

EFFECT OF INTER-LAYER PLACEMENT DELAY ON PERMEABILITY PROPERTIES OF ROLLER COMPACTED CONCRETE

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Abstract— Roller compacted concretes are generally applied in layers. These layers are known as the weakest part of the structures. One of the most important factors affecting the exact interlocking of the layers is the prolongation of the placement time between the layers. In this study, the effect of delayed placement of layers on the permeability properties of RCC mixtures was investigated. For this purpose, CEM 1 42.5 R type Portland cement and crushed limestone aggregate having three different particle sizes (0-5, 5-12, 12-22 mm) were used for preparing of the mixtures. The 15 cm cube specimens were placed as two layers and compressed. After the first layer was placed and compacted, the second layer was placed with a delay of 0, 60, 120, and 180 minutes. The prepared specimens were kept in the mold for 24 hours, then removed and subjected to water curing for 28 days. The 28-day Depth of penetration of water under pressure of the mixtures was performed according to the EN 12390-8 Standard. The permeability test was applied in two different directions. In the first case, water pressure was applied to the surface that is parallel to the casting direction of the sample. In the second one, water pressure was applied to the surface that is perpendicular to the casting direction. According to the results, the permeability of the mixtures increased due to the cold joint formation caused by delayed application of the layers.

In the case the second layers was placed with a delay of 180 minutes, the permeability measurement could not be taken because it is extremely permeable.

Keywords— Roller compacted concrete, Permeability, Depth of penetration of water under pressur

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