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Structural Behavior of Lightweight Concrete Made With Scoria Aggregates and Mineral Admixtures

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Abstract : Structural lightweight concrete is used primarily to reduce the dead-load weight in concrete members such as floors in high-rise buildings and bridge decks. With given materials, it is generally desired to have the highest possible strength/unit weight ratio with the lowest cost of concrete. The work presented herein is part of an ongoing research project that investigates the properties of concrete mixes containing locally available Scoria lightweight aggregates and mineral admixtures. Properties considered included: workability, unit weight, compressive strength, and splitting tensile strength. Test results indicated that developing structural lightweight concretes (SLWC) using locally available Scoria lightweight aggregates and specific blends of silica fume and fly ash seems to be feasible. The stress-strain diagrams plotted for the structural LWC mixes developed in this investigation were comparable to a typical stress-strain diagram for normal weight concrete with relatively larger strain capacity at failure in case of LWC.

Keywords : lightweight concrete, scoria, stress, strain, silica fume, fly ash
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