

A STUDY OF ANISOTROPIC SLABS WITH PARTICULAR REFERENCE TO THE EFFECTS OF OPENINGS

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Abstract

The anisotropic slabs designed in accordance with the optimum theory have been tested experimentally. In the design process of such slabs, the optimum theory has been applied in a broad manner, however, to work out the most efficient patterns of reinforcement to carry out the maximum loads possible. The field of the minimum amount of reinforcement in a slab has not generally been explored as such. The basic idea behind the whole experimental programme has been to work out such a pattern of reinforcement, which yields a load carrying capacity better than a slab designed according to the yield line method of Johansen and reinforced with the same amount of reinforcement as the slab under consideration.

Techniques of various researchers have been put together to obtain an optimum layout of reinforcement. The present work therefore follows in general the pattern of Morely's and Rozvany's work.

In all nine anisotropic slabs have been tested in conjunction with their corresponding isotropic slabs. All the anisotropic slabs have been designed with the same general layout of reinforcement, and the amount of reinforcement in anisotropic slabs No. 3-9 has been kept constant. The pattern of reinforcement within the general layout has, however, been varied for all the slabs to find out the most efficient orientation possible.

Except for the first isotropic and anisotropic slabs, all the slabs have been provided with a square opening in the centre of the slab at an equal distance from the boundaries of the slab. The intention behind the provision of the openings has been to observe their effects on the load carrying capacity in particular, of both the isotropic and anisotropic slabs.