

A study on the impact behavior of shear unbonded post tensioned concrete beams under drop weight impact using non-linear finite element modeling methods

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ABSTRACT

This paper presents the analysis from the simulation of unbonded post tensioned concrete beams under drop weight impact. Four beams were simulated using non-linear finite element dynamic analysis (NLFEDA) software by impacting a mass of 420 kg at a velocity of 2.5 m/s onto the midspan of simply support beam members. Variables for the concrete beams were the level of post tensioning forces which were equal to 50, 100, 150, and 200 kN per tendon. Beams were designed to fail in shear under static conditions per ACI (2014) code provisions. Analysis was done pertaining to the impacting loads at the midpoint (three point bending configuration), the observed reaction forces at the supports, and member deformation.

REFERENCES

ACI Committee 318 (2014), *Building Code Requirements for Structural Concrete (ACI 318-14) and Commentary (ACI 318R-14)*, American Concrete Institute, Farmington Hills, MI.

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