

AN EXPERIMENTAL STUDY ON PROPERTIES OF HIGH-PERFORMANCE CONCRETE USING RECYCLED AGGREGATES

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Abstracts:

This study evaluates the properties of high-performance concrete (HPC) using recycled coarse and fine aggregates sourced from Taiwan. Densified mixture design algorithm is used to calculate the mix proportion of the HPC. The HPC samples are prepared with a constant water-to-binder ratio of 0.35, using either natural fine aggregate (NFA) or recycled fine aggregate (RFA) combined with natural coarse aggregate (NCA) and recycled coarse aggregate (RCA). The effect of replacing 0%, 30%, and 100% NCA by RCA in each group mixture is studied. Both fresh and hardened properties of the HPC are evaluated. Test results show that the compressive strength values of the HPC range from 31.7 to 56.7 MPa. Moreover, all of the HPC samples produced in this study exhibit the excellent anti-erosion ability and durability performance with electrical surface resistivity and ultrasonic pulse velocity values of above 20 k Ω .cm and 3660 m/s, respectively.

Key words: High-performance concrete; Recycled aggregates; Engineering property; Compressive strength; Durability.