

Safety Alert

Failure of Holding Down Bolts on Bridge Deck Expansion Joint

12 October 2021

Background information

During a recent emergency bridge inspection, a fixing bolt attaching a (Type 5) expansion joint to a bridge deck, was found to have worked loose and was protruding above the road surface by approximately 25mm.

On close inspection, it was noted that a number of the holding down bolts along the joint were also starting to work loose, but were not yet protruding above the road surface.

The Type 5 joint had been in service for less than 12 months.

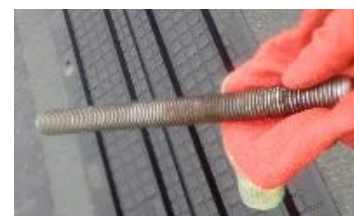
No harm was caused to our workforce or the road user, but several vehicles sustained punctures as a result of driving over the protruding stud.

Two previous joint failures on similar joints identified the same concerns with the fixings relating to inadequate embedment / anchorage lengths of the bolts and lack of bond between the between the bolt and the resin that anchors into the fixing to the concrete deck. These defects required extensive remedial works.

A full investigation in to this latest failure is ongoing.



Protruding stud



Removed Bolt



Bolt hole with stud removed



Breakdown of bolt hole resin

Lessons Learnt

- During routine Safety Inspections, Inspectors should be aware of this issue and lookout for protruding bolts.
- Any signs of deterioration, to the material surrounding the bolts at road level, should be picked-up during the principal inspections and flagged for action.
- The specification for all resin fixings for new Type 5 bridge expansion joint installations, to be checked and agreed with joint manufacturer, prior to installation.
- Records should be kept during installation of new joints to record the condition of the deck below the joint, the bolt embedment depths and any torque requirements for the fixing.