

Evaluations of 3D Concrete Printing Produced in the Environment of United Arab Emirates

Authors : Adil K. Tamimi, Tarig Ali, Rawan Anoochi, Ahmed Rajput, Kaltham Alkamali

Abstract : 3D concrete printing is one of the most innovative and modern techniques in the field of construction that achieved several milestones in that field for the following advantages: saving project's time, ability to execute complicated shapes, reduce waste and low cost. However, the concept of 3D printing in UAE is relatively new where construction teams, including clients, consultants, and contractors, do not have the required knowledge and experience in the field. This is the most significant obstacle for the construction parties, which make them refrained from using 3D concrete printing compared to conventional concreting methods. This study shows the historical development of the 3D concrete printing, its advantages, and the challenges facing this innovation. Concrete mixes and materials have been proposed and evaluated to select the best combination for successful 3D concrete printing. The main characteristics of the 3D concrete printing in the fresh and hardened states are considered, such as slump test, flow table, compressive strength, tensile, and flexural strengths. There is need to assess the structural stability of the 3D concrete by testing the bond between interlayers of the concrete.

Keywords : 3D printing, workability, compressive strength, robots, dimensions

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