

**G1-6 . Push-out and Punching shear resistance of Half Prefabricated Composite Slab  
with Truss-Type Reinforcement**

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Reinforced concrete slabs have been used for highway bridges as they assure lower cost and easier execution of construction. However, development of durable slabs for highway bridges have demanded since dropping-out accidents of some concrete parts due to fatigue was reported. Furthermore, saving labor and shortening term in execution of construction, reduction of dead load of slab, examination of LCC(Life Cycle Cost) and so on are also important factors. In response to this situation, various concrete-steel slab and composite concrete slab are proposed as new slab for highway bridges. HPCa slab is one of these new composite concrete slabs and consists of half-depth precast prestressed decks with truss-type reinforcement and in-situ concrete layer. The result of fatigue test using wheel-running machine has confirmed that HPCa slab has excellent fatigue durability. However, the experimental study concerning the structural effect of the truss-type reinforcement on the HPCa slab under construction stage and after constructed has been limited up to now.

In this study, we carried out a series of static bending test, push-out test and punching shear test of the HPCa slab to clarify the basic structural characteristics of the HPCa slab. This thesis presents the result of the push-out test for truss-type reinforcements as well as the punching shear test for HPCa slab. Furthermore, I attempted to describe shear-slip relationship of the interface between precast and cast-in-place concrete about these tests by non-linear 3D FEM analysis.

Through these considerations, it turns out that condition of interface between two concretes affects the behavior to destruction, and truss-type reinforcements operate as reinforcing bar for shear in the HPCa slab. It is also confirmed that conventional theory for shear strength is applied to the HPCa slab.