

Blast Resistance Performance Evaluation of Reinforced Concrete Columns with Various Structural Details

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ABSTRACT

This study investigates the impact of blast loads on reinforced concrete columns, employing ductility-based and residual strength-based evaluation methods. It examines the influence of longitudinal and transverse reinforcement ratios and axial load ratios on blast resistance. Augmented longitudinal reinforcement significantly enhances blast resistance by mitigating displacement and strength damage, while increased transverse reinforcement substantially improves lateral resistance. However, elevated axial load ratios exacerbate displacement-based damage that is attributable to the P- Δ effect. A comparative analysis between the two evaluation methods reveals limited consistency, highlighting the necessity for an integrated evaluation approach that incorporates both ductility and strength for an accurate assessment of blast resistance in forthcoming research.

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