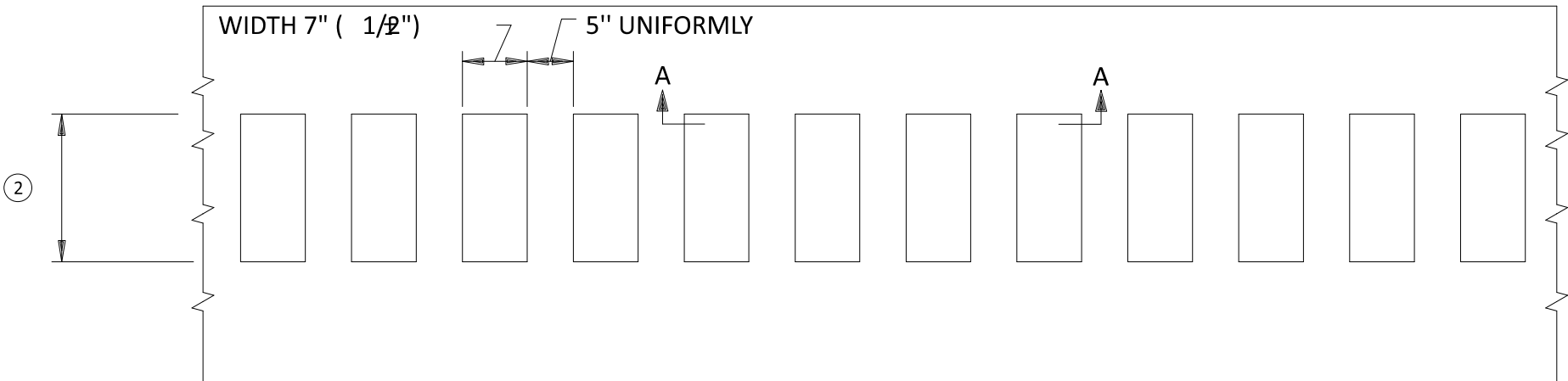


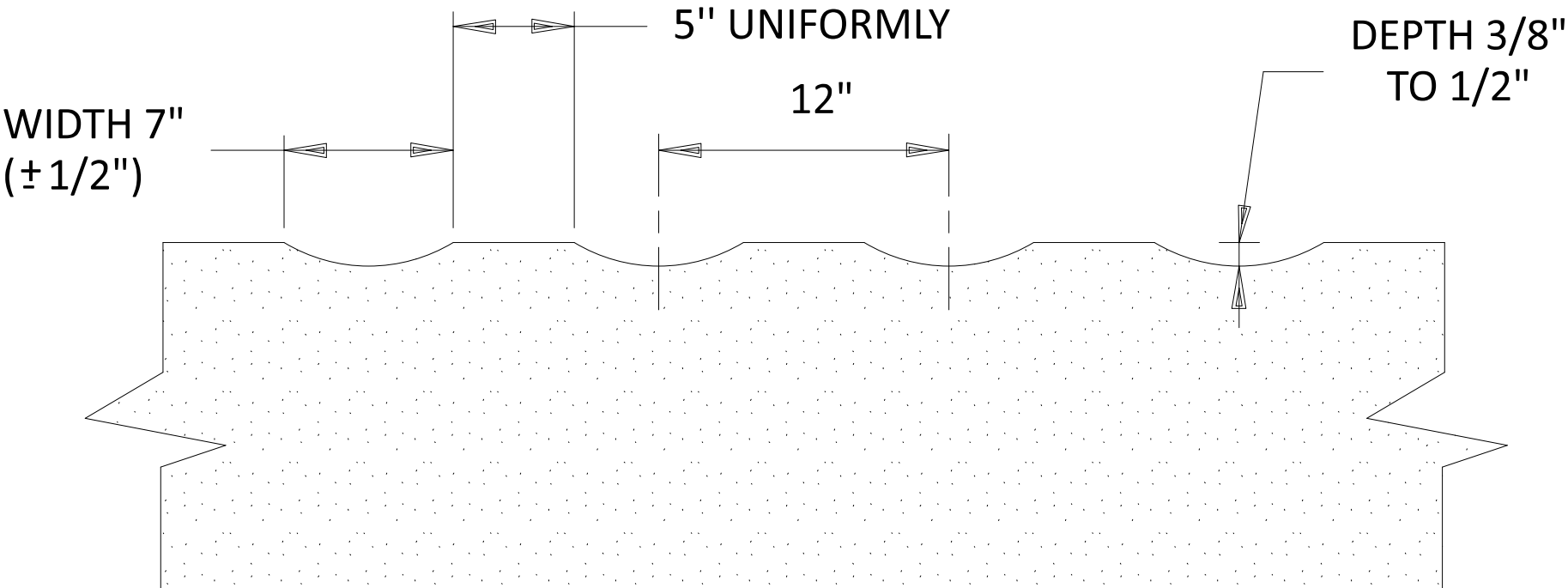
①

RECTANGULAR CORRUGATED RUMBLE STRIP PATTERN

PLAN VIEW



SECTION A-A

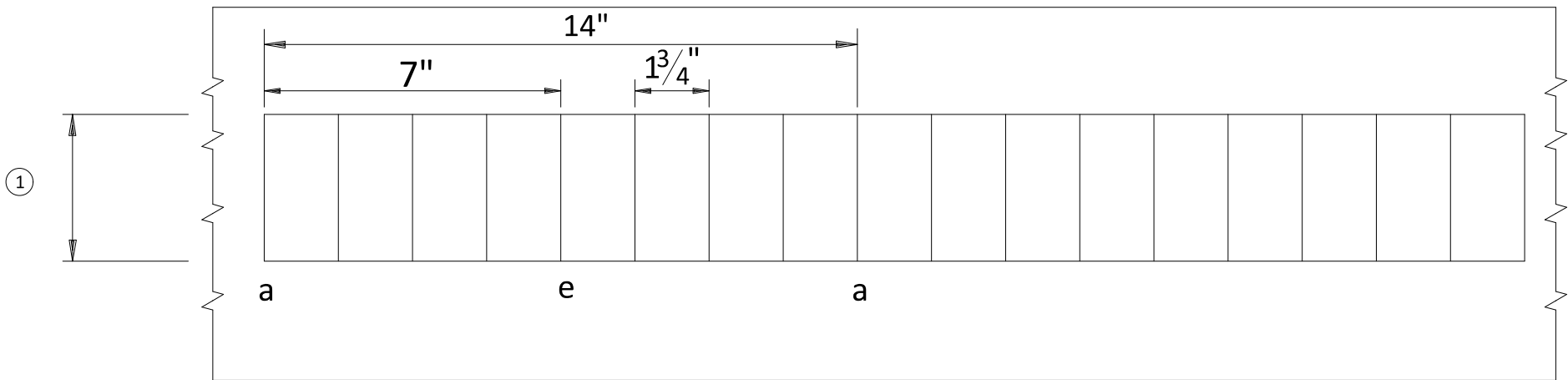


DESIGNER NOTES:

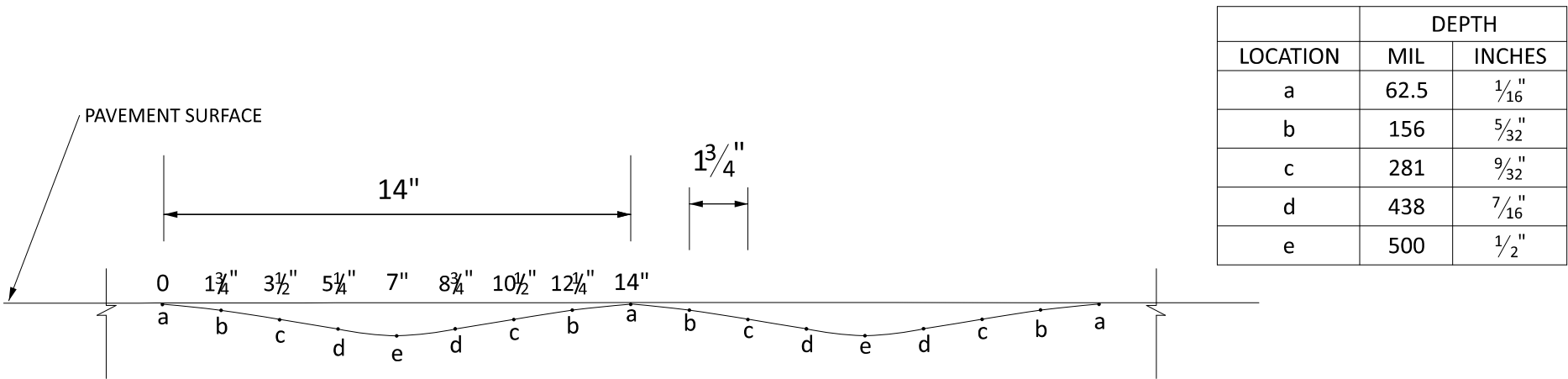
- ① RECTANGULAR CORRUGATED RUMBLE STRIPS SHALL NOT BE USED AS A CENTERLINE RUMBLE STRIP ON CONCRETE PAVEMENTS.
- ② SHOULDER RUMBLE STRIPS ARE WITHIN THE RANGE OF 8-12 IN. A 16 IN SHOULDER RUMBLE STRIP IS REQUIRED ON FREEWAY SEGMENTS.
- 3. THE STANDARD WIDTH OF CENTERLINE RUMBLE STRIPS ON BITUMINOUS PAVEMENTS IS 14 IN.

SINUSOIDAL RUMBLE STRIP PATTERN

PLAN VIEW



PROFILE VIEW



GENERAL NOTES:

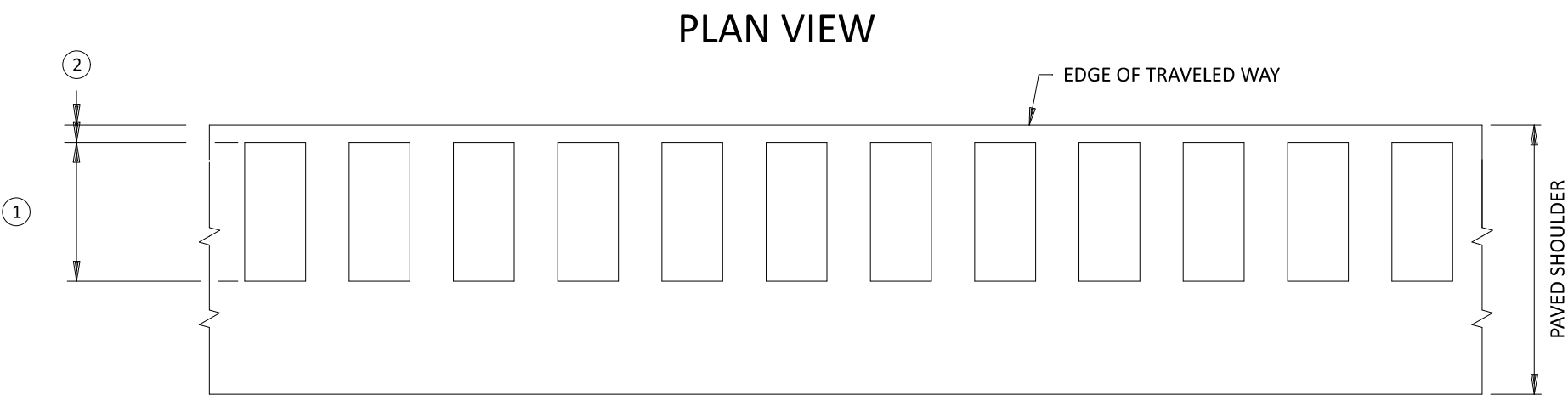
DEPTH TOLERANCE \pm 1/16 IN ALONG THE SINUSOIDAL WAVE.

DESIGNER NOTES:

- 1. SHOULDER RUMBLE STRIPS ARE WITHIN THE RANGE OF 8-12 IN. A 16 IN SHOULDER RUMBLE STRIP IS REQUIRED ON FREEWAY SEGMENTS.
- 2. THE STANDARD WIDTH OF CENTERLINE RUMBLE STRIPS ON BITUMINOUS PAVEMENTS IS 14 IN. INPUT CORRECT RUMBLE WIDTH.
- 3. FOR CONCRETE PAVEMENTS, A SPLIT RUMBLE DESIGN OF 6 IN SHALL BE USED.

BITUMINOUS SHOULDER RUMBLE STRIP

- CONTINUOUS CYCLE



GENERAL NOTE:
TYPICAL DETAIL SHOWS RUMBLE LOCATION AND CYCLE. FOR RUMBLE PATTERN AT SPECIFIC LOCATIONS, SEE OTHER SHEETS.

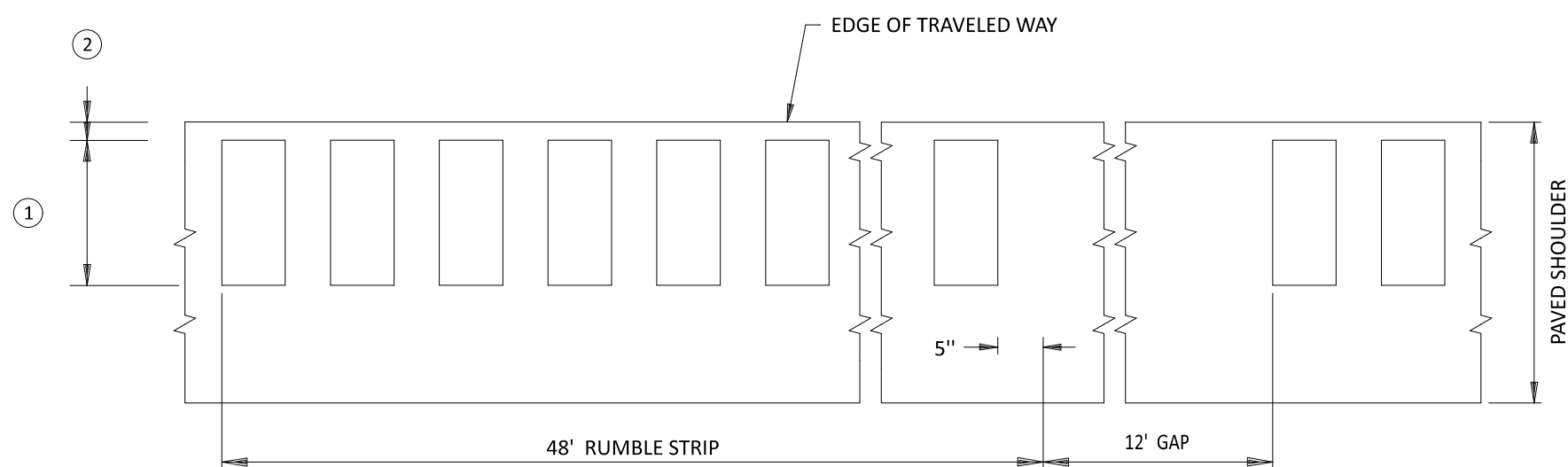
DESIGNER NOTES:

- 1 SHOULDER RUMBLE STRIPS ARE WITHIN THE RANGE OF 8-12 IN. A 16 IN SHOULDER RUMBLE STRIP IS REQUIRED ON FREEWAY SEGMENTS.
- 2 THE DISTRICT TRAFFIC ENGINEER HAS FLEXIBILITY RELATED TO THE LATERAL PLACEMENT OF THE RUMBLE STRIP. TYPICAL DISTANCES FOLLOW THE TABLE BELOW.MAKE SURE TO INCLUDE PATTERN(S) TO BE USED.
- 3. EITHER OR BOTH RECTANGULAR CORRUGATED OR SINUSOIDAL TYPICAL DETAILS.

| | SHOULDER WIDTH | DISTANCE FROM JOINT |
|------------------------------|----------------|---------------------|
| BITUMINOUS FREEWAYS | - | 24" |
| BITUMINOUS MULTILANE HIGHWAY | WIDTH < 6' | 2" |
| BITUMINOUS MULTILANE HIGHWAY | WIDTH ≥ 6' | 12" |

SHOULDER RUMBLE STRIP - INTERMITTENT CYCLE

PLAN VIEW



GENERAL NOTE:
TYPICAL DETAIL SHOWS RUMBLE LOCATION AND CYCLE. FOR RUMBLE PATTERN AT SPECIFIC LOCATIONS, SEE OTHER SHEETS.

DESIGNER NOTES:

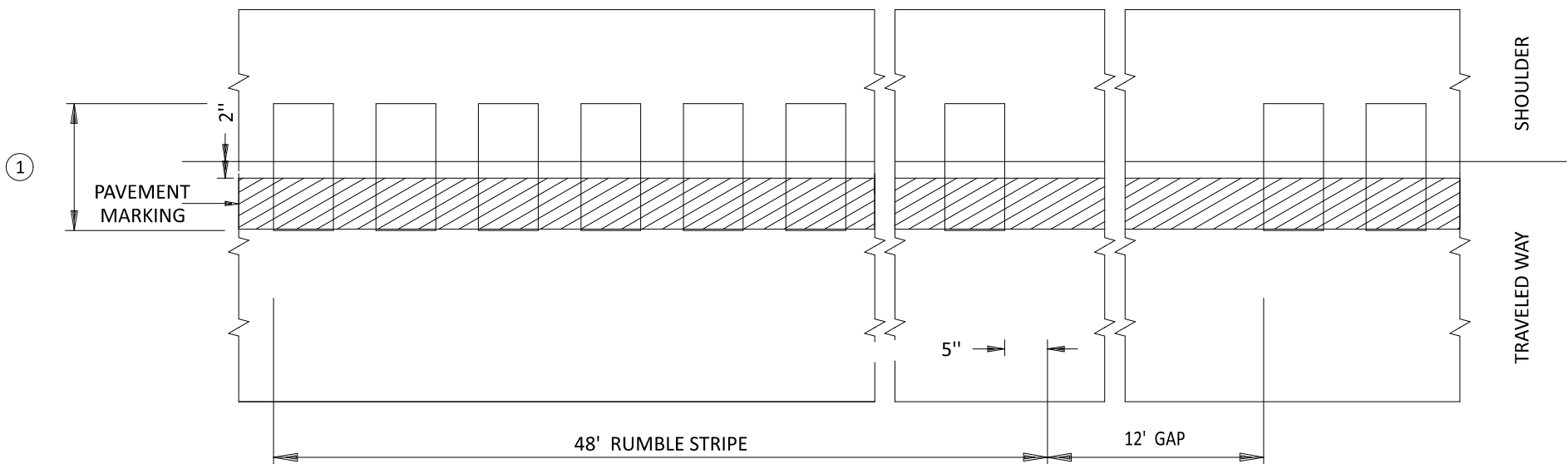
- ① SHOULDER RUMBLE STRIPS ARE WITHIN THE RANGE OF 8-12 IN. A 16 IN SHOULDER RUMBLE STRIP IS REQUIRED ON FREEWAY SEGMENTS.
- ② 2 IN WHERE SHOULDER WIDTH IS LESS THAN 6 FT AND 12 IN WHERE SHOULDER WIDTH IS 6 FT OR GREATER.
- 3. MAKE SURE TO INCLUDE PATTERN(S) TO BE USED. EITHER OR BOTH RECTANGULAR CORRUGATED OR SINUSOIDAL TYPICAL DETAILS.

BITUMINOUS EDGELINE RUMBLE STRIPE

- INTERMITTENT CYCLE

PLAN VIEW

PLAN VIEW



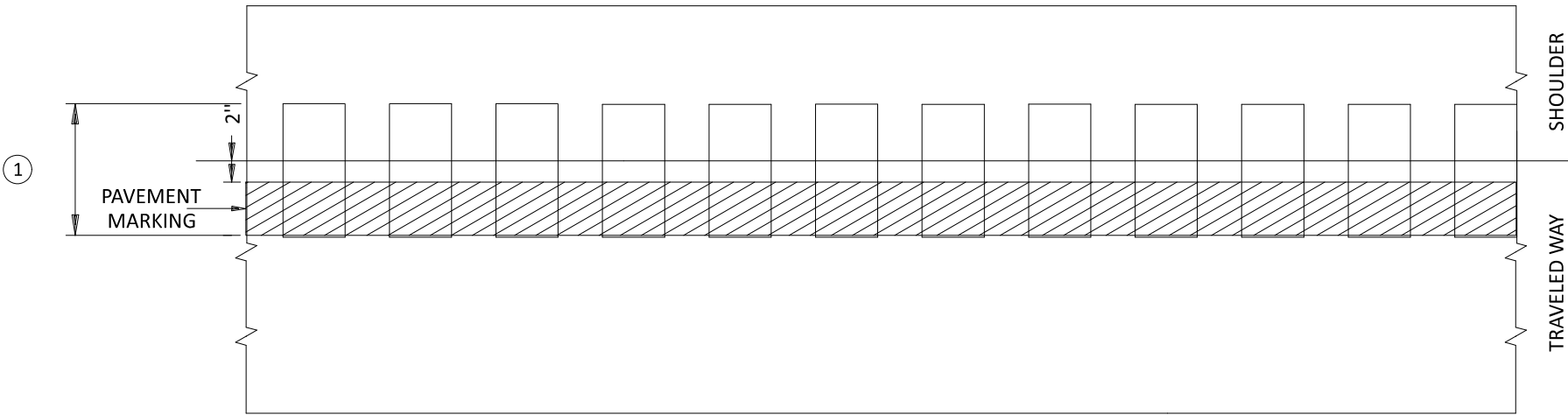
GENERAL NOTE:
TYPICAL DETAIL SHOWS RUMBLE LOCATION AND CYCLE. FOR RUMBLE PATTERN AT SPECIFIC LOCATIONS, SEE OTHER SHEETS.

- DESIGNER NOTES:
- 1. EDGELINE RUMBLE STRIPS ARE WITHIN THE RANGE OF 8-12". ALONG FREEWAY SEGMENTS, EDGELINE RUMBLE STRIPS SHALL BE 16".
 - 2. MAKE SURE TO INCLUDE PATTERN(S) TO BE USED. EITHER OR BOTH RECTANGULAR CORRUGATED OR SINUSOIDAL TYPICAL DETAILS.

BITUMINOUS EDGELINE RUMBLE STRIPE

- CONTINUOUS CYCLE

PLAN VIEW



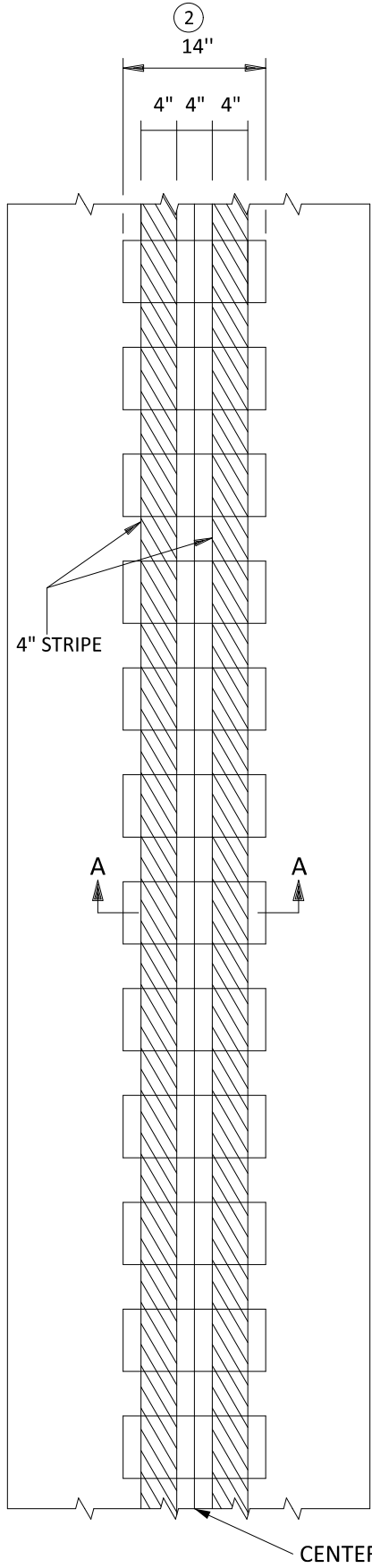
GENERAL NOTE:
TYPICAL DETAIL SHOWS RUMBLE LOCATION AND CYCLE. FOR RUMBLE PATTERN AT SPECIFIC LOCATIONS, SEE OTHER SHEETS.

DESIGNER NOTES:

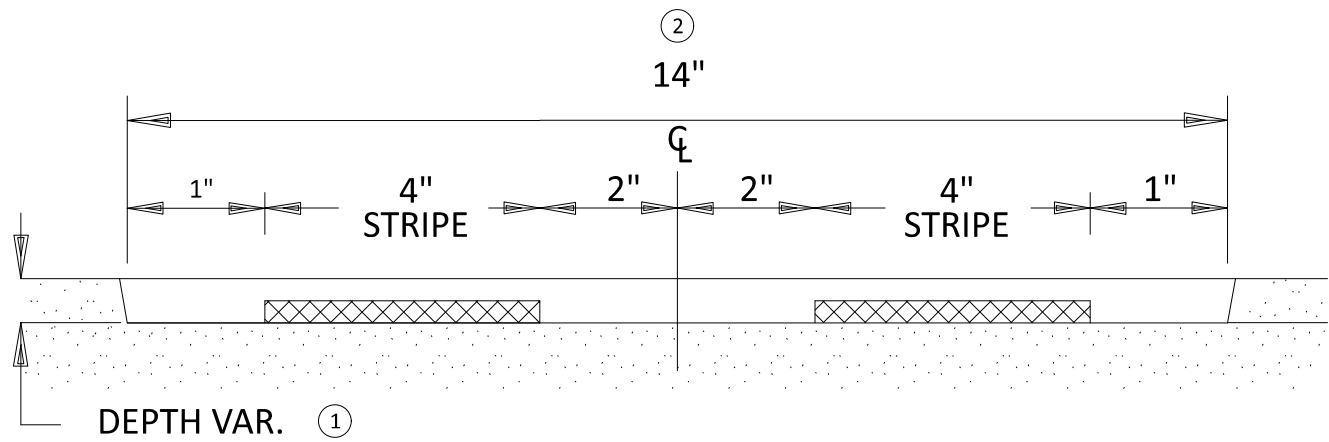
- ① EDGELINE RUMBLE STRIPS ARE WITHIN THE RANGE OF 8-12 IN. ALONG FREEWAY SEGMENTS, EDGELINE RUMBLE STRIPS SHALL BE 16 IN.
- 2. MAKE SURE TO INCLUDE PATTERN(S) TO BE USED. EITHER OR BOTH RECTANGULAR CORRUGATED OR SINUSOIDAL TYPICAL DETAILS.

BITUMINOUS CENTERLINE RUMBLE STRIPE

PLAN VIEW



SECTION A-A



GENERAL NOTE:
TYPICAL DETAIL SHOWS RUMBLE LOCATION AND CYCLE. FOR RUMBLE PATTERN AT SPECIFIC LOCATIONS, SEE OTHER SHEETS.

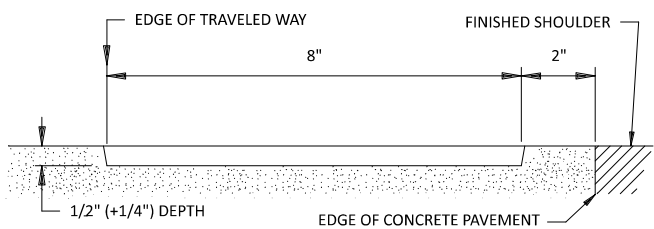
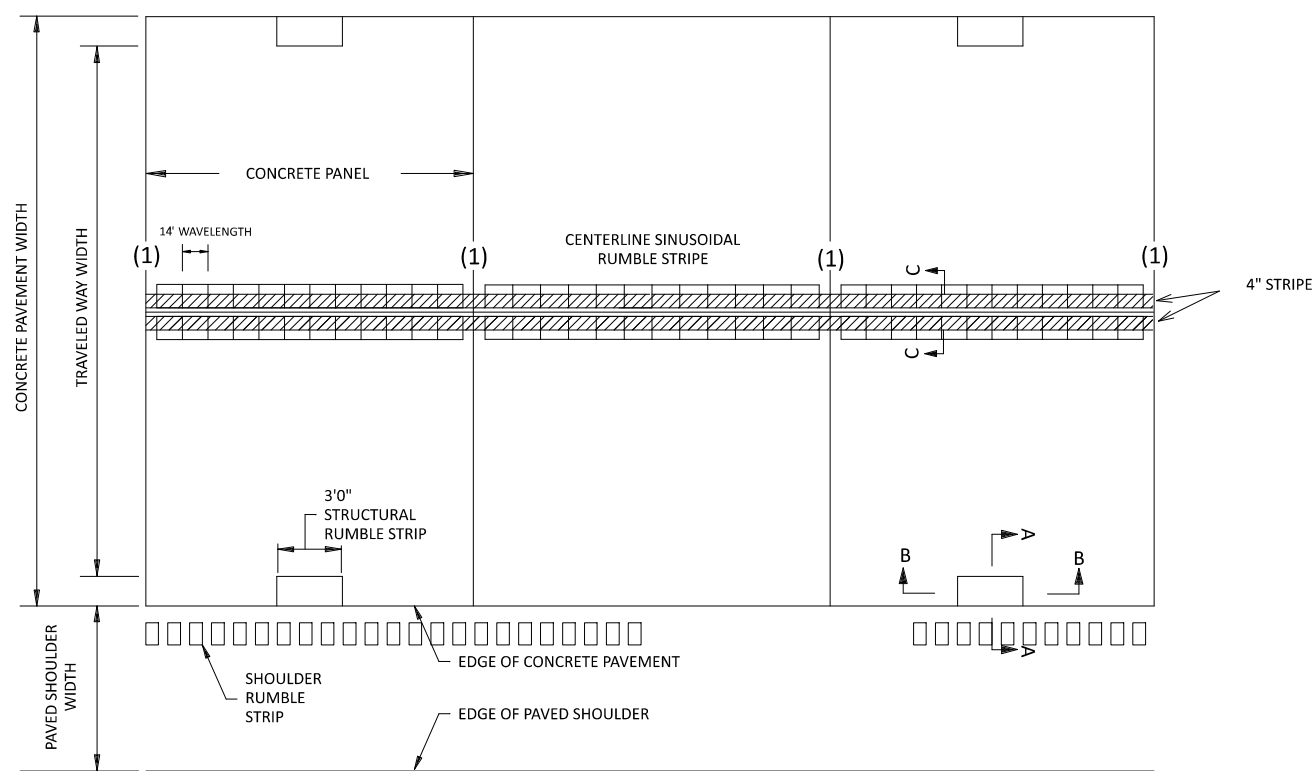
DESIGNER NOTES:

- ① INPUT THE CORRECT DEPTH CORRESPONDING TO THE TYPE OF RUMBLE STRIP USED. USE "DEPTH VAR." FOR THE SINUSOIDAL DESIGN OR [3/8 IN (± 1/8 IN)] FOR RECTANGULAR CORRUGATED DESIGN. MAKE SURE TO INCLUDE PATTERN(S) TO BE USED. INCLUDE EITHER OR BOTH RECTANGULAR CORRUGATED OR SINUSOIDAL TYPICAL DETAILS.
- ② WHEN INCREASING THE CENTERLINE STRIPING FROM 4" TO 6", THE WIDTH OF THE RUMBLE SHOULD BE INCREASED TO A MINIMUM OF 16" MAINTAINING THE 2" SPACING FROM THE CENTERLINE ALIGNMENT.

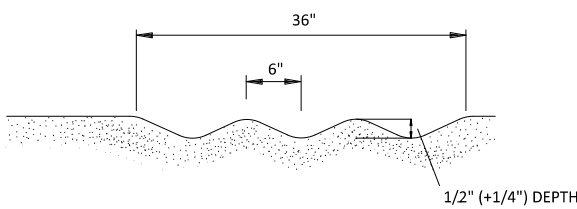
CONCRETE STRUCTURAL RUMBLE STRIP OPTION 1

- INTERMITTENT CYCLE

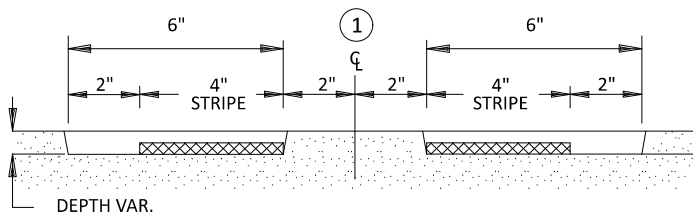
PLAN VIEW



SECTION A-A



SECTION B-B



SECTION C-C

GENERAL NOTES:

(1) RUMBLE STRIPS SHALL BE GAPPED SO THAT THERE IS AT LEAST 6 IN OF CLEARANCE ON EACH SIDE OF THE TRANSVERSE JOINT.

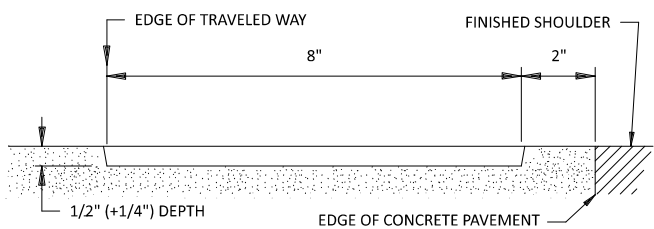
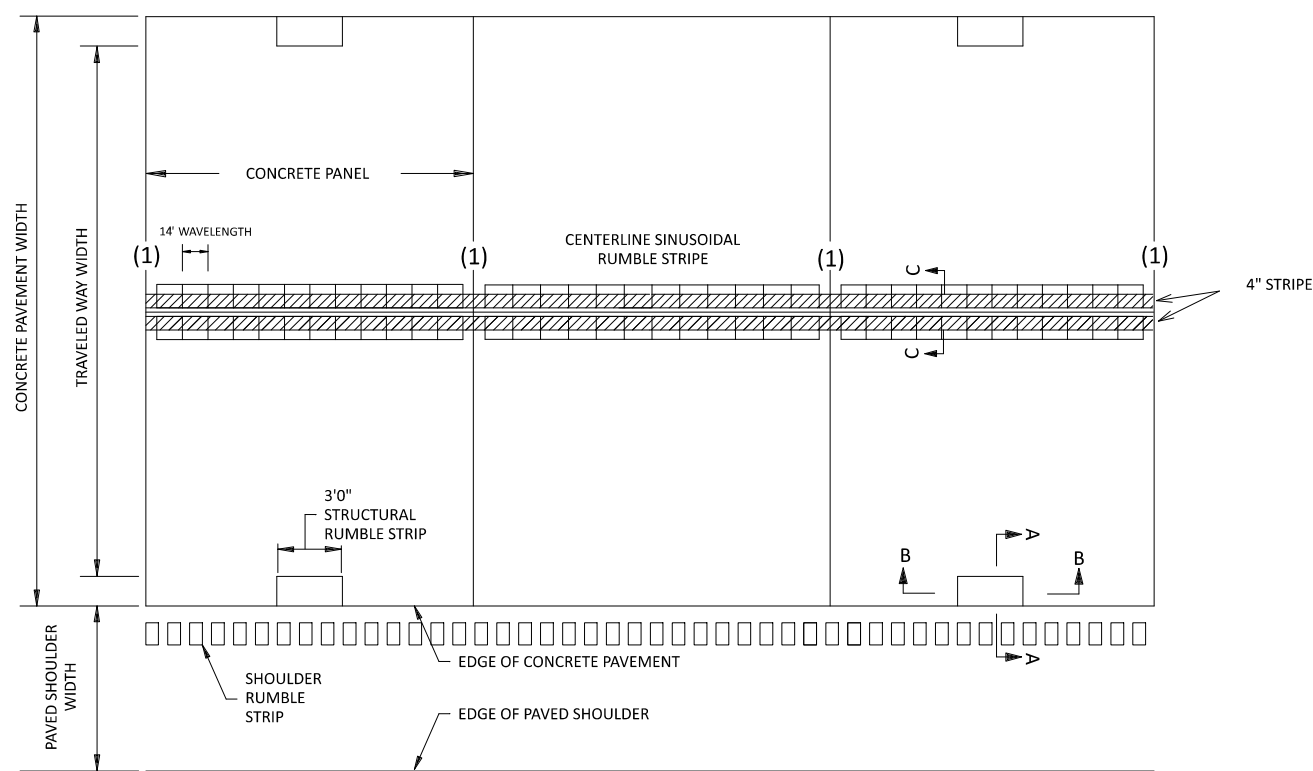
DESIGNER NOTES:

(1) WHEN INCREASING THE CENTERLINE STRIPING FROM 4" TO 6" THE WIDTH OF THE RUMBLE CAN REMAIN 6" OR BE INCREASED TO 7" MAINTAINING THE 2" SPACING FROM THE CENTERLINE ALIGNMENT.

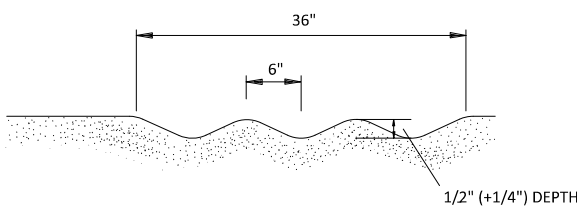
CONCRETE STRUCTURAL RUMBLE STRIP OPTION 1

- CONTINUOUS CYCLE

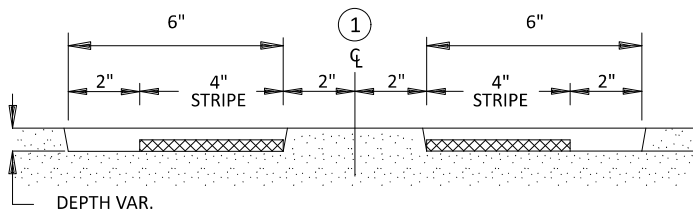
PLAN VIEW



SECTION A-A



SECTION B-B



SECTION C-C

GENERAL NOTES:

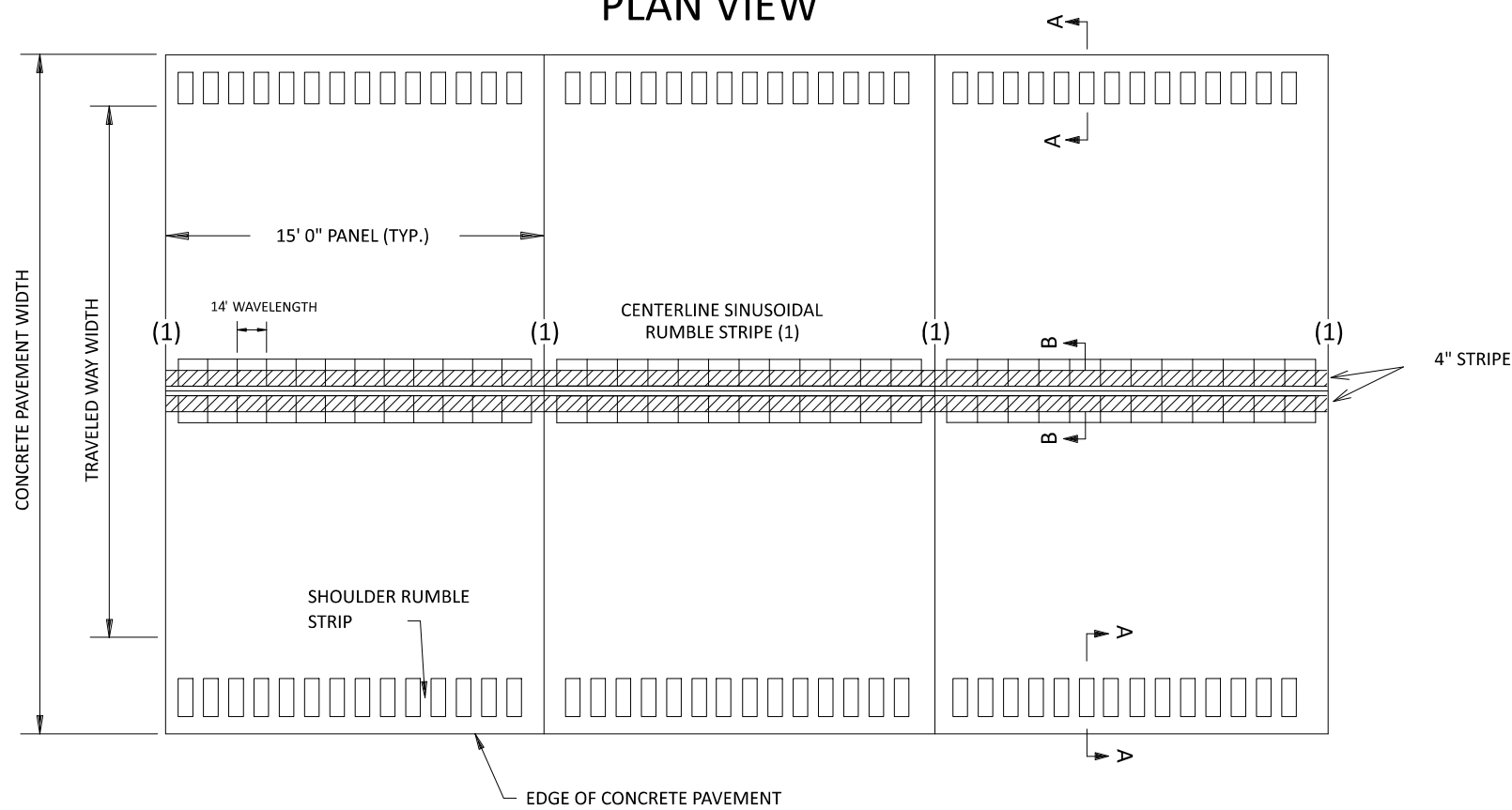
- (1) RUMBLE STRIPS SHALL BE GAPPED SO THAT THERE IS AT LEAST 6 IN OF CLEARANCE ON EACH SIDE OF THE TRANSVERSE JOINT.

DESIGNER NOTES:

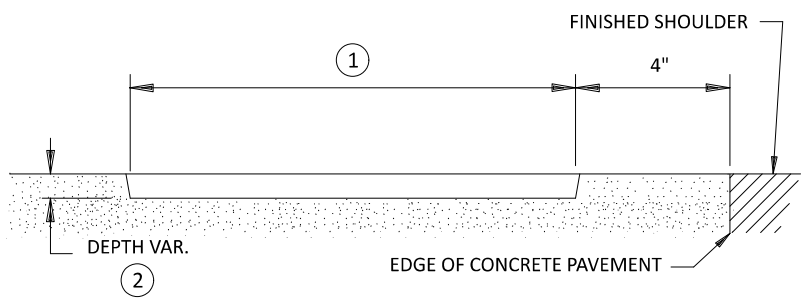
- (1) WHEN INCREASING THE CENTERLINE STRIPING FROM 4" TO 6" THE WIDTH OF THE RUMBLE CAN REMAIN 6" OR BE INCREASED TO 7" MAINTAINING THE 2" SPACING FROM THE CENTERLINE ALIGNMENT.

CONCRETE STRUCTURAL RUMBLE STRIP OPTION 2

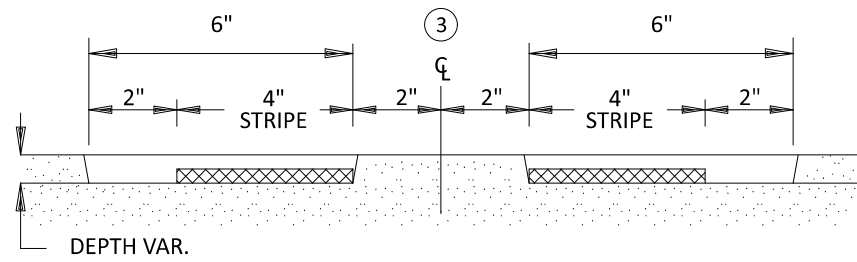
PLAN VIEW



SECTION A-A



SECTION B-B



GENERAL NOTES:

(1) RUMBLE STRIPS SHALL BE GAPPED SO THAT THERE IS AT LEAST 6 IN OF CLEARANCE ON EACH SIDE OF THE TRANSVERSE JOINT.

DESIGNER NOTES:

- (1) SHOULDER RUMBLE STRIPS ARE WITHIN THE RANGE OF 8-12 IN. A 16 IN SHOULDER RUMBLE STRIP IS REQUIRED ON FREEWAY SEGMENTS. LABEL SECTION A-A WITH THE DESIRED RUMBLE STRIP WIDTH.
- (2) INPUT THE CORRECT DEPTH CORRESPONDING TO THE CHOSEN RUMBLE STRIP DESIGN
- (3) WHEN INCREASING THE CENTERLINE STRIPING FROM 4" TO 6" THE WIDTH OF THE RUMBLE CAN REMAIN 6" OR BE INCREASED TO 7" MAINTAINING THE 2" SPACING FROM THE CENTERLINE JOINT.

APPROPRIATE BREAKS - SHOULDER RUMBLE STRIPS

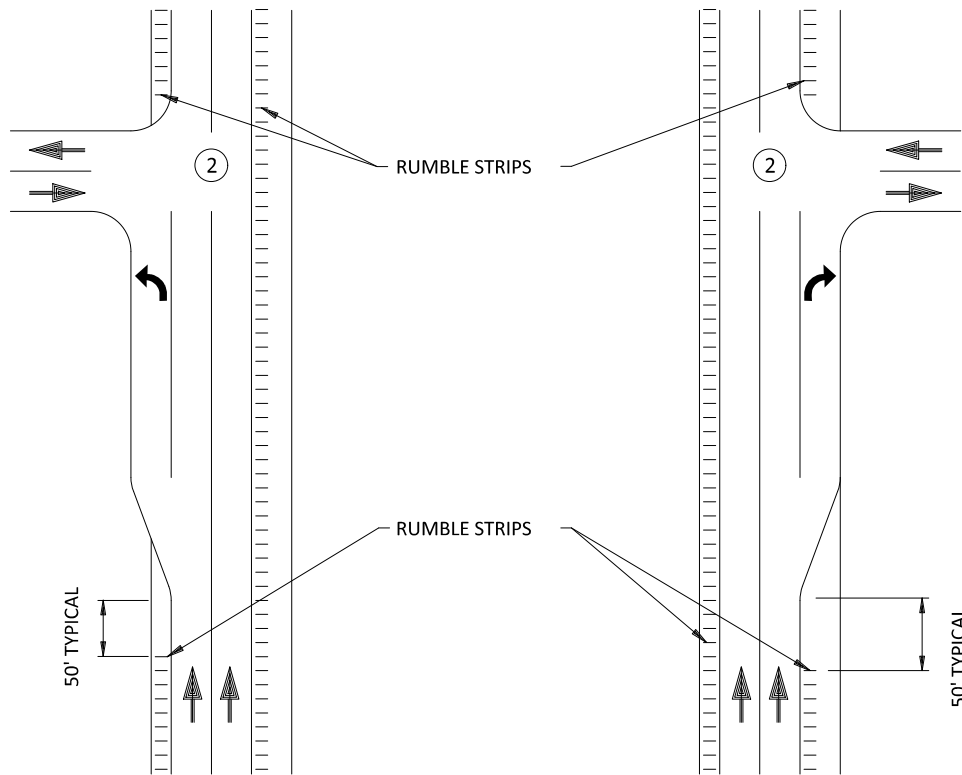


FIGURE 9A
LEFT TURN LANE

FIGURE 9B
RIGHT TURN LANE

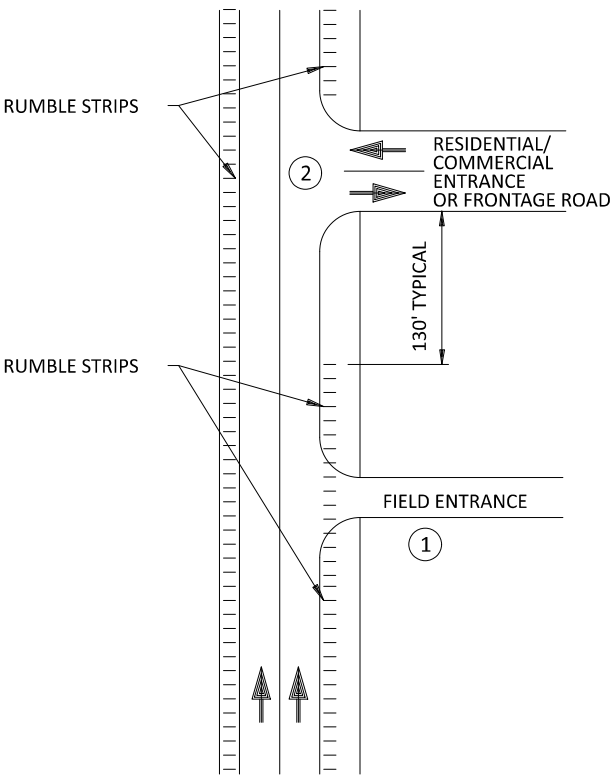


FIGURE 9C
ENTRANCE ROADS

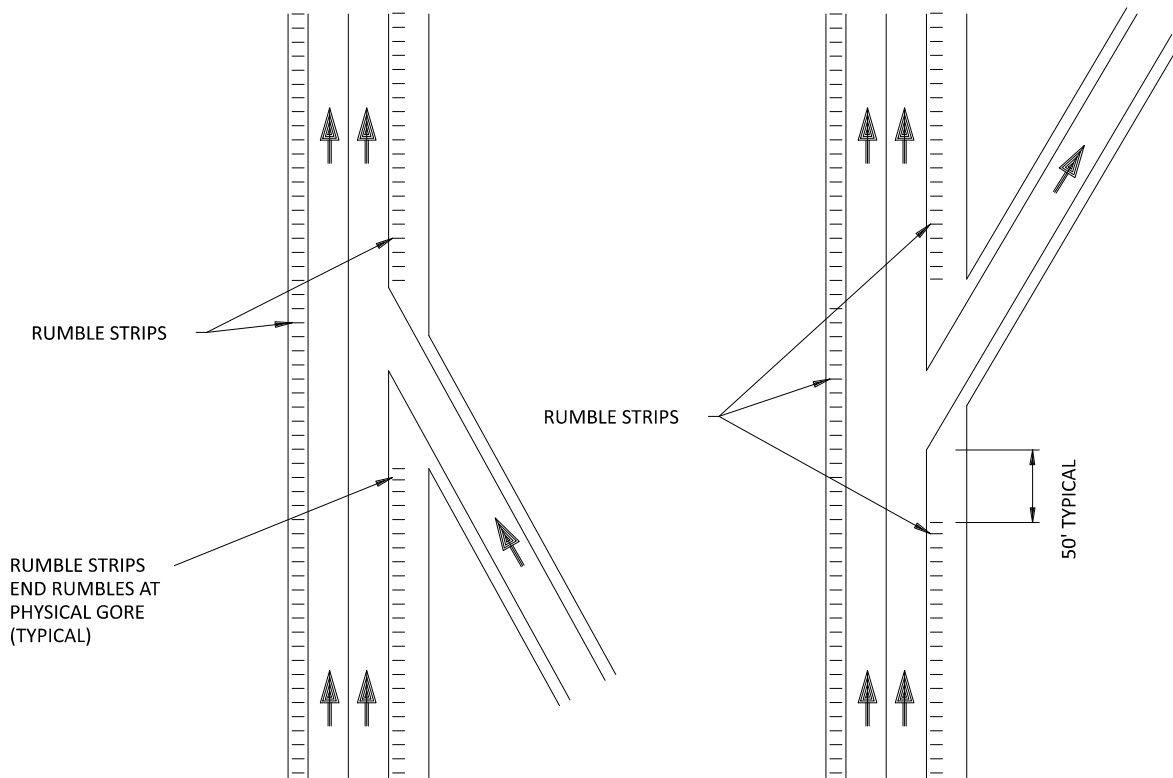


FIGURE 9D
ENTRANCE RAMP

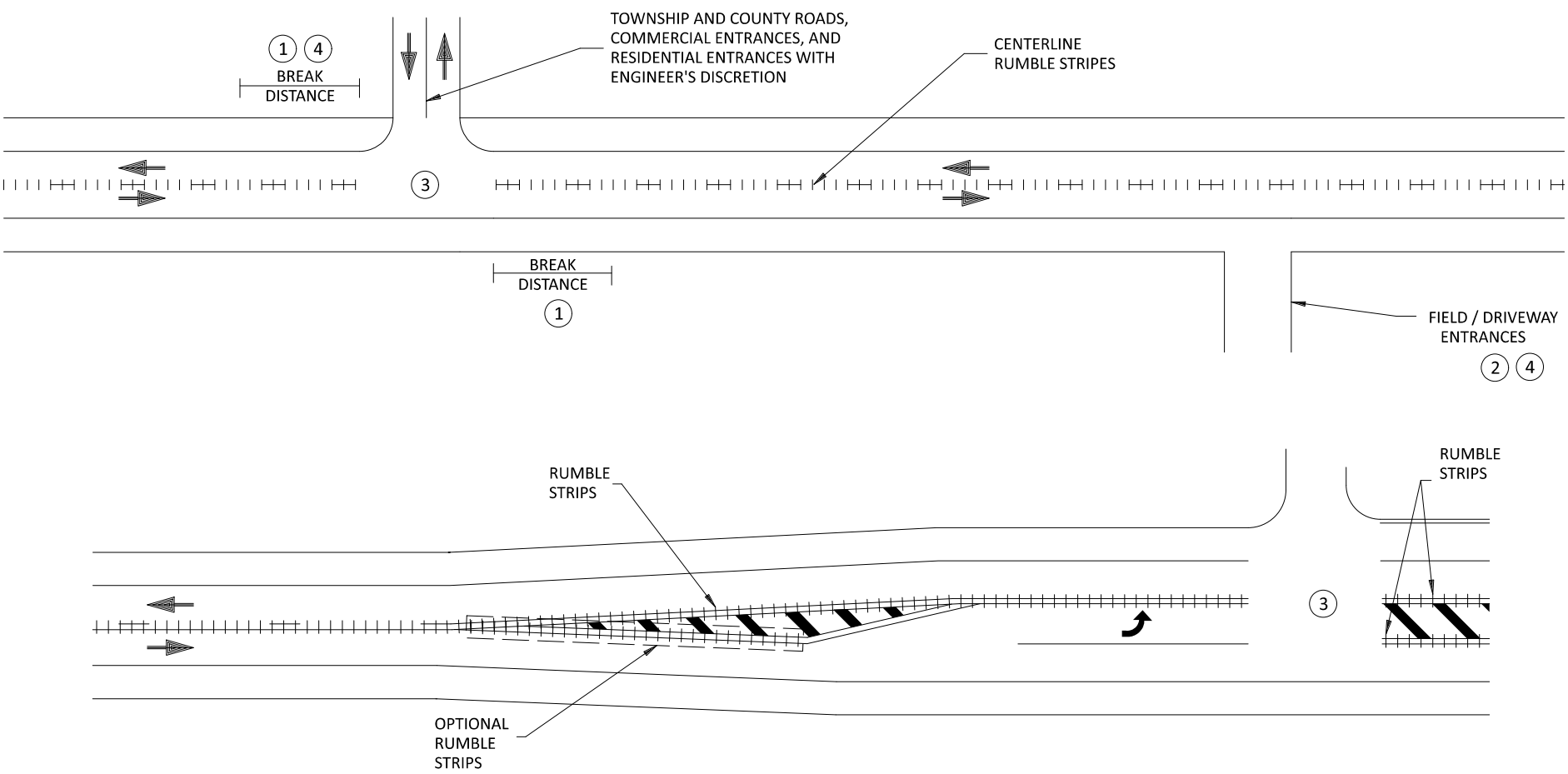
FIGURE 9E
EXIT RAMP

DESIGNER NOTES:

- ① IF RUMBLES ARE DISCONTINUED FOR ANY FIELD/DRIVEWAY ENTRANCE, DELETE THE FIELD/DRIVEWAY ENTRANCE FROM THE FIGURE.
- ② RUMBLE STRIP SEGMENTS OF 150 FT. OR LESS ARE OPTIONAL. IF THESE RUMBLES ARE TO BE OMITTED, THE DESIGNER NEEDS TO TAB THESE LOCATIONS IN THE PLAN OR ADD A GENERAL NOTE "(1) DO NOT INSTALL RUMBLE STRIPS OF 150' OR LESS".

APPROPRIATE BREAKS

- CENTERLINE RECTANGULAR CORRUGATED RUMBLE STRIP



GENERAL NOTES:

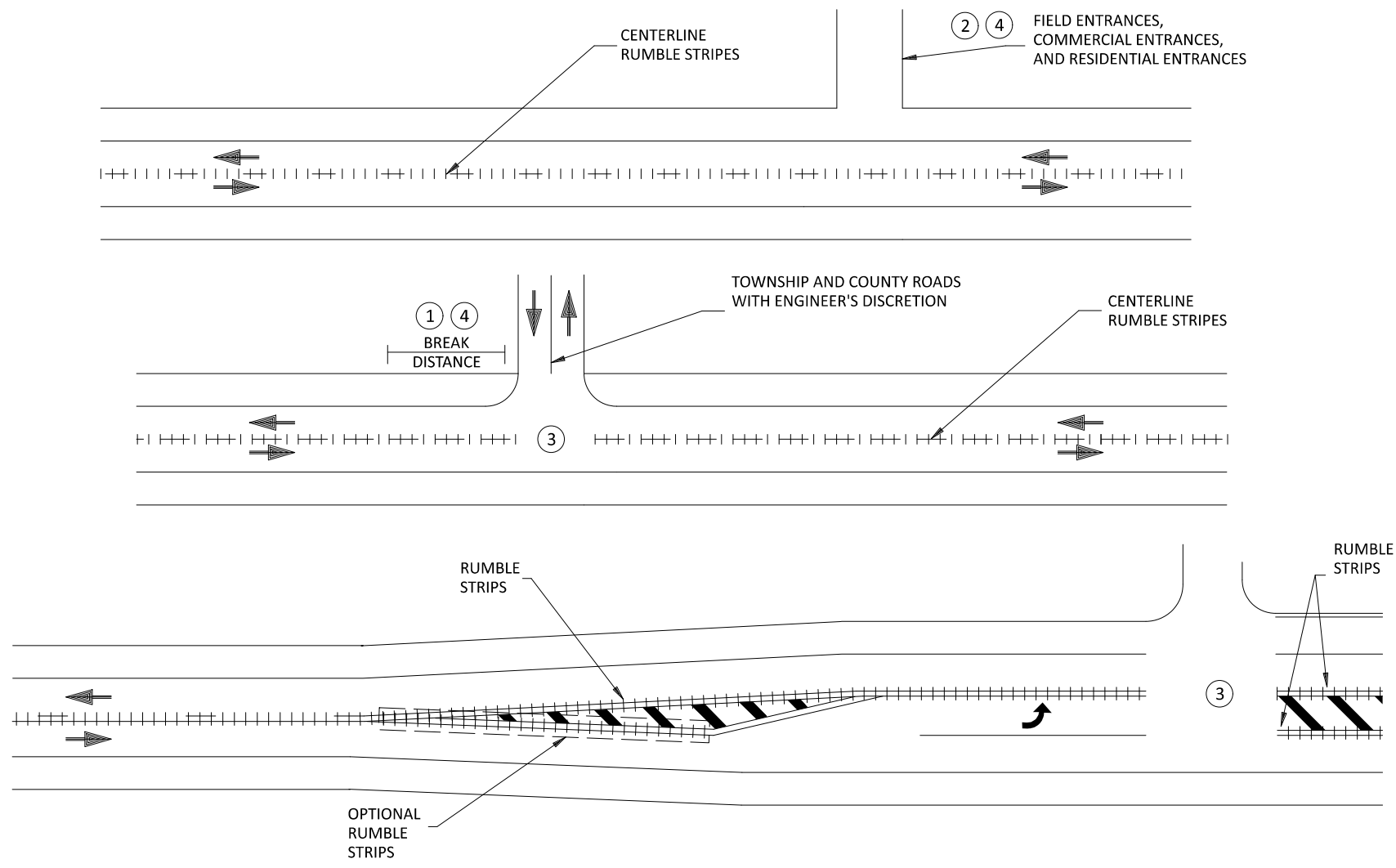
- (1) CONTINUE PAVEMENT MARKINGS AND RUMBLE STRIPS through the FIELD ENTRANCES.
- (2) THE RUMBLE STRIP GAP STARTS AND ENDS AT THE MAINLINE RADII POINTS.

DESIGNER NOTES:

- (1) THE DESIGNER HAS THE FLEXIBILITY TO INCLUDE A BREAK DISTANCE. THE RUMBLE MAY END AT THE MAINLINE RADII POINT, IF NOT, TYPICAL BREAK DISTANCES HAVE BEEN APPROXIMATELY 200 FT. IF BREAK DISTANCE IS USED, THE DESIGNER NEEDS TO TAB THESE LOCATIONS IN THE PLAN OR MODIFY GENERAL NOTE (2) TO "(2) BREAK DISTANCE IS (INSERT SPECIFIED DISTANCE)".
- (2) REMOVE THE GENERAL NOTE (1) IF RUMBLING IS DISCONTINUED FOR ANY FIELD/DRIVEWAY ENTRANCE AND ALSO DELETE THE FIELD/DRIVEWAY ENTRANCE FROM THE FIGURE.
- (3) FOR ENTRANCES OTHER THAN FIELD/DRIVEWAY ENTRANCES, RUMBLE STRIPS TYPICALLY DO NOT CONTINUE THROUGH THE INTERSECTION DUE TO NOISE CONCERNS. IF AN INTERSECTION IS RUMBLED, THE FIGURE MUST BE ADJUSTED SO THAT RUMBLES CONTINUE THROUGH THE INTERSECTION AND DELETE NOTE (2).
- (4) RUMBLE STRIP SEGMENTS OF 150 FT. OR LESS ARE OPTIONAL. IF THESE RUMBLES ARE TO BE OMITTED, THE DESIGNER NEEDS TO TAB THESE LOCATIONS IN THE PLAN OR ADD A GENERAL NOTE "DO NOT INSTALL RUMBLE STRIPS OF 150' OR LESS".

APPROPRIATE BREAKS

- CENTERLINE SINUSOIDAL RUMBLE STRIP



GENERAL NOTES:

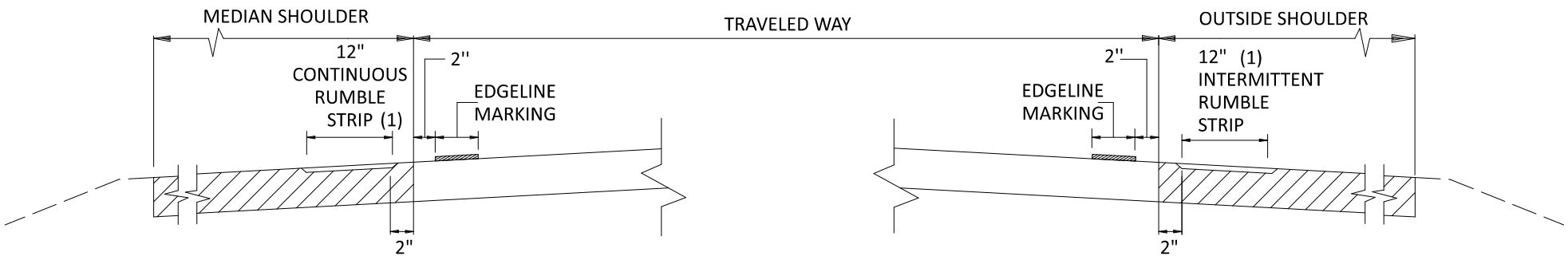
(1) CONTINUE PAVEMENT MARKINGS AND RUMBLE STRIPS through the FIELD ENTRANCES.

DESIGNER NOTES:

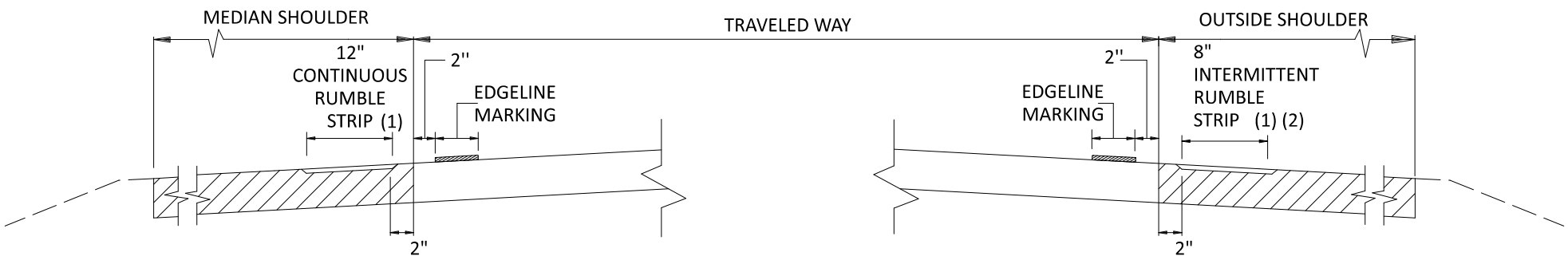
- ① THE DESIGNER HAS THE FLEXIBILITY TO INCLUDE A BREAK. THE RUMBLE MAY END AT THE MAINLINE RADII POINT AND INCLUDE A GENERAL NOTE (2) "THE RUMBLE STRIP GAP STARTS AND ENDS AT THE MAINLINE RADII POINTS." IF AN ADDITIONAL BREAK DISTANCE IS TO BE INCLUDED, TYPICAL BREAK DISTANCES HAVE BEEN APPROXIMATELY 200 FT. IF BREAK DISTANCE IS USED, THE DESIGNER NEEDS TO TAB THESE LOCATIONS IN THE PLAN OR ADD GENERAL NOTE (2) "BREAK DISTANCE IS (INSERT SPECIFIED DISTANCE)".
- ② REMOVE THE GENERAL NOTE (1) IF RUMBLING IS DISCONTINUED FOR ANY FIELD/DRIVEWAY ENTRANCE AND ALSO DELETE THE FIELD/DRIVEWAY ENTRANCE FROM THE FIGURE.
- ③ FOR ENTRANCES OTHER THAN FIELD/DRIVEWAY ENTRANCES, RUMBLE STRIPS TYPICALLY DO NOT CONTINUE THROUGH THE INTERSECTION. IF AN INTERSECTION IS RUMBLED, THE FIGURE MUST BE ADJUSTED SO THAT RUMBLES CONTINUE THROUGH THE INTERSECTION.
- ④ RUMBLE STRIP SEGMENTS OF 150 FT. OR LESS ARE OPTIONAL. IF THESE RUMBLES ARE TO BE OMITTED, THE DESIGNER NEEDS TO TAB THESE LOCATIONS IN THE PLAN OR ADD A GENERAL NOTE "DO NOT INSTALL CONTINUOUS RUMBLE STRIPS OF 150' OR LESS".

RUMBLE STRIPS ON BITUMINOUS DIVIDED ROADWAYS

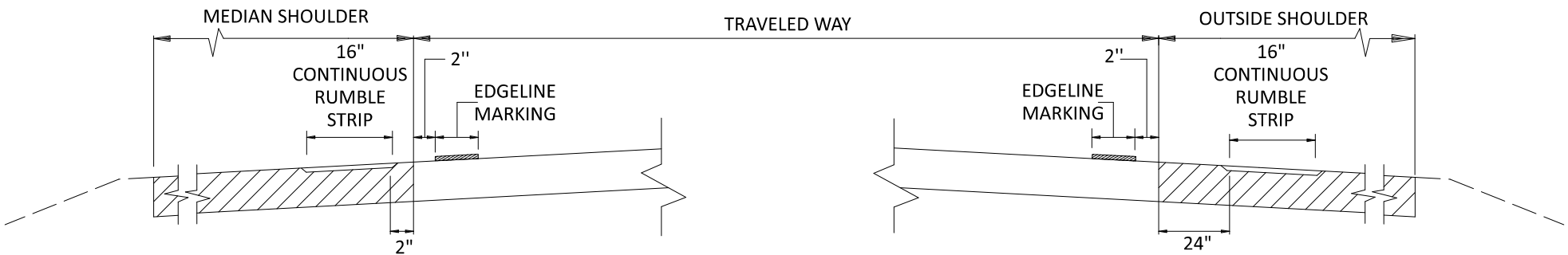
MULTI-LANE ROADS OR EXPRESSWAYS WITH OUTSIDE SHOULDER WIDTHS 6' OR GREATER



MULTI-LANE ROADS OR EXPRESSWAYS WITH OUTSIDE SHOULDER WIDTHS LESS THAN 6'



FREEWAY

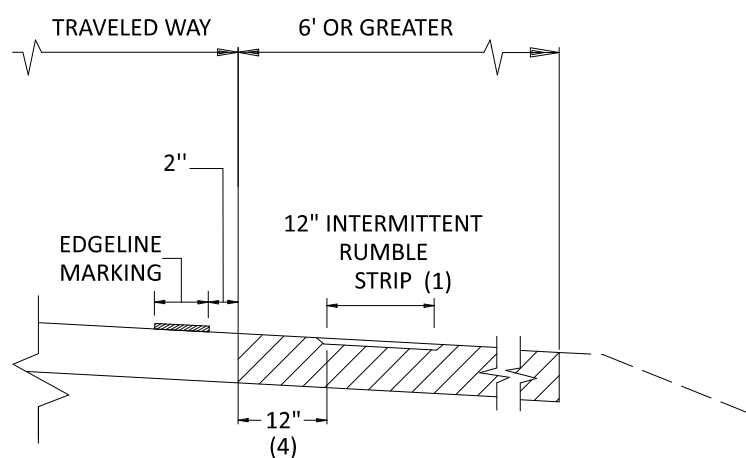


DESIGNER'S NOTES;

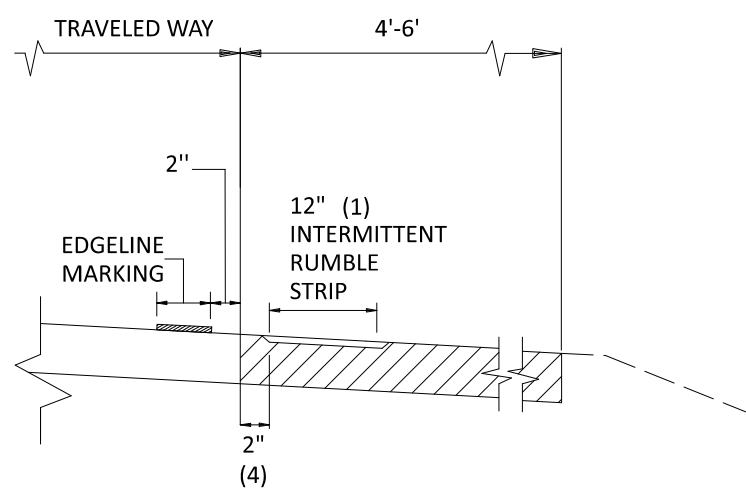
- (1) TYPICAL WIDTH OF RUMBLE IS SHOWN, BUT MAY BE 8"-12".
- (2) IF DETERMINED BIKEABLE BY DISTRICT TRAFFIC ENGINEER, MOVE RUMBLE TO 2"-4" FROM OUTSIDE PAVEMENT EDGE.
- 3. DISTRICT TRAFFIC ENGINEER CAN CHOOSE SINUSOIDAL OR RECTANGULAR CORRUGATED RUMBLE STRIPS FOR THEIR SPECIFIC INSTALLATION.

RUMBLE STRIPS ON BITUMINOUS TWO-WAY ROADWAYS

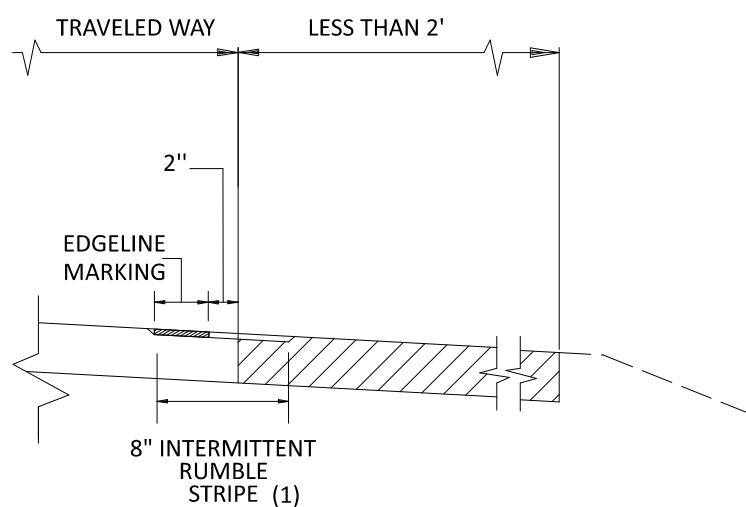
6' SHOULDER OR GREATER
SHOULDER RUMBLE OPTION



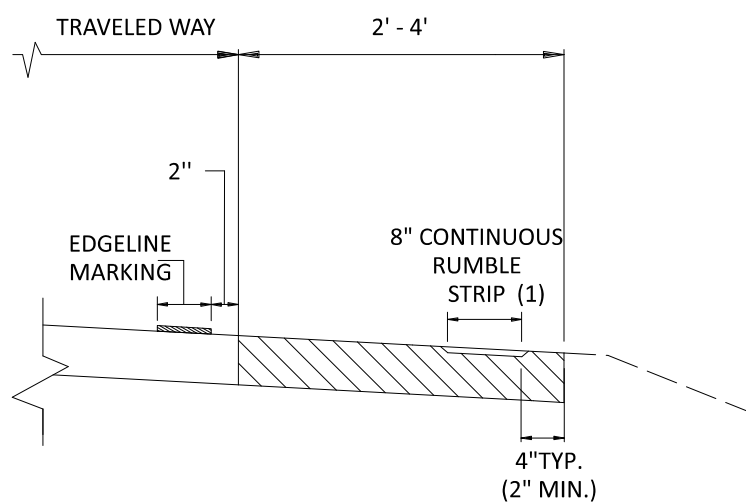
4'- 6' SHOULDER
SHOULDER RUMBLE OPTION



LESS THAN 2' SHOULDER
EDGE LINE RUMBLE STRIPE OPTION



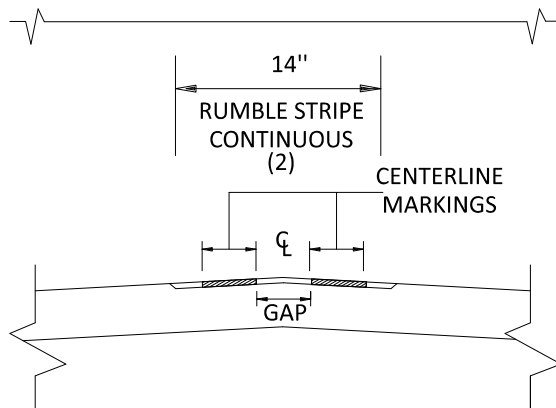
2' - 4' SHOULDER
RUMBLE STRIP OPTION



DESIGNER'S NOTES:

- (1) TYPICAL WIDTH OF RUMBLE IS SHOWN BUT MAY BE 8" - 12".
- (2) RUMBLES MAY BE WIDENED WHEN 6" PAVEMENT MARKINGS ARE INSTALLED. SEE BITUMINOUS CENTERLINE RUMBLE STRIPE DETAIL.
3. THE 2'-4' SHOULDER RUMBLE STRIP OPTION IS PREFERRED BY BICYCLISTS WITHOUT A 4' BIKEABLE SURFACE, SO IT IS RECOMMENDED TO CONSIDER USING THAT OPTION FOR SHOULDERS 5' OR LESS.
- (4) OFFSET FROM TRAVELLED WAY CAN BE INCREASED FROM TYPICAL DISTANCE AS LONG AS 4 FEET OF BIKEABLE SURFACE IS PROVIDED."
5. DISTRICT TRAFFIC ENGINEER CAN CHOOSE SINUSOIDAL OR RECTANGULAR CORRUGATED RUMBLE STRIPS FOR THEIR SPECIFIC INSTALLATION.

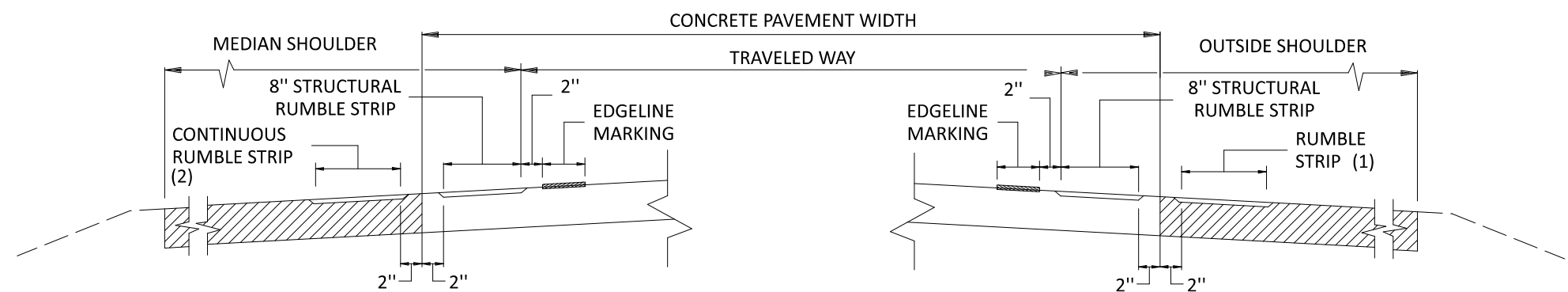
CENTERLINE RUMBLE
STRIPE OPTION



RUMBLE STRIPS ON CONCRETE DIVIDED ROADWAYS

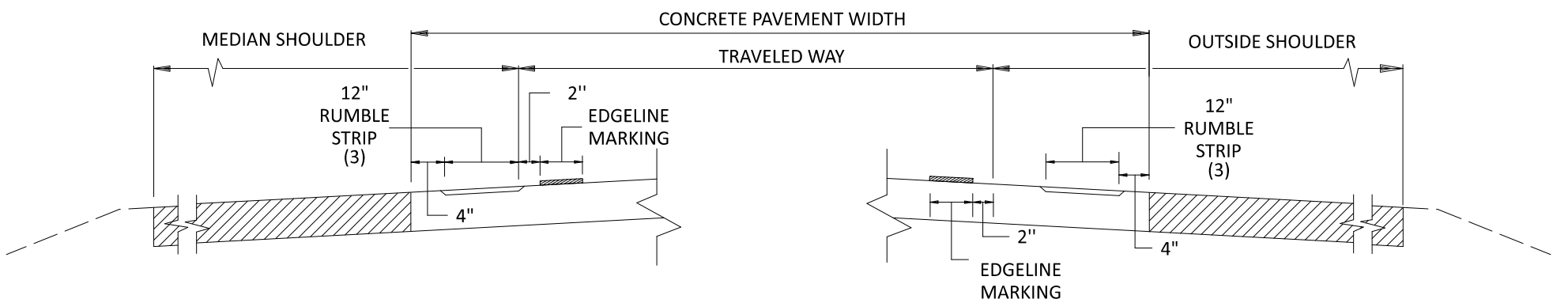
CONCRETE FREEWAY/MULTI-LANE EXPRESSWAY RUMBLE IN BITUMINOUS SHOULDER

(ONE ROADWAY SHOWN)



CONCRETE FREEWAY/MULTI-LANE EXPRESSWAY RUMBLE IN CONCRETE SHOULDER

(ONE ROADWAY SHOWN)

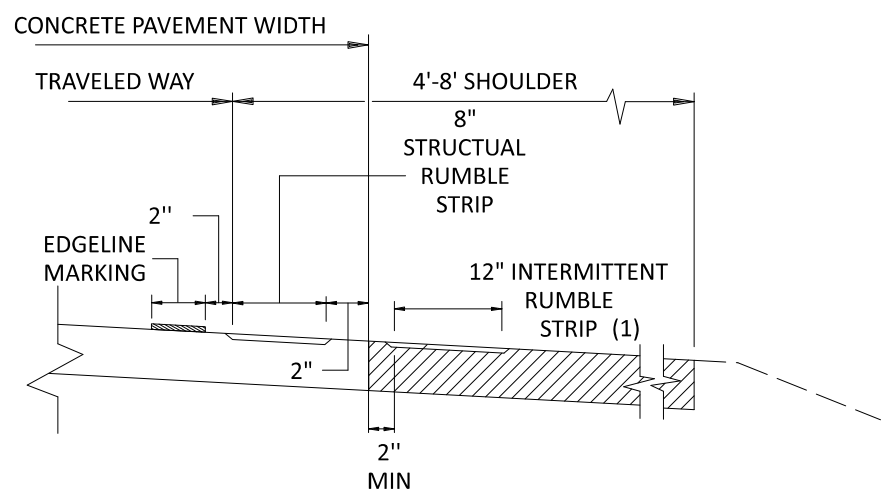


DESIGNER NOTES;

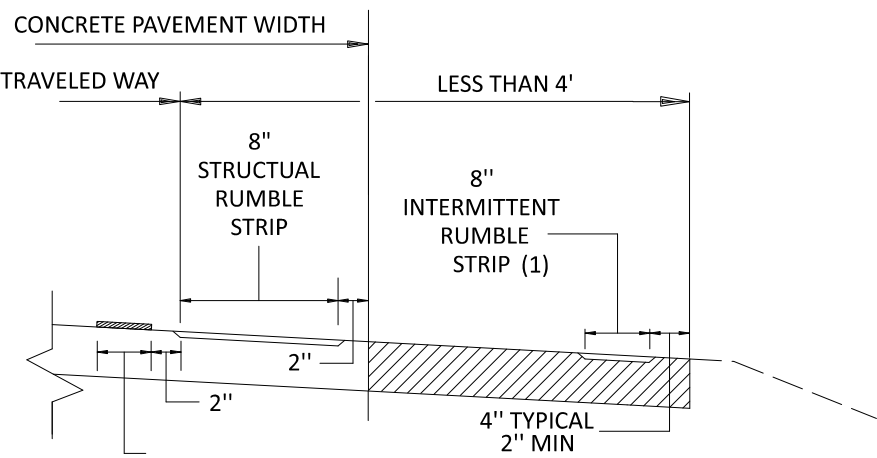
- (1) USE 8" INTERMITTENT WHERE SHOULDER WIDTH IS EQUAL TO OR GREATER THAN 4' AND LESS THAN 8'.
USE 12" INTERMITTENT WHERE SHOULDER WIDTH IS 8' OR GREATER.
USE 16" CONTINUOUS ON FREEWAY.
INSERT THE WIDTH OF THE RUMBLE INTO THE DETAIL.
- (2) USE 12" FOR EXPRESSWAY AND 16" FOR FREEWAY.
- (3) TYPICAL WIDTH OF RUMBLE IS SHOWN BUT MAY BE 8"-12".
4. DISTRICT TRAFFIC ENGINEER CAN CHOOSE SINUSOIDAL OR RECTANGULAR CORRUGATED RUMBLE STRIPS FOR THEIR SPECIFIC INSTALLATION.
5. WHEN THERE IS NO STRUCTURAL RUMBLE INSTALLED AND THE CONCRETE WIDTH IS EQUAL TO THE TRAVELED WAY WIDTH, USE THE RUMBLE STRIPS ON BITUMINOUS DIVIDED ROADWAYS TYPICAL DETAILS.

RUMBLE STRIPS ON CONCRETE TWO-WAY ROADWAYS

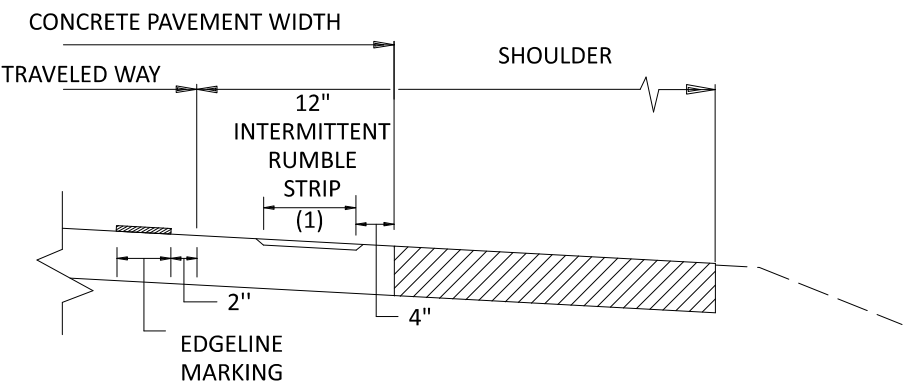
4' - 8' SHOULDER WITH RUMBLE STRIP
IN BITUMINOUS OPTION



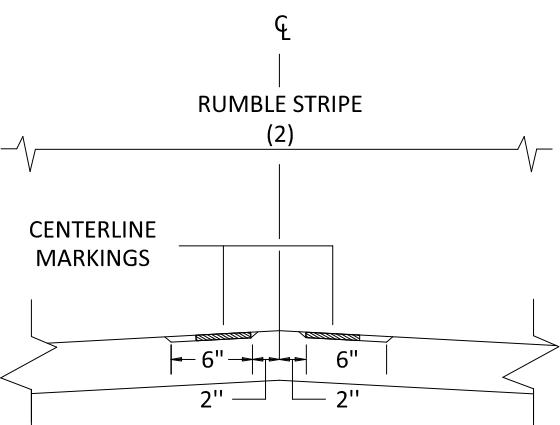
LESS THAN 4' SHOULDER WITH RUMBLE STRIP
IN BITUMINOUS OPTION



SHOULDER RUMBLE IN CONCRETE OPTION



CENTER LINE RUMBLE STRIPE



DESIGNER'S NOTES;

- (1) - TYPICAL WIDTH OF RUMBLE IS SHOWN BUT MAY BE 8"-12"
- (2) - RUMBLES MAY BE WIDENED WHEN 6" PAVEMENT MARKINGS ARE INSTALLED
- 3. DISTRICT TRAFFIC ENGINEER CAN CHOOSE SINUSOIDAL OR RECTANGULAR CORRUGATED RUMBLE STRIPS FOR THEIR SPECIFIC INSTALLATION.