Comparison of fresh and hardened properties of normal, self compacting and smart dynamic concrete

Kumar, Arun, author

Abstrak

This work investigates the fresh, mechanical and durability properties of normal, Self-Compacting Concrete (SCC) and Smart Dynamic Concrete (SDC), which are a new generation of concrete with a lower amount of cementitious content. SDC is a low-fine, self-compacting concrete, that combines the benefits of normal concrete (stability) and self-compacting concrete (fresh properties). Fresh properties such as slump flow, L-box and V-funnel tests were investigated to evaluate its self-compacting properties. Mechanical properties such as compressive, splitting tensile and flexural strengths were also examined to compare its effectiveness with normal concrete. In addition to the fresh and hardened properties, the rapid chloride permeability test was also conducted to check the durability of normal, SCC and SDC concrete mixtures. The test results of the fresh properties clearly showed that SDC exhibited superior flowability in the slump flow, L-box and V-funnel tests within the limits of EFNARC (The European Federation of Specialist Construction Chemical and Concrete Systems) guidelines. The mechanical properties of SDC attained higher compressive strength, splitting tensile strength and flexural strength compared with the normal and SCC concrete mixtures. The rapid chloride permeability tests result of SDC clearly showed that SDC exhibited similar and better results than that of normal and SCC concrete mixtures.