NONLINEAR ANALYSIS OF PLANE FRAME-WALL SYSTEMS

by

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CERTIFICATE

This is to certify that the thesis entitled "Nonlinear Analysis Of Plane Frame-Wall Systems" being submitted by Mrs. Sulata Kayal to the Indian Institute of Technology, Delhi, for the award of the degree of Doctor of Philosophy in Civil Engineering is the bona-fide research work carried out by her. Mrs. Kayal has worked under my guidance and supervision and has fulfilled the requirements for the submission of this thesis which to the best of my knowledge has reached the requisite standard. The material contained in this thesis has not been submitted, in part or full to any other University or Institute for the award of any degree or diploma.

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ABSTRACT

In the thesis analytical methods have been presented for obtaining the complete load-deflection curves of reinforced concrete columns and frames. The methods are based on the finite element technique and take into account both material and geometric non linearity.

A computer method for the analysis of reinforced concrete columns subjected to axial load and uniaxial bending is first presented. Both braced and unbraced columns are considered. The columns can be either elastically restrained or pin ended. A few braced and unbraced reinforced concrete columns are analysed by this method and the results checked against the existing solutions.

This method is then extended to the case of columns under biaxial bending. Again, both braced and unbraced columns are considered. The computer program is verified by solving a few pin-ended and restrained braced columns and comparing the results with existing solutions.

The method is then applied to the computation of the complete load-deflection response of reinforced concrete plane frames subjected to proportional vertical and lateral loading. The program is checked against certain existing solutions.

LIST OF CONTENTS
