

PAVEMENT MARKING MANUAL

2012



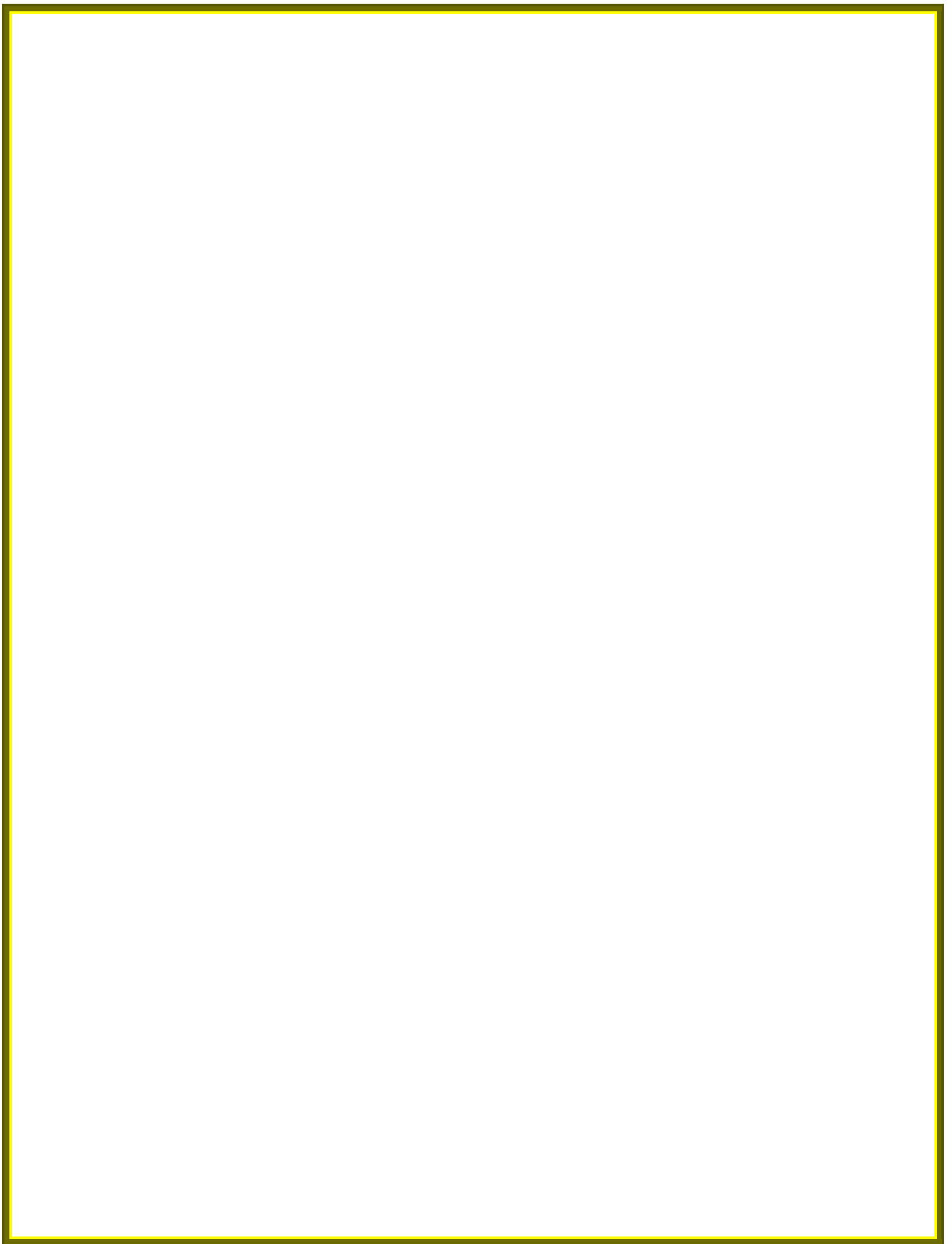


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CHAPTER I

INTRODUCTION

GENERAL

Pavement markings are a common and expected traffic control device whose purpose is to provide visual information to the motorist for regulating, warning, and guiding vehicular movements on the roadway. They are used to supplement other traffic control devices and also are used by themselves as the sole means of effectively conveying certain information to the motorist without diverting the driver's attention from the roadway. The capacity and safety of the roadway is increased by the orderly and proper regulation, warning, and guidance of the motorist, which results from the correct and standard application of pavement markings.

Therefore pavement markings must be readily recognized and understood by the motorist. This is accomplished by providing uniform standard pavement markings throughout the state highway system and using them only to convey the meaning prescribed in this manual.

The Wyoming Department of Transportation (WYDOT) is responsible for adopting a manual for a uniform system of traffic control devices for use on the state highway system. This manual is consistent with the "Manual on Uniform Traffic Control Devices for Streets and Highways" (MUTCD).

RESPONSIBILITIES

State Traffic Engineer

The State Traffic Engineer (STE) is responsible for developing and maintaining the WYDOT pavement marking manual and overseeing the statewide pavement marking program. This responsibility includes observance of the program to determine if it meets the standards of this manual and other WYDOT pavement marking program policies and procedures. This

responsibility also includes developing and monitoring quality and performance goals for the pavement marking program.

The STE is responsible for reviewing and approving paint and bead quantity estimates before purchase. The STE is responsible for assisting the Materials Laboratory in upgrading and maintaining pavement marking material specifications and for assisting the state equipment engineer in the operating specifications of the motorized pavement marking equipment.

The STE is responsible for establishing no-passing zones on the state highway system and for providing technical assistance to the district personnel as requested.

District Engineer

The District Engineer is responsible for oversight of the district pavement marking program in accordance to this manual.

District Traffic Engineer

The District Traffic Engineer (DTE) is responsible for the direct management of the district pavement marking program. This includes such items as crew oversight, budgeting, work schedules, inspections, and material estimates. The DTE is also responsible for assuring that adequate equipment, material, and personnel are available to accomplish the district pavement marking program. The DTE should report any pavement marking problems to the District Engineer and the STE for their assistance in correcting the problem.

The DTE with the district pavement marking foreman should field review the highways in the district annually to assure that adequate pavement markings are being maintained to the extent practical. The DTE is responsible for recommending the need for durable pavement marking material to the STE. This responsibility also includes recommending durable pavement marking needs for highway construction projects.

Pavement Marking Foreman

The pavement marking foreman is responsible for the supervision, performance, and safety of the crew and for the safety of the general public while performing pavement marking operations. The foreman assists the DTE in keeping accurate and timely records and informing the DTE of pavement marking problems.

Pavement Marking Crew

The pavement marking crew is responsible for performing their work in a safe and efficient manner. They should assist the foreman in attaining the highest degree of quantity and quality of pavement markings possible.

Pre-Marking Procedure

The foreman and striper driver should review all roadway surfaces before starting the actual marking operation. This review should reduce error, save time, and improve the quality of the pavement markings. The review should involve the following:

- The spotting for the new marking placement should be checked to determine if lane widths, channelization, taper lengths, etc. meet standards (see Figure 1).
- The roadway should be checked to determine if cleaning of the paved surface is needed. All areas, especially channelized areas, should have the entire area cleaned. Air spray **shall be used** on all longitudinal pavement marking operations. The air spray nozzle **shall be located** in front of the paint gun.
- Sight distances and other conditions which warrant no-passing zones should be checked for location and the beginning and ends of the zones permanently marked.

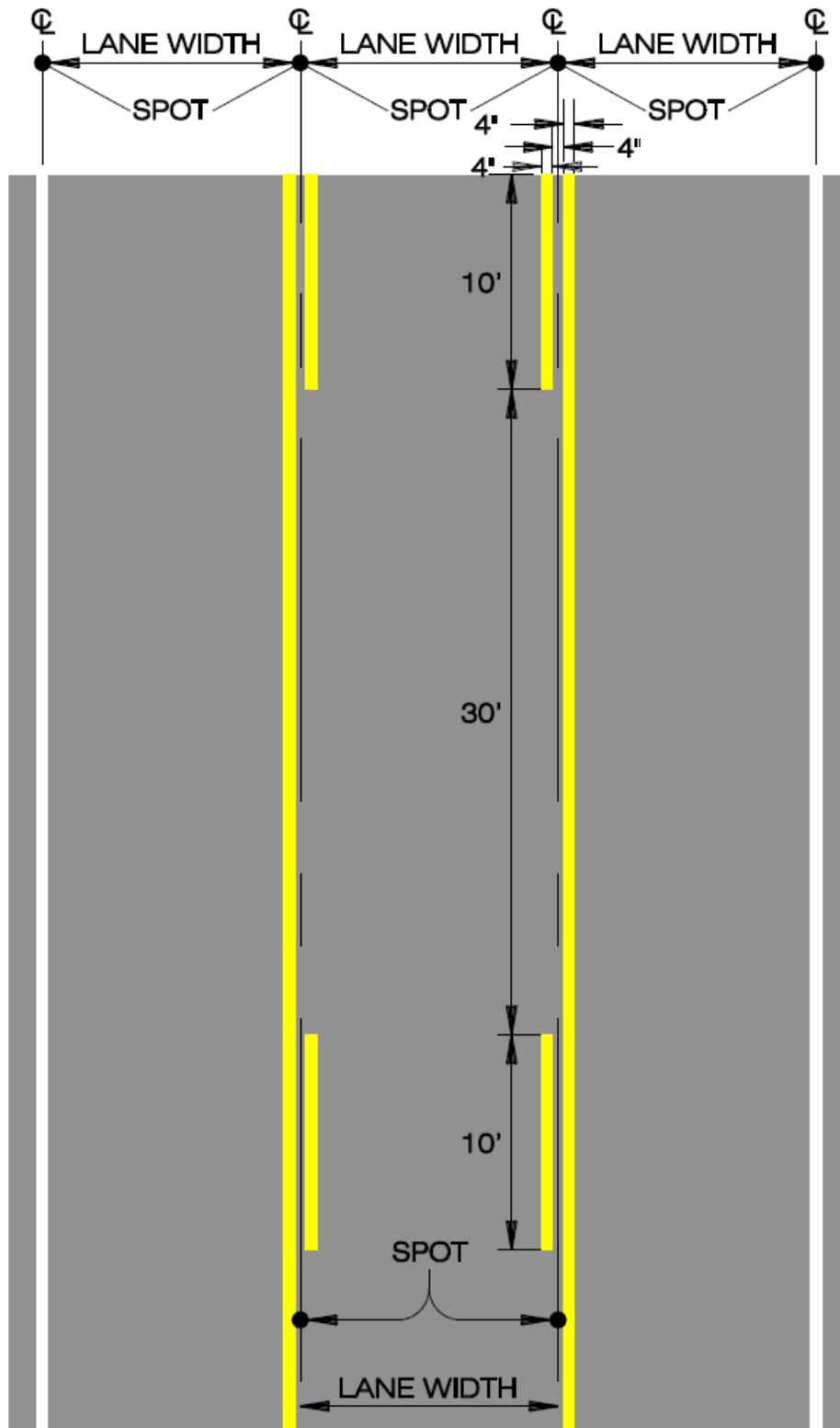


Figure 1
Lane Width Spotting

PRIORITY SCHEDULING

In order to provide the most practical and effective pavement markings to as many motorists as possible, the following priority scheduling should be followed as closely as possible. This schedule puts emphasis on marking and maintaining critical pavement markings based on weather conditions, roadway classifications, and traffic volumes. Local conditions can vary; therefore the final priority schedule should be determined by the DTE. Due to weather conditions, normal rural striping operations should not start before the 1st of April.

Rural Scheduling

- Stripe centerlines and no-passing zones on the National Highway System (NHS) and the lane lines on the Interstate Highway System (April-June).
- Stripe right shoulder edge line on the Interstate Highway System. Dotted line extensions through interchanges should be done at this time.
- Stripe centerlines and no-passing zones on state highways not designated on the NHS.
- Stripe shoulder edge lines on the NHS.
- Stripe shoulder edge lines on the state highway not designated on the NHS.
Stripe left shoulder edge lines on the Interstate Highway System.
- Stripe lane lines on the Interstate Highway System (Sept-Oct.).

Generally, one-half of the edge lines on all non-interstate highways should be striped each year.

The left or right shoulder edge line and the lane line on the Interstate Highway System and the centerline and right edge line on two-lane, two-way highways may be striped at the same time if the DTE determines it will help the district meet the time scheduling and not adversely affect the marking priorities.

Urban Scheduling

Due to higher traffic volumes, more complex pavement markings, pedestrian traffic, and multi-lane roadways year around, urban striping should be done as needed to the **extent practical**. To increase durability of markings, a double coating of 32 mils of paint may be applied.

New Markings

Temporary markings on construction or maintenance projects should be replaced with permanent markings as soon as practical. **These new markings will have a higher priority than normal pavement marking maintenance.**

Paint pavement markings on new pavements or chip seals are not as visible or wear as well as new paint over existing pavement markings. Therefore, two applications of paint should be considered when marking new pavement surfaces.

Removal of Markings

Occasionally pavement markings must be revised or removed due to changed geometrics, addition of lanes, etc. Existing markings that the DTE determines may cause confusion for the motorist **shall be removed or obliterated** as soon as practical. Markings may be temporarily masked with tape until they can be removed or obliterated.

CHAPTER II

GENERAL STANDARDS

RETROREFLECTIVITY

All pavement markings, except parking space lines and curb markings, **shall have** a retroreflective surface provided by the use of glass beads embedded in the paint. In addition to providing significantly increased night visibility, glass beads lengthen the durability of pavement markings

PAINT AND BEAD APPLICATION RATES

Due to the large quantity of paint and beads needed for the pavement marking program, as well as the retroreflective and durability requirements, paint and bead application rates are critical. The crew foreman should monitor the actual application rate of the striper periodically to assure the proper application rates are being maintained.

Paint **shall be applied** at a wet thickness rate of 16 mils (0.016 in.). This is equal to 17.6 and 4.4 gallons of paint per pass mile for a 4" solid and a 4" broken line respectfully, and approximately 13.2 gallons of paint per pass mile for a 4" centerline. A centerline consists of a 4" broken line and/or 4" solid no-passing line as warranted.

Glass beads **shall be applied** at 8 pound per gallon of paint usage.

LANE AND EDGE LINE TAPERS

When pavement markings are used **to shift or terminate** normal travel lanes, the transition taper length is based upon the posted speed limit of the roadway.

For posted speed limits of 45 mph or greater the shifting or merging taper length should be computed by the formula $L=WS$. Where the posted speed limit is less than 45 mph, the formula

is $L=WS^2/60$. In both formulas, L equals the taper length in feet, W equals the shift in feet, and S equals the posted speed limit (see Figures 2, 6 and 9).

Entrance tapers for interstate parallel deceleration lanes and entrances into passing/truck climbing lanes normally are 300 feet in length. Entrance tapers in urban areas will vary in length due to local geometric conditions.

Table 1 shows the merging or shifting taper lengths for various speed limits and common shift widths of six and 12 feet.

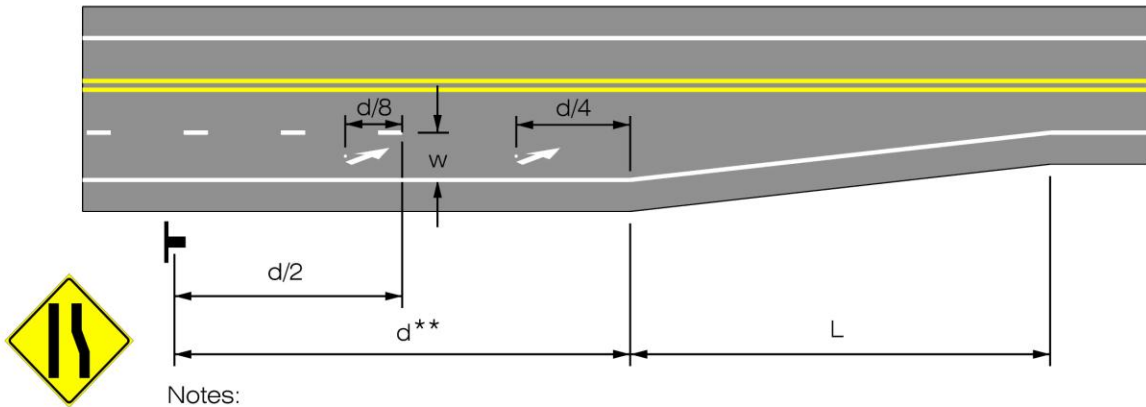
TABLE 1

LANE AND EDGE LINE MERGING OR SHIFTING-TAPERS

Posted Speed Limit (mph)	Taper Length (ft)	
	6' shift	12' shift
20	*40	*80
25	*60	130
30	*90	180
35	120	250
40	160	320
45	270	540
50	300	600
55	330	660
60	360	720
65	390	780
70	420	840
75	450	900

*Minimum merging or shifting taper lengths of 100 feet in urban areas and 200 feet in rural areas are desirable but may not be possible due to local physical roadway or traffic operational restrictions. Taper lengths less these desirable minimum lengths **shall have prior approval** of the DTE.

a - From 3 lanes to 2 lanes



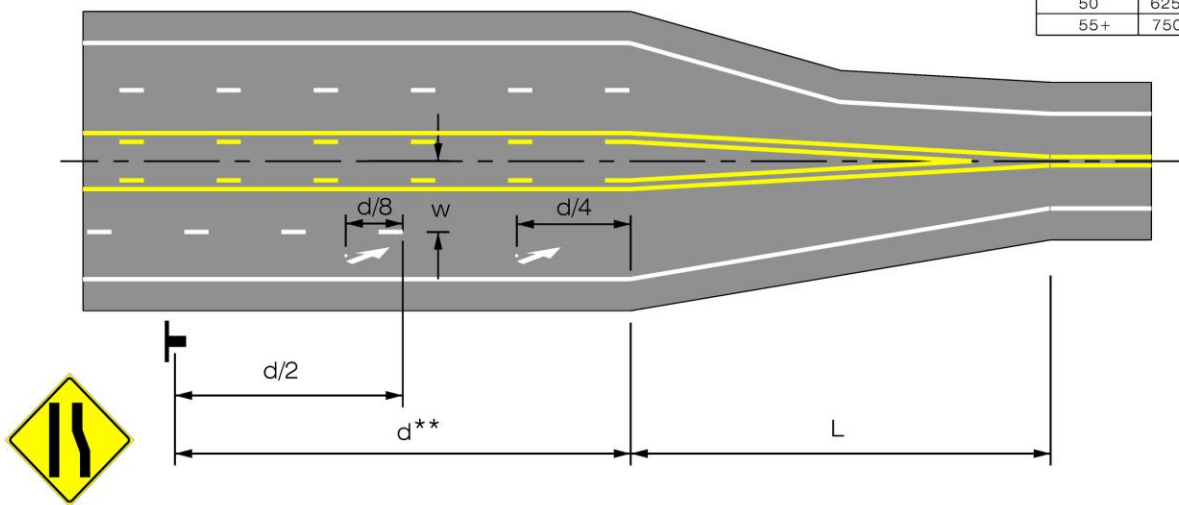
Notes:

1. Lane-reduction arrows are optional for speeds of less than 45 mph
2. $L = WS$ for speeds of 45 mph or greater and
 $L = WS^2 / 60$ for speeds of less than 45 mph, where:
 L = Length of taper in feet
 S = Posted, 85th-percentile, or statutory speed in mph
 W = Offset in feet
3. d = Advance warning distance

**
WARNING SIGN
PLACEMENT DISTANCE

M.P.H.	d
20	175 FT
25	250 FT
30	325 FT
35	400 FT
40	475 FT
45	550 FT
50	625 FT
55+	750 FT

b - From 5 lanes to 2 lanes



c - From 3 lanes to 2 lanes

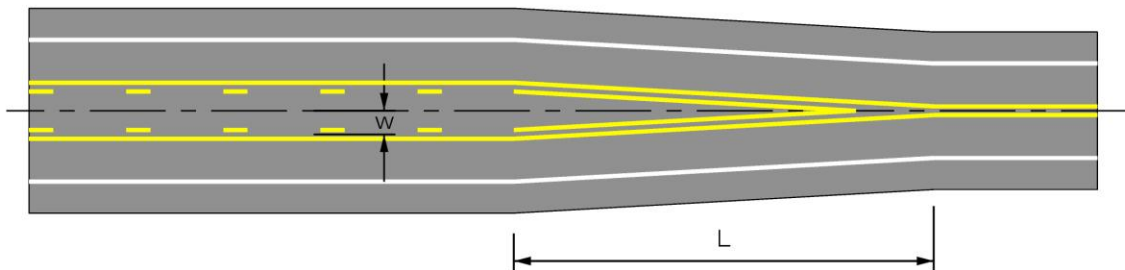


Figure 2
Merging or Shifting Tapers

The merging taper on an interstate entrance ramp is generally at a 50:1 ratio or 600 feet in length. Therefore, the entrance ramp merging taper length on interstate highways should be 600 feet in length.

LONGITUDINAL MARKINGS

Longitudinal markings are pavement markings that are parallel to the roadway and are used to control the lateral position of the vehicles on the roadway. This includes centerlines, lane and edge lines, no-passing lines, channelizing lines, etc.

Widths and Pattern of Lines

Normal Line

A normal line is 4" to 6" in width. **The standard width is 4".**

Wide Line

A wide line is at least twice the width of a normal line. **The standard width is 8".** The width of the line indicates the degree of emphasis.

Solid Line

A solid line prohibits or discourages crossing.

Double Line

A double line **shall consist** of two parallel lines separated by a 4" space. It indicates maximum or special restrictions.

Broken Line

A broken line is **normal line segments of 10 feet in length with 30 foot gaps** between line segments. A broken line indicates a permissive crossing condition.

Dotted Line

A dotted line has noticeably shorter line segments and shorter gaps than used for a broken line. The standard dotted line is **segments of 2 feet in length with 6 foot gaps** between line segments. For speeds > 45 mph, a dotted line used as a lane line should consist of segments 3 foot in length with 9 foot gaps. The width of a dotted line **shall be** at least the same as the width of the line it extends. A dotted line provides guidance.

Types of Lines

Broken White Line

A broken white line is used to separate traffic traveling in the same direction such as the lane line on multilane roadways.

Broken Yellow Line

A broken yellow line is used to separate traffic traveling in opposite directions such as the centerline on two-lane, two-way roadways.

Solid White Line

A solid white line is used to delineate the edge of two or more travel lanes in the same direction but where crossing the line is discouraged, it is also used on the right edge of the right travel lane, as an edge line, to separate the travel lane from the roadway shoulder.

Solid Yellow Line

A solid yellow line is used to designate a directional no-passing zone on two-lane, two-way roadways and is also used as a edge line on the left edge of the left travel lane on divided roadways, one-way roadways, and interstate ramps.

Double Solid White Line

A double solid white line is used to delineate the travel path where travel in the same direction is permitted on both sides of the line but crossing the line is prohibited. Its most common usage is as a channelizing line in advance of obstructions which may be passed

on either side but not encroached upon.

Double Solid Yellow Line

A double solid yellow line is used to separate traffic traveling in opposing directions where passing in both directions is prohibited. It is used to separate opposing traffic on multilane two-way roadways, and as a channelizing line in advance of an obstruction that must be passed on the right but not encroached upon. Crossing a double solid yellow line is permitted as part of a left turn maneuver.

Broken Yellow Line and Solid Yellow Line

A double line consisting of a broken yellow line and a solid yellow line delineates a separation between opposing traffic where passing is permitted for the traffic adjacent to the broken line and prohibited for the traffic adjacent to the solid line. It is also used for delineating continuous left turn lanes.

Dotted line

A dotted line is commonly used to delineate the extension of a line through an intersection or an auxiliary lane taper area. It **shall be the same color and width** as the line it extends.

TRANSVERSE MARKINGS

Transverse markings include STOP lines, YIELD lines, crosswalk edge lines, word and symbol markings, railroad crossing markings, parking space markings, and diagonal lines used in painted channelization.

Pavement marking letters, numerals, and symbols **shall be installed** in accordance with the “Standard Alphabets for Highway Signs and Pavement Markings” as shown in Appendix A.

All transverse markings **shall be white**, except median markings separating opposing traffic **shall be yellow**.

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CHAPTER III

STANDARD MARKINGS

CENTERLINES

Centerline pavement markings delineate the separation of traffic lanes that have opposite directions of travel on a roadway.

Centerline pavement markings **shall be placed** on all undivided two-way state highways with a width of 20 ft. or more. The centerline may be placed at a location that is not the geometric center of the roadway. Centerlines **shall be yellow**.

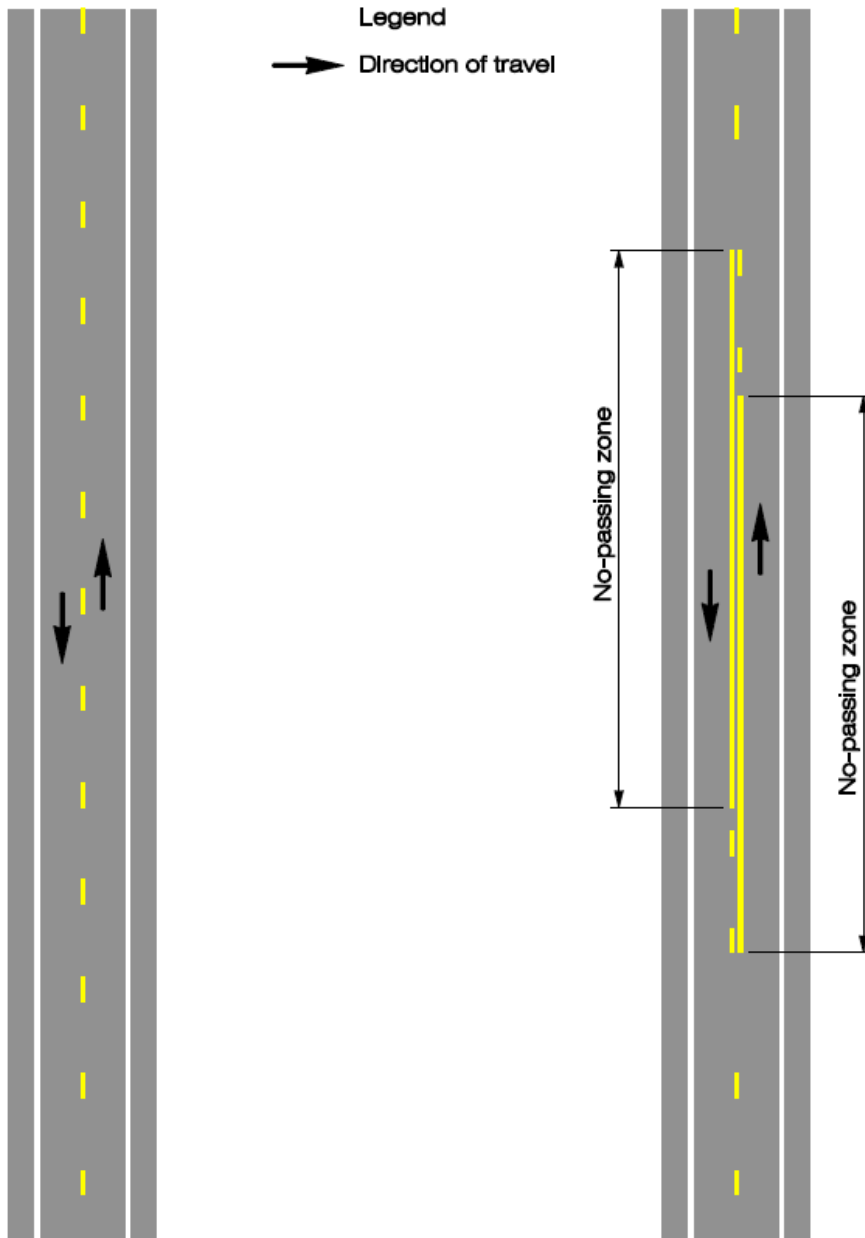
The centerline markings on two-lane, two-way roadways **shall be one** of the following (see Figure 3).

- Two-directional passing zone markings consisting of a normal broken yellow line where crossing the centerline markings for passing with care is permitted for traffic traveling in either direction.

- One-direction no-passing zone markings consisting of a normal broken yellow line and a normal solid yellow line where crossing the centerline markings for passing with care is permitted for the traffic traveling adjacent to the broken line, but is prohibited for traffic traveling adjacent to the solid line.

- Two-direction no-passing zone markings consisting of a double solid yellow line where crossing the centerline markings for passing is prohibited for traffic traveling in either direction.

Typical Two-Lane, Two-Way Marking Applications

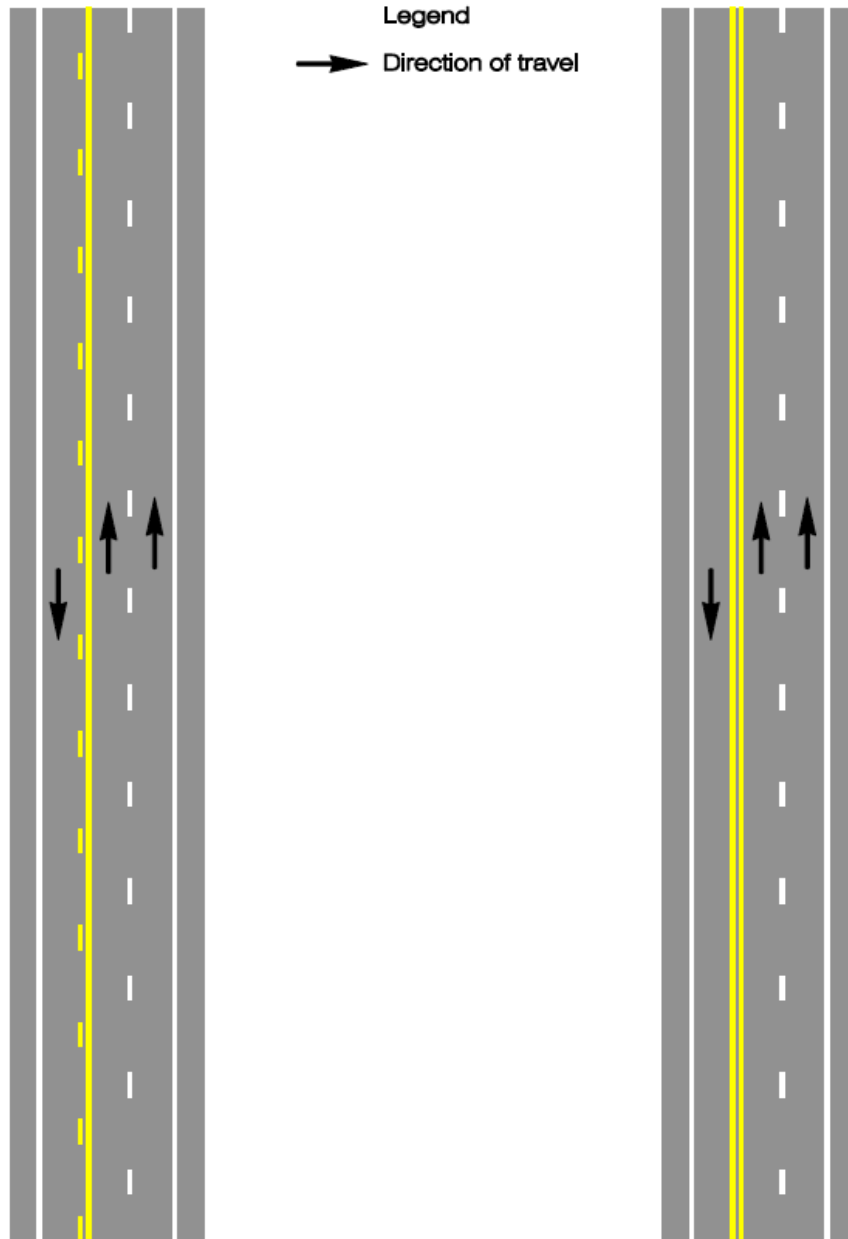


a - Typical two-lane, two-way marking with passing permitted in both directions

b - Typical two-lane, two-way marking with no-passing zones

Figure 3
Centerline Markings
(sheet 1 of 3)

Typical Three-Lane, Two-Way Marking Applications

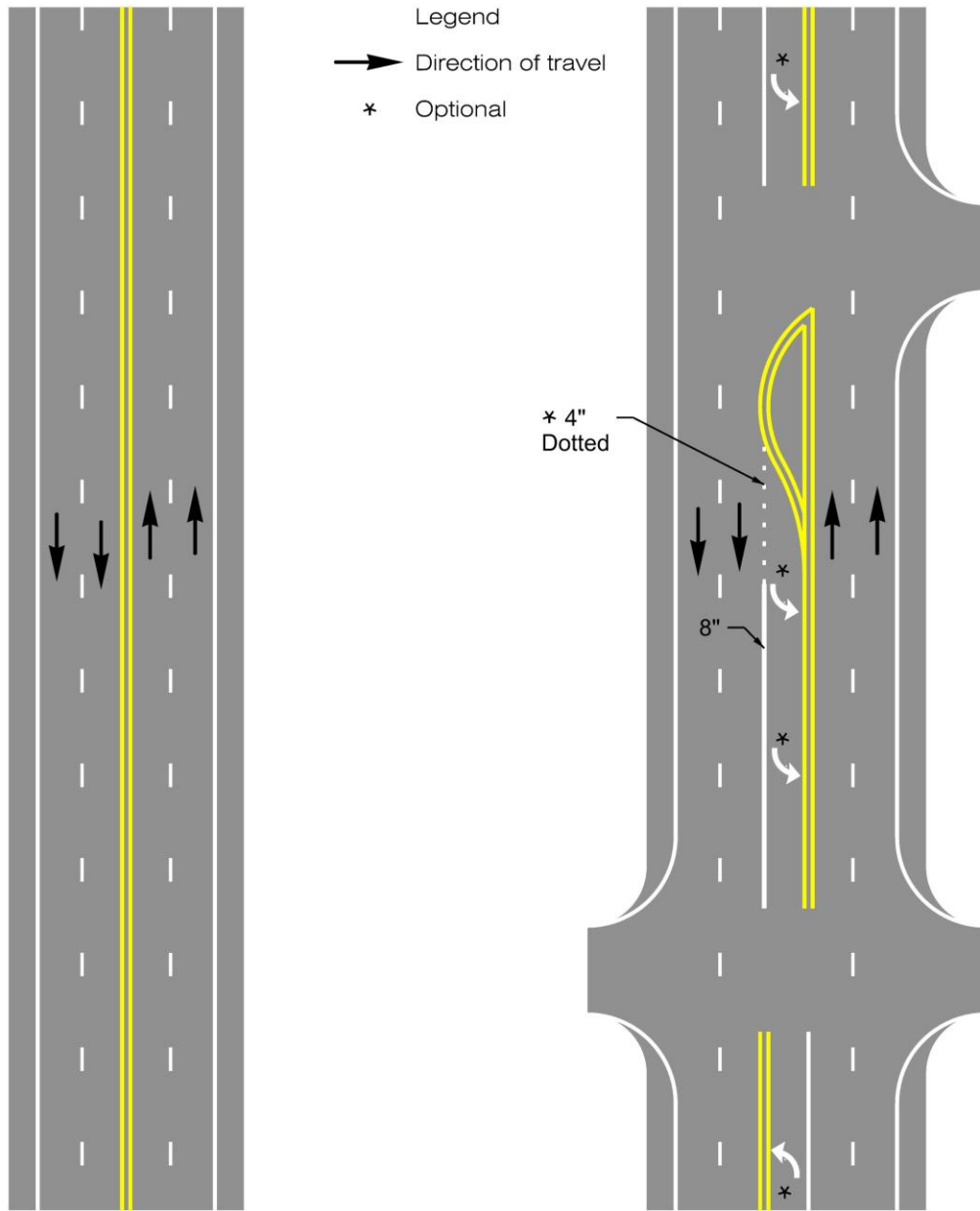


a - Typical three-lane, two-way marking with passing permitted in single lane direction

b - Typical three-lane, two-way marking with passing prohibited in single lane direction

Figure 3
Centerline Markings
(sheet 2 of 3)

Typical Four-or-More Lane, Two-Way Marking Applications



a - Typical multilane, two-way marking

b - Typical multilane, two-way marking with single lane left turn channelization

Figure 3
Centerline Markings
(sheet 3 of 3)

The centerline markings on undivided two-way roadways with two or more lanes in each direction always available **shall be** the two-direction no-passing zone markings consisting of two solid yellow lines.

On two-way roadways with three traffic lanes, two lanes should be designated for traffic in one direction using one- or two-direction no-passing zone markings.

NO-PASSING ZONES

General

No-passing zones **shall be marked** by either one direction or two direction no-passing zone markings (see Figure 3).

When centerline markings are used, no-passing zone markings **shall be used** on two-way roadways at lane reduction transitions and on approaches to obstructions that must be passed on the right (see Figures 2 and 6).

No-passing zone markings **shall be used** on approaches to highway-rail grade crossings and at other locations where the prohibition of passing is appropriate (see Figure 21).

On two-way, two- or three-lane roadways where centerline markings are installed, no-passing zones **shall be established** at vertical and horizontal curves and other locations where passing must be prohibited because of inadequate sight distances or other special conditions (see Figures 4, 9 and 15).

Governed By Passing Sight Distance Restriction

A no-passing zone at a vertical or horizontal curve **shall be used** where the passing sight distance is less than the minimum necessary for safe passing at the posted speed limit of the roadway. The passing sight distance on a vertical curve is the distance at which an object 3.5 feet above the pavement surface can be seen from a point 3.5 feet above the pavement (see Figure 4). Similarly, the passing sight distance on a horizontal curve is the distance measured

along the centerline (or right-hand lane line of a three-lane roadway) between two points 3.5 feet above the pavement on a line tangent to the embankment or other obstruction that cuts off the view on the inside of the curve (see Figure 4). WYDOT uses the two-vehicle electronic range tracking procedure for establishing the need for the no-passing zone and its beginning and ending location.

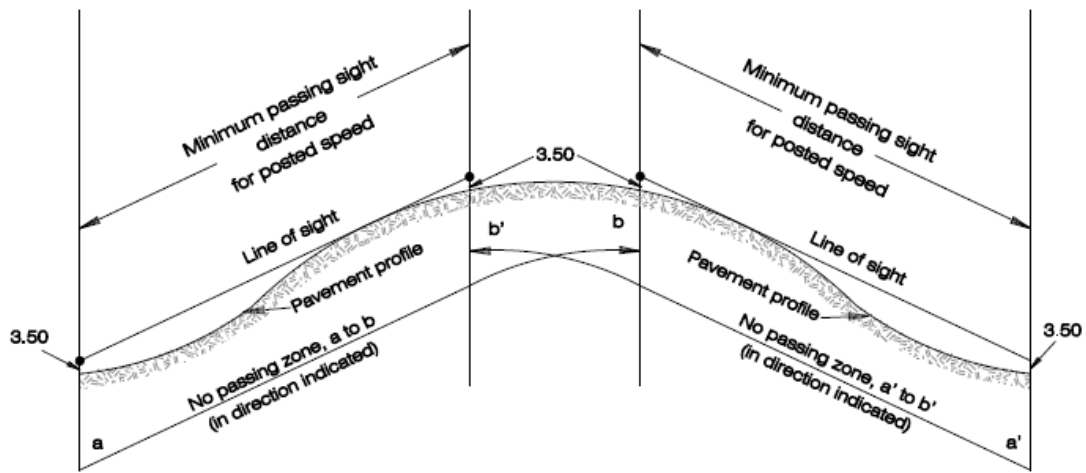
The minimum passing sight distance necessary for safe passing at the posted speed limit is shown in Table 2. Due to the rural nature and relatively low traffic volumes of a majority of the state highways, the speed of some vehicles may exceed the posted speed limit. **Therefore, the 70 MPH no-passing zone lengths for all types of no-passing zones shall be used on the posted 65 MPH highways unless otherwise directed by the DTE.***

**TABLE 2
NO-PASSING ZONE GOVERNED BY SIGHT DISTANCE**

POSTED SPEED LIMIT (MPH)	MINIMUM PASSING SIGHT DISTANCE (Feet)
25	450
30	500
35	550
40	600
45	700
50	800
55	900
60	1000
65	1100
*70	*1,200

*Use for posted 65 MPH highways.

VERTICAL CURVE



a, a' begin no-passing zone

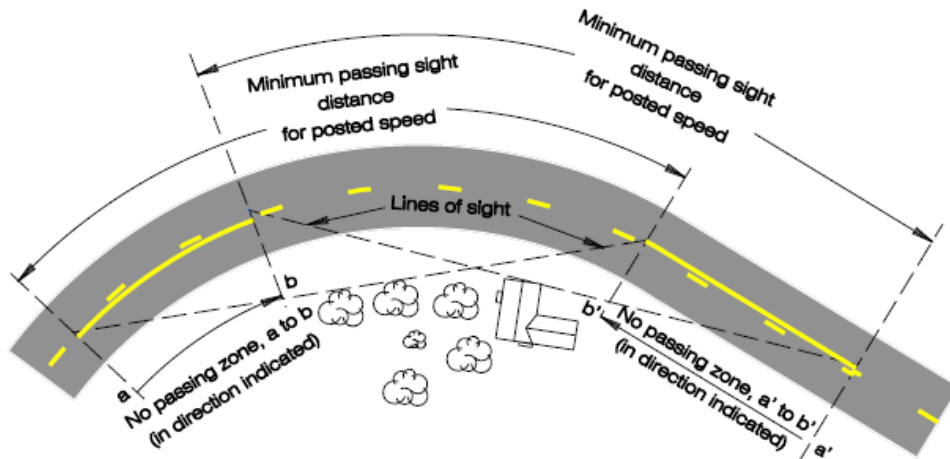
b, b' End no-passing zone

Sight distance becomes less than minimum measured between points 3.50 feet above pavement

Sight distance again exceeds minimum

Note: No-Passing zone in opposite directions may or may not overlap, depending on alignment.

HORIZONTAL CURVE



a, a' begin no-passing zone

b, b' End no-passing zone

Sight distance, measured along center line (or right-hand lane line on three lane road) becomes less than minimum.

Sight distance again exceeds minimum

Note: No-Passing zone in opposite directions may or may not overlap, depending on alignment.

Figure 4
No-Passing Zones For
Vertical & Horizontal Curves

Not Governed by Passing Sight Distance Restriction

Passing needs to be prohibited due to certain roadway and traffic operational characteristics where passing sight distance exists but passing maneuvers may be hazardous. No-passing zone markings not governed by passing sight distance restrictions **shall be placed** at the following locations:

- In advance of paint channelization which must be passed to the right.
- At intersections of primary and secondary rural highways.
- At crossroad approaches to interchange ramps.
- At railroad crossings with a posted speed limit of 40 mph or greater. **The length of the no-passing zone is as shown in Figure 21.**
- Other locations deemed necessary by the DTE.

The minimum no-passing zone lengths for the locations not governed by sight distance are shown in Table 3. If the minimum passing sight distance does not exist, the no-passing zone length listed below **shall be extended** to meet the minimum passing sight distance.

TABLE 3

NO-PASSING ZONE NOT GOVERNED BY PASSING SIGHT DISTANCE

POSTED SPEED LIMIT (MPH)	LENGTH OF ZONE (Feet)
25	280
30	320
35	370
40	410
45	500
50	550
55	650
60	700
65	800
*70	*850

***Use for posted 65 MPH highways.**

**Do not use Table 3 for the length of railroad crossing no-passing zones.
For railroad crossing no-passing zone lengths use Figure 21.**

Minimum Distance Between No-Passing Zones

When the distance between successive no-passing zones is less than that shown in Table 4, the no-passing zones **shall be connected**.

**TABLE 4
MINIMUM DISTANCE BETWEEN NO-PASSING ZONES**

POSTED SPEED LIMIT (MPH)	DISTANCE (Feet)
25	280
30	320
35	370
40	410
45	500
50	550
55	650
60	700
65	800
*70	*850

*Used for posted 65 MPH highways.

Maximum Sight Distance Restriction for Omitting No-Passing Zones

The minimum passing sight distance may be lost momentarily due to short severe vertical sags in the roadway or small obstructions alongside the roadway. If no-passing zones are installed for these short sections of restricted sight distance, they would not appear to be warranted and the motorist could lose respect for no-passing zone markings. No-passing zones should not be installed unless the sight distance restriction is greater than shown in Table 5.

TABLE 5
MAXIMUM SIGHT DISTANCE RESTRICTION
TO OMIT NO-PASSING ZONE

POSTED SPEED LIMIT (MPH)	MAXIMUM SIGHT DISTANCE RESTRICTION (Feet)
25	75
30	90
35	105
40	120
45	135
50	150
55	165
60	180
65	195
70	210

For speeds 45 mph and above, no-passing zone markings installed under these conditions **shall be extended** to a length of 500 feet with the additional length added to the beginning of the no-passing zone. For speeds less than 45 mph, no-passing zone markings installed under these conditions **shall be extended** to a length in accordance Table 3 with the additional length added to the beginning of the no-passing zone.

When evaluating locations of this nature, conditions in either direction beyond the sight restriction need to be evaluated before omitting the no-passing zone.

LANE LINES

Lane line markings are used to delineate the separation of traffic lanes that have the same direction of travel on a roadway. Lane line markings **shall be placed** on all state highways where two or more traffic lanes in the same direction of travel are provided.

Lane line markings **shall consist of** a broken line where crossing the lane line with care is permitted. All lane line markings **shall be white**.

Where crossing the lane line markings is discouraged, the lane line markings shall consist of a wide solid line. They may be used to separate through travel lanes from auxiliary lanes, such as left- or right-turn lanes, or to separate travel lanes approaching an intersection or crosswalk.

When crossing the lane line markings is prohibited, the lane line markings **shall consist of a double solid line**.

EDGE LINES

Edge line pavement markings are used to delineate the separation of travel lanes from the right or left shoulder or edge of the roadway (see Figures 10 thru 14).

Edge line markings **shall be white** except the left edge line on a divided or one-way roadway or ramp **shall be yellow**.

Edge line markings should be placed 12 feet from the centerline or lane line. They should not be placed where the travel lane is less than 10 feet in width unless approved by the STE. They should be placed at least 6 inches from the edge of pavement since irregularities and slope of the pavement edge usually result in poor visual quality if the edge line is placed closer to the pavement edge.

In rural areas, edge lines **shall be continuous** except at other major paved roadway intersections or approaches to interchanges, truck turn-outs, fly-bys, rest areas, etc., where acceleration or deceleration lanes are provided.

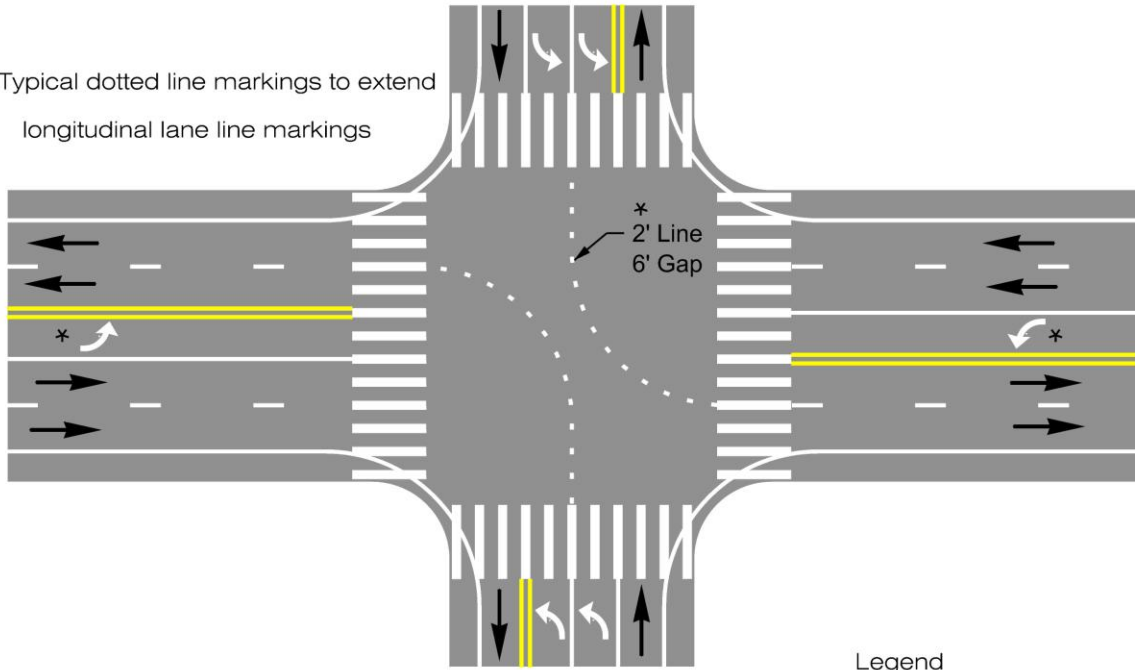
In urban areas, where edge lines are used, they **shall be continuous** except at street intersections or high volume approaches such as shopping centers.

PAVEMENT MARKING LINE EXTENSIONS

Where complex highway design or reduced visibility conditions make it desirable to provide lane control or help guide the driver through an intersection, a dotted line pavement marking may be used to extend lane or edge line pavement markings through an intersection area (see Figure 5).

Pavement marking line extensions **shall be the same color and at least the same width** as the line markings they extend. Where a greater degree of emphasis is required, solid pavement marking line extensions may be used.

a - Typical dotted line markings to extend longitudinal lane line markings



Note: Lane line extensions may be dotted or solid lines

- Legend
- ➔ Direction of travel
 - * Optional

b - Typical dotted line markings to extend longitudinal center line markings

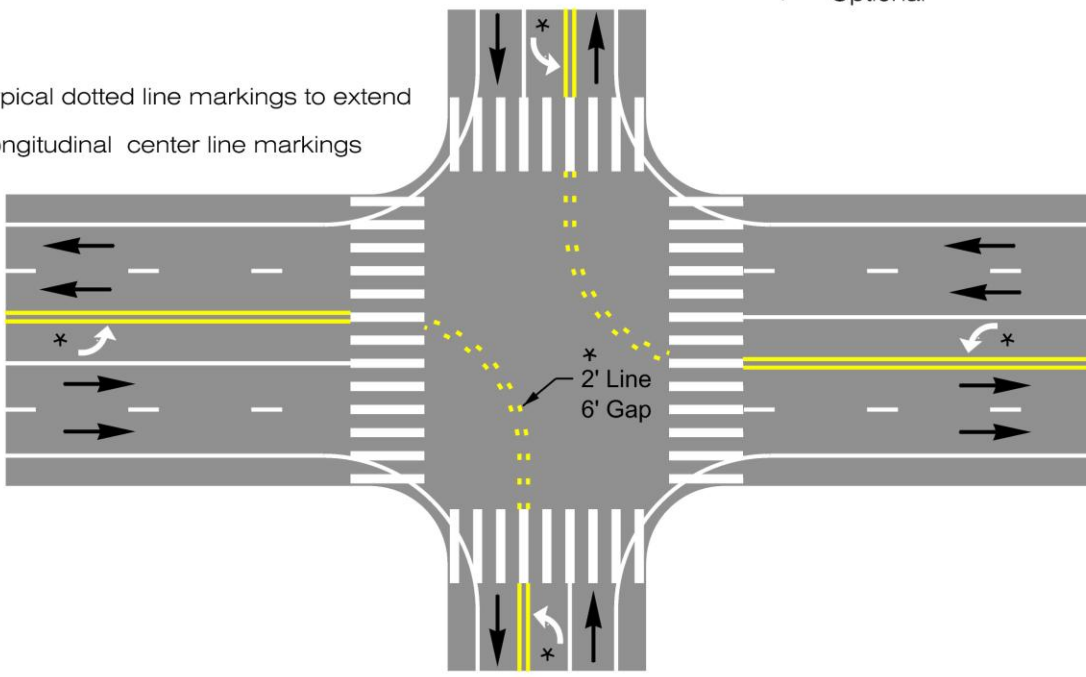


Figure 5
Typical Pavement Line Extensions

CHANNELIZING ISLANDS AND GORES

Channelizing islands are formed to define a neutral area on the roadway by use of either a wide or double solid channelizing line. Where travel in the same direction is permitted on both sides of the island, the line **shall be white**. If the island separates travel in opposite directions, the line **shall be yellow**. Other pavement markings in the island, such as diagonal lines, **shall be the same color** as the channelizing line.

Divided Roadways

Channelizing islands are used at interchange exit and entrance ramp gores to guide traffic at the proper angle for smooth divergence from the through travel lane onto the ramp and for promoting safe and efficient merging of the entrance ramp traffic with through traffic (see Figure 10 and the interstate marking section of this manual).

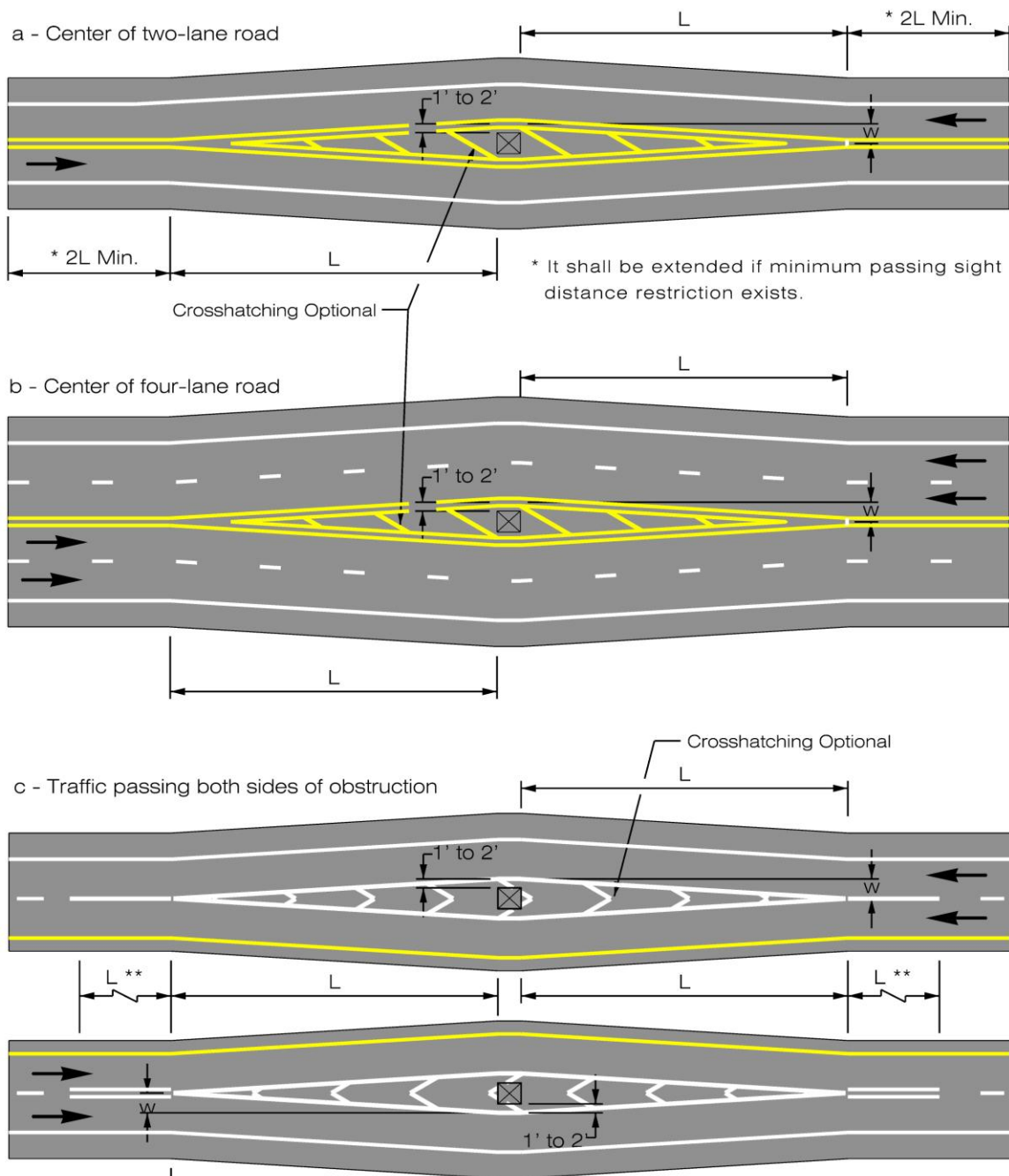
Roadway Obstructions

Channelizing islands are used to provide a neutral area as well as guide traffic away from a fixed physical obstruction in the roadway such as a raised or depressed median, or to provide a protected left turn lane (see Figures 6 and 7).

The channelizing island **shall consist of** a channelizing line extending from the centerline or lane line to a point 1 to 2 feet to the right side, or to both sides, of the approach end of the physical obstruction.

If traffic is required to pass only to the right of the obstruction, an approaching no-passing zone marking **shall be extended** from the point of taper for a distance as shown in Figure 6a.

If traffic can pass to either side of the obstruction, a channelizing line **shall be extended** in place of the lane line from the point of taper for a distance equal to the taper length.



L = Length in feet
 S = Posted, 85th-percentile, or statutory speed in mph
 W = offset in feet
 d = Advance warning distance

**Minimum length of L : 100 feet urban areas
 200 feet rural areas**

** 8 inch solid lane line marking
 or
 double 4 inch solid lane line marking

For speeds 45 mph or more:
 $L = WS$
 For speeds less than 45mph:
 $L = WS^2 / 60$

Figure 6
 Roadway Obstruction

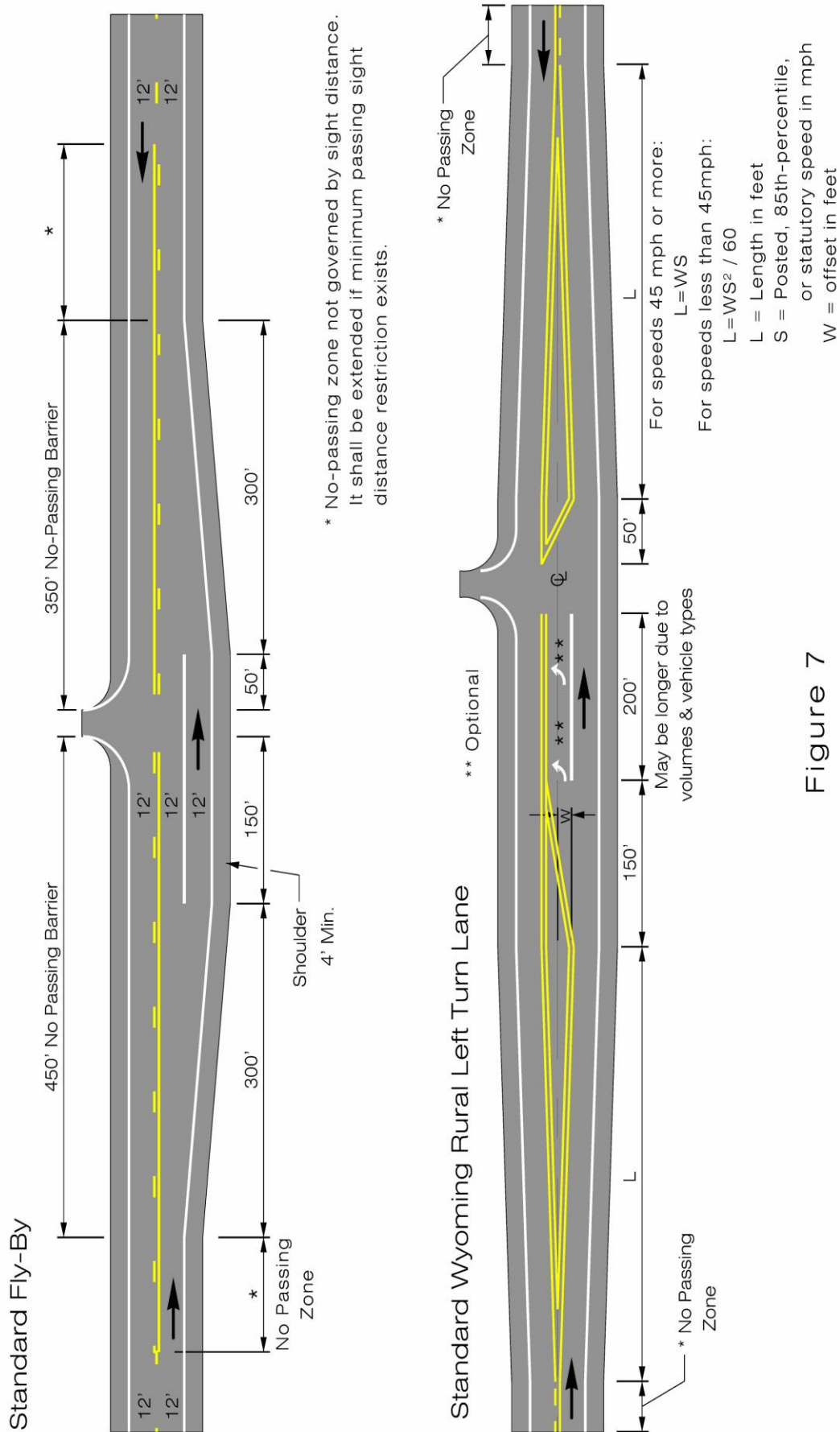


Figure 7
Typical Intersection Channelization

TWO-WAY LEFT-TURN LANE

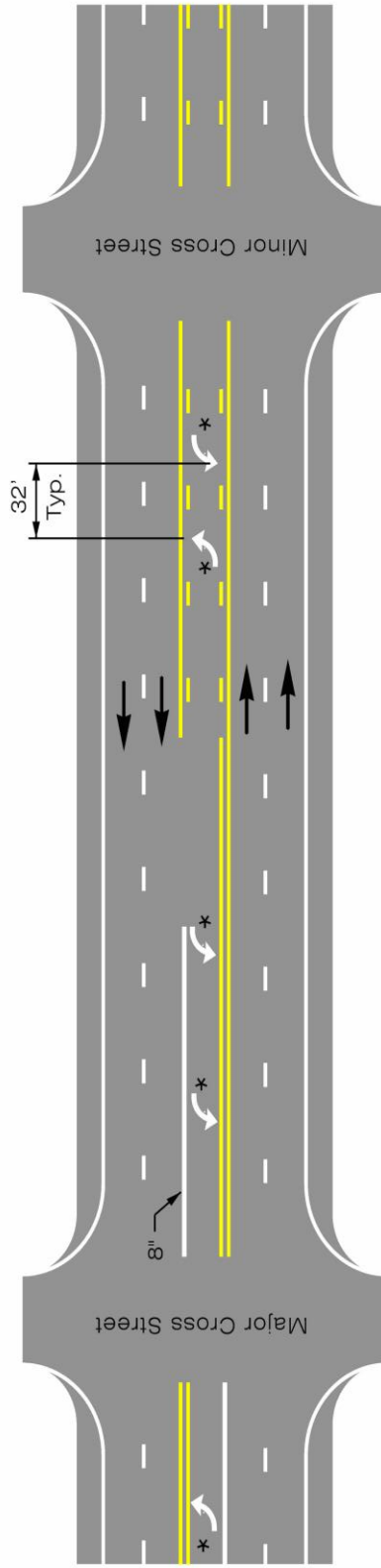
A two-way left-turn lane is a lane reserved for exclusive use of left turning vehicles and is not to be used for an overtaking and passing maneuver. The lane may be used for making a left turn in either direction.

The pavement markings on each side of the continuous two-way left-turn lane **shall consist of** a broken yellow line and a solid yellow line. These markings **shall be placed** with the broken line toward the two-way left-turn lane and the solid line toward the adjacent traffic lane (see Figure 8).

A pair of pavement marking arrows may be placed at both ends of the continuous two-way left-turn lane. Additional pairs of pavement arrows may be placed where heavy traffic volumes enter the roadway and other locations as determined by the DTE.

PASSING LANE/TRUCK CLIMBING LANE

Passing lanes or truck climbing lanes are used to increase the capacity and level-of-service of a two-lane, two-way roadway by providing the road user an opportunity to pass slower moving vehicles without yielding to opposing traffic. The transition from the passing lane section to normal two-way operation is critical and the pavement markings and signing placement **shall be as shown** in Figure 9.



Legend
 → Direction of travel
 * Optional

Figure 8
 Two-Way Left Turn Lane

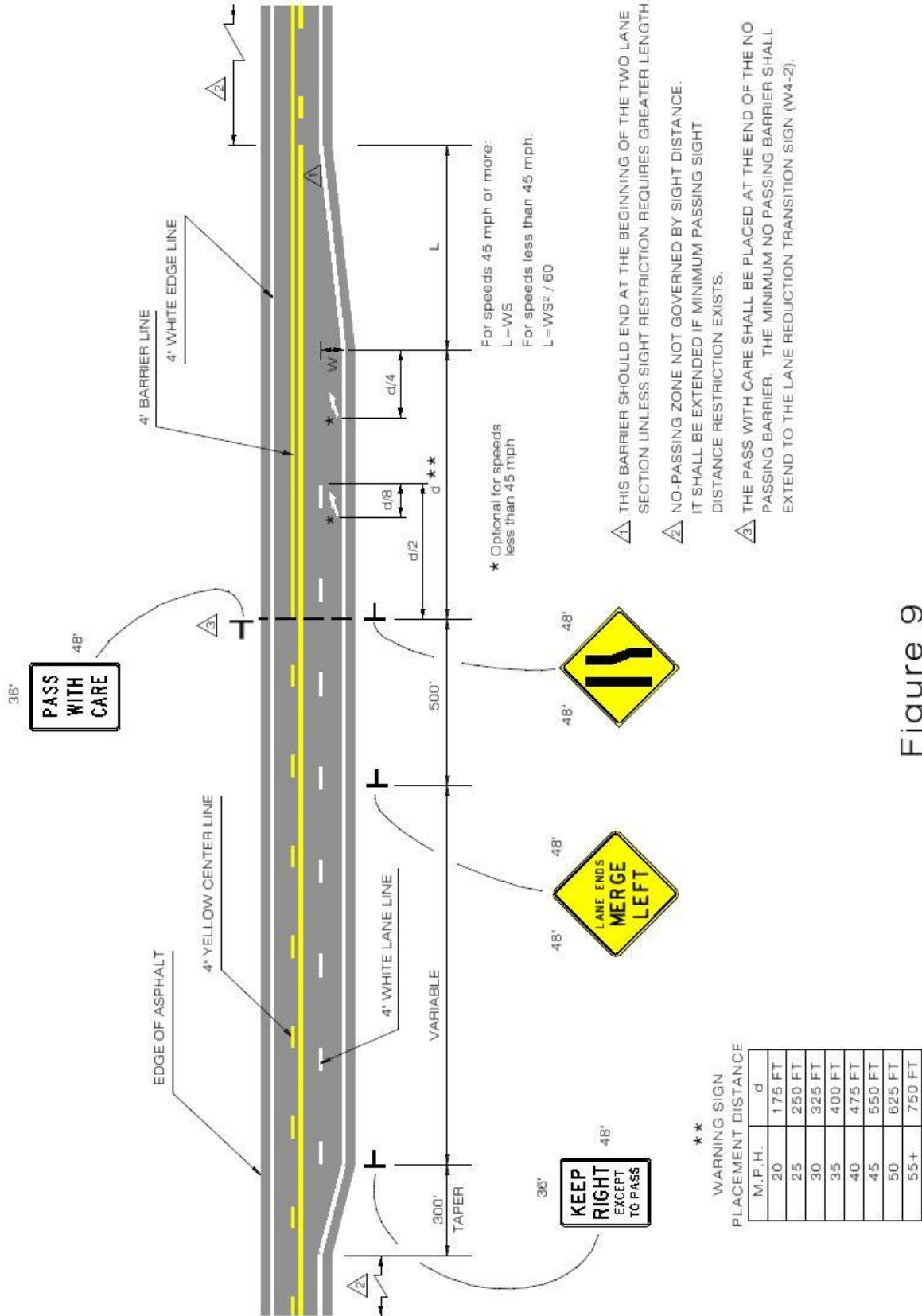


Figure 9
Typical Passing / Truck Climbing Lane

INTERSTATE HIGHWAY MARKINGS

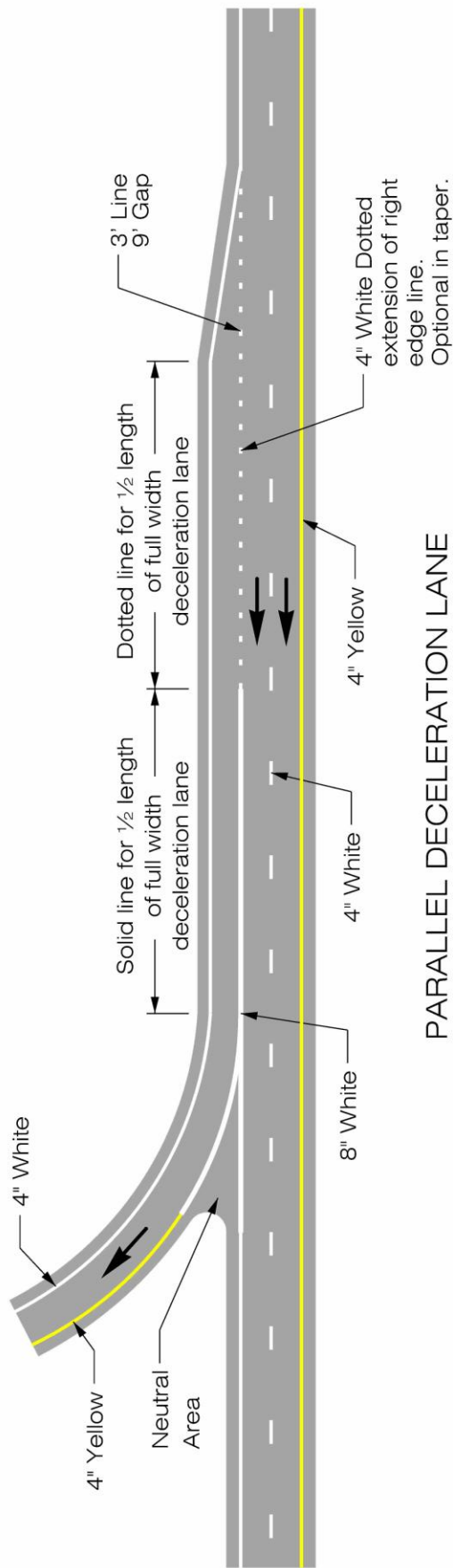
General

All interstate highways **shall have** lane line and edge line pavement markings. Channelizing islands **shall be provided** at exit and entrance ramps at interchanges and at other exit and entrance points to the through traffic lanes such as rest areas and parking areas (see Figures 10 thru 14).

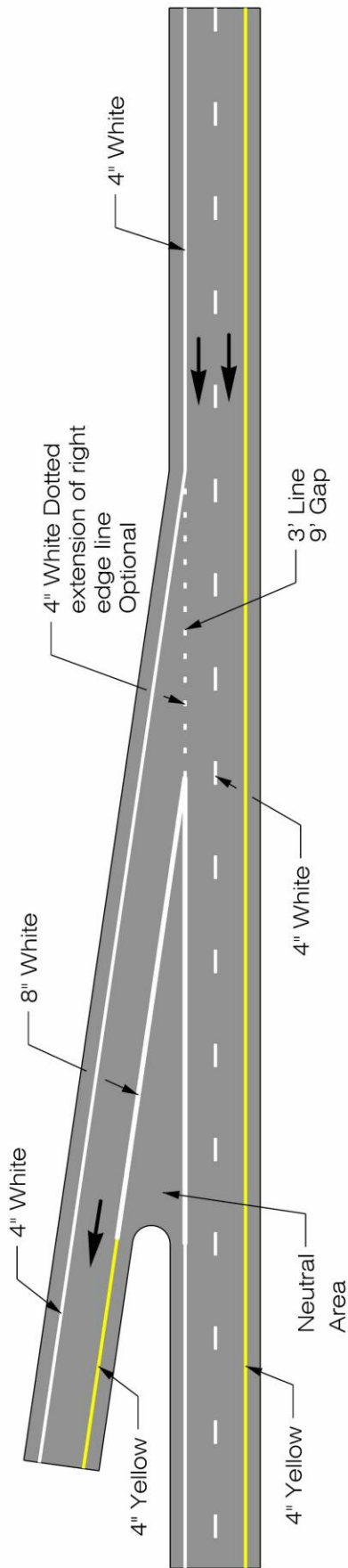
Interchange Markings

Exit Ramps

For exit ramps, channelizing lines **shall be placed** along the sides of the neutral area adjacent to the through traffic lane and the ramp lane. With a parallel deceleration lane, a channelizing line **shall be extended** from the beginning of the channelizing line upstream for a distance of one-half the length of the full-width deceleration lane (see Figure 10). A dotted line may be placed to extend the edge line from the point of divergence to the channelizing line. In a tapered deceleration lane, the dotted line may be placed to extend the edge line from the point of divergence to the channelizing island. White transverse diagonal markings may be placed in the channelized island (neutral area). The channelizing lines **shall be** 8 inches in width.



PARALLEL DECELERATION LANE



TAPERED DECELERATION LANE

Figure 10
Exit Ramps

Entrance Ramps

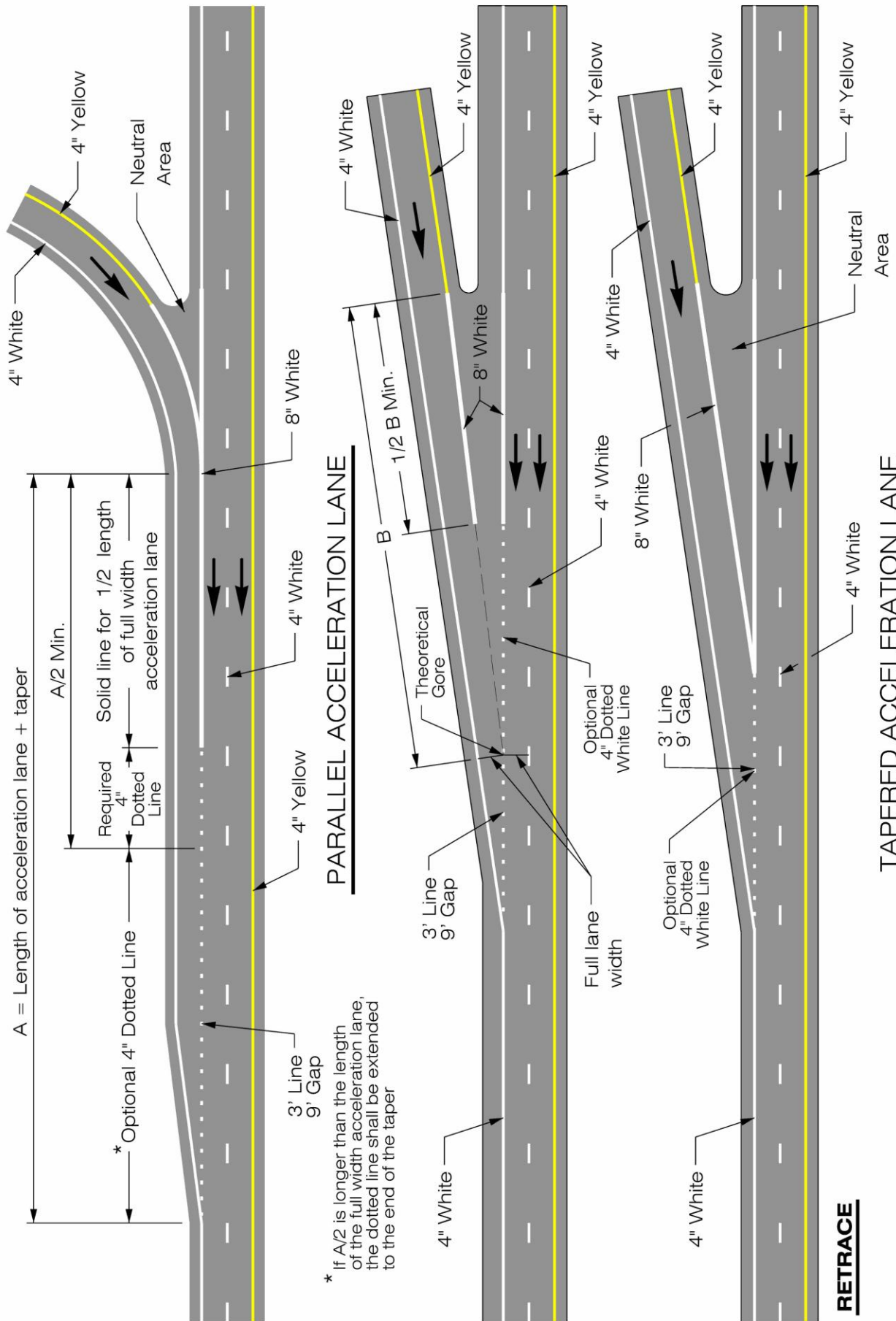
For parallel entrance ramps a channelizing line **shall be used** to extend the through traffic lane edge line from the physical gore downstream for a distance of one-half the length of the full-width acceleration lane. Another channelizing line **shall be used** to extend the ramp edge line from the physical gore to a point where it meets the through traffic lane channelizing line (see Figure 11). When retracing **existing** tapered entrance ramps, a channelizing line **shall be used** to extend the through traffic lane edge line and the entrance ramp edge line from the physical gore downstream to a point where they meet (see Figure 11).

When marking **new** pavement surfaced tapered entrance ramps a channelizing line **shall be placed** along the side of the neutral area adjacent to the ramp lane. Lane line markings shall be placed to extend the channelizing line to the point where the tapered lane meets the near side of the through traffic lane (see Figure 11).

The channelizing line **shall be** 8 inches in width.

Crossroads

An interchange crossroad connects the ramps of an interchange and may go over or under the major roadway. In either case, a two-direction no-passing zone **shall be marked** for the length of the crossroad between the ramps if the crossroad has centerline pavement markings. A no-passing zone **shall be installed** approaching the ramps and crossroad intersections (see Figure 12).



* If A/2 is longer than the length of the full width acceleration lane, the dotted line shall be extended to the end of the taper

Figure 11
Entrance Ramps

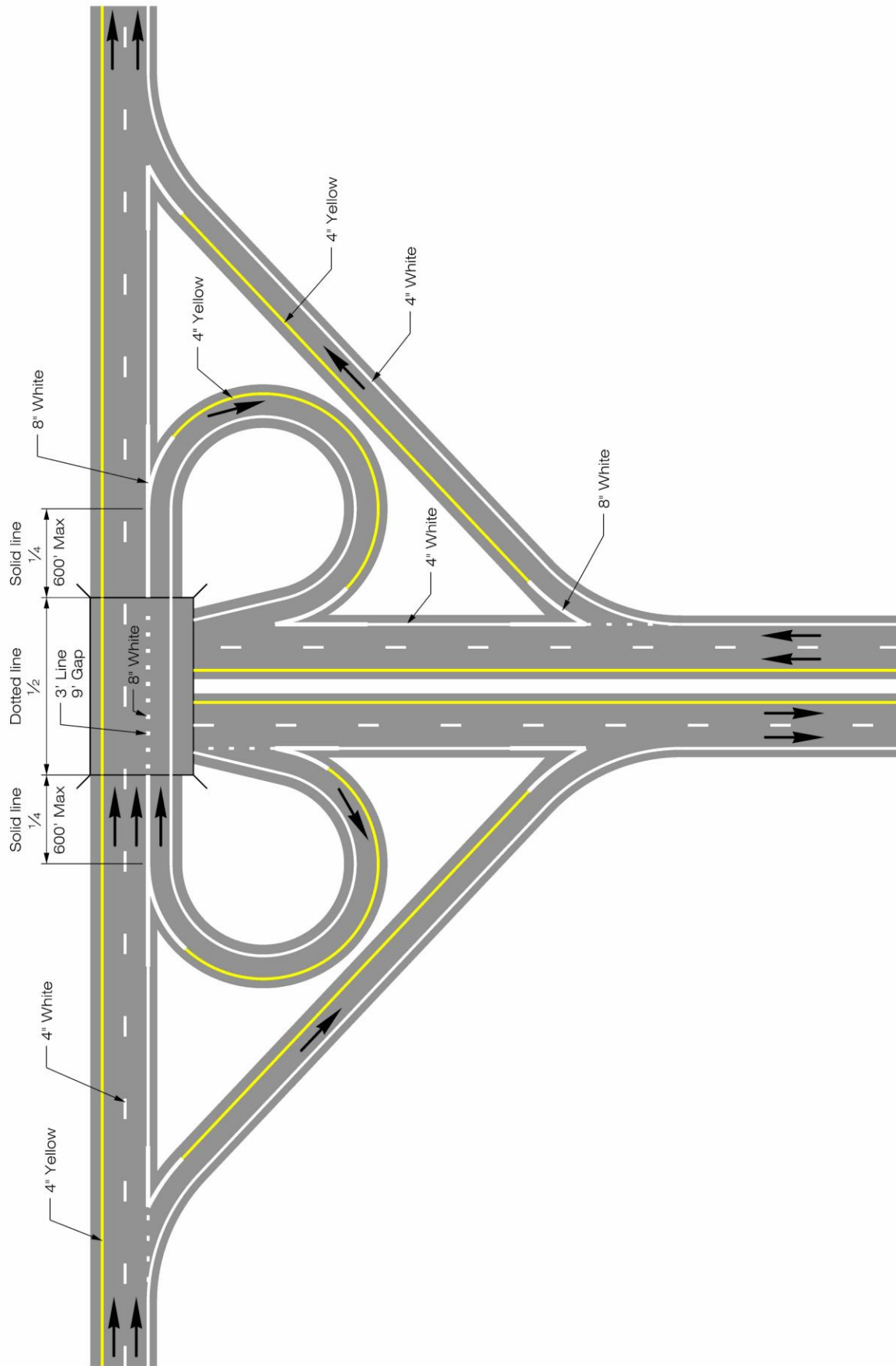


Figure 13
 Combination Parallel Accel-Decel Lane Markings

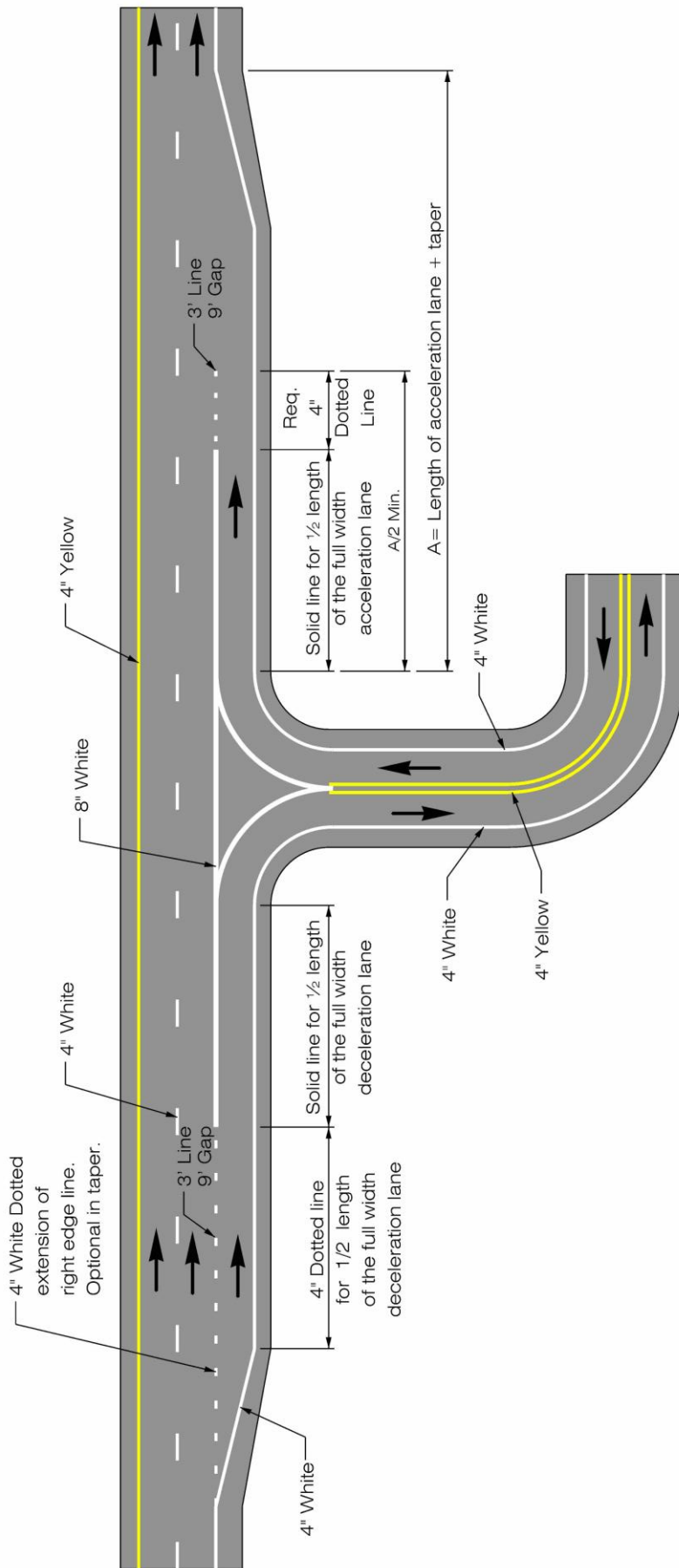


Figure 14
Jughandle Interchange Markings

TWO-WAY ROADWAY INTERSECTIONS

Pavement markings for two-way roadway intersections vary considerably due to the many different design elements incorporated in individual intersections. It is not practical to include all possible intersection designs in this manual. Therefore, a pavement marking plan should be provided to the crew foreman by the DTE for all major new intersections before marking begins. Typical major intersection pavement markings are shown in Figure 15.

STOP LINES

If used, stop lines **shall consist of** solid white lines 24 inches in width. They may be used where needed to indicate the point behind which vehicles are required to stop in compliance with a STOP sign, traffic control signal, or other traffic control device. The placement of stop lines at vehicle actuated traffic signals is very critical to ensure the vehicle stops at the proper location to actuate the signal.

If used, stop lines should be placed a minimum of 4 feet and a maximum of 30 feet in advance of and parallel to the nearest crosswalk line. If no crosswalk exists, the stop line should be placed at the desired stopping point, but should be placed no more than 30 feet nor less than 4 feet from the nearest edge of the intersecting traveled way. Stop lines should be placed to allow sufficient sight distance for all approaches to an intersection.

YIELD LINES

If used, yield lines **shall consist of** a row of isosceles triangles pointing toward approaching vehicles extending across approach lanes to indicate the point at which the yield is intended or required to be made. They may be used where vehicles are required to yield in compliance to a YIELD sign.

The individual triangles comprising the yield line should have a base of 12 to 24 inches wide and a height equal to 1.5 times the base. The space between the triangles should be 3 to 12 inches (see Figure 16).

If used, yield lines should be placed a minimum of 4 feet and a maximum of 30 feet in advance of and parallel to the nearest crosswalk line.

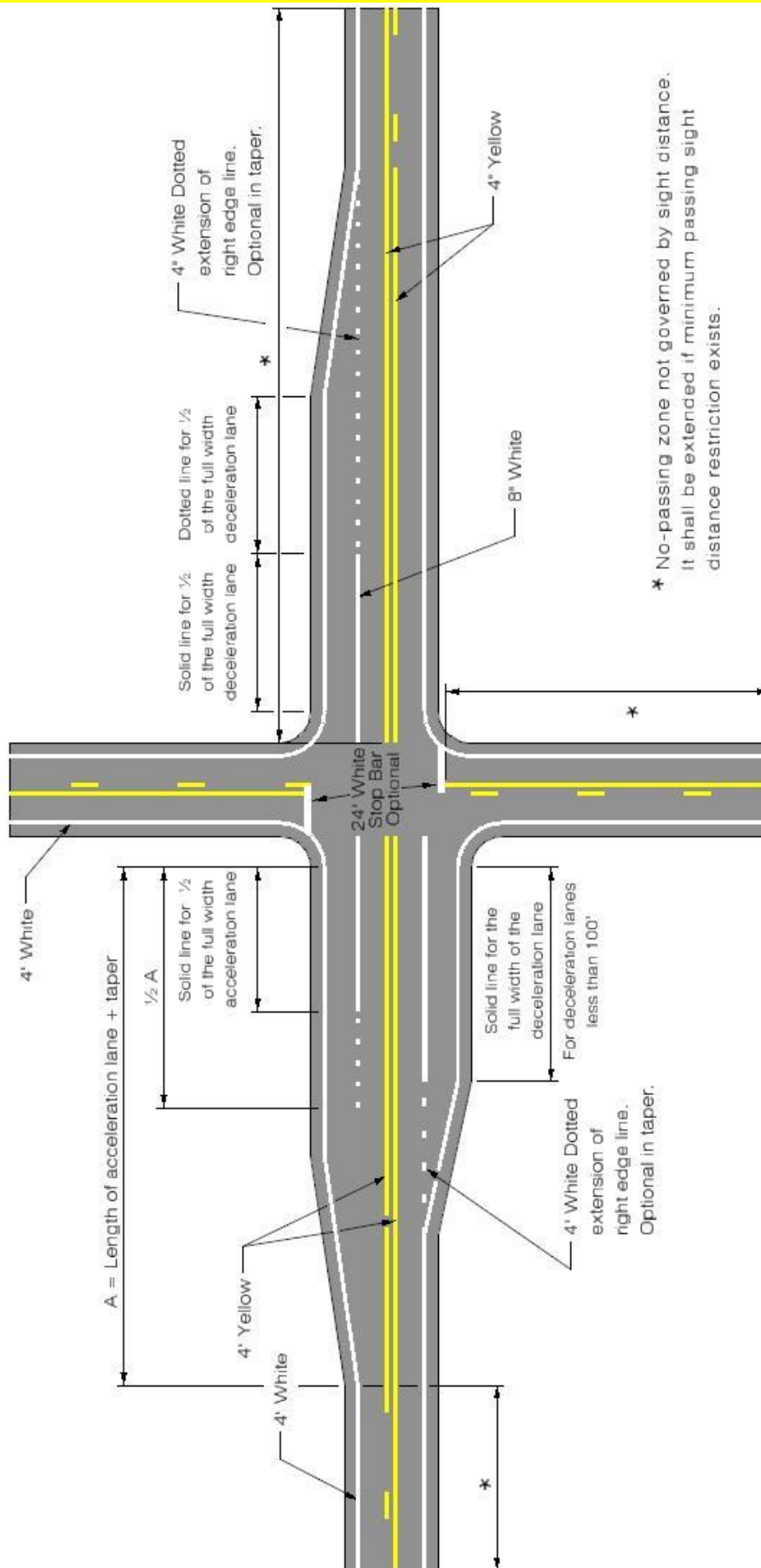
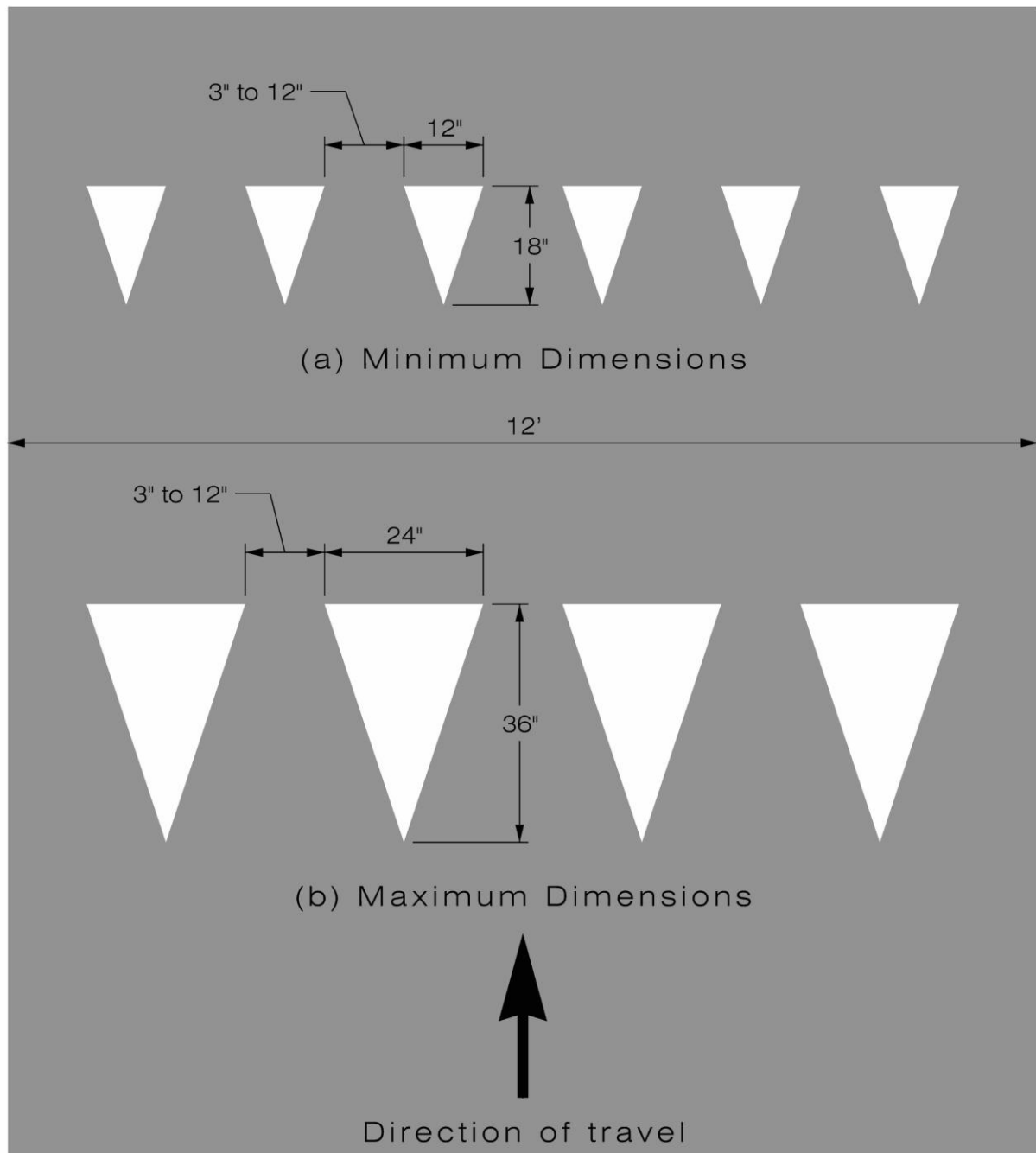


Figure 15
 Typical Two-Way Roadway Intersection Markings
 (sheet 2 of 2)



Notes:

Triangle length is equal to 1.5 times the base dimension.

Yield lines may be smaller than suggested when installed on much narrower, slow-speed facilities such as shared-use paths

Figure 16
Yield Line Markings

CROSSWALK MARKINGS

General

Crosswalk markings provide guidance for pedestrians who are crossing roadways by defining and delineating paths appropriate to and within intersections and other designated locations.

They also serve to alert the motorist of a designated pedestrian crossing point.

Crosswalks should be used at intersections where there is a substantial conflict between vehicle and pedestrian movements or where the pedestrian path may be confusing to the pedestrian.

They should also be used at other appropriate points of pedestrian concentration, such as at mid-block pedestrian crossings where pedestrians may not recognize the proper place to cross and the motorist does not normally expect a pedestrian crossing

Crosswalk lines should not be used indiscriminately. An engineering study should be required before they are used at locations other than at an intersection not controlled by a traffic signal or STOP sign or YIELD sign. Crosswalk markings **shall be used** at all designated school crossings.

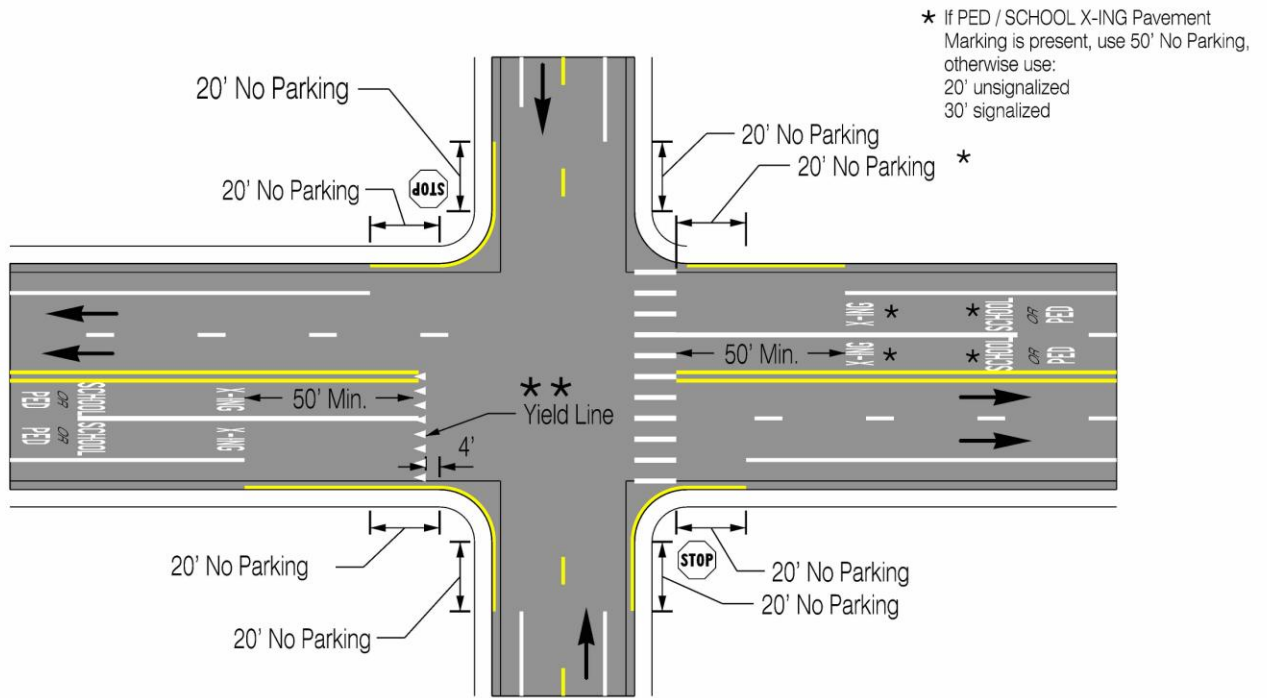
Crosswalks should extend across the full width of pavement to discourage diagonal walking between crosswalks.

Marked crosswalks should not be less than 6 feet in width. Typical pedestrian and school crosswalks are shown in Figure 17).

Longitudinal Line Crosswalk

A longitudinal line crosswalk **shall consist of** solid white longitudinal lines placed parallel to the roadway curb or shoulder line. They should be 12 to 24 inches wide and 12 feet in length. The spacing design should avoid the vehicle wheel path to reduce the crosswalk line marking wear.

The standard width of the crosswalk line is 18 inches and the spacing is normally 6 feet center-to-center of the longitudinal lines (see Figure 17).

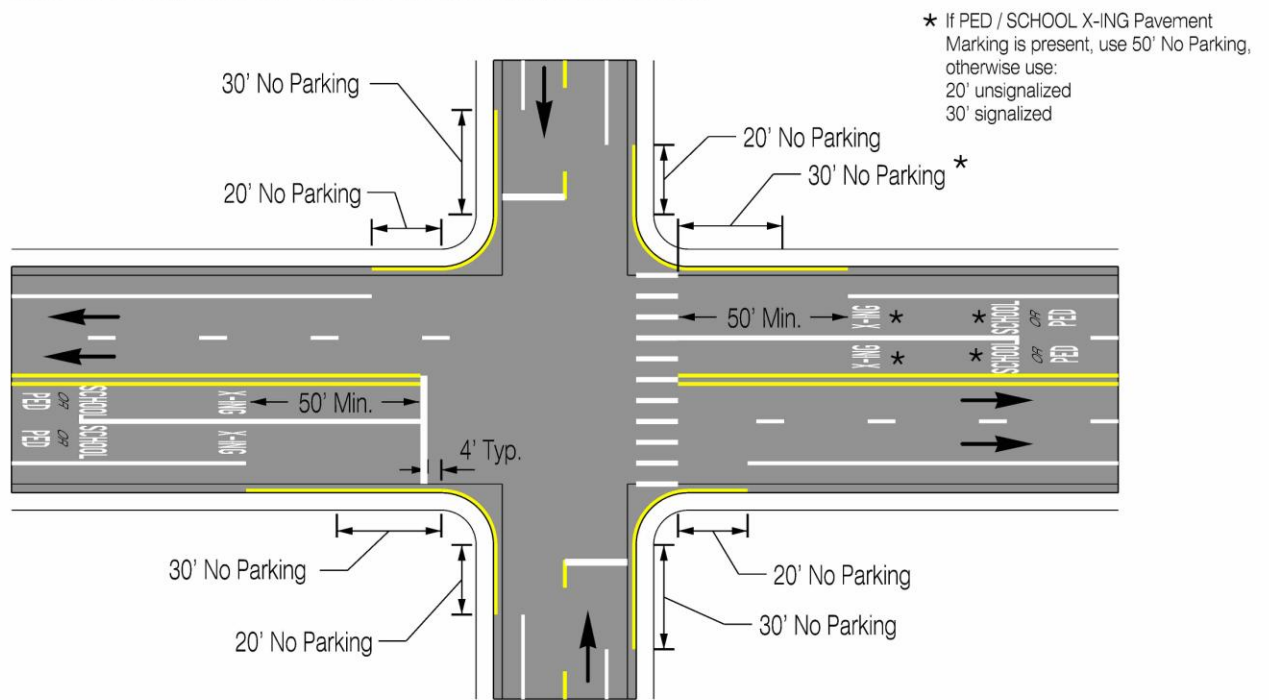


UNSIGNALIZED INTERSECTION

★ ★

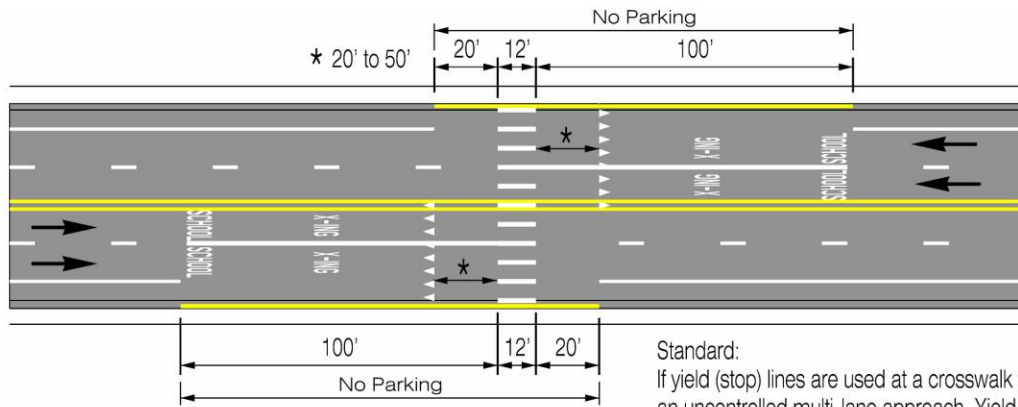
Standard:

If yield (stop) lines are used at a crosswalk that crosses an uncontrolled multi-lane approach, Yield Here To (Stop Here For) Pedestrians (R1-5 series) signs shall be used.



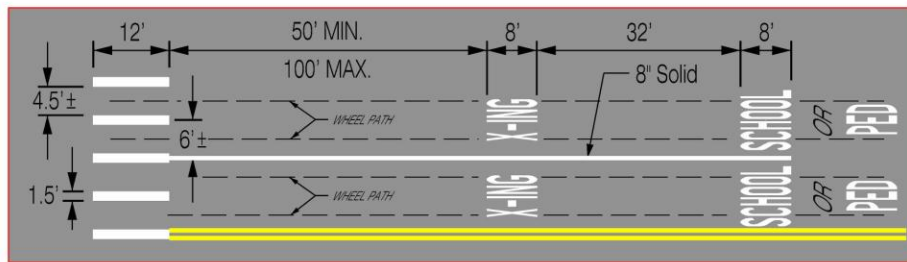
SIGNALIZED INTERSECTION

Figure 17
 Typical Four-Lane Undivided Roadway
 Pedestrian and School Crosswalk Markings
 (sheet 2 of 3)

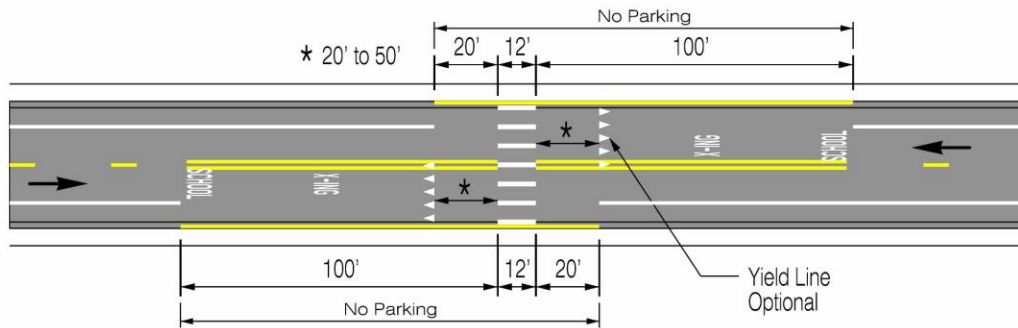


FOUR-LANE

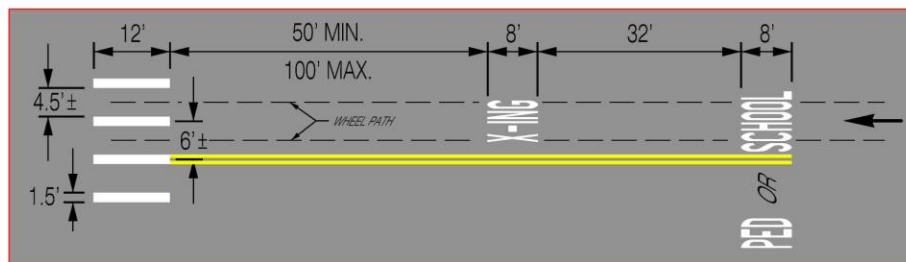
Standard:
 If yield (stop) lines are used at a crosswalk that crosses an uncontrolled multi-lane approach, Yield Here To (Stop Here For) Pedestrians (R1-5 series) signs shall be used.



PAVEMENT MARKING SPACING



TWO-LANE



PAVEMENT MARKING SPACING

Figure 17
 Typical Mid Block
 Pedestrian and School Crosswalk Markings
 (sheet 3 of 3)

PARKING SPACES

Marking of parking space boundaries encourages more orderly and efficient use of parking areas. Parking space markings tend to prevent parking encroachment into restricted areas such as loading zones, fire hydrant zones, and approaches to intersection.

Parking space markings **shall be** white solid 4 inch lines. Parking spaces reserved for handicapped parking may be marked with the handicapped pavement marking symbol shown in Appendix A.

CURB MARKINGS

Parking Restrictions

Since curb markings of yellow and white are used for delineation and visibility of raised islands, it is advisable to establish parking restrictions through the installation of standard parking restriction signs.

Parking restriction signs **shall be used** with curb markings in those areas where curb markings are frequently obliterated by snow or ice accumulation, unless the no parking zone is controlled by statute or local ordinance.

Parking restrictions marking on the curb should be yellow and need not be retroreflective.

Typical curb parking restriction markings at intersections should be placed as follows and as shown in Figure 18.

- If a marked crosswalk exists, the parking restriction should begin a minimum of 20 feet in advance of the near crosswalk line at an unsignalized intersection and 30 feet in advance at a signalized intersection.
- If no marked crosswalk exists, the parking restriction should begin a minimum of 20 feet in advance of the abutting sidewalk extension at an unsignalized intersection, and 30 feet in advance at a signalized intersection.

- If no marked crosswalk or sidewalk exists, the parking restriction should begin a minimum of 20 feet in advance of the intersection curb radius at an unsignalized intersection, and 30 feet in advance of the curb radius at a signalized intersection.

Curb parking restrictions **shall be placed** at all signalized intersections, at all signed and marked mid-block pedestrian crosswalks, and at all signed and marked school crossings.

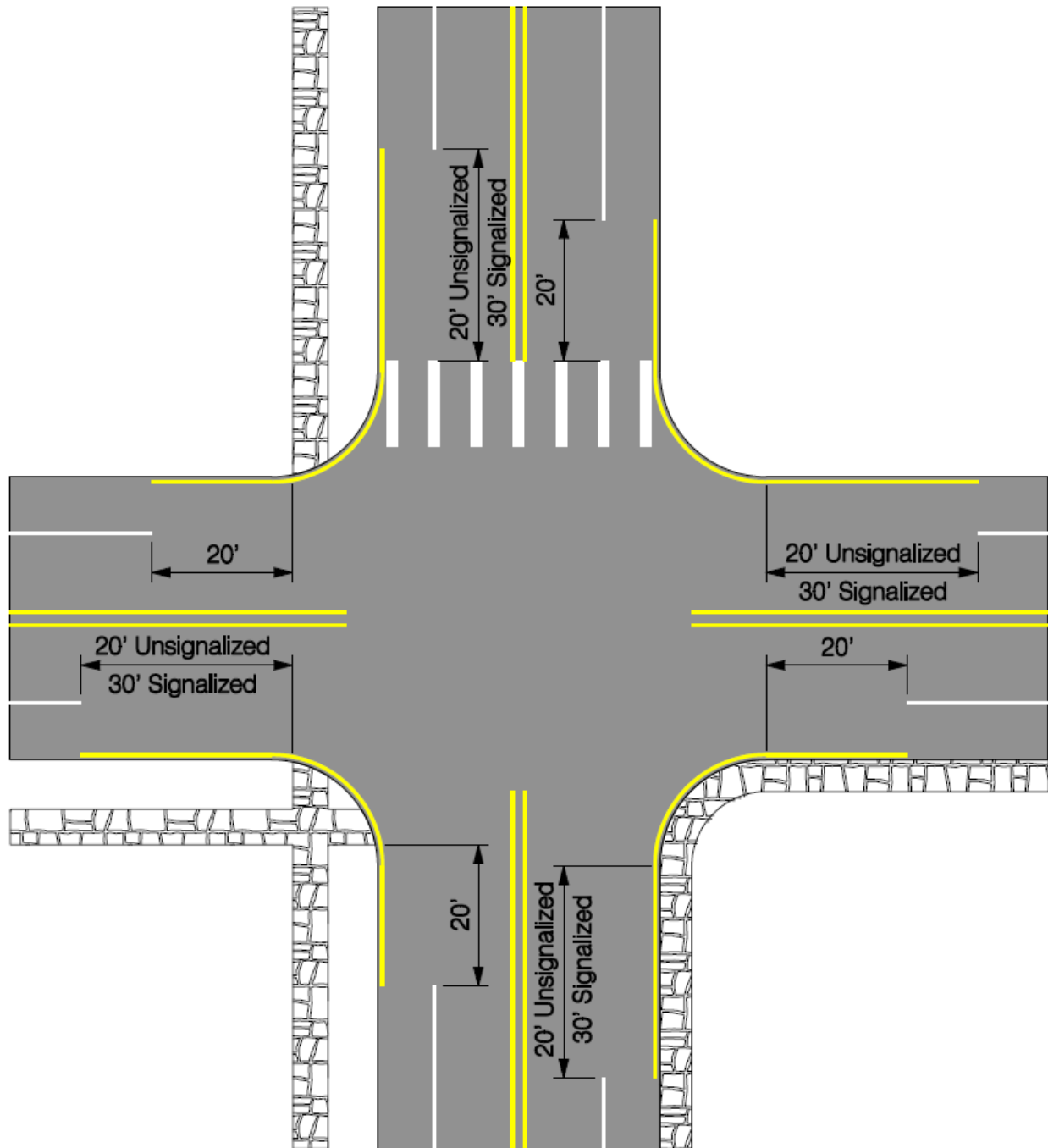


Figure 18
 Typical Curbmarking Restrictions

Island Curb Delineation

Island curb markings are used to delineate the physical island and the curb color should be determined by the direction or directions of travel they separate.

Normally the island is outlined by adjacent edge line pavement markings which are retroreflective. Therefore the curb, if marked, need not be retroreflective. If no edge lines exist but adequate roadway lighting exists, the curb markings do not need to be retroreflective.

On long islands, curb marking may be discontinued after becoming parallel to the adjacent travel lane such that it does not extend for the entire length of the island, especially if the island has roadway lighting or is marked with delineators.

WORD AND SYMBOL MARKINGS

Word and symbol pavement markings are used to guide, warn, and regulate traffic. They should have no more than three lines of message, and **shall be white** except for the optional handicapped symbol background. They **shall conform** to the design details in the pavement markings chapter of the “Standard Highway Signs and Markings” book. See Appendix A for design details. Letters and numerals **shall be** 8 feet in height.

Lane-use, lane-reduction, and wrong-way pavement marking arrows **shall be** designed as shown in Figure 19.

If a pavement marking word message consists of more than one line of information, it should read in the direction of travel (the first word of the message should be nearest to the road user).

The longitudinal space between word and symbol message markings, including arrow markings should be at least four times the height of the characters for low-speed roads, but not more than ten times the height of the characters.

When through traffic lanes approaching an intersection become mandatory turn lanes, lane-use arrow markings **shall be used** and accompanied by standard signs. The pavement marking word ONLY may be used to supplement the arrow marking (see Figure 20). The pavement markings

and signs should be repeated as necessary to prevent entrapment and to help the road user select the appropriate lane in advance of reaching a queue of waiting vehicles.

The word STOP **shall not be used** on the pavement unless accompanied by a stop line and STOP sign, and all vehicles are required to stop at all times.

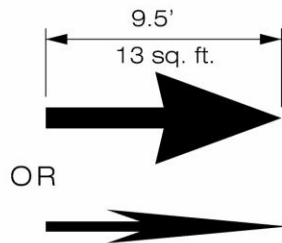
The yield-ahead triangle symbol or YIELD AHEAD word pavement marking **shall not be used** unless a YIELD sign is in place at the intersection.

Pavement word and symbol markings should not be more than one lane in width except for the SCHOOL word marking.

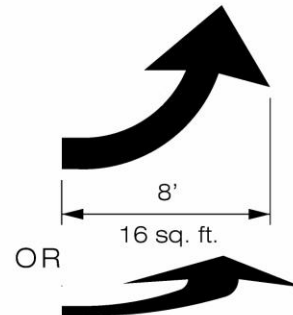
BICYCLE PAVEMENT MARKINGS

Placing and maintaining bicycle related pavement markings are the responsibility of the local jurisdiction. No special pavement markings are required for a bike route. Bicycle lane or route designation on state highways requested by local jurisdictions, **shall be reviewed** and approved by the DTE. Pavement markings and signing for bicycle lanes or routes **shall meet** the standards of the latest edition of the MUTCD.

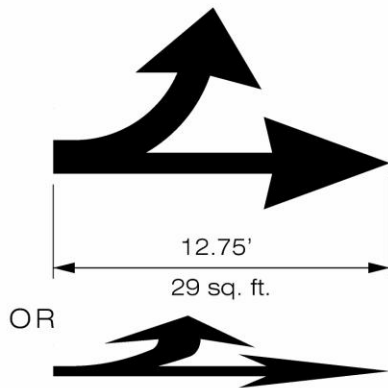
a. Through Lane-Use Arrow



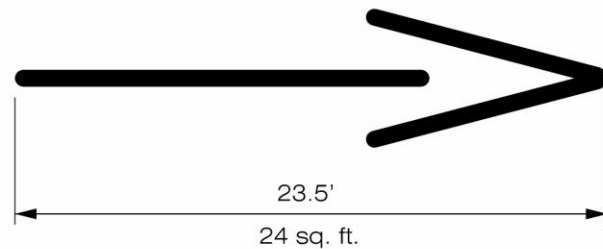
b. Turn Lane-Use Arrow



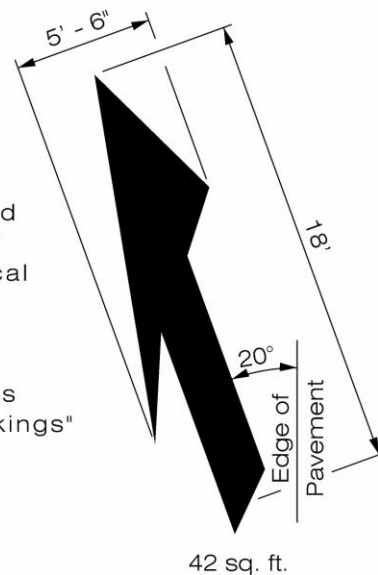
c. Turn and Through Lane-Use Arrow



d. Wrong-Way Arrow



e. Lane-Reduction Arrow



Notes:

1. Typical sizes for normal installation; sizes may be reduced approximately one-third for low-speed urban conditions; larger sizes may be needed for freeways, above average speeds, and other critical locations.
2. The narrow elongated arrow designs shown in Drawings A, B, and C are optional.
3. For proper proportion, see the Pavement Markings chapter of the "Standard Highway Signs and Markings" book (see Section 1A.11).

Figure 19
Typical Lane - Use, Lane - Reduction, and Warning Arrows

- * Optional
- If used, minimum of two arrows to be installed
- ** Mandatory if trap lane condition exists
- *** Recommended if trap lane condition exists
- 1 Supplement with signs

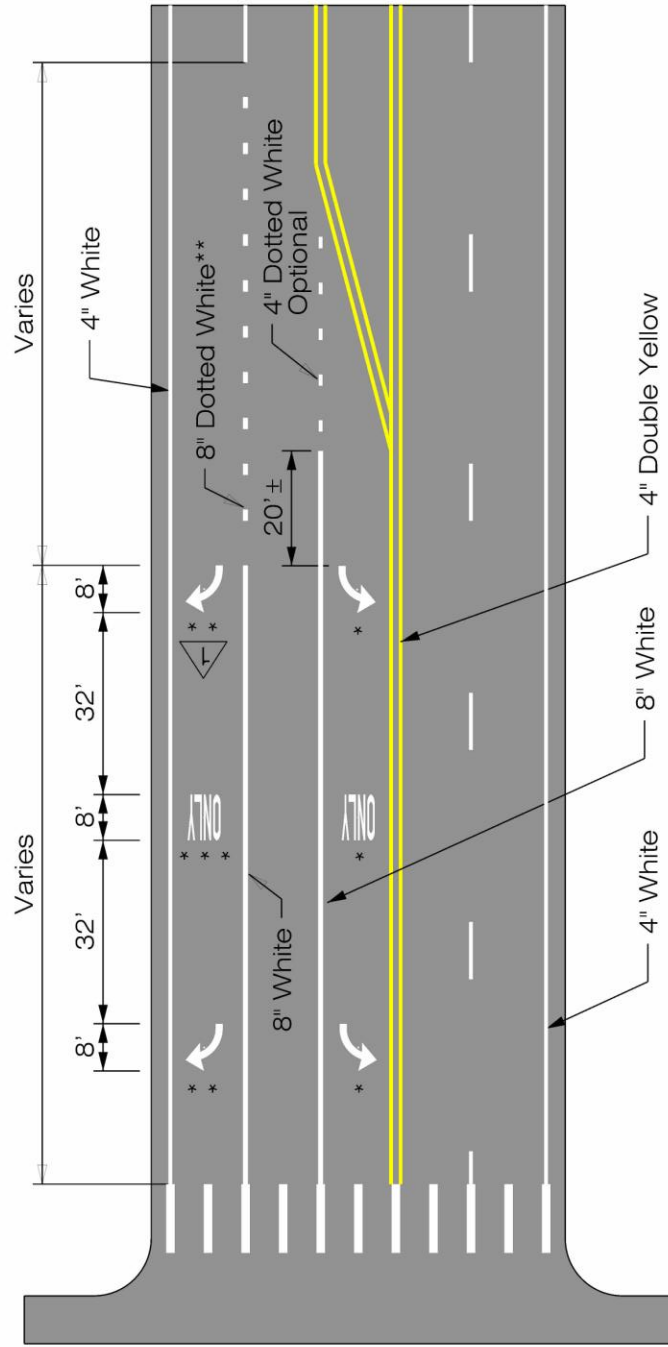


Figure 20
Typical Word & Symbol Markings

RAILROAD CROSSING MARKINGS

Pavement markings in advance of highway-rail crossings **shall consist of** an X, the letters RR, a no-passing marking (two-way, two-lane highways), and certain transverse lines as shown in Figure 21.

All railroad crossing pavement markings **shall be** white and retroreflective.

Railroad crossing pavement markings **shall be placed** in each approach lane on all state highways where signals or automatic gates are located, and at all other highway-rail grade crossings where the posted speed limit is 40 mph or greater.

Pavement markings **shall not be required** at highway-rail crossings where there are no gates and the posted speed limit is less than 40 mph. Pavement markings **shall be required** at all highway-rail crossings with gates.

The stop line should be a transverse line at a right angle to the traveled way at a point where a vehicle is to stop, or as near to that point as possible. The stop line should be placed approximately 8 feet from the gate (if existing), but no closer than 15 feet from the nearest rail.

The no-passing zone length approaching a railroad crossing **shall be** as shown in Figure 21.

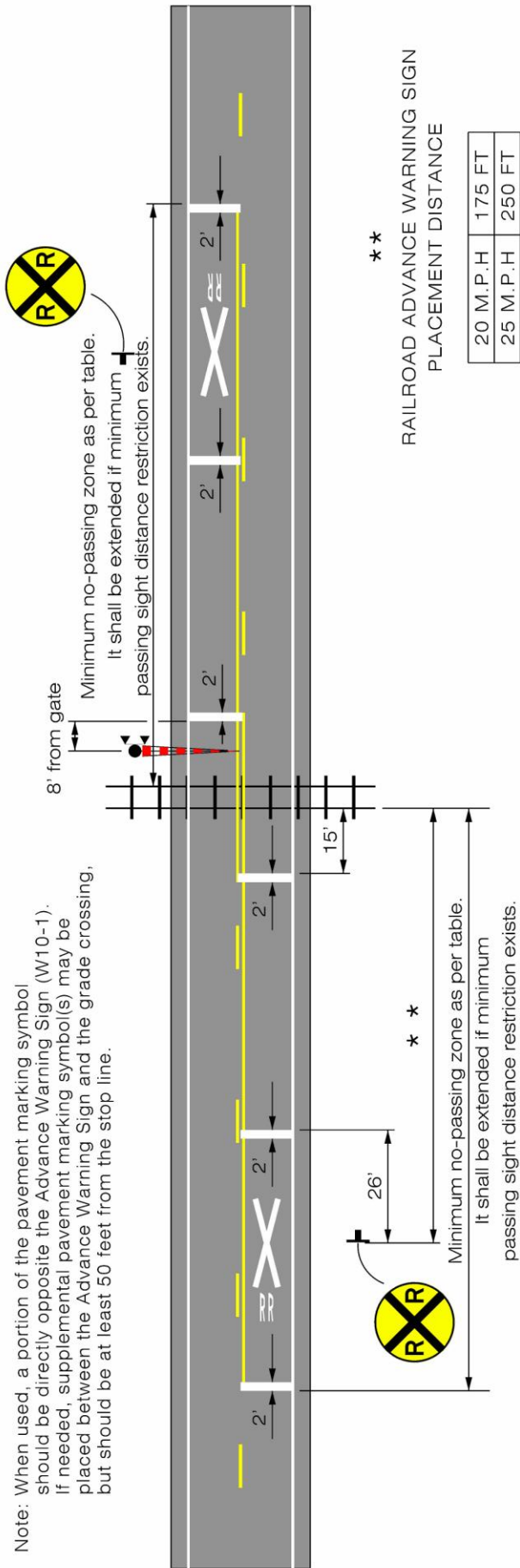
ROUNDABOUT INTERSECTION MARKINGS

Roundabout intersections are a distinctive circular type intersection that requires all entering vehicles to yield to vehicles within the intersection. Edge line extensions should not be placed across the exits from the circular roadway.

When crosswalk markings are used, they should be located a minimum of 25 feet upstream from the yield line, or if no yield line, from the YIELD sign location.

Typical pavement markings for a one-lane roundabout are shown in Figure 22.

Note: When used, a portion of the pavement marking symbol should be directly opposite the Advance Warning Sign (W10-1). If needed, supplemental pavement marking symbol(s) may be placed between the Advance Warning Sign and the grade crossing, but should be at least 50 feet from the stop line.



20 M.P.H.	175 FT
25 M.P.H.	250 FT
30 M.P.H.	325 FT
35 M.P.H.	400 FT
40 M.P.H.	475 FT
45 M.P.H.	550 FT
50 M.P.H.	625 FT
55 M.P.H.	700 FT
60 M.P.H.	775 FT
65 M.P.H.	850 FT

* * *

MINIMUM NO-PASSING ZONE
FOR RAILROAD CROSSINGS

20 M.P.H.	210 FT
25 M.P.H.	285 FT
30 M.P.H.	360 FT
35 M.P.H.	435 FT
40 M.P.H.	510 FT
45 M.P.H.	585 FT
50 M.P.H.	660 FT
55 M.P.H.	735 FT
60 M.P.H.	810 FT
65 M.P.H.	885 FT

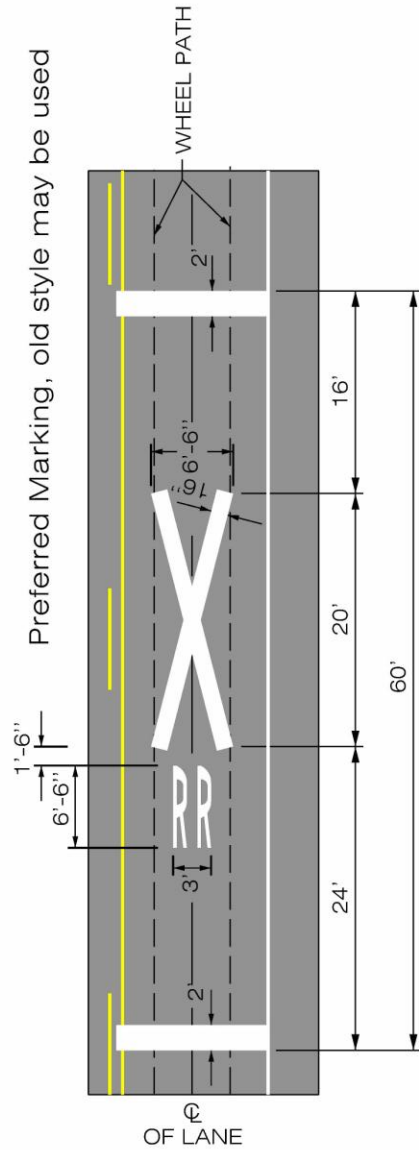


Figure 21
Railroad Crossing Markings

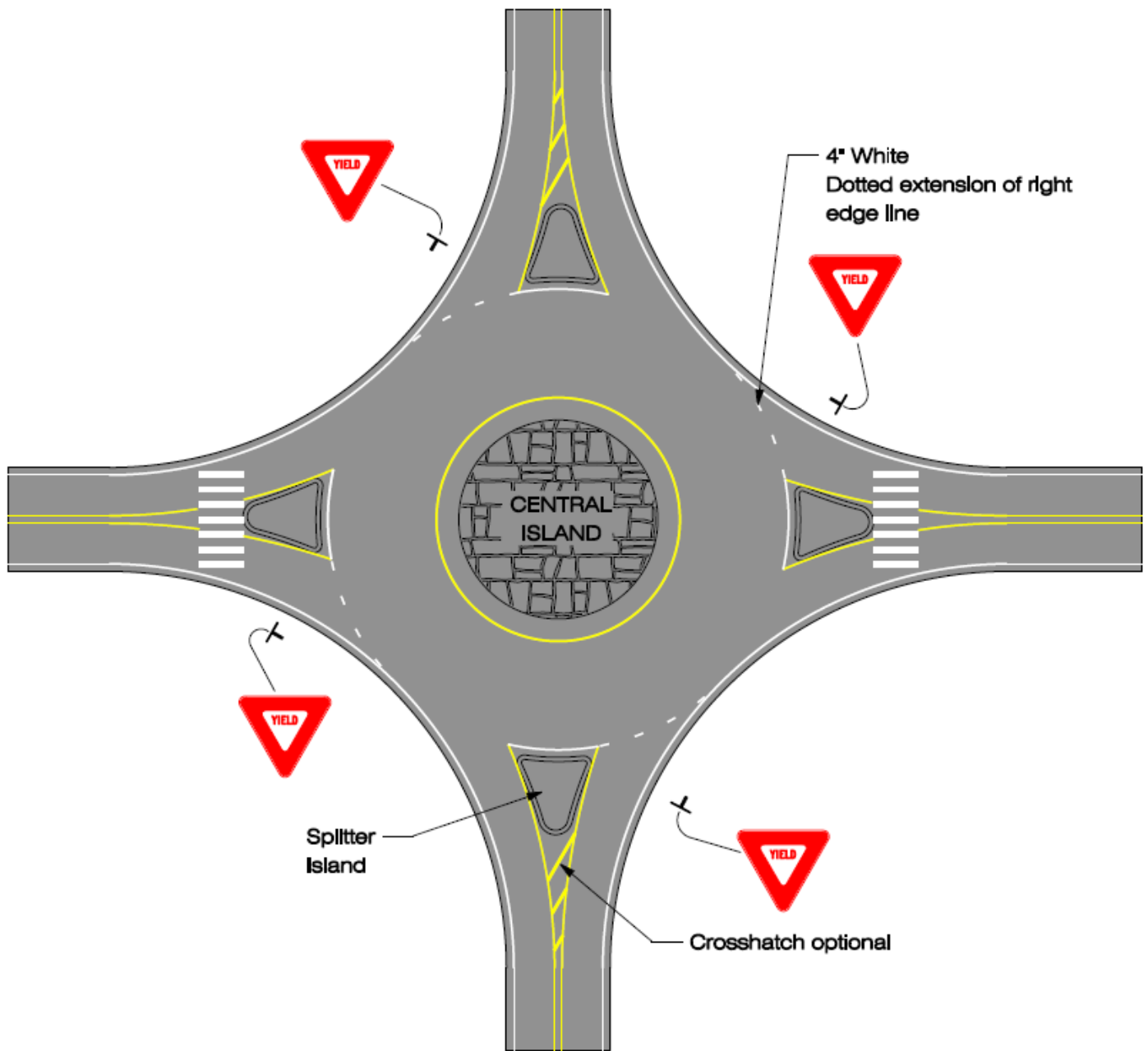


Figure 22
Roundabout Intersection Markings

Intentionally Left Blank

CHAPTER IV

SAFETY PRACTICES

PAVEMENT MARKING OPERATIONS

Loading Paint, Beads, and MEK

Paint and beads may be loaded inside a building, although it is preferred that they be loaded outside. MEK **shall not be transferred** from one container to another inside of a building. When transferring MEK from a drum, that drum **shall be grounded**: or if the drum is in a vehicle, that vehicle **shall be equipped** with a static strap. When using a portable container to transfer MEK, the portable container **shall be equipped** with a securely fastened wire that ends in an alligator clip. This wire **shall be clipped** to the tank or drum that is having MEK transferred to or from it.

Normal Roadway Striping

Generally, except for hearing protection, protective wear is not needed while painting longitudinal lines such as centerlines, lane lines, and edge lines. Hearing protection **shall be WYDOT approved** ear plugs or muffs. Headsets used for two-way communication also constitute hearing protection.

Hand Striping

When spraying paint with a handgun, a loose fitting respirator may be worn for protection from paint fumes and mist. If, in the crew foreman's opinion, the loose fitting respirator is warranted, it **shall be used**.

Other Marking Operations

Most preformed pavement markings may be applied without additional adhesives, sealers, or

primers. However, some manufacturers recommend the use of an additional material to be applied to the pavement or marking material. In all cases, these additional materials have safety precautions stated in the supplied instructions and MSDS for their intended use and handling. All information in the MSDS **shall be followed**.

Cone Placement and Pickup

When placing and picking up traffic cones, the employee performing the task **shall wear** a safety vest or approved substitute and work from a platform mounted securely to the vehicle. The driver of the vehicle **shall drive** at a speed and in a manner that is safe and comfortable for the employee on the platform. An employee **shall ride** on the platform only during the placing and picking up cone operation.

EQUIPMENT CLEANING

Paint Guns and Other Parts

Only approved solvents may be used to clean paint guns and parts. All solvents **shall be approved** by the DTE. Solvent disposal **shall have the approval** of the District Hazardous Materials Manager. Solvent **shall not be placed** in a WYDOT shop sump.

Striper Paint Tanks

Before cleaning the striper paint tanks, empty the tank, remove the tank lid, and let the tank set outdoors for at least 24 hours, or flush the tank and system with hot water and then fill the tank with hot water and let set overnight. Clean the tank outdoors preferably when there is a breeze. An electric fan set back from the fume area may be used if no breeze exists. Since the tank is a confined space, the atmosphere within the tank **shall be tested** to establish that it is safe to enter the tank. The District Hazardous Materials Manager should have an air monitoring device that should be worn on the employee's belt while inside the tank.

While cleaning the paint tank, proper protective wear **shall be used** at all times. Although the

probability of a worker being overcome by fumes is extremely remote, a worker should never clean the tank without a co-worker present. The co-worker should not be performing some other task that would unduly divert his/her attention from the worker inside the tank.

Exterior Cleaning of Equipment

Periodical and annual cleaning on the exterior surface of the striping equipment and vehicles is necessary. The cleaning **shall be done** by grinding, scraping, or hydro-blasting the surface. Proper safety apparel and tools **shall be used** for the cleaning.

Drums

During or after pumping the paint from the drum to the striper tank, the residue paint inside the drum should be scraped or brushed down to the bottom of the drum and poured or pumped out. Leave no more than ¼" of paint in the bottom of the drum.

Stencils

Stencils **shall not be left** to soak in solvents. They should be coated with grease or some other non-sticking, non-hazardous material and then scraped clean after use.

PLACARDS ON VEHICLES

If any WYDOT vehicle is carrying over 1000 pounds of the long pot life epoxy, placarding **shall be required** on the vehicle. Shipping papers for the epoxy **shall also be carried** in the vehicle.

PAINT AND MEK STORAGE

Indoors

WYDOT is classified as an industrial operation by the State OSHA which allows for the inside storage of pavement marking materials indoors with the following stipulations:

- The paint and MEK drums **shall be protected** by some type of physical barrier such as guardrail, or concrete barrier.
- The Fire Marshall and local city codes are the final authority and their requirements **shall not be violated**.
- A maximum of 660 gallons of MEK is allowed in a building at one time.
- If there are any questions concerning inside storage of any pavement marking, contact the DTE.

Outdoors

When storing paint or MEK outdoors, the following precautions apply to both full and empty drums:

- All drums **shall be stored** at least 10 feet away from any building, street, alley, or other public way.
- All drums **shall be stored** at least 20 feet from adjacent property that is occupied or can be built upon.
- All storage areas **shall be designed** so that any spills will be contained within WYDOT property.
- Dikes should be constructed around paint and MEK storage area.
- The storage area **shall be kept** free of weeds, tall grass, etc., to minimize fire hazards.
- Firefighting equipment **shall be able** to get within 200 feet of the most inaccessible stored paint or MEK drums.

TRAFFIC CONTROL FOR PAVEMENT MARKING OPERATIONS

The following message sets are recommended for striping operations using truck-mounted changeable message signs.

Table 6- Recommended Message sets for Striping Operations

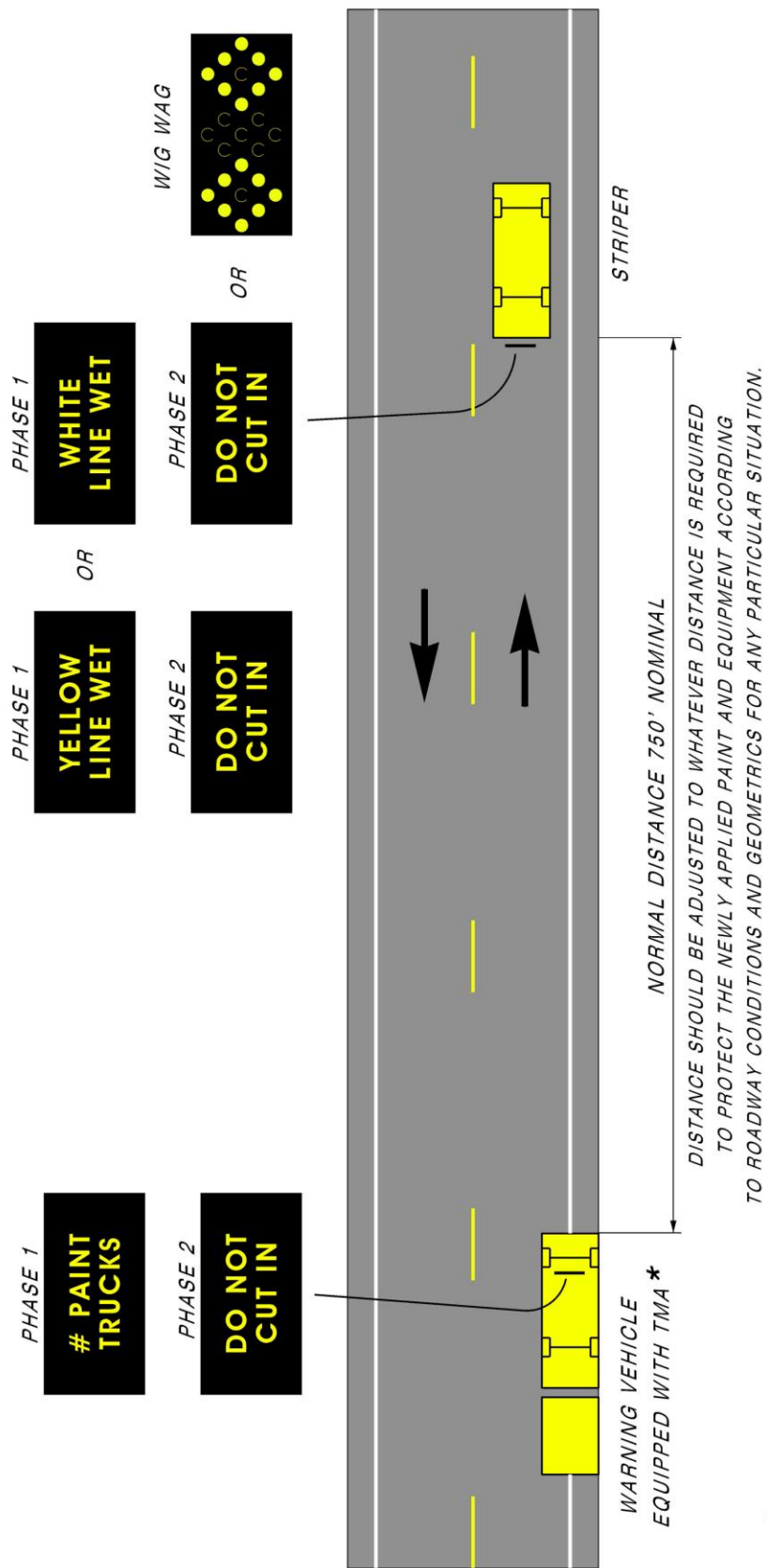
OPERATION	ROAD TYPE	PRIMARY CONCERN	PHASE 1	PHASE 2
STRIPING	2- LANE, 2- WAY	CONVOY RECOGNITION	# PAINT TRUCKS	DO NOT CUT IN
		CONVOY RECOGNITION & TRACKING PAINT	# PAINT TRUCKS	YELLOW[WHITE] LINE WET
		TRACKING PAINT	YELLOW[WHITE] LINE WET	DO NOT CUT IN
	MULTI- LANE	CONVOY RECOGNITION	# PAINT TRUCKS	DO NOT CUT IN
		CONVOY & PASSING MANEUVER	# PAINT TRUCKS	STAY IN LFT[RGT] LANE
		TRACKING PAINT	# PAINT TRUCKS	CNTRLINE[EDGELINE WET] WET

The appropriate number of trucks that are present in the convoy should be inserted where a # symbol is shown.

Figure 23 shows the traffic control which should be used during the most common longitudinal pavement marking operations. Deviations to the traffic control shown should only be used for the testing of new signs, additional signs, or vehicle positioning. All deviations **shall be approved** by the STE.

Rural longitudinal pavement marking operations **shall** be done with a warning vehicle equipped with a truck-mounted attenuator.

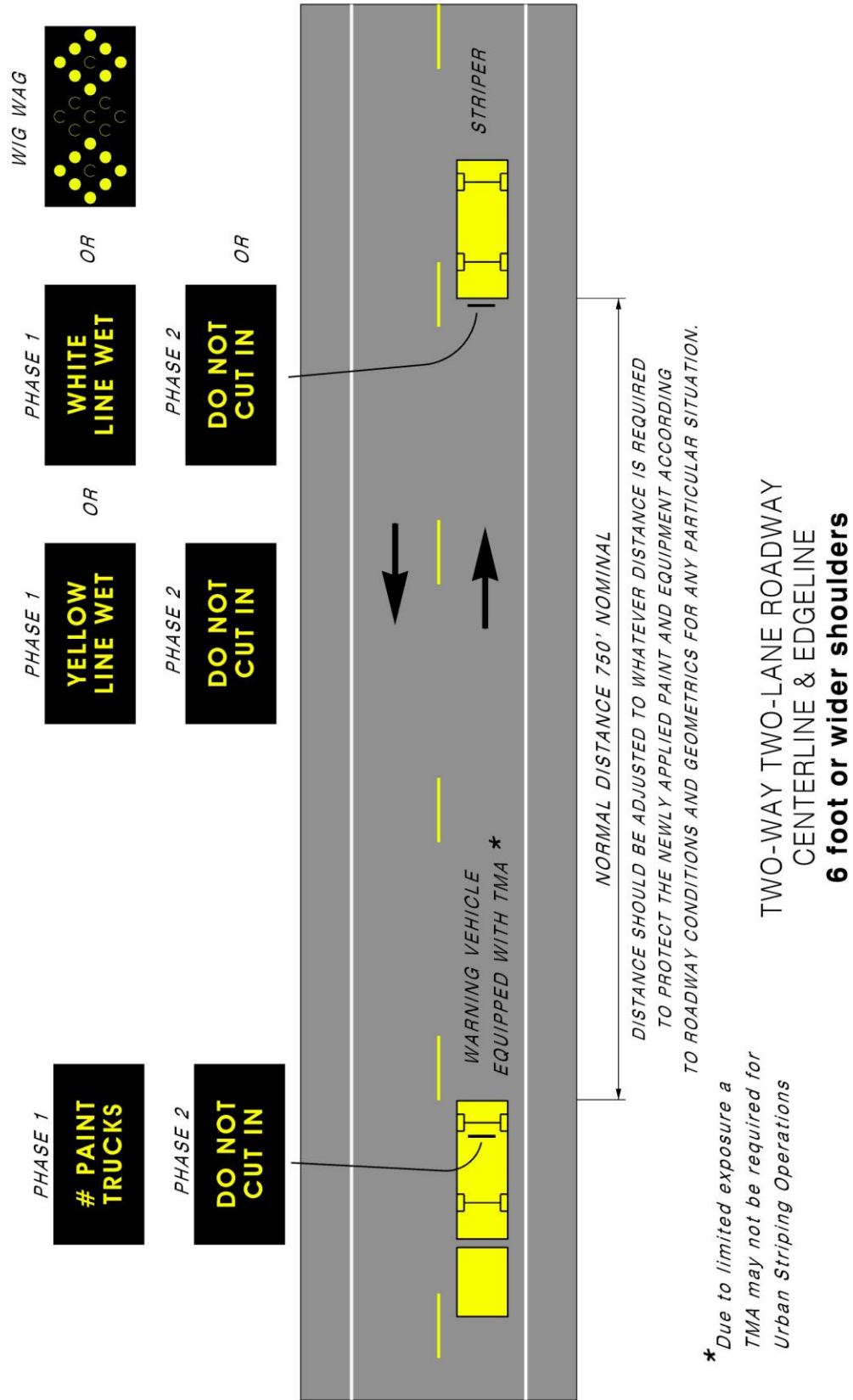
All rural and urban roadway pavement marking operations should not begin until proper traffic control is in place. The proper traffic control for a specific operation can be determined in this manual, the WYDOT "Traffic Control for Roadway Work Operations" manual, or the DTE.



* Due to limited exposure a TMA may not be required for Urban Striping Operations

TWO-WAY TWO-LANE ROADWAY CENTERLINE & EDGELINE Less than 6 foot shoulders

Figure 23
Traffic Control
(sheet 1 of 6)



* Due to limited exposure a TMA may not be required for Urban Striping Operations

TWO-WAY TWO-LANE ROADWAY CENTERLINE & EDGELINE 6 foot or wider shoulders

Figure 23
Traffic Control
(sheet 2 of 6)

PHASE 1
PAINT TRUCKS

PHASE 2
STAY IN RGT LANE

PHASE 1
CNTR LINE WET

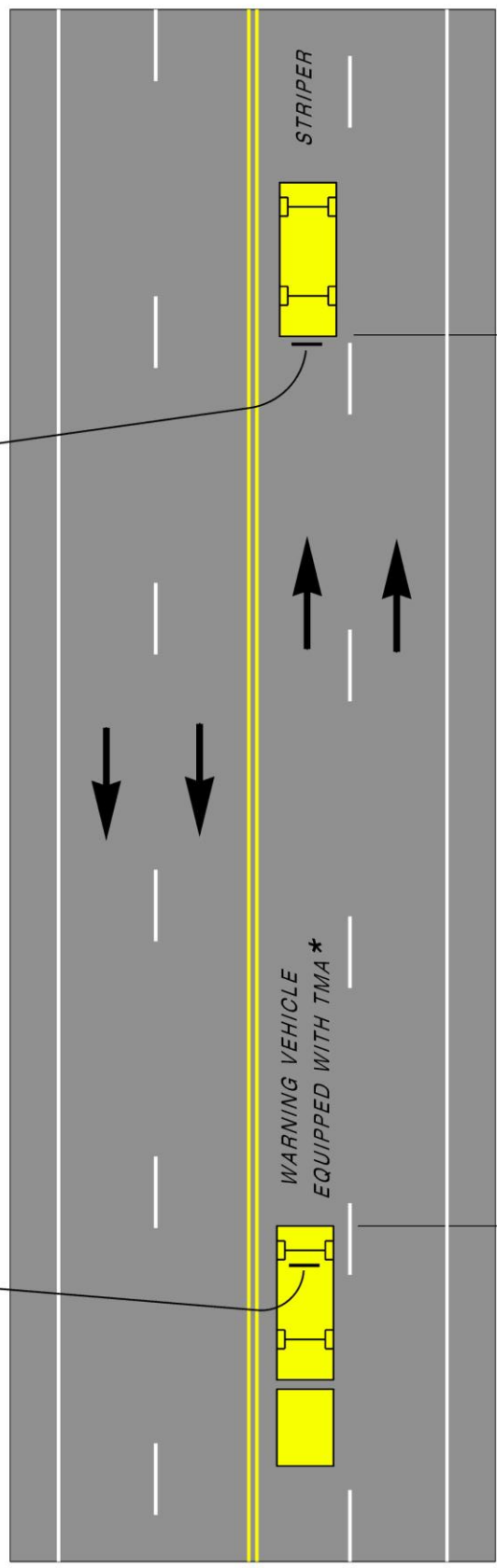
PHASE 2
STAY IN RGT LANE

PHASE 1
LANE LINE WET

PHASE 2
STAY IN RGT LANE

60" x 30"
PASS RIGHT

USE ONLY IF
VMS MALFUNCTIONS

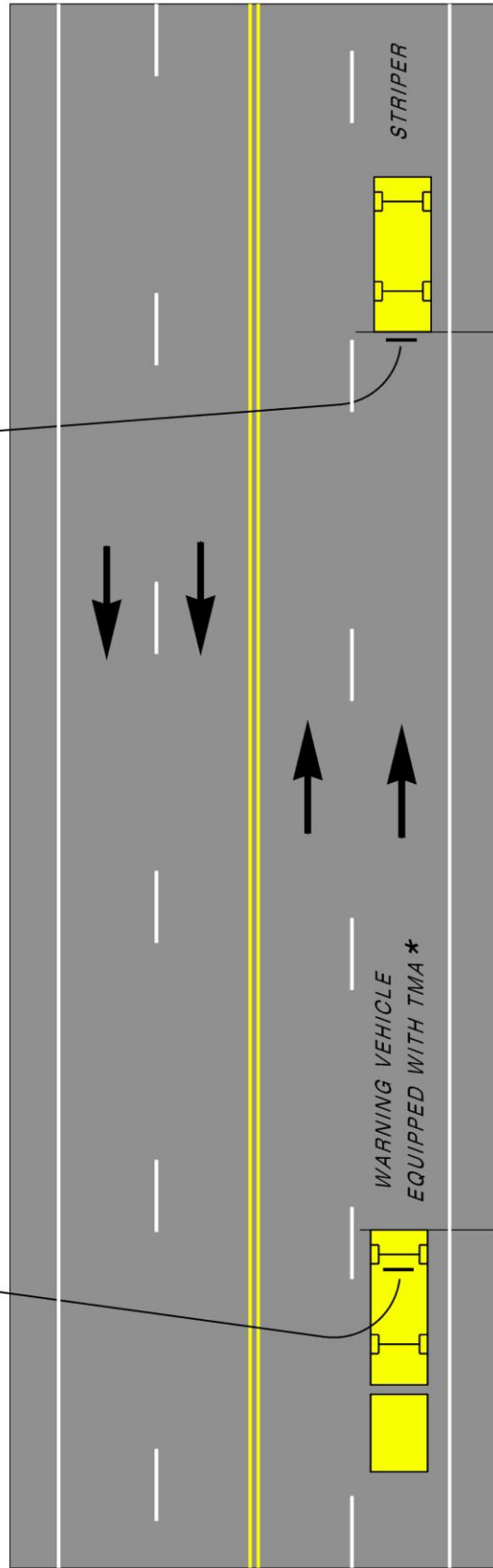


DISTANCE SHOULD BE ADJUSTED TO WHATEVER DISTANCE IS REQUIRED TO
PROTECT THE NEWLY APPLIED PAINT AND EQUIPMENT ACCORDING TO
ROADWAY CONDITIONS AND GEOMETRICS FOR ANY PARTICULAR SITUATION.

* Due to limited exposure a
TMA may not be required for
Urban Striping Operations

TWO-WAY FOUR-LANE UNDIVIDED ROADWAY
CENTERLINE & LANE LINE

Figure 23
Traffic Control
(sheet 3 of 6)



* Due to limited exposure a TMA may not be required for Urban Striping Operations

DISTANCE SHOULD BE ADJUSTED TO WHATEVER DISTANCE IS REQUIRED TO PROTECT THE NEWLY APPLIED PAINT AND EQUIPMENT ACCORDING TO ROADWAY CONDITIONS AND GEOMETRICS FOR ANY PARTICULAR SITUATION.

TWO-WAY FOUR-LANE UNDIVIDED ROADWAY
EDGE LINE

Figure 23
Traffic Control
(sheet 4 of 6)

PHASE 1
PAINT TRUCKS

PHASE 2
STAY IN RGT LANE

OR

PHASE 1
EDGE LINE WET

PHASE 2
STAY IN RGT LANE

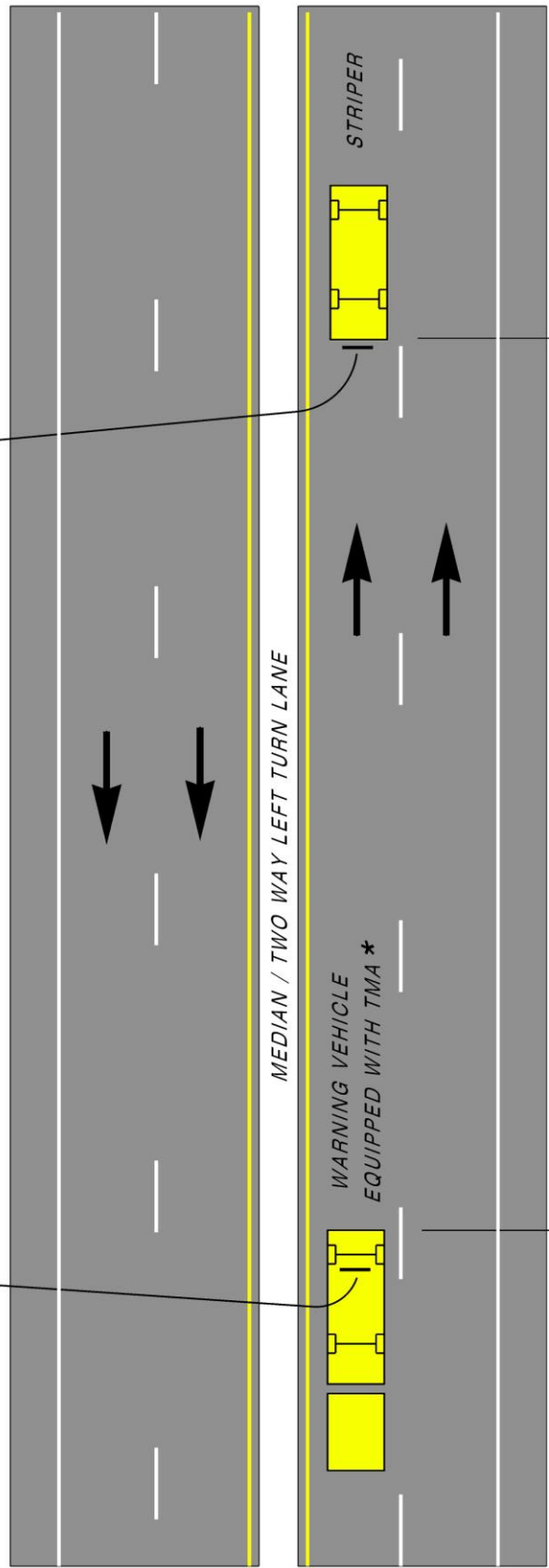
PHASE 1
LANE LINE WET

PHASE 2
STAY IN RGT LANE

60" x 30"

PASS RIGHT

USE ONLY IF
VMS MALFUNCTIONS



* Due to limited exposure a TMA may not be required for Urban Striping Operations

DISTANCE SHOULD BE ADJUSTED TO WHATEVER DISTANCE IS REQUIRED TO PROTECT THE NEWLY APPLIED PAINT AND EQUIPMENT ACCORDING TO ROADWAY CONDITIONS AND GEOMETRICS FOR ANY PARTICULAR SITUATION.

MULTI-LANE DIVIDED ROADWAY
LEFT EDGELINE & LANE LINE

Figure 23
Traffic Control
(sheet 5 of 6)

PHASE 1
PAINT TRUCKS

PHASE 2
STAY IN LFT LANE

OR

PHASE 1
LANE LINE WET

PHASE 2
STAY IN LFT LANE

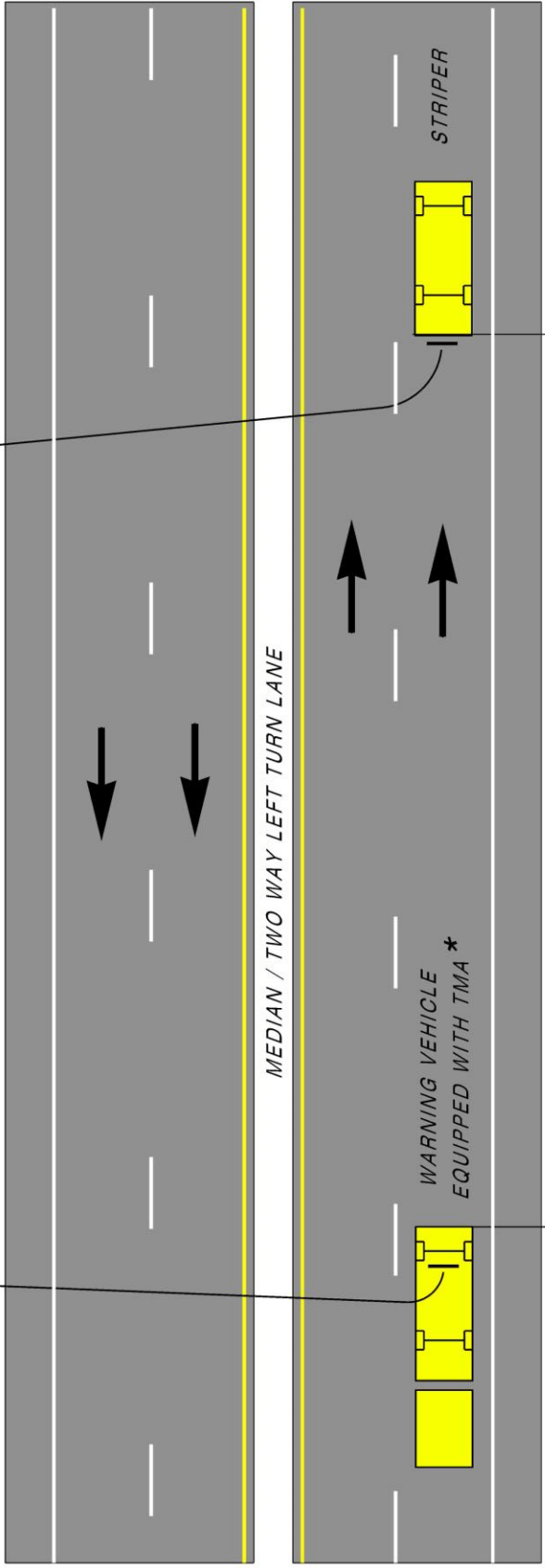
PHASE 1
EDGE LINE WET

PHASE 2
STAY IN LFT LANE

60" x 30"

PASS LEFT

USE ONLY IF
VMS MALFUNCTIONS



* Due to limited exposure a TMA may not be required for Urban Striping Operations

NORMAL DISTANCE 750' NOMINAL

DISTANCE SHOULD BE ADJUSTED TO WHATEVER DISTANCE IS REQUIRED TO PROTECT THE NEWLY APPLIED PAINT AND EQUIPMENT ACCORDING TO ROADWAY CONDITIONS AND GEOMETRICS FOR ANY PARTICULAR SITUATION.

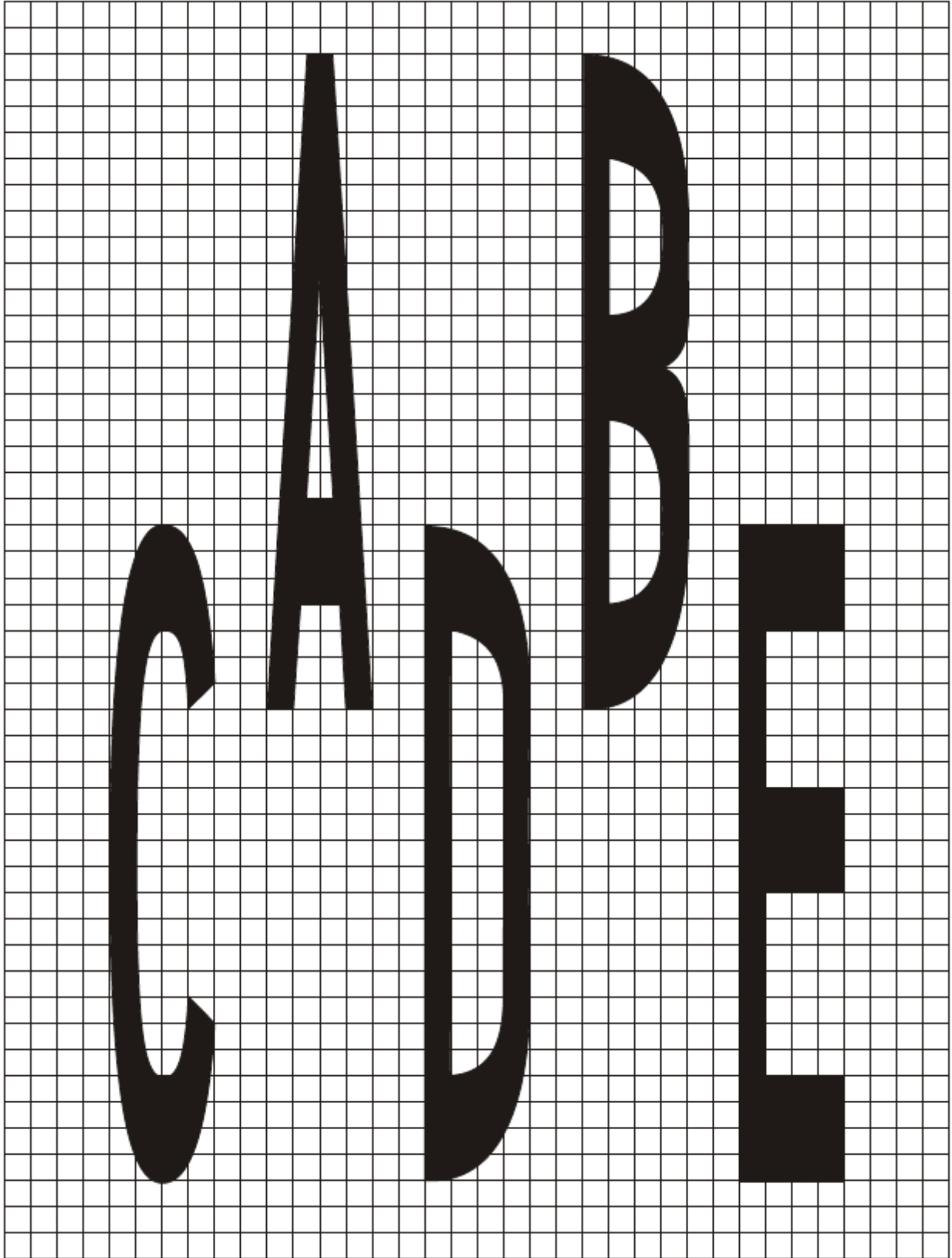
MULTI-LANE DIVIDED ROADWAY
RIGHT EDGE LINE

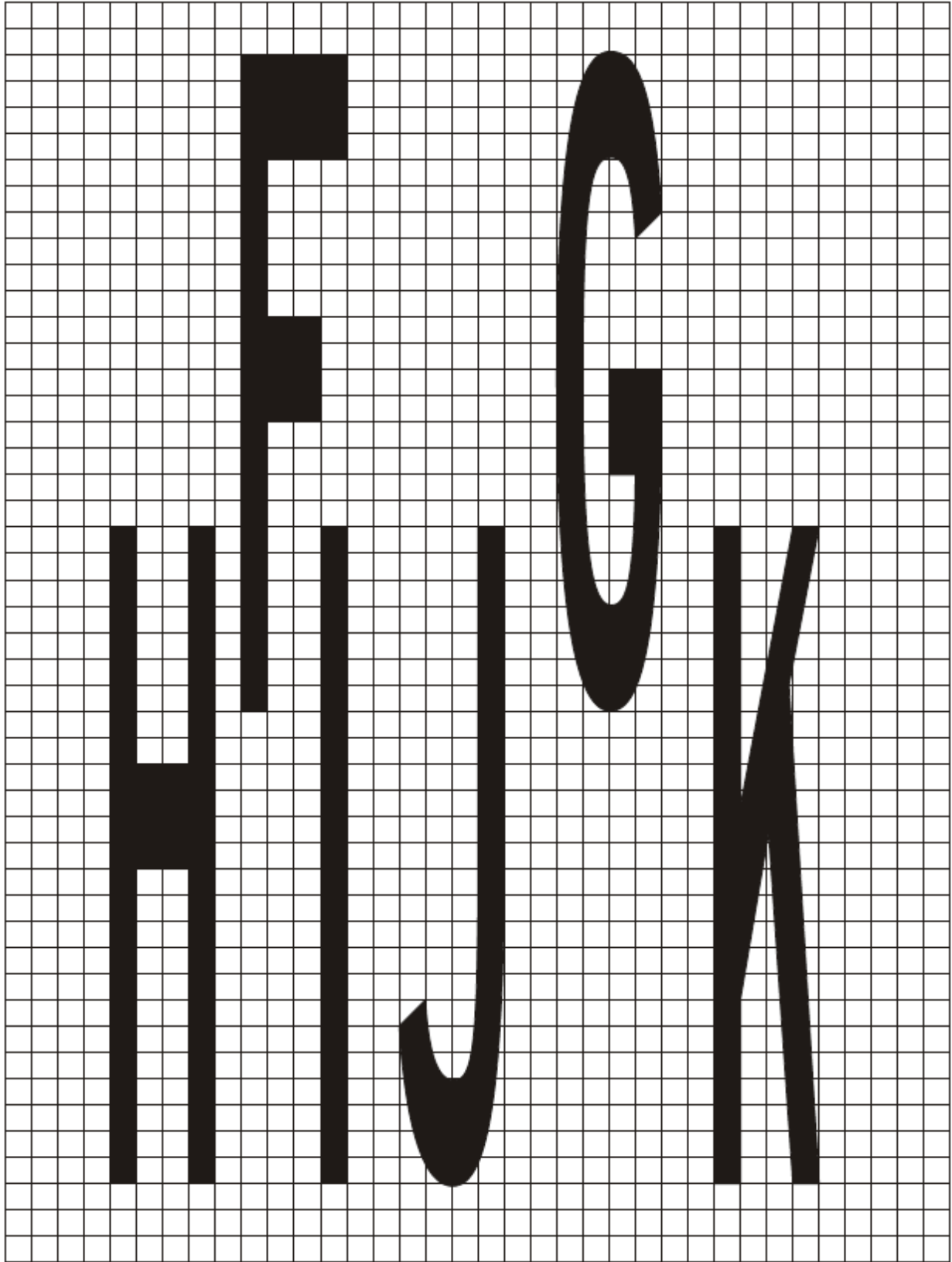
Figure 23
Traffic Control
(sheet 6 of 6)

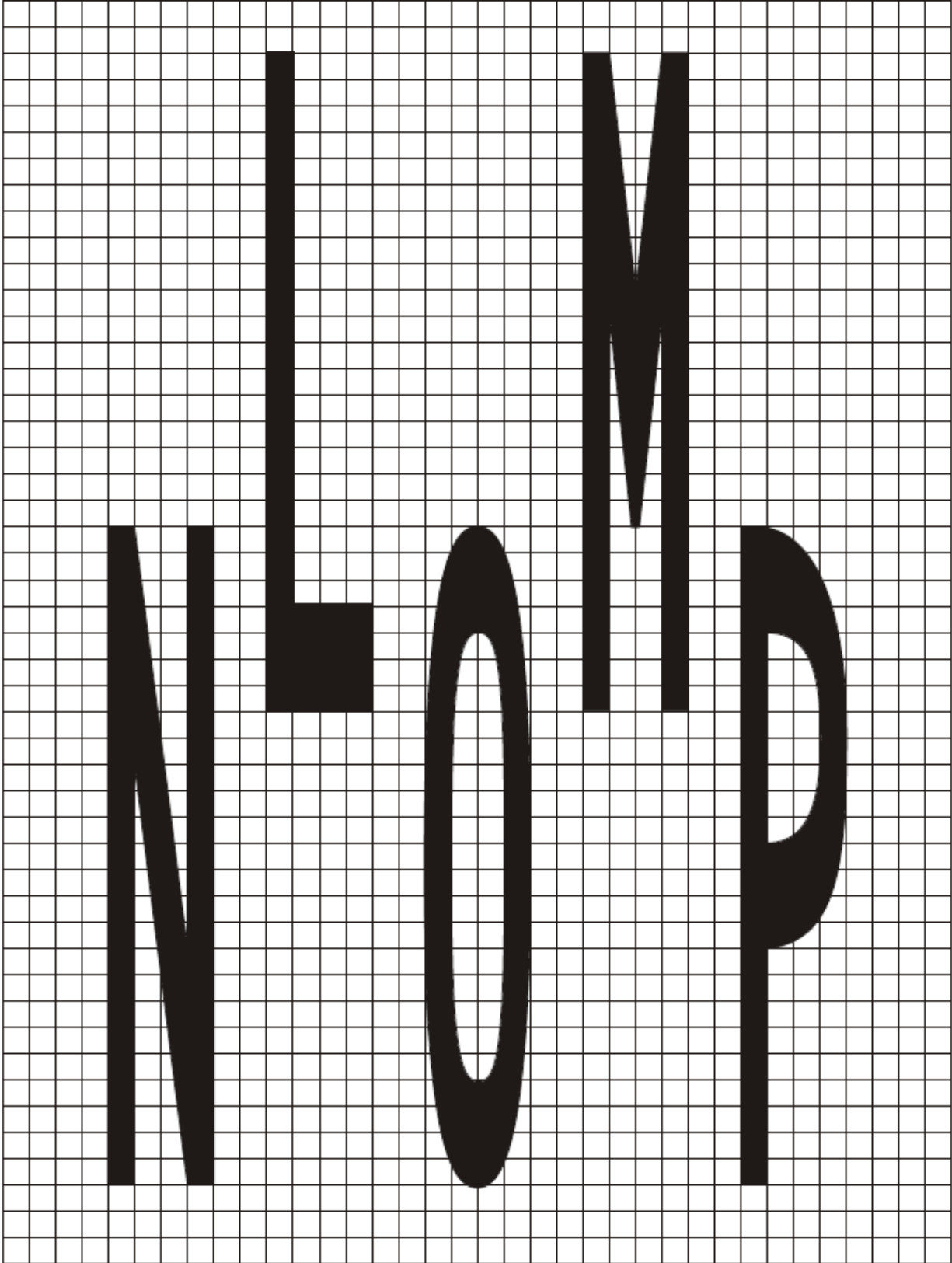
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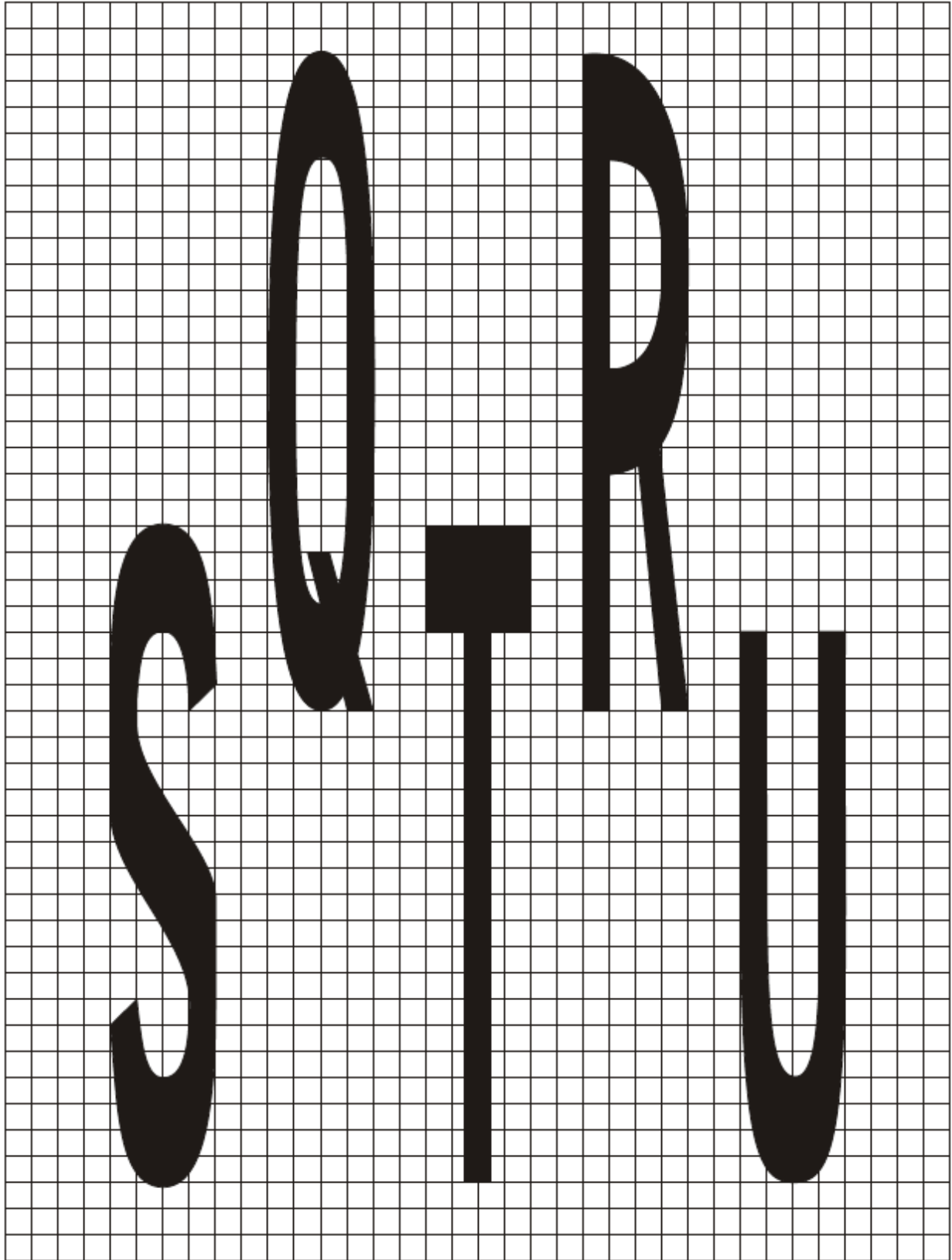
APPENDIX

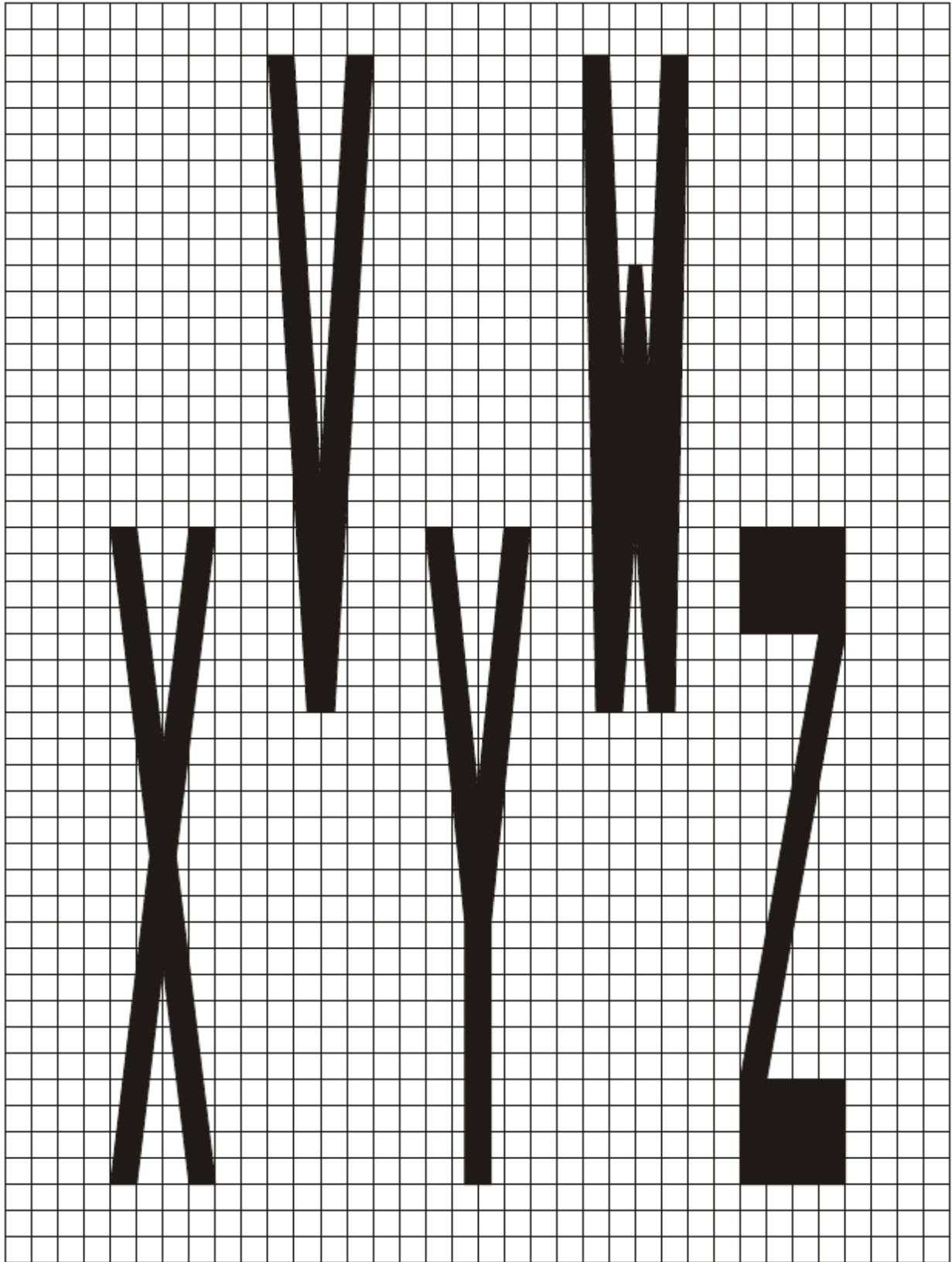
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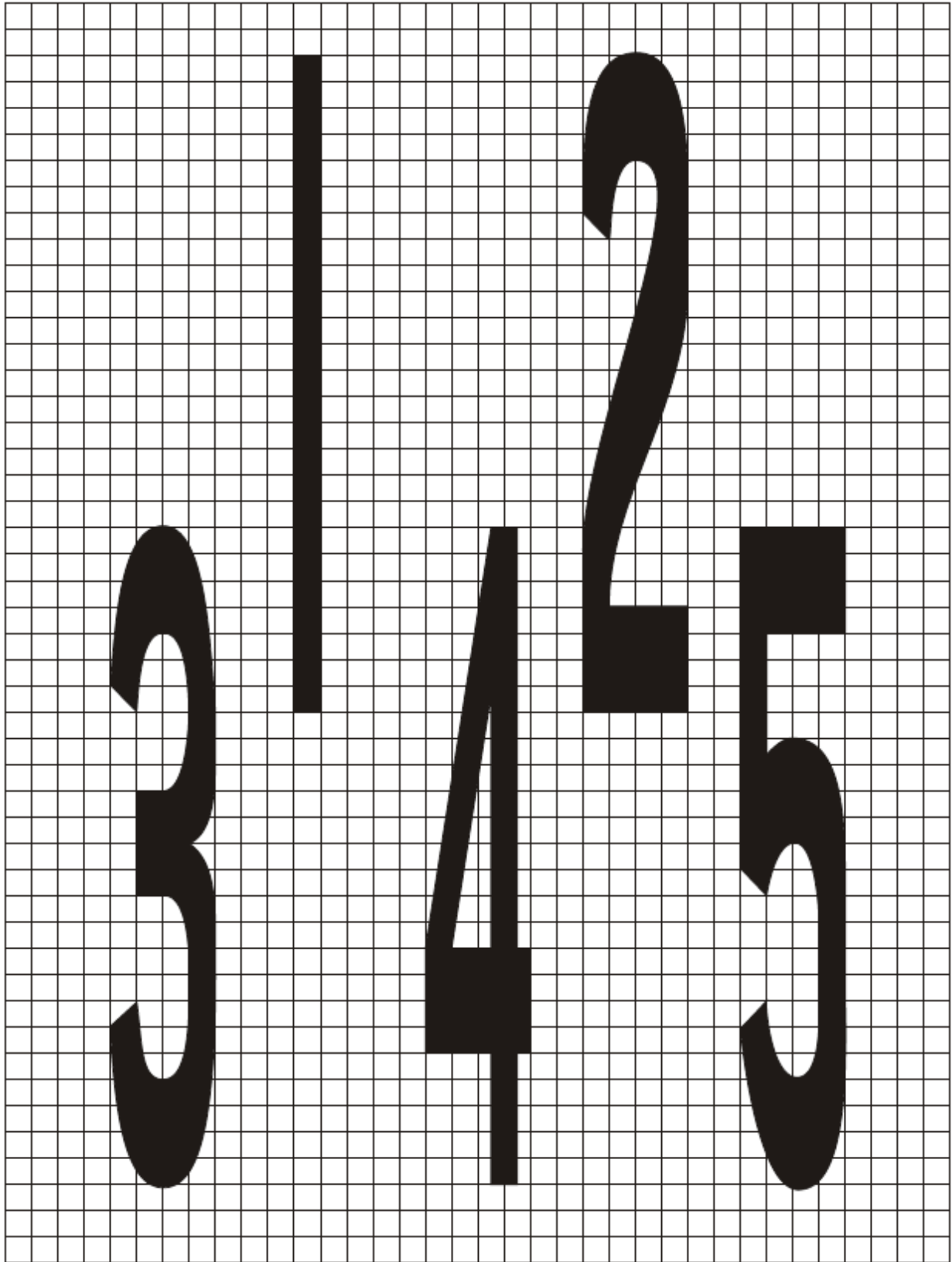


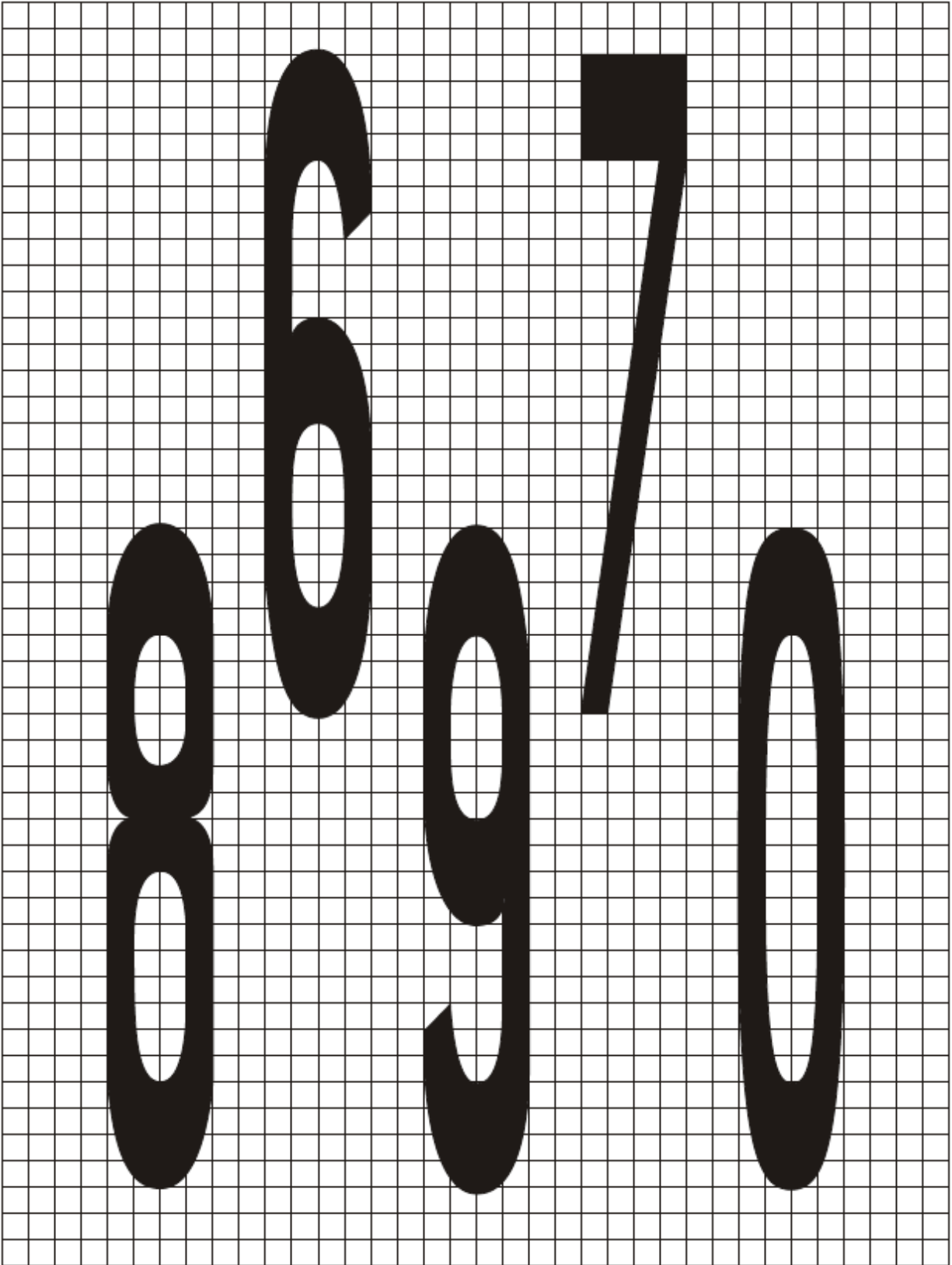


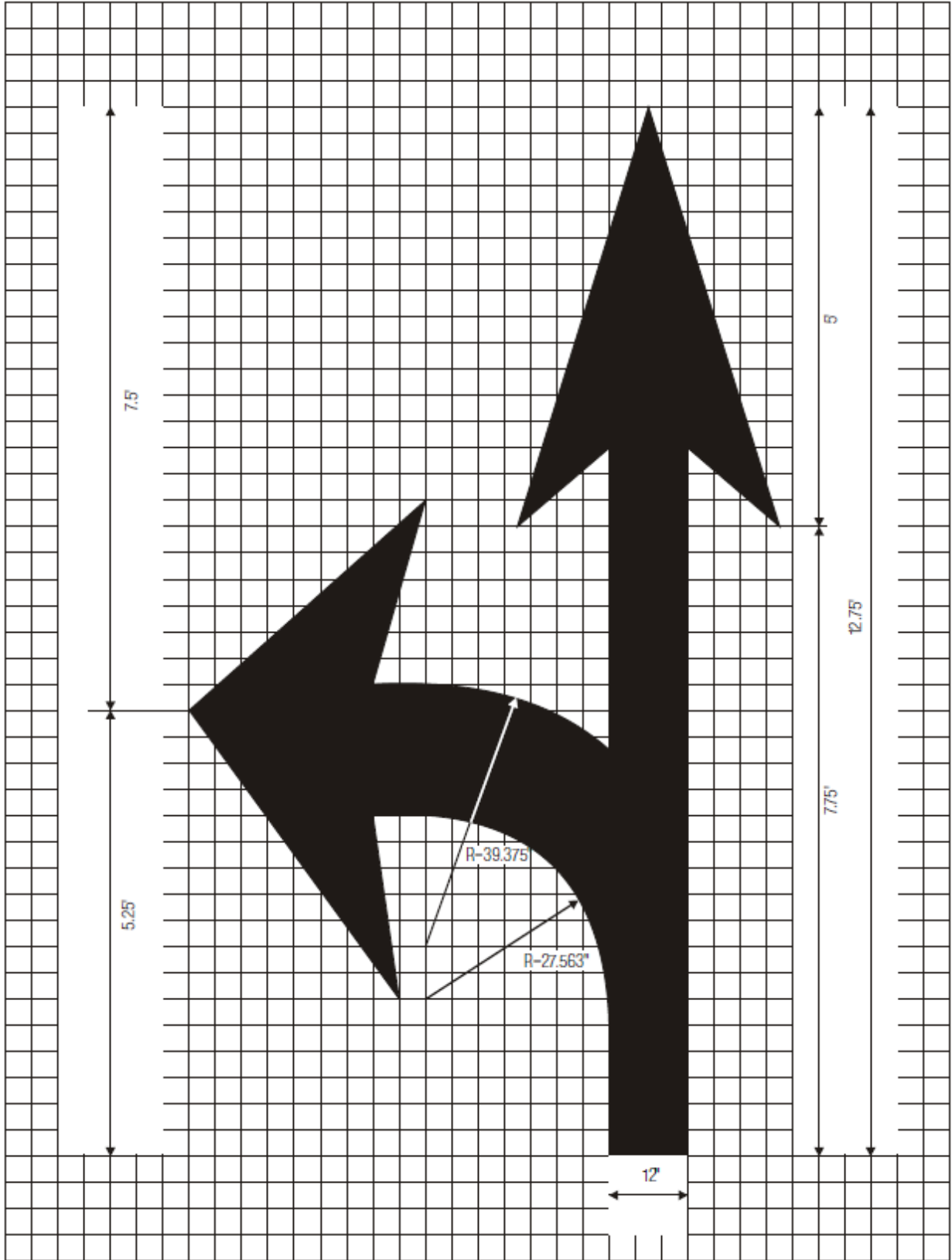


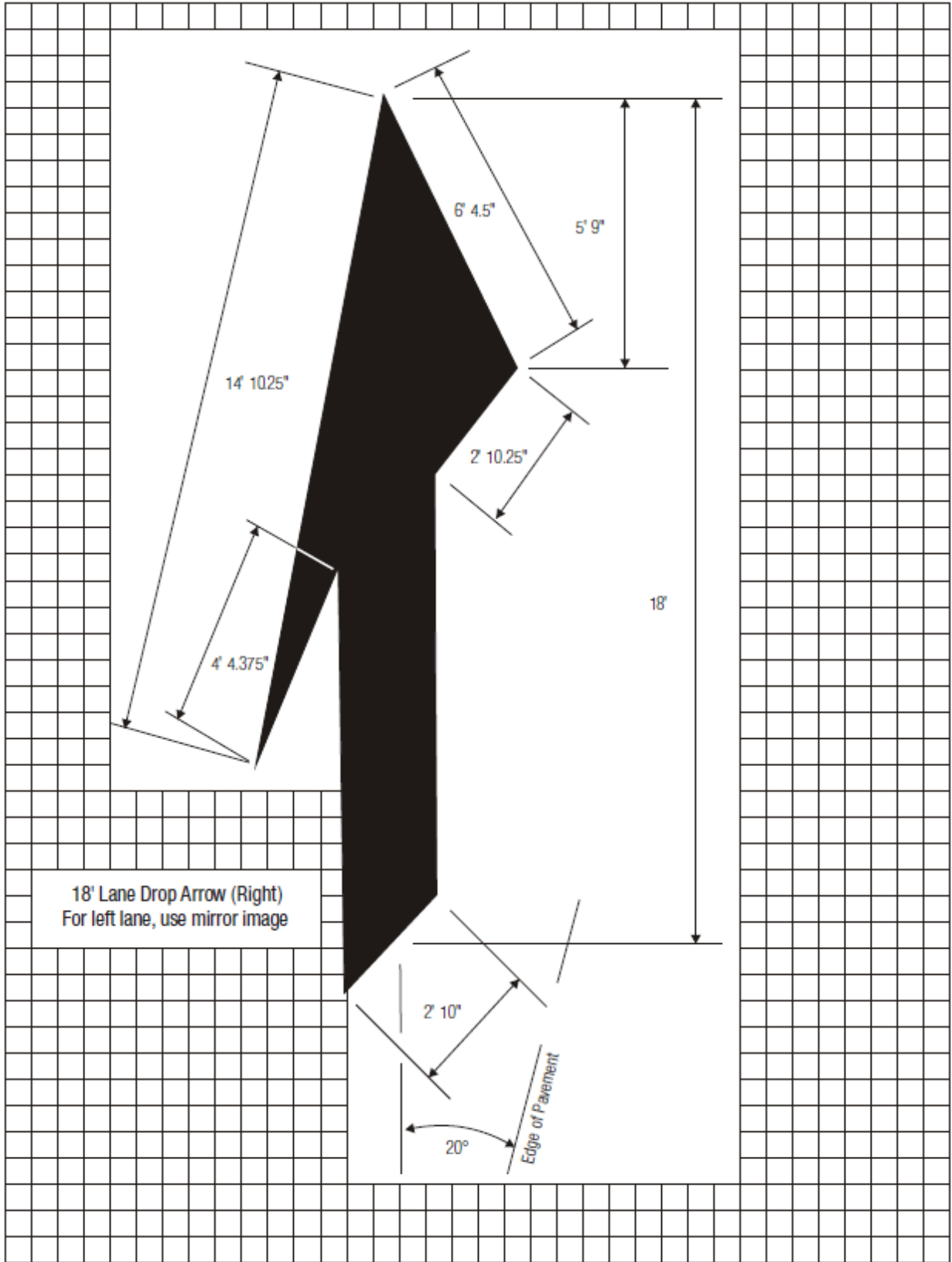


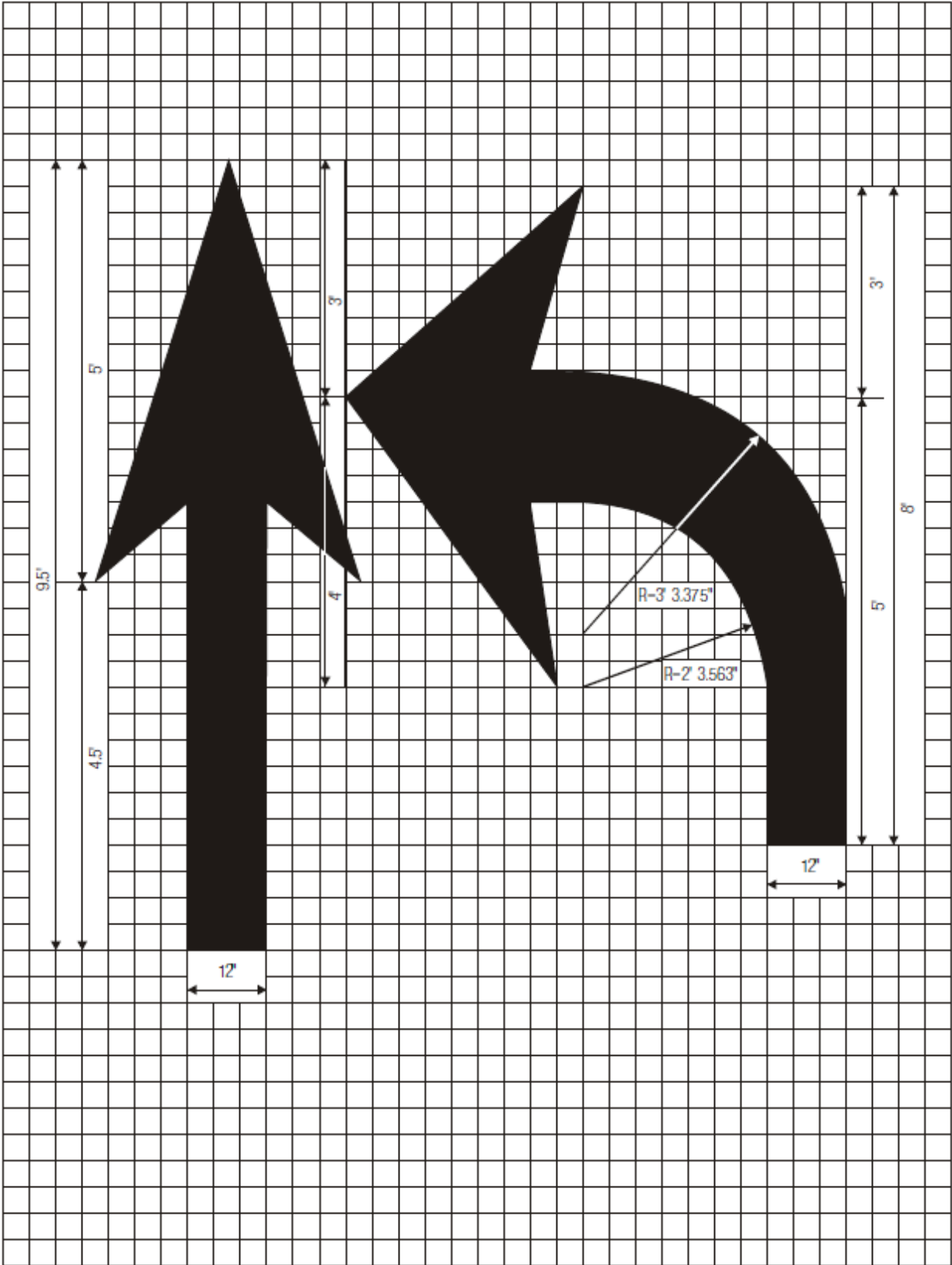


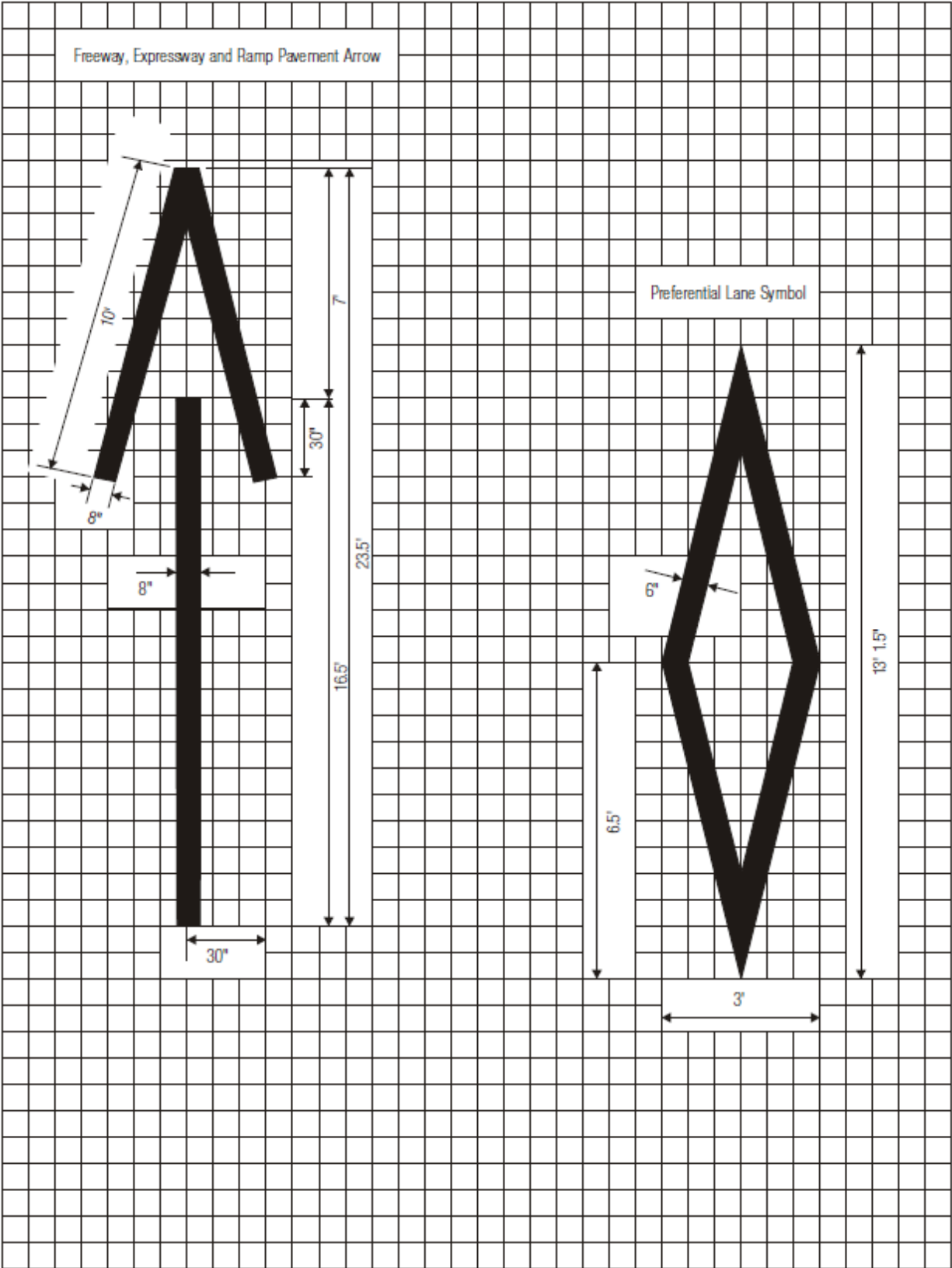


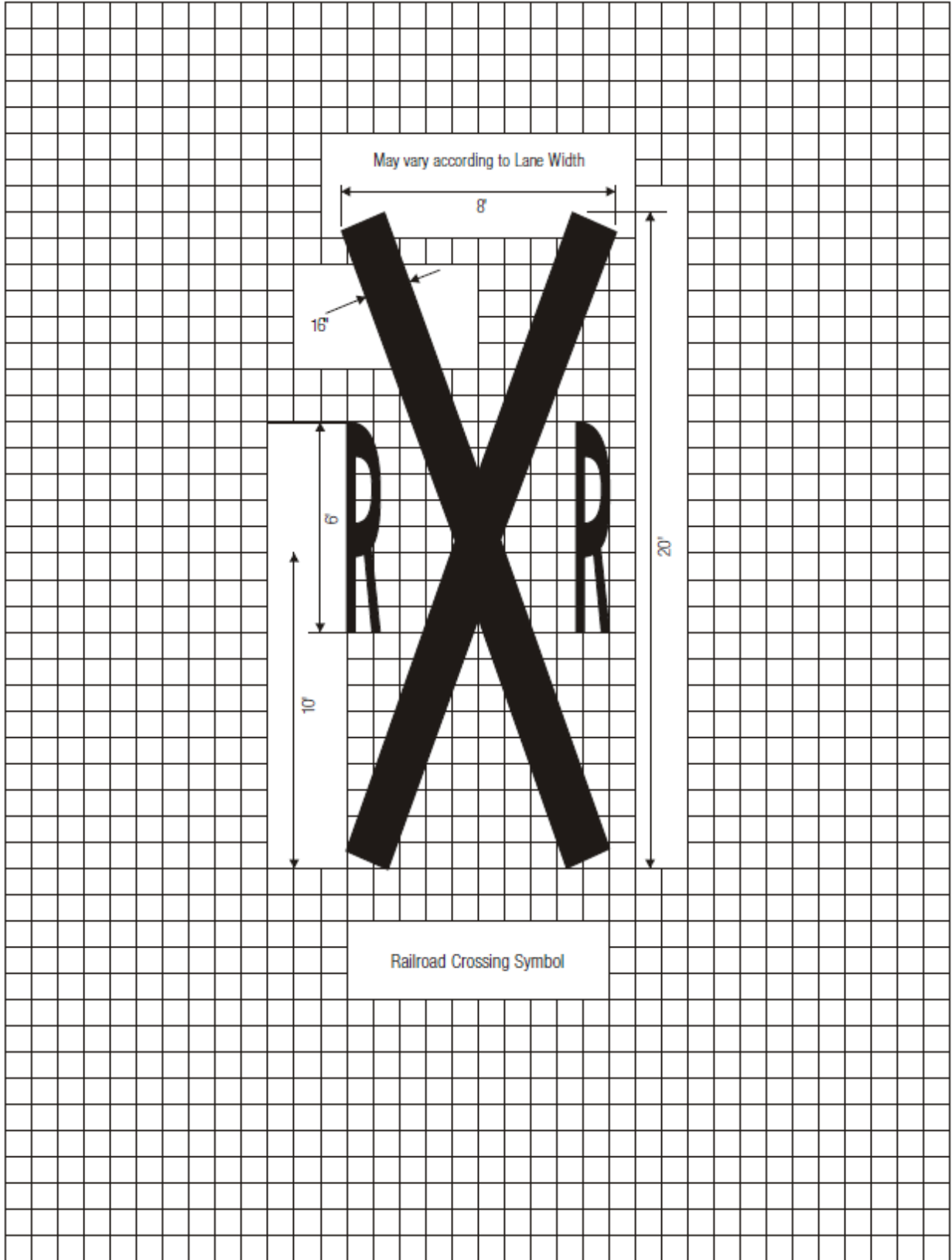


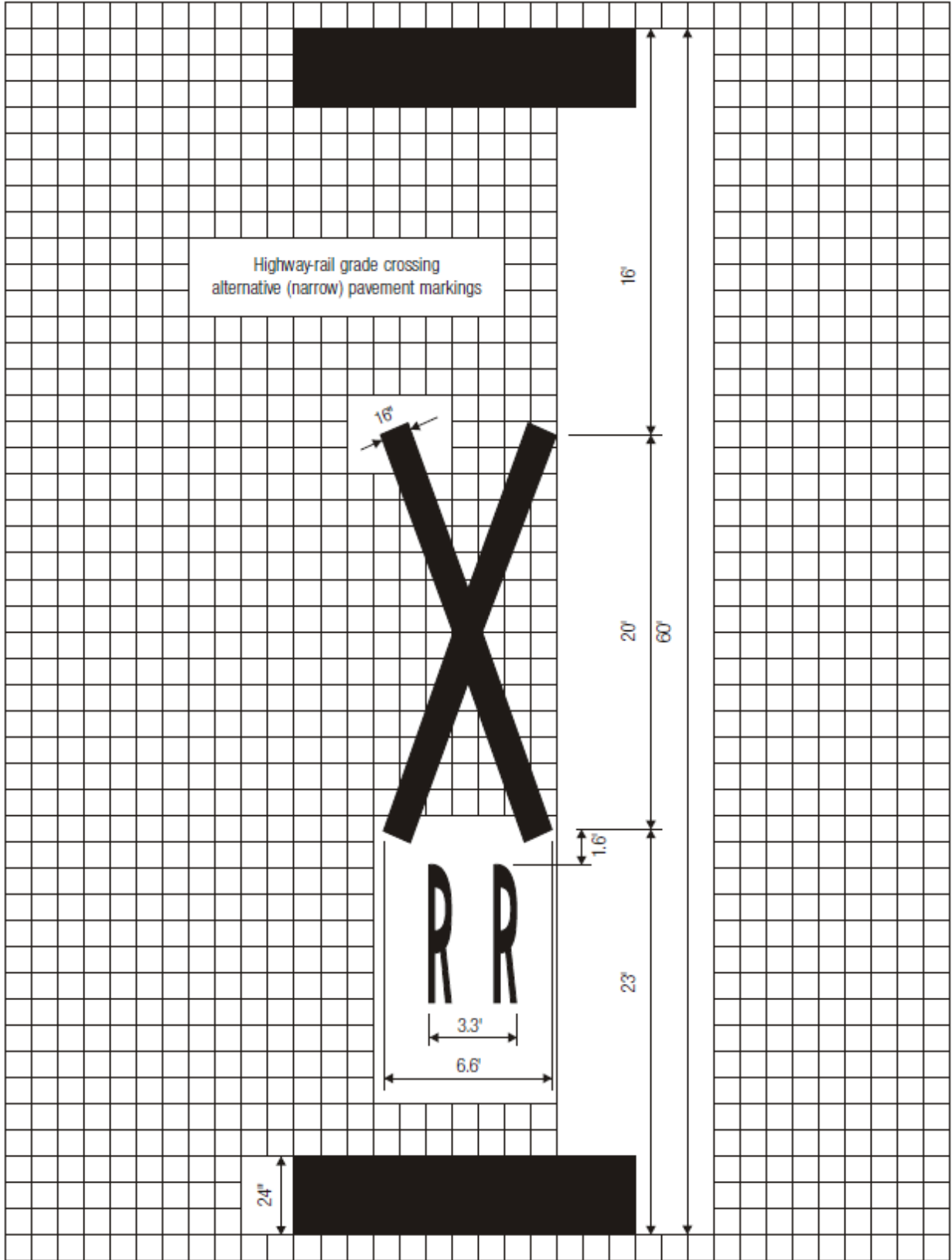



















PAVEMENT MARKING MATERIAL QUANTITIES			
8' Characters	Lineal Ft. (4")	Actual Sq. Ft.	Sq. Ft. To Report
A	17.00	5.67	6
C	16.00	5.33	5
D	19.00	6.33	6
E	19.00	6.33	6
F	18.33	6.11	6
G	19.32	6.44	6
H	19.32	6.44	6
I	8.31	2.77	3
L	12.33	4.11	4
N	18.66	6.22	6
O	18.69	6.23	6
P	17.64	5.88	6
R	21.00	7.00	7
S	19.32	6.44	6
T	12.33	4.11	4
U	18.00	6.00	6
X	15.66	5.22	5
Y	9.33	3.11	3
R (6')	15.75	5.25	5
SCHOOL	104.34	34.78	35
STOP	68.00	22.67	23
AHEAD	91.25	30.42	30
LEFT	62.00	20.67	21
RIGHT	80.28	26.76	27
TURN	70.00	23.33	23
ONLY	59.00	19.67	20
SIGNAL	95.00	31.67	32
X-ING	62.00	20.67	21
PED	55.64	18.55	19
	39.00	13.00	13
	48.00	16.00	16
	87.00	29.00	29
	126.19	42.06	42
	330.00	110.00	110
	195.39	65.13	65
	13.62	4.54	5