

# **A Study of the Bolt Connection System for a Concrete Barrier of a Modular Bridge**

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## **Abstract**

Modular technology has been recently studied to reduce the construction periods in the field of bridge construction. However, this method is restricted to the pier, girder, and deck, which are the main members of a bridge, and incidental facilities such as concrete barriers have been rarely studied. Thus, in this study, the connection system of a concrete barrier for modular bridges was developed, and a static loading experiment was performed to verify the structural capacity of the proposed system. The variables of the experiment were the vertical and horizontal bolt connections and the construction method. The barrier and plate were fabricated using match casting methods in which nuts were first inserted into the plates rather than anchor bolts using the conservative method. Moreover, a comparison with the conventional in situ barrier was also performed. The experiments were conducted according to the AASHTO LRFD standard. Consequently, the specimen using the vertical bolt connection had a structural capacity that was equal to 85% of that of the conventional specimen and exhibited similar crack patterns compared with the conventional specimen. In the case of the horizontal bolt connection, the separation in the connection area occurred with the application of the initial load and this specimen exhibited a poor performance because of the increase in the separation distance with the application of the maximum load.

**Keywords:** modular bridge, fabricated bridge, concrete barrier, vertical bolt connection, horizontal bolt connection

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