

**PAVEMENT MARKING MATERIAL FOR 2020 PAINTING SEASON**

**WATERBORNE PAINT**

Contract # 510299  
Delivery 21 calendar days  
**Expires 10-31-2020**  
Order Placement/Contract Info:  
Supplier: Ennis Flint  
Ronnie Walker  
4161 Piedmont Pkwy, Ste 370  
Greensboro, NC 27410  
336-218-6746  
[rwalker@ennisflint.com](mailto:rwalker@ennisflint.com)

**Prices**

White (984931):

5 gal pail=\$9.121/gal=\$45.61/pail  
55 gal drum=\$8.611/gal=\$45.61/drum  
275 gal tote=\$7.621/gal=\$2095.78/ tote

Yellow (984932):

5 gal pail=\$8.654/gal=\$43.27/pail  
55 gal drum=\$8.154/gal=\$448.47/drum  
275 gal tote=\$7.154/gal=\$1967.35/tote

\*\*Ammonia float additive is included  
\*\*Freight is included

**GLASS BEADS**

Contract # 510300  
Delivery 21 calendar days  
**Expires 10-31-2020**  
Order Placement/Contract Info:  
Supplier: Potters Industries Inc.  
Yvonne Harris  
610-651-4427  
PO Box 841  
Valley Forge, PA 19482  
[Yvonne.Harris@pottersbeads.com](mailto:Yvonne.Harris@pottersbeads.com)  
[Muscatinecustomerservice@pottersbeads.com](mailto:Muscatinecustomerservice@pottersbeads.com)

**Prices**

Deliveries over 10,000 pounds:

2000 lb tote = \$636/tote  
50lb bag = \$19.50/bag

Deliveries under 10,000 pounds:

2000 lb tote = \$636/tote  
50lb bag = \$19.50/bag

\*\*Freight is included

**TEMPORARY RAISED PAVEMENT  
MARKERS TYPE II**

Contract # : 510064  
Delivery 28 calendar days  
**Expires 10-15-20**  
Order Placement/Contract Info:  
Supplier: Apex Universal, Inc.  
Steve Edsinga  
PO Box 329  
Santa Fe Springs, CA  
562-944-8878  
[Sales@apexmarker.com](mailto:Sales@apexmarker.com)

**Prices**

Double Sided Yellow

500 count box = \$190.00/box

Single Sided White:

500 count box = \$180.00/box

\*\*Freight is included

**GUARDRAIL DELINEATORS**

Contract # 510064

Delivery 28 calendar days

**Expires 10-15-20**

Order Placement/Contract Info

Supplier: Lightle Enterprises LLC

Dave Lightle

PO Box 329

Frankfort, OH 45628

740-998-5363

[dlightle@lightleenterprises.com](mailto:dlightle@lightleenterprises.com)

**Prices**

Double Sided White

50 count box = \$144.00/box

Single Sided White:

50 count box = \$107.70/box

Single Sided White:

50 count box = \$107.70/box

\*\*Freight is included



#### PURPOSE

This subject was developed to provide guidance to improvement project inspectors as well as Department and County field and maintenance crews for the installation, service and maintenance of all types of highway signs and pavement markings on the State Highway network. The goal for this manual is to install signs and pavement markings to provide a safe, understandable and efficient system of guidance to the motoring public.

These guidelines are intended to provide a framework of policies and practices for the systematic reporting and handling of pavement marking installation and replacement or sign repair activities done by others under the direction of the Wisconsin Department of Transportation through its Regions. It is inherent these guidelines that the basic thrust be to promote safety of the motorist, safety for the improvement and maintenance crews and standardization of practices toward uniform application and appearance statewide.

Improvement project crews and maintenance crews will perform their operations in accordance with the Wisconsin Manual on Uniform Traffic Control Devices, Traffic Guidelines Manual and other Department policies as referenced within.

The Department recognizes these guidelines *may* require adjustments and revision as they are implemented.

#### INSTALLING MARKINGS

Pavement marking **shall** be in accordance with the WMUTCD, Facilities Development Manual and the Wisconsin Standard Specification Manual.

##### Types of Roadway Markings

Skip line is a broken or dashed line. The standard is a 12.5' line with a 37.5' gap.

Dash is a painted portion of a skip line. Typically a 3' line with 9' gap.

Cat track is a painted line for guidance. Typically a 2' line with a 6' gap.

Channelizing line is double the thickness of a standard line. Typically 8".

##### County Maintenance

Counties will be given segments of roadways that need to be painted. The scheduling of pavement marking operations will be left to the county. Counties will then be able to schedule their crews to what fits their needs, but the work **shall** be completed in a timely manner. WisDOT is requiring all marking to be placed at or above manufacture specifications. Each stripping crew is responsible for completing the Pavement Marking Daily Report. These reports **shall** be sent to the Regional Pavement Marking Coordinator or representative at the end of every week. State actual time spent not painting at the bottom of the report (drive time, weather delay, maintenance, etc)

##### Improvement/Refurbishment Projects

Install per Spec 646, 647, and 649.

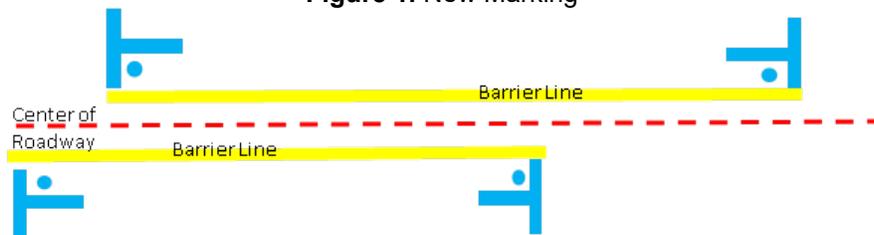
#### FIELD OPERATIONS

Paint and Beads **shall** be purchased off of the Statewide Bid for all State work. It **shall** be the responsibility of the County to order all paint and beads, unless other arrangements have been made with the Region. Return all empty paint totes to the provider. For application standards see the appropriate section below.

##### No Passing Zones

- No Passing Zone "T" is a mark on the roadway, which indicates the beginning and ending points of a barrier line.
- No Passing Zone "X" on the end of a line indicates that it needs to be extended or removed.
- No Passing Zone Dot indications the center of the roadway.

**Figure 1. New Marking**



**Figure 2. Existing Marking Extension**



**Figure 3. Existing Marking Removal**



**Waterborne Paint**

General

Store waterborne paint in a dry area that will not freeze. Do not store paint for more than 12 months. Keep in mind the weather will drastically change the dry time of this product. Humidity and cooler weather are the biggest factors. Please let the Marking Coordinators know of any and all issues with the paint.

Types of Spraying

There are 2 ways to spray paint:

- Conventional: Air jets with a pressure (60 psi to 140 psi) at the tip of the paint gun that breaks up the paint. The tip defines the size of the line.
- Airless: The pressure created by the pump forces paint out through an orifice in the tip of the gun. The angle and size of tip affect the size of the line.

Temperature

Refer to manufacture specifications for the temperature the paint *should* be applied at. Typically the ambient temperature *should* be above 50°F.

Beads

Wisconsin is currently using the AASTHO Type I bead gradation with 80% rounds. These can also be purchased off of the State Contract.

Application

Product	Mil thickness	Gallons per Mile	Feet per Gallon	Beads per Gallon
Paint	16	17.6	300	8-10

**Epoxy**

General

Epoxy is a two part system. Epoxy has a longer life expectancy and can be applied at lower temperatures; however, it takes longer to dry than waterborne paint. Epoxy has a life expectancy of 3-5 years. Humidity and cooler weather are the biggest factors. Please let the Marking Coordinators know of any issues.

Mixing

Since epoxy is a two part system the resin has to be mixed with a hardener. Typically it is 2 parts resin to 1 part hardener.

Temperature

Refer to manufacture specification for the temperature the epoxy *should* be applied at. Typically the ambient

temperature *should* be above 35°F

### Beads

Wisconsin is currently using the AASTHO Type I bead gradation with 80% rounds. See table above for how many pounds of beads per gallon are required.

### Application

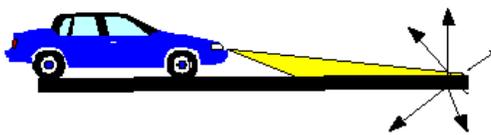
Product	Pavement Type	Mil Thickness	Gallons per Mile	Feet per Gallon	Beads per Gallon
Epoxy	SMA/ Seal Coat/ Epoxy Overlays	25	27.4	193	25
Epoxy	All Others not stated above	20	21.9	241	22.5

### Reflective Glass Beads

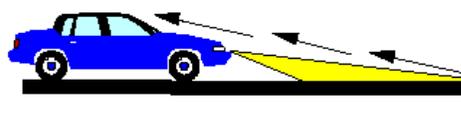
#### General

Beads are added to lines to increase the visibility of the lines at night. The beads help reflect light from a vehicle back to the driver as shown in the picture to the right.

**Figure 1: No Beads**



**Figure 2: Beads added**



Optimum embedment of beads is 50-60%. Anything less than that *may* cause the beads to pop out and any more than that affects how much light the bead can reflect back to the driver.

#### Bead Calibration

Bead calibration is very important since to many beads is expensive and doesn't adhere to the paint, and not enough beads can result in low retros. Hold a container under the bead gun for 10 seconds. Measure beads in milliliters. Use the table below to measure the volume of beads in milliliters per 10 seconds for a 4" wide line drop rate.

Bead Calibration Chart (AASHTO Type I to Type 4)					
Lbs/100ft Bead Calibration Chart					
Speed	8 lbs/1000 ft <sup>2</sup>	10 lbs/1000 ft <sup>2</sup>	12 lbs/1000 ft <sup>2</sup>	22 lbs/1000 ft <sup>2</sup>	24 lbs/1000 ft <sup>2</sup>
10 mph	1080	1340	1600	2930	3200
9 mph	960	1200	1440	2560	2880
8 mph	850	1070	1280	2350	2880
7 mph	750	940	1120	2040	2220
6 mph	640	800	960	1760	1920
5 mph	530	660	800	1460	1600
4mph	430	530	640	1160	1280
3 mph	320	400	480	880	960

Source: Ennis Flint Traffic Paint Guide Book

### General Application Calculations

Formula for Determining Mil Thickness (only for a 4" wide line)

$$\text{Mil Thickness} = \frac{(0.9115 \text{ miles/ft}) * (\text{Number of Gallons})}{(\text{Miles Striped})}$$

Example: 55 gallons of paint was used in a 2 mile segment. What was the mil thickness?

$$\text{Mil Thickness} = \frac{(0.9115 \text{ miles/ft}) * (55 \text{ Gallons})}{(2 \text{ miles})} = 25.07 \text{ Mil}$$

Formula for Determining Gallons Per Mile at a Designated Width and Mil Thickness

$$\frac{(19,200 \text{ ft}^2 \text{ per gallon of linear line})}{(\text{Mil Thickness}) * (\text{Desired width of line in inches})} = \frac{\text{Linear Feet}}{\text{Gallon}}$$

$$\frac{5280 \text{ ft}}{\text{Linear Feet Per Gallon}} = \frac{\text{Gallons}}{\text{Mile}}$$

Example: Assume the Line is 8" wide with a mil thickness of 15. How many gallons per mile do you need?

$$\frac{(19,200 \text{ ft}^2 \text{ per gallon of linear line})}{(15 \text{ mils}) * (8 \text{ inches})} = 160 \text{ linear ft per gallon}$$

$$\frac{5280 \text{ ft}}{160 \text{ linear ft per gallon}} = 33 \text{ gallons per mile}$$

### Troubleshooting Tips

Below are the common problems that occur during painting.

**Table 1: Conventional Paint Application Troubleshooting**

Source "MnDOT Pavement Marking Field Guide"

PAINT APPLICATION TROUBLESHOOTING		
PROBLEM	CAUSE	REMEDY
Excessive Thickness (overall)	<ul style="list-style-type: none"> <li>Paint tank or pump pressure too high</li> <li>Paint gun volume control open too wide (if present)</li> <li>Applicator speed too low</li> </ul>	<ul style="list-style-type: none"> <li>Reduce tank or pump pressure</li> <li>Adjust paint gun volume control</li> <li>Increase speed</li> </ul>
Excessive Thickness (middle of line)	<ul style="list-style-type: none"> <li>Paint tank or pump pressure too high</li> <li>Paint gun volume control open too wide (if present)</li> <li>Atomizing air pressure off or too low</li> <li>Material buildup in paint gun tip and/or shroud</li> </ul>	<ul style="list-style-type: none"> <li>Reduce tank or pump pressure</li> <li>Adjust paint gun volume control</li> <li>Increase atomizing air pressure</li> <li>Clean tip and/or shroud</li> </ul>
Excessive Thickness (along one side)	<ul style="list-style-type: none"> <li>Material buildup in paint gun tip and/or shroud</li> <li>Clogged hole(s) in paint gun atomizing tip</li> </ul>	<ul style="list-style-type: none"> <li>Clean paint tip and/or shroud</li> <li>Clear clogged hole(s) in paint gun atomizing tip</li> </ul>
Insufficient Thickness	<ul style="list-style-type: none"> <li>Paint tank or pump pressure too low</li> <li>Paint gun volume control not open enough (if present)</li> <li>Vehicle speed too high</li> <li>Atomizing pressure too low.</li> <li>Material buildup in paint gun tip and/or shroud</li> <li>Material buildup in paint filter(s) and/or plumbing</li> </ul>	<ul style="list-style-type: none"> <li>Increase tank or pump pressure</li> <li>Adjust paint gun volume control</li> <li>Increase applicator speed.</li> <li>Increase atomizing air pressure</li> <li>Clean paint gun tip and/or shroud</li> <li>Clean paint filter(s) and/or plumbing</li> </ul>
Wide Paint Line	<ul style="list-style-type: none"> <li>Paint gun set too high</li> <li>Worn or damaged paint gun tip and/or shroud</li> </ul>	<ul style="list-style-type: none"> <li>Lower gun</li> <li>Repair or replace tip and/or shroud</li> </ul>
Narrow Paint Line	<ul style="list-style-type: none"> <li>Paint gun too low</li> <li>Paint gun tip slot not at 90° angle to paint line</li> <li>Clogged paint gun tip and/or shroud</li> <li>Low air pressure in paint machine tire.</li> </ul>	<ul style="list-style-type: none"> <li>Raise paint gun</li> <li>Reposition paint gun tip</li> <li>Clean paint gun tip and/or shroud</li> <li>Inflate tire</li> </ul>
Uneven Paint Line (spotty)	<ul style="list-style-type: none"> <li>Atomizing air pressure too low</li> <li>Paint tank pressure too low</li> <li>Old paint (viscosity too high)</li> <li>Loose paint gun tip and/or shroud</li> <li>Not enough heat for paint to flow evenly</li> <li>No shroud</li> </ul>	<ul style="list-style-type: none"> <li>Increase atomizing air pressure</li> <li>Increase material tank pressure</li> <li>Rotate material stock</li> <li>Secure paint gun tip and/or shroud</li> <li>Increase heat</li> <li>Install shroud</li> </ul>

**Table 2: Epoxy Spray Application Troubleshooting**

Source "MnDOT Pavement Marking Field Guide"

EPOXY SPRAY APPLICATION TROUBLESHOOTING		
PROBLEM	CAUSE	REMEDY
Heavy or Light centers	<ul style="list-style-type: none"> <li>Inadequate fluid delivery</li> </ul>	<ul style="list-style-type: none"> <li>Increase fluid pressure</li> <li>Decrease tip size</li> </ul>
Surging pattern	<ul style="list-style-type: none"> <li>Pulsating fluid delivery</li> </ul>	<ul style="list-style-type: none"> <li>Reduce demand</li> <li>Remove restrictions in supply system</li> <li>Check individual pump pressures for unequal pressure</li> <li>Check supply hose for leaks</li> </ul>
"Lop-sided" millage	<ul style="list-style-type: none"> <li>Worn tip sides</li> <li>Clogged tip</li> </ul>	<ul style="list-style-type: none"> <li>Replace tips</li> <li>Clean tips</li> </ul>
Line too wide	<ul style="list-style-type: none"> <li>Gun too high</li> <li>Too wide a fan angle on tip</li> </ul>	<ul style="list-style-type: none"> <li>Lower gun</li> <li>Adjust tip size if necessary</li> </ul>
Line too narrow	<ul style="list-style-type: none"> <li>Gun too low</li> <li>Too narrow a fan angle on tip</li> </ul>	<ul style="list-style-type: none"> <li>Change tip size</li> <li>Decrease speed of application</li> <li>Verify pressure settings</li> </ul>
Too much or too little hardener	<ul style="list-style-type: none"> <li>Displacement pumps not properly synchronized</li> </ul>	<ul style="list-style-type: none"> <li>Adjust pumps</li> </ul>

**Table 3: Reflective Bead Application Troubleshooting**

Source "MnDOT Pavement Marking Field Guide"

REFLECTIVE BEAD APPLICATION TROUBLESHOOTING		
PROBLEM	CAUSE	REMEDY
Beads on one side	<ul style="list-style-type: none"> <li>Bead gun out of alignment</li> <li>Clogged bead gun</li> </ul>	<ul style="list-style-type: none"> <li>Adjust alignment of gun cap</li> </ul>
Excessive bead use	<ul style="list-style-type: none"> <li>Worn gun needle, seat and orifice</li> <li>Excessive glass bead pressure</li> </ul>	<ul style="list-style-type: none"> <li>Rebuild gun</li> <li>Decrease pressure</li> </ul>
Beads in middle of line	<ul style="list-style-type: none"> <li>Bead tank pressure too low</li> <li>Bead gun "off" and "on" control screw not adjusted</li> <li>Bead gun cap out of alignment</li> <li>Too big of a bead gun tip</li> </ul>	<ul style="list-style-type: none"> <li>Increase pressure</li> <li>Adjust control screw</li> <li>Align cap deflector</li> <li>Change to a smaller tip</li> </ul>
All beads buried	<ul style="list-style-type: none"> <li>Bead gun too close to paint</li> <li>Bead gun angle too shallow</li> <li>Excessive paint millage</li> </ul>	<ul style="list-style-type: none"> <li>Re-align bead gun</li> <li>Adjust angle of bead gun</li> <li>Check wet millage thickness</li> </ul>
All beads on top of line	<ul style="list-style-type: none"> <li>Bead gun too far from paint gun</li> </ul>	<ul style="list-style-type: none"> <li>Re-align bead gun</li> </ul>
Pulsed bead application	<ul style="list-style-type: none"> <li>Bead tank pressure inadequate</li> </ul>	<ul style="list-style-type: none"> <li>Raise tank pressure</li> <li>Rebuild applicator to increase pressure</li> </ul>
Excessive amount of beads beside line	<ul style="list-style-type: none"> <li>Too much overlap of bead pattern on line pattern</li> </ul>	<ul style="list-style-type: none"> <li>Move bead gun closer to roadway</li> </ul>

**CONTACTS**

DOT Contacts			
Region	Contact Person	Number	Email
Pavement Marking Staff 3609 Pierstorff St Madison, WI 53704	Jeannie Silver	608-246-5408	jeannie.silver@dot.wi.gov
	Linette Rizos	414-333-6234	linette.rizos@dot.wi.gov
	Matt Rauch	608-246-5305	matt.rauch@dot.wi.gov
SW Region- La Crosse 3550 Mormon Coulee Rd. La Crosse, WI 54601	Kory Keppel	608-785-9953	kory.keppel@dot.wi.gov
SW Region- Madison 3601 Pierstorff St Madison, WI 53704	Jeff Holloway	608-246-3268	jeffrey.holloway@dot.wi.gov
SE Region- West Allis 935 S. 60th St. West Allis, WI 53214	Donald Steel	262-548-6765	donald.steel@dot.wi.gov
	Chuck Saldivar	414-266-1164	<a href="mailto:chuck.saldivar@dot.wi.gov">chuck.saldivar@dot.wi.gov</a>
	Jenny Buckett	414-750-2427	jennifer.buckett@dot.wi.gov
NE Region- Green Bay 944 Vander Perren Way Green Bay, WI 54304	Steven Herlache	920-492-3512	steven.herlache@dot.wi.gov
NC Region- Wis Rapids 2841 Industrial St Wis Rapids, WI 54495	Mike Worzella	715-421-8003	michael.worzella@dot.wi.gov
NC Region- Rhinelander Hanson Lake Rd Rhinelander, WI 54501	Mike Worzella	715-421-8003	michael.worzella@dot.wi.gov
NW Region- Spooner W7102 Green Valley Rd Spooner, WI 54801	Chloe Anderson	715-855-7672	chloe.anderson@dot.wi.gov
NW Region- Eau Claire 5009 USH 53 South Eau Claire, WI 54701	Chloe Anderson	715-855-7672	chloe.anderson@dot.wi.gov

**South West**

Adams	David Johnson	(608) 339-3355
Dane	Robert Peterson	(608) 575-5209
Dodge	Wally Fett	(920) 296-2376
Iowa	Jeff Anderson	(608) 574 2934
Vernon	Phil Hewitt	(608) 606-3777

**Southeast**

Milwaukee	Scott Schweitzer	(414) 558-5752
Ozaukee	Josh Borden	(262) 238-8336
Racine	Mike Kirshling	(262) 770-9690
Walworth	Dave G	(262) 949-7835
Washington	Tim Pfeifer	(262) 483-3081
Waukesha	Bob Rochelle	(414) 548-7843

**Northeast**

Brown	Jim Burkel	(920) 609-4020
Calumet		(920)418-2320
Fond du Lac	John Hoffman	(920) 929-3491

Kewaunee	Keith Paplahm	(920) 255-3876
Marinette	Joe Baranek	(715) 923-6874
Sheboygan	Brian Olson	(920) 459-3822

**North Central**

Adams	David Johnson	(608) 339-3355
Langlade	Crystal Wells	(715) 627-6351
Portage	Steve Schlice	(715) 345-5235
Shawano	Casey Beyersdorf	(715) 853-1699
Waushara	Tom Dahlke	(920) 787-3327

**Northwest**

Taylor	Doug Brost	(715) 965-3141
Trempealeau	Tanner Kidd	(715) 538-3035
Washburn	Tim Baier	(715) 520-0215
	Adam Gronning	(715) 641-0570

**3-25-2 Field Crew Safety and Training****May 2017****PERSONAL SAFETY**

All Department of Transportation (DOT) personnel **and** any personnel working for the state are required to follow the safety policies stated in the DOT Transportation Administrative Manual (TAM). DOT, county, and contractor personnel **shall** wear:

- Eye Protection: (TAM SD 36)
  - Safety glasses with attached shields
- Foot Protection: Steel-toe boot or shoe (TAM SD30)
- Protective Headgear: (TAM SD 51)
  - Hard hat
- High Visibility Safety Apparel: (TAM SD 57)
  - Reflectorized Safety Vest at all times on or along the roadway
  - Reflectorized Safety Pants during nighttime hours.

Hazard Warning Information - Treated Wood Management (See Exhibit 5)

(Material Safety Data Sheets *should* be requested from the wood post vendor)

**EMPLOYEE RECOMMENDED TRAINING**

All agencies doing work for the DOT *should* make sure their employees are properly trained in the following areas:

1. Field Operations Awareness
2. Shop Tools
3. Major Equipment Operations
4. Utilities Locate. Call Diggers Hotline 811
5. Retraining
6. Vehicle Safety and Inspection

**WORK AREA TRAFFIC CONTROL**

All traffic control **shall** be in compliance with the WMUTCD and Departmental policies. See Standard detail drawings.

Vehicles used in highway signing operations **shall** be equipped with at least two (2) yellow, high intensity rotating beacons, clearly visible from the front, rear and both sides of the vehicle. These beacons **shall** be placed as high as possible on each vehicle. Vehicles **shall** have all warning lights operating when stopped, or moving slowly along any highway. Warning lights **SHALL NOT** be displayed while the vehicle is traveling at highway speeds or when traveling between jobs.

When conditions are less than ideal, additional advance warning signs or devices *should* be added to the traffic control layouts. In some cases, the work *should* be deferred until the conditions are more favorable.

All lane closures on two lane roadways require flagging of traffic as well as advance signing and cone placement in the work area. Remember that all flaggers **shall** use stop/slow paddles.

An encroachment into a lane of traffic *may* require cones and/or flagging. The amount of encroachment, the volume and speed of passing vehicles will determine traffic control measures required. For example, a cone *may* be sufficient to mark the point where an outrigger makes contact with the pavement outside the overall width of the truck.

**PUBLIC SAFETY**

Workers **shall** park vehicles off the road as far as practical. Care *should* be taken to not block the vision of existing traffic control devices such as stop signs and signals. Work activities *should* be performed with an assumption the motorist does not know what the workers are going to do.

## UTILITIES

Utility Locates. Diggers Hotline (811) **shall** be called and located before any work is performed. They *should* be given at least a 3 working day notice.

The following is a five-point plan for utility locates before digging in the highway right-of-way, which covers the routine steps required by Diggers Hotline:

1. Prepare a plan or work location sketch or drawing. Indicate a 25 foot radius around the stake or lath for "MARKING INSTRUCTIONS" for Diggers Hotline.
2. At each locate site, mark with a stake or by painting the pavement or shoulder of the highway. White or pink are the approved colors for ribbons, flags or paint when marking sign locations for utility locates.
3. Identify the exact location by measuring the distance from the nearest intersecting street or highway. Indicate which side of the highway the locate is on.
4. Contact Diggers Hotline to request the area to be located. Retain ticket number for a minimum of six years after work is completed.
5. Investigate the possibility of other utilities having services at the locate site.

Utility Damage Procedure. Damage prevention is the ultimate goal. As stated above it is essential to get clearance from utilities before doing any digging.

- BEFORE YOU DIG, CONFIRM UTILITIES HAVE BEEN LOCATED

### IF UTILITY DAMAGE OCCURS:

- CALL THE UTILITY FROM A SAFE LOCATION AS SOON AS POSSIBLE.
- CLEAR AREA IF NECESSARY.
- EXTINGUISH ALL FIRE SOURCES; BE MINDFUL OF LOSS OF LIFE.
- NOTIFY EMERGENCY SERVICES (IF NECESSARY).
- NOTIFY SUPERVISOR.
- BE AVAILABLE ON OR NEAR THE SITE UNTIL REPAIR CREW ARRIVES.

## MAJOR EQUIPMENT OPERATIONS

It is recommended that field operations that involve digger derricks or bucket trucks will NOT be performed with fewer than two crew persons on the job site.

HAVING A UTILITY LOCATE CLEARANCE DOESN'T NECESSARILY MEAN ALL DANGER HAS BEEN REMOVED.

Derrick operators must be aware of overhead lines to be certain the boom or its attachments remain the required distance away from the overhead lines.

## ACRONYMS & DESCRIPTIONS

HMA - Hot Mix Asphalt

MSDS - Material Safety Data Sheets

PCC - Portland Cement Concrete

PMC - Pavement Marking Coordinator

TMA - Transportation Maintenance Agreement

Type H Sheeting - Prismatic High Intensity

Type F Sheeting - Prismatic High Intensity Fluorescent Sheeting





# SDD 15C19-b Moving Pavement Marking Operation, Multi-Lane Undivided Roadway

## LEGEND

- V1 LEAD VEHICLE
- V2 MARKING VEHICLE
- V3 SHADOW VEHICLE
- TRUCK MOUNTED ATTENUATOR (TMA)
- SIGN ON TEMPORARY SUPPORT
- DIRECTION OF TRAFFIC
- FLASHING ARROW PANEL (MERGE)
- FLASHING ARROW PANEL (CAUTION)

## GENERAL NOTES

ALL VEHICLES SHALL BE EQUIPPED WITH TWO 360 DEGREE HIGH INTENSITY YELLOW FLASHING LIGHTS OR STROBE LIGHTS AND OPERATED WITH HEADLIGHTS TURNED ON.

ALL VEHICLES SHALL BE EQUIPPED WITH REAR FACING TYPE B OR C FLASHING ARROW PANEL. SIGNS PLACED ON VEHICLES MUST NOT OBSCURE THE ARROW PANEL.

ALL SIGNS ARE 48" X 48" UNLESS OTHERWISE SPECIFIED.

DISTANCE BETWEEN VEHICLES MAY VARY ACCORDING TO TERRAIN, SIGHT DISTANCE, PAINT DRYING TIME, AND OTHER FACTORS. WHENEVER ADEQUATE STOPPING SIGHT DISTANCE EXISTS TO THE REAR, SHADOW VEHICLES SHOULD MAINTAIN THE MINIMUM DISTANCE FROM THE WORK VEHICLE AND PROCEED AT THE SAME SPEED AS THE WORK VEHICLE. SHADOW VEHICLES SHOULD SLOW DOWN IN ADVANCE OF VERTICAL AND HORIZONTAL CURVES THAT RESTRICT SIGHT DISTANCE.

WHEN WORK ACTIVITY BLOCKS THE LEFT LANE, REVERSE TRAFFIC CONTROL.

WHEN A RAMP INTERSECTS THE FACILITY ON WHICH THE WORK IS BEING PERFORMED, PROVIDE ADDITIONAL TRAFFIC CONTROLS AS SPECIFIED IN THE CONTRACT OR AS APPROVED BY THE ENGINEER.

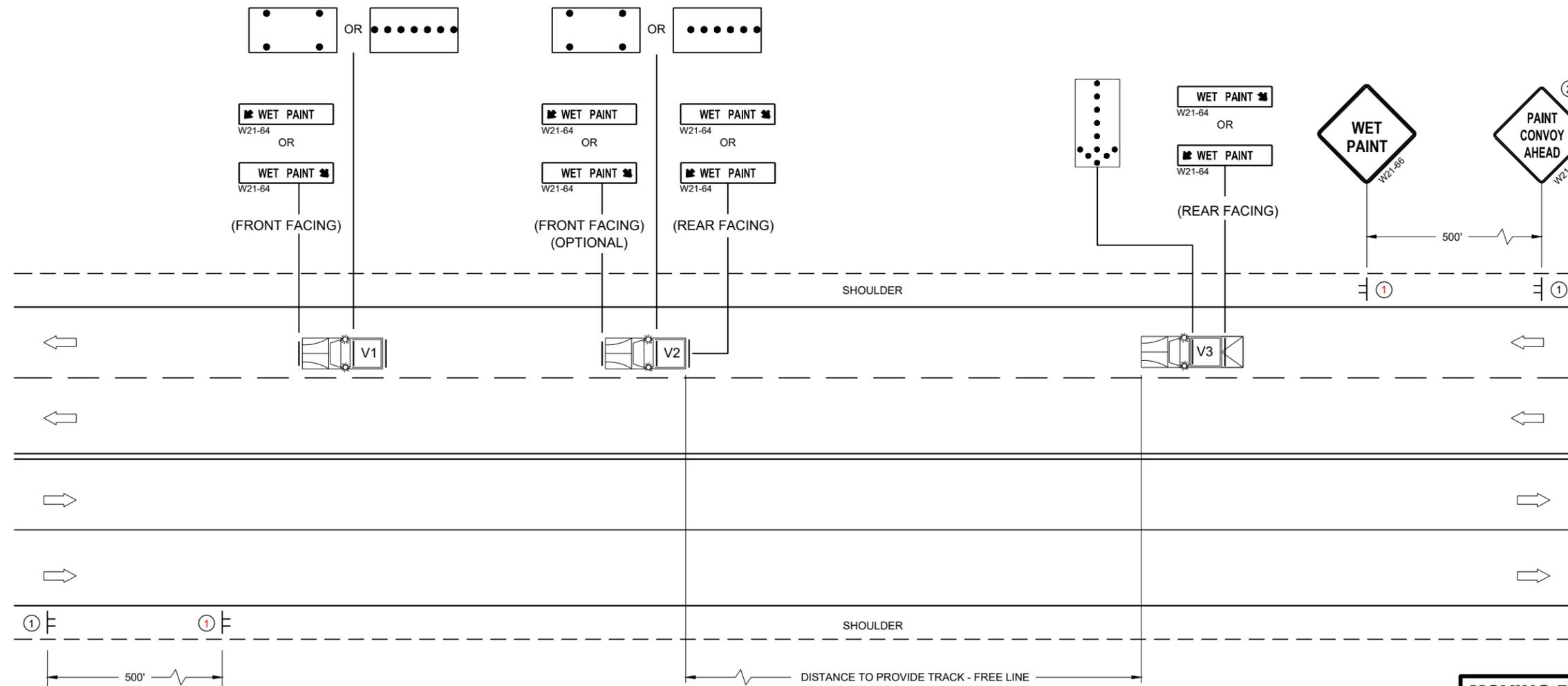
WHEN NO WORK ACTIVITY IS TAKING PLACE, REMOVE OR LAY STATIONARY SIGNS AND SUPPORTS FLAT ON THE GRADE WITH UPRIGHTS ORIENTED PARALLEL TO AND DOWNSTREAM FROM TRAFFIC.

CONES SHOULD BE USED BETWEEN THE MARKING AND SHADOW VEHICLES AT 100 FOOT SPACING. CONES MAY BE OMITTED ON PAINTED LINE IF APPROVED BY THE ENGINEER. CONSIDER PAVEMENT MARKING DRY OR CURE TIMES AND TRAFFIC VOLUME.

CONES SHALL HAVE A MINIMUM HEIGHT OF 18" FOR WET PAVEMENT MARKINGS.

- ① SIGNS SHALL BE REPEATED APPROXIMATELY EVERY THREE MILES.
- ② IF CONSTRUCTION WORK ZONE SIGNS ARE IN PLACE, W20-1A OR W21-63 ARE NOT REQUIRED.

6



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SDD 15C19 - 06b

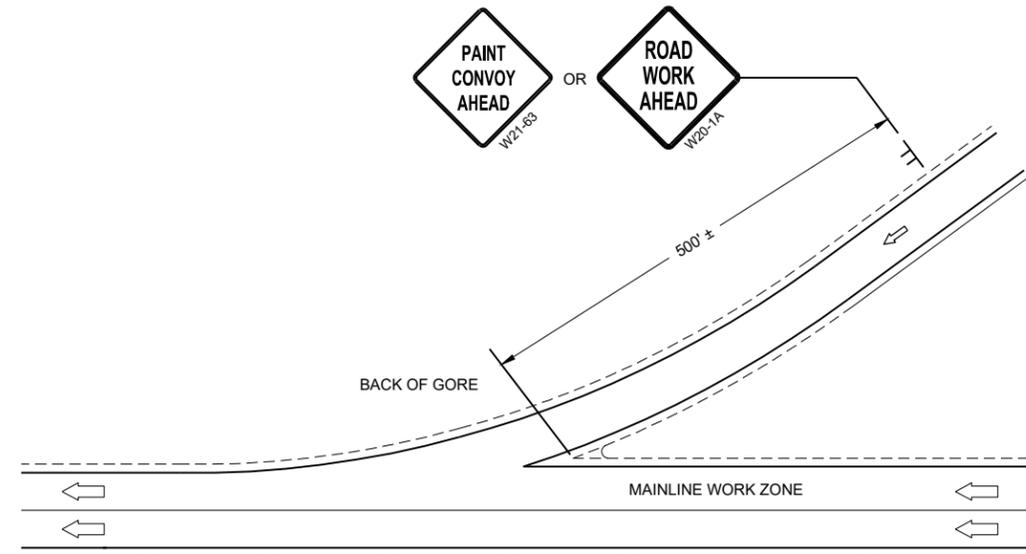
### MOVING PAVEMENT MARKING OPERATIONS MULTILANE UNDIVIDED ROADWAY

<b>MOVING PAVEMENT MARKING OPERATION MULTI-LANE UNDIVIDED ROADWAY</b>	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION	
APPROVED November 2019 DATE	/S/ Andrew Heidtke WORK ZONE ENGINEER
FHWA	

SDD 15C19 - 06b

## LEGEND

- V1 MARKING VEHICLE
- V2 SHADOW VEHICLE
- V3 TRAIL VEHICLE
- TRUCK MOUNTED ATTENUATOR (TMA)
- SIGN ON TEMPORARY SUPPORT
- DIRECTION OF TRAFFIC
- FLASHING ARROW PANEL (MERGE)
- FLASHING ARROW PANEL (CAUTION)



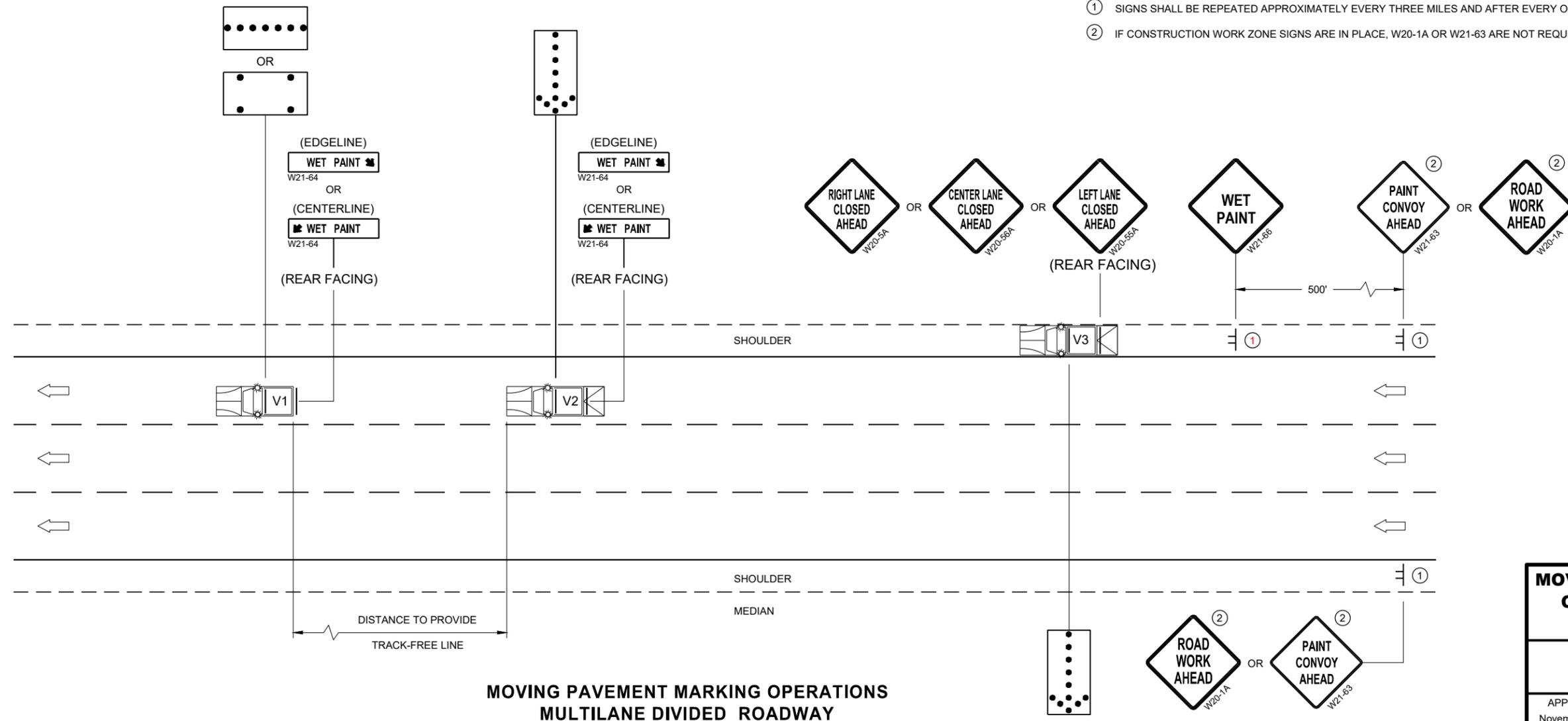
## GENERAL NOTES

- ALL VEHICLES SHALL BE EQUIPPED WITH TWO 360 DEGREE HIGH INTENSITY YELLOW FLASHING LIGHTS OR STROBE LIGHTS AND OPERATED WITH HEADLIGHTS TURNED ON.
- ALL VEHICLES SHALL BE EQUIPPED WITH REAR FACING TYPE B OR C FLASHING ARROW PANEL. SIGNS PLACED ON VEHICLES MUST NOT OBSCURE THE ARROW PANEL.
- ALL SIGNS ARE 48" X 48" UNLESS OTHERWISE SPECIFIED.
- DISTANCE BETWEEN VEHICLES MAY VARY ACCORDING TO TERRAIN, SIGHT DISTANCE, PAINT DRYING TIME, AND OTHER FACTORS. WHENEVER ADEQUATE STOPPING SIGHT DISTANCE EXISTS TO THE REAR, SHADOW VEHICLES SHOULD MAINTAIN THE MINIMUM DISTANCE FROM THE WORK VEHICLE AND PROCEED AT THE SAME SPEED AS THE WORK VEHICLE. SHADOW VEHICLES SHOULD SLOW DOWN IN ADVANCE OF VERTICAL AND HORIZONTAL CURVES THAT RESTRICT SIGHT DISTANCE.
- WHEN WORK ACTIVITY BLOCKS THE LEFT LANE, REVERSE TRAFFIC CONTROL.
- WHEN A RAMP INTERSECTS THE FACILITY ON WHICH THE WORK IS BEING PERFORMED, PROVIDE ADDITIONAL TRAFFIC CONTROLS AS SPECIFIED IN THE CONTRACT OR AS APPROVED BY THE ENGINEER.
- USE AN ATTENUATOR ON THE REARMOST VEHICLE THAT BLOCKS ALL OR PART OF THE TRAFFIC LANE.
- IF THE SHOULDER IS TOO NARROW TO ACCOMMODATE THE LAST TRAILING VEHICLE, THE VEHICLE SHOULD STRADDLE THE EDGE LINE.
- WHEN NO WORK ACTIVITY IS TAKING PLACE, REMOVE OR LAY STATIONARY SIGNS AND SUPPORTS FLAT ON THE GRADE WITH UPRIGHTS ORIENTED PARALLEL TO AND DOWNSTREAM FROM TRAFFIC
- CONES SHOULD BE USED BETWEEN THE MARKING AND SHADOW VEHICLE AT 100 FOOT SPACING. CONES MAY BE OMITTED ON PAINTED LINE IF APPROVED BY THE ENGINEER. CONSIDER PAVEMENT MARKING DRY OR CURE TIMES AND TRAFFIC VOLUME.
- CONES SHALL BE A MINIMUM HEIGHT OF 18" FOR WET PAVEMENT MARKINGS

- ① SIGNS SHALL BE REPEATED APPROXIMATELY EVERY THREE MILES AND AFTER EVERY ON RAMP.
- ② IF CONSTRUCTION WORK ZONE SIGNS ARE IN PLACE, W20-1A OR W21-63 ARE NOT REQUIRED.

6

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SDD 15C19 - 06c

SDD 15C19 - 06c

### MOVING PAVEMENT MARKING OPERATIONS MULTILANE DIVIDED ROADWAY

MOVING PAVEMENT MARKING OPERATION MULTI-LANE DIVIDED ROADWAY	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION	
APPROVED November 2019 DATE	/S/ Andrew Heidtke WORK ZONE ENGINEER
FHWA	

**GENERAL NOTES**

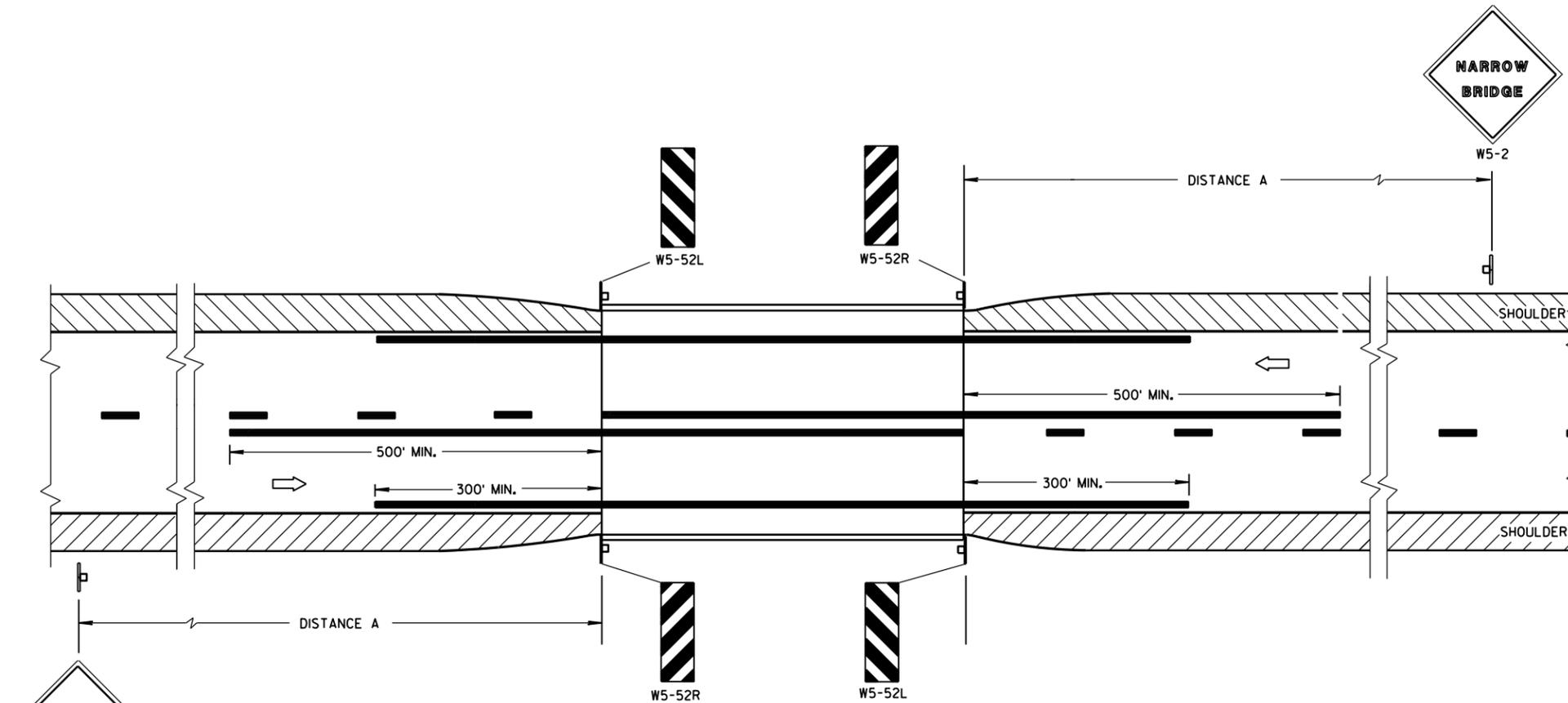
DETAILS OF TRAFFIC CONTROL DEVICES AND INSTALLATION NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS, THE SPECIAL PROVISIONS, AND THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.

LOCATE W5-52 SIGN POST(S) BEHIND GUARDRAIL WHEN PRESENT.

PLACE THE EDGE OF THE W5-52 SIGN IN LINE WITH FACE OF CURB OR PARAPET.

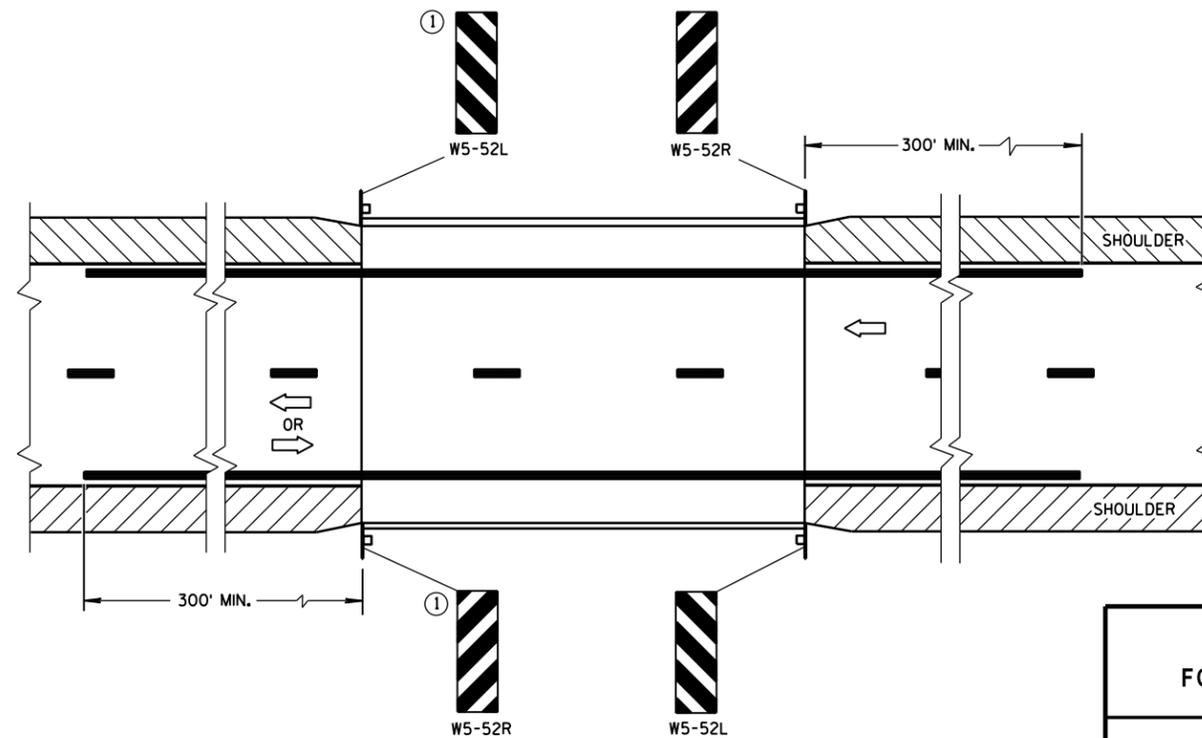
① OMIT ON ONE-WAY TRAVELLED WAYS.

➡ DIRECTION OF TRAFFIC



**SITUATION 1**

WARRANTING CRITERIA:  
BRIDGE WIDTH IS AT LEAST 16 FEET BUT LESS THAN 24 FEET.



**SITUATION 2**

WARRANTING CRITERIA:  
1. BRIDGE WIDTH IS AT LEAST 24 FEET AND  
2. BRIDGE SHOULDER WIDTH IS LESS THAN 6 FEET.

**DISTANCE TABLE**

POSTED OR 85th PERCENTILE SPEED	DISTANCE "A"
25	150'
30	200'
35	250'
40	300'
45	400'
50	550'
55	750'

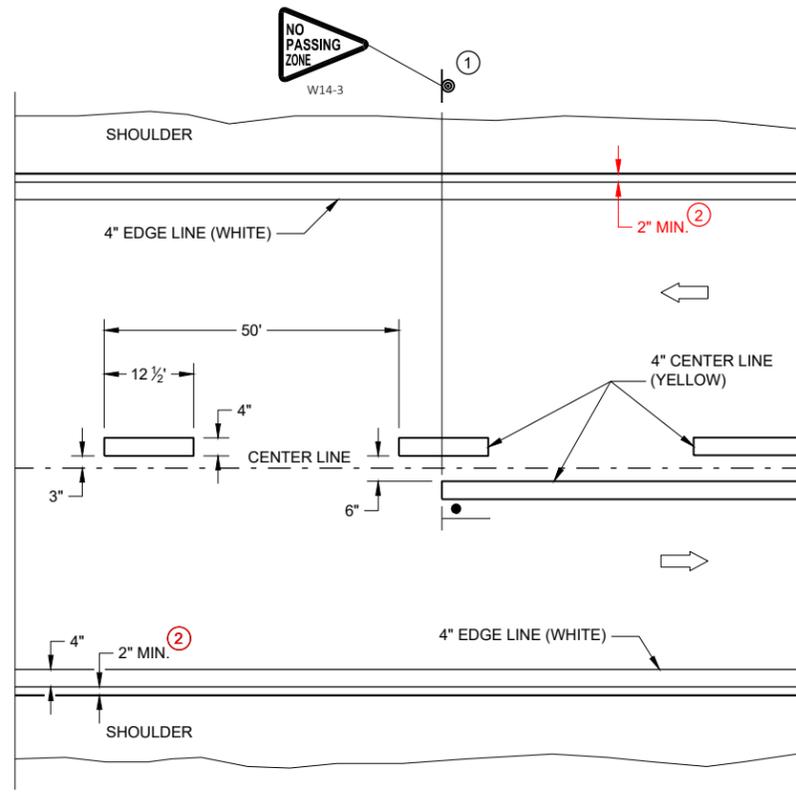
**SIGNING & MARKING FOR TWO LANE BRIDGES**

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

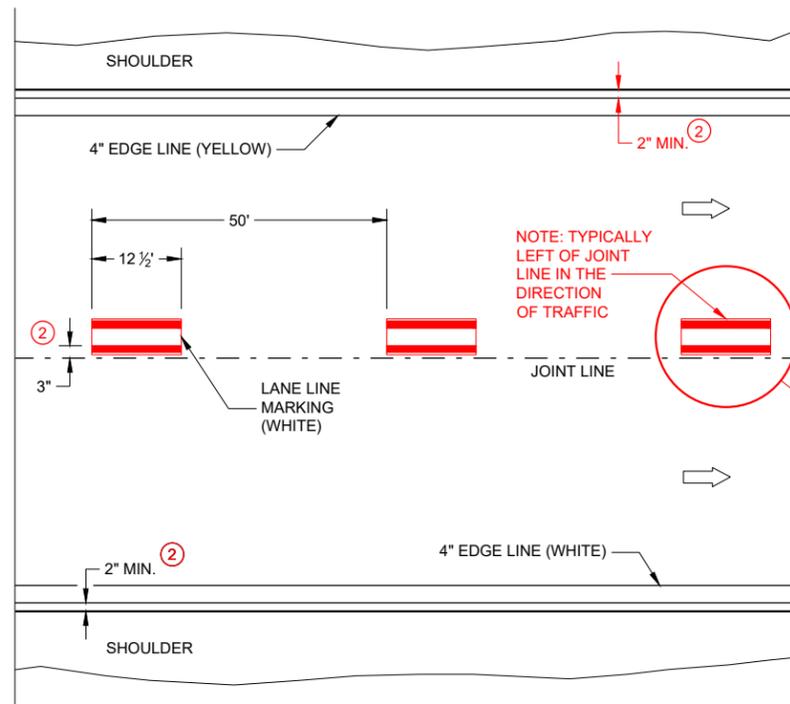
APPROVED  
June 2017 /S/ Matthew R. Rauch  
DATE STATE SIGNING AND MARKING ENGINEER  
FHWA



# SDD 15C08-a Longitudinal Marking (Mainline)

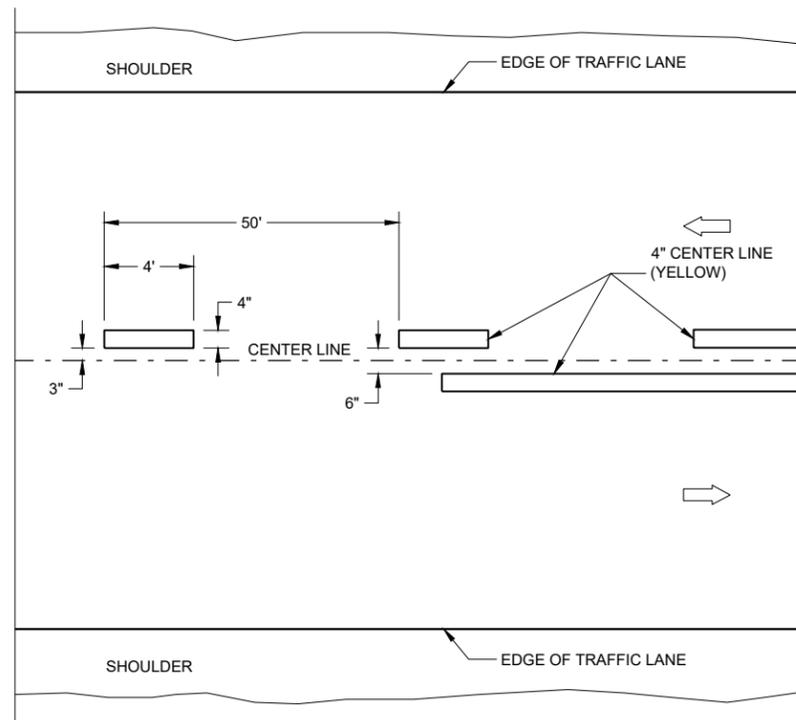


**TWO WAY TRAFFIC**

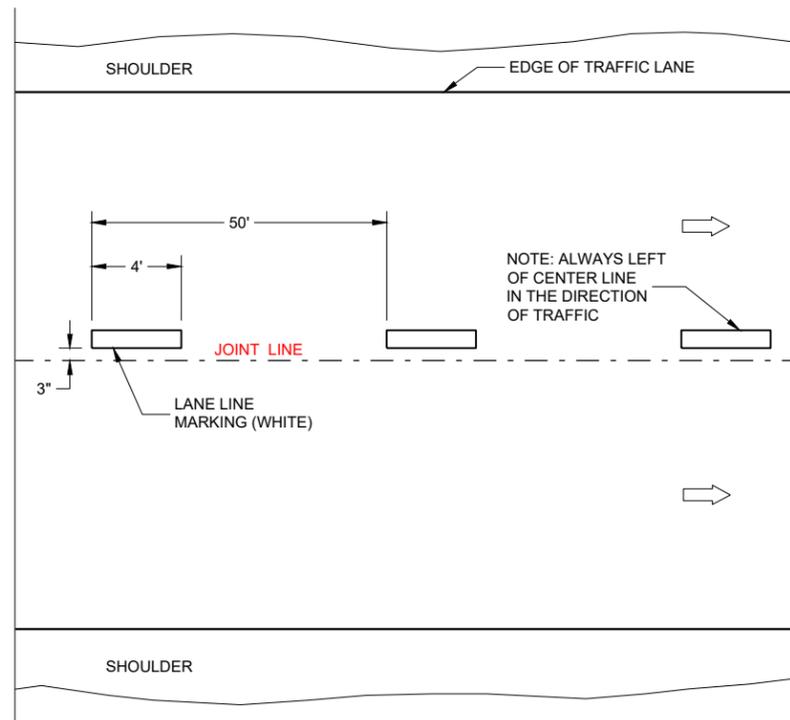


**ONE WAY TRAFFIC**

## PERMANENT PAVEMENT MARKING



**TWO WAY TRAFFIC**



**ONE WAY TRAFFIC**

## TEMPORARY PAVEMENT MARKING

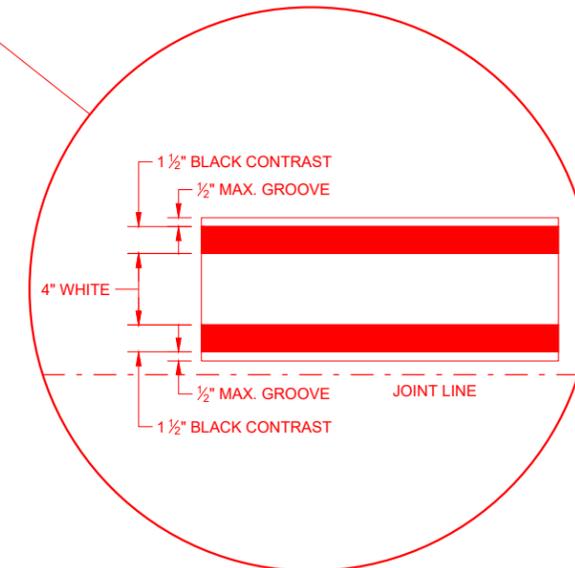
### GENERAL NOTES

DETAILS OF CONSTRUCTION NOT SHOWN ON THIS DRAWING SHALL CONFORM TO STANDARD SPECIFICATIONS AND SPECIAL PROVISIONS.

- ① LOCATE THE NO PASSING ZONE W14-3 SIGN WITH 50 FEET OF THE "T" MARKING
- ② MEASURE FROM EDGE OF MARKING TO JOINT LINE. THIS DOES NOT INCLUDE SPACE NEEDED FOR GROOVING OPERATIONS.

### LEGEND

- "T" MARKING
- SIGN ON PERMANENT SUPPORT
- DIRECTION OF TRAFFIC



### LONGITUDINAL MARKING (MAINLINE)

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

APPROVED  
February 2020 /S/ Matthew Rauch  
DATE STATEWIDE SIGNING AND MARKING  
ENGINEER

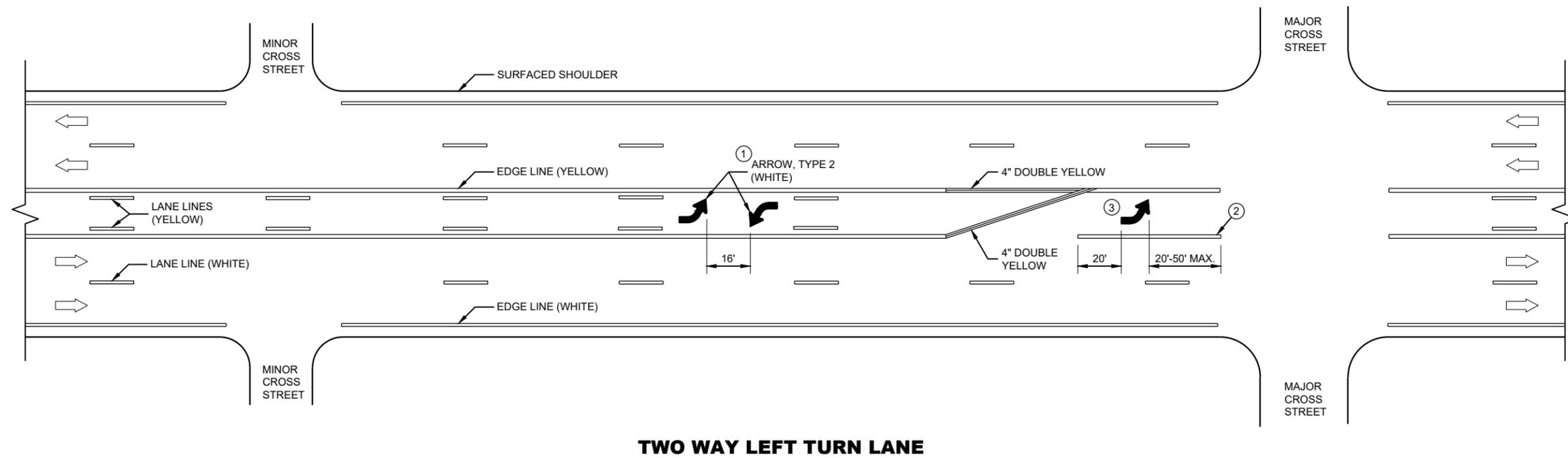


# SDD 15C08-b Pavement Marking (Turn Lanes)

## GENERAL NOTES

- ① A SET OF ARROWS IS REQUIRED EVERY 400 FEET OR NEAR INTERSECTIONS OR DRIVEWAYS WITH TURNING TRAFFIC.
- ② 8" WHITE
- ③ TURN BAY LENGTH OF LESS THAN 48' DOES NOT REQUIRE PAVEMENT ARROWS OR TEXT.

➡ DIRECTION OF TRAFFIC



6

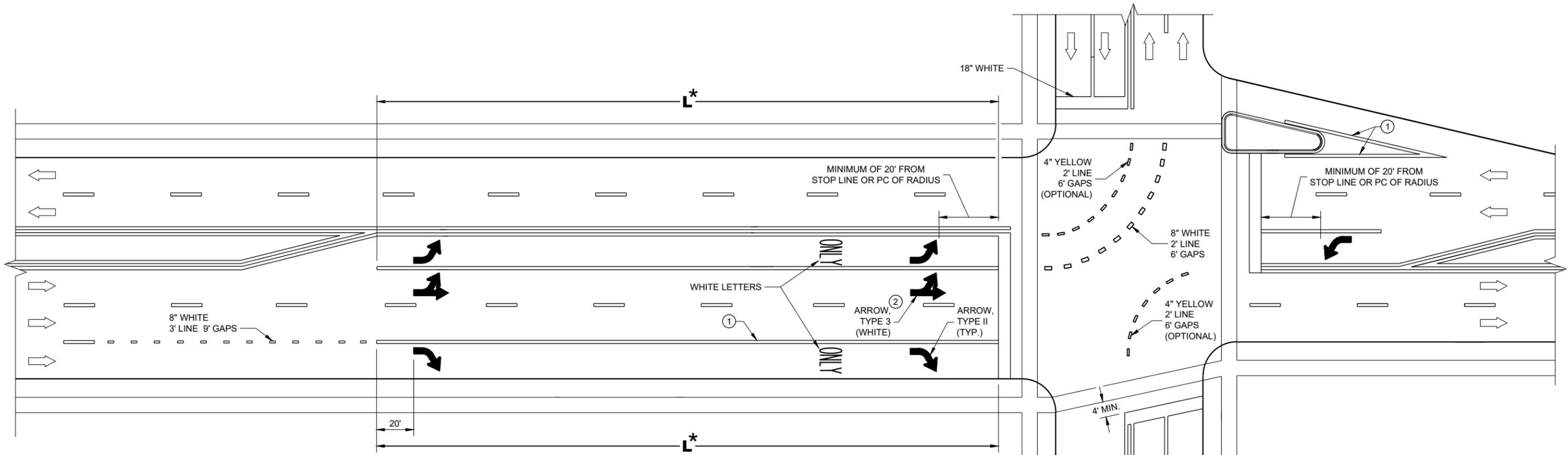
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SDD 15C08 - 20b

SDD 15C08 - 20b

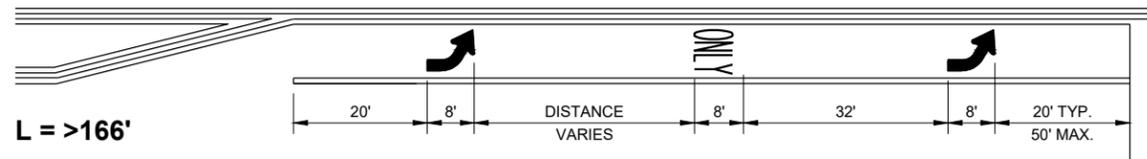
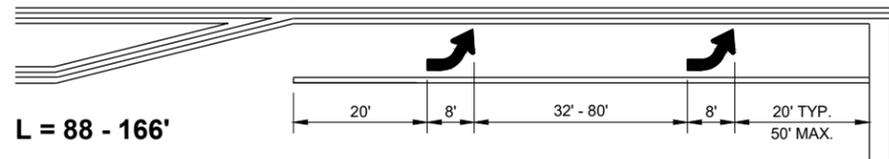
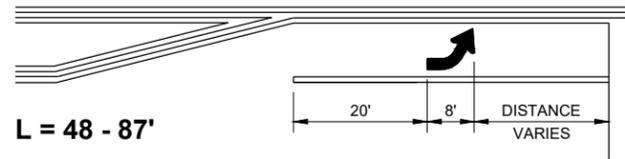
**PAVEMENT MARKING  
(TURN LANES)**

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION



### TURN LANE OPTIONS

LENGTH OF TURN BAY (  $L$  ) OF 0 - 47' DOES NOT REQUIRE PAVEMENT MARKING ARROWS OR WORDS



\*(SEE TURN LANE OPTIONS FOR PLACEMENT OF PAVEMENT MARKING ARROWS AND WORDS)

### GENERAL NOTES

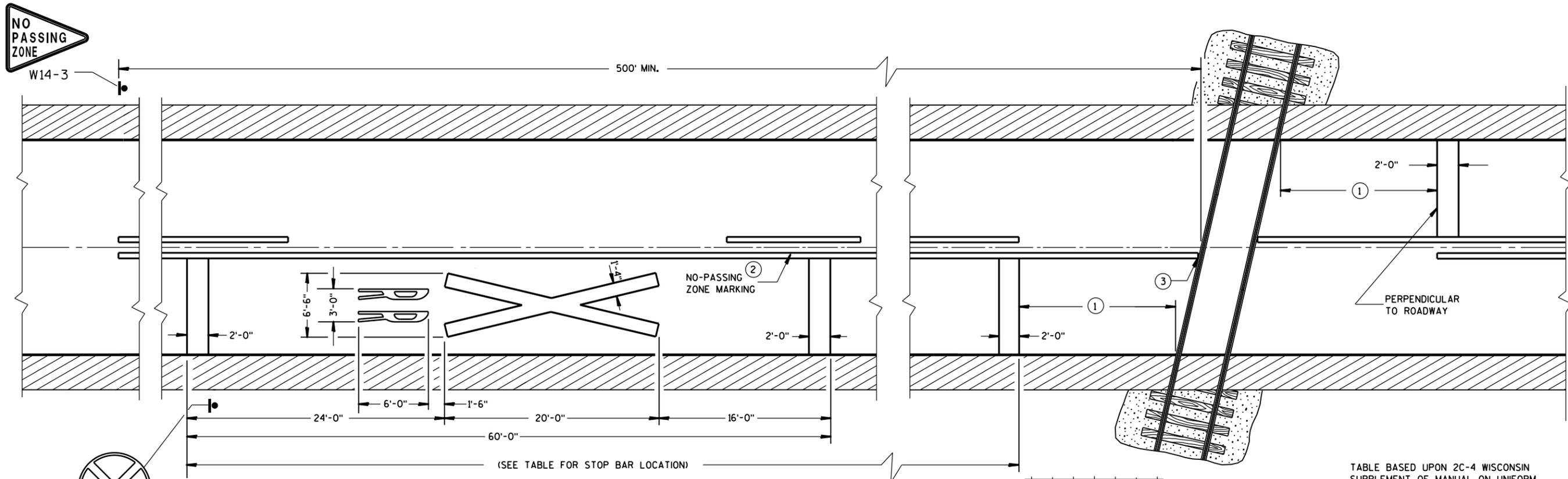
- ① 8" WHITE
- ② QUANTITY AND LOCATION OF TYPE 3 ARROWS ARE THE SAME AS THE TYPE II ARROWS IN THE ADJACENT TURN LANE. FOR TURN LANES WITH A PHYSICAL SEPARATION IN THE SAME DIRECTION OF TRAVEL, THE ARROWS AND "ONLY" MARKING **MAY BE ELIMINATED**.

➡ DIRECTION OF TRAFFIC

$L$  = LENGTH OF TURN BAY

### PAVEMENT MARKING (TURN LANES)

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

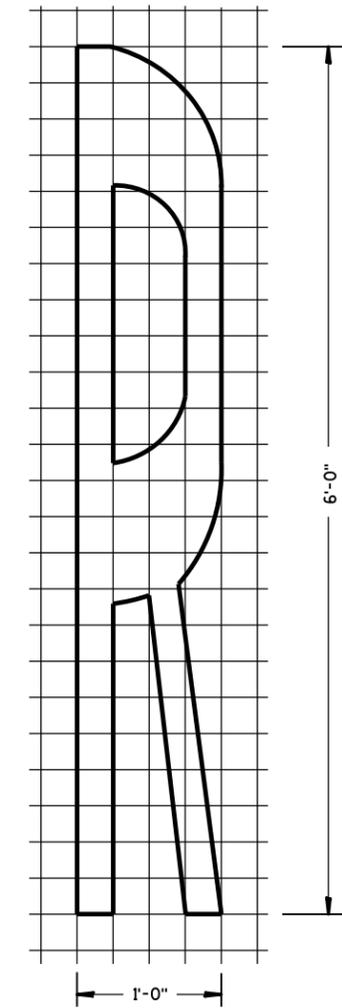


**PAVEMENT MARKING**

TABLE BASED UPON 2C-4 WISCONSIN SUPPLEMENT OF MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.

Posted Speed (M.P.H.)	Dimension Range (Feet)
25	150* - 250
30	200* - 300
35	250* - 450
40	300* - 500
45	400* - 650
50	550* - 800
55	750* - 1000
60	1000* - 1250
65	1000* - 1250

\* THE MINIMUM DISTANCES IN THE TABLE ARE DESIRABLE AND SHOULD BE USED. THE DISTANCES MAY BE INCREASED UP TO THE MAXIMUM TO ALLOW FOR FIELD CONDITIONS SUCH AS THE CLOSE PROXIMITY OF DRIVEWAYS, BRIDGES, SIDEROADS OR OTHER FEATURES THAT WOULD PROHIBIT THE MINIMUM DISTANCES FROM BEING USED.



**GENERAL NOTES**

DETAILS OF CONSTRUCTION, MATERIALS, AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND THE APPLICABLE SPECIAL PROVISIONS.

ON MULTI-LANE ROADS THE TRANSVERSE BANDS SHOULD EXTEND ACROSS ALL APPROACH LANES, AND INDIVIDUAL R X R SYMBOLS SHOULD BE USED IN EACH APPROACH LANE.

CENTER OR LANE LINES AND NO-PASSING ZONE MARKINGS SHOWN ON THIS DRAWING ARE REQUIRED AND PAID FOR UNDER OTHER ITEMS IN THE CONTRACT.

RETRACE EXISTING SYMBOL WHERE EXISTING SYMBOLS ARE PLACED.

- ① MINIMUM 8' FROM ANY RAILROAD WARNING DEVICES (SIGNALS, GATES, ETC.) OR 25' FROM THE NEAREST RAIL, WHICHEVER DISTANCE IS GREATER.
- ② 500' MINIMUM. MARKING LIMITS MAY BE EXTENDED AS DIRECTED BY THE ENGINEER TO MEET ADJACENT NO-PASSING ZONE MARKINGS.
- ③ FOR MULTIPLE TRACK CROSSINGS, THE BARRIER LINE SHALL EXTEND TO THE NEAR RAIL OF THE FURTHEST TRACK IN THE DIRECTION OF HIGHWAY TRAVEL.

**SIGNING AND PAVEMENT MARKING DETAILS FOR RAILROAD-HIGHWAY GRADE CROSSINGS**

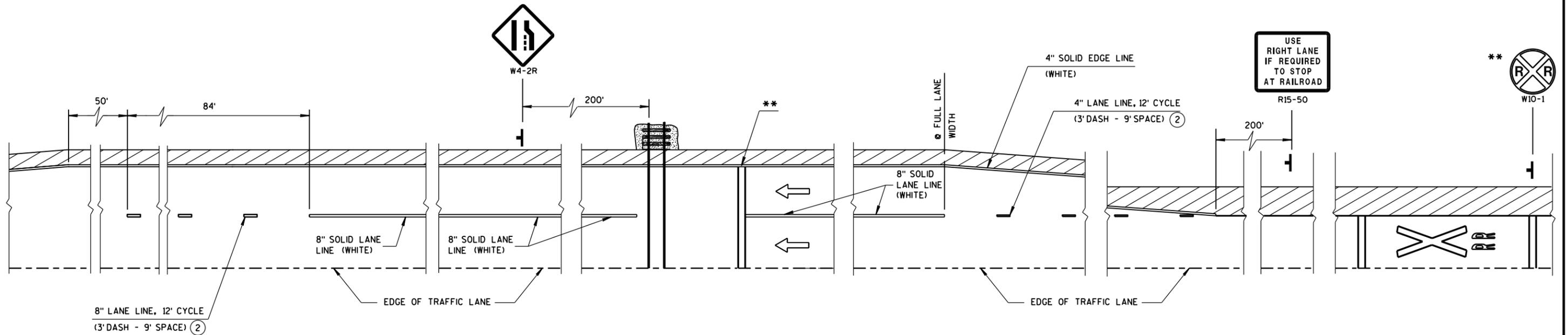
STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

APPROVED  
 Sept., 2017 /S/ Matthew R. Rauch  
 DATE STATE SIGNING AND MARKING ENGINEER  
 FHWA

**GENERAL NOTES**

SIGNING AND MARKING IS SHOWN AS TYPICAL PLACEMENT, FIELD CONDITIONS MAY DICTATE CHANGES IN SIGNING AND MARKING PLACEMENT.

- ① INSTALLED FOR EXPRESSWAYS.
- ② 3' LINE 9' GAP, EXCEPT RETRACE THE EXISTING LINE - GAP PATTERN WHERE EXISTING MARKINGS ARE IN PLACE.



**DETAIL FOR TRUCK STOPPING LANE PAVEMENT MARKINGS**

**LEGEND**

- DIRECTION OF TRAFFIC FLOW
- \*\* SEE "SIGNING AND PAVEMENT MARKING DETAILS FOR RAILROAD - HIGHWAY GRADE CROSSING" FOR LOCATION OF ADVANCE MARKINGS.
- POST MOUNTED SIGN



<b>TRUCK STOPPING LANE PAVEMENT MARKINGS</b>	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION	
APPROVED	/S/ Matthew R. Rauch
DATE	STATE SIGNING AND MARKING ENGINEER
FHWA	

6

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S.D.D. 15 C 9-11b

S.D.D. 15 C 9-11b



# SDD 15C12 Traffic Control for Lane Closure With Flagging Operation

## LEGEND

- SIGN ON PORTABLE OR PERMANENT SUPPORT
- TEMPORARY PORTABLE RUMBLE STRIP ARRAY
- DIRECTION OF TRAFFIC
- WORK AREA
- FLAGGER, EQUIPPED WITH STOP/SLOW PADDLE FASTENED ON SUPPORT STAFF

## GENERAL NOTES

DETAILS OF TRAFFIC CONTROL DEVICES AND INSTALLATION NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS, THE SPECIAL PROVISIONS, AND THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.

ALL SIGNS ARE 48" X 48" UNLESS OTHERWISE NOTED.

"WO" SIGNS ARE THE SAME AS "W" SIGNS EXCEPT THE BACKGROUND IS ORANGE.

THE EXACT NUMBER, LOCATION AND SPACING OF ALL SIGNS, DEVICES, AND LOCATION OF ALL FLAGGERS SHALL BE ADJUSTED TO FIT FIELD CONDITIONS AS APPROVED BY THE ENGINEER.

THE FIRST ADVANCE WARNING SIGN SHOULD TYPICALLY BE LOCATED IN ADVANCE OF THE ANTICIPATED TRAFFIC BACKUP OR QUEUE.

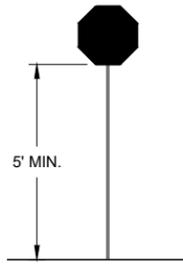
WHEN A SIDE ROAD OR RAMP INTERSECTS THE FACILITY ON WHICH THE WORK IS BEING PERFORMED, ADDITIONAL TRAFFIC CONTROLS SHALL BE PROVIDED AS SPECIFIED IN THE PLANS AND/OR THE SPECIAL PROVISIONS OR AS APPROVED BY THE ENGINEER.

## FLAGGING

- FLAGGERS SHALL BE IN SIGHT OF EACH OTHER OR IN DIRECT COMMUNICATION AT ALL TIMES. THEY SHALL BE EQUIPPED WITH STOP/SLOW PADDLES FASTENED ON SUPPORT STAFFS. WHEN THE FLAGGING OPERATION IS NOT IN EFFECT REMOVE TEMPORARY PORTABLE RUMBLE STRIPS PRIOR TO COVERING OR REMOVING ALL ADVANCE SIGNING.
- FOR MOVING WORK OPERATIONS, POST ADDITIONAL W20-7A FLAGGER SIGNS AT APPROXIMATELY 3,500' INTERVALS IN THE MOVING WORK OPERATION OR AS APPROVED BY THE ENGINEER.
  - SIGN NOT REQUIRED IF FLAGGING OPERATION OCCURS WITHIN A SIGNED ROAD WORK ZONE AREA.
- WHEN THE DISTANCE BETWEEN FLAGGERS EXCEEDS 2 MILES, A PILOT CAR IS REQUIRED. WHEN CURVES REDUCE SIGHT DISTANCE BELOW 400', A PILOT CAR IS REQUIRED.

## TEMPORARY PORTABLE RUMBLE STRIPS

- UTILIZE TEMPORARY PORTABLE RUMBLE STRIPS ON ALL FLAGGING OPERATIONS.
- EACH TEMPORARY PORTABLE RUMBLE STRIP ARRAY CONSISTS OF THREE RUMBLE STRIPS SPACED ACCORDING TO MANUFACTURER'S RECOMMENDATION, PLACED TRANSVERSE ACROSS THE LANE AT LOCATIONS SHOWN.
- ONLY USE TEMPORARY PORTABLE RUMBLE STRIPS FOR THE APPROVED PRODUCTS LIST.
- INSTALL TEMPORARY RUMBLE STRIPS PER MANUFACTURER'S RECOMMENDATIONS.
- PLACE ADVANCE SIGNING PRIOR TO INSTALLING TEMPORARY RUMBLE STRIPS.
- DO NOT INSTALL TEMPORARY PORTABLE RUMBLE STRIPS ON GRAVEL, MILLED SURFACES, OR ASPHALT THAT HAS BEEN PAVED LESS THAN 12 HOURS.



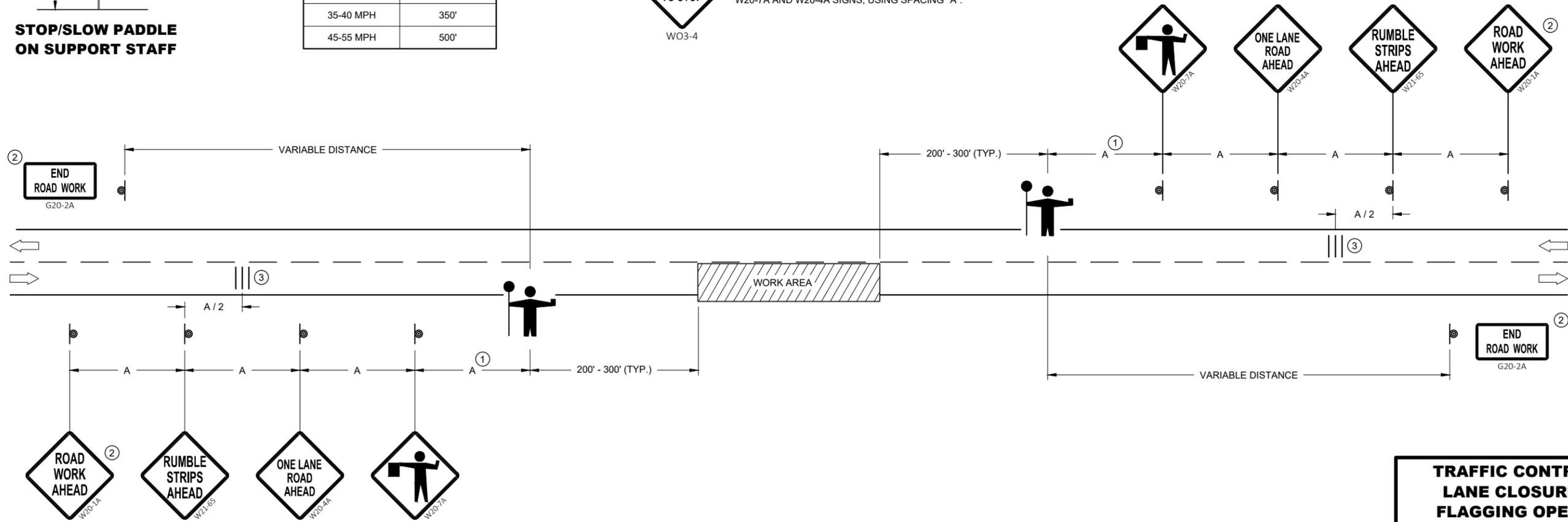
STOP/SLOW PADDLE ON SUPPORT STAFF

## SIGN AND TEMPORARY RUMBLE STRIP ARRAY SPACING TABLE

SPEED LIMIT	SPACING "A"
25-30 MPH	200'
35-40 MPH	350'
45-55 MPH	500'



USE OF W03-4 SIGN IS OPTIONAL. WHEN USED, THIS SIGN SHALL BE LOCATED BETWEEN THE W20-7A AND W20-4A SIGNS, USING SPACING "A".



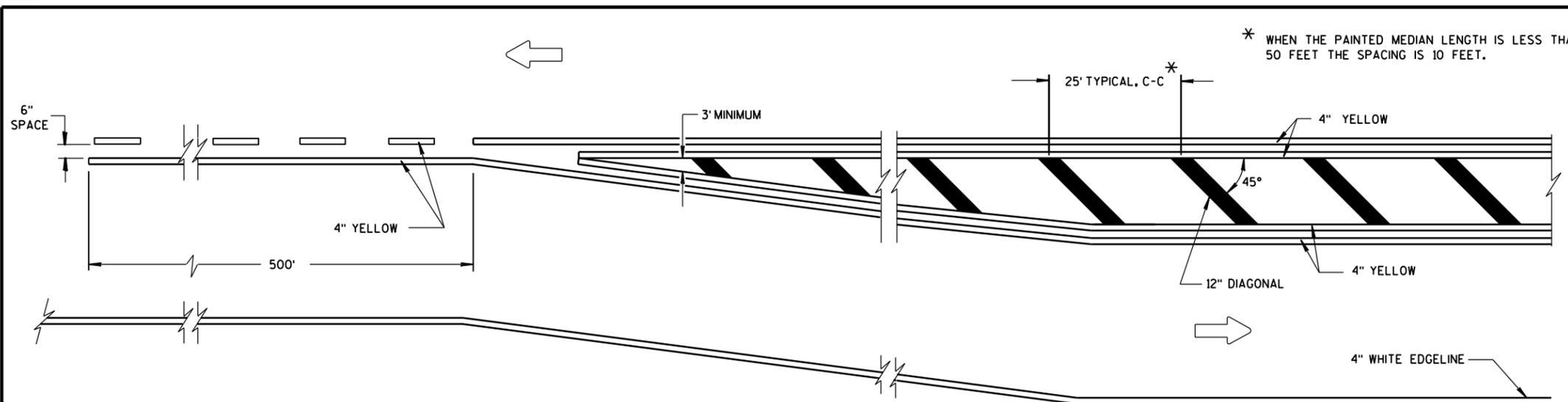
## TRAFFIC CONTROL FOR LANE CLOSURE WITH FLAGGING OPERATION

### TRAFFIC CONTROL FOR LANE CLOSURE WITH FLAGGING OPERATION

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

APPROVED  
DATE: May 2019 /S/ Andrew Heidtke  
WORK ZONE ENGINEER

FHWA

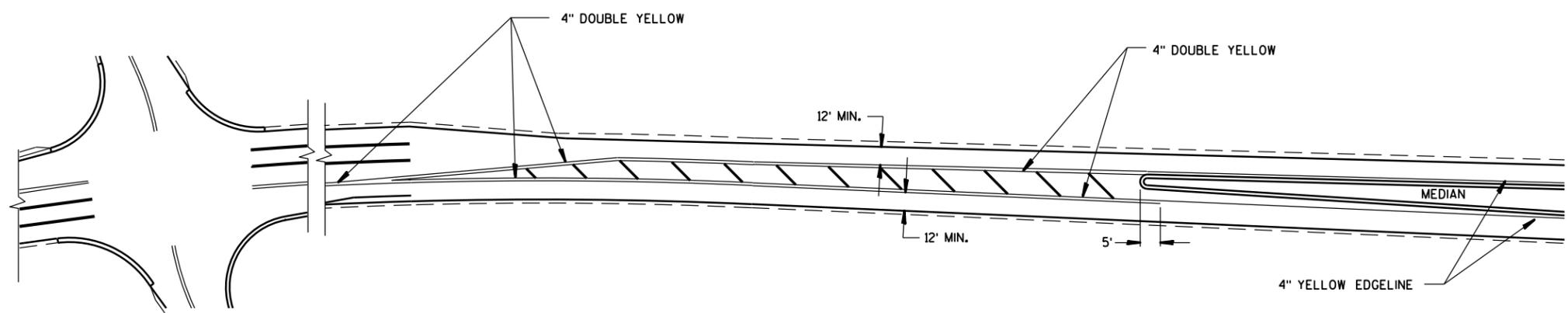


MEDIAN ISLAND DETAIL

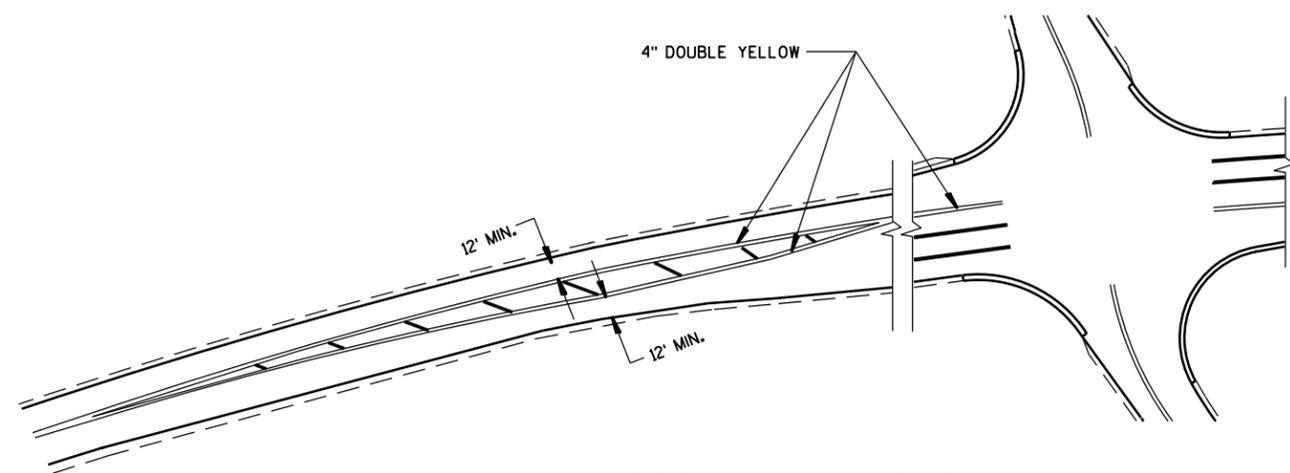
**GENERAL NOTE**

DIAGONALS ARE OPTIONAL WHEN PAINTED ISLAND IS LESS THAN 6 FEET AT WIDEST POINT.

➔ DIRECTION OF TRAVEL



APPROACH MARKINGS FOR OTHER MEDIAN TYPES



NON APPROACH MARKINGS

6

6

S.D.D. 15 C 18-4

S.D.D. 15 C 18-4

<b>MEDIAN ISLAND MARKING</b>	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION	
APPROVED June 2017 DATE	/S/ Matthew Rauch STATE SIGNING AND MARKING ENGINEER
FHWA	



# SDD 15C21 Signing and Marking for Two Lane to Four Lane Divided Transitions

## GENERAL NOTES

SIGNING AND MARKING IS SHOWN AS TYPICAL PLACEMENT. FIELD CONDITIONS MAY DICTATE CHANGES IN SIGNING AND MARKING PLACEMENT.

① USED ONLY WHEN APPROVED BY REGION TRAFFIC ENGINEER.

\* SIGNS MAY BE OMITTED IF SPACE DOES NOT PERMIT PLACEMENT.

\*\* IF POSTED SPEED IS 45 MPH OR GREATER, PLACE W5-54 SIGN UNDER R4-7 SIGN. MOUNT W5-54 SIGN AT 4' MOUNTING HEIGHT (TOP OF ROADWAY TO BOTTOM OF SIGN).

## LEGEND

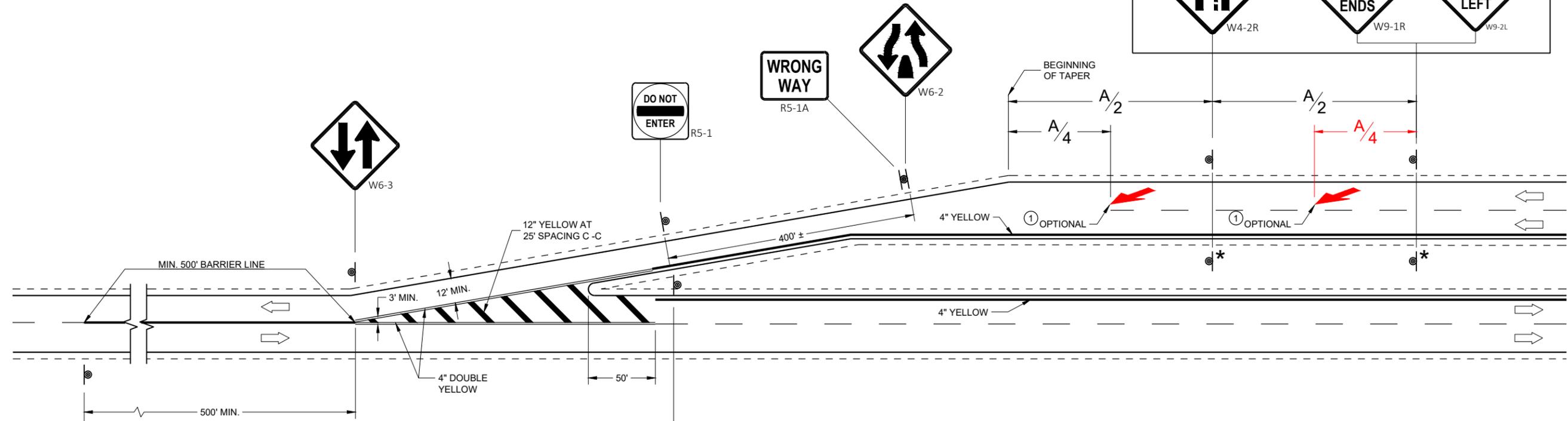
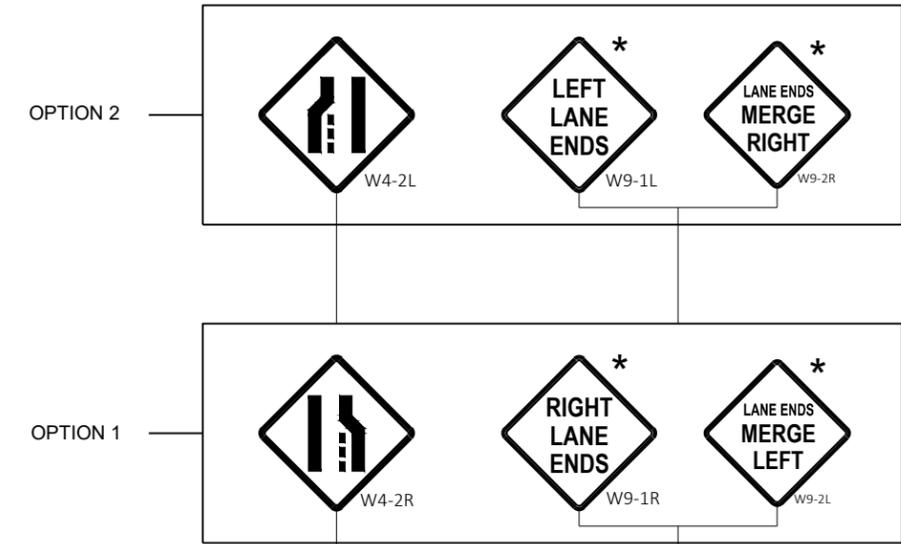
A DISTANCE DEPENDENT ON SPEED (SEE TABLE)

⊙ SIGN MOUNTED ON PERMANENT SUPPORT

➡ DIRECTION OF TRAFFIC

## DISTANCE TABLE

POSTED OR 85TH PERCENTILE SPEED	DISTANCE "A"
25	325'
30	460'
35	565'
40	670'
45	775'
50	885'
55	990'
65	1200'
70	1250'



6

6

SDD 15C21 - 10

SDD 15C21 - 10

DRAFT  
1/31/20

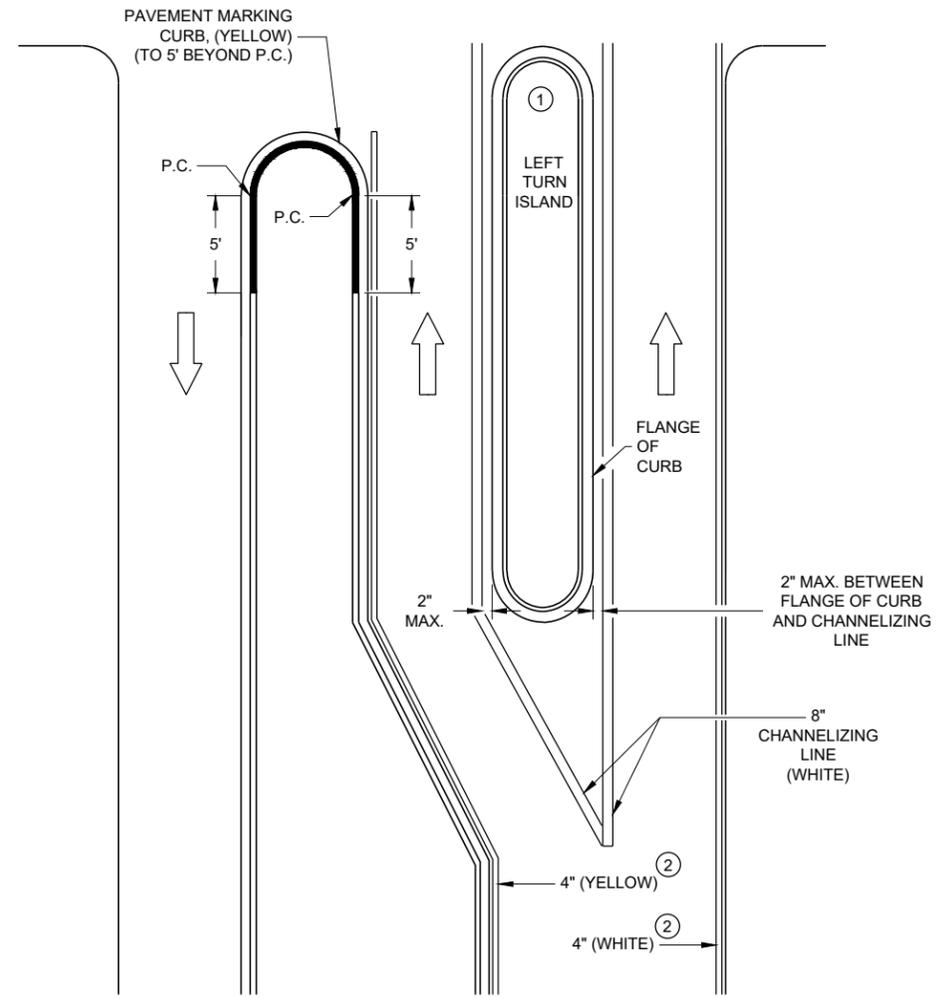
SIGNING AND MARKING TWO LANE TO FOUR LANE DIVIDED TRANSITIONS	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION	
APPROVED	/S/
DATE	STATE SIGNING AND MARKING ENGINEER
FHWA	

REQUIREMENTS FOR EDGE LINES		
POSTED SPEED	IS THERE CONTINUOUS LIGHTING?	
	YES	NO
≤ 30 MPH	NO	OPTIONAL
35 OR 40 MPH	OPTIONAL	RECOMMENDED
≥ 45 MPH	RECOMMENDED	REQUIRED

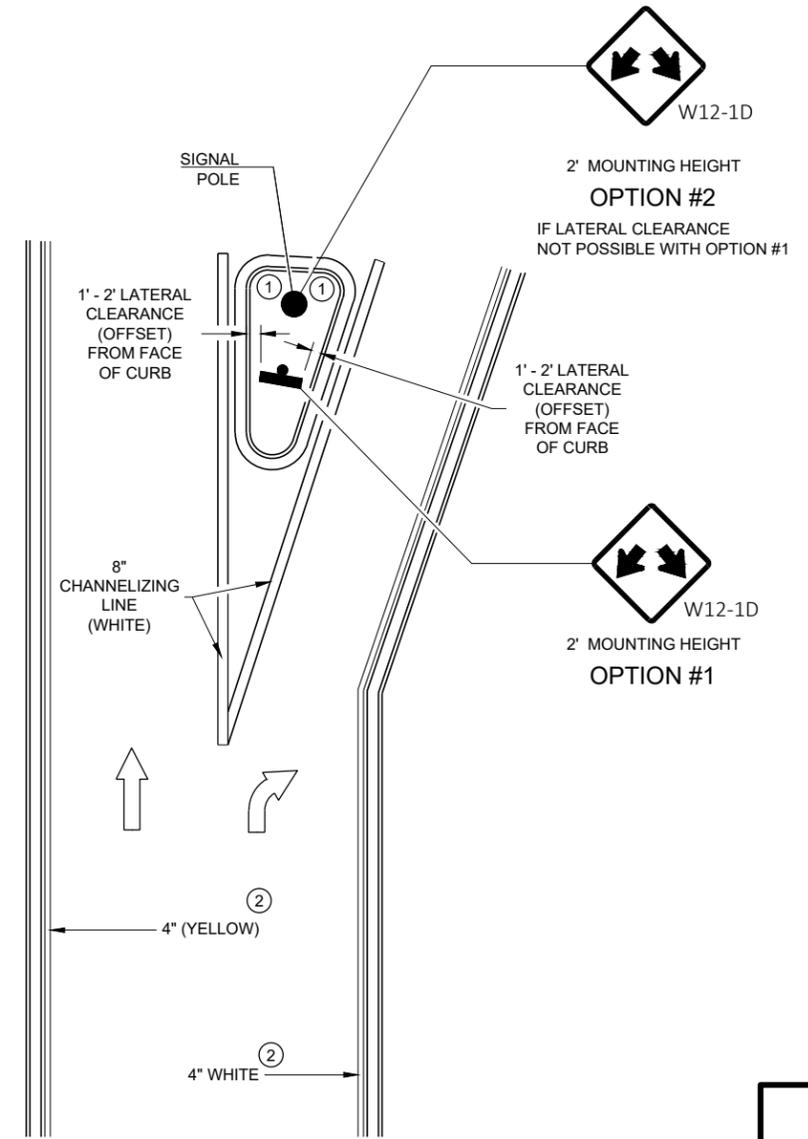
**GENERAL NOTES**

APPLIES TO ISLANDS AT LEFT TURNS AT ONE WAY ROADWAYS AS WELL.  
SEE MISCELLANEOUS QUANTITIES FOR SIGN SIZE.

- ① MARK CURB NOSES YELLOW.
- ② MARK ACCORDING TO TABLE.



**LEFT TURN & MEDIAN ISLAND**

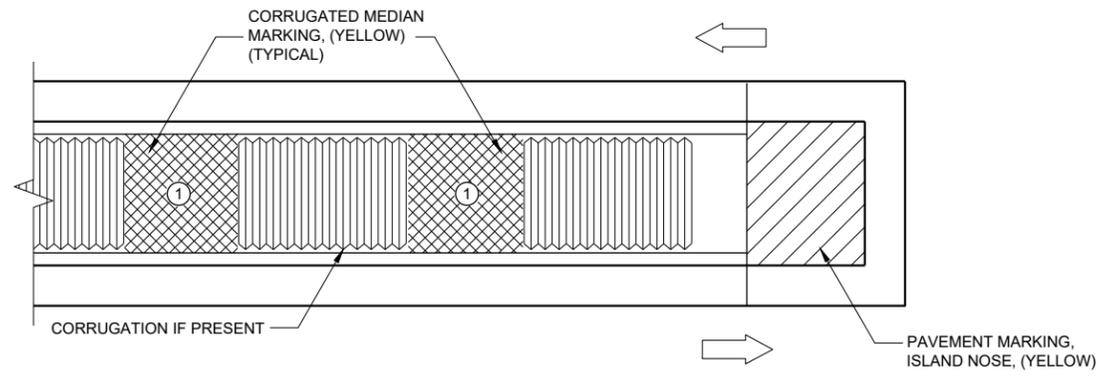


**RIGHT TURN ISLAND**

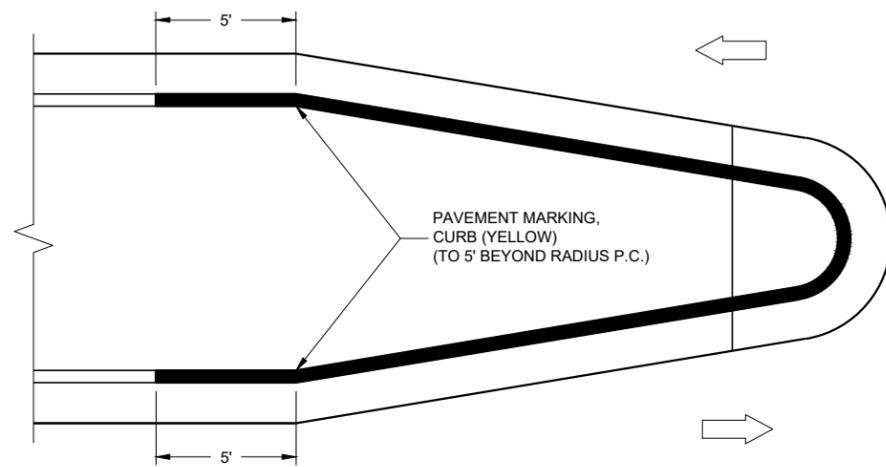
**DOUBLE ARROW  
WARNING SIGN PLACEMENT**

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

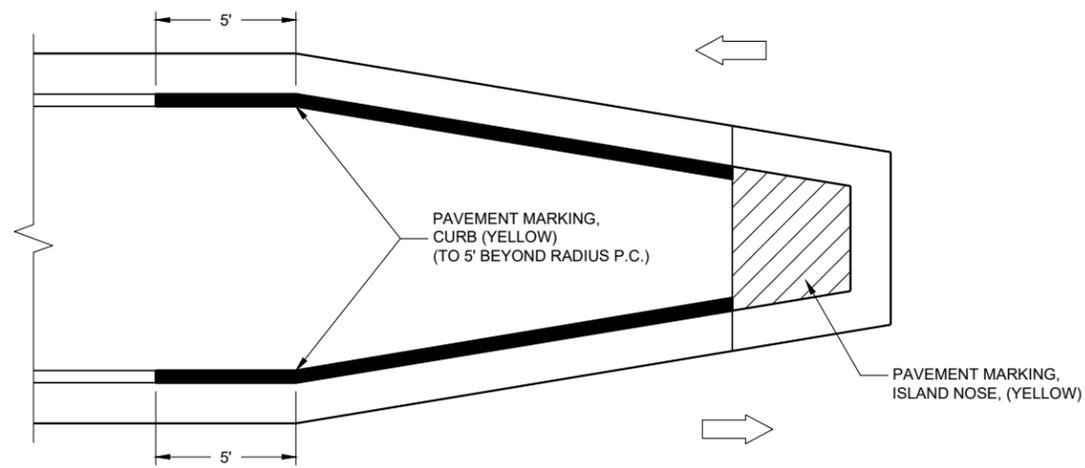
APPROVED  
7/2018 /S/ Matthew R. Rauch  
DATE STATE SIGNING AND MARKING ENGINEER



MEDIAN ISLAND WITH SQUARE BLUNT NOSE



MEDIAN ISLAND WITH ROUND BLUNT NOSE



MEDIAN ISLAND WITH SLOPED NOSE

**TYPICAL PLACEMENT OF PAVEMENT MARKING ON MEDIAN ISLANDS**

**GENERAL NOTES**

WHEN CONCRETE CORRUGATED MEDIAN IS CONSTRUCTED TO SEPARATE TRAFFIC OPERATING IN THE OPPOSING DIRECTION, YELLOW PAVEMENT MARKING SHALL BE APPLIED TO THE FLAT PORTION OF THE CONCRETE CORRUGATED MEDIAN. THE ITEM OF PAVEMENT MARKING, CONCRETE CORRUGATED MEDIAN, WILL BE MEASURED IN PLACE AND ACCEPTED IN ACCORDANCE WITH THE CONTRACT AND PAID FOR AT THE CONTRACT UNIT PRICE PER SQUARE FOOT.

-  ISLAND NOSE MARKING
-  CURB MARKING
-  CORRUGATED MEDIAN MARKING
-  DIRECTION OF TRAVEL

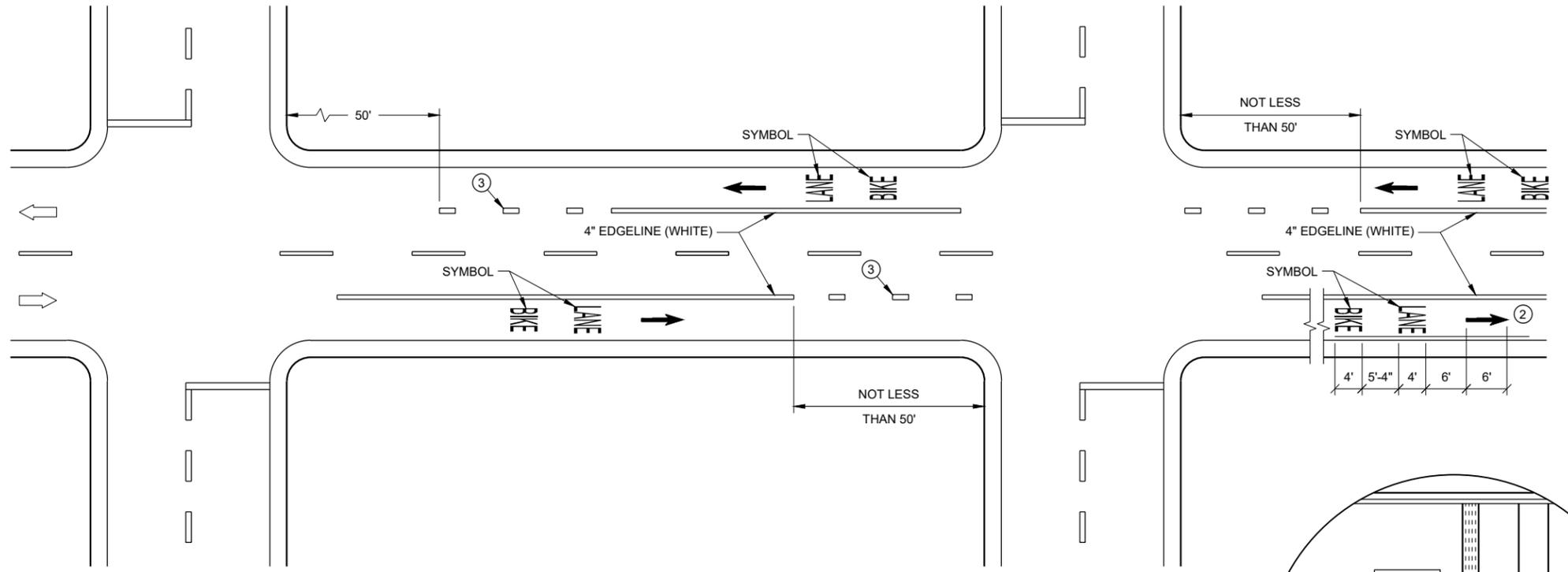
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SDD 15C27 - 03b

SDD 15C27 - 03b

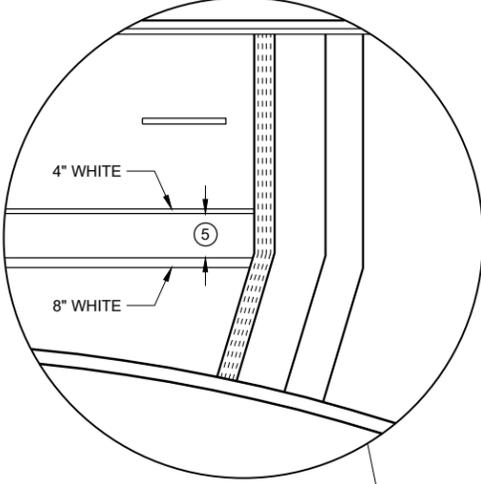
<b>PAVEMENT MARKINGS (ISLANDS)</b>	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION	
APPROVED 7/2018 DATE	/S/ Matthew R. Rauch STATE SIGNING AND MARKING ENGINEER
<small>FHWA</small>	



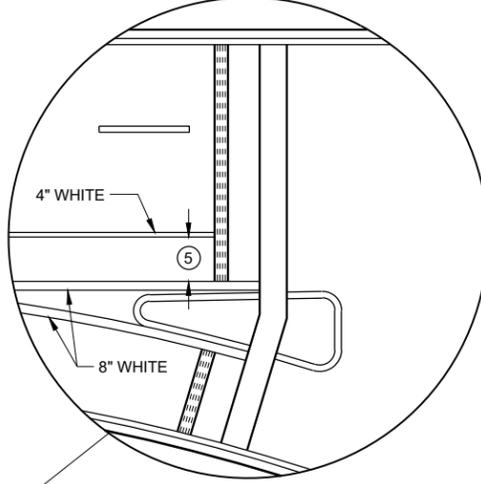
**DESIGNATED BIKE LANE - NO PARKING**

- GENERAL NOTES**
- ① DETAILS OF CONSTRUCTION NOT SHOWN ON THIS DRAWING SHALL CONFORM TO STANDARD SPECIFICATIONS AND SPECIAL PROVISIONS.
  - ② MINIMUM OF ONE PER BLOCK. MAXIMUM OF 250 FEET.
  - ③ DOTTED LINES (3' LINE, 9' GAP) SHOULD BE USED 50 FEET TO 200 FEET IN ADVANCE OF AN INTERSECTION WHERE THERE IS NO RIGHT TURN ONLY LANE AND THERE IS HEAVY RIGHT TURN TRAFFIC OR THERE IS A NEAR-SIDE BUS STOP. AT OTHER INTERSECTIONS WHERE RIGHT TURN TRAFFIC IS LIGHT TO MODERATE, A SOLID LINE CAN BE USED UP TO THE INTERSECTION.
  - ④ IF SIGNED AND/OR MARKED AS A BICYCLE FACILITY INCLUDE SECOND LINE OF LINE-SPACE MARKING, OTHERWISE DO NOT.
  - ⑤ BIKE ACCOMMODATION IS TYPICALLY 5 FEET WIDE AND MINIMUM OF 4 FEET FROM A LONGITUDINAL JOINT. USE 5 FEET AT  $\geq 45$  MPH.
  - ⑥ OMIT THESE MARKINGS FOR WIDER TURN LANE APPLICATIONS (MINIMUM OF 15 FOOT WIDE TURN LANE).
  - ⑦ REFER TO CONTRACT PLANS FOR LANE WIDTH.

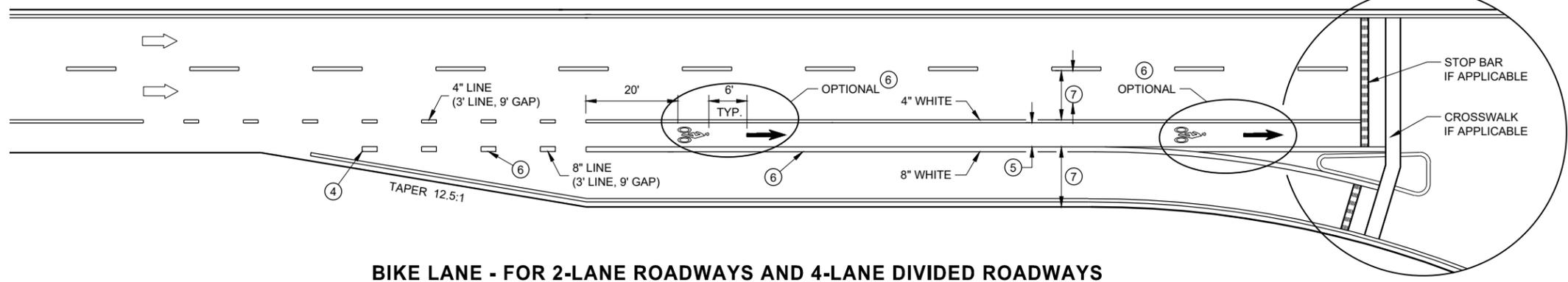
➡ DIRECTION OF TRAVEL



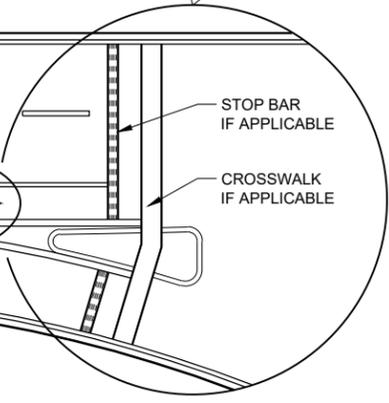
**4 LANE DIVIDED WITHOUT ISLAND**



**4 LANE DIVIDED WITH ISLAND**



**BIKE LANE - FOR 2-LANE ROADWAYS AND 4-LANE DIVIDED ROADWAYS (4-LANE DIVIDED WITH RIGHT TURN LANE SHOWN)**



**BIKE LANE MARKING**

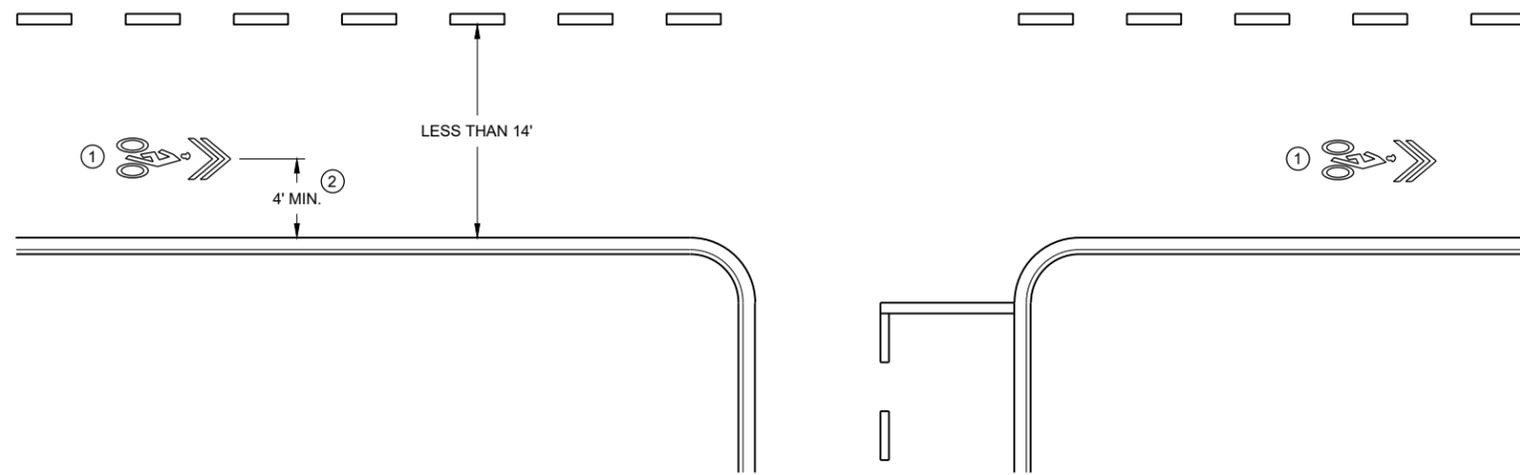
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7/2018 /S/ Matthew R. Rauch  
DATE STATE SIGNING AND MARKING ENGINEER

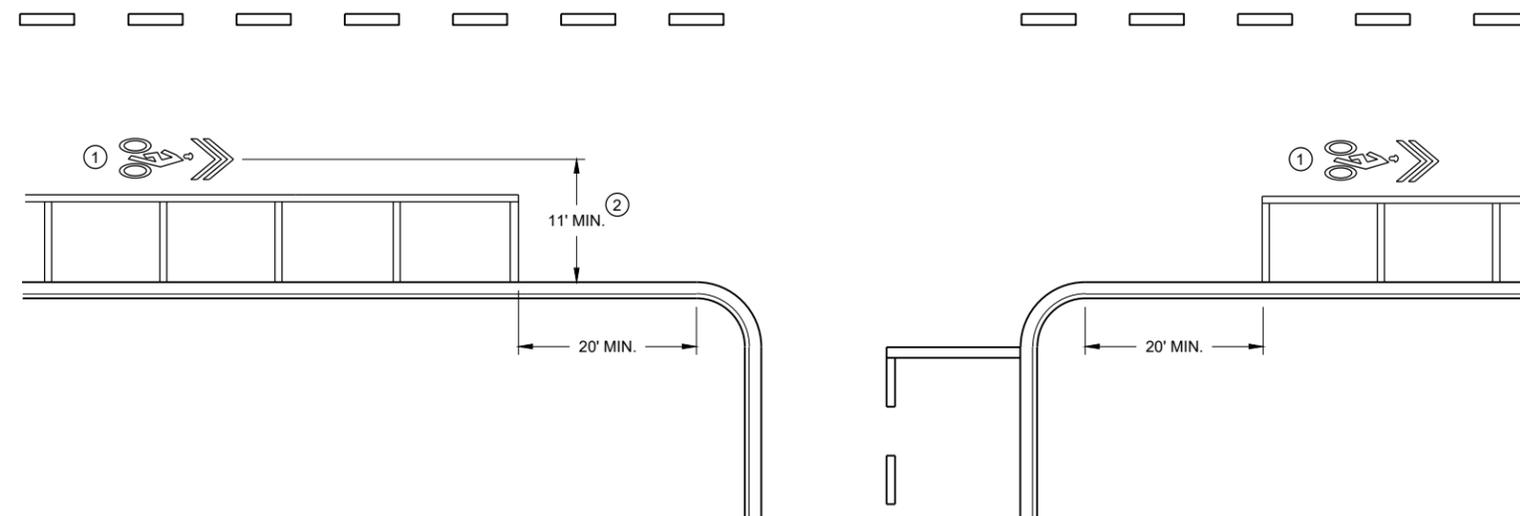
FHWA

**GENERAL NOTES**

- ① MINIMUM OF ONE PER BLOCK, MAXIMUM OF 250 FEET.
- ② OR TO EDGE OF PAVEMENT WITHOUT CURB.



**WITHOUT PARKING**



**WITH PARKING**

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SDD 15C29 - 06b

SDD 15C29 - 06b

**PAVEMENT MARKING  
FOR SHARED LANE  
35 MPH OR LESS**

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7/2018  
DATE

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ENGINEER

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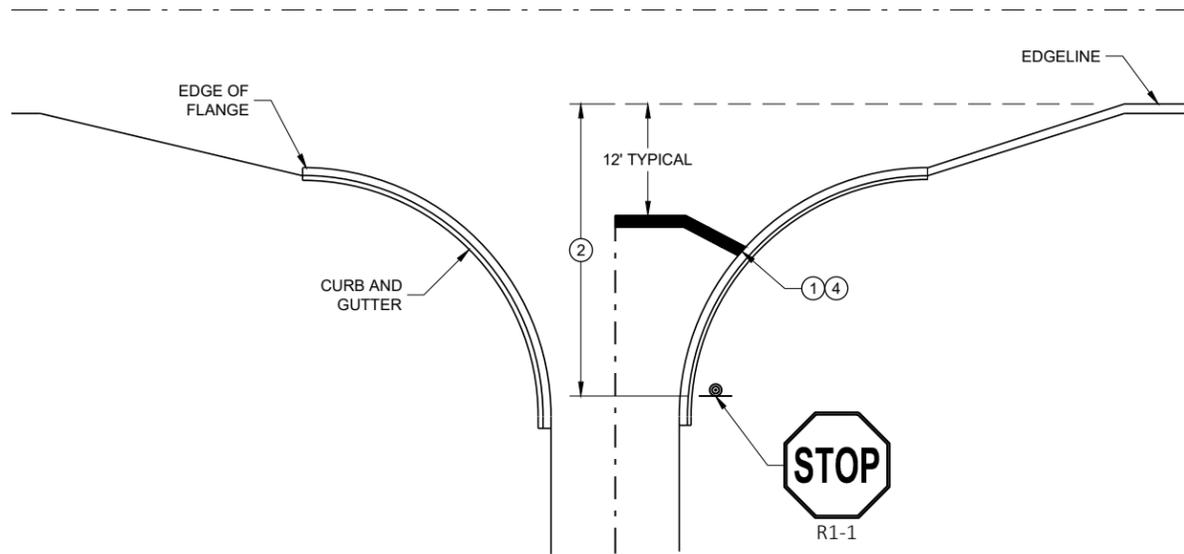


# SDD 15C33 Stop Line and Crosswalk Pavement Marking

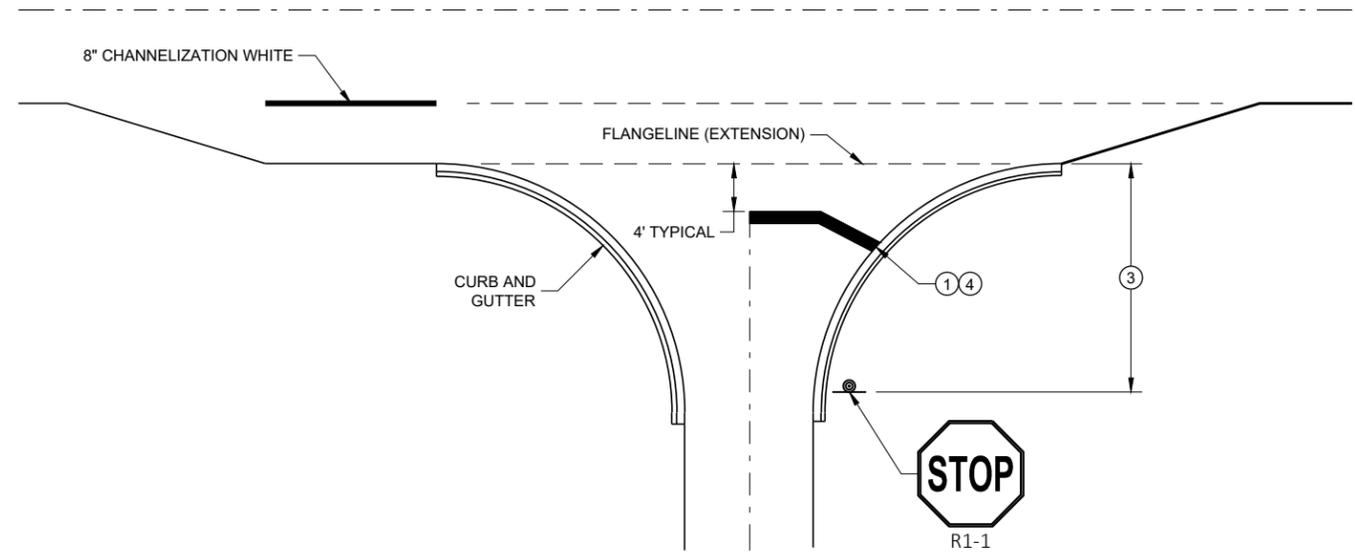
## GENERAL NOTES

STOP SIGN SHALL BE PLACED A MINIMUM OF 6 FEET TO A MAXIMUM OF 50 FEET FROM THE EDGELINE LOCATION.

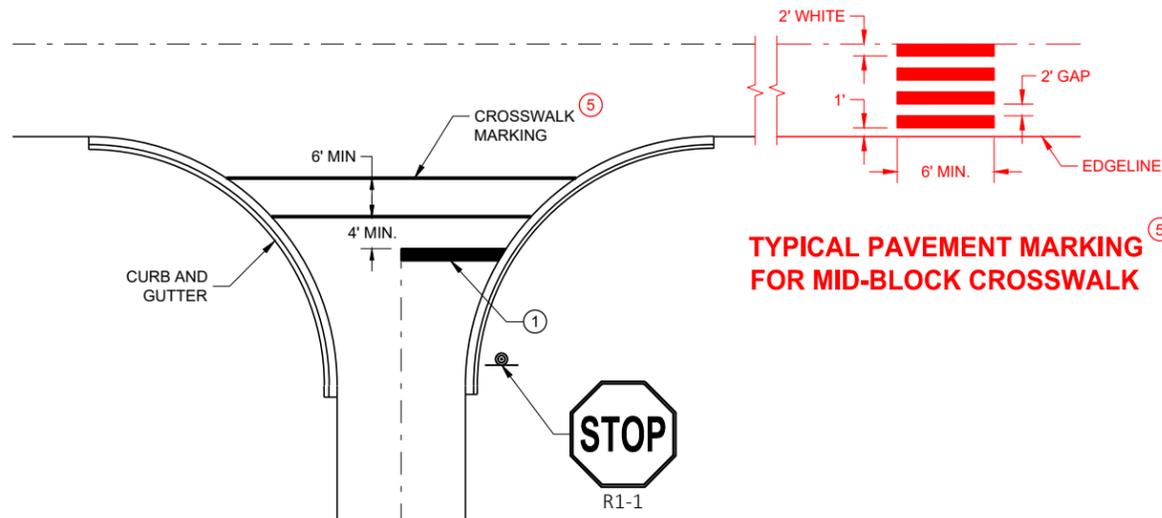
- ① 18-INCH STOP LINES MAY BE DELETED OR ADDED BY THE REGION MARKING ENGINEER BASED ON VISIBILITY AND SIGHT LINES.
- ② NO STOP LINE IS REQUIRED IF STOP SIGN IS LESS THAN OR EQUAL TO 40 FEET FROM THE EDGELINE.
- ③ NO STOP LINE IS REQUIRED IF STOP SIGN IS LESS THAN OR EQUAL TO 30 FEET FROM THE FLANGELINE EXTENSION.
- ④ MOVE CLOSER TO THE EDGE OF TRAVEL LINE AS NEEDED FOR VISIBILITY AND SIGHT LINES (NO CLOSER THAN 4 FEET).
- ⑤ LADDER BAR CROSSWALKS SHOULD ONLY BE USED FOR MID BLOCK CROSSINGS. USE 2 - 6" TRANSVERSE LINES INSTEAD.



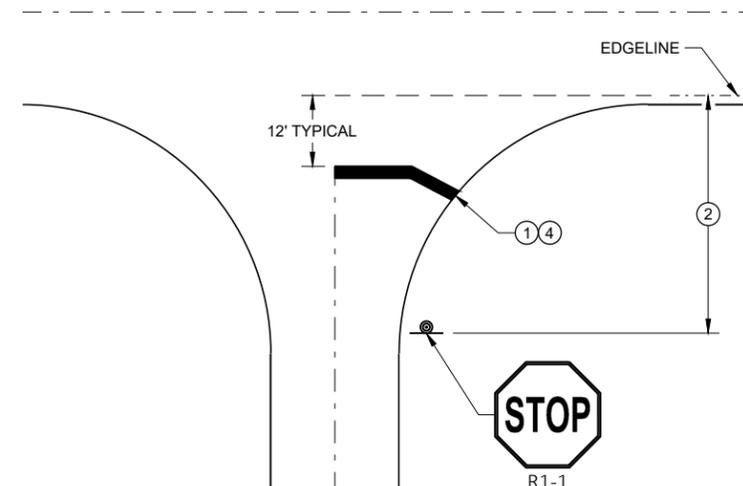
TYPICAL STOP LINE PAVEMENT MARKING WITH CURB AND GUTTER



TYPICAL STOP LINE PAVEMENT MARKING FOR SIDEROADS WITH RIGHT TURN LANE



TYPICAL STOP LINE PAVEMENT MARKING FOR SIDEROADS WITH CROSSWALK MARKING



TYPICAL STOP LINE PAVEMENT MARKING WITHOUT CURB AND GUTTER

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SDD 15C33 - 04

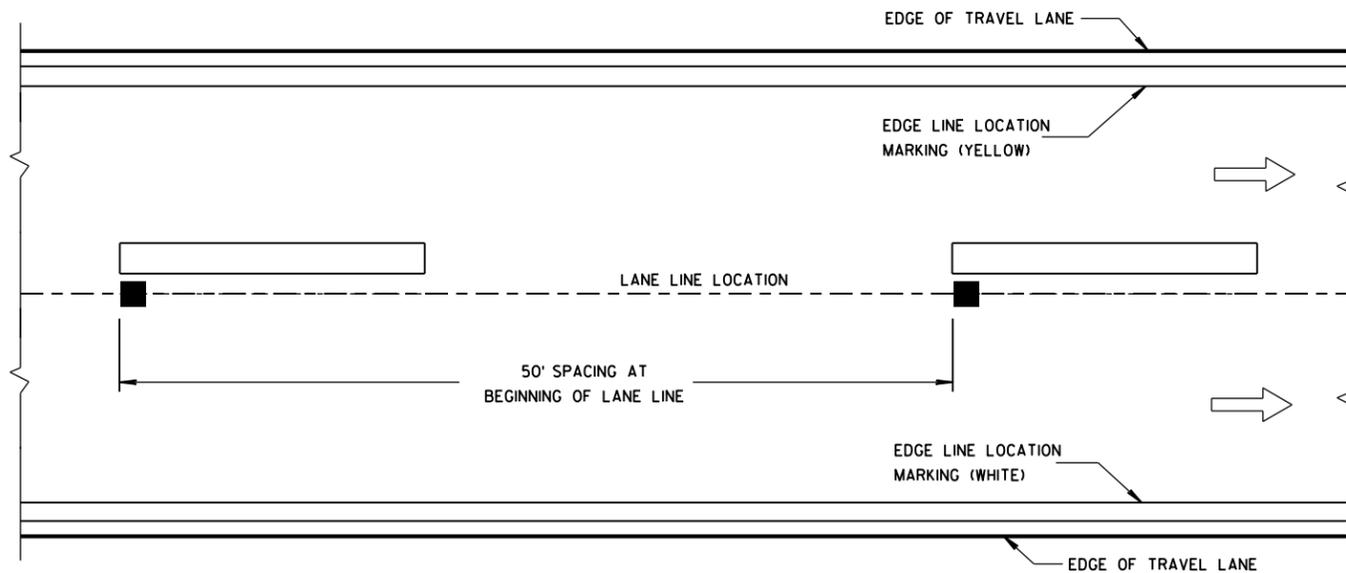
SDD 15C33 - 04

### STOP LINE AND CROSSWALK PAVEMENT MARKING

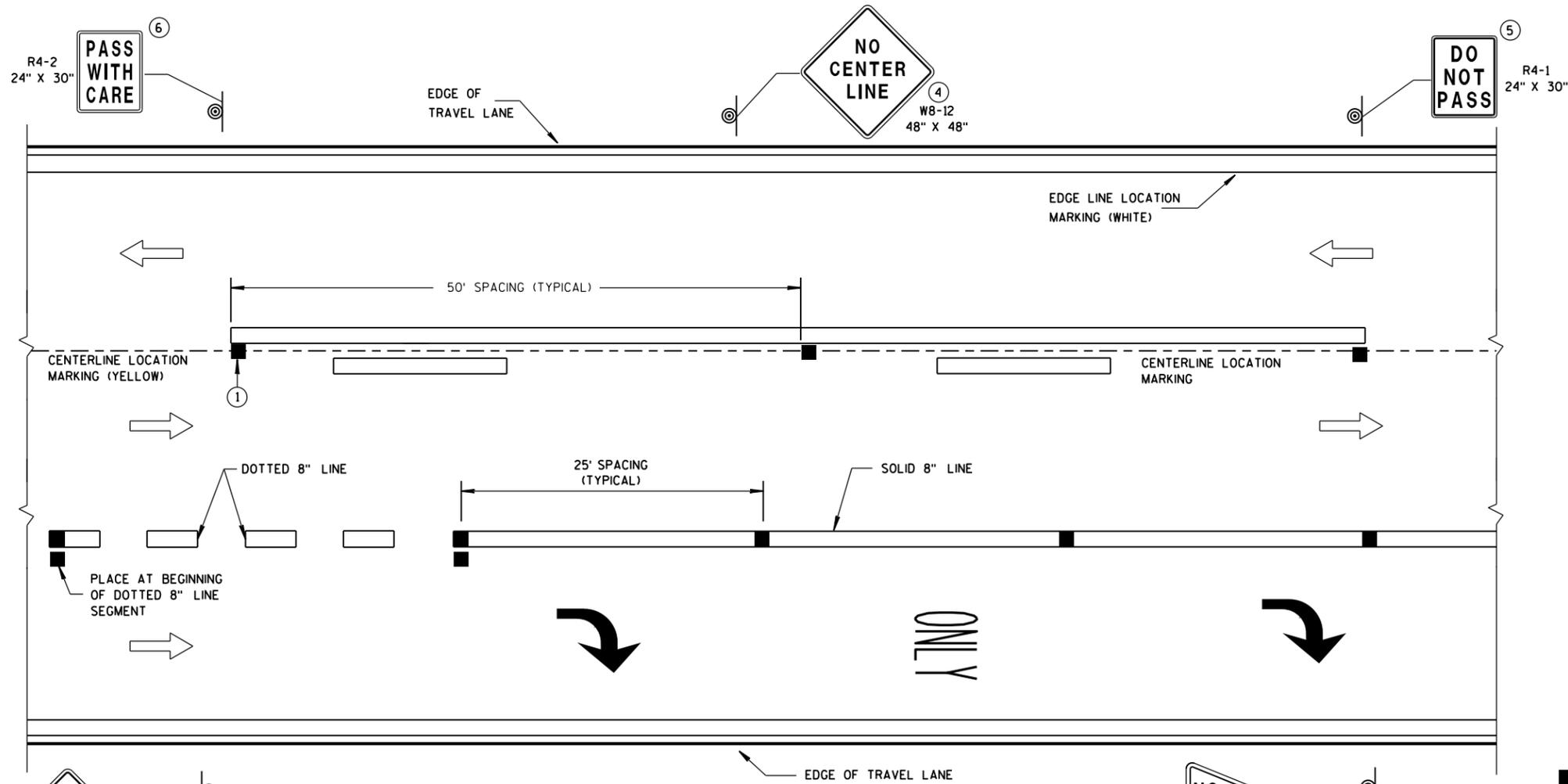
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DEPARTMENT OF TRANSPORTATION

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 November 2019 /S/ Matthew Rauch  
 DATE STATE SIGNING AND MARKING  
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LONGITUDINAL PLACEMENT 4-INCH LANE LINE



LONGITUDINAL PLACEMENT 4-INCH CENTERLINE AND 8-INCH CHANNEL LINE

GENERAL NOTES

DETAILS OF CONSTRUCTION NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE STANDARD SPECIFICATIONS AND SPECIAL PROVISIONS.

COLOR OF TEMPORARY RAISED PAVEMENT MARKERS, TYPE II SHALL MATCH THE COLOR OF THE MARKING THEY SUPPLEMENT.

PLACEMENT OF TEMPORARY RAISED PAVEMENT MARKERS ON EDGE LINES ARE OPTIONAL. IF PLACED ON EDGE LINES, MAXIMUM SPACING SHALL BE 50 FEET.

PROVIDE SINGLE OR MULTI-COVER TEMPORARY RAISED PAVEMENT MARKERS AS SHOWN ON PLAN.

MARK T's ON PAVEMENT FOR RE-ESTABLISHING NO PASSING ZONES.

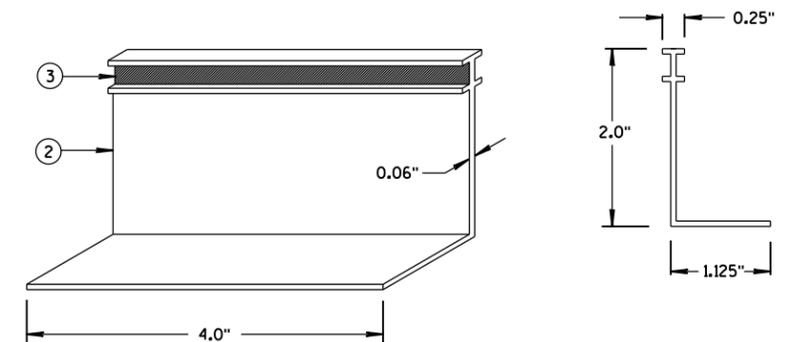
SAME DAY TEMPORARY PAVEMENT MARKING MAY BE USED IN LIEU OF TEMPORARY RAISED PAVEMENT MARKERS, TYPE II.

SIGNS THAT WILL BE IN PLACE LESS THAN SEVEN CONTINUOUS DAYS AND NIGHTS OR THAT WILL BE PLACED IN A CLOSED LANE, MAY BE MOUNTED ON PORTABLE SUPPORTS.

IF TEMPORARY SAME DAY PAVEMENT MARKING IS USED, ENSURE PROPOSED PAVEMENT MARKINGS ARE PLACED IN THE EXACT LOCATIONS AS THE EXISTING MARKINGS, USING A MINIMAL AMOUNT OF TEMPORARY RAISED PAVEMENT MARKERS, TYPE II OR OTHER METHODS AS APPROVED BY THE ENGINEER.

IF ROADWAY IS DETOURED DURING CONSTRUCTION, THE DO NOT PASS, PASS WITH CARE AND NO CENTERLINE SIGNS MAY BE OMITTED, PROVIDED A LIQUID MARKING IS INSTALLED BEFORE THE ROADWAY IS REOPENED TO TRAFFIC.

- ① FOR DOUBLE SOLID YELLOW, PLACE THE MARKERS BETWEEN THE LINES.
- ② MARKERS SHALL BE OF POLYURETHANE MATERIAL.
- ③ MARKERS SHALL HAVE A MINIMUM SIZE REFLECTIVE SURFACE OF 4 INCH WIDTH X 0.25 INCH HEIGHT.
- ④ NO CENTER LINE SIGNS SHALL BE PLACED AT THE BEGINNING OF PROJECT, AT TWO-MILE INTERVALS AND AFTER STATE AND COUNTY HIGHWAY INTERSECTIONS.
- ⑤ DO NOT PASS SIGNS SHALL BE INSTALLED AT THE BEGINNING OF NO PASSING ZONES. ADDITIONAL DO NOT PASS SIGNS SHALL BE INSTALLED AT ONE MILE INTERVALS AND AFTER STATE AND COUNTY HIGHWAY INTERSECTIONS WITHIN THE NO PASSING ZONE.
- ⑥ PASS WITH CARE SIGNS SHALL BE PLACED AT THE DOWNSTREAM END OF NO PASSING ZONES.



TEMPORARY RAISED PAVEMENT MARKER, TYPE II

LEGEND

- TEMPORARY RAISED PAVEMENT MARKER, TYPE II
- ⊙ SIGN ON PORTABLE OR PERMANENT SUPPORT
- ➔ DIRECTION OF TRAVEL

STANDARD APPLICATION FOR TEMPORARY RAISED PAVEMENT MARKERS, TYPE II

STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION

APPROVED 6-2017 /S/ Matthew R. Rauch  
DATE STATE SIGNING AND MARKING ENGINEER  
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S.D.D. 15 C 34-3

S.D.D. 15 C 34-3



# SDD 15C35-a Pavement Marking, Intersections

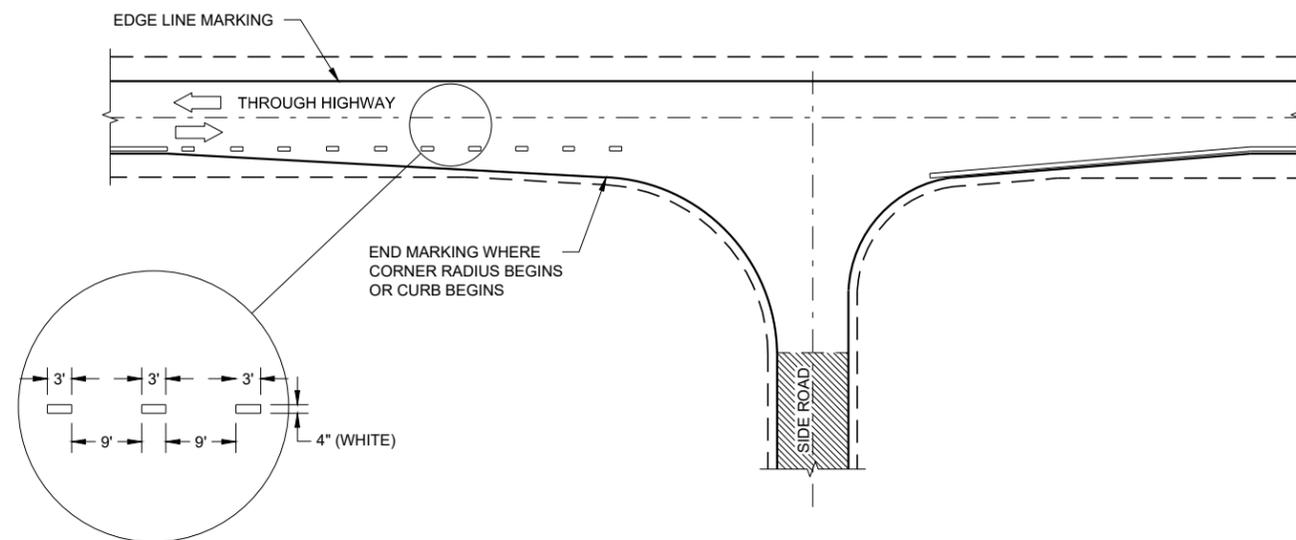
## GENERAL NOTES

OMIT EDGE LINES THROUGH INTERSECTIONS. CONTINUE EDGE LINES THROUGH DRIVEWAYS.

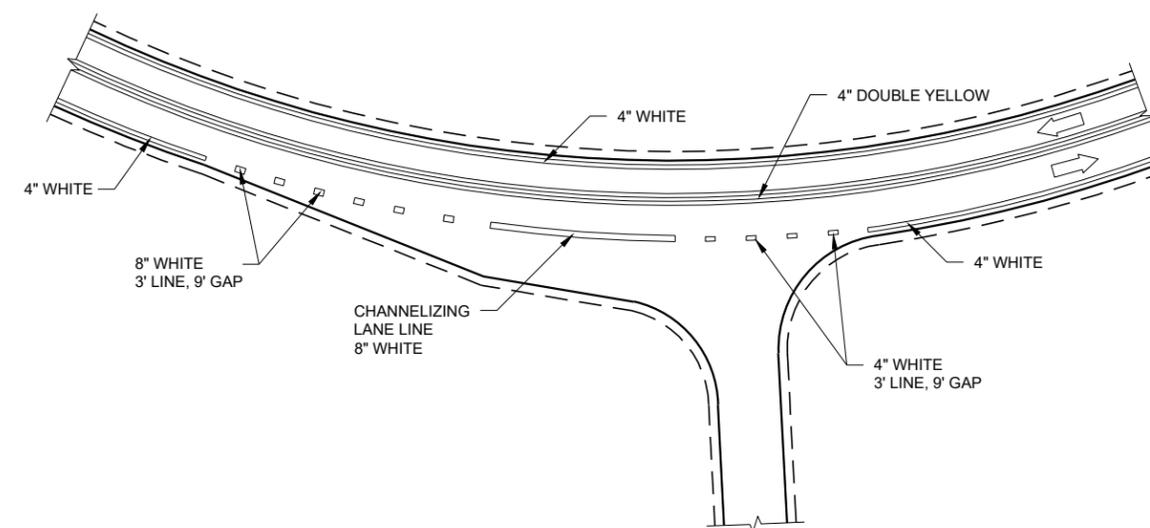
- ① WHEN DISTANCE "A" IS LESS THAN 250 FEET, OMIT LANE LINE.
- ② WHEN DISTANCE "B" IS LESS THAN 100 FEET, OMIT CHANNELIZING LANE LINE.
- ③ BARRIER LINE ENDS AT SIDE ROAD PAVEMENT / SURFACE EDGE EXTENSION.
- ④ BARRIER LINE STARTS 500 FEET PRIOR TO THE BYPASS TAPER.

## LEGEND

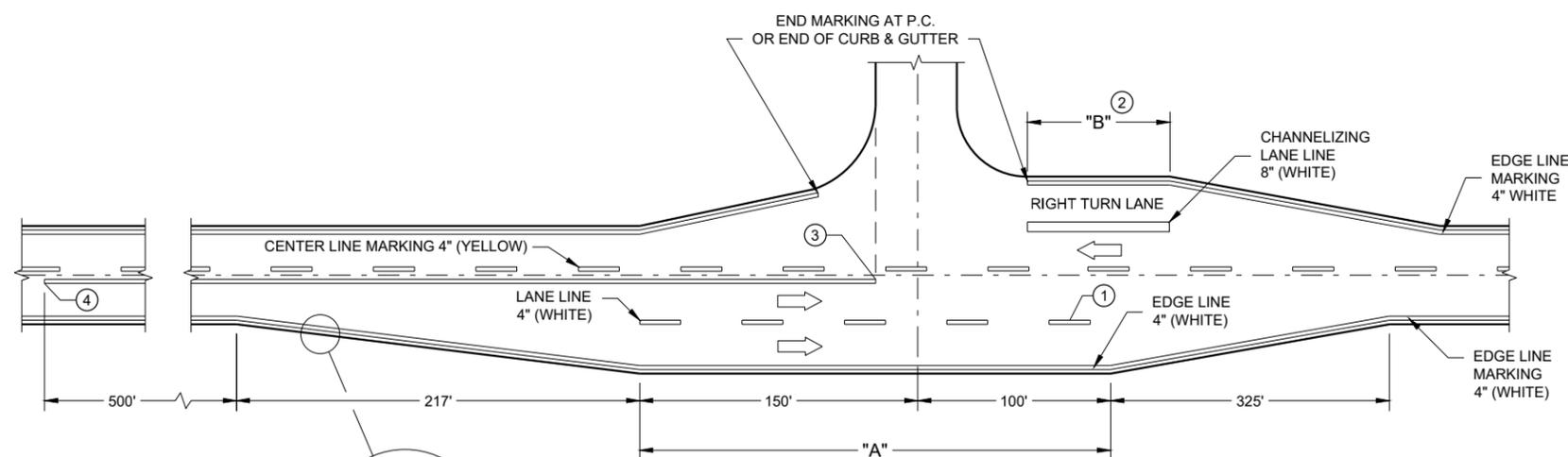
➡ DIRECTION OF TRAVEL



### MINOR INTERSECTION



### INTERSECTION ON OUTSIDE OF CURVE



### MAJOR INTERSECTIONS (INTERSECTION WITH FULL RIGHT TURN LANE OR BYPASS LANE)

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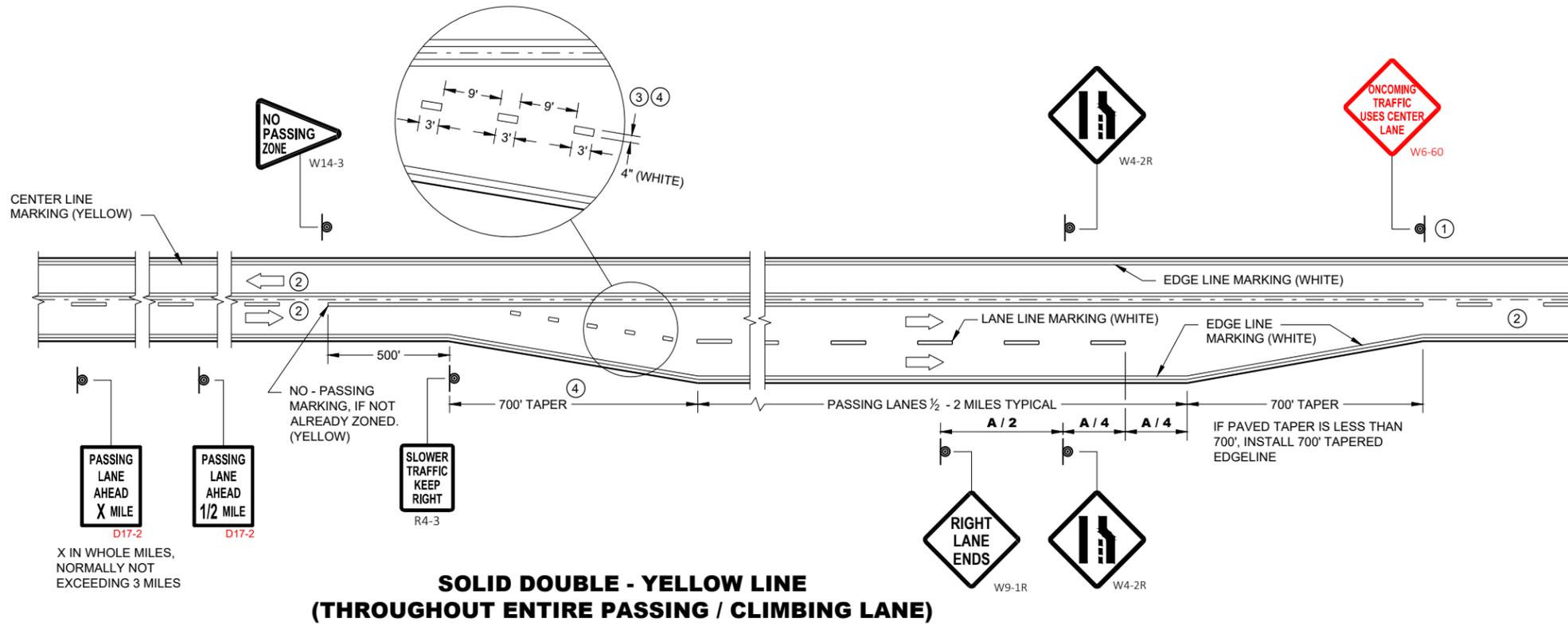
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SDD 15C35 - 04a

SDD 15C35 - 04a

**PAVEMENT MARKING  
(INTERSECTIONS)**

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION



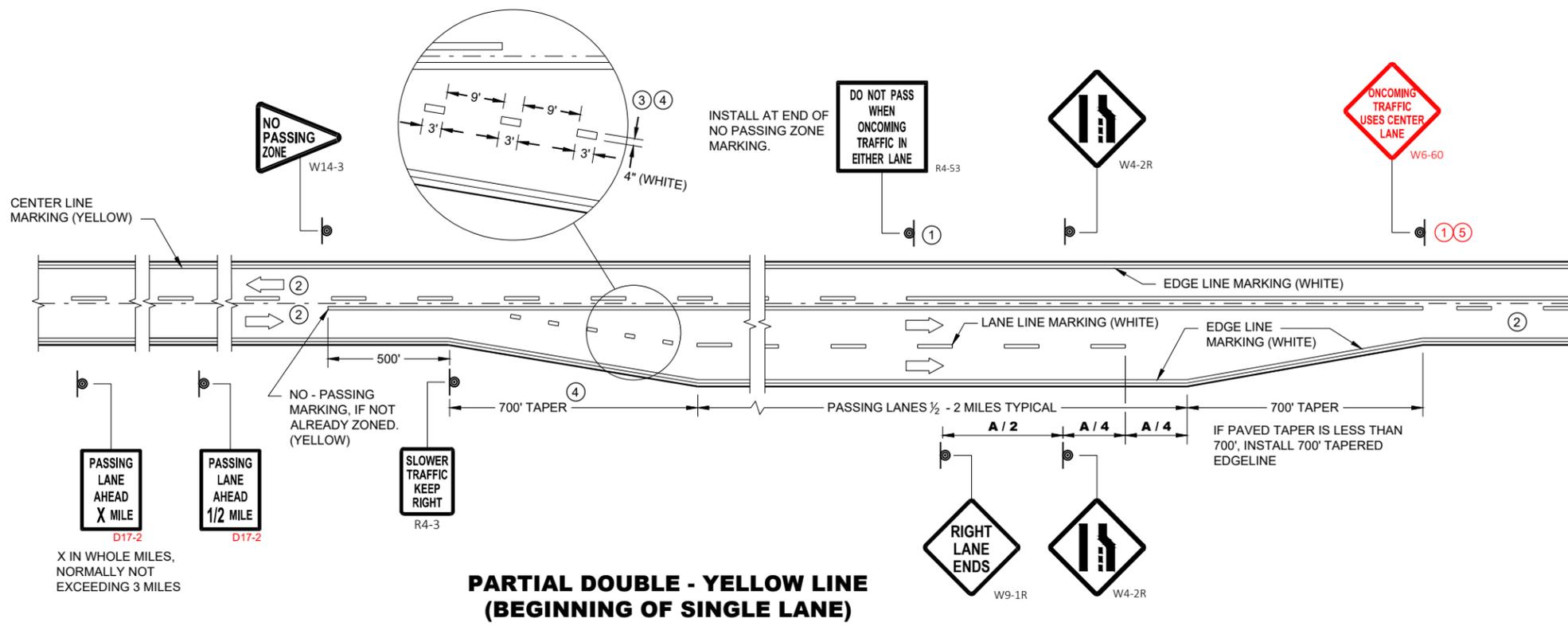
### GENERAL NOTES

- ① SIGN SHALL BE REPEATED AT 1 MILE INCREMENTS OR AT THE DISCRETION OF THE REGIONAL TRAFFIC ENGINEER.
- ② THERE MAY BE SOLID YELLOW ON THE CENTERLINE DUE TO SIGHT CONDITIONS.
- ③ THE TAPER LENGTH OF THE DOTTED LINE PAVEMENT MARKING SHALL BE 700 FEET, 3' LINE, 9' GAP, EXCEPT RETRACE THE EXISTING LINE - GAP PATTERN WHERE EXISTING MARKINGS ARE IN PLACE.
- ④ WHEN THE ENTRANCE TAPER IS LESS THAN 700 FEET OR THE SHOULDER WIDTH IN THE PASSING / CLIMBING LANE IS LESS THAN THE ADJACENT HIGHWAY, DO NOT INSTALL DOTTED LINE PAVEMENT MARKING.
- ⑤ REPEAT EVERY 1 MILE UP UNTIL R4-53.

ARROW SYMBOL ( ) SHOWS DIRECTION OF TRAVEL

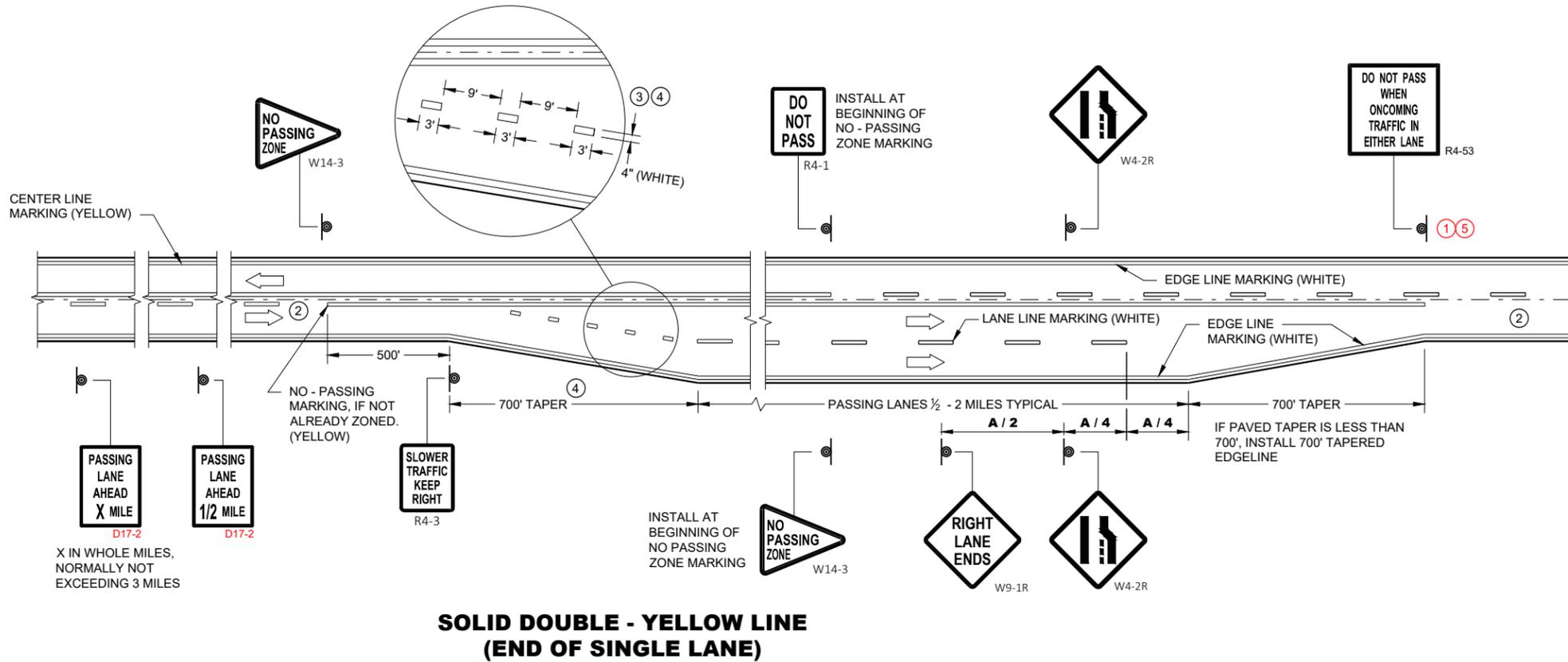
### DISTANCE TABLE

POSTED OR 85th PERCENTILE SPEED	DISTANCE "A"
45	775
50	885
55	990



### PAVEMENT MARKING & SIGNING (CLIMBING LANE & PASSING LANE)

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION



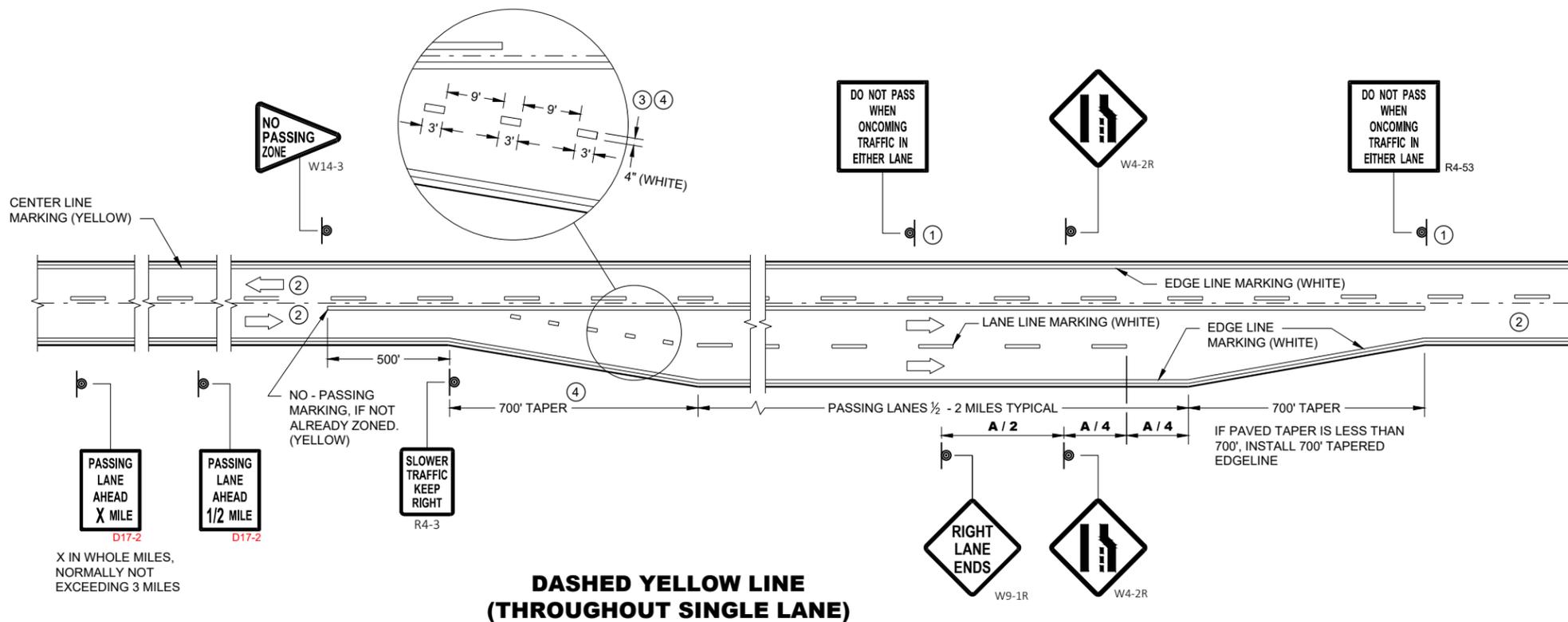
## GENERAL NOTES

- ① SIGN SHALL BE REPEATED AT 1 MILE INCREMENTS OR AT THE DISCRETION OF THE REGIONAL TRAFFIC ENGINEER.
- ② THERE MAY BE SOLID YELLOW ON THE CENTERLINE DUE TO SIGHT CONDITIONS.
- ③ THE TAPER LENGTH OF THE DOTTED LINE PAVEMENT MARKING SHALL BE 700 FEET, 3' LINE, 9' GAP, EXCEPT RETRACE THE EXISTING LINE - GAP PATTERN WHERE EXISTING MARKINGS ARE IN PLACE.
- ④ WHEN THE ENTRANCE TAPER IS LESS THAN 700 FEET OR THE SHOULDER WIDTH IN THE PASSING / CLIMBING LANE IS LESS THAN THE ADJACENT HIGHWAY, DO NOT INSTALL DOTTED LINE PAVEMENT MARKING.
- ⑤ REPEAT EVERY ONE MILE UP UNTIL NO PASSING ZONE.

ARROW SYMBOL ( ) SHOWS DIRECTION OF TRAVEL

**DISTANCE TABLE**

POSTED OR 85th PERCENTILE SPEED	DISTANCE "A"
45	775
50	885
55	990



**PAVEMNET MARKING & SIGNING  
(CLIMBING LANE & PASSING LANE)**

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

APPROVED  
November 2019 /S/ Matthew Rauch  
DATE STATE SIGNING AND MARKING ENGINEER

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