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.