

2. Method for Renewing Precast Prestressed Concrete Slabs Applicable to Highways - A New Joining Method for Improved Efficiency vs. the Loop Joint Method -

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To reduce the time required to work with precast PC deck slabs for road bridges, we developed a new joining method that provides performance equivalent to the conventional loop joint method. The new method involves restraining the reinforcing bars of the joints of the PC deck slabs with rectangular spiral bars. While the loop joint method requires the insertion of reinforcing bars perpendicular to the bridge axis (i.e., the length of the bridge) from the sides to inside the loop bars, rectangular spiral bars can be inserted from the upper surface of the deck slab, a significantly more efficient approach to reinforcement.

We performed static bending loading tests and running wheel load tests for the new joining method, confirming load-bearing performance and fatigue durability against traffic loads adequate for 100 years of use. We also performed a construction test involving a full-scale test specimen, confirming that this method can reduce the time required to perform joint reinforcement by 75% compared to the loop joint method.

Keywords: precast PC deck slab, joining method, running wheel load test, fatigue durability, partial-width construction