

**RESEARCH PROBLEM STATEMENT**

<b>DATE:</b> 09/25/2020	<b>PROJECT AREA:</b> Maintenance
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**TITLE:** Removing Bridge Expansion Joints and Making Bridge Decks Continuous

**PROBLEM STATEMENT:**

Bridge deck expansion joints allow for girder expansion and contraction due to temperature, live load deflection, deck shrinkage, and deck creep. The typical expansion joint is formed using a joint opening between adjacent bridge deck sections. Water intrusion through the gap is prevented by positioning an elastomeric strip within the gap. However, often joint failure occurs in the expansion strip and / or the sealant used to adhere the strip to the bridge deck. Expansion joint failure allows access for contaminated water and debris to the bridge framing system, which results in bridge structure corrosion. This study proposes to investigate replacing expansion joints using a link slab system to develop a jointless bridge deck. End results of developing a jointless bridge deck using a link slab system are improved deck durability and ride quality. The jointless system is developed by using a link slab section. In the link slab system, the expansion joint opening is sealed using a short slab section and adjacent deck sections are then made continuous. Deck expansion is compensated at the abutments by designing the abutments to allow for the bridge deck to slide.

**OBJECTIVES:**

Review current available expansion joint replacement methods. Develop details for ARDOT to replace expansion joints with a link slab system. Determine appropriate bridge configurations where the jointless bridge system is applicable (maximum bridge skew). Develop an approach that will minimize link slab cracking.

**FORM OF RESEARCH IMPLEMENTATION AND RETURN ON INVESTMENT:**

The system will be evaluated by: summarizing available research through a literature review, site visits to already installed link slab systems, field testing, numerical analysis, and field installation. Replacing expansion joints with a jointless bridge system will result in lower bridge deck maintenance costs and improved ride quality. Current costs for a expansion joint replacement include labor and supplies. Indirect costs to the public are experienced through traffic delays and detours during existing expansion joint failure repairs.

<b>Estimated Project Duration:</b> 24 Months
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Standing Subcommittee  
Ranking

5/8

Advisory Council  
Ranking

17

Statement Combined with  
Statement Number(s)

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