

Hong Kong Housing Authority

Project:

Transforming Business Practice in the Delivery of Public Housing as evinced by the project Tung Tau Cottage East (TTCAE)

Location:

Hong Kong

Type:

Public Rental Housing Development

Scheduled Time of Completion:

2014-15

Transforming the Whole Delivery Practice



HA sets up infrastructure to drive BIM

Transforming Business Practice in the Delivery of Public Housing

There is a transformation of business practice within HA involving in-house staff as well as stakeholders in the building industry through the use of Building Information Modelling (BIM) in the delivery of public housing.

HA's vision is to implement BIM in all projects, having seen some fruits of success in enhancing design efficiency and cost-effectiveness as evinced by the project at Tung Tau Cottage Area East (TTCAE).



HA motivates external business partners to use BIM

To support the vision, HA has formed a dedicated BIM Service Team, comprising Architects, Structural Engineers, Building Services Engineers and technical officers. The Team provides BIM modelling services to all project teams, sets up Standards and Guidelines, carries out BIM related Research and Development works and develops in-house libraries. Also, the establishment of a BIM Centre with training facilities and 20 more sophisticated workstations has facilitated users' interaction. BIM users could discuss design using Smartboard and resolve design conflict instantaneously.

With committed efforts in the use of BIM, the business practice of the HA was revamped to bring forth the whole detailed design process. The benefits are evinced in the project TTCAE where a new culture of collaborative design has been successfully implemented.

HA believed that BIM required strong teamwork and partnership. A number of seminars were conducted to share their vision and experience with academia, services providers, consultants and contractors so that all members can get ready to work using BIM, while the academia could train our next generations to be "BIM-literate".



A successful BIM pioneer - Tung Tau Cottage Area East

The Tung Tau Cottage Area East (TTCAE) project

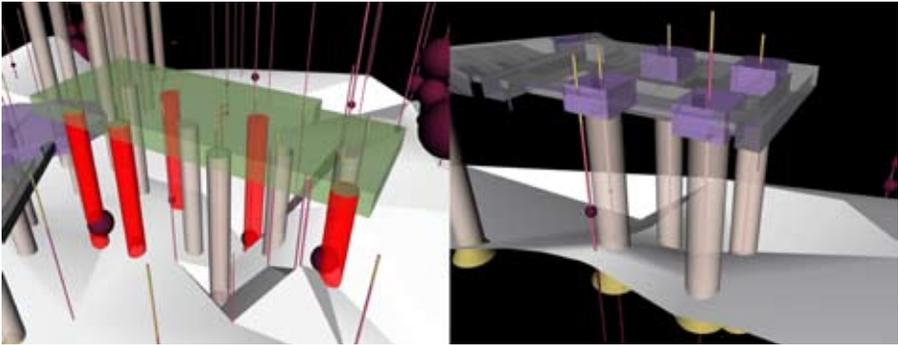
Tung Tau Cottage Area East (TTCAE) was among one of the projects that had been utilizing the BIM technology extensively. The technology was employed in feasibility study, scheme design and detailed design, and would be carried onto construction stage.

TTCAE comprises one 34-storey domestic building. It provides 990 flats, an open car-

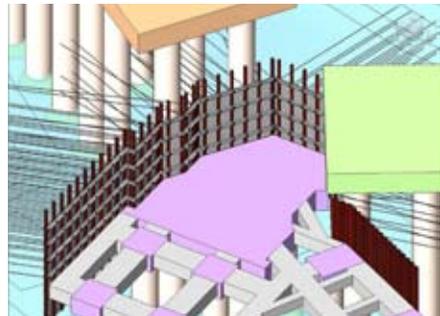
parking and an Estate Management Office, built on complex topography comprising three relatively small platforms with huge level differences requiring extensive site formation works.

i. Refining the Design Decision

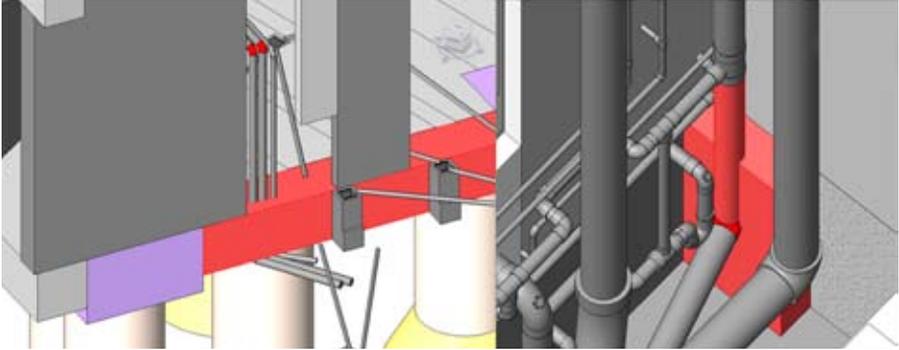
With BIM technology, the HA team was able to generate numerous design options in Revit so that they could select the best design solution.



One example is the use of 'dynamic sectioning' through the site which enabled engineers to visualize the site and the bedrock profiles more thoroughly and designed the most effective foundation system. The HA team carried out studies on various temporary lateral support options for the major excavation for pile cap construction with BIM models. The model helped them to check the viability of installing soil nails through congested pile group.



ii. Enhancing the Coordination between different systems



With BIM at design stage, architects and engineers could understand and resolve design issues without delay. Better co-ordination

eliminated design clashes between different building systems and optimized the design.

iii. Improving Constructability



A detailed 4D virtual construction simulation was created to plan the construction sequence more thoroughly. Not only for the main building, a 4D virtual construction simulation was also created for the site formation and foundation system to ensure that the workflow is accurately planned.

iv. Creating a More Sustainable Design

In TTCAE, the HA team analyzed the performance of different design options using BIM. One example was the making use of the site parametric model developed in Civil 3D to calculate the soil volume, while the team adjusted the site terrain levels, the software automatically calculate the cut and fill of the soil so that the engineers can minimize the soil remove from the site.

v. A Paradigm Shift of the Industry Practice

Before the emergence of BIM, each step of the building process is done sequentially and separately. Nowadays, architects and engineers can collaborate closely at the early feasibility stage with BIM models as common design idea exchange platform instead of sequential steps as observed in the traditional design process. Every project team members could visualize and resolve design issues promptly and comprehensively. As a result, BIM helped the project team to make decisions effectively, eliminate design clashes, co-ordinate better and shorten the drawing production time. Furthermore, they could avoid re-work on site, and thus reduce delay and construction waste during construction stage.

As a large government department, HA is gradually adapting to this new technology. Rather than applying it to a single project, the HA is introducing BIM as a standard to all other projects strategically. From hand drawings to AutoCAD and now 3D building information modelling, HA is moving forward as the technology advances. The construction industry is definitely facing another big shift. It's not just a change from hand drawings to electronic representations. BIM shifted the whole industry practice by pooling professional knowledge right from the start of the design process. In the near future, there will be stronger participation of various building stakeholders in BIM in Hong Kong. HA will continue to play an active role in advocating the use of BIM for a better design and a more efficient output.



ABOUT HONG KONG HOUSING AUTHORITY

The Hong Kong Housing Authority (HA) develops and implements a public housing programme which seeks to achieve the Government's policy objective of meeting the housing needs of people who cannot afford private rental housing. Approximately 30% of the Hong Kong population is now living in public rental housing units.

The HA plans, builds, manages and maintains different types of public housing, including rental housing estates, interim housing estates, and transit centres. In addition, the HA owns and operates some flatted factories and ancillary commercial and other non-domestic facilities.

The Housing Department (HD) acts as the executive arm of the HA to help the Government achieve its policy objective on public housing.