

Structural behaviour of distressed and strengthened post-tensioned box beams

ABSTRACT

This study focuses on the behaviour of post-tensioned box beams with snapped prestress cables. It also includes an investigation into the effectiveness of using select strengthening methods on distressed box beams. All beams were subjected to flexural-shear-torsional loads. The results show that snapping 15% of the prestressing cable area resulted in a 74% increase in deformation at service load and a 22% decrease in ultimate load. The snapping of prestress wires also increased the stresses in the snapped cables by 70%. All the strengthening techniques used effectively restored the beam performance at service and overcame the effect of cable snapping.

Keyword: Box beams; Combined load; Post-tensioned; Snapping; Strengthening