



The 5% Solution

Ashok Malhotra, Dan Carson, Scott Funnell, Julien Koop

WSP Canada Inc. Ottawa, Ontario, Canada

Contact: Ashok.Malhotra@wspgroup.com

Abstract

Opportunities abound in the field of structural design to make a meaningful contribution towards the reduction of our carbon footprint. Typical construction materials—steel and concrete—are among the highest CO₂-emitting materials during their production. Production of one tonne of steel emits 1.8 tonnes of CO₂, and production of one cubic meter of concrete, on average, emits 250 kg of CO₂. A modest reduction in the use of steel and concrete in structural designs will go a long way in reducing CO₂ emissions. The analysis of structural designs by us and other authorities shows that a reduction of 5% of steel and 5% of concrete in a building can be achieved without impacting the structural integrity by just being a little more judicious while designing. Being environmentally mindful while designing structural elements is what we call the 5% Solution.

Keywords: buildings; sustainability; greenhouse gas emissions; concrete; cement; steel