

## Sustainable Bridges – Implementing Owner Sustainability Requirements

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### Abstract

In recent years, significant steps have been taken to improve the sustainability performance of buildings, most commonly by defining mandatory requirements through laws and regulations in a 'top down' approach. But how are the principles of sustainability being brought into the world of bridges? Are similar 'top down' approaches being used? After setting out the subject of the paper and defining the 'top down' approach to implementation of new practices within the construction industry, a case study is presented which reviews how requirements for sustainability have been introduced into the existing framework for the technical approval of bridges in the United Kingdom. The advantages and disadvantages of such an approach are discussed.

**Keywords:** Bridges; sustainability; technical approval; case study.

### 1 Introduction

Achieving change, such as adopting the principles of sustainability in the construction industry, is frequently only accomplished by the imposition of new laws and regulations from above, which in turn foster innovation and development amongst researchers, designers, manufacturers and constructors. This does not have to be the case, but doing things differently usually implies extra costs for those involved, at least in the short term, which can be difficult to justify in a competitive business environment. Therefore, a degree of compulsion is usually required in order to bring about change.

This paper presents a short investigation of the implementation sustainability requirements by a particular responsible authority in the bridges sector (or in this sense 'Owner') using such a 'top down' approach.

The intention of this paper is to prompt discussion, investigation and development of how sustainability is being delivered by Owners in the bridges sector.

### 2 Background

The past 20 years have seen significant improvements in the environmental performance of buildings. Particular attention has been given to the 'whole-life' performance of buildings, where the majority of embodied energy and CO<sub>2</sub> impacts have been found to reside. Changes have taken place in the materials and methods used in heating and insulation, in the optimal use of natural day-lighting and in the better management of water, both clean and waste. Architects and engineers have addressed new challenges by creating new solutions which have yielded laudable results. 'Sustainability' is a strong marketing point for new buildings and rating,