



THE HONG KONG  
POLYTECHNIC UNIVERSITY  
香港理工大學

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# BIM Helps Building to Exacting User Requirements

**Project:** The PolyU Campus in the Shenzhen  
Virtual University Science Park

**Location:** Shenzhen

**Type:** Institutional

**Scheduled for completion:** end of 2009



“The building users could easily look at a 3D model, and found it impressive”

Ms Margaret Lam,  
Project Manager,  
Campus Development Office,  
The Hong Kong Polytechnic  
University

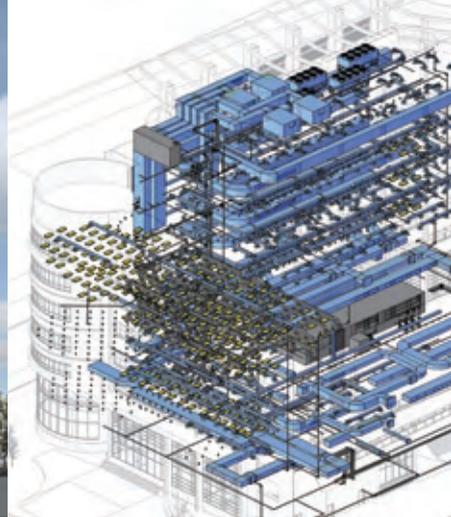
The building of the Hong Kong Polytechnic University campus in the new Shenzhen Virtual University Park has been built to exacting user requirements. With a total floor area of 16,500 square meter, including the basements, it comprises three blocks, which are three, six and seven storeys high.

With classrooms, offices and laboratories, the building had to meet the needs of a variety of users. With challenges including a host of design changes made through to construction stages, a 40-metre height constraint, and need for coordination between project teams in Hong Kong and Shenzhen, BIM was adopted for the design process.

### **Easy transfer of information from Autodesk Revit**

This is the first full project by the Campus Development Office of the Hong Kong Polytechnic University in which BIM has been used. Margaret Lam, Project Manager of the office, knew of BIM – including as a contractor for a previous project used BIM to simulate the precast construction, but relied on the project architects – from Aedas – for actual implementation, including through use of Autodesk Revit. It helped that project consultants were also familiar with BIM.





Importantly for the Campus Development Office, Aedas advised Ms. Lam that it would be easy to change some of the BIM information into AutoCAD, and to pdf, which is the main software the office uses.

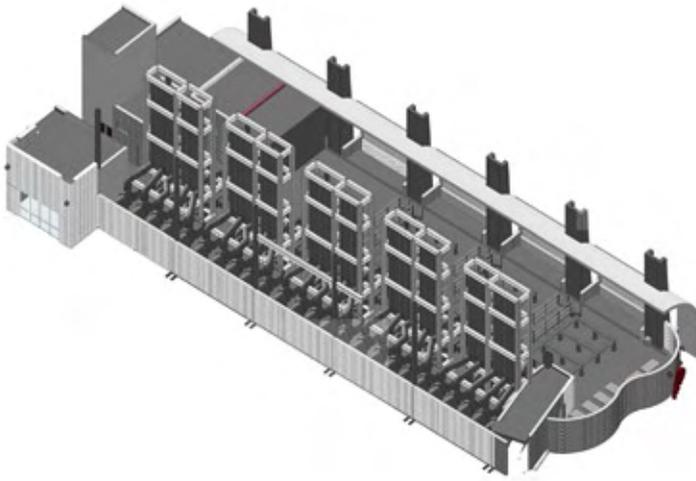
Also, the Hong Kong team worked with a China counterpart – a design institute, which in turn dealt with the government, ensuring the building design met regulations. This made communications relatively complex, and the Autodesk Revit model helped with explaining the design details, as well as producing 2D drawings for submission to the government.

### **3D images helped presentations**

Partly as there was a vetting process regarding the best allocation of space within the building, it was not possible to decide on exact room requirements when the design process began. Here, the BIM model helped with showing end users what the designs would look like in reality, so they could optimise their requirements.

“They could easily look at 3D model, and found it impressive,” says Ms. Lam. Indeed, the whole project team liked seeing actual 3D images rather than just looking at plans.

In some presentations, the designers could show the whole building – albeit without some of the interior details. They could show views walking into the building, as well as the building exterior, relationships to neighbouring buildings,



and even how a car could arrive, and park outside.

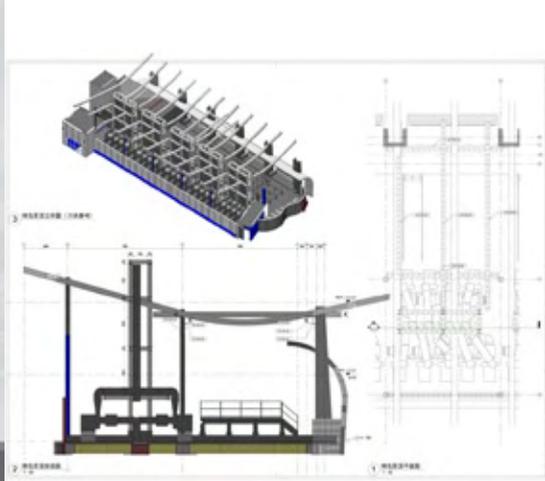
Academics including professors liked seeing animations and 3D images, without which they would have struggled to understand the designers' intentions. For instance, they could see how the lift lobby would look, and appreciate whether ideas they suggested would work in practice.

Using the BIM model for presentations contrasts with traditional presentation methods, in which perhaps three to four weeks is required to use plans to create a 3D representation. As designs are typically polished during this period, the representations cannot fully show the plans at the time a presentation is made. However, using the BIM model means the audience sees how the latest design will appear.

### **Colour codes help systems coordination**

Ms. Lam and colleagues made use of a datasheet with information on room sizes, as well as numbers of different rooms such as classrooms and laboratories. "It was quite easy to ask for this information," she says. "But in other projects, using AutoCAD, we would have to calculate the figures. Indeed, BIM impressed me most with the ease of generating room data sheets quickly and accurately, by consultants who might be just junior staff."

David Fung, the project architect, worked closely with the structural engineer; using the BIM model, they could see inconsistencies, and make changes to prevent clashes during construction. "We shared the files, and could see changes immediately," says Mr. Fung. "This is



unlike using paper, where we have to imagine based on what we have in our hands. You can't see everything on 2D drawings.”

The project team modelled laboratory equipment, including nearly 100 fume cupboards for expelling poison gases, which would be carried through vent and discharged to the air. The team used a colour code for the flues, and used the BIM model to arrange them correctly. They used other colour codes for ducts and pipes for fire services, electrical, plumbing and drainage, and air conditioning. Once these were input, each set of pipes and ducts could be shown individually, using just Autodesk Revit. Many potential clashes were solved in computers, rather than on site.

### **Visualising design intention**

Using the BIM model, the project team produced 250 A1 size tender drawings; none of these had to be drawn by CAD. Most of the spaces documented come with perspectives – probably making this the first project in Hong Kong to include perspectives in full set of tender drawings. The perspectives showed the intended space quality, so help the construction team to visualise design intention, and to ensure the building would look exactly as the designers planned.

Ms. Lam says that the project has proven to be beneficial to the Hong Kong Polytechnic University's Campus Development Office using BIM, and will support contractors that wish to use BIM in further department projects.



**LIFT LOBBY**  
DESIGN CONCEPT



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## 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.

The Campus Development Office, established on 1 October, 2002, is responsible for the acquisition of accommodation, space and land; overseeing the planning and development of the University and managing all capital and alteration & additions works.