



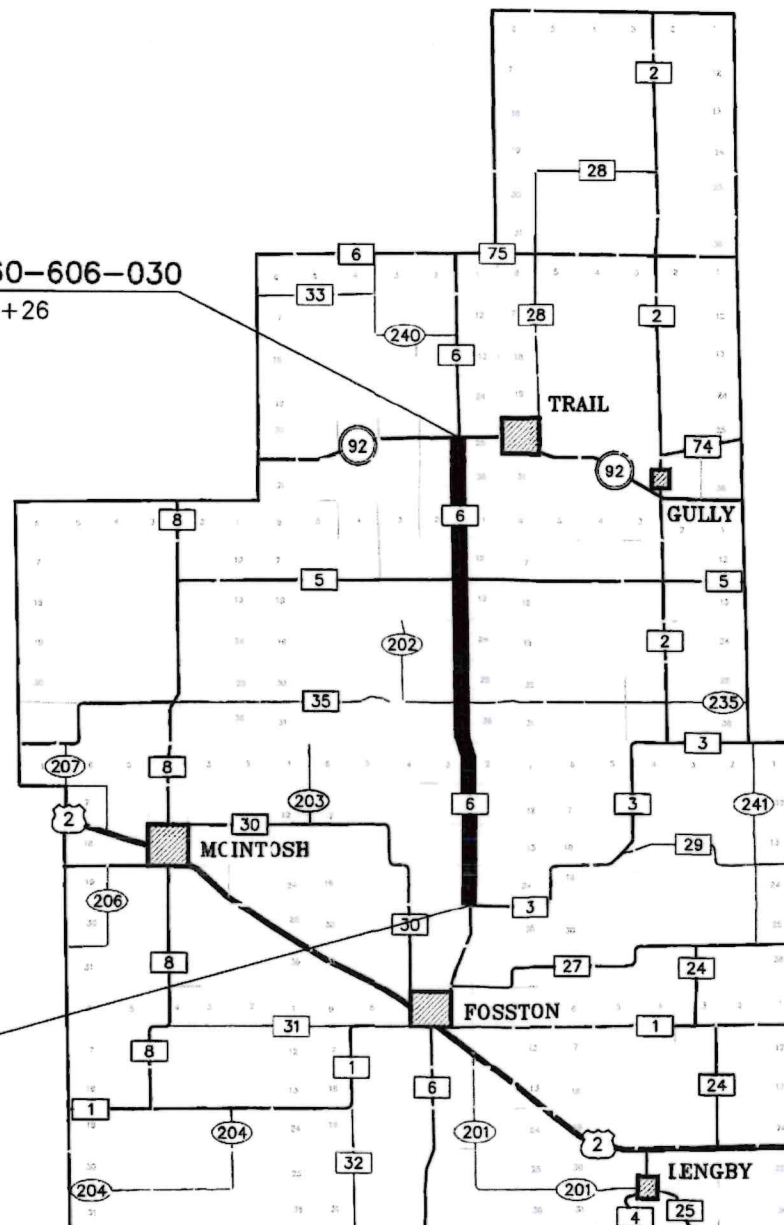
END: S.A.P. 060-606-030
STA. 765+26

GRADED UNDER:
S.A.P. 60-606-19 in 2002
S.A.P. 60-606-22 in 2003

SURFACED UNDER:
S.A.P. 60-606-19 in 2002
S.A.P. 60-606-22 in 2003

SCALE
INDEX MAP 1"=4.0 MILES
4 MI 0 4.0 MI

BEGIN: S.A.P. 060-606-030
STA. 150+61



DESIGN DESIGNATION

ADT (2025)	548
ADT (2045)	603
SHOULDER WIDTH	3.4'/3.6'
SOIL FACTOR	100
Ton Design	9
Design Speed (MPH)	55
CLEAR ZONE	15'
MAJOR COLLECTOR	
Design Standard	8820.9926

All Traffic Control Devices shall conform to the latest edition of the MMUTCD, including the latest "Field Manual for Temporary Traffic Control Zone Layouts".

STOPPING SIGHT DISTANCE BASED ON:
3.5' HEIGHT OF EYE
2.0' HEIGHT OF OBJECT

The subsurface utility information in this plan is quality level D. This quality level was determined according to the guidelines of CI/ASCE 38-22, entitled "Standard Guidelines for Investigating and Documenting Existing Utilities".

GOVERNING SPECIFICATIONS

The 2020 Edition of the Minnesota Department of Transportation "Standard Specifications for Construction" shall govern.

MINNESOTA DEPARTMENT OF TRANSPORTATION

POLK COUNTY

CONSTRUCTION PLAN FOR: BITUMINOUS OVERLAY
AND AGGREGATE SHOULDERING

COUNTY STATE AID HIGHWAY NO. 6

From C.S.A.H. 3, 2 MILES NORTH OF FOSSTON, MN.
To T.H. 92, 1 MILE WEST OF TRAIL, MN.

From a point 20' North of the South West cor. of sec. 23,
T. 148 N., R. 40 W.
To a point 24' South of the West 1/4 cor. of sec. 25,
T 150 N, R 40 W.

GROSS LENGTH	61,465	FEET	11.641	MILES
BRIDGES LENGTH	0	FEET	0	MILES
EXCEPTIONS LENGTH	0	FEET	0	MILES
NET LENGTH	61,465	FEET	11.641	MILES

INDEX

SHEET 1	TITLE SHEET
2-4	ESTIMATE OF QUANTITIES & TYPICAL SECTIONS
5-7	TRAFFIC CONTROL PLANS & DETAILS
8	PAVEMENT MARKING DETAILS
9	RUMBLE STRIP DETAILS

THIS PLAN CONTAINS 9 SHEETS

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

Richard C. Sanders, Digitally signed by Richard C. Sanders, PE
Date: 2025.04.12 06:11:46 -05'00'

Approved by: Polk County Engineer

4/12/2025

Date

Richard C. Sanders, P. E.
Name

23169

Reg. No.

STATE AID APPROVALS:

Brian Ketring

Digitally signed by Brian Ketring
DN: CN=Brian Ketring
Date: 2025.04.15 06:31:25-05'00'

Date: _____

District State Aid Engineer: Reviewer for Compliance with State-Aid Rules/Policy

Brian Ketring

Digitally signed by Brian Ketring
DN: CN=Brian Ketring
Date: 2025.04.15 06:31:55-05'00'

Date: _____

Approved For State Aid Funding:
State Aid Engineer

STATE AID PROJECT 060-606-030
COUNTY PROJECT 125-06-1405

SHEET 1 OF 9 SHEETS

ESTIMATED QUANTITIES

ITEM NO.	ITEM	UNIT	TOTAL EST. QUANTITIES
2221.509	SHOULDER BASE AGGREGATE CLASS 1	TON	10,700
① 2232.504	MILL BITUMINOUS SURFACE (1.5")	SQ YD	350
2232.603	MILLED RUMBLE STRIPS	LIN FT	110,000
2360.509	TYPE SP 9.5 BITUMINOUS MIXTURE FOR PAVER LEVELING (2,B)	TON	8,400
② 2360.509	TYPE SP 9.5 WEARING COURSE MIXTURE (2,B)	TON	15,900
2563.601	TRAFFIC CONTROL	LUMP SUM	1
2580.503	INTERIM PAVEMENT MARKING	LIN FT	9,800
④ 2582.503	4" SOLID LINE PAINT	LIN FT	22,000
③ 2582.503	6" SOLID LINE PAINT	LIN FT	121,000
④ 2582.503	4" BROKEN LINE PAINT	LIN FT	10,800

- ① INCLUDES MILLING AT PROJECT ENDS, C.S.A.H. 35 AND C.S.A.H. 5 AND AS DIRECTED BY THE ENGINEER.
- ② INCLUDES APPROX. 200 TONS FOR BITUMINOUS PATCHES AS DETERMINED BY THE ENGINEER, SAW CUTTING, REMOVAL AND DISPOSAL OF BITUMINOUS PAVEMENT SHALL BE CONSIDERED INCIDENTAL.
- ③ WHITE PAINT
- ④ YELLOW PAINT

BASIS FOR ESTIMATED QUANTITIES

BITUMINOUS WEARING COURSES

BITUMINOUS MIXTURE - 110 POUNDS/SQ YD/INCH OF DEPTH

BITUMINOUS TACK COAT

SEE SPECIAL PROVISIONS.

AGGREGATE SHOULDERING

AGGREGATE MATERIAL COMPUTED AT 135 POUNDS/CU FT

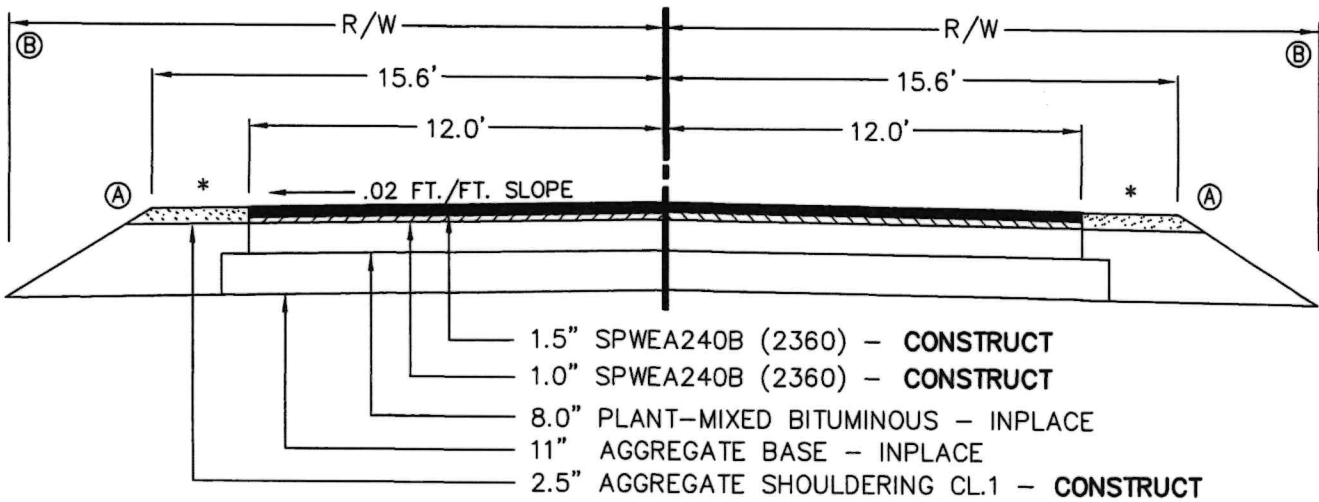
NOTES

ADDITIONAL MATERIAL FOR 12 ROAD APPROACHES, 95 ENTRANCES AND 17 MAILBOXES HAS BEEN PROVIDED FOR IN ITEMS, 2221.509 (1,500 TONS) 2360.509 (1,000 TONS).

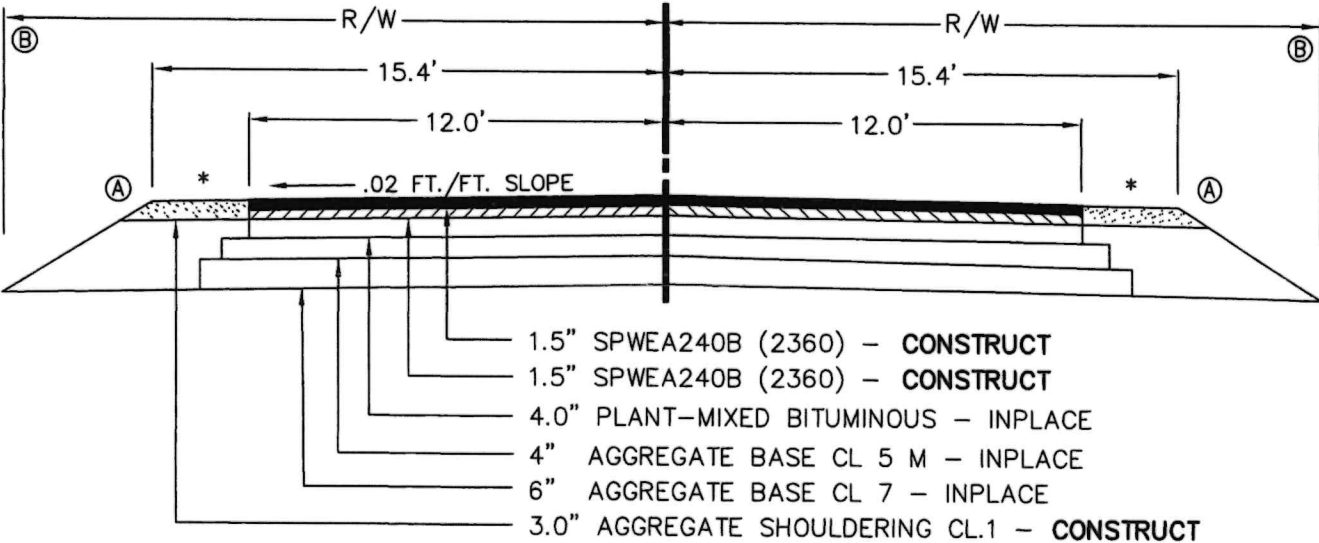
THE FOLLOWING STANDARD PLATES, APPROVED BY THE FEDERAL HIGHWAY ADMINISTRATION, SHALL APPLY.

STANDARD PLATES	
PLATE NO.	DESCRIPTION
8000 K	TEMPORARY CHANNELIZERS - TYPE A

TYPICAL SURFACING SECTIONS



THE ABOVE SECTION APPLIES FROM STA. 150+61 TO STA. 181+00
STA. 226+00 TO STA. 420+00



THE ABOVE SECTION APPLIES FROM STA. 181+00 TO STA. 226+00

- Ⓐ SLOPE THE NEW SHOULDER FROM THE SHOULDER P.I. TO BLEND INTO EXISTING SLOPE. ALL AGGREGATE MATERIAL SHALL BE COMPACTED COMPLETELY.
- Ⓑ RIGHT OF WAY DISTANCE VARIABLE THROUGHOUT PROJECT.
- * SHOULDER CROSS-SLOPE = 0.02 FT/FT

CERTIFIED BY: *Richard Sanders* #23169 4/12/2025

RICHARD C. SANDERS, P.E. DATE

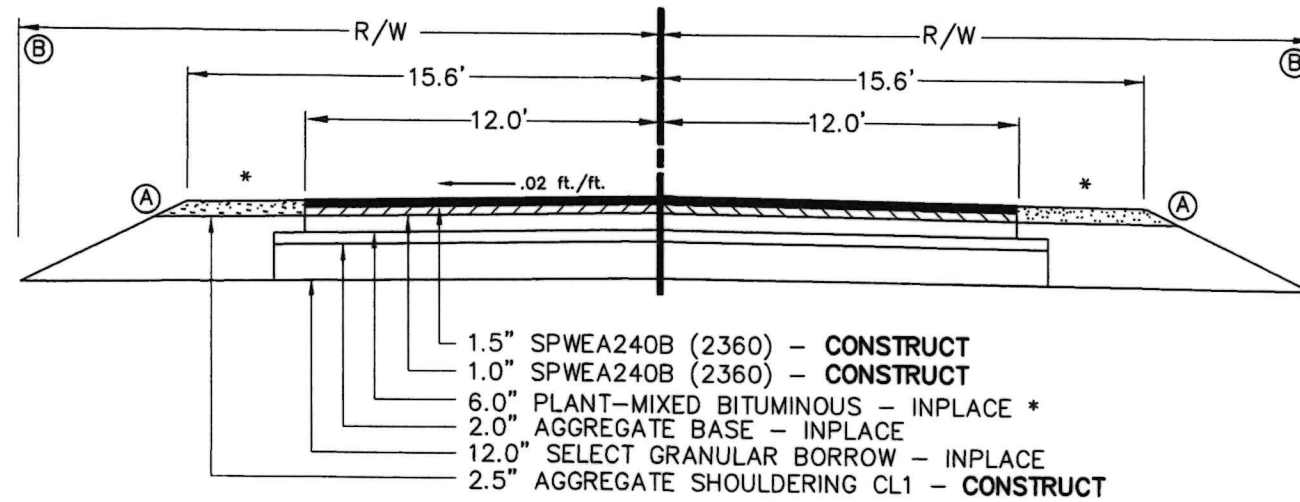
C.S.A.H. 6
POLK COUNTY, MN.

S.A.P. 060-606-030

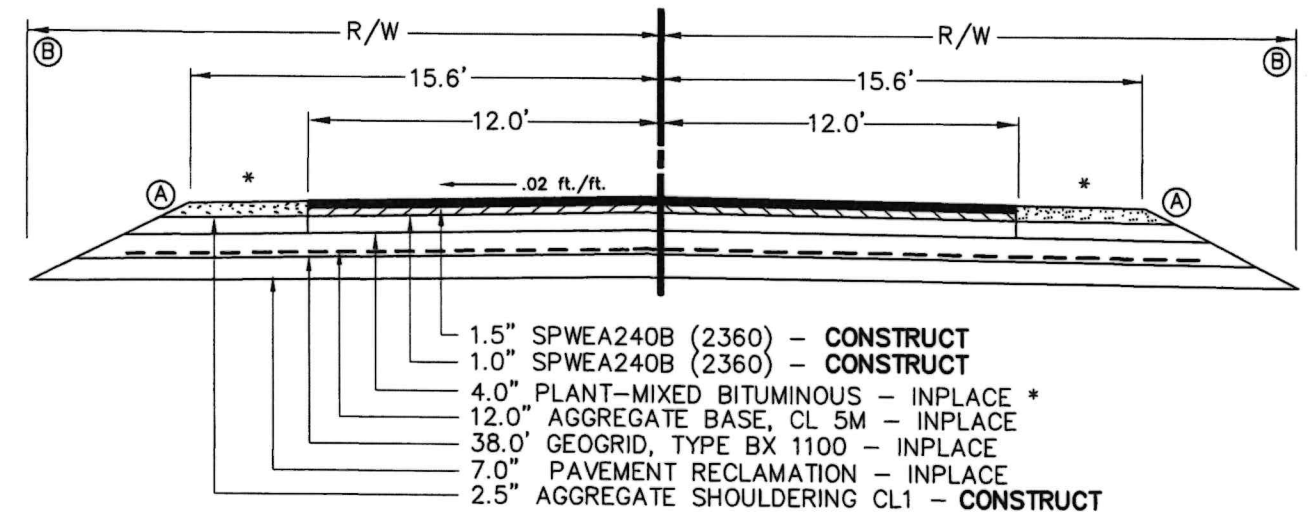
C.P. 125-06-1405

SHEET 2 OF 9 SHEETS

TYPICAL SURFACING SECTIONS

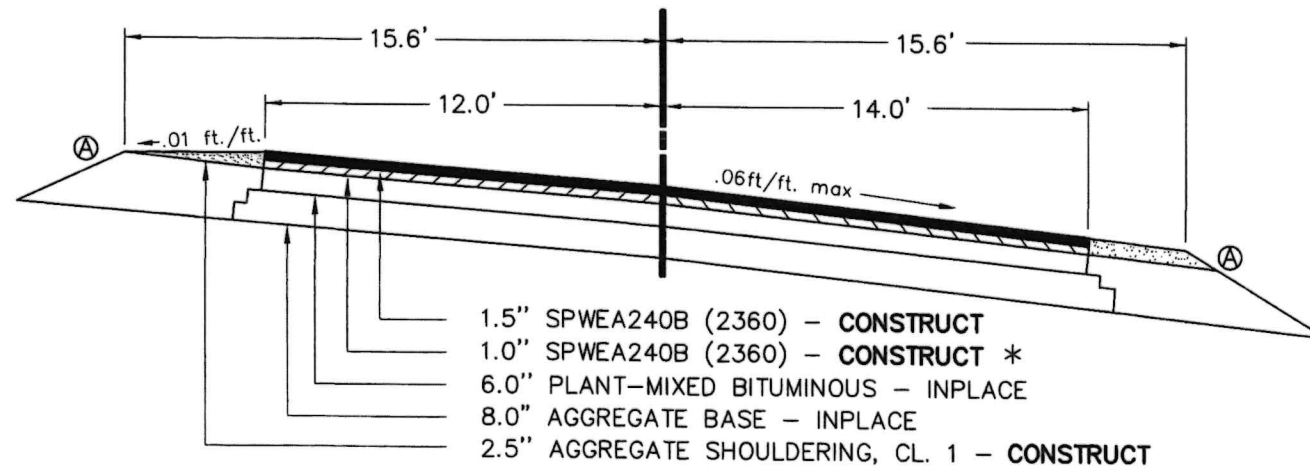


THE ABOVE SECTION APPLIES FROM STA. 420+00 TO STA. 528+00
 STA. 548+00 TO STA. 686+13
 * 5" PLANT-MIXED BITUMINOUS FROM STA. 686+13 TO STA. 765+26



THE ABOVE SECTION APPLIES FROM STA. 528+00 TO STA. 548+00

TYPICAL CURVE WIDENING SECTION



THE ABOVE SECTION APPLIES FROM STA. 187+02 TO STA. 196+80 *
 STA. 210+84 TO STA. 225+09 *
 STA. 236+77 TO STA. 242+72
 STA. 354+98 TO STA. 361+42
 STA. 368+85 TO STA. 375+71

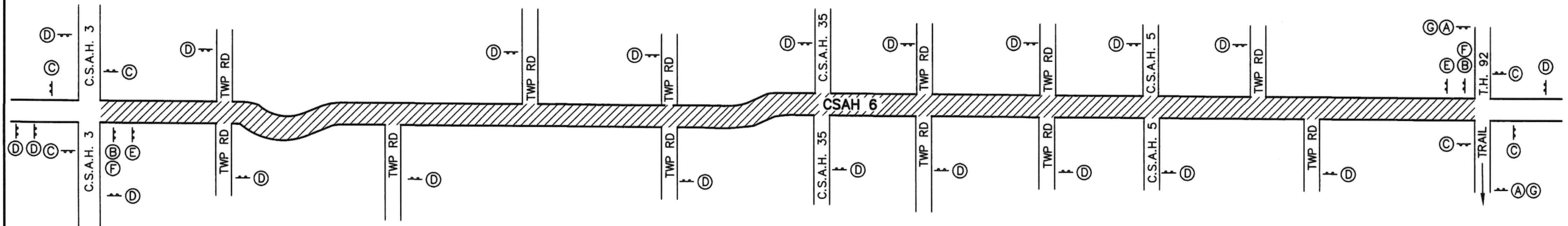
THE WIDENED INSIDE LANE SHALL BEGIN AT THE P.C. AND END AT THE P.T.

* 1.5"

(A) SLOPE THE NEW SHOULDER FROM THE SHOULDER P.I. TO BLEND INTO THE EXISTING SLOPE.
 ALL AGGREGATE MATERIAL SHALL BE COMPACTED COMPLETELY.


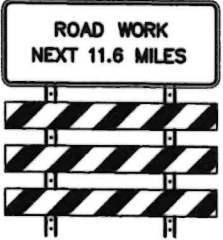
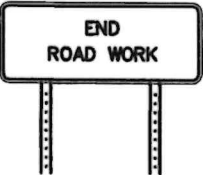




(B) RIGHT OF WAY DISTANCE VARIABLE THROUGHOUT PROJECT.

* SHOULDER CROSS-SLOPE = 0.02 FT/FT



1. CONSTRUCTION ZONE SIGNING SHALL ALSO BE THE RESPONSIBILITY OF THE CONTRACTOR WHICH WILL INCLUDE BUT NOT BE LIMITED TO FLAGMAN AHEAD, BUMP, SHOULDER WORK, AND LOW SHOULDER. THE NUMBER AND LOCATION WILL BE DETERMINED BY THE CONTRACTOR'S OPERATION.
2. ALL TRAFFIC CONTROL DEVICES SHALL CONFORM TO THE LATEST MMUTCD, INCLUDING THE LATEST "FIELD MANUAL FOR TEMPORARY TRAFFIC CONTROL ZONE LAYOUTS".
3. ALL STRUCTURES, SIGNS AND TRAFFIC CONTROL DEVICES SHALL BE CERTIFIED AS NCHRP 350 CRASH TESTED.

4. SIGN FACE MATERIAL FOR ALL SIGN PANELS SHALL BE HIGH PERFORMANCE SIGN SHEETING FOR RIGID PERMANENT SIGNS, DELINEATORS, AND MARKERS, FROM MNDOT OFFICE OF TRAFFIC SAFETY, SECURITY, AND OPERATIONS QUALIFIED PRODUCTS LIST. MUST MEET MINIMUM LEVELS FOR RETROREFLECTIVITY STATED IN TABLE 2A-3 OF MUTCD MANUAL.
5. IF CONSTRUCTION IS NOT STARTED WITHIN 10 WORKING DAYS AFTER THE INSTALLATION OF THE TRAFFIC CONTROL DEVICES, ALL SIGNS SHALL BE COVERED UNTIL WORK BEGINS. THE DEVICES SHALL BE REMOVED AS SOON AS THE WORK IS COMPLETED AND ARE NO LONGER NEEDED.
6. TRAFFIC CONTROL DEVICES 48" X 48" AND LARGER ON T.H. 92 REQUIRE FLASHERS.

INSTALLATION CODE	(A)	(B)	(C)	(D)	(E)	(F)	(G)
QUANTITY	11	2	6	27	2	2	2
MMUTCD REF.	W20-1	G20-1	G20-2A	W20-1	W20-X5	W13-1	M1-X4
SIZE	48" X 48"	60" X 36"	48" X 24"	36" X 36"	36" X 36"	24" X 24"	24" X 24"
SIGN							
NOTES	PLACE AT 1000' INTERVALS FROM INTERSECTION ON T.H.'S	PLACE ON TYPE III BARRICADE AT PROJECT TERMINI	PLACE 200' FROM INTERSECTION	PLACE 500' FROM TWP INTERSECTION 750' FROM C.S.A.H.'S	PLACE 200' FROM INSTALLATION CODE (B)	PLACE ONTO OR NEXT TO SIGN INSTALLATION CODE (B)	PLACE ONTO OR NEXT TO SIGN INSTALLATION CODE (A)

CERTIFIED BY: Richard Sanders #23169 4/12/2025
RICHARD C. SANDERS, P.E. DATE

C.S.A.H. 6
POLK COUNTY, MN

S.A.P. 060-606-030

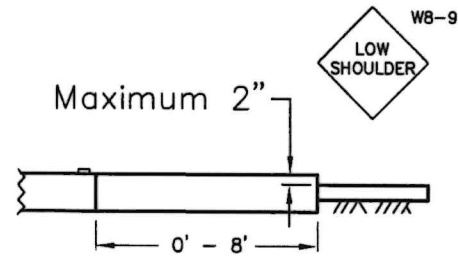
C.P. 125-06-1405

SHEET 4 OF 9 SHEETS

SHOULDER EDGE DROP-OFF

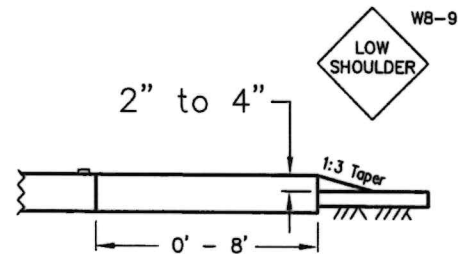
(SHOULDER - OPEN)

SHOULDER TO REMAIN OPEN
WITH APPROPRIATE WARNING SIGNS.



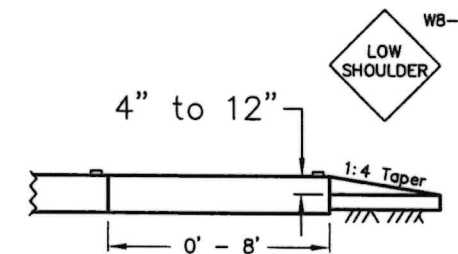
(SHOULDER - OPEN)

SHOULDER TO REMAIN OPEN
WITH APPROPRIATE WARNING SIGNS.



EDGE DROP-OFF WITH TAPER
(SHOULDER - OPEN)

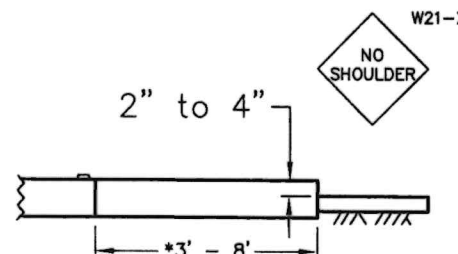
THIS CONDITION WILL NOT BE PERMITTED
UNLESS THE SLOPE IS COMPACTED
SO THAT A VEHICLE MAY SAFELY DRIVE
ONTO IT WITHOUT LOSING CONTROL AND
IN THE OPINION OF THE ENGINEER THERE
ARE NO OTHER HAZARDOUS CONDITIONS.



(SHOULDER - CLOSE)

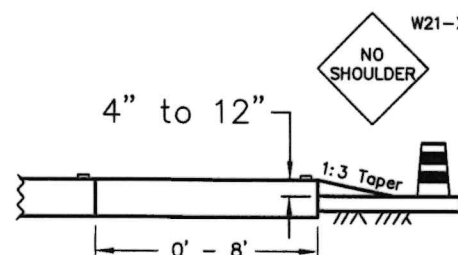
SHOULDER TO REMAIN CLOSED
WITH APPROPRIATE WARNING SIGNS.

* FOR DISTANCES LESS THAN 3 FEET,
TUBULAR MARKERS ARE REQUIRED AS
PER FIELD MANUAL.



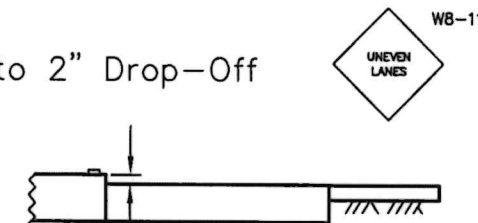
(SHOULDER - CLOSED)

SHOULDER SHALL BE CLOSED
WITH APPROPRIATE WARNING
SIGNS AND CHANNELIZING DEVICES
AS PER FIELD MANUAL.



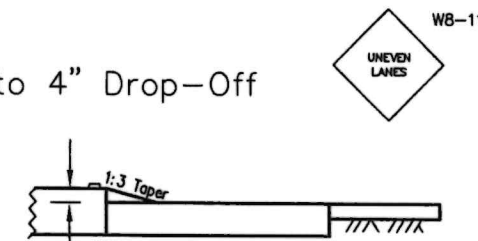
UNEVEN LANES

0.5" to 2" Drop-Off

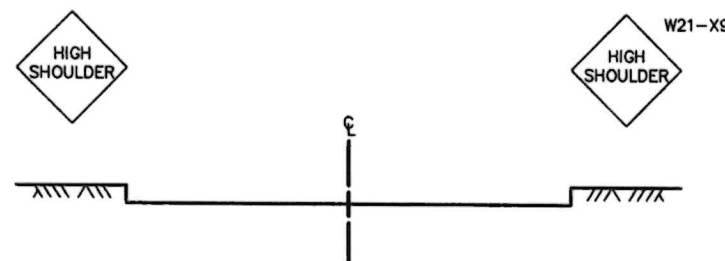


UNEVEN LANES - WITH TAPER

2" to 4" Drop-Off



MILLED EDGE



Note: Milled Edges greater than 2" require tapers and/or delineation
as detailed for Edge Drop-Offs in addition to the High Shoulder signs.

GUIDELINES

These guidelines are intended to increase traffic safety using traffic control devices, safety related appurtenances, and construction techniques for uneven lanes, milled edges, and edge drop-offs that occur in highway work zones. The best way to increase traffic safety is to make every attempt to minimize exposure to uneven lanes, milled edges, and drop-offs. Only when uneven lanes, milled edges, or drop-offs are deemed necessary, shall the appropriate portion(s) of these guidelines be applied to enhance traffic safety.

Tapered slopes shall be adequately compacted to provide a firm driving surface.

Appropriate uneven lane warning signs or shoulder warning signs shall be repeated after each intersection.

Maximum warning sign spacing shall be:

- a - 1 mile when the speed limit is greater than 30 mph and
- b - 1/4 mile when the speed limit is 30 mph or less.

1. Drop-offs of 4"- 12" adjacent to traffic carrying lanes are permitted without tapers or portable concrete barriers for:
 - a - projects within urban areas when the speed limit is 30 mph or less; or
 - b - short term (3 calendar days or less) concrete or utility repair, less than 50 feet in length when the speed limit is greater than 30 mph.
2. Weather permitting, all milling and paving operations shall be required to complete the full width of the section under construction at the end of each work period. At no time shall there be more than one uneven lane condition between the traffic carrying lanes which include auxiliary lanes, turn lanes, and ramp access or egress areas.
3. For any excavations or drop-offs in excess of 12" see the Minnesota latest Manual on Uniform Traffic Control Devices.

Traffic Control Treatment of
Longitudinal
Drop-offs in Work Zones

CERTIFIED BY: Richard Sanders #23169 4/12/2025
RICHARD C. SANDERS, P.E. DATE

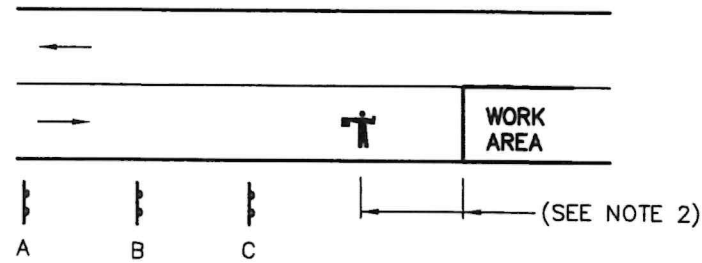
C.S.A.H. 6
POLK COUNTY, MN

S.A.P. 060-606-030




C.P. 125-06-1405

SHEET 5 OF 9 SHEETS

TYPICAL LAYOUT FOR PAVING AND SHOULDERING OPERATIONS



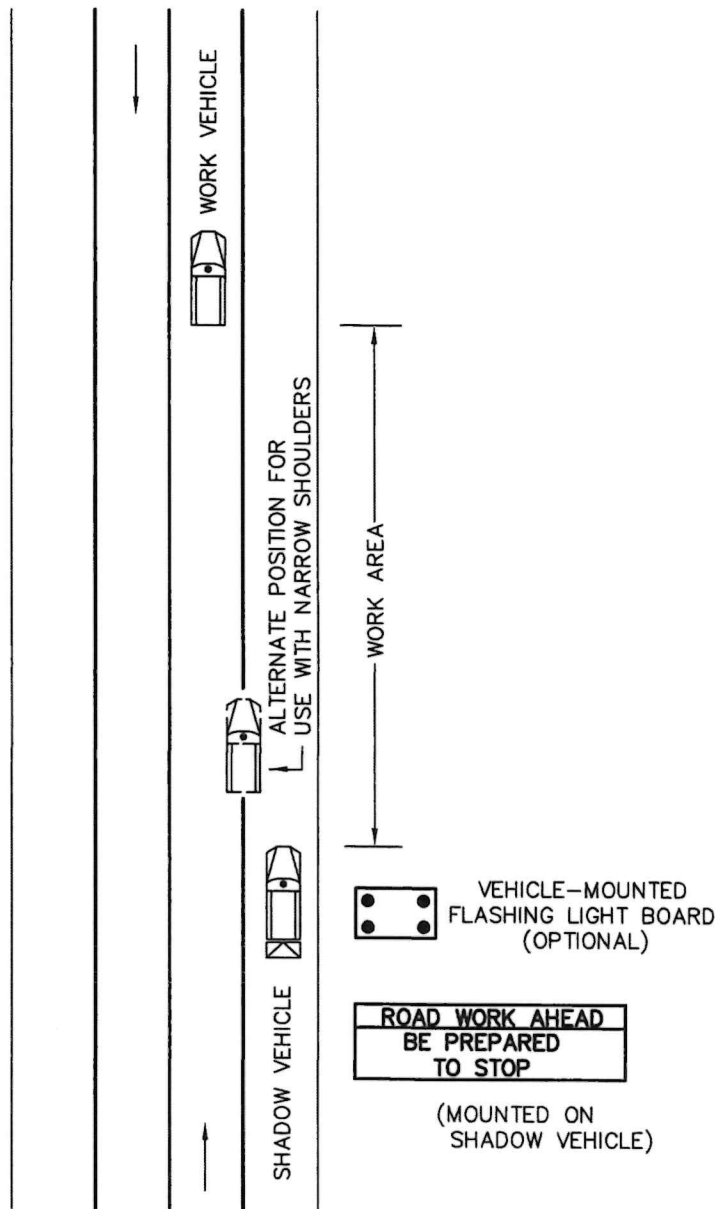
LAYOUT IS TYPICAL FOR THE OPPOSITE SIDE OF THE WORK AREA

INSTALL. CODE	MMUTCD REFERENCE	SIZE	SIGN	NOTES
A	W20-1	36"X36"		PLACE AT 750' INTERVALS
B	W20-4	36"X36"		PLACE AT 750' INTERVALS
C	W20-7	36"X36"		PLACE AT 750' INTERVALS

- NOTES:
- ALL SIGNS FURNISHED BY THE CONTRACTOR SHALL CONFORM TO SPECIFICATION 3352.2A.3
 - THE SIGNING LAYOUT AND THE FLAGMAN SHALL BE STATIONED AS CLOSE AS POSSIBLE BUT NO MORE THAN ONE MILE FROM THE WORK AREA.
 - SIGNS PLACED ON PORTABLE SUPPORTS ON THE SHOULDER SHALL BE A MINIMUM OF ONE FOOT ABOVE THE PAVEMENT.

LAYOUT A

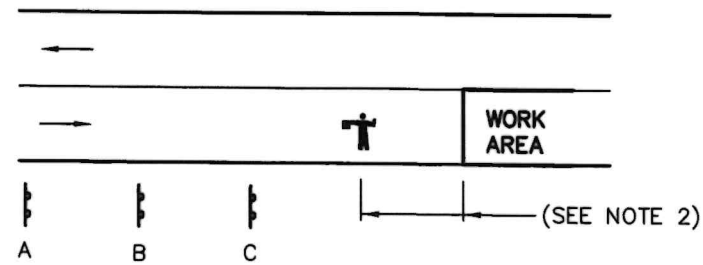
TYPICAL LAYOUT FOR SHOULDERING OPERATIONS
DAYLIGHT USE ONLY WITH GOOD VISIBILITY






- NOTES:
- ALL VEHICLES SHALL DISPLAY A 360 DEGREE FLASHING BEACON.
 - SIGNS SHALL HAVE BLACK LETTERS ON ORANGE BACKGROUND AND SHALL CONFORM TO SPECIFICATION 3352.2A.3.
 - IF THE APPROACH SITE DISTANCE IS RESTRICTED, A FLAGGER SHOULD BE USED TO PROTECT THE WORK AREA AND TO WARN THE DRIVER.
 - ADVANCED WARNING SIGNS SHOULD BE MOVED OR RESET AFTER EACH MAJOR ROAD INTERSECTION OR AFTER EACH MILE WICH EVER COMES FIRST.
 - A COMPACT WORK AREA SHALL BE MAINTAINED. WHEN THE WORK AREA EXTENDS BEYOND 500 FT IN LENGTH, OTHER TRAFFIC CONTROL LAYOUTS SHOULD BE CONSIDERED.

LAYOUT B

TYPICAL LAYOUT FOR PAVING AND SHOULDERING OPERATIONS



LAYOUT IS TYPICAL FOR THE OPPOSITE SIDE OF THE WORK AREA

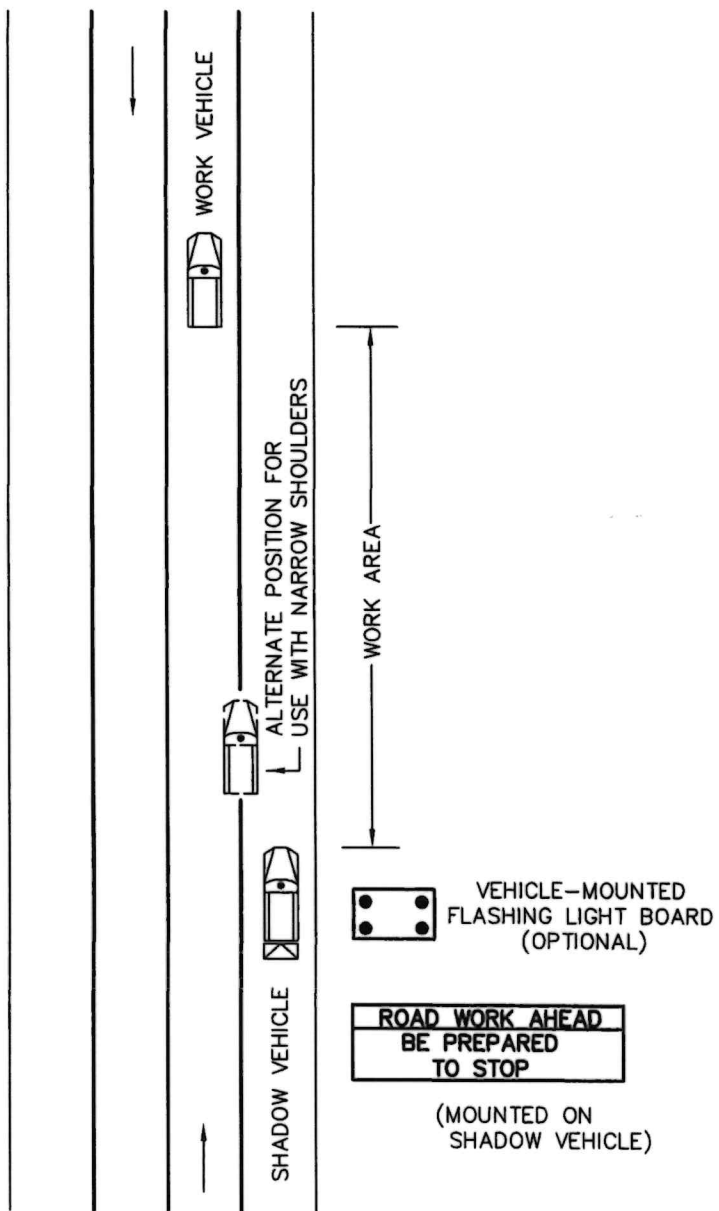
INSTALL. CODE	MMUTCD REFERENCE	SIZE	SIGN	NOTES
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LAYOUT A

TYPICAL LAYOUT FOR SHOULDERING OPERATIONS
DAYLIGHT USE ONLY WITH GOOD VISIBILITY



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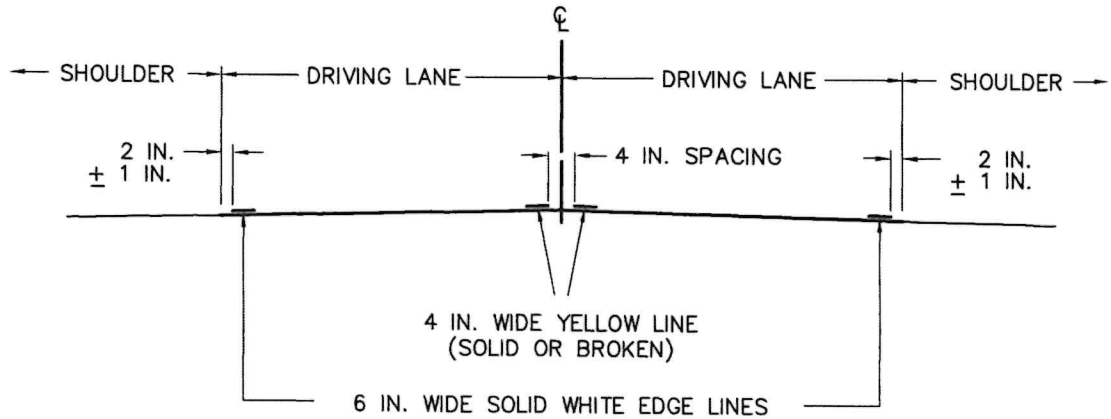
LAYOUT B

PAVEMENT MARKING

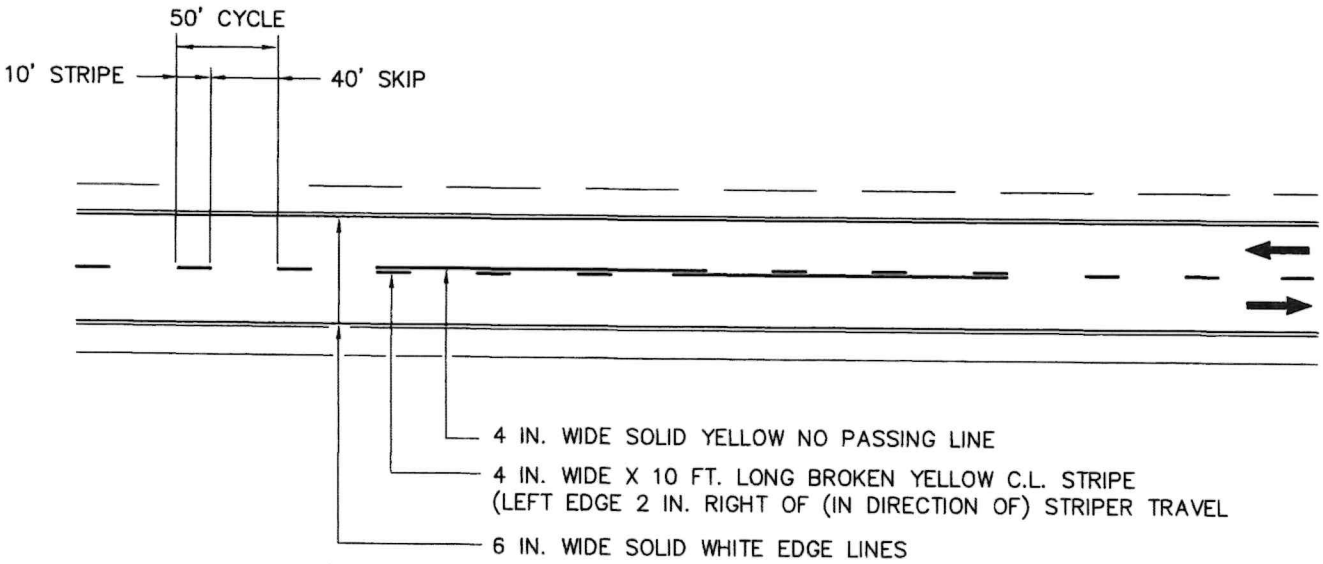
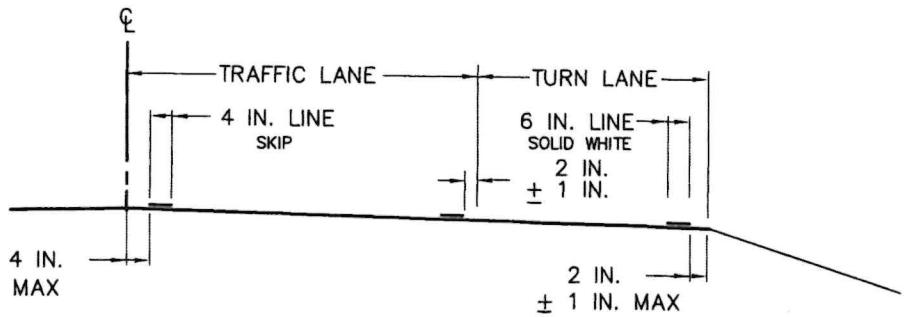
GENERAL REQUIREMENTS

THE ENGINEER'S INVOLVEMENT IN THE APPLICATION OF THE MATERIAL SHALL BE LIMITED TO FIELD SPOTTING, LOCATION, AND INSPECTION. THE ENGINEER WILL PLACE NECESSARY "SPOTTING" AT APPROPRIATE POINTS TO PROVIDE HORIZONTAL CONTROL FOR STRIPING AND TO DETERMINE NECESSARY STARTING AND CUTOFF POINTS. BROKEN LINE INTERVALS WILL NOT BE MARKED. LONGITUDINAL JOINTS, PAVEMENT EDGES, AND EXISTING MARKINGS SHALL SERVE AS HORIZONTAL CONTROL WHEN SO DIRECTED. EDGE LINES AND LANE LINES ARE TO BE BROKEN ONLY AT INTERSECTIONS WITH PUBLIC ROADS AND AT PRIVATE ENTRANCES IF THEY ARE CONTROLLED BY A YIELD SIGN, STOP SIGN, OR TRAFFIC SIGNAL. THE BREAK POINT IS TO BE AT THE START OF THE RADIUS FOR THE INTERSECTION OR AT MARKED STOP LINES OR CROSSWALKS.

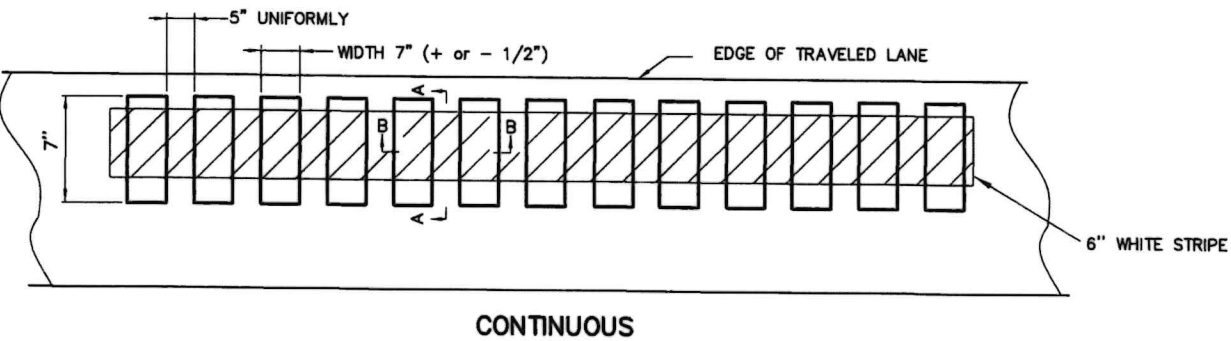
TWO-LANE TWO-WAY TRAFFIC MARKINGS



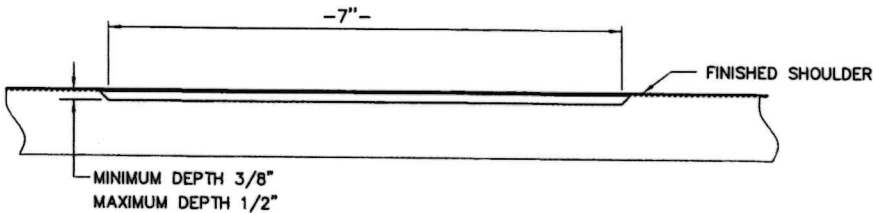
TYPICAL RIGHT TURN LANE



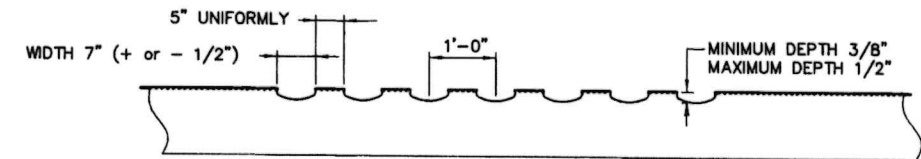
SHOULDER RUMBLE STRIP PLAN VIEW



SECTION A-A



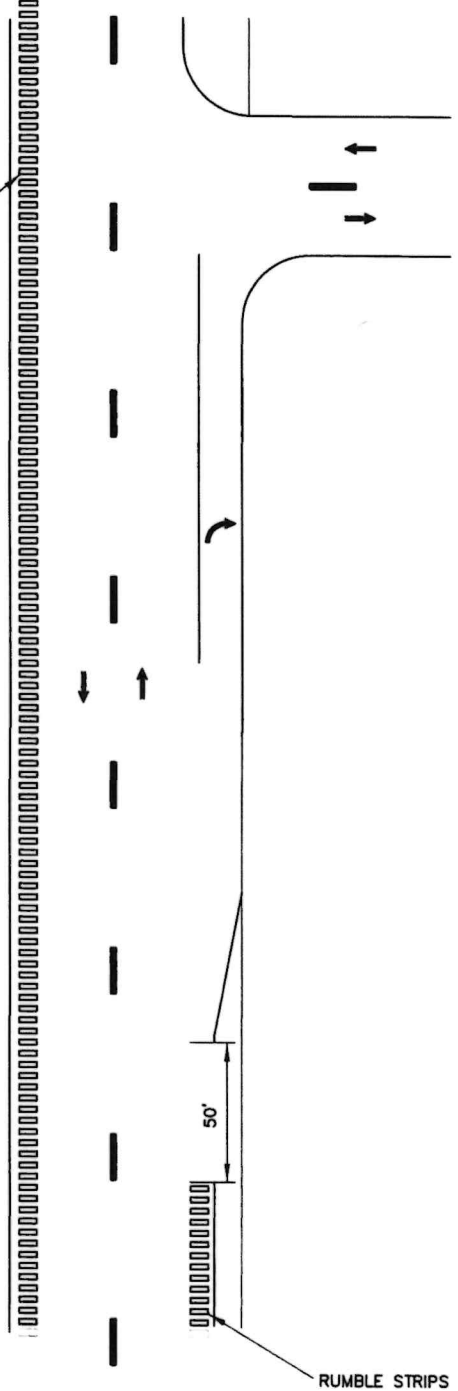
SECTION B-B



- (1) THE ITEM 2232.603, MILLED RUMBLE STRIP, SHALL BE PAID BY THE LIN. FT. OF RUMBLE STRIP INSTALLED AS SHOWN IN THE DETAILS.
- (2) MILLING SHALL BE THE ONLY ACCEPTABLE METHOD OF CONSTRUCTING THE RUMBLE STRIPS.

SHOULDER RUMBLE STRIP – APPROPRIATE BREAKS

RIGHT TURN LANE



ENTRANCE ROADS

