



THE HONG KONG
POLYTECHNIC UNIVERSITY
香港理工大學

ABOUT THE HONG KONG POLYTECHNIC UNIVERSITY:

The Hong Kong Polytechnic University is a university with a proud and illustrious history. Formerly known as the Hong Kong Polytechnic, the Institution assumed full university status in 1994.

PolyU is strategically located in Hung Hom, Kowloon, on a site of approximately 93,500 square metres adjacent to the Cross Harbour Tunnel. There has been extensive development and rapid expansion since the last 10 years. The University is the largest UGC-funded tertiary institution in terms of number of students. A wide range of courses which directly meets industrial, commercial and community needs is offered. In addition to meeting Hong Kong's manpower requirements, PolyU also makes significant contributions towards the territory's success by providing the public and private sectors with its expanding range of consultancy, professional training and applied research services. Through these activities, the University maintains a strong partnership with the business and industrial sectors.

<http://www.polyu.edu.hk>

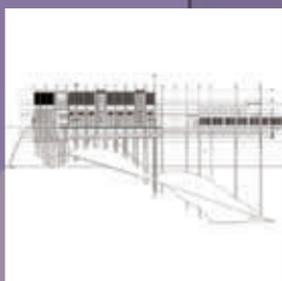


ABOUT THE DEPARTMENT OF BUILDING AND REAL ESTATE:

The department is one of the oldest departments in the Hong Kong Polytechnic University and has been producing graduates for the construction, real estate, and related industries for over 60 years. During this time they have helped develop the infrastructure and services of the region. Many of our graduates now occupy important positions in industry. They represent an important group of people contributing to the growth and development of Hong Kong.

Today we are educating and training young people for the future of Hong Kong and China. We provide educational programmes in the construction and the real estate sectors which will enable students to develop their full potential for personal and academic development and will enable them to practice and lead within their chosen professional discipline. Our aim is to provide programmes that are application orientated, and produce graduates who can apply theories in practice. To ensure this our research is of an applied nature relevant to industrial commercial and community needs. We have established and will continue to develop dedicated partnerships with business, industry and the professions.

<http://www.bre.polyu.edu.hk>



PROJECT USING BIM

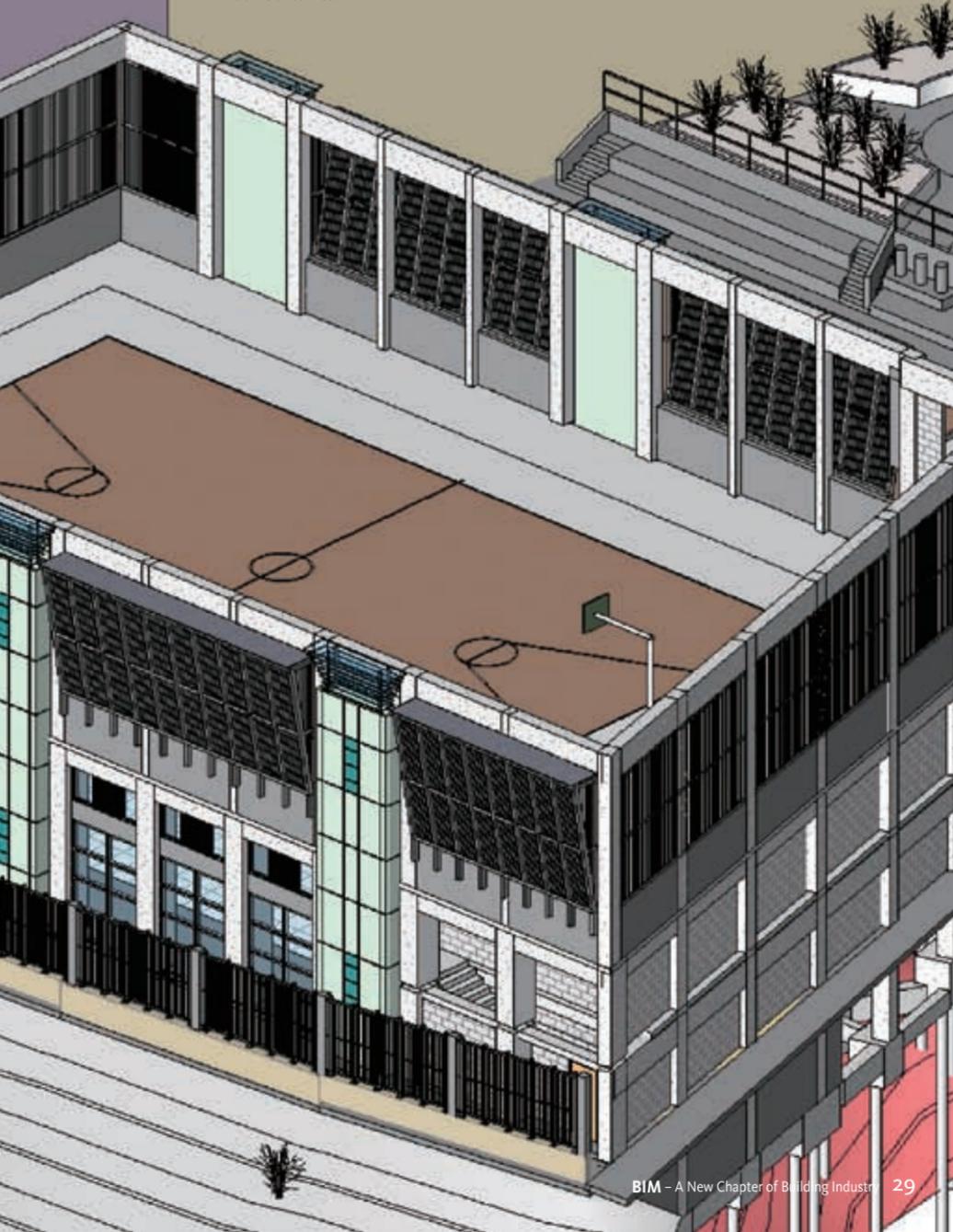
Project: Proposed Swimming Pool at
Fukien Secondary School, Hong Kong

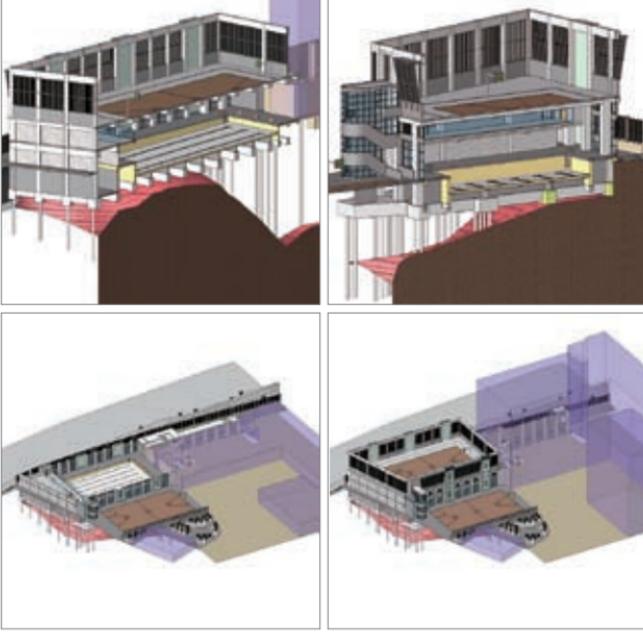
Location: Kwun Tong, Kowloon, Hong Kong

Type: Sport facilities

DESCRIPTION OF THE PROJECT

The project is a 2-storey in-door swimming pool which is an extension to an existing secondary school in Hong Kong. It is situated on top of a cut slope where the bed rock profile varies from 3.9m to 26.8m below the existing ground level. The foundation comprises 76 mini-piles with each pile penetrating 3.3 meters below the rock surface. The filtration plant, a 6-lane pool measured 15m x 50m, a male and a female changing room, an external basketball court and associated performance stage and planters. Another basketball court on the roof is accessible through an external staircase and a walkway connecting the existing school. The pool is equipped with some “green” features including solar chimneys, reflector panels and photovoltaic panels. The design was awarded a “Merit in Environmental Design” in the research and planning category by the Professional Green Building Council (PGBC, 2006). The construction commenced in November 2006 and is expected to be completed by September 2007. The implementation of BIM in this project is lead by the Project Manager (PM) and a BIM Manager rather than the design consultants.





CHALLENGES OF THE PROJECT

This is the first project in which BIM is applied by the Project Management team. The objectives are two folds: (i) to equip the PM team with the BIM techniques, and (ii) to study the use of BIM in material take-off in the field of quantity surveying. The main challenges came from learning BIM and building the model within a tight timeframe.

HOW BIM HELP

The integrated architecture and structure model was built using Revit Building 9.0. The software package has a built-in materials takeoff function. Once the function is chosen, a new materials takeoff dialogue box appears. The whole model is composed of different categories of building elements such as columns, windows and furniture. A single category or multi-category can be selected from given lists. The taking off can be targeted at either existing or new phases of construction. After making the selection, the materials takeoff properties dialogue box pops up. The fields of the materials schedule can then be chosen from a list of available fields. The schedule content can be filtered, sorted, and grouped according to need. Once all the selections are made, the materials schedule is automatically tabulated.

The key findings are the differences between Model Quantities and Bills of Quantities. An understanding of how the model quantities are derived by the built-in material takeoff function is essential in the first place. In summary, BIM is a new tool to facilitate material takeoff in quantity surveying. The domain knowledge of quantity surveyors is of vital importance for generating bills of quantities from building information models. However, it may not be the case in some countries where the quantity surveying profession does not exist and the method of measurement is more flexible.

SIGNIFICANT IMPROVEMENTS

The advent of BIM has lead to new thoughts and practices in the construction industry. Yet, computerization does give rise to concerns on the future value of some labour intensive tasks. Material takeoff is one of those which can be preformed automatically and accurately using BIM.

Reference: Tse, T.C., Wong, K.D. and Wong, K.W. (2007) "Design Visualisation and Documentation with Building Information Modelling – A Case Study". Proceedings of Computer Aided Architecture Design Research in Asia (CAADRIA) Conference 2007. Southeast University, Nanjing, 25-27 April 2007.