PERCEIVED CONSEQUENCES OF COUNTERFEIT, FRAUDULENT AND SUB-STANDARD CONSTRUCTION MATERIALS

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Abstract

The quality and suitability of construction materials has a significant impact on critical parameters such as time, cost, and quality in a construction project. Counterfeit, fraudulent and sub-standard (hereafter; CFSS) construction materials is a relatively unknown aspect in the literature. CFSS could potentially affect the degree of project success for both the client and the contractor. This research aims to answer the following research questions: What are the consequences of CFSS materials for the industry? What are the consequences of CFSS materials for the construction process? What are the consequences of CFSS materials for the final material? The research methods consist of a literature review and primary data was collected from the use of 13 in-depth interviews with key personnel from the client, contractor and supplier side of the Norwegian AEC-industry. The study is limited to the Norwegian AEC-industry. The research shows that CFSS-materials affects time, cost and quality in both the construction process and the final product. The use of CFSS-materials could provide “positive” consequences as competitive advantages for the contractor, but not without seriously risking negative consequences as loss of reputation, legal sanctions and/or extra costs. Consequences for the client can – if lucky – be none. If unlucky, the consequences can be higher operational costs or – if really “unlucky” – total structural collapse. The AEC-industry should be aware of false materials, and this paper contributes to exploring a relatively unexplored field within supply chain management in construction projects.

Keywords: Supply chain management, Procurement management, International construction issues, Quality management in construction

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1. **Introduction**

This paper presents an analysis of the perceived consequences of counterfeit, fraudulent and substandard (CFSS) materials in the Norwegian Construction Industry. The construction process is complex and includes a large number of different actors. Construction projects are known to have a potential downside that is larger than the upside (i.e., profit margins). Problems may occur when the strive for profit is combined with information asymmetry, giving rise to opportunistic behaviour [1]. In order to ensure profits, the actors may try to reduce costs by using CFSS materials. Therefore, CFSS materials constitute a threat to products, processes and the whole AEC-industry. According to Bloch and Bush [2], the phenomena can be understood in two dimensions, represented by the supply and the demand side. The supply side focuses on anti-counterfeiting activities and measures to mitigate the threat. The demand side focuses on why and how the phenomena is spreading and why consumers buy counterfeited products.

The Organisation for Economic Co-operation and Development (OECD) states that counterfeiting and piracy are economically driven. Demanders are individual consumers as well as firms that use the products as a transitional component in their production process [3]. Similarly to the view of Bloch and Bush [2], they divide the phenomena into demand- and supply drivers. Demand drivers are the features of the product, the consumer and the institutional environment in which demanders navigate. Supply drivers are market characteristics, technological and logistical considerations and the institutional environment [4]. The OECD stated that in 2013 counterfeit and pirated products accounted for as much as $461 Billion in world trade [3], a large increase since their previous report that estimated $200 Billion in the 2008 [4]. In 2015, the European Custom authorities made over 81,000 detentions (cases) valued at 640 million Euros [5]. The report also provided data on countries of origin, showing that the main source for false materials was China. In 2016, US Homeland Security reported 31,560 cases of intellectual property rights (hereafter; IPR), an increase of 9 percent since 2015. The report estimated seized goods to be worth $1.4 billion [6].

According to Gou and Liu [7], materials represent a substantial part of the total value in construction projects. An important aspect of construction projects is supply chain management and procurement of materials. The process of procuring is mainly concentrated on two aspects: 1) supplier selection and 2) procurement cost optimization [7]. If not proper materials are delivered, the entire construction chain is unstable, so CFSS materials provide a threat to productivity in construction projects. Koskela [8 149] describes waste as a non-value adding activity. Non-value adding activities such as inspections and control could be necessary, while activities as corrections, waiting and stop in production are categorized as unnecessary. To sum up; the use of counterfeit, fraudulent and sub-standard materials does exist in the construction industry. It is difficult to measure the extent, and the consequences seems to be somewhat unexplored. What is certain is that the consequences for the AEC-industry, the construction process and the final products are not beneficial. Therefore, this research aims to answer the following research questions: 1) what are the consequences of CFSS materials for the industry? 2) What are the consequences of CFSS materials for the construction process? 3) What are the consequences of CFSS materials for the final product?

The study is limited to an investigation of the perception of potential consequences among key industry actors within the Norwegian AEC-industry. The analysis does not include an investigation of cases of CFSS or an objective assessment of the extent of CFSS materials within the industry. Thus, it does not seek to provide any form of ‘complete’ list of consequences. The essence is to contribute to the pool of knowledge regarding potential threats to the construction supply chain (CSC) and to increase awareness among industry actors. Further work needs to be done to address the magnitude and possible mitigating strategies.

2. **Methodology**

The topic of CFSS materials seems not to be thoroughly investigated in the context of the construction industry. Therefore, in accordance to the prescription of Blumberg [9], an exploratory research methodology was chosen. This research on consequences is a follow-up on previous research conducted on the phenomena in Norway. This research started in 2014 with an extensive literature search, followed up with a pilot-survey regarding different aspects of counterfeiting. The survey was modelled after a survey carried out by CII [10]. Further, research on the existence of the phenomena was conducted in the first quarter of 2016. This research materialized as a research paper published in the summer of 2016 [11].

The methodology for the research presented in this paper consisted of two phases: a literature-review and data-collection. The first step was a critical review of existing literature according to the prescription of Blumberg [9]. The review exposed the limited pool of research that existed on CFSS materials within the construction industry. Because of the scarcity of literature, the review included research not directly related to the construction industry. Thus, to identify real consequences from the use of CFSS materials, the review was supplemented with a search on...
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