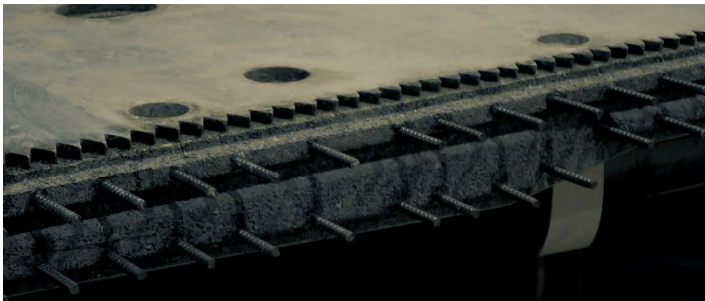


Tanaka Award: Bridge Design and Construction Category

Precast PC slab using UFC for water protection layer (UFC composite slab)



Developer: East Nippon Expressway Co., Ltd., Obayashi Corporation

An ultra high-strength fiber-reinforce concrete (UFC) composite slab has been newly developed for bridge deck replacement work. It is a precast (PC) slab with a hybrid structure in which normal-temperature hardening UFC is cast as the top surface. The density and isolating characteristics of this upper UFC layer make the slab waterproof. The slab joints, created when installing the composite slabs on site, are also cast with UFC, making this the first implementation in Japan of a fully waterproof bridge deck.

Use of this technology means that on-site slab waterproofing work, which can be carried out only in good weather, is unnecessary. Further, with only the joints being cast on-site, the construction period is reduced and less labor is required. As a result, the duration of traffic restrictions imposed during

slab replacement work can be reduced, limiting traffic congestion and accidents, while the risk of construction delays is reduced.

With conventional bridge slabs, on-site waterproofing needs to be repeated every 30 years or so, but the waterproofing performance of the UFC used in the new slab provides 100 years of design service life. As a result, slab durability is enhanced while lifecycle costs are reduced.

In summary, this technology achieves a fully waterproof bridge deck through the use of UFC while reducing the on-site construction period, saving labor costs, improving slab durability and reducing lifecycle costs. It is considered a significant contribution to future bridge renovation and maintenance and is recognized as being a worthy recipient of the Tanaka Award in the Bridge Design and Construction Category.