EFFECT OF OPENINGS IN PRESTRESSED CONCRETE BEAMS

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by

AHMAD AHMAD M. ABDEL HAMID
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Ain Shams University)

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1 _ Prof. Dr. M. M. El-Hashimy (supervisor)

2 _ Prof. Dr. M. A. Nasr

3 _ Prof. Dr. A. H. Hosny

To my parents

بسم الله الرحمن الرحيم

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INTRODUCTION

General :

In modern and particularly in industrial reinforced and prestressed concrete structures, there is an increasing need for holes and openings at different locations of structural elements. These openings and holes provide the continuity of ducts and pipes, etc. for sanitation, heating, ventilation, air conditioning and other mechanical equipment.

In present construction practice, architects and engineers generally specify that holes have to be provided in the webs of beams to accommodate the passage of utility components. This minimizes the story height and consequently the cost of the building could be reduced.

Openings may be of different sizes and shapes, and may cross the beams in different positions. The presence of such openings will affect the behaviour of the beams to an extent depending on their positions and relative sizes.

Object :

The purpose of this investigation is to study the effect of openings on the behaviour of rectangular