



Experimental study on mechanical behavior of combined joint using adhesives and high strength bolts

Takuya Kamino

Graduate student, Osaka City University, Osaka, Japan

Takashi Fujimoto

Bridge Engineer, Yokogawa Bridge Corp, Osaka, Japan

Takashi Yamaguchi

Professor, Osaka City University, Osaka, Japan

Yasumoto Aoki

Chief Engineer, Hanshin Expressway Co. Ltd., Osaka, Japan

Shinsuke Akamatsu

Chief Researcher, Hanshin Expressway Technology Center, Osaka, Japan

Hisakazu Horii

Engineer, Konishi Co. Ltd., Saitama, Japan

Contact: kamino@brdg.civil.eng.osaka-cu.ac.jp

Abstract

As a repair for corrosion damage of a steel bridge, a patch plate-repair using high strength bolts is generally applied. This method requires the surface of the damaged corroded part filled with an epoxy adhesive flat. The load transferring mechanism and slip resistance of such a combined joint with adhesives and high strength frictional bolts aren't clear. Since the shear strength of an adhesive might be increased due to constraint by the bolt axial force, the combined joint's slip resistance would be increased. To clarify the mechanical properties of the combined joint and to propose a new design method for such joints, two experiments have been conducted. The first was a frictional force experiment for adhesive specimens subjected to contact pressure on the surface to evaluate the constraint effect of adhesive on shear strength quantitatively. The last one is a slippage experiment for the combined joints to evaluate its slip coefficient.

Keywords: epoxy adhesive; high strength bolt; slippage test; combined joint.