Abstract

In the past time, people commonly used jointed construction. Bridge deck joint (expansion joint) add the maintenance costs of the bridge. Bridge support beam pads deterioration is a common problem in bridges with jointed bridge decks. Jointless multi-simple span deck girder (composite concrete deck with steel or prestressed concrete girder) bridge construction has been accepted as an alternative to jointed construction. Link slab that connects the decks of the adjacent spans is one of the methods used for building a jointless bridge.

This thesis focuses on the behavior of the link slab. The scope of the study is to develop Caner and Zia procedures and finite element models to analyze the variation of the rotations, forces, moments, stresses in the link slab, reinforcement stresses, percentage ratio of the reinforcement in the link slab, and crack width as well as the level of the continuity generated in the girder system.

The analysis is carried out for different bridge parameters which are likely to affect the behavior of link slab, especially span length, debonding length ratio (DLR) in link slab, gap width, and bearing stiffness. Besides, the study used variation simple span support namely H.R.R.H., H.R.H.R., and R.H.H.R. (H = *Hinged*, R = *Roller*) *configuration.*

One of the results obtained that finite element models gives more accurate result than Caner and Zia procedures. Other result is DLR 5% in link slab is more appropriate rather than 2.5% and 7.5% DLR. The last important result is the cost for building expansion joint bridge is much greater than building link slab system.

Keywords : link slab, expansion joint, debonding length ratio, jointless bridge.