UNIVERSITY OF CAMBRIDGE
Department of Engineering

CONSTRUCTION ENGINEERING MASTERS DISSERTATION ABSTRACT

The Applicability of Off-Site Manufacturing Strategies in the UK Housing Market

This thesis was a study into the relationship between the housing market and the application of offsite manufacturing strategies. It was aimed at drawing conclusions about how market factors will affect the appetite for off-site manufactured housing and how the construction industry should target specific markets in order to increase the foothold for off-site solutions.

The problems that motivated the research were the lack of quality sustainable housing being constructed and the minimal implementation of off-site strategies in the UK market. Current population and household forecasts suggest that demand is outstripping supply and that the type of tenure is shifting from owner occupier to private rented due to difficulties in securing finance. A review of the current housing market was carried out to demonstrate the need to increase housing production. Using case studies the evidence presented shows how various existing off-site solutions are being used to fill the gap between supply and demand. In doing so, this model for housing development is also tackling issues of efficiency and sustainability for new housing stock and raising the standards for new developments. The data from these case studies were then used to show how the effect of mass production and reaching scale with a solution could significantly increase the affordability of off-site strategies. This was a key finding within this thesis and forms the basis for justifying the applicability of off-site strategies using appropriate markets as a means of generating volume.

The research showed that the cost base for Build for Sale developers was extremely low and unlikely to be a market appropriate for off-site solutions at this stage. It was shown that the use of off-site manufacturing for Public Private Partnership (PPP) developments aligned neatly with the requirements of investors and others likely to support such developments. The key drivers for this are an increase in overall quality, reduced on-site programmes and reduced maintenance throughout the life of the development. More certainty around all of these metrics allows for more confidence around investment decisions. PPP Build for Social Rent is already starting to gain traction due to existing support from Government with the use of public land. It was suggested that by gaining traction in the above markets and reaching scale with manufacturing the cost base could be reduced sufficiently to enter the Build for Sale market. It was suggested that further investigation would be required to understand the exact reductions in cost achievable for mass produced housing.

Some additional support and incentives are likely to be required from Government in order for institutional investors to embrace the build to rent market segment and off-site methods of construction and these were briefly discussed. Further areas of research that are suggested as a result of this are an investigation into UK Government policy on incentivising investment in manufacturing and UK Government policy on mortgage lending as a mechanism of regulating the housing market.

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