INNOVATION IN CONSTRUCTION - EXPERIENCES FROM A HYPOCAUST SYSTEM IN AUSTRALIA

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Abstract
Introducing new technologies poses a particular challenge to the players involved in a project. For a successful low energy building, a new design process is required and players must assume new and additional responsibilities. Hypocaust systems, where conditioned or non-conditioned air is passed through ducts within the concrete floor or ceiling of a building prior to its delivery to the rooms, are starting to appear in new buildings in Australia. This paper describes the lessons learned from the early experiences with a hypocaust system, installed in a new building in Melbourne. It concludes that a more cooperative process among all those involved in introducing and using a new 'technology' is essential if the problems described are to be avoided or at least minimized.

Keywords
Design process, hypocaust systems, innovation, low energy building, technology introduction

INTRODUCTION

We are living in the era of significant change with respect to the type of building now being designed and erected. Driven by environmental concerns, particularly the need to reduce greenhouse gas emissions, many of our new buildings are now being described as 'low energy', 'sustainable', 'green' and even 'deep green'. In Australia, to this point in time, the impetus for this change has come from clients, who for a variety of reasons are responding to increased levels of environmental awareness, but increasingly the driving force will be legislation.

The development of new materials and technologies, the "hardware", becomes available as demand grows and manufacturers usually adapt to marketplace changes. The "software", however, which includes the knowledge required to operate innovative systems, new design and commissioning processes, and cooperative working between the parties involved, tends to lag behind hardware development. This means problems, failures and less-than-optimum outcomes due to lack of experience and cooperation between the main players are possible.

This paper further develops ideas previously explored by Fuller and Luther (2003). It describes some of the pitfalls that exist and the problems that have been encountered when introducing a new technology into the construction industry. In this instance, the new technology is the hypocaust system. Since the case study described in this paper is almost certainly the first application of this technology in Australia, the experiences should be of value to other first-time users. The technical performance of the hypocaust, its design details and any performance are only reported where necessary to illustrate problems that have occurred and their possible causes.