

PART 5. TRAFFIC CONTROL DEVICES FOR LOW-VOLUME ROADS

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CHAPTER 5A. GENERAL

Section 5A.01 Function

Support:

At some locations on low-volume roads, the use of traffic control devices might be needed to provide the road user limited, but essential, information regarding regulation, guidance, and warning.

Other Parts of this Manual contain criteria applicable to all low-volume roads; however, Part 5 specifically supplements and references the criteria for traffic control devices commonly used on low-volume roads.

Standard:

A low-volume road shall be defined for this Part of the Manual as follows:

- A. A low-volume road shall be a facility lying outside of built-up areas of cities, towns, and communities, and it shall have a traffic volume of less than 400 AADT.**
- B. A low-volume road shall not be a freeway, expressway, interchange ramp, freeway service road, or a road on a designated State highway system. In terms of highway classification, it shall be a variation of a conventional road or a special purpose road as defined in Section 2A.01.**
- C. A low-volume road shall be classified as either paved or unpaved.**

Support:

Low-volume roads typically include farm-to-market, recreational, resource management and development, and local roads.

Guidance:

The needs of unfamiliar road users for occasional, recreational, and commercial transportation purposes should be considered.

Section 5A.02 Application

Support:

It is possible, in many cases, to provide essential information to road users on low-volume roads with a limited number of traffic control devices. The focus might be on devices that:

- A. Warn of conditions not normally encountered;
- B. Prohibit unsafe movements; or
- C. Provide minimal destination guidance.

As with other roads, the application of traffic control devices on low-volume roads is based on engineering judgment or studies.

Standard:

The criteria contained in Part 5 shall not prohibit the installation nor the full application of traffic control devices on a low-volume road where conditions justify their use.

Guidance:

Additional traffic control devices and criteria contained in other Parts of the Manual should be considered for use on low-volume roads.

Section 5A.03 Design**Standard:**

Traffic control devices for use on low-volume roads shall be designed in accordance with the criteria contained in Part 5, and where required, in other applicable Parts of the Manual.

The minimum sizes for signs installed on low-volume roads shall be as shown in Table 5A-1.

All signs shall be retroreflective or illuminated to show the same shape and similar color both day and night, unless specifically stated otherwise in other applicable Parts of this Manual. The requirements for sign illumination shall not be considered to be satisfied by street, highway, or strobe lighting.

All markings shall be visible at night and shall be retroreflective unless ambient illumination ensures that the markings are adequately visible.

Guidance:

Larger sign sizes should be used where engineering judgment indicates a need based on high vehicle operating speeds, driver expectancy, traffic operations, or roadway conditions.

Section 5A.04 Placement

Standard:

The traffic control devices used on low-volume roads shall be placed and positioned in accordance with the criteria contained in Part 5 and, where necessary, in accordance with the lateral, longitudinal, and vertical placement criteria contained in Part 2 and other applicable Sections of this Manual.

Guidance:

The placement of warning signs should conform to the guidance contained in Section 2C.05 and other applicable Sections of this Manual.

Option:

A lateral offset of not less than 0.6 m (2 ft) from the roadway edge to the roadside edge of a sign may be used where roadside features such as terrain, shrubbery, and/or trees prevent lateral placement in accordance with Section 2A.19.

Standard:

If located within a clear zone, roadside mounted sign supports shall be yielding, breakaway, or shielded with a longitudinal barrier or crash cushion as required in Section 2A.19.

Table 5A-1. Minimum Sign Sizes on Low-Volume Roads

Sign	Sign Code	Section	Sign Sizes	
			Millimeters	Inches
Stop	R1-1	5B.02	750 x 750	30 x 30
Yield	R1-2	5B.02	750 x 750 x 750	30 x 30 x 30
Speed Limit	R2-1	5B.03	450 x 600	18 x 24
Do Not Pass	R4-1	5B.04	600 x 750	24 x 30
Do Not Enter	R5-1	5B.04	750 x 750	30 x 30
No Trucks	R5-2	5B.04	600 x 600	24 x 24
One Way	R6-2	5B.04	450 x 600	18 x 24
No Parking	R8-3	5B.05	450 x 600	18 x 24
No Parking (Symbol)	R8-3a	5B.05	600 x 600	24 x 24
No Parking Supplemental Plaque	----	5B.05	600 x 450	24 x 18
Road Closed	R11-2	5B.04	1200 x 750	48 x 30
Local Traffic Only	R11-3	5B.04	1500 x 750	60 x 30
Bridge Out	R11-3b	5B.04	1500 x 750	60 x 30
Weight Limit	R12-1	5B.04	600 x 750	24 x 30
Highway-Rail Crossing (Crossbuck) Sign	R15-1	5F.02	1200 x 225	48 x 9
Turn/Curve, Reverse Turn/Curve Winding Road	W1-1, 2, 3, 4, 5	5C.02	600 x 600	24 x 24
Large Arrow	W1-6	5C.02	900 x 450	36 x 18
Chevron	W1-8	5C.02	300 x 450	12 x 18
Intersection Warning Signs	W2-1, 4, 5	5C.03	600 x 600	24 x 24
Stop Ahead	W3-1a	5C.04	750 x 750	30 x 30
Yield Ahead	W3-2a	5C.04	750 x 750	30 x 30
Narrow Bridge	W5-2, 2a	5C.05	750 x 750	30 x 30
One Lane Bridge	W5-3	5C.06	750 x 750	30 x 30
Hill	W7-1, 1a	5C.07	600 x 600	24 x 24
XX% Grade	W7-3	5C.07	600 x 450	24 x 18
Next XX MI	W7-3a	5C.09	600 x 450	24 x 18
Pavement Ends	W8-3	5C.08	750 x 750	30 x 30
No Center Line	W8-H12	5G.02	600 x 600	24 x 24
Railroad Advance Warning	W10-1	5F.03	750 Dia.	30 Dia.
Crossing Warning	W10-2, 3, 4	5F.03	750 x 750	30 x 30
Entering / Crossing	W11 series	5C.09	600 x 600	24 x 24
Advisory Speed Plaques	W13-1	5C.10	450 x 450	18 x 18
Dead End / No Outlet Plaques	W14-1p, 2p	5C.11	600 x 600	24 x 24
No Passing Zone (pennant)	W14-3	5G.02	750x1000x1000	30 x 40 x 40
Supplemental Plaque	W16-1	5G.02	600 x 450	24 x 18
No Traffic Signs	W16-2	5C.12	750 x 750	30 x 30
Roadwork XX FT	W20-1	5G.02	900 x 900	36 x 36
Flagger	W20-7a	5G.02	900 x 900	36 x 36
Be Prepared to Stop	W20-7b	5G.02	900 x 900	36 x 36
Workers	W21-1a	5G.02	900 x 900	36 x 36
Fresh Oil	W21-2	5G.02	600 x 600	24 x 24
Road Machinery Ahead	W21-3	5G.02	600 x 600	24 x 24
Shoulder Work	W21-5	5G.02	600 x 600	24 x 24
Survey Crew	W21-6	5G.02	750 x 750	30 x 30
Construction Arrow	W1-H11	6F.44.1	750 x 750	24 x 24

CHAPTER 5B. REGULATORY SIGNS

Section 5B.01 Introduction

Support:

The purpose of a regulatory sign is to inform highway users of traffic laws or regulations, and to indicate the applicability of legal requirements that would not otherwise be apparent.

The criteria for regulatory signs are contained in Chapter 2B and in other Sections of this Manual. Criteria for regulatory signs that are specific to low-volume roads are contained in this Chapter.

Section 5B.02 STOP and YIELD Signs (R1-1 and R1-2)

Guidance:

STOP (R1-1) and YIELD (R1-2) signs should be considered for use on low-volume roads where engineering judgment or study indicates that either of the following conditions applies:

- A. An intersection of a less-important road with a main road where application of the normal right-of-way rule might not be readily apparent.
- B. An intersection that has restricted sight distance for the prevailing vehicle speeds.

Section 5B.03 Speed Limit Signs (R2 Series)

Standard:

If used, Speed Limit (R2 series) signs shall display the speed limit established by law, ordinance, regulation, or as adopted by the authorized agency following an engineering study. The speed limits shown shall be in multiples of 5 miles per hour.

Speed limits shall be established in accordance with Section 2B.11.

Speed Limit signs shall be used where statutory speed limits are changed by an authorized Speed Zone except that, when the authorized Speed Zone falls within the limits of a School Zone, there should be no Speed Limit signs (except School Speed Limit signs) erected or in place within the School Zone.

Option:

Speed limit signs may be used on low-volume roads that carry traffic from, onto, or adjacent to higher-volume roads that have posted speed limits.

Section 5B.04 Traffic Movement and Prohibition Signs (R3, R4, R5, R6, R9, R10, R11, R12, R13, and R14 Series)

Support:

The regulatory signs in these series inform road users of required, permitted, or prohibited traffic movements involving turn, alignment, exclusion, and pedestrians.

Standard:

If used, signs for traffic prohibitions or restrictions shall be placed in advance of the prohibition or restriction so that traffic can use an alternate route or turn around.

Guidance:

Signs should be used on low-volume roads to indicate traffic prohibitions and restrictions such as road closures and weight restrictions.

Option:

These signs may be useful on a low-volume road near and at the intersections or the connections with a higher class of road, and where the regulatory message is essential for safe transition from the low-volume road to the higher-class facility and vice versa.

Section 5B.05 Parking Signs (R8 Series)

Option:

Parking signs may be installed selectively on low-volume roads with due consideration of enforcement.



R1-1



R1-2



R2-1



R4-1



R4-7



R5-1



R5-2



R6-2



R11-2



R11-3a



R12-1

Section 5B.06 Other Regulatory Signs

Standard:

Other regulatory signs used on low-volume roads that are not discussed in Part 5 shall conform with the criteria contained in other Parts of this Manual.



R8-3



R8-3a



R8-3c
Supplemental Plaque



R8-3d
Supplemental Plaque

CHAPTER 5C. WARNING SIGNS

Section 5C.01 Introduction

Support:

The purpose of a warning sign is to provide advance warning to the road user of unexpected conditions on or adjacent to the roadway that might not be readily apparent.

The criteria for warning signs are contained in Chapter 2C and in other Sections of this Manual. Criteria for warning signs that are specific to low-volume roads are contained in this Chapter.

Section 5C.02 Horizontal Alignment Signs (W1-1 through W1-8)

Support:

Horizontal Alignment signs include turn, curve, reverse turn, reverse curve, winding road, large arrow, and chevron alignment signs.

Option:

Horizontal Alignment signs may be used where engineering judgment indicates a need to inform the road user of a change in the horizontal alignment of the roadway.

Section 5C.03 Intersection Warning Signs (W2-1 through W2-5)

Support:

Intersection signs include the crossroad, side road, T-symbol, and Y-symbol signs.

Option:

Intersection signs may be used where engineering judgment indicates a need to inform the road user in advance of an intersection.

Section 5C.04 Stop Ahead and Yield Ahead Signs (W3-1a, W3-2a)

Standard:

A Stop Ahead (W3-1a) sign shall be used where a STOP sign is not visible for a

sufficient distance to permit the road user to bring the vehicle to a stop at the STOP sign.

A Yield Ahead (W3-2a) sign shall be used where a YIELD sign is not visible for a sufficient distance to permit the road user to bring the vehicle to a stop, if necessary, at the YIELD sign.

Option:

Word message (W3-1 and W3-2) signs may be used as alternates to symbol signs.

Section 5C.05 Narrow Bridge Sign (W5-2)

Option:

The Narrow Bridge (W5-2) sign may be used on an approach to a bridge or culvert that has a clear width less than that of the approach roadway.

Section 5C.06 ONE LANE BRIDGE Sign (W5-3)

Guidance:

A ONE LANE BRIDGE (W5-3) sign should be used on low-volume roads in advance of bridges or culverts:

- A. That have a clear roadway width of less than 4.9 m (16 ft); or
- B. That have a clear roadway width of less than 5.5 m (18 ft) when commercial vehicles constitute more than ten percent of the traffic; or
- C. Where the approach sight distance is limited on the approach to a bridge or culvert having a clear roadway width of 5.5 m (18 ft) or less.

Option:

Roadway alignment and additional warning may be provided on the approach to a bridge or culvert by the use of object markers and/or delineators.



W1-1



W1-2



W1-3



W1-4



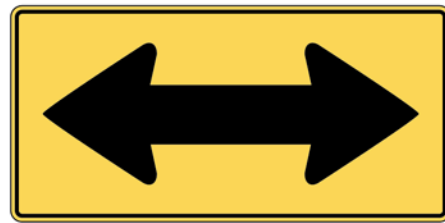
W1-5



W13-1
Advisory Speed Plaque



W1-6



W1-7



W1-8



W2-1



W2-4



W2-5



W3-1a



W3-2a



W5-2



W5-3



W7-1



W7-3



W7-3a



W8-3



W8-6



W11-1



W11-2



W11-3



W11-4



W11-5



W11-8



W11-10



W14-1



W14-2



W16-2

Section 5C.07 Hill Sign (W7-1a)

Option:

An engineering study of vehicles and road characteristics, such as percent grade and length of grade, may be conducted to determine hill signing requirements.

The use of the Hill sign on low-volume roads may be confined to roads where commercial or recreational vehicles are anticipated.

Word messages (W7-1) may be used as alternates to symbols.

Section 5C.08 PAVEMENT ENDS Sign (W8-3)

Option:

A PAVEMENT ENDS (W8-3) sign may be used to warn road users where a paved surface changes to a gravel or earth road surface.

Section 5C.09 Motorized Traffic and Crossing Signs (W11 Series and W8-6)

Guidance:

Motorized Traffic signs should be used to alert road users to unexpected entries into the roadway by trucks, farm vehicles, fire trucks, and other vehicles. Such signs should be used only at locations where the road user's sight distance is restricted or the activity would be unexpected.

Option:

Crossing signs may be used to alert the road user to unexpected entries into the roadway by pedestrian, bicyclist, animal, and other crossing activities that may cause potential conflicts.

A supplemental plaque (W7-3a), with the legend AHEAD, XX FEET, or NEXT XX MILES may be installed below a Motorized Traffic or Crossing sign (see Sections 2C.36 and 2C.37).

Guidance:

If the activity is seasonal or temporary, the sign should be removed or covered when the crossing activity does not exist.

Section 5C.10 Advisory Speed Plaque (W13-1)

Option:

An Advisory Speed (W13-1) plaque may be mounted below a warning sign when the condition requires a reduced speed.

Section 5C.11 DEAD END or NO OUTLET Plaques and Signs (W14-1P, W14-2P, W14-1, and W14-2)

Option:

The DEAD END and NO OUTLET plaques and signs may be used to warn road users of a road that has no outlet or that terminates in a dead end or cul-de-sac.

Guidance:

If used, these signs or plaques should be placed at a location that gives drivers of large commercial or recreational vehicles an opportunity to select a different route or turn around.

Section 5C.12 NO TRAFFIC SIGNS Sign (W16-2)

Option:

A warning sign (W16-2) with the legend NO TRAFFIC SIGNS may be used only on unpaved, low-volume roads to advise users that no signs are installed along the distance of the road. If used, the sign may be installed at the point where road users would enter the low-volume road or where, based on engineering judgment, the road user may need this information.

A supplemental plaque (W7-3a) with the legend AHEAD, XX FEET, or NEXT XX MILES may be installed below the W16-2 sign when appropriate.

Section 5C.13 Other Warning Signs

Standard:

Other warning signs used on low-volume roads that are not discussed in Part 5, but are in this Manual, shall conform with the criteria contained in other Parts of this Manual. Warning signs that are not specified in this Manual shall conform to the criteria in Sections 2C.02 and 2C.03.

CHAPTER 5D. GUIDE SIGNS

Section 5D.01 Introduction

Support:

The purpose of a guide sign is to inform road users regarding positions, directions, destinations, and routes.

The criteria for guide signs, in general, are contained in Chapters 2D through 2H and in other Sections of this Manual. Criteria for guide signs that are specific to low-volume roads are contained in this Chapter.

Guidance:

The familiarity of the road users with the road should be considered in determining the need for guide signs on low-volume roads.

Support:

Low-volume roads generally do not require guide signs to the extent that they are needed on higher classes of roads. Because guide signs are typically only beneficial as a navigational aid for road users who are unfamiliar with a low-volume road, guide signs might not be needed on low-volume roads that serve only local traffic.

Guidance:

If used, destination names should be as specific and descriptive as possible. Destinations such as campgrounds, ranger stations, recreational areas, and the like should be clearly indicated so that they are not interpreted to be communities or locations with road user services.

Option:

Guide signs may be used at intersections to provide information for road users returning to a higher class of roads.

CHAPTER 5E. MARKINGS

Section 5E.01 Introduction

Support:

The purpose of markings on highways is to provide guidance and information for road users regarding roadway conditions and restrictions.

The criteria for markings, delineators, and object markers, in general, are contained in Part 3 and in other Sections of this Manual. Criteria for markings that are specific to low-volume roads are contained in this Chapter.

Section 5E.02 Centerline Markings

Standard:

Where centerline markings are installed, no-passing zone markings in conformance with Section 3B.02 shall also be installed.

Guidance:

Centerline markings should be used on paved low-volume roads where engineering judgment or an engineering study indicates a need for them.

Section 5E.03 Edge Line Markings

Support:

The purpose of edge line markings is to delineate the left or right edge of the roadway.

Guidance:

Edge line markings should be considered for use on paved low-volume roads based on engineering judgment or an engineering study.

Option:

Edge line markings may be placed on highways with or without centerline markings.

Edge line markings may be placed on paved low-volume roads for roadway features such as horizontal curves, narrow bridges, pavement width transitions, curvilinear alignment, and at other

locations based on engineering judgment or an engineering study.

Section 5E.04 Delineators

Support:

The purpose of delineators is to enhance driver safety where it is desirable to call attention to a changed or changing condition such as abrupt roadway narrowing or curvature.

Option:

Delineators may be used on low-volume roads based on engineering judgment, such as for curves, T-intersections, and abrupt changes in the roadway width. In addition, they may be used to mark the location of driveways or other minor roads entering the low-volume road.

Section 5E.05 Object Markers

Support:

The purpose of object markers is to mark obstructions located within or adjacent to the roadway, such as bridge abutments, drainage structures, and other physical objects.

Guidance:

The end of a low-volume road should be marked with an end-of-roadway marker in conformance with Section 3C.04.

Option:

A Type III barricade may be used where engineering studies or judgment indicates a need for a more visible end-of-roadway treatment (see Section 3F.01).

Section 5E.06 Other Markings

Standard:

Other markings, such as stop lines, crosswalks, pavement legends, barricades, channelizing devices, and islands, used on low-volume roads shall conform with the criteria contained in this Manual.

CHAPTER 5F. TRAFFIC CONTROL FOR HIGHWAY-RAIL GRADE CROSSINGS

Section 5F.01 Introduction

Support:

The criteria for these traffic control devices are contained in Part 8 and in other Sections of this Manual.

Traffic control for highway-rail grade crossings includes all signs, signals, markings, illumination, and other warning devices and their supports along roadways either approaching or at highway-rail grade crossings. The function of this traffic control is to permit safe and efficient operation of both rail and road traffic at highway-rail grade crossings.

Section 5F.02 Highway-Rail Grade Crossing (Crossbuck) Sign (R15-1, R15-2)

Standard:

The Highway-Rail Grade Crossing (Crossbuck) (R15-1) sign shall be used at all highway-rail grade crossings. For all low-volume roads, Crossbucks signs shall be used on the right side of each approach. If there are two or more tracks, the supplemental Number of Tracks (R15-2) sign shall display the number of tracks and shall be installed below the Crossbuck sign.

A strip of retroreflective white material not less than 50 mm (2 in) in width shall be mounted on the back of each blade of each Crossbuck sign for the length of each blade. Also, a similar 50 mm (2 in) strip shall be used for the full length of the front and back of each support from the Crossbuck sign/Number of Tracks sign to near ground level.

Section 5F.03 Highway-Rail Grade Crossing Advance Warning Signs (W10 Series)

Standard:

Except as noted in the Option, a Highway-Rail Grade Crossing Advance Warning (W10-1) sign shall be used on all low-volume roads in advance of every highway-rail grade crossing.

Option:

The Highway-Rail Grade Crossing Advance Warning sign may be omitted for highway-rail grade crossings that are flagged by train crews.

The W10-2, W10-3, and W10-4 signs may be used on low-volume roads that run parallel to railroad tracks to warn road users making a turn that they will encounter a highway-rail grade crossing soon after making the turn.

Section 5F.04 STOP and YIELD Signs

Option:

STOP (R1-1) or YIELD (R1-2) signs may be used at low-volume highway-rail grade crossings, at the discretion of the responsible jurisdiction, for crossings without automatic traffic control devices.

Standard:

A Stop Ahead (W3-1) sign or Yield Ahead (W3-2) sign shall be used in advance of a STOP or YIELD sign at a highway-rail grade crossing if the STOP or YIELD sign is not visible for a distance that enables the road user to bring the vehicle to a safe stop at the highway-rail grade crossing.

Use of STOP signs at highway-rail grade crossings shall be in accordance with Section 4511.61 of the Ohio Revised Code (see Appendix B2).

Section 5F.05 Pavement Markings

Guidance:

Pavement markings at highway-rail grade crossings should be used on paved low-volume roads, particularly if they are already deployed at most other highway-rail grade crossings within the immediate vicinity, or when the roadway has centerline markings.

Section 5F.06 Other Traffic Control Devices

Standard:

Other traffic control devices that are used at highway-rail grade crossings on

low-volume roads, such as other signs, signals, and illumination that are not in this Chapter, shall conform with the criteria contained in Part 8 and other applicable Parts of this Manual.



R15-1



R15-2



W10-1



W10-2



W10-3



W10-4

CHAPTER 5G. TEMPORARY TRAFFIC CONTROL ZONES

Section 5G.01 Introduction

Guidance:

The safety of road users, including pedestrians and bicyclists, as well as personnel in work zones, should be an integral and high priority element of every project in the planning, design, maintenance, and construction phases. Part 6 should be reviewed for additional criteria, specific details, and more complex temporary traffic control zone requirements. The following principles should be applied to temporary traffic control zones:

- A. Traffic movement should be disrupted as little as possible.
- B. Road users should be guided in a clear and positive manner while approaching and within construction, maintenance, and utility work areas.
- C. Routine inspection and maintenance of traffic control elements should be performed both day and night.
- D. Both the contracting agency and the contractor should assign at least one person on each project to have day-to-day responsibility for assuring that the traffic control elements are operating effectively and any needed operational changes are brought to the attention of their supervisors.

Traffic control in temporary traffic control zones should be designed on the assumption that road users will only reduce their speeds if they clearly perceive a need to do so, and then only in small increments of speed. Temporary traffic control zones should not present a surprise to the road user. Frequent and/or abrupt changes in geometrics and other features should be avoided. Transitions should be well delineated and long enough to accommodate driving conditions at the speeds vehicles are realistically expected to travel.

A Traffic Control Plan (see Section 6C.01) should be used for a temporary traffic control zone on a low-volume road to specify particular traffic control devices and features, or to reference typical drawings such as those contained in Part 6.

Support:

Applications of speed reduction countermeasures and enforcement can be effective in reducing traffic speeds in temporary traffic control zones.



W1-H11



W8-7



W8-12H



W13-1
Advisory Speed Plaque



W14-3



W20-1



W20-7a



W20-7b



W21-1a



W21-2



W21-3



W21-5



W21-6



W16-1
Supplemental Plaque

Section 5G.02 Applications**Guidance:**

Planned work phasing and sequencing should be the basis for the use of traffic control devices for temporary traffic control zones. Part 6 should be consulted for specific traffic control requirements and examples where construction or maintenance work is planned.

Option:

Maintenance activities may not require extensive temporary traffic control if the traffic volumes and speeds are low. The traffic applications shown in Figures 6H-1, 6H-11, 6H-15, and 6H-16 of Part 6 are among those that may be used on low-volume roads.

For temporary traffic control zones on low-volume roads that require flaggers, a single flagger may be adequate if the flagger is visible to approaching traffic from all appropriate directions.

Section 5G.03 Channelization Devices**Standard:**

Channelization devices for nighttime use shall have the same retroreflective requirements as specified for higher-volume roadways.

Option:

To alert, guide, and direct road users safely through temporary traffic control zones on low-volume roads, tapers may be used to move a road user out of the traffic lane and around the temporary traffic control zone using the spacing of devices that is described in Section 6F.55.

Section 5G.04 Markings**Guidance:**

Pavement markings should be considered for temporary traffic control zones on paved low-volume roads, especially roads that had existing pavement markings or that have a surfaced detour or temporary roadway.

Option:

Interim pavement markings in a temporary traffic control zone may not be needed based on the criteria for these markings in Section 6F.66.

Section 5G.05 Other Traffic Control Devices

Standard:

Other traffic control devices, such as other signs, signals, and illumination that are used on low-volume roads in temporary traffic control zones, but are not described in Part 5, shall conform with the criteria contained in other Parts of this Manual.