



# *Manual on* **Uniform Traffic Control Devices**

*2011 Michigan MUTCD  
2009 Federal Edition*



U.S. Department of Transportation  
**Federal Highway  
Administration**

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## **PART 3. MARKINGS**

### **CHAPTER 3A. GENERAL**

Section 3A.01	Functions and Limitations .....	347
Section 3A.02	Standardization of Application .....	347
Section 3A.03	Maintaining Minimum Pavement Marking Retroreflectivity .....	347
Section 3A.04	Materials .....	348
Section 3A.05	Colors .....	348a
Section 3A.06	Functions, Widths, and Patterns of Longitudinal Pavement Markings.....	348b

### **CHAPTER 3B. PAVEMENT AND CURB MARKINGS**

Section 3B.01	Yellow Center Line Pavement Markings and Warrants.....	349
Section 3B.02	No-Passing Zone Pavement Markings and Warrants .....	352
Section 3B.03	Other Yellow Longitudinal Pavement Markings .....	354
Section 3B.04	White Lane Line Pavement Markings and Warrants.....	356
Section 3B.05	Other White Longitudinal Pavement Markings .....	370
Section 3B.06	Edge Line Pavement Markings .....	371
Section 3B.07	Warrants for Use of Edge Lines.....	371
Section 3B.08	Extensions Through Intersections or Interchanges .....	371
Section 3B.09	Lane-Reduction Transition Markings.....	374
Section 3B.10	Approach Markings for Obstructions.....	376
Section 3B.11	Raised Pavement Markers – General.....	376
Section 3B.12	Raised Pavement Markers as Vehicle Positioning Guides with Other Longitudinal Markings .....	379
Section 3B.13	Raised Pavement Markers Supplementing Other Markings.....	379
Section 3B.14	Raised Pavement Markers Substituting for Pavement Markings .....	380
Section 3B.15	Transverse Markings.....	381
Section 3B.16	Stop and Yield Lines.....	381
Section 3B.17	Do Not Block Intersection Markings.....	382
Section 3B.18	Crosswalk Markings .....	383
Section 3B.19	Parking Space Markings.....	385
Section 3B.20	Pavement Word, Symbol, and Arrow Markings.....	387
Section 3B.21	Speed Measurement Markings .....	393
Section 3B.22	Speed Reduction Markings.....	393
Section 3B.23	Curb Markings.....	394
Section 3B.24	Chevron and Diagonal Crosshatch Markings .....	395
Section 3B.25	Speed Hump Markings .....	395
Section 3B.26	Advance Speed Hump Markings .....	395

### **CHAPTER 3C. ROUNDABOUT MARKINGS**

Section 3C.01	General .....	399
Section 3C.02	White Lane Line Pavement Markings for Roundabouts .....	413
Section 3C.03	Edge Line Pavement Markings for Roundabout Circulatory Roadways.....	413
Section 3C.04	Yield Lines for Roundabouts .....	413
Section 3C.05	Crosswalk Markings at Roundabouts .....	413
Section 3C.06	Word, Symbol, and Arrow Pavement Markings for Roundabouts.....	413
Section 3C.07	Markings for Other Circular Intersections .....	414

### **CHAPTER 3D. MARKINGS FOR PREFERENTIAL LANES**

Section 3D.01	Preferential Lane Word and Symbol Markings .....	415
Section 3D.02	Preferential Lane Longitudinal Markings for Motor Vehicles .....	416

### **CHAPTER 3E. MARKINGS FOR TOLL PLAZAS**

Section 3E.01	Markings for Toll Plazas .....	423
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**CHAPTER 3F DELINEATORS**

Section 3F.01	Delineators .....	424
Section 3F.02	Delineator Design .....	424
Section 3F.03	Delineator Application .....	424
Section 3F.04	Delineator Placement and Spacing .....	426

**CHAPTER 3G COLORED PAVEMENTS**

Section 3G.01	General .....	428
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**CHAPTER 3H CHANNELIZING DEVICES USED FOR EMPHASIS OF PAVEMENT MARKING PATTERNS**

Section 3H.01	Channelizing Devices .....	429
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**CHAPTER 3I ISLANDS**

Section 3I.01	General .....	430
Section 3I.02	Approach-End Treatment .....	430
Section 3I.03	Island Marking Application .....	430
Section 3I.04	Island Marking Colors .....	430
Section 3I.05	Island Delineation .....	431
Section 3I.06	Pedestrian Islands and Medians .....	431

**CHAPTER 3J RUMBLE STRIP MARKINGS**

Section 3J.01	Longitudinal Rumble Strip Markings .....	432
Section 3J.02	Transverse Rumble Strip Markings .....	432

**PART 4 HIGHWAY TRAFFIC SIGNALS****CHAPTER 4A GENERAL**

Section 4A.01	Types .....	433
Section 4A.02	Definitions Relating to Highway Traffic Signals .....	433

**CHAPTER 4B TRAFFIC CONTROL SIGNALS—GENERAL**

Section 4B.01	General .....	434
Section 4B.02	Basis of Installation or Removal of Traffic Control Signals .....	434
Section 4B.03	Advantages and Disadvantages of Traffic Control Signals .....	434
Section 4B.04	Alternatives to Traffic Control Signals .....	435
Section 4B.05	Adequate Roadway Capacity .....	435

**CHAPTER 4C TRAFFIC CONTROL SIGNAL NEEDS STUDIES**

Section 4C.01	Studies and Factors for Justifying Traffic Control Signals .....	436
Section 4C.02	Warrant 1, Eight-Hour Vehicular Volume .....	437
Section 4C.03	Warrant 2, Four-Hour Vehicular Volume .....	439
Section 4C.04	Warrant 3, Peak Hour .....	439
Section 4C.05	Warrant 4, Pedestrian Volume .....	442
Section 4C.06	Warrant 5, School Crossing .....	442
Section 4C.07	Warrant 6, Coordinated Signal System .....	445
Section 4C.08	Warrant 7, Crash Experience .....	445
Section 4C.09	Warrant 8, Roadway Network .....	446
Section 4C.10	Warrant 9, Intersection Near a Grade Crossing .....	446

**CHAPTER 4D TRAFFIC CONTROL SIGNAL FEATURES**

Section 4D.01	General .....	449
Section 4D.02	Responsibility for Operation and Maintenance .....	449
Section 4D.03	Provisions for Pedestrians .....	450
Section 4D.04	Meaning of Vehicular Signal Indications .....	450

**Table I-2. Target Compliance Dates Established by the MMUTCD (Sheet 1 of 2)**

Rev. 1, 3


2011 MMUTCD Section Number(s)	2011 MMUTCD Section Title	Specific Provision	Compliance Date
2A.08	Minimum Retroreflectivity Levels	Implementation and continued use of an assessment or management method that is designed to maintain regulatory and warning sign retroreflectivity at or above the established minimum levels.	June 13, 2014*
2A.19	Lateral Offset	Crashworthiness of sign supports on roads with posted speed limit of 50 mph or higher. Sign supports within the clear zone for roads with posted speed limit of 50 mph or higher shall be crashworthy (NCHRP Report 350) unless shielded with a longitudinal barrier or crash cushion.	August 15, 2015 (a)
2B.40	ONE WAY Signs (R6-1, R6-2)	New requirement in the 2009 Federal MUTCD for the number and locations of ONE WAY and Keep Right signs. Compliance approximately 10 years from the effective date of Final Rule.	December 31, 2019
2C.06 thru 2C.14	Horizontal Alignment Warning Signs	Revised requirements and applications in the 2009 Federal MUTCD regarding the use of various horizontal alignment signs based on curve differential speed. Compliance approximately 10 years from the effective date of Final Rule.	December 31, 2019
2E.31, 2E.33, and 2E.36	Plaques for Left-Hand Exits	New requirement in the 2009 Federal MUTCD to use E1-5aP and E1-5bP plaques for left-hand exits. A left exit number (E1-5bP) plaque shall be used at the top left edge of the sign for numbered exits to the left to alert road users that the exit is to the left, which is often not expected. For nonnumbered exits to the left, a LEFT (E1-5aP) plaque shall be added to the top left-hand edge of the sign. This change also required that the "LEFT" portion of the message be black on a yellow background. Compliance approximately 5 years from the effective date of Final Rule.	December 31, 2014
3A.03	Maintaining Minimum Retroreflectivity	Implementation and continued use of a method that is designed to maintain retroreflectivity of longitudinal pavement markings (see Paragraph 1).	4 years from the effective date of this revision of the MUTCD
4D.26	Yellow Change and Red Clearance Intervals	New requirement in the 2009 Federal MUTCD that the durations of the yellow change and red clearance intervals shall be determined using engineering practices. Compliance approximately 5 years from the effective date of Final Rule or when timing adjustments are made to the individual intersection and/or corridor, whichever occurs first.	June 13, 2017, or when timing adjustments are made to the individual intersection and/or corridor, whichever occurs first
4E.06	Pedestrian Intervals and Signal Phases	New requirement in the 2009 Federal MUTCD that the pedestrian change interval shall not extend into the red clearance interval and shall be followed by a buffer interval of at least 3 seconds. Compliance approximately 5 years from the effective date of Final Rule or when timing adjustments are made to the individual intersection and/or corridor, whichever occurs first.	June 13, 2017, or when timing adjustments are made to the individual intersection and/or corridor, whichever occurs first
6D.03	Worker Safety Considerations	New requirement in the 2009 Federal MUTCD that all workers within the right-of-way on all highways (Federal-aid and non-Federal-aid) shall wear high-visibility apparel. Compliance approximately 2 years from the effective date of Final Rule.	December 31, 2011(**)
6E.02	High-Visibility Safety Apparel	New requirement in the 2009 Federal MUTCD that all Traffic Regulators within the right-of-way on all highways (Federal-aid and non-Federal-aid) shall wear high-visibility apparel. Compliance approximately 2 years from the effective date of Final Rule.	December 31, 2011(**)



**Table I-2. Target Compliance Dates Established by the MMUTCD (Sheet 2 of 2)**

2011 MMUTCD Section Number(s)	2011 MMUTCD Section Title	Specific Provision	Compliance Date
7D.04	Uniform of Adult Crossing Guards	New requirement in the 2009 Federal MUTCD for high-visibility apparel for law enforcement officers and adult crossing guards performing school crossing supervision on all highways (Federal-aid and non-Federal-aid). Compliance approximately 2 years from the effective date of Final Rule.	December 31, 2011(**)
8B.04	Grade Crossing (Crossbuck) Signs and Supports	Retroreflective strip on crossbuck sign and support. A strip of retroreflective white material, not less than 2 inches in width, shall be used on the back of each blade of each Crossbuck sign for the length of each blade, at all grade crossings where Crossbuck signs have been installed except those where Crossbuck signs have been installed back-to-back. A vertical strip of retroreflective white material, not less than 2 inches in width, shall be used on each Crossbuck support at passive grade crossing for the full length of the front (if support does not include a YIELD or STOP sign) and back of support from the Crossbuck sign or Number of Tracks plaque to within 2 feet above the ground. The vertical strip of retroreflective material may be omitted from the back sides of Crossbuck sign supports installed on one-way streets or where crossbuck signs have been installed back-to-back.	December 31, 2019
8B.04	Crossbuck Assemblies with YIELD or STOP Signs at Passive Grade Crossings	New requirement in the 2009 Federal MUTCD for the use of STOP or YIELD signs with Crossbuck signs at passive grade crossings. The YIELD or STOP sign shall be installed either on the same support as the Crossbuck sign or on a separate support at a point where the highway vehicle is to stop, or as near to that point as practical, but in either case, the YIELD or STOP sign is considered to be a part of the Crossbuck Assembly. Compliance approximately 10 years from the effective date of Final Rule.	December 31, 2019
(a) Date established in the 2005 MMUTCD (**) MUTCD requirement is a result of a legislative mandate (*) Types of signs other than regulatory or warning are to be added to an agency's management or assessment method as resources allow.			

Rev. 1

30. "Traffic Control Devices Handbook," 2001 Edition (ITE)
31. "Traffic Detector Handbook," 1991 Edition (ITE)
32. "Traffic Engineering Handbook," 2009 Edition (ITE)
33. "Traffic Signal Lamps," 1980 Edition (ITE)
34. "Vehicle Traffic Control Signal Heads," Part 1—1985 Edition; Part 2 (LED Circular Signal Supplement)—2005 Edition; Part 3 (LED Vehicular Arrow Traffic Signal Supplement)—2004 Edition (ITE)
35. "Uniform Vehicle Code (UVC) and Model Traffic Ordinance," 2000 Edition (National Committee on Uniform Traffic Laws and Ordinances—NCUTLO)
36. "NEMA Standards Publication TS 4-2005 Hardware Standards for Dynamic Message Signs (DMS) With NTCIP Requirements," 2005 Edition (National Electrical Manufacturers Association—NEMA)
37. "Occupational Safety and Health Administration Regulations (Standards - 29 CFR), General Safety and Health Provisions - 1926.20," amended June 30, 1993 (Occupational Safety and Health Administration—OSHA)
38. "Accessible Pedestrian Signals—A Guide to Best Practices (NCHRP Web-Only Document 117A)," 2008 Edition (Transportation Research Board—TRB)
39. "Guidelines for Accessible Pedestrian Signals (NCHRP Web-Only Document 117B)," 2008 Edition (TRB)
40. "Highway Capacity Manual," 2000 Edition (TRB)
41. "Recommended Procedures for the Safety Performance Evaluation of Highway Features," (NCHRP Report 350), 1993 Edition (TRB)
42. "The Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities (ADAAG)," July 1998 Edition (The U.S. Access Board)
43.  Michigan Vehicle Code (MVC) (SOS) and Uniform Traffic Codes for Cities, Townships, and Villages (MSP)
44. "Methods for Maintaining Pavement Marking Retroreflectivity," (FHWA-SA-22-028), 2022 Edition (FHWA)

## Section 1A.12 Color Code

### Support:

- 01 The following color code establishes general meanings for 11 colors of a total of 13 colors that have been identified as being appropriate for use in conveying traffic control information. tolerance limits for each color are contained in 23 CFR Part 655, Appendix to Subpart F and are available at the Federal Highway Administration's MUTCD website at <http://mutcd.fhwa.dot.gov> or by writing to the FHWA, Office of Safety Research and Development (HRD-T-301), 6300 Georgetown Pike, McLean, VA 22101.
- 02 The two colors for which general meanings have not yet been assigned are being reserved for future applications that will be determined only by FHWA after consultation with the States, the engineering community, and the general public. The meanings described in this Section are of a general nature. More specific assignments of colors are given in the individual Parts of this Manual relating to each class of devices.

### Standard:

- 03 The general meaning of the 13 colors shall be as follows:
- A. Black—regulation
  - B. Blue—road user services guidance, tourist information, and evacuation route
  - C. Brown—recreational and cultural interest area guidance
  - D. Coral—unassigned
  - E. Fluorescent Pink—incident management
  - F. Fluorescent Yellow-Green—pedestrian warning, bicycle warning, playground warning, school bus and school warning
  - G. Green—indicated movements permitted, direction guidance
  - H. Light Blue—unassigned
  - I. Orange—temporary traffic control
  - J. Purple—lanes restricted to use only by vehicles with registered electronic toll collection (ETC) accounts
  - K. Red—stop or prohibition
  - L. White—regulation
  - M. Yellow—warning

## Section 1A.13 Definitions of Headings, Words, and Phrases in this Manual

### Standard:

- 01 When used in this Manual, the text headings of Standard, Guidance, Option, and Support shall be defined as follows:
- A. Standard—a statement of required, mandatory, or specifically prohibitive practice regarding a traffic control device. All Standard statements are labeled, and the text appears in bold type. The verb “shall” is typically used. The verbs “should” and “may” are not used in Standard statements. Standard statements are sometimes modified by Options.
  - B. Guidance—a statement of recommended, but not mandatory, practice in typical situations, with deviations allowed if engineering judgment or engineering study indicates the deviation to be appropriate. All Guidance statements are labeled, and the text appears in unbold type. The verb “should” is typically used. The verbs “shall” and “may” are not used in Guidance statements. Guidance statements are sometimes modified by Options.
  - C. Option—a statement of practice that is a permissive condition and carries no requirement or recommendation. Option statements sometime contain allowable modifications to a Standard or Guidance statement. All Option statements are labeled, and the text appears in unbold type. The verb “may” is typically used. The verbs “shall” and “should” are not used in Option statements.
  - D. Support—an informational statement that does not convey any degree of mandate, recommendation, authorization, prohibition, or enforceable condition. Support statements are labeled, and the text appears in unbold type. The verbs “shall,” “should,” and “may” are not used in Support statements.



# PART 3

## MARKINGS

### CHAPTER 3A. GENERAL

#### Section 3A.01 Functions and Limitations

Support:

- 01 Markings on highways and on private roads open to public travel have important functions in providing guidance and information for the road user. Major marking types include pavement and curb markings, delineators, colored pavements, channelizing devices, and islands. In some cases, markings are used to supplement other traffic control devices such as signs, signals, and other markings. In other instances, markings are used alone to effectively convey regulations, guidance, or warnings in ways not obtainable by the use of other devices.
- 02 Markings have limitations. Visibility of the markings can be limited by snow, debris, and water on or adjacent to the markings. Marking durability is affected by material characteristics, traffic volumes, weather, and location. However, under most highway conditions, markings provide important information while allowing minimal diversion of attention from the roadway.

#### Section 3A.02 Standardization of Application

Standard:

- 01 **Each standard marking shall be used only to convey the meaning prescribed for that marking in this Manual. When used for applications not described in this Manual, markings shall conform in all respects to the principles and standards set forth in this Manual.**

Guidance:

- 02 *Before any new highway, private road open to public travel (see definition in Section 1A.13), paved detour, or temporary route is opened to public travel, all necessary markings should be in place.*

Standard:

- 03 **Markings that must be visible at night shall be retroreflective unless ambient illumination assures that the markings are adequately visible. All markings on Interstate highways shall be retroreflective.**
- 04 **Markings that are no longer applicable for roadway conditions or restrictions and that might cause confusion for the road user shall be removed or obliterated to be unidentifiable as a marking as soon as practical.**

Option:

- 05 Until they can be removed or obliterated, markings may be temporarily masked with tape that is approximately the same color as the pavement.

#### Section 3A.03 Maintaining Minimum Pavement Marking Retroreflectivity

Standard:

- 01 **Except as provided in Paragraph 5, a method designed to maintain retroreflectivity at or above 50 mcd/m<sup>2</sup>/lx under dry conditions shall be used for longitudinal markings on roadways with speed limits of 35 mph or greater.**

Guidance:

- 02 *Except as provided in Paragraph 5, a method designed to maintain retroreflectivity at or above 100 mcd/m<sup>2</sup>/lx under dry conditions should be used for longitudinal markings on roadways with speed limits of 70 mph or greater.*
- 03 The method used to maintain retroreflectivity should be one or more of those described in “Methods for Maintaining Pavement Marking Retroreflectivity” (see Section 1A.11) or developed from an engineering study based on the values in Paragraphs 1 and 2.

Support:

- 04 Retroreflectivity levels for pavement markings are measured with an entrance angle of 88.76 degrees and an observation angle of 1.05 degrees. This geometry is also referred to as 30-meter geometry. The units of pavement marking retroreflectivity are reported in mcd/m<sup>2</sup>/lx, which means millicandelas per square meter per lux.

Option:

- 05 The following markings may be excluded from the provisions established in Paragraphs 1 and 2:
- A. Markings where ambient illumination assures that the markings are adequately visible;
  - B. Markings on streets or highways that have an ADT of less than 6,000 vehicles per day;
  - C. Dotted extension lines that extend a longitudinal line through an intersection, major driveway, or interchange area (see Section 3B.08);
  - D. Curb markings;
  - E. Parking space markings; and
  - F. Shared-use path markings.

Support:

- 06 The provisions of this Section do not apply to non-longitudinal pavement markings including, but not limited to, the following:
- A. Transverse markings;
  - B. Word, symbol, and arrow markings;
  - C. Crosswalk markings; and
  - D. Chevron, diagonal, and crosshatch markings.
- 07 Special circumstances will periodically cause pavement marking retroreflectivity to be below the minimum levels. These circumstances include, but are not limited to, the following:
- A. Isolated locations of abnormal degradation;
  - B. Periods preceding imminent resurfacing or reconstruction;
  - C. Unanticipated events such as equipment breakdowns, material shortages, and contracting problems; and
  - D. Loss of retroreflectivity resulting from snow maintenance operations.

When such circumstances occur, compliance with Paragraphs 1 and 2 is still considered to be achieved if a reasonable course of action is taken to resume maintenance of minimum retroreflectivity in a timely manner according to the maintaining agency's method(s), policies, and procedures.

### Section 3A.04 Materials

Support:

- 01 Pavement and curb markings are commonly placed by using paints or thermoplastics; however, other suitable marking materials, including raised pavement markers and colored pavements, are also used. Delineators and channelizing devices are visibly placed in a vertical position similar to signs above the roadway.
- 02 Some marking systems consist of clumps or droplets of material with visible open spaces of bare pavement between the material droplets. These marking systems can function in a manner that is similar to the marking systems that completely cover the pavement surface and are suitable for use as pavement markings if they meet the other pavement marking requirements of the highway agency.

Guidance:

- 03 *The materials used for markings should provide the specified color throughout their useful life.*
- 04 *Consideration should be given to selecting pavement marking materials that will minimize tripping or loss of traction for road users, including pedestrians, bicyclists, and motorcyclists.*
- 05 *Delineators should not present a vertical or horizontal clearance obstacle for pedestrians.*

**Section 3A.05 Colors****Standard:**

01     **Markings shall be yellow, white, red, blue, or purple. The colors for markings shall conform to the standard highway colors. Black in conjunction with one of the colors mentioned in the first sentence of this paragraph shall be a usable color.**

02     **When used, white markings for longitudinal lines shall delineate:**

- A. The separation of traffic flows in the same direction, or
- B. The right-hand edge of the roadway.

03     **When used, yellow markings for longitudinal lines shall delineate:**

- A. The separation of traffic traveling in opposite directions,
- B. The left-hand edge of the roadways of divided highways and one-way streets or ramps, or
- C. The separation of two-way left-turn lanes and reversible lanes from other lanes.

04     **When used, red raised pavement markers or delineators shall delineate:**

- A. Truck escape ramps, or
- B. One-way roadways, ramps, or travel lanes that shall not be entered or used in the direction from which the markers are visible.

05     **When used, blue markings shall supplement white markings for parking spaces for persons with disabilities.**

06     **When used, purple markings shall supplement lane line or edge line markings for toll plaza approach lanes that are restricted to use only by vehicles with registered electronic toll collection accounts.**

**Option:**

07     Colors used for official route shield signs (see Section 2D.11) may be used as colors of symbol markings to simulate route shields on the pavement (see Section 3B.20.)

08     Black may be used in combination with the colors mentioned in the first sentence of Paragraph 1 where a light-colored pavement does not provide sufficient contrast with the markings.

**Support:**

09     When used in combination with other colors, black is not considered a marking color, but only a contrast-enhancing system for the markings.

**Section 3A.06 Functions, Widths, and Patterns of Longitudinal Pavement Markings****Standard:**

- 01 The general functions of longitudinal lines shall be:
- A. A double line indicates maximum or special restrictions,
  - B. A solid line discourages or prohibits crossing (depending on the specific application),
  - C. A broken line indicates a permissive condition, and
  - D. A dotted line provides guidance or warning of a downstream change in lane function.
- 02 The widths and patterns of longitudinal lines shall be as follows:
- A. Normal line—4 to 6 inches wide.
  - B. Wide line—at least twice the width of a normal line.
  - C. Double line—two parallel lines separated by a discernible space.
  - D. Broken line—normal line segments separated by gaps.
  - E. Dotted line—noticeably shorter line segments separated by shorter gaps than used for a broken line. The width of a dotted line extension shall be at least the same as the width of the line it extends.

**Support:**

- 03 The width of the line indicates the degree of emphasis.

**Guidance:**

- 04 Broken lines should consist of 12.5-foot line segments and 37.5-foot gaps, or dimensions in a similar ratio of line segments to gaps as appropriate for traffic speeds and need for delineation.

**Support:**

- 05 Patterns for dotted lines depend on the application (see Sections 3B.04 and 3B.08.)

**Guidance:**

- 06 A dotted line for line extensions within an intersection or taper area should consist of 2-foot line segments and 4-foot gaps. A dotted line used as a lane line should consist of 5-foot line segments and 20-foot gaps. A dotted line for tapered exits may consist of 5-foot line segments and 20-foot gaps.