

COMPANY
Nan Fung Development Limited

PROJECT
Island Garden

LOCATION
33 Chai Wan Road, Shau Kei Wan

TYPE
Mass-Luxury Residential Development

SCHEDULED TIME OF COMPLETION
Q1 2019

Using BIM to Anticipate On-Site Design and Construction Issues



About Nan Fung Development Limited

Founded in 1954, Nan Fung Development Limited is a subsidiary of Nan Fung Group, one of the largest privately-held conglomerates in Hong Kong with global interests in real estate development and investment and holds a well-diversified, substantial financial investment portfolio. The Group has a track record spanning over 50 years with over 165 projects including residential, commercial and industrial buildings. The Group's vertically integrated team enables significant synergies across development to property management.

In recent years, the Group expanded its investment focus on ICE (Innovation, Creativity and Entrepreneurship), exemplified by its signature project, the Mills, a revitalization of its legacy yarn factories into a hub promoting tech-style and destination for culture and learning. The Group also made significant progress in investments related to life sciences in the US via Pivotal; and in Mainland China via an affiliate, New Frontier, which focuses on healthcare, elderly care, education and new technology.

BIM PARTNER

WSP Hong Kong Limited

AUTODESK PRODUCTS USED

BIM 360 TEAM

Navisworks Manage

Revit

Project Description

Island Garden is mass-luxury residential project located at 33 Chai Wan Road, Shau Kei Wan, situated on a hillside overlooking the Eastern District. The development consists of 4 high-rise residential towers with a podium clubhouse and landscape, and multi-storey basement car park. The total domestic GFA is approximately 42,500 square meters over a site area of approximately 5,314 square meters and 470 residential units are provided. The development is built on a previous residential complex for civil servants.

Project Challenges

During construction stage, several sub-contractors across different trades had little experience in BIM and do not have the necessary resources for BIM coordination. This would jeopardize one of the objectives of using BIM for on-time project delivery and minimization of abortive works.

Secondly, Island Garden is a high-rise residential project with repeating typical unit layouts. The focus of on-site coordination was to establish modularized, typical CSD and CBWD from the BIM model to increase repeatability and standardization across units and floors while ensuring constructability.

Lastly, there was a need for a rapid design-mock up for the client to review the design and materials used.

Solutions for challenges

The project team and main contractor worked together to develop a BIM workflow, which consolidated information from trade contractors' design and performed clash analysis to eliminate abortive works during construction. A BIM consultant was also hired as the BIM Manager for the project to develop and coordinate the construction BIM model. Together, the workflow greatly reduced on-site coordination time and abortive works.

The use of BIM enhanced the repeatability and standardization of the CSD of the typical floor, increasing certainty of the overall construction programme. Also, no-nail zone drawings for conduits were produced from the BIM to determine optimal routing options for services which assisted future fit-out works and maintenance works to avoid damages to the concealed services.

Walk-through simulations and 3D printed scale models from the BIM model were utilized to facilitate design reviews and decision making by the project team.

How does BIM benefit the project?

The key benefit of BIM is the multi-disciplinary coordination prior to construction which led to reduction in on-site coordination time and abortive works. As the project is along a hillside, the site area for logistics was naturally constrained. With the help of 4D construction sequencing simulations, we ran multiple construction programme options, allowing us to anticipate potential site logistic problems and the feasibility of each construction option. We also minimised the excavation required to reduce construction wastage and abortive works. Through working closely with our subcontractors, we shared and reviewed the site planning using BIM for their relevant works and how their logistics fit into the overall project's construction planning. This greatly improved the overall construction planning and pre-emptively resolved on-site coordination issues, which in the past would usually only arise when we reach that construction stage.

Better with BIM

By establishing a Common Data Environment (CDE) with BIM, project managers, architects and engineers could review the latest BIM model updated accordingly based on the site-progress. Comments and mark-ups could be made on the CDE for each team member to review. The cloud-based CDE was a platform to facilitate communication and coordination of the project throughout the entire design and construction stage. Moreover, with RFI workflow integrated with BIM on the CDE, the project team could streamline the review of RFI and issue management workflow by reviewing the areas of concern linked to a specific location within BIM model.



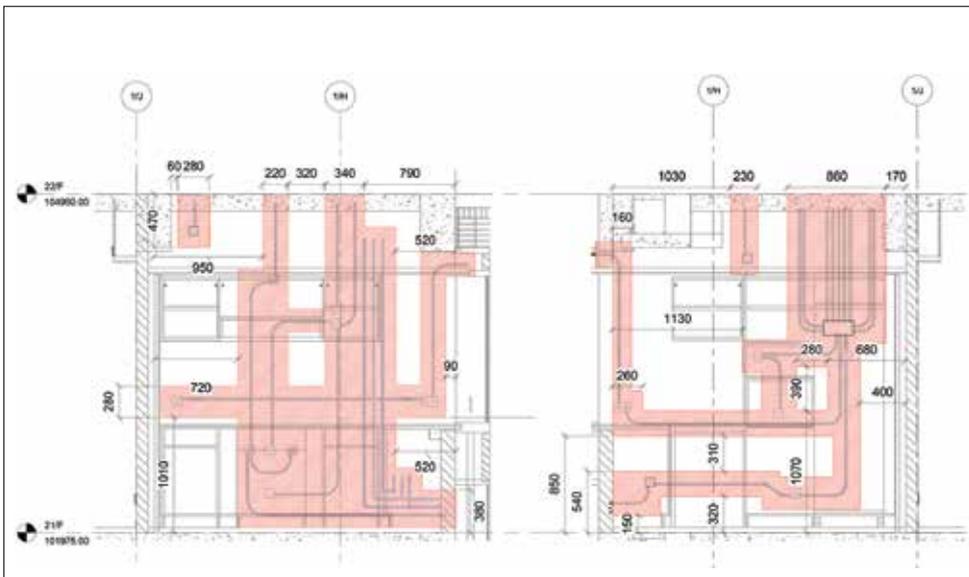
Overall view of Island Garden at 33 Chai Wan Road, Shau Kei Wan
Image courtesy of Nan Fung Development Limited



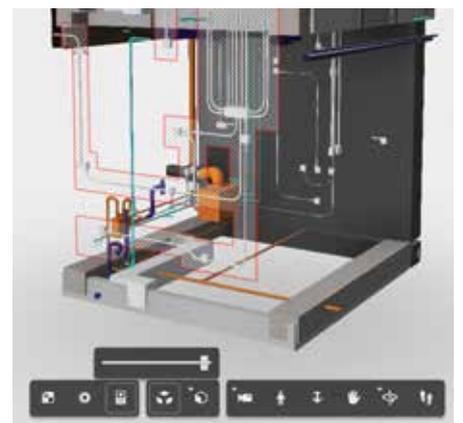
Project BIM models showing Coordinated building services
Image courtesy of Nan Fung Development Limited



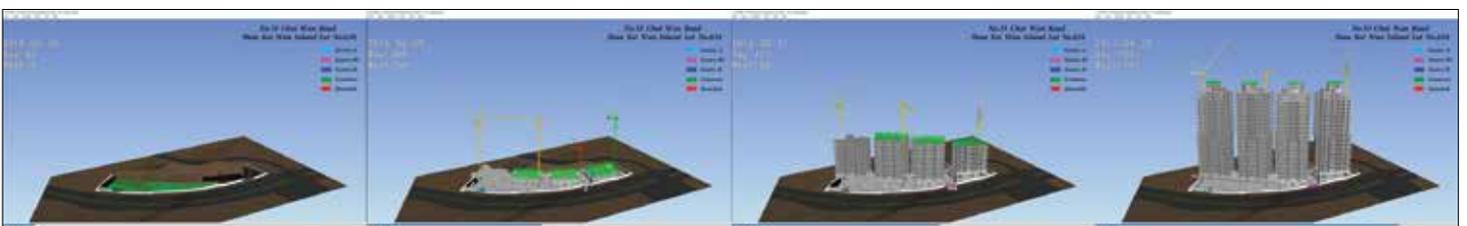
Virtual mockups and VR show flat were utilized for design reviews
Image courtesy of Nan Fung Development Limited



'No nail zone' drawing exported from project BIM models
Image courtesy of Nan Fung Development Limited



3D view of 'No nail zone' BIM models on web-based viewer
Image courtesy of Nan Fung Development Limited



4D Construction Sequence Simulation was carried out to compare different construction programmes
Image courtesy of Nan Fung Development Limited