CHAPTER 8
REHABILITATION

8 -1   General

This chapter provides guidance for the design of bridge widenings and rehabilitations.

In determining the scope of the rehabilitation work, representatives from the Structure Design Unit, the Bridge Maintenance Unit, and the Division Bridge Maintenance Unit should be involved. In addition, coordination with the various units will be required to reserve the equipment necessary to inspect the entire bridge.

When existing and proposed centerlines are not coincident, show both centerlines and the distance between them.

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8 -2   Superstructure

When widening a bridge, do not mix steel beams or girders with prestressed concrete girders in the same span.

The feasibility of using lightweight concrete shall be investigated for deck rehabilitation projects. For the unit weight of lightweight concrete, see Section 2-3 of this manual.

Consideration shall be given to using link slab details for deck replacement projects on simple span superstructures in lieu of replacing the joints.

For full deck replacements on prestressed concrete girder superstructures, place the following note on the plans:

Prior to deck removal, the Contractor shall submit to the Engineer the proposed method for removing concrete in the areas directly above the prestressed girders.

When an existing bridge is to be widened, call for a full depth saw cut to be made in the existing slab where the slab is to be removed. Locate the saw cut to clear the edge of the flange and detail adhesively anchored dowels in the same horizontal plane as the top mat of reinforcing steel. Place the following note on the plans:

A full depth saw cut shall be made and existing concrete removed in accordance with plan details.

For bridge widening projects, epoxy coated reinforcing steel shall be used in the proposed section of the bridge. When latex modified concrete is used, do not use epoxy coated reinforcing steel.

The Traffic Control, Pavement Marking, and Delineation Section of the Traffic Congestion and Engineering Operations Unit (Traffic Control) may require a temporary bridge rail. The pay item for temporary bridge rail will be a Traffic Control item and a Roadway detail or standard. Close coordination between Structure Design, Roadway Design and Traffic Control is extremely important. For guidelines on the use of temporary barrier rail, see Section 6-2 "Bridge Rails". On the existing deck, detail the same joint type as that used on the new deck. Place the following note on the plans:

> *During the joint installation procedure, the joint and surrounding area shall be kept clean and free of debris.*

When one or two girders are used to widen prestressed concrete girder bridges, the existing diaphragm tie rod should be extended for use in the new diaphragm. A turn-buckle or sleeve nut shall be used for this extension. For details of this tie rod assembly, see Figure 8-1. When three or more girders are added, do not detail a connecting diaphragm.

For bridge widenings, it is preferable to detail a 4 foot (1.2 m) or 5 foot (1.5 m) bay between new and existing beams or girders and eliminate the bent diaphragms. For beam or girder spacings wider than 5 foot (1.5 m) and for intermediate diaphragms, detail a bolted angle connection between existing steel beams or girders and new diaphragms and place the following note on the plans:

> *Where diaphragms are to be bolted to existing steel beams, do not remove paint from the contact surface.*

The diaphragm shall be field welded to the angle. The other end of this diaphragm is to be bolted to a shop welded connector plate with vertical slots. The connector plate slots should be sized so as to permit the vertical dead load deflection of the proposed adjoining beam. Show washers as required by the AASHTO Standard Specifications. Place the following note on the plans:

> *Connection bolts are to be located at the bottom of the connection slots and tightened to snug fit prior to field welding opposite end of diaphragm. After welding diaphragm to connection angle and prior to the pouring of the slab, back off bolts ½ turn to allow for vertical deflection of new beam. After deflections have occurred, tighten bolts as required by the Standard Specifications.*

Rolled beams shall be designed with cover plates only for those widening projects in which the existing structure contains cover-plated beams. Cover plates to be welded to flange members should be at least 1 ½ inches (40 mm) and preferably 2 inches (50 mm) less in width than the member to which it is welded. Plates

should be welded with a continuous fillet weld. The thickness of the cover plate should be between 5/16 inch (8 mm) and twice the flange thickness. Cover plates shall extend the length of the beam and terminate 1 foot (300 mm) from the centerline of bearing, see Figure 8-2. The weld shall be designed per the AASHTO ~~Standard~~ LRFD Bridge Design Specifications. The appropriate minimum fillet weld sizes are defined in the ANSI/AASHTO/AWS D1.5 "Bridge Welding Code".

When widening existing structures, the rotational and deflection characteristics of the existing bearing type should be considered when selecting the new bearings.

For rehabilitation and widening projects detailed with elastomeric bearings, detail a field weld between the sole plates and the flanges at both ends of the new beams or girders. Place the following note on the plans:

> ***When field welding the sole plate to the girder flange, use temperature indicating wax pens, or other suitable means to ensure that the temperature of the sole plate does not exceed 300°F (149°C). Temperatures above this may damage the elastomer.***

Approach pavement brackets are to be used only when bridges with existing pavement brackets are to be widened.

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8 -3   Substructure

At an end bent where a curtain wall is used, the top surface area of the cap shall be given the protective coating except that the Contractor may, but is not required to, coat the top surface area to be covered by the curtain wall.

When anchor bolt removal is required, the pay item should be per each bolt in lieu of a lump sum basis.