

COMPANY
Chun Wo Construction & Engineering Company Limited

PROJECT
The Hong Kong Breast Cancer Foundation Kowloon Centre

LOCATION
Lung Cheung Road, Ngau Chi Wan, Kowloon

TYPE
Government, Clinic

SCHEDULED TIME OF COMPLETION
Mid August, 2017

BIM Key for Eliminating Clashes, Estimating Quantities, and set to Empower Facilities Management



俊和發展集團
CHUN WO DEVELOPMENT HOLDINGS LIMITED
 (亞洲聯合基建控股有限公司集團成員)
 (Member of Asia Allied Infrastructure Holdings Limited)

About Chun Wo Construction & Engineering Company Limited

Chun Wo was founded in 1968, and initially primarily operated a construction business. In 1993, it was listed on the Main Board of the Hong Kong Stock Exchange under the name "Chun Wo Holdings Company Limited" (stock code: 00711.HK) and its business has since been expanded to include construction, property development and overseas business. And, in November 2007, to better reflect its dedication to developing a more diversified business, the Company changed its name to "Chun Wo Development Holdings Limited".

In 2016, the listed company name was changed to "Asia Allied Infrastructure Holdings Limited" (stock code: 00711.HK) in order to enhance the Group's corporate image and better reflect its long-term strategic goals. As the Group actively explored various forms of development, "Chun Wo Development Holdings Limited" has become a major branch of the Group in Hong Kong and will continue to develop its core businesses.

BIM PARTNERS

Chun Wo Construction & Engineering Co., Ltd.

MDM Group Inc. Limited

P&T Architects and Engineers Ltd

Tam & Philip So & Associates Ltd

WEC Engineering Consultants (International) Limited

Project Description

The Hong Kong Breast Cancer Foundation Kowloon Centre project adopted full BIM in the whole building life cycle from conceptual design stage to Operation and Maintenance stage. Different project stakeholders including the client, consultants, project manager, engineers, survey team, QS department, and foreman are involved in the BIM workflow, and are BIM ready with certificated training. The project success demonstrates that the increased BIM capability of project team members (**全民皆BIM**) can maximise the value of BIM.

Project Challenges

This project BIM delivery is driven by sub-contractor and monitored by main contractor. Different parties need to build /modify the model and do coordination work on the same BIM platform. Secondly, the site is congested and near a crowded road (Lung Cheung Road), and surrounded by many trees. We need to preserve the trees and replant them in other locations. Thirdly, bulky prefabricated facade and slabs need to be designed with a high safety factor, loading and weight should be accurately calculated before production, transport, lifting and installation within a short period of time.

Solutions for challenges

The central BIM model is stored on a VDS (Virtual Design System) and different consultants are authorised to log into the system with non-BIM ready computers. The survey team used a point cloud solution; the laser scanner, and the drone can easily scan the surrounding conditions, which helped logistics planning and recording information on trees. Precast facade and detailed slab design in BIM model include rebar, void formers, and embed. Manufacturers can use detailed design drawing from the model to form the moulds and rebar offsite. Meanwhile, a quantity surveyor extracts useful data from the model and combines this with the construction master schedule for the cashflow forecast.

How does BIM benefit the project?

The overall rework due to poor coordination was reduced by around 80% compared to a non-BIM project. The significant changes mainly involved reducing coring work and rerouting of E&M services. Major clashes have been eliminated as a result of the CDE (common data environment). The most updated BIM model is stored in the VDS, so that everyone shares the same model version. This prevents inconsistencies in the coordination platform. Apart from that, the QS team can accurately quantify the materials usage. It can reduce the materials wastage and prevent unwanted materials storage at the congested site area.

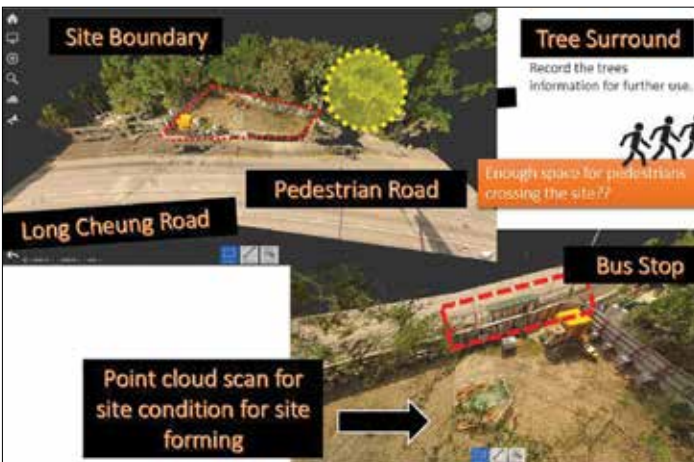
Better with BIM

The Building Information Model acts as a centralised database and contains information related to building and installation components. It helps the facility managers to find information more easily, analyse the system efficiency and avoid any loss of data. After the completion of the building model, all the information can be generated by users for fabricating, analysing, project scheduling (4D BIM), cost estimation (5D BIM), and eventually, for facilities management during the operation phase.

BIM requires enhanced integration of project teams and collaboration between all parties. Hence, regarding delivery methods, collaborative approaches such as IPD are more able to optimise BIM-based projects than linear methods.

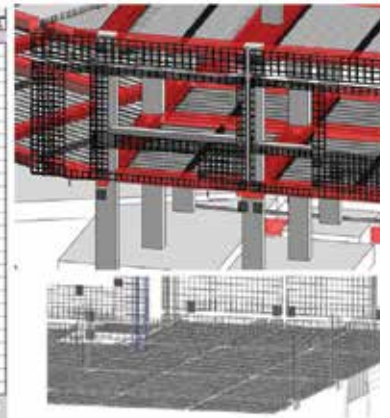


We use point cloud to fast check the site condition with the road nearby and surrounding trees. Image courtesy of Chun Wo Construction & Engineering Company Limited

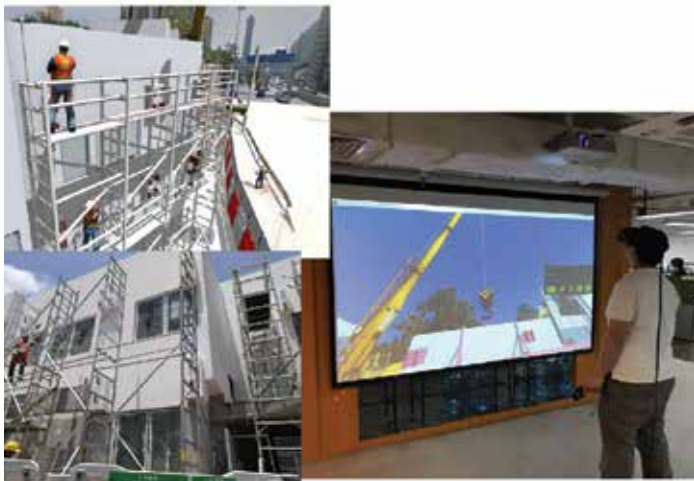


We use point cloud to fast check the site condition with the road nearby and surrounding trees. Image courtesy of Chun Wo Construction & Engineering Company Limited

| ITEM | QTY | UNIT PRICE | AMOUNT |
|----------|------------|-----------------|--------------|
| S1 | 52772.04 | cm ³ | 414.260003 |
| S2 | 48007.52 | cm ³ | 361.62025 |
| S3 | 46677.56 | cm ³ | 366.421901 |
| S4 | 78779.23 | cm ³ | 618.416562 |
| S5 | 76834.84 | cm ³ | 603.147761 |
| S6 | 72349.09 | cm ³ | 567.946337 |
| S7 | 49072.31 | cm ³ | 385.217667 |
| S7(RF) | 53774.66 | cm ³ | 422.13901 |
| S8 | 76414.62 | cm ³ | 599.844664 |
| S8(RF) | 66711.64 | cm ³ | 572.834363 |
| S9 | 29270.89 | cm ³ | 229.776616 |
| S10 | 13072.66 | cm ³ | 109.685379 |
| S10(RF) | 13867.99 | cm ³ | 108.785262 |
| S11 | 76290.44 | cm ³ | 599.649779 |
| S11(RF) | 77287.56 | cm ³ | 606.778469 |
| S12 | 79903.06 | cm ³ | 626.453991 |
| S12(RF) | 86666.46 | cm ³ | 672.473849 |
| S13 | 57809.47 | cm ³ | 453.884375 |
| S13(RF) | 59820.76 | cm ³ | 469.933163 |
| S14 | 192964.68 | cm ³ | 159.134344 |
| S14(RF) | 199624.32 | cm ³ | 169.449322 |
| S17 | 3024.89 | cm ³ | 22.807897 |
| S18 | 20136.57 | cm ³ | 158.672045 |
| S20(RF) | 17728.76 | cm ³ | 139.17075 |
| S21(RF) | 17688.61 | cm ³ | 138.866898 |
| S22(RF) | 19632.07 | cm ³ | 159.461782 |
| S23(RF) | 13582.40 | cm ³ | 105.366857 |
| EQTY 425 | 1447663.50 | cm ³ | 11364.156459 |



Semi-precast slab, facade, and stairs with detailed design drawing which include rebar, void form and precast concrete enhancing QTO. Image courtesy of Chun Wo Construction & Engineering Company Limited



Safety Officers, Engineers, and Foreman using VR + 4D construction simulation to preview facade installation procedures. Image courtesy of Chun Wo Construction & Engineering Company Limited



The clients are using VR technology to preview the building before construction in first person perspective. Image courtesy of Chun Wo Construction & Engineering Company Limited