

**EXPERIMENTAL INVESTIGATION ON FLEXURAL BEHAVIORS OF PRECAST
PRESTRESSED CONCRETE SLABS EXTERNALLY STRENGTHENED
WITH STEEL PLATES**

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Abstract

The objective of this paper is to present the flexural behaviors and modes of failure of the precast prestressed concrete slab externally strengthened by using steel plate. The total of 24 specimens was tested by using a four-point loading test. The specimen variables studied were effective span length of the slab, cross-sectional area of the steel plate, and steel plate-attaching method. The specimens were categorized into 4 groups. It was found that all the slabs studied have a similar load-deflection diagram in the form of the bilinear curve where the first part has a higher slope or stiffness than the second part. At the deflection of $L/360$, the strength and the stiffness of the strengthened slabs were increased from those of the slab without strengthening in the range of 38.1% to 120.1% and 35.3% to 114.4%, respectively. The strength and stiffness of the slabs depend mainly on the strengthening steel plate area and the effective span length of the slab. The modes of failure of the strengthened slabs were found to be progressive and abrupt mode of failure, depending mainly on the cross-sectional area of the steel plate.

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