END MARKER / PIER MARKER GUIDANCE

Reference Title

End Marker / Pier Marker Guidance

Reference Revision and Year:

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Reference Introduction and Discussion

End markers, also known as delineators, bridge end markers, or pier markers are identified by the Manual on Uniform Traffic Control Devices (MUTCD) as Type 3 Object Markers. The signs are utilized to mark obstructions within or adjacent to the roadway.

Reference Description

Missing or worn regulatory signs, such as object markers, shall be considered Priority B – “B Flags”. This section provides guidance on when end markers or pier markers are required.

Use of Object Markers

For most instances where bridges have appropriate guard rail systems around the bridge, object markers are not required. Common traits of an appropriate guard rail systems would be as follows:

- "Type T" end treatments
- W-beam which transitions to thrie-beam
- Presence of bridge end connectors
- Reduced post spacing in close proximity to the bridge end

For instances where bridges have no guardrail, or the railing does not include the characteristics noted below, the presence of curbs, pier/bents, walls, or other obstructions within the clear zone should be delineated with object markers.

A physical obstruction is not considered adjacent to the roadway if it is set back from the roadway by the presence of the roadside restraint system (guardrail, barrier wall, etc.). When considering if the obstruction is physically protected, the inspector should evaluate if the roadside restraint system has incorporated features that would appropriately transition stiffness.

Similarly, if bent columns or bents are set back from the roadway by the presence of the roadside restraint system that has the correct stiffness, then pier markers are not required.

Significantly narrowing roadways and shoulders would be an example of situation where object markers should be installed even with a guard rail system. Narrow shoulders are typically defined as a clear roadway on the bridge that is less than that of the approach roadway.

If an inspector is unsure if object markers are required, they should contact the District Bridge Engineer who may need to coordinate with district traffic.

Pier Markers

Unless protected by an appropriate guard rail system, a pier marker should be used to delineate all bents except ones that are:

1. More than 30 feet (30') from the travel lane of the highway.
2. Behind guardrail or concrete barrier and is 20 feet (20') or more from the travel lane.
3. Within a continuous installation of concrete barrier.

End Markers

End markers should be used to delineate ends of bridges. In addition, the guardrail may be delineated along its length on the face. In general, bridge ends should be delineated with object markers as noted below unless protected by an appropriate guard rail system:

1. All ends of a bridge on a two-lane roadway (4 signs).
2. Each end of the approach end of each bridge on a multilane roadway where there is a separate bridge for each direction of travel (4 signs).
3. The right side of each end of the bridge on a multi-lane facility where the two roadways carrying opposing traffic are separated by a raised median or concrete barrier and only one bridge exists (2 signs).
4. Each end of a bridge on a multi-lane facility where the two roadways carrying opposing traffic are separated by either a double center line or a smooth median (4 signs).

Examples



Longitudinal "Kink" in the Guardrail

Object Markers Required – Submit Priority B – "B Flags" if Missing

Discussion: Although the approach guardrail does have transition stiffness, object markers are needed. The shoulders narrow significantly at the bridge approach and the longitudinal "kink" in the guardrail requires the use of object markers.

Example 1 – Longitudinal "Kink" in the Guardrail



Guardrail without Transitions

Object Markers Required – Submit Priority B – "B Flags" if Missing

Discussion: Although bridge rail (in the form of guardrail) is present, it does not protect impact to the blunt end of the curb, thus object markers are required.

Example 2 – Guardrail without Transitions



Bridge Rail without Transitions

Object Markers Required – Submit Priority B – "B Flags" if Missing

Discussion: Although bridge rail (in the form of a concrete barrier with steel railing) is present, it does not protect impact to the blunt end of the bridge rail, thus object markers are required.

Example 3 – Bridge Rail without Transitions



No Bridge Rail (Curb Only)

Object Markers Required – Submit Priority B – "B Flags" if Missing

Discussion: No roadside barrier exists (only curb exists). To protect the blunt face of the curb, object markers are required.

Example 4 – No Bridge Rail (Curb Only)

	**End Markers Not Required** Object Markers Not Required (No Flags) **Discussion:** While object markers are installed, they are not required. The approach guardrail protects all blunt ends of the barrier wall and includes details that transitions stiffness in the event of impact.

Example 5 – End Markers Not Required

	**End Markers Not Required** Object Markers Not Required (No Flags) **Discussion:** Object markers are not installed and should not be recommended for installation by inspectors. The approach guardrail protects all blunt ends of the barrier wall and includes details that transitions stiffness in the event of impact.

Example 6 – End Markers Not Required

	**Pier Markers Not Required** Object Markers Not Required (No Flags) **Discussion:** Object markers are not installed and should not be recommended for installation by inspectors. The columns of the bents are protected by a continuous installation of concrete barrier and a appropriate guard rail system.

Example 7 – Pier Markers Not Required