

Adding value through innovation in structural design: 1 – Introduction, with reference to innovation in bridge design

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Abstract

Innovation is vital in any developing and growing society. It undoubtedly adds value in structural design, but the engineer's appointment needs to be such as to allow it to occur. The issues touched on briefly in this paper, and the four other associated papers, will be debated at the Seminar on this topic at the conference.

Keywords: Innovation, radical change, added value, incremental improvement, bridge design, seminar introduction.

1 Introduction

This short paper presents some of the background to the subject of adding value through innovation in structural design – the theme of an open forum discussion seminar organised at the conference by the Institution of Structural Engineers. It is the introduction to a series intended to stimulate debate on this important topic.

Innovation is the lifeblood of any engineering enterprise that seeks to improve the efficiency, economy and effectiveness of the engineering solutions we devise. To engineer is to innovate, and engineering without innovation is largely unthinkable. However, some engineers seem content to repeat themselves and avoid the apparent risks of innovation. Others might like to try something new but the terms of their appointment prohibit the extra time and rigour needed to develop genuinely innovative solutions.

The challenges and opportunities presented by the need to innovate are the theme of the seminar. This paper introduces the subject, and touches on some specific innovation examples from the author's experience in the world of bridge design and construction.

2 Innovation in Structural Engineering

All engineers like to think that they are innovative, and many clients ask for innovation, sometimes without knowing quite what they mean by it, and look for evidence of innovative solutions when selecting their structural engineering consultants. But what is innovation in the context of structural engineering, why is it important, and how does it add value to a project?

For many, the word innovation implies some significant step change; a radical departure in a new direction that has not been tried before. For others, innovation is a small incremental change; an improvement on previous practice but hardly anything new. Both are important, but the risks associated with each are generally very different.

2.1 Radical Innovation

Radical innovation, sometimes called disruptive innovation, can result in significant change and opportunity for those daring enough to give it a go. It can set a whole new direction for a business and deliver significant added value to a client by saving time and money in construction, operation and maintenance, and in other ways.