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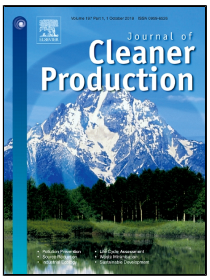

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Searching for an optimal level of prefabrication in construction: An analytical framework

Weisheng Lu[1], Ke Chen[2], Fan Xue[3], and Wei Pan[4]

Abstract

Many countries or regions, in recent years, show a rising interest in prefabrication as a "cleaner" production strategy to meet their enormous construction demand, e.g. for housing and infrastructure. Along with this trend is the observation that many governments tend to set forth a high level of prefabrication as a part of their ambitious construction plan. This paper argues that unnecessarily a higher level of prefabrication is better and develops an analytical framework for questing the optimal level of prefabrication adoption in a certain PEST (political, economic, social and technological) background. This framework contains thirteen PEST factors affecting the prefabrication adoption, including policy, supply, labor, social attitude, user acceptance, and so on. These factors in combination will determine the optimal prefabrication adoption level from 0 to 4, which was defined by Gibb 2001 to represent the range from entire cast-in-situ construction to complete prefabricated building, respectively. The framework was substantiated by using Hong Kong's prominent offshore prefabrication construction as a case. It was identified that Levels 2 and 3 are the optimal level of prefabrication adoption subject to the current PEST background in Hong Kong. This paper helps to clarify the prevailing misconception that "the higher the prefabrication level, the better". The developed framework can be used by other economies to devise their proper prefabrication roadmaps.

Keywords: prefabrication; construction; analytical framework; Hong Kong

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