Critical Factors Affecting Effective Management of Site Personnel and Operatives in Confined Site Construction

John P. Spillane, School of Planning, Architecture and Civil Engineering, Queen’s University Belfast, Belfast, UK
Lukumon O. Oyedele, School of Planning, Architecture and Civil Engineering, Queen’s University Belfast, Belfast, UK
Jason von Meding, School of Planning, Architecture and Civil Engineering, Queen’s University Belfast, Belfast, UK
Ashwini Konanahalli, School of Planning, Architecture and Civil Engineering, Queen’s University Belfast, Belfast, UK
Babatunde E. Jaiyeoba, Department of Architecture, Obafemi Awolowo University, Ile-Ife, Nigeria
Iyabo K. Tijani, Department of Graphic Design, Yaba College of Technology, Lagos, Nigeria

ABSTRACT

The aim of this paper is to identify and classify the numerous managerial issues encountered in the management of personnel in confined site construction. For the purpose of this research, a confined construction site is defined as a site where permanent works fit the site footprint, extending to levels above and/or below ground level, leaving spatial restrictions for other operations (e.g., plant and material movements, materials storage and temporary accommodation etc.) and require effective resource co-ordination beyond normal on-site management input. A literature review and analysis, case studies incorporating interviews and focus groups, and a questionnaire survey were used in order to gain a comprehensive insight into the issues of management of personnel in a confined construction site environment. The following are the top five leading issues highlighted; (1) Accidents due to an untidy site, (2) One contractor holding up another because of the lack of space, (3) A risk to personnel because of vehicular traffic on-site, (4) Difficult to facilitate several contractors at one work location, and (5) Numerous personnel working within the one space. In today’s modern environment, spatial restrictions are quickly becoming the norm in the industry. Therefore, the management of personnel on-site becomes progressively more difficult with the decrease in available space on-site. Where such environments exist, acknowledging the numerous issues highlighted above, aids site management in the supervision and co-ordination of personnel on-site, thus reducing accidents, increasing productivity and increasing profit margins. As on-site management professionals successfully identify, acknowledge and counteract the numerous issues illustrated, the successful management of personnel on a confined construction site is achievable. By identifying the numerous issues, on-site management can proactively mitigate such issues through adopting counteractive measures and through successful identification of the traits identified.

Keywords: Brownfield/Brown Site Development, Confined Site Construction, Modern Construction Management Techniques, Personnel Management, Strategic Management, Urban Development

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INTRODUCTION

Over the last decade, the construction industry has entered a point of transition in the environment in which it operates. Due to global changes in the movement of population densities, there is a noted regression in rural population densities in favour of urban environments (United Nations, 2008a, 2008b, 2010), resulting in the need for extensive redevelopment of urban centres. With the significant increase in the development of urban centres (Angel, Sheppard & Civco, 2005) and the continued influx of population (Li et al., 2007), increased development of urban centres is essential to accommodate the population explosion (Jones & Evans, 2008; Roberts & Sykes, 2000). In addition, urban centres are not expanding outwards but, contra to belief, are being re-developed from within (Biddy, 2009), thus further illustrating the increased development of inner city, urban site development in the industry.

With this increased urban development comes increased management of the available space. The site which occupies the majority of the site is now commonplace (Tindiwensi, 2000), which results in increased management of the various resources on-site. Effective site management of a construction project can be largely attributed to the characteristics of the site environment in which the development is located (Chau & Anson, 2002; Lambeck & Eschemuller, 2008). In urban centres, increased spatial restrictions are present, resulting in increased management of various resources (Singer, 2002) such as the need to acknowledge and accommodate the various facilities within a specific space (Tam, Tong, Leung, & Chin, 2002; Samdani, Bhakal, & Singh, 2006; Zhou, Abourizk, & Al-Battaineh, 2009), but in particular, on-site personnel.

The effective management of the construction industries most important resource – personnel (Egan, 1998) requires considerable management interface (Thomas & Horman, 2006). This is illustrated in the high fatality figures present in the industry (Sawacha, Naoum, & Fong, 1999; Perttulaa, Merjamab, Kiurulaa, & Laitinen, 2003; Mitropoulos, Howell, & Abdelhamid, 2005), reduced productivity (Thomas et al., 2006; Enshassi, Mohamed, Mustafa, & Mayer, 2007), improper site layout planning (Tam et al., 2002; Elbeltagi, Hegazy, & Eldosouky, 2004) and effective scheduling and programming (Thomas et al., 2006; Faniran, Love, & Li, 1999). In addition, effective spatial management is often conducted in an ad-hoc, intuitive nature, thus further exasperating the issue (Arditi, Sikangwan, & Tokdemir, 2002; Mohamed & Anumba, 2006; Winch & North, 2006). As a result, the need for effective management of the assignment and utilisation of the limited space on-site to meet the requirement of personnel is a factor in the management of urban, confined site environments.

When reviewing the abundance of literature on the subject of effective personnel management in the construction industry (Loosemore, Dainty, & Lingard, 2003b; Cooper, 2004; Winch, 2010), the vast majority of authors disregard the effect spatial restrictions have on the management of personnel on-site. Some of the literature focuses on the design management aspect, prior to the commencement of the works (Gambatese & Hinze, 1999; Weinstein, Gambatese, & Hecker, 2005) while others focus on site specific issues such as the design site layout (Elbeltagi et al., 2004; Khalafallah & El-Rayes, 2004; Mawdesley, Al-Jibouri, & Yang, 2002), movement of materials (Haslam et al., 2005), the movement of construction plant (Soltani & Fernando, 2004) and the general site environment (Mohamed, 2002), all with respect to health and safety of personnel on-site.

The objective of this research is to highlight the issues in the management of personnel on confined construction sites. Through highlighting the numerous issues, on-site management can acknowledge the various concerns and implement numerous strategies to mitigate these issues, should they arise.

By conducting a literature review and case study analysis, an exhaustive list of possible issues emerged. These factors were included
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