

S Y N O P S I S

The present investigation is aimed at studying the behaviour of structural elements in flexure with restrictions to end displacements at supports - a phenomenon very commonly occurring in actual construction, particularly in prefabricated reinforced concrete construction.

In spite of the fact that such end restraint increases the flexural carrying capacity of the members above their calculated strength by 10-20 %, a rational basis of calculation, taking into consideration such effects, is yet to be worked out.

This discrepancy between the actual load carrying capacity of structural members in construction and their flexural strengths calculated by conventional methods of structural mechanics may be attributed to a few basic assumptions made in the analysis. These assumptions are stated and their limitations discussed.

Theoretical investigation was broadly carried out in two parts - first on metallic constructions and secondly, on reinforced concrete members. The effects of limited end displacements of flexural members on their carrying capacities, deflections etc. were studied.

Experimental part of the work consists of the test results of 19 reinforced concrete beams tested to destruction. The tests were planned to study the effect of the following variable parameters: (1) percentage of main reinforcements, (2) the depth to the span ratio and (3) the extent of horizontal restraint to the end sections.

Available data of previous works have also been incorporated.

As a result of these studies certain broad inferences can be made. The presence of restrictions to the end displacements increases the carrying capacity and decreases the deflection of flexural members. In reinforced concrete members this increase in carrying capacity would be more predominant in under-reinforced beams.

A general agreement of the theoretical and experimental work is observed.