

COMPANY
Architectural Services Department,
HKSAR Government

PROJECT
Refuse Collection Point at Kai Tak
Development, Kowloon

LOCATION
Kai Tak District, Kowloon City

TYPE
Government Refuse Collection Point

SCHEDULED TIME OF COMPLETION
2018 Q2

Virtual Assembly Enhances Real World Buildability



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Architectural Services Department

About Architectural Services Department, HKSAR Government

The Architectural Services Department is a department of Hong Kong Special Administrative Region Government, which performs functions in relation to Government-owned and Government-funded facilities in the areas of development, upkeep, monitoring and advisory services.

Project Description

The project is to design and construct a refuse collection point (RCP) for FEHD in Kai Tak Development, Kowloon. It is located on the eastern corner of the existing pumping station, between Kai Tak Second Lane and Shing Kai Road. The overall site area is 687 sq.m and the total CFA is 507 sq.m. The RCP is provided with basic facilities such as refuse storage, loading and unloading space, office, toilet and changing facilities for staff. Unlike the usual RCP, this building was constructed mainly with a steel structure and designed with glass, masonry blocks and vertical greenery as external façade.

Project Challenges

The project is a minor works project carried by a small-scale contractor. The budget and programme are tight. Careful logistics planning and close project coordination are required to ensure smooth and safe project delivery. The project team faces several constraints: a pre-determined cost ceiling, shortage of resources for the contractor and the required design coordination with various outside parties. These constraints turn into the driving force to improve buildability of the design.

Solutions for challenges

Prefabrication and standardisation of various building elements were examined and adopted.

The BIM workflow enables virtual assembly of precast concrete blocks, structural steel members and modular façade elements. It allows dimensional coordination across multi-disciplines. This virtual reality allows the project team members to visualise the impact of buildability upon various building components from a more holistic perspective, making steps to no frills design and achieving cost effectiveness and LEAN construction.

During the construction stage, the buildability studies conducted through the BIM workflow provides data and insight to the contractor to enhance quality, reduce abortive work, minimise wastage and improve the project's constructability.

How does BIM benefit the project?

Using BIM Technology to achieve LEAN CONSTRUCTION - Reduce Waste & Save Money

BIM was used to achieve a LEAN construction throughout project delivery, in order to minimise wastage, and save money and time for the organisation. Benefits reaped from the BIM model include:

1. Design from small to large scale minimises wastage and enhances site efficiency;
2. Advanced multi-disciplinary coordination reduces contractors' burden during construction stage; and
3. Improved contractor understanding saved time in project delivery and minimised abortive works.

The project used more time than the traditional model in the design stage, but it provides all stakeholders with an in-depth understanding of the proposed design.

Besides, BIM allows the presentation of isometric views in 3D and can enhance the presentation of different elements. It makes the communication with contractors efficient and helps to reduce errors and abortive works on site. Also, 3D images and animations allow client to have a better understanding of the design. Logistical and operational concerns can be raised in the early design stage to improve the final product.

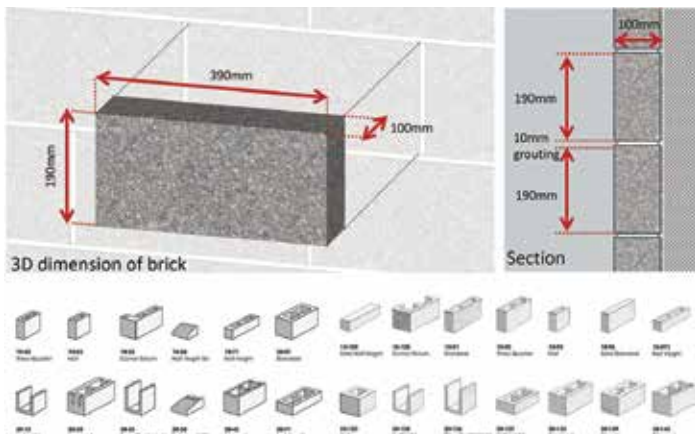
Better with BIM

The BIM model is found to be an effective tool in enhancing communication with stakeholders, e.g. presentations to the client and for statutory submissions. The BIM model is also the clue to the collaboration among project team members. The long adopted linear and sequential information flow among project team members – i.e. Arch → SE → BS → QS – does not accord with the interactive nature of information generation. In this project, in which the BIM model links up all disciplines. Design changes made by one party can be shared instantly. Clashing of structural members with the large air duct is easily spotted, saved the pain in tackling the shortfall in the 2D regime.

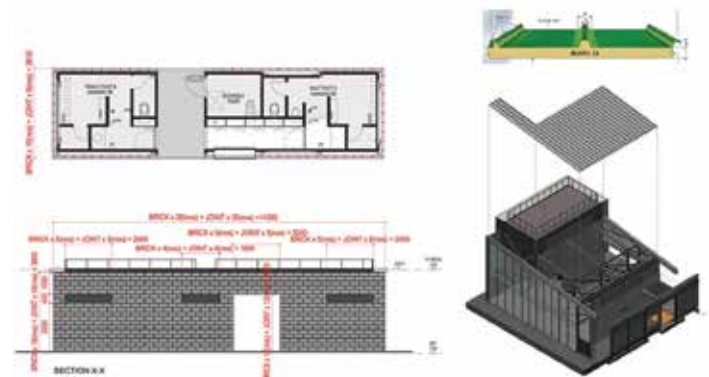
BIM benefits extend to the post-construction stage. RFID will be adopted on steel work in this project to allow the possible reuse on other sites, prolonging the life-cycle of structural members. Integration of RFID technology with BIM facilitates easy element selection and improves a facility manager's information retrieval efficiency during the O&M phase.



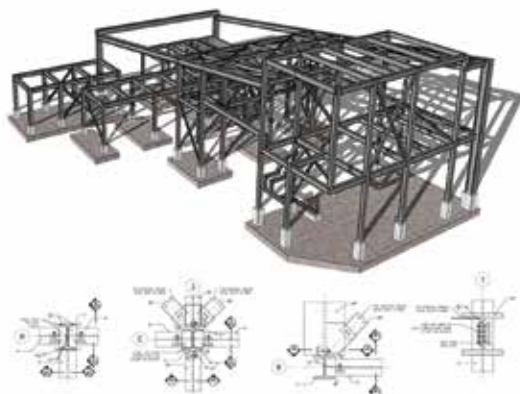
The Kai Tak RCP is constructed mainly by steel structure and designed with glass, masonry block and vertical green as external façade. Image courtesy of Architectural Services Department, HKSAR Government



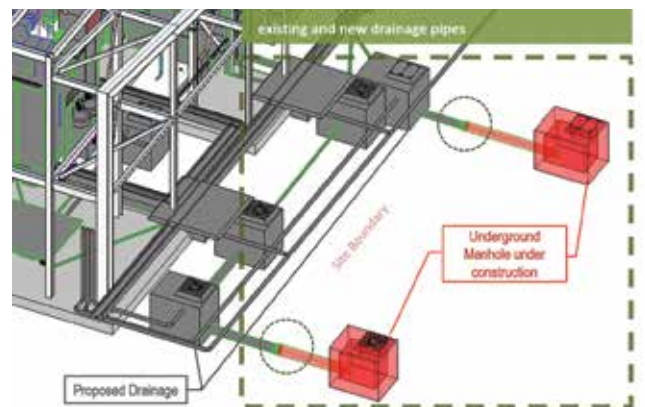
Prefabrication and standardization of various building elements are examined and adopted. Image courtesy of Architectural Services Department, HKSAR Government



Design from small to big scale minimizes wastage and enhances site efficiency. Image courtesy of Architectural Services Department, HKSAR Government



BIM was used to achieve a LEAN construction throughout project delivery to minimize wastage, save money and time for the organization. Image courtesy of Architectural Services Department, HKSAR Government



Advanced multi-disciplinary coordination reduces contractor burden during construction stage and minimized abortive works. Image courtesy of Architectural Services Department, HKSAR Government



Combined Building Services, Air Ducts, Water Pipes, Fire Services (From left to right) Image courtesy of Architectural Services Department, HKSAR Government