Abstract Details

Title: Design of Indeterminate Structures

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Abstract: This paper proposes a method for analysis of statically indeterminate structures, considering the shear deformations, which is an extension to the slope-deflection method, which is used to analyze all kinds of structures in the plane. This methodology considers the shear deformation and flexure. The traditional method takes into account only the flexure deformation and without taking into account the shear deformation, this is how it usually develops structural analysis of statically indeterminate rigid frames. It also makes a comparison between the proposed method and the traditional method as can be seen in the results tables of the problems considered, in the traditional method not all values are on the side of safety. Therefore, the usual practice, without to consider the shear deformations will not be a recommended solution. Then is proposed the use of considering shear deformations and also is more attached to real conditions. This document also gives guidance on designing of statically indeterminate structures. Here theory and practices are discussed in detail to understand the current scenario of designing. Analysis of multi storey building frames involves lot of complications and tedious calculations by conventional methods. To carry out such analysis is a time consuming task. Approximate analysis method and force method for analysis of statically indeterminate structure can be handy in quick analysis so as to get the estimates ready and participate in the bidding process. In this work, the applicability and effectiveness of this method has been checked under various loading conditions. Here loads has been apply on various types of frames, trusses, beams and cables etc. to check the results by deriving equations and solving matrix. It also provides guidance on simple checks to ensure the analysis is correct and an overview of member design for the less experienced designer. This document is limited to the modeling of general building and plant structures of normal proportions under static loading.

Keywords: Indeterminate Structures, Force Method, Approximate Analysis.