

COMPANY

Hip Hing Joint Venture

PROJECT

Design and Construction of West Kowloon Government Offices in Yau Ma Tei

LOCATION

11 Hoi Ting Road, Yau Ma Tei, Kowloon, Hong Kong

TYPE

Design & Build

SCHEDULED TIME OF COMPLETION

2018

Design and Build Better Projects with BIM

“We are trying to use BIM to improve the construction process – it’s helping us make the right decisions, and plan the work properly.”

—Ir Derek So Kwok-leung
Executive Director,
Hip Hing Joint Venture

BIM PARTNERS INVOLVED

Architectural Services Department,
HKSAR Government

Andrew Lee King Fun & Associates
Limited

J. Roger Preston Limited

Siu Yin Wai & Associates Limited



Project overview
Image courtesy of Hip Hing Joint Venture

Hip Hing is developing a BIM process for combined services coordination to enhance the design and construction of a government offices project.

Hip Hing has been awarded a contract by the Architectural Services Department (ArchSD) for the design and construction of the West Kowloon Government Offices. Located in Yau Ma Tei, the West Kowloon Government Offices consists of two office towers with two-storey basements for the accommodation of various government departments. With full support from her client ArchSD, Hip Hing has undertaken to explore the value of BIM in this construction project. It was expected that BIM would deliver multiple benefits for project planning, site administration, safety planning, design coordination and clash detection prior to construction.

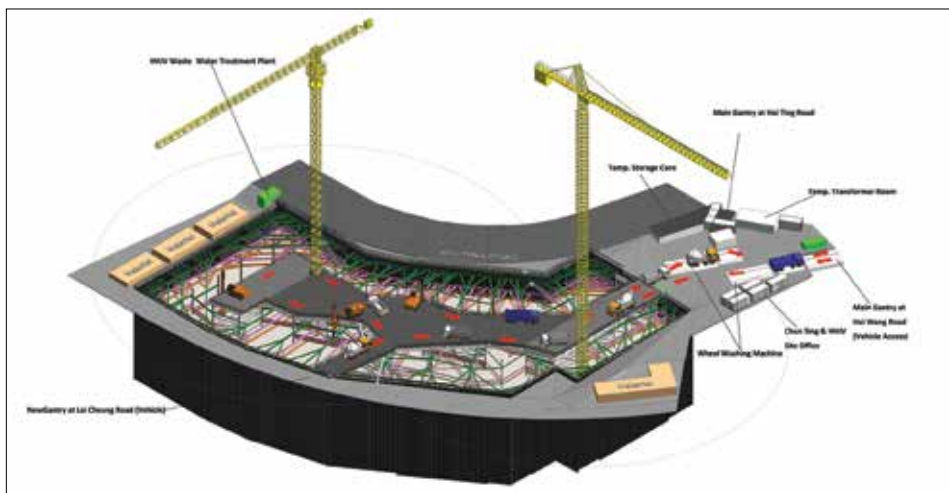
Hip Hing has been working on BIM projects since 2006. On top of her internal BIM section which was established to meet the advanced technological needs of the company as a whole, a dedicated BIM team was formed to improve buildability of the West Kowloon Government Offices project. This special team proactively involves in the whole project life cycle, starting right from the onset of the design stage to the completion of the project.

Basement benefits encourage engineers

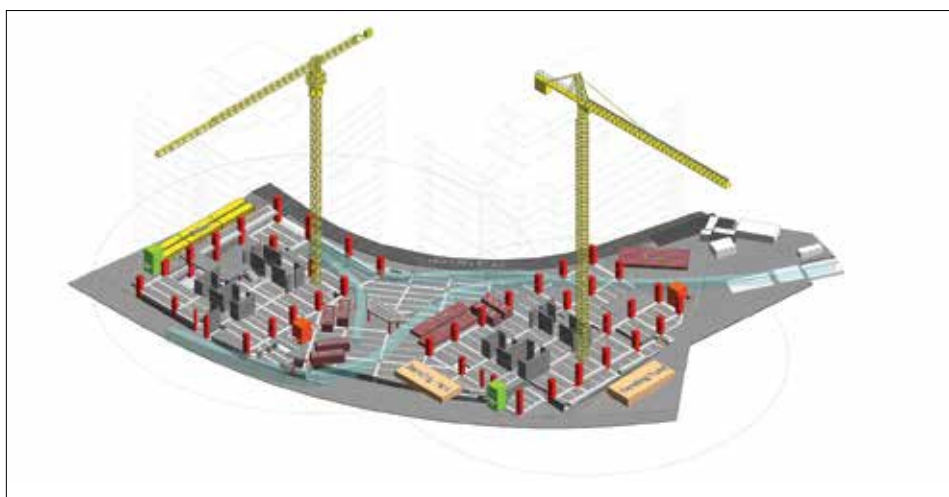
In order to improve site safety, temporary structures like working platform on the Excavation and Lateral Support (ELS) at the basement level were created and optimised within BIM. “BIM model enabled us to identify issues with the ELS, and provide our advices to engineers in a timely manner,” says Mr Froky Wong Yuen Hung, Manager (BIM) of Hip Hing Joint Venture. “At the beginning, engineers were not seeing the benefits of using BIM. They believed 2D drawings were good enough. But, after we presented them a simple model showing a quarter of the ELS to illustrate potential issues. The 3D model not only showed clashes clearly, but also issues like the clearance of elements.” Engineers were being convinced with the benefits of using BIM model after the demonstration and asked if it was possible to have a more detailed walkthrough.

Thereafter, the team deployed BIM to design temporary steel platforms and staircases. During the process, potential safety issues were detected. By conducting swept path analysis, a safer and more desirable truck path and construction sequence was selected.

With help from BIM models, hazards were identified and eliminated in the earlier



Logistics planning during substructure stage
Image courtesy of Hip Hing Joint Venture



Logistics planning during superstructure stage
Image courtesy of Hip Hing Joint Venture

stage of development. It also facilitated the project team to do better site planning. For instance, making optimal use of site space for safe pedestrian paths with railings and convenient vehicular access.

Tower cranes properly positioned

At ground level, the team deployed BIM for site logistics planning, using 4D scheduling and sequencing to identify traffic considerations and potential hazards in the vicinity, especially involving two tower cranes required for construction.

“The site is adjacent to a highway and the work-area of one of the tower cranes will possibly overlap with it,” says Mr Wong. “There will be potential clashes with lighting post and traffic signage. And we need to make sure this will not be the case.”

In the past, engineers need to obtain drawings from government departments and check the cranes against them. But the information could be out of date, so

our project team may have to conduct surveys as well. Upon completion of surveys it still requires some experiences to position the cranes properly.

In this project, the team conducted 3D laser scanning of the site and surrounding areas, and incorporated the data into the BIM model. “3D laser

scanning is fast and making it easier for us to predict the crane movements” says Mr Wong.

BIM Process for Combined Services Drawing

“In traditional BIM, different building services’ trade subcontractors create their own Services Drawings, and put them into the model, before coordination work,” says Ir Derek So Kwok-leung, Executive Director, Hip Hing Joint Venture. “But to improve the coordination process, we adopted a new workflow we call BIM Process for Combined Services Drawing. At the very earliest stage of design, we created the Architectural and Structural BIM model and Building Services BIM model based on single line designs, and then started to find critical areas.”

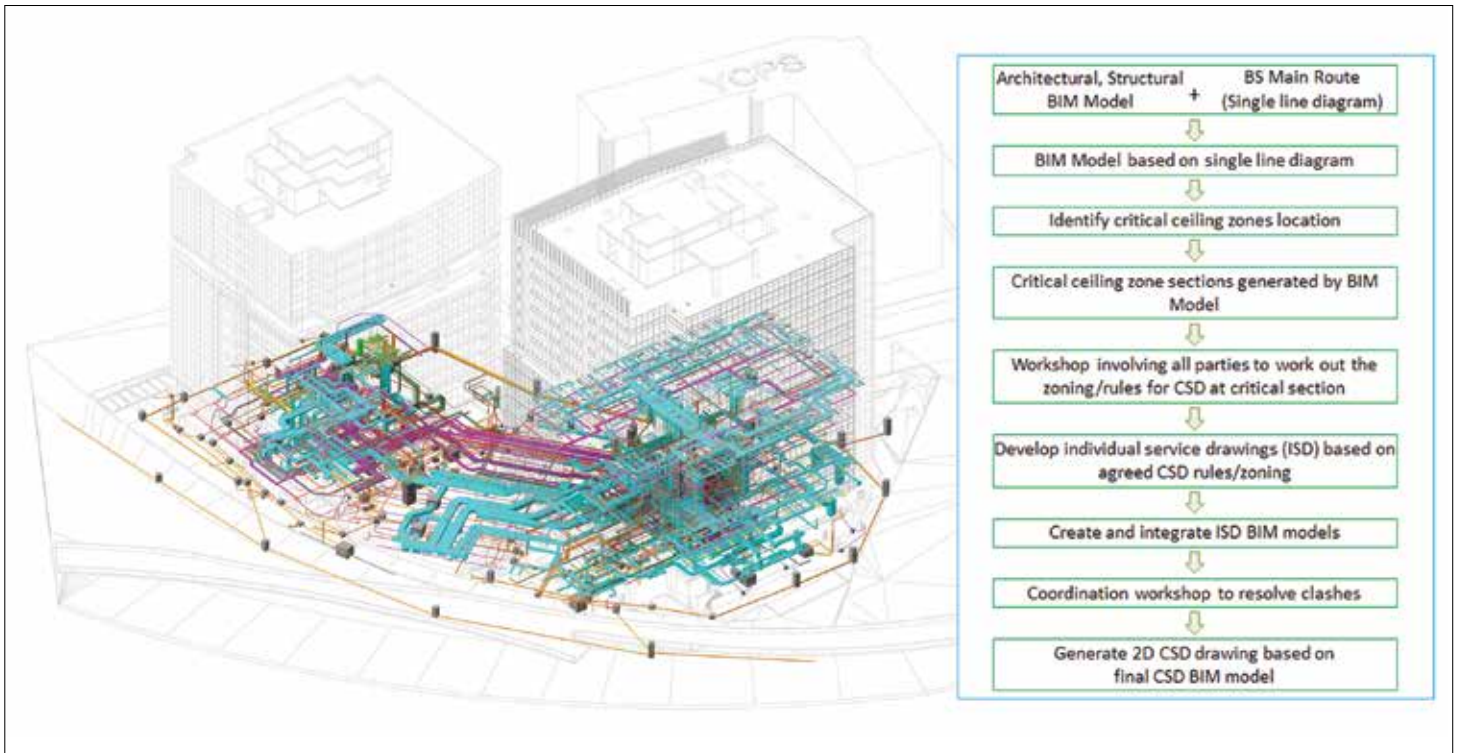
These areas included ceiling zones that were identified based on the BIM model, which was also used to generate sections of these zones. All building services parties were involved in workshops led by the Hip Hing BIM team, to work out the zoning and rules for combining services at critical sections.

“At first, not all building services engineers 100 percent bought in to this process, but they found more effective now with the use of BIM,” says Ir So. “We can combine services more efficiently, with less iteration than in the traditional workflow.”

While the process had previously relied largely on engineers’ experiences, the



Tower crane working radius simulation based on integration of site condition scanning model and project BIM model
Image courtesy of Hip Hing Joint Venture



New workflow for BIM-based CSD coordination
Image courtesy of Hip Hing Joint Venture

Hip Hing BIM team started developing a rule based engine for building services coordination – such as which trade to include first, spatial relationship for individual building services, room for maintenance, etc.

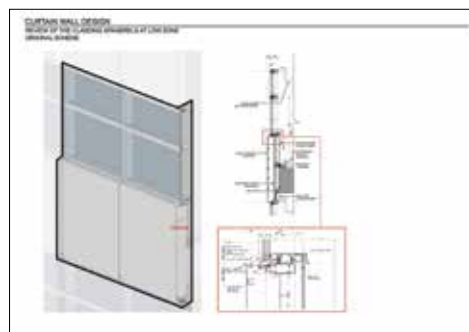
After working on critical zones, the team progressively increased the level of detail in the model. By improving productivity in construction, such as minimising re-working and wastage, they may have saved around two to three percent of the construction cost.

A competitive edge

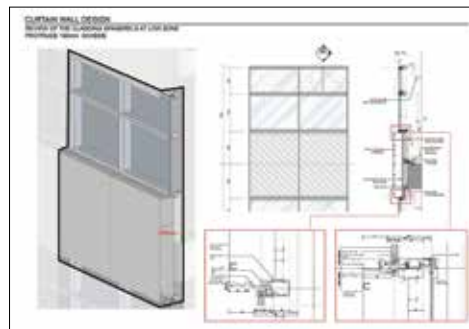
The use of BIM model allows the project team to achieve faster response times for design reviews, including the complicated curtain wall design.

“Plus, we are trying to use BIM to improve the construction process – it’s helping us make the right decisions, and plan the work properly,” says Ir So.

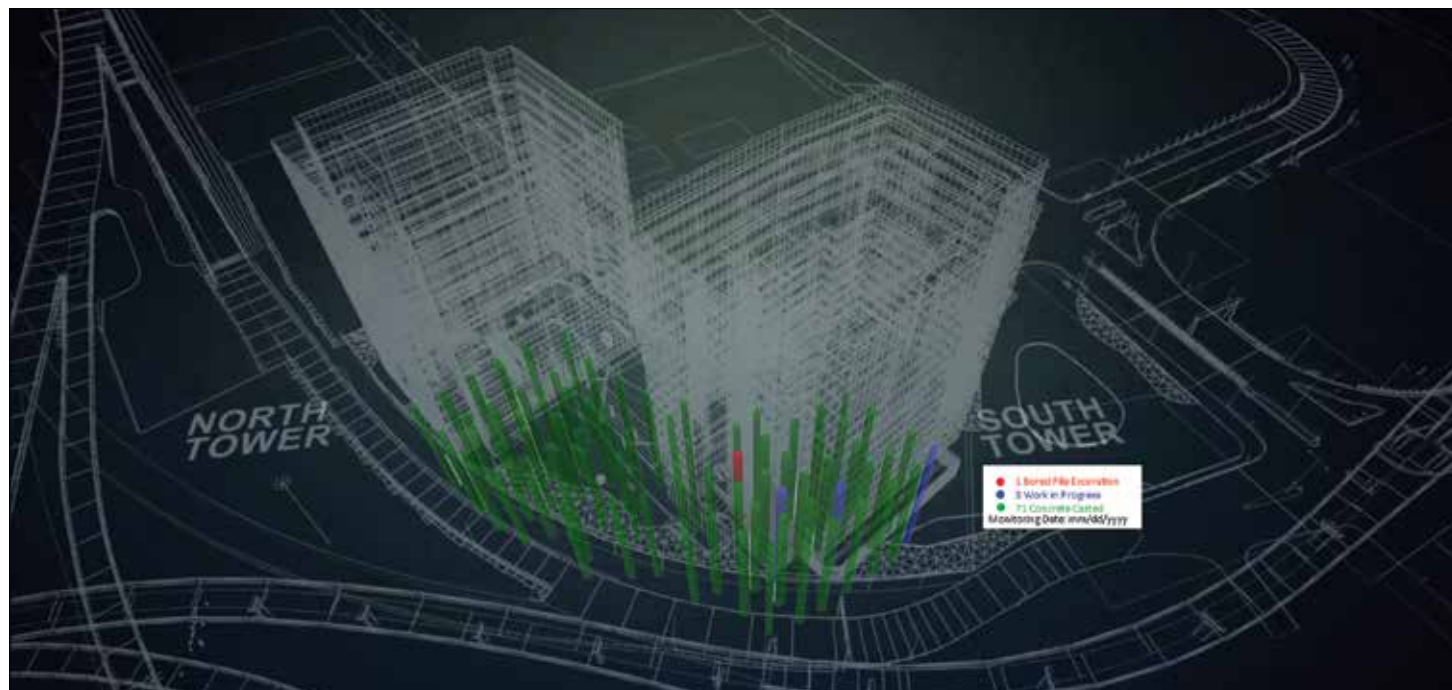
Soon, Hip Hing will deploy BIM for all design and build projects. “All 120 engineers will be trained to navigate and modify objects in BIM models.” says Ir So. “We see BIM as one of our competitive edges, for future projects.”



Curtain wall design original scheme
Image courtesy of Hip Hing Joint Venture



Curtain wall design protrude scheme
Image courtesy of Hip Hing Joint Venture



Site Progress Monitoring
Image courtesy of Hip Hing Joint Venture

About Hip Hing Joint Venture

Since being established in 1961, Hip Hing Construction Co., Ltd. (Hip Hing) has grown to become one of the leading contractors in Hong Kong. During the past 55 years, Hip Hing has been trusted by our clients to construct many of the landmark buildings which define Hong Kong. The expertise and capabilities we have developed allows us to provide comprehensive design, procurement, construction, testing and commissioning and handover solutions.

Hip Hing has been embracing advances in technology to provide professional construction services that meet our clients' needs. For example, Hip Hing has its own internal BIM team to leverage new technological advancements for operation efficiency, Apart from deployment Building Information Modelling (BIM), we also introduced Virtual Reality (VR), 3D Scanning, 3D printing, 3D holography, Drone for aerial photography/ videography and other applications to deliver innovative and sustainable solutions.

While we have rich experience and expertise, we also possess a positive working attitude, which is demonstrated by our commitment, proactiveness, integrity, teamwork and professionalism. We call these qualities the "Hip Hing Spirit", the winning behaviours shared by Hip Hing's staff.