

COMPANY

Drainage Services Department,
HKSAR Government
Black & Veatch Hong Kong Limited
Vircon Limited

PROJECT

Construction of Dry Weather Flow Interceptor
at Cherry Street Box Culvert

LOCATION

Cherry Street, Tai Kok Tsui, Kowloon, Hong Kong

TYPE

Public Services Utilities

SCHEDULED TIME OF COMPLETION

End of 2022

No BIM No DfMA



About Drainage Services Department, HKSAR Government

Established in 1989 to provide world-class wastewater and stormwater drainage services enabling the sustainable development of Hong Kong, Drainage Services Department (DSD) has strived to upgrade sewage treatment and flood protection levels in Hong Kong, and committed to introduce new technologies for projects implementation and operation of facilities. DSD will continue to promote BIM technology, with resources being deployed on development, so as to upgrade the accuracy of project design and shorten works period.

About Black & Veatch Hong Kong Limited

B&V has over 80 years of wide-ranging engineering experience in Hong Kong, B&V's vision is to continue developing the talent of professionals and contributing to a range of meaningful and sustainable water-related works in Hong Kong and abroad.

About Vircon Limited

Vircon has over 20 years of BIM experience in Building Life Cycle for improving the productivity and reducing pollution on earth.

BIM PARTNER

China Metallurgical Group Corporation
- Top Express Construction Engineering
Limited Joint Venture

AUTODESK PRODUCTS USED

BIM 360 Doc and Design

BIM Recap

Dynamo for Revit

Navisworks Manage

Revit

Project Description

The existing Cherry Street box culvert (CSBC) collects runoff from Kowloon Tong, Mong Kok and Yau Ma Tei districts and discharges into the New Yau Ma Tei Typhoon Shelter (NYMTTS). At present, the water quality at the typhoon shelter and the odour associated with it remains unsatisfactory. An underground Dry Weather Flow Interceptor (DWFI) and a pumping station at the seafront of NYMTTS will be constructed to intercept the polluted stormwater from the CSBC and deliver to the nearby sewer.

Project Challenges

The extremely congested site and tight time frame necessitate the DWFI and pumping stations works to be carried out concurrently. Design for Manufacture and Assembly (DfMA) is the solution as it is a design approach that focuses on ease of manufacture and efficient assemble in the minimum time and at a lower cost as well as minimize nuisance to the surrounding. However, it requires high accuracy in the design stage without any errors or mistakes. In addition, owing to different contractors apply various types of BIM software, information loss was found during file conversion from Tekla to Revit.

Solutions for challenges

In order to deliver the project smoothly, the manufacturer utilized BIM 3D and 4D in design, drawing production, manufacturing. During the design and manufacturing process, the manufacturer used BIM models on cloud platform for design review in order to enhance the communication between consultants and the main contractor. Drawings were then produced from the BIM and passed to manufacturer to fabricate the DfMA components. Because of data lost during file conversation, the project team applied Dynamo for scripting to retrieve the building data for drawing preparation in Revit platform.

How does BIM benefit the project?

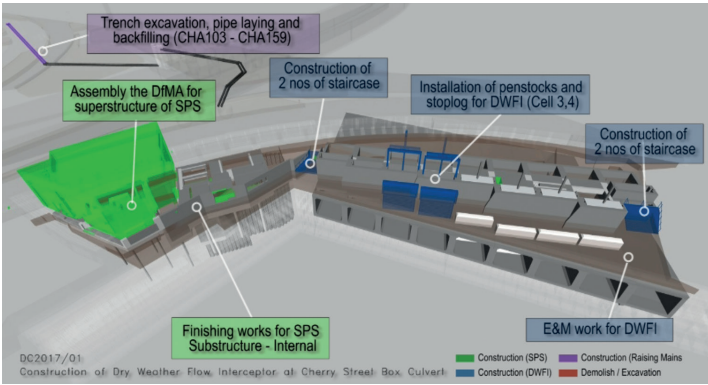
BIM allows the project team to foresee the constructability of DfMA during the early design stage. The encountered design and foreseeable construction problems could be resolved to prevent any abortive work on site which ensures smooth delivery of the project on time. Not only BIM is adopted in design and construction stages, IoT tags are also installed into the DfMA components during manufacturing stage to integrate BIM data and construction record for asset management use.

Better with BIM

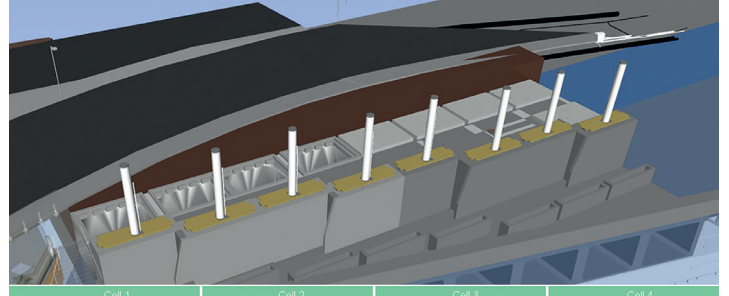
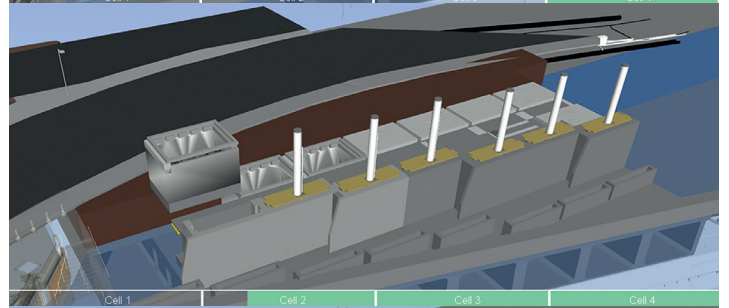
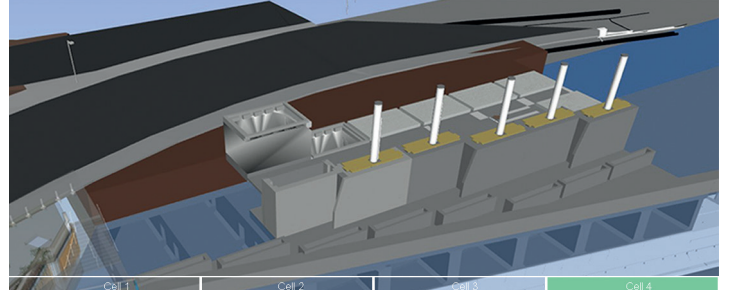
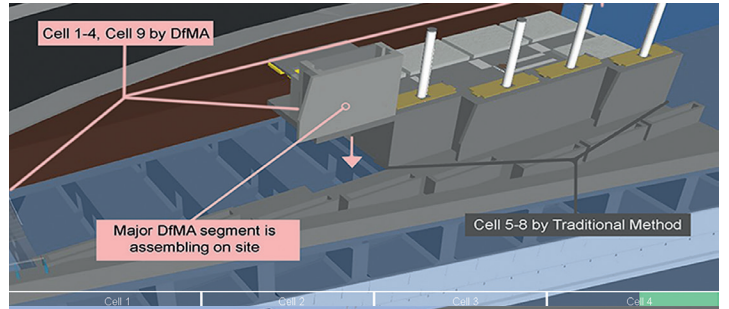
- BIM facilitates the project team to carry out 3D design which enable DfMA construction that requires extreme accuracy at early stage.
- BIM allows the project team to monitor the progress and review the sequence of works with aid of 4D planning.
- BIM enhances communication between parties by cloud platform during coordination meetings.
- BIM could also be used in assets management when retrieving information and data stored in the model.
- BIM becomes our essential tool and process in our project mindset.



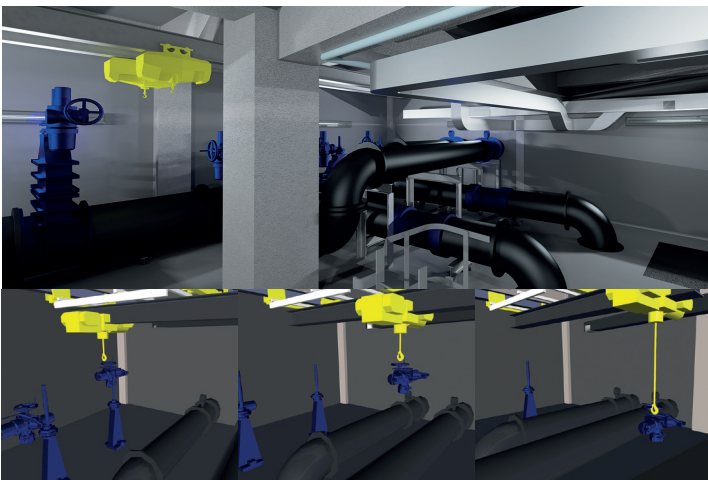
Photomontage of Proposed Cherry Street Box Culvert
Image Courtesy of Drainage Services Department, HKSAR Government and Black & Veatch Hong Kong Limited and Vircon Limited



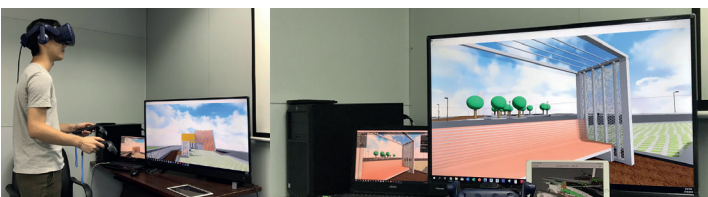
Phase Planning to Present the Construction Planning
Image Courtesy of Drainage Services Department, HKSAR Government and Black & Veatch Hong Kong Limited and Vircon Limited



DFMA 4D Planning
Image Courtesy of Drainage Services Department, HKSAR Government and Black & Veatch Hong Kong Limited and Vircon Limited



Simulation of Maintenance Access
Image Courtesy of Drainage Services Department, HKSAR Government and Black & Veatch Hong Kong Limited and Vircon Limited



360 Glues and VR Application Using BIM Model
Image Courtesy of Drainage Services Department, HKSAR Government and Black & Veatch Hong Kong Limited and Vircon Limited