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## **Water Accumulation and Behavior of Surfactant Associated with Moisture Permeation in Bituminous Pavement on Concrete Deck Bridge**

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Water-related damage is one of the major problems for the durability of the bituminous pavement and concrete slabs of concrete deck bridges. In particular, damage can be drastically accelerated by the intervention of water and some chemicals such as surfactants and salts. Therefore, the mass transfer mechanism of water and the mechanism of chemical absorption in pavement materials are important to study. The authors previously pointed out that water storage in bituminous pavement layers is caused by moisture vapor in the air, and developed a new moisture permeation test apparatus to analyze the mass transfer. Based on this test method, the present study showed experimentally that water and surfactant accumulate in the bridge deck pavement and concrete slabs. Water accumulation in the pavement and deck slabs increases according to the daily climatic fluctuation. The repetitive moisture permeation test showed that alkylphenol-ethoxylate type surfactant applied on the top surface permeates through water-impermeable pavement layers and accumulates in the concrete slab.

**Keywords:** [Bituminous mixture](#), [Concrete slab](#), [Surfactant](#), [Moisture permeation](#), [Mass transfer](#)

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