

Infiltration and Clogging with Pervious Concrete Pavement

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Abstract. Pervious pavement is a best management practice (BMP) designed to increase infiltration, reducing peak flows and improving water quality by routing runoff through underlying strata that act as filters. However, the sustainability of pervious pavement has been questioned, due to clogging. This study measured infiltration into saturated pervious concrete under three conditions: (1) as-built; (2) clogged with 4-29 kg/m² of sand; and (3) clogged with 0.16-0.45 kg/m² of clay. The sand was the type applied for winter traction. The clay, montmorillonite, represented clogging by fines. Water infiltrated through 13 cm of pervious concrete, 15 cm of base course, and 15 cm of sand – representing the underlying soil – before draining into an open gallery. For as-built conditions, infiltration was 46-50 cm/hr, with 94-99% of the head loss in the sand. When clogged with sand, infiltration was 30-40 cm/hr, with 38-99% of the head loss in the sand. When clogged with clay, infiltration was 9.5-58 cm/hr, with 39-58% of the head loss in the sand. Without the sand layer, infiltration rates would have been higher, as reported in the literature. In field applications, infiltration would be limited by the underlying soil, which would likely have a smaller permeability than sand. Although fines clogged the pervious concrete more severely than sand, the limiting factor was frequently the underlying soil, rather than the clogged pavement. This suggests that design of pervious concrete pavement as a stormwater retention BMP should carefully consider the permeability of the underlying soil.

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