

CIRIA GUIDE C766: AN OVERVIEW OF THE UPDATED CIRIA C660 GUIDANCE ON CONTROL OF CRACKING IN REINFORCED CONCRETE STRUCTURES

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Abstract

This paper provides a brief overview of the updated version of the CIRIA C660 guide on control of thermal cracking, which has been used extensively in the UK and is also popular across Europe. The updated guide is entitled CIRIA C766 – Control of cracking caused by restrained deformation in concrete. It aims towards designing reinforced concrete structures subjected to restrained thermal and shrinkage deformations in a more efficient and sustainable manner, as well as less conservatively while maintaining an adequate degree of safety.

The primary updates present a design approach more closely aligned with BS EN 1992-1-1+A1:2014 and BS EN 1992-3:2006. Revisions include limiting cracking widths, calculation of restraint considering early age and long-term effect and viscoelasticity, models to predict temperature histories of concretes containing mineral additions, as well as a more sustainable selection of parameters relevant to the estimation of crack inducing strains and minimum steel required to control crack widths. Nonetheless, there are still aspects of design that may have not been adequately addressed, potentially requiring further improvements.

Keywords: Early age/Long term cracking, crack control, restraint, thermal and shrinkage cracking

1. INTRODUCTION

Cracking due to restrained volumetric changes in reinforced concrete (RC) structures has long been a recognised problem. This cracking occurrence is predominately associated with imposed deformations due to thermal and shrinkage (autogenous and drying) related effects, at both early ages and long-term, and it is often desired to control them in terms of the resulting crack width [1]. The primary reasons that crack control in RC structures is of great importance for the serviceability limit state design quoted in C766 are: a) ensuring adequate durability of concrete depending on exposure conditions throughout a specified design service life, b)

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