



## Florida Department of Transportation

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GOVERNOR

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KEVIN J. THIBAUT, P.E.  
SECRETARY

**OFFICE OF DESIGN BULLETIN 21-02**  
**TRAFFIC ENGINEERING AND OPERATIONS BULLETIN 21-01**  
**FREIGHT AND MULTIMODAL OPERATIONS BULLETIN 21-01**

DATE: February 12, 2021

TO: District Directors of Transportation Operations, District Directors of Transportation Development, District Design Engineers, District Construction Engineers, District Structures Design Engineers, District Maintenance Engineers, District Consultant Project Management Engineers, District Roadway Design Engineers, District Traffic Operations Engineers, Program Management Engineers, District Materials Engineers, District Specifications Engineers, District Estimates Engineers, District Rail Administrators and Coordinators, District Safety Engineers, District Modal Administrators, District Intermodal Systems Development Administrators

FROM: Tim Lattner, P.E., Director, Office of Design DocuSigned by:  
Tim Lattner  
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Trey Tillander, P.E., Director, Traffic Engineering and Operations Office DocuSigned by:  
Trey Tillander  
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Rickey Fitzgerald, Manager, Freight and Multimodal Operations DocuSigned by:  
Rickey Fitzgerald  
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COPIES: Courtney Drummond, Brad Thoburn, Will Watts, Dan Hurtado, Rudy Powell, Michael Shepard, Stefanie Maxwell, Scott Arnold, Paul Hiers, Vern Danforth, Daniel Strickland, Robert Robertson, Lora Hollingsworth, Gevin McDaniel, Kevin Burgess (FHWA), Chad Thompson (FHWA), Bren George (FHWA)

SUBJECT: **Railroad At-Grade Crossings: Signing and Pavement Markings**

This Bulletin introduces revisions to the *FDOT Design Manual (FDM)* and the *FDOT Standard Plans for Road and Bridge Construction (Standard Plans)* to further enhance safety at highway-railroad at-grade crossings.

### **REQUIREMENTS**

1. Delete *FDM 220.2.1.1* and replace it with Attachment 'A'.
2. *Standard Plans, Index 509-070 (Railroad Grade Crossing Traffic Control Devices)* has been updated to remove signing and pavement marking details and is released as an *Interim Revision (IR509-070-1)* to the *FY 2020-21 Standard Plans*. See Attachment 'B'. An *Interim Revision*

Office of Design Bulletin 21-02  
Traffic Engineering and Operations Bulletin 21-01  
Freight and Multimodal Operations Bulletin 21-01  
Railroad At-Grade Crossings: Signing and Pavement Markings  
Page 2 of 2

will also replace the original version of the Index published on October 30, 2020 with the ***FY 2021-22 Standard Plans***.

3. ***Standard Plans, Index 711-001 (Pavement Markings)*** has been updated to include a ‘*Railroad Dynamic Envelope (RDE) Pavement Marking Detail*’ and ‘*Railroad Crossing Pavement Message*’ details. This update is released as an ***Interim Revision (IR711-001-1)*** to the ***FY 2020-21 Standard Plans***. See Attachment ‘C’. An ***Interim Revision*** will also replace the original version of the Index published on October 30, 2020 with the ***FY 2021-22 Standard Plans***.

## **IMPLEMENTATION**

These requirements are effective immediately for all projects where the Railroad Dynamic Envelope Safety Countermeasures (per Traffic Engineering and Operations Bulletin 20-01, Roadway Design Bulletin 20-02, Program Management Bulletin 20-01, Construction Bulletin 20-02, and Freight and Multimodal Operations Bulletin 20-01) have not been installed. For projects where Railroad Dynamic Envelope Safety Countermeasures have already been installed, this new criteria may be used if the District determines that it will enhance the safety of the railroad crossing.

## **CONTACT**

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TL/TT/RF/gjm

Attachment 'A'

### 220.2.1.1 Signing and Pavement Markings

**Exhibits 220-1** through **220-4** provide typical signing and pavement markings for Active Grade Crossings. Refer to the [MUTCD](#) for definitions and signing and pavement markings at Passive Grade Crossings.

Do not place turning movement lane-use pavement markings on the upstream approach between the railroad crossing pavement message and the tracks.

Where intersections occur between the W10-1 sign shown in **Exhibits 220-1** through **220-4** and the tracks, place an additional W10-1 sign between the intersection and the railroad gate.

Include Railroad Dynamic Envelope (RDE) pavement markings at Active and Passive Grade Crossings on:

- State Roads,
- State-owned rails, and
- State-owned property.

Any Variations to not install an RDE are to be approved by the Chief Engineer.

The determination of slightly or significantly skewed is at the discretion of the EOR.

Detail RDE pavement markings in the Plans in accordance with **Standard Plans, Index 711-001** and the details shown in **Exhibits 220-1** through **220-4**. Ensure the details in the plans include the following:

- (1) Orient RDE pavement markings:
  - (a) In the direction of the travel lanes at all approaches upstream of the crossing (i.e., transverse to the travel lanes).
    - i. For slightly skewed railroads extend the RDE markings transverse across all lanes, as shown in **Exhibits 220-2** and **220-3**.
    - ii. For significantly skewed railroads, step the RDE markings transverse across each lane, as shown in **Exhibit 220-4**.
  - (b) Along the railroad (i.e., parallel to the railroad tracks) for areas between tracks and downstream of the crossing.

- (c) To maximize the visibility of the RDE pattern for both the upstream and downstream sides of the track. Locate markings in a manner to ensure the “X” pattern is identifiable to the motorists and bicyclists and centered in the lanes to the extent practicable.
- (2) Place RDE markings through the foul area as shown in **Exhibits 220-3** and **220-4**. If the railroad owner will not allow the RDE markings through the foul area, or the substrate material will not provide an appropriate bonding surface for the markings, keep the RDE markings outside of the railroad’s foul area as shown in **Exhibits 220-1** and **220-2**.
- (3) Replace all skip lane lines with solid lines for the following distance: From stop bar to stop bar of each approach, then upstream and downstream for a Distance “A” plus 15 feet. For Distance “A”, see table in **Exhibit 220-1**.
- (4) Continue solid longitudinal edge line, lane line, and centerline markings through the RDE pattern, maintaining a 9-inch clear space between the RDE pattern and the longitudinal lane lines or gore areas.
- (5) Refurbish all existing longitudinal lane lines, edge lines, and centerlines to remain in-place for the following minimum distance: From stop bar to stop bar of each approach, then upstream and downstream for a Distance “A” plus 15 feet. For Distance “A”, see table in **Exhibit 220-1**.
- (6) Place RPMs at 10’ maximum on center for the following distance: From stop bar to stop bar of each approach excluding the foul area, then upstream and downstream for a Distance “A” plus 15 feet. For Distance “A”, see table in **Exhibit 220-1**.
- (7) For conditions where multiple tracks are configured non-parallel to each other, maintain the typical RDE pattern and fill the gap between the tracks, as necessary.
- (8) RDE markings must not interfere with any pedestrian crosswalk.

Consider the following additional provisions for Active and Passive Grade Crossings:

- For significantly skewed angles, corridor highway lighting for the following minimum distance: From stop bar to stop bar of each approach, then upstream and downstream for a Distance “A” plus 15 feet. For Distance “A”, see table in **Exhibit 220-1**.
- For significantly skewed angles, curves, and intersections directly adjacent to crossings, consider using additional channelization techniques for the roadway alignment. Some channelization techniques include Internally Illuminated RPMs

Topic #625-000-002  
FDOT Design Manual

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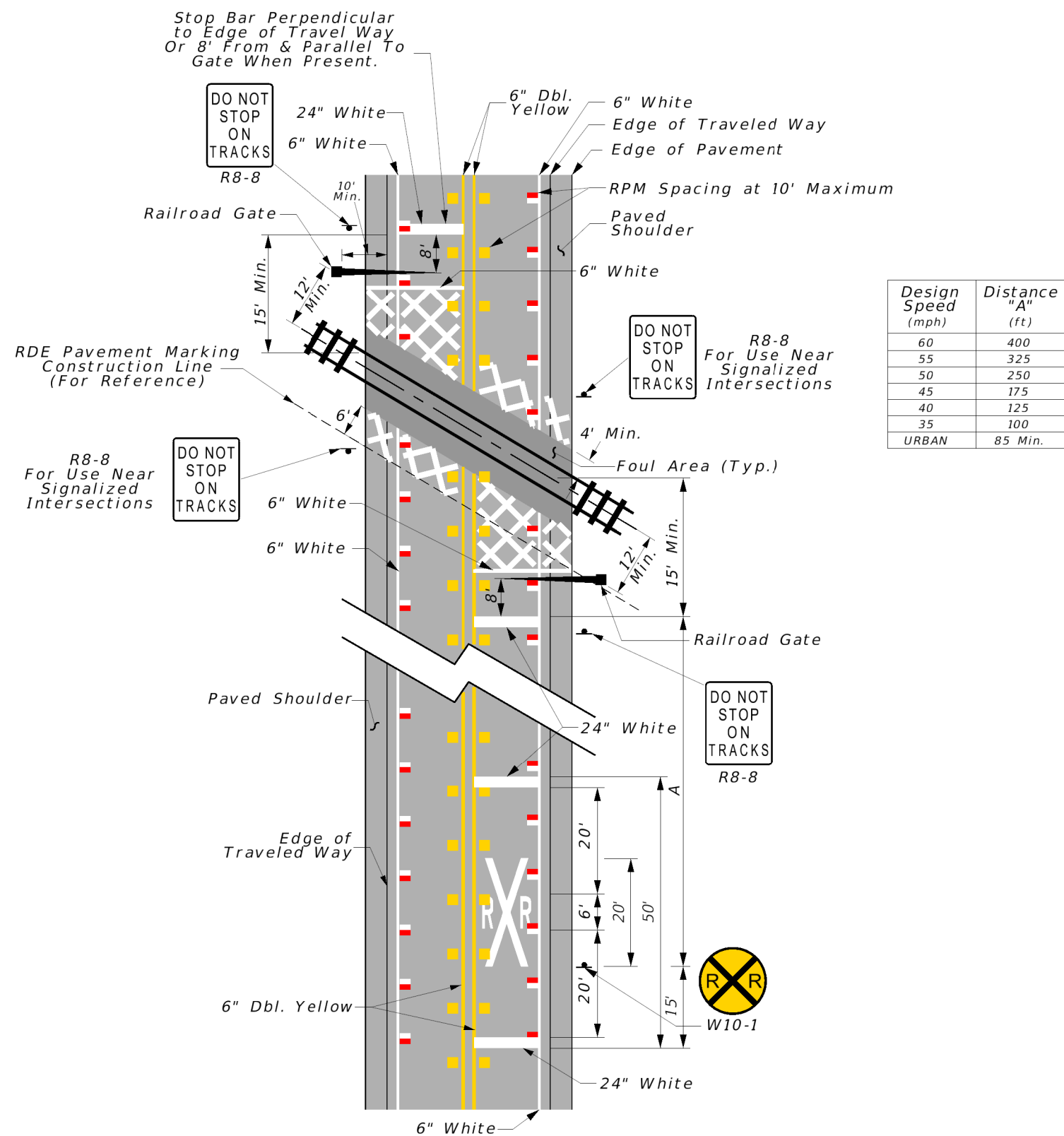
and Tubular Markers. When crest vertical curves impede the visibility of RPMs, Tubular Markers should be used. Consider excluding downstream RDE pattern when traffic queuing is not expected.

- Consider the use of through lane-use arrows. For turn lanes, a route shield may be used in conjunction with the through lane-use arrow.
- Remove all existing traffic control signs and pavement markings (e.g., turning signs and turning arrow lane-use pavement markings) from the upstream approach that may lead to driver confusion on the correct turning point for downstream turning movements.

For pavement marking material selection, see **FDM 230**.

For side roads with Active and Passive Grade Crossings within 100 feet of the edge of traveled way, include W10-2, W10-3 or W10-4 signs on the mainline state road in accordance with the [MUTCD](#).

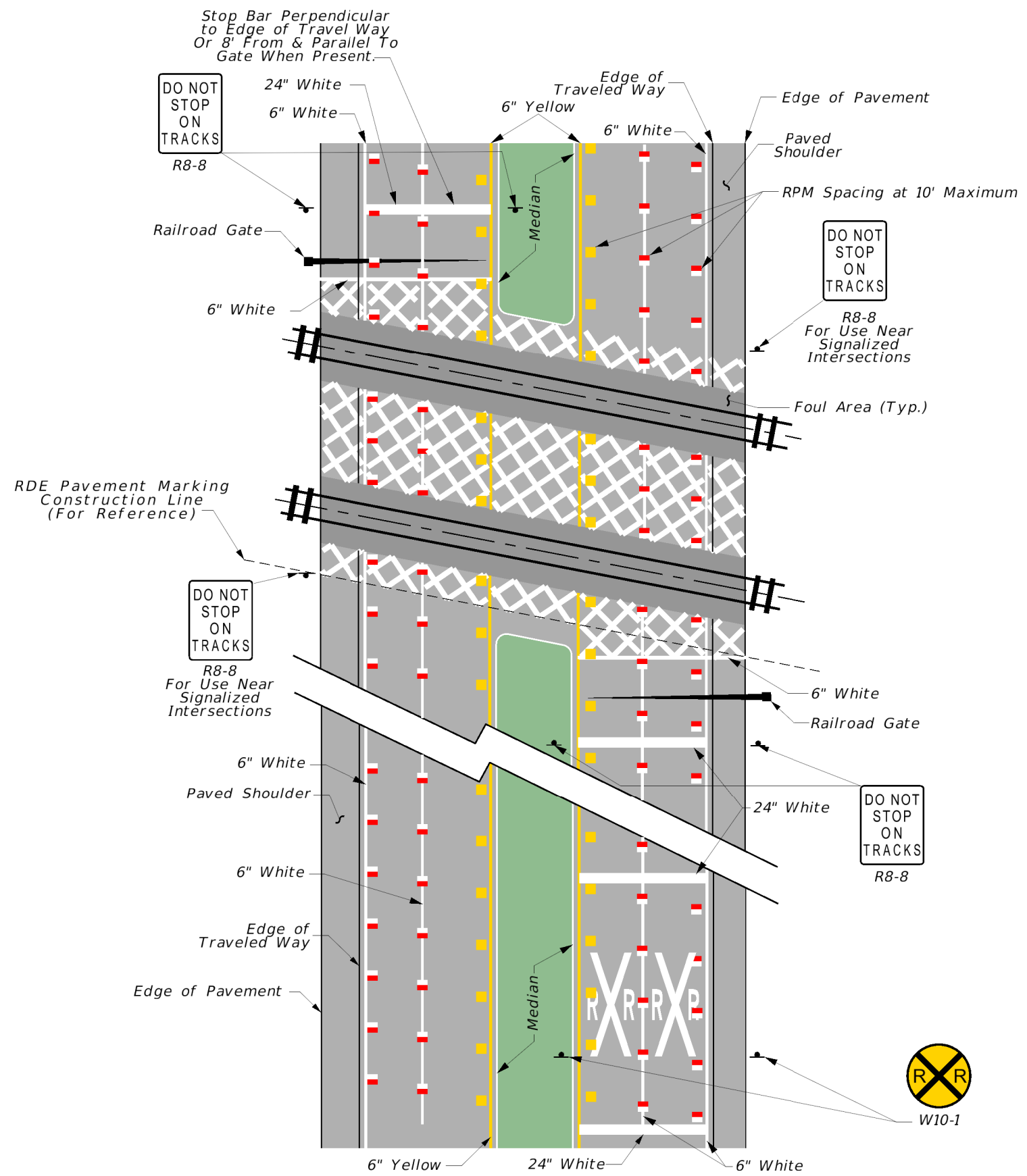
# RAILROAD CROSSING AT TWO-LANE ROADWAY



NOT TO SCALE

EXHIBIT 220-1  
02/05/2021

# RAILROAD CROSSING AT MULTILANE ROADWAY



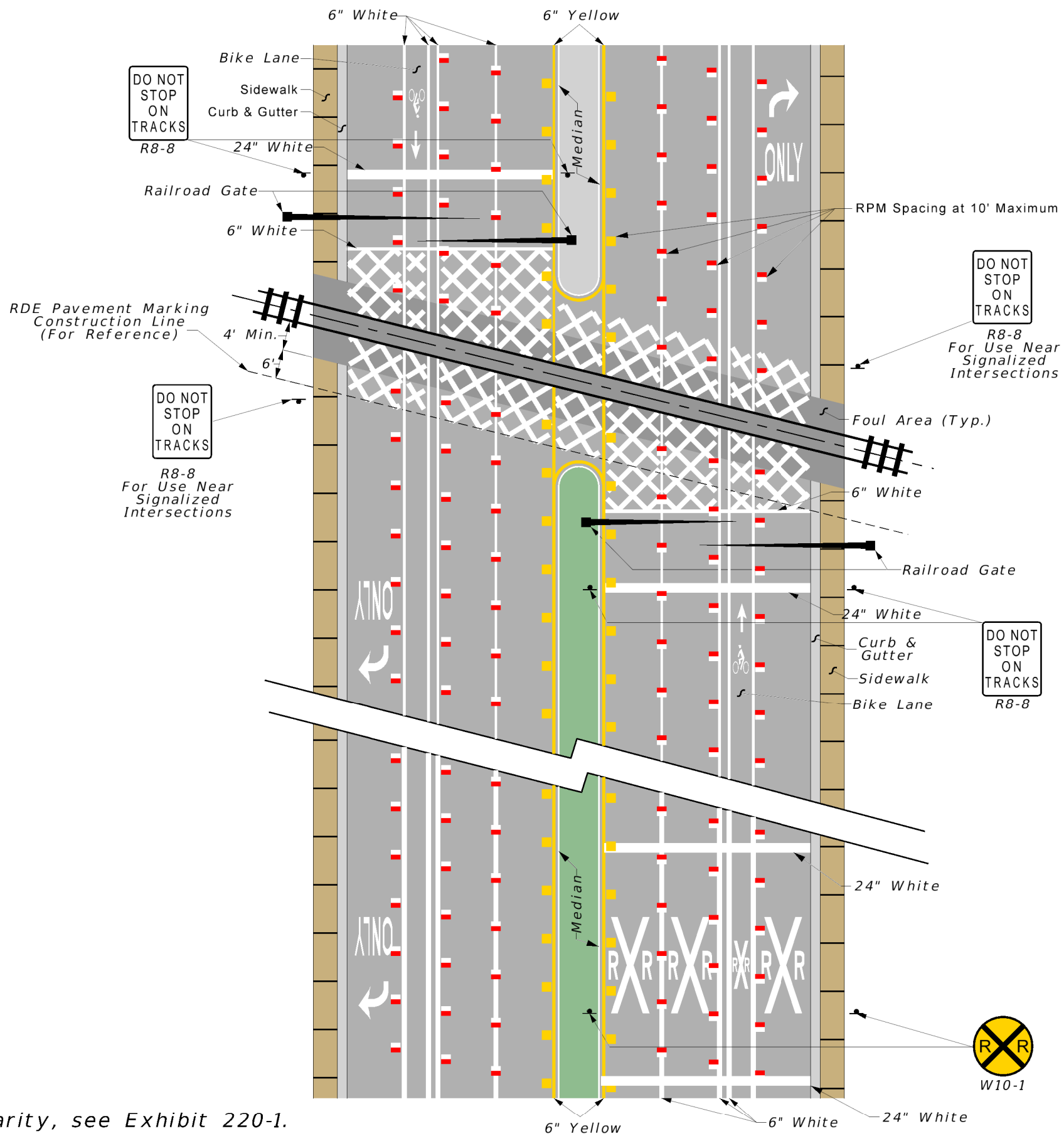
Dimensions not shown for clarity, see Exhibit 220-1.

NOT TO SCALE

EXHIBIT 220-2  
02/05/2021



# RAILROAD CROSSING AT URBAN MULTILANE ROADWAY WITH TURN LANE

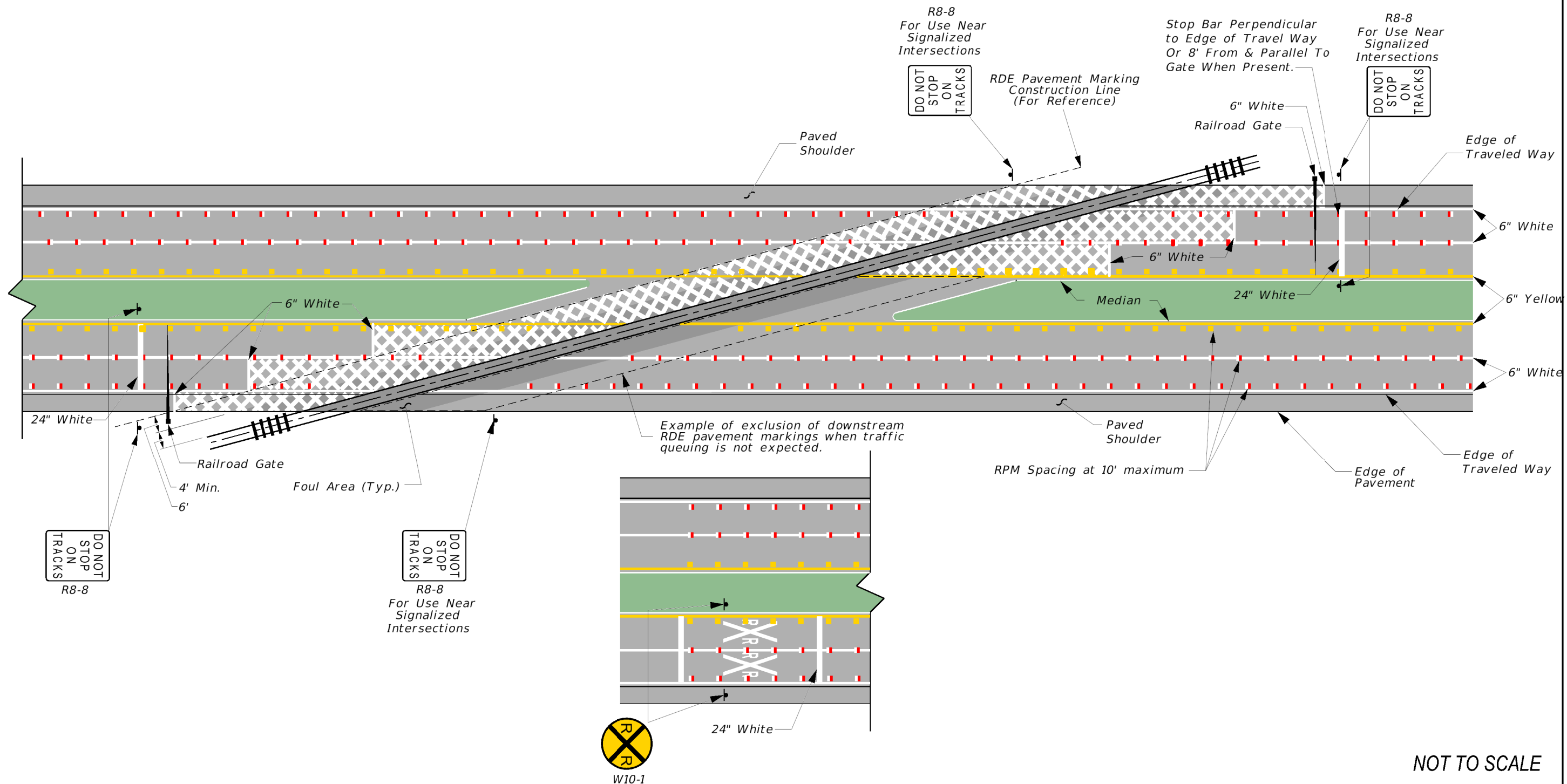


Dimensions not shown for clarity, see Exhibit 220-1.

NOT TO SCALE

EXHIBIT 220-3  
02/05/2021

# RAILROAD CROSSING WITH SIGNIFICANT SKEW TO THE ROADWAY

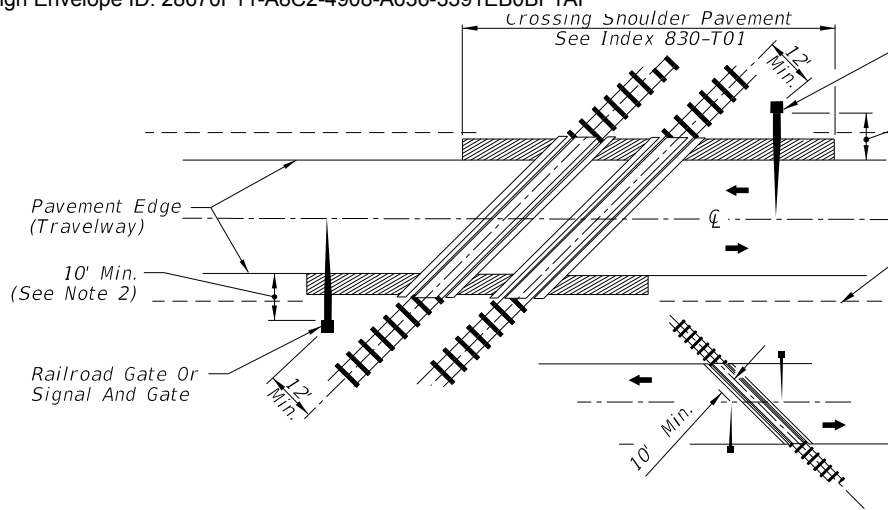


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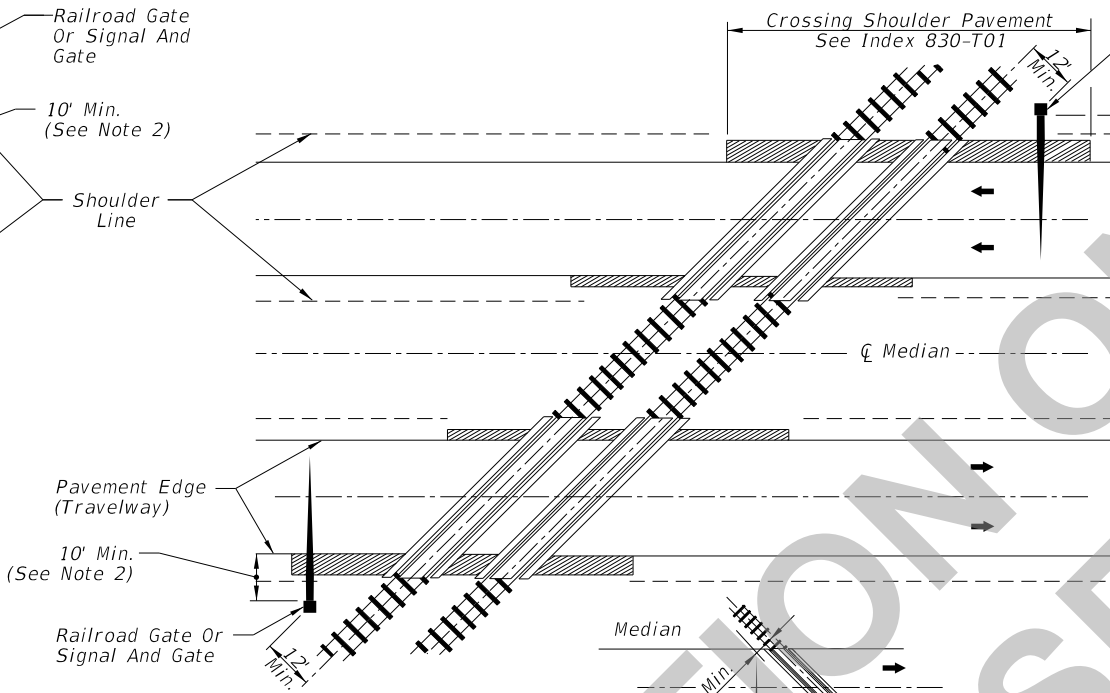
EXHIBIT 220-4  
02/05/2021

Dimensions not shown for clarity, see Exhibit 220-1.

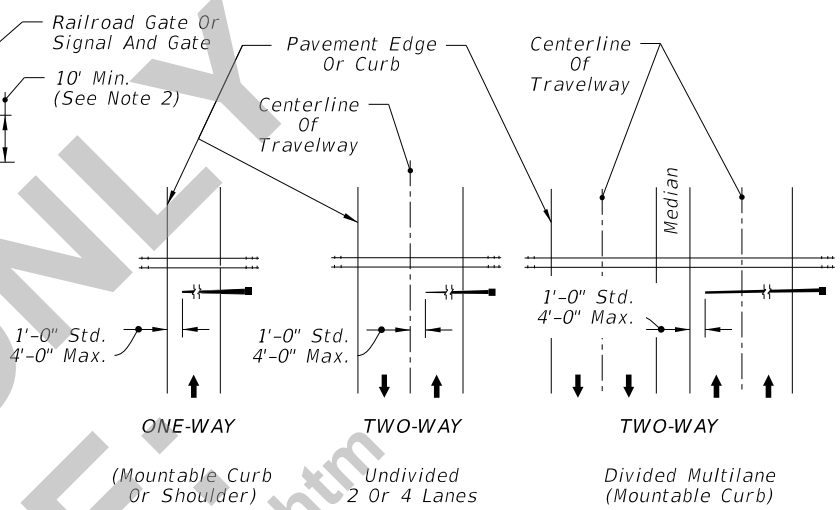
# Attachment 'B'



**SIGNAL PLACEMENT AT RAILROAD CROSSING  
(2 - LANE DESIGN)**



**SIGNAL PLACEMENT AT RAILROAD CROSSING  
(4 - LANE DESIGN)**



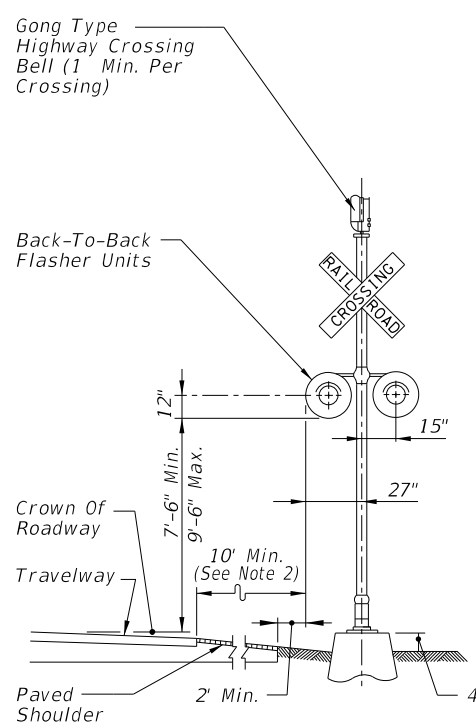
**FIGURE 1**

**GENERAL NOTES:**

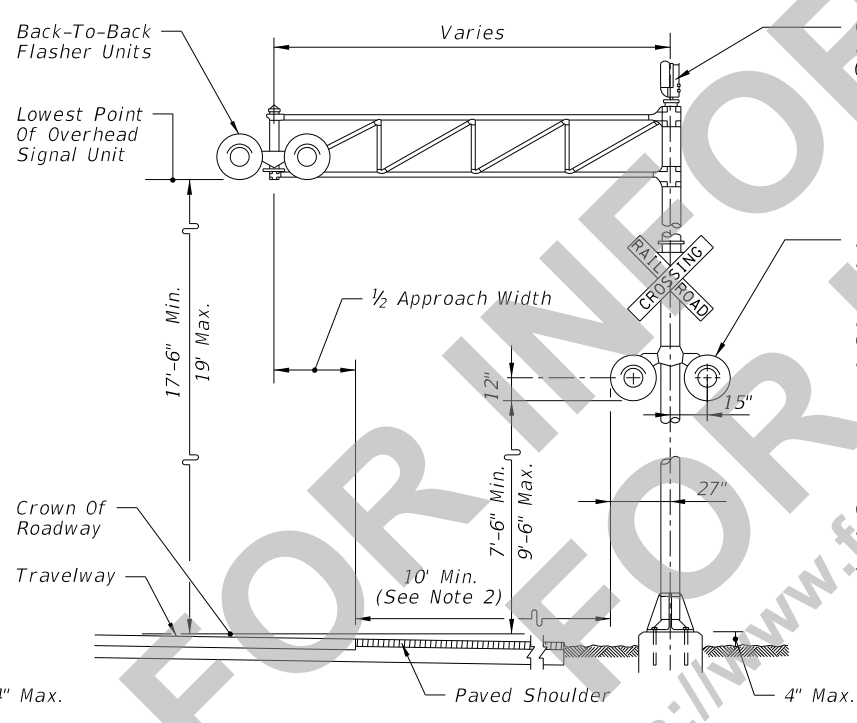
1. No guardrail is proposed for signals; however, some form of impact attenuation device may be specified for certain locations.
2. Advance flasher to be installed when and if called for in Plans or Specifications.
3. Top of foundation shall be no higher than 4" above finished shoulder grade.
4. Type of traffic control device
  - I Flashing warning devices
  - II Flashing warning devices with cantilever
  - III Flashing warning devices with gate
  - IV Flashing warning devices with cantilever and gate
  - V Gate
5. Class of traffic control devices (Not Shown)
  - I 2 Quadrant flashing warning devices-one track
  - II 2 Quadrant flashing warning devices-multiple tracks
  - III 2 Quadrant flashing warning devices and gates-one track
  - IV 2 Quadrant flashing warning devices and gates-multiple tracks
  - V 3-4 Quadrant flashing warning devices and gates-one track
  - VI 2-4 Quadrant flashing warning devices and gates-multiple tracks

**NOTE:**

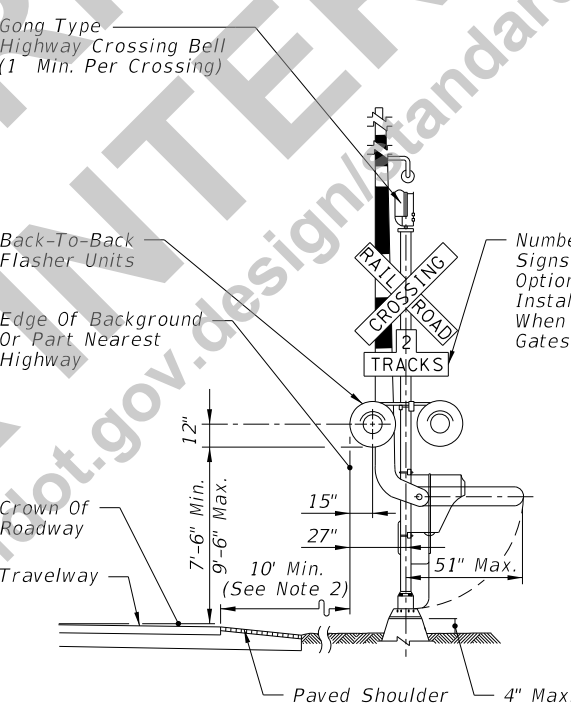
1. Two separate foundations may be required (one for signals, one for gate), depending on type of equipment used.
2. When 10' is deemed impractical the control device can be located as close as 2' from the edge of a paved shoulder but not less than 6' from the edge of the near traffic lane.



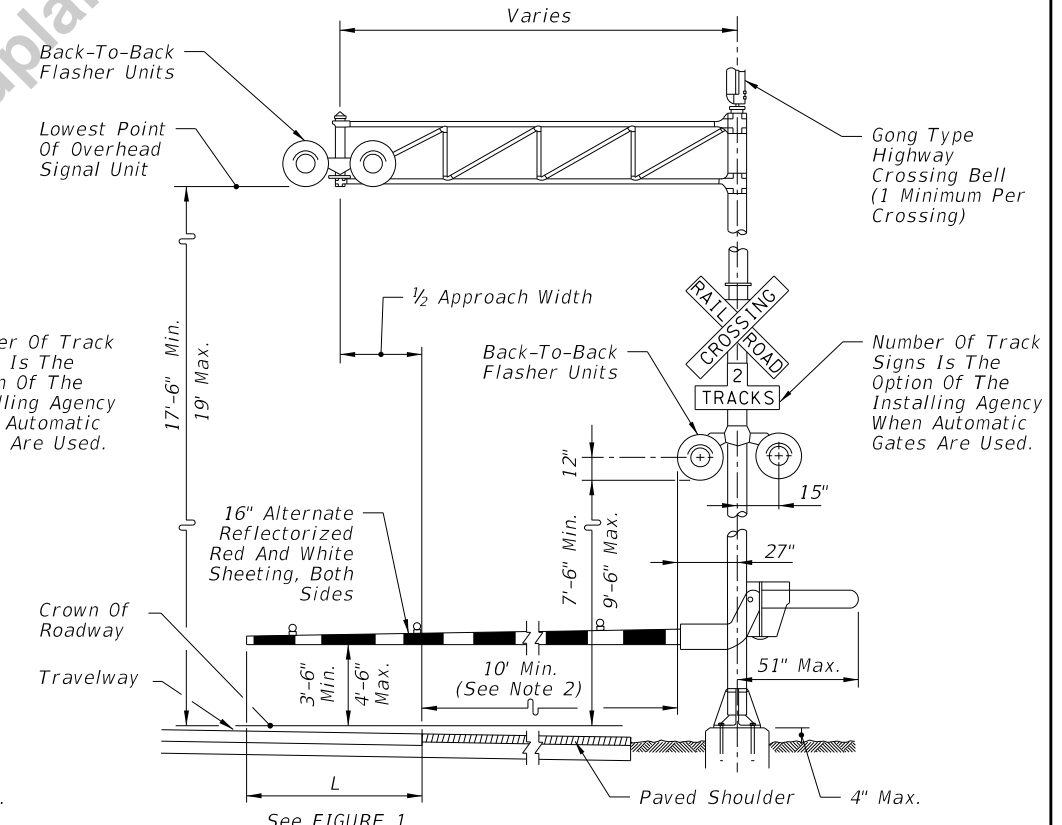
**TYPE I**



**TYPE II**



**TYPE III AND TYPE V**

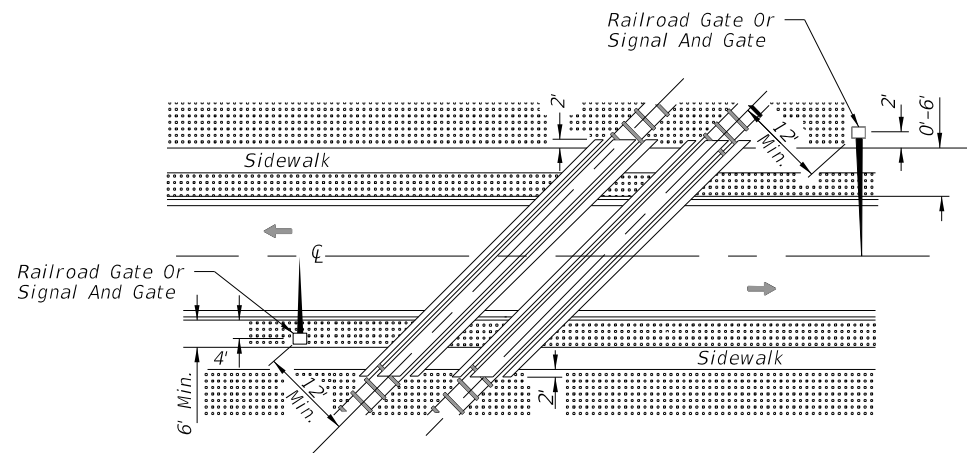


**TYPE IV AND TYPE VI**

**TRAFFIC CONTROL DEVICES FOR FLUSH SHOULDER ROADWAY**

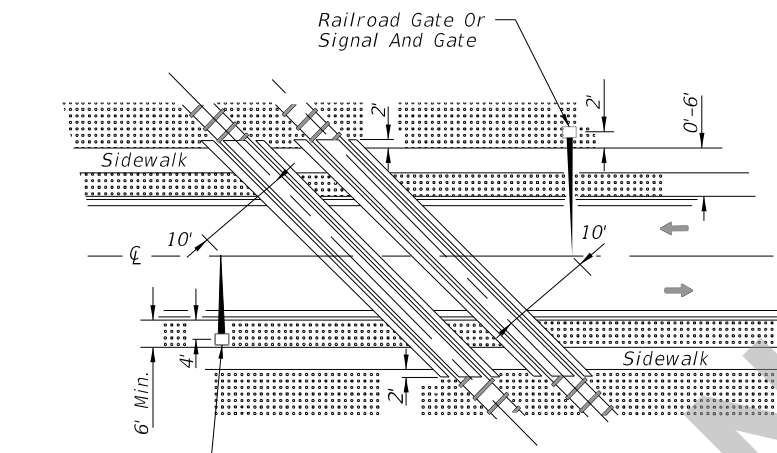
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|                           |  |  |  |                    |                 |
|---------------------------|--|--|--|--------------------|-----------------|
| LAST REVISION<br>02/05/21 | DESCRIPTION:<br>Deleted railroad signage and pavement marking details. | <br>FY 2020-21<br>STANDARD PLANS | <b>RAILROAD GRADE CROSSING<br/>TRAFFIC CONTROL DEVICES</b> | INDEX<br>509-070-1 | SHEET<br>1 of 3 |
|---------------------------|--|--|--|--------------------|-----------------|



ACUTE ANGLE (AND RIGHT ANGLE)

SIGNAL PLACEMENT AT RAILROAD CROSSING  
(2 LANES, CURB & GUTTER)

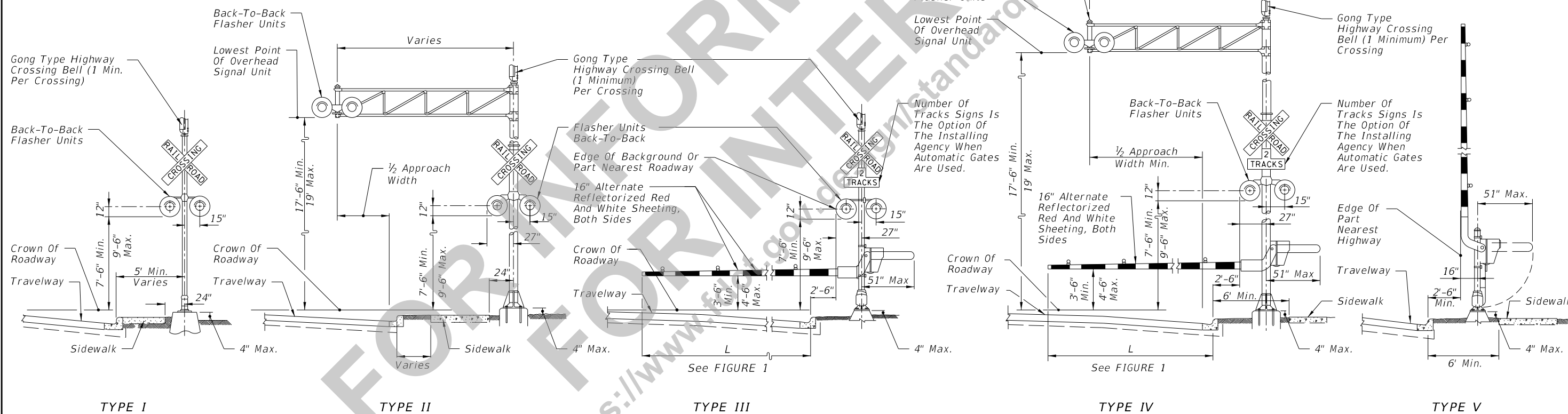


OBTUSE ANGLE

SIGNAL PLACEMENT AT RAILROAD CROSSING  
(2 LANES, CURB & GUTTER)

NOTES:

1. The location of flashing warning devices and stop lines shall be established based on future (or present) installation of gate with appropriate track clearances.
2. Where plans call for railroad traffic control devices to be installed in curbed medians, the minimum median width shall be 12'-6".
3. Location of railroad traffic control device is based on the distance available between face of curb & sidewalk. 0' to 6' - Locate device outside sidewalk. Over 6' - Locate device between face of curb and sidewalk.
4. Stop line to be perpendicular to edge of roadway, approx. 15' from nearest rail; or 8' from and parallel to gate when present.
5. When a cantilevered-arm flashing warning device is used, the minimum vertical clearance shall be 17'-6" from above the Crown of Roadway to the Lowest Point of the Overhead Signal Unit.

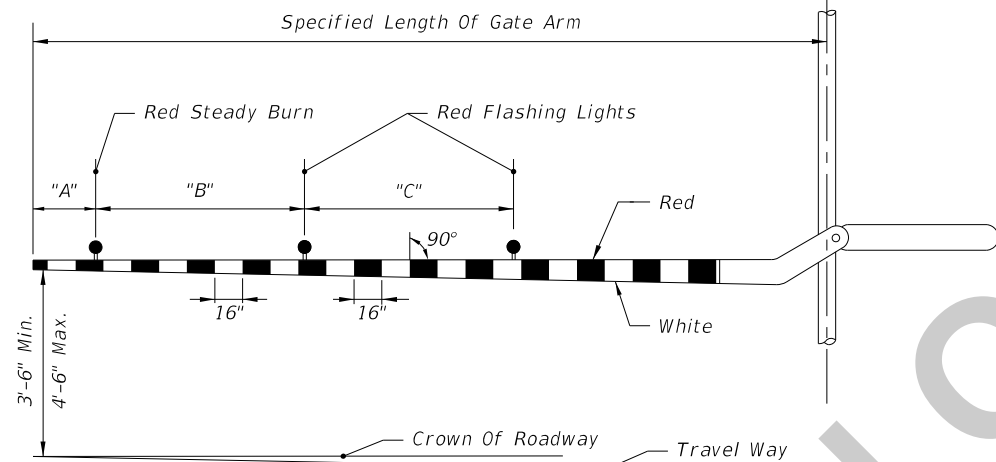
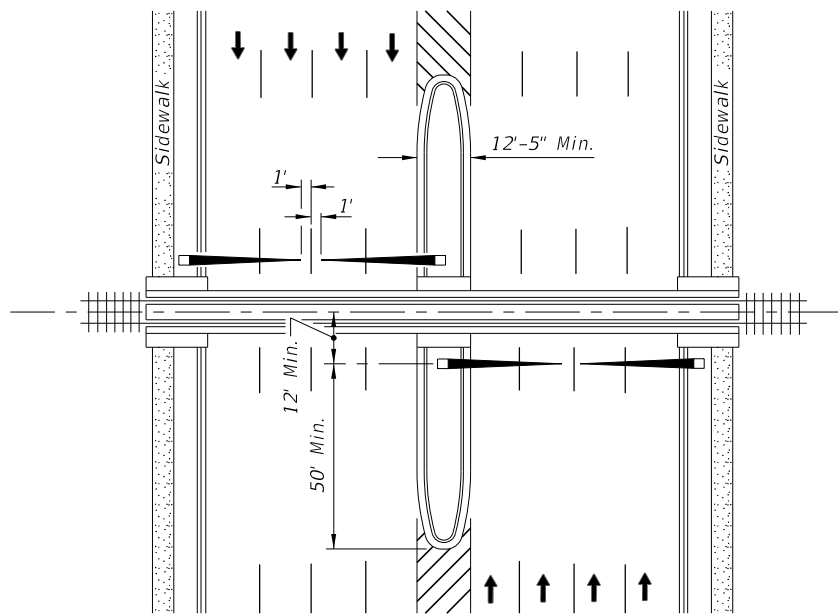


As A Minimum, Position One Flasher Unit Over Lane Separation Lines (More Than One Flasher Unit If There Are More Than 2 Approach Lanes).

TRAFFIC CONTROL DEVICES FOR CURBED ROADWAY

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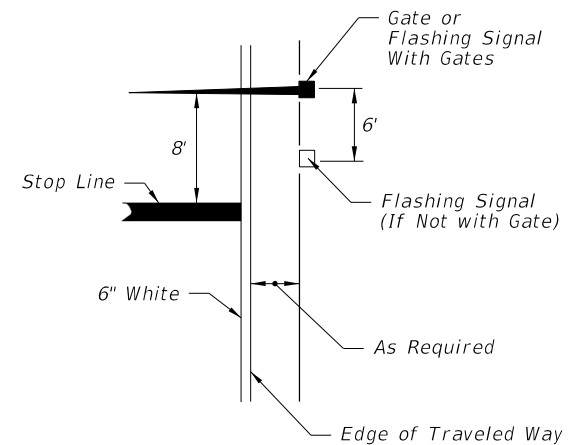
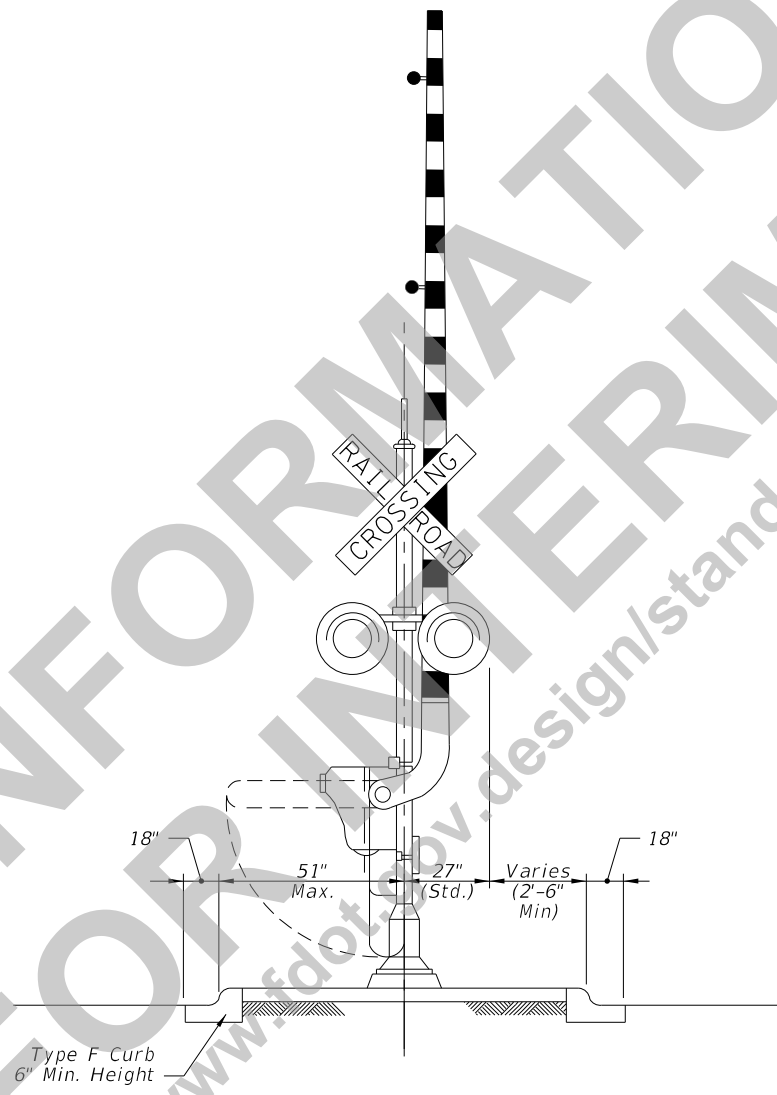
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| <p>LAST REVISION<br/>02/05/21</p> | <p>DESCRIPTION:<br/>Deleted railroad signage and pavement marking details.</p> | <p>FY 2020-21<br/>STANDARD PLANS</p> | <p>RAILROAD GRADE CROSSING<br/>TRAFFIC CONTROL DEVICES</p> | <p>INDEX<br/>509-070-1</p> | <p>SHEET<br/>2 of 3</p> |
|-----------------------------------|--|--------------------------------------|--|----------------------------|-------------------------|



| RAILROAD GATE ARM LIGHT SPACING |               |               |               |
|---------------------------------|---------------|---------------|---------------|
| Specified Length Of Gate Arm    | Dimension "A" | Dimension "B" | Dimension "C" |
| 14 Ft.                          | 6"            | 36"           | 5'            |
| 15 Ft.                          | 18"           | 36"           | 5'            |
| 16-17 Ft.                       | 24"           | 36"           | 5'            |
| 18-19 Ft.                       | 28"           | 41"           | 5'            |
| 20-23 Ft.                       | 28"           | 4'            | 5'            |
| 24-28 Ft.                       | 28"           | 5'            | 5'            |
| 29-31 Ft.                       | 36"           | 6'            | 6'            |
| 32-34 Ft.                       | 36"           | 7'            | 7'            |
| 35-37 Ft.                       | 36"           | 9'            | 9'            |
| 38 And Over                     | 36"           | 10'           | 10'           |

**NOTE:**

For additional information see the "Manual On Uniform Traffic Control Devices", Part 8; The "Traffic Control Handbook", Part VIII; and AASHTO "A Policy On Geometric Design Of Streets And Highways".



**MEDIAN SIGNAL GATES FOR MULTILANE UNDIVIDED URBAN SECTIONS**

(Three or More Driving Lanes in one Direction, 45 mph or less)

**RELATIVE LOCATION OF CROSSING TRAFFIC CONTROL DEVICES**

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|                           |  |
|---------------------------|--|
| LAST REVISION<br>02/05/21 | DESCRIPTION:<br>Added Relative Location of Crossing Traffic Control Devices details. |
|---------------------------|--|



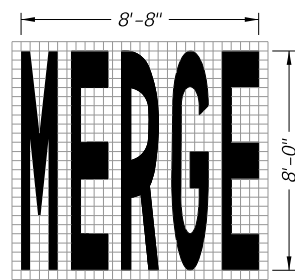
FY 2020-21  
STANDARD PLANS

RAILROAD GRADE CROSSING  
TRAFFIC CONTROL DEVICES

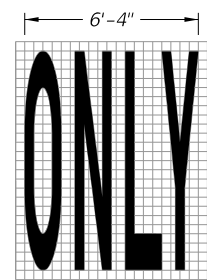
INDEX  
509-070-1

SHEET  
3 of 3

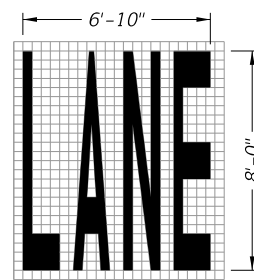
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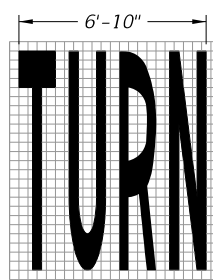
34 S.F.



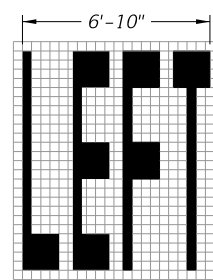
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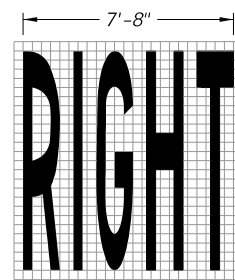
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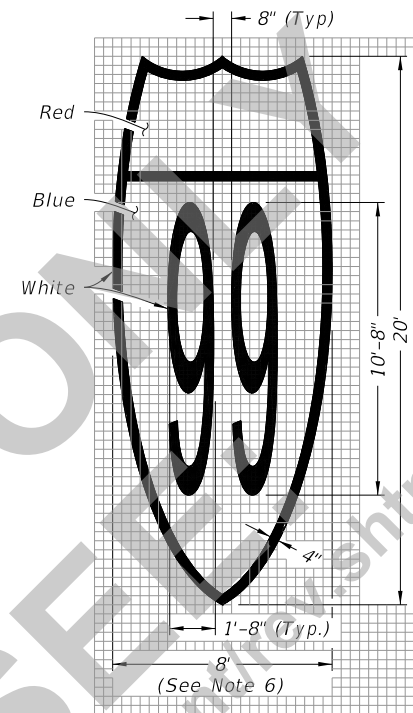
24 S.F.



20 S.F.

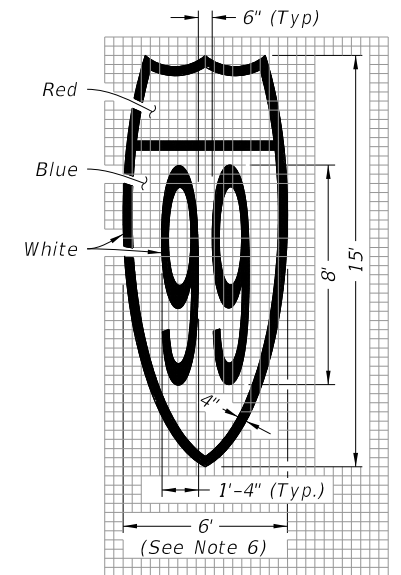


26 S.F.



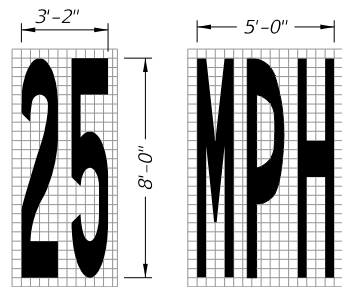
Route Shield for Limited Access Roadways (Interstate Route Shield Shown; U.S. and State Route Shield Similar)

128 S.F.

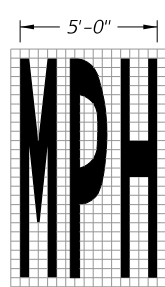


Route Shield for Arterials and Collectors (Interstate Route Shield Shown; U.S. and State Route Shield Similar)

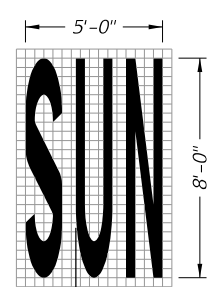
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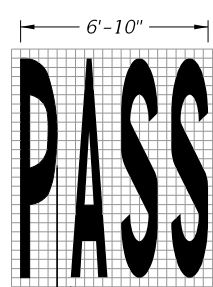
13 S.F.



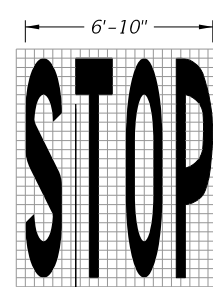
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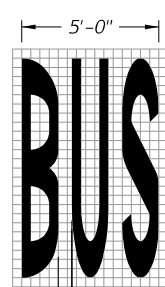
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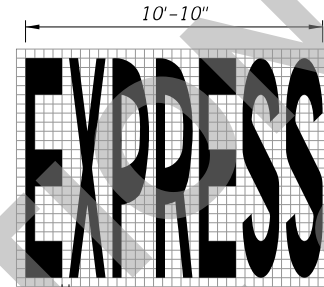
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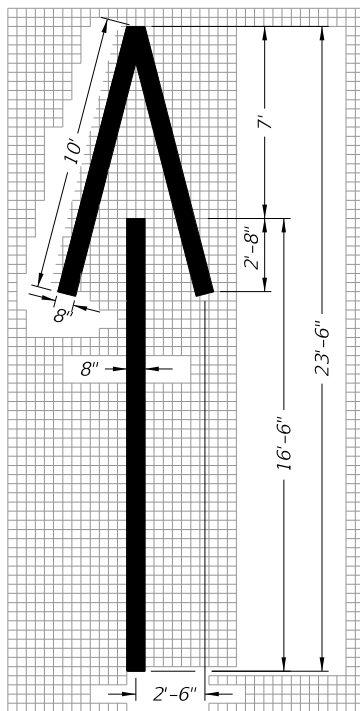
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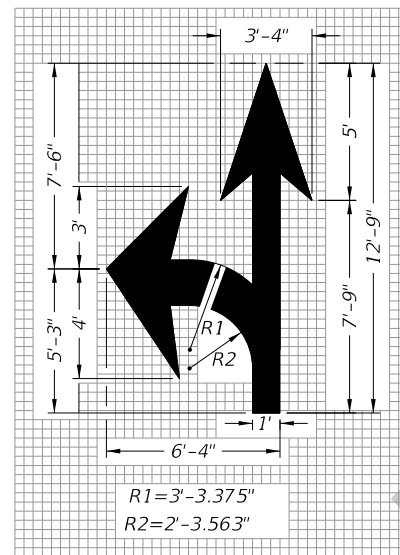
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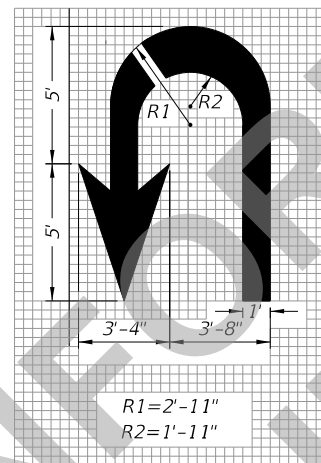
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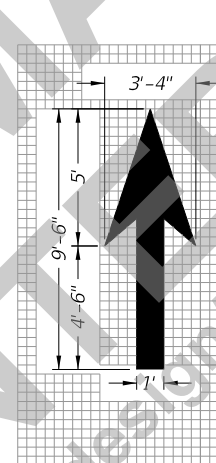
Wrong-Way Arrow  
24 S.F.



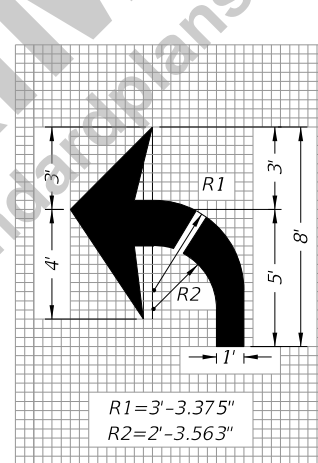
Turn and Through Lane-Use Arrow  
29 S.F.



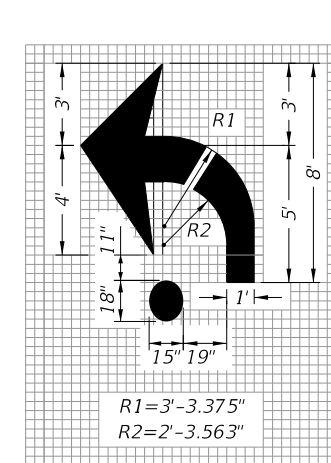
U Turn Lane-Use Arrow  
27 S.F.



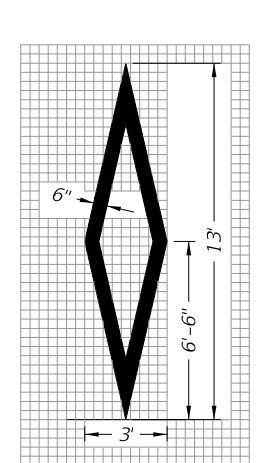
Through Lane-Use Arrow  
12 S.F.



Turn Lane-Use Arrow (Left Turn Shown - Right Turn Similar)  
17 S.F.



Roundabout Approach Arrow  
19 S.F.



Preferential Lane Symbol  
11 S.F.

**NOTES FOR PAVEMENT MESSAGES:**

1. When an arrow or another pavement message is used with a pavement message, maintain a minimum distance of "S" between items, measured from the base of each item. See the Pavement Message Spacing Table for "S" value.
2. Place all pavement messages 25' back from the stop line.
3. Dimensions are within 1" ±.
4. All grids are 4" x 4".
5. All pavement messages must be white except route shields.
6. Increase width of route shield for routes with three digits.

| PAVEMENT MESSAGE SPACING TABLE |                     |
|--------------------------------|---------------------|
| Posted Speed (mph)             | Distance "S" (feet) |
| ≤ 25                           | 40                  |
| 30 - 35                        | 56                  |
| 40 - 45                        | 72                  |
| ≥ 50                           | 88                  |

**PAVEMENT MESSAGE AND ARROW DETAILS**

**GENERAL NOTE:**

1. See Index 509-070 for pavement markings at railroad crossings.

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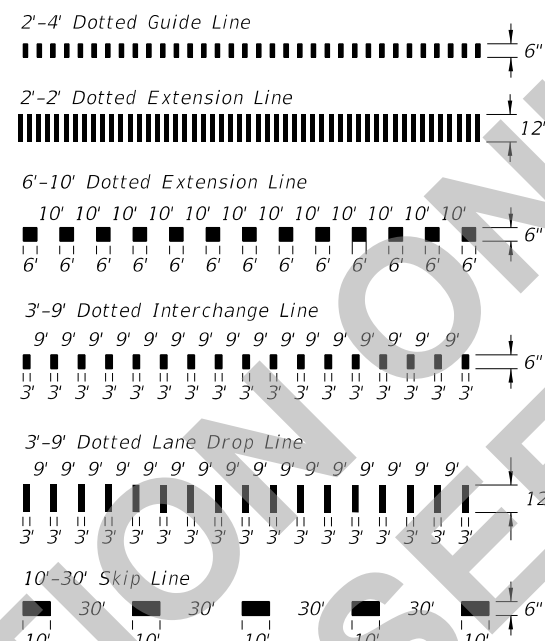
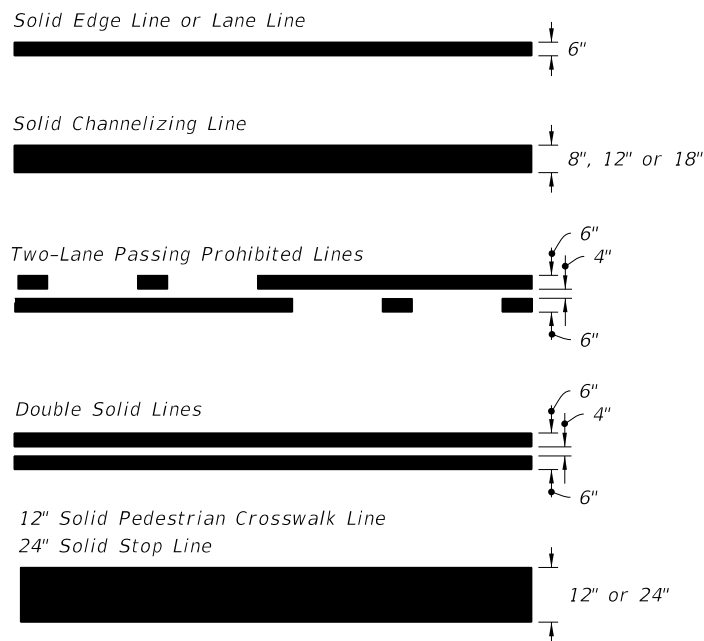
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|---------------------------|--|
| LAST REVISION<br>02/05/21 | DESCRIPTION:<br>Added railroad pavement marking details. |
|---------------------------|--|

**FY 2020-21  
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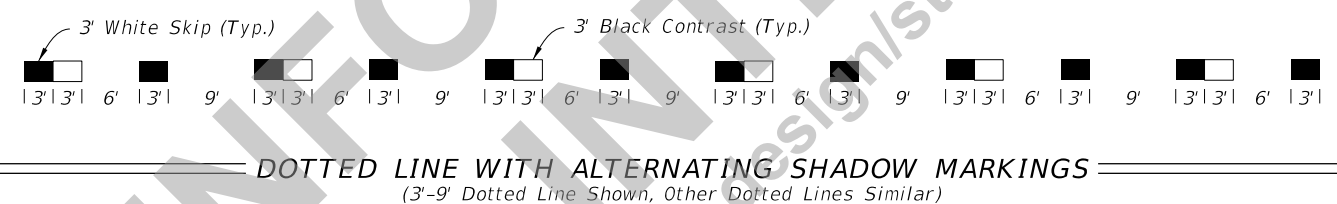
**PAVEMENT MARKINGS**

|                    |                  |
|--------------------|------------------|
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|--------------------|------------------|

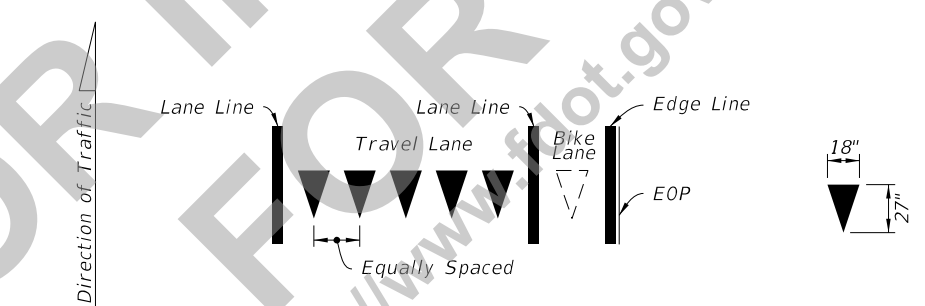




PAVEMENT MARKING LINES



DOTTED LINE WITH ALTERNATING SHADOW MARKINGS  
(3'-9' Dotted Line Shown, Other Dotted Lines Similar)

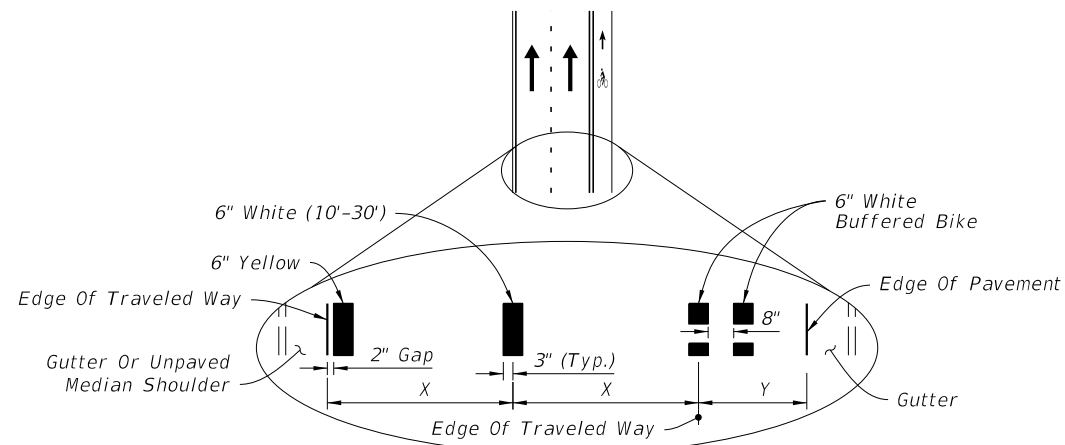


Yield Lines consist of five - 18" X 27" white triangles which face traffic. Equally space triangles within traffic lane. When a bike lane is present, add one additional triangle in the center of the bike lane.

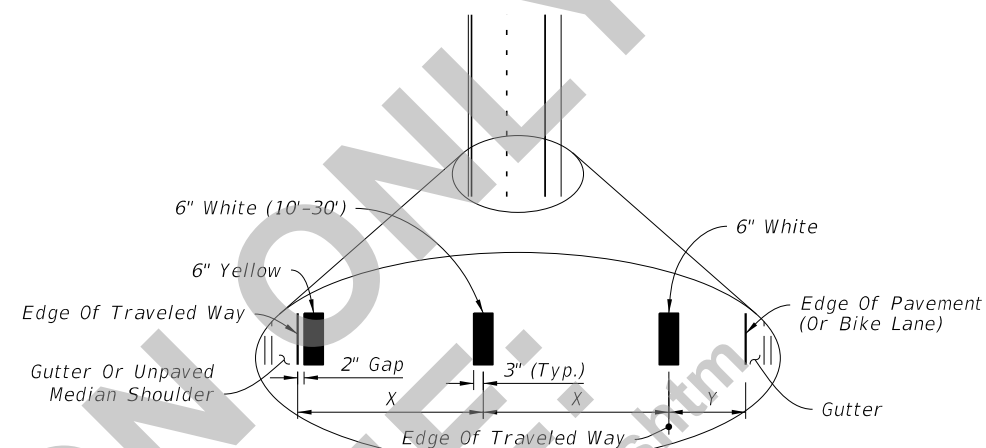
YIELD LINES

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2/5/2021

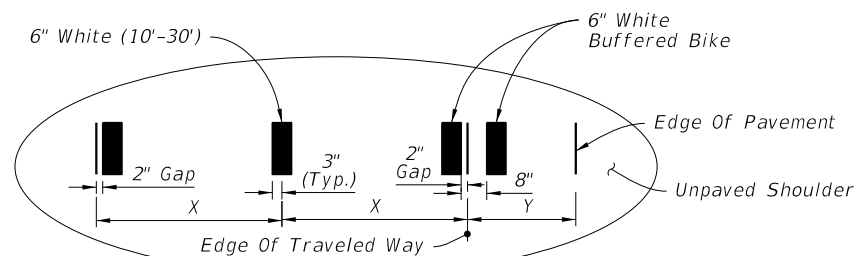
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|---------------------------|---|---|-------------------|--------------------|------------------|
| LAST REVISION<br>02/05/21 | REVISION DESCRIPTION:<br>Added railroad pavement marking details. |  FY 2020-21<br>STANDARD PLANS | PAVEMENT MARKINGS | INDEX<br>711-001-1 | SHEET<br>2 of 14 |
|---------------------------|---|---|-------------------|--------------------|------------------|



**CURB AND GUTTER**

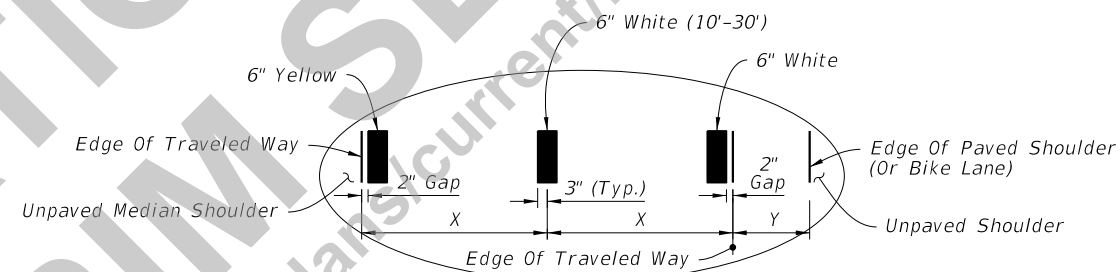


**CURB AND GUTTER**



**FLUSH SHOULDER**

X = LANE WIDTH (FT.)  
Y = BUFFERED BIKE LANE WIDTH (FT.)

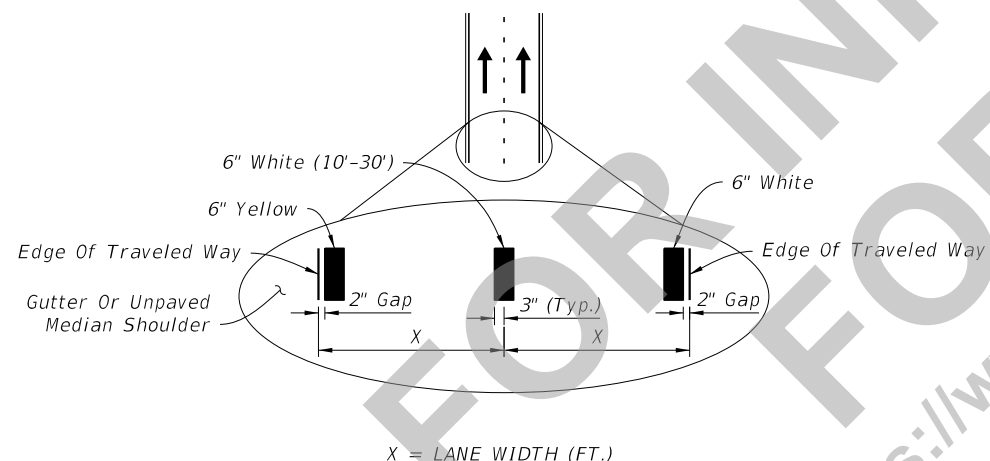


**FLUSH SHOULDER**

X = LANE WIDTH (FT.)  
Y = PAVED SHOULDER / BIKE LANE

==== STRIPING FOR BUFFERED BIKE LANE =====

==== STRIPING WITH SHOULDER OR NON-BUFFERED BIKE LANE =====



==== STRIPING WITH NO SHOULDER OR BIKE LANE =====

**NOTES:**

1. Lane widths (X) may not be same for each lane in the section.
2. For placement of RPMs, see Index 706-001.

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|---------------|----------|----------|--|

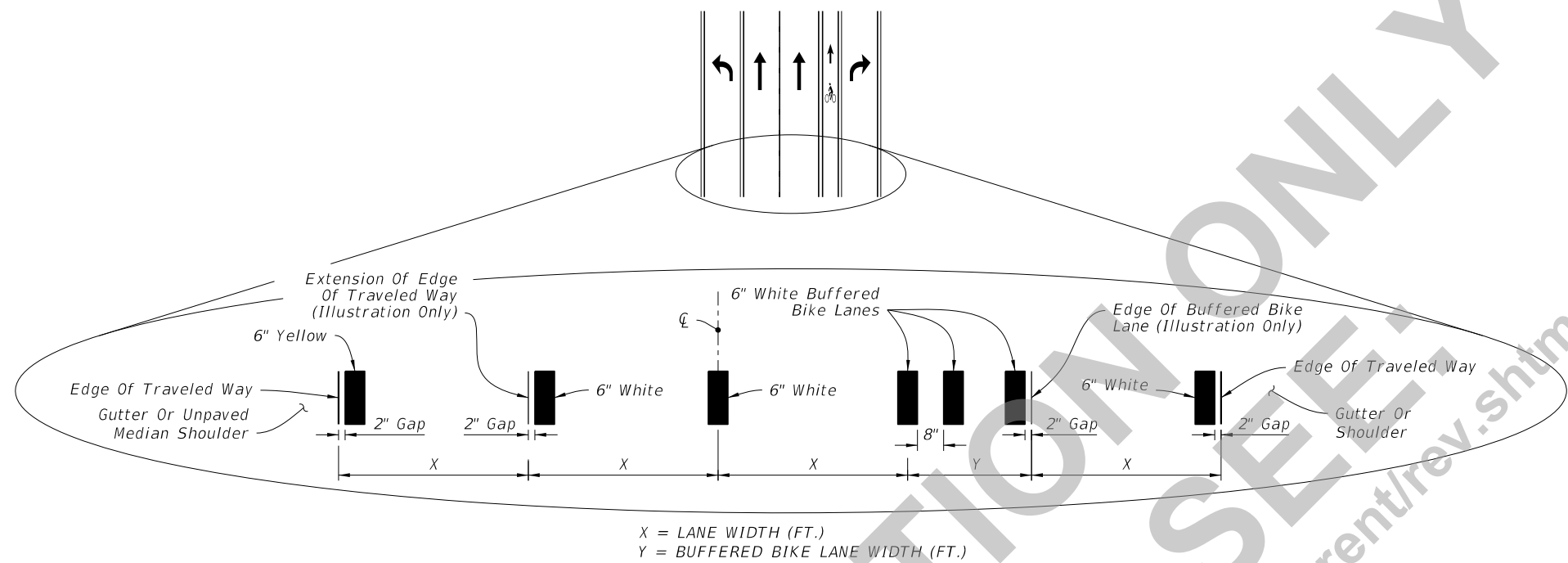


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PAVEMENT MARKINGS

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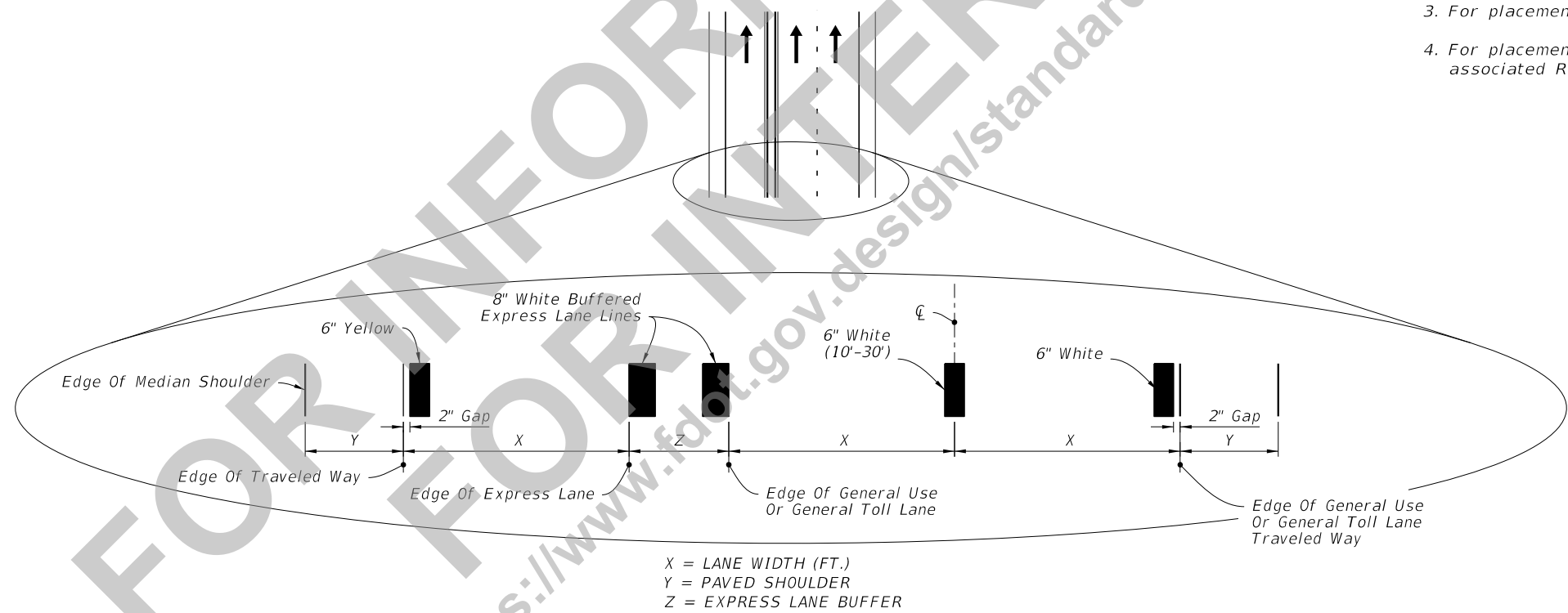
SHEET  
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**INTERSECTION APPROACH STRIPING WITH TURN LANES AND BUFFERED BIKE LANE KEY HOLE**

**NOTES:**

1. Lane widths (X) may not be same for each lane in the section.
3. For placement of RPMs, see Index 706-001.
4. For placement of Express Lane markers and associated RPMs, see the Plans.

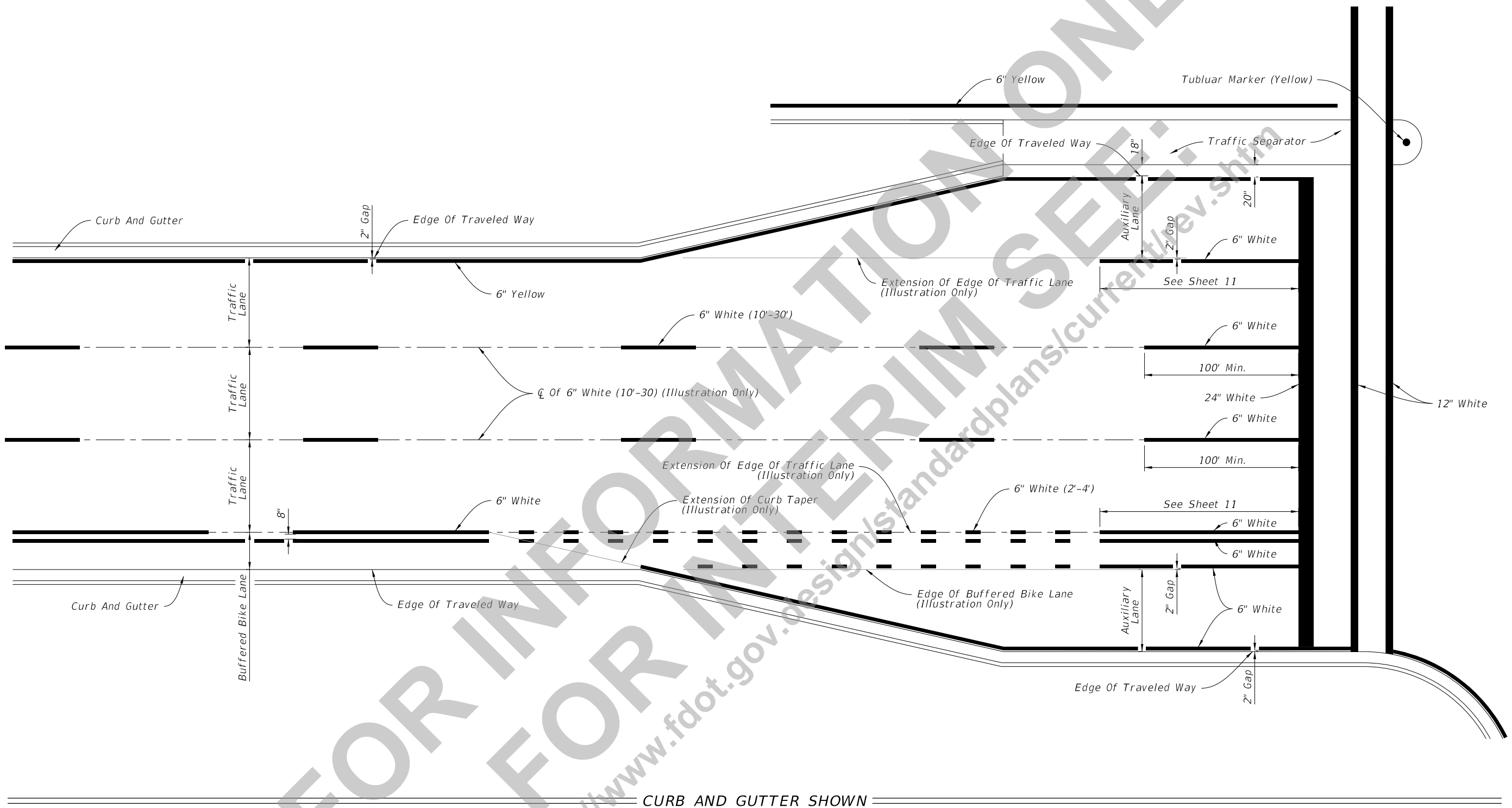


**BUFFERED EXPRESS LANE STRIPING**

**PLACEMENT OF LONGITUDINAL PAVEMENT MARKINGS**

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|                           |  |                              |                   |                    |                  |
|---------------------------|--|------------------------------|-------------------|--------------------|------------------|
| LAST REVISION<br>02/05/21 | DESCRIPTION:<br>Added railroad pavement marking details. | FY 2020-21<br>STANDARD PLANS | PAVEMENT MARKINGS | INDEX<br>711-001-1 | SHEET<br>4 of 14 |
|---------------------------|--|------------------------------|-------------------|--------------------|------------------|



FOR INFORMATION ONLY  
FOR INTERIM SELECTION  
<https://www.fdot.gov/design/standardplans/current/rev.shtml>

PLACEMENT OF LONGITUDINAL PAVEMENT MARKINGS

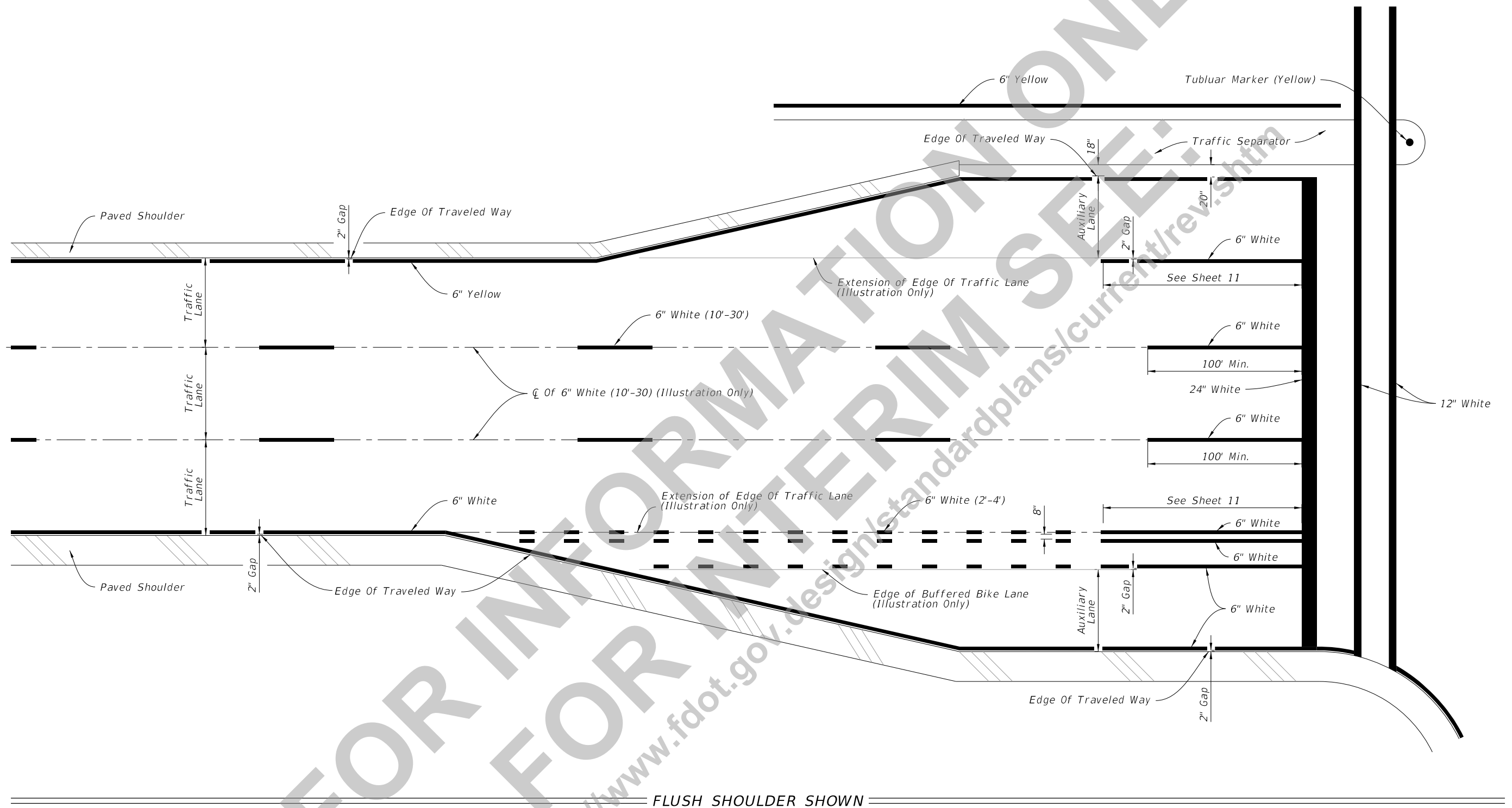
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|---------------|----------|----------|--|
| LAST REVISION | 02/05/21 | REVISION | DESCRIPTION:<br>Added railroad pavement marking details. |
|---------------|----------|----------|--|

**FY 2020-21  
STANDARD PLANS**

PAVEMENT MARKINGS

|           |         |
|-----------|---------|
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2/5/2021



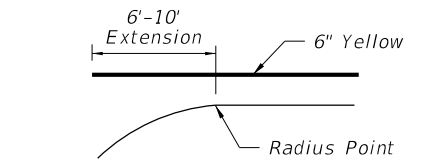
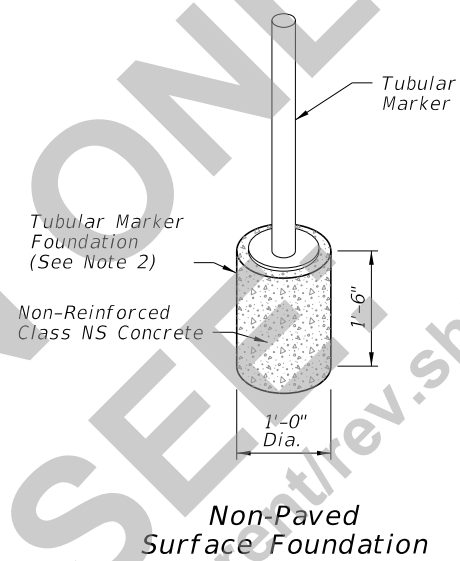
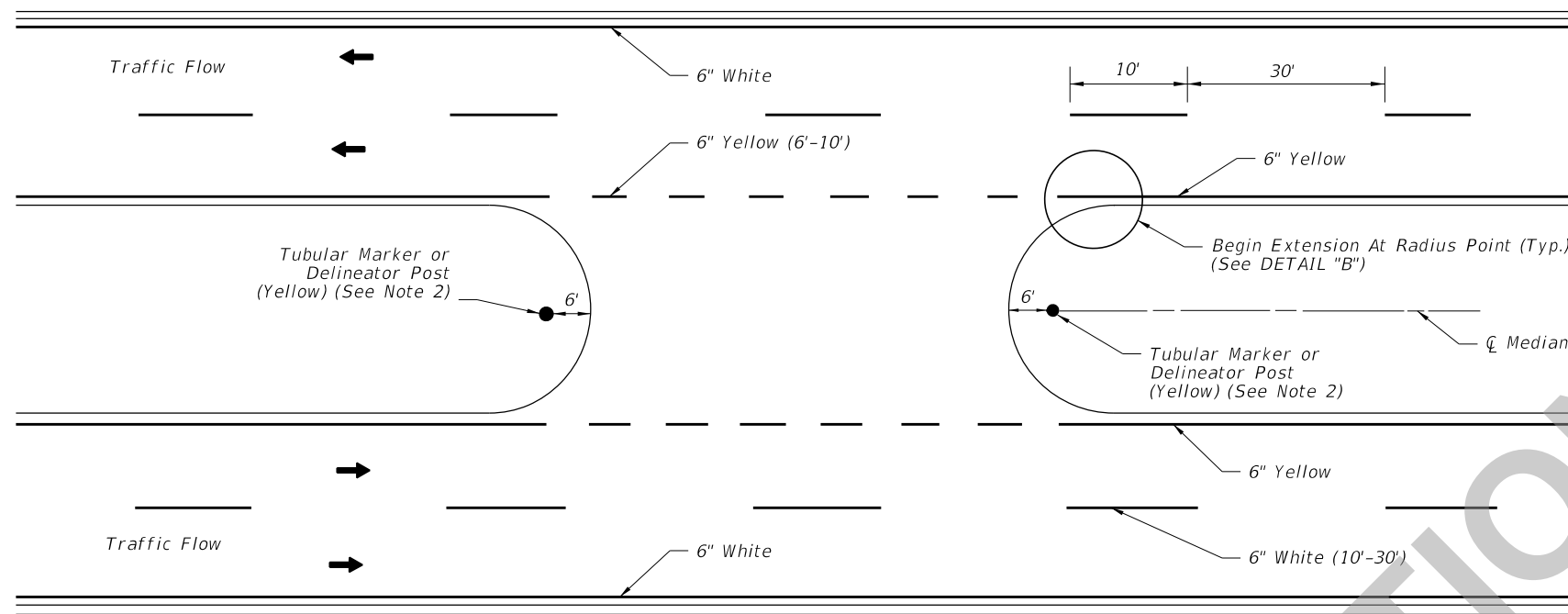
FOR INFORMATION ONLY  
FOR INTERIM SHEET

https://www.fdot.gov/design/standardplans/current/revsheet

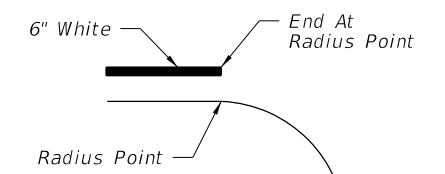
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2/5/2021

PLACEMENT OF LONGITUDINAL PAVEMENT MARKINGS

|                           |   |                              |                   |                    |                  |
|---------------------------|---|------------------------------|-------------------|--------------------|------------------|
| LAST REVISION<br>02/05/21 | REVISION DESCRIPTION:<br>Added railroad pavement marking details. | FY 2020-21<br>STANDARD PLANS | PAVEMENT MARKINGS | INDEX<br>711-001-1 | SHEET<br>6 of 14 |
|---------------------------|---|------------------------------|-------------------|--------------------|------------------|



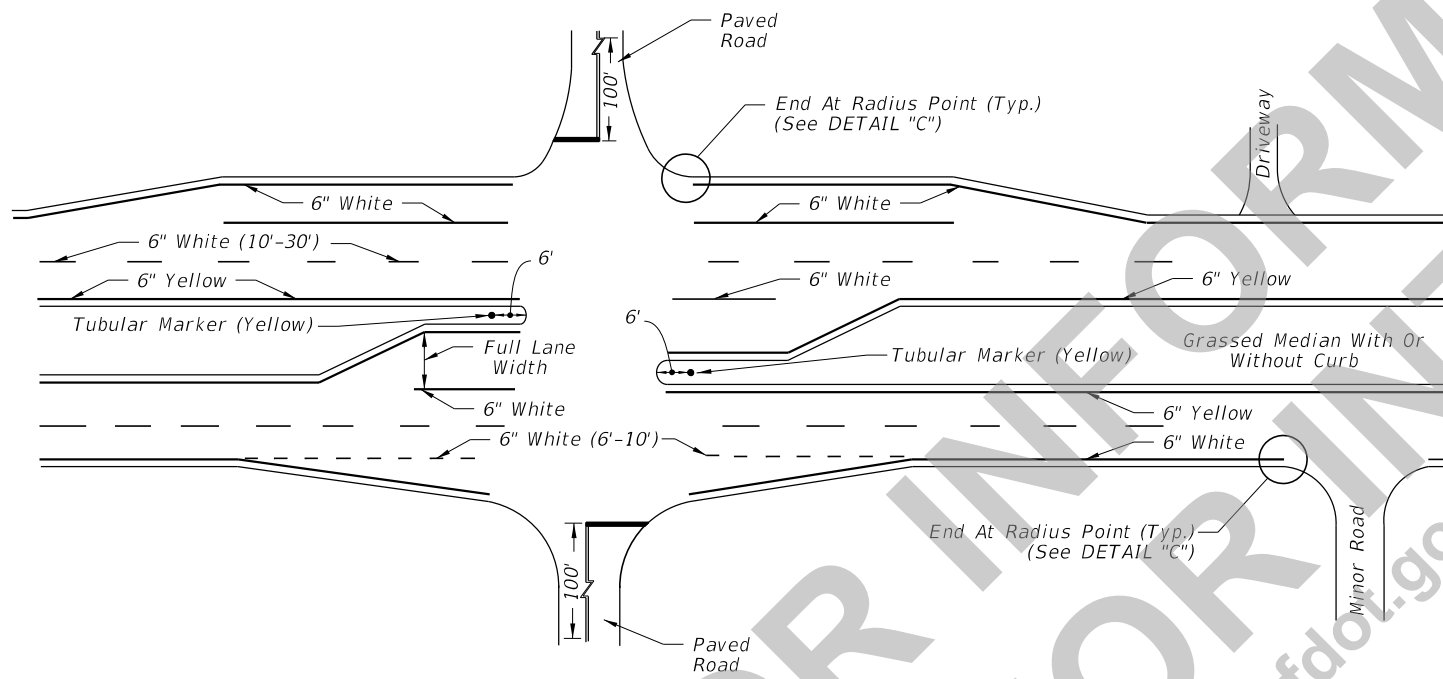
DETAIL "B"



DETAIL "C"

PAVEMENT MARKINGS AND DELINEATORS FOR MEDIAN CROSSOVER

DETAIL "A"



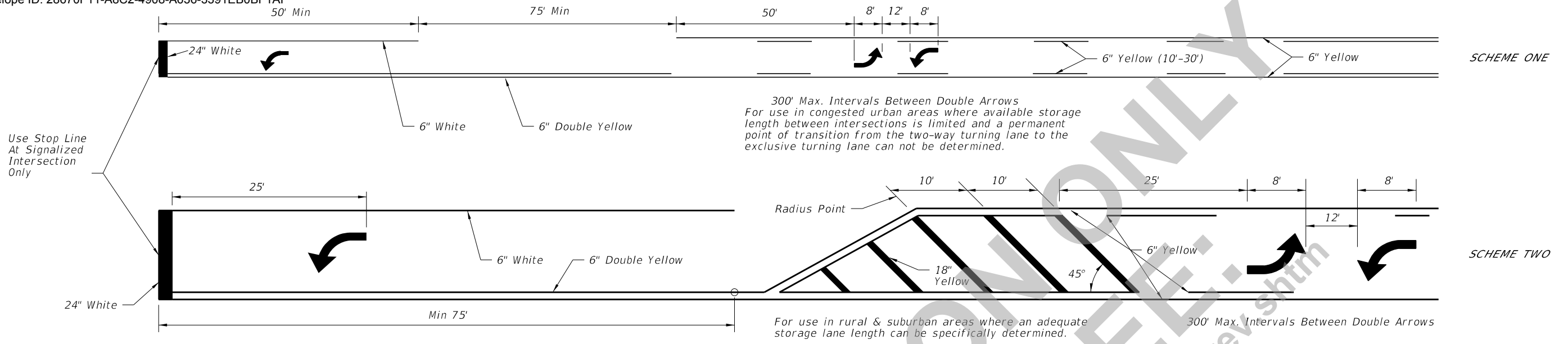
NOTE:

1. Apply yellow reflective paint to the noses of curbed medians, traffic separators, and raised islands. When applying yellow reflective paint in conjunction with Raised Pavement Markers, see Index 706-001.
2. Options for grassed medians:
  - A. Option 1: Tubular Marker (Yellow). Attach Tubular Marker according to manufacturer's instructions. Non-Paved Surface Foundation (See Detail "A") is provided as an option if no other suitable surface is provided. Install Non-Paved Surface Foundation flush with the surrounding ground surface.
  - B. Option 2: Delineator Post. Use yellow retro-reflective sheeting on both sides of the delineator. Install the post so that the top is 4'-0" above the grade at the edge of the pavement.
3. Extend double yellow centerlines 100' back from intersection on all approaches or 50' for unmarked cross roads.

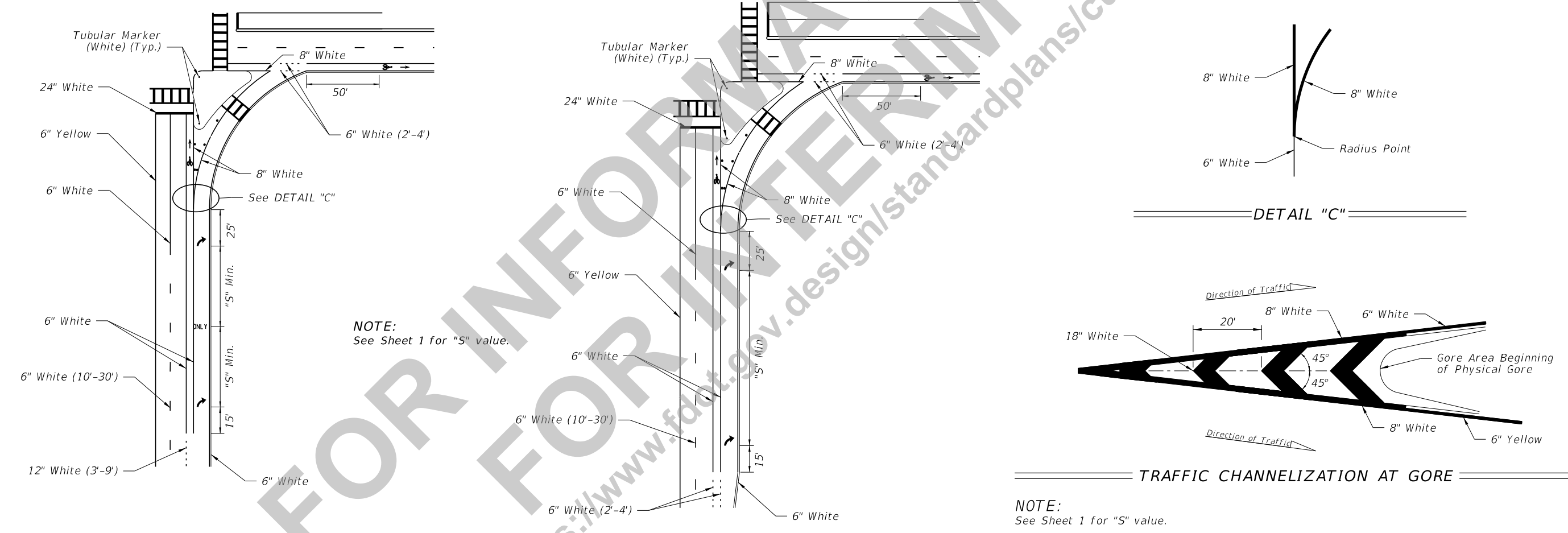
PAVEMENT MARKINGS FOR INTERSECTIONS WITH MAJOR AND MINOR ROADS

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|                           |  |  |                   |                    |                  |
|---------------------------|--|--|-------------------|--------------------|------------------|
| LAST REVISION<br>02/05/21 | DESCRIPTION:<br>Added railroad pavement marking details. | <br>FY 2020-21<br>STANDARD PLANS | PAVEMENT MARKINGS | INDEX<br>711-001-1 | SHEET<br>7 of 14 |
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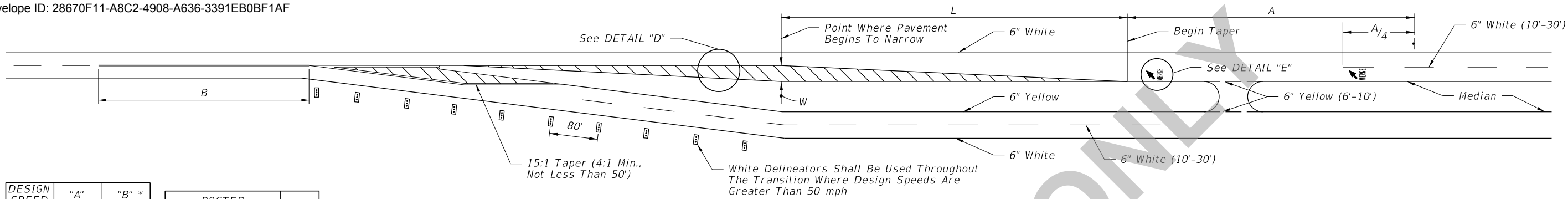


**TWO WAY LEFT TURN LANE**  
 (With Single Lane Left Turn Channelization)



2/5/2021 12:06:27 PM

|                           |  |   |                   |                    |                  |
|---------------------------|--|---|-------------------|--------------------|------------------|
| LAST REVISION<br>02/05/21 | DESCRIPTION:<br>Added railroad pavement marking details. |  FY 2020-21<br>STANDARD PLANS | PAVEMENT MARKINGS | INDEX<br>711-001-1 | SHEET<br>8 of 14 |
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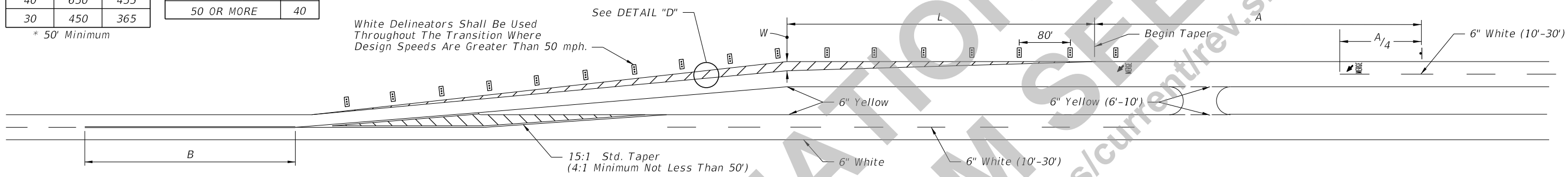
| DESIGN SPEED (MPH) | "A" (FT.) | "B" * (FT.) |
|--------------------|-----------|-------------|
| 60                 | ---       | 640         |
| 55                 | 950       | 595         |
| 50                 | 850       | 550         |
| 45                 | 750       | 500         |
| 40                 | 650       | 455         |
| 30                 | 450       | 365         |

\* 50' Minimum

| POSTED SPEED LIMIT MPH | "y" (FT.) |
|------------------------|-----------|
| 30 OR LESS             | 10        |
| 35                     | 20        |
| 40                     | 20        |
| 45                     | 30        |
| 50 OR MORE             | 40        |

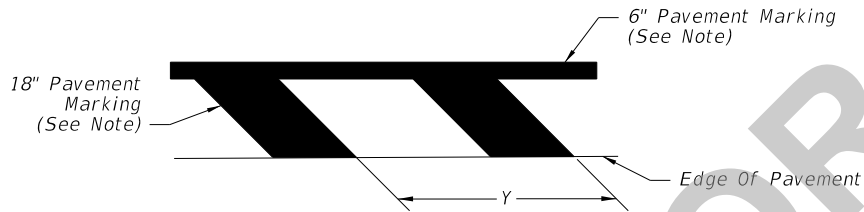
| DESIGN SPEED 'S' (MPH) | Length 'L' (FT.) |
|------------------------|------------------|
| 40 or Less             | $L = WS^2/60$    |
| 45 or Greater          | $L = WS$         |

LEFT ROADWAY CENTERED ON EXISTING ROADWAY

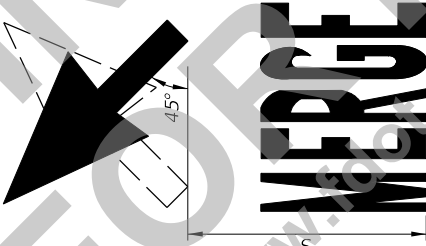


RIGHT ROADWAY CENTERED ON EXISTING ROADWAY

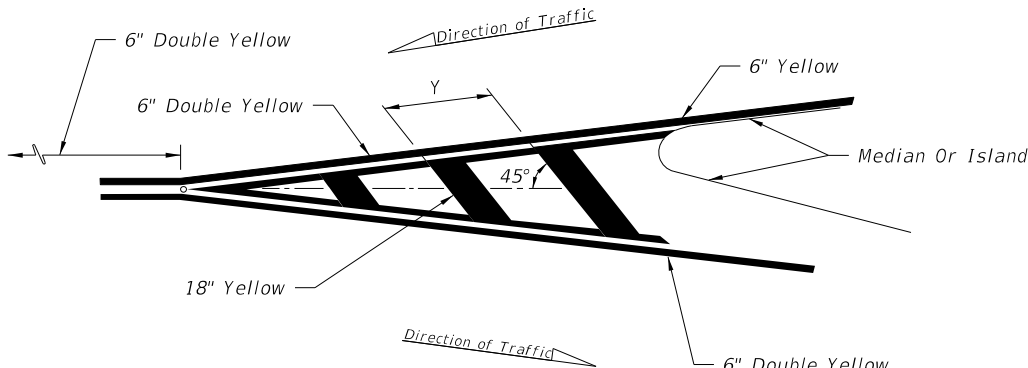
SCHEMES FOR TRANSITION - 2 LANE / 4 LANE ROADWAY



**NOTE:**  
Make pavement markings yellow for left roadway centered on existing roadway. Right roadway centered on existing roadway is similar with white pavement markings.



**NOTE:** See Sheet 1 for "S" value.



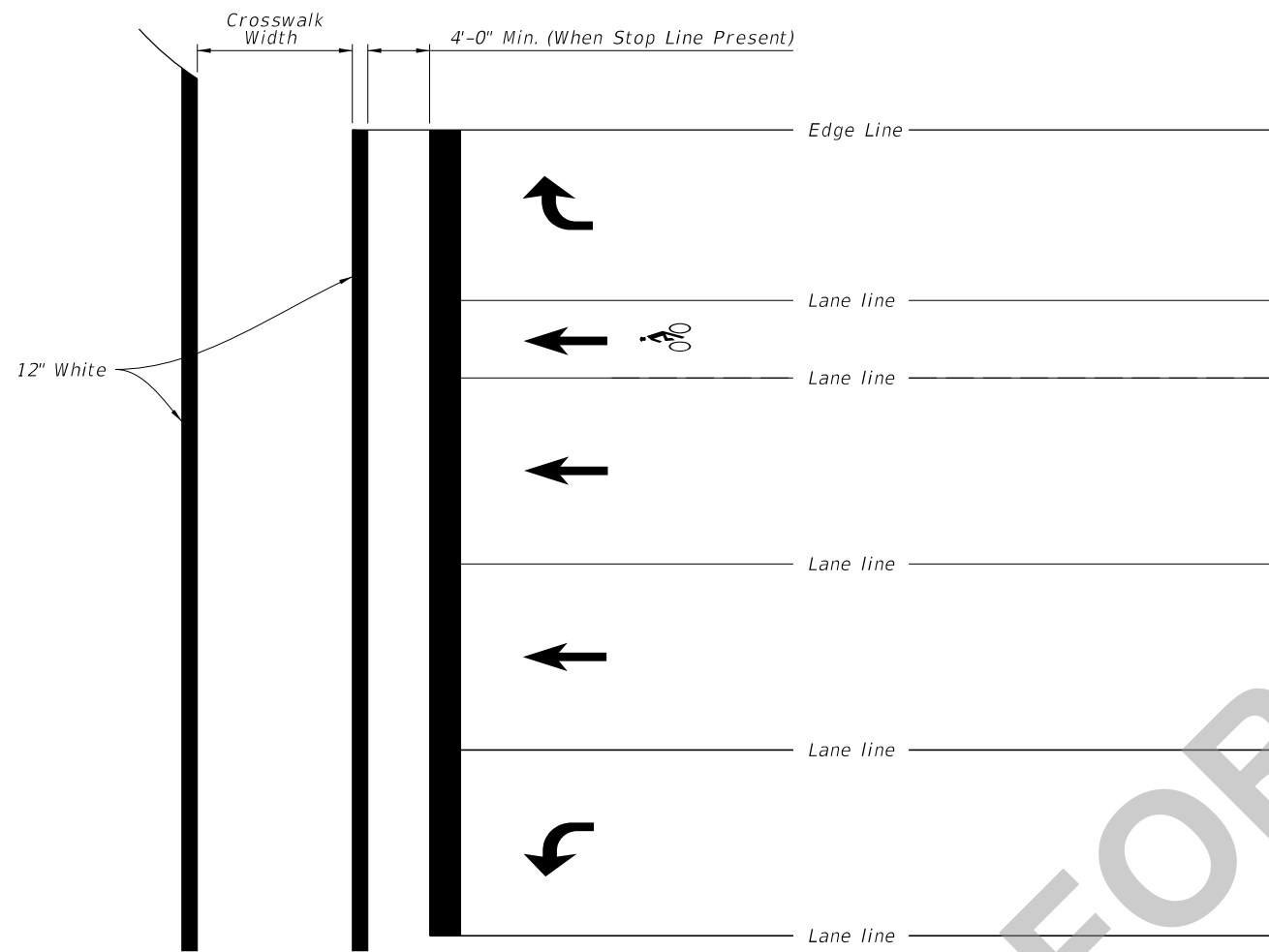
MARKINGS FOR TRAFFIC SEPARATION

DETAIL "D"

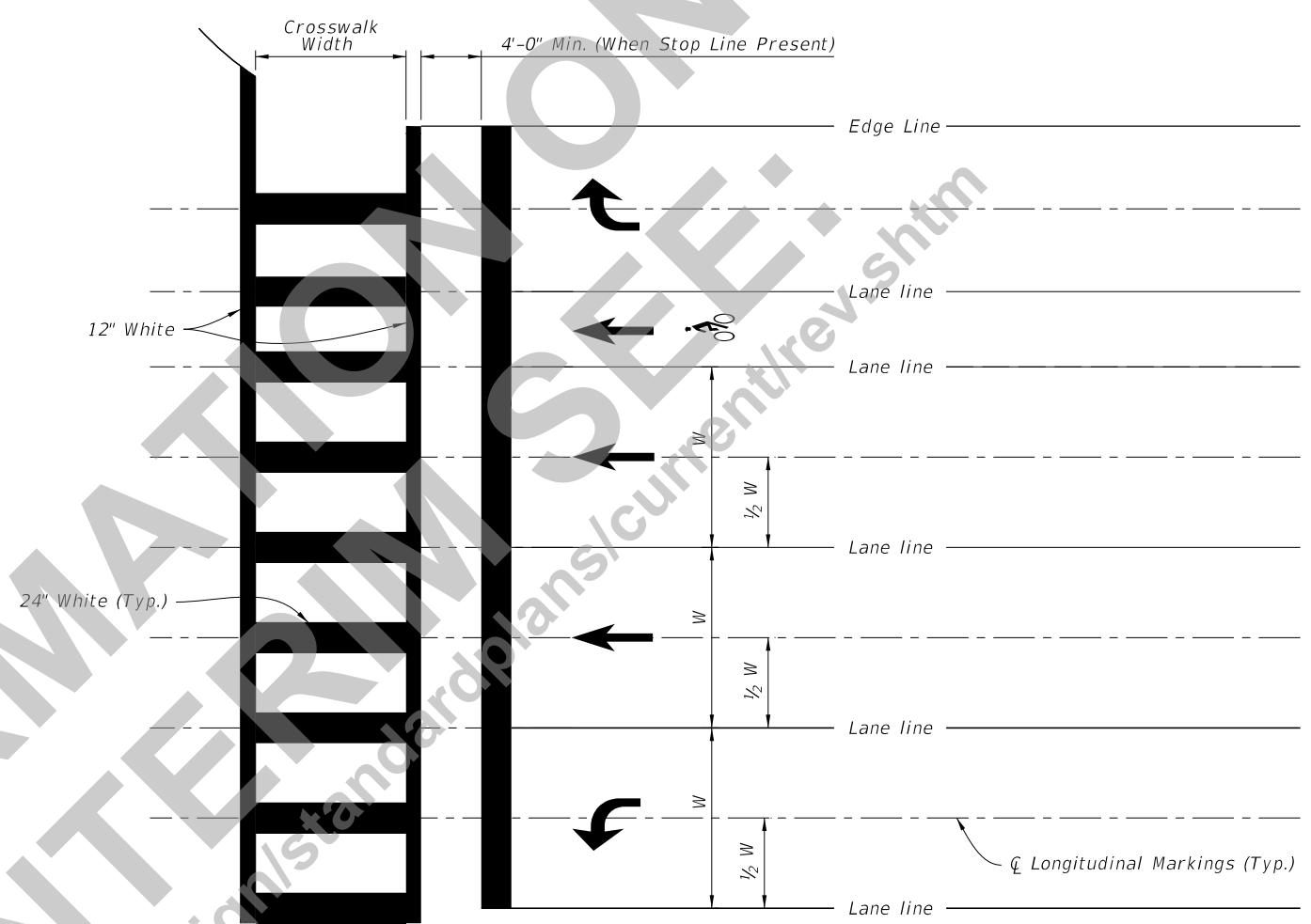
DETAIL "E"

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STANDARD CROSSWALK DETAILS



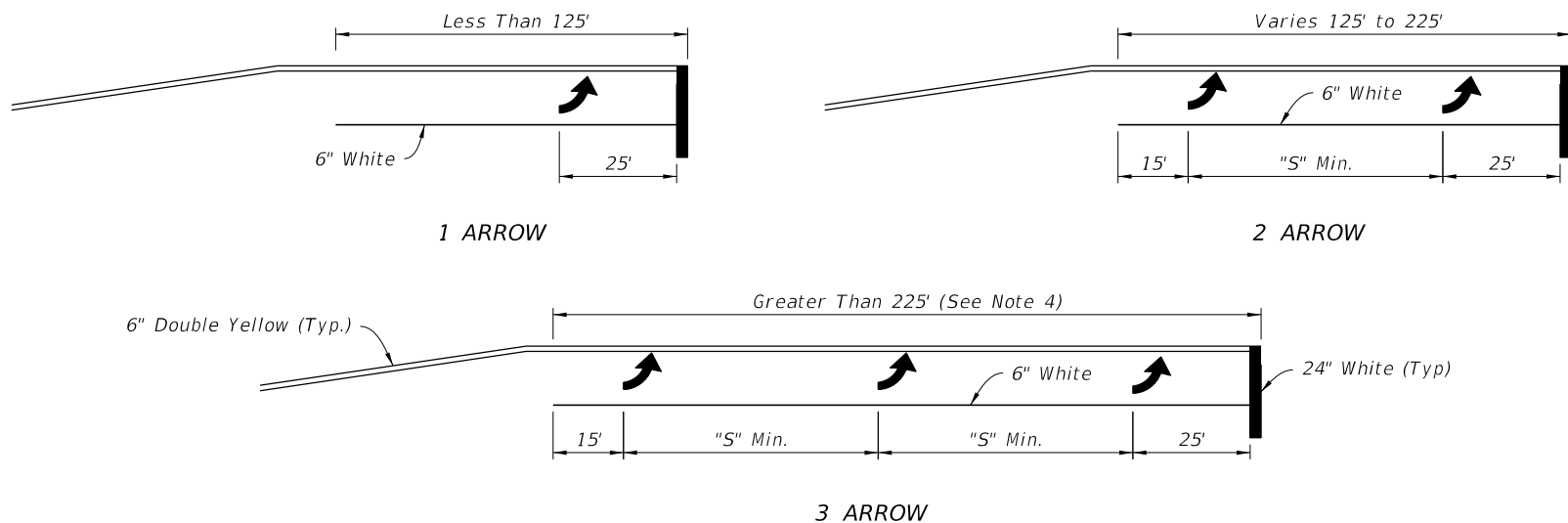
SPECIAL EMPHASIS CROSSWALK DETAILS

**NOTES:**

1. For crosswalk width, exceed width of the adjacent sidewalk, but do not make width less than 6' for intersection crosswalks and 10' for midblock crosswalks. Measure width from the inside of the transverse crosswalk markings.
2. When the Special Emphasis Crosswalk is not perpendicular to the lane lines, make the longitudinal markings parallel to the lane lines.
3. Refer to Index 522-002 when Curb Ramps are present.

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2/5/2021

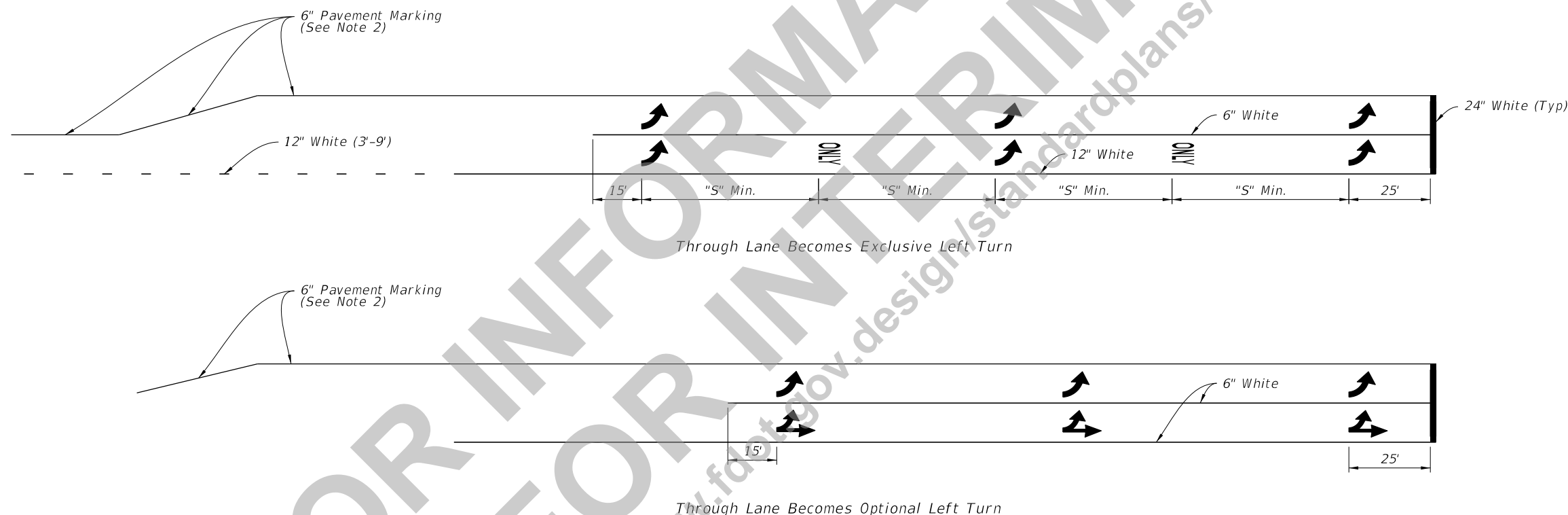
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|-----------------------------------|---|---|--------------------------|----------------------------|---------------------------|
| <p>LAST REVISION<br/>02/05/21</p> | <p>REVISION DESCRIPTION:<br/>Added railroad pavement marking details.</p> | <p>FDOT<br/>FY 2020-21<br/>STANDARD PLANS</p> | <p>PAVEMENT MARKINGS</p> | <p>INDEX<br/>711-001-1</p> | <p>SHEET<br/>10 of 14</p> |
|-----------------------------------|---|---|--------------------------|----------------------------|---------------------------|



**NOTES:**

1. This Index also applies to right turn lanes.
2. Make pavement marking yellow for left-turn lanes and white for right-turn lanes.
3. See Sheet 1 for "S" value.
4. Space arrows evenly between the first and last arrow with a minimum spacing of "S" between arrows.
5. For turn lanes greater than 225' in length, use a minimum of three arrows. Use additional arrows in accordance with the Plans or as directed by the Engineer. Space arrows evenly throughout the available length with a minimum spacing of "S" between arrows.

**SINGLE LEFT TURNS**

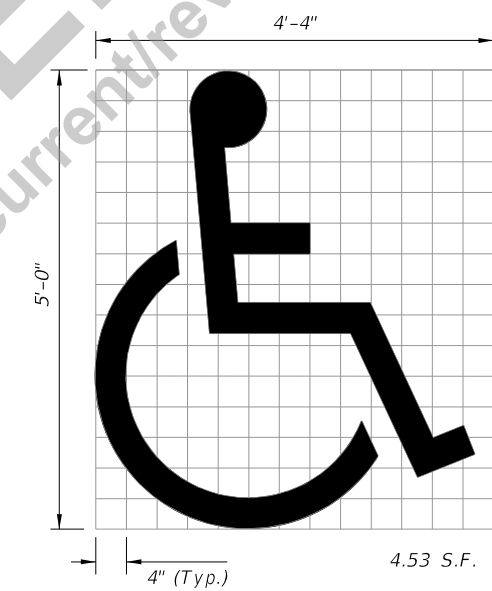
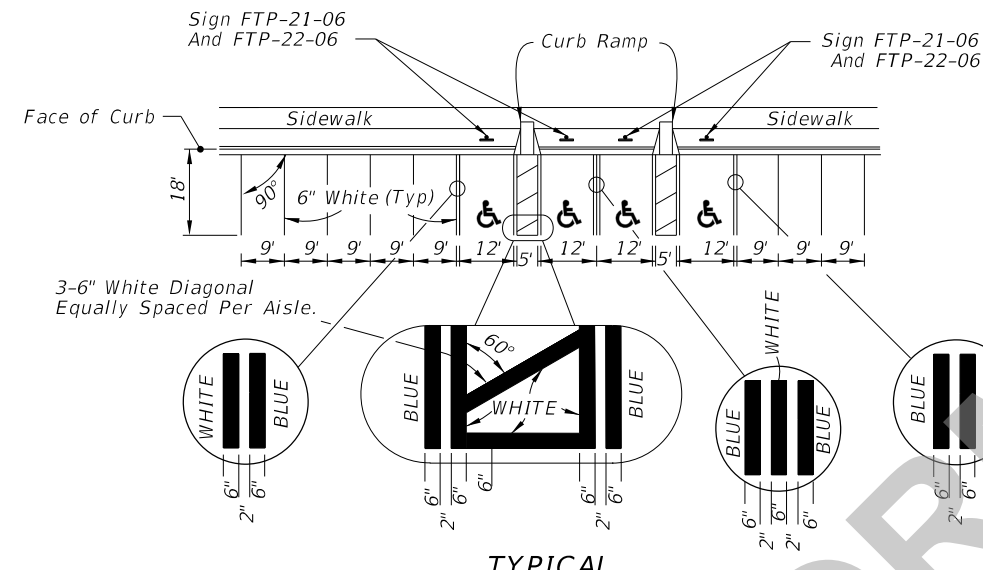
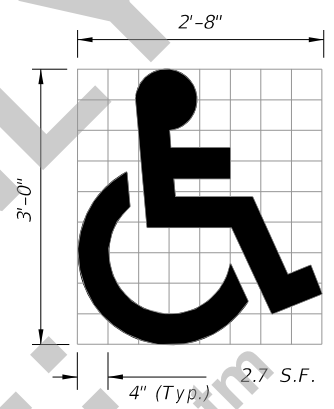
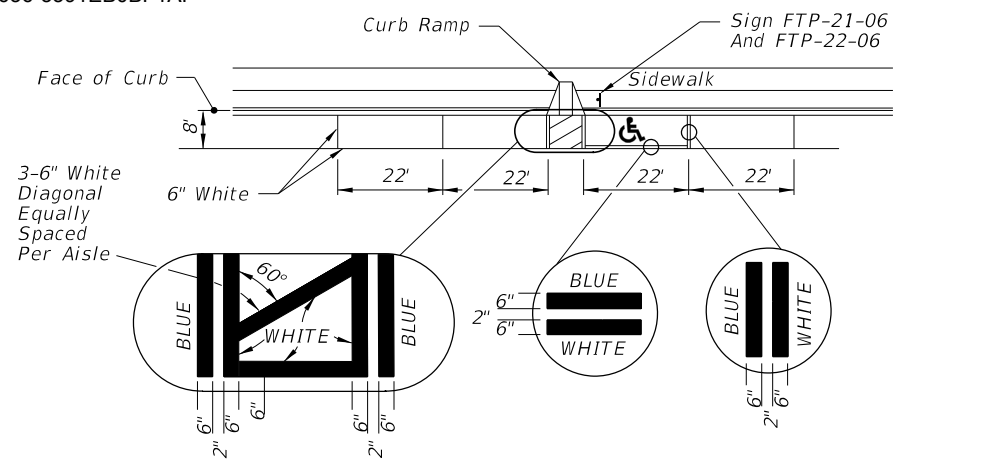


**DOUBLE LEFT TURNS**

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2/5/2021

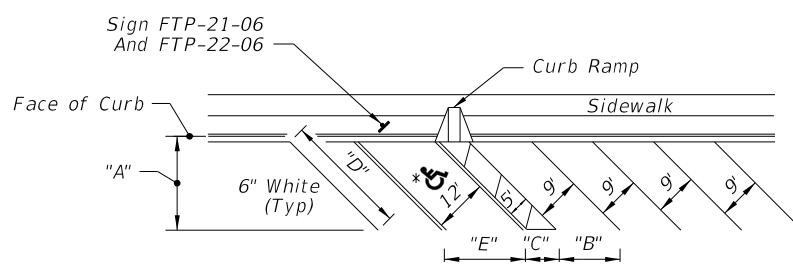
**TURN LANE MARKINGS**

|                           |   |  |                              |                   |                    |                   |
|---------------------------|---|--|------------------------------|-------------------|--------------------|-------------------|
| LAST REVISION<br>02/05/21 | REVISION DESCRIPTION:<br>Added railroad pavement marking details. |  | FY 2020-21<br>STANDARD PLANS | PAVEMENT MARKINGS | INDEX<br>711-001-1 | SHEET<br>11 of 14 |
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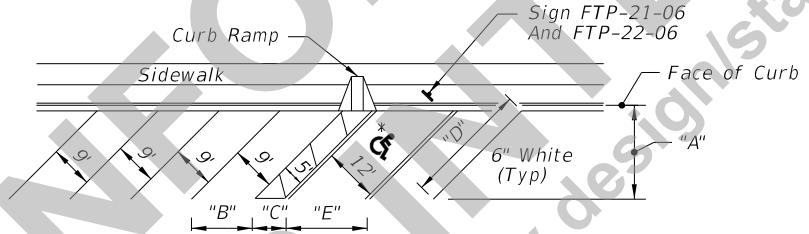


(See Note 6)

UNIVERSAL SYMBOL OF ACCESSIBILITY



FORWARD-IN PARKING



REVERSE-IN PARKING

\* FOR ACCESSIBLE MARKINGS - SEE ABOVE

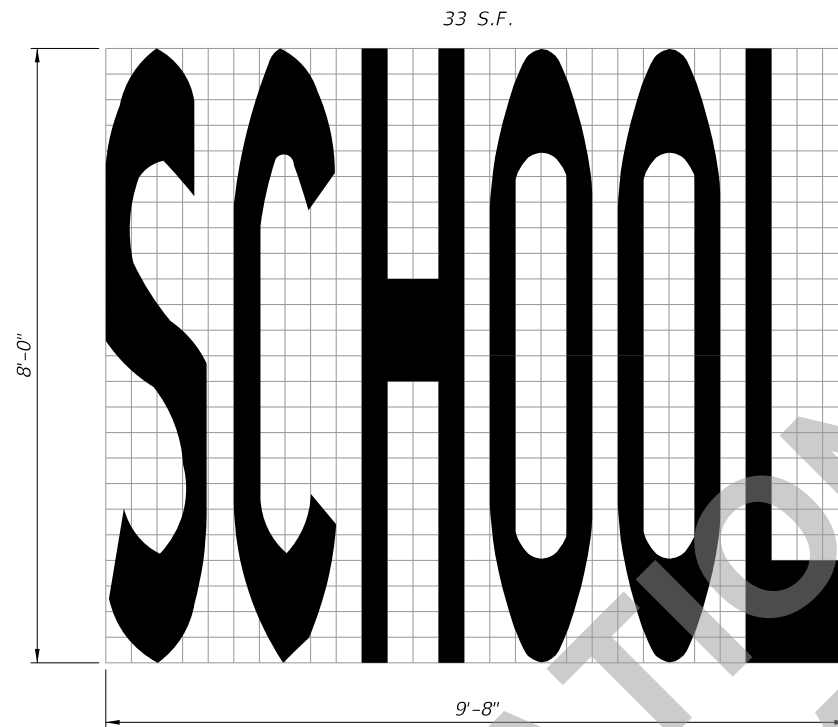
| DIMENSIONS |        |        |       |        |        |
|------------|--------|--------|-------|--------|--------|
| Δ θ        | "A"    | "B"    | "C"   | "D"    | "E"    |
| 45°        | 17'-0" | 12'-9" | 7'-0" | 24'-0" | 17'-0" |

PAVEMENT MARKING FOR PARKING

NOTES:

1. Dimensions are to the centerline of markings.
2. An Access Aisle is required for each accessible space when angle parking is used.
3. Criteria for pavement markings only, not public sidewalk curb ramp locations. For ramp locations refer to plans.
4. Tint blue pavement markings to match color 15180 of Federal Standards 595a.
5. Mount FTP-22-06 sign below the FTP-21-06 sign.
6. Use of the pavement symbol in accessible parking spaces is optional. When pavement symbol is used, the symbol is either 3'-0" or 5'-0" high and white in color.

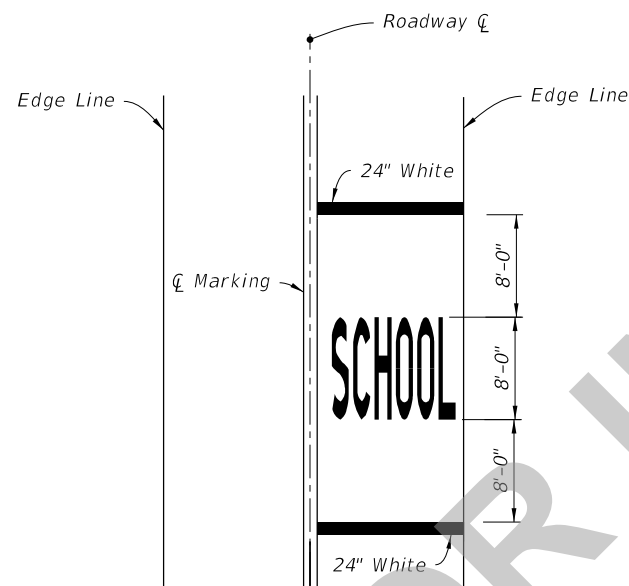
12:06:32 PM 2/5/2021



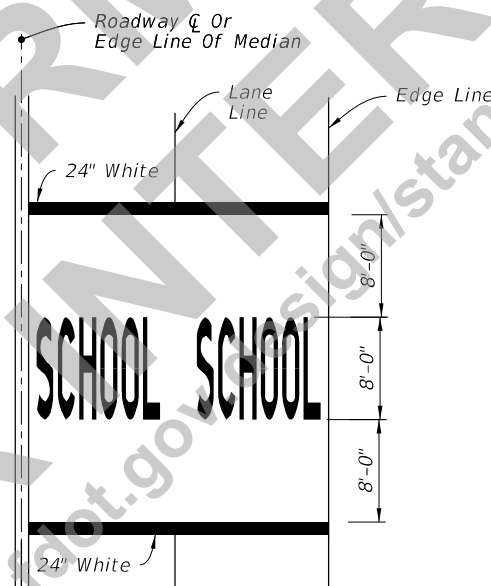
SCHOOL PAVEMENT MARKING

NOTES:

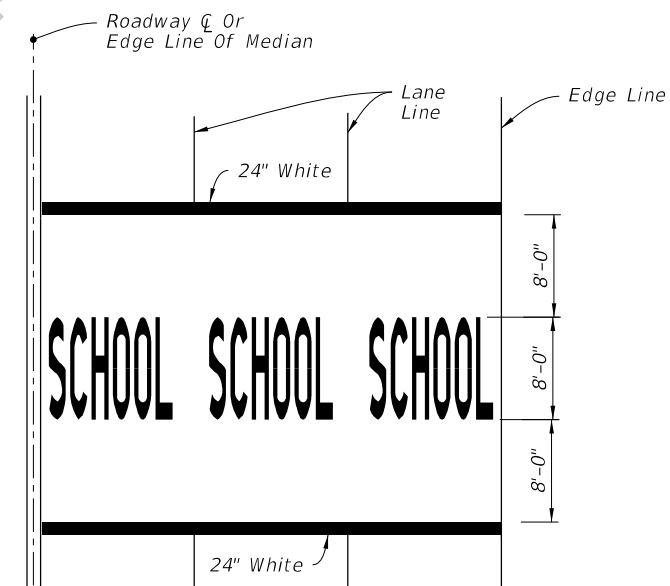
1. All grids are 4" x 4".
2. Pavement Marking Should Not Extend Into Opposing Lane.
3. Center School Pavement Marking in lane.



SINGLE-LANE APPROACH



TWO-LANE APPROACH



MULTI-LANE APPROACH  
(Three or More)

MARKINGS FOR SCHOOL ZONES

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2/5/2021

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|---------------|----------|----------|--|
| LAST REVISION | 02/05/21 | REVISION | DESCRIPTION:<br>Added railroad pavement marking details. |
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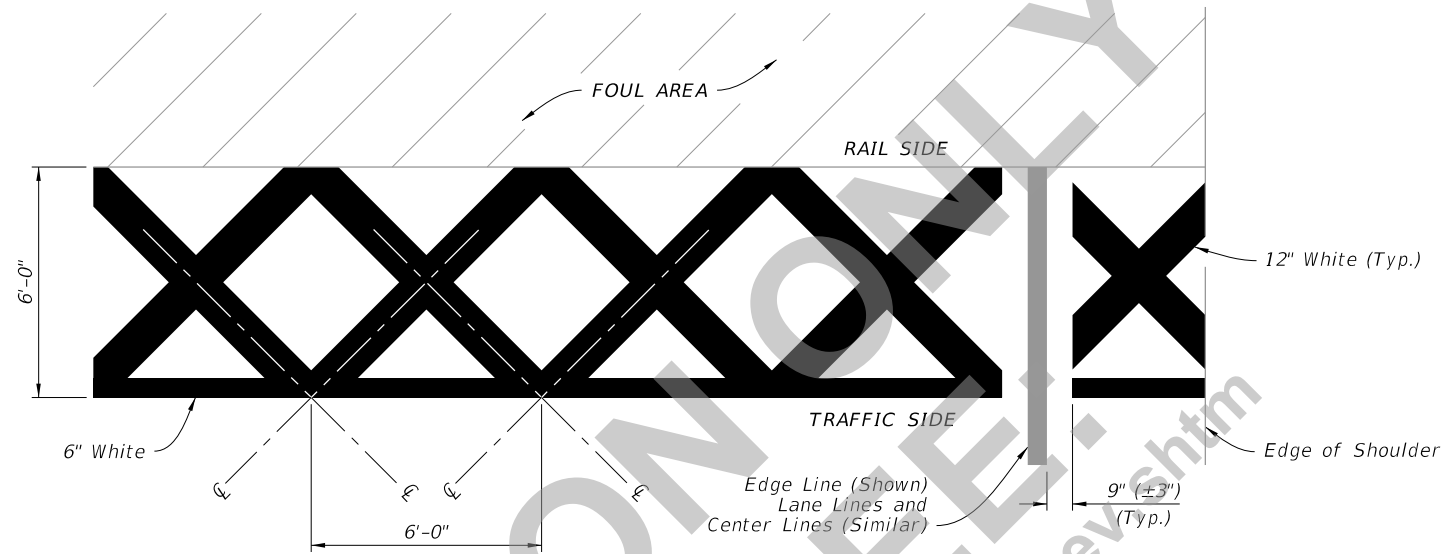
**FY 2020-21**  
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PAVEMENT MARKINGS

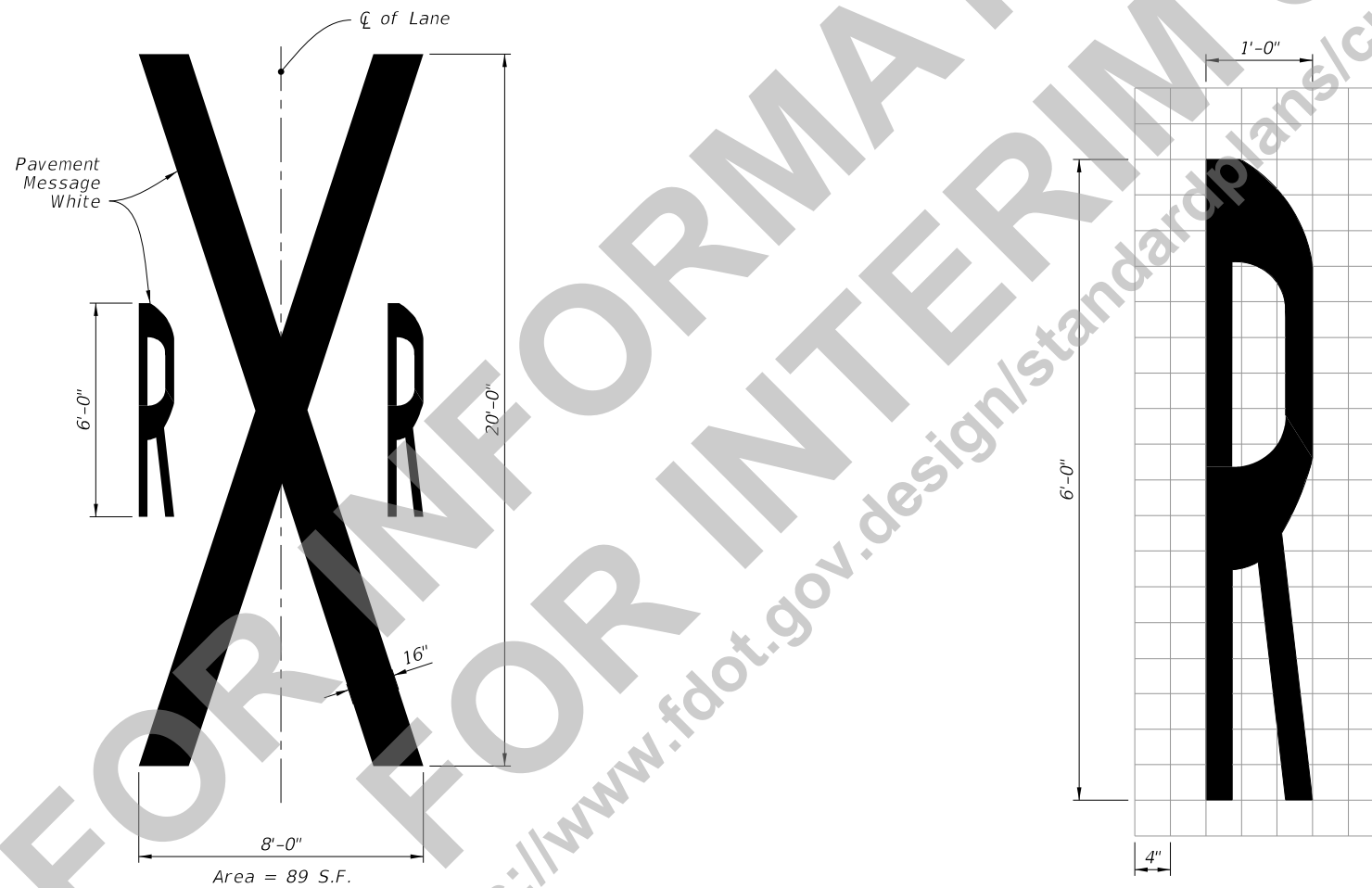
|           |          |
|-----------|----------|
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**NOTE:**

Orient Railroad Dynamic Envelope Marking as shown in the Plans.



RAILROAD DYNAMIC ENVELOPE (RDE) PAVEMENT MARKING DETAIL



RAILROAD CROSSING PAVEMENT MESSAGE

12:06:36 PM  
2/5/2021

|               |          |          |  |
|---------------|----------|----------|--|
| LAST REVISION | 02/05/21 | REVISION | DESCRIPTION:<br>Added railroad pavement marking details. |
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