UNIVERSITY OF CAMBRIDGE
Department of Engineering

CONSTRUCTION ENGINEERING MASTERS DISSERTATION ABSTRACT

OPTIMISING THE DESIGN AND MANAGEMENT OF FALSEWORK AND FORMWORK TO INCREASE PRODUCTIVITY AND COST CERTAINTY

The UK construction industry is often marred by its poor reputation for projects going over budget and historically low levels of productivity. Landmark projects such as Crossrail and HS2 are lambasted when budgets escalate whilst construction productivity levels appear even worse when compared to the automotive and aeronautical industries. The temporary works sector is no exception to this industry wide criticism, yet little is understood about the scale of these issues and what can be done to tackle them. Formwork and falsework are items of temporary works, essential for the construction of concrete buildings and structures. This research project aims to investigate the key barriers to improved productivity and cost certainty within the formwork and falsework sector and recommend steps to minimise their effects. The aims of this study run in parallel to two of the governments ambitious Construction 2025 targets: reducing the initial and whole life cost of built assets by 33% and reducing project completion times by 50%.

A survey questionnaire was identified as the most effective method to gather data from across the formwork and falsework sector on productivity and cost certainty. Stakeholders were identified from 84 different companies which lead to 520 questionnaires being distributed. 131 of these were completed in full. Importantly, there was at least one response from every job role and organisation type identified. The survey response rate was 25% which was higher than similar studies have achieved.

The findings confirmed that over 70% of respondents considered productivity and cost certainty to be an issue in the formwork and falsework sector. Formwork and falsework design briefs were found to lack the quality and detail needed, reducing productivity significantly in the design phase. Inadequate and ineffective on-site management of materials and components was identified as the leading cause of reduced productivity on site and the second highest cause of cost increases. Cost certainty was found to be most significantly improved by minimising or eliminating late design changes.

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