

## COMPANY

CLP Power Hong Kong Limited

## PROJECT

CLP Ma Sik Road Substation

## LOCATION

Fanling, Sheung Shui Town Lot No. 281

## TYPE

Industrial building

## SCHEDULED TIME OF COMPLETION

Mar 2023

# Utility of the Future - Digital Substation Twin



## About CLP Power Hong Kong Limited

CLP Power Hong Kong Limited (CLP Power) is committed to supporting Hong Kong's long-term development as a world-class smart city. Being the largest electricity supplier in the city, CLP Power develops electricity supply infrastructure continuously to deliver a safe, reliable and environmentally friendly power supply to over 6.2 million people in its supply area. The company strives to provide excellent customer services and develop smart substations through innovations and adoption of emerging technologies.

### BIM PARTNERS

**Andrew Lee King Fun & Associates  
Architects Limited**

**Beria Consultant Limited**

**David S.K. Au & Associates Limited**

**Hip Hing Construction Company Limited**

**isBIM Limited**

**WSP (Asia) Limited**

### AUTODESK PRODUCTS USED

**Autodesk® AutoCAD®**

**Autodesk® BIM Collaborate Pro**

**Autodesk® Build®**

**Autodesk® Docs**

**Autodesk® Dynamo**

**Autodesk® Navisworks® Freedom**

**Autodesk® Navisworks® Manage**

**Autodesk® Revit®**

**Autodesk® Takeoff**

## Project Description

Ma Sik Road (MSR) Substation is a 132kV transmission substation owned and operated by CLP Power. This substation is located at the rural – urban fringe area in Fanling, surrounded by residential developments, village houses and agricultural lands. The new MSR Substation will provide reliable electricity supply to support the growing population at New Territories North and the development of Northern Metropolis where commercial, community, recreation and cultural facilities will be developed in the area.

## Project Challenges

The development of MSR Substation undergoes multiple phases of the building life cycle, starting from inception, detail design, procurement, construction to operation. Challenges encountered in different phases include design coordination issues, change of work scope, change of site condition, construction safety, etc. To provide a safe and reliable electricity supply to support rapid development in nearby areas, careful site work management and quality control have to be maintained in constructing the new substation. On the other hand, as the project is located near residential area, it is vital to minimise construction impact to the community.

## Solutions for Challenges

Implementation of Building Information Modelling (BIM) had played an important role in the multi-disciplinary stakeholders' collaborative process. An effective common data environment was established with BIM technology for different project team members including project manager, consultants and contractors. The 3D BIM model of MSR Substation with relevant project information was built at design stage and used for coordination throughout the project life cycle. With the clouded platform and BIM model, project team can identify the design or site problems and resolve the conflicts at early stage.

## How does BIM benefit the project?

With the use of BIM, 3D model with building information and 4D animation were generated quickly and it helped exchange project information and data between parties involved across different phases of the life cycle of MSR Substation. The visuals also facilitated communication with the concerned stakeholders including local residents and district council members as it gave a clear and comprehensible picture of our project. BIM helped the company perform value engineering for both initial and long-term investment of MSR Substation during the early planning and design stage. BIM was deployed to assess the feasibility of MSR Substation regarding the functionality and constructability as well.

## Better with BIM

CLP Power attaches high importance to safety at work. With the use of BIM technology, animation of critical work process can be generated and visualised easily. Project team and operator can assess the safety risk of those tasks and carefully plan at early project stage. The construction team can fully understand the site condition and pay attention to some specific areas and avoid unnecessary accident or injury. The BIM model could also provide an immersive training with Virtual - Reality (VR) device, where operators could simulate the work process before actual site work.

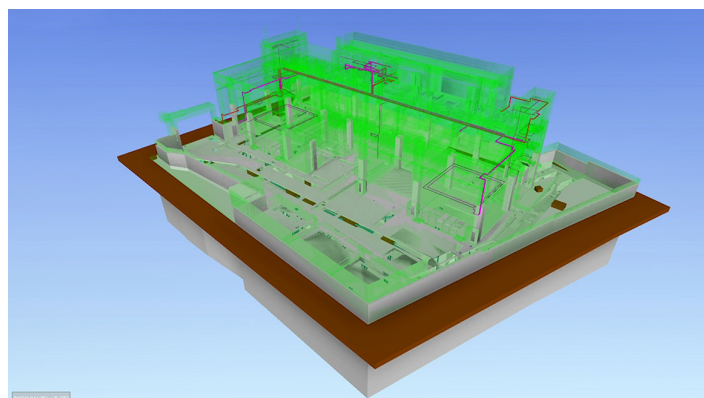




Design of Ma Sik Road Substation  
Image Courtesy of CLP Power Hong Kong Limited



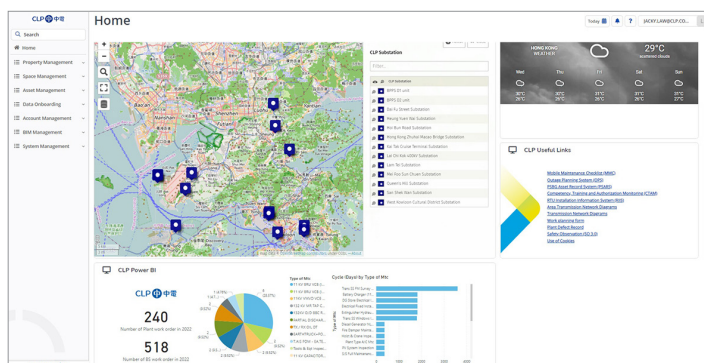
Design of Ma Sik Road Substation  
Image Courtesy of CLP Power Hong Kong Limited



Construction Sequencing using BIM  
Image Courtesy of CLP Power Hong Kong Limited



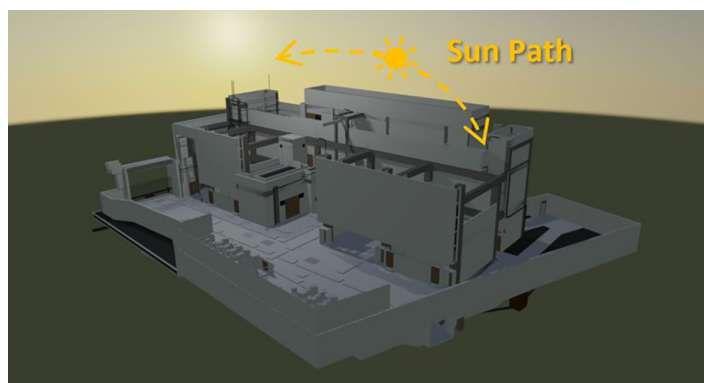
Construction Monitoring (Eagle Eye System)  
Image Courtesy of CLP Power Hong Kong Limited



CLP Power's BIM Platform for Transmission Substations  
Image Courtesy of CLP Power Hong Kong Limited



Construction Simulation of Metal Grille in Transformer Bay  
Image Courtesy of CLP Power Hong Kong Limited



Sun Path Analysis  
Image Courtesy of CLP Power Hong Kong Limited