ONE BIM FOR ALL - Revolutionising Project Collaboration

COMPANY

Airport Authority Hong Kong
China State Construction Engineering (Hong Kong) Limited

PROJECT

Contract 3310 North Runway Modification Works

LOCATION

Hong Kong International Airport, Lantau, Hong Kong

TYPE

Infrastructure/Civil

SCHEDULED TIME OF COMPLETION

Q4 2024

About Airport Authority Hong Kong

The Airport Authority Hong Kong (AAHK) is a statutory body wholly owned by the Hong Kong SAR Government established in 1995. AAHK is responsible for the operation and development of Hong Kong International Airport (HKIA), aiming to strengthen HKIA as the leading international aviation hub and a key engine for the economic growth of Hong Kong. Currently, the Company is committed to the Three Runway System (3RS) Project, which is the largest complex infrastructure development in Hong Kong. The 3RS project comprises 650 hectares of reclamation, a new runway and concourse, expansion of T2, new Automated People Mover system and Baggage Handling system, and other related facilities. Upon commissioning, it enables the capacity of HKIA to increase to over 100 million passengers and 9 million tonnes of cargo by 2030, catering for the long-term air traffic demand in Hong Kong.

About China State Construction Engineering (Hong Kong) Limited

China State Construction Engineering (Hong Kong) Limited started its construction business in Hong Kong since 1979. It's a vertically integrated construction powerhouse, engaging in building construction and civil engineering operations as well as foundation work, site investigation, mechanical and electrical engineering, highway and bridge construction, ready-mixed concrete, pre cast production and infrastructure investment. In July 2005, China State Construction was listed on the Main Board of The Hong Kong Stock Exchange (stock code: 3311). China State Construction is amongst the largest construction contractors in Hong Kong to deliver Buildings, Port Works, Roads and Drainage, Site Formation and Waterworks. China State Hong Kong plays an active role in the construction industry by means of quality management and has professional expertise capable of undertaking high quality and technically advanced projects. It has undertaken over 800 construction projects in Hong Kong and Macau over the past 40 years and has acquired substantial experience and capabilities in doing so.

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Project Description

Contract 3310 is one of the major Contract of Three-Runway System (3RS) Project involving an overall investment of over HKD5.2 billion. C3310 Works Area covers an extensive horizon over 5km in length and over 2,910,000 m^2 of land including the closure and modifications of existing North Runway, construction of additional taxiways and vehicular tunnels, and other essential infrastructure works required for the 3RS operation. AAHK and China State capitalise digital technologies to stay ahead of the curve with the concept of ONE BIM FOR ALL.

Project Challenges

This project faces different challenges due to tight deadlines to complete various site formation works, utiltity works, airfield pavement works, other infrastructure works, etc. The extensive scope of work adds demand on resources and schedules. Coordinating with numerous project intefaces and stakeholders further complicates the matter. The massive amount of information from different parties also needs to be properly managed to ensure all works are progressing according to plan. It will be an uphill task for the project team to overcome these challenges and deliver the project as scheduled.

Solutions for Challenges

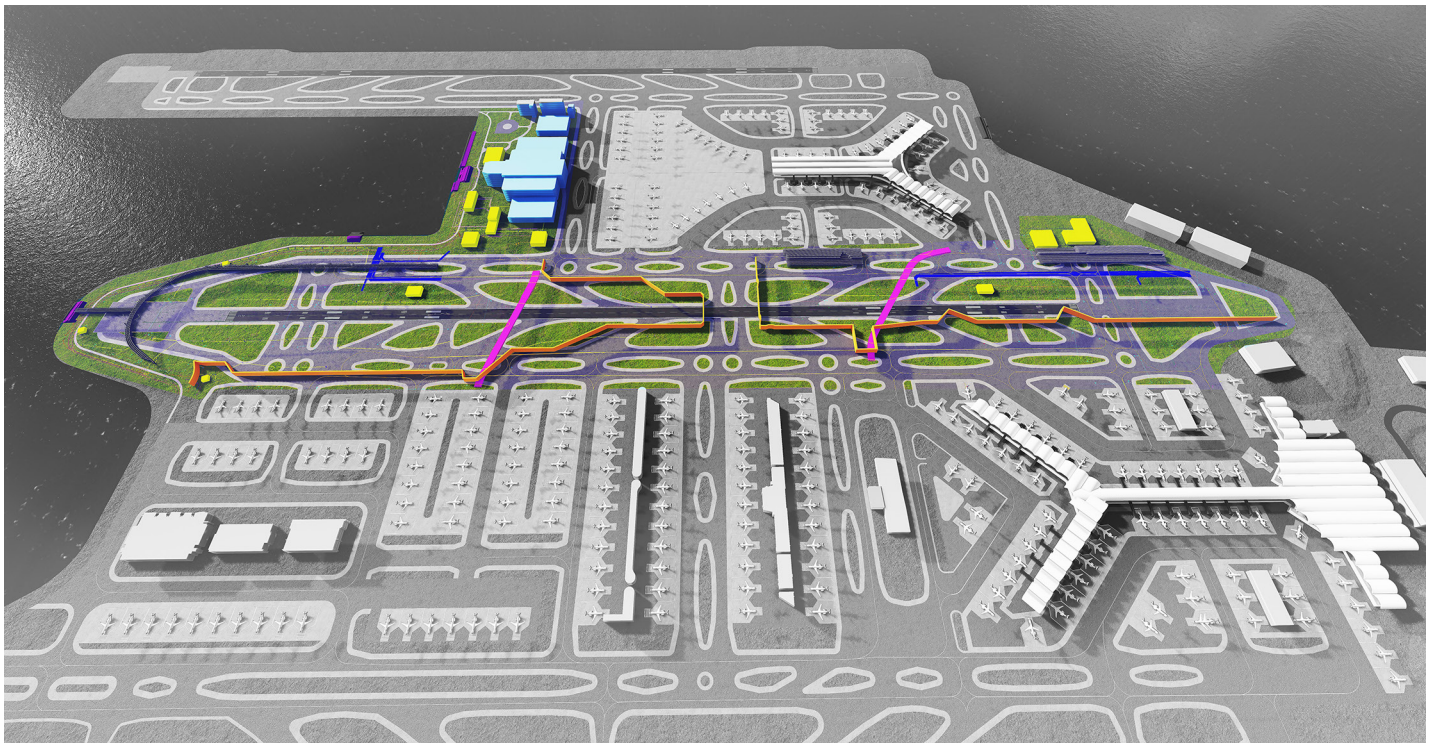
To address the project challenges, the concept of ONE BIM FOR ALL is adopted. This collaborative approach utilises integrated BIM technologies to develop a foreseeable information flow system. BIM and the accompanying use of a Autodesk BIM 360 form the bedrock of digital transformation for effective project management and efficient information exchange control throughout the project life-cycle. BIM automation is to ensure quality and flexibility in the large-scale civil project. Laser scanning technology is adopted for synchronisation between site data and BIM models. Machine control solutions are employed for accurate positioning of paving machinery (and subsequently asphalt paving), based on BIM models and GNSS systems.

How does BIM benefit the project?

The project team embraces a complete BIM workflow for airfield pavement works and underground utilities works, incorporating 3D, 4D, and 5D BIM, resulting in enhanced efficiency and accuracy. It reduces clashes by an impressive 98%, minimizing costly rework and delays. This comprehensive approach also envisions the project for better design review, planning, construction phasing and cost estimation. Lastly, BIM enables seamless collaboration among the client, main contractor, designers, subcontractors and the interface contractors. The unified BIM platform facilitates effective communication, coordination, and information exchange.

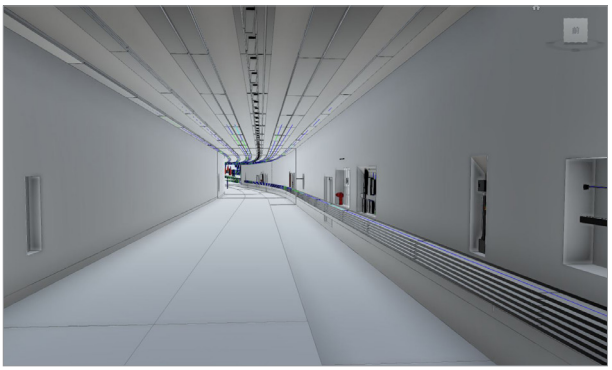
Better with BIM

BIM allows all project stakeholders to visualise and collabrate in a 3D model environment from the start. This will facilitate early conflict detection and resolution. The model contains all necessary information which can be extracted and organised, helping to manage the massive data in a more structured way. Resources can be planned and tracked more efficiently with clear information exhange. BIM implementation not only connects data but also processes and people to deliver the extensive project scope with the strict deadline.



Contract 3310 Overview
Image Courtesy of Airport Authority Hong Kong and China State Construction Engineering (Hong Kong) Limited

Contract 3310 Runway
Image Courtesy of Airport Authority Hong Kong and China State Construction Engineering (Hong Kong) Limited



MEP Coordination with BIM Collabrate Pro
Image Courtesy of Airport Authority Hong Kong and
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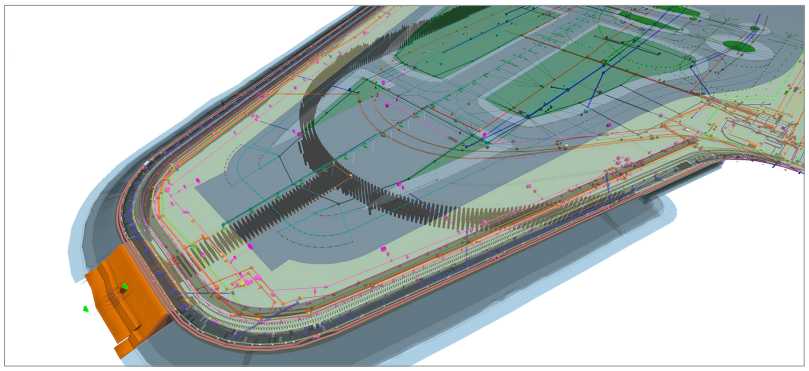

Digital Underground System
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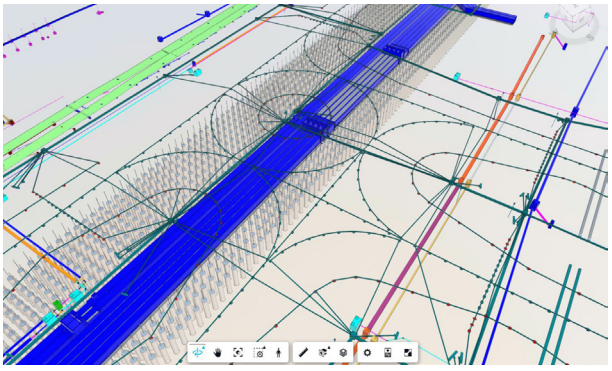

UU Coordination with BIM Collabrate Pro
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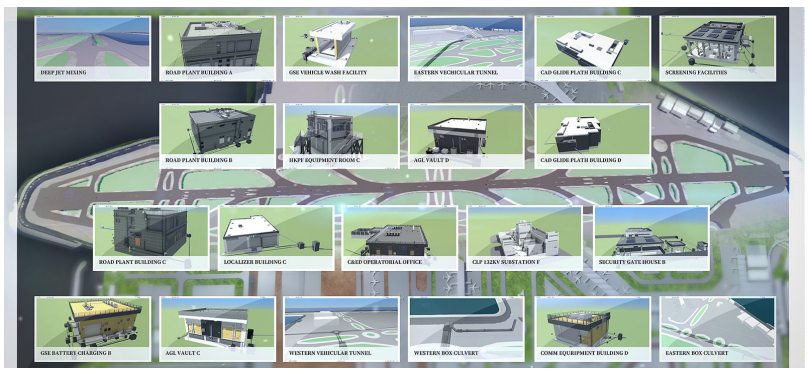

Extensive Project Scope: Structure Works
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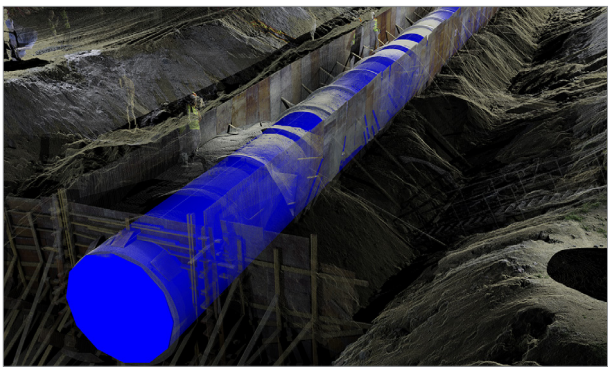

Scan to BIM for Underground Utilities
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