

Experimental Investigation on High Performance Concrete with Silica Fume and Ceramic Waste

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Abstract : This experimental investigation focuses on the study of the strength of concrete with ceramic waste as coarse aggregate. It is not a new concept of using alternate materials for aggregates. Pottery and ceramics have been an important part of human culture for thousands of years. The ceramic waste from ceramic and construction industries is a major contribution to construction demolition waste (CDW), representing a serious environmental, technical, and economical problem of today's society. The major sources of ceramic waste are ceramic industry, building construction and building demolition. In ceramic industries, a significant part of the losses in the manufacturing of ceramic elements is not returned to the production process. In building construction, ceramic waste is produced during transportation to the building site, on the execution of several construction elements and on subsequent works. This waste is regionally deposited in dumping grounds, without any separation or reuse. In this study an attempt has been made to find the suitability of the ceramic industrial wastes as a possible replacement for conventional crushed stone coarse aggregate in high performance concrete. In this study, glazed stoneware pipe waste was used as coarse aggregates. In this investigation, physical properties of ceramic waste coarse aggregates were studied. Experiments were carried out to determine the strength of high performance concrete with silica fume and ceramic stoneware pipe waste coarse aggregate of 10%, 20%, 30%, 40% and 50% different replacement ratios in comparison with those of corresponding conventional concrete mixes.

Keywords : ceramic waste, coarse aggregate replacement, glazed stoneware pipe waste, silica fume

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