

## **Continuous RC slab flexural limit state optimization from slab depth consideration**

### **ABSTRACT**

The use of reliability based structural optimisation is a rational approach that can accounts for the inherent uncertainties associated with the design variables. Despite the availability of this powerful tool its application on real life structures remains a critical issue amongst practicing engineers, principally due to high numerical cost involved in finding solutions using this method. Studies have shown, the few available literatures are mostly on steel structures, and very few covers concrete structures, specifically RC slab. In order to bridge this cavity, this paper present a non-conventional slab depth optimisation for the design of continuous RC slab types. The study seeks to know the effect of reducing the current minimum design depth applicable for two-way slab confirming to standard fire resistance requirement, REI240 on flexural capacity requirement along both axes with the use of first order reliability method. The study was limited to four different rectangular slab ends condition. The study safety analysis results in comparison with weighted least square and objective cost functions evaluation shows good prospect in terms of cost saving and yet avoiding flexural failure through the application of the aforementioned rational method.

**Keyword:** Rectangular slab; Optimisation; Reliability; Design depth; FORM