**COMBINING DURABILITY AND SUSTAINABILITY IN MATERIAL SELECTION FOR CONCRETE**

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**Conference:**……………..

**Theme:**……………………

**ABSTRACT.** The paper is concerned with selecting materials for concrete that is both durable and sustainable and the issues associated with achieving this. The paper starts by reviewing the current situation in standards and then progresses to consider the work of several studies exploring sustainability options for concrete (through novel cement combinations, efficiency in mix proportioning and alternative aggregates) and their influence on various aspects of durability (including carbonation rates, chloride ingress and freeze/thaw attack). It is demonstrated that these can be used to effectively match the performance of conventional concrete. The paper then explores the relationship between durability (chloride ingress) of various cement combination concretes and their environmental impact (measured in terms of embodied CO2 (ECO2)). This suggests that there is likely to be the need for some compromise in achieving performance and lowest ECO2. It is also noted that some of the low ECO2 concretes require longer times to attain the early strength necessary for structural applications. Thus factors relating to construction may also need to be included when considering durability and sustainability in the material selection process.

**Keywords:** Durability, Sustainability, Cement, Material selection, Embodied CO2

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