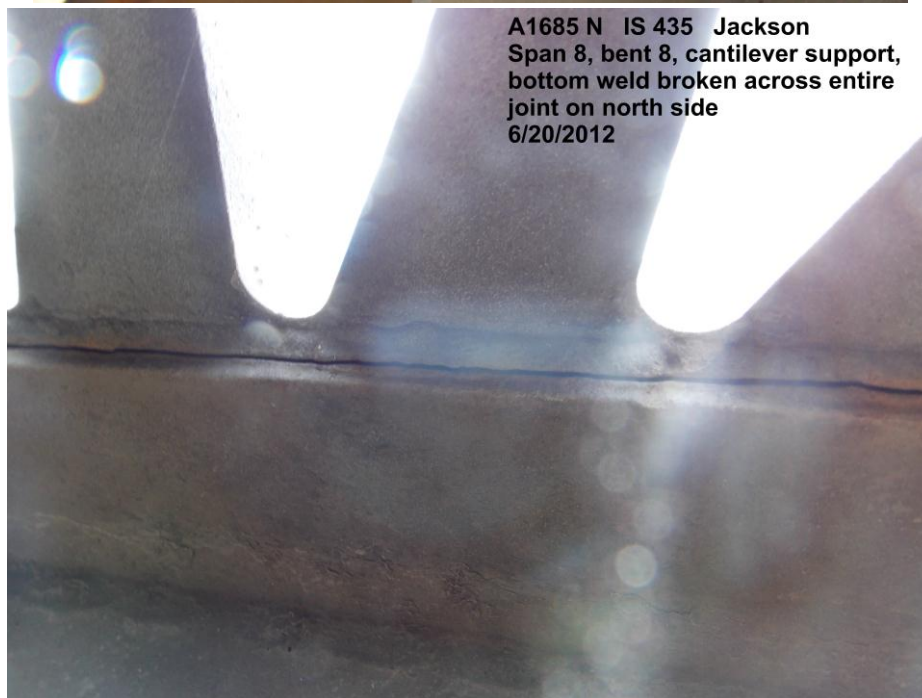


## Evaluation of Finger Plate and Flat Plate Connection Design

### Response to Questions and Comments

- 1) I was wondering if you could share some additional images of the failures of these joints.





March 28, 2014  
A3292  
Pier 9 Expansion Joint





March 28, 2014  
A3292  
Pier 9 Expansion Joint  
Broken Strap



**2) Are these failures predominate in a certain area in Missouri?**

Although there have been recent failures in Kansas City and St Louis, this problem is not specific to a certain area of Missouri. It appears to be on structures with higher truck volumes.

**3) Do only bridges with high traffic volume suffer failures, or are there some on bridges with lower traffic volumes?**

We have seen failures of finger plates with lower traffic but after many years of service and years of deterioration. This seems to be more prevalent of an issue in locations of high traffic volumes; however we don't want to preclude designing for failure related to the overstresses caused by heavy vehicles and multiple lanes. We want to also consider these types of failures in order to get a longer and more predictable service life.

**4) Are there any budget limitations set for this project?**

A \$200,000 to \$300,000 limit is believed to be appropriate for the work to be done. The proposal selection process will be on the basis of demonstrated competence and qualifications for the type of service required as a Qualification Based Selection Process will be used to evaluate the proposals. Providing a budget offers information as to the level of effort that is anticipated for the deliverables expected by MoDOT.

**5) The RFP states that the connection design life be 40 years. Why was this life chosen? Can alternate design lives be recommended?**

MoDOT would like finger/flat plates to last long enough that their repair or replacement would not be necessary until work is needed on the bridge deck. Current literature, research, and field observations show a reasonable expectation for the life of a bridge deck to be around 40 years. Alternate design lives could be considered with a desire for them to last longer than 40 years. Anything shorter than 40 years would need adequate justification in order to be considered.

**6) Will MoDOT consider connection designs that include a trough or other measure to control runoff?**

The emphasis of this project is to focus on the longevity and reliability of these expansion device systems. While the use of troughs can add positive drainage functionality/directionality to the "open" finger plate joint, they can also have undesirable effects on fingerplates like premature deterioration of steel or maintenance obstruction issues for which this study was not designed to make that the focus either as part of any design/failure simulation or design enhancement/improvement for future use. Troughs are inherently used for the protection of structure below the expansion device and using them while seemingly beneficial can detract from the simplicity and advantages of an "airy" finger plate design without a trough system. Troughs are currently being utilized on MoDOT structures, but only where they are deemed appropriate. In these cases they are discretely incorporated and are not part of the standard design.

- 7) **Will MoDOT provide a database of previous failed connections (with details of bridge characteristics, pictures/description of damage, bridge location information, etc). Does MoDOT anticipate/expect the consultant/research team to inspect the field conditions of any joints?**

MoDOT does not have a database of failed connections to share but there are several recent documented cases which can be studied (with characteristics, pictures/description of damage, bridge location and design information, etc.). MoDOT does not anticipate or expect the consultant/research team to inspect or instrument field conditions at any of these joints. However, MoDOT would provide traffic control for the consultant/research team in the event they desire or deem it necessary to inspect or instrument the field conditions of failed or functioning finger/flat plate systems.