

CONSTRUCTION ENGINEERING MASTERS DISSERTATION ABSTRACT

What active measures are adopted to effectively manage defects and rework in UK construction projects?

The consequences of defects and rework can be severe for construction organisations. Conservative estimates indicate that rework accounts for up to 12.5% of construction project spend. Managing defect and rework prevalence offers a significant opportunity for increased efficiency and profitability. To reduce rework on a project, defects must first be recognised and assessed to establish the root causes and develop active management measures.

Previous research highlights both the root causes of defects and the challenges in their identification. Moreover, there are proposals that contractors can be unwilling to freely report defects. As a result, learning opportunities were often lost despite many learning techniques being available. This is reflected in the type of research that has been carried out, which to date mainly focuses on the root cause of defects and rework. Research has been either questionnaire-based qualitative studies or highly detailed quantitative, observation-based studies on one specific project, typically yielding low numbers of defects from which to carry out detailed analysis.

This research aims to supplement current studies utilising qualitative data captured on three recently completed, large-scale construction projects, each of which employed strategies that demonstrate how effective management and reporting can reduce pre and post practical completion defects and rework providing opportunities for future learning; the projects used for this study each adopted their own methods to manage defects and rework.

The projects selected for the study were JCT Design and Build and FIDIC forms of contract, ranging between £72m and £187m in total value procured via a two-stage bid strategy. Information was collected via a series of semi-structured interviews with key members of the management team from each of the projects. All the research participants were directly involved with the management of defects and rework on each of their respective projects.

The research and analysis revealed that the selected projects applied various strategies of structured and effective defect management, following a mix of both pre-established and project-specific developed processes, facilitating high-level quality control and process improvements. All projects were actively open in defect reporting and addressing rework during the construction phase. This in turn enabled pre-completion rework to be undertaken promptly when key supply chain partners were still present on the projects and before the buildings being handed over to the end-user and put into service.

The findings of the study indicate that an increased frequency of pre-handover defect reporting and rework being undertaken led to a reduced frequency in both pre-completion and post-completion defects occurring during the defect's liability period on the case-study

projects. The analysis focuses on the quality management strategies and organisational learning techniques employed by the case study projects, reducing the need for costly rework, increasing project margins, facilitating the completion of high-quality end products, maintaining reputations, and enhancing key client relationships, leading to repeat business.

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