

INDUSTRY DEVELOPMENT

Case Study

CONSTRUCTION INDUSTRY TRANSFORMATION: 18 WESTLANDS ROAD, HONG KONG – A CASE STUDY IN BUILDING INFORMATION MODELLING (BIM)

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ABSTRACT

This presentation will describe the implementation of Building Information Modelling (BIM) technology and working methods on the procurement and construction of a new 70 storey office tower in Hong Kong. This project is an example of Global Construction Industry Transformation which, in part, seeks to employ state of the art digital tools and processes to substantially reduce waste, save time and improve quality.

The owner, Swire Properties Limited in Hong Kong, commissioned Gehry Technologies to provide the technology for, organize and manage the BIM for this new project. The owner implemented BIM as part of his initiatives to help to bring about the following improvements in this project, and ultimately to the industry as a whole:

- Comprehensive 3-dimensional geometric co-ordination of all building elements prior to tender.
- Enhanced quantity take-off from the BIM to improve speed and accuracy of the preparation of bill of quantities in Hong Kong Institute of Surveyors format - prior to tender.
- Lower, more accurate tender pricing resulting from reduced unknowns and risks.
- Automation and interoperability of 2-dimensional drawings with 3-dimensional building information model.
- Creation of reusable catalogue of intelligent parametric building parts (knowledge capture).
- Management of construction sequence and process modelling using the BIM elements.
- Reduction of waste in the construction throughout the entire process.
- Reduction of claims on site resulting from incomplete design coordination.
- Quicker construction.
- Lower construction cost.
- Continue to maximise safety.
- Better build quality.
- Facilities maintenance using the BIM elements.

A BIM project office was established adjacent to the construction site in Hong Kong. The owner, project design consultants, and the project BIM consultant, Gehry Technologies (GT) began the process of working together in the same project space to create a single, 3D electronic Building Information Model. Representatives from the organisations of the owner,

the architect, the structural engineer, the mechanical and electrical services consultant, the quantity surveyor, potential main contractors and potential sub contractors were trained in the use of Digital Project – the software tool chosen to create the BIM for this project.

This presentation will highlight the following key elements of this process which resulted in a highly successful and ground breaking implementation of BIM in real world construction: exhaustive 3-dimensional design co-ordination prior to tender, automated clash identification and management, rule based parametric object creation and knowledge capture, automated quantity take off from the BIM, functional interoperability between 2-D drawings, Excel tables and the 3-D BIM model, file sharing and interoperability over the Internet:, weekly virtual building walk throughs, and construction sequence modelling.

The project is currently under construction, and when it is complete, the owner hopes to save 10% on the construction cost and a number of months on the construction time, largely through the implementation of BIM. As this technology and way of working spread, substantial improvements will be realised by the industry as a whole.