



Construction innovation: theory & practice

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Abstract

The challenges of reducing global output of greenhouse gases and the need for resource efficiency require a step-change in the way we construct buildings. However, the construction industry has a reputation for being conservative and slow to change. This lecture will present a case study of innovation and describe an emergent framework for describing innovation in construction.

Keywords: Construction innovation; Case study; innovation framework; Ferrocement;

1 Introduction

A recent scenario analysis suggested that if the UK construction industry is to meet its greenhouse gas targets, embodied carbon intensity in construction projects may need to fall by up to 67% by 2027 (1). Innovation will be critical to reach this goal. However, the industry's reputation for conservatism suggests that the required change may not occur unprompted. Previous research has shown the importance of capability, opportunity and motivation for delivery of construction innovation on construction projects (2). These aspects are explored in the context of a case study. An emergent framework for assessing interventions to promote innovation will then be presented.

2 Innovation case study

The Stavros Niarchos Foundation Cultural Centre (SNFCC), Athens, Greece was opened in 2016 providing new homes for the Greek National Library and National Opera. While the project is a showcase of innovative engineering, the

innovation process for the 10,000m² ferrocement solar canopy is the focus of this presentation.

2.1 Motivation – constraints & aspirations

2.1.1 Project contexts, client requirements

The client wanted to deliver a world class cultural centre in Athens, a seismic zone. After an international competition, the Renzo Piano Building Workshop (RPBW) was appointed to deliver the project. The client adopted RPBW's design vision for the scheme. The strength of the client's commitment encouraged the team to work together to overcome the site constraints to deliver the scheme and architectural vision. That vision, in itself, became a constraining factor on project decisions, leading to the development of the ferrocement canopy.

2.1.2 Aspirations: Delivery v deliverable

While the time and cost budgets during delivery were important on this project, the client also wanted to ensure that RPBW's vision was successfully delivered. To achieve this, they were