 1.12 lbs./ft. (1.67 kg/m)
- Steel - 7'-0" (2.1 m) (Unless otherwise specified)

**METAL POSTS FOR SIGNS, MARKERS & DELINEATORS**

**STANDARD 720011-01**
When road classification only is on the second line, it should not be abbreviated.

**TYPICAL SIGN STYLES**

<table>
<thead>
<tr>
<th>SIGN</th>
<th>STYLE</th>
<th>DIMENSIONS</th>
<th>LETTER SIZE UC/LC PRIMARY</th>
<th>BORDER</th>
</tr>
</thead>
<tbody>
<tr>
<td>abc</td>
<td>Var1</td>
<td>13 (33)</td>
<td>17 (43) 6 (15) 3 (7)</td>
<td>6/4</td>
</tr>
<tr>
<td></td>
<td>Var2</td>
<td>16 (40)</td>
<td>18 (46) 8 (20) 5 (12)</td>
<td>8/6</td>
</tr>
<tr>
<td></td>
<td>Var3</td>
<td>24 (60)</td>
<td>25 (63) 10 (25) 7 (17)</td>
<td>10/7</td>
</tr>
<tr>
<td></td>
<td>Var4</td>
<td>30 (75)</td>
<td>16 (40) 12 (30) 9 (22)</td>
<td>12/9</td>
</tr>
<tr>
<td>cde</td>
<td>Var1</td>
<td>24 (60)</td>
<td>15 (38) 6 (15) 4 (10)</td>
<td>4/3</td>
</tr>
<tr>
<td></td>
<td>Var2</td>
<td>30 (75)</td>
<td>19 (48) 8 (20) 6 (15)</td>
<td>6/4</td>
</tr>
<tr>
<td></td>
<td>Var3</td>
<td>35 (89)</td>
<td>24 (60) 10 (25) 7 (17)</td>
<td>7/5</td>
</tr>
<tr>
<td></td>
<td>Var4</td>
<td>42 (105)</td>
<td>3 (75) 12 (30) 7 (17)</td>
<td>12/9</td>
</tr>
<tr>
<td>f</td>
<td>Var1</td>
<td>24 (60)</td>
<td>15 (38) 6 (15) 4 (10)</td>
<td>4/3</td>
</tr>
<tr>
<td></td>
<td>Var2</td>
<td>30 (75)</td>
<td>19 (48) 8 (20) 6 (15)</td>
<td>6/4</td>
</tr>
<tr>
<td></td>
<td>Var3</td>
<td>35 (89)</td>
<td>24 (60) 10 (25) 7 (17)</td>
<td>7/5</td>
</tr>
<tr>
<td></td>
<td>Var4</td>
<td>42 (105)</td>
<td>3 (75) 12 (30) 7 (17)</td>
<td>12/9</td>
</tr>
</tbody>
</table>

* Supplemental Messages

**SUPPORTING CHANNELS**

**GENERAL NOTES**

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.

**DATE**

1-1-18 Revised MOUNTING LOCATION detail

1-1-12 Revised table and lettering to upper/lower case per current MUTCD

**REVISIONS**

 STANDARD 720016-04
SIGN PANELS
EXTRUDED ALUMINUM TYPE

(STANDARD 720021-03)

(Face of sign panel)

6 (150) PANEL

TYPE B SIGN PANEL

SECTION A-A

(Section B-B)

(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 over-head mounted signs.)

SECTION C-C

(Molding

w/o panel bolts)

SIGN MOLDING

(Color shall match sign face material. To be riveted to sign panel at 24 (600) O.C.)

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

DATE

1-1-22

REVISIONS

Removed stainless steel clips

(options and minor types)

1-1-09

Added aluminum clip

(Sheet 1 of 2)

English (metric)

Illinois Department of Transportation

January 1, 2022

APPROVED

Engineer of Design and Environment

January 1, 2022

Engineer of Operations

DATE

REVISIONS

1-1-22

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(options and minor types)

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English (metric)

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APPROVED

Engineer of Design and Environment

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Engineer of Operations

DATE

REVISIONS

1-1-22

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(options and minor types)

1-1-09

Added aluminum clip

(Sheet 1 of 2)

English (metric)

Illinois Department of Transportation

January 1, 2022

APPROVED

Engineer of Design and Environment

January 1, 2022

Engineer of Operations

DATE

REVISIONS

1-1-22

Removed stainless steel clips

(options and minor types)

1-1-09

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(Sheet 1 of 2)

English (metric)

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(options and minor types)

1-1-09

Added aluminum clip

(Sheet 1 of 2)

English (metric)
**TERMINAL MARKERS**

**OBJECT AND TERMINAL MARKERS**

**STANDARD 725001-01**

**ENGINEER OF DESIGN AND ENVIRONMENT**

**ENGINEER OF OPERATIONS**

**APPROVED**

**ISSUED**

**DATE**

**REVISIONS**

**1-1-17**

*Limited minimum reflectivity area requirement for terminal marker.*

**4-1-16**

*Re-numbered standard from 635006.*

---

**Case I**

- **Object Marker Details**
  - **Sheeting Position:** CASE II
  - **Direct Applied**
    - Alternating black and yellow stripes.
  - **Terminal Marker Details**
    - Color: Black / Yellow reflectorized
    - *The width and height (a, b) of the terminal marker shall be within approximately 1/2 (25) of the outer edge of the terminal end.*

**Case II**

- **Object Marker Details**
  - **Sheeting Position:** CASE II
  - **Post Mounted**
    - Alternating black and yellow stripes.

**Type 1 or Type 4**

- **Object Marker Details**
  - **Sheeting Position:** CASE II
  - **Post Mounted**
    - Alternating black and yellow stripes.

**Type 2**

- **Object Marker Details**
  - **Sheeting Position:** CASE II
  - **Post Mounted**
    - Alternating black and yellow stripes.

**Type 3**

- **Object Marker Details**
  - **Sheeting Position:** CASE II
  - **Post Mounted**
    - Alternating black and yellow stripes.

---

**General Notes**

See detail on Standard 729001 for mounting markers to posts.

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

All bolts 1/4 (M10) hex head zinc or cadmium plated.

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

TELESCOPING STEEL
SIGN SUPPORT

STANDARD 728001-01

DATE REVISIONS
1-1-09 Switched units to
English (metric)
1-1-07 New Standard. Used to
be part of Standard
For diamond shaped sign with side S as shown, use required post size for a sign with W = 0.7S and D = 1.4S.

NOTE: Minimum of 2 bolts per post required.

**GENERAL NOTES**


LOADING: for 60 mph (95 km/h) wind velocity with 38% 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.

**APPLICATIONS OF TYPES A & B METAL POSTS (FOR SIGNS & MARKERS)**

**STANDARD 729001-01**
Letters I, D, and H are 2 (50 series D raised).

1/8 (13) hole
3 pieces

1/4 (16) hole

1/4 (13) dia.

Washer shim. Additional washers shall be used to level the base when necessary.

1/2 (13) dia.

1 1/2 (32) R

1 (25) R

1/2 (13) dia.

3 places

HOLE

ANCHOR BOLT DETAIL

POST ASSEMBLY DETAIL

1/2 (13) Galvanized carriage bolt

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

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 RR 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

TYPICAL PAVEMENT MARKINGS

STANDARD 780001-05

(1-1-15) Added symbols.  Revised
(1-1-14) Added bike symbol.  Revised
1-1-97 Added bike symbol.  Revised
Height Legend Size Arrow
6' (1.8 m) Small 2.9 (74)
8' (2.4 m) Large 3.8 (96)

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

TYPICAL PAVEMENT MARKINGS

Illinois Department of Transportation
January 1, 2015
APPROVED

ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

PASSED ENGINEER OF OPERATIONS

STANDARD 780001-05
Reduce to 40' (12.2 m) o.c. on curves with posted or advisory speeds of 45 mph (70 km/h) or less.

**See MULTI LANE DIVIDED detail**

**for lane marker notes.**

**MULTI-LANE UNDIVIDED**

---

**MULTI-LANE DIVIDED**

---

**TWO-LANE / TWO-WAY**

---

**TWO-WAY LEFT TURN**

---

**FREEWAY EXIT RAMP**

---

**RURAL LEFT TURN**

---

**TYPICAL APPLICATIONS**

---

**SYMBOLS**

---

**STANDARD 781001-04**

---

**RAISED REFLECTIVE PAVEMENT MARKERS**

---

**Apr 1, 2016**

---

**ENGINEER OF DESIGN AND ENVIRONMENT**

---

**APPROVED**

---

**DATE**

---

**REVISIONS**

---

**English (metric).**
Metal rivet

Adhesive weep slots or holes equally spaced on both sides

REFLECTOR TYPE A
(monomirectional shown)

REFLECTOR TYPE B
(bidirectional shown)

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

GUARDRAIL AND BARRIER WALL REFLECTOR MOUNTING DETAILS

DATE REVISIONS
1-1-20 Revised from F-shape to constant shape parapet, revised note 3 on sheet 3, and fixed typo.
3-8-16 Added reflector spacing
4-1-16 Revised TERMINAL detail. Moved TERMINAL MARKER to side 725001.

STANDARD 782006-01
Reflective area. May be rectangular or slight trapezoid.

Minimum total area of base 7.0 sq. in. (4536 mm²).

3 min. adhesive weep holes or slots each side, variable spacing.

Cross section may be "I" or "T" shaped and may have side supports at ends.

REFLECTOR TYPE C

Minimum at base 2 (51) min.

TYPICAL MOUNTING DETAIL FOR GUARDRAIL REFLECTOR

TYPICAL MOUNTING DETAIL FOR BRIDGE RAIL REFLECTOR

TYPICAL MOUNTING DETAIL FOR BARRIER WALL REFLECTOR

G U A R D R A I L A N D B A R R I E R W A L L R E F L E C T O R

MOUNTING DETAILS

STANDARD 782006-01

Illinois Department of Transportation
2020 APPROVED
ENGINEER OF DESIGN AND ENVIRONMENT ISSUED 1-1-2000
ENGINEER OF OPERATIONS

PASSED

(Mount 2 of 3)
Terminal marker, see standard 725001, whichever is less.

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.

Where the shoulder width is reduced to less than 24 (610), use bidirectional crystal/crystal in lieu of monodirectional crystal.

Guardsrail / Barrier Wall
Reflector Placement Detail

One-Way Traffic

Two-Way Traffic
The following equipment is to be furnished and installed on the TYPE C installation:

1. Cable in conduit (electric cable, No. 6, 2/C except where otherwise specified).
2. Galvanized steel conduit 1/2 (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.

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

TYPE A

- Steel conduit
- Conduit clamps at 5 (1.52 m) intervals
- Two 1/C No. 8 cables in 1 (25) conduit
- Connector for non-metallic
- Meter
- Circuit breaker (50 amperes) in weatherproof enclosure (NEMA 4X)
- Ground stud for neutral connection
- Ground clamp
- Ground rod
- Copper wire

TYPE B

- Steel conduit
- Conduit clamps at 5 (1.52 m) intervals
- Two 1/C No. 8 cables in 1 (25) conduit
- Connector for non-metallic
- Meter
- Circuit breaker (50 amperes) in weatherproof enclosure (NEMA 4X)
- Ground stud for neutral connection
- Ground clamp
- Ground rod
- Copper wire

TYPE C

- Steel conduit
- Conduit clamps at 5 (1.52 m) intervals
- Two 1/C No. 8 cables in 1 (25) conduit
- Connector for non-metallic
- Meter
- Circuit breaker (50 amperes) in weatherproof enclosure (NEMA 4X)
- Ground stud for neutral connection
- Ground clamp
- Ground rod
- Copper wire

ALTERNATE INSTALLATION

Installation where weatherproof box cannot be installed facing the adjacent property line.

ELECTRICAL SERVICE INSTALLATION DETAILS

DATE: 1-1-09
REVISIONS: Switched units to English (metric).

STANDARD 805001-01

ILLINOIS DEPARTMENT OF TRANSPORTATION
APPROVED ENGINEER OF DESIGN AND ENVIRONMENT
DATE: 1-1-09
PASSED ENGINEER OF OPERATIONS
DATE: 1-1-09

STANDARD 805001-01
**INTEGRAL/SEMI-INTEGRAL ABUTMENT WITH PARAPET ON APPROACH PAVEMENT**

**JOINTED ABUTMENT WITH PARAPET ON APPROACH PAVEMENT**

Stainless steel junction box 12 x 12 x 6 (300 x 300 x 150) min.

2 (50) Liquidtight flexible nonmetallic conduit, 21 (535) min. length.

Expansion bushing.

**CONSTRUCTION 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) min. stainless steel junction boxes attached to back of wall and connected with liquidtight flexible nonmetallic conduit for all expansion joints.

- See Standard 631031 for details of steel connector plate for constant slope parapet.

**GENERAL NOTES**

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

- The standard name, and fixed typo.

- Revised from F-Shape to constant slope parapet, added general note for steel connector plate, revised standard name, and fixed typo.

- New standard.
**Jointed Abutment with Parapet Ending on Bridge Deck**

**Plan**
- Guardrail terminal
- Parapet wall on bridge deck
- Expansion joint
- 2 (50) PVC conduit embedded in structure

**Elevation**
- Wingwall
- Parapet wall with bushing
- Stainless steel conduit 10' x 2 (3 m x 50) mm
- Stainless steel conduit with bushing
- Expansion joint
- 2 (50) liquidtight flexible nonmetallic conduit: 6' (1.83 m) max. length

**View B-B**
- Parapet wall on bridge deck
- Guardrail terminal
- 2 (50) PVC conduit embedded in structure
- Stainless steel conduit
- Bridge
- 2 (50) liquidtight flexible nonmetallic conduit: 6' (1.83 m) max. length

**Raceways Embedded in Structure**
- Standard 812001-01

**Illinois Department of Transportation**
- Approved January 1, 2020
- Engineer of Design and Environment
- Issued 1-1-15
PORTLAND CEMENT CONCRETE

ELEVATION

CONDUIT

24 (610)
min.

18 (450)

21 (535)
min.

28 (710)

min.

8 (200)

min.

French drain

Nonmetallic conduit bell

Galvanized steel hooks

21 1/2 (553)

min.

Concrete yd³ (m³)

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<tr>
<th>Depth</th>
<th>Handhole</th>
<th>Heavy Duty Handhole</th>
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<tr>
<td>80</td>
<td>0.64</td>
<td>0.62</td>
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<tr>
<td>76</td>
<td>0.62</td>
<td>0.60</td>
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<td>38</td>
<td>0.73</td>
<td>1.10</td>
</tr>
<tr>
<td>21</td>
<td>0.89</td>
<td>1.50</td>
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QUANTITIES

ELEVATION

COMPOSITE CONCRETE

HANDEHOLE

PORTLAND CEMENT CONCRETE

HEAVY DUTY

1-1-15

Corrected dimension on

Concrete quantities table.

9-1-09

Switched units to

English (metric).

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

STANDARD 814001-03

DATE  REVISIONS
1-1-15  Corrected dimension on

Concrete quantities table.

1-1-09  Switched units to

English (metric)
**Flush hinge**  
**Conduit**

**ELEVATION**

- **Portland cement concrete**
- **Galvanized steel hooks**
- **Nonmetallic conduit belts**
- **French drain**

**PLAN**

- 4'-6" (1.37 m) min.
- 4' (1.22 m)
- 6 (450)
- 18

**Conduit**

- 32 (815) min.
- 30 (760)
- 24 or 30

**Steel hooks**

**Galvanized conduit bells**

**Nonmetallic drain**

**French**

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

**DATE**

1-1-21  
Corrected dimension in Portland Cement Concrete Plan view.

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

**REVISIONS**

**DOUBLE HANDHOLES**

**STANDARD 814006-03**
Underpass luminaire mounted to pier or abutment wall (typ.).

7 (6) expansion anchor with 5 (13) spacing bushing, three required.

1 (25) min. stainless steel conduit to junction box.

Conduit clamp as needed (typ.).

Stainless steel conduit shall be used beneath bridge deck. Rigid steel conduit may be used in lieu of flexible conduit.

Branch circuits to luminaire shown routed from underground. Branch circuits may be routed from bridge parapet above.

All dimensions are in inches (millimeters) unless otherwise shown.
Transformer base, when used.

Conductor splice (typ.).

Surge arrester (typ.).

Breakaway fuse holder with fuses (typ.).

Grounding nut in transformer base.

Bare No. 6 wire, Ground rod clamp.

Concrete foundation.

Raceway with branch circuit conductors, (typ.).

Light pole handhole with ground lug.

See plans for branch lighting circuit conductors.

Green equipment grounding conductor. See plans for size.

Concrete.

Any voids in the foundation shall be filled with fine aggregate.

Conductors extended into light poles shall be of a length sufficient for splices to be withdrawn 18 (450) out of pole handhole.

All conductors originating in pole shall be No. 10 unless noted otherwise.

Conductors up to Bare No. 6 wire.

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.

Concrete foundation.

Metal foundation.

Any voids in the foundation shall be filled with fine aggregate.

Conductors up to Bare No. 6 wire.

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.

Concrete foundation.

Metal foundation.

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 handhole.

Any voids in the foundation shall be filled with fine aggregate.

See Standard 836-01 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 ‘breaker’.

STANDARD 821101-02

LUMINAIRE WIRING IN POLE
Service.

3-wire, overhead 120/240 V, 1-phase, Weatherhead.

as needed.

Down guy and anchor, as needed.

25' (7.5 m) Wood service pole.

3-No. 8 XLP cables in 1 (25) rigid steel conduit. Malleable iron conduit clamps at 5 (15.5 m) intervals.

Meter (when required) Conduit hub.

Service disconnect switch. Rigid steel conduit elbow.

Rigid steel conduit. (13) Sch. 40 PVC conduit. Ground line.

No. 6 bare copper wire.

Branch lighting circuits.

Controller enclosure, minimum dimensions: 18H x 12W x 8D (450 x 300 x 200)

20 amp, 2-pole circuit breaker.

Surge arrester.

Service disconnect switch - 2-pole, 3-wire, 30 amp, fused at 30 amp, solid neutral in NEMA 4X enclosure having lockable external handle.

Terminal block sized for conductors as shown on plant.

* Size larger as needed.

** Provide 24x1: (304x225x25) watertight pouch mounted inside controller door with as built plans and schematics.

Provide engraved nameplate on front of enclosure and schematics. Mounted inside controller door with as-built plans and schematics.

Provide 12x9x1 (305x225x25) Watertight pouch mounted inside controller door with as built plans and schematics.

** Provide engraved nameplate on front of enclosure and schematics. Mounted inside controller door with as-built plans and schematics.

BRANCH LIGHTING CIRCUITS

Photocell.

Neutral bar.

Equipment ground bar.

GENERAL NOTES

Provide 12x9x1: (304x225x25) Watertight pouch mounted inside controller door with as-built plans and schematics.

Provide engraved nameplate on front of enclosure and schematics. Mounted inside controller door with as-built plans and schematics.

Provide 12x9x1: (304x225x25) Watertight pouch mounted inside controller door with as-built plans and schematics.

Provide engraved nameplate on front of enclosure and schematics. Mounted inside controller door with as-built plans and schematics.

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.

1-1-19 Replaced ** note with new note regarding consulting utility company standards for installation.

1-1-19 Replaced ** note with new note regarding consulting utility company standards for installation.

4-1-16 Corrected connection at terminal block.

STANDARD 825001-04

ILLINOIS DEPARTMENT OF TRANSPORTATION

APPROVED 2019

ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-10

PASSED

ELECTRICAL AND MECHANICAL UNIT CHIEF

DATE

REVISIONS

1-1-19 Replaced ** note with new note regarding consulting utility company standards for installation.

4-1-16 Corrected connection at terminal block.

LIGHTING CONTROLLER POLE MOUNTED, 240V

(Sheet 1 of 2)
3-wire, 60 amp*, fused at 60 amp*, 120/240V secondary, single-phase, 60Hz.

Surge arrester.

Transformer - 1KVA*, 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.

Controller enclosure.

Controller enclosure, minimum dimensions: 30H x 20W x 24D - *(760 x 510 x 355)".

Insulating mounting board.

No. 6 bare copper wire.

Branch lighting circuits in unit duct(s).

Neutral bar.

Equipment ground bar.

Ground line.

No. 6 bare copper wire.

Controller enclosure.

Rigid steel conduit elbow.

Rigid steel conduit.

Rigid steel conduit, 1/2" (13) Sch. 40 PVC conduit.

Metal (when required). **

Conduit hub.

Service disconnect switch.

Ventilator.

Controller enclosure.

Branch lighting circuits.
**Lighting Service**

- 3-wire, overhead 120/240 V, 1-phase, Weatherhead.
- 25' (7.5 m) Wood service pole. *Size larger as needed.
- Service conductors in rigid steel conduit, sized as required.
- Malleable iron conduit clamps at 5' (1.5 m) intervals.
- Feeder conductors in rigid conduit to lighting controller.

**Electrical Service Installation**

- 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.

**Foundation (Plan)**

- (Work pad not shown.)

**Anchor Rod Detail**

- (Typical overhead service shown. Cut pole off for underground service and treat cut surface with preservative. Consult utility company standards for exact requirements.) *Size larger as needed.

**Controller Enclosure**

- Minimum dimensions: 39h x 29w x 14d * (1000 x 750 x 350).
- Insulated mounting board.
- Neutral bar.
- Equipment ground bar.
- Terminal block sized for conductors as shown on plans.
- Branch lighting circuits.

**Control Schematic**

- Single-pole, single-throw switch.
- Incandescent luminaire, enclosed and gasketted with 100 watt lamp.
- Photocell with integral surge arrester.
- 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.
**Lighting Service**

- 3-wire, overhead service
- 120/240 V, 1-phase, Weatherhead needed
- Anchor, as needed
- Down guy and cover overhang

**Service Pole**

- 25' (7.5 m) Wood service pole, as required
- Malleable iron conduit (13) Sch. 40, sized as required
- PVC conduit (5 (125) Sch. 40, sized as required

**Ground Line**

- No. 6 bare copper wire
- Ground rod

**Control Schematic**

- Photocell with integral surge arrester
- 100 amp, 1-pole circuit breaker
- Surge arrester
- GFCI duplex receptacle

**Electrical Service Installation**

- Typical overhead service shown. Cut pole off for underground service and treat cut surface with preservative. Consult utility company standards for exact requirements.
- Size larger as needed.

**Foundation Plan**

- Work pad not shown

**Anchor Rod Detail**

-ANCHOR ROD

**Dimensions**

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

- 3-wire, overhead 240/480 V, 1-phase, Weatherhead needed.
- Anchor, as required.
- Down guy and cover overhang.
- Slotted ventilator in underside of service pole.
- 25' (7.5 m) Wood pole as required.
- Conduit, sized in rigid steel Malleable iron conduit required.
- Service conductors in rigid steel conduit, sized as required.
- Clamps at 5' (1.5 m) intervals.
- **Meter (when required).**
- **Branch disconnect switch.**
- Ground line.
- **Additional wiring window as needed.**
- PVC conduit. (13) Sch. 40
- 2 1
- **Ground line.**
- Concrete foundation.
- **No. 6 bare copper wire.**
- **Ground rod.**
- **Feeder conductors in rigid conduit to lighting controller.**
- **Conduit hub.**
- **Service disconnect switch.**
- **To service pole.**
- **Core and sheath of conductors sized as required.**
- **Feeder conductors sized as required.**
- **Photocell with integral surge arrester.**
- **GFCI duplex receptacle.**
- **Surge arrester.**
- **Single-pole, single-throw switch.**
- **Neutral bar.**
- **Equipment ground bar.**
- **Ground rod in access well.**
- **Neutral bar.**
- ** توف wiring window.**
- **Additional wiring window as needed.**
- **Controller enclosure.**
- **Controller enclosure, minimum dimensions.**
- **50 H x 36 W x 17 D minimum dimensions: Controller enclosure, standards.**
- **(Typical overhead service shown. Cut pole off for underground service and treat cut surface with preservative. Consult utility company standards for exact requirements.) Size larger as needed.**
- When cold sequencing is required, provide a meter disconnect switch as directed by utility company.

**CONTROL SCHEMATIC**

- Photocell with integral surge arrester.
- HAND-OFF-AUTO selector switch.
- 100 amp*, 1-phase, 100 amp*, fused at 100 amp*, solid neutral in NEMA 4X enclosure having lockable external handle.
- Service disconnect switch - 1-pole, 2-pole circuit breaker.
- 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.
- Transformer - 1KVA*, 480V primary, 120/240V secondary, single-phase, 60Hz.
- 15 amp, 2-pole circuit breaker.
- 100 amp*, 2-pole circuit breaker.
- Terminal block sized for conductors as shown on plans.

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

**DATE**

1-1-19

**REVISIONS**

1-1-19 Replaced ** note with new note regarding utility company standards. Made *** the ** note.


**LIGHTING CONTROLLER**

BASE MOUNTED, 480V

**STANDARD 825026-04**
LIGHTING

3-wire, overhead 120/240 V, 1-phase, Weatherhead needed.

Anchor, as Downguy and needed.

Slotted ventilator in underside of cover overhang.

Slotted ventilator as needed.

Weatherhead

120/240 V, 1-phase, 3-wire, overhead service.

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.

1/4 (16) dia. anchor rod.

Concrete foundation.

Additional wiring window as needed.

Lighting controller.

PVC wiring window.

Feeder conductors in rigid conduit to lighting controller.

Ground line.

No. 6 bare copper wire.

28' (8.5 m) 5'-6”

diameter, 

(450)

18

5'-6”

6"m (1.2 m)

18

(15) 45° Chamfer.

Additional waterproofing.

Controller enclosure.

Controller enclosure.

12 x 9 x 1 (305 x 275 x 275) watertight pouch mounted inside door with as-built drawings and schematics.

Engraved name plate.

Lighting controller.

Foundation (Plan)

(Work pad not shown.)

* Size larger as needed.

Obstruction Warning

Illinois Department of Transportation

January 1, 2022

APPROVED

January 1, 2022

ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-19

PASSED

ELECTRICAL AND MECHANICAL UNIT CHIEF

DATE

REVISIONS


2022 Replaced "Navigation" with Control Schematic.

1-1-19 Replaced ** note with new note regarding consulting utility.

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

ELECTRIC SERVICE INSTALLATION

(Typical overhead service shown. Cut pole off for underground service and treat cut surface with preservative. Consult utility company standards for exact requirements.)

* Size larger as needed.

ANCHOR ROD DETAIL

STANDARD 826001-03

OBSTRUCTION WARNING

LIGHTING CONTROLLER, 240V

[Sheet 1 of 2]
Controller enclosure, minimum dimensions: 390 x 446 x 260 (1500 x 1120 x 660)

Insulated mounting board.

Service conductors, sized as required.

Feeder conductors, sized as required.

Neutral bar.

Equipment ground bar.

Roadway lighting circuits.

Obstruction warning lighting circuits.

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.

PHOTOCELL with integral surge arrester for roadway lighting.

PHOTOCELL with integral surge arrester for obstruction warning 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 gasketted 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.

PHOTOCELL with integral surge arrester for roadway lighting.

PHOTOCELL with integral surge arrester for obstruction warning 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 gasketted 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.

CONTROLLER ENCLOSURE, 390 x 446 x 260 (1500 x 1120 x 660)

MINIMUM DIMENSIONS:

LIGHTING CONTROLLER, 240V

OBSTRUCTION WARNING

PASSED: 1-1-12

ENGINEER OF DESIGN AND ENVIRONMENT

APPROVED: 1-1-12
Electric Service Installation

(Typical overhead service shown. Cut pole off for underground service and treat cut surface with preservative. Consult utility company standards for exact requirements.)

- Size larger as needed.
- ** When cold sequencing is required, provide a meter disconnect switch as directed by Utility Company.

Obstruction Warning

"Obstruction Warning" in std title, note (2) and Control Schematic. Replaced previous note with new note regarding utility company standards. Made "** note.

Lighting Controller, 480V

All dimensions are in inches (millimeters) unless otherwise shown.
Controller enclosure, minimum dimensions:
590 x 440 x 260 \( \text{mm} \)
(1500 x 1120 x 660)

Service conductors.

Neutral bar.

GFCI duplex receptacle.

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.

20 amp*, 2-pole circuit breaker.

Transformer - 1 KVA*, 480V primary, 120/240 secondary, single phase, 60 Hz.

15 amp, 2-pole circuit breaker.

Terminal block sized for conductors as shown on plans.

* Size larger as needed.

CONTROL SCHEMATIC
**Handhole / Identification**

**Orientation Detail**

- **Handhole**
- **Pole Identification**
- **Pole on median barrier wall**

**Section A-A**

- **Bolt circle**
- **Hex nut with washer**
- **Washer shall cover entire slot**
- **Nut covers required but not shown**

Screen wrapped around nuts and anchor rods between foundation and bottom of pole base. Provide 6 (150) minimum overlap and wire-tie with matching wire.

Concrete foundation, barrier or retaining wall.

**Detail A**

- **2½ O.D. x ½ (64 x 7)** washers both sides of 2½ O.D. x ½ (64 x 12) min. isolation washer
- **Pole base**
- **6 (13) min. isolation pad sized to match pole base**
- **6 (13) inveting plate sized to match pole base**
- **1 (25) leveling nut**

Screen wrapped around nuts and anchor rods between foundation and bottom of leveling plate. Provide 6 (150) minimum overlap and wire-tie with matching wire.

**Elevation at Concrete Foundation, Metal Foundation or Retaining Wall**

- **Leveling nut (typ.)**
- **Nut covers required but not shown**

Hex nut and lock washer on fully threaded rod for metal foundation.

Metal foundation.

**Elevation at Bridge Parapet**

- **4 x 8 (100 x 200) min. Handhole and cover**
- **See orientation detail**

**Pole Base Details**

- **Bridge parapet**
- **See DETAIL A**

**Light Pole**

**Aluminum Mast Arm**

**Bridge Plans**

- **1 (25) anchor rod by others**

See Bridge Plans for 1 (25) anchor rod by others.

**Tapped ⅜ (13) hole for grounding connector**

Reinforcing frame with full circumferential welds.
DAVIT LIGHT POLE
(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.

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.

**LIGHT POLE**
**ALUMINUM DAVIT ARM**

**DATE:** 1/1/9

**REVISIONS:**
1/1/17 - Added notes 3 and 4.

1/1/19 - Revised standard to comply with the 2013 version of AASHTO.

**ENGINEER OF DESIGN AND ENVIRONMENT:** 2019

**APPROVED:** 2019

**ISSUED:** 2019

**STANDARD 830006-05**

(Rev. Sheet 1 of 2)
Traffic flow

Pole identification.

Handhole.

Traffic flow

Pole.

Traffic flow

Pole on barrier wall, retaining wall or parapet.

Traffic flow

Pole on ground mounted foundation.

Traffic flow

Davit arm.

Traffic flow

Pole identification.

Traffic flow

Pole identification.

Traffic flow

Pole identification.

Traffic flow

Pole on median barrier wall.

Traffic flow

Pole.

Traffic flow

Pole on ground mounted foundation.

Traffic flow

Pole.

Section A-A

North (not shown)

Bolt circle.

Hex nut with washer.

Washer shall cover entire shank (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.

See DETAIL A.

Elevation at concrete foundation, metal foundation or retaining wall.  

Elevation at bridge parapet.  

Pole base details.

Light pole aluminum davit arm

Illinois Department of Transportation

January 1, 2019

APPROVED

ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED

2019

STANDARD 830006-05
Pole cap secured to pole with three 5/16" (8) set screws.

Clamp type bracket with hex head bolts and hardware (typ.).

See pole base and handhole detail.

Pole identification banded to pole. See orientation detail.

Mast arm length
15'-0" (4.57 m) max.

Mast arm tapered to 2 1/4" (60) OD.

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.

DATE
1-1-19 Revised POLE and BASE POLE tables
1-1-19 Added pole mounted on bridge parapet. Modified attachment of screen.

REVISIONS

Lower shaft length shall be from the bottom of the pole base to the bottom of the slip joint.

3° max. for unloaded pole, 1.5° max. for loaded pole.
Traffic flow

Pole identification.

Traffic flow

Pole on median barrier wall.

Traffic flow

Pole on ground mounted foundation.

Handhole.

3\(\frac{1}{2}\) x 2 (32 x 50) slot (typ.).

Tapped \(6\) (13) hole for grounding connector.

Bolt circle.

Hex nut with washer. Washer shall cover entire bolt (typ.). Nut covers required but not shown.

Concrete foundation, barrier or retaining wall.

Elevation at concrete foundation, metal foundation or retaining wall.

Section A-A (bolts not shown)

See Bridge Plans for 1 (25) anchor rod by others.

2\(\frac{1}{2}\) O.D. x \(\frac{1}{2}\) (64 x 7) washers both sides of 2\(\frac{1}{2}\) O.D. x \(\frac{1}{2}\) (64 x 12) min. isolation washer.

Pole base.

\(\frac{1}{2}\) (13) min. isolation pad sized to match pole base.

\(\frac{1}{2}\) (13) min. leveling plate sized to match pole base.

1 (25) leveling nut.

Screen wrapped around nuts and anchor rods between foundation and bottom of pole base. Provide 6 (150) minimum overlap and wire-tie with matching wire.

Screen wrapped around nuts and anchor rods between foundation and bottom of leveling plate. Provide 6 (150) minimum overlap and wire-tie with matching wire.

Handhole and cover. See orientation detail.

Handhole cover.

Handhole gasket.

See DETAIL A.

Handhole and cover. See orientation detail.

Leveling nut (typ.).

Leveling nut (typ.).

Omit leveling nuts when breakout devices are required.

Handhole and cover. See orientation detail.
### Pole Identification
- Tenon top, see detail.
- Twin tenon, see detail.

### Base Plate

<table>
<thead>
<tr>
<th>Mounting Height</th>
<th>Bolt Circle Diameter</th>
<th>Base Plate Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>5' (1.5 m) or less</td>
<td>1 1/2 (290)</td>
<td>1 (25)</td>
</tr>
<tr>
<td>Greater than 35' (10.7 m) to 50' (15.2 m)</td>
<td>1 1/2 (380)</td>
<td>1 1/2 (32)</td>
</tr>
<tr>
<td>Greater than 50' (15.2 m)</td>
<td>2 (380)</td>
<td>2 (32)</td>
</tr>
</tbody>
</table>

### Light Pole

<table>
<thead>
<tr>
<th>Mounting Height</th>
<th>Minimum Shaft Diameter</th>
<th>Maximum Wall Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>35' (10.7 m) or less</td>
<td>8 tapered to 4</td>
<td>25 gauge</td>
</tr>
<tr>
<td>Greater than 35' (10.7 m) to 50' (15.2 m)</td>
<td>10 tapered to 4</td>
<td>10 gauge</td>
</tr>
</tbody>
</table>

### TENON DETAIL
- See pole base and handhole detail.
- Pole identification banded to pole. See orientation detail.

### TENON TOP LIGHT POLE
- (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 barding 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.
Traffic flow

Pole identification.

Pole on ground mounted foundation.

Handhole.

Traffic flow

Pole identification.

Pole on parapet or retaining wall.

SECTION A-A

1½ x 2 (32 x 50) slot (typ.).

Tapped ½ (13) hole for grounding connector.

Bolt space.

Handhole and cover.

See orientation detail.

Hex nut with washer.

Washer shall cover entire slot (typ.).

Nut covers required but not shown.

Screen wrapped around nuts and anchor rods between foundation and bottom of pole base. Provide 6 (150) minimum overlap and wire-tie with matching wire.

Concrete foundation, barrier or retaining wall.

ELEVATION AT CONCRETE FOUNDATION, METAL FOUNDATION OR RETAINING WALL

See Bridge Plans for 1 (25) anchor rod by others.

3 (25) self-locking nut. Install with torque wrench to specification.

Pole base.

1½ (13) min. isolation pad sized to match pole base.

1½ (13) min. leveling plate sized to match pole base.

1 (25) leveling nut.

DETAIL A

Screen wrapped around nuts and anchor rods between foundation and bottom of leveling plate. Provide 6 (150) minimum overlap and wire-tie with matching wire.

2½ O.D. x ½ (64 x 12) washer both sides of 2½ O.D. x ½ (64 x 12) min. isolation washer.

Pole base.

ELEVATION AT BRIDGE PARAPET

POLE BASE DETAILS

HANDHOLE / IDENTIFICATION ORIENTATION DETAIL

HANDHOLE DETAIL

HANDHOLE cover.

Handhole gasket.

HANDHOLE DETAIL

HANDHOLE cover.

Handhole gasket.
**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.

**Temporary Roadway Lighting**

**Standard 830026-01**
**Concrete Foundation**

**Revisions**

**Engineer of Design and Environment**

**Light Pole**

- Mounting height: (14.0 m - 15.2 m)
- (12.5 m - 13.7 m)
- (10.9 m - 12.2 m)
- (9.4 m - 10.7 m)

- Bolt circle diam. shall be 17 (430) when a transformer base is used.

- Diameter: (See table)
- Bolt circle: (8 3 8)

- **January 1,**
- **January 1,**

- **Shaft deph:** (381)
- (292)
- (292)
- (300 x 300 x 25)

- **Depth:** (2.13 m)
- (1.98 m)
- (1.83 m)

- **Plate to be installed when required (See ring plate detail)**

- **Anchor rod:** 1 (25) hex head nut fully seated, typ.

- **Thread bottom of anchor rod:** 2 (50) and provide matching hex head nut fully seated, typ.

- **Cut and Thread anchor rods:** (typ.)

- **Ring Plate Detail:**

- **See Ring Plate Detail when rock is encountered.**

- **General Notes:**

  - All foundations are designed to be located on slopes not exceeding 2:1 where soils have an unconfined compressive strength of at least 1.0 ksf. The Contractor shall verify the soil strength during staking for 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 may be reduced 6 (150) for every 12 (300) of embedment in rock. The minimum foundation depth shall be 4/16 (3.37 m) cut anchor rods 6 (150) above bottom of excavated hole. See ring plate detail.

  - Anchor rods shall be increased in diameter as needed for 60 (15.2 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 shown.
**GENERAL NOTES**

See standard 637006 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.

---

**LIGHT POLE FOUNDATION**

**CONCRETE BARRIER**

**44 IN. (1120 mm)**

**STANDARD 836011-02**
**SHAFT LENGTH TABLE**

<table>
<thead>
<tr>
<th>SOIL CONSISTENCY</th>
<th>Qu in ft³ (Qu in kPa)</th>
<th>80'</th>
<th>90'</th>
<th>100'</th>
<th>110'</th>
<th>120'</th>
<th>130'</th>
<th>140'</th>
<th>150'</th>
<th>160'</th>
</tr>
</thead>
<tbody>
<tr>
<td>MEDIUM</td>
<td>5 to 10</td>
<td>15'</td>
<td>16'</td>
<td>16'</td>
<td>17'</td>
<td>17'</td>
<td>18'</td>
<td>18'</td>
<td>19'</td>
<td>20'</td>
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<tr>
<td>VARIOUS</td>
<td>10 to 25</td>
<td>14'</td>
<td>15'</td>
<td>16'</td>
<td>17'</td>
<td>17'</td>
<td>18'</td>
<td>18'</td>
<td>19'</td>
<td>20'</td>
</tr>
<tr>
<td>DENSE</td>
<td>25 to 50</td>
<td>14'</td>
<td>15'</td>
<td>16'</td>
<td>17'</td>
<td>17'</td>
<td>18'</td>
<td>18'</td>
<td>19'</td>
<td>20'</td>
</tr>
<tr>
<td>VERY DENSE</td>
<td>&gt; 50</td>
<td>13'</td>
<td>14'</td>
<td>15'</td>
<td>16'</td>
<td>16'</td>
<td>17'</td>
<td>17'</td>
<td>18'</td>
<td>19'</td>
</tr>
</tbody>
</table>

**LIGHT TOWER FOUNDATION**

**SHAFT LENGTH TABLE**

<table>
<thead>
<tr>
<th>SOIL CONSISTENCY</th>
<th>Qu in ft³ (Qu in kPa)</th>
<th>80'</th>
<th>90'</th>
<th>100'</th>
<th>110'</th>
<th>120'</th>
<th>130'</th>
<th>140'</th>
<th>150'</th>
<th>160'</th>
</tr>
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<tbody>
<tr>
<td>MEDIUM</td>
<td>5 to 10</td>
<td>15'</td>
<td>16'</td>
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<td>20'</td>
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<td>16'</td>
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<td>17'</td>
<td>18'</td>
<td>18'</td>
<td>19'</td>
<td>20'</td>
</tr>
<tr>
<td>DENSE</td>
<td>25 to 50</td>
<td>14'</td>
<td>15'</td>
<td>16'</td>
<td>17'</td>
<td>17'</td>
<td>18'</td>
<td>18'</td>
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<td>&gt; 50</td>
<td>13'</td>
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<td>17'</td>
<td>17'</td>
<td>18'</td>
<td>19'</td>
</tr>
</tbody>
</table>

**SOIL CONSISTENCY**

- VERY DENSE
- MEDIUM
- LOOSE
- VERY LOOSE
- HARD
- Very Dense
- Dense
- Medium
- Loose
- Very Loose
- Hard

**AVERAGE STRENGTH**

<table>
<thead>
<tr>
<th>Qu in ft³ (Qu in kPa)</th>
<th>80'</th>
<th>90'</th>
<th>100'</th>
<th>110'</th>
<th>120'</th>
<th>130'</th>
<th>140'</th>
<th>150'</th>
<th>160'</th>
</tr>
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<tbody>
<tr>
<td>5 to 10</td>
<td>15'</td>
<td>16'</td>
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<td>18'</td>
<td>18'</td>
<td>19'</td>
<td>20'</td>
</tr>
<tr>
<td>10 to 25</td>
<td>14'</td>
<td>15'</td>
<td>16'</td>
<td>17'</td>
<td>17'</td>
<td>18'</td>
<td>18'</td>
<td>19'</td>
<td>20'</td>
</tr>
<tr>
<td>25 to 50</td>
<td>14'</td>
<td>15'</td>
<td>16'</td>
<td>17'</td>
<td>17'</td>
<td>18'</td>
<td>18'</td>
<td>19'</td>
<td>20'</td>
</tr>
<tr>
<td>&gt; 50</td>
<td>13'</td>
<td>14'</td>
<td>15'</td>
<td>16'</td>
<td>16'</td>
<td>17'</td>
<td>17'</td>
<td>18'</td>
<td>19'</td>
</tr>
</tbody>
</table>

**SHAFT LENGTH**

- 20'-0" to 25'-0"
- 26'-0" to 30'-0"
- 31'-0" to 35'-0"
- 36'-0" to 40'-0"
- 41'-0" to 45'-0"
- 46'-0" to 50'-0"
- 51'-0" to 55'-0"
- 56'-0" to 60'-0"
- 61'-0" to 65'-0"
- 66'-0" to 70'-0"
- 71'-0" to 75'-0"
- 76'-0" to 80'-0"
- 81'-0" to 85'-0"
- 86'-0" to 90'-0"
- 91'-0" to 95'-0"
- 96'-0" to 100'-0"
- 101'-0" to 105'-0"
- 106'-0" to 110'-0"
- 111'-0" to 115'-0"
- 116'-0" to 120'-0"
- 121'-0" to 125'-0"
- 126'-0" to 130'-0"
- 131'-0" to 135'-0"
- 136'-0" to 140'-0"
- 141'-0" to 145'-0"
- 146'-0" to 150'-0"

**DATE**

1-1-20: Revised min. anchor rods
1-1-15: Added 6'-0" min. anchor rods
1-1-24: Revised min. anchor rods
1-1-25: Revised min. anchor rods
1-1-26: Revised min. anchor rods

**STANDARD 837001-05**

**LIGHT TOWER FOUNDATION**

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.

---

**ROD AND REINFORCEMENT TABLE**

<table>
<thead>
<tr>
<th>TOWER HEIGHT</th>
<th>ANCHOR ROD DIAM (MIN)</th>
<th>TOWER CLEARANCE (MIN)</th>
<th>TOWER BASE DIAM (MIN)</th>
<th>DRILLED SHAFT DIAM (MIN)</th>
<th>V BAR QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>80' (24.0 m)</td>
<td>1/8 (3)</td>
<td>30</td>
<td>24</td>
<td>4'-0&quot; (1.2 m)</td>
<td>14</td>
</tr>
<tr>
<td>100' (30.5 m)</td>
<td>1/8 (3)</td>
<td>30</td>
<td>24</td>
<td>4'-0&quot; (1.2 m)</td>
<td>14</td>
</tr>
<tr>
<td>110' (34 m)</td>
<td>1/8 (3)</td>
<td>30</td>
<td>24</td>
<td>4'-0&quot; (1.2 m)</td>
<td>14</td>
</tr>
<tr>
<td>120' (37 m)</td>
<td>1/8 (3)</td>
<td>30</td>
<td>24</td>
<td>4'-0&quot; (1.2 m)</td>
<td>14</td>
</tr>
<tr>
<td>130' (40 m)</td>
<td>1/8 (3)</td>
<td>30</td>
<td>24</td>
<td>4'-0&quot; (1.2 m)</td>
<td>14</td>
</tr>
<tr>
<td>140' (43 m)</td>
<td>1/8 (3)</td>
<td>30</td>
<td>24</td>
<td>4'-0&quot; (1.2 m)</td>
<td>14</td>
</tr>
<tr>
<td>150' (46 m)</td>
<td>1/8 (3)</td>
<td>30</td>
<td>24</td>
<td>4'-0&quot; (1.2 m)</td>
<td>14</td>
</tr>
<tr>
<td>160' (49 m)</td>
<td>1/8 (3)</td>
<td>30</td>
<td>24</td>
<td>4'-0&quot; (1.2 m)</td>
<td>14</td>
</tr>
</tbody>
</table>

Diameter based on a 5 (125) conc. cover. The min. cover shall be 3 (75) in dry shaft excavation and 4 (100) in a wet hole. When rock is encountered a 5 (125) cover against soil and a 2 (50) cover against rock shall be required.

**SECTION B-B**

**DETAIL A**

See Detail A

**DETAIL B**

See Detail B

**ANCHOR ROD CAGE (PLAN)**

Anchor rods evenly spaced.

2 x 5/8 (19 x 13)

Steel bar, length as required (typ).

Self-locking hex head nut with steel insert.

Flange washer (typ.)

Hex head nut

Typ

\( \frac{5}{8} \) (6)

Sch. 40 steel pipe, (typ.); Dia. \( \geq 16 \) greater than anchor rod diameter.

660 x 55 (165 x 6)

Steel template.
**BREAKAWAY COUPLINGS ON CONCRETE FOUNDATION FOR STEEL LIGHT POLE**

(Provide pole base skirt around wire cloth when required.)

- Wire cloth wrapped around couplings between foundation and pole base. Provide 6 (150) minimum overlap and wire tie at three locations at each end of overlap.
- Concrete foundation.
- Breakaway coupling.
- Washer.
- Hex nut with washer.
- Light pole base.
- Washer.
- Breakaway coupling.
- Washer.
- Concrete foundation.
- Hex nut with washer.
- Light pole base.
- Washer.
- Breakaway coupling.
- Washer.
- Hex nut with lock washer.
- Stud bolt.

**BREAKAWAY TRANSFORMER BASE FOR STEEL OR ALUMINUM POLE**

(Steel pole shown)

- 2¼ (70) O.D. x ¾ (13) thick flat washer.
- Pedestal base.
- Anchor rod.
- Hex nut.
- 2¼ (70) O.D. x ¾ (13) thick flat washer.
- Concrete foundation.
- Breakaway transformer base.
- Access door.

**BREAKAWAY COUPLINGS ON METAL FOUNDATION FOR STEEL POLE**

(Provide pole base skirt around wire cloth when required.)

- Wire cloth wrapped around couplings between foundation and pole base. Provide 6 (150) minimum overlap and wire tie at three locations at each end of overlap.
- Metal foundation.
- Breakaway coupling.
- Washer.
- Hex nut with lock washer.
- Stud bolt.
**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 slot.

See Standard 836001 for Light Pole Foundation.

Wire cloth shall be stainless steel, have a maximum opening of 6/64 (0.09375) and have a minimum wire size of AWG No. 16 (1.6).

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

**ALUMINUM POLES**

(Provide pole base skirt around wire cloth when required.)

**BREAKAWAY COUPLINGS FOR**

**VIEW A-A**

When encountered, cut wire cloth to conform to depressions in bottom of pole base.

**VIEW B-B**

Three stainless steel wire ties, top, middle, and bottom of overlap.

Overlap wire cloth 6 (150) min. and tie together with stainless steel wire.

Three stainless steel wire ties, top, middle, and bottom of overlap.

Depression in cast aluminum base, depending on the manufacturer.

Light pole shaft.

Aluminum nut cover.

See VIEW A-A.

Light pole base.

Wire cloth wrapped around breakaway couplings. Breakaway coupling installation same as for steel pole.

Concrete or metal foundation (concrete shown).

**BREAKAWAY DEVICES**

*STANDARD 838001-01*
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.

CR1 and CR2 are 120VAC 3PDT Relays.

All three shields shall be isolated at the railroad facility end.

REVISIONS

DATE

1-1-09

Limited note regarding units of length.

203

1-1-04

New Standard.

Illinois Department of Transportation

January 1, 2009

APPROVED

ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED

PASSED

ENGINEER OF OPERATIONS

RR Facility

RED
FRONT

BLUE
BACK

BLACK
HEEL

facility end.

isolated at the railroad

All three shields shall be

isolated at the railroad

facility end.

AC-

In-line fuse

2 Amp

AC+

Separately shielded conductors

CR1

PREEMPT RELAY

CR2

SUPERVISORY RELAY

Railroad relay

#10 AWG to AC-

SUPERVISED RAILROAD INTERCONNECT CIRCUIT

STANDARD 857006-01
Note: The power transfer relay may be internal to the inverter/charger.
See Detail "A"

See Detail "B"

Recessed cover

Cable hooks

U.L. Listed
direct burial
splice kit

No. 6 AWG
equipment grounding
conductor (green)

Equipment grounding
conductor to controller
double handhole.

To pole or post

To pole or post

DETAIL "A"

Handhole cover

Handhole frame

Hand hole cover handle

Heavy-duty compression
terminal with stainless
tee nut. Anti-corrosion
compound shall be applied
to the assembly.

Stainless steel bolt, nut,
and two washers. Anti-
corrosion compound shall
be applied to the assembly.

DETAIL "B"

CAST CORNER
FRAME WEB

HANDHOLE COVER & FRAME

BONDING A HANDHOLE
COVER & FRAME

Handhole Frame and cover

Heavy-duty compression
terminal (typical)

Heavy-duty compression
terminal (typical)

Heavy-duty compression
terminal (typical)

Access cover

Grounding electrode
cable

Equipment grounding

GROUNDING A MAST ARM POLE/POST

GROUNDING & BONDING

COVER & FRAME

BONDING AN EXISTING
HANDHOLE COVER & FRAME

1-1/2" x 1" (13 x 31) stainless steel bolt with
split lock washer and nylon inser lockout
welded to frame and to cover (typical).
Anti-corrosion compound shall be applied
to each assembly.

HEAVY-DUTY
COMPRESSION TERMINAL

HEAVY-DUTY
GROUND ROD CLAMP

1/4" (19) Clamp Size

All dimensions are in inches (millimeters)
unless otherwise shown.
PEDESTRIAN ONE PUSH BUTTON POST

- 3/4" (19 mm) max. 
- 3' 6" (1.05 m) min.
- 3' 6" (1.05 m) max. 
- 30 (762) min.
- 3'-6" (1.05 m) max.
- 30 (762) min.
- 3'-6" (1.05 m) max.
- 36 (914) preferred

PEDESTRIAN TWO PUSH BUTTON POST

- 3/4" (19 mm) max. 
- 3' 6" (1.05 m) min.
- 3' 6" (1.05 m) max. 
- 30 (762) mm
- 3'-6" (1.05 m) max.
- 30 (762) mm
- 3'-6" (1.05 m) max.
- 36 (914) preferred

All dimensions are in inches (millimeters) unless otherwise shown.
Mast arm length as specified on the plans:

- (typ.) 12' (3.6 m)
- (min.) 8' (2.4 m)

This signal head only for arms 36' 110.97 m) and longer.

Removable cap (990)

4x8 (100x200) Handhole with frame and cover located opposite of oncoming traffic.

Thread bottom of anchor rod 2 (50) and provide matching hex head nut fully seated, typ.

4x8 (100x200) Handhole opposite handhole.

Distance from top of pole base to bottom of hand hole shall match the inside diameter of the pole at the midpoint of the hand hole.

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

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.
Mast arm length as specified on the plans.

Four spaces at 12' (3.6 m) typ., 8' (2.4 m) (min.)

39x39 (990 x 990)
Sign panel or blankout sign 100 lb (45 kg) max.

16' (5.0 m) min.
18' (5.5 m) max.

Removable cap

100 lb (45 kg) max.

Blankout sign closest to pole.

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 blankout sign closest to pole.

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

**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 blankout sign closest to pole.

All dimensions are in inches (millimeters) unless otherwise shown.
**MAST ARM LENGTH**

- 16' thru 30' (4.87 m thru 9.14 m)
- 12' thru 16' (3.6 m thru 4.87 m)

**ANCHOR ROD CIRCLE**

- 36" thru 60" (914 mm thru 1524 mm)
- 24" thru 36" (610 mm thru 914 mm)

**ANCHOR ROD SIZE**

- 4" OD x 3/8" (100 mm x 9.53 mm)
- 2" OD x 1/2" (50 mm x 12.7 mm)

**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.

**DATE**

1-1-18

**REVISIONS**

- Revised for RLFD reqs.
- Revised GEN. NOTES for sign locations.
- Revised ANCHOR ROD DETAIL.
- Changed sign panel to 36x36.
- Added max weight of 100 lb.
- Modified dim. to outer signal.

**STANDARD 877006-06**

**ENGINEER OF DESIGN AND ENVIRONMENT**

**APPROVED**

January 1, 2018
Copper wire

No. 6 bare

1 (25) Bevel

Ground clamp

Bushing

Grade line

Finished rod

Anchor

Concrete

24 (600) diameter

24 (600) Square or

rod

Ground

Conduit (size

as required)

Concrete

36 (900) Apron

TOP VIEW

TOP VIEW

TOP VIEW

Revised TYPE E detail.

Revised anchor rod end in

Type E detail.

Conduit (size

as required)

Concrete

36 (900) Apron

Type C

FOR GROUND MOUNTED

CONTROLLER CABINET

AND UPS BATTERY CABINET

Type D

FOR GROUND MOUNTED

CONTROLLER CABINET
**Top View**

- Bolt circle and quantity of anchor rods as specified.
- Vertical rebar equally spaced.

**Foundation Details**

<table>
<thead>
<tr>
<th>Mast Arm Length</th>
<th>Foundation Depth</th>
<th>Foundation Diameter</th>
<th>Spiral Diameter</th>
<th>Quantity of Rebars</th>
<th>Size of Rebars</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 30' (9.1 m)</td>
<td>10'-0&quot; (3.0 m)</td>
<td>30 (750)</td>
<td>24 (600)</td>
<td>B</td>
<td>6 (19)</td>
</tr>
<tr>
<td>Greater than or equal to 30' (9.1 m) and less than 40' (12.2 m)</td>
<td>13'-0&quot; (4.0 m)</td>
<td>36 (900)</td>
<td>30 (750)</td>
<td>12</td>
<td>7 (22)</td>
</tr>
<tr>
<td>Greater than or equal to 40' (12.2 m) and less than 50' (15.2 m)</td>
<td>15'-0&quot; (4.6 m)</td>
<td>36 (900)</td>
<td>30 (750)</td>
<td>12</td>
<td>7 (22)</td>
</tr>
<tr>
<td>Greater than or equal to 50' (15.2 m) and up to 55' (16.8 m)</td>
<td>17'-0&quot; (5.1 m)</td>
<td>36 (900)</td>
<td>30 (750)</td>
<td>12</td>
<td>7 (22)</td>
</tr>
<tr>
<td>Greater than or equal to 55' (16.8 m) and less than 65' (19.8 m)</td>
<td>19'-0&quot; (5.8 m)</td>
<td>42 (1060)</td>
<td>36 (900)</td>
<td>16</td>
<td>8 (25)</td>
</tr>
<tr>
<td>Greater than or equal to 65' (19.8 m) and up to 75' (22.9 m)</td>
<td>21'-0&quot; (6.4 m)</td>
<td>42 (1060)</td>
<td>26 (600)</td>
<td>16</td>
<td>8 (25)</td>
</tr>
</tbody>
</table>

*For standard and combination mast arm assemblies, foundation depths for standard dual mast arms with the longest arm length up to and including 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.*

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.
**SPAN WIRE MOUNTED SIGNALS AND FLASHING BEACON**

- Span wire
- Tether wire
- Thimble eye nut
- Sag distance
- 5% of span
- Thimble eye nut
- Curved washers
- Angle bolt
- Guy wire
- 3 bolt clamps
- or dead-end

**CONTROL POLE DETAIL**

- Hub plate
- Conduit clamp
- Meter
- Disconnect switch
- Service sleeve
- Service cable
- Weatherhead
- Hub plate
- Ground wire clamp
- Ground rod

**SIDEWALK GUARD DETAIL**

- Service sleeve
- Thimble eye
- Curved washers
- Angle bolt
- Guy wire
- 3 bolt clamps
- or dead-end

**POST MOUNTED FLASHING BEACON**

- 1½ (38) g.s. conduit
- 4 evenly spaced conduit clamps shall be used to attach conduit to post.

**MOUNTING DETAIL**

- 2½ (63) Galv. post plate
- 2 (51) LB condulet with removable covers
- Service sleeve
- Guy guard
- Anchor rod
- Anchor

---

**CONDUIT SIZE**

- (1.83 m) max.
- (1.52 m) min.

**SPAN WIRE**

- 5% of span

**THIMBLE EYE**

- Straight bolt with nut and 2½ (63) curved washers

**GUY GUARD**

- 1½ (38) g.s. conduit
- 4 evenly spaced conduit clamps shall be used to attach conduit to post.

---

**DATE**

- 1-1-02

**REVISIONS**

- 1-1-02

**APPROVED**

- Illinois Department of Transportation
- January 1, 2009

**Issued**

- January 1, 2009

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**STANDARD 880001-01**

- Illinois Department of Transportation
- Illinois Department of Transportation

---
Pinnacle Collar | Signal bracket | vinyl insert | Slotted tube with bands | High-strength clamp | Aluminum alloy or stainless steel u-bolts | Stainless steel clamp straps | Set screws for wiring | bottom cover plate | Lower arm with compartment | Terminal compartment | Pole plate with terminals | bands stainless steel | Pole plate with stainless steel bands | stainless steel | Steel or aluminum pole | Pole plate with stainless steel bands | Stainless steel bands | Stainless steel bands | Stainless steel bands | STANDARDS 880006-01

STEEL MAST ARM MOUNTING

POST MOUNTED TRAFFIC SIGNAL HEAD

POST MOUNTED PEDESTRIAN SIGNAL HEAD

POST MOUNTED PEDESTRIAN SIGNAL HEAD

ONE WAY

TWO WAY

BRACKET MOUNTED TRAFFIC SIGNAL HEAD

BRACKET MOUNTED TRAFFIC SIGNAL HEAD

BRACKET MOUNTED TRAFFIC SIGNAL HEAD

ONE WAY

TWO WAY
Drill hole through pavement. Insert conduit and fill with approved sealer.

2% min. slope toward handhole

Sawed slot for detector loop

Approved sealer

Grade controller base box, signal base, or controller base

Plastic tube

Loop wire in plastic tube

PCC PAVEMENT

ASPHALT PAVEMENT

DETECTOR LOOP LEAD-IN

DETECTOR LOOP INSTALLATION

DETECTOR LOOP AT PAVEMENT OR PAVEMENT CRACK

NOTE

Loop wire shall follow saw cut to bottom, forming slack section at joint.

LOOP WIRE AND LEAD-IN CABLE SPLICE

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

4 = Lead-in cable (single pair or multipair)
5 = Lead-in cable shield
6 = Lead-in cable shield drain wire
7 = Lead-in cable insulated conductor
8 = Bare conductor
9 = Loop wire in tube
10 = Loop wire insulated conductor
11 = Twisted and resin soldered conductor
12 = Electrical tape insulated splice
13 = Rigid mold
14 = Waterproof and dielectric resin

NOTE

Switched units to English (metric)
For point detection:
- Short Loop
- Long Loop

For presence detection:
- Multiple Loop in Series
- Quadripole Loop

For extended-call detection:
- Quadripole Loop

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

TYPICAL LAYOUTS
FOR DETECTION LOOPS

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

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

STANDARD 886006-01
**GENERAL NOTES**

All cast basins shall be separated from the pavement and curb by laying out as shown in the detail. Manhole castings within the pavement limits shall be boxed in a like manner except when telescoping type castings are used.

When a joint falls within 5 ft (1.5 m) of or contacts basins, manholes, or other structures, shorten one or more panels either side of opening to permit joint to fall at the corners of the box out.

When specified, roundouts as shown on Standard 420111 shall be used in lieu of the manhole detail shown herein except No. 3 (No. 16) bars shall be used in lieu of No. 6 (No. 19) bars.

All transverse joints must extend through curbs and be continuous across pavement, except tied transverse construction joints. Expansion joints will be required as shown on the plans.

When specified, the pavement structure thickness at intersections shall be increased. This requirement generally will occur when the design traffic through the intersection exceeds the typical design of the pavement structure either side of the intersection.

Joints shall be sawed to a depth of t/4 for transverse joints and t/3 for longitudinal joints. Saw joints shall be sealed with material meeting the requirements of Section 1050 of the Standard Specifications.

This alternate construction is at the Contractor's option and shall be constructed in accordance with Section 406 of the Standard Specifications. The combination concrete curb and gutter shall be measured in place and the area computed in sq yd (sq m). This work will be paid for at the contract unit price per sq yd (sq m) for standard cement concrete pavement special with integral curb of the thickness specified.

Transverse joint spacing shall not exceed 12' (3.6 m) for pavements less than 10 (250) thick or 15' (4.5 m) for pavements 10 (250) thick and greater.

Construct TYPE D tied transverse construction joint when construction joints does not fall at a TYPE C sawed transverse joint.

**DETAIL B**

- **CATCH BASIN DETAIL**
  - Transverse joint
  - Keyed joint
  - Type C joint
  - Type A joint

- **MANHOLE DETAIL**
  - Type C joint
  - Type A joint
  - Type D joint

- **COMB. CURB & GUTTER DETAIL**
  - Alt. conic. see G.N.

- **INTEGRAL CURB**
  - See DETAIL A for crosswalks and DETAIL B for driveways.

**PCC PAVEMENT SPECIAL (NONREINFORCED)**

(Sheet 2 of 2)

STANDARD B.L.R. 10-8
Longitudinal sawed joint

22'-0'' (6.6 m) or 24'-0'' (7.2 m)

11'-0'' (3.3 m) or 12'-0'' (3.6 m)

Slope 1.5 %

Hot poured joint sealer

Cell plastic foam backer rod

(22) Heat resistant closed

8

7

(20)

4

3

(6)

1

0 (0) to

4

5

0 (0) to

(6)

15 (250) (typ.)

12 (300) (typ.)

22 (550) (typ.)

20 (500) (typ.)

18 (450) (typ.)

15 (375) (typ.)

12 (300) (typ.)

10 (250) (typ.)

8 (200) (typ.)

6 (150) (typ.)

4 (100) (typ.)

12 (300) cts.

18 (450) cts.

6 (150) cts.

3 (75) cts.

2 (50) cts.

1 (25) cts.

No. 5 (No. 16) tie bars at 36 (900) cts.

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

Hot poured joint sealer

Sawed groove

1/3 min. x 1/3

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

Hot poured joint sealer

3/8 (22) Heat resistant closed cell plastic foam backer rod

27 (685) or more

5/8 (16) or more

This portion of saw cut not required when base course and surface are cut separately.

Base course

Bituminous surface

4 (100) cts.

3 (75) cts.

2 (50) cts.

1 (25) cts.

Dowel Bar Assembly

9 (225)

9 (225)

Bar supports

Dowel bar assembly

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

Transverse contraction joint

TRANSVERSE CONSTRUCTION JOINT

NEW

ILLINOIS DEPARTMENT OF TRANSPORTATION

PASSED

ENGINEER OF LOCAL ROADS AND STREETS

ISSUED

1-1-97

APPROVED

ENGINEER OF DESIGN AND ENVIRONMENT

PASSED

ENGINEER OF LOCAL ROADS AND STREETS

DATE

REVISIONS

1-1-22

1-1-18

Deleted spacing of transverse contraction joints, dowel bar table and header board callout.

Eliminated skewed joint.

NEW

1-1-22

Deleted spacing of transverse contraction joints, dowel bar table and header board callout.

Eliminated skewed joint.

GENERAL NOTES


Dowel bars are only required for Class I, II, or III Roads and Streets having pavement thickness of 7 (175) or greater.

t = Pavement thickness (See Typical Cross Section)

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

PORTLAND CEMENT CONCRETE PAVEMENT (NONREINFORCED)

STANDARD B.L.R. 14-13
CLOSED ROAD
Sign R11-2 or R11-4 mounted as shown.
Type III Barricades with Standard equipment to use road shoulder for passing resident traffic and day labor force's passage of traffic.
Use when shoulders are too narrow for
minimum dimensions of 36x36 (900x900) and black legends on orange reflectorized backgrounds shall be appropriate for the specific job conditions.

Resident traffic and day labor force's equipment to use road shoulder for passing barricade.

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

Traffic Control Devices - Day Labor Construction

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

ENGINEER OF LOCAL ROADS AND STREETS

DATE REVISIONS
1-1-09 Switched units to
English meaning.
1-1-98 Rev. "R11-1" to "R11-4"
Rev. 6th General Note

STANDARD B.L.R. 17-4
**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 obstruction, excavation, or pavement drop off greater than 3' (75) 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 80 minutes on the shoulder respectively.

All warning signs shall have minimum dimensions of 36x36 (900x900) 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.
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 locknut furnished in place by the Contractor to be tightened only to a point that will allow plate G to be free to move.  

Splice bolts with washer under nut.  

Splice bolts with washer under nut.  

\( \frac{3}{4} \) (19) Dia. holes (typ.)  

Soil plate 'I'  

4 1/2 (M16) Dia. hex head bolts with std. hex nut  

\( \frac{3}{4} \) (6) Thick soil plate 'I' on these 4 posts only  

\( \frac{3}{4} \) (6) Thick soil plate 'I' on these 4 posts only  

ELEVATION-TRAFFIC BARRIER TERMINAL TYPE 5R  

RUB RAIL PLATE R-2  

See standard B.L.R. 20-7 for details of guardrail not shown.  

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' and shall be tightened only to a point that will allow plate G to be free to move.  

When an expansion joint exists below the connector, "G" after the 1 (25) bolts are in place.  

20-7 (Sheet 1 of 2)  

TRAFFIC BARRIER TERMINAL-TYPE 5R  

GENERAL NOTES  

See standard B.L.R. 20-7 for details of guardrail not shown.  

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' and shall be tightened only to a point that will allow plate G to be free to move.  

When an expansion joint exists below the connector, bolts shall be provided with locknut or double nut and 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.
ROAD CLOSED AHEAD
ROAD CLOSED 500 FT
ROAD CLOSED AHEAD
ROAD CLOSED 500 FT
ROAD CLOSED AHEAD

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)

GENERAL NOTES
Type III Barricades and R11-2-4830 signs shall be positioned as shown in "Road Closed To All Traffic" detail on Highway Standard 709103.

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), 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.

SYMBOLS

Work area
Type III Barricade
Sign with 18x18 (450x450) min. orange flag attached

DATE
REVISIONS
1-1-12
1-1-97
1-1-12

APPROVED

STANDARD B.L.R. 21-9
TYPICAL APPLICATION OF TRAFFIC CONTROL DEVICES FOR CONSTRUCTION ON RURAL LOCAL HIGHWAYS

ILLINOIS DEPARTMENT OF TRANSPORTATION
ENGINEER OF DESIGN AND ENVIRONMENT
ENGINEER OF LOCAL ROADS AND STREETS

PASSED
ISSUED
January 1, 2012
January 1, 2012

Illinois Department of Transportation

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, as the option of the Contractor. If standard wood posts are used, one post shall be located midway between and in lieu of those 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 eighteenpenny nails driven into the post and bent over the top of the plate.

When this terminal is used with Standard 630001, 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.

TRAFFIC BARRIER

TERMINAL TYPE 1

(Sheet 1 of 2)

Illinois Department of Transportation

January 1, 2012

APPROVED

ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED

DATE

REVISIONS

1-1-12
Revised barrier terminal

height and width

breakaway post

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

STANDARD B.L.R. 23-4
### DIMENSIONS - ft. (m)

<table>
<thead>
<tr>
<th>Width of Shoulder (X)</th>
<th>12 (3.6)</th>
<th>10 (3.0)</th>
<th>8 (2.4)</th>
<th>6 (1.8)</th>
<th>5 (1.5)</th>
<th>4 (1.2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>L₁</td>
<td>50 (15)</td>
<td>30 (9.0)</td>
<td>23 (6.9)</td>
<td>15 (4.5)</td>
<td>15 (4.5)</td>
<td>15 (4.5)</td>
</tr>
<tr>
<td>L₂</td>
<td>20 (6.0)</td>
<td>20 (6.0)</td>
<td>15 (4.5)</td>
<td>10 (3.0)</td>
<td>10 (3.0)</td>
<td>10 (3.0)</td>
</tr>
</tbody>
</table>

**Note:**
Dimensions for Township and District Roads may vary from the above dimensions.

### 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.

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

### MAILBOX TURNOUT FOR LOCAL ROADS

STANDARD B.L.R. 24-2
TYPE 1A BARRICADE
FOR NON-NHS ROUTES

STANDARD B.L.R. 25-1
**Post bolt with std. hex nut**

<table>
<thead>
<tr>
<th>Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>3(\frac{3}{8}) (8.3)</td>
</tr>
<tr>
<td>6</td>
</tr>
<tr>
<td>2(\frac{3}{8}) (14.9)</td>
</tr>
</tbody>
</table>

**W8x8 (W110x33) or W8x8.5 (W150x43) steel post**

**Steel Post Construction**

**STEEL BLOCK-OUT DETAIL**

**Plate A**

**NOTE**

Plate A shall be placed between rail element and block-out at non-splice mounting points only when steel block-outs are used.

**STEEL PLATE BEAM GUARDRAIL**

**WOOD POST CONSTRUCTION**

**POST OR SPlice BOLT & NUT**

**STEEL POST CONSTRUCTION**

**STEEL PLATE BEAM GUARDRAIL 29'' (731mm) HEIGHT**

**STANDARD B.L.R. 26-3**
NOTE
Anchor plate T shall be used to attach cable assembly to guardrail when required on traffic barrier terminals.

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.
Optional round hole

9 (203) min. (Steel post)
10 (250) min. (Wood post)

Note: Ledge line is top of rock ledge or hard slag fill.

GUARDRAIL PLACED BEHIND CURB

(D = 0 desirable to 12 (300) maximum)

WOOD BLOCK-OUT AND
STEEL POST DETAILS

CABLE ASSEMBLY

1 (M24) double nuts or locknuts and washer

STEEL PLATE BEAM GUARDRAIL
29" (731mm) HEIGHT

STANDARD B.L.R. 26-3
PLATE WASHER D

6\(\frac{1}{4}\) (16) Bridge rail

PLATE WASHER D

PLACEMENT OF PLATE WASHER D

(PLAN)

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 630001, the guardrail shall transition down to the height of the terminal.

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

Construction joints at 75-0 (7.5 m) max. cts. (typ.)

2-No. 4 (No. 13) bars placed at mid-depth (when space permits)

Drainage casting with curb box

Back of curb

5'-0" (1.5 m)

5'-0" (1.5 m)

Edge of pavement

Undoweled contraction joint (typ.) construction options:
1. Form with 3/8 (3) thick steel template
2. Saw 2 (50) deep at 4 to 24 hours, and seal.
3. Insert 1/8 (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 without curb box

Back of curb

5'-0" (1.5 m)

5'-0" (1.5 m)

Edge of pavement

Mountable curb shown (other types permitted)

HMA surfacing (other types permitted)

Base course

ON DISTURBED SUBGRADE

ON UNDISTURBED SUBGRADE

PLAN

DEPRESSED CURB

BARRIER CURB

ADJACENT TO FLEXIBLE PAVEMENT

CONCRETE CURB TYPE B

ADJACENT TO PCC PAVEMENT OR PCC BASE COURSE

CONCRETE CURB AND GUTTER

ILLINOIS DEPARTMENT OF TRANSPORTATION

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B.L.R. 28-1