



Evolvement of New Precast Retaining Wall Design in Malaysia

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Abstract

Escalating labour and material costs are the main challenges for the builders in the current competitive construction industry especially for conventional in-situ retaining wall construction. Laborious practices using timber formwork and in-situ reinforced concrete have been proven very wasteful and not sustainable. To alleviate the problems, modularized precast retaining wall panels with efficient structural section and easy-to-construct features were developed and introduced in local market since year 2002. Tee-shape precast panels with specially profiled rib were designed to facilitate single-lift operation and top-down construction with minimal in-situ concreting works. The precast system with speedy construction process has gained popular acceptance for market segments of wall heights of 3m to 9m. Brief outlines of the evolvement and development trends, and projections of further research and development works are presented.

Keywords: precast retaining wall; top-down construction; cantilever wall, counterfort wall; research and development.

1 Introduction

Earth retaining structures are commonly built in the man-made environment to support earth platforms with abrupt change in level. Besides temporary shoring works and permanent applications in supporting building platforms, retaining walls are also widely used in the civil infrastructure projects for stabilization of slopes, road embankments and riverbanks. For the marine and coastal protection works, retaining walls are the structural elements for the construction of harbour, slipway, quay, wharf and breakwater structures.

The retaining wall structures are made from various building materials and available in several

structural forms like gravity, cantilever, reinforced soil, embedded wall (Figure 1) or hybrid system for maintaining the stability. Their usages have increased enormously in recent decades especially in the urban areas due to high land cost, where vertical walls are built to maximize the space utilization for economic reasons. Indeed, major advances in the understanding of soil mechanics, analytical theories, reinforcing techniques and concrete technologies have contributed greatly towards the development of new design concepts with better performance and features. In this context, reinforced concrete retaining walls are becoming more popular in comparison to other wall systems, especially for wall heights over 3m. Besides cost factors, the popularity is also