



## Transfer zone cracking research of a new type of prestressed floor slab

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### Summary

This paper discusses a new typology of precast concrete slab designed for one-way floors. The members, without transverse reinforcement, are prestressed with pretensioned wires or strands. Due of the unusual cross-section geometry of these slabs, and the closely related spread of the prestressing forces, the design is highly susceptible to appear cracking at prestress release. This cracking is related to the existence of high tensile stresses. This explains the documented existence of brittle failure in these members during building construction. Different analytical models have been used to calculate the end zone tensile stress, and the results are disparate. Due to these circumstances, authors are currently performing a research at Technical University of Madrid, whose aim is to find an analytical model to resolve the aforementioned problems.

**Keywords:** prestressed concrete, prestress transfer, pretensioned prestressing steel, built up of prestress, bond stress, bursting, spalling, transfer zone.

### 1. Description of the typology under consideration

A new typology of precast concrete members designed for one-way composite floors was developed in Spain at the beginning of this century. Currently is also produced in other European countries. The members, without transverse reinforcement, are prestressed with pretensioned wires or strands. The cross-section consists in a lower flange and four vertical webs. Interjoist elements lay over the flange, and an upper concrete flange is cast on-site (Fig. 1).