

Innovative Technique Award

New Joint Structure for Precast Slabs Using Rebars with Plate Anchorages (Head-bar Joints®)



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Many reinforced concrete (RC) slabs constructed for road bridges during Japan's period of rapid economic growth are now suffering from deterioration due to chloride attack, fatigue and so on. A large number of projects to replace such slabs are underway or in planning. When replacing a bridge slab, it is necessary to minimize road traffic disruption. This means reducing the construction period as much as possible and bringing the bridge back into service immediately. In the case of highway bridges, replacement with precast PC slabs (PCa slabs) has become the standard method. The use of PCa slabs offers advantages in terms of quality control, constructability and reduced construction periods, but one of the outstanding issues has been the joints between individual PCa slabs, which are cast-in-place at the site.

In the technology developed here, rebars at the locations of joints between PCa slabs are provided with plate anchorages and anchorage performance is significantly improved by filling the joint with high-strength fiber-reinforced mortar. This allows the width of the filled joint to be significantly reduced compared to conventional methods and no transverse rebars are required in the joints. Further, the bottom formwork for the filled section can be simplified and the labor required to fill the joints is reduced, significantly improving constructability and shortening the time required for PCa slab installation and joint filling.

This technology is expected to be an effective way of replacing aging road bridge slabs and will significantly contribute to society, so it is recognized as being a worthy recipient of the Innovative Technique Award.