Hang Lung Properties Limited

Project:
Blue Pool Road Residential Development

Location:
I.L.5747, Nos. 11-39 Blue Pool Road, Hong Kong

Type:
Low Rise Residential Development

Tentative Time of Completion:
2013

Holistic Design for Luxury Townhouses

BIM is helping a project team to design a luxury housing development for Hang Lung Properties Limited, including arranging building services in a confined space under a road and within the low-rise buildings.

Low-rise buildings yet significant challenges

Blue Pool Road Residential Development is a luxury townhouse project of Hang Lung Properties Limited. Set on a narrow site on a slope at Happy Valley, it will feature nine blocks of three-storey houses.

"As it's a low-rise project, some may think using BIM is not worthwhile," says Jeff Cheung, Contracts Manager of the main contractor, Tysan Building Construction Co. Ltd. "Yet there are challenges, including landscaping the hillside slope, designing a retaining wall, and arranging building services in the densely packed site."

This is the first time Hang Lung Properties Limited has used BIM. With BIM, it would be possible to see conflicts before actual construction and thereby mitigate the abortive works.

Streamlined design reduces costs

The BIM model was created by Ray Lau, BIM Engineer, Forida Limited, by combining designs from the architect, engineers and landscape architect. "All components in the BIM model have genuine dimensions," he says. "We included the various building services in the small area, and modelled the retaining wall."

Hang Lung Properties Limited aimed to minimise reworking of the existing slope, and Ray used survey data to create a slope profile in the BIM model to achieve this end. The design team, main contractor and consultants held many meetings in which they discussed the model, and worked on the design for the slope work and retaining wall.

LANDSCAPE DESIGN AND CONSTRUCTION COST SAVING

Front view of House 1

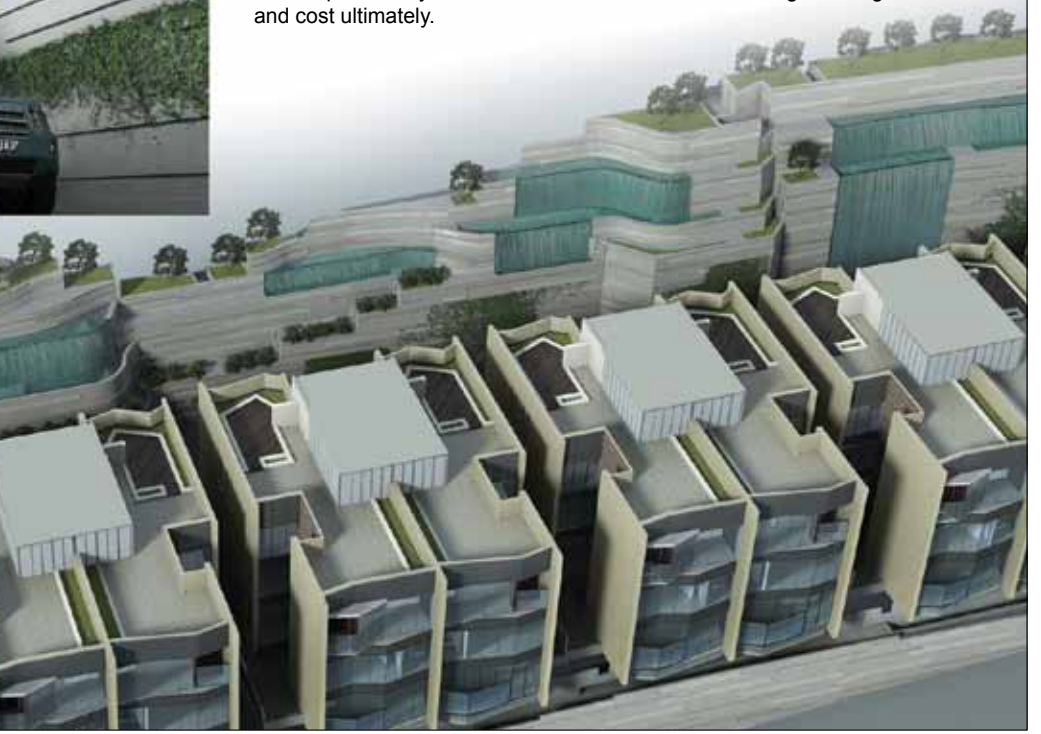
The retaining wall comprises 24 roughly L-shaped structures, rather like a linear jigsaw puzzle. "Without BIM we couldn't have an accurate design of the L-shaped wall," says Tommy Lee, Senior Project Manager, Tysan Building Construction Co. Ltd. There was also a planter wall, as a landscape feature.

After the BIM model was first built, Ray used it to help to project the costs of the materials for the planter walls. The resulting figure

With BIM, our team works efficiently with landscape architect during the design process. BIM visualizes the design and extracts 3D geometry data to assist the decision making concerning aesthetic, function and cost.

Through the collaboration, BIM successfully helps to maintain the design principle while optimizing the structural design to reduce significantly the concrete volume and in turn the construction cost.

BIM helps not only to visualize but also facilitate the design, saving time and cost ultimately.



was significantly over budget. The project team worked to streamline the design in the BIM model, and within a month achieved a 40% reduction in the concrete volume and formwork needed.

"In the early stages of the project, the BIM model also showed the team the whole drainage system, which led to major changes," says Nelson Wong, Building Services Manager, Tysan Building Construction Co. Ltd. Many clashes that had gone unnoticed on 2D drawings were revealed in the 3D model, such as drains running along the emergency vehicle access (EVA).

Arranging services below road and over ceilings

The BIM model was also used to check access to building services laid under the emergency vehicle access (EVA) running behind the

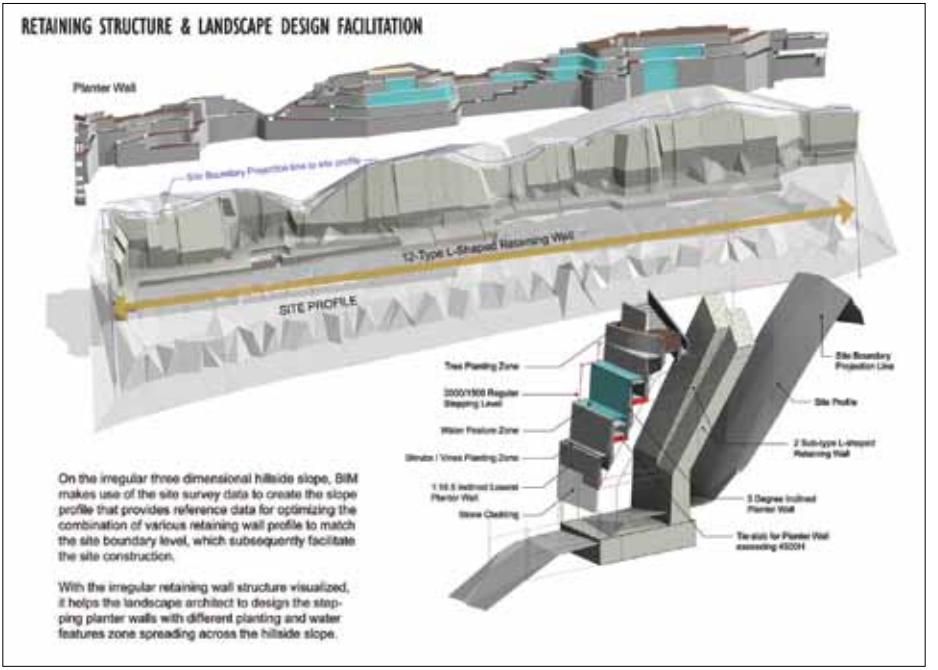
houses. The manhole covers had to be precisely positioned, to fit into the pattern of paving stones.

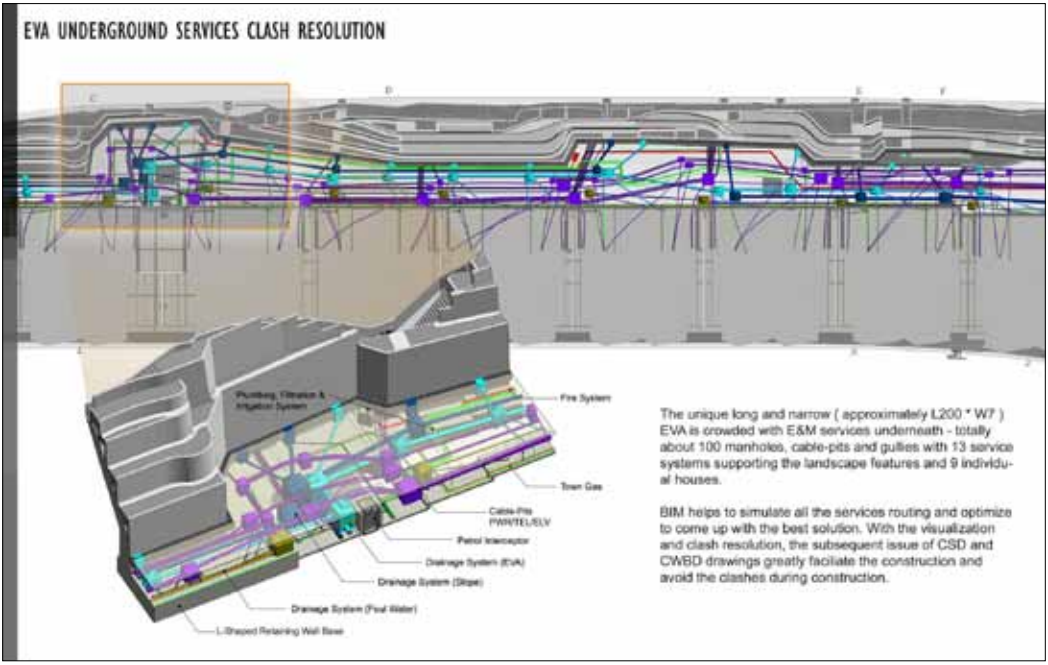
Around 13 types of utilities had to be laid uner the EVA, within a strip around six metres wide and a little less than 2 metre deep. The main utilities here are drainage for the slope, the emergency vehicle access, planters, featured pools and the houses; others include electrical power supply, security, surveillance, telephone lines, broadband fibres, gas, as well as water supplies for potable, flushing, irrigation and featured pools on the slope. Adding to the complexity, some of the pipes needed to be of specific gradients.

"BIM helped us a lot," says Tommy Lee, Senior Project Manager, Tysan Building Construction Co. Ltd. "It gave us a very early impression of how things would look under the EVA, so we could understand the whole system under this area." Working with the BIM model, the building services team minimised the clashes between all services and the sub-structure.

Though the townhouses are only three-storey buildings, Nelson explains that they presented challenges for designers, "They are luxury houses in the middle of the city, with a lot of services. For instance, they have motorised blinds built into the curtain walls and within the double-glazing."

The most challenging aspect of designing the houses was achieving maximum headroom to ensure spacious rooms for users. This task was complicated by the automation system requiring double of the wiring of traditional houses. To account for this and maximise living space, services were concentrated above areas such as corridors.





Using the BIM model, the main project team and the sub-contractors arranged the building services in much the same way as under the EVA: creating and refining a design with the services fitting into a small space, with access for maintenance, but without detectable clashes.

Impressive benefits of BIM

The project team is impressed by the ways in which the BIM model has performed, and delivered impressive results. “BIM is a very good platform,” says Tommy Lee. “You can have a holistic view of a design, without which everyone would have 2D drawings of their own systems, which you would have to combine. Working with a BIM model, the E&M team can coordinate between themselves, and devise the best options for a project.”

Ray Lau demonstrated a “walkthrough” animation he created from the BIM model, showing how the completed project will look. It resembles a guided tour, with an appearence recalling a realistic computer game: you enter from Blue Pool Road, and pass the retaining wall with a water feature and greenery, before coming to a stop beside one of the houses. This is the first time Tysan has been involved in creating such a video.

** All images in this article are provided by Hang Lung Properties Limited*

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HANG LUNG PROPERTIES

ABOUT HANG LUNG PROPERTIES LIMITED

Hang Lung Properties Limited, a constituent stock of the Hang Seng Index and Hang Seng Corporate Sustainability Indices in Hong Kong, is a leading real estate developer in Hong Kong and mainland China. Boasting a diversified portfolio of investment properties in Hong Kong, the Company has progressively branched out into the Mainland since the 1990s, building, owning and managing world-class commercial complexes in key cities that have earned international acclaim for their exceptional quality of architectural design, services and sustainable features.

Riding on the immense success of its two landmark properties in Shanghai, Plaza 66 and Grand Gateway 66, the Company's footprint has expanded to Shenyang, Jinan, Wuxi, Tianjin, Dalian, and now Kunming following the successful acquisition of a prime site in that city in September 2011. Subsequent to the grand openings of Palace 66 in Shenyang in 2010 and Parc 66 in Jinan the following year, the next world-class investment property to come on stream will be Forum 66 in Shenyang.

As Hang Lung's business continues to grow with soaring perspectives, the Company is set to develop into the most admired mega national enterprise in the market.