Ryotaro Arai et al., J Civil Environ Eng 2016, 6:5 (Suppl)
http://dx.doi.org/10.4172/2165-784X.C1.008

Repair method of damaged steel braced structure and restoring force characteristics after repair state

Ryotaro Arai, Hanako Satoh, Kenta Aoki and **Takumi Ito Changhoon Choi**
Tokyo University of Science, Japan

A lot of steel structures have experienced severe earthquake disasters in Japan, and its various kinds of failure mode have been reported. Especially on steel braced structure, the failure modes are generally categorized into two modes; buckling and fracture of brace member, and yielding of joints and fasteners. After a lot of earthquake disasters, the technical manual has been published to repair and recover the damaged building structures in Japan. The manual suggests the actual repairing method for damaged steel braced structures; however, it is guessed that a few of these methods have some difficulties related to construction technique and estimation of recovery after repair. In this paper, new repairing method for joints on damaged steel brace structure has been proposed, and its applicability and feasibility are investigated experimentally. Herein, the horizontally loading test on diagonal steel brace are performed with parameters as follows; thickness of gusset plate, layout of bolts, slenderness ratio of brace and the method of joint. At first, the damaged state of gusset plate was reproduced by horizontally loading test. Next, the damaged gusset plate was repaired. Finally, the loading test was done to the repaired specimen again. From the test results, the strength was reinforced after repair, and the rigidity was almost same. The change of failure mode and slenderness ratio is presented, and which is related to eccentric distance and torsional parameters. Furthermore, the evaluation method of the failure mode and buckling strength are proposed, and this estimation method shows good utility.

Biography

Ryotaro Arai has completed his Bachelor of Engineering degree in 2015. He is now a Master's course student of Tokyo University of science (TUS) and investigated about steel structural engineering. In research activities, he submitted some paper to an academic journal of architectural institute of Japan.

aaryo25013@yahoo.co.jp

Notes: