

614 TEMPORARY RAISED PAVEMENT MARKERS

THIS ITEM OF WORK SHALL CONSIST OF FURNISHING, INSTALLING, MAINTAINING, AND SUBSEQUENTLY REMOVING TEMPORARY RAISED PAVEMENT MARKERS (TRPM'S). THE TRPM'S SHALL BE YELLOW OR WHITE, AS DESCRIBED IN THE PLAN.

MATERIAL

ALL UNITS SHALL BE OF SUFFICIENT STRENGTH AND PROPERLY SHAPED SO AS NOT TO BE DISLODGED OR BROKEN, OR THE REFLECTOR DISLODGED OR BROKEN, OR THE REFLECTOR DISLODGED OR DAMAGED BY IMPACTS FROM VEHICLES TIRES, INCLUDING THOSE OF HIGH PRESSURE TRUCK TIRES LOADED TO 4500 POUNDS.

RETROREFLECTORS SHALL BE PROVIDED IN ONE OR TWO DIRECTIONS ON EACH UNIT AS REQUIRED BY THE USAGE AND SHALL RETURN WHITE OR YELLOW LIGHT AS IS APPROPRIATED FOR THE APPLICATION.

THE REFLECTOR SHALL HAVE AN EFFECTIVE AREA OF 0.35 SQUARE INCH FOR TYPE A OR 3.0 SQUARE INCH FOR TYPE B. ITS BRIGHTNESS OR SPECIFIC INTENSITY (WHEN TESTED AT 0.2 DEGREE ANGLE OF OBSERVATION AND THE FOLLOWING ANGLES OF INCIDENCE) SHALL MEET OR EXCEED THE FOLLOWING:

INCIDENCE ANGLE (DEGREES)	SPECIFIC INTENSITY	
	TYPE A	
	WHITE	YELLOW
0	1.0	0.6
20	0.4	0.24
45	-	-
	TYPE B	
	WHITE	YELLOW
	0	3.0
20	1.2	0.72
45	0.3	0.2

ANGLE OF INCIDENCE FORMED BY A RAY FROM LIGHT SOURCE TO THE MARKER AND THE NORMAL TO THE LEADING EDGE OF THE MARKER FACE (ALSO HORIZONTAL ENTRANCE ANGLE).

ANGLE OF OBSERVATION FORMED BY A RAY OF LIGHT SOURCE TO THE MARKER AND THE RETURNED RAY FROM THE MARKER TO THE MEASURING RECEPTOR.

SPECIFIC INTENSITY IS THE MEAN CANDLEPOWER OF THE REFLECTED LIGHT (AT GIVEN INCIDENCE AND DIVERGENCE ANGLES) FOR EACH FOOT-CANDLE AT THE REFLECTOR (ON A PLANE PERPENDICULAR TO THE INCIDENT LIGHT).

TYPE A UNITS ARE INTENDED TO PROVIDE HIGH VISIBILITY BOTH AT NIGHT AND DURING DAYLIGHT. THEIR DAY TIME VISIBILITY SHALL BE ASSURED BY SIZE, SHAPE AND COLOR AS FOLLOWS:

1) THE UNITS SHALL BE A HIGH VISIBILITY YELLOW OR WHITE COLOR WHICH WILL NOT DEGRADE SUBSTANTIALLY DUE TO TRAFFIC WEAR AND WHICH WILL MATCH THE COLOR OF THE REFLECTOR.

2) WHEN VIEWED FROM ABOVE, THE UNITS SHALL HAVE A VISIBLE AREA OF NOT LESS THAN 14 SQUARE INCHES.

3) WHEN VIEWED FROM THE FRONT, PARALLEL TO THE PAVEMENT, AS FROM APPROACHING TRAFFIC, THE UNIT HAVE A WIDTH OF APPROXIMATELY 4 INCHES AND A VISIBLE AREA OF NOT LESS THAN 1.5 SQUARE INCHES.

TYPE B UNITS ARE INTENDED TO PROVIDE HIGH VISIBILITY AT NIGHT BY RETROREFLECTING AUTOMOTIVE HEADLIGHT BACK TO THE DRIVER.

INSTALLATION: THEY SHALL BE ATTACHED TO CLEAN, DRY PAVEMENT BY A BUTYLADHESIVE PAD, A BITUMINOUS ADHESIVE OR OTHER CONSTRUCTION GRADE ADHESIVES (SUCH AS FRANKLIN PANEL AND METAL ADHESIVE) SUITABLE TO ANCHOR THE UNIT UNDER THE ABOVE CONDITIONS. WHEN IT IS NECESSARY TO ATTACH UNITS TO NEW CONCRETE WITH CURING COMPOUND REMAINING, THE CURING COMPOUND MEMBRANE SHALL BE REMOVED BY SANDBLASTING OR OTHER MECHANICAL CLEANING METHOD. THEY SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

THE CONTRACTOR SHALL IMMEDIATELY REPLACE, AT HIS COST, ANY UNITS WHICH FAIL (BROKEN HOUSING, HOUSING WORN TO THE EXTENT THAT DAYTIME VISIBILITY IS SIGNIFICANTLY DIMINISHED OR OF AN UNACCEPTABLE COLOR, DETACHED OR BROKEN REFLECTOR, HOUSING DETACHED FROM ADHESIVE).

TRPM'S ARE LIKELY TO BE REMOVED BY SNOW PLOWING OPERATIONS, THUS THEY ARE NOT CONSIDERED SUITABLE FOR USE DURING THE PERIOD FROM OCTOBER 15 UNTIL APRIL 30. THE CONTRACTOR IS ADVISED TO SCHEDULE HIS WORK AND/OR THE USE OF THESE DEVICES TO AVOID THIS PERIOD. SHOULD THE CONTRACTOR CHOOSE TO USE TRPM'S DURING THIS PERIOD AND THEY ARE SUBSEQUENTLY REMOVED OR DESTROYED BY SNOW AND ICE CONTROL ACTIVITIES, THE CONTRACTOR SHALL IMMEDIATELY, AT HIS COST, PROVIDE A SUBSTITUTE TRAFFIC GUIDANCE SYSTEM EFFECTIVE DURING LIGHT AND DARK AND WHICH IS ACCEPTABLE TO THE ENGINEER.

THE UNITS SHALL BE PLACED ACCURATELY TO DEPICT STRAIGHT OR UNIFORMLY CURVING LINES. WHEN USED TO SUPPLEMENT TEMPORARY PAVEMENT MARKINGS, THEY MAY BE PLACED ON OR IMMEDIATELY ADJACENT TO THE PAVEMENT MARKING. LOCATIONS SHALL BE ADJUSTED UP TO ONE FOOT LONGITUDINALLY OR SIX INCHES LATERALLY TO AVOID PLACEMENT ON JOINTS, CRACKED OR DETERIORATED PAVEMENT. THEY SHALL NOT BE PLACED DIRECTLY ON PAVEMENT MARKINGS IF THIS WILL DETRACT FROM THEIR ABILITY TO REMAIN ATTACHED TO THE PAVEMENT.

APPLICATION

1) WHEN REQUIRED TO SUPPLEMENT PAVEMENT MARKING, THEY SHALL BE PLACED AS FOLLOWS:

LINE	TYPE	SPACING
EDGE LINE	A OR B	20' C/C
LANE LINE	A OR B	40' C/C
CENTER LINE (SINGLE/BROKEN)	A OR B	40' C/C
CENTER LINE (DOUBLE/SOLID)	A OR B	2 UNITS SIDE BY SIDE 4 INCHES APART 20' C/C
CHANNELIZING LINE (INCLUDES EXIT GORE NOSE)	A OR B	10' C/C

2) WHEN USED TO SIMULATE (REPLACE) PAVEMENT MARKING THEY SHALL BE PLACED AS FOLLOWS:

LANE	TYPE	SPACING
EDGE LINE	A	5' C/C
LANE LINE	A	4@3.33' C/C 30' GAP (40' CYCLE)
CENTER LINE (DOUBLE/SOLID)	A	2 UNITS SIDE BY SIDE 5' C/C
CENTER LINE (SINGLE/BROKEN)	A	4@3.33' C/C 30' GAP (40' CYCLE)
CHANNELIZING LINE (INCLUDES EXIT GORE NOSE)	A	5' C/C
EDGE LINE (TWO COLOR) (WHITE/YELLOW)	A	BACK TO BACK 5' C/C

YELLOW TRPM'S USED TO SEPARATE OPPOSITE FLOWS OF TRAFFIC (CENTER LINES) SHALL INCLUDE REFLECTIONS FOR BOTH DIRECTIONS. ALL OTHER YELLOW TRPM'S AND WHITE TRPM'S SHALL PROVIDE RETROREFLECTIVITY FOR ONE DIRECTION.

REMOVAL

REMOVAL SHALL BE ACCOMPLISHED IN A MANNER THAT LITTLE OR NONE OF THE ADHESIVE REMAINS ON THE PAVEMENT AND PERMANENT PAVEMENT SURFACES SHALL NOT BE SCARRED, BROKEN OR ROUGHENED SIGNIFICANTLY.

PAYMENT

BASIS OF PAYMENT SHALL BE AT THE CONTRACT UNIT PRICE PER EACH TRPM AND SHALL INCLUDE ALL LABOR, EQUIPMENT, HARDWARE AND INCIDENTALS REQUIRED TO PERFORM THE WORK. IT SHALL ALSO INCLUDE REPLACEMENT AT NO ADDITIONAL COST OF ALL TRPM'S WHICH, IN THE JUDGEMENT OF THE ENGINEER, FAIL FOR ANY REASON, EXCEPT DUE TO THE FAILURE OF THE PAVEMENT TO WHICH THEY ARE ATTACHED.

ITEM	UNIT	DESCRIPTION
614	EACH	TEMPORARY RAISED PAVEMENT MARKERS

PHASE	STATIONING (FROM-TO) (DIRECTION OF TRAVEL*)	SPACING (FEET C/C)	TYPE A			TYPE B			REMARKS (LINE TYPE)	
			W	Y	Y/Y	W	Y	Y/Y		
I	36+30 TO 40+88 NB	20				24			EDGE LINE	
	38+00 TO 40+00 NB	20					10		CENTERLINE	
	38+00 TO 40+00 SB	20						10	CENTERLINE	
	40+00 TO 40+55 NB & SB	20						4	CENTERLINE	
	40+10 TO 40+55 NB	10				5			CHANNELIZING LINE	
	41+45 TO 43+25 NB & SB	20						10	CENTERLINE	
	41+45 TO 43+15 SB	10					18		CHANNELIZING LINE	
	41+15 TO 64+20 NB	20					116		EDGE LINE	
	41+45 TO 63+80 SB	20					112		EDGE LINE	
	43+25 TO 46+60 NB	20						15	CENTERLINE	
	43+25 TO 46+60 SB	20						15	CENTERLINE	
	46+60 TO 57+30 NB & SB	20						54	CENTERLINE	
	57+30 TO 63+30 NB	20						30	CENTERLINE	
	57+30 TO 63+30 SB	20						30	CENTERLINE	
	63+30 TO 63+80 NB & SB	20						3	CENTERLINE	
	63+40 TO 63+80 NB	10				5			CHANNELIZING LINE	
	64+50 TO 68+25 NB	20					19		EDGE LINE	
	64+80 TO 65+20 SB	10					5		CHANNELIZING LINE	
	64+80 TO 65+30 NB & SB	20						3	CENTERLINE	
	65+30 TO 68+25 NB	20						14	CENTERLINE	
	65+30 TO 68+25 SB	20						14	CENTERLINE	
	68+25 TO 69+25 NB & SB	20						6	CENTERLINE	
	68+35 TO 69+25 NB	10					10		CHANNELIZING LINE	
	68+25 TO 69+25 NB	40					3		LANE LINE	
	II	36+30 TO 40+00 NB	20					19		CENTERLINE
		36+30 TO 40+00 SB	20					19		CENTERLINE
		40+00 TO 40+55 NB & SB	20						3	CENTERLINE
		38+75 TO 40+75 NB	20					11		EDGE LINE
		40+10 TO 40+55 NB	10					5		CHANNELIZING LINE
		38+25 TO 40+85 SB	20					13		EDGE LINE
41+15 TO 63+75 SB		20					115		EDGE LINE	
41+20 TO 61+25 NB		20					101		EDGE LINE	
41+45 TO 43+00 NB & SB		20						9	CENTERLINE	
41+45 TO 42+90 SB		10					15		CHANNELIZING LINE	
43+00 TO 46+80 NB		20						18	CENTERLINE	
43+00 TO 46+80 SB		20						18	CENTERLINE	
46+80 TO 57+30 NB & SB		20						53	CENTERLINE	
57+30 TO 63+30 NB		20						29	CENTERLINE	
57+30 TO 63+30 SB		20						29	CENTERLINE	
63+30 TO 63+80 NB & SB		20						3	CENTERLINE	
62+50 TO 63+80 NB		40					4		LANE LINE	
62+50 TO 63+80 SB		40					4		LANE LINE	
63+40 TO 63+80 NB		10					5		CHANNELIZING LINE	
64+80 TO 68+25 SB		20					18		EDGE LINE	
64+80 TO 65+20 SB	10					5		CHANNELIZING LINE		
64+80 TO 65+30 NB & SB	20						3	CENTERLINE		
65+30 TO 66+30 NB	20						4	CENTERLINE		
65+30 TO 66+30 SB	20						4	CENTERLINE		
66+30 TO 69+25 NB & SB	20						15	CENTERLINE		
66+40 TO 69+25 NB	10					29		CHANNELIZING LINE		
64+80 TO 69+25 SB	40					12		LANE LINE		
64+80 TO 69+25 NB	40					12		LANE LINE		
SUB-TOTALS										
TOTALS								666	278	166
									1110	

* NB = NORTHBOUND
SB = SOUTHBOUND

STATE OF OHIO
DEPARTMENT OF TRANSPORTATION

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DESIGNED	DRAWN	CHECKED	DATE	REVISED
			5-12-87	