

## TEMPORARY TRAFFIC CONTROL DEVICES

### Channelizing Devices

The function of channelizing devices is to delineate a desired vehicle path, mark specific hazards on or near the roadway, separate opposing traffic flows and partially or totally close the roadway. See the "Longitudinal Drop-off Guidelines" on pages 6K-xxi thru 6K-xxiii for the use of channelizing devices adjacent to shoulder edge drop-offs or uneven lanes.

Channelizing devices include cones, drums, barricades, temporary raised islands and various kinds of markers. The devices are broken into two type classifications based upon the nighttime visibility of the device. Their visibility is determined upon the total amount of reflective area of the device. Devices with less than 270 square inches are classified as Type A Channelizing devices and devices with more than 270 square inches of reflective area are Type B devices. Type A channelizing devices may be used in attended TTC zones and Type B channelizing devices shall be used if the TTC zone will be left unattended overnight or be in place longer than 12 hours. Where a Type B channelizing device, such as a drum, causes an isolated sight restriction, or is too wide for a space, a 42-inch tall weighted channelizer may be substituted. This substitution may be used in unattended overnight conditions at sight or space restricted locations as approved by the road authority. When used, the spacing of the devices should be reduced by up to 50 percent. Figure 6K-11 shows a breakdown of devices by Channelizer Type (drawn to approximate scale). See the MN MUTCD, Part 6F for additional details on application restrictions.

### Flashing Warning Lights

Flashing warning lights may be used to supplement road, ramp and sidewalk closure signing, and other warning signs and/or barricades to attract the road user's attention.

### Vehicle Warning Lights

All vehicles shall have approved operating vehicle warning lights when decelerating to enter a TTC zone and again when a vehicle leaves the TTC zone and enters the traveled traffic lane. All vehicles within a mobile TTC operation; or working within 15 feet of an open traffic lane should have approved vehicle warning lights.

### High Visibility Clothing

All workers who are exposed to traffic, work vehicles or construction equipment within the TTC zone shall wear high-visibility safety apparel that meets the Performance Class 2 or 3 requirements of the ANSI/ISEA 107-2004 publication entitled "American National Standard for High-Visibility Safety Apparel and Headwear" (see Section 1A.11), or equivalent revisions, and labeled as meeting the ANSI 107-2004 standard performance for Class 2 or 3 risk exposure.

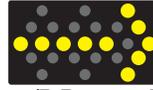
**Operating Mode**

**Panel Display \***

1. At least one of the following two modes shall be provided:

( Right arrow is shown, left arrow is similar )

**Flashing Arrow**



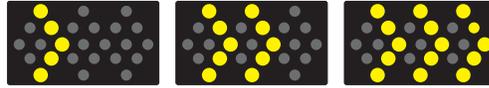
**Move/Merge Right**

**Sequential Arrow**



**Move/Merge Right**

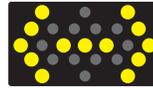
**Sequential Chevron**



**Move/Merge Right**

2. The following mode shall be provided:

**Flashing Double Arrow**



**Move/Merge Right or Left**

3. At least one of the following three modes shall be provided:

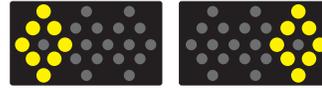
**Flashing Four Corners**



**Flashing Bar**



**Alternating Flashing Diamonds**



**Caution**

\* Element layout for Type C panel shown

Panel Type	Minimum Size (inches)	Minimum Legibility Distance (miles)	Minimum Number of Elements	Recommended Usage
A	48 x 24	0.5	12	Low speed streets
B	60 x 30	0.75	13	Anything not covered in A or C
C	96 x 48	1	15	Freeways and Expressways

**Arrow Stick**

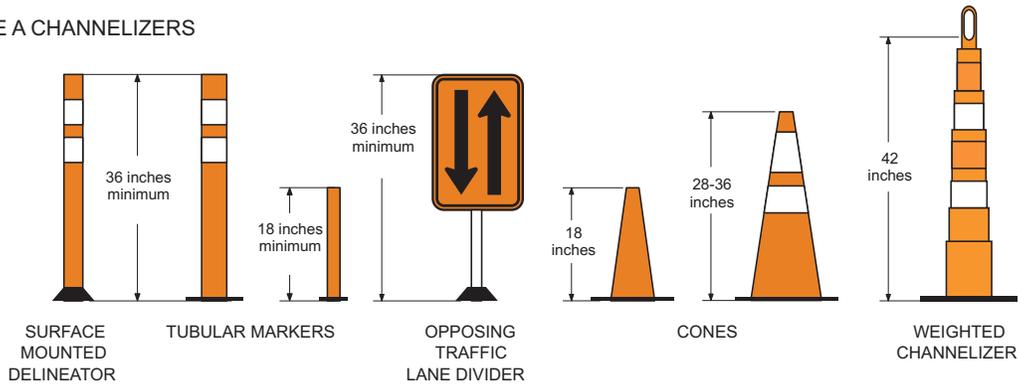


Arrow Sticks may supplement other TTC devices, but shall not be used in place of arrow boards

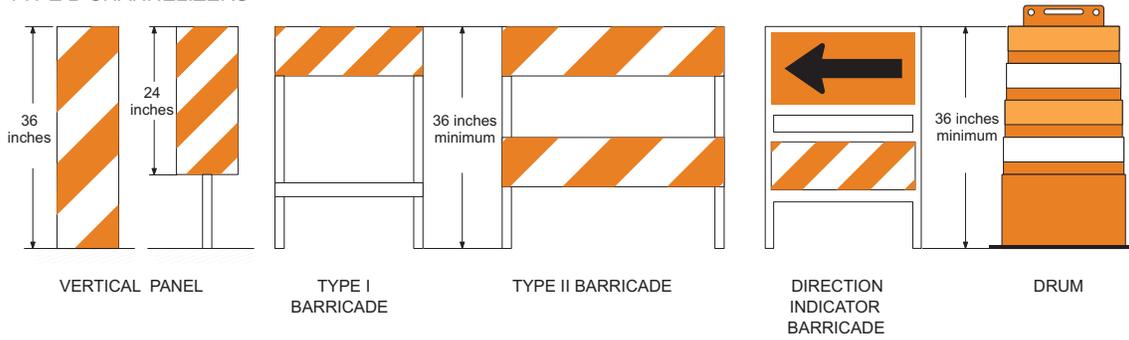
**Advance Warning Arrow Board Specifications**

Figure 6K-2

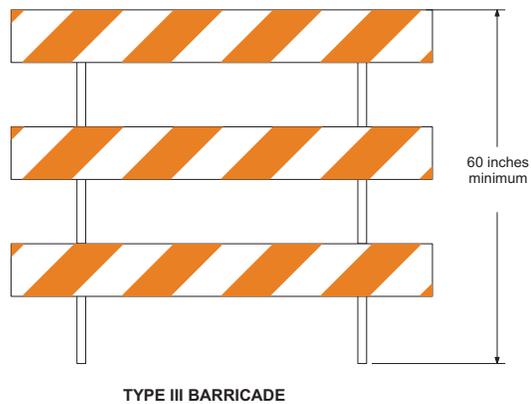
TYPE A CHANNELIZERS



TYPE B CHANNELIZERS

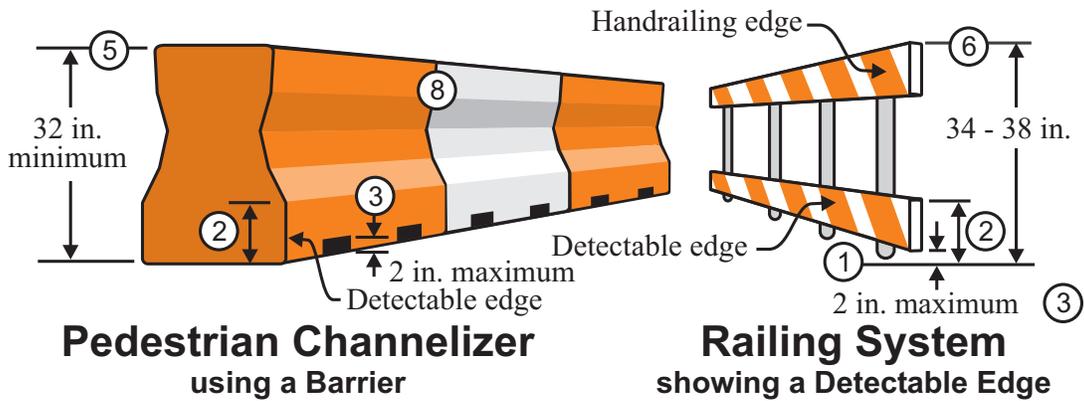


TYPE C CHANNELIZER



**Channelizing Devices**

Figure 6K-11  
6K-xxix



**NOTES:**

1. To prevent any tripping hazard to pedestrians, ballast shall be located behind or internal to the device. Any support on the front of the device shall not extend into the 48 in. minimum walkway clear space and shall have 0.5 in. maximum height above the walkway surface with approved beveling (see note #9 on page 6K-xxx for beveling details).
2. Detectable edges for long canes shall be continuous and 6 in. min high above the walkway surface and have color or markings contrasting with the walkway surface.
3. Devices shall not block water drainage from the walkway. A gap height or opening from the walkway surface up to 2 in. maximum height is allowed for drainage purposes.
4. Railings or other objects may protrude a maximum of 4 in. into the walkway clear space when located 27 in. minimum above the walkway surface.
5. Longitudinal channelizing devices for pedestrians shall be 32 in. high or greater.
6. When hand guidance is required, the top rail or top surface shall:
  - be in a vertical plane perpendicular to the walkway above the detectable edge,
  - be continuous at a height of 34 to 38 in. above the walkway surface, and
  - be supported with minimal interference to the pedestrian's hands or fingers.
7. All devices shall be free of sharp or rough edges, and fasteners (bolts) shall be rounded to prevent harm to hands, arms or clothing of pedestrians.
8. All devices used to channelize pedestrian flow should interlock such that gaps do not allow pedestrians to stray from the channelized path.
9. Any pedestrian devices used to provide positive protection (traffic or hazard) for pedestrians or workers shall meet crashworthy requirements appropriate for the barriers' application.
10. Barricades shall be used to close the entire width of the walkway surface.
11. A walkway surface shall be firm, stable, and slip resistant.

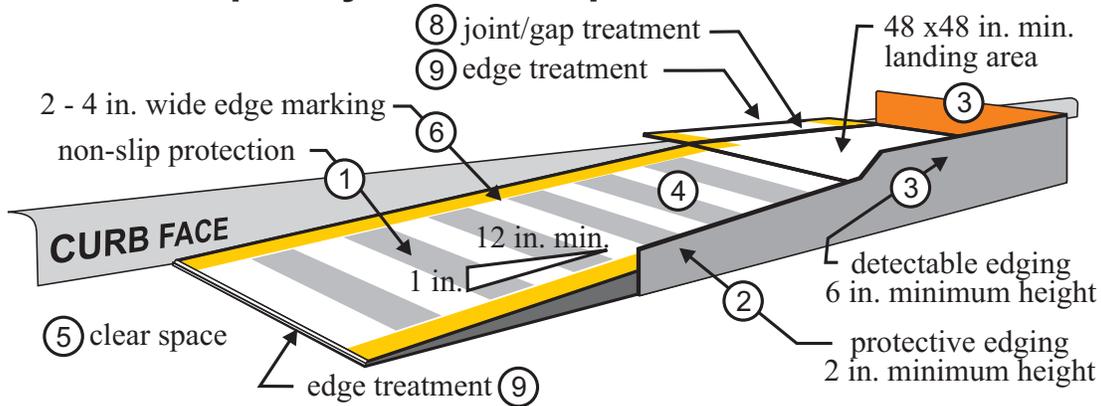


**Typical TPAR Devices**

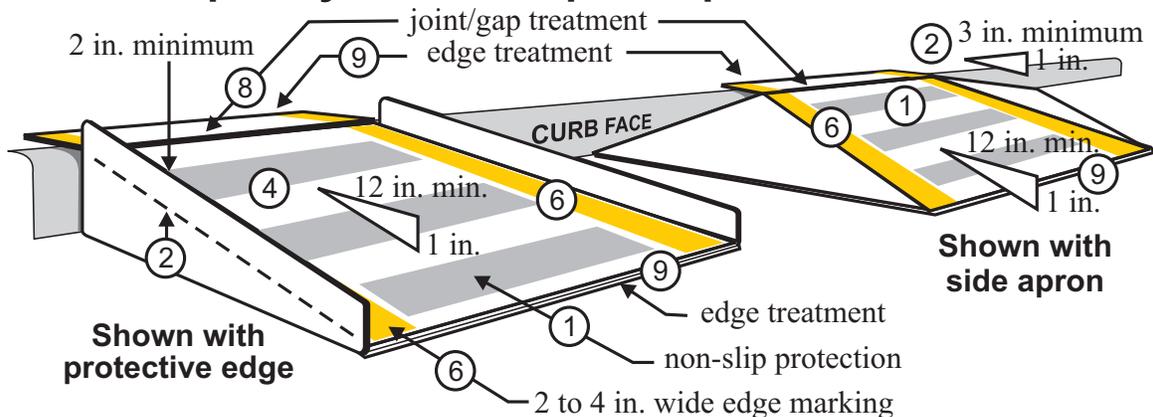
Refer to the MnDOT TPAR website for additional standards, guidance, and options for designing temporary pedestrian access routes.  
<http://www.dot.state.mn.us/trafficeng/workzone/tpar.html>

Figure 6K-12

## Temporary Curb Ramp - Parallel to Curb



## Temporary Curb Ramp - Perpendicular to Curb



### NOTES:

1. Curb ramps shall be 48 in. minimum width with a firm, stable and non-slip surface.
2. Protective edging with a 2 in. minimum height shall be installed when the curb ramp or landing platform has a vertical drop of 6 in. or greater or has a side apron slope steeper than 1:3 (33%). Protective edging should be considered when curb ramps or landing platforms have a vertical drop of 3 in. or more.
3. Detectable edging with 6 in. minimum height and contrasting color shall be installed on all curb ramp landings where the walkway changes direction (turns).
4. Curb ramps and landings should have a 1:50 (2%) max cross-slope.
5. Clear space of 48 x 48 in. minimum shall be provided above and below the curb ramp.
6. The curb ramp walkway edge shall be marked with a contrasting color 2 to 4 in. wide marking. The marking is optional where color contrasting edging is used.
7. Water flow in the gutter system shall have minimal restriction.
8. Lateral joints or gaps between surfaces shall be less than 0.5 in. width.
9. Changes between surface heights should not exceed 0.5 in. Lateral edges should be vertical up to 0.25 in. high, and beveled at 1:2 between 0.25 in. and 0.5 in. height.

## Typical TPAR Devices

Refer to the MnDOT TPAR website for additional standards, guidance, and options for designing temporary pedestrian access routes.

<http://www.dot.state.mn.us/trafficeng/workzone/tpar.html>

Figure 6K-13

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