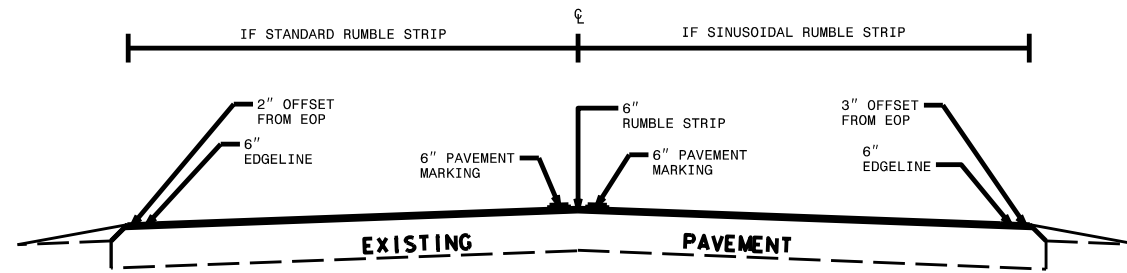
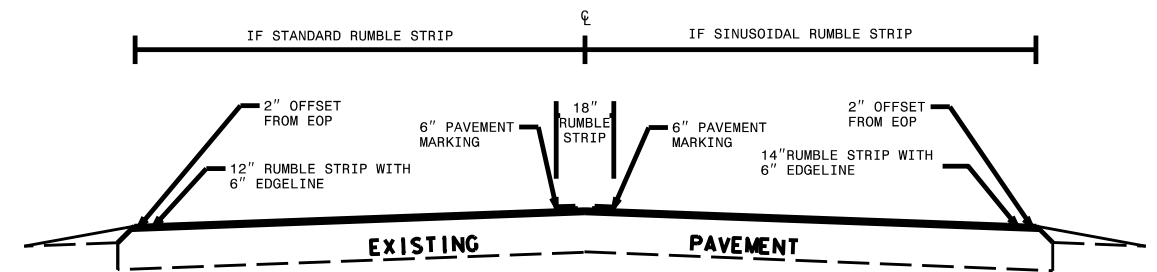


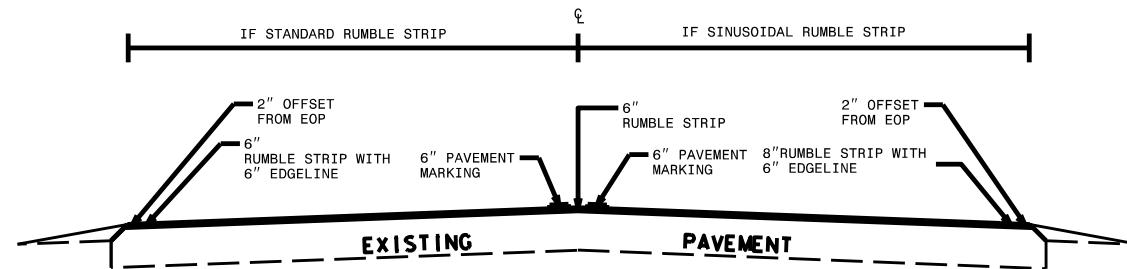
																		PROJECT NO.	SHEET NO.
																		DK00459	1
<b>Summary of Quantities</b>																			
												1881000000-E	1881000000-E	4688000000-E	4700000000-E	4850000000-E	4860000000-E		
Project No	County	Route	Description	Begin Milepost	End Milepost	Lanes	Lane Type	Typical Number	Length	Width	SINUSOIDAL MILLED RUMBLE STRIPS, 12" EDGELINE	SINUSOIDAL MILLED RUMBLE STRIPS, 12"	CENTERLINE SINUSOIDAL MILLED RUMBLE STRIPS, ASPHALT CONCRETE, 18"	THERMOPLASTIC PAVEMENT MARKING LINES YELLOW (6", 90 MIL)	THERMOPLASTIC PAVEMENT MARKING LINES WHITE (6", 90 MIL)	THERMOPLASTIC PAVEMENT MARKING LINES WHITE (12", 90 MIL)	REMOVAL OF PAVEMENT MARKING LINES 4"	REMOVAL OF PAVEMENT MARKING LINES 6"	
	Wilkes	US 421	From SR 1301 (Fall Creek Rd) heading west to beginning of four lane undivided highway	33.4	34.2	4	MD		0.80	50		16896		8448	10560		19008		
	Wilkes	US 421	From beginning of four lane undivided highway 0.8 miles west of SR 1301 (Fall Creek Rd) to County Line	34.2	35.53	4	2WU		1.33	50	14045		7022	14045	17556		3511		
	Watauga	US 421	From County Line to beginning of five lane highway section 0.15 miles east of SR 1361 (Orchard Rd)	0	1.38	4	2WU		1.38	50	14573		7286	14573	18216		3643		
	Watauga	US 421	From beginning of five lane highway section 0.15 miles east of SR 1361 (Orchard Rd) to US 221 Off Ramp	1.38	3.47	5	2WLTL		2.09	52		22070	22070	27588	27588		27588		
	Watauga	US 421	From US 221 Off Ramp to end of four lane divided highway 0.26 miles east of SR 1461 (Old US Hwy 421 S)	1.1	8.29	4	MD		7.19	52		151853		75926	94908	2500	170835	2500	
	Watauga	US 421	US 421/US 221 Ramps						1					10560					
<b>TOTAL FOR PROJECT 50983.1.4</b>										<b>13.79</b>	<b>28618</b>	<b>201379</b>	<b>36379</b>	<b>140580</b>	<b>168828</b>	<b>2500</b>	<b>224585</b>	<b>2500</b>	
<b>Grand Total</b>											<b>229997</b>			<b>309408</b>					



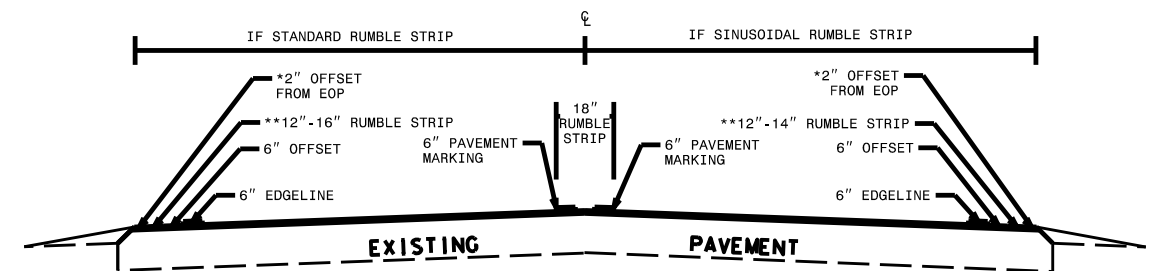
TYPICAL SECTION NO. 1  
 $20' \leq \text{PAVEMENT WIDTH} < 22'$



TYPICAL SECTION NO. 4  
 $24' \leq \text{PAVEMENT WIDTH} < 26'$

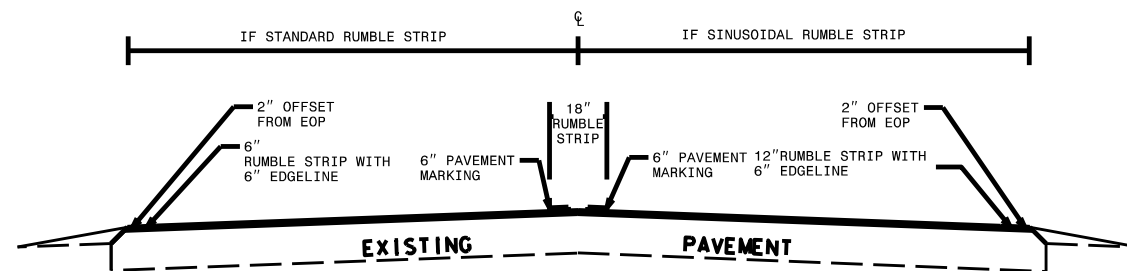


TYPICAL SECTION NO. 2  
 $22' \leq \text{PAVEMENT WIDTH} < 23'$



TYPICAL SECTION NO. 5  
 $\text{PAVEMENT WIDTH} \geq 26'$

\* INCREASE THIS DISTANCE FOR PAVEMENT WIDTHS > 30' BASED ON A LANE WIDTH OF 12'  
 \*\* WIDTH OF RUMBLE STRIP IS BASED ON A LANE WIDTH OF 10'-12'



TYPICAL SECTION NO. 3  
 $23' \leq \text{PAVEMENT WIDTH} < 24'$

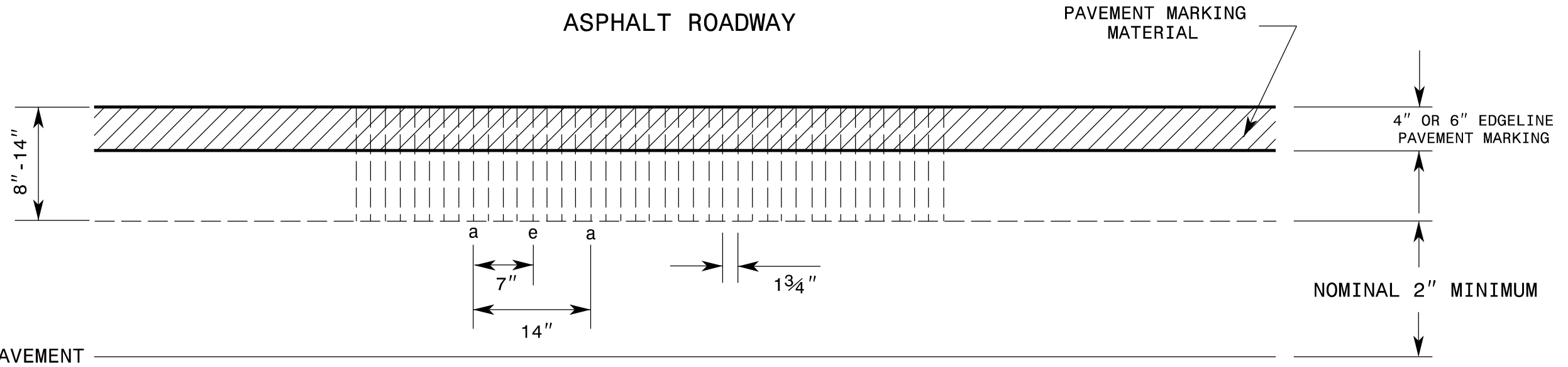
\$\$\$\$\$SYSTEMTIME\$\$\$\$\$  
 \$\$\$JUL2023 10:00:00 AM\$\$\$  
 \$\$\$USER: JCB\$\$\$\$\$

APPROVED: _____	DATE: _____	<b>MILLED/SINUSOIDAL RUMBLE STRIP DETAIL</b>	
SEAL 			
SCALE: NONE	DATE: OCT 2023		REVISIONS
DWG. BY: JCB	DESIGN BY: WAT		
REVIEWED BY: _____			

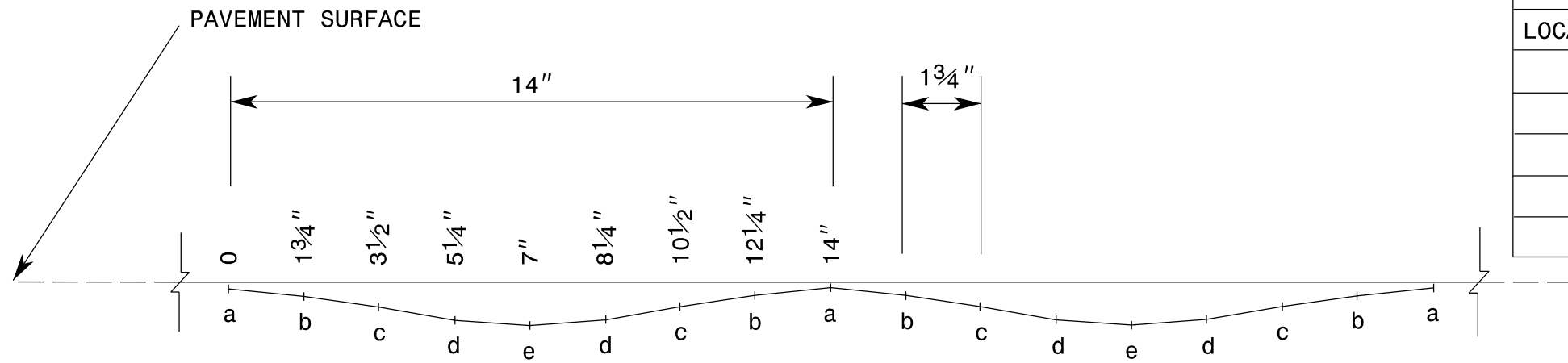
See Table 1 within Rumble Strip Policy for Design Guidance

PLAN VIEW

TRAVEL LANE(S)  
ASPHALT ROADWAY



PROFILE VIEW



LOCATION	DEPTH	
	MIL	INCHES
a	62.5	$\frac{1}{16}$ "
b	125	$\frac{1}{8}$ "
c	219	$\frac{7}{32}$ "
d	344	$\frac{11}{32}$ "
e	375	$\frac{3}{8}$ "

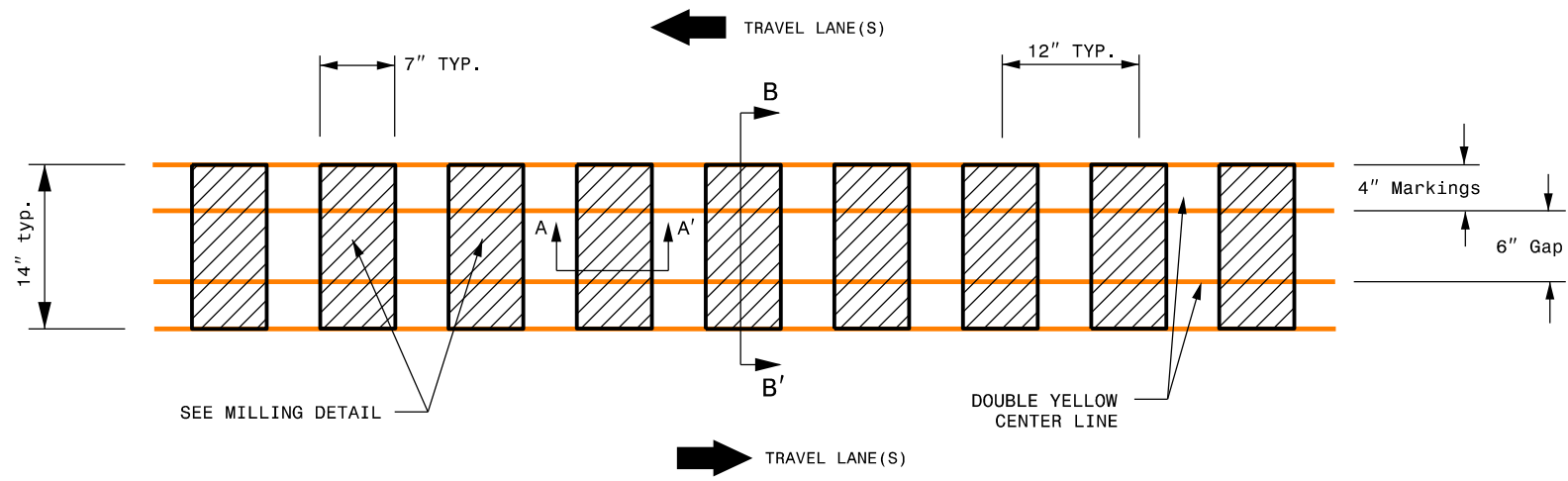
REFERENCE DRAWING ID: Sin.Stripe

NOTES:

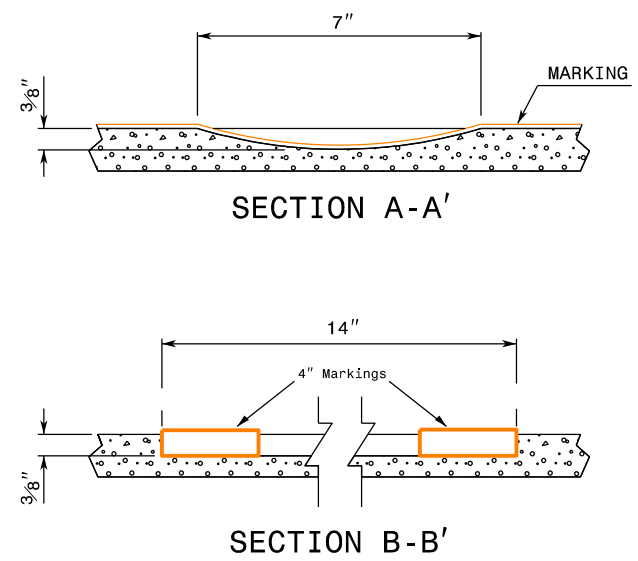
- 1) Specification in table taken from MNDOT Research Project Final Report 2016-23: *Sinusoidal Rumble Strip Design Optimization Study By: Terhaar et. al, June 2016*
- 2) USING A VACUUM, REMOVE ALL DEBRIS FROM THE MILLINGS JUST PRIOR TO PLACING ANY PAVEMENT MARKINGS.
- 3) ENSURE GLASS BEADS ARE SPREAD UNIFORMLY OVER THE ENTIRE SURFACE OF THE PAVEMENT MARKING MATERIAL.

See Table 2 within Rumble Strip Policy for Design Guidance

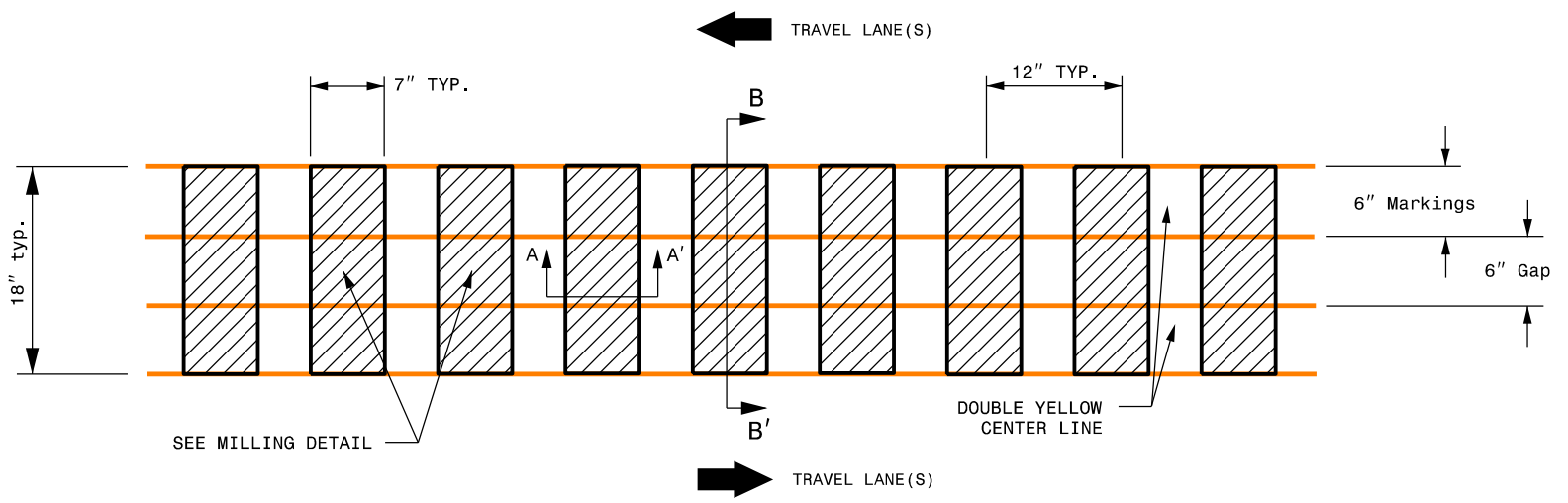
If 4" Markings will be used:



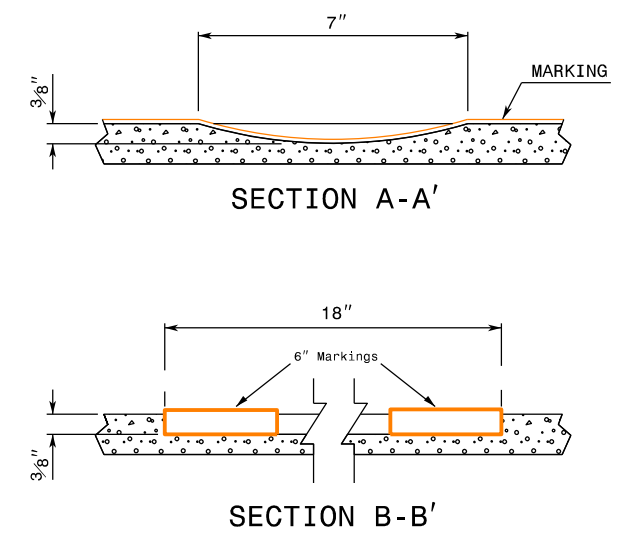
MILLING DETAIL - 4" Markings



If 6" Markings will be used:



MILLING DETAIL - 6" Markings

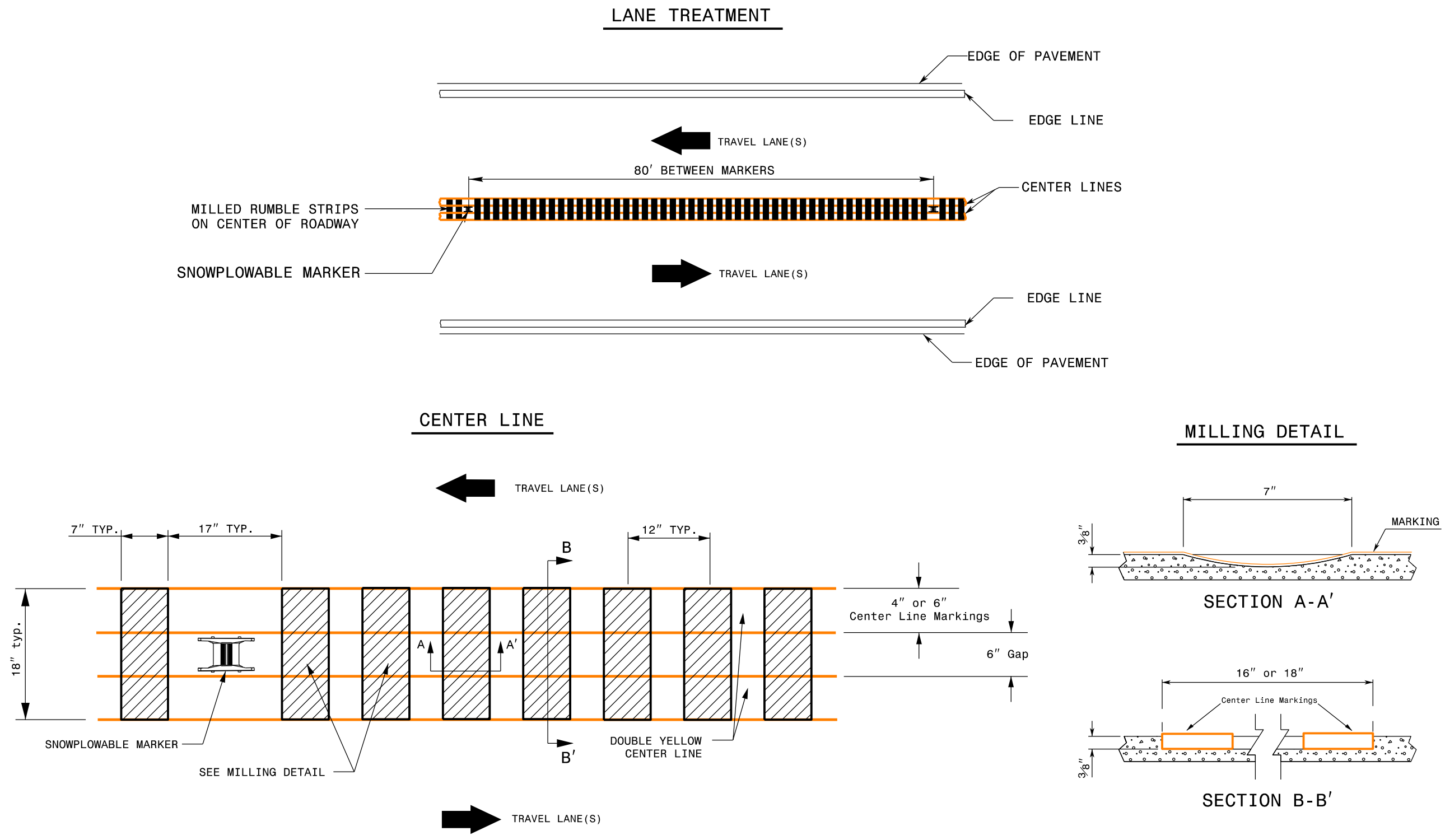


REFERENCE DRAWING ID: Trad.CL

NOTES:

- 1) USING A VACUUM, REMOVE ALL DEBRIS FROM THE MILLINGS JUST PRIOR TO PLACING ANY PAVEMENT MARKINGS.
- 2) ENSURE GLASS BEADS ARE SPREAD UNIFORMLY OVER THE ENTIRE SURFACE OF THE PAVEMENT MARKING MATERIAL.

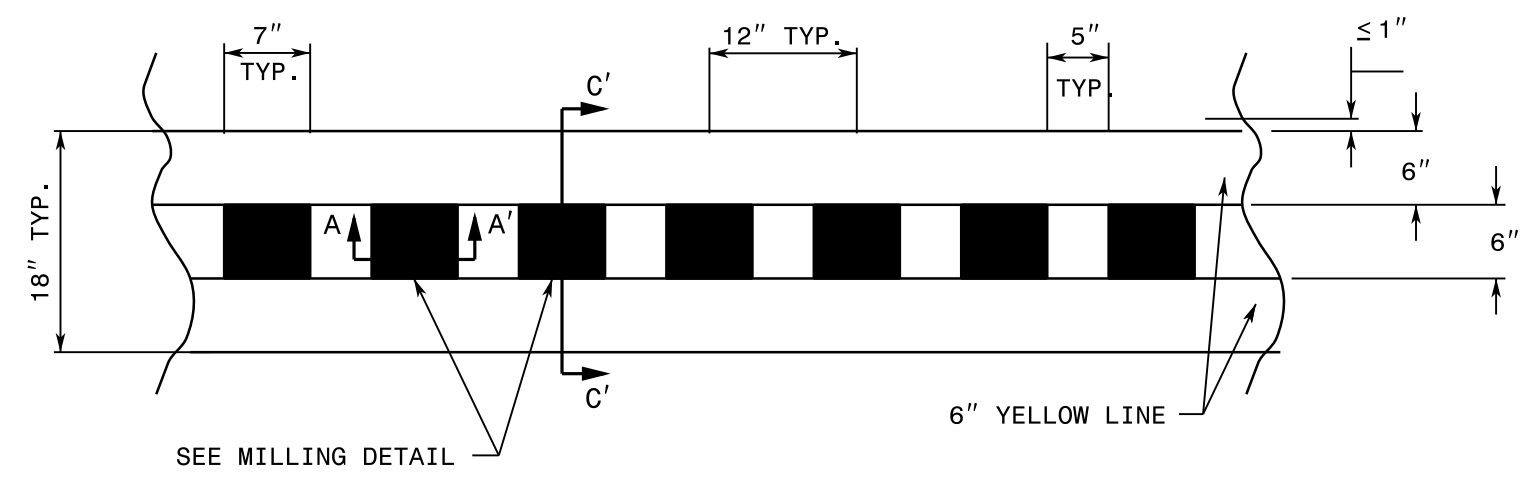
See Table 2 within Rumble Strip Policy for Design Guidance



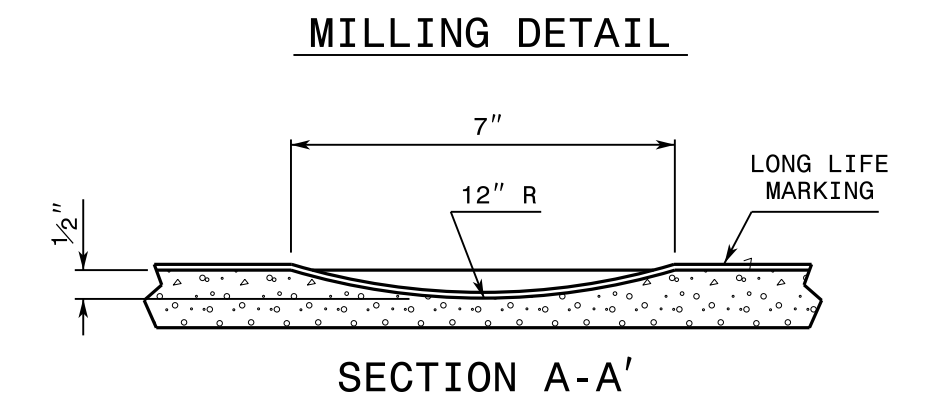
REFERENCE DRAWING ID: Trad.CL with Snowplowable Markers

**NOTES:**

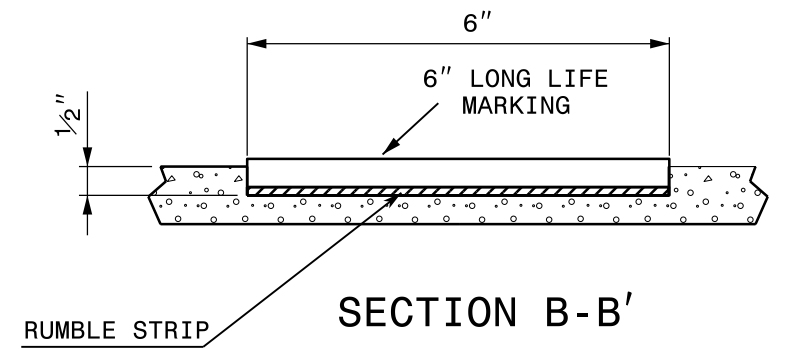
- 1) USING A VACUUM, REMOVE ALL DEBRIS FROM THE MILLINGS JUST PRIOR TO PLACING ANY PAVEMENT MARKINGS.
- 2) ENSURE GLASS BEADS ARE SPREAD UNIFORMLY OVER THE ENTIRE SURFACE OF THE PAVEMENT MARKING MATERIAL.
- 3) INSTALL SNOWPLOWABLE MARKERS AT APPROXIMATELY 80' INCREMENTS. DO NOT MILL RUMBLE STRIPS IN SECTION WHERE SNOWPLOWABLE MARKERS ARE INSTALLED.



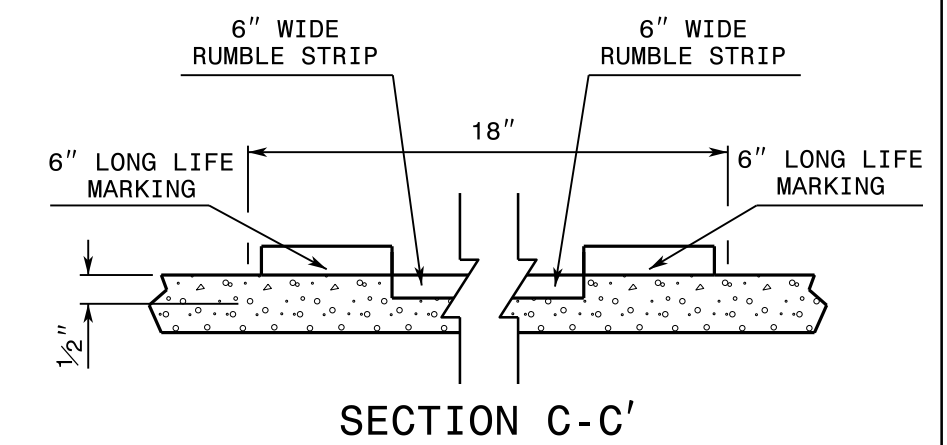
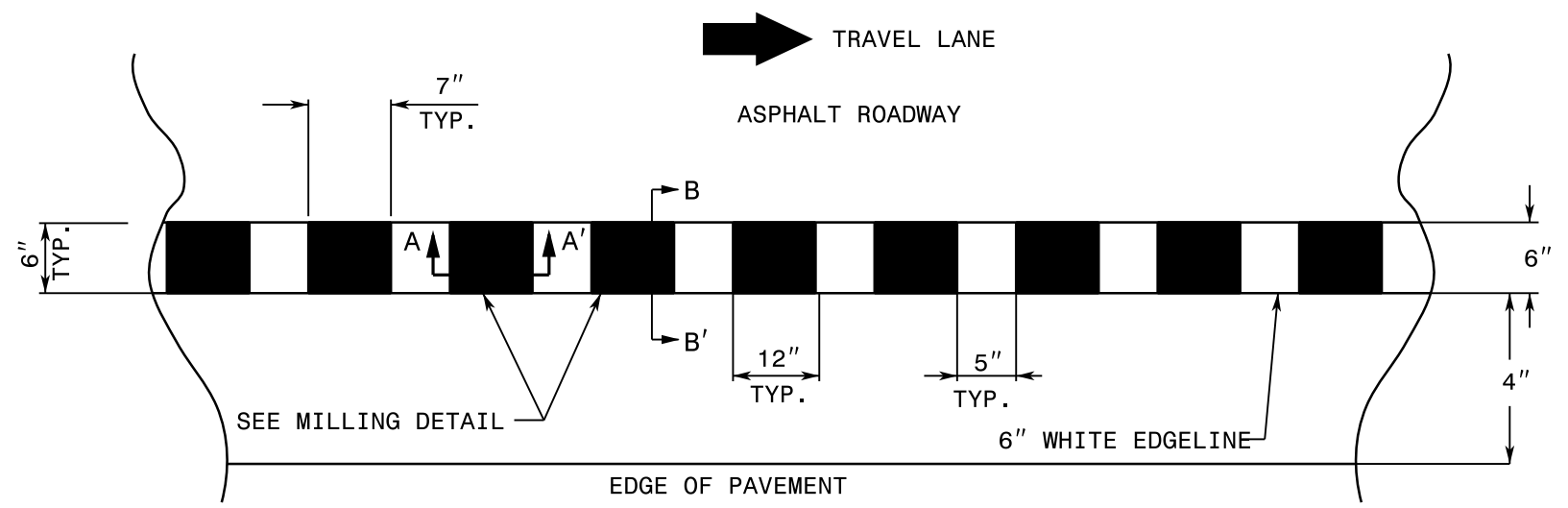
**CENTERLINE**



**SECTION A-A'**



**SECTION B-B'**

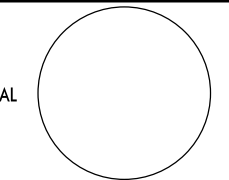


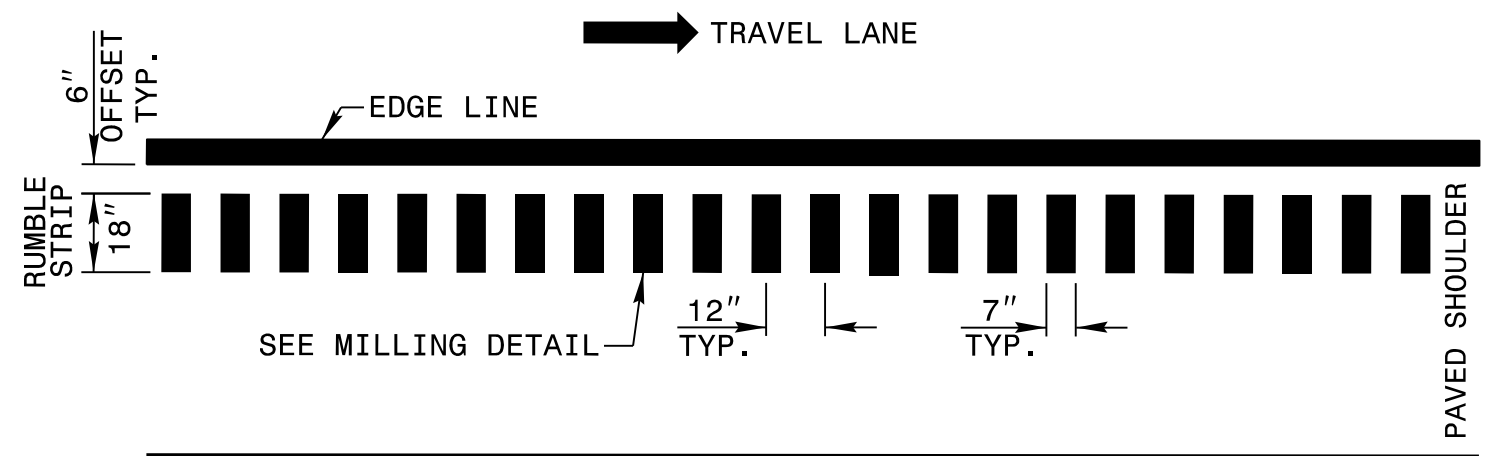
**SECTION C-C'**

**NOTE:**

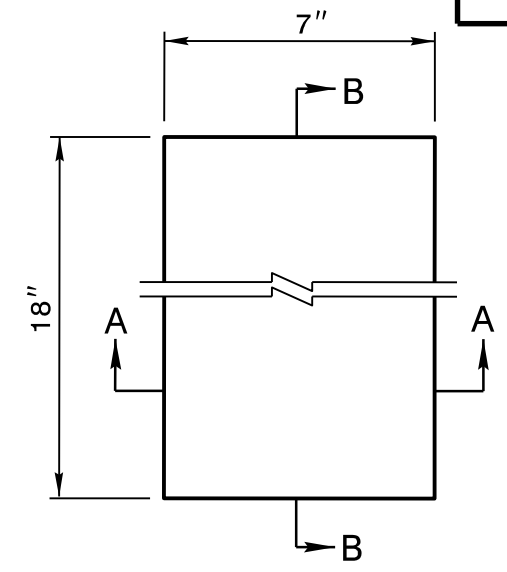
- 1) USING A VACUUM, REMOVE ALL DEBRIS FROM THE MILLINGS JUST PRIOR TO PLACING ANY PAVEMENT MARKINGS.
- 2) ENSURE GLASS BEADS ARE SPREAD UNIFORMLY OVER THE ENTIRE SURFACE OF THE PAVEMENT MARKING MATERIAL.
- 3) IF SNOWPLOWABLE MARKERS ARE TO BE INSTALLED IN THE CENTERLINE, SKIP A 18" SPACE IN THE RUMBLE STRIPS EVERY 80'

17-JAN-2024 10:04 AM  
 C:\Users\jamesone\OneDrive - State of North Carolina\Desktop\Rumble Strip Typicals.dgn  
 USER: jameone

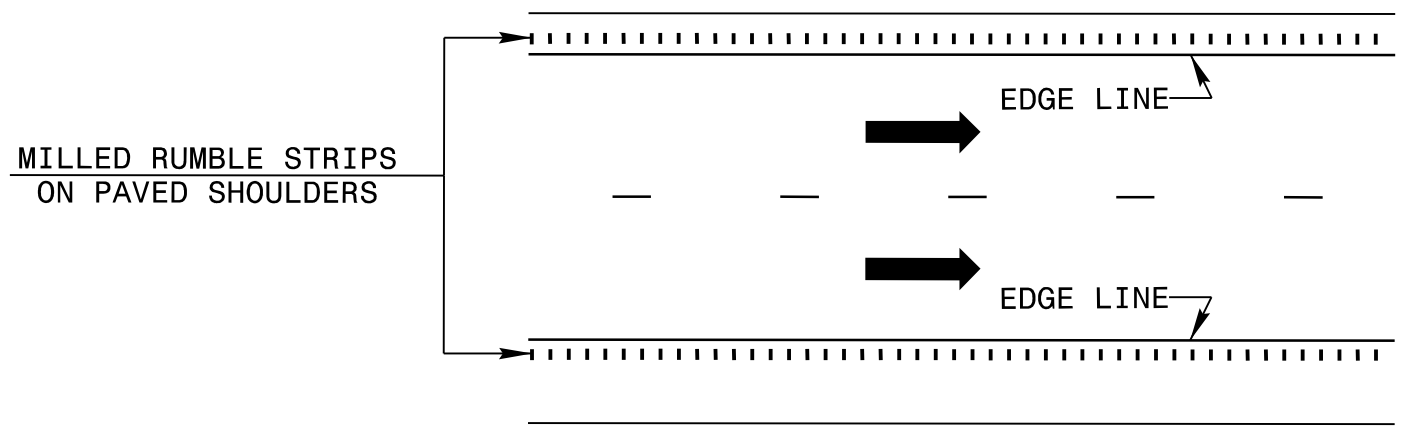
APPROVED: _____	DATE: _____	<b>MILLED RUMBLE STRIP DETAIL</b>	
			
		DATE: JUN 17'	
DESIGN BY: TWB			
REVIEWED BY: _____			



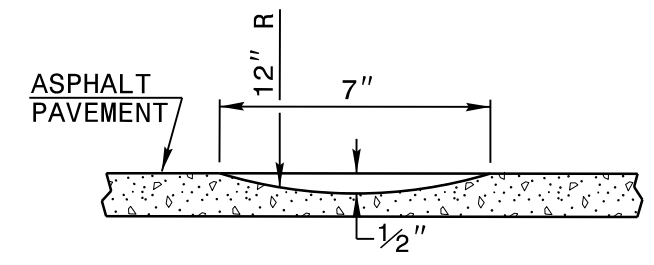
**PLAN VIEW  
PAVED SHOULDER**



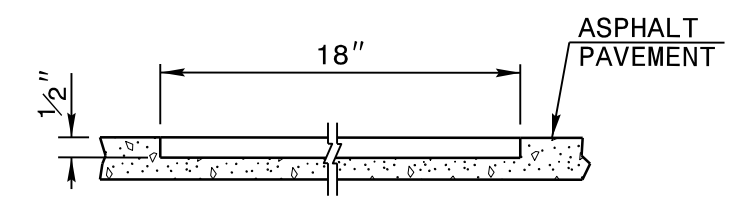
**PLAN VIEW  
MILLING DETAIL**



**LANE TREATMENT**



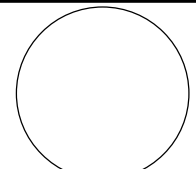

**SECTION A-A**



**SECTION B-B**

**NOTES:**

1. THE MILLING OPERATION SHALL MAINTAIN A MINIMUM CLEARANCE OF 3" FROM CONSTRUCTION JOINTS.

APPROVED: _____	DATE: _____	<b>MILLED/SINUSOIDAL RUMBLE STRIP DETAIL</b>	
SEAL 			
		DATE: _____	
DWG. BY: _____			
DESIGN BY: _____			
REVIEWED BY: _____			
CADD FILE			