PRECASTING IN SINGAPORE’S DESIGN & BUILD PROJECTS

LIM Jiann Yeh\(^1\), WANG Shou Qing\(^2\) and TIONG R\(^3\)

\(^1\) Department of Building, National University of Singapore, Singapore 117566. Email: bdgwq@cma.nus.edu.sg
\(^2\) School of Civil and Environmental Engineering, Block N1, Nanyang Avenue, Singapore 639798. Email: clktiong@e.ntu.edu.sg

Abstract
A key means of upgrading the construction industry in Singapore is to improve the existing industry techniques and practices that affect construction productivity and cost efficiency, in addition to reviewing the management practices of the industry. Precast technology is not new to the industry, but its use in the local context is still limited for many reasons. The use of Design & Build (D&B) systems also has a long history of development. Its emphasis on a single source of responsibility has an influence on the design aspect, which tends to be more buildable. This study investigates in detail some critical issues related to precasting in Singapore’s D&B projects through a questionnaire survey followed by several interviews. It verifies that although D&B encouraged the adoption of precast technology, contractual adoption is still dependent on various factors, especially the cost factor. Other findings, especially the benefits attained through D&B projects when the appropriate precast technology is also integrated, and measures for promoting precasting and D&B in Singapore, are also presented.

Keywords
Precasting, Design & Build, Cost, Productivity, Buildability.

INTRODUCTION

In the 1992 Construction Productivity Task Force Report (CIDB 1992), one of the long-term key directions urged in raising the productivity of the construction industry in Singapore is the development and promotion of more buildable designs. Priority areas are the precasting of structural systems and architectural external and internal walls, taking into account lean construction considerations. In addition, the promotion of D&B as an alternative procurement approach for construction projects is another priority area.

The traditional procurement system in Singapore generally separates design from construction. Since designers are not responsible for construction, there is little incentive for them to adopt a design that will minimise construction costs and increase productivity. On the other hand, due to the constraints of time, there is little opportunity for contractors to propose cheaper and more suitable alternative designs.

In many Western countries, for the tendering purpose designers only perform the preliminary design and stipulate performance specifications. The contractors tender on a lump sum basis to meet the performance specifications and perform the detailed design of the main structural members, reflecting their competence. Potentially, productivity achievement should be better, as construction considerations are taken into account at the design stage.