

INTERFACIAL PROPERTIES OF 3D PRINTED LAYERED CONCRETE

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3D printing layered concrete is a promising innovative technology that can automate the housing sector's construction. It is the manufacture of concrete material in the absence of formwork. The fresh concrete should have sufficient stiffness to be stable under its weight during the printing or deposition process to avoid strength-based failure in the fresh material state. The 3D concrete printing material requirement is within reach, as concrete material technology has advanced, as performance base material specification is possible.

This paper investigates the interfacial mechanical properties between 3D printed concrete layers. The influence of time intervals between layers on the interfacial layer strength was critically analyzed. The investigated time intervals were 10 min, 1 hour and 1 day. The studies show that careful attention to rheological conditions of fresh concrete including the rising printed element's buckling stability and surface cracking must be considered to avoid inter-layer shear failure when the intervals were 1 day. The strength-based failure and the geometrical control of a single layer.

Keywords: 3D Printing Concrete, Yield Stress, Rheology, Fresh Concrete, Hardened Concrete.