500 DELINEATORS

500.1 INTRODUCTION

The purpose of this guidance is to define the use of roadway delineation supplementing pavement marking and retroreflective pavement markers on the State Highway System, such as post-type delineators (flexible or non-flexible), and guardrail and barrier reflectors.

The purpose of delineation is to inform drivers of changes in roadway geometry and of the presence of barrier or guardrail.

Delineators may be beneficial at locations where roadway alignment might be confusing or unexpected, such as at curves or lane-reduction transitions. Delineators can be effective guidance devices at night and during adverse weather. An important advantage of delineators in certain locations is that they can remain visible when the roadway is wet or covered in snow. Delineators are considered guidance devices rather than warning devices.

In general, delineators should not be substituted for object markers. Obstructions within the roadway, or adjacent to the roadway within the clear zone, should be marked where appropriate with object markers in accordance with the Warning Signs chapter of the MUTCD. Obstructions of this type may include, but are not limited to:

- Culvert openings or headwalls
- Signs (or posts for signs) facing in a different direction than an adjacent travel or turn lane, such as a No Passing Zone, Wrong Way, or crossroad sign
- Bridge piers
- Utility poles
- Railings or barriers

Where marking a sign, post, or similar object, the object marker may be affixed directly to the post or back of the sign panel as appropriate. Based on engineering judgment, delineators of the appropriate type and color may be used in advance of a roadway obstruction but should not be used in lieu of object markers.

The types of delineators used by ADOT include:

Table 500-1 - Delineator Types

Type	Color	Application
Single Delineator	White (F1W, S1W)	Used for delineation along the right-hand side of a roadway.
	Yellow (F1Y, S1Y)	Used along the median side of a divided roadway.
	White (S2W)	Can be used along the right-hand side of a roadway in areas that experience deep snow accumulation.
Double Delineator	Yellow (F2Y, F2YR)	Used at median or on each approach to the crossovers.
Triple Delineator	Yellow (F3YR)	
Quadruple Delineator	Yellow (F4YR)	
360 Degree Delineator	White (F3W)	Used along the right-hand side of a roadway or the outside edge of an intersection.
	Yellow (F3Y)	Used in or around a median.
Escape Ramp Delineator	Red (F1R, S1R)	Used to delineate truck escape ramps.

500.2 GUARDRAIL AND BARRIER DELINEATION

Delineation of guardrail should be in accordance with Sections 703 and 905 of the most recent Standard Specifications or Stored Specifications and standard drawing M-26.

Guardrail end treatments should be marked with an appropriate OM101-1 object marker applied to the face of the end treatment.

The primary delineation method for guardrail or barrier should be L or T shaped barrier markers, mounted to the top of the guardrail post or barrier wall. Additionally, standard drawing M-32 indicates a prismatic reflector as an acceptable delineator for barriers. Guardrail tab products installed within the guardrail web shall be considered supplemental to the post-mounted delineation tabs and flexible delineators. The spacing for guardrail delineation is every 18th post (112.5 ft), unless the guardrail is on a ramp, in which case the delineators should be spaced 100 feet apart.

Post-type delineators should not be installed at or near guardrail end treatments, unless the delineator is a snowplow marker. If installed near a guardrail end treatment, markers should be installed in a manner that will not interfere with the function of the end treatment.

500.3 POST-TYPE DELINEATORS

Curves - General

Delineators should be installed on horizontal curves in accordance with the chapter of the MUTCD addressing delineation, including spacing values shown in the MUTCD table for delineator spacing on horizontal curves. The Regional Traffic Engineer can recommend that delineators on horizontal curves not be installed if one or more of the following conditions exist:

a) Continuous illumination; or
b) barrier wall or guardrail that is delineated in Section 500.2; or
c) retroreflectorized pavement markers are used continuously on center lines and lane lines throughout all curves and on all tangents to supplement pavement markings.

See Figure 500-A for an example of delineator placement on a horizontal curve on a two-way roadway See Figure 500-B for an example of delineator placement on horizontal curves on a one-way ramp. In both figures, the S value is the spacing value from the MUTCD table. S should be measured along the roadway centerline; however, if this is impractical, S may be measured along the delineator line on the outside of the curb. Delineators for each direction in horizontal curves should be installed at the same longitudinal location, i.e. across from one another. On two-way roadways, delineators with a white face on each side of the delineator may be installed on the outside of the horizontal curve in lieu of placing delineators on both sides.

Curve radius and spacing information should be provided by Traffic Design to the District Maintenance Superintendent, Regional Traffic Maintenance Superintendent, and Regional Traffic Engineer so that delineator replacements can be made at the required MUTCD spacing, as shown in Table 500-2 below. Where delineators are installed on horizontal curves, there should be a minimum of three delineators continuously visible. Where three delineators are not visible, additional delineators should be placed until three become continuously visible.

Curves - Two-Way Roadways

If delineators are used at horizontal curves on two-way roadways, F1W or S1W white delineators should be installed on the right-hand side of the roadway. S2W delineators may be substituted for F1W or S1W delineators in snow areas as directed by the Regional Traffic Engineer.

Curves - Divided Roadways

If delineators are used at horizontal curves on divided roadways, F1W or S1W white delineators should be installed on the right-hand side of the divided roadway. F1Y or S1Y yellow delineators may be installed on the left-hand side of divided roadways at right-hand curves as directed in

highway plans or in other locations as directed by the Regional Traffic Design Manager or their designee.

Table 500-2 - Approximate Spacing for Delineators on Horizontal Curves

Radius (R) of Curve	Approximate Spacing (S) on Curve
50 feet	20 feet
115 feet	25 feet
180 feet	35 feet
250 feet	40 feet
300 feet	50 feet
400 feet	55 feet
500 feet	65 feet
600 feet	70 feet
700 feet	75 feet
800 feet	80 feet
900 feet	85 feet
1,000 feet	90 feet

Notes: 1. Spacing for specific radii may be interpolated from table
2. The minimum spacing should be 20 feet.
3. The spacing on curves should not exceed 300 feet.
4. In advance of or beyond a curve, and proceeding away from the end of the curve, the spacing of the first delineator is 2S, the second 3S, and the third 6S, but not to exceed 300 feet. **See Figure 500-A.**
5. S refers to the delineator spacing for specific radii computed from the formula $S = 3\sqrt{R - 50}$.
6. The distances for S shown in the table above were rounded to the nearest 5 feet.

Tangent Sections on Mainline Roadway

Three F1W or S1W white delineators should be installed on the right-hand side of tangent sections in advance of or departing a horizontal curve where delineators are installed. The delineator nearest the start or end of the curve should be spaced at a distance of 2S upstream or downstream from the approximate P.C. or P.T. of the horizontal curve, where S is the value from the MUTCD table used for delineator spacing within the curve. Another delineator should be placed at a distance of 3S

upstream or downstream of the first tangent delineator, and a third delineator should be placed at a distance of either 6S or 300 feet (whichever is less) upstream or downstream from the second delineator. See Figure 500-A.

Short tangent sections less than 500 feet in length that have delineators, guardrail or barrier delineation installed on the preceding and subsequent curves should continue the delineator spacing pattern along the tangent section consistent with the preceding and subsequent curves.

Other than the three delineators approaching or departing horizontal curves, new delineators should not be installed or replaced on tangent sections except as directed by the Regional Traffic Engineer.

Snow area (S2W) delineators may be installed continuously along tangent sections as directed by the Regional Traffic Engineer. The spacing for snow area delineators should be as directed by the Regional Traffic Engineer but should not exceed 530 feet.

Ramps and Lane Reduction Transitions

F1W or S1W white delineators should be installed along the right-hand side of lane reduction transition areas and ramps. The spacing should be 100 feet. See Figure 500-B for an example of delineator placement on a one-way ramp. See Standard Drawing M-4 for an example of delineator placement at a lane reduction transition.

Truck Escape Ramps

F1R or S1R red delineators shall be installed along both sides of truck escape ramps facing traffic entering the ramp. The spacing should be 50 feet. See Standard Drawing M-14 for more information.

Acceleration and Deceleration Lanes

For acceleration or deceleration lanes on the right-hand side of the roadway, F1W or S1W white delineators should be installed along the right-hand side of the acceleration and deceleration lanes. For acceleration or deceleration lanes on the left side of the roadway where a physical median is present, F1Y or S1Y yellow delineators should be installed along the left-hand side of the acceleration and deceleration lanes. The spacing should be 100 feet.

Median Crossovers

F2Y, F2YR, F3YR, or F4YR yellow delineators should be installed at median crossovers in accordance with Standard Drawing M-27.

Intersections

F3W 360-degree white delineators may be installed at the direction of the Regional Traffic Engineer to assist in delineating roadway edge geometrics at intersections or driveways.

F3Y 360-degree yellow delineators may be installed at the direction of the Regional Traffic Engineer to assist in delineating median geometrics at intersections or driveways.

Delineator Placement

Delineators should be placed at a consistent distance from the roadway edge, except that when an obstruction exists near the pavement edge, the line of delineators should make a smooth transition to the inside of the obstruction. For roadways below 4,000 feet in elevation where snowplow activities are not likely to occur, delineators should be installed no closer than 2 feet and no further than 8 feet from the edge of the pavement to facilitate mowing operations. For roadways above 4,000 feet in elevation where snowplow activities are likely to occur, delineators should be installed no closer than 4 feet and no further than 8 feet from the edge of the pavement to facilitate snowplow operations. Cut sections may require an offset from the roadway that is less than the above values. These offsets should be approved by the Regional Traffic Engineer.

In locations where it is impractical to install post-type delineators, such as where there is a rock face or wall adjacent to the traveled way, reflective elements with color and size approximately similar to the comparable delineator type may be affixed directly to the adjacent object(s) facing adjacent traffic.

Selection of Delineator Material Type

The use of rigid square tube delineators in lieu of flexible delineators may be approved by the Regional Traffic Engineer. Flexible and rigid delineators should not be mixed within a segment of highway, except for delineators that only exist in one material type, such as S2W snow area delineators.

Figure 500-A. Example of Delineators on a Two-Way Roadway at a Horizontal Curve

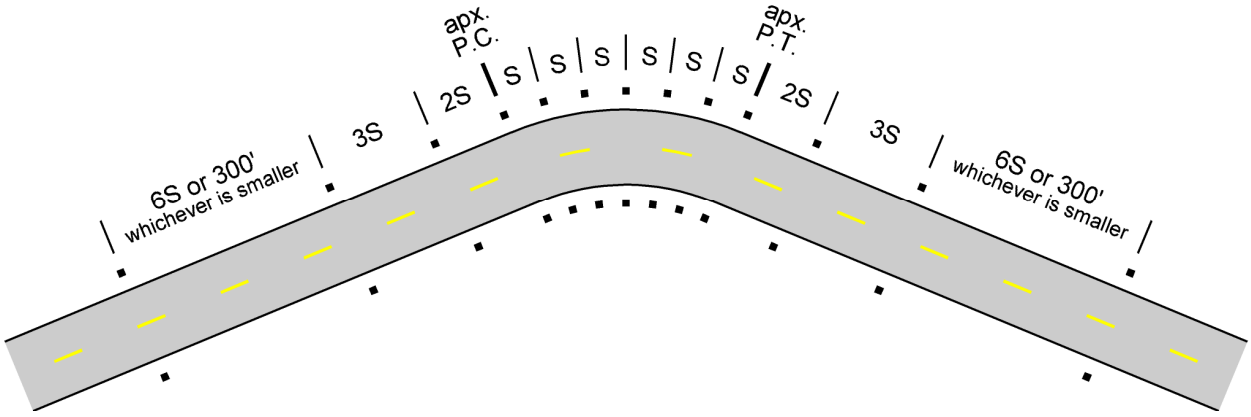

Figure 500-B. Example of Delineators on a One-Way Ramp