

# **STREET and UTILITY REPAIRS**



## **WORK AREA PROTECTION GUIDE**



# Street and Utility Repairs Work Area Protection Guide

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## **INTRODUCTION:**

This booklet was prepared to be used as a general guide by City, utility, and contractor construction crews during work operations on City right-of-ways and streets open to traffic. City Capital Improvement Projects (CIP) may include different standards within the contract documents, i.e. Illinois Department of Transportation (IDOT), etc.

The information contained within this document is consistent with the requirements of the Illinois Manual on Uniform Traffic Control Devices for streets and highways for work area protection on urban two-lane and multi-lane roads. This booklet is a guide that may not apply to long-term closings or other special circumstances and is not a substitute for the judgment of those responsible for work site safety. This document suggests procedures that should provide a reasonable level of safety; however, application of these guidelines cannot guarantee the safety of every work site. Each worker and supervisor should, therefore, be alert for any circumstance which could require procedures different from those included in this guide. Special attention should also be given to City Ordinances and procedures and to State requirements when work is being done on highways under the jurisdiction of the IDOT.

Properly used, work area protection helps prevent injury to employees and the public. Proper planning is essential in every job so that it is executed in a safe and orderly manner with a minimum of interference with the motorists.

**NOTE:** If the observed speed of the traffic is greater than the posted speed limit, the work zone set-up should reflect the greater speed. Each job site may dictate more traffic control than listed in this book.

## **GENERAL INFORMATION:**

1. Any street closure and any arterial lane closure require a Press Release and public notification (see Appendix A-1 for procedure).
2. Whenever possible, the work site on a two-lane street or highway shall be confined to one traffic lane leaving the opposite lane open to traffic.
3. Whenever possible, work vehicles shall be parked on the same side of the street as the job site.
4. Whenever possible, workers shall remove themselves from the area of the work zone impacted by traffic.
5. Work vehicles may be used as an additional barricade with the flasher light lit, but not as a substitute for any work area protection that may be called for.

6. Under certain field conditions such as hills, crossroads, curves, driveways, etc., the spacing of work area protection should be adjusted as necessary.
7. All employees working on the job site along highly traveled roads should wear high visibility vests.
8. Flaggers shall wear high visibility vest when directing traffic.
9. Flaggers shall use the proper traffic control sign when directing traffic.
10. When two flaggers are necessary, they shall be in direct communication with each other at all times either by sight or radio communication.
11. When there is no work in progress and the flagger is not required, the "FLAGGER SYMBOL" Sign should be removed.
12. Remove or cover all signs or traffic control devices that do not apply to existing conditions. For example, if work is not being performed, the warning signs should either be taken down or covered.
13. When openings in or near the sidewalk are necessary, barricades should be properly placed so that anyone passing by would not inadvertently fall into the excavation.
14. All excavations or work that present a hazard, or must be left open overnight, shall be properly barricaded with advance warning and lighted barricades for the protection of the public (see Appendix A for overnight requirements).

## **CHANNELIZING DEVICES**

Listed below is a summary of the requirements for each type of allowable channelizing device. Different traffic control arrangements will necessitate varying combinations of the following equipment. Different device requirements are necessary for day and night applications. For a comprehensive description of channelization device requirements, please refer to Appendix B of this guide, "Manual on Uniform Traffic Control Devices, Channelizing Device Requirements." Channelization devices shall be maintained to an acceptable level per the IDOT "Quality Standard for Work Zone Traffic Control Devices". *See common examples included at the end of this Introduction Section.*

1. Cones. Cones shall be predominantly orange and shall be made of a material that can be struck without causing damage to the impacting vehicle. For daytime and low-speed roadways, cones shall be not less than 450 mm (18 inches) in height. When cones are used on freeways and other high-speed highways or at night on all highways, or when more conspicuous guidance is needed, cones shall be a minimum of 700 mm (28 inches) in height.

For nighttime use, cones shall be retroreflective or equipped with lighting devices for maximum visibility. Retroreflectorization of cones that are 700 to 900 mm (28 to 36 inches) in height shall be provided by a 150 mm (6 inch) wide white band located 75 to 100 mm (3 to 4 inches) from the top of the cone and an additional 100-mm (4 inch) wide white band located approximately 50 mm (2 inches) below the 150 mm (6 inch) band.

Retroreflectorization of cones that are more than 900 mm (36 inches) in height shall be provided by horizontal, circumferential, alternating orange and white retroreflective stripes that are 100 to 150 mm (4 to 6 inches) wide. Each cone shall have a minimum of two orange and two white stripes with the top stripe being orange. Any nonretroreflective spaces between the orange and white stripes shall not exceed 75 mm (3 inches) in width.

2. Tubular Markers. Tubular markers shall be predominantly orange and shall be not less than 450 mm (18 inches) high and 50 mm (2 inches) wide facing road users. They shall be made of a material that can be struck without causing damage to the impacting vehicle.

Tubular markers shall be a minimum of 700 mm (28 inches) in height when they are used on freeways and other high-speed highways, on all highways during nighttime, or whenever more conspicuous guidance is needed.

For nighttime use, tubular markers shall be retroreflectorized. Retroreflectorization of 700 mm (28 inches) or larger tubular markers shall be provided by two 75 mm (3 inch) wide white bands placed a minimum of 50 mm (2 inches) from the top, with a maximum of 150 mm (6 inches) between the bands.

3. Vertical Panels. Vertical panels shall be 200 to 300 mm (8 to 12 inches) in width and at least 600 mm (24 inches) in height. They shall have orange and white diagonal stripes and be retroreflectorized.

Vertical panels shall be mounted with the top a minimum of 900 mm (36 inches) above the roadway. Where the height of the vertical panel itself is 900 mm (36 inches) or greater, a panel stripe width of 150 mm (6 inches) shall be used.

Markings for vertical panels shall be alternating orange and white retroreflective stripes, sloping downward at an angle of 45 degrees in the direction vehicular traffic is to pass. Vertical panels used on freeways, expressways, and other high-speed roadways shall have a minimum of 169,000 mm<sup>2</sup> (270 inches<sup>2</sup>) retroreflective area facing vehicular traffic.

4. Drums. Drums used for road user warning or channelization shall be constructed of lightweight, deformable materials. They shall be a minimum of 900 mm (36 inches) in height and have at least a 450 mm (18 inch) minimum width regardless of orientation. Metal drums shall not be used. The markings on drums shall be horizontal, circumferential, alternating orange and white retroreflective stripes 100 to 150 mm (4 to 6 inches) wide. Each drum shall have a minimum of two orange and two white stripes with the top stripe being orange. Any nonretroreflectorized spaces between the horizontal orange and white stripes shall not exceed 75 mm (3 inches) wide. Drums shall have closed tops that will not allow collection of construction debris or other debris.
5. Type I, II, or III Barricades. Stripes on barricade rails shall be alternating orange and white retroreflective stripes sloping downward at an angle of 45 degrees in the direction road users are to pass. Except as noted in the Option, the stripes shall be 150 mm (6 inches) wide.

The minimum length for Type I and Type II barricades shall be 600 mm (24 inches) and the minimum length for Type III barricades shall be 1,200 mm (48 inches). Each barricade rail shall be 200 to 300 mm (8 to 12 inches) wide. Barricades used on freeways, expressways, and other

high-speed roadways shall have a minimum of 169,000 mm<sup>2</sup> (270 inches<sup>2</sup>) of retroreflective area facing road users.

Ballast shall not be placed on top of any striped rail. Barricades shall not be ballasted by nondeformable objects such as rocks or chunks of concrete. Ballast shall not extend into the accessible passage width of 1,500 mm (60 inches).

A sign shall be installed with appropriate legend concerning permissible use by local road users. Adequate visibility of the barricades from both directions shall be provided.

6. Direction Indicator Barricades. The direction indicator barricade shall consist of a one-direction large arrow sign mounted above a diagonal striped, horizontally aligned, retroreflective rail.

The one-direction large arrow sign shall be black on an orange background. The stripes on the bottom rail shall be alternating orange and white retroreflective stripes sloping downward at an angle of 45 degrees in the direction road users are to pass. The stripes shall be 100 mm (4 inches) wide. The one-direction large arrow sign shall be 600 x 300 mm (24 x 12 inches). The bottom rail shall have a length of 600 mm (24 inches) and a height of 200 mm (8 inches).

7. Temporary Traffic Barriers as Channelizing Devices. Temporary traffic barriers serving as TTC devices shall conform to requirements for such devices as set forth throughout Part 6.

Temporary traffic barriers shall not be used solely to channelize road users, but also to protect the work space. If used to channelize vehicular traffic, the temporary traffic barrier shall be supplemented with delineation, pavement markings, or channelizing devices for improved daytime and nighttime visibility.

8. IDOT – Quality Standard for Work Zone Traffic Control Devices. The following pages illustrate common examples of quality standards. The full standard can be obtained from the City Engineer or the IDOT web site at <http://www.dot.state.il.us/workzone/wztc2004r.pdf>

**Taper Length and Spacing for Channelizing Devices (cones, tubular markers, barrels, or Type II barricades):**

Speed Limit MPH	Taper Length per Lane Width in Feet			Number of Cones	Spacing of Cones Along Taper in Feet
	10	11	12		
25	105	115	125	6	25
30	150	165	180	7	30
35	205	225	245	8	35
40	270	295	320	9	40
45	450	495	540	13	45
50	500	550	600	13	50
55	550	605	660	13	55

1. Note: Taper length may be modified to provide access to side streets.
2. Note: Spacing for cones on tapers for one-lane, two-way roadways should be at 20-foot spacing regardless of the speed. High traffic areas may require closer spacing (i.e., 5 to 10 feet).



**Sign Size Designation Guidelines:**

Posted Speed Limit	Class of Road		
	2-Lane	Multi-Lane	IDOT
40 and below	36"	36"	48"
45 and above	48"	48"	48"

**Typical Sign Spacing Distances:**

**Table 6H-3. Meaning of Letter Codes on Typical Application Diagrams**

Road Type	Distance Between Signs**		
	A	B	C
Urban (low speed)*	30 (100)	30 (100)	30 (100)
Urban (high speed)*	100 (350)	100 (350)	100 (350)
Rural	150 (500)	150 (500)	150 (500)
Expressway/Freeway	300 (1,000)	450 (1,500)	800 (2,640)

\*Speed category to be determined by highway agency.

\*\*Distances are shown in meters (feet). The column headings A, B, and C are the dimensions shown in Figures 6H-1 through 6H-48. The A dimension is the distance from the transition or point of restriction to the first sign. The B dimension is the distance between the first and second signs. The C dimension is the distance between the second and third signs. (The third sign is the first one in a three-sign series encountered by a driver approaching a TTC zone.)

**Typical Applications:** The following section shows traffic control diagrams for typical application.

**Acceptable** - This is an example of an **acceptable** sign. It is not new. There are abrasions on the surface but very little loss of lettering. There has been no touch-up of the lettering.



**Marginal** - This is an example of a sign with **marginal** acceptability. Of the many surface abrasions throughout the sign face, many are within the individual letters of the message. The sign surface is free of any residue. Although some color fading is evident, the background color and reflectivity are still apparent at night.



**Unacceptable** - This is an example of an **unacceptable** sign. Signs with asphalt splatter and/or cement slurry or any combination of missing and/or covered reflective material similar in area presented would also make a sign **unacceptable**. Some letters have a loss of more than 50%. There is noticeable color fading.



**Please Note:** Signs shall be fluorescent orange in color. Signs shall have retro-reflective sheeting. Signs with bends and dents that alter the size and/or shape of the sign are unacceptable. These photos are to be used as examples of the condition of the sheeting only.

**Acceptable** - This is an example of an **acceptable** panel. It is not new. There are several abrasions on the surface but very little loss of reflective sheeting. The orange is vivid and the stripes provide contrast that is clearly visible with low beam headlights at night.



**Marginal** - This is an example of a panel with **marginal** acceptability. There are numerous surface abrasions throughout the panel surface. Some color fading is evident; however, it is free of large areas of residue or missing reflective material. The colors, stripes, and reflectivity are visible and discernible with low beam headlights at night.



**Unacceptable** - This is an example of an **unacceptable** panel. The surface is marred over a high percentage of the panel area. There is noticeable loss of reflectivity and obvious color fading. Panels with asphalt splatter and/or cement slurry, or any combination of missing and/or covered reflective material similar in area presented would also make a panel **unacceptable**.



**Acceptable** - This is an example of an **acceptable** drum. It is not new. The sheeting has only minor tears and scratches. It will readily respond to washing.



**Marginal** – This is an example of a drum with **marginal** acceptability. The sheeting has numerous tears and scratches; however, it is free of large areas of residue or missing reflective material. Some fading is evident. It may not readily respond to washing.



**Unacceptable** - This is an example of an **unacceptable** drum. The large areas of missing reflective material make this drum **unacceptable**. Drums with asphalt splatter and/or cement slurry, or any combination of missing and/or covered reflective material similar in area presented would also make a drum **unacceptable**. Large areas of fading are evident. It will not respond to washing.

**Note: Fluorescent orange sheeting is required on drums**



**Acceptable** – These are examples of **acceptable** cones. Although they are not new the surfaces are free of punctures and abrasions, and the color is bright. The surfaces may be dirty, but will readily respond to washing.



**Marginal** – These are examples of cones with **marginal** acceptability. The surfaces are dirty and may not be readily cleaned due to abrasion and discoloration.



**Unacceptable** - This is an example of **unacceptable** cones. Punctures and large areas of staining make these an unlikely candidate for improvement. Also, large areas of asphalt splatter and/or cement slurry would make cones **unacceptable**.



**Acceptable** - This is an example of an **acceptable** paddle. It is not new. There are several abrasions on the surface but very little loss of lettering. There has been no touch-up of the lettering. The sheeting color is vivid with contrasting colors. The handle color is the same as the sheeting color. The paddle is 6' high from pavement to bottom of sign. The surface may be dirty but will readily respond to washing.

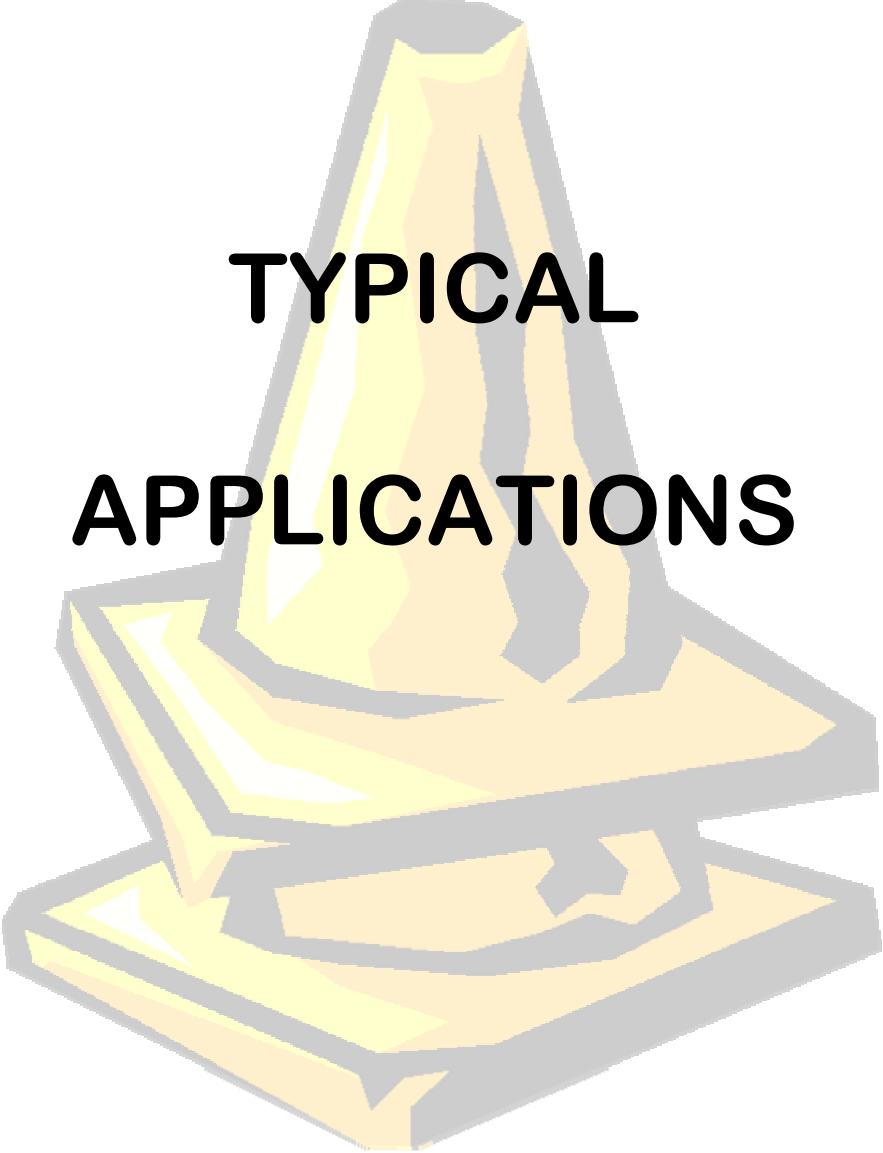


**Marginal** - This is an example of a paddle with **marginal** acceptability. Of the many surface abrasions throughout the paddle face, many are within the individual letters of the message. The paddle surface is free of any residue. Although some color fading is evident, the background color and reflectivity are still apparent at night. The surface is dirty and may not be readily cleaned due to abrasion and discoloration.



**Unacceptable** - This is an example of an **unacceptable** paddle. Paddles with asphalt splatter and/or cement slurry of an amount similar to the abrasions that are evident throughout the face of this sign are **unacceptable**. Some letters have a loss of more than 20 percent. Color fading is noticeable.



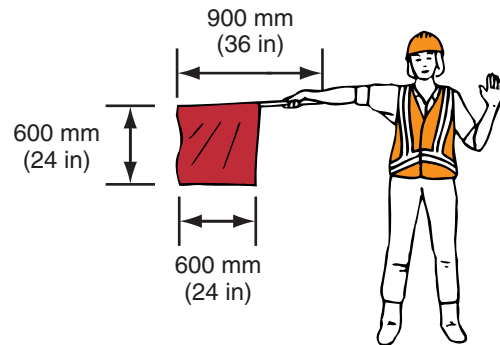


# **TYPICAL APPLICATIONS**

**Figure 6E-1. Use of Hand-Signaling Devices by Flaggers**

**PREFERRED METHOD  
STOP/SLOW Paddle**

**EMERGENCY SITUATIONS ONLY  
Red Flag**



**TO STOP TRAFFIC**























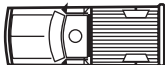
**TO LET  
TRAFFIC PROCEED**



**TO ALERT AND  
SLOW TRAFFIC**



**Table 6H-2. Meaning of Symbols on Typical Application Diagrams**

	Arrow panel
	Arrow panel support or trailer (shown facing down)
	Changeable message sign or support trailer
	Channelizing device
	Crash Cushion
	Direction of temporary traffic detour
	Direction of traffic
	Flagger
	High level warning device (Flag tree)
	Luminaire
	Pavement markings that should be removed for a long term project
	Sign (shown facing left)
	Surveyor
	Temporary barrier
	Temporary barrier with warning lights
	Traffic or Pedestrian signal
	Truck mounted attenuator
	Type III Barricade
	Warning lights
	Work space
	Work vehicle

### Notes for Figure 6H-3—Typical Application 3

#### Work on Shoulders

**Guidance:**

1. A SHOULDER WORK sign should be placed on the left side of the roadway for a divided or one-way street only if the left shoulder is affected.

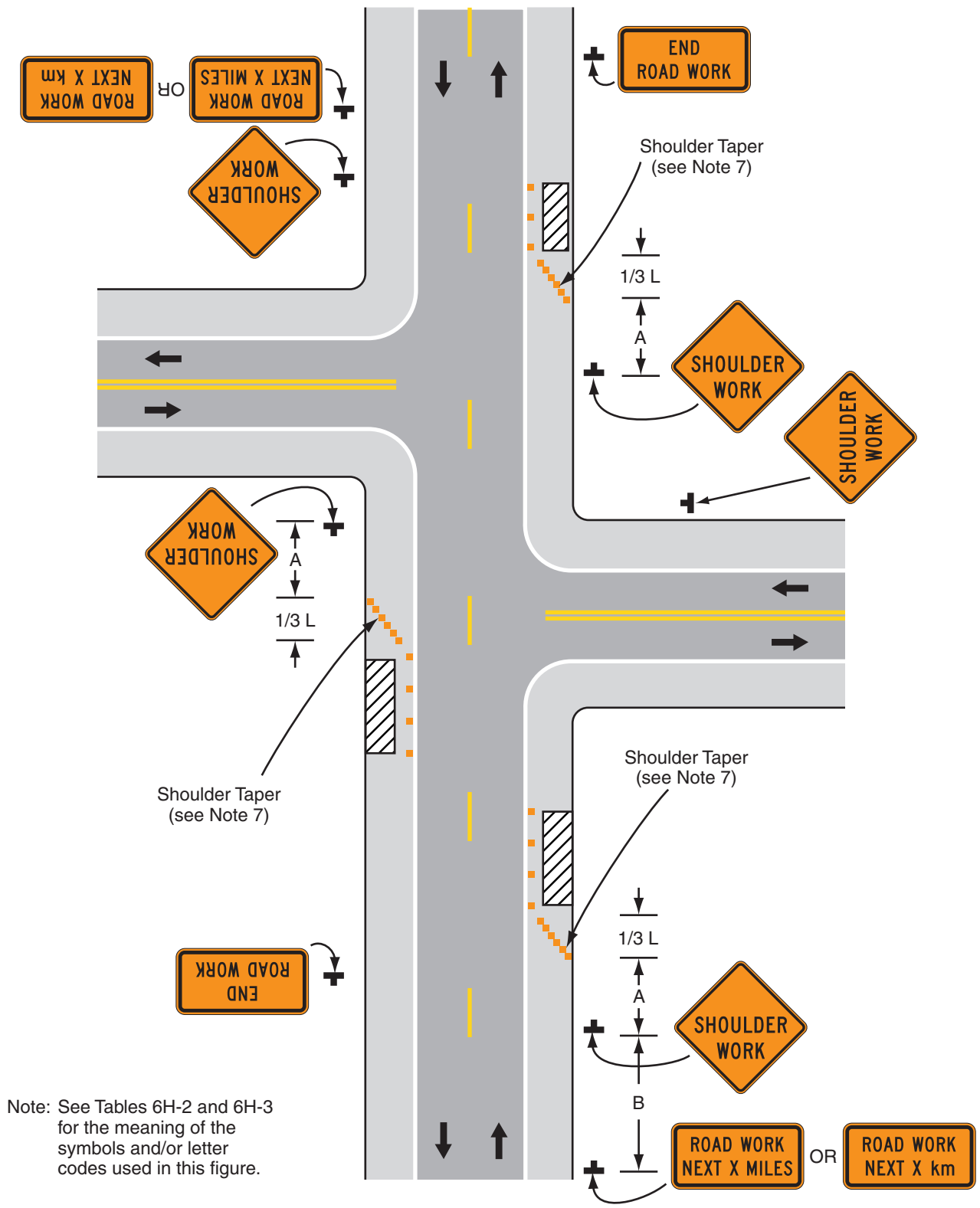
**Option:**

2. The Workers symbol signs may be used instead of SHOULDER WORK signs.
3. The SHOULDER WORK AHEAD sign on an intersecting roadway may be omitted where drivers emerging from that roadway will encounter another advance warning sign prior to this activity area.
4. For short-duration operations of 60 minutes or less, all signs and channelizing devices may be eliminated if a vehicle with activated high-intensity rotating, flashing, oscillating, or strobe lights is used.
5. Vehicle hazard warning signals may be used to supplement high-intensity rotating, flashing, oscillating, or strobe lights.

**Standard:**

6. **Vehicle hazard warning signals shall not be used instead of the vehicle's high-intensity rotating, flashing, oscillating, or strobe lights.**
7. **When paved shoulders having a width of 2.4 m (8 ft) or more are closed, at least one advance warning sign shall be used. In addition, channelizing devices shall be used to close the shoulder in advance to delineate the beginning of the work space and direct vehicular traffic to remain within the traveled way.**

**Figure 6H-3. Work on Shoulders (TA-3)**



**Typical Application 3**

**Notes for Figure 6H-4—Typical Application 4**  
**Short-Duration or Mobile Operation on Shoulder**

**Guidance:**

1. In those situations where multiple work locations within a limited distance make it practical to place stationary signs, the distance between the advance warning sign and the work should not exceed 8 km (5 mi).
2. In those situations where the distance between the advance signs and the work is 3.2 km (2 mi) to 8 km (5 mi), a Supplemental Distance plaque should be used with the ROAD WORK AHEAD sign.

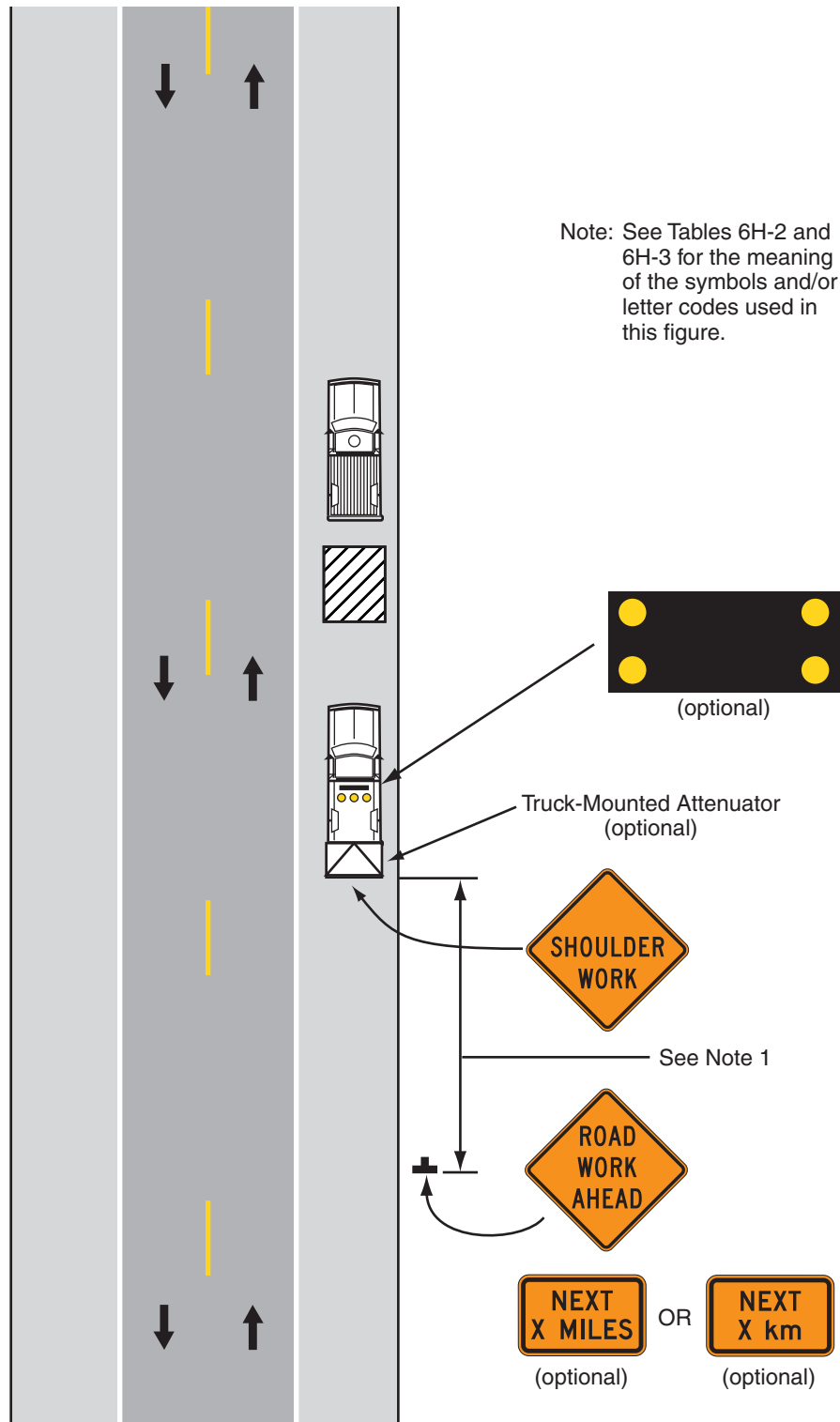
**Option:**

3. The ROAD WORK NEXT XX km (MILES) sign may be used instead of the ROAD WORK AHEAD sign if the work locations occur over a distance of more than 3.2 km (2 mi).
4. Warning signs may be omitted when the work vehicle displays high-intensity rotating, flashing, oscillating, or strobe lights if the distance between work locations is 1.6 km (1 mile) or more, and if the work vehicle travels at vehicular traffic speeds between locations.
5. Vehicle hazard warning signals may be used to supplement high-intensity rotating, flashing, oscillating, or strobe lights.

**Standard:**

6. **Vehicle hazard warning signals shall not be used instead of the vehicle's high-intensity rotating, flashing, oscillating, or strobe lights.**
7. **If an arrow panel is used for an operation on the shoulder, the caution mode shall be used.**

**Figure 6H-4. Short-Duration or Mobile Operation on Shoulder (TA-4)**



**Typical Application 4**

**Notes for Figure 6H-6—Typical Application 6**  
**Shoulder Work with Minor Encroachment**

**Guidance:**

1. All lanes should be a minimum of 3 m (10 ft) in width as measured to the near face of the channelizing devices.
2. The treatment shown should be used on a minor road having low speeds. For higher-speed traffic conditions, a lane closure should be used.

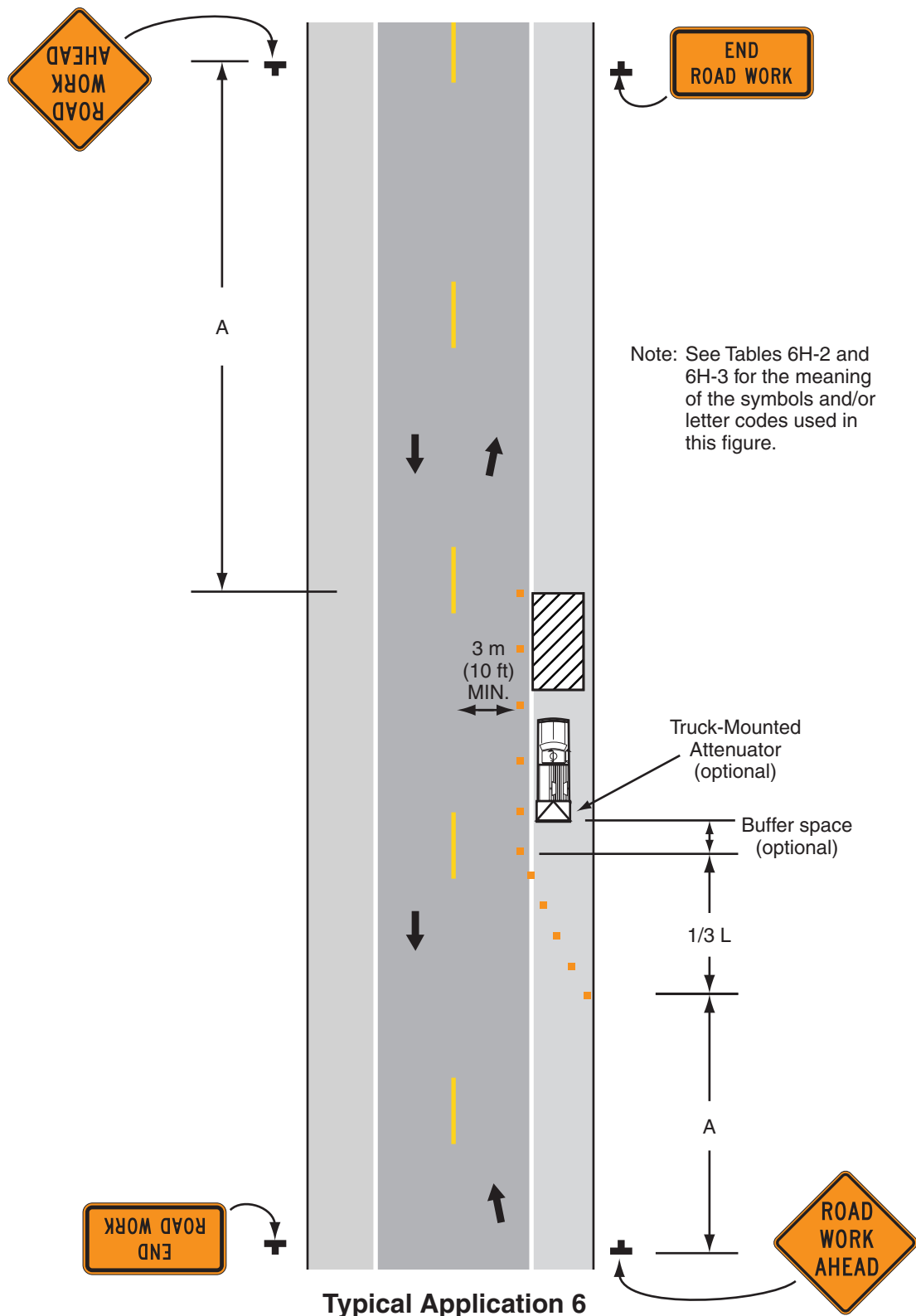
**Option:**

3. For short-term use on low-volume, low-speed roadways with vehicular traffic that does not include longer and wider heavy commercial vehicles, a minimum lane width of 2.7 m (9 ft) may be used.
4. Where the opposite shoulder is suitable for carrying vehicular traffic and of adequate width, lanes may be shifted by use of closely spaced channelizing devices, provided that the minimum lane width of 3 m (10 ft) is maintained.
5. Additional advance warning may be appropriate, such as a ROAD NARROWS sign.
6. Temporary traffic barriers may be used along the work space.
7. The shadow vehicle may be omitted if a taper and channelizing devices are used.
8. A truck-mounted attenuator may be used on the shadow vehicle.
9. For short-duration work, the taper and channelizing devices may be omitted if a shadow vehicle with activated high-intensity rotating, flashing, oscillating, or strobe lights is used.
10. Vehicle hazard warning signals may be used to supplement high-intensity rotating, flashing, oscillating, or strobe lights.

**Standard:**

- 11. Vehicle hazard warning signals shall not be used instead of the vehicle's high-intensity rotating, flashing, oscillating, or strobe lights.**

**Figure 6H-6. Shoulder Work with Minor Encroachment (TA-6)**



## Notes for Figure 6H-10—Typical Application 10

### Lane Closure on Two-Lane Road Using Flaggers

**Option:**

1. For low-volume situations with short work zones on straight roadways where the flagger is visible to road users approaching from both directions, a single flagger, positioned to be visible to road users approaching from both directions, may be used (see Chapter 6E).
2. The ROAD WORK AHEAD and the END ROAD WORK signs may be omitted for short-duration operations.
3. Flashing warning lights and/or flags may be used to call attention to the advance warning signs. A BE PREPARED TO STOP sign may be added to the sign series.

**Guidance:**

4. The buffer space should be extended so that the two-way traffic taper is placed before a horizontal (or crest vertical) curve to provide adequate sight distance for the flagger and a queue of stopped vehicles.

**Standard:**

- 5. At night, flagger stations shall be illuminated, except in emergencies.**

**Guidance:**

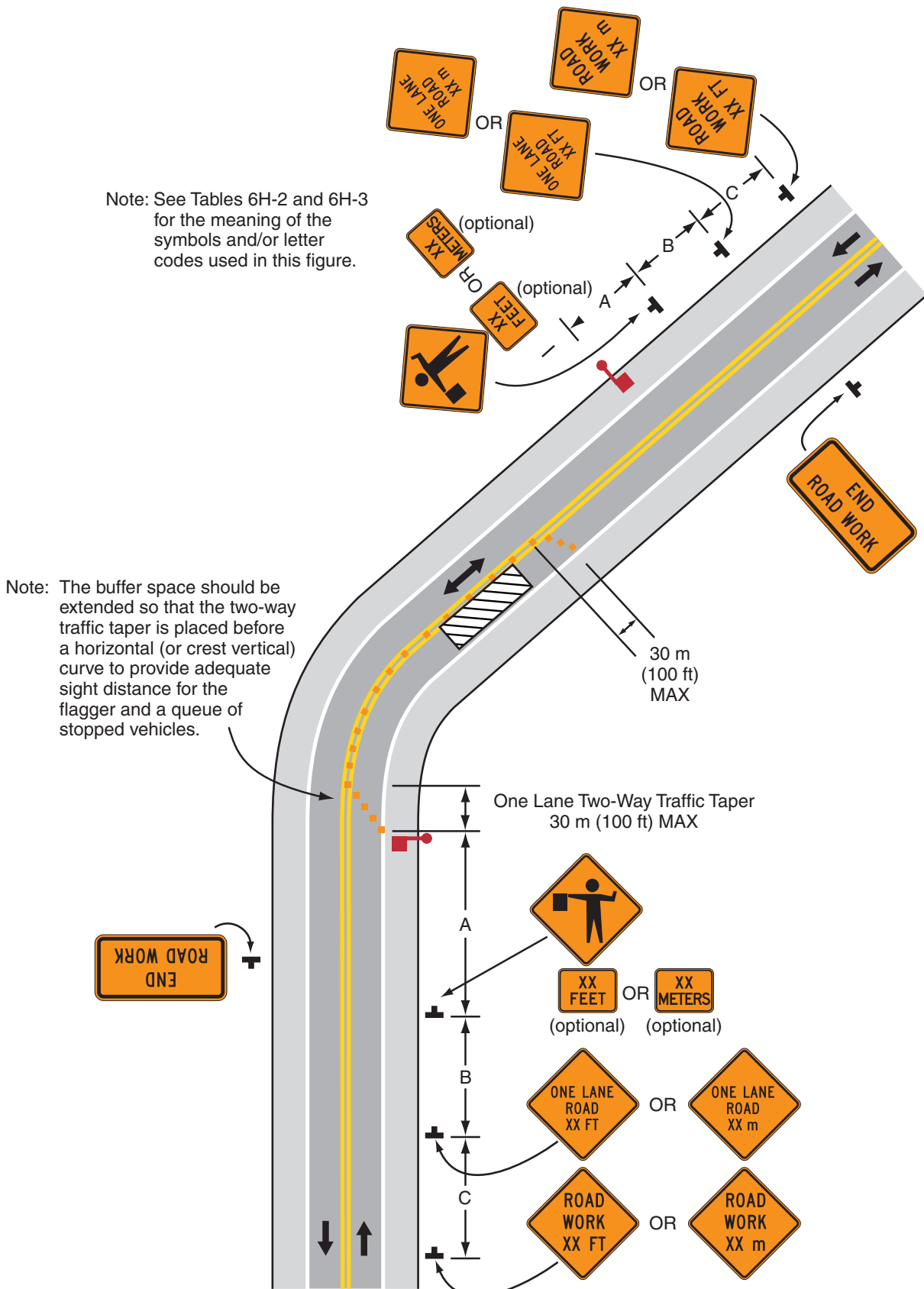
6. When used, the BE PREPARED TO STOP sign should be located between the Flagger sign and the ONE LANE ROAD sign.
7. When a highway-rail grade crossing exists within or upstream of the transition area and it is anticipated that queues resulting from the lane closure might extend through the highway-rail grade crossing, the TTC zone should be extended so that the transition area precedes the highway-rail grade crossing.
8. When a highway-rail grade crossing equipped with active warning devices exists within the activity area, provisions should be made for keeping flaggers informed as to the activation status of these warning devices.
9. When a highway-rail grade crossing exists within the activity area, drivers operating on the left side of the normal centerline should be provided with comparable warning devices as for drivers operating on the right side of the normal centerline.
10. Early coordination with the railroad company should occur before work starts.

**Option:**

11. A flagger or a uniformed law enforcement officer may be used at the highway-rail grade crossing to minimize the probability that vehicles are stopped within 4.6 m (15 ft) of the highway-rail grade crossing, measured from both sides of the outside rails.



**Figure 6H-10. Lane Closure on Two-Lane Road Using Flaggers (TA-10)**



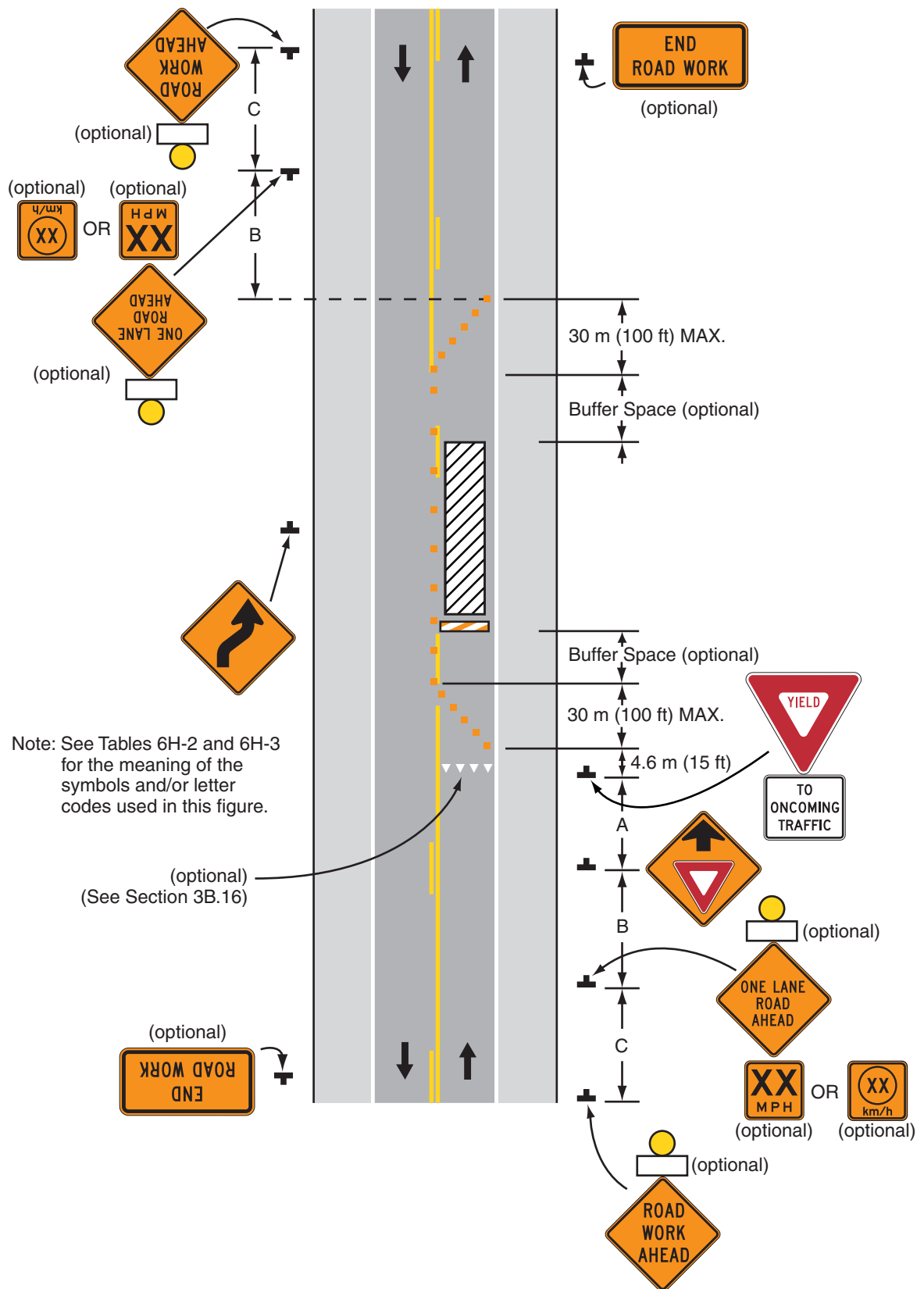
**Typical Application 10**

**Notes for Figure 6H-11—Typical Application 11**  
**Lane Closure on Two-Lane Road with Low Traffic Volumes**

Option:

1. This TTC zone application may be used as an alternate to the TTC application shown in Figure 6H-10 (using flaggers) when the following conditions exist:
  - a. Vehicular traffic volume is such that sufficient gaps exist for vehicular traffic that must yield.
  - b. Road users from both directions are able to see approaching vehicular traffic through and beyond the work site and have sufficient visibility of approaching vehicles.
2. The Type B flashing warning lights may be placed on the ROAD WORK AHEAD and the ONE LANE ROAD AHEAD signs whenever a night lane closure is necessary.

**Figure 6H-11. Lane Closure on Two-Lane Road with Low Traffic Volumes**



**Typical Application 11**

**Notes for Figure 6H-13—Typical Application 13**  
**Temporary Road Closure**

Support:

1. Conditions represented are a planned closure not exceeding 20 minutes during the daytime.

**Standard:**

2. **A flagger or uniformed law enforcement officer shall be used for this application. The flagger, if used for this application, shall follow the procedures noted in Sections 6E.04 and 6E.05.**

Guidance:

3. The uniformed law enforcement officer, if used for this application, should follow the procedures noted in Sections 6E.04 and 6E.05.

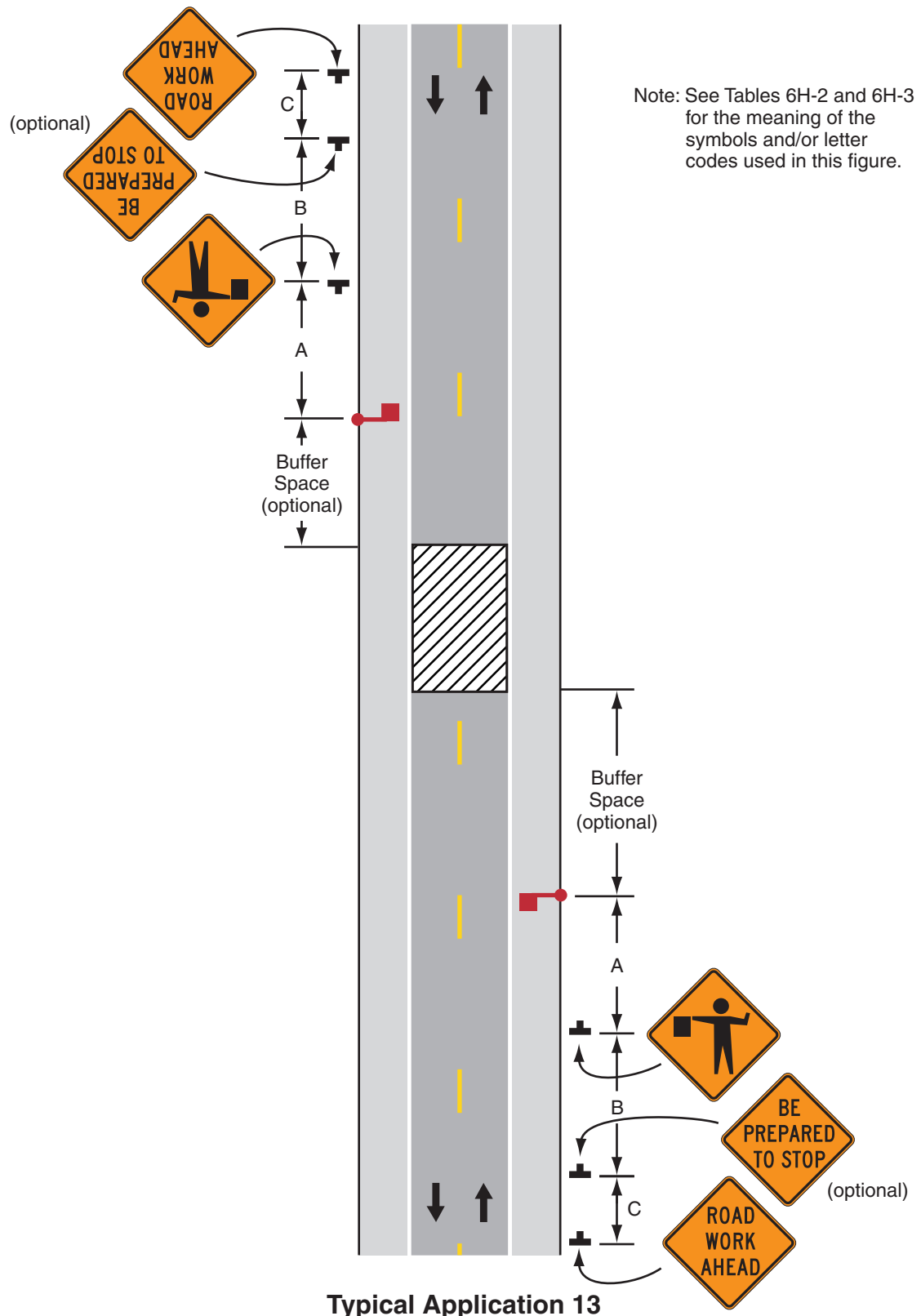
Option:

4. A BE PREPARED TO STOP sign may be added to the sign series.

Guidance:

5. When used, the BE PREPARED TO STOP sign should be located before the Flagger symbol sign.

Figure 6H-13. Temporary Road Closure (TA-13)



**Notes for Figure 6H-15—Typical Application 15**  
**Work in Center of Road with Low Traffic Volumes**

**Guidance:**

1. The lanes on either side of the center work space should have a minimum width of 3 m (10 ft) as measured from the near edge of the channelizing devices to the edge of pavement or the outside edge of paved shoulder.
2. Workers in the roadway should wear high-visibility safety apparel as described in Section 6D.03.

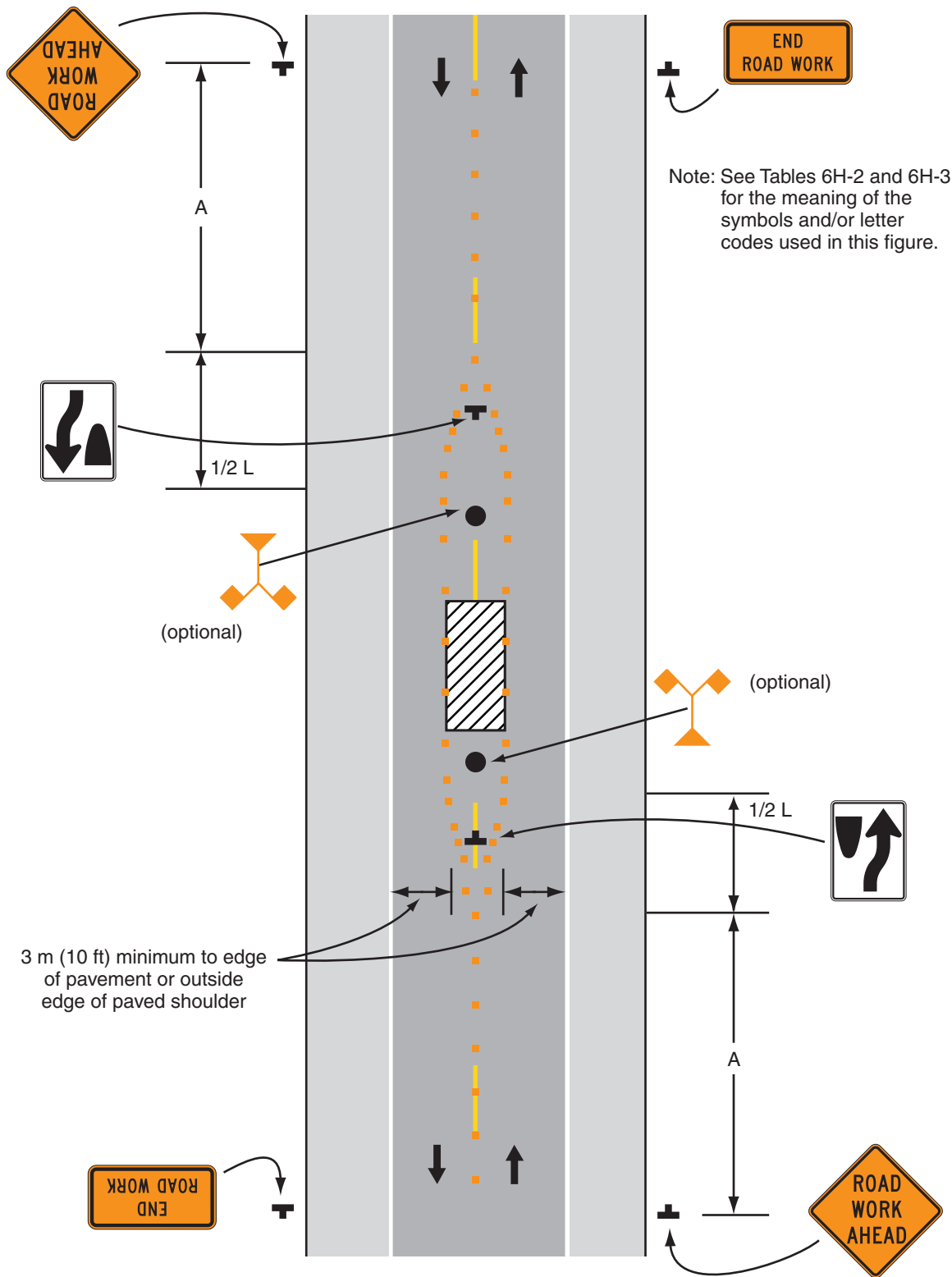
**Option:**

3. Flashing warning lights and/or flags may be used to call attention to the advance warning signs.
4. If the closure continues overnight, warning lights may be used on the channelizing devices.
5. A lane width of 2.7 m (9 ft) may be used for short-term stationary work on low-volume, low-speed roadways when motor vehicle traffic does not include longer and wider heavy commercial vehicles.
6. A work vehicle displaying high-intensity rotating, flashing, oscillating, or strobe lights may be used instead of the channelizing devices forming the tapers or the high-level warning devices.
7. Vehicle hazard warning signals may be used to supplement high-intensity rotating, flashing, oscillating, or strobe lights.

**Standard:**

8. **Vehicle hazard warning signals shall not be used instead of the vehicle's high-intensity rotating, flashing, oscillating, or strobe lights.**

**Figure 6H-15. Work in Center of Road with Low Traffic Volumes (TA-15)**



**Typical Application 15**

**Notes for Figure 6H-16—Typical Application 16**  
**Surveying Along Centerline of Road with Low Traffic Volumes**

**Guidance:**

1. Cones should be placed 150 mm (6 in) to 300 mm (12 in) on either side of the centerline.
2. When using metric units, spacing of channelizing devices should not exceed a distance in meters equal to 1/5 of the speed limit (km/h) when used for taper channelization and a distance in meters equal to 2/5 of the speed limit (km/h) when used for tangent channelization. When using English units, spacing of channelizing devices should not exceed a distance in feet equal to the speed limit (mph) when used for the taper channelization and a distance in feet of 2 times the speed limit (mph) when used for tangent channelization.
3. A flagger should be used to warn workers who cannot watch road users.
4. Workers in the roadway should wear high-visibility safety apparel as described in Section 6D.03.

**Standard:**

- 5. For surveying on the centerline of a high-volume road, one lane shall be closed using the information illustrated in Figure 6H-10.**

**Option:**

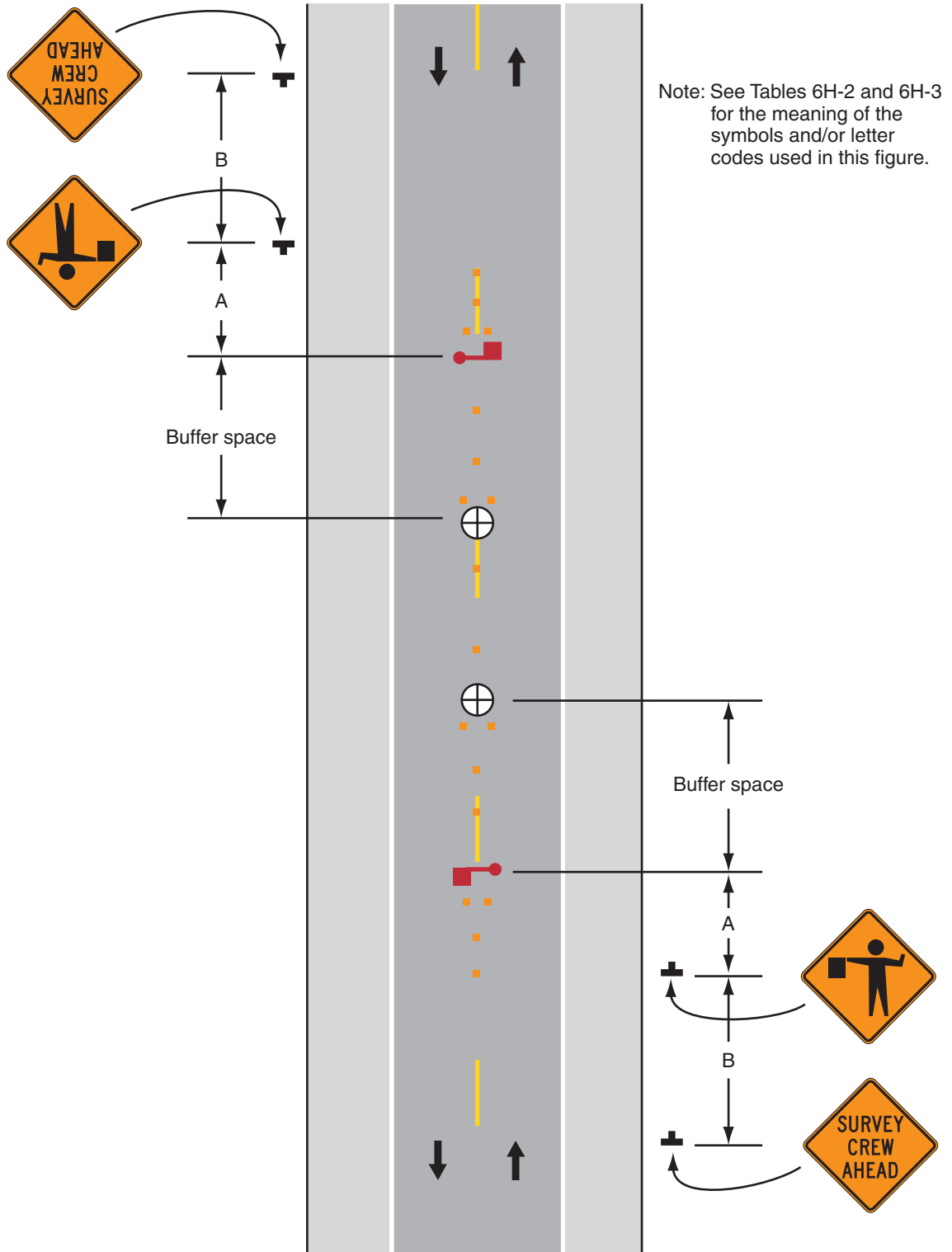
6. A high-level warning device may be used to protect a surveying device, such as a target on a tripod.
7. Cones may be omitted for a cross-section survey.
8. ROAD WORK AHEAD signs may be used in place of the SURVEY CREW AHEAD signs.
9. Flags may be used to call attention to the advance warning signs.
10. If the work is along the shoulder, the flagger may be omitted.
11. For a survey along the edge of the road or along the shoulder, cones may be placed along the edge line.
12. A BE PREPARED TO STOP sign may be added to the sign series.

**Guidance:**

13. When used, the BE PREPARED TO STOP sign should be located before the Flagger symbol sign.



**Figure 6H-16. Surveying Along Centerline of Road with Low Traffic Volumes (TA-16)**



**Typical Application 16**

**Notes for Figure 6H-17—Typical Application 17**  
**Mobile Operations on Two-Lane Road**

**Standard:**

1. **Vehicle-mounted signs shall be mounted in a manner such that they are not obscured by equipment or supplies. Sign legends on vehicle-mounted signs shall be covered or turned from view when work is not in progress.**
2. **Shadow and work vehicles shall display high-intensity rotating, flashing, oscillating, or strobe lights.**
3. **If an arrow panel is used, it shall be used in the caution mode.**

**Guidance:**

4. Where practical and when needed, the work and shadow vehicles should pull over periodically to allow vehicular traffic to pass.
5. Whenever adequate stopping sight distance exists to the rear, the shadow vehicle should maintain the minimum distance from the work vehicle and proceed at the same speed. The shadow vehicle should slow down in advance of vertical or horizontal curves that restrict sight distance.
6. The shadow vehicles should also be equipped with two high-intensity flashing lights mounted on the rear, adjacent to the sign.

**Option:**

7. The distance between the work and shadow vehicles may vary according to terrain, paint drying time, and other factors.
8. Additional shadow vehicles to warn and reduce the speed of oncoming or opposing vehicular traffic may be used. Law enforcement vehicles may be used for this purpose.
9. A truck-mounted attenuator may be used on the shadow vehicle or on the work vehicle.
10. If the work and shadow vehicles cannot pull over to allow vehicular traffic to pass frequently, a DO NOT PASS sign may be placed on the rear of the vehicle blocking the lane.

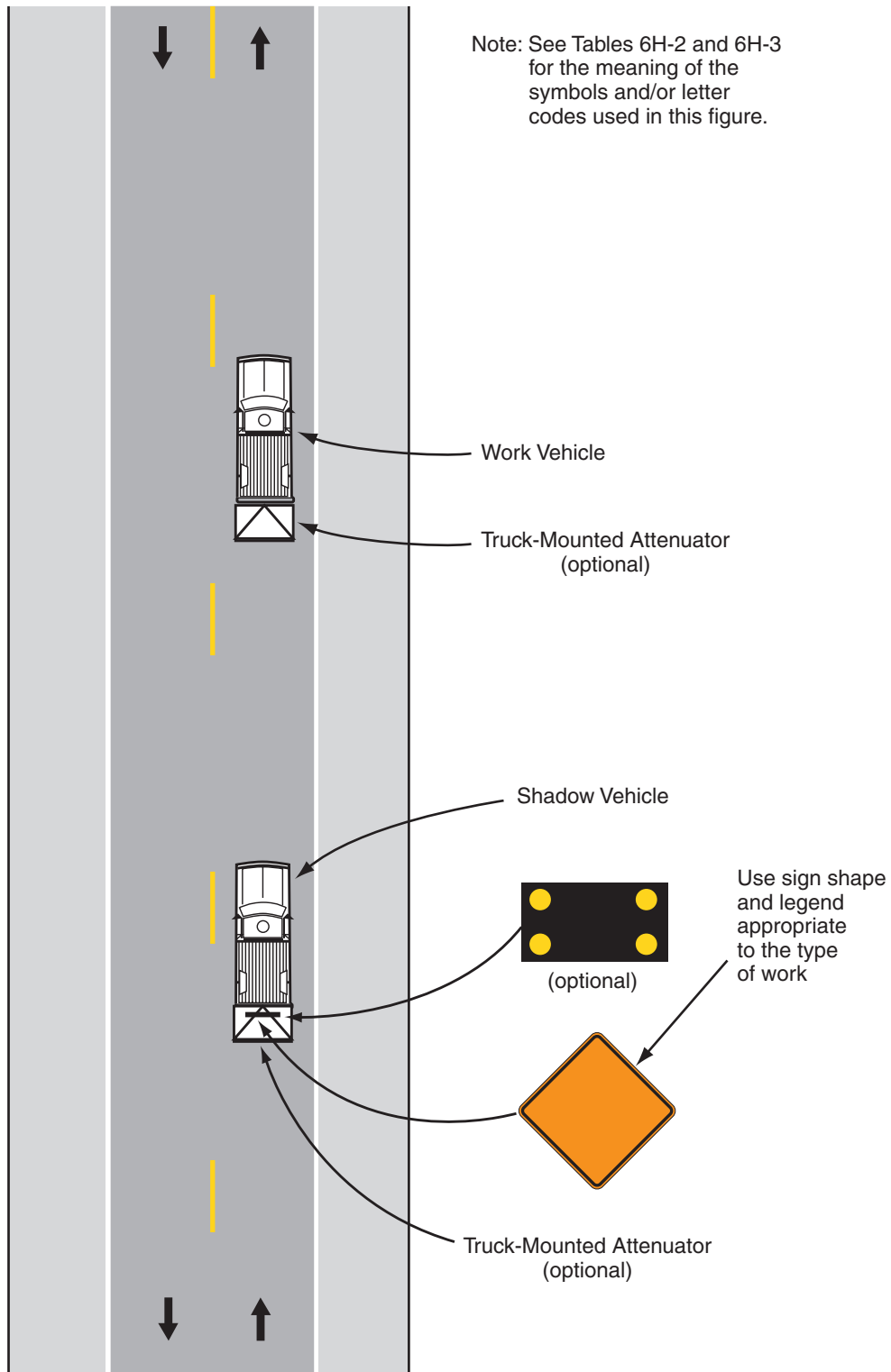
**Support:**

11. Shadow vehicles are used to warn motor vehicle traffic of the operation ahead.

**Standard:**

12. **Vehicle hazard warning signals shall not be used instead of the vehicle's high-intensity rotating, flashing, oscillating, or strobe lights.**

**Figure 6H-17. Mobile Operations on Two-Lane Road (TA-17)**



**Typical Application 17**

**Notes for Figure 6H-18—Typical Application 18**  
**Lane Closure on Minor Street**

**Standard:**

1. **This TTC shall be used only for low-speed facilities having low traffic volumes.**

Option:

2. Where the work space is short, where road users can see the roadway beyond, and where volume is low, vehicular traffic may be self-regulating.

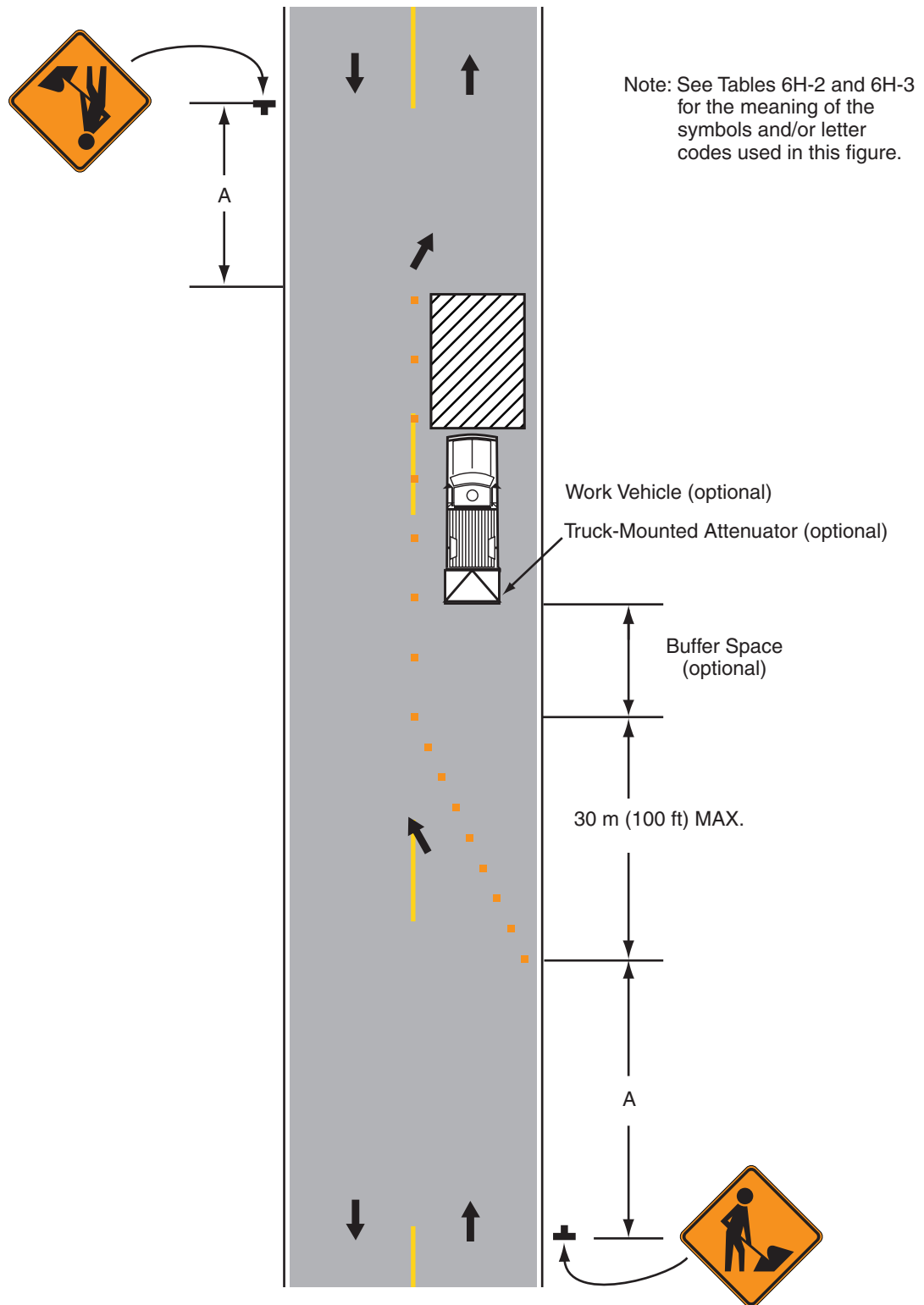
**Standard:**

3. **Where vehicular traffic cannot effectively self-regulate, one or two flaggers shall be used as illustrated in Figure 6H-10.**

Option:

4. Flashing warning lights and/or flags may be used to call attention to the advance warning signs.
5. A truck-mounted attenuator may be used on the work vehicle and the shadow vehicle.

**Figure 6H-18. Lane Closure on Minor Street (TA-18)**



**Typical Application 18**

**Notes for Figure 6H-19—Typical Application 19**  
**Detour for One Travel Direction**

**Guidance:**

1. This plan should be used for streets without posted route numbers.
2. On multi-lane streets, Detour signs with an Advance Turn Arrow should be used in advance of a turn.

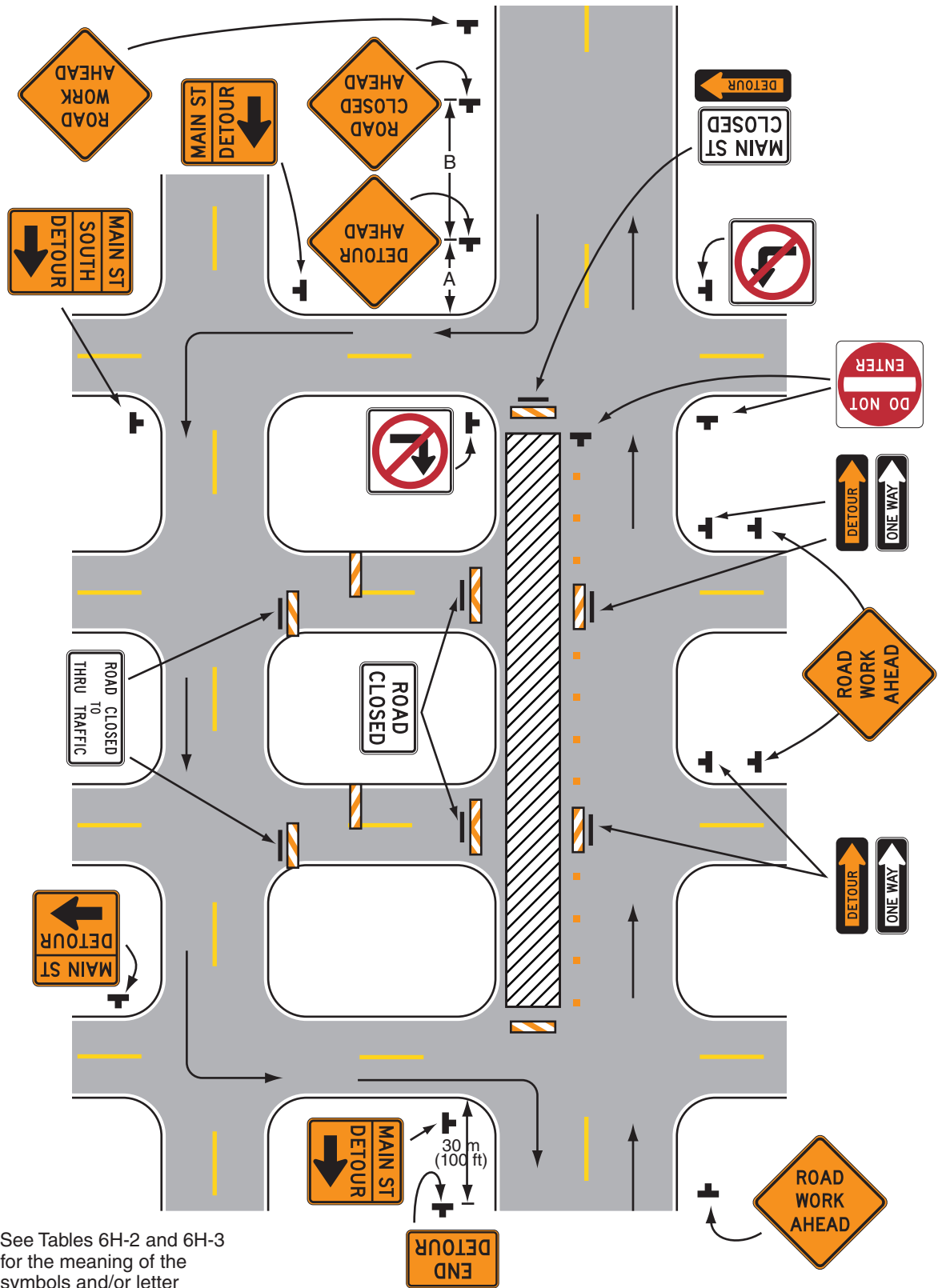
**Option:**

3. The STREET CLOSED legend may be used in place of ROAD CLOSED.
4. Additional DO NOT ENTER signs may be used at intersections with intervening streets.
5. Warning lights may be used on Type III Barricades.
6. Detour signs may be located on the far side of intersections.
7. A Street Name sign may be mounted with the Detour sign. The Street Name sign may be either white on green or black on orange.

**Standard:**

8. **When used, the Street Name sign shall be placed above the Detour sign.**

**Figure 6H-19. Detour for One Travel Direction (TA-19)**



Note: See Tables 6H-2 and 6H-3 for the meaning of the symbols and/or letter codes used in this figure.

**Typical Application 19**

**Notes for Figure 6H-20—Typical Application 20**  
**Detour for Closed Street**

**Guidance:**

1. This plan should be used for streets without posted route numbers.
2. On multi-lane streets, Detour signs with an Advance Turn Arrow should be used in advance of a turn.

**Option:**

3. Flashing warning lights and/or flags may be used to call attention to the advance warning signs.
4. Flashing warning lights may be used on Type III Barricades.
5. Detour signs may be located on the far side of intersections. A Detour sign with an advance arrow may be used in advance of a turn.
6. A Street Name sign may be mounted with the Detour sign. The Street Name sign may be either white on green or black on orange.

**Standard:**

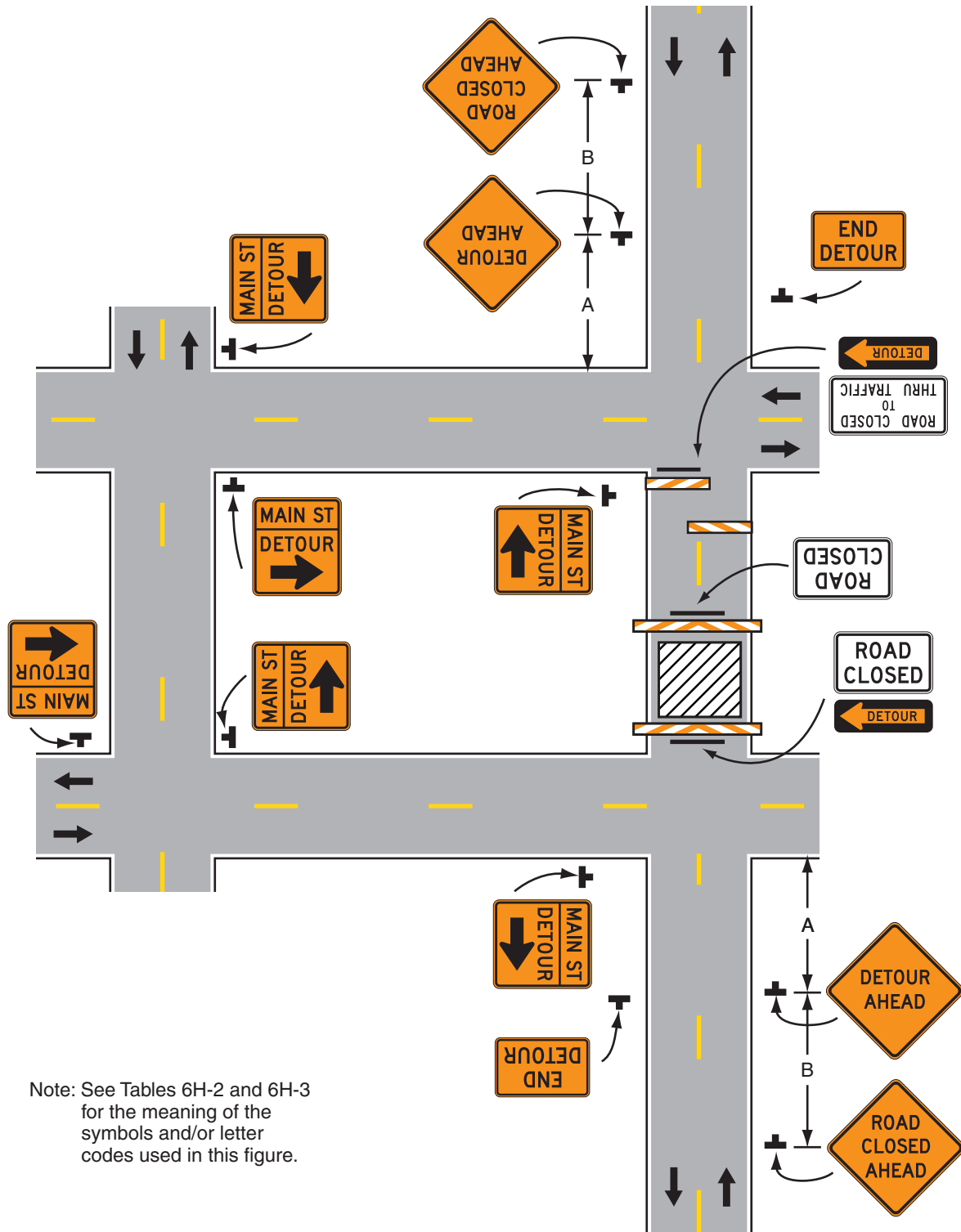
- 7. When used, the Street Name sign shall be placed above the Detour sign.**

**Support:**

8. See Figure 6H-9 for the information for detouring a numbered highway.



Figure 6H-20. Detour for Closed Street (TA-20)



Typical Application 20

**Notes for Figure 6H-21—Typical Application 21**  
**Lane Closure on Near Side of Intersection**

**Standard:**

- 1. The merging taper shall direct vehicular traffic into either the right or left lane, but not both.**

**Guidance:**

2. In this typical application, a left taper should be used so that right-turn movements will not impede through motor vehicle traffic. However, the reverse should be true for left-turn movements.
3. If the work space extends across a crosswalk, the crosswalk should be closed using the information and devices shown in Figure 6H-29.

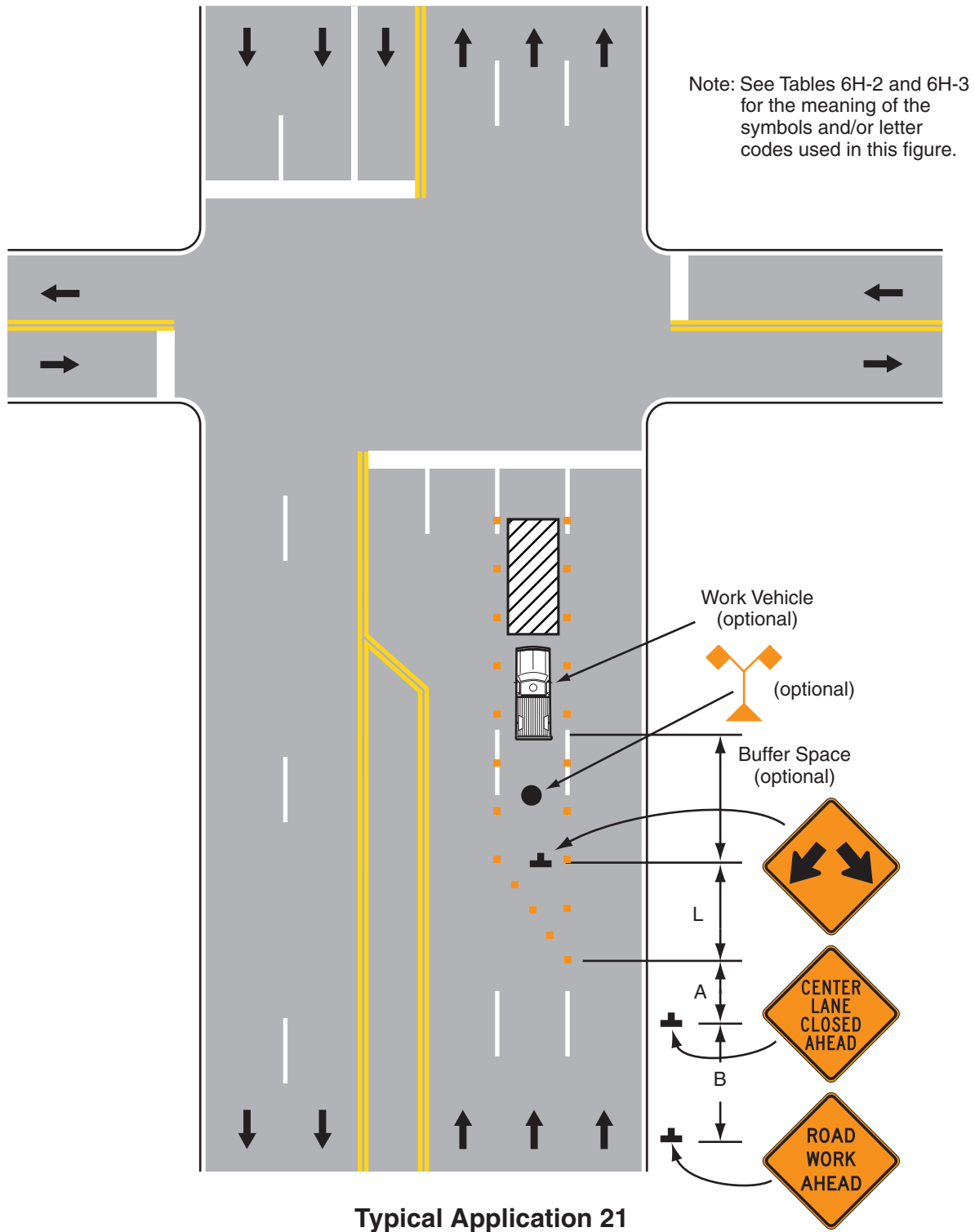
**Option:**

4. Flashing warning lights and/or flags may be used to call attention to the advance warning signs.
5. A shadow vehicle with a truck-mounted attenuator may be used.
6. A work vehicle with high-intensity rotating, flashing, oscillating, or strobe lights may be used with the high-level warning device.
7. Vehicle hazard warning signals may be used to supplement high-intensity rotating, flashing, oscillating, or strobe lights.

**Standard:**

- 8. Vehicle hazard warning signals shall not be used instead of the vehicle's high-intensity rotating, flashing, oscillating, or strobe lights.**

**Figure 6H-21. Lane Closure on Near Side of Intersection (TA-21)**



## **Notes for Figure 6H-22—Typical Application 22**

### **Right Lane Closure on Far Side of Intersection**

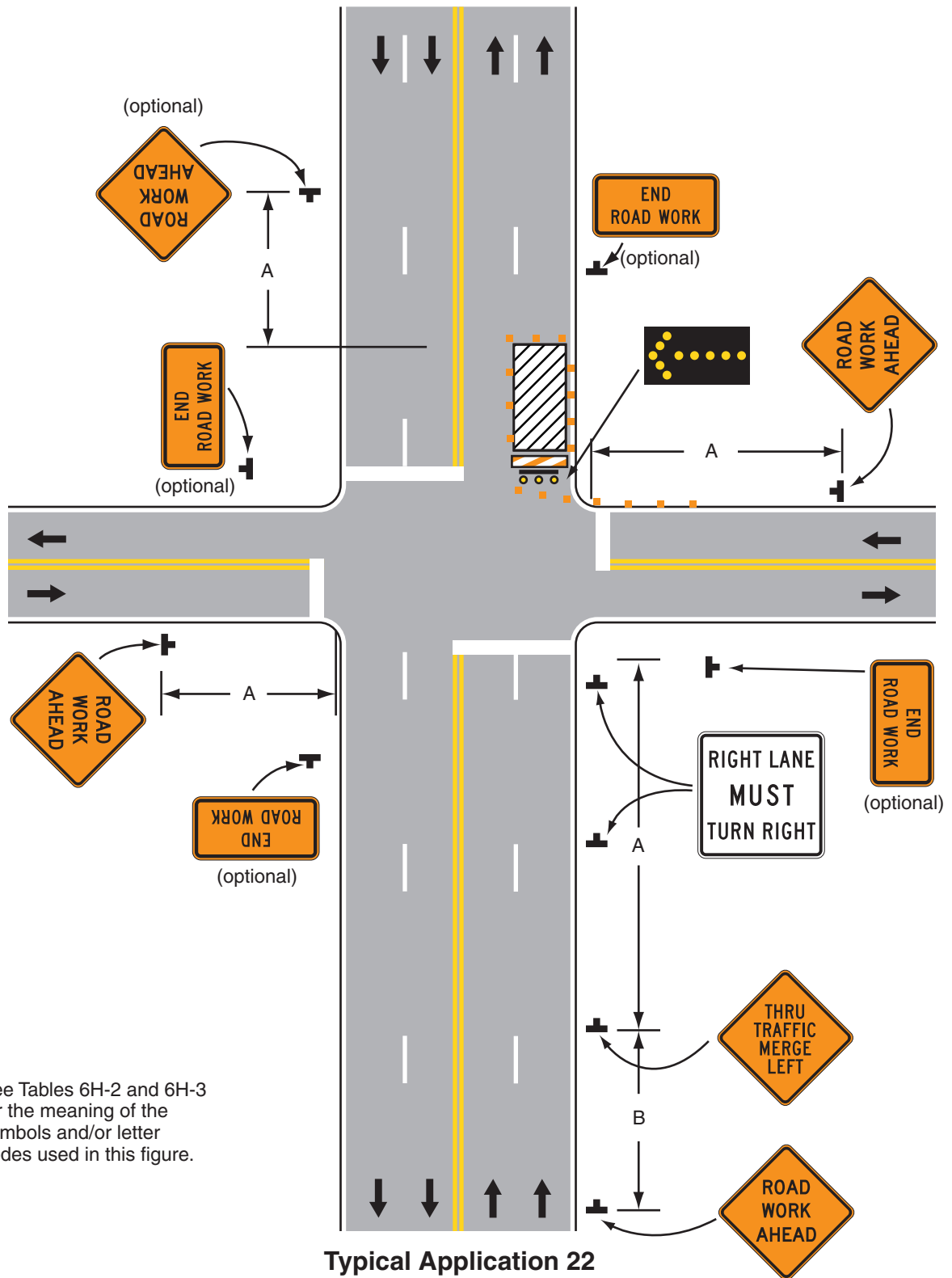
#### **Guidance:**

1. If the work space extends across a crosswalk, the crosswalk should be closed using the information and devices shown in Figure 6H-29.

#### **Option:**

2. The normal procedure is to close on the near side of the intersection any lane that is not carried through the intersection. However, when this results in the closure of a right lane having significant right turning movements, then the right lane may be restricted to right turns only, as shown. This procedure increases the through capacity by eliminating right turns from the open through lane.
3. For intersection approaches reduced to a single lane, left-turning movements may be prohibited to maintain capacity for through vehicular traffic.
4. Flashing warning lights and/or flags may be used to call attention to the advance warning signs.
5. Where the turning radius is large, it may be possible to create a right-turn island using channelizing devices or pavement markings.

**Figure 6H-22. Right Lane Closure on Far Side of Intersection (TA-22)**



Note: See Tables 6H-2 and 6H-3 for the meaning of the symbols and/or letter codes used in this figure.

**Notes for Figure 6H-23—Typical Application 23**  
**Left Lane Closure on Far Side of Intersection**

Guidance:

1. If the work space extends across a crosswalk, the crosswalk should be closed using the information and devices shown in Figure 6H-29.

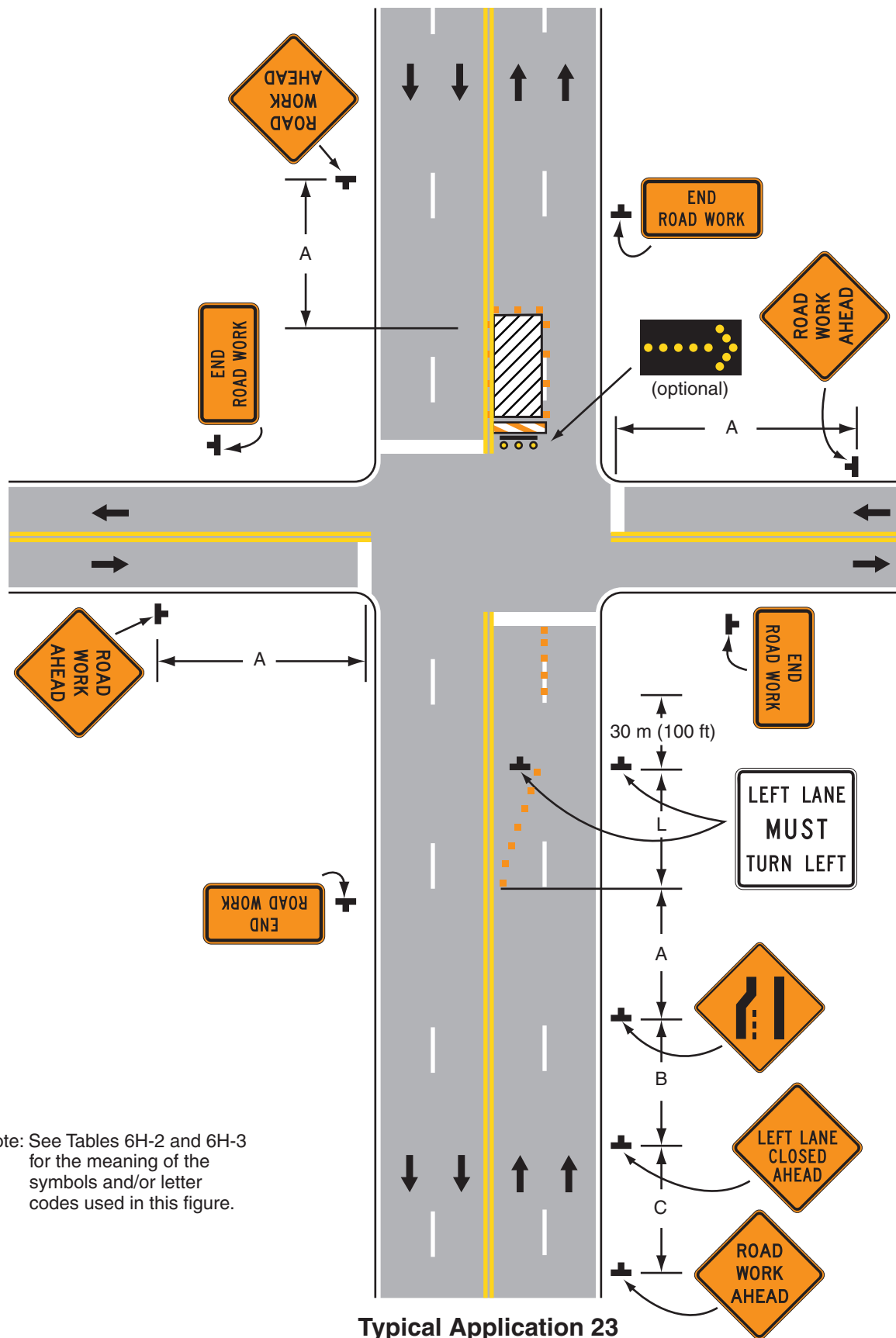
Option:

2. Flashing warning lights and/or flags may be used to call attention to the advance warning signs.
3. The normal procedure is to close on the near side of the intersection any lane that is not carried through the intersection. However, when this results in the closure of a left lane having significant left-turning movements, then the left lane may be reopened as a turn bay for left turns only, as shown.

Support:

4. By first closing off the left lane and then reopening it as a turn bay, an island is created with channelizing devices that allows the LEFT LANE MUST TURN LEFT sign to be repeated on the left adjacent to the lane that it controls.

**Figure 6H-23. Left Lane Closure on Far Side of Intersection (TA-23)**



Note: See Tables 6H-2 and 6H-3 for the meaning of the symbols and/or letter codes used in this figure.

**Typical Application 23**

### **Notes for Figure 6H-24—Typical Application 24 Half Road Closure on Far Side of Intersection**

#### **Guidance:**

1. If the work space extends across a crosswalk, the crosswalk should be closed using the information and devices shown in Figure 6H-29.
2. When turn prohibitions are implemented, two turn prohibition signs should be used, one on the near side and, space permitting, one on the far side of the intersection.

#### **Option:**

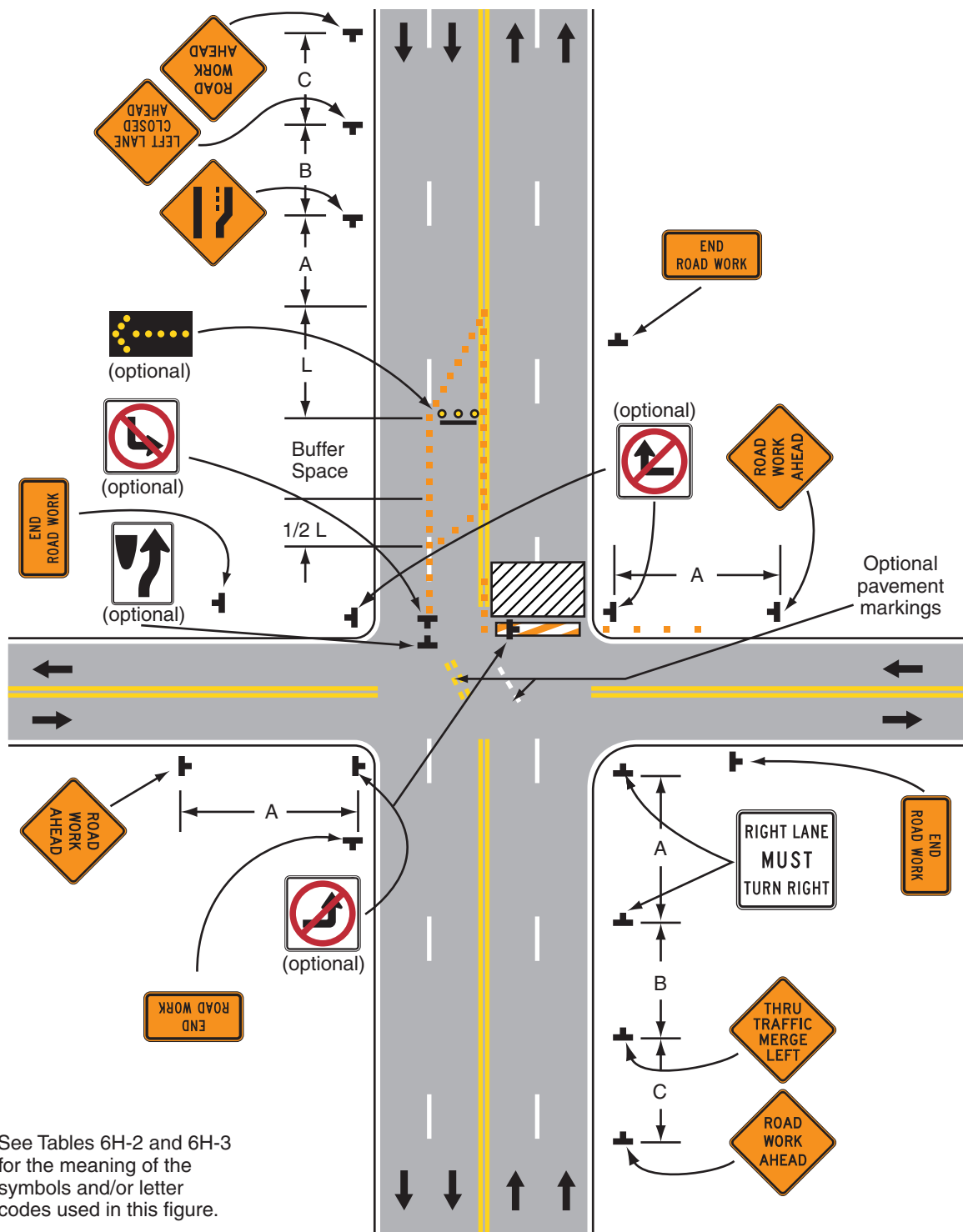
3. A buffer space may be used between opposing directions of vehicular traffic as shown in this application.
4. The normal procedure is to close on the near side of the intersection any lane that is not carried through the intersection. However, if there is a significant right-turning movement, then the right lane may be restricted to right turns only, as shown.
5. Where the turning radius is large, a right-turn island using channelizing devices or pavement markings may be used.
6. There may be insufficient space to place the back-to-back Keep Right sign and No Left Turn symbol signs at the end of the row of channelizing devices separating opposing vehicular traffic flows. In this situation, the No Left Turn symbol sign may be placed on the right and the Keep Right sign may be omitted.
7. For intersection approaches reduced to a single lane, left-turning movements may be prohibited to maintain capacity for through vehicular traffic.
8. Flashing warning lights and/or flags may be used to call attention to advance warning signs.
9. Temporary pavement markings may be used to delineate the travel path through the intersection.

#### **Support:**

10. Keeping the right lane open increases the through capacity by eliminating right turns from the open through lane.
11. A temporary turn island reinforces the nature of the temporary exclusive right-turn lane and enables a second RIGHT LANE MUST TURN RIGHT sign to be placed in the island.



**Figure 6H-24. Half Road Closure on Far Side of Intersection (TA-24)**



Note: See Tables 6H-2 and 6H-3 for the meaning of the symbols and/or letter codes used in this figure.

**Typical Application 24**

**Notes for Figure 6H-25—Typical Application 25**  
**Multiple Lane Closures at Intersection**

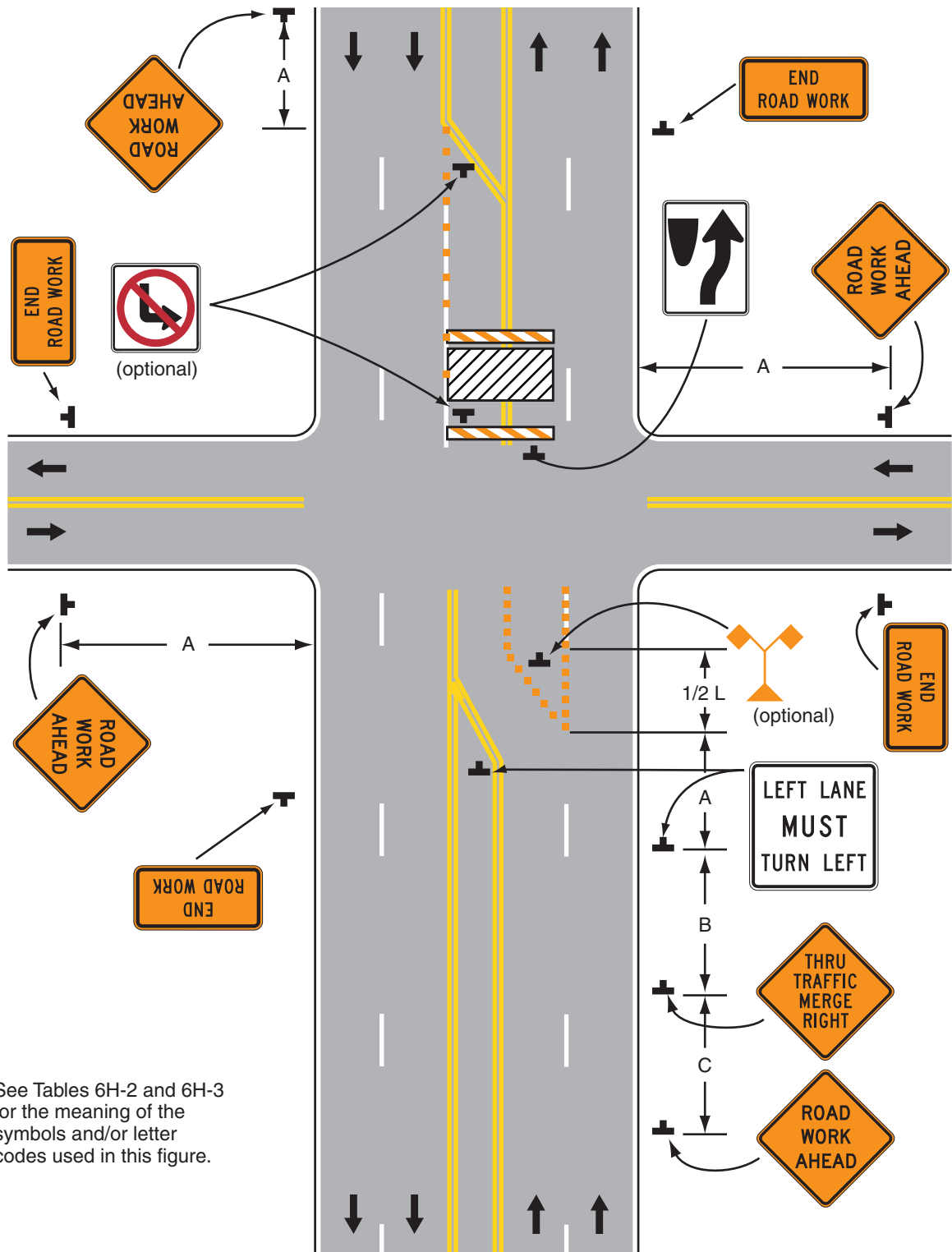
Guidance:

1. If the work space extends across a crosswalk, the crosswalk should be closed using the information and devices shown in Figure 6H-29.
2. If the left through lane is closed on the near-side approach, the LEFT LANE MUST TURN LEFT sign should be placed in the median to discourage through vehicular traffic from entering the left-turn bay.

Option:

3. The normal procedure is to close on the near side of the intersection any lane that is not carried through the intersection. If the left-turning movement that normally uses the closed turn bay is small and/or the gaps in opposing vehicular traffic are frequent, left turns may be permitted on that approach.
4. Flashing warning lights and/or flags may be used to call attention to the advance warning signs.

**Figure 6H-25. Multiple Lane Closures at Intersection (TA-25)**



Note: See Tables 6H-2 and 6H-3 for the meaning of the symbols and/or letter codes used in this figure.

**Typical Application 25**

**Notes for Figure 6H-26—Typical Application 26**  
**Closure in Center of Intersection**

**Guidance:**

1. All lanes should be a minimum of 3 m (10 ft) in width as measured to the near face of the channelizing devices.

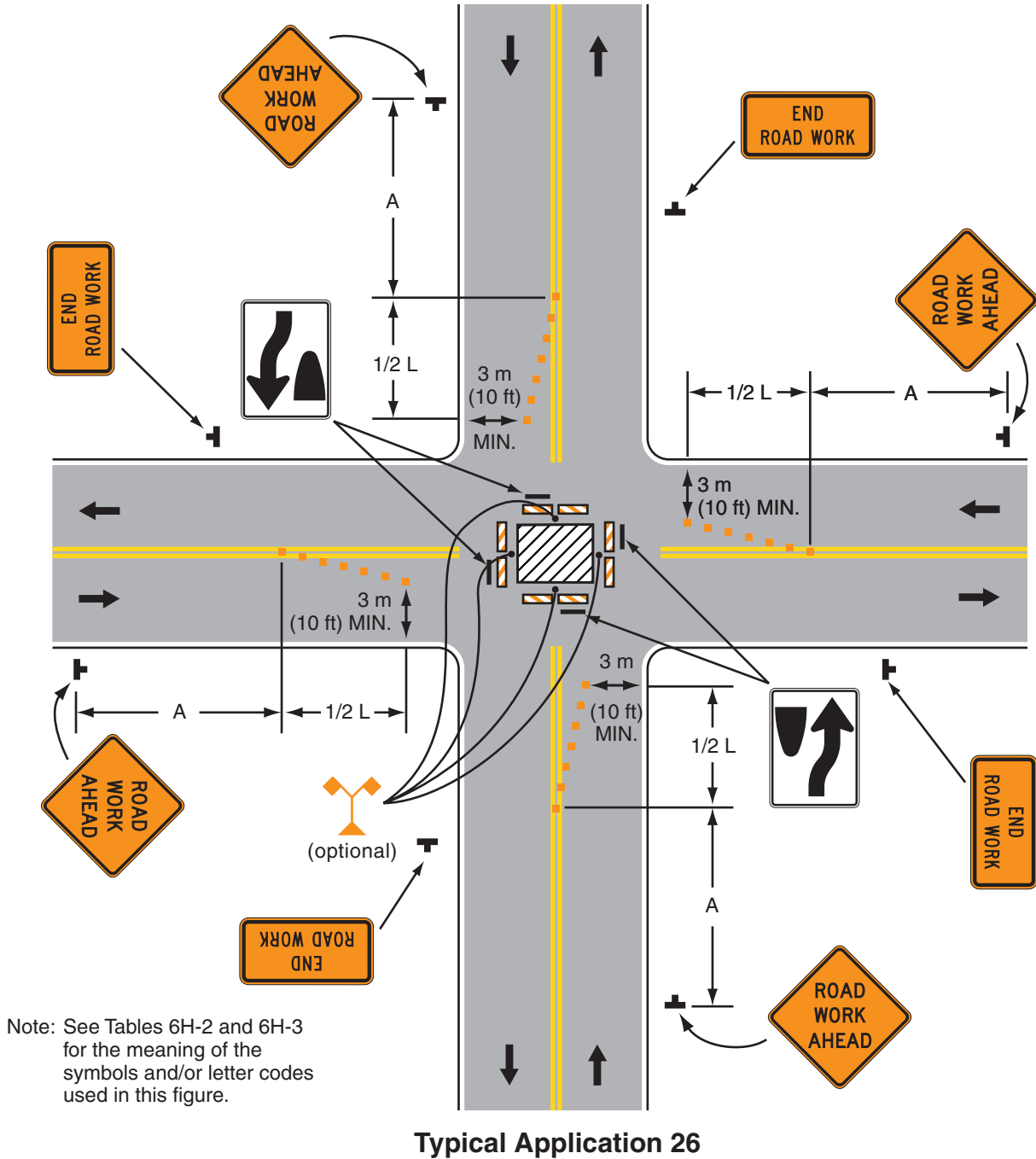
**Option:**

2. A high-level warning device may be placed in the work space, if there is sufficient room.
3. For short-term use on low-volume, low-speed roadways with vehicular traffic that does not include longer and wider heavy commercial vehicles, a minimum lane width of 2.7 m (9 ft) may be used.
4. Flashing warning lights and/or flags may be used to call attention to advance warning signs.
5. Unless the streets are wide, it may be physically impossible to turn left, especially for large vehicles. Left turns may be prohibited as required by geometric conditions.
6. For short-duration work operations, the channelizing devices may be eliminated if a vehicle displaying high-intensity rotating, flashing, oscillating, or strobe lights is positioned in the work space.
7. Vehicle hazard warning signals may be used to supplement high-intensity rotating, flashing, oscillating, or strobe lights.

**Standard:**

8. **Vehicle hazard warning signals shall not be used instead of the vehicle's high-intensity rotating, flashing, oscillating, or strobe lights.**

Figure 6H-26. Closure in Center of Intersection (TA-26)



**Notes for Figure 6H-27—Typical Application 27**  
**Closure at Side of Intersection**

**Guidance:**

1. The situation depicted can be simplified by closing one or more of the intersection approaches. If this cannot be done, and/or when capacity is a problem, through vehicular traffic should be directed to other roads or streets.
2. Depending on road user conditions, flagger(s) or uniformed law enforcement officer(s) should be used to direct road users within the intersection.

**Standard:**

- 3. At night, flagger stations shall be illuminated, except in emergencies.**

**Option:**

4. ONE LANE ROAD AHEAD signs may also be used to provide adequate advance warning.
5. Flashing warning lights and/or flags may be used to call attention to the advance warning signs.
6. For short-duration work operations, the channelizing devices may be eliminated if a vehicle displaying high-intensity rotating, flashing, oscillating, or strobe lights is positioned in the work space.
7. A BE PREPARED TO STOP sign may be added to the sign series.

**Guidance:**

8. When used, the BE PREPARED TO STOP sign should be located before the Flagger symbol sign.

**Support:**

9. Turns can be prohibited as required by vehicular traffic conditions. Unless the streets are wide, it might be physically impossible to make certain turns, especially for large vehicles.

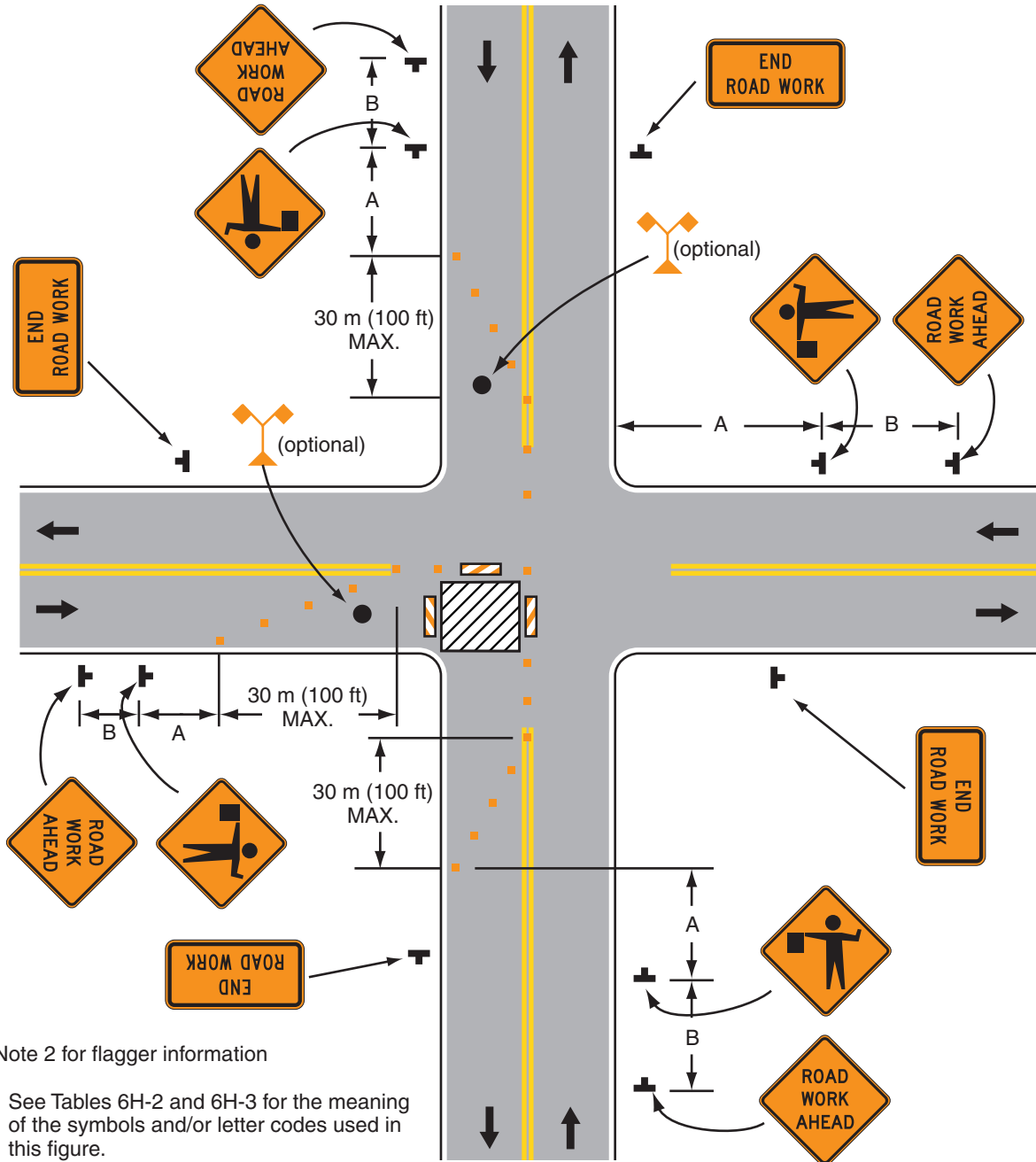
**Option:**

10. Vehicle hazard warning signals may be used to supplement high-intensity rotating, flashing, oscillating, or strobe lights.

**Standard:**

- 11. Vehicle hazard warning signals shall not be used instead of the vehicle's high-intensity rotating, flashing, oscillating, or strobe lights.**

**Figure 6H-27. Closure at Side of Intersection (TA-27)**



See Note 2 for flagger information

Note: See Tables 6H-2 and 6H-3 for the meaning of the symbols and/or letter codes used in this figure.

**Typical Application 27**

## Notes for Figure 6H-28—Typical Application 28

### Sidewalk Closures and Bypass Sidewalks

#### Standard:

1. **When crosswalks or other pedestrian facilities are closed or relocated, temporary facilities shall be detectable and shall include accessibility features consistent with the features present in the existing pedestrian facility.**

#### Guidance:

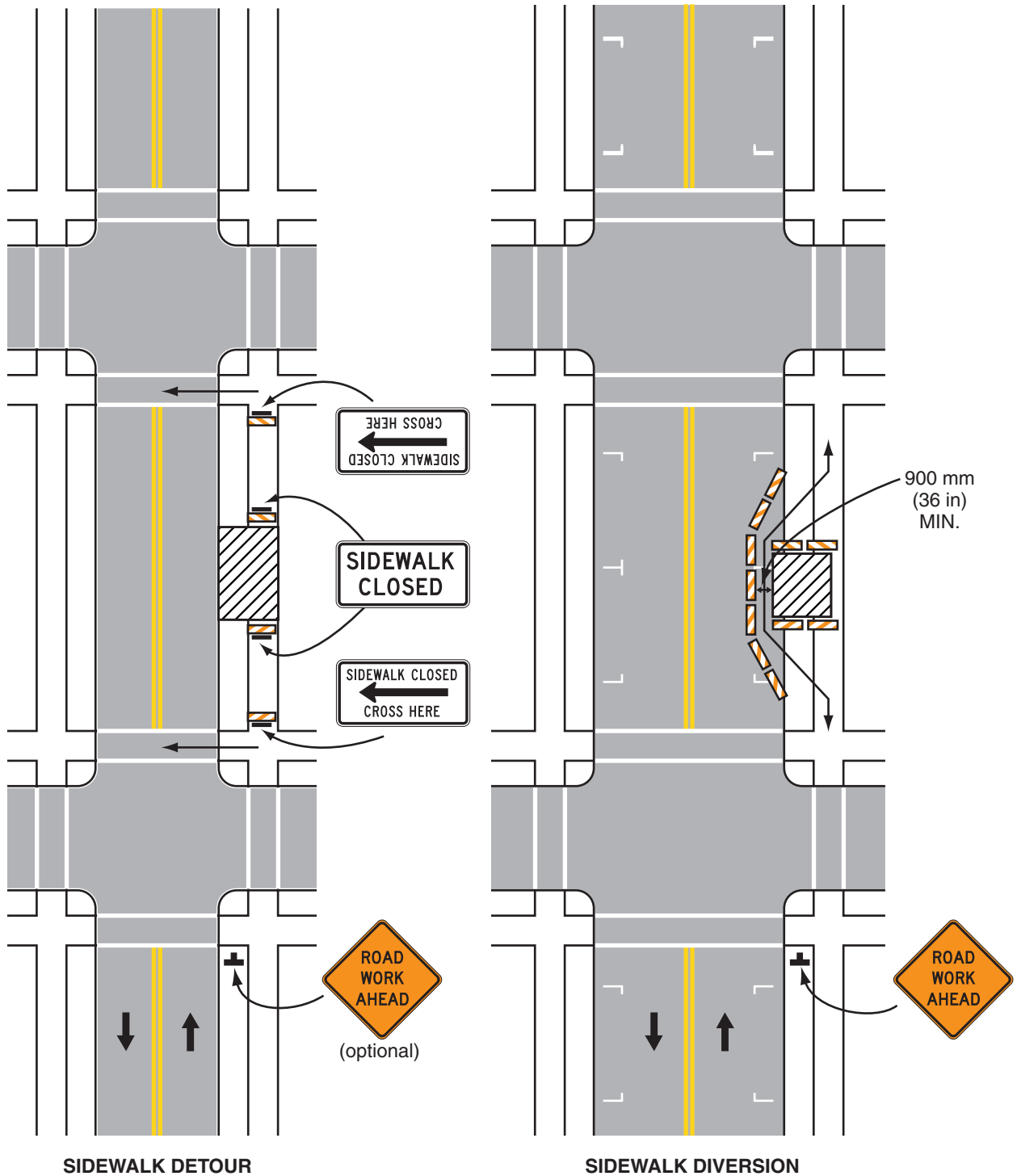
2. Where high speeds are anticipated, a temporary traffic barrier and, if necessary, a crash cushion should be used to separate the temporary sidewalks from vehicular traffic.
3. Audible information devices should be considered where midblock closings and changed crosswalk areas cause inadequate communication to be provided to pedestrians who have visual disabilities.

#### Option:

4. Street lighting may be considered.
5. Only the TTC devices related to pedestrians are shown. Other devices, such as lane closure signing or ROAD NARROWS signs, may be used to control vehicular traffic.
6. For nighttime closures, Type A Flashing warning lights may be used on barricades that support signs and close sidewalks.
7. Type C Steady-Burn or Type D 360-degree Steady-Burn warning lights may be used on channelizing devices separating the temporary sidewalks from vehicular traffic flow.
8. Signs, such as KEEP RIGHT (LEFT), may be placed along a temporary sidewalk to guide or direct pedestrians.



**Figure 6H-28. Sidewalk Detour or Diversion (TA-28)**



**Typical Application 28**

Note: See Tables 6H-2 and 6H-3 for the meaning of the symbols and/or letter codes used in this figure.

**Notes for Figure 6H-29—Typical Application 29**  
**Crosswalk Closures and Pedestrian Detours**

**Standard:**

- 1. When crosswalks or other pedestrian facilities are closed or relocated, temporary facilities shall be detectable and shall include accessibility features consistent with the features present in the existing pedestrian facility.**
- 2. Curb parking shall be prohibited for at least 15 m (50 ft) in advance of the midblock crosswalk.**

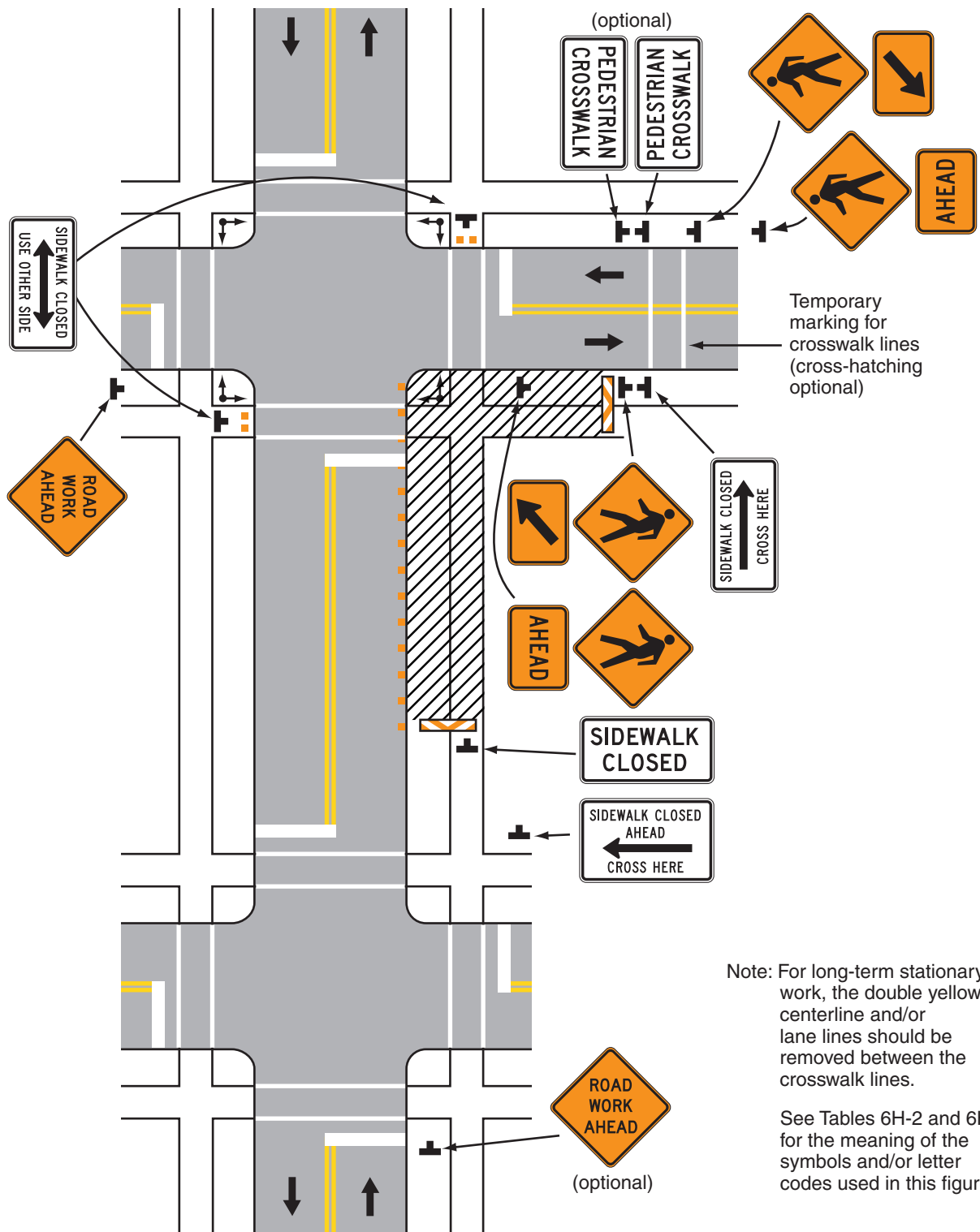
**Guidance:**

3. Audible information devices should be considered where midblock closings and changed crosswalk areas cause inadequate communication to be provided to pedestrians who have visual disabilities.
4. Pedestrian traffic signal displays controlling closed crosswalks should be covered or deactivated.

**Option:**

5. Street lighting may be considered.
6. Only the TTC devices related to pedestrians are shown. Other devices, such as lane closure signing or ROAD NARROWS signs, may be used to control vehicular traffic.
7. For nighttime closures, Type A Flashing warning lights may be used on barricades supporting signs and closing sidewalks.
8. Type C Steady-Burn warning lights may be used on channelizing devices separating the work space from vehicular traffic.
9. In order to maintain the systematic use of the fluorescent yellow-green background for pedestrian, bicycle, and school warning signs in a jurisdiction, the fluorescent yellow-green background for pedestrian, bicycle, and school warning signs may be used in TTC zones.

**Figure 6H-29. Crosswalk Closures and Pedestrian Detours (TA-29)**



**Typical Application 29**

**Notes for Figure 6H-30—Typical Application 30**  
**Interior Lane Closure on Multi-lane Street**

Guidance:

1. This information applies to low-speed, low-volume urban streets. Where speed or volume is higher, additional signing such as LEFT LANE CLOSED XX m (FT) should be used between the signs shown.

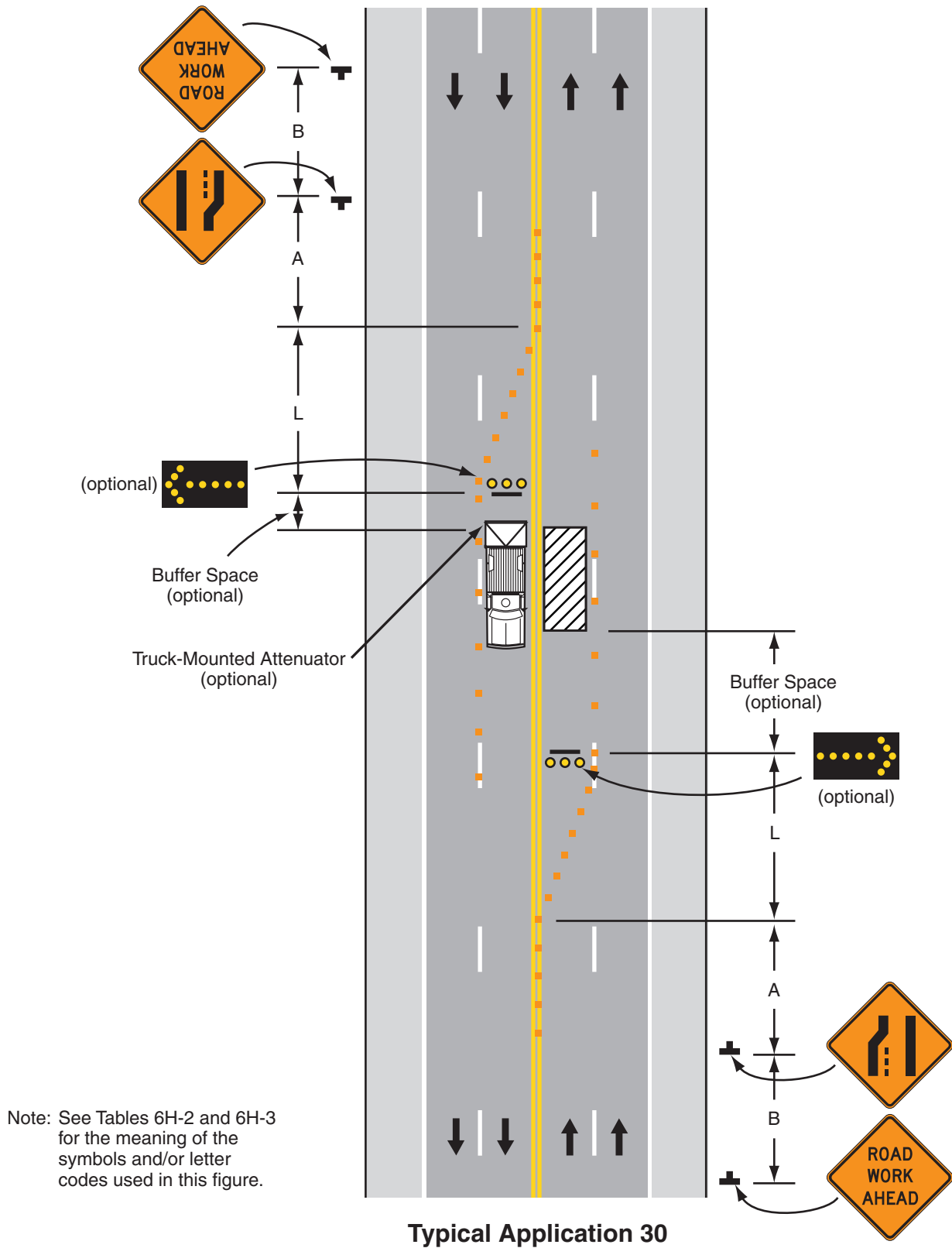
Option:

2. The closure of the adjacent interior lane in the opposing direction may not be necessary, depending upon the activity being performed and the work space needed for the operation.
3. Shadow vehicles with a truck-mounted attenuator may be used.

Guidance:

4. When a highway-rail grade crossing exists within or upstream of the transition area and it is anticipated that backups resulting from the lane closure might extend through the highway-rail grade crossing, the TTC zone should be extended so that the transition area precedes the highway-rail grade crossing.
5. Early coordination with the railroad company should occur before work starts.

**Figure 6H-30. Interior Lane Closure on Multi-lane Street (TA-30)**



Note: See Tables 6H-2 and 6H-3 for the meaning of the symbols and/or letter codes used in this figure.

**Notes for Figure 6H-31—Typical Application 31**  
**Lane Closure on Street with Uneven Directional Volumes**

**Standard:**

1. **The illustrated information shall be used only when the vehicular traffic volume indicates that two lanes of vehicular traffic shall be maintained in the direction of travel for which one lane is closed.**

## Option:

2. The procedure may be used during a peak period of vehicular traffic and then changed to provide two lanes in the other direction for the other peak.

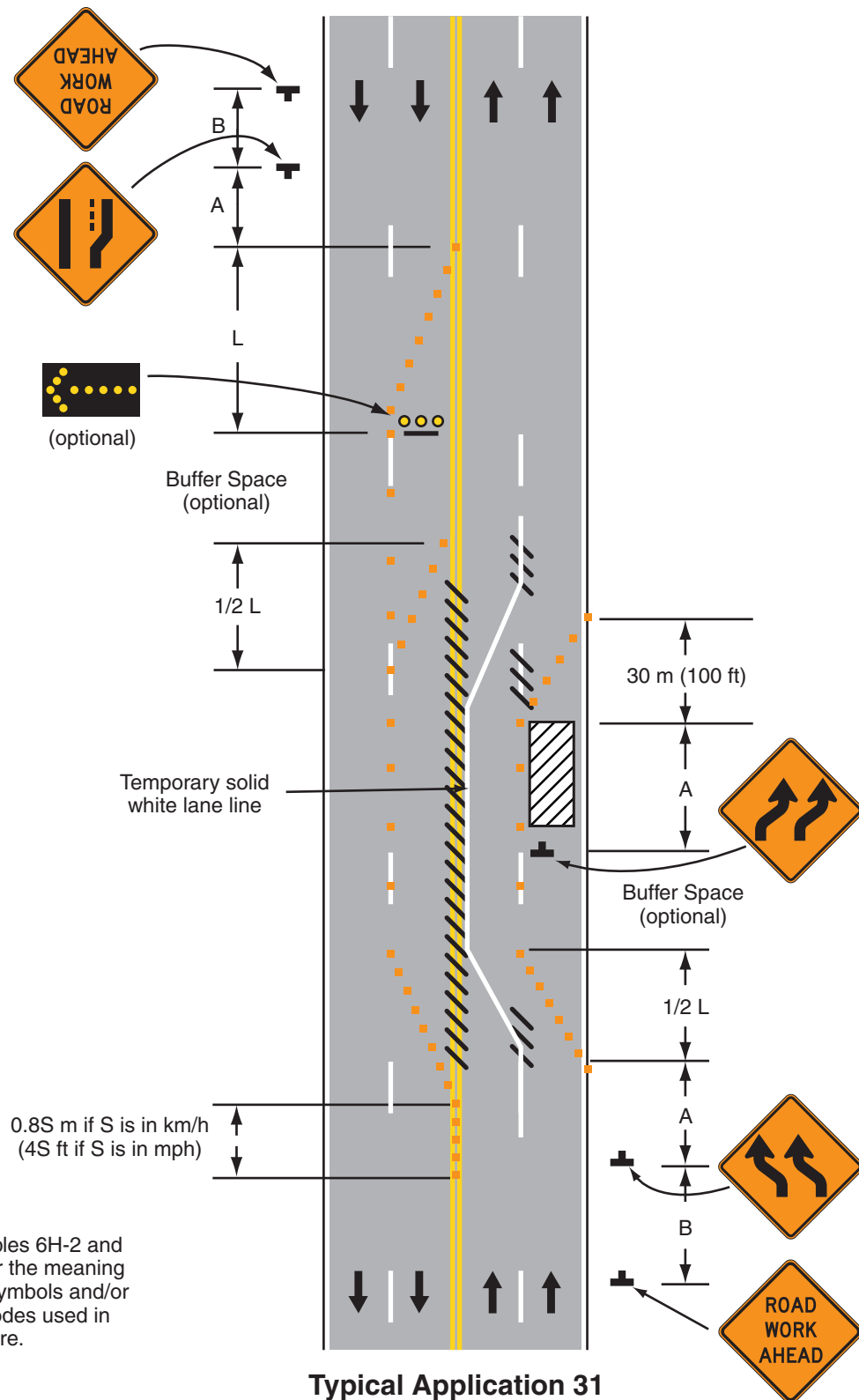
## Guidance:

3. For high speeds, a LEFT LANE CLOSED XX m (FT) sign should be added for vehicular traffic approaching the lane closure, as shown in Figure 6H-32.
4. Conflicting pavement markings should be removed for long-term projects. For short-term and intermediate-term projects where this is not practical, the channelizing devices in the area where the pavement markings conflict should be placed at a maximum spacing of 0.1 S m (0.5 S ft) where S is the speed in km /h (mph). Temporary markings should be installed where needed.
5. If the lane shift has curves with recommended speeds of 50 km/h (30 mph) or less, Reverse Turn signs should be used.
6. Where the shifted section is long, a Reverse Curve sign should be used to show the initial shift and a second sign should be used to show the return to the normal alignment.
7. If the tangent distance along the temporary diversion is less than 180 m (600 ft), the Double Reverse Curve sign should be used at the location of the first Two Lane Reverse Curve sign. The second Two Lane Reverse Curve sign should be omitted.

## Option:

8. A longitudinal buffer space may be used in the activity area to separate opposing vehicular traffic.
9. An ALL LANES THRU supplemental plaque may be used to emphasize the point that all lanes shift and no lanes are closed.
10. A work vehicle or a shadow vehicle may be equipped with a truck-mounted attenuator.

**Figure 6H-31. Lane Closures on Street with Uneven Directional Volumes (TA-31)**



Note: See Tables 6H-2 and 6H-3 for the meaning of the symbols and/or letter codes used in this figure.

**Notes for Figure 6H-46—Typical Application 46**  
**Work in Vicinity of Highway-Rail Grade Crossing**

**Guidance:**

1. When highway-rail grade crossings exist either within or in the vicinity of roadway work activities, extra care should be taken to minimize the probability of conditions being created, either by lane restrictions, flagging or other operations, where vehicles might be stopped within the highway-rail grade crossing, considered as being 4.6 m (15 ft) on either side of the closest and farthest rail.

**Standard:**

2. **If the queuing of vehicles across active rail tracks cannot be avoided, a uniformed law enforcement officer or flagger shall be provided at the highway-rail grade crossing to prevent vehicles from stopping within the highway-rail grade crossing (as described in Note 1), even if automatic warning devices are in place.**

**Guidance:**

3. Early coordination with the railroad company should occur before work starts.
4. In the example depicted, the buffer space of the activity area should be extended upstream of the highway-rail grade crossing (as shown) so that a queue created by the flagging operation will not extend across the highway-rail grade crossing.
5. The DO NOT STOP ON TRACKS sign should be used on all approaches to a highway-rail grade crossing within the limits of a TTC zone.

**Option:**

6. Flashing warning lights and/or flags may be used to call attention to the advance warning signs.
7. A BE PREPARED TO STOP sign may be added to the sign series.

**Guidance:**

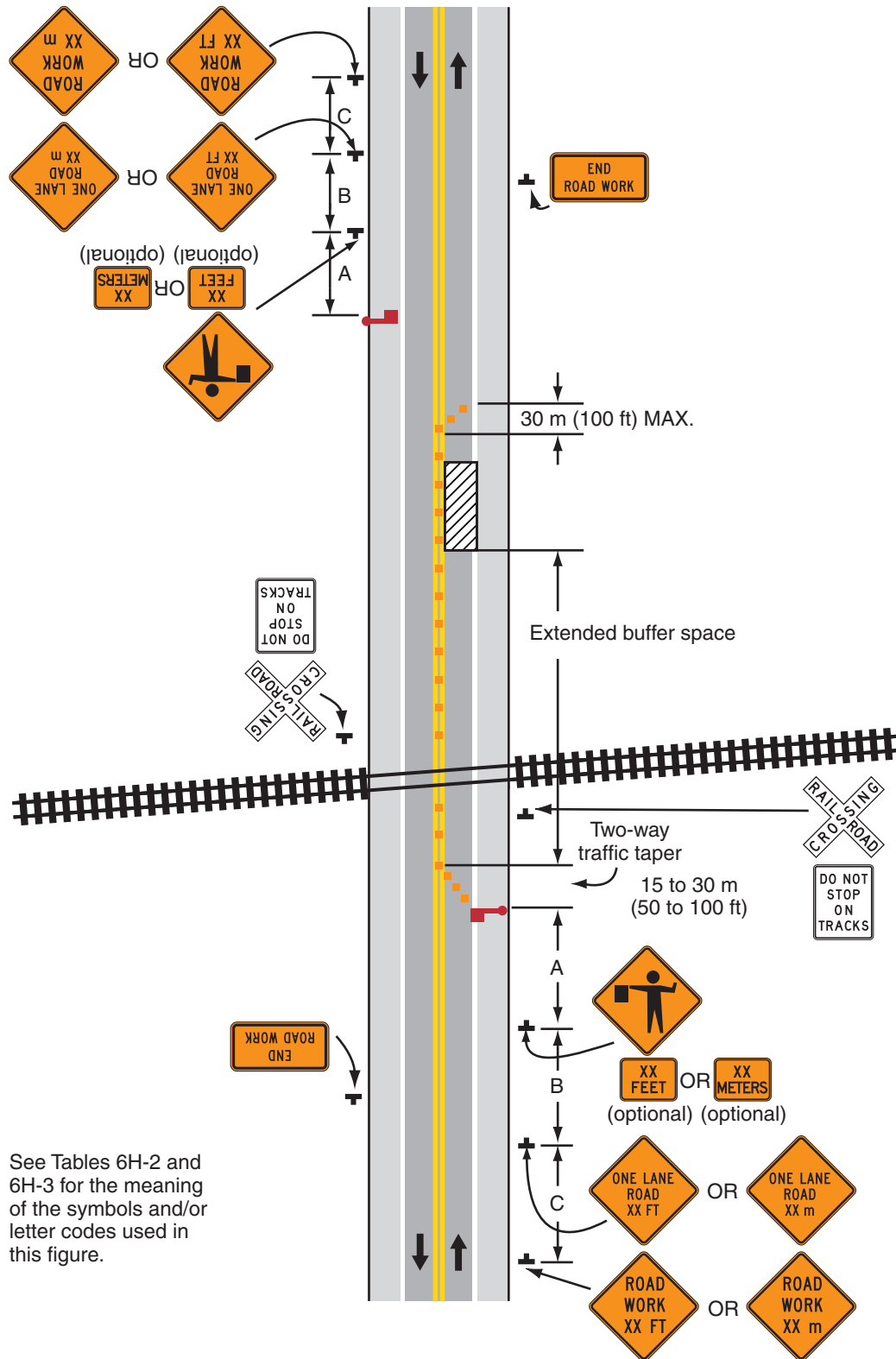
8. When used, the BE PREPARED TO STOP sign should be located before the Flagger symbol sign.

**Standard:**

9. **At night, flagger stations shall be illuminated, except in emergencies.**



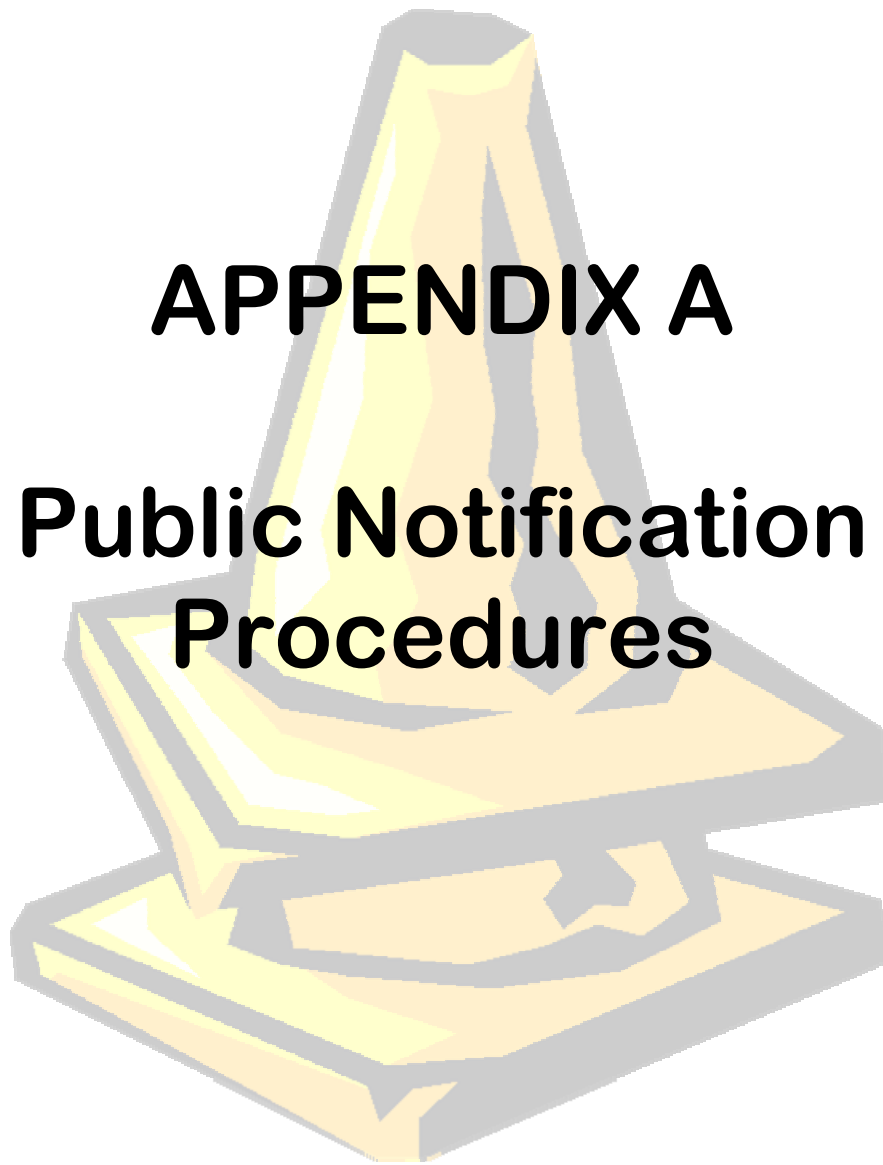
**Figure 6H-46. Work in Vicinity of Highway-Rail Grade-Crossing (TA-46)**



Note: See Tables 6H-2 and 6H-3 for the meaning of the symbols and/or letter codes used in this figure.

**Typical Application 46**





# **APPENDIX A**

## **Public Notification Procedures**



## **TRAFFIC CONTROL PUBLIC NOTIFICATION GUIDELINES**

**Introduction:** These guidelines are meant to be specifically for public notification related to temporary traffic control installation for construction and maintenance activities. It is not intended to act in place of the City's Public Notification Policy (A.P. 1.06). The City's Public Notification Policy (AP 1.06) should still be followed for the overall project or activity involved.

### **Levels of Public Notification:**

#### Level 1 Public Notification (72 hours in advance of closure)

Press Release to Standard Notification List via fax machine

Administrative staff emails to In-House News Release distribution (CGTV & Website News, etc).

WAR or Preview Report Depending on Timing

#### Level 2 Public Notification (48 hours in advance of closure)

Press Release to Standard Notification List via fax machine

Administrative staff emails to In-House News Release distribution (CGTV & Website News, etc).

#### Level 3 Public Notification (24 hours in advance of closure preferable)

Door-to-door contact with citizens impacted (door hangers etc)

#### Level 4 Public Notification (No notification required).

Public notification would not be required

### **Street Closure vs. Type of Notification:**

- Arterial Street Complete Closure = Level 1
- Arterial Street Partial Closure (lane closure, etc.) = Level 2 or Level 1 (if high impact)
- Arterial Street Partial Closure (no drive obstruction, duration less than 30 minutes) = Level 3
- Arterial Street Partial Closure (no drive obstruction, work completed prior to 6:30 a.m. Monday through Friday or before 8:00 a.m. on Saturday) = Level 4
- Collector Street Complete Closure = Level 2
- Collector Street Partial Closure (lane closure, etc.) = Level 2 or 3 (assess public impact)
- Collector Street Partial Closure (no drive obstruction, duration less than 60 minutes) = Level 4
- Collector Street Partial Closure (no drive obstruction, work completed prior to 6:30 a.m. Monday through Friday or before 8:00 a.m. on Saturday) = Level 4
- Emergency Complete Closure = Level 3 with Level 1 or 2 follow-up (depending on seriousness of emergency)
- Local Street Complete Closure = Level 2 or Level 3 (assess public impact)
- Local Street Partial Closure (lane closure and/or driveway blocking) = Level 3
- Local Street Partial Closure (no drive obstruction, work completed prior to 6:30 a.m. Monday through Friday or before 8:00 a.m. on Saturday) = Level 4
- Local Street Partial Closure (no driveway blocking, duration less than 60 minutes) = Level 4

### **Notes:**

- Always provide administrative staff with clear direction regarding the desired Public Notification Level, i.e. it is not their job to determine the appropriate level.

- This is a guide for public notification; individual circumstances may require more or less notification. The responsible party (supervisor, project manager, or inspector) should use good judgment to determine the level required.
- Use best judgment on short duration emergency closures, etc. (if the closure is low impact and only for a few hours, notification may not be useful; however, if an emergency response route is impacted, a call to Metcad may be warranted).
- If in doubt of street type, ask your supervisor.
- All closures should have appropriate traffic control at the soonest possible opportunity.
- It is good practice to have traffic control plans for Arterial and Collector Streets sketched up in advance and reviewed by another person who has traffic control training.
- It is generally good practice to provide public notice for any construction activity that will impact the public.
- It is never wrong to make additional calls directly to MTD, Police, and Fire.
- Private developers and contractors are responsible for preparation of their own press releases. If requested, the City will fax it out to the external New Release fax list.
- Additional notifications for private work are the responsibility of the right-of-way inspector or the development engineer working on the project.



# **APPENDIX B**

## **Manual on Uniform Traffic Control Devices Channelizing Device Requirements (Pages 6F-30 to 6F-35)**

For additional applications and standards,  
refer to [www.mutcd.fhwa.dot.gov](http://www.mutcd.fhwa.dot.gov)





**Option:**

Warning lights may be added to channelizing devices in areas with frequent fog, snow, or severe roadway curvature, or where visual distractions are present.

**Standard:**

**Warning lights shall flash when placed on channelizing devices used alone or in a cluster to warn of a condition. Warning lights placed on channelizing devices used in a series to channelize road users shall be steady-burn.**

**The retroreflective material used on channelizing devices shall have a smooth, sealed outer surface that will display a similar color day or night.**

**Option:**

The name and telephone number of the highway agency, contractor, or supplier may be shown on the nonretroreflective surface of all types of channelizing devices.

**Standard:**

**The letters and numbers of the name and telephone number shall be nonretroreflective and not over 50 mm (2 in) in height.**

**Guidance:**

Particular attention should be given to maintaining the channelizing devices to keep them clean, visible, and properly positioned at all times.

**Standard:**

**Devices that are damaged or have lost a significant amount of their retroreflectivity and effectiveness shall be replaced.**

**Section 6F.59 Cones****Standard:**

**Cones (see Figure 6F-7, Sheet 1 of 2) shall be predominantly orange and shall be made of a material that can be struck without causing damage to the impacting vehicle. For daytime and low-speed roadways, cones shall be not less than 450 mm (18 in) in height. When cones are used on freeways and other high-speed highways or at night on all highways, or when more conspicuous guidance is needed, cones shall be a minimum of 700 mm (28 in) in height.**

**For nighttime use, cones shall be retroreflectorized or equipped with lighting devices for maximum visibility. Retroreflectorization of cones that are 700 to 900 mm (28 to 36 in) in height shall be provided by a 150 mm (6 in) wide white band located 75 to 100 mm (3 to 4 in) from the top of the cone and an additional 100 mm (4 in) wide white band located approximately 50 mm (2 in) below the 150 mm (6 in) band.**

**Retroreflectorization of cones that are more than 900 mm (36 in) in height shall be provided by horizontal, circumferential, alternating orange and white retroreflective stripes that are 100 to 150 mm (4 to 6 in) wide. Each cone shall have a minimum of two orange and two white stripes with the top stripe being orange. Any nonretroreflective spaces between the orange and white stripes shall not exceed 75 mm (3 in) in width.**

**Option:**

Traffic cones may be used to channelize road users, divide opposing vehicular traffic lanes, divide lanes when two or more lanes are kept open in the same direction, and delineate short duration maintenance and utility work.

**Guidance:**

Steps should be taken to minimize the possibility of cones being blown over or displaced by wind or moving vehicular traffic.

Cones should not be used for pedestrian channelization or as pedestrian barriers in TTC zones on or along sidewalks unless they are continuous between individual devices and detectable to users of long canes.

**Option:**

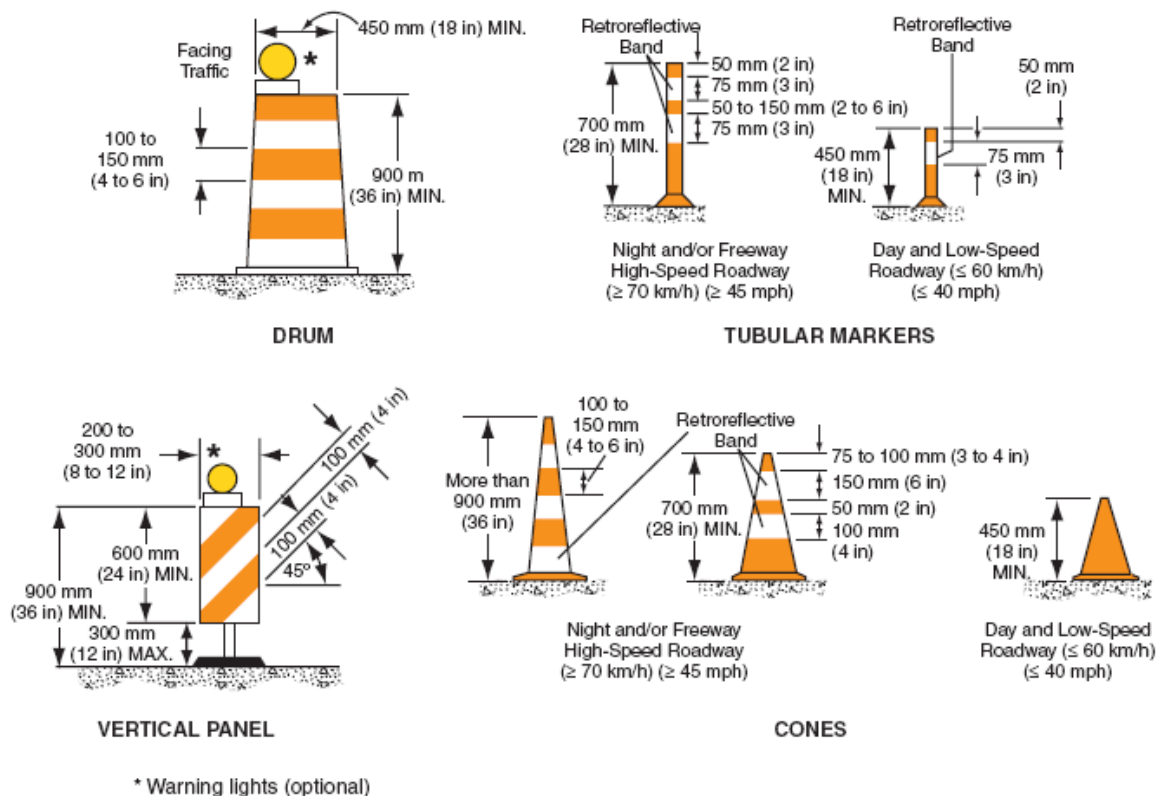
Cones may be doubled up to increase their weight.

**Support:**

Some cones are constructed with bases that can be filled with ballast. Others have specially weighted bases, or weight such as sandbag rings that can be dropped over the cones and onto the base to provide added stability.

**Guidance:**

Ballast should be kept to the minimum amount needed.

**Figure 6F-7. Channelizing Devices (Sheet 1 of 2)**

Note: If drums, cones, or tubular markers are used to channelize pedestrians, they shall be located such that there are no gaps between the bases of the devices, in order to create a continuous bottom, and the height of each individual drum, cone, or tubular marker shall be no less than 900 mm (36 in) to be detectable to users of long canes.

## Section 6F.60 Tubular Markers

### Standard:

Tubular markers (see Figure 6F-7, Sheet 1 of 2) shall be predominantly orange and shall be not less than 450 mm (18 in) high and 50 mm (2 in) wide facing road users. They shall be made of a material that can be struck without causing damage to the impacting vehicle.

Tubular markers shall be a minimum of 700 mm (28 in) in height when they are used on freeways and other high-speed highways, on all highways during nighttime, or whenever more conspicuous guidance is needed.

For nighttime use, tubular markers shall be retroreflectORIZED. RetroreflectORIZED of 700 mm (28 in) or larger tubular markers shall be provided by two 75 mm (3 in) wide white bands placed a maximum of 50 mm (2 in) from the top with a maximum of 150 mm (6 in) between the bands.

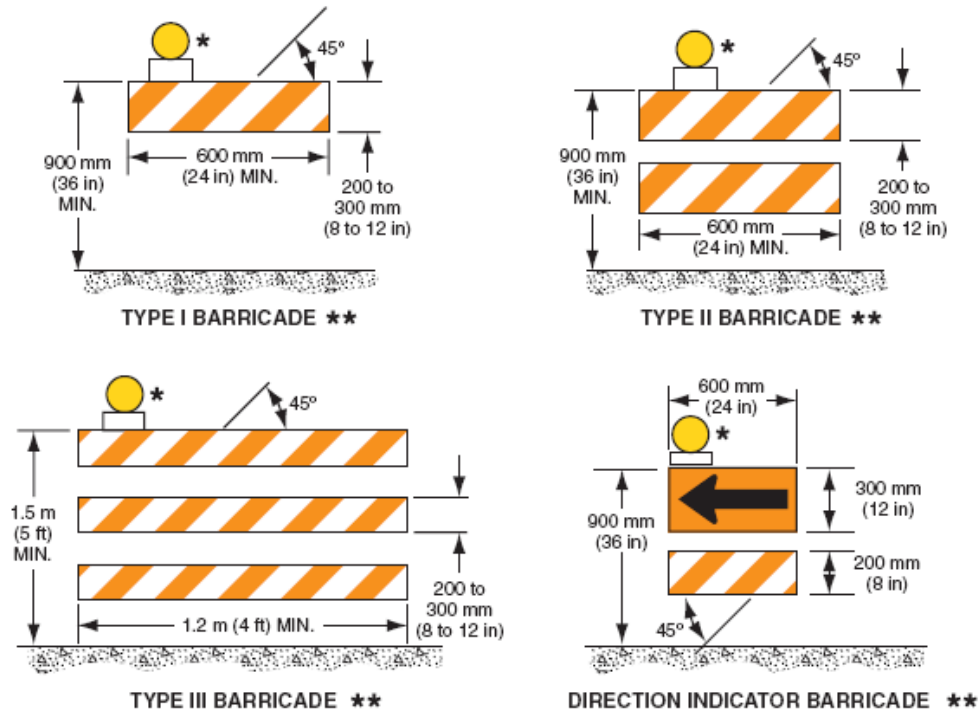
### Guidance:

Tubular markers should not be used for pedestrian channelization or as pedestrian barriers in TTC zones on or along sidewalks unless they are continuous between individual devices and detectable to users of long canes.

Tubular markers have less visible area than other devices and should be used only where space restrictions do not allow for the use of other more visible devices.

Tubular markers should be stabilized by affixing them to the pavement, by using weighted bases, or weights such as sandbag rings that can be dropped over the tubular markers and onto the base to provide added stability. Ballast should be kept to the minimum amount needed.

Figure 6F-7. Channelizing Devices (Sheet 2 of 2)



\* Warning lights (optional)  
 \*\* Rail stripe widths shall be 150 mm (6 in), except that 100 mm (4 in) wide stripes may be used if rail lengths are less than 900 mm (36 in). The sides of barricades facing traffic shall have retroreflective rail faces.

Note: If barricades are used to channelize pedestrians, there shall be continuous detectable bottom and top rails with no gaps between individual barricades to be detectable to users of long canes. The bottom of the bottom rail shall be no higher than 150 mm (6 in) above the ground surface. The top of the top rail shall be no lower than 900 mm (36 in) above the ground surface.

**Option:**

Tubular markers may be used effectively to divide opposing lanes of road users, divide vehicular traffic lanes when two or more lanes of moving motor vehicle traffic are kept open in the same direction, and to delineate the edge of a pavement drop off where space limitations do not allow the use of larger devices.

**Standard:**

When a noncylindrical tubular marker is used, it shall be attached to the pavement in a manner such that the width facing road users meets the minimum requirements.

A tubular marker shall be attached to the pavement to display the minimum 50 mm (2 in) width to the approaching road users.

**Section 6F.61 Vertical Panels**

**Standard:**

Vertical panels (see Figure 6F-7, Sheet 1 of 2) shall be 200 to 300 mm (8 to 12 in) in width and at least 600 mm (24 in) in height. They shall have orange and white diagonal stripes and be retroreflectORIZED.

Vertical panels shall be mounted with the top a minimum of 900 mm (36 in) above the roadway.

Sect. 6F.60 to 6F.61

Where the height of the vertical panel itself is 900 mm (36 in) or greater, a panel stripe width of 150 mm (6 in) shall be used.

Option:

Where the height of the vertical panel itself is less than 900 mm (36 in), a panel stripe width of 100 mm (4 in) may be used.

**Standard:**

Markings for vertical panels shall be alternating orange and white retroreflective stripes, sloping downward at an angle of 45 degrees in the direction vehicular traffic is to pass. Vertical panels used on freeways, expressways, and other high-speed roadways shall have a minimum of 169,000 mm<sup>2</sup> (270 in<sup>2</sup>) retroreflective area facing vehicular traffic.

Option:

Where space is limited, vertical panels may be used to channelize vehicular traffic, divide opposing lanes, or replace barricades.

### Section 6F.62 Drums

**Standard:**

Drums (see Figure 6F-7, Sheet 1 of 2) used for road user warning or channelization shall be constructed of lightweight, deformable materials. They shall be a minimum of 900 mm (36 in) in height and have at least a 450 mm (18 in) minimum width regardless of orientation. Metal drums shall not be used. The markings on drums shall be horizontal, circumferential, alternating orange and white retroreflective stripes 100 to 150 mm (4 to 6 in) wide. Each drum shall have a minimum of two orange and two white stripes with the top stripe being orange. Any nonretroreflectorized spaces between the horizontal orange and white stripes shall not exceed 75 mm (3 in) wide. Drums shall have closed tops that will not allow collection of construction debris or other debris.

Support:

Drums are highly visible, have good target value, give the appearance of being formidable obstacles and, therefore, command the respect of road users. They are portable enough to be shifted from place to place within a TTC zone in order to accommodate changing conditions, but are generally used in situations where they will remain in place for a prolonged period of time.

Option:

Although drums are most commonly used to channelize or delineate road user flow, they may also be used alone or in groups to mark specific locations.

Guidance:

Drums should not be used for pedestrian channelization or as pedestrian barriers in TTC zones on or along sidewalks unless they are continuous between individual devices and detectable to users of long canes.

Drums should not be weighted with sand, water, or any material to the extent that would make them hazardous to road users or workers when struck. Drums used in regions susceptible to freezing should have drain holes in the bottom so that water will not accumulate and freeze causing a hazard if struck by a road user.

**Standard:**

**Ballast shall not be placed on the top of a drum.**

### Section 6F.63 Type I, II, or III Barricades

Support:

A barricade is a portable or fixed device having from one to three rails with appropriate markings and is used to control road users by closing, restricting, or delineating all or a portion of the right-of-way.

As shown in Figure 6F-7, Sheet 2 of 2, barricades are classified as either Type I, Type II, or Type III.

**Standard:**

Stripes on barricade rails shall be alternating orange and white retroreflective stripes sloping downward at an angle of 45 degrees in the direction road users are to pass. Except as noted in the Option, the stripes shall be 150 mm (6 in) wide.

Option:

When rail lengths are less than 900 mm (36 in), 100 mm (4 in) wide stripes may be used.

**Standard:**

The minimum length for Type I and Type II Barricades shall be 600 mm (24 in), and the minimum length for Type III Barricades shall be 1200 mm (48 in). Each barricade rail shall be 200 to 300 mm (8 to 12 in) wide. Barricades used on freeways, expressways, and other high-speed roadways shall have a minimum of 169,000 mm<sup>2</sup> (270 in<sup>2</sup>) of retroreflective area facing road users.

**Guidance:**

Where barricades extend entirely across a roadway, the stripes should slope downward in the direction toward which road users must turn.

Where both right and left turns are provided, the barricade stripes should slope downward in both directions from the center of the barricade or barricades.

Where no turns are intended, the stripes should be positioned to slope downward toward the center of the barricade or barricades.

Barricade rails should be supported in a manner that will allow them to be seen by the road user, and in a manner that provides a stable support that is not easily blown over or displaced.

The width of the existing pedestrian facility should be provided for the temporary facility if practical. Traffic control devices and other construction materials and features should not intrude into the usable width of the sidewalk, temporary pathway, or other pedestrian facility. When it is not possible to maintain a minimum width of 1500 mm (60 in) throughout the entire length of the pedestrian pathway, a 1500 x 1500 mm (60 x 60 in) passing space should be provided at least every 60 m (200 ft) to allow individuals in wheelchairs to pass.

Barricade rail supports should not project into pedestrian circulation routes more than 100 mm (4 in) from the support between 675 mm (27 in) and 2000 mm (80 in) from the surface as described in Section 4.4.1 of the "Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities (ADAAG)" (see Section 1A.11).

**Option:**

For Type I Barricades, the support may include other unstriped horizontal panels necessary to provide stability.

**Guidance:**

Barricades should be crashworthy as they are located adjacent to vehicular traffic flow and are subject to impact by errant vehicles.

On high-speed expressways or in other situations where barricades may be susceptible to overturning in the wind, ballasting should be used.

**Option:**

Sandbags may be placed on the lower parts of the frame or the stays of barricades to provide the required ballast.

**Standard:**

**Ballast shall not be placed on top of any striped rail. Barricades shall not be ballasted by nondeformable objects such as rocks or chunks of concrete. Ballast shall not extend into the accessible passage width of 1500 mm (60 in).**

**Support:**

Type I or Type II Barricades are intended for use in situations where road user flow is maintained through the TTC zone.

**Option:**

Barricades may be used alone or in groups to mark a specific condition or they may be used in a series for channelizing road users.

Type I Barricades may be used on conventional roads or urban streets.

**Guidance:**

Type II or Type III Barricades should be used on freeways and expressways or other high-speed roadways. Type III Barricades should be used to close or partially close a road.

**Option:**

Type III Barricades used at a road closure may be placed completely across a roadway or from curb to curb.

**Guidance:**

Where provision is made for access of authorized equipment and vehicles, the responsibility for Type III Barricades should be assigned to a person who will provide proper closure at the end of each work day.

**Support:**

When a highway is legally closed but access must still be allowed for local road users, barricades usually are not extended completely across the roadway.

**Standard:**

A sign (see Section 6F.09) shall be installed with the appropriate legend concerning permissible use by local road users. Adequate visibility of the barricades from both directions shall be provided.

**Option:**

Signs may be installed on barricades (see Section 6F.03).

**Section 6F.64 Direction Indicator Barricades****Standard:**

The Direction Indicator Barricade (see Figure 6F-7, Sheet 2 of 2) shall consist of a One-Direction Large Arrow (W1-6) sign mounted above a diagonal striped, horizontally aligned, retroreflective rail.

The One-Direction Large Arrow (W1-6) sign shall be black on an orange background. The stripes on the bottom rail shall be alternating orange and white retroreflective stripes sloping downward at an angle of 45 degrees in the direction road users are to pass. The stripes shall be 100 mm (4 in) wide. The One-Direction Large Arrow (W1-6) sign shall be 600 x 300 mm (24 x 12 in). The bottom rail shall have a length of 600 mm (24 in) and a height of 200 mm (8 in).

**Guidance:**

The Direction Indicator Barricade, including any associated ballast or lights, should be crashworthy.

**Option:**

The Direction Indicator Barricade may be used in tapers, transitions, and other areas where specific directional guidance to drivers is necessary.

**Guidance:**

If used, Direction Indicator Barricades should be used in series to direct the driver through the transition and into the intended travel lane.

**Section 6F.65 Temporary Traffic Barriers as Channelizing Devices****Support:**

Temporary traffic barriers are not TTC devices in themselves; however, when placed in a position identical to a line of channelizing devices and marked and/or equipped with appropriate channelization features to provide guidance and warning both day and night, they serve as TTC devices.

**Standard:**

Temporary traffic barriers serving as TTC devices shall conform to requirements for such devices as set forth throughout Part 6.

Temporary traffic barriers shall not be used solely to channelize road users, but also to protect the work space (see Section 6F.81). If used to channelize vehicular traffic, the temporary traffic barrier shall be supplemented with delineation, pavement markings, or channelizing devices for improved daytime and nighttime visibility.

**Guidance:**

Temporary traffic barriers should not be used for a merging taper except in low-speed urban areas. Temporary traffic barriers should not be used for a constricted/restricted TTC zone.

When it is necessary to use a temporary traffic barrier for a merging taper in low-speed urban areas or for a constricted/restricted TTC zone, the taper shall be delineated and the taper length should be designed to optimize road user operations considering the available geometric conditions.

When used for channelization, temporary traffic barriers should be of a light color for increased visibility.

**Section 6F.66 Longitudinal Channelizing Barricades****Support:**

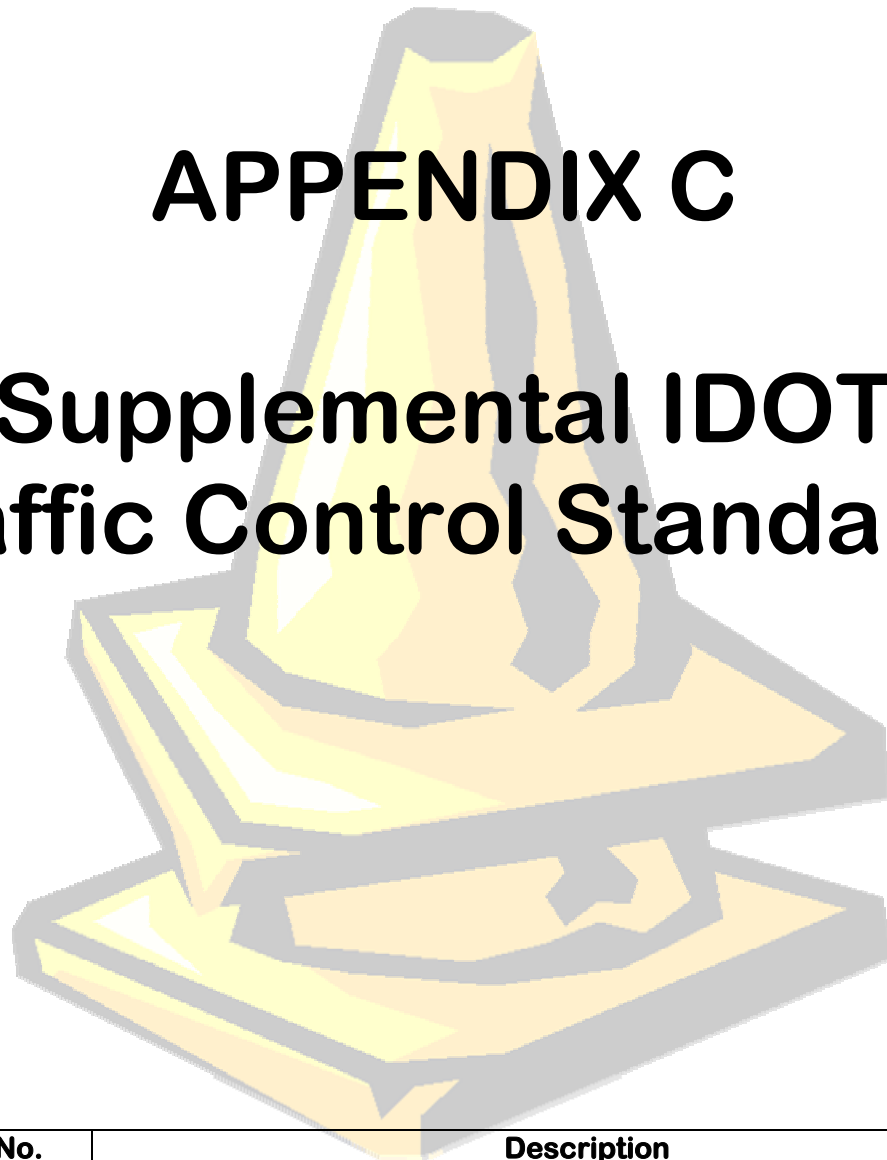
Longitudinal channelizing barricades are lightweight, deformable channelizing devices that can be used singly as Type I, II, or III barricades, or connected so they are highly visible and have good target value.

**Guidance:**

When used as a barricade, longitudinal channelizing barricades should conform to the general size, color, stripe pattern, retroreflectivity, and placement characteristics established for the devices described in Chapter 6F.

# APPENDIX C

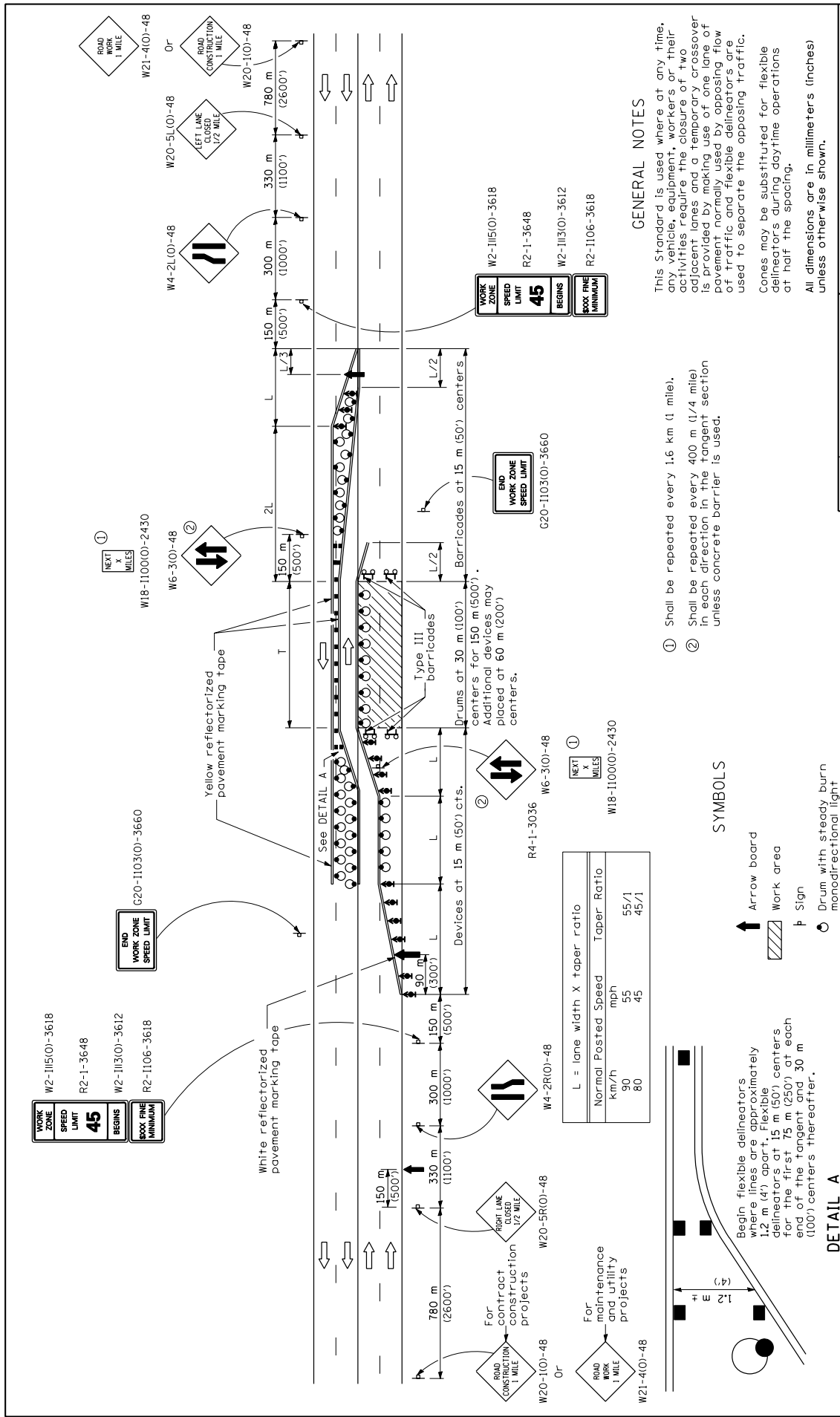
## Supplemental IDOT Traffic Control Standards



<b>Standard No.</b>	<b>Description</b>
701431-03	Lane closure, multilane, undiv. with crossover, for speeds $\geq$ 45 MPH to 55 MPH
701501-03	Urban lane closure 2L, 2W undivided
701502-01	Urban lane closure 2L, 2W with bidirectional left turn lane
701601-04	Urban lane closure multilane 1W or 2W with nontraversable median
701602-02	Urban lane closure, multilane 2W with bidirectional left turn lane
701606-04	Urban lane closure multilane 2W with mountable median
701701-04	Urban lane closure multilane intersection







**GENERAL NOTES**

This Standard is used where at any time, any vehicle, equipment, workers or their activities require the closure of two adjacent lanes and a temporary crossover is provided by making use of one lane of pavement normally used by opposing flow of traffic and flexible delineators are used to separate the opposing traffic.

Cones may be substituted for flexible delineators during daytime operations at half the spacing.

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

- ① Shall be repeated every 1.6 km (1 mile).
- ② Shall be repeated every 400 m (1/4 mile) in each direction in the tangent section unless concrete barrier is used.

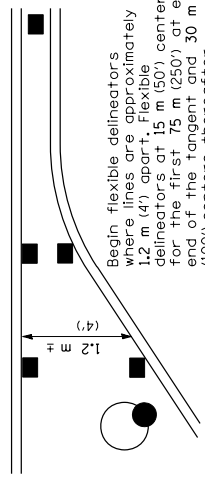
**SYMBOLS**

- ➔ Arrow board
- ▨ Work area
- ⊥ Sign
- Drum with steady burn monodirectional light
- ⬆ Direction indicator barricade with steady burn monodirectional light
- Flexible delineator
- ⊕ Type III barricade with flashing monodirectional lights

L = lane width x taper ratio		
Normal Posted Speed	Speed	Taper Ratio
km/h	mph	
90	55	55/1
80	45	45/1

Begin flexible delineators where lines are approximately 1.2 m (4') apart. Flexible delineators at 15 m (50') centers for the first 75 m (250') at each end of the tangent and 30 m (100') centers thereafter.

**DETAIL A**



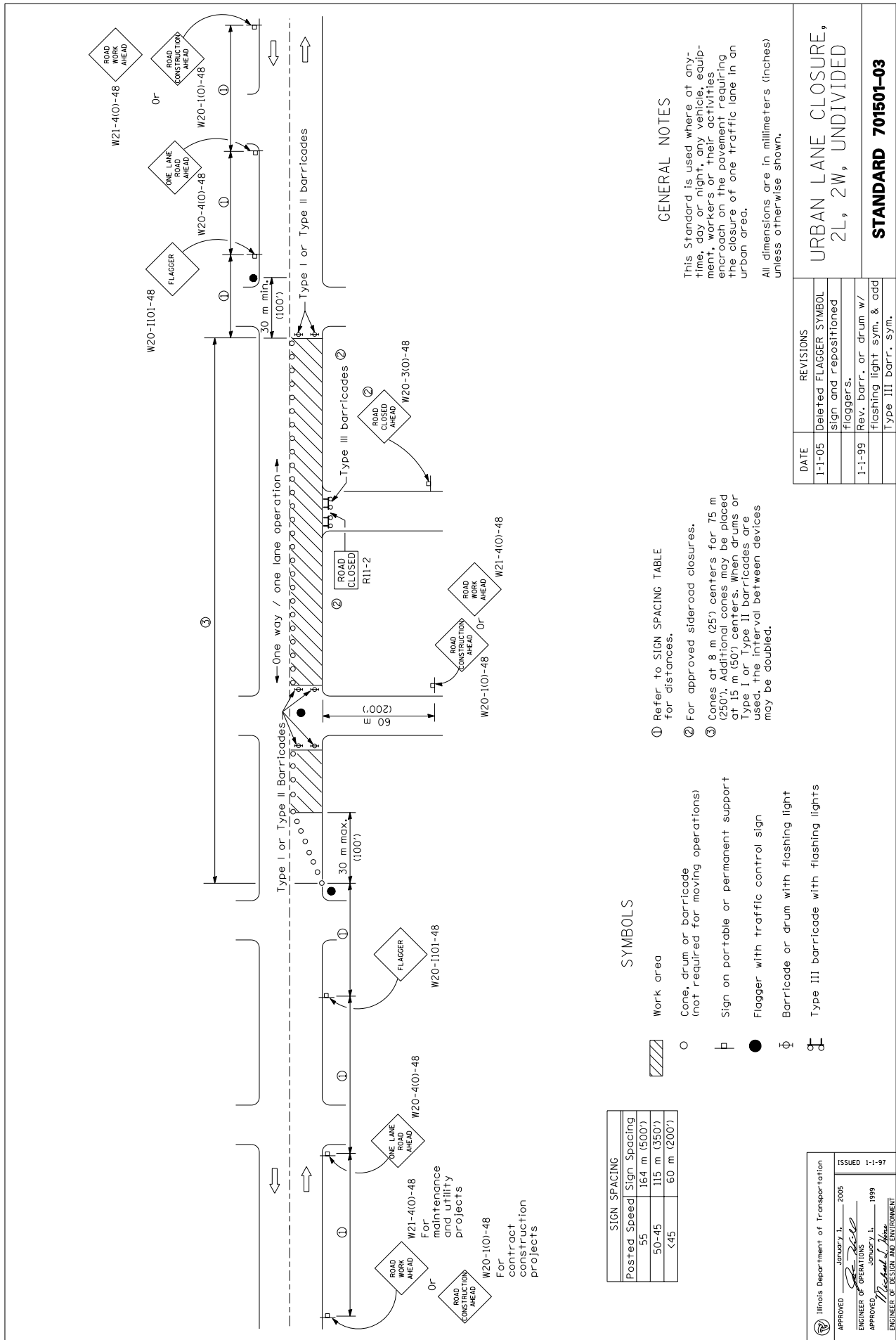
DATE	REVISIONS
4-15-04	Revised signs.
4-1-04	Revised Workzone speed limit signs and lane tapers.

**LANE CLOSURE, MULTILANE, UNDIV. WITH CROSSOVER, FOR SPEEDS ≥ 45 MPH TO 55 MPH**

**STANDARD 701431-03**

APPROVED  
 APRIL 15, 2004  
 ENGINEER OF OPERATIONS  
 APPROVED  
 APRIL 15, 2004  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97



SIGN SPACING	
Posted Speed	Sign Spacing
55	164 m (500')
50-45	115 m (350')
<45	60 m (200')

**SYMBOLS**

- Work area
- Cone, drum or barricade (not required for moving operations)
- Sign on portable or permanent support
- Flagger with traffic control sign
- Barricade or drum with flashing light
- Type III barricade with flashing lights

- ① Refer to SIGN SPACING TABLE for distances.
- ② For approved sideroad closures.
- ③ Cones at 8 m (25') centers for 75 m (250'). Additional cones may be placed at 15 m (50') centers. When drums or Type I or Type II barricades are used, the interval between devices may be doubled.

**GENERAL NOTES**

This Standard is used where at any-time, day or night, any vehicle, equipment, workers or their activities encroach on the pavement requiring the closure of one traffic lane in an urban area.

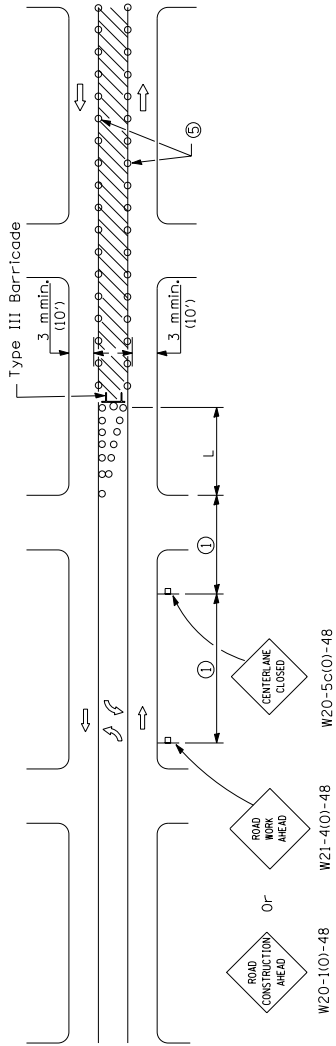
All dimensions are in millimeters (inches) unless otherwise shown.

DATE	REVISIONS
1-1-05	Deleted FLAGGER SYMBOL sign and repositioned flaggers.
1-1-99	Rev. barr. or drum w/ flashing light sym. & add Type III barr. sym.

**URBAN LANE CLOSURE,  
2L, 2W, UNDIVIDED**

**STANDARD 701501-03**

Illinois Department of Transportation  
 APPROVED January 7, 1, 2005  
 ENGINEER OF OPERATIONS  
 APPROVED January 7, 1, 1999  
 ENGINEER OF DESIGN AND ENVIRONMENT



**CASE I**

(Signs required for both directions)

Posted Speed	Sign Spacing
55 (90)	150 m (500')
50-45 (80)	115 m (350')
<45	60 m (200')

**SYMBOLS**

- ↑ Arrow board
- ▨ Work area
- ⊕ Barricade or drum with steady burning mandirectional light
- I Barricade or drum without flashing light
- Flagger with traffic control sign
- Cone, drum or barricade (Cones for daytime use only)
- ⊥ Sign on portable or permanent support

**GENERAL NOTES**

This Standard is used to close one lane of an urban, two lane, two way roadway with a bidirectional turn lane.

Case I applies when no workers are present. When workers are present, two lanes shall be closed and traffic control shall be according to Standard 701501.

Calculate L as follows:

- |                    |                                        |
|--------------------|----------------------------------------|
| <b>SPEED LIMIT</b> | <b>FORMULAS</b>                        |
| 70 km/h (40 mph)   | Metric $L = \frac{WS^2}{60}$ (English) |
| or less:           | $L = 150$                              |
| 80 km/h (45 mph)   | $L = 0.65(W)(S)$                       |
| or greater:        | $L = 0.65(W)(S)$                       |
| <b>W</b> =         | Width of offset in meters (feet).      |
| <b>S</b> =         | Normal posted speed km/h (mph).        |

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

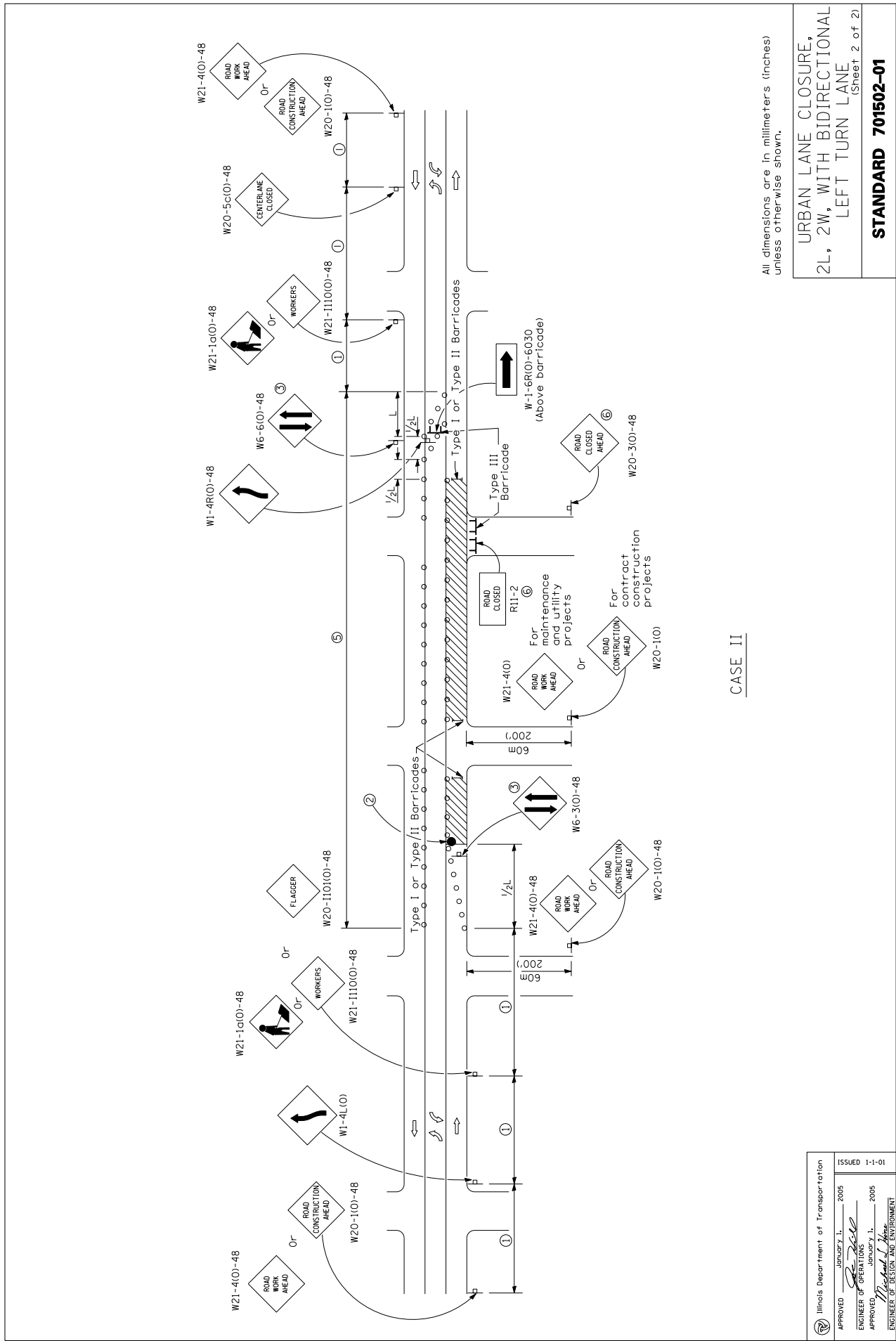
- ① Refer to SIGN SPACING TABLE for distances.
- ② Required for speeds > 70 km/h (40 mph).
- ③ Required if work exceeds 164 m (500') or 1 block.
- ④ For speeds exceeding 80 km/h (45 mph) contact the District Operations Office for approval of sign spacing.
- ⑤ Cones at 8 m (25') centers for 75 m (250'). Additional cones may be placed at 15 m (50') centers. When drums or type I or II barricades are used, the interval between devices may be doubled.
- ⑥ For approved sideroad closures.

DATE	REVISIONS
1-1-05	Revised notes and deleted FLAGGER SYMBOL sign.
1-1-01	New Standard

**URBAN LANE CLOSURE, 2L, 2W, WITH BIDIRECTIONAL LEFT TURN LANE.**  
(Sheet 1 of 2)

**STANDARD 701502-01**

	APPROVED	JANUARY 1, 2005	ISSUED	1-1-01
	 ENGINEER OF OPERATIONS APPROVED, JANUARY 1, 2005  ENGINEER OF DESIGN AND ENVIRONMENT			



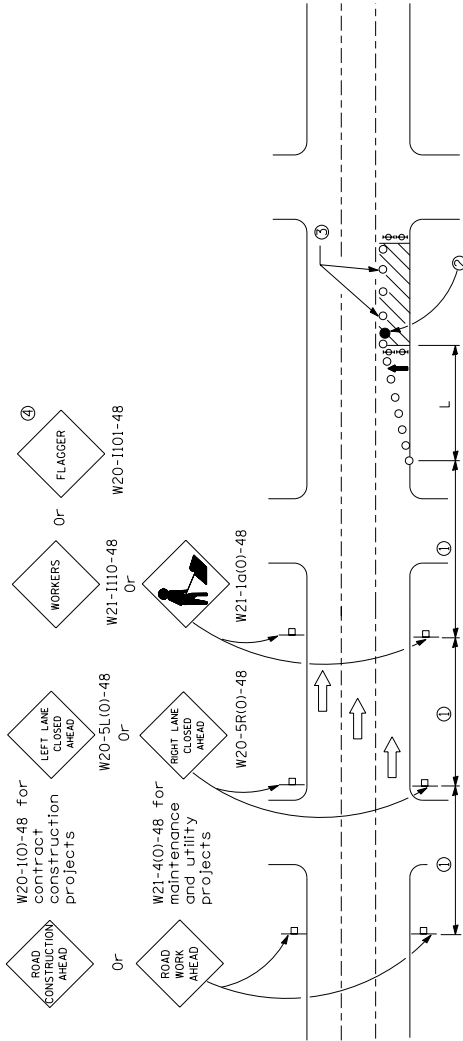
All dimensions are in millimeters (inches) unless otherwise shown.

CASE II

**URBAN LANE CLOSURE,  
2L, 2W, WITH BIDIRECTIONAL  
LEFT TURN LANE.**  
(Sheet 2 of 2)

**STANDARD 701502-01**

Illinois Department of Transportation APPROVED January 1, 2005 ENGINEER OF OPERATIONS APPROVED January 1, 2005 Michael J. Ryan ENGINEER OF DESIGN AND ENVIRONMENT	ISSUED 1-1-01
	APPROVED January 1, 2005 ENGINEER OF OPERATIONS APPROVED January 1, 2005 Michael J. Ryan ENGINEER OF DESIGN AND ENVIRONMENT



W20-1(0)-48 for contract construction projects  
 Or  
 W20-5L(0)-48  
 Or  
 W21-1(0)-48  
 Or  
 W21-1a(0)-48

ROAD WORK AHEAD  
 Or  
 ROAD WORK AHEAD  
 Or  
 LEFT LANE CLOSED AHEAD  
 Or  
 RIGHT LANE CLOSED AHEAD  
 Or  
 WORKERS  
 Or  
 FLAGGER

SIGN SPACING	
Posted Speed	Sign Spacing
55	164 m (500')
50-45	115 m (350')
<45	60 m (200')

**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.

① Refer to SIGN SPACING TABLE for distances.

② Required for speeds > 40 MPH

③ Cones at 8 m (25') centers for 75 m (250'). Additional cones may be placed at 15 m (50') centers. When drums or Type I or Type II barricades are used, the interval between devices may be doubled.

④ Use flagger sign only when flagger is present.

⑤ For approved sideroad closures.

**GENERAL NOTES**

This Standard is used where at any-time, day or night, any vehicle, equipment, workers or their activities encroach on the pavement during shoulder operations or where construction requires lane closures in urban areas.

Calculate L as follows:

**SPEED LIMIT FORMULAS**

70 km/h (40 mph) Metric (English)  
 or less: L = WS<sup>2</sup> L = WS<sup>2</sup>  
 150 60

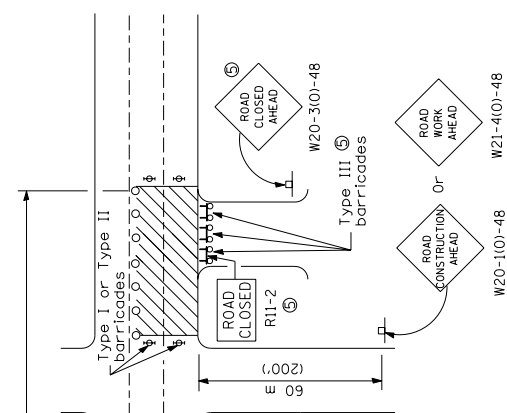
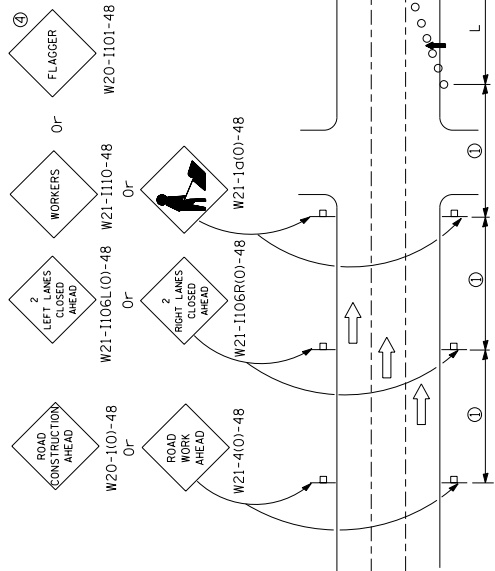
80 km/h (45 mph) or greater: L = 0.65(W)(S) L = (W)(S)

W = Width of offset in meters (feet).  
 S = Normal posted speed km/h (mph).

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

DATE	REVISIONS
1-1-05	Added tangent distance to 2 lane closure paper.
1-1-00	Rev. arrow board for single lane work.
	Rev. GENERAL NOTES.

Illinois Department of Transportation APPROVED January 7, 2005 ENGINEER OF OPERATIONS APPROVED January 7, 2005 ENGINEER OF DESIGN AND ENVIRONMENT	ISSUED 1-1-97
	URBAN LANE CLOSURE, MULTILANE, 1W OR 2W WITH NONTRAVERSABLE MEDIAN (Sheet 1 of 2) <b>STANDARD 701601-04</b>

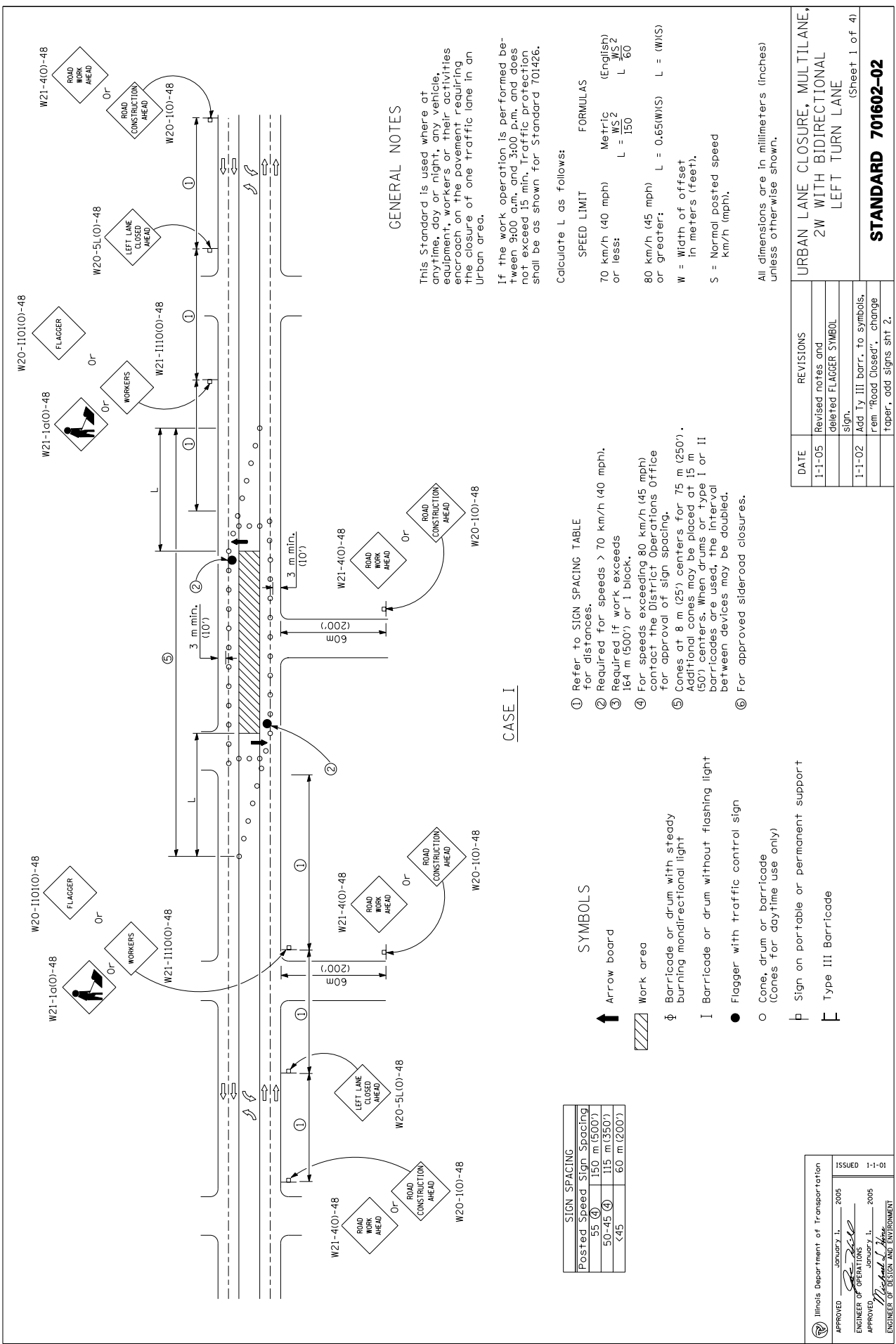


All dimensions are in millimeters (inches) unless otherwise shown.

**URBAN LANE CLOSURE,  
MULTILANE, 1W OR 2W WITH  
NONTRAVERSABLE MEDIAN**  
(Sheet 2 of 2)

**STANDARD 701601-04**

Illinois Department of Transportation APPROVED January 7, 1, 2005 ENGINEER OF OPERATIONS APPROVED January 7, 1, 2005 ENGINEER OF DESIGN AND ENVIRONMENT	ISSUED 1-1-97
	APPROVED January 7, 1, 2005 ENGINEER OF OPERATIONS APPROVED January 7, 1, 2005 ENGINEER OF DESIGN AND ENVIRONMENT



**GENERAL NOTES**

This Standard is used where at any time, day or night, any vehicle, equipment, workers or their activities encroach on the pavement requiring the closure of one traffic lane in an Urban area.

If the work operation is performed between 9:00 a.m. and 3:00 p.m. and does not exceed 15 min, Traffic protection shall be as shown for Standard 701426.

Calculate L as follows:

SPEED LIMIT	FORMULAS
70 km/h (40 mph) or less:	Metric $L = \frac{WS^2}{150}$ (English) $L = \frac{WS^2}{60}$
80 km/h (45 mph) or greater:	$L = 0.65(W)(S)$ $L = (W)(S)$

W = Width of offset in meters (feet).  
S = Normal posted speed km/h (mph).

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

**CASE I**

**REFER TO SIGN SPACING TABLE**

- ① Refer to SIGN SPACING TABLE for distances.
- ② Required for speeds > 70 km/h (40 mph).
- ③ Required if work exceeds 164 m (500') or 1 block.
- ④ For speeds exceeding 80 km/h (45 mph) contact the District Operations Office for approval of sign spacing.
- ⑤ Cones at 8 m (25') centers for 75 m (250'). Additional cones may be placed at 15 m (50') centers. When drums or Type I or II barricades are used, the interval between devices may be doubled.
- ⑥ For approved sideroad closures.

**SYMBOLS**

- ↑ Arrow board
- ▨ Work area
- ⊠ Barricade or drum with steady burning nondirectional light
- I Barricade or drum without flashing light
- Flagger with traffic control sign
- Cone, drum or barricade (Cones for daytime use only)
- ▬ Sign on portable or permanent support
- F Type III Barricade

Posted Speed	Sign Spacing
55 (4)	150 m (500')
50-45 (4)	115 m (350')
<45	60 m (200')

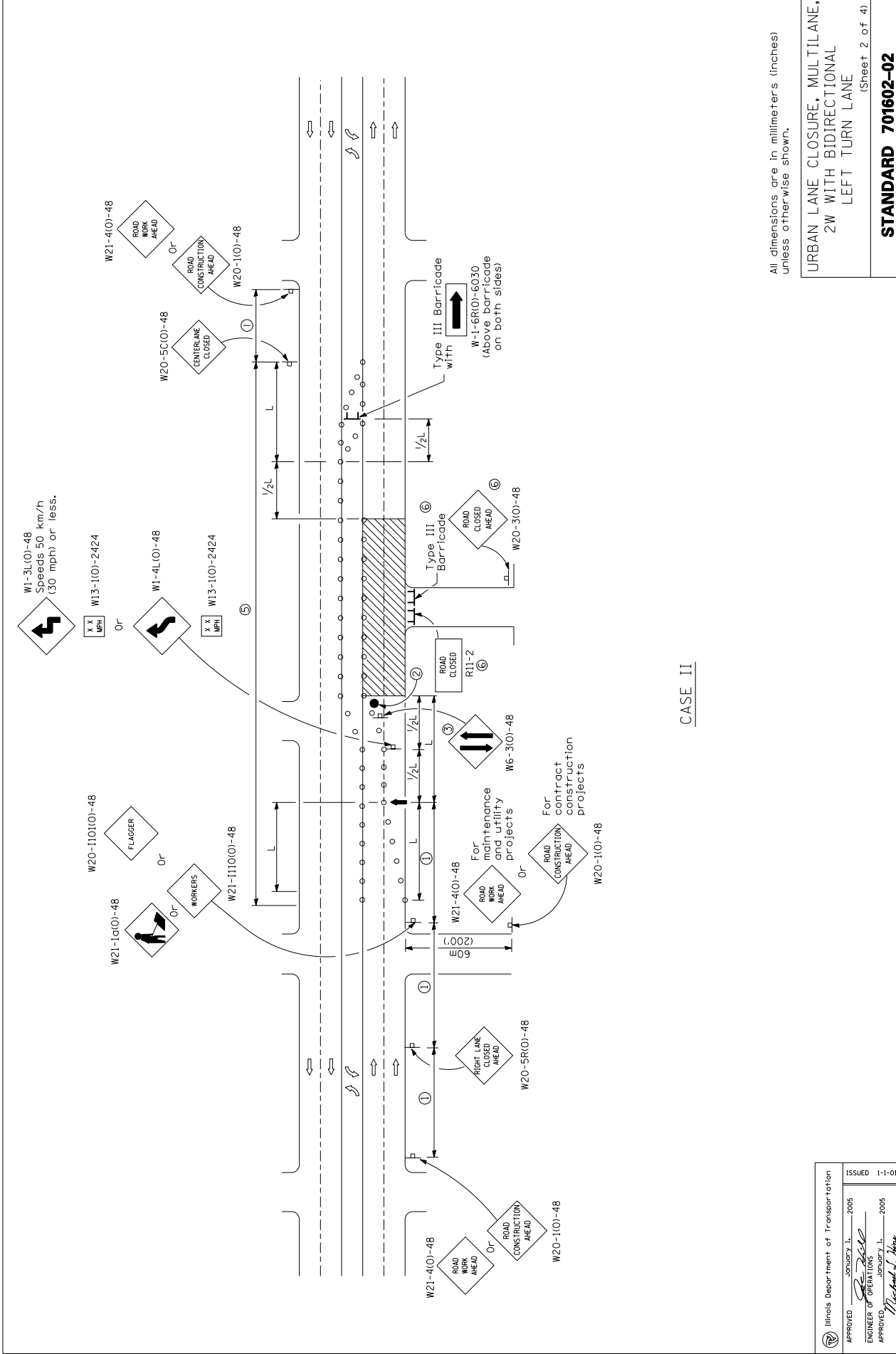
DATE	REVISIONS
1-1-05	Revised notes and deleted FLAGGER SYMBOL sign.
1-1-02	Add Ty III barr. to symbols, rem "Road Closed", change taper, add signs sht 2.

**URBAN LANE CLOSURE, MULTILANE, 2W WITH BIDIRECTIONAL LEFT TURN LANE** (Sheet 1 of 4)

**STANDARD 701602-02**

APPROVED	January 7, 2005	ISSUED	1-1-01
ENGINEER OF OPERATIONS	<i>Michael J. Hove</i>	ENGINEER OF DESIGN AND ENVIRONMENT	

Illinois Department of Transportation



W1-3L(O)-48  
Speeds 50 km/h  
(30 mph) or less.

W13-1101-2424  
X X MPH  
Or  
W1-4L(O)-48  
X X MPH

W21-1a(O)-48  
W21-1a(O)-48  
Or  
W21-1110(O)-48

W20-1101(O)-48  
FLAGGER  
Or  
WORKERS

W21-4(O)-48  
ROAD WORK AHEAD  
Or  
ROAD CONSTRUCTION AHEAD

W20-5C(O)-48  
CENTERLINE CLOSED

W20-1(O)-48  
ROAD WORK AHEAD  
Or  
ROAD CONSTRUCTION AHEAD

W1-6R(O)-6030  
(Above barricade on both sides)

Type III Barricade

ROAD CLOSED R11-2

W20-3(O)-48  
ROAD CLOSED AHEAD

W6-3(O)-48  
ROAD CLOSED AHEAD

W21-4(O)-48  
ROAD WORK AHEAD  
Or  
ROAD CONSTRUCTION AHEAD

W20-1(O)-48  
ROAD CONSTRUCTION AHEAD

W20-5R(O)-48  
RIGHT LANE CLOSED AHEAD

W21-4(O)-48  
ROAD WORK AHEAD  
Or  
ROAD CONSTRUCTION AHEAD

W20-1(O)-48  
ROAD CONSTRUCTION AHEAD

80

CASE II

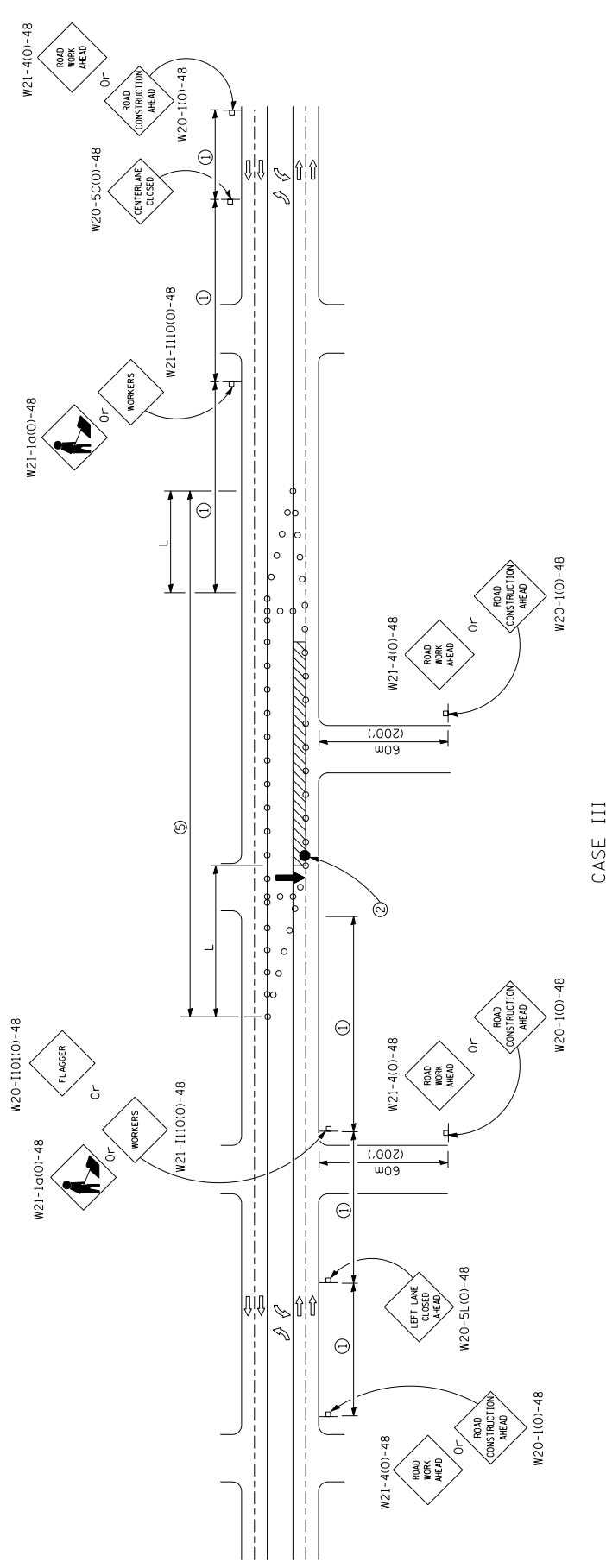
All dimensions are in millimeters (inches) unless otherwise shown.

**URBAN LANE CLOSURE, MULTILANE, 2W WITH BIDIRECTIONAL LEFT TURN LANE**  
(Sheet 2 of 4)

**STANDARD 701602-02**

Illinois Department of Transportation		ISSUED	1-1-01
APPROVED	January 1, 2005		
ENGINEER OF OPERATIONS	[Signature]		
APPROVED	January 1, 2005		
	[Signature]		
ENGINEER OF DESIGN AND ENVIRONMENT			





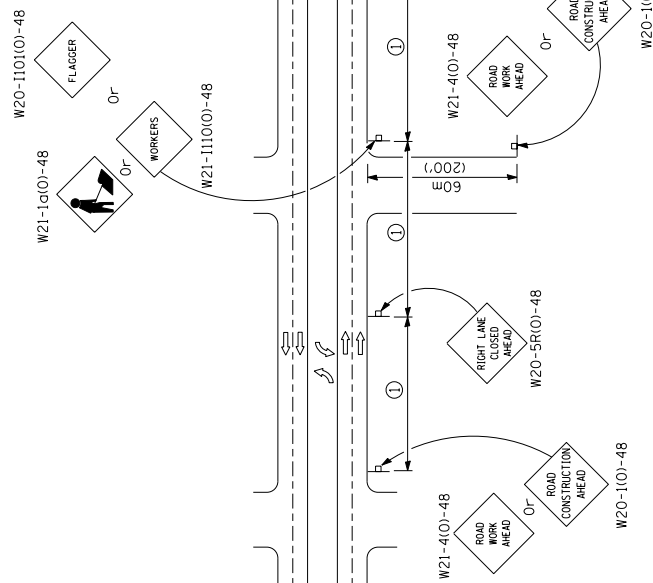
All dimensions are in millimeters (inches) unless otherwise shown.

URBAN LANE CLOSURE, MULTILANE,  
2W WITH BIDIRECTIONAL  
LEFT TURN LANE  
(Sheet 3 of 4)

**STANDARD 701602-02**

CASE III

Illinois Department of Transportation APPROVED January 7, 1, 2005 ENGINEER OF OPERATIONS APPROVED January 7, 1, 2005 <i>Michael J. Ryan</i> ENGINEER OF DESIGN AND ENVIRONMENT	ISSUED 1-1-01
	APPROVED January 7, 1, 2005 <i>[Signature]</i> ENGINEER OF OPERATIONS APPROVED January 7, 1, 2005 <i>[Signature]</i> ENGINEER OF DESIGN AND ENVIRONMENT



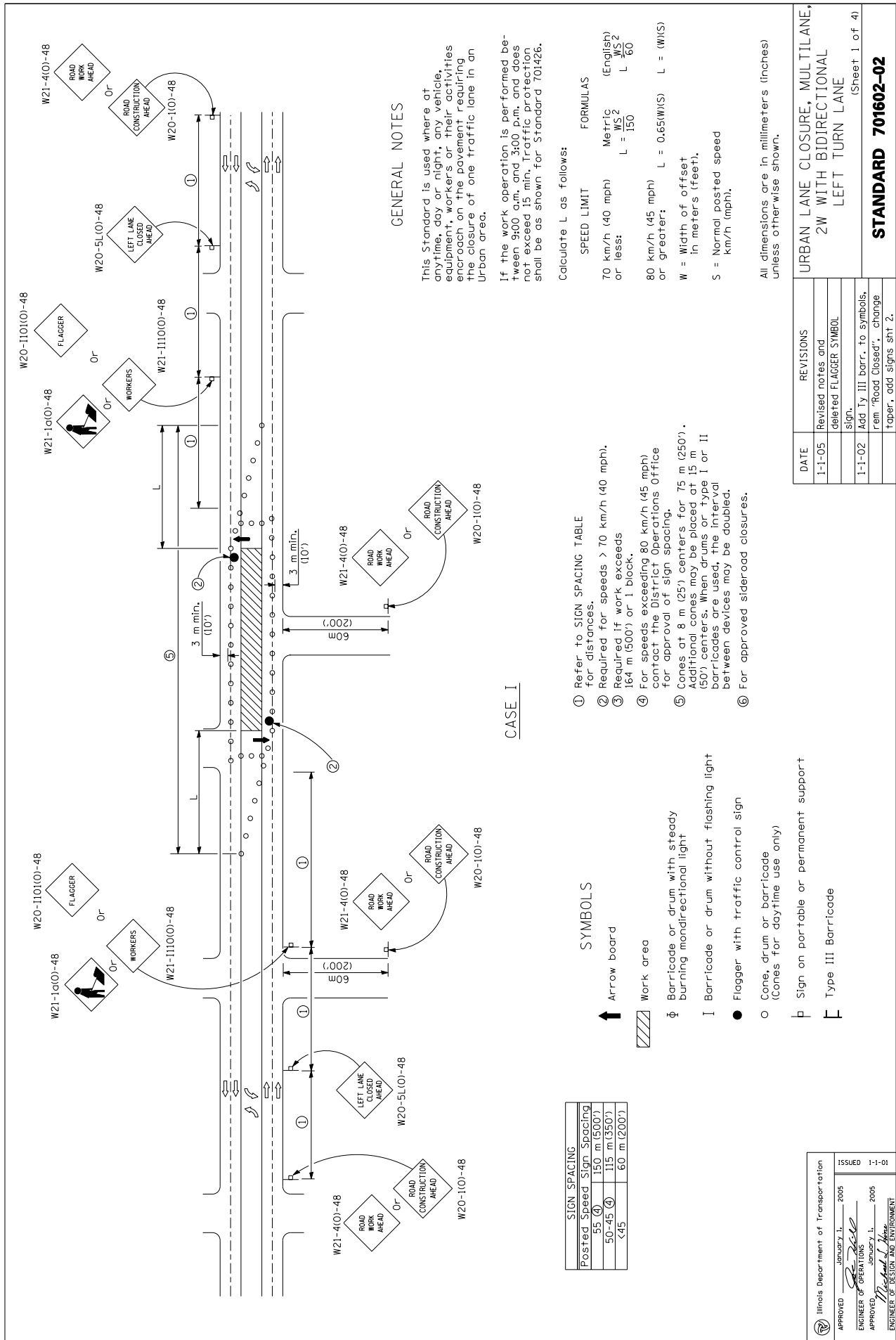
CASE IV

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

URBAN LANE CLOSURE, MULTILANE,  
2W WITH BIDIRECTIONAL  
LEFT TURN LANE  
(Sheet 4 of 4)

**STANDARD 701602-02**

Illinois Department of Transportation APPROVED January 1, 2005 ENGINEER OF OPERATIONS APPROVED January 1, 2005 ENGINEER OF DESIGN AND ENVIRONMENT	ISSUED 1-1-01
	APPROVED January 1, 2005 ENGINEER OF OPERATIONS APPROVED January 1, 2005 ENGINEER OF DESIGN AND ENVIRONMENT



**GENERAL NOTES**

This Standard is used where at any time, day or night, any vehicle, equipment, workers or their activities encroach on the pavement requiring the closure of one traffic lane in an Urban area.

If the work operation is performed between 9:00 a.m. and 3:00 p.m. and does not exceed 15 min. Traffic protection shall be as shown for Standard 701426.

Calculate L as follows:

SPEED LIMIT	FORMULAS
70 km/h (40 mph) or less:	Metric $L = \frac{WS^2}{150}$ (English) $L = \frac{WS^2}{60}$
80 km/h (45 mph) or greater:	$L = 0.65(W)(S)$ $L = (W)(S)$

W = Width of offset in meters (feet).  
S = Normal posted speed km/h (mph).

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

**CASE I**

**REFER TO SIGN SPACING TABLE**

- ① Refer to SIGN SPACING TABLE for distances.
- ② Required for speeds > 70 km/h (40 mph).
- ③ Required if work exceeds 164 m (500') or 1 block.
- ④ For speeds exceeding 80 km/h (45 mph) contact the District Operations Office for approval of sign spacing.
- ⑤ Cones at 8 m (25') centers for 75 m (250'). Additional cones may be placed at 15 m (50') centers. When drums or Type I or II barricades are used, the interval between devices may be doubled.
- ⑥ For approved sideroad closures.

**SYMBOLS**

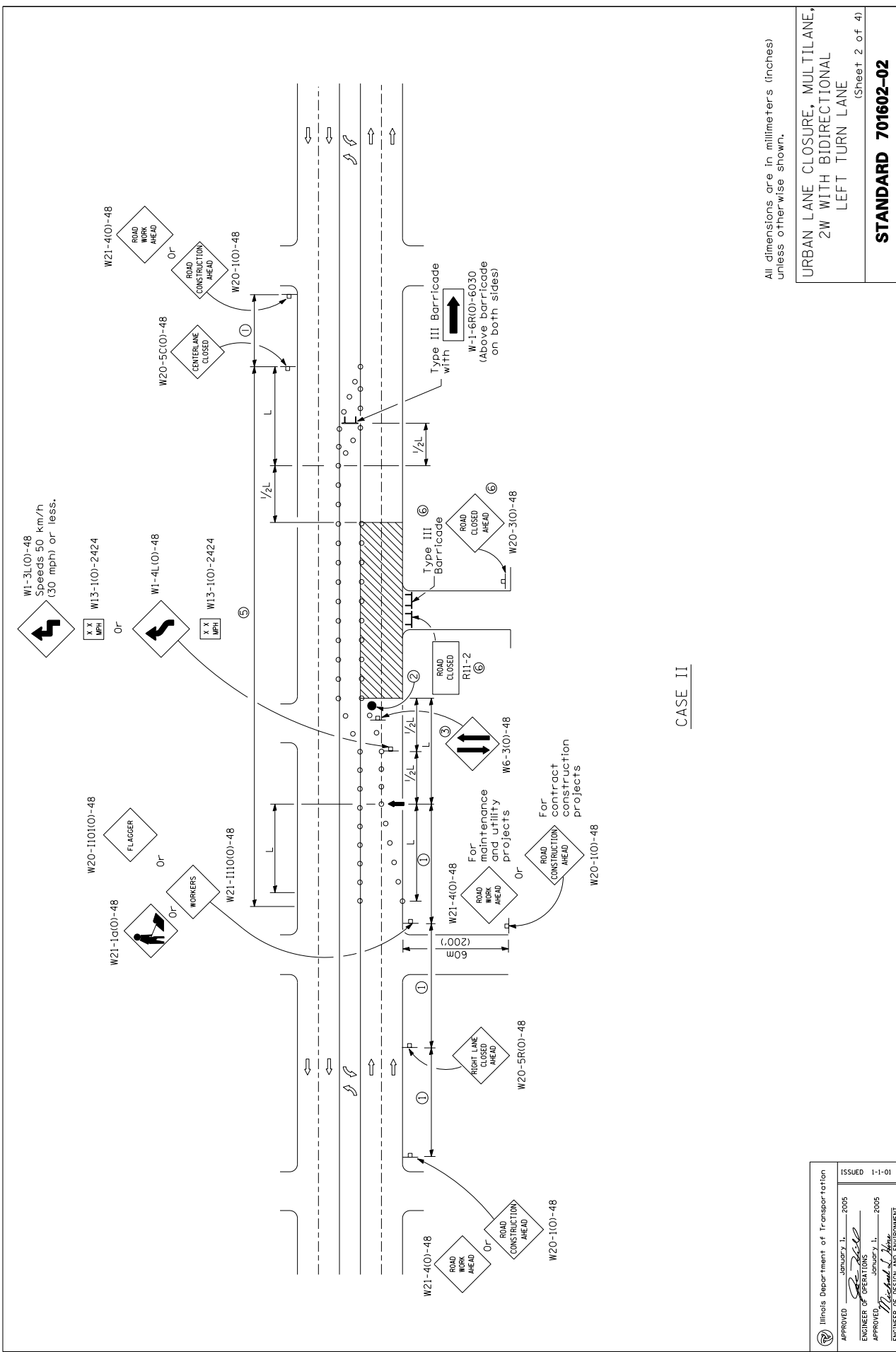
- ↑ Arrow board
- ▨ Work area
- ⊠ Barricade or drum with steady flashing nondirectional light
- I Barricade or drum without flashing light
- Flagger with traffic control sign
- Cone, drum or barricade (Cones for daytime use only)
- ▬ Sign on portable or permanent support
- ⊞ Type III Barricade

Posted Speed	Sign Spacing
55 (4)	150 m (500')
50-45 (4)	115 m (350')
<45	60 m (200')

DATE	REVISIONS
1-1-05	Revised notes and deleted FLAGGER SYMBOL sign.
1-1-02	Add Ty III barr. to symbols, rem "Road Closed", change taper, add signs sht 2.

Illinois Department of Transportation APPROVED January 7, 2005 ENGINEER OF OPERATIONS APPROVED January 7, 2005 Michael J. Hove ENGINEER OF DESIGN AND ENVIRONMENT	ISSUED 1-1-01
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**URBAN LANE CLOSURE, MULTILANE, 2W WITH BIDIRECTIONAL LEFT TURN LANE**  
(Sheet 1 of 4)  
**STANDARD 701602-02**



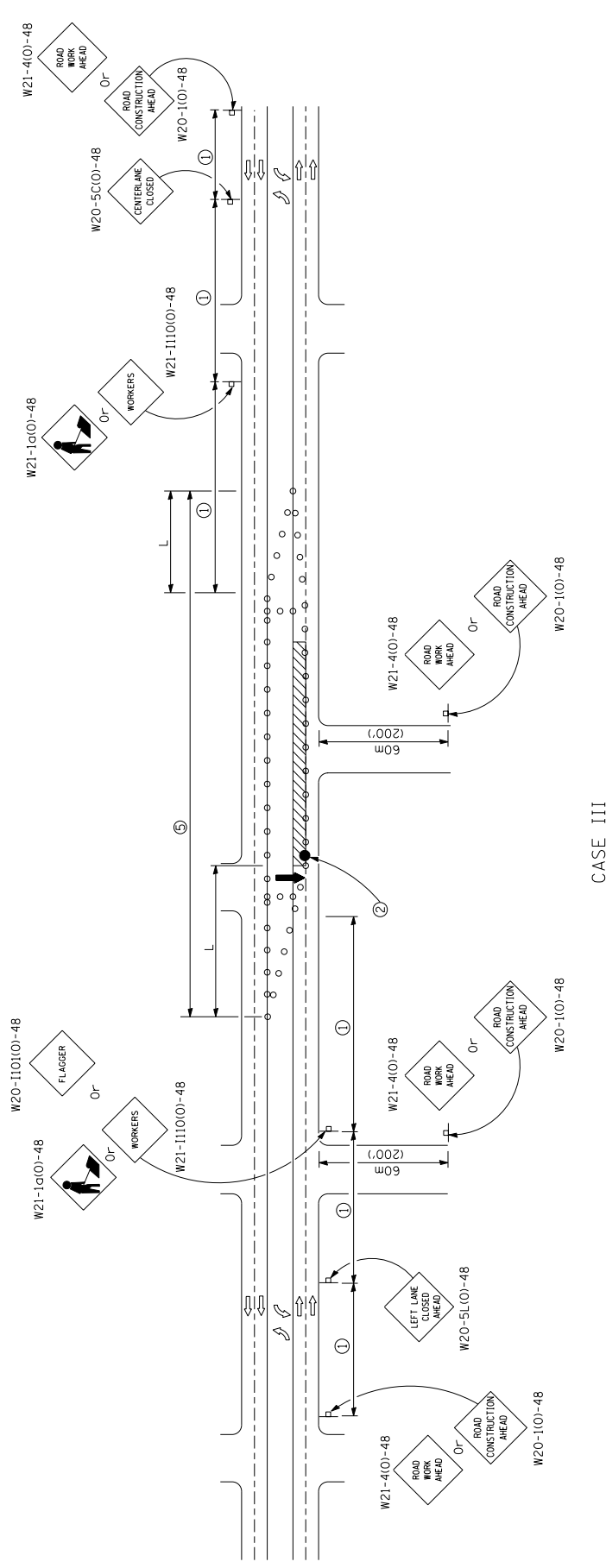
All dimensions are in millimeters (inches) unless otherwise shown.

**URBAN LANE CLOSURE, MULTILANE, 2W WITH BIDIRECTIONAL LEFT TURN LANE**  
(Sheet 2 of 4)

**STANDARD 701602-02**

CASE II

Illinois Department of Transportation APPROVED: <i>[Signature]</i> January 7, 2005 ENGINEER OF OPERATIONS APPROVED: <i>[Signature]</i> January 7, 2005 ENGINEER OF DESIGN AND ENVIRONMENT	ISSUED 1-1-01
	January 7, 2005 January 7, 2005



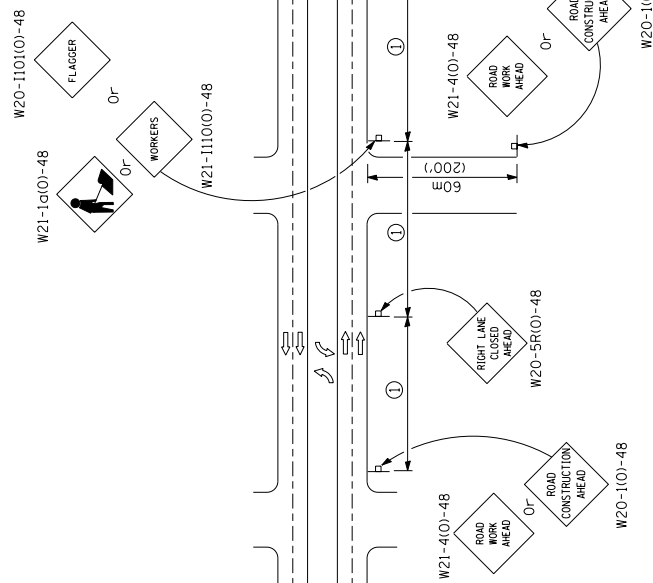
CASE III

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

URBAN LANE CLOSURE, MULTILANE,  
2W WITH BIDIRECTIONAL  
LEFT TURN LANE  
(Sheet 3 of 4)

**STANDARD 701602-02**

Illinois Department of Transportation APPROVED January 7, 2005 ENGINEER OF OPERATIONS APPROVED January 7, 2005 <i>Michael J. Ryan</i> ENGINEER OF DESIGN AND ENVIRONMENT	ISSUED 1-1-01
	APPROVED January 7, 2005 ENGINEER OF OPERATIONS APPROVED January 7, 2005 <i>Michael J. Ryan</i> ENGINEER OF DESIGN AND ENVIRONMENT



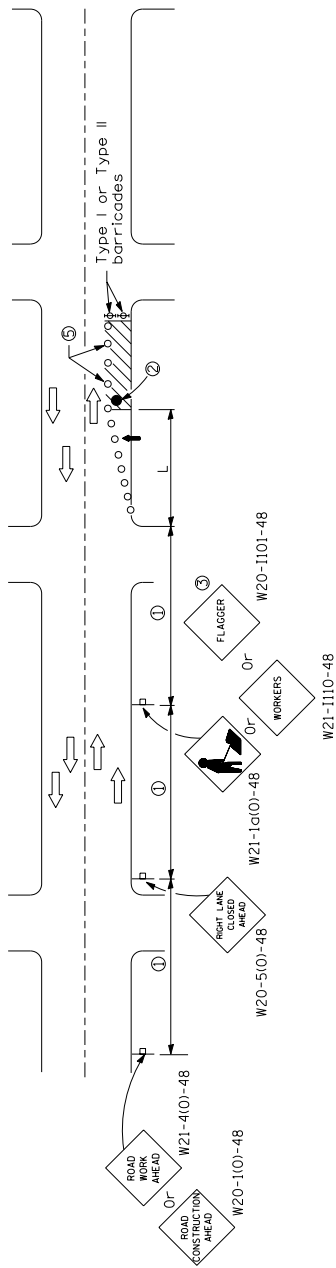
CASE IV

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

URBAN LANE CLOSURE, MULTILANE,  
2W WITH BIDIRECTIONAL  
LEFT TURN LANE  
(Sheet 4 of 4)

**STANDARD 701602-02**

Illinois Department of Transportation APPROVED January 1, 2005 ENGINEER OF OPERATIONS APPROVED January 1, 2005 ENGINEER OF DESIGN AND ENVIRONMENT	ISSUED 1-1-01
	APPROVED January 1, 2005 ENGINEER OF OPERATIONS APPROVED January 1, 2005 ENGINEER OF DESIGN AND ENVIRONMENT



GENERAL NOTES

This Standard is used where at anytime, day or night, any vehicle, equipment, workers or their activities encroach the pavement requiring the closure of one or more traffic lanes in an urban area.

Calculate L as follows:

SPEED LIMIT	FORMULAS
70 km/h (40 mph) or less:	Metric (English) $L = \frac{WS^2}{150}$ $L = \frac{WS^2}{60}$
80 km/h (45 mph) or greater:	$L = 0.65(W)(S)$ $L = (W)(S)$

W = Width of offset in meters (feet).  
S = Normal posted speed km/h (mph).

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

① Refer to SIGN SPACING TABLE for distances.

② Required for speeds > 40 MPH

③ Use flagger sign only when flagger is present.

④ For approved sideroad closures.

⑤ Cones at 8 m (25') centers for 75 m (250'). Additional cones may be placed at 15 m (50') centers. When drums or type I or Type II barricades are used, the interval between devices may be doubled.

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.

SIGN SPACING	
Posted Speed	Sign Spacing
55	164 m (500')
50-45	115 m (350')
<45	60 m (200')

DATE	REVISIONS
1-1-05	Added tangent distance to 2 lane closure taper.
1-1-00	Rev. GENERAL NOTES and 2 RT. LANES CLOSED AHEAD sign number.

URBAN LANE CLOSURE, MULTILANE, 2W WITH MOUNTABLE MEDIAN <small>(Sheet 1 of 2)</small>
<b>STANDARD 701606-04</b>

Illinois Department of Transportation

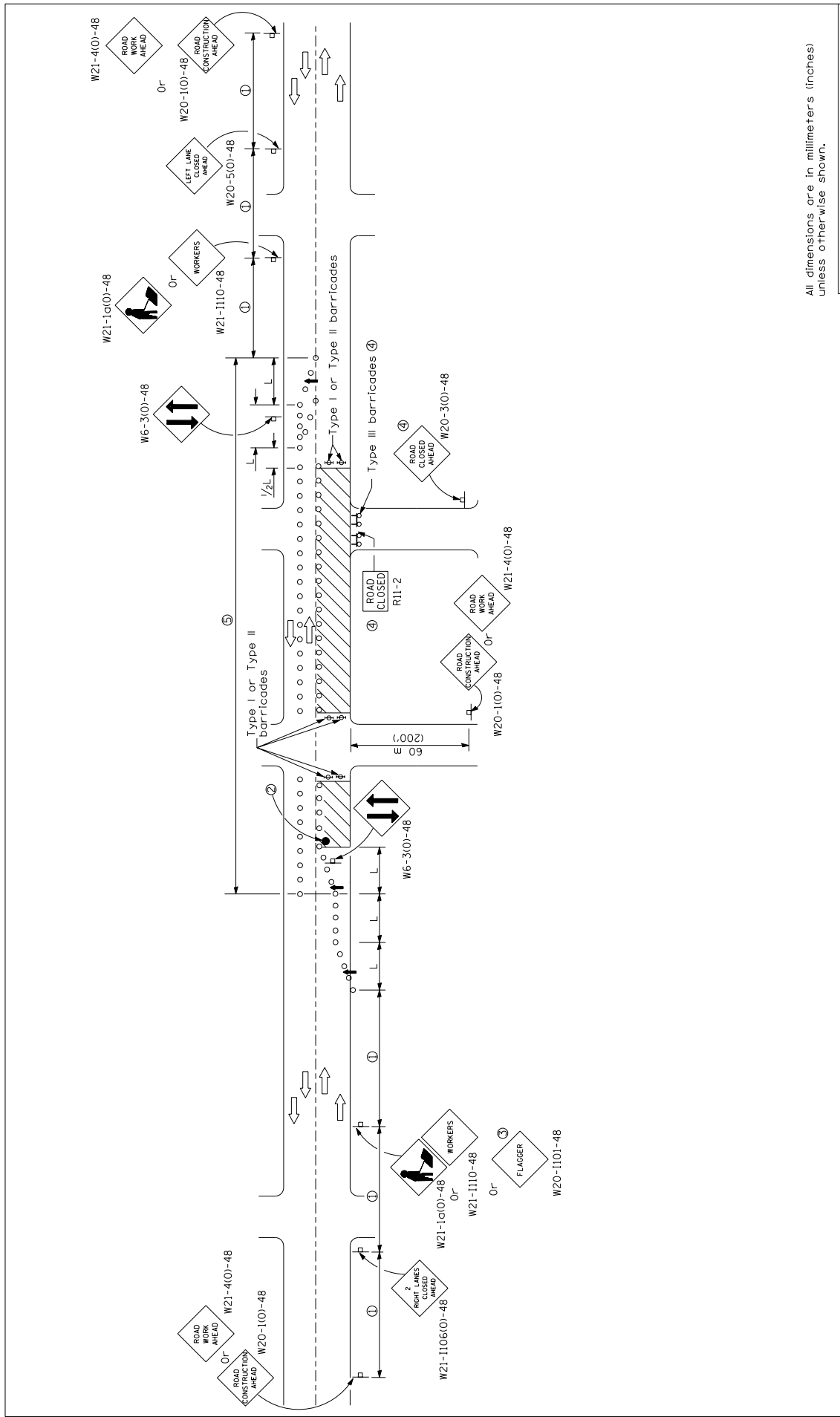
APPROVED January 7, 2005

ENGINEER OF OPERATIONS

APPROVED January 7, 2005

ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97



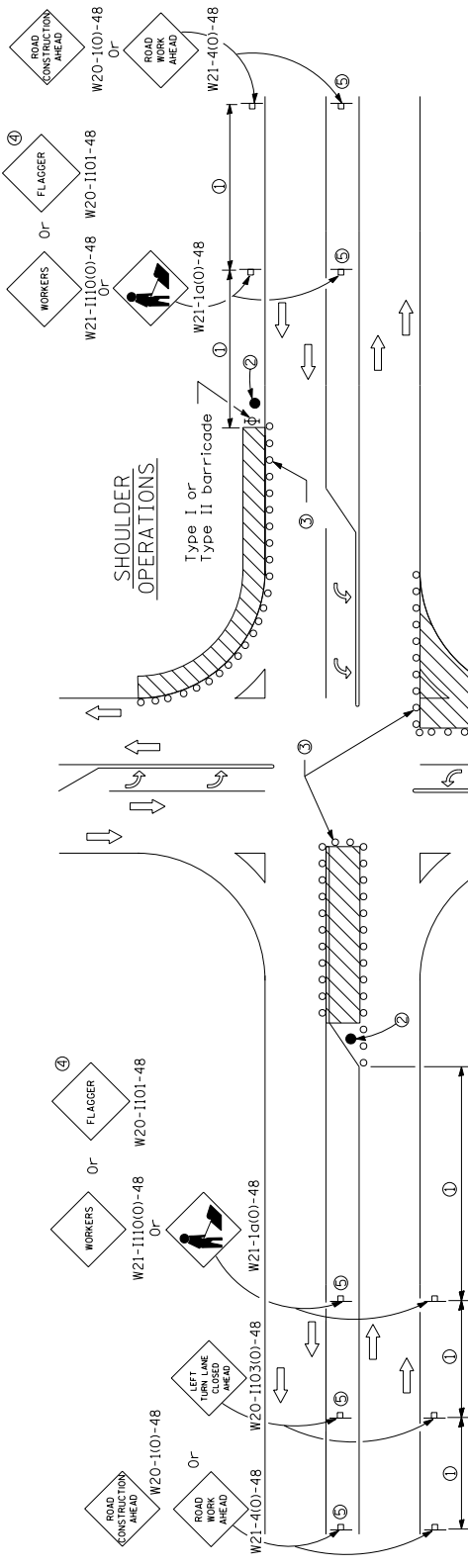
All dimensions are in millimeters (inches) unless otherwise shown.

URBAN LANE CLOSURE,  
MULTILANE, 2W WITH  
MOUNTABLE MEDIAN  
(Sheet 2 of 2)

**STANDARD 701606-04**

Illinois Department of Transportation APPROVED January 1, 2005 ENGINEER OF OPERATIONS APPROVED January 1, 2005 Michael J. Ryan ENGINEER OF DESIGN AND ENVIRONMENT	ISSUED 1-1-97
	APPROVED January 1, 2005 ENGINEER OF OPERATIONS APPROVED January 1, 2005 Michael J. Ryan ENGINEER OF DESIGN AND ENVIRONMENT





**LEFT TURN LANE OR CENTER MEDIAN OPERATIONS**

① Refer to SIGN SPACING TABLE for distance.

② Required for speed > 40 mph.

③ Cones at 8 m (25') centers for 75 m (250'). Additional cones may be placed at 15 m (50') centers. When drums or Type I or Type II barricades are used, the interval between devices may be doubled.

④ Use flagger sign only when flagger is present.

⑤ Omit this sign when median is less than 3 m (10') or for bi-directional turn lanes.

Posted Speed	Sign Spacing
55	164 m (500')
50-45	115 m (350')
<45	60 m (200')

**SYMBOLS**

- Work area
- Cone, drum or barricade
- Sign on portable or permanent support
- Arrow board
- Barricade or drum with flashing light
- Flagger with traffic control sign

**GENERAL NOTES**

This Standard is used where, at anytime, day or night, any vehicle, equipment, workers or their activities encroach on the pavement during shoulder operations or where construction requires lane closures in an urban area.

Calculate L as follows:

**FORMULAS**

**SPEED LIMIT**  
70 km/h (40 mph) or less:

$$L = \frac{WS^2}{150}$$

Metric (English)  
L =  $\frac{WS^2}{60}$

80 km/h (45 mph) or greater:

$$L = 0.65(W/S) L = (W/S)$$

W = Width of offset in meters (feet).

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

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

W21-4(0)-48 for contract construction and utility projects

W21-4(0)-48 for maintenance and utility projects

DATE	REVISIONS
1-1-05	Deleted FLAGGER signs and repositioned Flagger.
1-1-00	Revised GENERAL NOTES.

Illinois Department of Transportation  
 APPROVED January 7, 1, 2005  
 ENGINEER OF OPERATIONS  
 APPROVED January 7, 1, 2005  
 Michael J. Hines  
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

**URBAN LANE CLOSURE, MULTILANE INTERSECTION**

**STANDARD 701701-04**

