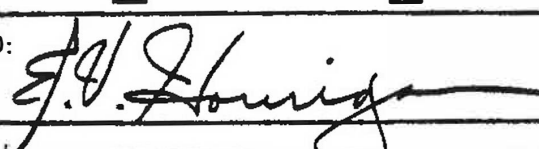


TO:		ENGINEERING INSTRUCTION	
SUPERSEDED BY EB 98-014 EFFECTIVE 4/24/98		NEW YORK STATE DEPARTMENT OF TRANSPORTATION	
		SUBJECT: Design Criteria for Bridges - Bridge Barrier and Railing Systems	
		Subject Code: 7.35-4	
Distribution:		☒ Main Office ☒ Regions ☒ Special	Code: EI 83-35 Date: 9/2/83 Supersedes:
APPROVED: 			

I. Background

Bridge barrier (railing) systems have been changing over the past ten years resulting in steel barriers which have grown in cost. During the same period, concrete bridge barrier designed to redirect impacting vehicles has come into use at selected locations, such as an unusually high bridge or a bridge spanning deep water or railroad tracks. As the use of concrete barrier has increased, slipforming of the barrier has also increased, with resultant lower costs. These lower costs have brought concrete bridge barrier down in price to a point where it is virtually equal to 2-rail steel railings used with no curb and less than all other steel railing systems. The use of a concrete barrier may require additional bar reinforcement in the slab fascia overhang which supports the barrier. In addition, the structural system supporting the deck requires more strength due to the increased dead load of the barrier and the additional 7 inches of bridge deck width required by the barrier (each barrier requires 3 1/2 inches more bridge width than a steel bridge railing system). The higher costs for these items were taken into consideration in the cost analysis. Reduced maintenance costs and better protective characteristics for the bridge user enhance the choice of the concrete barrier.

II. Policy

Concrete bridge barriers shall be used as the barrier system of choice on new or replacement highway bridges without sidewalks, designed by or for the Department. They shall also be used on highway bridges being rehabilitated when the deck slab is being replaced and the added dead load of the barrier can be accommodated by the structural support system without strengthening; or when the deck slab is being left in place, and the slab and structural support system can accommodate the barrier loading.

III. Details

There are some situations where the use of concrete bridge barrier is inappropriate, as follows:

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1. Do not use on earth covered structures. Use an appropriate highway barrier system instead.
2. Do not use on bridges with a structural support system less than 24 inches deep since the concrete barrier dead load will make up a disproportionate amount of the total dead load. This includes rolled beam bridges, concrete slab bridges, prestressed slab and box bridges, and precast or cast-in-place culverts without earth cover.

The application of Item 2 above will normally result in the use of concrete bridge barriers only on bridges longer than about 65 feet. This is not only desirable because of the effect of dead load, but also because concrete bridge barriers used on short span bridges are thought to be more costly than other systems. This is because the cost of mobilization for casting must be amortized over a shorter length of barrier. Short runs of concrete barrier are also thought to be aesthetically "poor" when located in longer runs of steel guide railing normally used on bridge approaches and along highways.

When considering the use of concrete barrier on bridges being rehabilitated, the effect of the dead load should be the primary consideration. Unless there is an extremely strong safety warrant, concrete barrier should not be used on a bridge requiring strengthening in order to support the barrier. However, if the bridge requires strengthening to improve live load capacity, it would be reasonable to add another increment of strengthening in order to allow use of the concrete barrier. This should not be done if the extra strengthening is required in areas not being strengthened for live load, or if for some other reason, the cost of strengthening would be disproportionate to the cost of the project. It is also reasonable to assume that concrete barrier would be considered when the deck slab is being replaced on a bridge. In addition, where the existing slab is being left in place and both it and the superstructure can support the additional load, concrete barrier should be considered. There may be cases where the higher cost of installing a concrete barrier on an existing bridge is warranted by traffic benefits. However, that possibility should be considered at the start of design.

Exceptions to this policy will be allowed if warranted by local conditions. Such conditions include aesthetic considerations and the detrimental effects of concrete barrier on bridge drainage or on snow control. The owners of bridges not on the State Highway System will be allowed to determine whether concrete barrier will be used at the time the Design Report or the Preliminary Structure Plan is prepared.

Concrete barrier details are shown on the B.D.D. Sheet titled "Superstructure Details - Fascia, Curbs, Sidewalks, Parapets (at structures)".

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If there is any question regarding the specification to use for the concrete barrier, contact the Special Design Unit of the Structures Division.

New bridges will be assigned a bridge barrier type at the preliminary plan stage. For existing bridges the type of barrier shall be tentatively assigned at the preliminary plan stage. However, design considerations may cause a change in the type of barrier used. When a change is necessary the designer shall make the choice of barrier in conjunction with the Special Design Unit.

This policy shall be implemented immediately. Projects in the preliminary plan stage shall be changed to conform to this policy, while those now in final design need not be changed. If there is any question regarding this Engineering Instruction contact the Special Design Unit of the Structures Division at 518-457-2459.