



ABSTRACT

The use of fine recycled aggregates in structural concrete is limited due to the lack of understanding of the material characteristics and variability. Due to this lack of understanding, there are currently no standards that govern the use of fine recycled aggregates in concrete. Previous studies have found that the replacement of the fines component with fine recycled aggregates yields similar results to concrete containing virgin materials. However, these studies used recycled lab-cast concrete. This study aims to use crushed construction and demolition waste as the recycled material component and investigate the variability in material characteristics over a period and how this variability affects the properties of concrete produced using these materials. The aggregate characteristics include chemical analysis such as XRD, XRF and TGA, whereas the physical analysis includes particle distribution, particle shape and water absorption capacity. The concrete properties include compressive strength, slump and slump loss over time and durability indexes, OPI and WSI. The fine recycled aggregate will be introduced at 25% and 50% replacement levels and, more specifically, replacing the dune sand component of the fines. Two w/b ratios will be introduced to increase the depth of testing which will provide insight into the performance of the fine recycled aggregates at low and high strength concrete. These results will then be analysed statistically to determine the reliability and correlation, which will provide an indication of the suitability of the material in practice.
