

## **2013 Changes to the 2011 MMUTCD, Part 6 September 2013**

The requirements for drum spacing in Sections 6C.07 (Page 557 (MI)) and 6F.63 (Page 604 (MI)) have been revised to more closely match the pavement marking skip line configuration. The reason for change is the MMUTCD Section 3A.06-04 states that broken lines should consist of 12.5 foot long segments and 37.5 foot gaps. This allows the placement of a drum at the beginning of every broken line for 50 foot spacing on tapers and at the beginning of every other line for 100 foot spacing on tapers.

In Table 6F-1 (Sheet 3 of 3) (Page 580 (MI)), the name of the W24-1cP plaque has been changed from "All Lanes" to "All Lanes (plaque)". The size of the W24-1cP plaque shall be "24 x 18" instead of "24 x 24" in the Conventional Road column, and "30 x 24" instead of "30 x 30" in the Freeway or Expressway column.

This page is intentionally blank.

03 Longer tapers are not necessarily better than shorter tapers (particularly in urban areas with characteristics such as short block lengths or driveways) because extended tapers tend to encourage sluggish operation and to encourage drivers to delay lane changes unnecessarily. The test concerning adequate lengths of tapers involves observation of driver performance after TTC plans are put into effect.

Guidance:

04 *The appropriate taper length (L) should be determined using the criteria shown in Tables 6C-3 and 6C-4.*

05 *The maximum distance in feet between devices in a taper should not exceed 1.0 times the work zone speed limit in mph for roadways with a posted work zone speed limit less than 45 mph and should not exceed 50 feet on roadways with a posted work zone speed limit of 45 mph or greater.*

Support:

06 A merging taper requires the longest distance because drivers are required to merge into common road space.

Guidance:

07 *A merging taper should be long enough to enable merging drivers to have adequate advance warning and sufficient length to adjust their speeds and merge into an adjacent lane before the downstream end of the transition.*

Support:

08 A shifting taper is used when a lateral shift is needed. When more space is available, a longer than minimum taper distance can be beneficial. Changes in alignment can also be accomplished by using horizontal curves designed for normal highway speeds.

Guidance:

09 *A shifting taper should have a length of approximately 1/2 L (see Tables 6C-3 and 6C-4).*

Support:

10 A shoulder taper might be beneficial on a high-speed roadway where shoulders are part of the activity area and are closed, or when improved shoulders might be mistaken as a driving lane. In these instances, the same type, but abbreviated, closure procedures used on a normal portion of the roadway can be used.

Guidance:

11 *If used, shoulder tapers should have a length of approximately 1/3 L (see Tables 6C-3 and 6C-4). If a shoulder is used as a travel lane, either through practice or during a TTC activity, a normal merging or shifting taper should be used.*

Support:

12 A downstream taper might be useful in termination areas to provide a visual cue to the driver that access is available back into the original lane or path that was closed.

Guidance:

13 *If used, a downstream taper should have a minimum length of 50 feet and a maximum length of 100 feet with devices placed at a spacing of approximately 20 feet.*

Support:

14 The one-lane, two-way taper is used in advance of an activity area that occupies part of a two-way roadway in such a way that a portion of the road is used alternately by traffic in each direction.

Guidance:

15 *Traffic should be controlled by a traffic regulator or temporary traffic control signal (if sight distance is limited), or a STOP or YIELD sign. A short taper having a minimum length of 50 feet and a maximum length of 100 feet with channelizing devices at approximately 20-foot spacing should be used to guide traffic into the one-lane section, and a downstream taper should be used to guide traffic back into their original lane.*

**Table 6C-3. Taper Length Criteria for Temporary Traffic Control Zones**

Type of Taper	Taper Length
Merging Taper	at least L
Shifting Taper	at least 0.5 L
Shoulder Taper	at least 0.33 L
One-Lane, Two-Way Traffic Taper	50 feet minimum, 100 feet maximum
Downstream Taper	50 feet minimum, 100 feet maximum

Note: Use Table 6C-4 to calculate L

**Table 6C-4. Formulas for Determining Taper Length**

Speed (S)	Taper Length (L) in feet
40 mph or less	$L = \frac{WS^2}{60}$
45 mph or more	$L = WS$

Where: L = taper length in feet  
 W = width of offset in feet  
 S = posted speed limit, or off-peak 85th-percentile speed prior to work starting, or the anticipated operating speed in mph

Support:

16 An example of a one-lane, two-way traffic taper is shown in Figure 6C-3.

### Section 6C.09 Detours and Diversions

Support:



01 A detour is a temporary rerouting of road users onto an existing highway in order to avoid a TTC zone. Michigan State Statute has the following provisions in Sections 247.291 and 247.292 regarding closing highways or bridges for construction or repair.



#### CLOSING ROADS UNDER CONSTRUCTION OR REPAIR (EXCERPT)

##### Act 165 of 1917

#### 247.291 Closing highways or bridges for construction or repair; barriers; highway, definition.

Sec. 1. The officials in charge of constructing, improving or repairing highways may close any highway or portion thereof, which is under process of construction, improvement or repair or upon which is located any bridge which is being constructed or repaired. No highway shall be closed under the provisions of this act until suitable barriers have been erected at the ends of the highway or of the closed portion thereof, and also at the point of intersection of such highway or portion thereof with other highways. Suitable barriers are those which conform to the manual of uniform traffic control devices adopted pursuant to section 608 of Act No. 300 of the Public Acts of 1949, being section 257.608 of the Compiled Laws of 1948. For the purposes of this act “highway” includes roads and streets.

**History:** 1917, Act 165, Eff. Aug. 10, 1917; CL 1929, 4626; CL 1948, 247.291; Am. 1966, Act 176, Imd. Eff. July 1, 1966.



#### CLOSING ROADS UNDER CONSTRUCTION OR REPAIR (EXCERPT)

##### Act 165 of 1917

#### 247.292 Closing of highways or bridges for construction or repair; detours, notices, removal of barriers on completion of work.

Sec. 2. No highway shall be closed under the provisions of this act until suitable detours around the same, or the closed portion thereof, are provided and are placed in reasonably safe and passable condition for traffic. Notices in the form of plainly legible signs shall be placed by the highway officials having such work in charge at either end of the closed highway or portion of highway and at such intermediate points along the detour, or detours, as may be necessary to plainly mark the same. Upon the completion of the work of construction, improvement or repair and as soon as the highway or bridge constructed, improved or repaired shall be in suitable condition for public travel, all barriers, marks and signs whatsoever erected under the provisions hereof shall be at once removed by the officials erecting or placing the same.

**History:** 1917, Act 165, Eff. Aug. 10, 1917; CL 1929, 4627; CL 1948, 247.292; Am. 1966, Act 176, Imd. Eff. July 1, 1966.

#### Standard:



02 **Detours for the closing of highways or bridges for construction or repair shall be clearly signed over their entire length so that road users can easily use existing highways to return to the original highway.**

*Guidance:*



02A *Detour route signing should resemble permanent route signing as shown in Figures 6H-8 and 6H-9.*

Support:

03 A diversion is a temporary rerouting of road users onto a temporary highway or alignment placed around the work area.

### Section 6C.10 One-Lane, Two-Way Traffic Control

#### Standard:

01 **Except as provided in Paragraph 5, when traffic in both directions must use a single lane for a limited distance, movements from each end shall be coordinated.**

*Guidance:*



02 *Provisions should be made for alternate one-way movement through the constricted section via methods such as traffic regulator control, a flag transfer, a pilot car, traffic control signals, or stop or yield control.*

03 *Control points at each end should be chosen to permit easy passing of opposing lanes of vehicles.*



04 *If traffic on the affected one-lane roadway is not visible from one end to the other, then traffic regulating procedures, a pilot car with a traffic regulator used as described in Section 6C.13, or a traffic control signal should be used to control opposing traffic flows.*

**Table 6F-1. Temporary Traffic Control Zone Sign and Plaque Sizes (Sheet 2 of 3)**

Sign or Plaque	Sign Designation	Section	Conventional Road	Freeway or Expressway	Minimum
XX MPH Speed Zone Ahead	W3-5a	6F.16	36 x 36	48 x 48	30 x 30
Merging Traffic	W4-1,5	6F.16	36 x 36	48 x 48	36 x 36
Lane Ends	W4-2	6F.24	36 x 36	48 x 48	30 x 30
Added Lane	W4-3,6	6F.16	36 x 36	48 x 48	30 x 30
No Merge Area (plaque)	W4-5P	6F.16	18 x 24	24 x 30	—
Road Narrows	W5-1	6F.16	36 x 36	48 x 48	30 x 30
Narrow Bridge	W5-2	6F.16	36 x 36	48 x 48	30 x 30
One Lane Bridge	W5-3	6F.16	36 x 36	48 x 48	30 x 30
Ramp Narrows	W5-4	6F.26	36 x 36	48 x 48	30 x 30
Divided Highway	W6-1	6F.16	36 x 36	48 x 48	30 x 30
Divided Highway Ends	W6-2	6F.16	36 x 36	48 x 48	30 x 30
Two-Way Traffic	W6-3	6F.32	36 x 36	48 x 48	30 x 30
Two-Way Traffic	W6-4	6F.76	12 x 18	12 x 18	—
Hill (symbol)	W7-1	6F.16	36 x 36	48 x 48	30 x 30
Next XX Miles (plaque)	W7-3aP	6F.53	24 x 18	36 x 30	—
Bump	W8-1	6F.16	36 x 36	48 x 48	30 x 30
Dip	W8-2	6F.16	36 x 36	48 x 48	30 x 30
Pavement Ends	W8-3	6F.16	36 x 36	48 x 48	30 x 30
Soft Shoulder	W8-4	6F.44	36 x 36	48 x 48	30 x 30
Slippery When Wet	W8-5	6F.16	36 x 36	48 x 48	30 x 30
Truck Crossing	W8-6	6F.36	36 x 36	48 x 48	30 x 30
Loose Gravel	W8-7	6F.16	36 x 36	48 x 48	30 x 30
Rough Road	W8-8	6F.16	36 x 36	48 x 48	30 x 30
Low Shoulder	W8-9	6F.44	36 x 36	48 x 48	30 x 30
Uneven Lanes	W8-11	6F.45	36 x 36	48 x 48	30 x 30
No Center Line	W8-12	6F.47	36 x 36	48 x 48	30 x 30
Fallen Rocks	W8-14	6F.16	36 x 36	48 x 48	30 x 30
Grooved Pavement	W8-15	6F.16	36 x 36	48 x 48	30 x 30
Motorcycle (plaque)	W8-15P	6F.54	24 x 18	30 x 24	—
Shoulder Drop Off (symbol)	W8-17	6F.44	36 x 36	48 x 48	30 x 30
Shoulder Drop-Off (plaque)	W8-17P	6F.44	24 x 18	30 x 24	—
Road May Flood	W8-18	6F.16	36 x 36	48 x 48	24 x 24
No Shoulder	W8-23	6F.16	36 x 36	48 x 48	30 x 30
Steel Plate Ahead	W8-24	6F.46	36 x 36	48 x 48	30 x 30
Shoulder Ends	W8-25	6F.16	36 x 36	48 x 48	30 x 30
Lane Ends	W9-1,2	6F.16	36 x 36	48 x 48	30 x 30
Center Lane Closed Ahead	W9-3	6F.23	36 x 36	48 x 48	30 x 30
Grade Crossing Advance Warning	W10-1	6F.16	36 dia.	—	—
Truck	W11-10	6F.36	36 x 36	48 x 48	30 x 30
Double Arrow	W12-1	6F.16	30 x 30	—	—
Low Clearance	W12-2	6F.16	36 x 36	48 x 48	30 x 30
Advisory Speed (plaque)	W13-1P	6F.52	24 x 24	30 x 30	18 x 18
On Ramp (plaque)	W13-4P	6F.25	36 x 36	36 x 36	—
No Passing Zone (pennant)	W14-3	6F.16	48 x 48 x 36	64 x 64 x 48	40 x 40 x 30
XX Feet (plaque)	W16-2P	6F.16	24 x 18	30 x 24	—
Road Work (with distance)	W20-1	6F.18	36 x 36	48 x 48	30 x 30

**Table 6F-1. Temporary Traffic Control Zone Sign and Plaque Sizes (Sheet 3 of 3)**

Sign or Plaque	Sign Designation	Section	Conventional Road	Freeway or Expressway	Minimum
Detour (with distance)	W20-2	6F.19	36 x 36	48 x 48	30 x 30
Road (Street) Closed (with distance)	W20-3	6F.20	36 x 36	48 x 48	30 x 30
One Lane Road (with distance)	W20-4	6F.21	36 x 36	48 x 48	30 x 30
Lane(s) Closed (with distance)	W20-5,5a	6F.22	36 x 36	48 x 48	30 x 30
Traffic Regulator (symbol)	W20-7a	6F.31	36 x 36	48 x 48	30 x 30
Slow (on Stop/Slow Paddle)	W20-8	6E.03	18 x 18	—	—
Workers	W21-1,1a	6F.33	36 x 36	48 x 48	30 x 30
Fresh Oil (Tar)	W21-2	6F.34	36 x 36	48 x 48	30 x 30
Road Machinery Ahead	W21-3	6F.35	36 x 36	48 x 48	30 x 30
Slow Moving Vehicle	W21-4	6G.06	36 x 18	—	—
Shoulder Work	W21-5	6F.37	36 x 36	48 x 48	30 x 30
Shoulder Closed	W21-5a	6F.37	36 x 36	48 x 48	30 x 30
Shoulder Closed (with distance)	W21-5b	6F.37	36 x 36	48 x 48	30 x 30
Survey Crew	W21-6	6F.38	36 x 36	48 x 48	30 x 30
Utility Work Ahead	W21-7	6F.39	36 x 36	48 x 48	30 x 30
Mowing Ahead	W21-8	6G.06	36 x 36	48 x 48	30 x 30
Blasting Zone Ahead	W22-1	6F.41	36 x 36	48 x 48	30 x 30
Turn Off 2-Way Radio and Cell Phone	W22-2	6F.42	42 x 36	42 x 36	—
End Blasting Zone	W22-3	6F.43	42 x 36	42 x 36	36 x 30
Slow Traffic Ahead	W23-1	6F.27	48 x 24	48 x 24	—
New Traffic Pattern Ahead	W23-2	6F.30	36 x 36	48 x 48	30 x 30
Double Reverse Curve (1 lane)	W24-1	6F.49	36 x 36	48 x 48	30 x 30
Double Reverse Curve (2 lanes)	W24-1a	6F.49	36 x 36	48 x 48	30 x 30
Double Reverse Curve (3 lanes)	W24-1b	6F.49	36 x 36	48 x 48	30 x 30
All Lanes (plaque)	W24-1cP	6F.49	24 x 18	30 x 24	—
Road Work Next XX Miles	G20-1	6F.56	36 x 18	48 x 24	—
End Road Work	G20-2	6F.57	36 x 18	48 x 24	—
Pilot Car Follow Me	G20-4	6F.58	36 x 18	—	—
Work Zone (plaque)	G20-5aP	6F.12	24 x 18	36 x 24	—
Exit Open	E5-2	6F.28	48 x 36	48 x 36	—
Exit Closed	E5-2a	6F.28	48 x 36	48 x 36	—
Exit Only	E5-3	6F.29	48 x 36	48 x 36	—
Detour	M4-8	6F.59	24 x 12	30 x 15	—
End Detour	M4-8a	6F.59	24 x 18	24 x 18	—
End	M4-8b	6F.59	24 x 12	24 x 12	—
Detour	M4-9	6F.59	30 x 24	48 x 36	—
Bike/Pedestrian Detour	M4-9a	6F.59	30 x 24	—	—
Pedestrian Detour	M4-9b	6F.59	30 x 24	—	—
Bike Detour	M4-9c	6F.59	30 x 24	—	—
Detour	M4-10	6F.59	48 x 18	—	—

\* See Table 2B-1 for minimum size required for signs facing traffic on multi-lane conventional roads

- Notes: 1. Larger signs may be used wherever necessary for greater legibility or emphasis  
 2. Dimensions are shown in inches and are shown as width x height

**Standard:**

- 15 **The minimum element on-time shall be 50 percent for the flashing mode, with equal intervals of 25 percent for each sequential phase. The flashing rate shall be not less than 25 or more than 40 flashes per minute.**
- 16 **An arrow board shall have the following three mode selections:**
- A. **A Flashing Arrow, Sequential Arrow, or Sequential Chevron mode;**
  - B. **A flashing Double Arrow mode; and**
  - C. **A flashing Caution or Alternating Diamond mode.**
- 17 **An arrow board in the arrow or chevron mode shall be used only for stationary or moving lane closures on multi-lane roadways.**
- 18 **For shoulder work, blocking the shoulder, for roadside work near the shoulder, or for temporarily closing one lane on a two-lane, two-way roadway, an arrow board shall be used only in the caution mode.**  
*Guidance:*
- 19 *For a stationary lane closure, the arrow board should be located on the shoulder at the beginning of the merging taper.*
- 20 *Where the shoulder is narrow, the arrow board should be located in the closed lane.*

**Standard:**

- 21 **When arrow boards are used to close multiple lanes, a separate arrow board shall be used for each closed lane.**  
*Guidance:*
- 22 *When arrow boards are used to close multiple lanes, if the first arrow board is placed on the shoulder, the second arrow board should be placed in the first closed lane at the upstream end of the second merging taper (see Figure 6H-37). When the first arrow board is placed in the first closed lane, the second arrow board should be placed in the second closed lane at the downstream end of the second merging taper.*
- 23 *For mobile operations where a lane is closed, the arrow board should be located to provide adequate separation from the work operation to allow for appropriate reaction by approaching drivers.*

**Standard:**

- 24 **A vehicle displaying an arrow board shall be equipped with high-intensity rotating, flashing, oscillating, or strobe lights.**
- 25 **Arrow boards shall only be used to indicate a lane closure. Arrow boards shall not be used to indicate a lane shift.**  
*Option:*
- 26 *A portable changeable message sign may be used to simulate an arrow board display.*

**Section 6F.62 High-Level Warning Devices (Flag Trees)***Option:*

- 01 *A high-level warning device (flag tree) may supplement other TTC devices in TTC zones.*

*Support:*

- 02 *A high-level warning device is designed to be seen over the top of typical passenger cars. A typical high-level warning device is shown in Figure 6F-2.*

**Standard:**

- 03 **A high-level warning device shall consist of a minimum of two flags with or without a Type B high-intensity flashing warning light. The distance from the roadway to the bottom of the lens of the light and to the lowest point of the flag material shall be not less than 8 feet. The flag shall be 16 inches square or larger and shall be orange or fluorescent red-orange in color.**  
*Option:*
- 04 *An appropriate warning sign may be mounted below the flags.*  
*Support:*
- 05 *High-level warning devices are most commonly used in high-density road user situations to warn road users of short-term operations.*

## Section 6F.63 Channelizing Devices

### Standard:

01 **Designs of various channelizing devices shall be as shown in Figure 6F-7. All channelizing devices shall be crashworthy.**

### Support:

02 The function of channelizing devices is to warn road users of conditions created by work activities in or near the roadway and to guide road users. Channelizing devices include cones, tubular markers, vertical panels, drums, barricades, and longitudinal channelizing devices.

03 Channelizing devices provide for smooth and gradual vehicular traffic flow from one lane to another, onto a bypass or detour, or into a narrower traveled way. They are also used to channelize vehicular traffic away from the work space, pavement drop-offs, pedestrian or shared-use paths, or opposing directions of vehicular traffic.

### Standard:

04 **Devices used to channelize pedestrians shall be detectable to users of long canes and visible to persons having low vision.**


05 **Where channelizing devices are used to channelize pedestrians, there shall be continuous detectable bottom and top surfaces to be detectable to users of long canes. The bottom of the bottom surface shall be no higher than 2 inches above the ground. The top of the top surface shall be no lower than 32 inches above the ground.**


### Option:


06 A gap not exceeding 2 inches between the bottom rail and the ground surface may be used to facilitate drainage.

### Guidance:

07 *Where multiple channelizing devices are aligned to form a continuous pedestrian channelizer, connection points should be smooth to optimize long-cane and hand trailing.*

 08 *The spacing between cones, tubular markers, vertical panels, drums, and barricades on roadways with a posted work zone speed limit of 45 mph or greater should be placed at 50 feet when used for taper channelization, and a distance of 100 feet when used for tangent channelization.*

 08a *The spacing between cones, tubular markers, vertical panels, drums, and barricades on roadways with a posted work zone speed limit of less than 45 mph should not exceed a distance in feet equal to 1.0 times the work zone speed limit in mph when used for taper channelization, and a distance in feet equal to 2.0 times the work zone speed limit in mph when used for tangent channelization.*

 09 *When channelizing devices have the potential of leading vehicular traffic out of the intended vehicular traffic space as shown in Figure 6H-39, the channelizing devices should be extended beyond the downstream end of the transition area a distance of 100 feet on roadways with a posted work zone speed limit of 45 mph or greater or a distance in feet of 2.0 times the speed limit on roadways with a posted work zone speed limit less than 45 mph.*

### Option:

10 Warning lights (see Section 6F.83) may be added to channelizing devices in areas with frequent fog, snow, or severe roadway curvature, or where visual distractions are present.

### Standard:

11 **Warning lights shall flash when placed on channelizing devices used alone or in a cluster to warn of a condition. Except for the sequential flashing warning lights discussed in Paragraphs 12 and 13, warning lights placed on channelizing devices used in a series to channelize road users shall be steady-burn.**

### Option:

12 A series of sequential flashing warning lights may be placed on channelizing devices that form a merging taper in order to increase driver detection and recognition of the merging taper.

### Standard:

13 **When used, the successive flashing of the sequential warning lights shall occur from the upstream end of the merging taper to the downstream end of the merging taper in order to identify the desired vehicle path. Each warning light in the sequence shall be flashed at a rate of not less than 55 nor more than 75 times per minute.**

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



Option:

- <sup>15</sup> The name and telephone number of the highway agency, contractor, or supplier may be displayed on the non-retroreflective surface of all types of channelizing devices.

**Standard:**

- <sup>16</sup> **The letters and numbers of the name and telephone number shall be non-retroreflective and not over 2 inches in height.**

*Guidance:*

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

**Standard:**

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

**Section 6F.64 Cones****Standard:**

01 **Cones (see Figure 6F-7) 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 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 28 inches in height.**

02 **For nighttime use, cones shall be retroreflectorized or equipped with lighting devices for maximum visibility. Retroreflectorization of cones that are 28 to 36 inches in height shall be provided by a 6-inch wide white band located 3 to 4 inches from the top of the cone and an additional 4-inch wide white band located approximately 2 inches below the 6-inch band.**

03 **Retroreflectorization of cones that are more than 36 inches in height shall be provided by horizontal, circumferential, alternating orange and white retroreflective stripes that are 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 non-retroreflective spaces between the orange and white stripes shall not exceed 3 inches in width.**

*Option:*

04 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:*

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

*Option:*

06 Cones may be doubled up to increase their weight.

*Support:*

07 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:*

08 *Ballast should be kept to the minimum amount needed.*

**Section 6F.65 Tubular Markers****Standard:**

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

02 **Tubular markers shall be a minimum of 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.**

03 **For nighttime use, tubular markers shall be retroreflectorized. Retroreflectorization of tubular markers that have a height of less than 42 inches shall be provided by two 3-inch wide white bands placed a maximum of 2 inches from the top with a maximum of 6 inches between the bands. Retroreflectorization of tubular markers that have a height of 42 inches or more shall be provided by four 4- to 6-inch wide alternating orange and white stripes with the top stripe being orange.**

*Guidance:*

04 *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.*

05 *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.*