

65-3294

STANDARDS FOR
PAVEMENT MARKING
1949

MICHIGAN STATE HIGHWAY DEPARTMENT

Charles M. Ziegler

State Highway Commissioner

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PLANNING & TRAFFIC DIVISION

STANDARDS FOR PAVEMENT MARKING - 1949

INTRODUCTION

The orderly and safe movement of vehicular traffic on our highways depends to a large extent upon pavement markings. Unless state-wide uniformity is obtained, these markings tend to confuse, rather than expedite, traffic movement.

In an effort to obtain such uniformity, and in compliance with national standards, definite instructions for pavement marking have been established. These instructions are intended to be an aid to the field organizations in carrying out the painting season program.

GENERAL INSTRUCTIONS

In the preparation of the 1949 pavement marking program, it is intended that, except on a few high accident routes, black paint shall be used on concrete sections and white paint on bituminous sections. However, there may be routes which, due to patching operations, fall under one of the following categories. Such sections shall be marked as directed by the District Traffic Engineer.

- A. Any section of concrete whose surface continuity is interrupted by repeated patches of bituminous material shall be marked throughout as a bituminous section.

- B. Any section whose surface is predominantly bituminous, such as a short section of concrete bounded on both ends by bituminous surfaces or a short section of concrete bounded on one end by bituminous surface and the other by a city or village, shall be marked throughout as a bituminous section.
- C. Bituminous patch sections not exceeding 200 feet in length which are bounded on both ends by long sections of concrete shall be marked as a concrete surface. Should the patch section be on a horizontal curve or some location where it is necessary to maintain a prominent line, white paint may be used in place of black.
- D. Any section of concrete whose longitudinal construction joint is not well defined because of patching operations shall be marked as a bituminous surface.
- E. All center lines and lane lines shall be four inches in width.

Breaking At Intersections

Center lines, lane lines, and No Passing zone lines shall be broken only at trunkline, county road or city street intersections.

RURAL PAVEMENT MARKING

CONCRETE SECTIONS - UNREFLECTORIZED
AS INDICATED IN GREEN ON MAP "PAVEMENT MARKING PROGRAM FOR 1949"

Two Lane Sections

Center lines on all two lane concrete sections shall be marked with solid black paint.

Three Lane Sections

Lane lines on all three lane concrete sections shall be marked with solid black paint. No lane shall be less than 10 feet in width.

Four or More Lane Undivided Sections

All four or more lane undivided concrete sections shall be marked with a solid black center line and lane lines and two solid yellow reflectorized barrier lines. The barrier lines shall be placed one inch from and parallel to the center line. The center line and lane lines may be eliminated on those sections where, due to crack filling operations, the longitudinal construction joint is black and has the general appearance of a painted line. No lane shall be less than 10 feet in width.

Four or More Lane Divided Sections

All four or more lane divided concrete sections shall be marked with solid black lane lines. Those sections need not be marked where, due to crack filling operations, the longitudinal construction joint is black and has the general appearance of a painted line. No lane shall be less than 10 feet in width.

CONCRETE SECTIONS - REFLECTORIZED
AS INDICATED IN RED ON MAP "PAVEMENT MARKING PROGRAM FOR 1949"

Two Lane Sections

Center lines shall be marked with alternating 20 foot reflectorized white and 30 foot black paint on all two lane concrete sections. The center line shall be placed at one side of the longitudinal construction joint. The line shall be placed as near as possible to the joint; the maximum allowable variation will be two inches. On those trunklines whose general direction is east and west, the center line shall be offset to the north side of the construction joint. On those trunklines whose general direction is north and south, the center line shall be offset to the east side of the joint.

Three Lane Sections

Lane lines shall be marked with alternating 20 foot reflectorized white and 30 foot black paint on all three lane concrete sections. Both lane lines shall be placed on the inside of the longitudinal construction joints. The line shall be placed as near as possible to the joint; the maximum allowable variation will be two inches.

Four or More Lane Undivided Sections

All four or more lane undivided concrete sections shall be marked with a solid black center line, two solid yellow reflectorized barrier lines placed one inch from and parallel to the center line, and lane lines shall be marked with alternating 20 foot reflectorized white and 30 foot black paint. The lane lines shall be placed on the inside of the longitudinal construction joint. The line shall be placed as near as possible to the joint; the maximum allowable variation will be two inches. The center line may be eliminated on those sections where, due to crack filling operations, the longitudinal center joint is black and has the general appearance of a painted line.

Four or More Lane Divided Sections

Lane lines shall be marked with alternating 20 foot reflectorized white and 30 foot black paint on all four or more lane divided concrete sections. The lane lines shall be placed on the inside of the longitudinal construction joint. The line shall be placed as near as possible to the joint; the maximum allowable variation will be two inches.

PRIMARY RURAL BITUMINOUS SECTIONS
AS INDICATED IN RED ON MAP "PAVEMENT MARKING PROGRAM FOR 1949"

Two Lane Sections

Center lines shall be marked with alternating 20 foot reflectorized

white paint and 30 foot skip on all two lane primary bituminous sections. The center line shall be eliminated throughout overlapping No Passing zones.

Three Lane Sections

Lane lines shall be marked with alternating 20 foot reflectorized white paint and 30 foot skip on all three lane primary bituminous sections. No lane shall be less than 10 feet in width.

Four or More Lane Undivided Sections

All four or more lane primary bituminous sections shall be marked with two parallel solid yellow reflectorized barrier lines placed six inches apart and placed equal distance from the center of the paved surface of the roadway. The lane lines shall be marked with alternating 20 foot reflectorized white paint and 30 foot skip. No lane shall be less than 10 feet in width.

Four or More Lane Divided Sections

Lane lines shall be marked with alternating 20 foot reflectorized white paint and 30 foot skip on all four or more lane divided bituminous sections. No lane shall be less than 10 feet in width.

SECONDARY RURAL BITUMINOUS SECTIONS AS INDICATED IN BLUE ON MAP "PAVEMENT MARKING FOR 1949"

Two Lane Sections

Center lines shall be marked with alternating 20 foot reflectorized white paint and 40 foot skip on all two lane secondary bituminous sections. The center line shall be eliminated throughout overlapping No Passing zones.

Three Lane Sections

Lane lines shall be marked with alternating 20 foot reflectorized

white paint and 40 foot skip on all three lane secondary bituminous sections. No lane shall be less than 10 feet in width.

SPECIAL RURAL PAVEMENT MARKINGS

Approaches to Medial Dividers

Approaches to a medial divider or a center pier at grade separations on four or more lane undivided highways shall be marked as indicated on print file No. T2-B8-67, attached, except those within an intersection. Special plans may sometimes be submitted for marking these locations which will supersede standard markings.

Channelization

Special channelization markings shall be in accordance with 1948 markings or as specified by plans for each location. All paint shall be reflectorized and of the color specified on the plans.

Stop Bars

Stop bars are solid reflectorized white lines placed transversely to the center line of the roadway, extending across those lanes upon which traffic is stopped. They shall be 12 inches in width in urban areas and 18 inches in width in rural areas.

Stop bars may be used only as a supplement to other existing controls such as stop signs or traffic signals. If used at intersections where crosswalks exist they shall be placed four feet in advance of the nearest edge of the crosswalk. If used at intersections where crosswalks do not exist, their location shall be established by the District Traffic Engineer.

Crosswalk Lines

Crosswalk markings are white, non-reflectorized solid lines which indicate to both foot and vehicle traffic where pedestrians should cross

the pavement. Each of the two lines shall be four inches in width and shall extend parallel across the roadway or transversely to its center line. Where sidewalks exist, the lines shall extend from the outer edges of the paved walks. Where sidewalks do not exist, location of crosswalk lines shall be determined by the District Traffic Engineer.

School Markings

School markings are used as a supplement to standard school signs to advise traffic of the condition that exists. They may be used, as directed by the District Traffic Engineer, only at those locations where children are controlled by a school patrol or an officer.

The markings shall be installed prior to the beginning of the fall term and must conform to print file No. T1-B4-142, attached.

Approaches to Railroad Crossings

Approaches to railroad crossings are marked as an auxiliary to the standard R.R. sign. They shall be used at all main line rural crossings where flashers or gates do not exist.

The markings shall conform to print file No. T2-B8-68, attached.

Other Markings

All special pavement markings not included in the standards established herein shall be in accordance with plans prepared by the Planning and Traffic Division.

NO PASSING ZONES

Two or Three Lane Pavement

No Passing zones are solid yellow reflectorized lines, four inches in width, placed parallel to and one inch from the center line or lane line.

When placed on the driver's side of the center line or lane line, it becomes a barrier line advising the vehicle operator that passing is unlawful.

From studies made in various parts of the state we have determined that the average speed on our highways is approximately 50 miles per hour. However, it is generally found that when road widths, roadside development, or general topography change to any material extent, speeds also change.

Such locations shall be studied and the appropriate sight distance used from the following table which supersedes general instructions on prints file No. T2-B8-76 and No. T2-B8-77, attached.

Average Speed (M.P.H.)	Sight Distance for Warrant of No Passing Zones
50	1000 feet
45	900 "
40	800 "
35	700 "
30	600 "
25	500 "

URBAN PAVEMENT MARKING

Two Lane Surface With Parallel Parking

All areas where parking parallel to the roadway is evident and the pavement surface is narrower than two free moving lanes in each direction, or when the pavement is less than 40 feet in width between parked cars, shall be marked with a solid white reflectorized center line only. The solid center line shall begin where it is evident that urban conditions exist and shall be indicated on the pavement by the letter "S".

Two Lane Surface With Parallel Parking on One Side

All areas where parallel parking on one side is evident and all

parking on the other side is prohibited shall be marked with a solid white reflectorized line. The line shall be placed in the center of that area between parked cars and the opposite curb.

Three Lane Surfaces

All three lane surfaces in urban areas shall be in accordance with plans prepared by the Planning and Traffic Division.

Urban Areas With Angle Parking

Any area where angle parking still exists, contrary to the state law, and the width between parked cars is less than 40 feet may be marked, subject to approval of the District Traffic Engineer, with alternating 20 foot reflectorized white paint and 30 foot black paint center line on concrete, or 20 foot - 30 foot skip center line on bituminous surfaces.

Any area where angle parking is evident and the width between parked cars is 40 feet or more may be marked with a solid white reflectorized center line only.

Any area where angle parking on one side of the street and parallel parking on the other side is evident shall be marked according to plans prepared by the Planning and Traffic Division.

Four or More Lane Surface With Parallel Parking

All areas where parking along the roadway is evident and where the area between parked cars is greater than 60 feet shall be marked as follows:

- A. Two solid yellow reflectorized barrier lines placed six inches apart and equal distance from the center of the road between parked cars.
- B. The lane lines shall be alternating 20 foot reflectorized white paint and 30 foot black paint on concrete surfaces or 20 foot - 30 foot skip on bituminous surfaces.

C. The inside lanes shall be 10 feet in width through those areas where the pavement width between parked cars is greater than 60 feet but less than 80 feet.

Parking Stalls

Parking stalls, where necessary, shall be marked with white paint. The work shall be done by the municipality and all costs be borne by them.

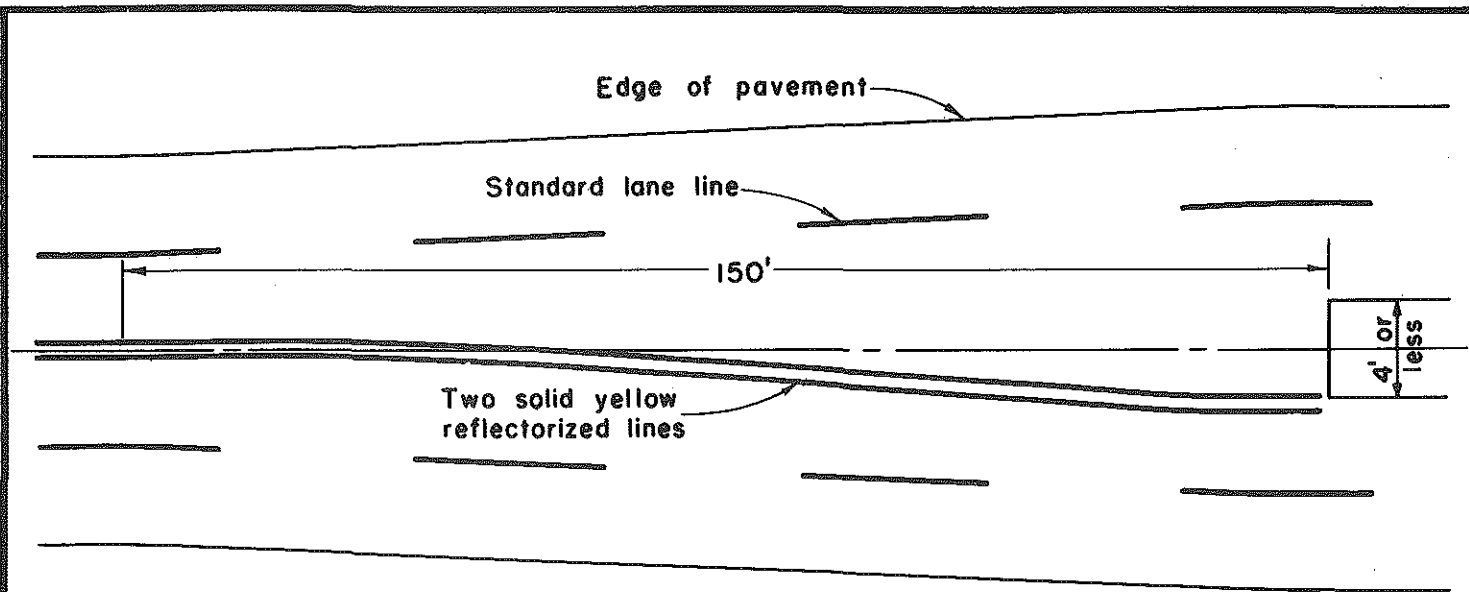


FIGURE 1

Approach to center pier at grade separations on four or more lane pavements where medial divider is less than four feet in width.

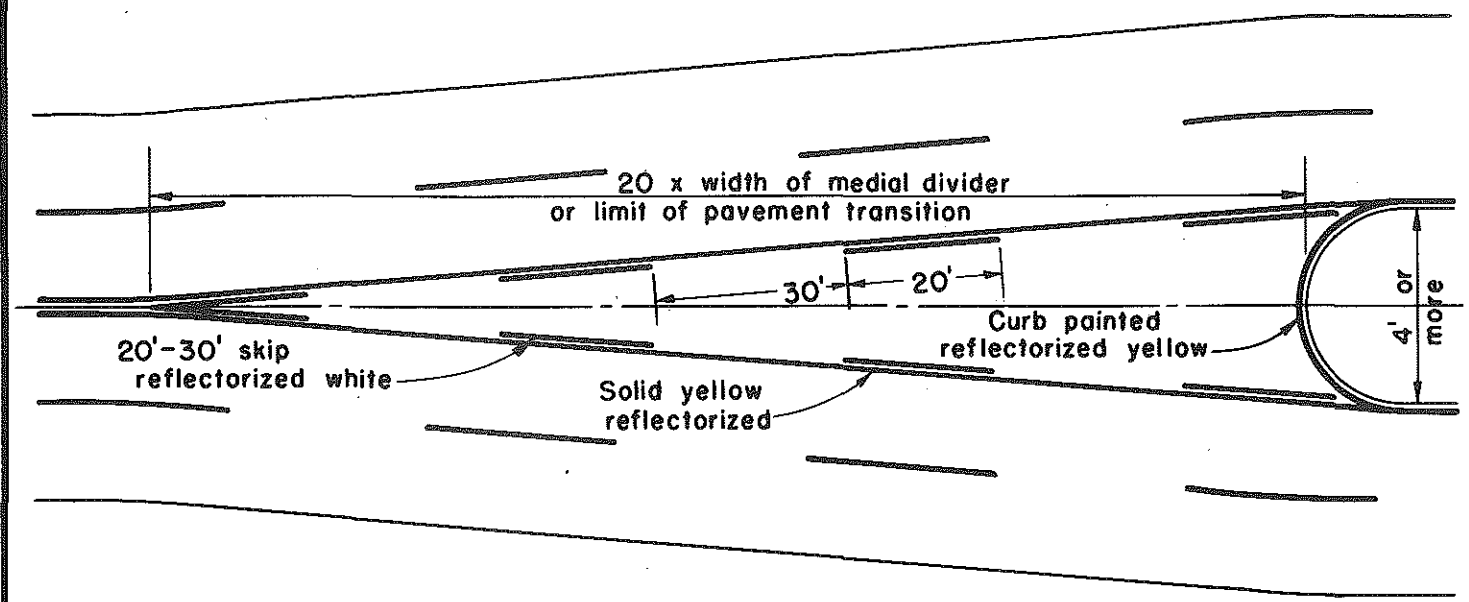
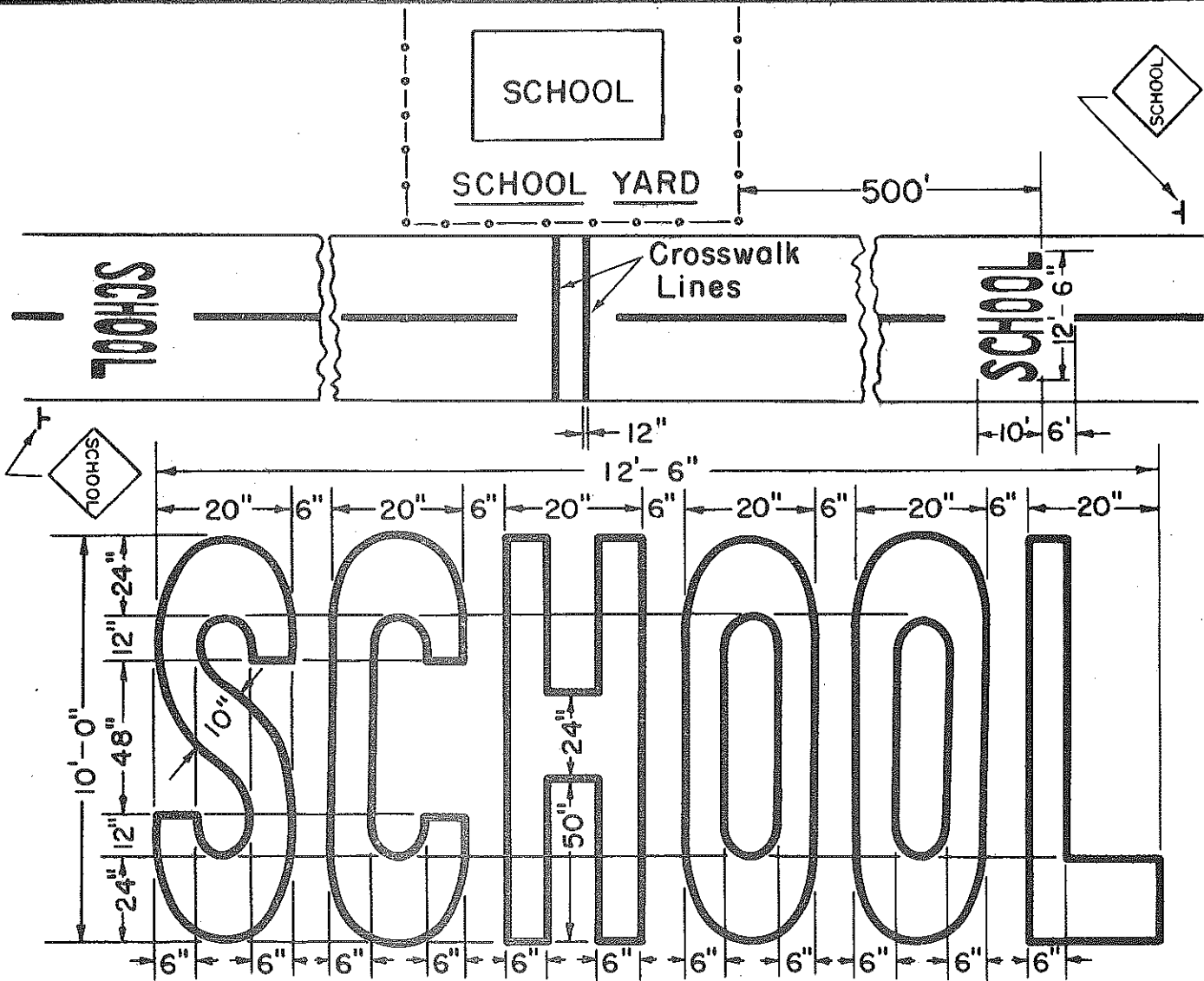


FIGURE 2

Approach to medial divider on four or more lane pavements where the medial divider is greater than four feet in width.

MICHIGAN STATE HIGHWAY DEPARTMENT CHARLES M. ZIEGLER STATE HIGHWAY COMMISSIONER	
PLANNING & TRAFFIC DIVISION	
PAVEMENT MARKING FOR APPROACH TO MEDIAL DIVIDER	
AUTH. NO. REVISIONS	DRAWN BY <i>L.R.S.</i> DATE 5-9-49 SCALE
SHEET NO. 1 OF 1	FILE NO. T2-B8-67



SCHOOL ZONE MARKINGS

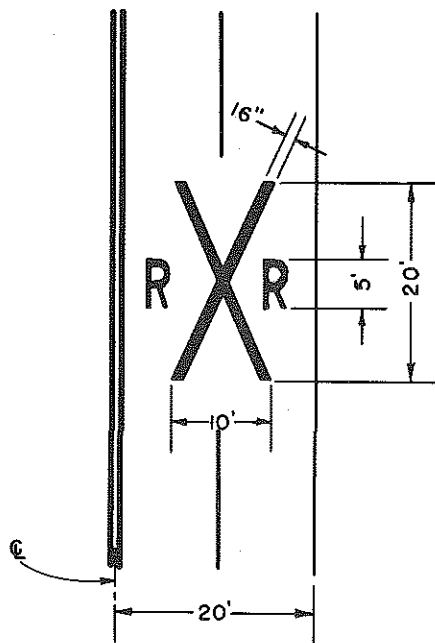
It is often necessary to mark pavements as advance warning for School Crossings. When such markings are used the word "SCHOOL" shall be used only as a supplement to the standard "School" sign and shall be used to define the School Zone where the school or school grounds are adjacent to the state highway.

All markings shall be white paint. (Non-reflectorized)

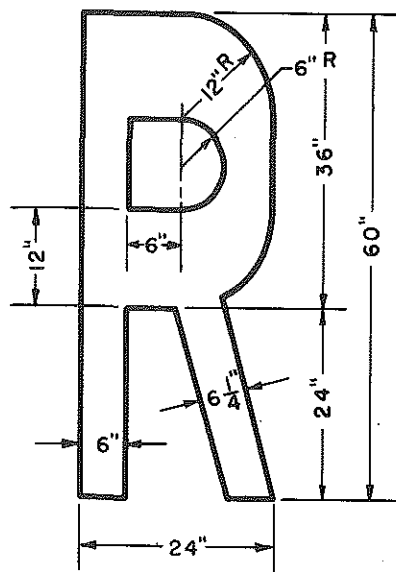
On two lane pavements, the markings shall be as per print.
 On three lane pavements, the word "SCHOOL" shall be confined to the right fifteen feet of the roadway.

On four lane pavements, the word "SCHOOL" shall be confined to the right of the center line.

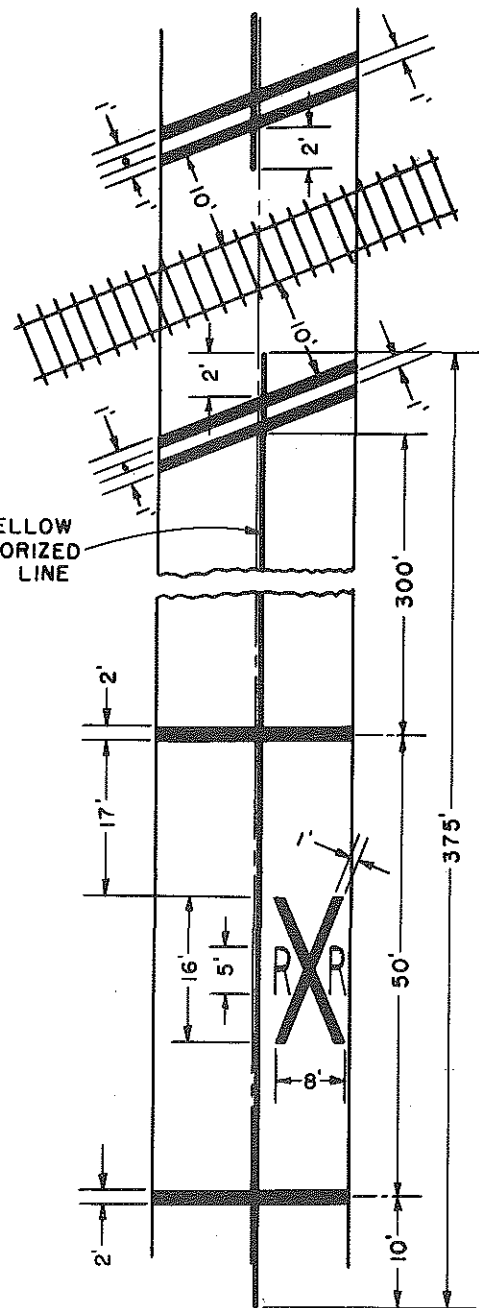
MICHIGAN STATE HIGHWAY DEPARTMENT CHARLES M. ZIEGLER STATE HIGHWAY COMMISSIONER	
PLANNING & TRAFFIC DIVISION	
"SCHOOL" FOR PAVEMENT MARKING	
AUTH NO REVISIONS	DRAWN BY E.M. DATE Nov. 1946 SCALE
SHEET NO. OF	FILE NO. TI-B4-142



4 LANE PAVEMENT



DETAIL OF LETTER "R"



2 AND 3 LANE PAVEMENT

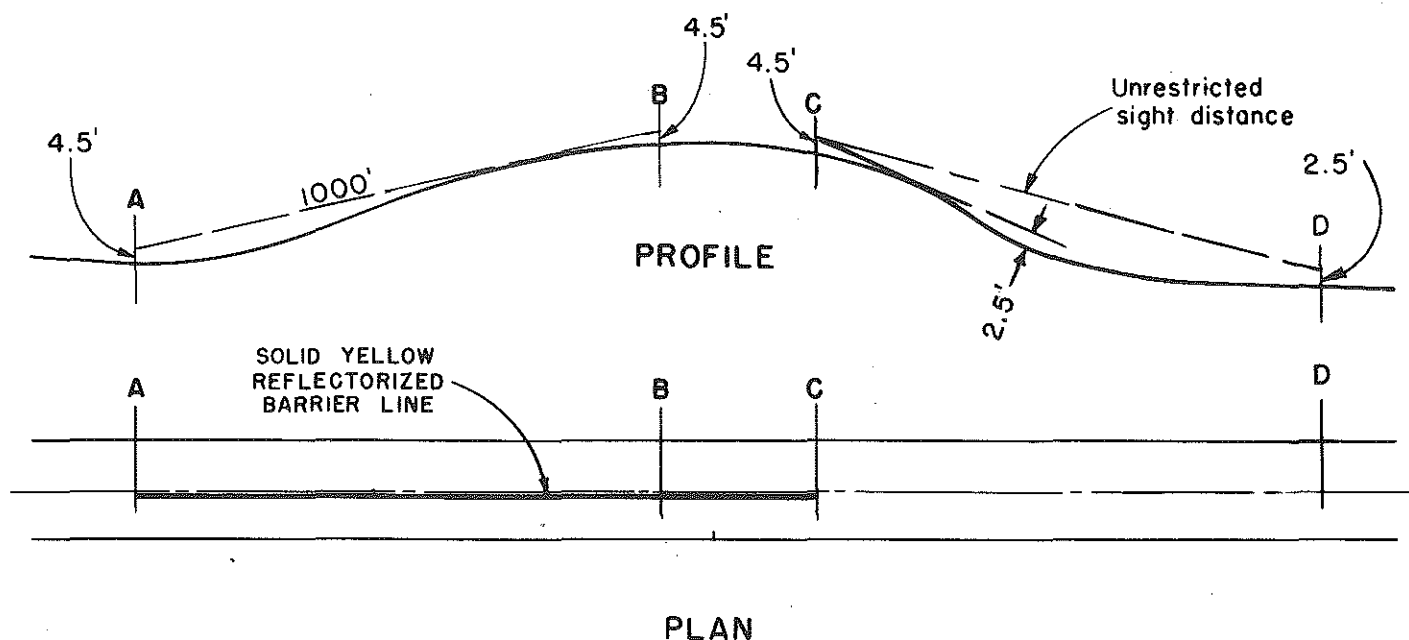
APPROACHES TO RAILROAD CROSSINGS

Approaches to non-signalized main railroad crossings should be marked as per print and may be used as a supplement to the standard railroad signs.

All markings except the BARRIER LINE shall be reflectorized white paint.

All approaches to railroad crossings in rural areas on 2 and 3 lane pavements should have a "BARRIER LINE" as indicated on print.

MICHIGAN STATE HIGHWAY DEPARTMENT CHARLES M. ZIEGLER STATE HIGHWAY COMMISSIONER	
PLANNING & TRAFFIC DIVISION	
PAVEMENT MARKING FOR APPROACH TO RAILROAD CROSSING	
AUTH. NO. REVISIONS	DRAWN BY L. P. S. DATE 5-10-49 SCALE
SHEET NO. OF	FILE NO. T2-B8-68



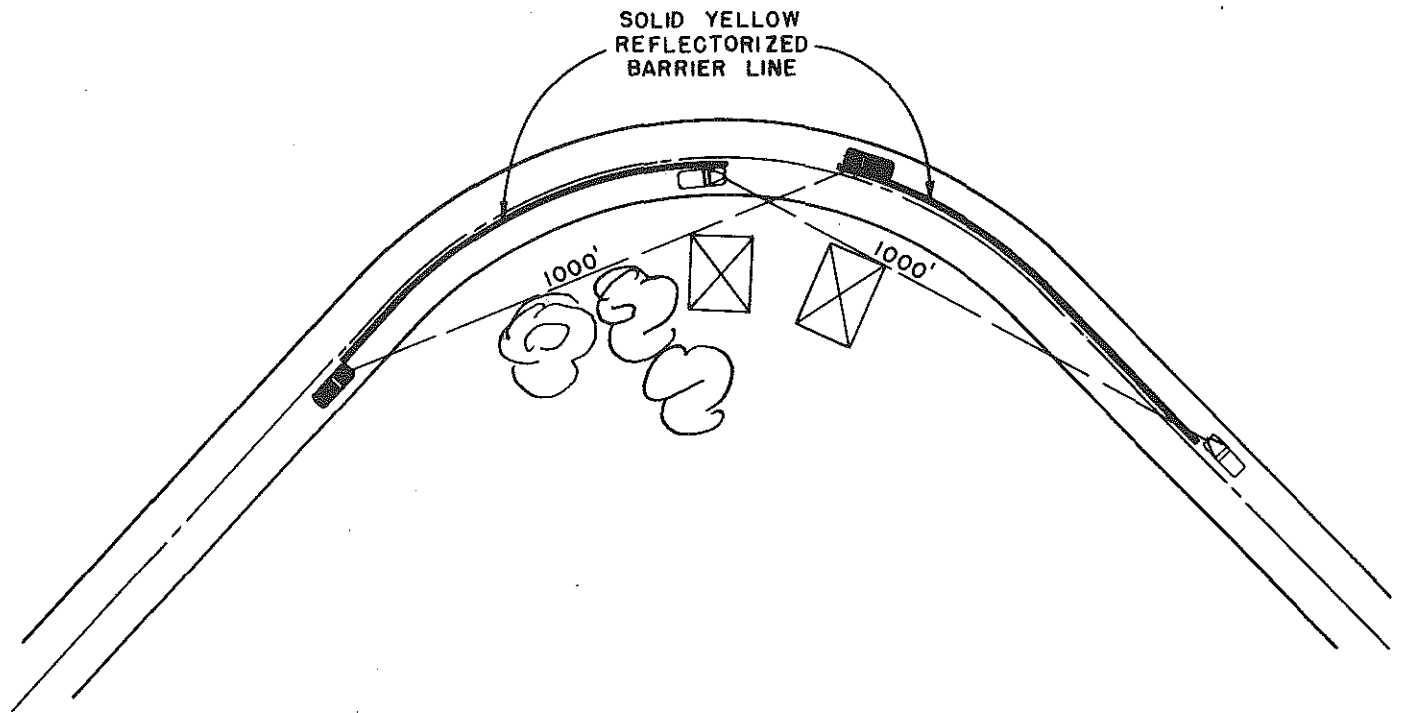
The sight distance on a vertical curve is that distance at which a vehicle driver can see an object at a given height above the road surface.

No-passing zones are warranted on two and three lane pavements if the sight distance becomes less than 1000 feet from points 4.5 feet above the road surface. The zones, if warranted, shall begin at that point on the roadway where the sight distance becomes less than 1000 feet and shall extend toward and in some cases over the crest of the hill to a point on the roadway where the vehicle driver can see the headlights on an approaching vehicle at any point within 1000 feet. For this purpose headlights are presumed to be 2.5 feet above the road surface.

The zones of multiple restricted areas shall be connected if the distance between the ending of one zone and the beginning of the next is less than 400 feet.

That zone which is less than 200 feet in length shall be eliminated. That zone which is more than 200 feet in length shall be increased to 400 feet.

MICHIGAN STATE HIGHWAY DEPARTMENT CHARLES M. ZIEGLER STATE HIGHWAY COMMISSIONER	
PLANNING & TRAFFIC DIVISION	
NO PASSING ZONES ON VERTICAL CURVES	
AUTH. NO. REVISIONS	DRAWN BY <i>L. R. S.</i> DATE 5-11-49 SCALE
SHEET NO. 1 OF 1	FILE NO. T2-B8-76



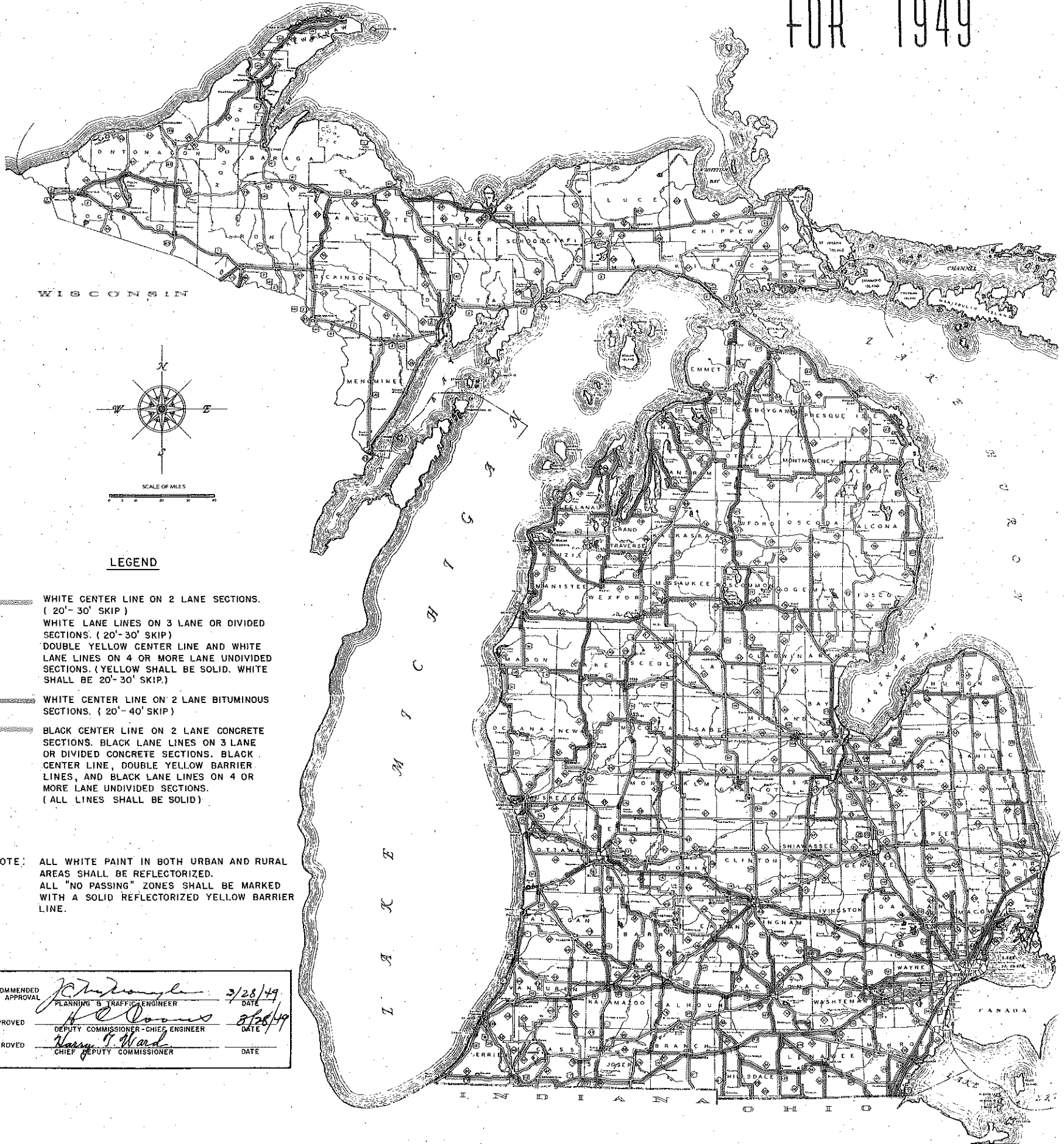
A limited sight distance on a horizontal curve is considered herein as being one which is caused by an obstruction at the side of the roadway and on the inside of the curve.

No-passing zones at horizontal curves on two and three lane pavements are warranted if the sight distance becomes less than 1000 feet.

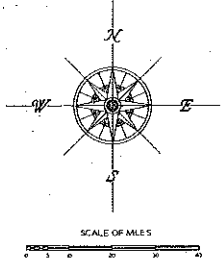
The NO-PASSING ZONE, if warranted, shall begin at that point on the roadway where the sight distance becomes less than 1000 feet and shall extend around the curve to that point on the roadway where the sight distance again becomes unrestricted for a distance greater than 1000 feet.

MICHIGAN STATE HIGHWAY DEPARTMENT CHARLES M. ZIEGLER STATE HIGHWAY COMMISSIONER	
PLANNING & TRAFFIC DIVISION	
NO-PASSING ZONE MARKING ON HORIZONTAL CURVES	
AUTH. NO. REVISIONS	DRAWN BY <i>L. R. S.</i> DATE 5-11-49 SCALE
SHEET NO. 1 OF 1	FILE NO. T2-B8-77

TRUNKLINE PAVEMENT PAINTING PROGRAM FOR 1949



WISCONSIN



LEGEND

- WHITE CENTER LINE ON 2 LANE SECTIONS. (20'-30' SKIP)
 WHITE LANE LINES ON 3 LANE OR DIVIDED SECTIONS. (20'-30' SKIP)
 DOUBLE YELLOW CENTER LINE AND WHITE LANE LINES ON 4 OR MORE LANE UNDIVIDED SECTIONS. (YELLOW SHALL BE SOLID. WHITE SHALL BE 20'-30' SKIP.)
- WHITE CENTER LINE ON 2 LANE BITUMINOUS SECTIONS. (20'-40' SKIP)
- BLACK CENTER LINE ON 2 LANE CONCRETE SECTIONS. BLACK LANE LINES ON 3 LANE OR DIVIDED CONCRETE SECTIONS. BLACK CENTER LINE, DOUBLE YELLOW BARRIER LINES, AND BLACK LANE LINES ON 4 OR MORE LANE UNDIVIDED SECTIONS. (ALL LINES SHALL BE SOLID)

NOTE: ALL WHITE PAINT IN BOTH URBAN AND RURAL AREAS SHALL BE REFLECTORIZED.
ALL "NO PASSING" ZONES SHALL BE MARKED WITH A SOLID REFLECTORIZED YELLOW BARRIER LINE.

RECOMMENDED FOR APPROVAL	<i>J. C. O'Connell</i>	3/28/49
	PLANNING & TRAFFIC ENGINEER	DATE
APPROVED	<i>H. C. O'Connell</i>	3/28/49
	DEPUTY COMMISSIONER - CHIEF ENGINEER	DATE
APPROVED	<i>Harry P. Ward</i>	
	CHIEF DEPUTY COMMISSIONER	DATE