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# Spotlight on *Structures*


## Editor's Featured Article

The Featured Article for Volume 76 of *Structures* is now available. Associate Editor, Zhenjun Yang, has selected a paper investigating the shear performance of 3D-printed concrete beams of different span ratios.

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**Influence of the shear span ratio on the shear performance of 3D-printed concrete beams without web reinforcement**

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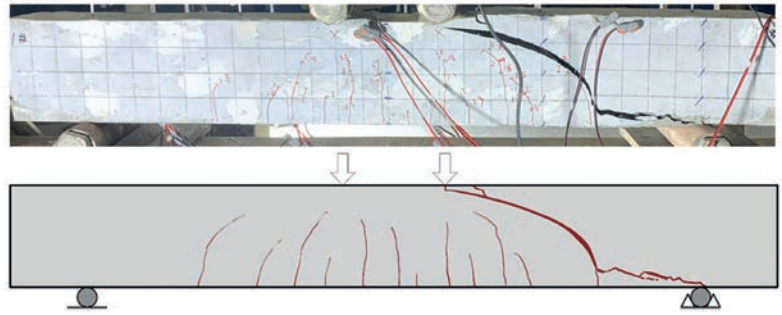
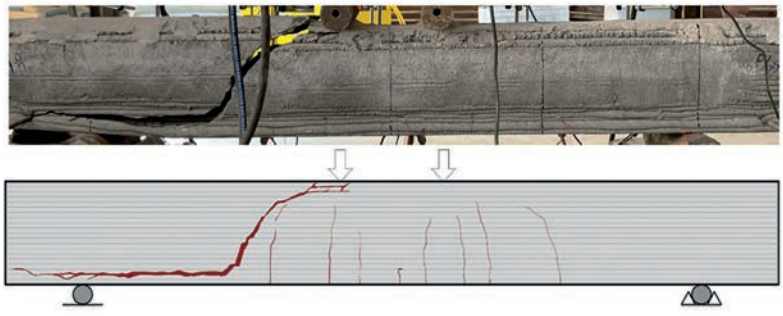
Owing to the current limitations of 3D concrete printing technology, it is possible to manually add flexural steel bars, but incorporating web reinforcement into 3D printed flexural components is still not feasible. Therefore, quantitative research is needed to evaluate the shear performance of 3D-printed components without web reinforcement. In this study, the shear strength of 3D-printed beams without web reinforcement under shear span ratios of 2.78, 2.22 and 1.67 was experimentally studied and compared with that of cast concrete beams with the same material, size and shear span ratio. The experimental results revealed that compression single bond shear failure occurred in all three groups of beams without web reinforcement. Under different shear span ratios, the shear strength of the 3D-printed beams decreased by 18.7%, 12.1% and –1.3% compared with that of the cast beams. On the basis of the experiments and analysis, a simplified calculation method for the shear strength of 3D-printed concrete beams is proposed. The simplified method considers the decrease in shear strength of printed concrete beams as the strength of the concrete materials decreases, and the magnitude of this decrease is related to the stress transfer path. When the shear span ratio increases, the angle between the main stress and the 3D printed concrete layer decreases, and the tensile strength of the concrete is close to the interlayer strength. In contrast, when the shear span ratio decreases, the strength of the printed concrete approaches the strength of the matrix concrete. By using this simplified method, the deviations between the calculated shear strength of the beam and the experimental results were 2.8%, 0.6% and 7.2%, respectively.

→| Read the full paper at **https://doi.org/10.1016/j.istruc.2025.109023**



a Failure mode for B-1-C



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