

Effects of graded concrete on compressive strengths

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Abstrak

Concrete is a favoured building material due to its ease of production and use. Even though the concrete mix is designed to have a uniform strength throughout the entire member, casting, as well as the basic characteristics of the concrete materials, could yield a non-homogeneous constitution, resulting in a concrete strength gradation as a function of the depth of the member. A functionally continuous and smooth strength gradation of the concrete member along its axis or section is defined as graded concrete. The objective of this research is to analyse the influence of two different concrete compressive strengths that composed the graded concrete member. The study is split into two parts: the experimental work describing and identifying the mechanical properties of functionally graded concrete and the finite element analysis implementing these property variations in a model. The results showed that the concrete gradation influenced the ultimate strength of a member negatively and altered the stress distribution and displacement response of the specimen.