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A REVIEW OF THE SPAN-TO-DEPTH RATIO METHODS OF DESIGN

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ABSTRACT

Concrete flat slabs structures are economic and the most popular form of concrete used in multi-storey structures. Deflection of slabs is a principal criterion in design, it governs thickness, which in turn has significant economic impact. Deflection is usually controlled by limiting span/depth ratio. This paper reviews the history of the span-to-depth method of design.

Span/depth ratios are based on knowledge of deflection and in recent years, advances have been made in modelling deflection. Yet, the actual performance of reinforced concrete flat slabs in the field remains largely unknown. Rarely have models been calibrated against actual construction projects. Part of the wider research study aims to document the deflection of a concrete slab in a large residential block. The intention is to note any serviceability issues and to compare design models and assumptions with reality.

The other part of the research is to look at current design limits. Limits on deformation were set many decades ago, when the forms of construction, partitions, finishes, cladding and service were very different from what they are now. Perhaps, the current limits are too conservative. In order to justify change, and enable more sustainable and economic designs, knowledge of the background to current limits and of current performance is needed. Part of that is to review the span-to-depth method of design.

Keywords: Slab deflection, design for serviceability limit state, span/depth ratio, Eurocode 2 design code