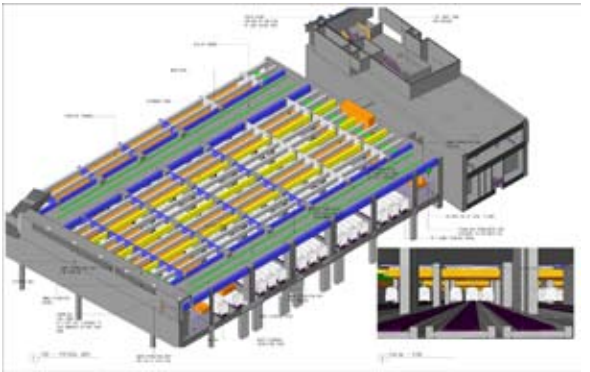
MTR Corporation Limited

Project:
Shatin to Central Link, Preliminary Design

Location:
Shatin to Central, Hong Kong

Type:
Railway/ Infrastructure

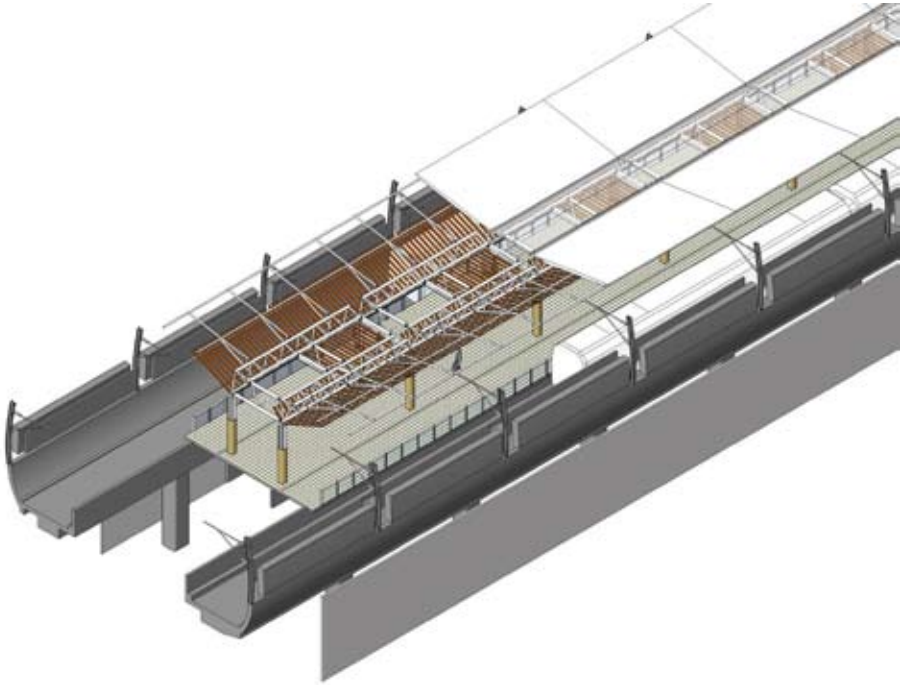
Standardization Using BIM



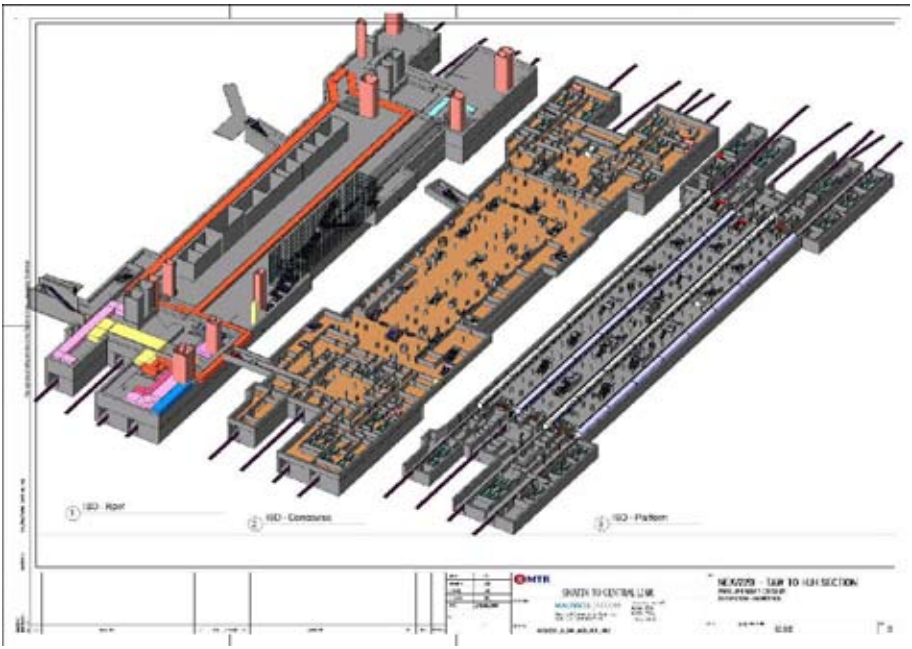
Different components are well-coordinated in the stabling sidings.

The preliminary design of the Shatin to Central Link (SCL) involves the design of different underground and above ground stations and a stabling sidings. Each of which comes with different design options. The MTR Corporation design team made good use of BIM technology to assist in the design of such a large-scale project.

The MTR Corporation Limited welcomes the Government's decision for the Corporation to proceed with further planning and design for the Shatin to Central Link. The 17-km Shatin to Central Link will have two components. Firstly, the section from Tai Wai to Hung Hom is an 11-km extension of the Ma On Shan Line. It will extend from Tai Wai Station, through new stations at Hin Keng, Diamond Hill, Kai Tak, To Kwa Wan, Ma Tau Wai, Ho Man Tin connecting to the West Rail Line at the Hung Hom Station to form the east-west rail corridor. Secondly, the cross harbour section, a 6-km extension from the Hung Hom Station of the East Rail Line, will be extended across the harbour to the new stations at the Exhibition and Admiralty and form the north-south corridor. This rail line will benefit not only the residents in the areas along the alignments, they will also add on to the existing network providing more convenient rail services to the people of Hong Kong.



The components can be standardized in BIM.



Working drawings created directly from BIM

Simplifying Complex Procedures

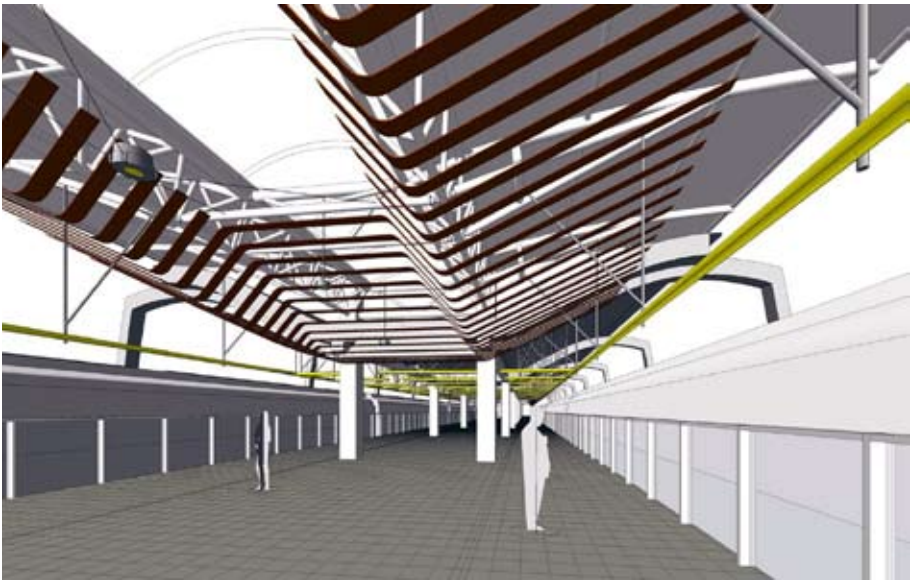
Building a new rail line is never an easy task. With every new station, the MTR Corporation needs to balance between engineering design, public demand as well as environmental impact. “With a total of 10 stations in our new line, the BIM system helped us produce consistent layouts with same levels of details in a timely manner,” said Jason Wong, the Design Manager of the project. He added, “We used BIM in project scheduling, preliminary design, drawings productions and it also helps to interface with Civil Engineering information.” BIM improved the communication between different design disciplines by providing accurate information and 3D model so that different designers can coordinate better. Moreover, the ability to coordinate between 2D information and 3D information is particularly useful for coordinating services such as the complex ducting system within the ceiling voids of the stations.

Standardizing the Components

During the preliminary design stage, the design team needed to study different design options for the new railway stations. Since there are 10 stations being designed at the same time, multiple BIM models were used to represent the design of each station. To maintain good communication and the same level of details, the design team had developed object libraries, a collection of architectural and mechanical components. These object libraries were shared among different stations' design teams. This ensured the consistency of the stations and at the same time helped to maintain design quality.

Improving Design Quality and Presentation Style

Design options could also be obtained in the same BIM model effectively. 2D and 3D presentation drawings were produced quickly and with similar presentation style. Further, information was well coordinated within the BIM model. Therefore, project team could test out more design possibilities within the same amount of time. Since drawing conventions such as line weight, annotation style, level of detail could be pre-set in BIM; the setting could be transferred and shared instantaneously among different design teams. Therefore, the project team could produce drawings for different stations with same quality in a much shorter time.

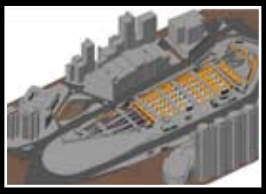


A more energy-efficient design.

Optimizing Environmental Conservation

Besides a better presentation, a good design also includes minimizing the harm to the environment. In the SCL, close attention was paid to minimize the harm to the surroundings as early as in the design stage. Hin Keng Station is a good example to illustrate the point. Hin Keng Station is going to be built above ground, thus the project team made use of the solar analysis feature in Revit to simulate how direct sunlight casted onto the station. That helps to design sun shading devices and to achieve energy efficiency.

As a growing number of projects are making use of the BIM technology, MTR is setting up a BIM standard as a guideline for future projects. Wong added, "We think that BIM usage is becoming more and more prevalent, currently we are not only using in the design stage but also in the station operation and maintenance; we will definitely see more of its application in the near future."



ABOUT MTR CORPORATION LIMITED

Carrying an average of 3.9 million passengers every weekday, the MTR is regarded as one of the world's leading railways for safety, reliability, customer service and cost efficiency.

The MTR Corporation was established in 1975 as the Mass Transit Railway Corporation with a mission to construct and operate, under prudent commercial principles, an urban metro system to help meet Hong Kong's public transport requirements. The Company was re-established as the MTR Corporation Limited in 2000 after the Hong Kong SAR Government sold 23% of its issued share capital to private investors in an Initial Public Offering. MTR Corporation shares were listed on the Stock Exchange of Hong Kong on 5 October 2000. It marked another major milestone on 2 December 2007 when the operations of the other Government-owned rail operator, the Kowloon-Canton Railway Corporation, were merged with the MTR Corporation, heralding a new era in the Hong Kong railway development.

The merged rail network comprises nine railway lines serving Hong Kong Island, Kowloon and the New Territories. In addition, a Light Rail network serves the local communities of Tuen Mun and Yuen Long in the New Territories while a fleet of buses provide convenient feeder services.

The Corporation also operates the Airport Express, a dedicated high-speed link providing the fastest connections to Hong Kong International Airport and the city's newest exhibition and conference centre, AsiaWorld-Expo.