Development of the Dead Weight Compensation Device for Improving Anti-Catastrophe Performance of a Viaduct

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Railway structures may be severely damaged if the intensity of an earthquake is beyond the design motion. Even in this situation, the significant loss of life and the long-term suspension of train operation would be avoidable if the total collapse of the structure were somehow prevented. This feature is referred to as “anti-catastrophe” in the Japanese design standard. In order to attain such a characteristic, a new “dead weight compensation” device is proposed. The dynamic loading tests were conducted using a shake table, on which a viaduct model with the device was mounted. It is confirmed that the proposed device is capable of avoiding the total collapse of the specimen under extreme motions.