UNIVERSITY OF CAMBRIDGE
Department of Engineering

CONSTRUCTION ENGINEERING MASTERS DISSERTATION ABSTRACT

Safety Performance Implication of Construction Using Offsite manufactured Products: A Study of Risk Perception and Behaviour

With construction consistently acknowledged as one of the most dangerous industries to work in, off-site manufacture (OSM) is widely supported to reduce accidents and improve safety performance. OSM construction removes a number of high frequency, low severity risks from the construction site, and replaces them with fewer, low frequency, but potentially high severity risks. Studies suggest that these risks should be easier to identify and control however there is little evidence to demonstrate this to be the case.

A lack of workplace studies linking construction risk perception and risk taking behaviour present an opportunity for this research. It is clearly important to understand how individuals on site form their views on the risk faced, how they assess and identify the risk, and what assumptions they make before deciding how to act. The study therefore aims to investigate how risk perception of workers towards OSM affects safety performance.

A qualitative research approach was applied to a case study using embedded units; two Laing O'Rourke concrete framed construction projects. Data collection involved twelve semi-structured interviews with frontline workers on these two projects. Secondary data from observation and document reviews supported the interviews by way of triangulation. Content analysis was carried out using a constant comparative method.

The study findings demonstrate that working with OSM products is seen as both undemanding physically and mentally; and whatever happens, in the eyes of the worker, it's safer than in-situ construction. Furthermore, although OSM construction demands strict process adherence to maintain safety, it is suggested that this need is incompatible with project constraints. Workers will act unsafely because the system allows it; limited training in technical risks, inconsistently applied controls, and repetition of errors in supply mean that workers feel flexibility is crucial to meet demanding schedules. Workers adjust their behaviour to balance out these constraints because the perceived risk is simply not big enough for them to think twice, and because they perceive the risk they are taking is both normal and acceptable.

As the study can do little to challenge the increased pressure that workers feel OSM construction sometimes creates; recommendations are made to improve the accuracy of risk assessment, and to challenge risk acceptability by increasing consistency of delivery.

The main conclusion to be taken from the study is that risk perception must be considered fundamental within safety planning. Through ignoring how risk is framed and communicated and by inconsistently applying controls; serious accidents with OSM are not unlikely, but inevitable.

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