Prospect Move Forward

COMPANY
Architectural Services Department, HKSAR
Hip Hing Engineering Company Limited

PROJECT
Design and Construction of Expansion of the Legislative Council Complex

LOCATION
Legislative Council Complex, 1 Legislative Council Road, Central, Hong Kong SAR

TYPE
Government Offices

SCHEDULED TIME OF COMPLETION
Q2 2026

"The future of Building Information Modeling (BIM) in architectural design, construction, and manufacturing is poised for transformative growth. I foresee an increasing integration of advanced technologies like artificial intelligence, machine learning, and augmented reality, enhancing collaboration and efficiency across all phases of a project.

BIM will evolve from a static tool to a dynamic platform, facilitating real-time data sharing and decision-making among stakeholders. This shift will streamline workflows, reduce errors, and optimize resource management, leading to more sustainable practices.

Moreover, the role of the BIM will expand to include oversight of digital twins and smart building technologies, ensuring that designs not only meet aesthetic goals but also operational efficiency. As we embrace a more interconnected and data-driven approach, the BIM will be essential in guiding teams through this digital landscape, ultimately delivering innovative solutions that redefine the built environment."

— Brian C Cheung
Assistant Project BIM Manager,
Hip Hing Engineering Company Limited

BIM PARTNERS
Leigh & Orange Limited
WSP Hong Kong Limited
Jangho Group Company Limited
Wing Kei Structural Metalworks Company Limited
Majestic Engineering Company Limited
Young's Engineering Company Limited
China International Marine Containers (Group) Limited
Inhabit Hong Kong

AUTODESK PRODUCTS USED
Autodesk® 3ds Max®
Autodesk® AutoCAD®
Autodesk® Civil 3D®
Autodesk® Docs
Autodesk® Ecotect Analysis
Autodesk® Inventor®
Autodesk® Navisworks® Manage
Autodesk® ReCap® Pro
Autodesk® Revit®
Autodesk® Vehicle Tracking

East Elevation
Image Courtesy of Architectural Services Department, HKSAR and Hip Hing Engineering Company Limited

Expansion of the Legislative Council Complex: Leveraging Autodesk Software for Efficient Project Execution

The Design and Construction of the Expansion of the Legislative Council Complex is a pivotal project that involves the Addition and Alteration (A&A) of the existing Secretariat Building. This expansion will add 8,500 square meters of Net Operational Floor Area to accommodate additional legislators. The design aims to harmonise with the existing Legislative Council Complex, the adjoining Central Government Offices, and the Chief Executive's Office. To achieve this, the project's height and massing have been optimised, and the façade will utilise consistent materials and colours to maintain a cohesive appearance.

Elevation
Image Courtesy of Architectural Services Department, HKSAR and Hip Hing Engineering Company Limited

Entrance
Image Courtesy of Architectural Services Department, HKSAR and Hip Hing Engineering Company Limited

A&A Works and Documentation

Accurate documentation of existing conditions is critical to the A&A works. Traditional as-built drawings may not always reflect the true state of the building due to changes over time. The project team employs advanced technologies such as point cloud scanning and 360-degree photography to address this. These methods allow for precise documentation of the building's current state, facilitating better design integration.

The point cloud data can be directly incorporated into design models, allowing designers to quickly identify potential issues and adapt the project to real-world conditions. This level of accuracy is essential, especially when working within the confines of an existing structure.

Design for Manufacturing (DfMA) and Modular in Construction (MiC)

A key innovation in this project is using Modular in Construction (MiC) technology. This expansion marks the first instance where structural steel MiC modules will be installed atop an existing reinforced concrete structure. The project will consist of 286 MiC modules, with the L-shaped portion featuring structural elements and the triangular infill portion comprising non-structural modules.

Each floor in the L-shaped portion will house 15 legislative offices, meeting rooms, restrooms, and pantry areas, with each office covering approximately 60 square meters. These offices are constructed by assembling three modules, which include separate offices for legislators and open-plan spaces for staff.

BIM software plays a pivotal role in the manufacturing process of the MiC modules. Using the design models, our manufacturer could easily import them into Inventor. The team can simulate the performance of these components under various conditions, ensuring that they meet safety and design standards. The ability to run simulations helps identify potential issues before they arise, allowing for adjustments in the design that can significantly reduce risks during construction.

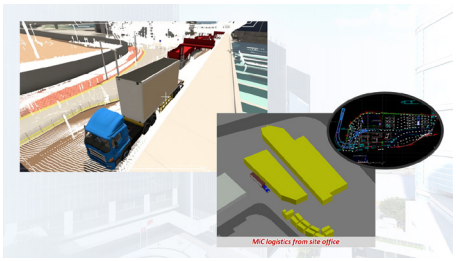
Moreover, Inventor's capabilities for generating detailed fabrication drawings streamline the manufacturing process, ensuring that the modules are built accurately and efficiently in the factory setting. This is particularly important given the Just in Time (JIT) delivery approach adopted for the project, which minimises on-site storage and optimises logistics.

BIM for Site Logistics and Logistics Planning

Civil 3D is another critical tool in this project, particularly for site design and logistics planning. This software assists in analysing the existing infrastructure, which is vital for determining how to efficiently deliver the MiC modules to the site.

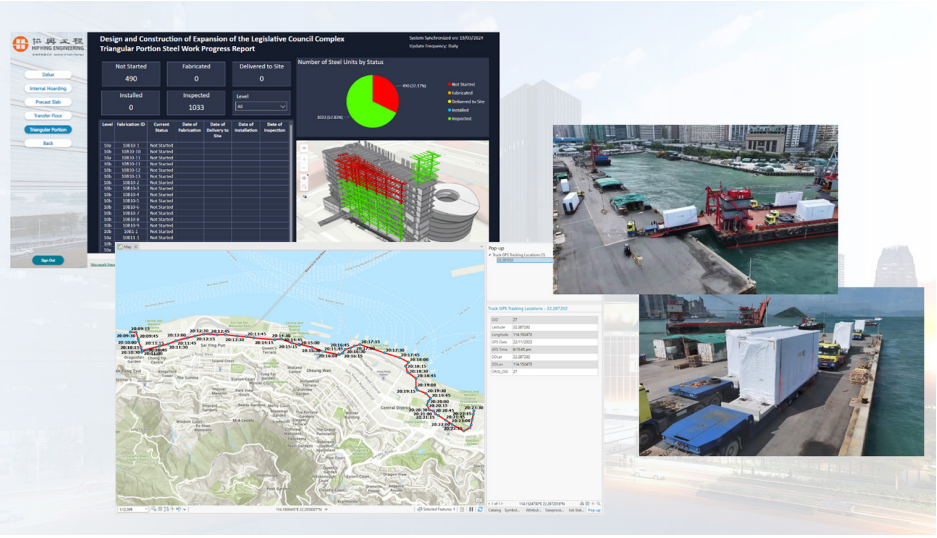
One of Civil 3D's notable features is its vehicle tracking capability. This allows the project team to simulate vehicle movements and assess the logistics routes for delivering the MiC modules. By testing various scenarios, the team can identify the most efficient paths for transportation, minimising disruptions and ensuring that deliveries occur smoothly within the limited site area.

Site Documentation
Image Courtesy of Architectural Services Department, HKSAR and Hip Hing Engineering Company Limited

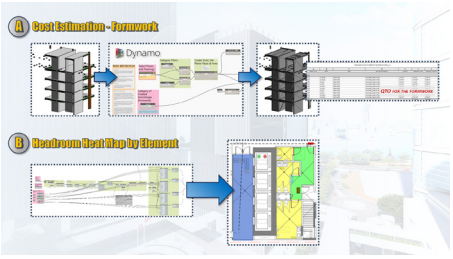


Logistic considerations for MiC Delivery
Image Courtesy of Architectural Services Department, HKSAR and Hip Hing Engineering Company Limited

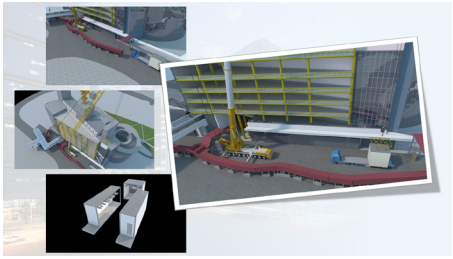
Legislator's Office
Image Courtesy of Architectural Services Department, HKSAR and Hip Hing Engineering Company Limited



Hip Hing IIMP
Image Courtesy of Architectural Services Department, HKSAR and Hip Hing Engineering Company Limited



Automation
Image Courtesy of Architectural Services Department, HKSAR and Hip Hing Engineering Company Limited



Site Planning
Image Courtesy of Architectural Services Department, HKSAR and Hip Hing Engineering Company Limited

Integrated Information Management Platform (IIMP)

The Hip Hing Integrated Information Management Platform (IIMP) is a central management tool that enhances project monitoring. It provides project managers with real-time insights and data necessary for effective decision-making. The IIMP dashboard offers an overview of project progress, supported by data-driven workflows and a Geographic Information System (GIS) platform.

The platform visualises data through parametric 3D models and detailed installation statuses, allowing for efficient construction process management. Features such as live monitoring of Permit-to-work status and AI-enabled cameras strengthen safety management on-site. Additionally, smart monitoring sensors provide environmental data, while daily workforce tracking ensures adequate manpower is available.

One of the key features of the IIMP is the integration of the Programme S-Curve, which enhances progress monitoring and allows for timely interventions when necessary. This capability is crucial in a design-and-build project where rapid changes can occur.

Collaboration and Communication

A Common Data Environment (CDE) is employed alongside the IIMP to ensure all stakeholders remain informed and aligned. This system allows for seamless information sharing among project teams, ensuring everyone can access the most up-to-date data. The project team achieves efficient cross-platform information exchanges by utilising an online Request for Information (RFI) system and the openBIM approach. This collaborative environment is essential for managing the project's complexities, which involve numerous fast-paced elements. Continuous access to updated information facilitates quick responses to challenges, ensuring the project remains on track.

Conclusion

The expansion of the Legislative Council Complex exemplifies the effective use of modern technology and software in the construction industry. The project team enhances design accuracy, manufacturing efficiency, and logistical planning by leveraging the Autodesk suite, which includes Revit, AutoCAD, Inventor, 3ds Max, and Civil 3D, among others.

Integrating MiC technology and the IIMP further streamlines project execution, improving safety management and progress monitoring. As a result, the project is well-positioned to meet the needs of the legislators while maintaining harmony with the existing architectural context. This approach sets a standard for future developments and demonstrates how innovation can drive efficiency in construction projects.

Collaboration and Design Review using BIM Cave
Image Courtesy of Architectural Services Department, HKSAR and Hip Hing Engineering Company Limited

建築署
Architectural Services Department

協興工程有限公司
HIP HING ENGINEERING CO LTD

Legislator's Office
Image Courtesy of Architectural Services Department, HKSAR and Hip Hing Engineering Company Limited

About Architectural Services Department, HKSAR

Architectural Services Department (ArchSD) was found in 1986 serving as one of the works departments under the Development Bureau of the HKSAR Government for the development and upkeep of public facilities.
Our aim is to provide efficient and cost-effective professional and project management services for the design, construction, maintenance and refurbishment of government buildings and facilities. We also provide professional and technical advice to the Government and quasi-government organisations. Our vision is to serve and take care of our community by enriching the living environment through high quality professional services; and to promote best practices in the building industry.

About Hip Hing Engineering Company Limited

Founded in 1964, Hip Hing Engineering Co., Ltd. undertakes the design and construction of building and civil engineering works for public sector clients, and it is one of the members of Hip Hing Construction Group ("Hip Hing"). Over the past decades, Hip Hing has grown to become one of the leading contractors in Hong Kong, and has been trusted by our clients to construct many of the landmark buildings which define Hong Kong. Our experience and expertise in the design, procurement, engineering and construction disciplines enables us to provide comprehensive project delivery services. We have also been embracing advancing technologies to take our services to the next level, so as to meet our clients' needs.