

## COMPANY

**Water Supplies Department, HKSAR Government**

## PROJECT

**Study on the Trial Use of Building Information Modelling (BIM) for Asset Management**

## LOCATION

**Tai Po and Telegraph Bay Salt Water Pumping Stations**

## TYPE

**Waterworks**

## SCHEDULED TIME OF COMPLETION

**2015**

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— **Ir Tam Siu Ming**

Engineer/Asset Management(1)  
Water Supplies Department

## BIM PARTNERS INVOLVED

**Summit Technology (HK) Ltd.**

**Sino-iTech Holdings Co Ltd.**

# BIM Proves a Boon for Asset Management



Image courtesy of Water Supplies Department, HKSAR Government

The Water Supplies Department (WSD) places strong emphasis on asset management to maintain a secure and reliable water supply for Hong Kong, such as simple as ensuring pumps up and running. This in turn requires a wealth of data on these assets. With the current Asset Management System (AMS) almost a decade old – and far from ideal since it’s a combination of several legacy systems that only support textual data and simple sketch drawings, with time and effort required to find conventional 2D drawings – the WSD decided to explore how the emerging technology can help improve or upgrade the current AMS to a new Asset Management Information System (AMIS), and to link this to BIM so that the latter’s benefits in asset management could also be realised.

“We want to stay abreast of the latest technology, and are always looking at ways to improve,” says Ir Chau Sai Wai, Chief Engineer/Development(1), Water Supplies Department. “We know BIM is becoming popular, especially for design and construction. To use it in asset management, you need an integrated system downstream of BIM.”

## Modelling existing buildings

Assisted by consultants, the WSD team decided to adopt Construction Operations Building Information Exchange (COBie) as an interface solution to transfer asset information from BIM model to the AMIS. “We believe COBie is a simple and reliable information exchange tool”, says Ir Chau. “It is in a format like a spreadsheet, containing all aspects of asset information essential to the operator and maintenance agents, and can be read by most facility and asset management softwares. We could also customise an asset hierarchy in COBie specific to our assets to effect the same asset hierarchy in the AMIS through the data transfer.”

The team opted to implement the BIM plus COBie combination for two salt water pumping stations, at Tai Po and Cyberport. Information from as-built drawings was combined with results of laser-scanning to create the BIM models. Then, the team members extracted information from the existing asset management systems. “This was a painstaking process, as we had to rebuild relationships between assets and map objects in assets,” notes Ir Chau. “We

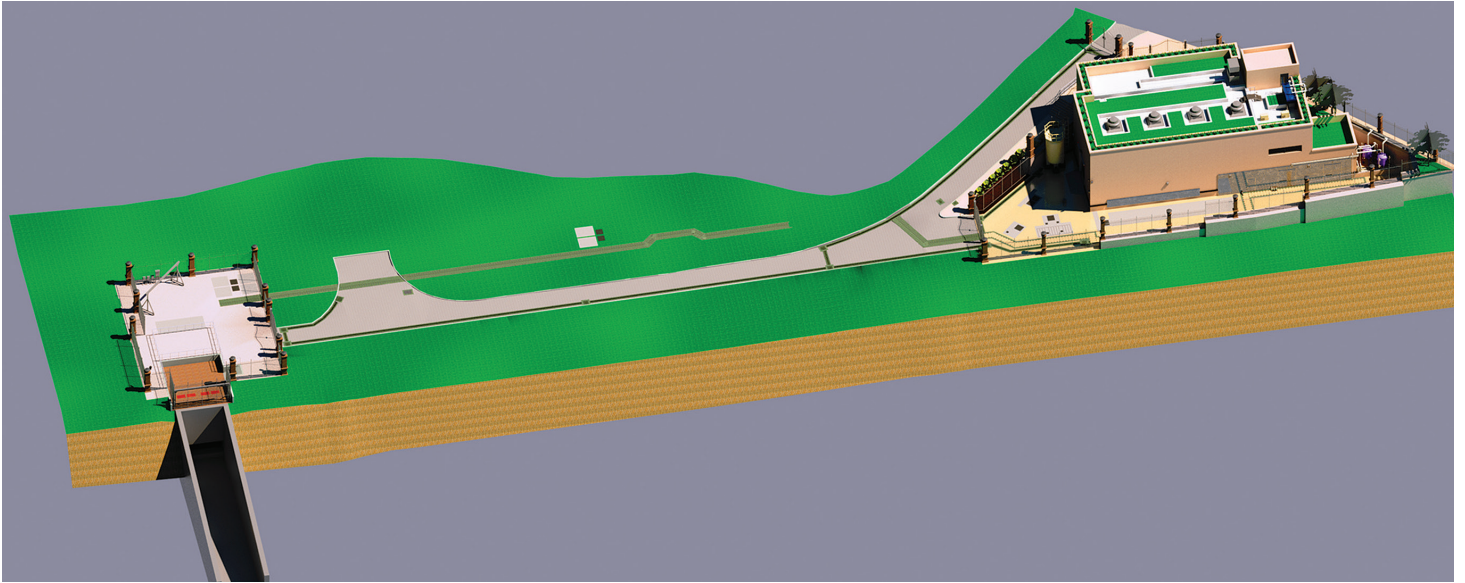


Image courtesy of Water Supplies Department, HKSAR Government

held many working meetings to resolve the problems.”

Ir Tam, Engineer/Asset Management(1), Water Supplies Department, adds that while the models were built relatively quickly from 2D drawings, the team soon found that there were issues in trying to map asset identities from the existing systems to the BIM model. This is because a design may only need relatively basic information on an asset, such as the shape and dimensions of a pump, while maintenance managers require extra details from maintenance point of view and

would like treating the pump casing and pump motor separately, with full information on each – such as manufacturer, installation date, risk level, and time of last service. “There are around 130 key asset elements for each pumping station, and each asset may have 30-35 attributes,” says Ir Tam.

### Custom BIM standards

To tackle this issue, the team has tailored made specific BIM standards for WSD assets, producing a handbook that can be used for future projects, and can be expanded to

cover other types of assets. This has been challenging work, yet there are encouraging results from the pilot project.

“We’ve developed a 3D viewer for the operation and maintenance staff – like a computer game,” says Ir Tam. “It’s as if you were walking around a pumping station. You might check a fire extinguisher, and can call up all the details, like fire certificates so you know when they’ll expire.” Also, engineers can use the model to check pumping stations remotely, saving them the need to go to sites frequently. “They’re happy as there’s another

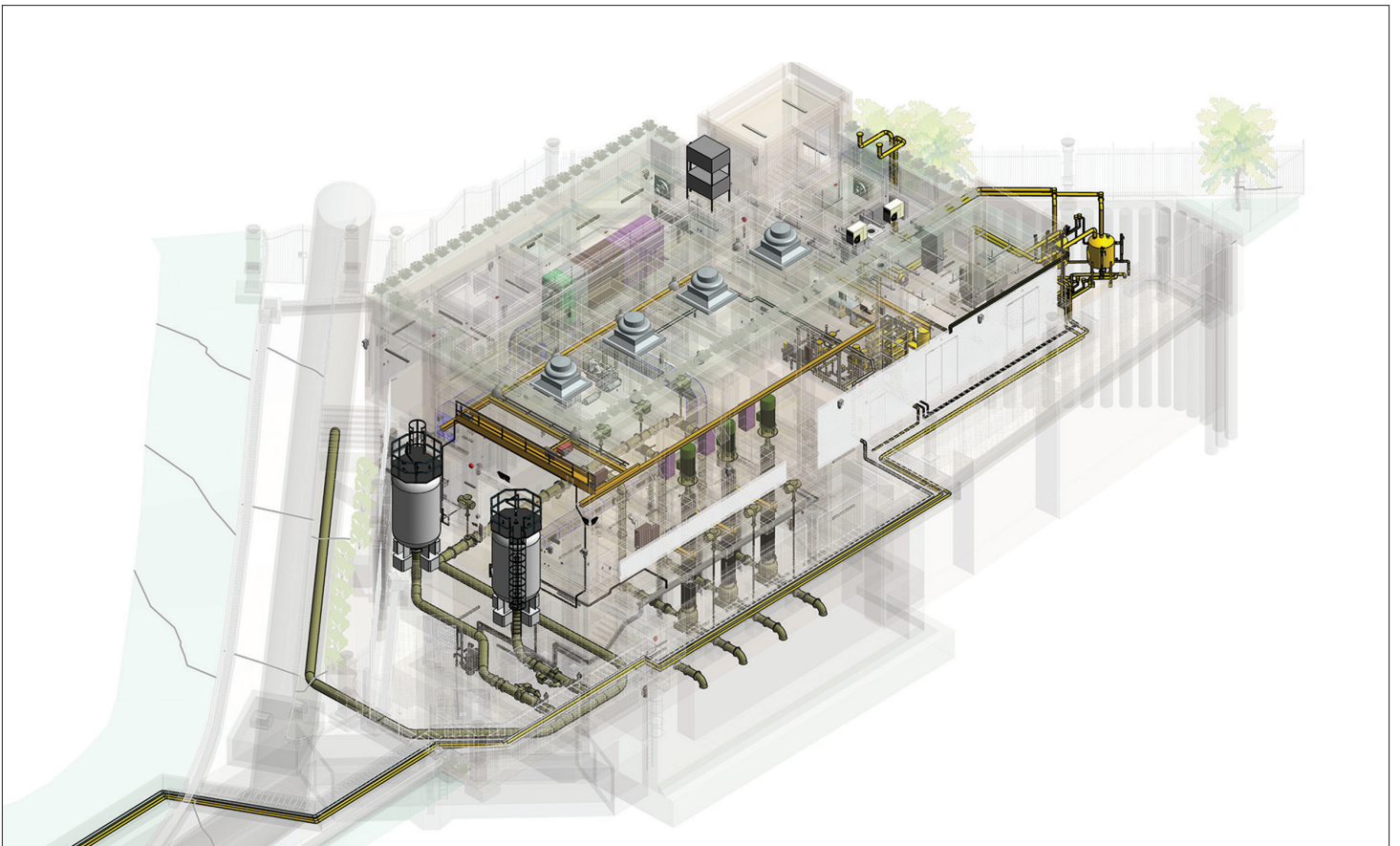


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way of doing things, though it may take some time to adapt to change,” adds Ir Tam.

### An electronic owner’s manual

The BIM model has effectively become an electronic owner’s manual, passing relevant data into the asset management process. Using it can lead to considerable time savings, compared to the existing systems. While input of all asset data of a water treatment works could take up to two years with the existing AMS during asset hand over, data conversion using the BIM plus COBie might take only a few months. Information retrieval is also much faster too, without the need to perhaps search through reams of printed material.

Furthermore, the project team is keen to explore whether the post processed BIM model may bring about more added values to our maintenance and operational staff, such as connection to CCTV footage or SCADA system. “I think there could be many potential applications – it’s up to the client to imagine how BIM can be used,” says Ir Tam.

Though the WSD team is confident that deploying BIM can provide a uniform and common platform for information exchange, along with less chance of data loss and more

data consistency, they may apply it to only selected existing facilities, due to constraints on resources. However, for new projects they envisage adopting BIM from design stages, through to as-built models that will benefit long-term maintenance of assets.

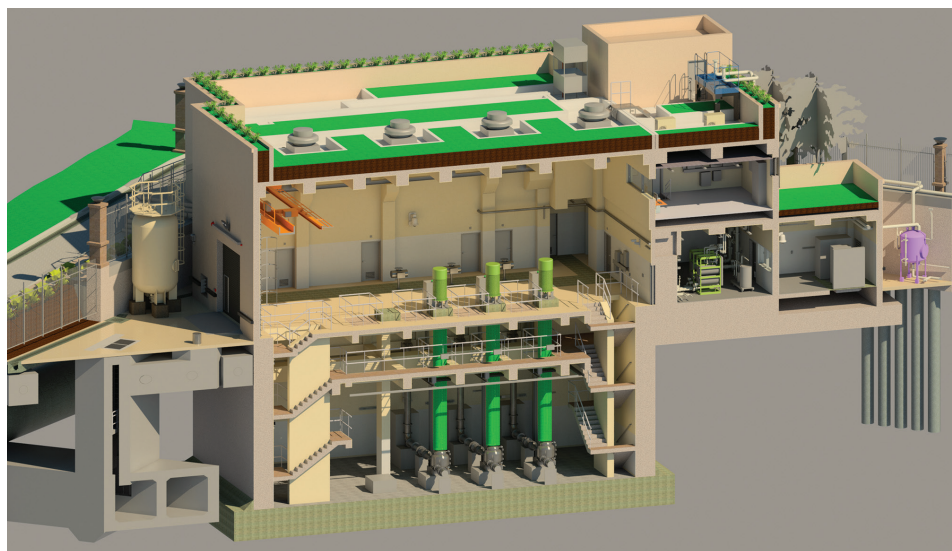


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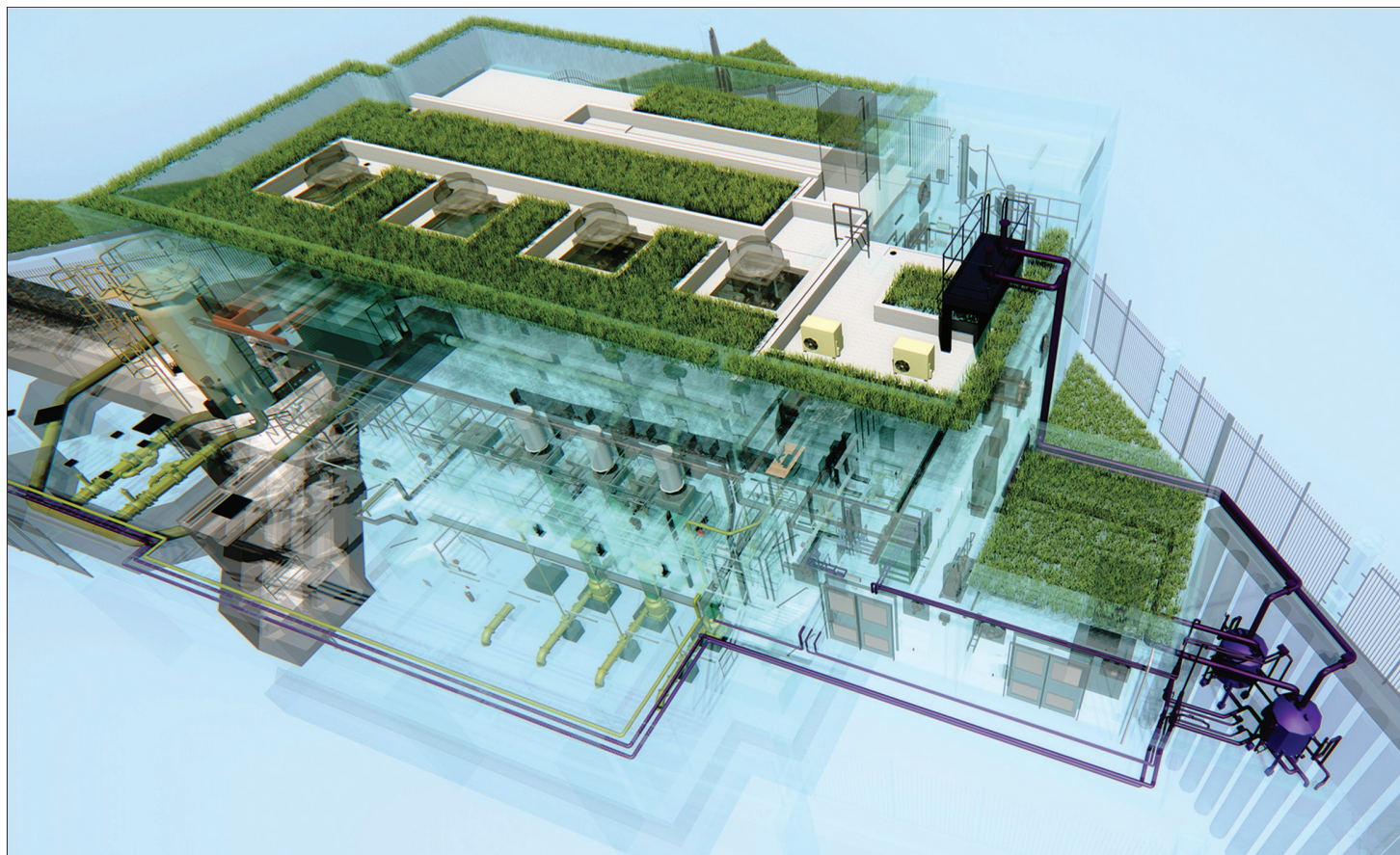


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## About Water Supplies Department

The Hong Kong SAR Government's Water Supplies Department oversees and manages all aspects of sourcing and maintaining supplies of fresh and salt water throughout the Territory. Every day we pump 2.56 million cubic metres of fresh water to meet the needs of 7.19 million people. We get our fresh water supplies primarily from Hong Kong's expansive hillside catchments along with considerable reserves piped in from Dongjiang in southern China, which undergoes strict water testing and treatment to meet global safety standards. Afterwards fresh water is stored in a broad array of service reservoirs for distribution to homes and commercial developments. The Department also utilises seawater which is treated and then piped to toilet flushing systems. Seawater flushing is generally found in a majority of residential, commercial and industrial buildings throughout Hong Kong; the utilisation of this type of water resource helps lower our overall need for fresh water. The Department is also responsible for initiating and monitoring the development of new water sources based on methods like desalination, water recycling and rainwater harvesting.

WSD is an asset intensive organisation. To maintain a reliable water supply to the Hong Kong people, WSD depends very much on the proper operation and maintenance of the assets, including for example water treatment works, service reservoirs, pumping stations as well as underground water mains. In this regard, WSD has been deploying extensive resources in upkeeping the condition and raising the efficiency of the assets during the past decades.

We dedicate ourselves every day to meeting the expectations of our customers. Water is an essential element that underpins the vitality and prosperity of Hong Kong. For this reason, we will continue to closely work in collaboration with all stakeholders to optimise supplies so that Hong Kong's water remains secure and of high quality now and in the future.