



HIGHWAY FACTORS ATTACHMENT

Cottman Avenue Rumble Strips

Philadelphia, Pennsylvania

HWY23FH014

(5 pages)

NOTES

- USE CENTERLINE RUMBLE STRIPS (CLRS) ONLY ON NON-INTERSTATE HIGHWAYS AND UNDIVIDED TWO-LANE OR FOUR-LANE RURAL AND URBAN ROADWAYS.
- INSTALL MILLED CLRS ONLY ON BITUMINOUS PAVEMENT WITH AN UNDERLYING CONCRETE OR ASPHALT BASE OF BETTER OR EQUAL QUALITY. CONCRETE BASE WITH GREATER THAN 60 (2.5") OVERLAY.
- IF CLRS ARE BEING RETROFIT ON EXISTING PAVEMENT, THE PAVEMENT SHOULD BE IN SUFFICIENTLY GOOD CONDITION, AS DETERMINED BY THE DISTRICT, TO EFFECTIVELY ACCEPT THE MILLING PROCESS WITHOUT RAELING AND DETRIMENTAL WEAR. MILLING OPERATIONS SHOULD BE COMPLETED WITHIN 2 WEEKS OF CLRS MILLING ANY DESIRED CLRS.
- DO NOT INSTALL CLRS ON BRIDGE DECKS.
- CLRS MAY BE INSTALLED IN PASSING ZONES WHERE DEEMED APPROPRIATE BY DISTRICT SAFETY PERSONNEL. REDUCE DEPTH OF CUT TO (3/8") IN AREAS WHERE PASSING IS PERMITTED.
- CLRS ARE TO BE BROKEN FOR INTERSECTIONS (SEE FIGURE 3). ALSO CONSULT DESIGNER FOR DRIVEWAYS ACCORDING TO ENGINEERING JUDGMENT (SEE FIGURE 4).
- COORDINATE THE MILLING OF CLRS WITH ALL NECESSARY PROJECT OPERATIONS TO AVOID DELAYS TO THE PROJECT. ALL NECESSARY CONSTRUCTION PHASES ARE COMPLETED.
- COORDINATE THE MILLING OF CLRS WITH TRAFFIC LANE PAINTING OPERATIONS TO AVOID MILLING UNPAINTED TRAFFIC LINES. INSTALL NEW YELLOW CENTERLINES WITHIN 2 WEEKS OF CLRS COMPLETION.
- PROVIDE MATERIALS AND WORKMANSHIP IN ACCORDANCE WITH PUBLICATION 40P.
- ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED. U.S. CUSTOMARY UNITS IN () PARENTHESES.
- DEVIATION FROM THESE SPECIFICATIONS AND GUIDELINES MAY BE CONSIDERED IN ORDER TO SUIT FIELD CONDITIONS - PROVIDED THAT THE BUREAU OF HIGHWAY SAFETY AND TRAFFIC ENGINEERING HAS APPROVED.

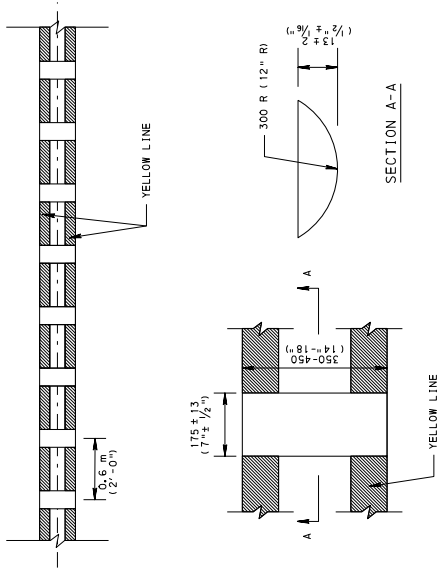


FIGURE 1
SEE TABLE

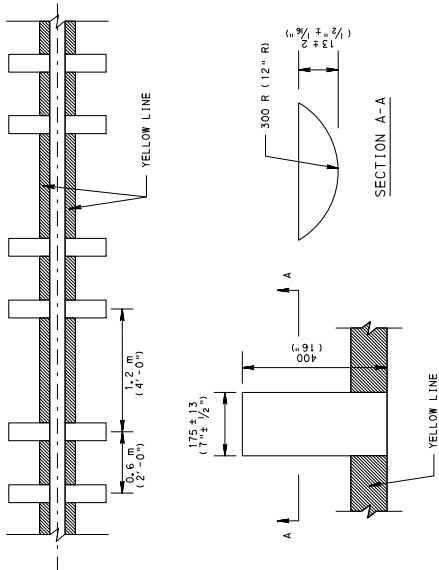


FIGURE 2
SEE TABLE

LANE / SHOULDER CONDITIONS	CLRS FIGURE
LANE WIDTH GREATER THAN OR EQUAL TO 3.6 m (12'-0") AND PAVED SHOULDER A MINIMUM OF 0.9 m (3'-0")	FIGURE 1
LANE WIDTH OF 3.3 m (11'-0") AND PAVED SHOULDER A MINIMUM OF 0.9 m (3'-0")	FIGURE 1 OR 2
LANE WIDTH OF 3.3 m (11'-0") AND EITHER PAVED SHOULDER LESS THAN 0.9 m (3'-0") OR NO SHOULDER	FIGURE 2
LANE WIDTH OF 3.0 m (10'-0") WITH OR WITHOUT SHOULDER	FIGURE 2
LANE WIDTH LESS THAN 3.0 m (10'-0")	CONSULT BUREAU OF HIGHWAY SAFETY AND TRAFFIC ENGINEERING

NOTE: EITHER ALL METRIC OR ALL ENGLISH VALUES MUST BE USED ON PLANS. METRIC AND ENGLISH VALUES SHOWN MAY NOT BE MIXED.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

MILLED RUMBLE STRIPS
UNDIVIDED ROADWAYS
CENTERLINE RUMBLE STRIPS FOR
NON-INTERSTATES AND
NON-EXPRESSWAYS

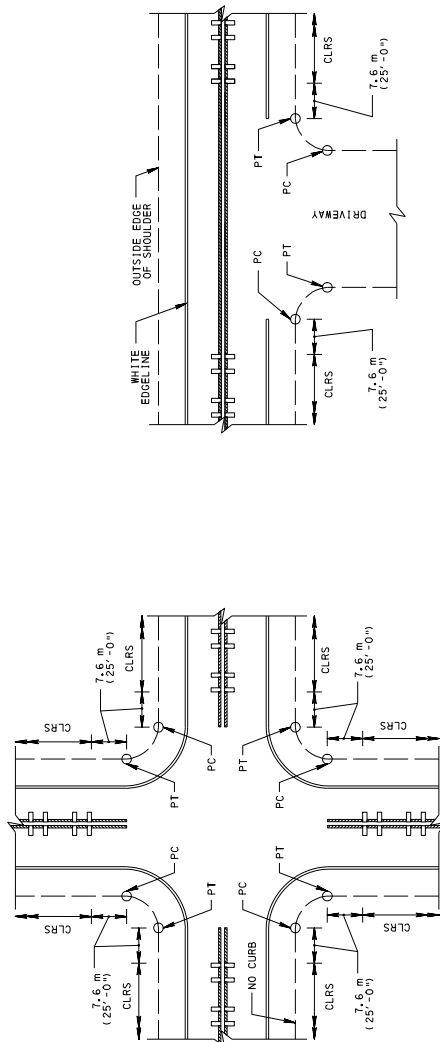


FIGURE 3
SEE NOTE 6

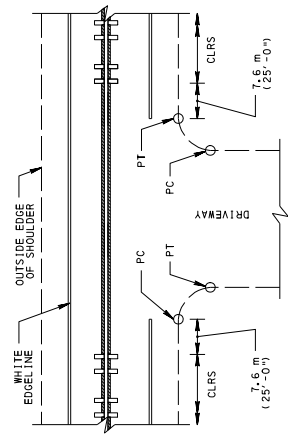


FIGURE 4
SEE NOTE 6

NOTES

- USE BICYCLE TOLEABLE SHOULDER (BTSRS) RUMBLE STRIPS (RTSRS) ONLY ON NON-INTERSTATE HIGHWAY EXPRESSWAYS AND DIVIDED FOUR-LANE RURAL AND URBAN ROADWAYS.
- HAVE THE DISTRICT PEDESTRIAN / BICYCLE COORDINATOR JOINTLY REVIEW THE AREAS TO BE TARGETED.
- THE PAVED SHOULDER MUST BE TYPE 1-SP, OR 6-SP SHOULDER OR WITH BETTER PAVEMENT STRUCTURE.
- INSTALL RTSRS ONLY ON BITUMINOUS PAVEMENT WITH AN ID-2, ID-3, OR SUPERPAVE SURFACE WITH GBGC BASE OR BETTER.
- IF RTSRS ARE BEING RETROFIT ON EXISTING PAVEMENT, THE PAVEMENT SHOULD BE IN SUFFICIENTLY GOOD CONDITION. THE MILLING PROCESS WITHOUT TRAVELING AND DETERIORATING THE MILLING AND DESIGNS RTSRS.
- DO NOT INSTALL RTSRS ON BRIDGE DECKS.
- RTSRS ARE TO BE BROKEN FOR INTERSECTIONS (SEE FIGURE 3).
- COORDINATE THE MILLING OF RTSRS WITH ALL NECESSARY PROJECT PHASES. DO NOT MILL THE RTSRS UNTIL ALL APPROPRIATE CONSTRUCTION PHASES ARE COMPLETED.
- IF THERE IS NO ACTUAL PAVEMENT SHOULDER JOINT, MEASURE THE OFFSET FROM THE PAVEMENT SHOULDER TRAFFIC LINE.
- DEVIATION FROM THESE SPECIFICATIONS AND GUIDELINES MAY BE NECESSARY TO CORRECT EXISTING FIELD CONDITIONS THAT PRESENT A HAZARD TO HIGHWAY SAFETY AND TRAFFIC ENGINEERING HAS APPROVED.

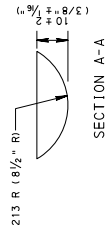
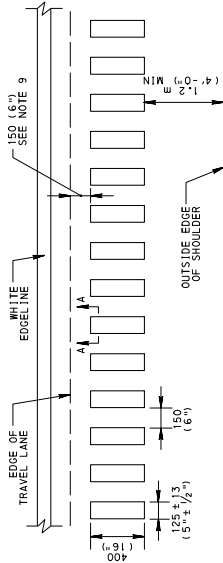


FIGURE 1

55 mph OR MORE POSTED SPEED

SEE TABLE

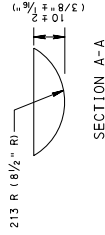
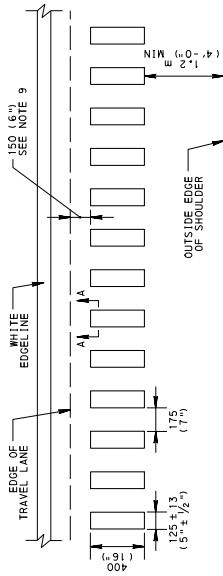


FIGURE 2

LESS THAN 55 mph POSTED SPEED

SEE TABLE

LANE / SHOULDER CONDITIONS	BTSRS FIGURE
LANE WIDTH GREATER THAN OR EQUAL TO 36'-0" AND SHOULDER GREATER THAN OR EQUAL TO SHOULDER (6'-0") AND POSTED SPEED OF 55 mph OR GREATER	FIGURE 1
LANE WIDTH GREATER THAN OR EQUAL TO 36'-0" AND SHOULDER GREATER THAN OR EQUAL TO 1.8 m (6'-0") AND POSTED SPEED OF LESS THAN 55 mph	FIGURE 2
PAVED SHOULDER LESS THAN 1.8 m (6'-0")	CONSIDER EDGELINE RUMBLE STRIPS

NOTE: EITHER ALL METRIC OR ALL ENGLISH VALUES MUST BE USED ON PLANS. METRIC AND ENGLISH VALUES SHOWN MAY NOT BE MIXED.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
 BUREAU OF DESIGN

MILLED RUMBLE STRIPS
 UNDIVIDED ROADWAYS
 BICYCLE TOLERABLE SHOULDER
 RUMBLE STRIPS FOR NON-INTERSTATES
 AND NON-EXPRESSWAYS

RECOMMENDED JUN. 1, 2010
 DIRECTOR, BUREAU OF DESIGN

SHT 2 OF 4
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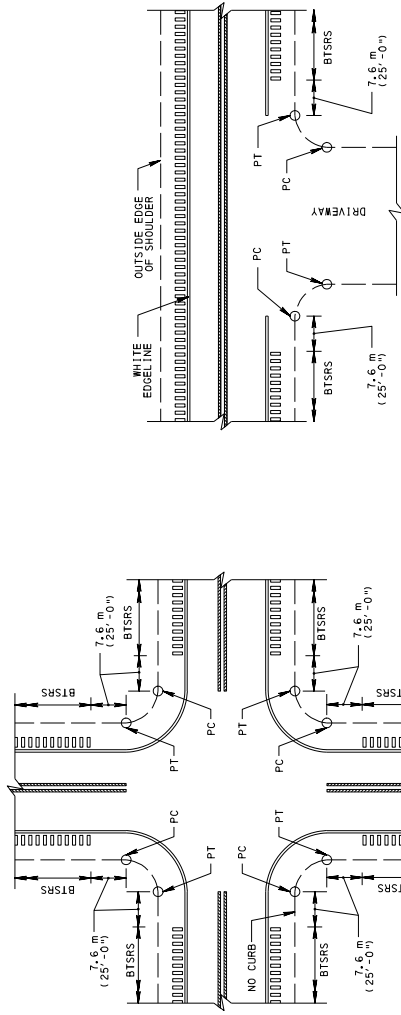


FIGURE 3

TYPICAL INTERSECTION

SEE NOTE 7

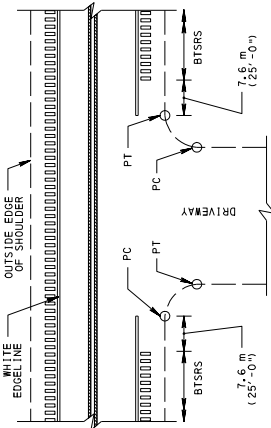


FIGURE 4

TYPICAL DRIVEWAY

SEE NOTE 7

NOTES

- USE EDGE LINE RUMBLE STRIPS (ERS), ONLY ON NON-INTERSTATE AND NON-EXPRESSWAY UNDIVIDED TWO-LANE OR FOUR-LANE RURAL AND URBAN ROADWAYS.
- REVIEW THE STRIP LIST TO BE USED BY CYCLE COORDINATOR JOINTLY WITH THE DESIGN ENGINEER.
- IF THE SHOULDER WIDTH IS 1.5 m (5'-0") TO 1.8 m (6'-0") AND THERE IS CONCERN WITH THE PAVEMENT JOINT BETWEEN THE ROADWAY AND SHOULDER, OFFSET ERS 50 TO 100 (2'-0" TO 4'-0") FROM THE JOINT INTO THE SHOULDER SURFACE (SEE FIGURE 2).
- IF SHOULDER WIDTH IS LESS THAN 1.5 m (5'-0") AND THERE IS CONCERN WITH THE PAVEMENT JOINT BETWEEN THE ROADWAY AND SHOULDER, OFFSET ERS 50 TO 100 (2'-0" TO 4'-0") FROM THE JOINT INTO THE TRAVEL LANE SURFACE (SEE FIGURE 3).
- DISCONTINUE ERS 15.2 m (50'-0") BEFORE AND AFTER ADJACENT GUIDE RAIL WHERE THE FACE OF THE GUIDE RAIL IS LOCATED (SEE FIGURE 4).
- THE PAVED SHOULDER SHOULD BE TYPE 1-SP, OR 6-5P SHOULDER OR WITH BETTER PAVEMENT STRUCTURE.
- INSTALL ERS ONLY ON BITUMINOUS PAVEMENT WITH AN ID-2, ID-3, OR SUPERPAVE SURFACE WITH BCBG BASE OR BETTER.
- IF ERS ARE BEING RETROFIT ON EXISTING PAVEMENT, THE PAVEMENT AND SHOULDER SHOULD BE IN SUFFICIENTLY GOOD CONDITION TO ACCEPT THE MILLING PROCESS WITHOUT RAVELING OR OTHERWISE DETERIORATING THE PAVEMENT. OTHERWISE, BOTH THE PAVEMENT AND SHOULDER NEED TO BE UPGRADED PRIOR TO MILLING ERS.
- DO NOT INSTALL ERS ON BRIDGE DECKS.
- ERS ARE TO BE BROKEN FOR INTERSECTIONS (SEE FIGURE 5), ALSO JOINTS AND DRIVEWAYS (SEE FIGURE 6).
- COORDINATE THE MILLING OF ERS WITH ALL NECESSARY PROJECT PHASES. DO NOT MILL THE ERS UNTIL ALL APPROPRIATE CONSTRUCTION PHASES ARE COMPLETED.
- COORDINATE THE MILLING OF ERS WITH TRAFFIC LINE PAINTING OPERATIONS TO AVOID MILLING NEWLY APPLIED TRAFFIC LINES. COORDINATE WHITE EDGE LINES WITHIN 2 WEEKS OF ERS COMPLETION.
- DEVIATION FROM THESE SPECIFICATIONS AND GUIDELINES MAY BE CONSIDERED IN ORDER TO SUIT FIELD CONDITIONS, PROVIDED THAT THE BUREAU OF HIGHWAY SAFETY AND TRAFFIC ENGINEERING HAS APPROVED.

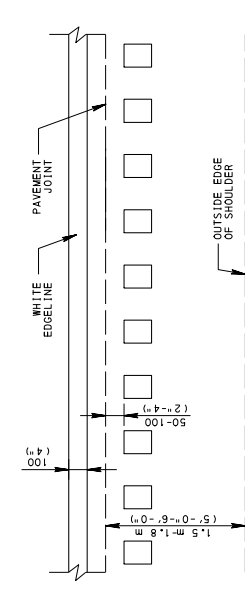


FIGURE 2
SEE NOTE 3

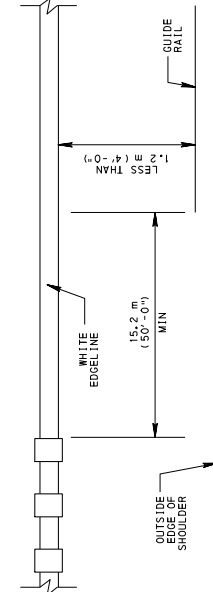


FIGURE 3
SEE NOTE 5

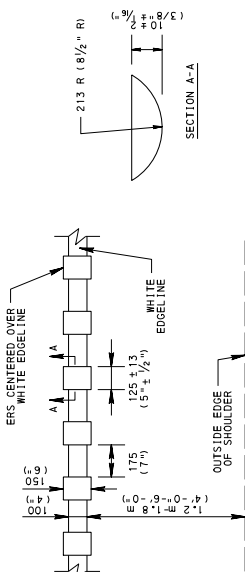


FIGURE 1
SEE TABLE

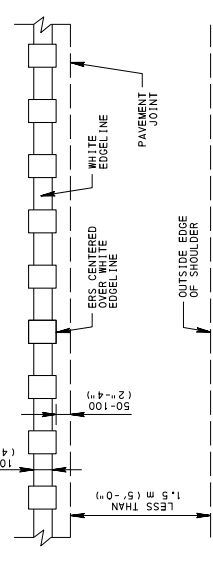


FIGURE 4
SEE NOTE 5

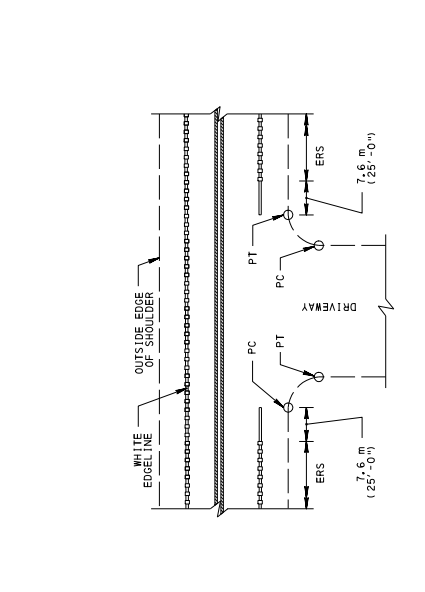


FIGURE 5
SEE NOTE 10

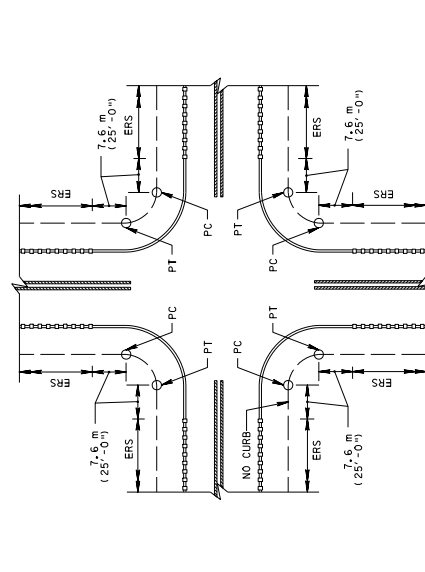


FIGURE 6
SEE NOTE 10

LANE / SHOULDER CONDITIONS	ERS FIGURE
LANE WIDTH GREATER THAN OR EQUAL TO 3.0 m (10'-0") AND 1.8 m (6'-0") OF PAVED SHOULDER	FIGURE 1
SHOULDER WIDTH GREATER THAN OR EQUAL TO 1.8 m (6'-0")	CONSIDER BICYCLE TOLERABLE SHOULDER RUMBLE STRIPS

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MILLED RUMBLE STRIPS
UNDIVIDED ROADWAYS
EDGE LINE RUMBLE STRIPS FOR
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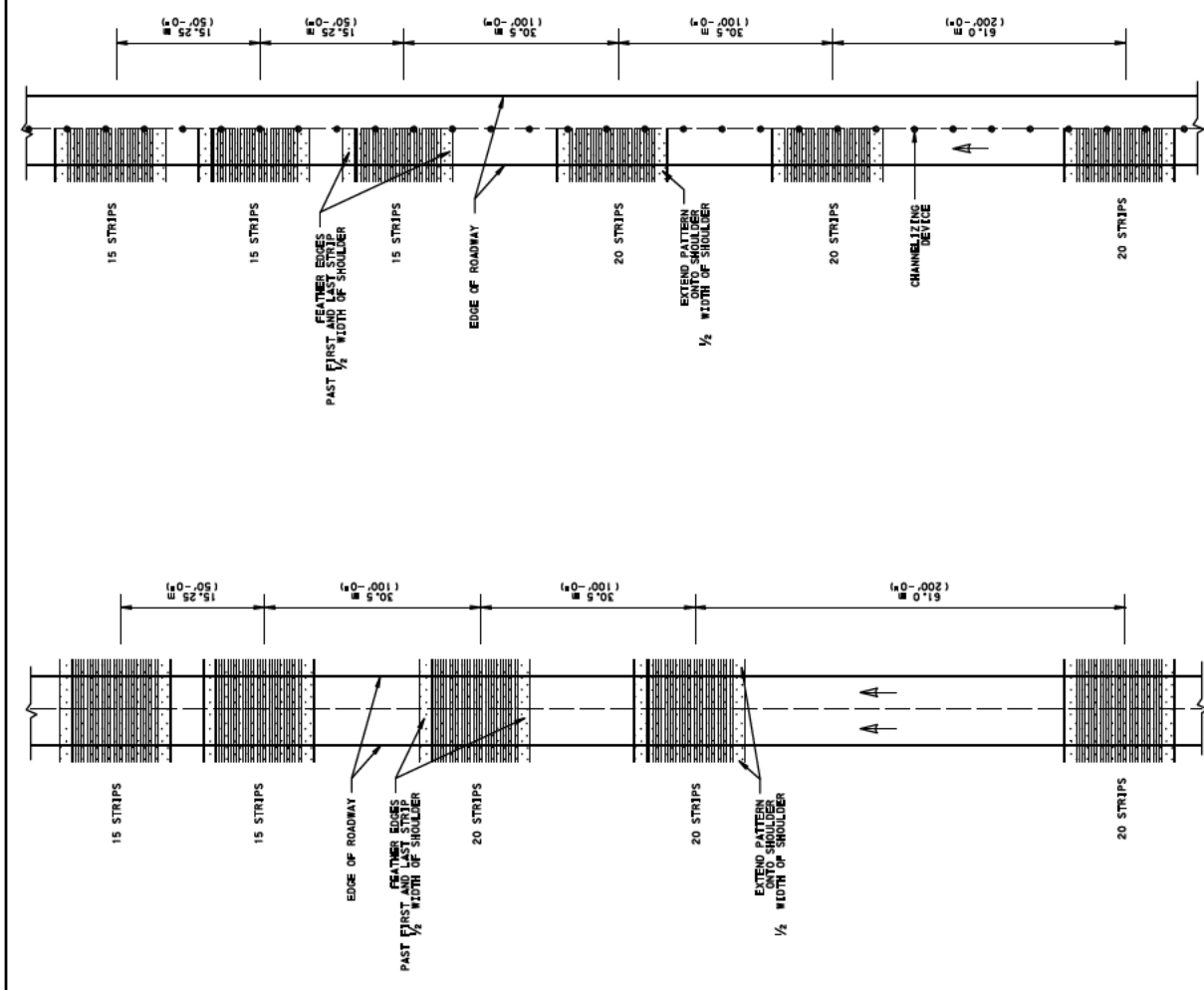


FIGURE 1
RUMBLE STRIP PATTERN A

FIGURE 2
RUMBLE STRIP PATTERN B

NOTES

1. MAX. 1 1/2" X 4" PLYWOOD STRIPS IN PLACE AT 300 OVERLAY, THEN REMOVE PLYWOOD STRIPS (SEE FIGURE 3).
2. DEVIATION FROM THESE SPECIFICATIONS AND GUIDELINES MAY BE CONSIDERED IN ORDER TO SUIT FIELD CONDITIONS, PROVIDED THAT THE BUREAU OF HIGHWAY SAFETY AND TRAFFIC ENGINEERING HAS APPROVED.

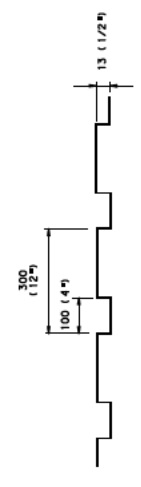


FIGURE 3
LONGITUDINAL CROSS SECTION
SEE NOTE 1

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TEMPORARY BITUMINOUS
RUMBLE STRIP PATTERNS