



Innovative Uses of Marine Mud for Construction

Patrick Pak Wai LEUNG

Senior Structural Engineer, Hong Kong Housing Authority, Kowloon, Hong Kong

Contact: patrick.leung@housingauthority.gov.hk

Abstract

Soft and bouncy marine mud was successfully converted into eco-friendly and inexpensive Cement-Stabilized Marine Mud (CSMM) for earthwork, and also Marine Mud Made Materials (MMMM) for blockwork in a public housing development project in Hong Kong. These green initiatives were the first of their kinds in Hong Kong and resulted in a saving of about HK\$6M (SEK 6.6M or US\$ 0.8M) in the project.

Keywords: Marine Mud, CSMM, MMMM, Innovation, Green-initiative, Green-treatment, Cement-stabilization, Eco-friendly, Cost-effective

1 Introduction

The construction site was located at Site 1A of the former Hong Kong Kai Tak International Airport which was reclaimed from the foreshore of Kowloon Bay in the early 1920s (Fig. 1). In those days, marine mud was not removed from the seabed before reclamation.



Figure 1. The Site

The Site had an area of 3.47 hectares and was subject to a maximum domestic plot ratio of 6.3. The development mainly consisted of 5,204 public

rental housing flats in six high-rise residential blocks ranging from 34 to 40 domestic storeys.

At planning stage, ground investigations revealed that fill of heterogeneous composition could be found anywhere in the Site. Among the different soil types in the fill was the marine mud, estimated at approximately 16,000 cubic metres, which would be excavated from construction activities (Fig. 2); it was equivalent to the total volume of six standard Olympic swimming pools dumped into all the landfills in Hong Kong for four days. The marine mud was regarded as waste material which had little usage in construction. Under normal circumstances it would be disposed of in local landfills or marine dumping sites. However, as the disposal options were not sustainable from the environmental and the technical perspectives, the Project Team thus explored green initiatives to recycle and reuse the waste material without undue risks to human health or the environment or disproportionate costs; they developed the innovative Cement-Stabilized Marine Mud (CSMM) for earthwork and the Marine Mud Made Materials (MMMM) for blockwork.