Please Note:
This booklet is based on the Illinois Department of Transportation's Highway Standards and Standard Specifications for Road and Bridge Construction, adopted April 1, 2016. Refer to your contract documents for the appropriate provisions that are in effect for each Specific Contract. If you have any questions or concerns, please contact the Bureau of Safety Engineering at (217) 782-3568.

FOR INFORMATIONAL USE ONLY
# TABLE OF CONTENTS

Traffic Control Deficiency Deduction  
Public Convenience and Safety  

<table>
<thead>
<tr>
<th>Standard</th>
<th>Application</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>701001-02</td>
<td>Off-Road Operations, 2L, 2W, More than 15’ (4.5 m) Away</td>
<td>2</td>
</tr>
<tr>
<td>701006-05</td>
<td>Off-Road Operations, 2L, 2W, 15’ (4.5 m) to 24” (600 mm) from Pavement Edge</td>
<td>4</td>
</tr>
<tr>
<td>701011-04</td>
<td>Off-Road Moving Operations, 2L, 2W, Day Only</td>
<td>6</td>
</tr>
<tr>
<td>701105-05</td>
<td>Off-Road Operations, Multilane, 15’ (4.5 m) to 24” (600 mm) from Pavement Edge</td>
<td>8</td>
</tr>
<tr>
<td>701106-02</td>
<td>Off-Road Operations, Multilane, More Than 15’ (4.5 m) Away</td>
<td>10</td>
</tr>
<tr>
<td>701201-04</td>
<td>Lane Closure, 2L, 2W, Day Only, for Speeds ≥ 45 MPH</td>
<td>12</td>
</tr>
<tr>
<td>701206-03</td>
<td>Lane Closure, 2L, 2W, Night Only, for Speeds ≥ 45 MPH</td>
<td>14</td>
</tr>
<tr>
<td>701301-04</td>
<td>Lane Closure, 2L, 2W, Short Time Operations</td>
<td>16</td>
</tr>
<tr>
<td>701306-03</td>
<td>Lane Closure, 2L, 2W, Slow Moving Operations Day Only, for Speeds ≥ 45 MPH</td>
<td>18</td>
</tr>
<tr>
<td>701311-03</td>
<td>Lane Closure, 2L, 2W, Moving Operations – Day Only</td>
<td>20</td>
</tr>
<tr>
<td>701316-11</td>
<td>Lane Closure, 2L, 2W, Bridge Repair for Speeds &gt; 45 MPH</td>
<td>22</td>
</tr>
<tr>
<td>701321-16</td>
<td>Lane Closure, 2L, 2W, Bridge Repair with Barrier</td>
<td>27</td>
</tr>
<tr>
<td>701326-04</td>
<td>Lane Closure, 2L, 2W, Pavement Widening, for Speeds ≥ 45 MPH</td>
<td>32</td>
</tr>
<tr>
<td>701331-04</td>
<td>Lane Closure, 2L, 2W, With Run-Around, for Speeds ≥ 45 MPH</td>
<td>34</td>
</tr>
<tr>
<td>701336-06</td>
<td>Lane Closure, 2L, 2W, Work Areas in Series, for Speeds ≥ 45 MPH</td>
<td>36</td>
</tr>
<tr>
<td>701400-09</td>
<td>Approach to Lane Closure, Freeway / Expressway</td>
<td>38</td>
</tr>
<tr>
<td>701401-10</td>
<td>Lane Closure, Freeway / Expressway</td>
<td>40</td>
</tr>
<tr>
<td>701402-12</td>
<td>Lane Closure, Freeway / Expressway, with Barrier</td>
<td>43</td>
</tr>
<tr>
<td>701406-11</td>
<td>Lane Closure, Freeway / Expressway, Day Operations Only</td>
<td>45</td>
</tr>
<tr>
<td>701411-09</td>
<td>Lane Closure, Multilane, at Entrance or Exit Ramp, for Speeds ≥ 45 MPH</td>
<td>48</td>
</tr>
<tr>
<td>701416-10</td>
<td>Lane Closure, Freeway / Expressway, with Crossover and Barrier</td>
<td>51</td>
</tr>
<tr>
<td>701421-08</td>
<td>Lane Closure, Multilane, Day Operations Only, for Speeds ≥ 45 MPH to 55 MPH</td>
<td>53</td>
</tr>
<tr>
<td>701422-09</td>
<td>Lane Closure, Multilane, for Speeds ≥ 45 MPH to 55 MPH</td>
<td>56</td>
</tr>
<tr>
<td>701423-10</td>
<td>Lane Closure, Multilane, with Barrier, for Speeds ≥ 45 MPH to 55 MPH</td>
<td>59</td>
</tr>
<tr>
<td>701426-09</td>
<td>Lane Closure, Multilane, Intermittent or Moving Operations, for Speeds ≥ 45 MPH</td>
<td>61</td>
</tr>
<tr>
<td>701427-05</td>
<td>Lane Closure, Multilane, Intermittent or Moving Operations, for Speeds ≤ 40 MPH</td>
<td>63</td>
</tr>
<tr>
<td>701428-01</td>
<td>Traffic Control Setup and Removal Freeway / Expressway</td>
<td>65</td>
</tr>
<tr>
<td>701431-12</td>
<td>Lane Closure, Multilane, Undivided with Crossover, for Speeds ≥ 45 MPH to 55 MPH</td>
<td>67</td>
</tr>
<tr>
<td>701446-08</td>
<td>Two Lane Closure, Freeway / Expressway</td>
<td>69</td>
</tr>
<tr>
<td>701451-04</td>
<td>Ramp Closure, Freeway / Expressway</td>
<td>71</td>
</tr>
<tr>
<td>701456-04</td>
<td>Partial Exit Ramp Closure, Freeway / Expressway</td>
<td>73</td>
</tr>
<tr>
<td>701501-06</td>
<td>Urban Lane Closure, 2L, 2W, Undivided</td>
<td>75</td>
</tr>
<tr>
<td>701502-07</td>
<td>Urban Lane Closure, 2L, 2W, Bi-Directional Left Turn Lane</td>
<td>77</td>
</tr>
<tr>
<td>701601-09</td>
<td>Urban Lane Closure, Multilane, 1W or 2W with Non Traversable Median</td>
<td>80</td>
</tr>
<tr>
<td>701602-08</td>
<td>Urban Lane Closure, Multilane, 2W with Bi-Directional Left Turn Lane</td>
<td>83</td>
</tr>
</tbody>
</table>

**Bold** indicates a change from the previous booklet
701606-10 Urban Single Lane Closure, Multilane, 2W with Mountable Median 88
701611-01 Urban Half Closure, Multilane, 2W with Mountable Median 90
701701-10 Urban Lane Closure, Multilane Intersection 92
701801-06 Sidewalk, Corner or Crosswalk Closure 94
701901-06 Traffic Control Devices 97

Section 702 Nighttime Work Zone Lighting 105
704001-08 Temporary Concrete Barrier 107
B.L.R. 17-4 Traffic Control Devices – Day Labor Construction 110
B.L.R. 18-6 Traffic Control Devices – Day Labor Maintenance 111
B.L.R. 21-9 Typical Application of Traffic Control Devices for Construction on Rural Local Highways 112
B.L.R. 22-7 Typical Application of Traffic Control Devices for Construction on Rural Local Highways (2-Lane 2-Way Rural Traffic) (Road Closed to Thru Traffic) 113
B.L.R. 25-1 Type 1A Barricade for Non-NHS Routes 114
720011-01 Metal Posts for Signs, Markers & Delineators 115
729001-01 Applications of Types A & B Metal Posts (For Signs & Markers) 116
780001-05 Typical Pavement Markings 117
Section 703 Work Zone Pavement Marking 120
781001-04 Typical Applications Raised Reflective Pavement Markers 123

Supplemental Specifications and Recurring Special Provisions

Errata 125

704 Temporary Concrete Barrier 129
#14 Pavement and Shoulder Resurfacing 131
#19 Temporary Portable Bridge Traffic Signals 132
#20 Work Zone Public Information Signs 133
#21 Nighttime Inspection of Roadway Lighting 134
Pavement Marking Removal 134
#32 Temporary Raised Pavement Markers 135
LRS3 Work Zone Traffic Control Surveillance 136
LRS4 Flaggers in Work Zones 136

BDE Special Provisions

Automated Flagger Assistance Device 138
Pavement Marking Blackout Tape 139
Pavement Marking Removal 141
Pavement Marking Tape Type IV 142
Portable Changeable Message Signs 144
Speed Display Trailer 145
Tubular Markers 146
Temporary Concrete Barrier 146

Bold indicates a change from the previous booklet
Traffic Control Deficiency Deduction

Article 105.03

(b) Traffic Control Deficiency Deduction. When the Engineer is notified, or determines a traffic control deficiency exists, he/she will notify and direct the Contractor to correct the deficiency within a specified time. The specified time, which begins upon notification to the Contractor, will be from 1/2 hour to 12 hours based upon the urgency of the situation and the nature of the deficiency. The Engineer shall be the sole judge.

A deficiency may be any lack of repair, maintenance, or non-compliance with the traffic control plan. A deficiency may also be applied to situations where corrective action is not an option such as the use of non-certified flaggers for short term operations; working with lane closures beyond the time allowed in the contract; or failure to perform required contract obligations such as traffic control surveillance.

If the Contractor fails to correct a deficiency within the specified time, a daily monetary deduction will be imposed for each calendar day or fraction thereof the deficiency exists. The calendar day(s) will begin with notification to the Contractor and end with the Engineer’s acceptance of the correction. The daily monetary deduction will be $2,500.00. For those deficiencies where corrective action was not an option, this monetary deduction will be immediate.

Public Convenience and Safety

Article 107.09

No broken pavement, open holes, trenches, barricades, cones, or drums will remain on or adjacent to the traveled way and all lanes shall be opened to traffic during any legal holiday period, except where major bridge construction and/or other roadway reconstruction (excluding patching and resurfacing) requiring overnight lane closures would make it impractical. The legal holidays will include:

<table>
<thead>
<tr>
<th>New Year’s Day</th>
<th>Labor Day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Easter</td>
<td>Thanksgiving Day</td>
</tr>
<tr>
<td>Memorial Day</td>
<td>Christmas Day</td>
</tr>
<tr>
<td>Independence Day</td>
<td></td>
</tr>
</tbody>
</table>

The length of the holiday period shall vary as follows, depending on the day of the week the legal holiday falls on or is observed:

<table>
<thead>
<tr>
<th>Day of Holiday</th>
<th>Length of Holiday Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sunday</td>
<td>3 p.m. Friday – 11:59 p.m. Monday</td>
</tr>
<tr>
<td>Monday</td>
<td>3 p.m. Friday – 11:59 p.m. Monday</td>
</tr>
<tr>
<td>Tuesday</td>
<td>3 p.m. Friday – 11:59 p.m. Tuesday</td>
</tr>
<tr>
<td>Wednesday</td>
<td>3 p.m. Tuesday – 11:59 p.m. Wednesday</td>
</tr>
<tr>
<td>Thursday</td>
<td>3 p.m. Wednesday – 11:59 p.m. Sunday</td>
</tr>
<tr>
<td>Friday</td>
<td>3 p.m. Thursday – 11:59 p.m. Sunday</td>
</tr>
<tr>
<td>Saturday</td>
<td>3 p.m. Thursday – 11:59 p.m. Sunday</td>
</tr>
</tbody>
</table>

On weekends, excluding holidays, roadways with Average Daily Traffic of 25,000 or greater, all lanes shall be open to traffic from 3:00 PM Friday to midnight Sunday except where structure construction or major rehabilitation makes it impractical.
TYPICAL APPLICATIONS

- Landscaping work
- Utility work
- Fencing contracts and maintenance
- Clearing culverts

GENERAL NOTES

This standard is used where or at 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 TH01006.

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

OFF-ROAD OPERATIONS,
2L, 2W, MORE THAN
15' (4.5 m) AWAY

STANDARD 701001-02
Standard 701001

General Information:

1. No special signing is required.

2. All personnel on foot, excluding flaggers, within the highway right-of-way shall wear a fluorescent orange, fluorescent yellow/green, or a combination of fluorescent orange and fluorescent yellow/green vest meeting the requirements of ANSI/ISEA 107-2004 or ANSI/ISEA 107-2010 for Conspicuity Class 2 garments. Other types of garments may be substituted for the vest as long as the garments have a manufacturer’s tag identifying them as meeting the ANSI Class 2 requirement. [SS pg. 586 / 701.12]

3. When the work operation requires that two or more work vehicles cross the 15 ft. clear zone in any one hour, traffic control should be in conformance with STANDARD 701006. [Standard – General Notes]
GENERAL NOTES
This Standard is used when 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:

\[
L = \begin{cases} 
60 & \text{if speed} \\
150 & \text{or less} \\
160 & \text{or greater}
\end{cases}
\]

\[W = \text{Width of offset (in feet/meters)}\]

\[S = \text{Normal posted speed (mph/km/h)}\]

All dimensions are in inches/millimeters unless otherwise shown.
Standard 701006

When the work operation requires four or more work vehicles enter through traffic lanes in a one hour period, a flagger shall be provided and a “FLAGGER” (W20-7) sign shall be substituted for the “WORKER” sign. [SS pg. 595 / 701.18(a)]

Various Specifications:

1. The traffic control shall remain in place only as long as needed and shall be removed when directed by the Engineer. Signs that do not apply to current conditions shall be removed, covered, or turned from the view of motorists. [SS pg. 584 / 701.04]

2. All personnel on foot, excluding flaggers, within the highway right-of-way shall wear a fluorescent orange, fluorescent yellow/green, or a combination of fluorescent orange and fluorescent yellow/green vest meeting the requirements of ANSI/ISEA 107-2004 or ANSI/ISEA 107-2010 for Conspicuity Class 2 garments. Other types of garments may be substituted for the vest as long as the garments have a manufacturer’s tag identifying them as meeting the ANSI Class 2 requirement. [SS pg. 586 / 701.12]

3. The Contractor shall keep all equipment, material, and vehicles off the pavement and shoulders on the side of the pavement which is open to traffic. At any location on existing pavements less than three lanes in width, the sequence of construction shall limit operations to one side of the pavement. [SS pg. 585 / 701.08]

4. For periods of time greater than two hours, during working and for all nonworking hours, all vehicles, materials, and equipment shall be parked or stored a minimum of 30 ft. (9 m) from the pavement when the project has adequate right-of-way. When adequate right of way does not exist, vehicles and materials shall be located at least 15 ft. (4.5 m) from the edge of any pavement open to traffic, unless located behind temporary concrete barrier, temporary bridge rail, or other man-made or natural barriers. [SS pg. 586 / 701.11]

5. Any unattended obstacle or excavation (not patching) in the work area which constitutes a hazard in the opinion of the Engineer, shall be delineated by devices at 50 ft. (15 m) centers. If the hazard exceed 250 ft. (75 m) in length, the spacing of devices may be increased to 100 ft. (30 m) [SS pg. 586 / 701.11]

6. Devices delineating isolated obstacles, excavations, or hazards at night. (Does not apply to patching.) Lights required: Flashing bi-directional lights. [SS pg. 591 / 701.16]

7. Longitudinal dimensions shown on the plans for the placement of signs may be increased up to 100 ft. (30 m) to avoid obstacles, hazards, or to improve sight distance, when approved by the Engineer. [SS pg. 588 / 701.14]

General Information:

If the work operation does not exceed 60 minutes, traffic may be in conformance with STANDARD 701301.
TYPICAL APPLICATIONS

Shoulder work
Utility operations

SYMBOLS

- Work area
- Sign
- Flagger with traffic control sign when required

FOR CONSTRUCTION PROJECTS

W20-110800-48
W21-110800-48

FOR MAINTENANCE AND UTILITY PROJECTS

W20-1106-48
W21-110600-48

GENERAL NOTES

This Standard is used where at any time, any vehicles, 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.

Where the work operation does not exceed 60 minutes, traffic control may be according to Standard 70136.

All dimensions are in inches (millimeters) unless otherwise shown.
Standard 701011

When the work operation requires four or more work vehicles enter through traffic lanes in a one hour period, a flagger shall be provided and a “FLAGGER” (W20-7) sign shall be substituted for the “WORKER” sign. [SS pg. 595 / 701.18(a)]

Various Specifications:

1. The traffic control shall remain in place only as long as needed and shall be removed when directed by the Engineer. Signs that do not apply to current conditions shall be removed, covered, or turned from the view of motorists. [SS pg. 584 / 701.04]

2. All personnel on foot, excluding flaggers, within the highway right-of-way shall wear a fluorescent orange, fluorescent yellow/green, or a combination of fluorescent orange and fluorescent yellow/green vest meeting the requirements of ANSI/ISEA 107-2004 or ANSI/ISEA 107-2010 for Conspicuity Class 2 garments. Other types of garments may be substituted for the vest as long as the garments have a manufacturer’s tag identifying them as meeting the ANSI Class 2 requirement. [SS pg. 586 / 701.12]

3. For periods of time greater than two hours, during working and for all nonworking hours, all vehicles, materials, and equipment shall be parked or stored a minimum of 30 ft. (9 m) from the pavement when the project has adequate right-of-way. When adequate right of way does not exist, vehicles and materials shall be located at least 15 ft. (4.5 m) from the edge of any pavement open to traffic, unless located behind temporary concrete barrier, temporary bridge rail, or other man-made or natural barriers. [SS pg. 586 / 701.11]

4. Any unattended obstacle or excavation (not patching) in the work area which constitutes a hazard in the opinion of the Engineer, shall be delineated by devices at 50 ft. (15 m) centers. If the hazard exceed 250 ft. (75 m) in length, the spacing of devices may be increased to 100 ft. (30 m) [SS pg. 586 / 701.11]

5. Longitudinal dimensions shown on the plans for the placement of signs may be increased up to 100 ft. (30 m) to avoid obstacles, hazards, or to improve sight distance, when approved by the Engineer. [SS pg. 588 / 701.14]

6. Devices delineating isolated obstacles, excavations, or hazards at night. (Does not apply to patching.) Lights required: Flashing bi-directional lights. [SS pg. 591 / 701.16]

7. Devices delineating obstacles, excavations, or hazards exceeding 100 ft. (30 m) in length at night. (Does not apply to widening.) Lights required: Steady burn bi-directional lights. [SS pg. 591 / 701.16]

General Information:

All signs are to be removed at the completion of the day's operations.

FOR INFORMATIONAL USE ONLY
TYPICAL APPLICATIONS

- Utility operations
- Shoulder repairs
- Guardrail installation and maintenance
- Directional signs
- Landscaping operations
- Sign installation and maintenance

SYMBOLS

- Work area
- Sign
- Cane, drum or barricade

GENERAL NOTES

This Standard is used where any vehicular 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:

\[
L = \frac{W^2}{2S} + \frac{W}{2S} \\ \text{or}\ \ \frac{W}{2S} \\
\text{in feet (meters)}
\]

40 mph (64 km/h) or below

45 mph (72 km/h) or greater

- W = Width of offset
- S = Normal posted speed

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

OFF-ROAD OPERATIONS, MULTILANE,
15' (4.5 m) TO 24" (600 mm)
FROM PAVEMENT EDGE

STANDARD 701101-05
Standard 701101

When the work operation requires four or more work vehicles enter through traffic lanes in a one hour period, a flagger shall be provided and a “FLAGGER” (W20-7) sign shall be substituted for the “WORKER” sign [SS pg. 595 / 701.18(a)]

Various Specifications:

1. The traffic control shall remain in place only as long as needed and shall be removed when directed by the Engineer. Signs that do not apply to current conditions shall be removed, covered, or tuned from the view of the motorists. [SS pg. 584 / 701.04]

2. All personnel on foot, excluding flaggers, within the highway right-of-way shall wear a fluorescent orange, fluorescent yellow/green, or a combination of fluorescent orange and fluorescent yellow/green vest meeting the requirements of ANSI/ISEA 107-2004 or ANSI/ISEA 107-2010 for Conspicuity Class 2 garments. Other types of garments may be substituted for the vest as long as the garments have a manufacturer’s tag identifying them as meeting the ANSI Class 2 requirement. [SS pg. 586 / 701.12]

3. Any unattended obstacle or excavation (not patching) in the work area which constitutes a hazard in the opinion of the Engineer, shall be delineated by devices at 50 ft. (15 m) centers. If the hazard exceeds 250 ft. (75 m) in length, the spacing of devices may be increased to 100 ft. (30 m). [SS pg. 586 / 701.11]

4. Longitudinal dimensions shown on the plans for the placement of signs may be increased up to 100 ft. (30 m) to avoid obstacles, hazards, or to improve sight distance, when approved by the Engineer. [SS pg. 588 / 701.14]

5. Devices delineating isolated obstacles, excavations, or hazards at night. (Does not apply to patching.) Lights required: Flashing bi-directional lights. [SS pg. 591 / 701.16]

6. Devices delineating obstacles, excavations, or hazards exceeding 100 ft. (30 m) in length at night. (Does not apply to widening.) Lights required: Steady burn bi-directional lights. [SS pg. 591 / 701.16]
GENERAL NOTES
This Standard is used where at all times all vehicles, equipment, workers or their activities are more than 15' (4.5 m) from the edge of pavement.

When the work operation requires that two or more work vehicles cross the 15' (4.5 m) clear zone in any one hour, traffic control shall be according to Standard T-1-430-04.

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

DATE | REVISIONS
--- | ---
1-1-05 | Switched units to
| | English units.
1-1-05 | Revised title.

OFF-ROAD OPERATIONS, MULTILANE, MORE THAN 15' (4.5 m) AWAY

STANDARD 70100-02
Standard 701106

General Information:

1. No special signing required.

2. All personnel on foot, excluding flaggers, within the highway right-of-way shall wear a fluorescent orange, fluorescent yellow/green, or a combination of fluorescent orange and fluorescent yellow/green vest meeting the requirements of ANSI/ISEA 107-2004 or ANSI/ISEA 107-2010 for Conspicuity Class 2 garments. Other types of garments may be substituted for the vest as long as the garments have a manufacturer’s tag identifying them as meeting the ANSI Class 2 requirement. [SS pg. 586 / 701.12]

4. When the work operation requires that two or more work vehicles cross the 15 ft. clear zone in any one hour, traffic control shall be in conformance with STANDARD 701101. [Standard – General Notes]

3. This standard also applies to work performed in the median more than 15 ft. (4.5 m) from either pavement. [Standard – General Notes]
1. cones at 23' 18 in centers, for 300' (75 ml). Additional cones may be placed at 50' (15 ml) centers. When drums or barricades are used, the interval between devices may be doubled.

---

**SYMBOLS**

- Work area
- Sign
- Barricade or drum
- Cone, drum or barricade
- Flagger with traffic control align

**TYPICAL APPLICATIONS**

- Ice patching
- Utility operations
- Storm sewer
- Culvert
- Cable placement

---

**GENERAL NOTES**

This standard is used when at any time, any vehicle, equipment, workers or their activities will intrude 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 200' (600 ml), conditional 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 701201-04**

<table>
<thead>
<tr>
<th>DATE</th>
<th>REVISIONS</th>
</tr>
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<tr>
<td>1-1-11</td>
<td>Revised flagger align.</td>
</tr>
<tr>
<td>1-1-09</td>
<td>Switched units to English</td>
</tr>
<tr>
<td></td>
<td>material.</td>
</tr>
<tr>
<td></td>
<td>Corrected align No. 0.</td>
</tr>
</tbody>
</table>

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**ILLINOIS DEPARTMENT OF TRANSPORTATION**

APPROVED: January 2, 2011

ENGINEER OF RECORD: [Name]

APPROVED: [Name]

POSITION OF PROJECT: [Position]
Standard 701201

Various Specifications:

1. The traffic control shall remain in place only as long as needed and shall be removed when directed by the Engineer. Signs that do not apply to current conditions, shall be removed, covered, or turned from the view of the motorists. [SS pg. 584 / 701.04]

2. All personnel on foot, excluding flaggers, within the highway right-of-way shall wear a fluorescent orange, fluorescent yellow/green, or a combination of fluorescent orange and fluorescent yellow/green vest meeting the requirements of ANSI/ISEA 107-2004 or ANSI/ISEA 107-2010 for Conspicuity Class 2 garments. Other types of garments may be substituted for the vest as long as the garments have a manufacturer’s tag identifying them as meeting the ANSI Class 2 requirement. [SS pg. 586 / 701.12]

3. The Contractor shall keep all equipment, material, and vehicles off the pavement and shoulders on the side of the pavement which is open to traffic. … At any location on existing pavements less than three lanes in width, the sequence of construction shall limit operations to one side of the pavement. [SS pg. 585 / 701.08]

4. The longitudinal placement of the flagger may be increased up to 100 ft. (30 m) from that shown on the plans to improve the visibility of the flagger. … Flaggers will not be required when no work is being performed, unless there is a lane closure on two-lane, two-way pavement. [SS pg. 587 / 701.13]

5. Two Lane Highways. Two flaggers will be required for each separate operation where two-way traffic is maintained over one lane of pavement. Work operations controlled by flaggers shall be no more than 1 mile (1600 m) in length. Flaggers shall be in sight of each other or in direct communication at all times. Direct communication shall be obtained by using portable two-way radios or walkie-talkies. [SS pg. 587 / 701.13(a)]

6. Longitudinal dimensions shown on the plans for the placement of signs may be increased up to 100 ft. (30 m) to avoid obstacles, hazards, or to improve sight distance, when approved by the Engineer. [SS pg. 588 / 701.14]

7. Pavement patching: [SS pg. 593 - 594 / 701.17(e)]

8. No broken pavement, open holes, or partially filled patches shall remain overnight and all devices shall be removed before dark. If patches are not opened when required, additional traffic control shall be provided at no additional cost to the Department. [SS pg. 594 / 701.17(e) (2)b]

General Information:

1. At the completion of the day’s operations, all materials, equipment, signs, cones, barricades, and drums are to be removed and the work area opened to traffic.

2. If the work operation does not exceed 60 minutes, traffic may be in conformance with STANDARD 701301.

FOR INFORMATIONAL USE ONLY
TYPICAL APPLICATIONS

Isolated patron
Installation at drainage structure
Utility operations

SYMBOLS

- Work area
- Sign
- Flagger with traffic control sign
- Barriade or drum
- Barriade or drum with flashing light
- Barriade or drum with steady burning light

GENERAL NOTES

This Standard is used where at any time, any vehicle, equipment, worker, or their activities will intrude in the area between the center line and a line 24" (600) from the edge of pavement for nighttime operations.

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

LANE CLOSURE, 2L, 2W,
NIGHT ONLY,
FOR SPEEDS ≥ 45 MPH

STANDARD 701206-03
**Standard 701206**

Various Specifications:

1. The Contractor shall keep all equipment, material, and vehicles off the pavement and shoulders on the side of the pavement which is open to traffic. ... At any location on existing pavements less than three lanes in width, the sequence of construction shall limit operations to one side of the pavement. [SS pg. 585 / 701.08]

2. The longitudinal placement of the flagger may be increased up to 100 ft. (30 m) from that shown on the plans to improve the visibility of the flagger. [SS pg. 587 / 701.13]

3. For nighttime flagging, flaggers shall be illuminated by an overhead light source providing a minimum vertical illuminance of 10 fc (108 lux) measured 1 ft. (300 mm) out from the flagger's chest. The bottom of any luminaire shall be a minimum of 10 ft. (3 m) above the pavement. Luminaire(s) shall be shielded to minimize glare to approaching traffic and trespass light to adjoining properties. [SS pg. 587 / 701.13]

Nighttime flaggers shall be equipped with a fluorescent orange or fluorescent orange and fluorescent yellow/green apparel meeting the requirements of ANSI/ISEA 107-2004 or ANSI/ISEA 107-2010 for Conspicuity Class 3 garments. [SS pg. 587 / 701.13]

4. Flaggers shall be in sight of each other or in direct communication at all times. Direct communication shall be obtained by using portable two-way radios or walkie-talkies. [SS pg. 587 / 701.13(a)]

5. When work operations exceed four days, signs shall be post mounted unless the signs are located on the pavement or define a moving or intermittent operation. ... Longitudinal dimensions shown on the plans for the placement of signs may be increased up to 100 ft. (30 m) to avoid obstacles, hazards, or to improve sight distance, when approved by the Engineer. [SS pg. 587-588 / 701.14]

6. First two warning signs on each approach to the work involving a nighttime lane closure. Lights required: Flashing mono-directional lights. [SS pg. 591 / 701.16]

**General Information:**

1. This standard may be used for bridge repair projects in lieu of STANDARD 701316 where the minimum passing sight distance (Section 3B-5 MUTCD) through the barricaded area is available from a point approximately 350 ft. (105 m) in advance of the first barricade in either direction, the maximum length of closure, including taper, is approximately 300 ft. (90 m) and the estimated ADT does not exceed 1,000.

2. When Standard 701206 is specified for bridge repair projects, the bridge rail and guardrail adjacent to the open traffic lane shall be delineated with guardrail/parapet markers at 25 ft. (7.6 m) centers.

3. Refer to Section 702 for Nighttime Work Zone Lighting. [SS pg. 603-605 / 702] and also pages 105-106 of this booklet.

FOR INFORMATIONAL USE ONLY
For any operation that approaches in the area between the centerline and a line 24 ft (7.3 m) outside the edge of the pavement for a period of less than 15 minutes.

Vehicle with dual flashers or flashing amber dome light operating.

For any operation that is more than 24 ft (7.3 m) 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 approaches in the area between the centerline and a line 24 ft (7.3 m) 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
- Signing line
- Lifting operations
- Clearing up debris or pavement

SYMBOLS
- **Work area**
  - Sign on portable or permanent support
  - Flagger with traffic control sign

LANE CLOSURE, 2L, 2W, SHORT TIME OPERATIONS

STANDARD 701301-04
Standard 701301

Various Specifications:

1. The traffic control shall remain in place only as long as needed and shall be removed when directed by the Engineer. Signs that do not apply to current conditions shall be removed, covered, or turned from the view of motorists. [SS pg. 584 / 701.04]

2. All personnel on foot, excluding flaggers, within the highway right-of-way shall wear a fluorescent orange, fluorescent yellow/green, or a combination of fluorescent orange and fluorescent yellow/green vest meeting the requirements of ANSI/ISEA 107-2004 or ANSI/ISEA 107-2010 for Conspicuity Class 2 garments. Other types of garments may be substituted for the vest as long as the garments have a manufacturer’s tag identifying them as meeting the ANSI Class 2 requirement. [SS pg. 586 / 701.12]

3. The Contractor shall keep all equipment, material, and vehicles off the pavement and shoulders on the side of the pavement which is open to traffic. … At any location on existing pavements less than three lanes in width, the sequence of construction shall limit operations to one side of the pavement. [SS pg. 585 / 701.08]

4. The longitudinal placement of the flagger may be increased up to 100 ft. (30 m) from that shown on the plans to improve the visibility of the flagger. [SS pg. 587 / 701.13]

5. Flaggers shall be in sight of each other or in direct communication at all times. Direct communication shall be obtained by using portable two-way radios or walkie-talkies. [SS pg. 587 / 701.13(a)]

6. Longitudinal dimensions shown on the plans for the placement of signs may be increased up to 100 ft. (30 m) to avoid obstacles, hazards, or to improve sight distance, when approved by the Engineer. [SS pg. 588 / 701.14]

General Information:

During working hours, all vehicles and/or nonoperating equipment which are parked, two hours or less, shall be parked at least 8 ft. (2.5m) from the open traffic lane. For other periods of time during working and for all nonworking hours, all vehicles, materials, and equipment shall be parked or stored a minimum of 30 ft. (9m) from the pavement when the project has adequate right-of-way. When adequate right-of-way does not exist, vehicles and materials shall be located at least 15 ft. (3.5m) from the edge of any pavement open to traffic, unless located behind temporary concrete barrier, temporary bridge rail, or other main-made or natural barriers. [SS pg. 586 / 701.11]
Standard 701306:

Various Specifications:

1. The traffic control shall remain in place only as long as needed and shall be removed when directed by the Engineer. Signs that do not apply to current conditions, shall be removed, covered, or turned from the view of the motorists. [SS pg. 584 / 701.04]

2. The Contractor shall keep all equipment, material, and vehicles off the pavement and shoulders on the side of the pavement which is open to traffic. … At any location on existing pavements less than three lanes in width, the sequence of construction shall limit operations to one side of the pavement. [SS pg. 585 / 701.08]

3. The longitudinal placement of the flagger may be increased up to 100 ft. (30 m) from that shown on the plans to improve the visibility of the flagger. [SS pg. 587 / 701.13]

4. Work operations controlled by flaggers shall be no more than 1 mile (1600 m) in length. Flaggers shall be in sight of each other or in direct communications at all times. Direct communication shall be obtained by using portable two-way radios or walkie-talkies. [SS pg. 587 / 701.13(a)]

5. Longitudinal dimensions shown on the plans for the placement of signs may be increased up to 100 ft. (30 m) to avoid obstacles, hazards, or to improve sight distance, when approved by the Engineer. [SS pg. 588 / 701.14]

6. Where construction operations on two-lane roads open to traffic result in the removal or covering of any pavement striping indicating passing restrictions, "NO PASSING ZONES NOT STRIPED NEXT _ MILES" (G20-I100) signs shall be used. The contractor shall place the signs at the beginning of the unstriped area, just beyond each major intersection within the unstriped area and at other locations as directed by the engineer, to ensure a minimum spacing of 5 miles (8 km). The signs shall be placed just prior to removal or covering of the striping and shall remain in place until full no passing zone striping has been restored. [SS pg. 592 / 701.17(c)]

7. Prime or Tack Coat. “FRESH OIL” (W21-2) signs shall be erected when prime or tack and fine aggregate are applied to pavement that is open to traffic. The signs shall remain until tracking of the prime or tack ceases as directed by the Engineer. The signs shall be erected a minimum of 500 ft. (150 m) preceding the start of the prime or tack. [SS pg. 592 / 701.17(c)(1)]

8. Cold Milling. “ROUGH GROOVED SURFACE” (W8-I107) signs shall be erected when the road has been cold milled and opened to traffic. The signs shall be placed just prior to the cold milling operation and shall remain in place until the milled surface condition no longer exists. These signs shall be erected a minimum of 500 ft. (150 m) preceding the start of the milled pavement, just before each major intersection within the milled area, and at other locations as directed by the Engineer. The signs shall have an amber flashing light attached. [SS pg. 592 / 701.17(c)(2)]

FOR INFORMATIONAL USE ONLY
TYPICAL APPLICATIONS
- Landscaping work
- Utility work
- Pavement marking
- Roadway measurements
- Debris clearance
- Crack pouring

SYMBOLS
- Arrow board (Hazard Mode only)
- Truck with headlights, emergency flashers and flashing amber light, (visible from all directions)
- 18x60 (60x180 mm) orange flag (use when guide wheel is used)
- Truck mounted attenuator

GENERAL NOTES
This Standard is used where any vehicle, equipment, workers, or their activities will require a continuous moving operation where the average speed is greater than 3 mph (5 km/h).

For shoulder operations not involving traffic control, use DETAIL A, Standard 704124.

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

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LANE CLOSURE 2L, 2W
MOVING OPERATIONS—DAY ONLY
STANDARD 701311-03
**Standard 701311**

Various Specifications:

Truck Mounted/Trailer Mounted Attenuators (TMA). TMA host vehicles shall have the parking brake engaged when stationary. [SS pg. 590 / 701.15(h)]

Truck Mounted/Trailer Mounted Attenuators (TMA). The attenuator shall be either a NCHRP 350 or MASH approved unit for Test Level 3. Test Level 2 may be used as directed by the Engineer for normal posted speed less than or equal to 45 mph. [SS pg. 1130 / 1106.02(g)]

General Information:

During pavement marking operations, “WET PAINT” signs with the appropriate arrow(s) shall be mounted on the back of the striper and the following vehicle where necessary to reduce tracking.
Type III barricade to be placed when no work is being performed.

Guardrail/barrier wall reflectors at 25' (7.6) m. See Standards 704001 & 782000L.

Vertical panels at 25' (7.6) m. throughout lane shift. These devices may be omitted when the guardrail, warning panels, extend to at least this point on the taper.

The edge of the post-mounded signal head shall be between 24' (7.3m) and 6' (1.8 m) from edge of shoulder.

See Sheet 2 for general notes.

LARGE CLOSURE, 2L, 2W, BRIDGE REPAIR, FOR SPEEDS > 45 MPH

DATE REVISIONS
1-1-17 Revised note 3.
4-2-16 Changed standard reference from 63501 to 782000 in note 2.

STANDARD 701316-11
**Standard 701316**

The exact location of the signals, detector loops, stop bars, and signs shall be as directed by the Engineer. The locations shall also be adjusted as required for stage construction.  
[SS pg. 595 - 598 / 701.18(b)]

The Engineer shall be notified at least 72 hours in advance of placing the signals in operation and at least one week prior to a traffic lane width reduction.

Any damage to the temporary traffic signals from any cause shall be repaired at no additional cost to the Department. If at any time the Contractor fails to perform any work deemed necessary by the Engineer to keep the temporary traffic signals in proper operating condition, the Department reserves the right to have other electrical Contractors perform the needed work, and the cost will be deducted from compensation due or which may become due the Contractor under the contract.

During daytime operations when workers are present, the Engineer may allow Type I or Type II barricades to be placed parallel to the centerline. Cones may be substituted for barricades at half the barricade spacing during the daytime operations.

Lane Closure on Two-Way, Two-Lane Rural Road. The Contractor shall furnish, install, maintain, and remove temporary traffic signals including a traffic actuated controller, a cabinet, detector amplifiers, and other associated equipment as listed below and on Standard 701316 for each location specified. The Contractor shall have available one spare controller and cabinet. The Contractor shall retain ownership of all traffic control equipment, miscellaneous accessories, and the installation methods shall be according to the following.

a. **TRAFFIC SIGNAL HEADS:** Two signal heads shall be provided for each mainline approach and for each sideway within the designated work area. When using incandescent signal heads, all lamps shall be new. When the signals are not operating, the signal head shall be hooded according to Article 880.03 and the “SIGNAL AHEAD” sign covered or removed. The left signal head shall be mounted at a height of 10 ft. (3.0 m) above the road surface measured to the bottom of the signal head. The right signal head shall be mounted at a height of 14 ft. (4.3 m) above the road surface. Back plates will be required on all signals.

The right signal head shall be aimed so the centers of the light beams of the indications are directed toward a point in the center of the approach lane 500 ft. (150 m) in advance of the signal. The left indication shall be aimed at a point in the center of the approach lane 100 ft. (30 m) in advance of the stop line.

b. **LENSES:** All lenses shall be 12 in. (300 mm) nominal diameter.

c. **WIRE AND CABLE:** The contractor shall supply all overhead and underground wiring for both signal circuits and loop detector lead-ins. The electric cable shall be aerially suspended, at a minimum height of 10 ft. (3.0 m) and as close to the right-of-way line as possible. When the electric cable crosses a roadway or entrance, it shall be aerially suspended, at a minimum height of 18 ft. (5.5 m), according to the local utility requirements, or placed in a trench with a minimum of 2 ft. (600 mm) of cover, or protected in a manner approved by the Engineer.
d. MOUNTING: The controller shall be mounted on a post, pole, or temporary concrete foundation. The signal heads shall be mounted on 25 ft. (7.5 m) standard tubular steel posts or on a minimum Class 4 wood pole, when overhead wiring is used between signals. Alternative methods of mounting the cabinet or signal heads shall be approved by the Engineer. The supports shall be kept in a vertical position for the duration of the project.

e. SERVICE INSTALLATION: The Contractor shall be responsible for the installation and cost of 110 V electrical service. When the service cable from the controller to the power source is suspended overhead, the line height shall not be less than 10 ft. (3.0 m) above the ground and located as close to the right-of-way lines as practicable. When the cable crosses a roadway or entrance, the cable shall be raised to a minimum height of 18 ft. (5.5 m) or pass under the pavement through a culvert opening. Portable power generating equipment may be used for a short period of time until local power is available, provided at least one person is present at all times at the site to ensure proper operation.

f. TRAFFIC SIGNAL CONTROLLER:

1. The controller shall be standard eight phase NEMA controller housed in a weather proof cabinet. The traffic signals shall dwell in All-Red. The long All-Red intervals shall be adjustable up to 99 seconds in one second increments. Long All-Red intervals shall be obtained by using a trail green feature or an equivalent, or by using dummy phases. The long All-Red interval shall be preempted if the previous movement is detected before the conflicting movement is detected and shall cause the previous movement to return to the green display with a minimum four second delay. When a conflict or failure is detected, the signal shall display a flashing All-Red. When an additional phase is used for a side road movement, only one long red interval shall be used between active phases on each side of the work area.

All devices used, in lieu of controller software to produce this sequence, shall be mounted within the cabinet but not within the controller. The Contractor shall provide an operational demonstration of the controller assembly for the Engineer subsequent to installation and prior to being place into operation. The Contractor shall program the controller, trouble shoot, and correct any problems that arise, and verify the equipment is functions according to the contract. If any controller malfunction occurs during the time of operation or in the event of a power failure, the Contractor shall, without delay, provide flaggers for traffic control and immediately install a replacement controller to operate the signals.

2. When specified, the Department will furnish the traffic actuated controller. The controller, complete with loop detector-amplifiers and pole mount cabinet, shall be picked up and returned upon completion of the project to the location designated on the plans. The Contractor shall provide notice to the Department at least two weeks in advance of requiring the traffic actuated controller. The Contractor shall be responsible for maintenance of the controller and all related equipment within the controller cabinet. The controller shall be inspected by the Contractor and Engineer subsequent to installation and prior to being placed into operation. Any malfunction of the Department owned equipment revealed during the inspection by the Contractor shall be repaired and will be paid for
Standard 701316 - Continued

according to Article 109.04. The Contractor shall be responsible for any damage to the Department-owned equipment as a result of negligence or poor workmanship during installation at his/her expense. The Contractor shall provide all maintenance required, at his/her expense, to keep the Department-owned equipment functioning properly after being placed in operation.

g. DETECTOR LOOPS: Three detector loops shall be installed on each approach as shown on the plan. The near detector loop shall be placed 12 in. (300 mm) from the centerline and the far loop shall be placed 12 in. (300 mm) from the edge line. Each loop shall be connected to a separate detector amplifier channel. Call delay feature shall be used for the loops nearest the stop lines and defeated during the green of that phase. An alternate method of detection may be used if it has been demonstrated and approved by the Department.

The loop detector lead-in cable shall be protected from construction and maintenance activities. In the event of detector loop failure, the Contractor shall have 48 hours to repair or replace the loops. Upon completion of the project, the detector loop shall be terminated in such a manner as to provide for future use.

[SS pg. 595 - 598 / 701.18(b)]

Various Specifications:

1. When work operations exceed four days, all signs shall be post mounted unless the signs are located on the pavement or define a moving or intermittent operation. When approved by the Engineer, temporary sign supports may be used where posts are impractical. Longitudinal dimensions shown on the plans for the placement of signs may be increased up to 100 ft. (30 m) to avoid obstacles, hazards, or to improve sight distance, when approved by the engineer. [SS pg. 587 - 588 / 701.14]

2. First two warning signs on each approach to the work involving a nighttime lane closure. Lights Required: Flashing mono-directional lights. [SS pg. 591 / 701.16]

4. Devices in nighttime lane closure tapers on Standards 701316 and 701321. Lights Required: Steady burn bi-directional lights. [SS pg. 591 / 701.16]

General Information:

Temporary rumble strips conforming to Standard 701901 are recommended where poor alignment or restricted sight distance indicated potential operational problems.

FOR INFORMATIONAL USE ONLY
detector loops

temporary pavement marking

vertical panels

lane closure, 2l, 2w,
bridge repair with barrier

standard 701321-16
Where the clear width through a work zone with temporary concrete barrier will be 16.0 ft. (4.88 m) or less, the Contractor shall notify the Engineer at least 21 days in advance of implementing the traffic control for that restriction. [SS pg. 584 / 701.06]

The exact location of the signals, detector loops, stop bars, and signs shall be as directed by the Engineer. The locations shall also be adjusted as required for stage construction. [SS pg. 595-598 / 701.18(b)]

The Engineer shall be notified at least 72 hours in advance of placing the signals in operation and at least one week prior to a traffic lane width reduction.

Any damage to the temporary traffic signals from any cause shall be repaired at no additional cost to the Department. If at any time the Contractor fails to perform any work deemed necessary by the Engineer to keep the temporary traffic signals in proper operating condition, the Department reserves the right to have other electrical Contractors perform the needed work, and the cost will be deducted from compensation due or which may become due the Contractor under the contract.

Lane Closure on Two-Way, Two-Lane Rural Road. The Contractor shall furnish, install, maintain, and remove temporary traffic signals including a traffic actuated controller, a cabinet detector amplifiers, and other associated equipment as listed below and on Standard 701321 for each location specified. The Contractor shall have available one spare controller and cabinet. The Contractor shall retain ownership of all traffic control equipment, miscellaneous accessories, and the installation methods shall be according to the following.

a. **TRAFFIC SIGNAL HEADS:** Two signal heads shall be provided for each mainline approach and for each sideroad within the designated work area. When using incandescent signal heads, all lamps shall be new. When the signals are not operating, the signal head shall be hooded according to Article 880.03 and the "SIGNAL AHEAD" sign covered or removed. The left signal head shall be mounted at a height of 10 ft. (3.0 m) above the road surface measured to the bottom of the signal head. The right signal head shall be mounted at a height of 14 ft. (4.3 m) above the road surface. Back plates will be required on all signals.

The right signal head shall be aimed so the centers of the light beams of the indications are directed toward a point in the center of the approach lane 500 ft. (150 m) in advance of the signal. The left indication shall be aimed at a point in the center of the approach lane 100 ft. (30 m) in advance of the stop line.

b. **LENSES:** All lenses shall be 12 in. (300 mm) nominal diameter.

c. **WIRE AND CABLE:** The Contractor shall supply all overhead and underground wiring for both signal circuits and loop detector lead-ins. The electric cable shall be aerially suspended, at a minimum height of 10 ft. (3.0 m) and as close to the right-of-way line as possible. When the electric cable crosses a roadway or entrance, it shall be aerially suspended, at a minimum height of 18 ft. (5.5 m), according to the local utility requirements, or placed in a trench with a minimum of 2 ft. (600 mm) of cover, or protected in a manner approved by the Engineer.
Standard 701321 - Continued

d. MOUNTING: The controller shall be mounted on a post, pole, or temporary concrete foundation. The signal heads shall be mounted on 25 ft. (7.5 m) standard tubular steel posts or on a minimum Class 4 wood pole, when overhead wiring is used between signals. Alternative methods of mounting the cabinet or signal heads shall be approved by the Engineer. The support shall be kept in a vertical position for the duration of the project.

e. SERVICE INSTALLATION: The Contractor shall be responsible for the installation and cost of 110 V electrical service. When the service cable from the controller to the power source is suspended overhead, the line height shall not be less than 10 ft. (3.0 m) above the ground and located as close to the right-of-way lines as practicable. When the cable crosses a roadway or entrance, the cable shall be raised to a minimum height of 18 ft. (5.5 m) or pass under the pavement through a culvert opening. Portable power generating equipment may be used for a short period of time until local power is available, provided at least one person is present at all times at the site to ensure proper operation.

f. TRAFFIC SIGNAL CONTROLLER:

1. The controller shall be a standard eight phase NEMA controller housed in a weather proof cabinet. The traffic signals shall dwell in All-Red. The long All-Red intervals shall be adjustable up to 99 seconds in one second increments. Long All-Red intervals shall be obtained by using a trail green feature or an equivalent, or by using dummy phases. The long All-Red interval shall be pre-empted if the previous movement is detected before the conflicting movement is detected and shall cause the previous movement to return to the green display with a minimum four second delay. When a conflict or failure is detected, the signal shall display a flashing All-Red. When an additional phase is used for a side road movement, only one long red interval shall be used between active phases on each side of the work area.

All devices used, in lieu of controller software to produce this sequence, shall be mounted within the cabinet but not within the controller. The Contractor shall provide an operational demonstration of the controller assembly for the Engineer subsequent to installation and prior to being placed into operation. The Contractor shall program the controller, trouble shoot, and correct any problems that arise, and verify the equipment is functioning according to the contract. If any controller malfunction occurs during the time of operation or in the event of a power failure, the Contractor shall, without delay, provide flaggers for traffic control and immediately install a placement controller to operate the signals.

2. When specified, the Department will furnish the traffic actuated controller. The controller, complete with loop detector-amplifiers and pole mount cabinet, shall be picked up and returned upon completion of the project to the location designated on the plans. The Contractor shall provide notice to the Department at least two weeks in advance of requiring the traffic actuated controller. The Contractor shall be responsible for maintenance of the controller and all related equipment within the controller and all related equipment within the controller cabinet. The controller shall be inspected by the Contractor and Engineer subsequent to installation and prior to being placed into operation. Any malfunction of the Department owned equipment revealed during the inspection
Standard 701321 - Continued

by the Contractor shall be repaired and will be paid for according to Article 109.04. The Contractor shall be responsible for any damage to the Department-owned equipment as a result of negligence or poor workmanship during installation at his/her expense, to keep the Department-owned equipment functioning properly after being placed in operation.

g. DETECTOR LOOPS: Three detector loops shall be installed on each approach as shown on the plans. The near detector loops shall be placed 12 in. (300 mm) from the centerline and the far loop shall be placed 12 in. (300 mm) from the edge line. Each loop shall be connected to a separate detector amplifier channel. Call delay feature shall be used for the loops nearest the stop lines and defeated during the green of that phase. An alternate method of detection may be used if it has been demonstrated and approved by the Department.

The loop detector lead-in cable shall be protected from construction and maintenance activities. In the event of detector loop failure, the Contractor shall have 48 hours to repair or replace the loops. Upon completion of the project, the detector loop shall be terminated in such a manner as to provide for future use.

Various Specifications:

1. All existing pavement marking which conflict with revised traffic pattern shall be removed according to Section 783. [SS pg. 584 / 701.04]

2. When work operations exceed four days, all signs shall be post mounted unless the signs are located on the pavement or define a moving or intermittent operation. When approved by the Engineer, temporary sign supports may be used where posts are impractical. … Longitudinal dimensions shown on the plans for the placement of signs may be increased up to 100 ft. (30 m) to avoid obstacles, hazards, or to improve sight distance, when approved by the engineer. [SS pg. 587-588 / 701.14]

3. First two warning signs on each approach to the work involving a nighttime lane closure. Lights Required: Flashing mono-directional lights. [SS pg. 591 / 701.16]

5. Devices in nighttime lane closure tapers on Standards 701316 and 701321. Lights Required: Steady burn bi-directional lights. [SS pg. 591 / 701.16]

General Information:

Temporary rumble strips conforming to Standard 701901 are recommended where poor alignment or restricted sight distance indicates potential operational problems.
**Standard 701326**

No paving or excavating operations shall be performed at night unless authorized by the Engineer. [SS pg. 598 / 701.18(c)]

**Various Specifications:**

1. The Contractor shall keep all equipment, material, and vehicles off the pavement and shoulders on the side of the pavement which is open to traffic. … At any location on existing pavements less than three lanes in width, the sequence of construction shall limit operations to one side of the pavements. [SS pg. 585 / 701.08]

2. The longitudinal placement of the flagger may be increased up to 100 ft. (30 m) from that shown on the plans to improve the visibility of the flagger. [SS pg. 587 / 701.13]

3. Work operations controlled by flaggers shall be no more than 1 mile (1600 m) in length. Flaggers shall be in sight of each other or in direct communication at all times. Direct communication shall be obtained by using portable two-way radios or walkie-talkies. [SS pg. 587 / 701.13(a)]

4. When work operations exceed four days, signs shall be post mounted unless the signs are located on the pavement or define a moving or intermittent operation. … Longitudinal dimensions shown on the plans for the placement of signs may be increased up to 100 ft. (30 m) to avoid obstacles, hazards, or to improve sight distance, when approved by the Engineer. [SS pg. 587-588 / 701.14]
Standard 701331

Various Specifications:

1. When work operations exceed four days, signs shall be post mounted unless the signs are located on the pavement or define a moving or intermittent operation. Longitudinal dimensions shown on the plans for the placement of signs may be increased up to 100 ft. (30 m) to avoid obstacles, hazards, or to improve sight distance, when approved by the Engineer. [SS pg. 587-588 / 701.14]

2. First two warning signs on each approach to the work involving a nighttime lane closure. Lights Required: Flashing mono-directional lights. [SS pg. 591 / 701.16]

General Information:

1. No passing zones shall be striped where sight distance restrictions warrant.

2. Edge and centerline pavement markings are required for this Standard.
GENERAL NOTES

This Standard is used where at any time, any vehicle, equipment, workers or their activities will approach in the area between the centerline and a line 24' (7.3 m) outside the edge of the pavement.

Two flaggers shall be required for each separate lane closure. The flagger shall be a minimum of 200' (60 m) and a maximum of 1/2 day's operation beyond the flagger align. When the distance between successive patches exceeds 200' (60 m), additional flaggers, warning signs, and topers 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 20' (6 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 20' (6 m) parallel to the centerline, one barricade/drum shall be placed in each hole. For large holes, barricades/drums shall be placed at 50' (15 m) centers.

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

SYMBOLS

- Patience
- Sign
- Flagger with traffic control sign
- Barricade or drum
- Cone, barricade or drum

TYPICAL APPLICATIONS

- Pedestrian

LANE CLOSURE, 2L, 2W, WORK AREAS IN SERIES, FOR SPEEDS >= 45 MPH

STANDARD 701336-06
**Standard 701336**

Two flaggers shall be required for each separate construction operations. The flagger shall be a minimum of 200 ft. (60 m) and a maximum distance of ½ day's operation beyond the flagger sign. When the distance between successive patches exceeds 2000 ft. (600 m), additional flaggers warning signs, and tapers shall be places as shown.

Barricades/drums shall be placed at intervals not greater than 100 ft. (30 m) or cones shall be placed at intervals not greater than 50 ft. (15 m) centers throughout the work zone.

When the spacing between open holes is greater than 50 ft. (15 m), two barricades/drums shall be places in front of each open hole and one on the backside close to the centerline.

When the open hole is greater than 10 ft. (3 m) parallel to the centerline, one barricade/drum shall be placed in each hole. For larger holes, barricades/drums shall be placed at 50 ft. (16 m) centers. [Standard – General Notes]

**Various Specifications:**

1. The longitudinal placement of the flagger may be increased up to 100 ft. (30 m) from that shown on the plans to improve the visibility of the flagger. [SS pg. 587 / 701.13]

2. Work operations controlled by flaggers shall be no more than 1 mile (1600 m) in length. Flaggers shall be in sight of each other or in direct communication at all times. Direct communication shall be obtained by using portable two-way radios or walkie-talkies. [SS pg. 587 / 701.13(a)]

3. When work operations exceed four days, signs shall be post mounted unless the signs are located on the pavement or define a moving or intermittent operation. ... Longitudinal dimensions shown on the plans for the placement of signs may be increased up to 100 ft. (30 m) to avoid obstacles, hazards, or to improve sight distance, when approved by the Engineer. [SS pg. 587-588 / 701.14]

4. First two warning signs on each approach to the work involving a nighttime lane closure. Lights Required: Flashing mono-directional lights. [SS 591 / 701.16]

5. Pavement Patching: [SS pg. 593 - 594 / 701.17(e)]

6. No broken pavement, open holes, or partially filled patches shall remain overnight and all devices shall be removed before dark. If patches are not opened when required, additional traffic control shall be provided at no additional cost to the Department. [SS pg. 594 / 701.17(e)(2)b]
SYMBOLS

1. Arrow board
2. Trolley mounted sign
3. Sign
4. Type II barricade, drums, or vertical barricade with non-directional flashing light

① The Road Construction Ahead sign shall be located 3 to 5 miles in advance of the project limits.
② The message and size of the Work Zone Public Information Sign shall be as specified by the Department.
③ The message board shall be used to display status of lanes within the project. The primary messages shall be:
   "Right Lane Closed" / "n Miles Ahead"
   "Left Lane Closed" / "n Miles Ahead"
   "All Lanes Open"
④ Three, Type II barricades, drums, or vertical barricades at 25' 18 in. centers.
⑤ This sign shall be used when 2 lanes are closed.
⑥ This sign shall be omitted when median width is less than 10' 15 in.
⑦ This sign shall only be used if the existing speed limit is greater than 65 mph.

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 two signs 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.

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

**APPENDIX TO LANE CLOSURE, FREeway/EXPRESSWAY**

**STANDARD 701400-09**

<table>
<thead>
<tr>
<th>DATE</th>
<th>REVISIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-1-17</td>
<td>Added trailer mounted speed display sign. Changed device showing and note (i).</td>
</tr>
<tr>
<td>1-1-15</td>
<td>Revised &quot;7 RIGHT LANES CLOSED 1 MILE&quot; sign.</td>
</tr>
</tbody>
</table>

[Logo: Virginia Department of Transportation]
Standard 701400

Various Specifications:

First two warning signs on each approach to the work involving a nighttime lane closure. Lights Required: Flashing mono-directional lights. [SS pg. 591 / 701.16]

General Information:

1. This Standard is to be used with Standards 701401, 701402, 701406, 701416, and 701446.

2. The message panel shall be a minimum of 7 ft (2.1 m) above the edge of pavement in urban areas and a minimum of 5 ft (1.5 m) above the edge of pavement in rural areas, present a level appearance, and be capable of displaying up to eight characters in each of three lines at a time. [BDE Special Provision Portable Changeable Message Signs]

3. When portable changeable message signs are shown on the Standard, this work will not be paid for separately but shall be considered as included in the cost of the Standard. [SS pg. 603 / 701.20(h)]

4. When speed display trailers are shown on the Standard, this work will not be paid for separately, but shall be considered as included in the cost of the Standard. [BDE special provision SPEED DISPLAY TRAILER (page 145 of this booklet)].

FOR INFORMATIONAL USE ONLY
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 24600 of the edge of pavement.

This Standard must always be used in combination with Standard 70400.

This Standard also applies when work is being performed in the left lane. Under these conditions, the setup would be a mirror image to what is shown.

A check bollard shall be placed in the middle of the closed lane and at the shoulder at 1000 (300 m) centers. All dimensions are in inches (millimeters) unless otherwise shown.

LANE CLOSURE,
FREEWAY / EXPRESSWAY

STANDARD 70401-10
Standard 701401

The END WORK ZONE SPEED LIMIT sign shall be black on white. [Standard – Sign Code]

1. Multilane Pavement Resurfacing: For the construction of binder course, surface course and shoulder resurfacing on multilane pavements, Standards 701401, 701406, 701421, 701422, or 701446 shall be used from the beginning of business on Monday to 4:30 p.m. on Friday. Only Standards 701406 and 701421 shall be used from 4:30 p.m. Friday to start of business on Monday. [SS pg. 598 / 701.18(d)(1)]

2. Shoulder Upgrading and Replacement: The following shall apply to shoulder pipe underdrain installation and/or shoulder reconstruction on existing multilane divided highways.

The Contractor shall close the adjacent lane of pavement according to the Standard within the limits of the construction zone:

a. When required by the Contractor’s operations; and,

b. When no workers are present and the difference in elevation between the pavement and the shoulder and/or widening is greater than 12 in. (300).

During shoulder work on ramps, refer to standard 701456.

Standard 701401 and 701422 will only be measured for payment where the average depth of shoulder reconstruction required by the plans, exclusive of any trench for pipe underdrain installation, is in excess of 3 in. (75 mm). Where such shoulder reconstruction is 3 in. (75 mm) or less, no open trench greater than 3 in. (75 mm) deep will be permitted overnight. If, because of unforeseen circumstances, an open trench greater than 3 in. (75 mm) deep should occur overnight, the Contractor shall, at no additional cost to the Department, close the adjacent traffic lane according to Standards 701400 and 701401 or according to Standard 701422.

Excavations greater than 3 in. (75 mm) in depth between the pavement and shoulder, including any trenches within the shoulder area, shall be restricted to one shoulder in each direction of travel. In addition, shoulder drop-offs greater than 1 ½ in. (38 mm) caused by the Contractor’s operations will not be permitted over the winter shutdown.

The Contractor shall schedule the work so the lane closure at any one-work area does not exceed five working days. The closure time may be exceeded for conditions beyond the Contractor’s control, except if continual and persistent closures in excess of the five working days are made, the Engineer will initiate measures to delay or limit the daily production of the Contractor’s operations.

All debris shall be removed from the shoulder and right-of-way prior to the removal of barricades, drums, or vertical panels. [SS pg. 598-599 / 701.18(d)(2)]

Various Specifications:

1. The traffic control shall remain in place only as long as needed and shall be removed when directed by the Engineer. Signs that do not apply to current conditions, shall be removed, covered, or turned from the view of the motorists. [SS pg. 584 / 701.04]
2. The longitudinal placement of the flagger may be increased up to 100 ft. (30 m) from that shown on the plans to improve the visibility of the flagger. [SS pg. 587 / 701.13]

3. One flagger will be required for each separate activity of an operation that requires frequent encroachment in a lane open to traffic. [SS pg. 587 / 701.13(b)]

4. When work operations exceed four days, signs shall be post mounted unless the signs are located on the pavement or define a moving or intermittent operation. ... Longitudinal dimensions shown on the plans for the placement of signs may be increased up to 100 ft. (30 m) to avoid obstacles, hazards, or to improve sight distance, when approved by the Engineer. [SS pg. 587-588 / 701.14]

5. Work Zone Speed Limit Signs. Work zone speed limit sign assemblies shall be provided and located as shown on the plans. Two additional assemblies shall be place 500 ft. (150 m) beyond the last entrance ramp for each interchange or sideroad.

All permanent "SPEED LIMIT" signs located within 500 ft. (150 m) in advance of the first work zone speed limit sign to the end of the work zone shall be removed or covered. This work shall be coordinated with the lane closures(s) by promptly establishing a posted work zone speed zone when the lane closures(s) are put into effect and promptly reinstating the posted speed zone when the lane closure(s) are removed.

The work zone speed limit signs and end work zone speed limit signs shown in advance of and at the end of the lane closure(s) shall be used for the entire duration of the closures(s).

The work zone speed limit signs shown within the lane closure(s) shall only be used when workers are present in the closed lane adjacent to traffic. The sign assemblies shown within the lane closure(s) will not be required when the worker(s) are located behind a concrete barrier wall. [SS pg. 588-589 / 701.14(b)]

6. Daylight operations. Lights Required: None. [SS pg. 591 / 701.16]

7. Channelizing devices for nighttime lane closures on multi-lane roads. Lights Required: Steady burn mono-directional lights. [SS pg. 591 / 701.16]

8. Devices delineating patches at night on roadways with an ADT of 25,000 or more. Lights Required: Steady burn mono-directional lights. [SS pg. 591 / 701.16]

9. “ROUGH GROOVED SURFACE” signs. [SS pg. 592 / 701.17(c)(2)]

10. Pavement Patching: [SS pg. 593-594 / 701.17(e)]

11. Where posted speeds are greater than 40 mph cones shall be a minimum of 28 in. (700 mm) in height. [Standard 701901]

General Information:

This standard does not apply when work is being performed in the middle lane(s) of a six or more lane highway. Special plans will be required.

FOR INFORMATIONAL USE ONLY
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) ft of the edge of pavement for daytime operation exceeding one day and where temporary concrete barrier is utilized.

This standard must always be used in combination with Standard 704000.

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 704000.

Calculate L as follows:

NORMAL POSTED SPEED FORMULAS

45 mph (60 kph)

English Metric

L = (N x W) x 0.08

or more

W = Width of offset

in feet (meters)

5 = Normal posted speed

in mph (kph)

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

LANE CLOSURE, FREEWAY/EXPRESSIONWAY, WITH BARRIER

STANDARD 701402-12

DATE
1-3-17
4-1-16

REVISIONS
Revised END WORK ZONE

QUALITY OF DETAIL AND EARTHWORK

APPROVED
January 6, 2017

ENGINEER OF RECORD

11/20/16

43
Standard 701402
The END WORK ZONE SPEED LIMIT sign shall be black on white. [Standard – Sign Code]

Various Specifications:

1. All existing pavement markings which conflict with the revised traffic pattern shall be removed according to Section 783. [SS pg. 584 / 701.04]

2. Where the clear width through a work zone with temporary concrete barrier will be 16.0 ft. (4.88 m) or less, the Contractor shall notify the Engineer at least 21 days in advance of implementing the traffic control for that restriction. [SS pg. 584 / 701.06]

3. When work operations exceed four days, signs shall be post mounted unless the signs are located on the pavement or define a moving or intermittent operation. … Longitudinal dimensions shown on the plans for the placement of signs may be increased up to 100 ft. (30 m) to avoid obstacles, hazards, or to improve sight distance, when approved by the Engineer. [SS pg. 587-588 / 701.14]

Lights Required: Steady burn mono-directional lights. [SS pg. 591 / 701.16]
The END WORK ZONE SPEED LIMIT sign shall be black on white. [Standard – Sign Code]

1. Multilane Pavement Resurfacing. For the construction of binder course, surface course and shoulder resurfacing on multilane pavements, this standard may be used at all times. [SS pg. 598 / 701.18(d)(1)]

2. Shoulder Upgrading and Replacement. The following shall apply to shoulder pipe underdrain installation and/or shoulder reconstruction on existing multilane divided highways.

The Contractor shall close the adjacent lane of pavement according to the Standard within the limits of the construction zone.

a. When required by the contractor’s operations; and,

b. When no workers are present and the difference in elevation between the pavement and the shoulder and/or widening is greater than 12 in. (300 mm).

During shoulder work on ramps, refer to Standard 701456.

Excavations greater than 3 in. (75 mm) in depth between the pavement and shoulder, including any trenches within the shoulder area, shall be restricted to one shoulder in each direction of travel. In addition, shoulder drop-offs greater than 1 ½ in. (38 mm) caused by the Contractor’s operations will not be permitted over the winter shutdown.

The Contractor shall schedule the work so the lane closure at any one work area, does not exceed five working days. The closure time may be exceeded for conditions beyond the Contractor’s control, except if continual and persistent closures in excess of the five working days are made, the Engineer will initiate measures to delay or limit the daily production of the Contractor’s operations.

All debris shall be removed from the shoulder and right-of-way prior to the removal of barricades, drums, or vertical panels. [SS pg. 598-599 / 701.18(d)(2)]

Various Specifications:

1. The traffic control shall remain in place only as long as needed and shall be removed when directed by the Engineer. Signs that do not apply to current conditions, shall be removed, covered, or turned from the view of the motorists. [SS pg. 584 / 701.04]

2. The longitudinal placement of the flagger may be increased up to 100 ft. (30 m) from that shown on the plans to improve the visibility of the flagger. [SS pg. 587 / 701.13]

3. One flagger will be required for each separate activity of an operation that requires frequent encroachment in a lane open to traffic. [SS pg. 587 / 701.13(b)]

4. Longitudinal dimensions shown on the plans for the placement of signs may be increased up to 100 ft. (30 m) to avoid obstacles, hazards, or to improve sight distance, when approved by the Engineer. [SS pg. 588 / 701.14]
5. **Work Zone Speed Limit Signs.** Work zone speed limit sign assemblies shall be provided and located as shown on the plans. Two additional assemblies shall be placed 500 ft. (150 m) beyond the last entrance ramp for each interchange or sideroad.

All permanent “SPEED LIMIT” signs located within 500 ft. (150 m) in advance of the first work zone speed limit sign to the end of the work zone shall be removed or covered. This work shall be coordinated with the lane closures(s) by promptly establishing a reduced posted speed zone when the lane closures(s) are put into effect and promptly reinstating the posted speed zone when the lane closure(s) are removed.

The work zone speed limit signs and end work zone speed limit signs shown in advance of and at the end of the lane closure(s) shall be used for the entire duration of the closures(s).

The work zone speed limit signs shown within the lane closure(s) shall only be used when workers are present in the closed lane adjacent to traffic. The sign assemblies shown within the lane closure(s) will not be required when the worker(s) are located behind a concrete barrier wall. [SS pg. 588-589 / 701.14(b)]

6. **Cold Milling.** “ROUGH GROOVED SURFACE” (W8-I107) signs shall be erected when the road has been cold milled and opened to traffic. The signs shall be placed just prior to the cold milling operation and shall remain in place until the milled surface condition no longer exists. These signs shall be erected a minimum of 500 ft. (150 m) preceding the start of the milled pavement, just before each major intersection within the milled area, and at other locations as directed by the Engineer. The signs shall have an amber flashing lights attached. [SS pg. 592 / 701.17(c)(2)]

7. **Daylight operations.** Lights Required: None. [SS pg. 591 / 701.16]

8. **Where posted speeds are greater than 40 mph cones shall be a minimum of 28 in. (700 mm) in height.** [Standard 701901]

**General Information:**

1. Equipment, materials, signs, cones, barricades, and drums are to be removed at the completion of the day’s operations and the work area opened to traffic.

2. This standard does not apply when work is being performed in the middle lane(s) of a six or more lane highway. Special plans will be required.
APPLICATION NO. 1
Application No. 1 depicts a modified entrance ramp. This method shall be utilized whenever existing entrance ramps 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 motorists' line of sight through, between or over the delineation devices.
**Standard 701411**

This Standard shall supplement mainline traffic controls for lane closures.

The channelizing devices shall clearly define a path for motorists entering or exiting the highway.

Raised reflectorized pavement markers at 25 ft. (8 m) centers may be used in lieu of tape where the pavement marking is to be placed adjacent to the barricades or drums. [SS pg. 599 / 701.18(g)]

When work does not exceed 5 days, pavement marking tape may be omitted. [Standard – General Notes]

Use of APPLICATION NO. 1 and APPLICATION NO. 3 shall be limited to five days per location. [Standard – General Notes]

Various Specifications:

1. When work operations exceed four days, signs shall be post mounted unless the signs are located on the pavement or define a moving or intermittent operation. … Longitudinal dimensions shown on the plans for the placement of signs may be increased up to 100 ft. (30 m) to avoid obstacles, hazards, or to improve sight distance, when approved by the Engineer. [SS pg. 587-588 / 701.14]

2. Daylight operations. Lights Required: None. [SS pg. 591 / 701.16]

3. First two warning signs on each approach to the work involving a nighttime lane closure. Lights Required: Flashing mono-directional lights. [SS pg. 591 / 701.16]

SYMBOLS

 Arrow board

 Work area

 Sign

 Directional indicator bollard with steady burn non-directional light

 Type II bollard with steady burn non-directional light

 Drum with steady burn non-directional light

 Vertical Panel

 Type III bollard with flashing lights

 Temporary concrete barrier

 "L" and "T" shall be as shown on the plan details.

GENERAL NOTES

This Standard is used where at anytime, 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. Concrete barrier is used to separate the opposing traffic.

This Standard must always be used in combination with Standard 70400.

All bollards, drums, and vertical panels shall be at 50 ft. (15 m) centers.

Temporary concrete barrier shall be according to Standard 70400.

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

LANE CLOSURE, FREEWAY / EXPRESSWAY, WITH CROSSOVER AND BARRIER

STANDARD 701416-10

<table>
<thead>
<tr>
<th>DATE</th>
<th>REVISIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/1/17</td>
<td>Revised END WORK ZONE</td>
</tr>
<tr>
<td>1/1/17</td>
<td>SPEED LIMIT sign from</td>
</tr>
<tr>
<td>1/1/17</td>
<td>orange to white background, from back-to-back to single-sided.</td>
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</tbody>
</table>
Standard 701416

The END WORK ZONE SPEED LIMIT sign shall be black on white. [Standard – Sign Code]

A reflective solid edge line and yellow centerline for each direction of traffic shall be used when the closure time exceeds four days or when the normal posted speed outside the area of operations exceeds 50 mph. Reflectorized pavement marking tape shall be used for marking the edge lines and centerline on existing pavement. Either tape or reflectorized pavement marking paint may be used for markings on the paved crossovers. Raised reflective pavement markers at 25 ft. (8 m) centers shall be installed for additional delineation.

Vertical panels may be attached to concrete barriers where available space prohibits the use of drums. [SS pg. 599 / 701.18(e)]

Various Specifications:

1. All existing pavement markings which conflict with the revised traffic pattern shall be removed according to Section 783. [SS pg. 584 / 701.04]

2. Where the clear width through a work zone with temporary concrete barrier will be 16.0 ft. (4.88 m) or less, the Contractor shall notify the Engineer at least 21 days in advance of implementing the traffic control for that restriction. [SS pg. 584 / 701.06]

3. When work operations exceed four days, signs shall be post mounted unless the signs are located on the pavement or define a moving or intermittent operation. … Longitudinal dimensions shown on the plans for the placement of signs may be increased up to 100 ft. (30 m) to avoid obstacles, hazards, or to improve sight distance, when approved by the Engineer. [SS pg. 587-588 / 701.14]

4. Work Zone Speed Limit Signs. Work zone speed limit sign assemblies shall be provided and located as shown on the plans. Two additional assemblies shall be place 500 ft. (150 m) beyond the last entrance ramp for each interchange or sideroad.

All permanent “SPEED LIMIT” signs located within 500 ft. (150 m) in advance of the first work zone speed limit sign to the end of the work zone shall be removed or covered. This work shall be coordinated with the lane closures(s) by promptly establishing a reduced posted speed zone when the lane closures(s) are put into effect and promptly reinstating the posted speed zone when the lane closure(s) are removed.

The work zone speed limit signs and end work zone speed limit signs shown in advance of and at the end of the lane closure(s) shall be used for the entire duration of the closures(s).

The work zone speed limit signs shown within the lane closure(s) shall only be used when workers are present in the closed lane adjacent to traffic. The sign assemblies shown within the lane closure(s) will not be required when the worker(s) are located behind a concrete barrier wall. [SS pg. 588-589 / 701.14(b)]

Lights Required: Steady burn mono-directional lights. [SS pg. 591 / 701.16]

FOR INFORMATIONAL USE ONLY
Standard 701421

The END WORK ZONE SPEED LIMIT sign shall be black on white. [Standard – Sign Code]

1. Multilane Pavement Resurfacing. For the construction of binder course, surface course and shoulder resurfacing on multilane pavement, this standard may be used at all times. [SS pg. 598 / 701.18(d)(1)]

2. Shoulder Upgrading and Replacement: The following shall apply to shoulder pipe underdrain installation and/or shoulder reconstruction on existing multilane divided highways.

The Contractor shall close the adjacent lane of pavement according to the Standard within the limits of the construction zone.

a. When required by the contractor’s operations; and,

b. When no workers are present and the difference in elevation between the pavement and the shoulder and/or widening is greater than 12 in. (300 mm).

During shoulder work on ramps, refer to Standard 701456.

Excavations greater than 3 in. (75 mm) in depth between the pavement and shoulder, including any trenches within the shoulder area, shall be restricted to one shoulder in each direction of travel. In addition, should drop-offs greater than 1 ½ in. (38 mm) caused by the Contractor’s operations will not be permitted over the winter shutdown.

The Contractor shall schedule the work so the lane closure at any one work area does not exceed five working days. The closure time may be exceeded for conditions beyond the Contractor’s control, except if continual and persistent closures in excess of the five working days are made, the Engineer will initiate measures to delay or limit the daily production of the Contractor’s operations.

All debris shall be removed from the shoulder and right-of-way prior to the removal of barricades, drums or vertical panels. [SS pg. 598-599 / 701.18(d)(2)]

Various Specifications:

1. The traffic control shall remain in place only as long as needed and shall be removed when directed by the Engineer. Signs that do not apply to current conditions shall be removed, covered, or turned form the view of motorists. [SS pg. 584 / 701.04]

2. The longitudinal placement of the flagger may be increased up to 100 ft. (30 m) from that shown on the plans to improve the visibility of the flagger. [SS pg. 587 / 701.13]

3. One flagger will be required for each separate activity of an operation that requires frequent encroachment in a lane open to traffic. [SS pg. 587 / 701.13(b)]

4. When work operations exceed four days, signs shall be post mounted unless the signs are located on the pavement or define a moving or intermittent operations. … Longitudinal dimensions shown on the plans for the placement of signs may be increased up to 100 ft. (30 m) to avoid obstacles, hazards, or to improve sight distance, when approved by the Engineer. [SS pg. 587-588 / 701.14]
5. Work Zone Speed Limit Signs. Work zone speed limit sign assemblies shall be provided and located as shown on the plans. Two additional assemblies shall be placed 500 ft. (150 m) beyond the last entrance ramp for each interchange or sideroad.

All permanent “SPEED LIMIT” signs located within 500 ft. (150 m) in advance of the first work zone speed limit sign to the end of the work zone shall be removed or covered. This work shall be coordinated with the lane closures(s) by promptly establishing a reduced posted speed zone when the lane closure(s) are put into effect and promptly reinstating the posted speed zone when the lane closure(s) are removed.

The work zone speed limit signs and end work zone speed limit signs shown in advance of and at the end of the lane closure(s) shall be used for the entire duration of the closures(s).

The work zone speed limit signs shown within the lane closure(s) shall only be used when workers are present in the closed lane adjacent to traffic. The sign assemblies shown within the lane closure(s) will not be required when the worker(s) are located behind a concrete barrier wall. [SS pg. 588-589 / 701.14(b)]

6. Daylight operations. Lights Required: None. [SS pg. 591 / 701.16]

7. Cold Milling. “ROUGH GROOVED SURFACE” (W8-I107) signs shall be erected when the road has been cold milled and opened to traffic. The signs shall be placed just prior to the cold milling operation and shall remain in place until the milled surface condition no longer exists. These signs shall be erected a minimum of 500 ft. (150 m) preceding the start of the milled pavement, just before each major intersection within the milled area, and at other locations as directed by the Engineer. The signs shall have an amber flashing light attached. [SS pg. 592 / 701.17(c)(2)]

8. Pavement Patching. [SS pg. 593-594 / 701.17(e)]

9. Where posted speeds are greater than 40 mph cones shall be a minimum of 28 in. (700 mm) in height. [Standard 701901]

General Information:

1. Equipment, materials, signs, cones, barricades, and drums are to be removed at the completion of the day’s operations and the work area opened to traffic.

2. This standard does not apply when work is being performed in the middle lane(s) of a six or more lane highway. Special plans will be required.

FOR INFORMATIONAL USE ONLY
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 (6000) of the edge of pavement for daylight operation exceeding one day.

This standard also applies when work is being performed in the left lane. Under these conditions LEFT LANE CLOSED signs shall be substituted for RIGHT LANE CLOSED signs. On undivided highways, signs shall be added in the opposite direction as shown.

A check barricade shall be placed in the middle of the closed lane and at the shoulder at 1000' (3050) intervals.

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

LANE CLOSURE, MULTILANE, FOR

SPEEDS > 45 MPH TO 55 MPH

STANDARD 701422-09
**Standard 701422**

The END WORK ZONE SPEED LIMIT sign shall be black on white. [Standard – Sign Code]

1. Multilane Pavement Resurfacing: For the construction of binder course, surface course and shoulder resurfacing on multilane pavements, Standard 701422 shall be used for the beginning of business on Monday to 4:30 p.m. on Friday. Only Standards 701406 and 701421 shall be used from 4:30 p.m. Friday to start of business on Monday.  

2. Shoulder Upgrading and Replacement: The following shall apply to shoulder pipe underdrain installation and/or shoulder reconstruction on existing multilane divided highways.

The Contractor shall close the adjacent lane of pavement according to the Standard within the limits of the construction zone.

   a. When required by the contractor’s operations; and,

   b. When no workers are present and the difference in elevation between the pavement and the shoulder and/or widening is greater than 12 in. (300 mm).

During shoulder work on ramps, refer to standard 701456.

Standards 701401 and 701422 will only be measured for payment where the average depth of shoulder reconstruction required by the plans, exclusive of any trench for pipe underdrain installation, is in excess of 3 in. (75 mm). Where such shoulder reconstruction is 3 in. (75 mm) or less, no open trench greater than 3 in. (75 mm) deep will be permitted overnight. If, because of unforeseen circumstances, and open trench greater than 3 in. (75 mm) deep should occur overnight, the Contractor shall, at no additional cost to the Department, close the adjacent traffic lane according to Standard 701422.

Excavations greater than 3 in. (75 mm) in depth between the pavement and shoulder, including any trenches within the shoulder area, shall be restricted to one shoulder in each direction of travel. In addition, shoulder drop-offs greater than 1 ½ in. (38 mm) caused by the Contractor’s operations will not be permitted over the winter shutdown.

The Contractor shall schedule the work so the lane closure at any one work area does not exceed five working days. The closure time may be exceeded for conditions beyond the Contractor’s control, except if continual and persistent closures in excess of the five working days are made, the Engineer will initiate measures to delay or limit the daily productions of the Contractor’s operations.

All debris shall be removed from the shoulder and right-of-way prior to the removal of barricades, drums or vertical panels. [SS pg. 598-599 / 701.18(d)(2)]
Standard 701422 - Continued

Various Specifications:

1. The traffic control shall remain in place only as long as needed and shall be removed when directed by the Engineer. Signs that do not apply to current conditions shall be removed, covered, or turned from the view of motorists. [SS pg. 584 / 701.04]

2. The longitudinal placement of the flagger may be increased up to 100 ft. (30 m) from that shown on the plans to improve the visibility of the flagger. [SS pg. 587 / 701.13]

3. One flagger will be required for each separate activity of an operation that requires frequent encroachment in a lane open to traffic. [SS pg. 587 / 701.13(b)]

4. Longitudinal dimensions shown on the plans for the placement of signs may be increased up to 100 ft. (30 m) to avoid obstacles, hazards, or to improve sight distance, when approved by the Engineer. [SS pg. 588 / 701.14]

5. Work Zone Speed Limit Signs. Work zone speed limit sign assemblies shall be provided and located as shown on the plans. Two additional assemblies shall be placed 500 ft. (150 m) beyond the last entrance ramp for each interchange or sideroad.

All permanent “SPEED LIMIT” signs located within 500 ft. (150 m) in advance of the first work zone speed limit sign to the end of the work zone shall be removed or covered. This work shall be coordinated with the lane closures(s) by promptly establishing a reduced posted speed zone when the lane closures(s) are put into effect and promptly reinstating the posted speed zone when the lane closure(s) are removed.

The work zone speed limit signs and end work zone speed limit signs shown in advance of and at the end of the lane closure(s) shall be used for the entire duration of the closures(s).

The work zone speed limit signs shown within the lane closure(s) shall only be used when workers are present in the closed lane adjacent to traffic. The sign assemblies shown within the lane closure(s) will not be required when the worker(s) are located behind a concrete barrier wall. [SS pg. 588-589 / 701.14(b)]

6. First two warning signs on each approach to the work involving a nighttime lane closure. Lights Required: Flashing mono-directional lights. [SS pg. 591 / 701.16]

7. Channelizing devices for nighttime lane closures on multi-lane roads. Lights Required: Steady burn mono-directional lights. [SS pg. 591 / 701.16]

8. Where posted speeds are greater than 40 mph cones shall be a minimum of 28 in. (700 mm) in height. [Standard 701901]

General Information:

1. This standard does not apply when work is being performed in the middle lane(s) of a six or more lane highway. Special plans will be required.

FOR INFORMATIONAL USE ONLY
GENERAL NOTES
This standard is used where at any time any vehicular equipment, workers or their activities will encroach on the pavement or on the shoulder within 24 (600) of the edge of pavement for daylight operation exceeding one day and where temporary concrete barrier is utilized.

When work is being performed in the left lane, the set up would be a mirror image to what is shown.

Calculate L as follows:

NORMAL POSTED SPEED FORMULAS

\[ \text{L = \frac{45 \text{ mph} \times N}{S} \text{ or more}} \]

W = Width of offset, in feet or meters.

S = Normal posted speed, in mph or km/h.

All dimensions are in inches or millimeters unless otherwise shown.

LANE CLOSURE, MULTILANE, WITH BARRIER, FOR SPEEDS > 45 MPH TO 55 MPH

STANDARD 701423-10
Standard 701423

The END WORK ZONE SPEED LIMIT sign shall be black on white. [Standard – Sign Code]

Various Specifications:

1. All existing pavement markings which conflict with the revised traffic pattern shall be removed according to Section 783. [SS pg. 584 / 701.04]

2. Where the clear width through a work zone with temporary concrete barrier will be 16.0 ft. (4.88 m) or less, the Contractor shall notify the Engineer at least 21 days in advance of implementing the traffic control for that restriction. [SS pg. 584 / 701.06]

3. When work operations exceed four days, signs shall be post mounted unless the signs are located on the pavement or define a moving or intermittent operation. … Longitudinal dimensions shown on the plans for the placement of signs may be increased up to 100 ft. (30 m) to avoid obstacles, hazards, or to improve sight distance, when approved by the Engineer. [SS pg. 587-588 / 701.14]

4. First two warning signs on each approach to the work involving a nighttime lane closure. Lighting Required: Flashing mono – directional lights. [SS pg. 591 / 701.16]

5. Channelizing devices for nighttime lane closures on multi-lane roads. Lights Required: Steady burn mono-directional lights. [SS pg. 591 / 701.16]

6. Work Zone Speed Limit Signs. Work zone speed limit sign assemblies shall be provided and located as shown on the plans. Two additional assemblies shall be placed 500 ft. (150 m) beyond the last entrance ramp for each interchange or sideroad.

All permanent “SPEED LIMIT” signs located within 500 ft. (150 m) in advance of the first work zone speed limit sign to the end of the work zone shall be removed or covered. This work shall be coordinated with the lane closures(s) by promptly establishing a reduced posted speed zone when the lane closures(s) are put into effect and promptly reinstating the posted speed zone when the lane closure(s) are removed.

The work zone speed limit signs and end work zone speed limit signs shown in advance of and at the end of the lane closure(s) shall be used for the entire duration of the closures(s).

The work zone speed limit signs shown within the lane closure(s) shall only be used when workers are present in the closed lane adjacent to traffic. The sign assemblies shown within the lane closure(s) will not be required when the worker(s) are located behind a concrete barrier wall. [SS pg. 588-589 / 701.14(b)]
**DETAIL A**

NOTE
When a shoulder does not exist or is narrow, use Detail B.

**DETAIL B**

**DETAIL C**

Required when workers are on the pavement.

**TYPICAL APPLICATIONS**

- Landscaping work
- Utility work
- Pavement marking
- Roadway striping
- Roadway measurements
- Shoulder cleanup
- Crack pouring

**GENERAL NOTES**

This standard is used where any vehicle, equipment, workers, or other 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 or on the median shoulder. Under these conditions, KEEP LEFT signs shall be substituted for KEEP RIGHT 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/Traffic signal truck
- Fagster with traffic control sign
- Sign

**LANE CLOSURE, MULTILANE, INTERMITTENT OR MOVING OPER., FOR SPEEDS > 45 MPH**

**DATE**

| 3-2-17 | Revised "NOTE" on DETAIL A to use DETAIL B in lieu of DETAIL C. |
| 4-3-16 | Added trailer option for attenuator symbol. Added note (B). Revised gain notes. |

**STANDARD 701426-08**
Standard 701426

The truck mounted/trailer mounted attenuator shown on the shoulder is required.

Various Specifications:

1. Longitudinal dimensions shown on the plans for the placement of signs may be increased up to 100 ft. (30 m) to avoid obstacles, hazards, or to improve sight distance, when approved by the Engineer. [SS pg. 588 / 701.14]

2. Truck Mounted/Trailer Mounted Attenuators (TMA). TMA host vehicles shall have the parking brake engaged when stationary [SS pg. 590 / 701.15(h)]
Standard 701427

The truck mounted /trailer mounted attenuator shown on the shoulder is required.

Various Specifications:

1. Longitudinal dimensions shown on the plans for the placement of signs may be increased up to 100 ft. (30 m) to avoid obstacles, hazards, or to improve sight distance, when approved by the Engineer. [SS pg. 588 / 701.14]

2. Truck Mounted/Trailer Mounted Attenuators (TMA). TMA host vehicles shall have the parking brake engaged when stationary [SS pg. 590 / 701.15(h)]

3. Truck Mounted/Trailer Mounted Attenuators (TMA). The attenuator shall be either a NCHRP 350 or MASH approved unit for Test Level 3. Test Level 2 may be used as directed by the Engineer for normal posted speed less than or equal to 45 mph. [SS pg. 1130 / 1106.02(g)]
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 tangential and the first 100' (30 m) of channelizing devices in the tangential.

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
--- | ---
4-1-96 | Added trailer option for attenuator symbol
1-1-04 | New Standard

TRAFFIC CONTROL
SETUP AND REMOVAL
FREeway/EXPRESSWAY

STANDARD 701428-01
Standard 701428

This standard is to be used when the ADT is greater than 25,000. [Standard – General Notes]

The truck mounted/trailer mounted attenuator shown on the shoulder is required.

When the shoulder width will not allow placement of the shoulder truck and provide 9 ft. (3.0 m) of unobstructed lane width in the lane being closed, the shoulder truck shall not be used. [SS pg. 600 / 701018(j)]

Various Specifications:

1. Truck Mounted/Trailer Mounted Attenuators (TMA). TMA host vehicles shall have the parking brake engaged when stationary [SS pg. 590 / 701.15(h)]
Standard 701431

The END WORK ZONE SPEED LIMIT sign shall be black on white. [Standard – Sign Code]

Reflective solid edge lines and a double yellow centerline shall be used when the closure time exceeds four days or when the normal posted speed outside the area of operations exceeds 50 mph. Reflectorized pavement marking tape shall be used for marking the centerline and edge lines on the existing pavement. Raised reflective pavement markers at 25 ft. (8 m) centers shall be installed under good weather conditions to supplement the pavement marking tape. [SS pg. 599 / 701.18(f)]

Devices no greater than 24 in. (600 mm) wide, maybe used in place of tubular markers when the two-way operation is to be in place four days or less. [BDE Special Provision Tubular Markers]

Various Specifications:

1. When work operations exceed four days, signs shall be post mounted unless the signs are located on the pavement or define a moving or intermittent operation. ... Longitudinal dimensions shown on the plans for the placement of signs may be increased up to 100 ft. (30 m) to avoid obstacles, hazards, or to improve sight distance, when approved by the Engineer. [SS pg. 587-588 / 701.14]

2. Work Zone Speed Limit Signs. Work zone speed limit sign assemblies shall be provided and located as shown on the plans. Two additional assemblies shall be placed 500 ft. (150 m) beyond the last entrance ramp for each interchange or sideroad.

   All permanent “SPEED LIMIT” signs located within 500 ft. (150 m) in advance of the first work zone speed limit sign to the end of the work zone shall be removed or covered. This work shall be coordinated with the lane closures(s) by promptly establishing a reduced posted speed zone when the lane closures(s) are put into effect and promptly reinstating the posted speed zone when the lane closure(s) are removed.

   The work zone speed limit signs and end work zone speed limit signs shown in advance of and at the end of the lane closure(s) shall be used for the entire duration of the closures(s).

   The work zone speed limit signs shown within the lane closure(s) shall only be used when workers are present in the closed lane adjacent to traffic. The sign assemblies shown within the lane closure(s) will not be required when the worker(s) are located behind a concrete barrier wall. [SS pg. 588-589 / 701.14(b)]

3. Daylight operations. Lights Required: None. [SS pg. 591 / 701.16]

4. First two warning signs on each approach to the work involving a nighttime lane closure. Lights Required: Flashing mono-directional lights. [SS pg. 591 / 701.16]

5. Where posted speeds are greater than 40 mph cones shall be a minimum of 28 in. (700 mm) in height. [Standard 701901]

General Information:

1. On long term projects, wing barricades should be considered for the mounting of the first 3 sets of advance warning signs approaching the lane closure.

FOR INFORMATIONAL USE ONLY
Standard 701446

The END WORK ZONE SPEED LIMIT sign shall be black on white. [Standard – Sign Code]

Various Specifications:

1. When work operations exceed four days, signs shall be post mounted unless the signs are located on the pavement or define a moving or intermittent operation. … Longitudinal dimensions shown on the plans for the placement of signs may be increased up to 100 ft. (30 m) to avoid obstacles, hazards, or to improve sight distance, when approved by the Engineer. [SS pg. 587-588 / 701.14]

2. First two warning signs on each approach to the work involving a nighttime lane closure. Lights Required: Flashing mono-directional lights. [SS pg. 591 / 701.16]


General Information:

This Standard is to be used when two lanes are to be closed on a freeway/expressway. Specifications applicable to Standards 701401 shall be applicable to this Standard.
EXIT RAMP CLOSURE

1. Enter this sign when median is less than 10' (3 m).
2. See sign spacing table.
3. Drums for entrance ramp closure shall be omitted if turn lanes are not present.

SYMBOLES
- Sign
- Type III barricade
- Drum with steady burning light

ENTRANCE RAMP CLOSURE

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>50-55</td>
<td>500-1500 (100-300 m)</td>
</tr>
<tr>
<td>60+</td>
<td>2000 (600 m)</td>
</tr>
</tbody>
</table>

DATE | REVISIONS
-----|------------------------
1-9-17 | Added flashing lights to Type III barricade.
1-9-18 | Modified EXIT CLOSED sign number.
**Standard 701451**

Only one interchange at a time may have ramps closed and only one exit ramp and one entrance ramp may be closed at a time. [SS pg. 600 / 701.18(i)]

**Various Specifications:**

1. When work operations exceed four days, signs shall be post mounted unless the signs are located on the pavement or define a moving or intermittent operation. … Longitudinal dimensions shown on the plans for the placement of signs may be increased up to 100 ft. (30 m) to avoid obstacles, hazards, or to improve sight distance, when approved by the Engineer. [SS pg. 587-588 / 701.14]

2. First two warning signs on each approach to the work involving a nighttime lane closure. Lights Required: Flashing mono-directional lights. [SS pg. 591 / 701.16]
PARTIAL EXIT RAMP CLOSURE

SymbOls

- Sign
- Type III barricade with flashing lights
- Drum with steady burning light
- Work area
- Hopper with traffic control sign

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

DATE | REVISIONS
-----|---------------------
1-1-17 | Added flashing lights to Type III barricades.
1-1-15 | ON RAMP sign now 36x36.
          | Del, G20-2 & W13-1 signs.
          | Added drn at work area.

PARTIAL EXIT RAMP CLOSURE
FREeway /EXPRESSWAY

STANDARD 701456-04
Standard 701456

On ramps, drop-offs at the edge of pavement greater than 1 1/2 in. (38 mm) caused by the Contractor's operations will be allowed only on one side of the ramp at a time. [SS pg. 585 / 701.07]

Various Specifications:

1. When work operations exceed four days, signs shall be post mounted unless the signs are located on the pavement or define a moving or intermittent operation. … Longitudinal dimensions shown on the plans for the placement of signs may be increased up to 100 ft. (30 m) to avoid obstacles, hazards, or to improve sight distance, when approved by the Engineer. [SS pg. 587-588 / 701.14]

2. No broken pavement, open holes, or partially filled patches shall remain overnight and all devices shall be removed before dark. [SS pg. 594 / 701.17 (e)(2)b]

3. Cleaning Up. Prior to opening the pavement to traffic, the entire right-of-way adjacent to the patching operations shall be cleared of all materials caused by the Contractor's operations, and the backfill along the shoulder edge of the pavement shall be compacted. [SS pg. 594 / 701.17(e)(3)a]
**Standard 701501**

On two-lane/two-way roadways, construction operations shall be confined to one traffic lane leaving the opposite lane open to traffic. [SS pg. 600 / 701.18 (h)(2)]

“NO PARKING” (R8-3) signs shall be installed throughout the work area.

When the work area is in the parking lane “ROAD CONSTRUCTION AHEAD” (W20-I103) signs shall be installed 200 ft. (60 m) in advance of the work area and the area shall be delineated with cones and barricades. [SS pg. 599 / 701.18 (h)(1)]

Various Specifications:

1. Flaggers shall be in sight of each other or in direct communication at all times. Direct communication shall be obtained by using portable two-way radios or walkie-talkies.

   The engineer will determine when a side road or entrance shall be closed to traffic. A flagger will be required at each side road or entrance remaining open to traffic within the operation where two-way traffic is maintained on one lane of pavement. [SS pg. 587 / 701.13(a)]

2. Flaggers will not be required when no work is being performed, unless there is a lane closure on a two-lane, two-way pavement. [SS pg. 587 / 701.13]

3. When work operations exceed four days, signs shall be post mounted unless the signs are located on the pavement or define a moving or intermittent operations. … Longitudinal dimensions shown on the plans for the placement of signs may be increased up to 100 ft. (30 m) to avoid obstacles, hazards, or to improve sight distance, when approved by the Engineer. [SS pg. 587-588 / 701.14]

4. First two warning signs on each approach to the work involving a nighttime lane closure. Lights Required: Flashing mono-directional lights. [SS pg. 591 / 701.16]

5. Channelizing devices for nighttime lane closures on two-lane roads. Lights Required: Steady burn bi-directional lights. [SS pg. 591 / 701.16]

General Information:

1. In lieu of utilizing flaggers during nonworking hours with one lane closed, one direction of traffic may be detoured over an approved route.
CASE I
(Signs required for both directions)

1. Refer to SIGN SPACING TABLE for distances.
2. Required if work exceeds 500' (150 m) or 1 week.
3. 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 1 or 2 barricades are used, the interval between devices may be doubled.
4. For approved shoulder closures.
5. Cones, drum or barricades at 20' (6 m) centers in taper.
6. Use flagger sign only when flagger is present.

SYMBOLS

- Work area
- Barricade or drum
- Flagger with traffic control sign
- Cone, drum or barricade
- Sign on portable or permanent support
- Type III barricade with flashing lights

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 T0505.

Calculate L as follows:

SPEED LIMIT FORMULAS

<table>
<thead>
<tr>
<th>40 mph (64 km/h)</th>
<th>30 mph (48 km/h)</th>
</tr>
</thead>
<tbody>
<tr>
<td>L = \frac{W}{2} + \frac{L}{5}</td>
<td>L = \frac{W}{2} + \frac{L}{5}</td>
</tr>
</tbody>
</table>

N = Width of offset

L = Normal posted speed

All dimensions are in feet (meters) unless otherwise shown.

URBAN LANE CLOSURE.
2L, 2W, WITH BIDIRECTIONAL LEFT TURN LANE

STANDARD T0102-07
Standard 701502

“NO PARKING” (R8-3) signs shall be installed throughout the work area.

When the work area is in the parking lane “ROAD CONSTRUCTION AHEAD” (W20-1103) signs shall be installed 200 ft. (60 m) in advance of the work area and the area shall be delineated with cones and barricades.

Reflectorized temporary pavement marking tape shall be placed throughout the taper and alongside the adjacent work area where the closure time exceeds 14 days. The edge line shall be yellow for left lane closures. [SS pg. 599-600 / 701.18(h)(1)]

Various Specifications:

1. The traffic control shall remain in place only as long as needed and shall be removed when directed by the Engineer. Signs that do not apply to current conditions shall be removed, covered, or turned from the view of motorists. [SS pg. 584 / 701.04]

2. Flaggers shall be in sight of each other or in direct communication at all times. Direct communication shall be obtained by using portable two-way radios or walkie-talkies. [SS pg. 587 / 701.13(a)]

3. Flaggers will not be required when no work is being performed, unless there is a lane closure on two-lane, two-way pavement. [SS pg. 587 / 701.13]

4. When work operations exceed four days, signs shall be post mounted unless the signs are located on the pavement or define a moving or intermittent operation. … Longitudinal dimensions shown on the plans for the placement of signs may be increased up to 100 ft. (30 m) to avoid obstacles, hazards, or to improve sight distance, when approved by the Engineer. [SS pg. 587-588 / 701.14]

5. First two warning signs on each approach to the work involving a nighttime lane closure. Lights Required: Flashing mono-directional lights. [SS pg. 591 / 701.16]


7. Channelizing devices for nighttime lane closures on multi-lane roads separating opposing directions of traffic. Lights Required: Steady burn bi-directional lights. [SS pg. 591 / 701.16]

General Information:

When necessary, additional flaggers should be positioned so as to regulate side street traffic.

Case I only applies when no workers are present. When workers are present, Standard 701501 shall be used. [Standard – General Notes]

FOR INFORMATIONAL USE ONLY
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

GENERAL NOTES:
This Standard is used when at any time, day or night, any vehicles, 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:

\[ L = \frac{W}{S} \]

Where:
- \( L \) = Length of offset (in feet, meters)
- \( W \) = Width of offset (in feet, meters)
- \( S \) = Normal posted speed (mph, km/h)

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

URBAN LANE CLOSURE, MULTILANE, 1W OR 2W WITH NONTRAVERSABLE MEDIAN

STANDARD 701601-09
Standard 701601

“NO PARKING” (R8-3) signs shall be installed throughout the work area.

When the work area is in the parking lane “ROAD CONSTRUCTION AHEAD” (W20-I103) signs shall be installed 200 ft. (60 m) in advance of the work area and the area shall be delineated with cones and barricades.

Refl ectorized temporary pavement marking tape shall be placed throughout the taper and alongside the adjacent work area where the closure time exceeds 14 days. The edge line shall be yellow for left lane closures. [SS pg. 599-600 / 701.18(h)(1)]

Various Specifications:

1. When work operations exceed four days, signs shall be post mounted unless the signs are located on the pavement or define a moving or intermittent operation. … Longitudinal dimensions shown on the plans for the placement of signs may be increased up to 100 ft. (30 m) to avoid obstacles, hazards, or to improve sight distance, when approved by the Engineer. [SS pg. 587-588 / 701.14]

2. First two warning signs on each approach to the work involving a nighttime lane closure. Lights Required: Flashing mono-directional lights. [SS pg. 591 / 701.16]


General Information:

This standard does not apply when work is being performed in the middle lane(s) of a six or more lane highway. Special plans approved by the Engineer will be required.
**Standard 701602**

“NO PARKING” (R8-3) signs shall be installed throughout the work area.

When the work area is in the parking lane “ROAD CONSTRUCTION AHEAD” (W20-I103) signs shall be installed 200 ft. (60 m) in advance of the work area and the area shall be delineated with cones and barricades.

Reflectorized temporary pavement marking tape shall be placed throughout the taper and alongside the adjacent work area where the closure time exceeds 14 days. The edge line shall be yellow for left lane closures. [SS pg. 599-600 / 701.18(h)(1)]

**Various Specifications:**

1. The traffic control shall remain in place only as long as needed and shall be removed when directed by the Engineer. Signs that do not apply to current conditions shall be removed, covered, or turned from the view of motorists. [SS pg. 584 / 701.04]

2. When work operations exceed four days, signs shall be post mounted unless the signs are located on the pavement or define a moving or intermittent operation. ... Longitudinal dimensions shown on the plans for the placement of signs may be increased up to 100 ft. (30 m) to avoid obstacles, hazards, or to improve sight distance, when approved by the Engineer. [SS pg. 587-588 / 701.14]

3. First two warning signs on each approach to the work involving a nighttime lane closure. Lights Required: Flashing mono-directional lights. [SS pg. 591 / 701.16]


5. Channelizing devices for nighttime lane closures on multi-lane roads separating opposing directions of traffic. Lights Required: Steady burn bi-directional lights. [SS pg. 591 / 701.16]

**General Information:**

When necessary, additional flaggers should be positioned so as to regulate side street traffic.

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**FOR INFORMATIONAL USE ONLY**
Standard 701606

“NO PARKING” (R8-3) signs shall be installed throughout the work area.

When the work area is in the parking lane “ROAD CONSTRUCTION AHEAD” (W20-I103) signs shall be installed 200 ft. (60 m) in advance of the work area and the area shall be delineated with cones and barricades.

Reflectorized temporary pavement marking tape shall be placed throughout the taper and alongside the adjacent work area where the closure time exceeds 14 days. The edge line shall be yellow for left lane closures. [SS pg. 599-600 / 701.18(h)]

Various Specifications:

1. The traffic control shall remain in place only as long as needed and shall be removed when directed by the Engineer. Signs that do not apply to current conditions shall be removed, covered, or turned from the view of the motorists. [SS pg. 584 / 701.04]

2. When work operations exceed four days, signs shall be post mounted unless the signs are located on the pavement or define a moving or intermittent operation. … Longitudinal dimensions shown on the plans for the placement of signs may be increased up to 100 ft. (30 m) to avoid obstacles, hazards, or to improve sight distance, when approved by the Engineer. [SS pg. 587-588 / 701.14]

3. First two warning signs on each approach to the work involving a nighttime lane closure. Light Required: Flashing mono-directional lights. [SS pg. 591 / 701.16]


General Information:

This standard does not apply when work is being performed in the middle lane(s) the highway. Special plans approved by the Engineer will be required.
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:

\[ L = \frac{W \times S}{100} \]

where:
- \( W \) = Width of offset (in feet, meters)
- \( S \) = Normal posted speed (mph, km/h)

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

<table>
<thead>
<tr>
<th>DATE</th>
<th>REVISIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-1-16</td>
<td>Moved first reverse curve sign to Inside of Tangent, New Sign Location.</td>
</tr>
<tr>
<td>11-1-13</td>
<td>New UTRU Type.</td>
</tr>
</tbody>
</table>
Standard 701611

Reflective pavement markings shall be used when the closure time exceeds four days. The double yellow centerline shall be used in the two-way traffic area in addition to barricades or drums. Single yellow left edge line shall be used to outline the barricade island. White right edge line shall be used along the barricades delineating the work area. [SS pg. 600 / 701.18(h)(3)]

“NO PARKING” (R8-3) signs shall be installed throughout the work area.

When the work area is in the parking lane “ROAD CONSTRUCTION AHEAD” (W20-I103) signs shall be installed 200 ft. (60 m) in advance of the work area and the area shall be delineated with cones and barricades.

Reflectorized temporary pavement marking tape shall be placed throughout the taper and alongside the adjacent work area where the closure time exceeds 14 days. The edge line shall be yellow for left lane closures. [SS pg. 599-600 / 701.18(h)(1)]

Various Specifications:

1. The traffic control shall remain in place only as long as needed and shall be removed when directed by the Engineer. Signs that do not apply to current conditions shall be removed, covered, or turned from the view of the motorists. [SS pg. 584 / 701.04]

2. When work operations exceed four days, signs shall be post mounted unless the signs are located on the pavement or define a moving or intermittent operation. … Longitudinal dimensions shown on the plans for the placement of signs may be increased up to 100 ft. (30 m) to avoid obstacles, hazards, or to improve sight distance, when approved by the Engineer. [SS pg. 587-588 / 701.14]

3. First two warning signs on each approach to the work involving a nighttime lane closure. Light Required: Flashing mono-directional lights. [SS pg. 591 / 701.16]


5. Channelizing devices for nighttime lane closures on multi-lane roads separating opposing directions of traffic. Lights Required: Steady burn bi-directional lights. [SS pg. 591 / 701.16]

General Information:

This standard does not apply when work is being performed in the middle lane(s) of a six or more lane highway. Special plans approved by the Engineer will be required.
LEFT TURN LANE OR CENTER MEDIAN OPERATIONS

1. Refer to SIGN SPACING TABLE for distance.
2. Required for speed > 40 mph.
3. Cones at 29'-9" intervals for 260'-15". Additional cones may be placed at 50'-0" intervals. 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. Until this sign when median is less than 10'-6" or for bidirectional turn lanes.
6. Cones, drums or barricades at 20'-6" intervals.
7. Advanced arrow board required for speeds > 45 mph.
8. Three Type II barricades, drums or vertical barricades at 50'-0" intervals.

SYMBOLS

- Work area
- Cones, 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

SHOULDER OPERATIONS

GENERAL NOTES

This Standard is used along any time, day or night, any vehicle, equipment, workers or other activities approach on the pavement during shoulder operations or where construction requires lane closures in an urban area.

Colours L as follows:

SPEED LIMIT

FORMULAS

40 mph (60 km/h)

45 mph (72 km/h)

W = Width of offset (in feet meter).

S = Normal posted speed (mph/km/h).

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

DATE REVISIONS

4-1-16 Corrected align number for:

5-9-14 Added devices of arrow board without flash paper.

REV. WORKER SIGN NUMBER:

URBAN LANE CLOSURE, MULTILANE INTERSECTION

STANDARD 701701-10
Standard 701701

“NO PARKING” (R8-3) signs shall be installed throughout the work area.

When the work area is in the parking lane “ROAD CONSTRUCTION AHEAD” (W20-I103) signs shall be installed 200 ft. (60 m) in advance of the work area and the area shall be delineated with cones and barricades.

Reflectorized temporary pavement marking tape shall be placed throughout the taper and alongside the adjacent work area where the closure time exceeds 14 days. The edge line shall be yellow for left lane closures. [SS pg. 599-600 / 701.18(h)(1)]

Various Specifications:

1. The traffic control shall remain in place only as long as needed and shall be removed when directed by the Engineer. Signs that do not apply to current conditions shall be removed, covered, or turned from the view of the motorists. [SS pg. 584 / 701.04]

2. When work operations exceed four days, signs shall be post mounted unless the signs are located on the pavement or define a moving or intermittent operation. … Longitudinal dimensions shown on the plans for the placement of signs may be increased up to 100 ft. (30 m) to avoid obstacles, hazards, or to improve sight distance, when approved by the Engineer. [SS pg. 587-588 / 701.14]

3. First two warning signs on each approach to the work involving a nighttime lane closure. Lights Required: Flashing mono-directional lights. [SS pg. 591 / 701.16]

GENERAL NOTES

This Standard is used where, at any time, pedestrian traffic must be rerouted due to work being performed.

This Standard must be used in conjunction with other Traffic Control & Protection Standards when roadway traffic is affected.

Temporary facilities shall be detectable and accessible.

The temporary pedestrian facilities shall be provided on the same side of the closed facilities whenever possible.

The SIDEWALK CLOSED / USE OTHER SIDE sign shall be placed at the nearest crosswalk or intersection to each end of the closure. Where the closure occurs at a corner, the signs shall be erected on the corners across the street from the closure. The SIDEWALK CLOSED signs shall be used at the ends of the actual closures.

Type I barricades and R3-2-4830 signs shall be positioned as shown in "ROAD CLOSED TO ALL TRAFFIC" detail on Standard 70190.

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

SIDEWALK, CORNER OR CROSSWALK CLOSURE

DATE
REVISIONS
4-1-16  Updated orange safety fence
from standard on recat.
covered in the bid spec.
1-1-12  Added SIDEWALK DIVERSION
Modified appearance of
plan view. Renamed S/D.
**Standard 701801**

“NO PARKING” (R8-3) signs shall be installed throughout the work area. [SS pg. 599 / 701.18(h)(1)]

Where a temporary walkway encroaches on an existing parking lane, the lane shall be closed with cones, barricades, or drums.

Where a temporary walkway encroaches on a travel lane, the lane shall be closed according to Standards 701501, 701601, or 701606.

All walkways shall be clearly identified, protected from motor vehicle traffic and free of any obstructions and hazards, such as holes, debris, construction equipment, and stored materials.

All hazards near or adjacent to walkways shall be clearly delineated.

When barricades are impractical to use or do not provide enough protection, orange safety fence shall be used to close off an area, with the approval of the Engineer. [SS pg. 600 / 701.18(h)(4)]

Detectable Pedestrian Channelizing Barricade. Detectable pedestrian channelizing barricades are cane detectable and visible to persons having low vision. These barricades are used to channelize pedestrian traffic. [SS pg. 590 / 701.15(l)]

**Various Specifications:**

1. When work operations exceed four days, signs shall be post mounted unless the signs are located on the pavement or define a moving or intermittent operation. [SS pg. 587 / 701.14]

2. Channelizing devices for nighttime lane closures on two-lane roads. 
   Lights Required: Steady burn bi-directional lights. [SS pg. 591 / 701.16]

3. The top and bottom panels shall have alternating white and orange stripes sloping 45 degrees on both sides.
   
   The top and bottom rails shall be continuous to allow for detection for hand trailing and cane trailing, respectively
   
   The faces of the barricade rails shall be vertical. [SS pg. 1133 / 1106.02(m)]

**FOR INFORMATIONAL USE ONLY**
**POST MOUNTED SIGNS**

** When curb or paved shoulder are present this dimension shall be 24 in. (600 mm) to the face of curb or 6 in. (150 mm) to the outside edge of the paved shoulder.

---

**MAX WIDTH SIGN**

XX' - XX"

X MILES AHEAD

W12-1103-4848

**WIDTH RESTRICTION SIGN**

XX' - XX" width and X miles are variable.

---

**STOP**

FRONT SIDE

REVERSE SIDE

---

**SLOW**

---

**FLAGGER TRAFFIC CONTROL SIGN**

---

**ROAD CONSTRUCTION NEXT X MILES**

10 x 18 in. (250 x 450 mm) Orange flags

**SIGN OF SPECIFIED**

---

**HIGH LEVEL WARNING DEVICE**

---

**WORK LIMIT SIGNING**

**WORK ZONE**

**SPEED LIMIT**

XX

**PHOTO ENFORCED**

R2-1-3648

---

**SPEED LIMIT MINIMUM**

R10-120bp-3618

---

**END WORK ZONE SPEED LIMIT**

G20-10301-6036

---

**HIGHWAY CONSTRUCTION SPEED ZONE SIGNS**

---

**TRAFFIC CONTROL DEVICES**

(Sheet 2 of 3)

STANDARD 701901-06
Standard 701901

701.15 Traffic Control Devices. For devices that must meet FHWA crashworthiness standards, the Contractor shall provide a manufacturer’s self-certification letter for each Category 1 device and a FHWA acceptance letter for each Category 2 and Category 3 device used on the contract. The letter(s) shall state the device has been accepted by FHWA for its respective category and test level, and shall include a detailed drawing of the device. The set-up and use of certified/accepted devices shall be the same as that described in the letter.

All devices shall be kept clean. Any device which has become ineffective due to damage or defacement shall be replaced.

Devices having angled striping shall be oriented with the striped sloping down toward the side on which traffic will pass. Lights on devices shall be mounted on the side of the device on which traffic shall pass and shall not obscure any reflectorized portion of the device.

Where more than one type of device is permissible, only one type of device shall be used within that individual run of devices or lane closure taper.

Additional requirements for the use of specific devices are as follows.

a. Cones. Cones are used to channelize traffic during daylight operations. Reflectorized cones are for nighttime operation, but shall only be used when specified in the plan or when approved by the Engineer.

b. Type I, II, and III Barricades. Type I and Type II barricades are used to channelize traffic; to delineate unattended obstacles, patches, excavations, drop-offs, and other hazards; and as check barricades.

Type I barricades are for use on roads with normal posted speeds of 40 mph or less. However, they may be used on higher speed roads provided the reflective area of the upper rail is at least 2 sq. ft. (0.18 sq m).

Type III barricades are used to close lanes and to close roads.

c. Vertical Barricades. Vertical barricades are used to channelize traffic, as well as to delineate unattended obstacles, patches excavations, drop-offs, and other hazards. Vertical barricades shall not be used not be used in lane closure tapers or as check barricades.

d. Vertical Panels. Vertical panels are used to channelize traffic and to delineate unattended excavations and drop-offs.

e. Direction Indicator Barricades. Direction indicator barricades are used in lane closure tapers.
f. Drums. Drums are used to channelize traffic and to delineate unattended obstacles, patches, excavations, drop-offs, and other hazards.

g. Tubular Markers. Tubular markers are used to channelize traffic. They shall only be used when specified. [BDE Special Provision Tubular Markers]

h. Truck Mounted/Trailer Mounted Attenuators (TMA). TMA host vehicles shall have the parking brake engaged when stationary.

i. Arrow Boards. Arrow boards are used to warn motorists of an upcoming lane closure. Arrow boards shall not be used to direct passing moves into lanes used by opposing traffic or to shift traffic without having a lane change.

On roads with normal posted speeds of 45 mph and above, Type C units shall be used for all operations 24 hours or more in duration, and Type B units may be used for operations less than 24 hours in duration. On roads with normal posted speed less than 45 mph, Type A, B, or C units may be used for all operations.

j. Portable Changeable Message Signs. The Contractor shall supply the modem, the cellular phone, and the necessary software to run the sign from a remote computer at a location designated by the Engineer. The Contractor shall promptly program and/or reprogram the computer to provide the messages as directed by the Engineer.

The Contractor shall provide all preventive maintenance efforts deemed necessary to achieve uninterrupted service. If service is interrupted for any cause and not restored within 24 hours, the Engineer will cause such work to be performed as may be necessary to provide this service and the cost of such work will be deducted from compensation due or which may become due to the Contractor under the contract.

k. Temporary Ruble Strips. Temporary rumble strips be placed snugly against one another and attached to the pavement with an adhesive meeting the recommendations of the rumble strip manufacturer.

l. Detectable Pedestrian Channelizing Barricade. Detectable pedestrian channelizing barricades are cane detectable and visible to persons having low vision. These barricades are used to channelize pedestrian traffic. [SS pg. 589-590 / 701.15]
Standard 701901 - Continued

701.14 Signs. When work operations exceed four days, signs shall be post mounted unless the signs are located on the pavement or define a moving or intermittent operation. When approved by the Engineer, temporary sign supports may be used where posts are impractical. When post mounting is not required, either temporary sign supports or sign trailers may be used.

Post mounted signs shall be a “breakaway” design. The signs shall be within five degrees of vertical. Two posts shall be used for signs greater than 16 sq. ft. (1.5 sq m) in area or where the height between the sign and the ground exceeds 7 ft. (2.1 m).

Signs on temporary supports shall meet the requirements of NCHRP Report 350 or MASH. Documentation of meeting the requirements shall be the FHWA letter stating acceptance of the sign support system for the required test level. The signs shall be supported within 20 degrees of vertical. Weights used to stabilize signs shall be attached to the sign support as per the manufacturer’s specifications.

Sign trailers, when erected, shall have their tires resting on the ground or elevated a maximum of 6 in. (150 mm) above the ground. Weights used to stabilize the trailer shall be sandbags mounted a maximum of 12 in. (300 mm) above the ground. To prevent wind induced rolling of the trailer, the wheels shall be chocked with sandbags or the trailer tongue may be pinned. The pinning method shall be designated to give way in the event of a vehicular impact and shall meet the approval of the Engineer.

The sign trailer shall only be attached to its tow vehicle when the sign is actually being moved. The tow vehicle, when not attached to the trailer, shall be parked according to Article 701.11.

Longitudinal dimensions shown on the plans for the placement of signs may be increased up to 100 ft. (30 m) to avoid obstacles, hazards, or to improve sight distance, when approved by the Engineer.

a) “ROAD CONSTRUCTION AHEAD” Signs. “ROAD CONSTRUCTION AHEAD” (W20-I103) signs shall be erected on all side roads located within the limits of the mainline “ROAD CONSTRUCTION AHEAD” signs.

b) Work Zone Speed Limit Signs. Work zone speed limit signs assemblies shall be provided and located as shown on the plans. Two additional assemblies shall be placed 500 ft. (150 m) beyond the last entrance ramp for each interchange or sideroad.

All permanent “SPEED LIMIT” signs located within 500 ft. (150 m) in advance of the first work zone speed limit sign to the end of the work zone shall be removed or covered. This work shall be coordinated with the lane closures(s) by promptly establishing a reduced posted speed zone when the lane closures(s) are put into effect and promptly reinstating the posted speed zone when the lane closure(s) are removed.

The work zone speed limit signs and end work zone speed limit signs shown in advance of and at the end of the lane closure(s) shall be used for the entire duration of the closure(s).

The work zone speed limit signs shown within the lane closure(s) shall only be used when workers are present in the closed lane adjacent to traffic. The sign assemblies shown within the lane closure(s) will not be required when worker(s) are located behind a concrete barrier wall.
Standard 701901 – Continued

701.16 Lights. Lights shall be used on devices as required in the traffic control plan and the following table.

<table>
<thead>
<tr>
<th>Circumstance</th>
<th>Lights Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daylight operations</td>
<td>None</td>
</tr>
<tr>
<td>First two warning signs on each approach to the work involving a nighttime lane closure</td>
<td>Flashing mono-directional lights</td>
</tr>
<tr>
<td>Devices delineating isolated obstacles, excavations, or hazards at night. (Does not apply to patching)</td>
<td>Flashing bi-directional lights</td>
</tr>
<tr>
<td>Devices delineating obstacles, excavations, or hazards exceeding 100 ft. (30 m) in length at night. (Does not apply to widening)</td>
<td>Steady burn bi-directional lights</td>
</tr>
<tr>
<td>Channelizing devices for nighttime lane closures on two-lane roads</td>
<td>Steady burn bi-directional lights</td>
</tr>
<tr>
<td>Channelizing devices for nighttime lane closures on multi-lane roads</td>
<td>Steady burn mono-directional lights</td>
</tr>
<tr>
<td>Channelizing devices for nighttime lane closures on multi-lane roads separating opposing directions of traffic</td>
<td>Steady burn bi-directional lights</td>
</tr>
<tr>
<td>Devices in nighttime lane closure tapers on Standards 701316 and 701321</td>
<td>Steady burn bi-directional lights</td>
</tr>
<tr>
<td>Devices in nighttime lane closure tapers</td>
<td>Steady burn mono-directional lights</td>
</tr>
<tr>
<td>Devices delineating a widening trench</td>
<td>None</td>
</tr>
<tr>
<td>Devices delineating patches at night on roadways with an ADT less than 25,000</td>
<td>None</td>
</tr>
<tr>
<td>Devices delineating patches at night on roadways with an ADT of 25,000 or more</td>
<td>Steady burn mono-directional lights</td>
</tr>
</tbody>
</table>

Batteries for the lights shall be replaced on a group basis at such times as may be specified by the Engineer. [SS pg. 591 / 701.16]

1106.02 Devices. Work zone traffic control devices and combinations of devices shall meet FHWA crashworthiness standards for their respective categories. The categories are as follows.

Category 1 includes small, lightweight, channelizing, and delineating devices that have been in common use for many years and are known to be crashworthy by crash testing of similar devices or years of demonstrable safe performance. These include cones, tubular markers, flexible delineators, and plastic drums with no attachments. Category 1 devices shall be crash tested and accepted or may be self-certified by the manufacturer.

Category 2 includes devices that are not expected to produce significant vehicular velocity change but may otherwise be hazardous. These include drums and vertical panels with lights, barricades, and portable sign supports. Category 2 devices shall be crash tested and accepted for Test Level 3.

Category 3 includes devices that are expected to cause significant velocity changes or other potentially harmful reactions to impacting vehicles. These include crash cushions (impact attenuators), truck mounted attenuators, and other devices not meeting the definitions of Category 1.
or 2. Category 3 devices shall be crash tested and accepted for either Test Level 3 or the test level specified.

Category 4 includes portable or trailer-mounted devices such as arrow boards, changeable message signs, temporary traffic signals, and area lighting supports. Currently, there is no implementation date set for this category and it is exempt from the NCHRP 350 or MASH compliance requirement.

The Contractor shall provide a manufacturer’s self-certification letter for each Category 1 device and an FHWA acceptance letter for each Category 2 and Category 3 device used on the contract. The letters shall state the device meets FHWA crashworthiness standards for its respective category and test level, and shall include a detailed drawing of the device. The set-up and use of certified/accepted devices shall be the same as that described in the letter.

### 1106.01 Signs

Sign faces shall be according to the MUTCD and Section 1091, except as modified herein.

At the time of manufacturing, the retroreflective prismatic sheeting shall meet or exceed the minimum coefficient of retroreflection specified in Article 1091.03 for the sheeting type required by the Department’s Fabrications of Highway Signs Policy. Orange signs shall be fluorescent orange in color.

Sign sheeting shall be mounted on materials such as aluminum, rigid plastic, or exterior grade plywood. Signs utilizing a base of fabric, fiberboard, or other highly flexible or frangible material will not be permitted, except signs having a reflective sheeting face bonded to a durable plastic or fabric base will be permitted, (a) in work zones with posted speeds above 45 mph (70 km/hr) when workers are present to maintain the devices and (b) in all work zones having posted speeds of 45 mph (70 km/hr) or less.

Specific requirements for various signs shall be as follows.

(a) Work Zone Speed Limit Signs. Work zone speed limit sign assemblies shall be as shown on the plans. The individual signs that make up an assembly may be combined on a single panel.

(b) Flagger Traffic Control Paddle. The “STOP” face shall consist of white letters and border on a red background. The “SLOW” face shall consist of black letters and border on a fluorescent orange background. Areas outside sign borders shall be light blue or black. The staff may consist of two sections joined by a coupling.

### Various Specifications:

1. Lights shall be maintained so as to be visible on a clear night from a distance of 3000 ft. (900 m). [SS pg. 1129 / 1106.02]
Section 702. NIGHTTIME WORK ZONE LIGHTING

702.01 Description. This work shall consist of furnishing, installing, maintaining, moving, and removing lighting for nighttime work zones. Nighttime shall be defined as occurring shortly before sunset until after sunrise.

702.02 Materials. The lighting shall consist of mobile and/or stationary lighting systems as required herein for the specific type of construction. Mobile lighting systems shall consist of luminaires attached to construction equipment or moveable carts. Stationary lighting systems shall consist of roadway luminaires mounted on temporary poles or trailer mounted light towers at fixed locations. Some lighting systems, such as balloon lights, may be adapted to both mobile and stationary applications.

702.03 Equipment. The Contractor shall furnish an illuminance meter for use by the Engineer. The meter shall have a digital display calibrated to NIST standards, shall be cosine and color corrected, and shall have an accuracy of ± five percent. The sensor shall have a level indicator to ensure measurements are taken in a horizontal plane.

CONSTRUCTION REQUIREMENTS

702.04 General. At the preconstruction conference, the Contractor shall submit the type(s) of lighting system to be used and the locations of all devices.

Before nighttime construction may begin, the lighting system shall be demonstrated as being operational.

702.05 Nighttime Flagging. The requirements for nighttime flagging shall be according to Article 701.13 of the Standard Specifications and the glare control requirements contained herein.

702.06 Lighting System Design. The lighting system shall be designed to meet the following.

(a) Lighting Levels. The lighting system shall provide a minimum of 5 foot candles (54 lux) throughout the work area. For mobile operations, the work area shall be defined as 25 ft. (9 m) in front of and behind moving equipment. For stationary operations, the work area shall be defined as the entire area where work is being performed.

Lighting levels will be measured with an illuminance meter. Readings will be taken in a horizontal plane 3 ft. (1 m) above the pavement or ground surface.

(b) Glare Control. The lighting system shall be designed and operated so as to avoid glare that interferes with traffic, workers, or inspection personnel. Lighting systems with flood, spot, or stadium type luminaires shall be aimed downward at the work and rotated outward no greater than 30 degrees from nadir (straight down). Balloon lights shall be positioned at least 12 ft. (3.6 m) above the roadway.

As a large component of glare, the headlights of construction vehicles and equipment shall not be operated within the work zone except as allowed for specific construction operations. Headlights shall never be used when facing oncoming traffic.
(c) Light Trespass. The lighting system shall be designed to effectively light the work area without spilling over to adjoining property. When, in the opinion of the Engineer, the lighting is disturbing adjoining property, the Contractor shall modify the lighting arrangement or add hardware to shield the light trespass.

702.07 Construction Operations. The lighting design required above shall be provided at any location where construction equipment is operating or workers are present on foot. When multiple operations are being carried on simultaneously, lighting shall be provided at each separate work area.

The lighting requirements for specific construction operations shall be as follows.

(a) Installation or Removal of Work Zone Traffic Control. The required lighting level shall be provided at each truck and piece of equipment used during the installation or removal of work zone traffic control. Headlights may be operated in the work zone.

(b) Milling and Paving. The required lighting level shall be provided by mounting a minimum of one balloon light to each piece of mobile construction equipment used in the work zone. This would include milling machines, mechanical sweepers, material transfer devices, spreading and finishing machines, and rollers; but not include trucks used to transport materials and personnel or other vehicles that are continuously moving in and out of the work zone. The headlights of construction equipment shall not be operated within the work zone.

(c) Patching. The required lighting level shall be provided at each patching location where work is being performed.

(d) Pavement Marking and Raised Reflective Pavement Marker Removal/Installation. The striping truck and the attenuator/arrow board trucks may be operated by headlights alone; however, additional lighting may be necessary for the operator of the striping truck to perform the work.

For raised reflective pavement marker removal and installation and other pavement marking operations where workers are on foot, the required lighting level shall be provided at each truck and piece of equipment.

(e) Layout, Testing, and Inspection. The required lighting level shall be provided for each active area of construction layout, material testing, and inspection. The work area shall be defined as 15 ft. (7.6 m) in front and back of the individual(s) performing the tasks.

702.08 Basis of Payment. This work will be paid for at the contract lump sum price for NIGHTTIME WORK ZONE LIGHTING.

FOR INFORMATIONAL USE ONLY
Standard 704001

704.01 Description. This work shall consist of furnishing, placing, maintaining, relocating, and removing precast concrete barrier at temporary locations.

704.03 General. Precast concrete barrier shall be the F shape as detailed on the plans.

704.04 Installation. The barriers shall be seated on bare, clean pavement or paved shoulder and pinned together in a smooth, continuous line at the exact locations provided by the Engineer. The barrier unit at each end of the installation shall be secured to the pavement or paved shoulder using six anchoring pins and protected with an impact attenuator as shown on the plans.

Barriers or attachments damaged during transportation or handling, or by traffic during the life of the installation, shall be repaired or replaced. The Engineer will be the sole judge in determining which units or attachments require repair or replacement.

The barriers shall be removed when no longer required by the contract. After removal, all anchoring holes in the pavement or paved shoulder shall be filled with a rapid hardening mortar or concrete. Only enough water to permit placement and consolidation by rodding shall be used and the material shall be struck-off flush.

704.05 Method of Measurement. This work will be measured for payment in feet (meters) in place along the centerline of the barrier. When the barrier is relocated within the limits of the jobsite, the relocated barrier will be measured for payment in feet (meters) in place along the centerline of the barrier.

704.06 Basis of Payment. When the Contractor furnishes the barrier, this work will be paid for at the contract unit price per foot (meter) for TEMPOARY CONCRETE BARRIER or RELOCATE TEMPORARY CONCRETE BARRIER.

When the Department furnishes the barrier, this work will be paid for at the contract unit price per foot (meter) for TEMPOARY CONCRETE BARRIER, STATE OWNED, or RELOCATED TEMPORARY CONCRETE BARRIER, STATE OWNED.

Impact attenuators will be paid for separately.

Supplemental Specifications:

Except on bridge decks,...the barrier unit at each end of an installation shall be anchored to the pavement or paved shoulder using six anchor pins and protected with an impact attenuator as shown on the plans. When pinning of additional barrier units within the installation is specified, three anchor pins shall be installed in the traffic side holes of the required barriers.

Where both pinned and unpinned barrier units are used in a continuous installation, a transition shall be provided between them. The transition from pinned to unpinned barrier shall consist of two anchor pins installed in the end holes on the traffic side of the first barrier beyond the pinned section and one anchor pin installed in the middle hole on the traffic side of the second barrier beyond the pinned section. The third barrier beyond the pinned section shall then be unpinned.

Anchor pins, except for the six anchor pins for the barrier unit at each end of an installation, will be measured for payment as each, per anchor pin installed. [Supplemental Specifications / Section 704] FOR INFORMATIONAL USE ONLY
Resident traffic and day labor force's equipment to use road shoulder for passing barricades.

Use when shoulders are too narrow for passage of traffic.

TWO-LANE, TWO-WAY TRAFFIC, RURAL OPERATIONS EXCEEDING ONE DAYLIGHT PERIOD

GENERAL NOTES
Type III barricades to be width of pavement only.

Reflective 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 reflective backgrounds shall be utilized where needed.

This case is for use on rural local roads where the local authorities considers this protection to be appropriate for the specific job conditions.

All dimensions are in inches unless otherwise shown.

TRAFFIC CONTROL DEVICES – DAY LABOR CONSTRUCTION

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 kmh), a ONE LANE AHEAD sign, 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 600' (200 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 obstacle, 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 beams are required for all maintenance vehicles while in operation.

Appropriate operations illustrated in standard manuals may be used when operations do not exceed 15 minutes on the pavement or 60 minutes on the shoulder respectively.

All warning signs shall have minimum dimensions of 36x36 (90x90) sq cm and have black legend on an orange reflectorized background.

When fluorescent signs are used, orange flags are not required.

This case is for use on rural local roads where the local authority considers this protection to be appropriate for the specific job conditions.

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

TRAFFIC CONTROL DEVICES—DAY LABOR MAINTENANCE

STANDARD B.L.R.18-6
**CONDITION I**

**APPROACH TRAFFIC STOPPED**

**CONDITION II**

**APPROACH TRAFFIC DOES NOT STOP**

**SYMBOLS**

- Work area
- Type III Barricades
- Sign with 18x18 in (450x450 mm), orange flag attached

**GENERAL NOTES**

Type III Barricades and R8-4-4020 signs shall be positioned as shown in the "Road Closed To All Traffic" dashed Highway Signs Standard 72800. If the distance "D" exceeds 3000 ft (900 m), an additional set of barricades and R8-4-4020 shall be placed at each end of the work area.

Two Type A Low Intensity Flashing Lights shall be used on each approach in advance of the work area. One light shall be installed above each barricade. If only one barricade is required, the other light shall be installed above the first advance warning sign.

All warning signs shall have minimum dimensions of 36 x 36 in (900 x 900 mm) and have a black legend on an orange reflectorized background.

When fluorescent signs are used, orange flags are not required.

Longitudinal dimensions may be adjusted to fit field conditions.

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

**TYPICAL APPLICATION OF TRAFFIC CONTROL DEVICES FOR CONSTRUCTION ON RURAL LOCAL HIGHWAYS (TWO-LANE TWO WAY RURAL TRAFFIC) ROAD CLOSED TO THRU TRAFFIC**

**STANDARD B.L.R. 22-7**
GENERAL NOTES

Dimensions shown for cross sections are minimum.

All holes are 5/32" (4 mm).

Sx-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, Sx-x shall be corrected for the net section.

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

---

**SECTION D-D**

**SECTION E-F**

Steel: 1.12 lb/ft³, 0.61 kg/ft³

---

**TYPE A**

**TYPE B**

**TYPE C**
ONE POST INSTALLATION

TWO POST INSTALLATION

For diamond shaped sign with side S as shown, use required post size for C sign with \( R = 0.75 \)
and \( D = 1.45 \).

<table>
<thead>
<tr>
<th>SIGN (in) (10)</th>
<th>H</th>
<th>NO, AND TYPE OF POST FOR SIGN WIDTH (in)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>12</td>
</tr>
<tr>
<td>5&quot;-0&quot;0.75</td>
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<td>A</td>
</tr>
<tr>
<td>5&quot;-0&quot;1.0</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td>6&quot;-0&quot;0.8</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td>6&quot;-0&quot;1.0</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td>7&quot;-0&quot;0.9</td>
<td>A</td>
<td>A</td>
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<tr>
<td>7&quot;-0&quot;1.1</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td>8&quot;-0&quot;0.9</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td>8&quot;-0&quot;1.1</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td>9&quot;-0&quot;1.2</td>
<td>A</td>
<td>A</td>
</tr>
</tbody>
</table>

**GENERAL NOTES**


LOADINGS: For 60 mph/96 km/h wind velocity with 30% gust factor, noted to sign.

SOIL PRESSURE: Minimum allowable soil pressure 1.25 psf (100 kPa).

See Standard 720001 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)**

<table>
<thead>
<tr>
<th>DATE</th>
<th>REVISIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-1-09</td>
<td>Switched units to English metric.</td>
</tr>
<tr>
<td>1-1-97</td>
<td>Mahur, Standard 2263-0.</td>
</tr>
</tbody>
</table>

STANDARD 720001-01
2 LANE

LANE AND EDGE LINES

- Approximately 15' (4.5 m) from nearest rail or 8' (2.4 m) on back from gate, if present. Stop line placed perpendicular to center line.

- 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 "XR" 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 (AW-1M) as placed by Table 2C-4, Condition B of the MUTCD.

MULTI LANE

PAVEMENT MARKINGS AT
RAILROAD-HIGHWAY GRADE CROSSING

DATE: ____________

REVISIONS:
1-1-15 Added symbols, Revised
1-1-14 Added bike symbol, Revised note

TYPICAL PAVEMENT MARKINGS
(Sheet 1 of 3)

STANDARD 780001-05
SECTION 703. WORK ZONE PAVEMENT MARKING

703.01 Description. This work shall consist of furnishing, installing, maintaining, and removing short term and temporary pavement markings.

703.02 Materials. Materials shall be according to the following.

<table>
<thead>
<tr>
<th>Item</th>
<th>Article/Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) Pavement Marking Tape</td>
<td>1095.06</td>
</tr>
<tr>
<td>(b) Paint Pavement Markings</td>
<td>1095.02</td>
</tr>
</tbody>
</table>

CONSTRUCTION REQUIREMENTS

703.03 General. Short term pavement markings shall consist of abbreviated patterns for edge, lane, and centerline markings. Within a specified time limit, short term pavement markings shall either be resurfaced or replaced and replaced with the full pavement marking patterns indicated on the plans with either a temporary material paid for as temporary pavement marking or with permanent material. Within the conditions as specified, the Contractor may be required to place all or a part of the quantities shown on the plans for short term pavement markings and temporary pavement markings.

The surface to which the pavement marking is to be applied shall be clean and dry. Pavement marking tape shall be applied to the prepared surface according to the manufacturer's recommendations or by a method approved by the Engineer. Painted lines shall be installed according to Section 780, except hand-operated stripers may be used for all applications of short term and temporary pavement marking.

703.04 Short Term Pavement Markings. Before the lane is opened to traffic, appropriate short term pavement markings shall be installed between all lanes open to traffic. Centerline or lane line markings shall consist of an abbreviated pattern of single stripes 4 ft. (1.2 m) in length and a minimum of 4 in. (100 mm) wide at a maximum spacing of 40 ft. (12 m) between stripes. Centerlines on two-lane highways shall be yellow and lane lines separating two or more lanes of traffic moving in the same direction shall be white. Edge line markings shall consist of 4 ft. (1.2 m) stripes on 100 ft. (30 m) centers installed at approximately a 45 degree diagonal pointing in the direction of traffic. Edge line markings will only be required on multilane divided highways and other highways with a paved shoulder greater than 4 ft. (1.2 m) wide. Markings on the final wearing surface shall be transversely offset from the permanent pavement marking location as directed by the Engineer. Markings shall be removed within five days after the permanent pavement markings are installed.

The short term pavement markings shall be removed and replaced with the required full standard pavement markings consisting of either temporary or permanent pavement marking as soon as possible. Except as indicated below, temporary pavement marking or the permanent pavement markings shall be installed for no passing zones within three calendar days and for all other markings within 14 calendar days, respectively, after the completion of any intermediate or final surface treatment. This time restriction shall begin at the completion of each intermediate or final lift on resurfacing projects.
Section 703 - Continued

If the existing markings are obliterated by milling or any other surface treatment, the time restriction shall begin when the entire surface has been treated. These restrictions may be delayed by the Engineer whenever the Contractor cannot apply pavement markings due to unanticipated inclement weather (other than winter shutdown on the project), strike activities, or other circumstances beyond the Contractor's control as determined by the Engineer. In these cases, the required full standard temporary or permanent markings shall be installed as soon as construction activities are resumed. Prior to winter shutdown, standard edge lines, lane lines, centerlines, no passing zones, and any other necessary markings as determined by the Engineer shall be installed on any intermediate or final surface remaining open to traffic during the winter shutdown period.

703.05 Temporary Pavement Marking. When any intermediate course cannot be overlaid or if the final surface cannot be permanently marked within the time restrictions listed above, the full standard markings shall be installed with temporary pavement marking. The temporary markings shall be of the same color and dimensions as shown on the plans for the permanent markings, or as directed by the Engineer.

Type I marking tape or paint shall be used at the option of the Contractor, except paint shall not be applied to the final wearing surface unless authorized by the Engineer for late season applications where tape adhesion would be a problem. Type III marking tape shall be used on the final wearing surface when the temporary pavement marking will conflict with the permanent pavement marking such as on tapers, crossovers and lane shifts.

Except during winter shutdown periods, temporary pavement marking showing deterioration for any reason within seven days after placement, shall be replaced by the Contractor. Temporary pavement markings which are in conflict with subsequently established pavement markings, or which interfere with the permanent pavement markings, shall be removed. Marking tape or paint placed on the final wearing course shall be transversely offset from the permanent pavement marking planned location as directed by the Engineer. All remaining temporary pavement marking tape or paint shall be removed within five working days after placement of the permanent pavement marking. When edge lines or channelizing lines are required, they shall be continuous. When continuous sections of tape are used, they shall be cut completely through at intervals of approximately 25 ft. (8 m).

Instead of pavement markings, no passing zones on two-lane and three-lane roads may be identified by either the pennant “NO PASSING ZONE” (W14-3) warning sign or both the “DO NOT PASS” (R4-1) and “PASS WITH CARE” (R4-2) regulatory signs in conjunction with short term markings for periods of time up to three calendar days after an intermediate or final lift is completed on resurfacing projects.

These signs may also be used in lieu of pavement markings on low volume roads until it is practical and possible to install the permanent pavement markings.

If, in the traffic control plan, the road is specified as low volume, it is exempt from the requirements regarding no passing zone pavement markings.
Section 703 - Continued

703.06 Method of Measurement. Short term pavement markings and temporary pavement markings of the various line widths will be measured for payment in feet (meters) in place and accepted. Double yellow lines will be measured as two separate lines.

The replacement of temporary pavement markings of the various line widths during winter shutdown periods will be measured for payment in feet (meters) as specified above, except only those pavement markings directed by the Engineer to be replaced will be measured for payment.

Letters and symbols used in conjunction with temporary pavement marking conforming to the sizes and dimensions specified will be measured for payment in square feet (square meters) according to the areas listed in Table 1, Section 780.

Short term and temporary pavement marking removal will be measured for payment in square feet (square meters).

703.07 Basis of Payment. This work will be paid for at the contract unit price per foot (meter) for SHORT TERM PAVEMENT MARKING or for TEMPORARY PAVEMENT MARKING of the line width specified, and at the contract unit price per square foot (square meter) for TEMPORARY PAVEMENT MARKING LETTERS AND SYMBOLS.

Removal of short term pavement markings will be paid for at the contract unit price per square foot (square meter) for SHORT TERM PAVEMENT MARKING REMOVAL. Removal of temporary pavement marking will be paid for according to Article 783.06

When temporary pavement marking is shown on the Standard, the cost of the temporary pavement marking will be included in the cost of the Standard.

When Pavement Marking Tape, Type III is specified in the contract other than on a Standard, the work will be paid for at the contract unit price per foot (meter) for PAVEMENT MARKING TAPE, TYPE III of the line width specified and at the contract unit price per square feet (square meter) for PAVEMENT MARKING TAPE, TYPE III - LETTERS AND SYMBOLS.

FOR INFORMATIONAL USE ONLY
TWO-LANE / TWO-WAY

LANE REDUCTION TRANSITION

MULTI-LANE UNDIVIDED

MULTI-LANE DIVIDED

RURAL LEFT TURN

TWO-WAY LEFT TURN

FREEWAY EXIT RAMP

SYMBOLS

Yellow stripe
White stripe
One-way amber marker
One-way crystal marker
Two-way amber marker

TYPICAL APPLICATIONS
RAISED REFLECTIVE
PAVEMENT MARKERS

DATE
REVISIONS
4-1-16 Revised LANE MARKS sign
8-15-04 to agree with current MUTCD.
3-1-08 Switched units to English (FirstOrDefault).

STANDARD 781001-04
Errata, Supplemental Specifications and Recurring Special Provisions

Check Sheets

Adopted January 1, 2017
Page 84  Article 204.02. In the seventh line of the first paragraph change “AASHTO T 99 (Method C)” to “Illinois Modified AASHTO T 99 (Method C)”.

Page 90  Article 205.06. In the first sentence of the third paragraph change “AASHTO T 99 (Method C)” to “Illinois Modified AASHTO T 99 (Method C)”.

Page 91  Article 205.06. In the first sentence of the fourth paragraph change “AASHTO T 99 (Method C)” to “Illinois Modified AASHTO T 99 (Method C)”, and in the second sentence change “AASHTO T 224” to “Illinois Modified AASHTO T 99 (Annex A1)”.

Page 91  Article 205.06. In the second line of the fifth paragraph change “AASHTO T 191” to “Illinois Modified AASHTO T 191”.

Page 91  Article 205.06. In the sixth line of the eighth paragraph change “AASHTO T 99 (Method C)” to “Illinois Modified AASHTO T 99 (Method C)”.

Page 148  Article 302.09. In the second sentence of the fifth paragraph change “AASHTO T 191” to “Illinois Modified AASHTO T 191”, and in the third sentence change “AASHTO T 99” to “Illinois Modified AASHTO T 99”.

Page 152  Article 310.09. In the second sentence of the second paragraph change “AASHTO T 191” to “Illinois Modified AASHTO T 191”, and in the third sentence change “AASHTO T 99” to “Illinois Modified AASHTO T 99”.

Page 155  Article 311.05(a). In the first sentence of the fifth paragraph change “AASHTO T 99 (Method C)” to “Illinois Modified AASHTO T 99 (Method C)”, and in the second sentence change “AASHTO T 224” to “Illinois Modified AASHTO T 99 (Annex A1)”.

Page 155  Article 311.05(a). In the second line of the sixth paragraph change “AASHTO T 191” to “Illinois Modified AASHTO T 191”.

Page 163  Article 351.05(a). In the second sentence of the fifth paragraph change “AASHTO T 99 (Method C)” to “Illinois Modified AASHTO T 99 (Method C)”, and in the third sentence change “AASHTO T 224” to “Illinois Modified AASHTO T 99 (Annex A1)”.

Page 163  Article 351.05(a). In the second line of the sixth paragraph change “AASHTO T 191” to “Illinois Modified AASHTO T 191”.

Page 169  Article 352.11. In the second sentence of the fourth paragraph change “AASHTO T 191” to “Illinois Modified AASHTO T 191”, and in the third sentence change “AASHTO T 134 (Method B)” to “Illinois Modified AASHTO T 134 (Method B)”.
Article 352.12. In the first sentence of the first paragraph change “AASHTO T 22” to “Illinois Modified AASHTO T 22”, and in the second sentence change “AASHTO T 134 (Method B)” to “Illinois Modified AASHTO T 134 (Method B)”.

Article 406.07(a). After the footnotes in Table 1 - Minimum Roller Requirements for HMA add the following:

“EQUIPMENT DEFINITION

\( V_s \) - Vibratory roller, static mode, minimum 125 lb/in. (2.2 kg/mm) of roller width. Maximum speed = 3 mph (5 km/h) or 264 ft/min (80 m/min). If the vibratory roller does not eliminate roller marks, its use shall be discontinued and a tandem roller, adequately ballasted to remove roller marks, shall be used.

\( V_d \) - Vibratory roller, dynamic mode, operated at a speed to produce not less than 10 impacts/ft (30 impacts/m).

\( P \) - Pneumatic-tired roller, max. speed 3 1/2 mph (5.5 km/h) or 308 ft/min (92 m/min). The pneumatic-tired roller shall have a minimum tire pressure of 80 psi (550 kPa) and shall be equipped with heat retention shields. The self-propelled pneumatic-tired roller shall develop a compression of not less than 300 lb (53 N) nor more than 500 lb (88 N) per in. (mm) of width of the tire tread in contact with the HMA surface.

\( T_b \) - Tandem roller for breakdown rolling, 8 to 12 tons (7 to 11 metric tons), 250 to 400 lb/in. (44 to 70 N/mm) of roller width, max. speed = 3 1/2 mph (5.5 km/h) or 308 ft/min (92 m/min).

\( T_f \) - Tandem roller for final rolling, 200 to 400 lb/in. (35 to 70 N/mm) of roller width with minimum roller width of 50 in. (1.25 m). Ballast shall be increased if roller marks are not eliminated. Ballast shall be decreased if the mat shoves or distorts.

\( 3W \) - Three wheel roller, max. speed = 3 mph (5 km/h) or 264 ft/min (80 m/min), 300 to 400 lb/in. (53 to 70 N/mm) of roller width. The three-wheel roller shall weigh 10 to 12 tons (9 to 11 metric tons).”

Article 442.06(a)(2). In the third line of the sixth paragraph delete “transverse”.

Article 505.04(p). Under Range of Clearance in the first table change “in. x 10^{-6}” to “in. x 10^{-3}”.

Article 542.03. In the Notes in Table IIIB add “CPP Corrugated Polypropylene (CPP) pipe with smooth interior”.

Article 542.03. In the fourth column in Table IIIB (metric) change the heading for Type 5 pipe from “CPE” to “CPP”.

Article 542.03. In the Notes in Table IIIB (metric) change “PE Polyethylene (PE) pipe with a smooth interior” to “CPP Corrugated Polypropylene (CPP) pipe with smooth interior”.
Page 449  Article 542.04(f)(2). In the third line of the second paragraph change “AASHTO T 99 (Method C)” to “Illinois Modified AASHTO T 99 (Method C)”.  

Page 450  Article 542.04(h). In the third sentence of the second paragraph change “in the table below” to “per the Contractor’s design”.  


Page 621  Article 727.03. In the first sentence of the third paragraph change “AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals” to “AASHTO LRFD Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals”.  

Page 629  Article 734.03(a). In the fourth line of the second paragraph change “AASHTO T 99 (Method C)” to “Illinois Modified AASHTO T 99 (Method C)”.  


Page 742  Article 1003.04(c). Under Gradation in the table change “(see Article 1003.02(c))” to “(see Article 1003.01(c))”.  

Page 755  Article 1004.03(b). Revise the third sentence of the first paragraph to read “For Class A (seal or cover coat), and other binder courses, the coarse aggregate shall be Class C quality or better.”.  

Page 755  Article 1004.03(c). In the table for Class A-1, 2, & 3, change the Gradation No. “CA 16” to “CA 16 or CA 20”.  

Page 777  Article 1006.29(d). Revise the third sentence of the third paragraph to read “Stainless steel washers shall be plain flat, conforming to ANSI/ASME B18.22.1, Type A or B as appropriate, or MS 15795, and made of 18-8 stainless steel.”.  

Page 809  Article 1020.04(e). In the third line of the first paragraph change “ITP SCC-3” to “ITP SCC-4”.
Page 810  Article 1020.05(b). In the second line of the first paragraph change “according the qualified products list” to “according to the qualified products list.”.

Page 810  Article 1020.05(b). Delete the first sentence of the second paragraph.

Page 836  Article 1020.15(b)(1)c. Replace the fourth sentence of the first paragraph with the following: "The Contractor shall provide freeze/thaw test results according to AASHTO T 161, and the relative dynamic modulus of elasticity of the mix design shall be a minimum of 80 percent. Testing shall be performed by an independent laboratory accredited by the AASHTO Materials Reference Laboratory (AMRL) for Portland Cement Concrete."

Page 852  Article 1030.05(a)(6). Change “Hot-Mix Asphalt QC/QA Start-Up Procedures” to “Hot-Mix Asphalt Test Strip Procedures”.

Page 945  Article 1069.05. In the first sentence of the tenth paragraph change ““Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals”” to “AASHTO LRFD Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals”.

Page 961  Article 1070.04(b)(1). In the third sentence of the first paragraph change ““Standard Specifications of Structural Supports for Highway Signs, Luminaires and Traffic Signals” published by AASHTO” to “AASHTO LRFD Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals”.


Page 1121  Article 1103.13(a). In the first line of the first paragraph change “Bridge Deck Approach Slabs.” to “Bridge Deck and Approach Slabs.”.
This Supplemental Specification amends the provisions of the Standard Specifications for Road and Bridge Construction, adopted April 1, 2016 and shall be construed to be a part thereof, superseding any conflicting provisions thereof applicable to the work under the contract.

704.02 Materials. Revise this Article to read:

"704.02 Materials. Materials shall be according to the following.

<table>
<thead>
<tr>
<th>Item</th>
<th>Article/Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) Precast Temporary Concrete Barrier</td>
<td>1042</td>
</tr>
<tr>
<td>(b) Reinforcement Bars</td>
<td>1006.10(a)</td>
</tr>
<tr>
<td>(c) Connecting Pins and Anchor Pins (Note 1)</td>
<td></td>
</tr>
<tr>
<td>(d) Connecting Loop Bars (Note 2)</td>
<td></td>
</tr>
<tr>
<td>(e) Packaged Rapid Hardening Mortar or Concrete</td>
<td>1018</td>
</tr>
</tbody>
</table>

Note 1. Connecting pins and anchor pins shall be according to the requirements of ASTM F 1554 Grade 36 (Grade 250).

Note 2. Connecting loop bars shall be smooth bars according to the requirements of ASTM A 36 (A 36M)."

704.04 Installation. Revise this Article to read:

"704.04 Installation. The barriers shall be seated on bare, clean pavement or paved shoulder and connected together in a smooth, continuous line at the locations provided by the Engineer.

Except on bridge decks, or where alternate anchoring details are shown on the plans, the barrier unit at each end of an installation shall be anchored to the pavement or paved shoulder using six anchor pins and protected with an impact attenuator as shown on the plans. When pinning of additional barrier units within the installation is specified, three anchor pins shall be installed in the traffic side holes of the required barriers.

Where both pinned and unpinned barrier units are used in a continuous installation, a transition shall be provided between them. The transition from pinned to unpinned barrier shall consist of two anchor pins installed in the end holes on the traffic side of the first barrier beyond the pinned section and one anchor pin installed in the middle hole on the traffic side of the second barrier beyond the pinned section. The third barrier beyond the pinned section shall then be unpinned.

Barriers located on bridge decks shall be restrained as shown on the plans. Anchor pins shall not be installed through bridge decks, unless otherwise noted."
Barriers or attachments damaged during transportation or handling, or by traffic during the life of the installation, shall be repaired or replaced. The Engineer will be the sole judge in determining which units or attachments require repair or replacement.

The barriers shall be removed when no longer required by the contract. After removal, all anchor holes in the pavement or paved shoulder shall be filled with a rapid hardening mortar or concrete. Only enough water to permit placement and consolidation by rodding shall be used and the material shall be struck-off flush."

704.05 Method of Measurement. Add the following paragraph after the first paragraph of this Article:

"Anchor pins, except for the six anchor pins for the barrier unit at each end of an installation, will be measured for payment as each, per anchor pin installed."

704.06 Materials. Add the following paragraph after the second paragraph of this Article:

"Anchor pins, except for the six anchor pins for the barrier unit at each end of an installation, will be paid for at the contract unit price per each for PINNING TEMPORARY CONCRETE BARRIER."
Revise Article 406.10 of the Standard Specifications to read:

“406.10 Resurfacing Sequence. The resurfacing operations shall satisfy the following requirements:

(a) Before paving in a lane, the adjacent lane and its paved shoulder shall be at the same elevation.

(b) Each lift of resurfacing shall be completed, including paved shoulders, before the next lift is begun.

(c) Elevation differences between lanes shall be eliminated within twelve calendar days.”

Revise the first sentence of the eleventh paragraph of Article 406.13 of the Standard Specifications to read:

“When a HMA binder and surface course mixture is used on shoulders and is placed simultaneously with the traffic lane as specified in Section 482, the quantity of HMA placed on the traffic lane that will be paid for will be limited to a calculated tonnage based upon actual mat width and length, plan thickness or a revised thickness authorized by the Engineer, and design mix weight per inch (millimeter) of thickness.”

Delete the twelfth paragraph of Article 406.13 of the Standard Specifications.

Revise the sixth paragraph of Article 482.05 of the Standard Specifications to read:

“On pavement and shoulder resurfacing projects, the resurfacing sequence shall be according to Article 406.10. When the HMA binder and surface course option is used, the shoulders may be placed, at the Contractor’s option, simultaneously with the adjacent traffic lane for both courses, provided the specified density, thickness and cross slope of both the pavement and shoulder can be satisfactorily obtained.”
Description. At the Contractor’s option, temporary portable bridge traffic signals may be used in place of temporary bridge traffic signals. Work shall be according to Article 701.18(b) of the Standard Specifications, except as follows:

Materials. Materials shall be according to the following.

<table>
<thead>
<tr>
<th>Item</th>
<th>Article/Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) Traffic Signal Head</td>
<td>1078</td>
</tr>
<tr>
<td>(b) Electric Cable</td>
<td>1076.04</td>
</tr>
<tr>
<td>(c) Controller</td>
<td>1073</td>
</tr>
<tr>
<td>(d) Controller Cabinet</td>
<td>1074.03</td>
</tr>
<tr>
<td>(e) Detector Loop</td>
<td>1079</td>
</tr>
</tbody>
</table>

CONSTRUCTION REQUIREMENTS

General. The temporary portable bridge traffic signals shall be trailer-mounted units. The trailer-mounted units shall be set up securely and level. Each unit shall be self-contained and consist of two signal heads. The left signal head shall be mounted on a mast arm capable of extending over the travel lane. Each unit shall contain a solar cell system to facilitate battery charging. There shall be a minimum of 12 days backup reserve battery supply and the units shall be capable of operating with a 120 V power supply from a generator or electrical service.

All signal heads located over the travel lane shall be mounted at a minimum height of 17 ft. (5 m) from the bottom of the signal back plate to the top of the road surface. All far right signal heads located outside the travel lane shall be mounted at a minimum height of 8 ft. (2.4 m) from the bottom of the signal back plate to the top of the adjacent travel lane surface.

The long all red intervals for the traffic signal controller shall be adjustable up to 250 seconds in one-second increments.

As an alternative to detector loops, temporary portable bridge traffic signals may be equipped with microwave sensors or other approved methods of vehicle detection and traffic actuation. All portable traffic signal units shall be interconnected using hardwire communication cable or radio communication equipment. If radio communication is used, a site analysis shall be completed to ensure that there is no interference present that would affect the traffic signal operation. The radio equipment shall meet all applicable FCC requirements.

The temporary portable bridge traffic signal system shall meet the physical display and operational requirements of conventional traffic signals as specified in Part IV of the Manual on
Uniform Traffic Control Devices (MUTCD). The signal system shall be designed to continuously operate over an ambient temperature range between \(-30\,^\circ\text{F} (-34\,^\circ\text{C})\) and \(120\,^\circ\text{F} (48\,^\circ\text{C})\).

When not being utilized to inform and direct traffic, portable signals shall be treated as non-operating equipment according to Article 701.11 of the Standard Specifications.

**Basis of Payment.** This work will be paid for according to Article 701.20(c) of the Standard Specifications.

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State of Illinois
Department of Transportation

SPECIAL PROVISION
FOR
WORK ZONE PUBLIC INFORMATION SIGNS

Effective: September 1, 2002
Revised: January 1, 2007

**Description.** This work shall consist of furnishing, erecting, maintaining, and removing work zone public information signs.

Camera-ready artwork for the signs will be provided to sign manufacturing companies upon request by contacting the Central Bureau of Operations at 217-782-2076. The sign number is W21-I116-6048.

**Freeways/Expressways.** These signs are required on freeways and expressways. The signs shall be erected as shown on Highway Standard 701400 and according to Article 701.14 of the Standard Specifications.

**All Other Routes.** These signs shall be used on other routes when specified on the plans. They shall be erected in pairs midway between the first and second warning signs.

**Basis of Payment.** This work will not be paid for separately but shall be considered as included in the cost of the Standard.
State of Illinois
Department of Transportation

SPECIAL PROVISION
FOR
NIGHT TIME INSPECTION OF ROADWAY LIGHTING

Effective: May 1, 1996

The Contractor shall provide traffic control and protection for the night time inspection of the roadway lighting as shown in the contract. Any fixtures found not to be aimed to provide optimum lighting on the roadway during the night time inspection shall be re-aimed to optimum during the inspection. Any work necessary for re-aiming will not be paid for separately but, shall be included in the cost of the highway lighting bid items.

State of Illinois
Department of Transportation

SPECIAL PROVISION
FOR
PAVEMENT MARKING REMOVAL

Effective: April 1, 2009

This recurring special provision has been replaced with the BDE Special Provision “PAVEMENT MARKING REMOVAL”, page 141 of this booklet.
Description. This work shall consist of furnishing and installing temporary raised pavement markers on preventive maintenance projects requiring cape seals or bituminous surface treatments.

Materials. The marker body shall be approximately 0.06 in. (1.5 mm) thick polyurethane formed in an “L” shape. The base of the marker shall be approximately 4 in. (100 mm) wide by 1.125 in. (28 mm) long with a solid 0.125 in. (3.2 mm) thick butyl rubber adhesive pad protected with a release paper. The vertical portion of the marker shall be approximately 4 in. (100 mm) wide by 2 in. (50 mm) high.

A cube-corner micro-prism reflective tape material shall be placed horizontally along both sides at the top of the vertical section of the marker. The reflective material shall be recessed in an “I-Beam” design to protect the reflective material from aggregate. A clear flexible polyvinyl chloride plastic cover is to be attached to the vertical section of the marker with a heavy duty staple to cover the reflective material during surfacing operations. The flexible raised pavement marker shall be readily visible at night when viewed with high beam automobile headlamps from a distance of at least 300 ft. (90 m).

Construction Requirements

Application. The temporary markers shall be installed at the centerline or lane line(s) prior to application of any surface treatment which would cover the existing pavement markings. Temporary markers shall also be applied at edge lines when specified on the plans.

For temporary replacement of skip dash markings, an abbreviated pattern of two markers spaced 4 ft. (1.2 m) apart with a maximum spacing of 40 ft. (12 m) between sets of markers shall be used. For temporary replacement of solid lines, one marker shall be placed every 5 ft. (1.5 m). The marker color and location shall match the existing line color and location.

Basis of Payment. This work will be paid for at the contract unit price per each for TEMPORARY RAISED PAVEMENT MARKER.
Revise Article 701.10 of the Standard Specifications to read:

“The Contractor shall conduct inspections of the worksite at a frequency that will allow for the timely replacement of any traffic control device that has become displaced, worn, or damaged. A sufficient quantity of replacement devices, based on vulnerability to damage, shall be readily available to meet this requirement.”

Delete Articles 701.19(d) and Article 701.20(g) of the Standard Specifications.

Revise the last paragraph of Article 701.13 of the Standard Specifications to read:

“Flaggers are required only when workers are present.”
Bureau of Design
& Environment
Special Provisions

January 1, 2017
AUTOMATED FLAGGER ASSISTANCE DEVICES (BDE)

Effective: January 1, 2008

Description. This work shall consist of furnishing and operating automated flagger assistance devices (AFADs) as part of the work zone traffic control and protection for two lane highways where two-way traffic is maintained over one lane of pavement. Use of these devices shall be at the option of the Contractor.

Equipment. AFADs shall be according to the FHWA memorandum, “MUTCD - Revised Interim Approval for the use of Automated Flagger Assistance Devices in Temporary Traffic Control Zones (IA-4R)”, dated January 28, 2005. The devices shall be mounted on a trailer or a moveable cart and shall meet the requirements of NCHRP 350, Category 4.

The AFAD shall be the Stop/Slow type. This device uses remotely controlled “STOP” and “SLOW” signs to alternately control right-of-way.

Signs for the AFAD shall be according to Article 701.03 of the Standard Specifications and the MUTCD. The signs shall be 24 x 24 in. (600 x 600 mm) having an octagon shaped “STOP” sign on one side and a diamond shaped “SLOW” sign on the opposite side. The letters on the signs shall be 8 in. (200 mm) high. If the “STOP” sign has louvers, the full sign face shall be visible at a distance of 50 ft. (15 m) and greater.

The signs shall be supplemented with one of the following types of lights.

(a) Flashing Lights. When flashing lights are used, white or red flashing lights shall be mounted within the “STOP” sign face and white or yellow flashing lights within the “SLOW” sign face.

(b) Stop and Warning Beacons. When beacons are used, a stop beacon shall be mounted 24 in. (600 mm) or less above the “STOP” sign face and a warning beacon mounted 24 in. (600 mm) or less above, below, or to the side of the “SLOW” sign face. As an option, a Type B warning light may be used in lieu of the warning beacon.

A “WAIT ON STOP” sign shall be placed on the right hand side of the roadway at a point where drivers are expected to stop. The sign shall be 24 x 30 in. (600 x 750 mm) with a black legend and border on a white background. The letters shall be at least 6 in. (150 mm) high.

This device may include a gate arm or mast arm that descends to a horizontal position when the “STOP” sign is displayed and rises to a vertical position when the “SLOW” sign is displayed. When included, the end of the arm shall reach at least to the center of the lane being controlled. The arm shall have alternating red and white retroreflective stripes, on both sides, sloping downward at 45 degrees toward the side on which traffic will pass. The stripes shall be 6 in. (150 mm) in width and at least 2 in. (50 mm) in height.

Flagging Requirements. Flaggers and flagging requirements shall be according to Article 701.13 of the Standard Specifications and the following.

AFADs shall be placed at each end of the traffic control, where a flagger is shown on the plans. The flaggers shall be able to view the face of the AFAD and approaching traffic during operation.

To stop traffic, the “STOP” sign shall be displayed, the corresponding lights/beacon shall flash, and when included, the gate arm shall descend to a horizontal position. To permit traffic to move, the
“SLOW” sign shall be displayed, the corresponding lights/beacon shall flash, and when included, the gate arm shall rise to a vertical position.

If used at night, the AFAD location shall be illuminated according to Section 701 of the Standard Specifications.

When not in use, AFADs will be considered nonoperating equipment and shall be stored according to Article 701.11 of the Standard Specifications.

Basis of Payment. This work will not be paid for separately but shall be considered as included in the cost of the various traffic control items included in the contract.

80192

PAVEMENT MARKING BLACKOUT TAPE (BDE)

Effective: November 1, 2014
Revised: April 1, 2016

Revise the fourth paragraph of Article 701.04 of the Standard Specifications to read:

“The traffic control shall remain in place only as long as needed and shall be removed when directed by the Engineer. Signs that do not apply to current conditions shall be removed, covered, or turned from the view of motorists. All existing pavement markings which conflict with the revised traffic pattern shall be removed according to Section 783 or when specified, temporarily covered with pavement marking blackout tape. The width of blackout tape shall be at least 1 in. (25 mm) wider than the width of the pavement marking being covered. The removing or covering of existing markings shall be scheduled immediately to facilitate the revised traffic pattern. If darkness or inclement weather prohibits the removal or covering operations, such operations shall be resumed the next morning or when weather permits.”
Revise Article 701.19(f) of the Standard Specifications to read:

“(f) Removal of existing pavement markings and raised reflective pavement markers will be measured for payment according to Article 783.05. Temporary covering of existing pavement markings with blackout tape will be measured for payment in feet (meters) in place. Removal of blackout tape will be measured for payment in square feet (square meters).”

Revise Article 701.20(j) of the Standard Specifications to read:

“(j) Removal of existing pavement markings and raised reflective pavement markers will be paid for according to Article 783.06. Temporary covering of existing pavement markings with blackout tape will be paid for at the contract unit price per foot for PAVEMENT MARKING BLACKOUT TAPE, of the line width specified.” Removal of blackout tape will be paid for as short term pavement marking removal according to Article 703.07.”

Revise the first two paragraphs of Article 1095.06 of the Standard Specifications to read:

“1095.06 Pavement Marking Tape. White or yellow marking tape shall consist of glass spheres of high optical quality embedded into a binder on a suitable backing that is precoated with a pressure sensitive adhesive. The spheres shall be of uniform gradation and distributed evenly over the surface of the tape. Blackout marking tape shall be a Type III tape consisting of a matte black, non-reflective, patterned surface that is precoated with a pressure sensitive adhesive. The surface of the blackout pavement marking tape shall provide a minimum skid resistance value of 45 BPN when tested according to ASTM E 303-74.

The material shall be white, yellow, or matte black as specified. White and yellow colors shall conform closely to Federal color tolerances for pavement marking paint.”

Revise the second table of Article 1095.06 to read:

<table>
<thead>
<tr>
<th>Test</th>
<th>Type I</th>
<th>Type III</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>White</td>
<td>Yellow</td>
</tr>
<tr>
<td>Initial Thickness,</td>
<td></td>
<td></td>
</tr>
<tr>
<td>mils (mm)</td>
<td>20 (0.51) 20 (0.51)</td>
<td>20 (0.51) 20 (0.51)</td>
</tr>
<tr>
<td>Durability (cycles)</td>
<td>5,000</td>
<td>5,000</td>
</tr>
</tbody>
</table>

Notes:
1/ Measured at the thickest point of the patterned surface.
2/ Measured at the thinnest point of the patterned surface.”
PAVEMENT MARKING REMOVAL (BDE)

Effective: July 1, 2016

Revise Article 783.02 of the Standard Specifications to read:

“783.02 Equipment. Equipment shall be according to the following.

<table>
<thead>
<tr>
<th>Item</th>
<th>Article/Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) Grinders (Note 1)</td>
<td></td>
</tr>
<tr>
<td>(b) Water Blaster with Vacuum Recovery</td>
<td>1101.12</td>
</tr>
</tbody>
</table>

Note 1. Grinding equipment shall be approved by the Engineer.”

Revise the first paragraph of Article 783.03 of the Standard Specifications to read:

“783.03 Removal of Conflicting Markings. Existing pavement markings that conflict with revised traffic patterns shall be removed. If darkness or inclement weather prohibits the removal operations, such operations shall be resumed the next morning or when weather permits. In the event of removal equipment failure, such equipment shall be repaired, replaced, or leased so removal operations can be resumed within 24 hours.”

Revise the first and second sentences of the first paragraph of Article 783.03(a) of the Standard Specifications to read:

“The existing pavement markings shall be removed by the method specified and in a manner that does not materially damage the surface or texture of the pavement or surfacing. Small particles of tightly adhering existing markings may remain in place, if in the opinion of the Engineer, complete removal of the small particles will result in pavement surface damage.”

Revise the first paragraph of Article 783.04 of the Standard Specifications to read:

“783.04 Cleaning. The roadway surface shall be cleaned of debris or any other deleterious material by the use of compressed air or water blast.”

Revise the first paragraph of Article 783.06 of the Standard Specifications to read:

“783.06 Basis of Payment. This work will be paid for at the contract unit price per each for RAISED REFLECTIVE PAVEMENT MARKER REMOVAL, or at the contract unit price per square foot (square meter) for PAVEMENT MARKING REMOVAL – GRINDING and/or PAVEMENT MARKING REMOVAL – WATER BLASTING.”

Delete Article 1101.13 from the Standard Specifications.
PAVEMENT MARKING TAPE TYPE IV (BDE)

Effective: April 1, 2012
Revised: April 1, 2016

Revise Article 703.02 of the Standard Specifications to read:

“703.02 Materials. Materials shall be according to the following.

(a) Pavement Marking Tape, Type I and Type III ...................................................... 1095.06
(b) Paint Pavement Markings ................................................................................... 1095.02
(c) Pavement Marking Tape, Type IV ........................................................................ 1095.11”

Revise the second paragraph of Article 703.05 of the Standard Specifications to read:

“Type I marking tape or paint shall be used at the option of the Contractor, except paint shall not be applied to the final wearing surface unless authorized by the Engineer for late season applications where tape adhesion would be a problem. Type III or Type IV marking tape shall be used on the final wearing surface when the temporary pavement marking will conflict with the permanent pavement marking such as on tapers, crossovers and lane shifts.”

Revise the fourth paragraph of Article 703.07 of the Standard Specifications to read:

“When Pavement Marking Tape, Type III or Pavement Marking Tape, Type IV is specified in the contract other than on a Standard, the work will be paid for at the contract unit price per foot (meter) for PAVEMENT MARKING TAPE, TYPE III or PAVEMENT MARKING TAPE, TYPE IV of the line width specified and at the contract unit price per square feet (square meter) for PAVEMENT MARKING TAPE, TYPE III - LETTERS AND SYMBOLS or PAVEMENT MARKING TAPE, TYPE IV – LETTERS AND SYMBOLS.”

Add the following to Section 1095 of the Standard Specifications:

“1095.11 Pavement Marking Tape, Type IV. The temporary, preformed, patterned markings shall consist of a white or yellow tape with wet retroreflective media incorporated to provide immediate and continuing retroreflection during both wet and dry conditions. The tape shall be manufactured without the use of heavy metals including lead chromate pigments or other similar, lead-containing chemicals.

The white and yellow Type IV marking tape shall meet the Type III requirements of Article 1095.06 and the following.

(a) Composition. The retroreflective pliant polymer pavement markings shall consist of a mixture of high-quality polymeric materials, pigments and glass beads distributed throughout its base cross-sectional area, with a layer of wet retroreflective media bonded to a durable polyurethane topcoat surface. The patterned surface shall have approximately 40% ± 10% of the surface area raised and presenting a near vertical face to traffic from any direction. The channels between the raised areas shall be substantially free of exposed beads or particles.

(b) Retroreflectance. The white and yellow markings shall meet the following for initial dry and wet retroreflectance.
(1) Dry Retroreflectance. Dry retroreflectance shall be measured under dry conditions according to ASTM D4061 and meet the values described in Article 1095.06 for Type III tape.

(2) Wet Retroreflectance. Wet retroreflectance shall be measured under wet conditions according to ASTM E2177 and meet the values shown in the following table.

<table>
<thead>
<tr>
<th>Wet Retroreflectance, Initial $R_L$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Color</td>
</tr>
<tr>
<td>White</td>
</tr>
<tr>
<td>Yellow</td>
</tr>
</tbody>
</table>

(c) Color. The material shall meet the following requirements for daylight reflectance and color, when tested, using a color spectrophotometer with 45 degrees circumferential/zero degree geometry, illuminant D65, and a two degree observer angle. The color instrument shall measure the visible spectrum from 380 to 720 nm with a wavelength measurement interval and spectral bandpass of 10 nm.

<table>
<thead>
<tr>
<th>Color</th>
<th>Daylight Reflectance %Y</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>65 minimum</td>
</tr>
<tr>
<td>Yellow</td>
<td>36-59</td>
</tr>
</tbody>
</table>

*Shall match Federal 595 Color No. 33538 and the chromaticity limits as follows.

<table>
<thead>
<tr>
<th>x</th>
<th>0.490</th>
<th>0.475</th>
<th>0.485</th>
<th>0.530</th>
</tr>
</thead>
<tbody>
<tr>
<td>y</td>
<td>0.470</td>
<td>0.438</td>
<td>0.425</td>
<td>0.456</td>
</tr>
</tbody>
</table>

(d) Skid Resistance. The surface of the markings shall provide an average minimum skid resistance of 50 BPN when tested according to ASTM E303.

(e) Sampling, Testing, Acceptance, and Certification. Prior to approval and use of the wet reflective, temporary, removable pavement marking tape, the manufacturer shall submit a notarized certification from an independent laboratory, together with the results of all tests, stating that the material meets the requirements as set forth herein. The certification test report shall state the lot tested, manufacturer's name, and date of manufacture.

After approval by the Department, samples and certification by the manufacturer shall be submitted for each batch used. The manufacturer shall submit a certification stating that the material meets the requirements as set forth herein and is essentially identical to the material sent for qualification. The certification shall state the lot tested, manufacturer’s name, and date of manufacture.

All costs of testing (other than tests conducted by the Department) shall be borne by the manufacturer."
PORTABLE CHANGEABLE MESSAGE SIGNS (BDE)

Effective: November 1, 2016

Revise this second sentence of the first paragraph of Article 1106.02(i) of the Standard Specifications to read:

“The message panel shall be a minimum of 7 ft (2.1 m) above the edge of pavement in urban areas and a minimum of 5 ft (1.5 m) above the edge of pavement in rural areas, present a level appearance, and be capable of displaying up to eight characters in each of three lines at a time.”

80377
SPEED DISPLAY TRAILER (BDE)

Effective: April 2, 2014
Revised: January 1, 2017

Revise the third paragraph of Article 701.11 of the Standard Specifications to read:

“When not being utilized to inform and direct traffic, sign trailers, speed display trailers, arrow boards, and portable changeable message boards shall be treated as nonoperating equipment.”

Add the following to Article 701.15 of the Standard Specifications:

“(m) Speed Display Trailer. A speed display trailer is used to enhance safety of the traveling public and workers in work zones by alerting drivers of their speed, thus deterring them from driving above the posted work zone speed limit.”

Add the following to Article 701.20 of the Standard Specifications:

“(k) When speed display trailers are shown on the Standard, this work will not be paid for separately but shall be considered as included in the cost of the Standard.

For all other speed display trailers, this work will be paid for at the contract unit price per calendar month or fraction thereof for each trailer as SPEED DISPLAY TRAILER.”

Add the following to Article 1106.02 of the Standard Specifications:

“(o) Speed Display Trailer. The speed display trailer shall consist of a LED speed indicator display with self-contained, one-direction radar mounted on an orange see-through trailer. The height of the display and radar shall be such that it will function and be visible when located behind concrete barrier.

The speed measurement shall be by radar and provide a minimum detection distance of 1000 ft (300 m). The radar shall have an accuracy of ±1 mile per hour.

The speed indicator display shall face approaching traffic and shall have a sign legend of “YOUR SPEED” immediately above or below the speed display. The sign letters shall be between 5 and 8 in. (125 and 200 mm) in height. The digital speed display shall show two digits (00 to 99) in mph. The color of the changeable message legend shall be a yellow legend on a black background. The minimum height of the numerals shall be 18 in. (450 mm), and the nominal legibility distance shall be at least 750 ft (250 m).

The speed indicator display shall be equipped with a violation alert that flashes the displayed detected speed when the work zone posted speed limit is exceeded. The speed indicator shall have a maximum speed cutoff. On roadway facilities with a normal posted speed limit greater than or equal to 45 mph, the detected speeds of vehicles traveling more than 25 mph over the work zone speed limit shall not be displayed. On facilities with normal posted speed limit of less than 45 mph, the detected speeds of vehicles traveling more than 15 mph over the work zone speeds limit shall not be displayed. On any roadway facility if detected speeds are less than 25 mph, they shall not be displayed. The display shall include automatic dimming for nighttime operation.

The speed indicator measurement and display functions shall be equipped with the power supply capable of providing 24 hours of uninterrupted service.”
**TUBULAR MARKERS (BDE)**

Effective: January 1, 2017

Revise Article 701.03(j) of the Standard Specifications to read:

“(j) Tubular Markers ................................................................. 1106.02”

Revise Article 701.15(g) of the Standard Specifications to read:

“(g) Tubular Markers. Tubular markers are used to channelize traffic. They shall only be used when specified.”

Revise the second paragraph of Article 701.18(f) of the Standard Specifications to read:

“Devices no greater than 24 in. (600 mm) wide, may be used in place of tubular markers when the two-way operation is to be in place four days or less.”

Revise the second sentence of the second paragraph of Article 1106.02 of the Standard Specifications to read:

“These include cones, tubular markers, and plastic drums with no attachments.”

Revise the third sentence of the seventh paragraph of Article 1106.02 of the Standard Specifications to read:

“Sheeting used on cones, drums, and tubular markers shall be reboundable as tested according to ASTM D 4956.”

Revise Article 1106.02(f) of the Standard Specifications to read:

“(f) Tubular Markers. Tubular Markers shall be designed to bend under repeated impacts and return to an upright position without damage to the impacting vehicle or the markers. The markers shall be readily removable from the bases to permit field replacement.

The markers shall be orange in color having two white and two fluorescent orange bands.”

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**TEMPORARY CONCRETE BARRIER (BDE)**

Moved to Section 704 of the Supplemental Specifications and also pages 129 – 130 of this booklet