C-02

THE IMPORTANCE OF STRUCTURAL STIFFNESS FOR DESIGNING BUILDINGS IN COMPRESSIBLE GROUND

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At present, the design of foundations is based on limiting total settlements, although it is the differential settlements which cause distress to a building. The differential settlements can be controlled by providing stiffness to a structure.

The settlement patterns of a large number of new buildings in the low lying areas in and around Colombo have been studied. From these results, limiting deformation criteria (based on differential settlement) have been established in terms of angular distortion for framed structures, and deflection ratio for load bearing wall structures.

A non-dimensional parameter called the relative stiffness factor is defined. This takes into account both the stiffness of the structure and the stiffness of the ground. Methods are established for determining the relative stiffness factor. The theoretically determined stiffnesses are then compared with the actual stiffness of several buildings as observed by the settlement pattern of the buildings.