COMPANY

Architectural Services Department, HKSAR
Shui On Joint Venture
WSP Hong Kong Limited

PROJECT

Redevelopment of Kwai Chung Hospital (Phase 2)

LOCATION

3-15, Kwai Chung Hospital Road, New Territories, Hong Kong

TYPE

Building Project

SCHEDULED TIME OF COMPLETION

2024

Build Green Build Smart Build Fast With BIM Technology

"Embrace the power of Building Information Modelling (BIM) in the Redevelopment of Kwai Chung Hospital Phase 2. We revolutionize how we design and construct this vital healthcare facility. BIM's collaborative approach enables efficient coordination and enhanced visualization and facilitates seamless information exchange for design optimization, off-site fabrication, logistic planning, etc. By harnessing the full potential of BIM, we can ensure the successful transformation from traditional project delivery to building innovation and help societies thrive sustainably."

—**Sofia Lau**
Senior Project Manager, Architectural Services Department, HKSAR

—**Eric Sze**
Project Manager, Shui On Joint Venture

—**Ricky Shum**
Assistant BIM Manger, Shui On Joint Venture

—**Aeon Yuen**
BIM Manager, WSP Hong Kong Limited

BIM PARTNERS

TFP Farrells Limited
Arup (Civil, Structural & Geotechnical)
AECOM Asia Company Limited
Southa Technical Limited

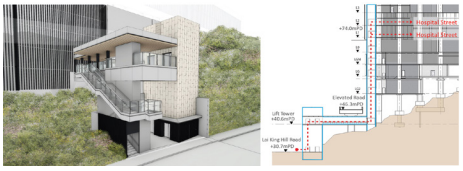
AUTODESK PRODUCTS USED

Autodesk® 3ds Max®
Autodesk® Architecture, Engineering & Construction Collection
Autodesk® AutoCAD®
Autodesk® BIM 360®
Autodesk® Dynamo Studio
Autodesk® Navisworks® Freedom
Autodesk® Navisworks® Manage
Autodesk® ReCap® Pro
Autodesk® Revit®

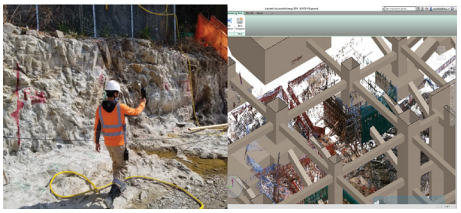
Redevelopment of Kwai Chung Hospital - creating a supportive environment for patient-focused mental healthcare
Image Courtesy of Architectural Services Department, HKSAR and Shui On Joint Venture and WSP Hong Kong Limited

Project Background

Redevelopment of Kwai Chung Hospital (KCH), Phase 2 calls for revolutionary design aiming to support the drive to shift psychiatric care towards a person-centred approach. The redevelopment involves demolishing existing buildings and constructing a new hospital campus that will offer a comprehensive range of psychiatric services. These services include inpatient wards, rehabilitation facilities, ambulatory centres, and outpatient specialty services. The project also includes provisions for pharmacy services, community health education and allied health and medical social services. Adopting Building Information Modeling (BIM) throughout all phases enables effective collaboration and visualization of innovative design. The redeveloped KCH will become the first local hybrid-mode psychiatric hospital, providing holistic patient-centred care that combines inpatient and community care services. The therapeutic village setting will create a supportive environment for patients. Overall, the project represents a significant advancement in mental health facility design and the delivery of psychiatric care, emphasizing a person-centred approach and efficient collaboration among stakeholders.



BIM enabled highly detailed visualizations of building and spatial relationship for coordination with users
Image Courtesy of Architectural Services Department, HKSAR and Shui On Joint Venture and WSP Hong Kong Limited



Surveying with 3D handheld scanner seamlessly integrating site condition into the BIM model.
Image Courtesy of Architectural Services Department, HKSAR and Shui On Joint Venture and WSP Hong Kong Limited

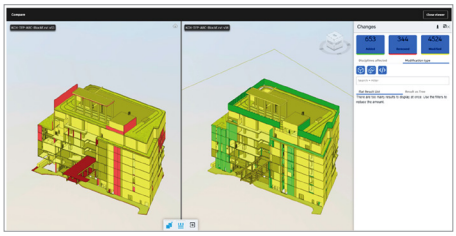
Advantages of BIM on the Design Stage

BIM offers significant advantages during the design stage of a hospital construction project. It enables enhanced collaboration among architects, engineers, contractors, healthcare professionals and facility managers, facilitating the integration

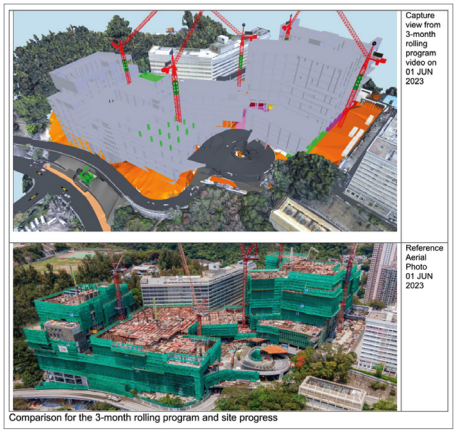
of various systems and requirements. BIM's clash detection capabilities help identify conflicts between structural, mechanical, electrical, and plumbing components, ensuring efficient coordination and reducing design errors. Detailed 3D visualizations assist in understanding the hospital's layout and spatial relationships, enabling stakeholders to optimize patient flow, staff efficiency, and operational workflows. BIM's data-rich models aid in accurate cost estimation, quantity take-offs, and scheduling, supporting budget management and timely project delivery. BIM's sustainability analysis also optimizes energy efficiency, ventilation and lighting, ensuring a patient-centric and environmentally friendly hospital design. Overall, BIM empowers stakeholders to create well-coordinated, cost-effective, and patient-focused hospital designs, improving healthcare delivery in the construction stage.

Project Innovation

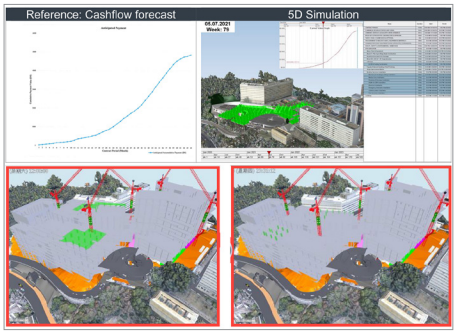
In this phase 2 of the Redevelopment of Kwai Chung Hospital, innovative technologies of 3D scanners, prefabrication components of MiC



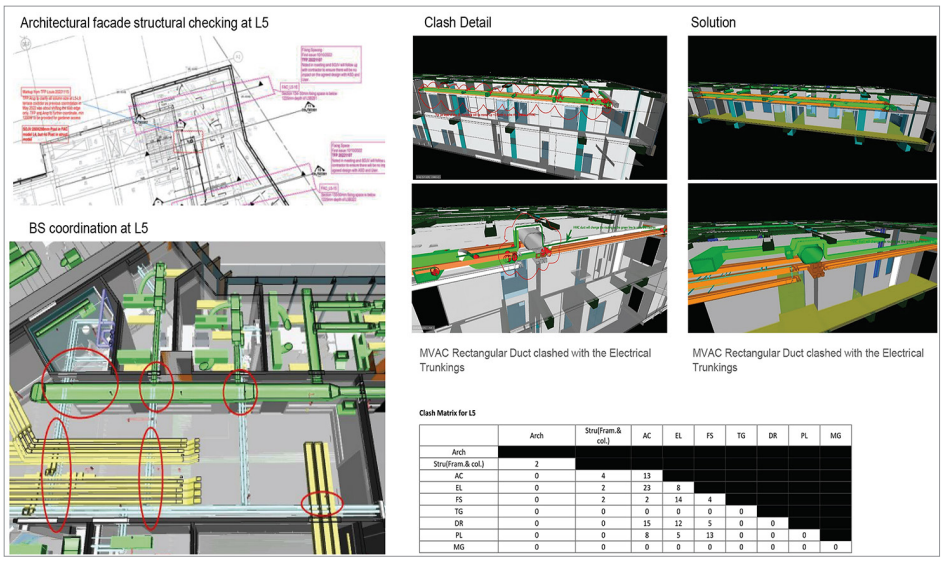
Track Changes for the Disciplined BIM Model
Image Courtesy of Architectural Services Department, HKSAR and Shui On Joint Venture and WSP Hong Kong Limited



4D Progress Comparison Report
Image Courtesy of Architectural Services Department, HKSAR and Shui On Joint Venture and WSP Hong Kong Limited



5D Cashflow Forecast Report
Image Courtesy of Architectural Services Department, HKSAR and Shui On Joint Venture and WSP Hong Kong Limited



	Arch	Stru(Fram.& col.)	AC	EL	FS	TG	DR	PL	MG
Arch									
Stru(Fram.& col.)	2								
AC	0	4	13						
EL	0	2	23	8					
FS	0	2	2	14	4				
TG	0	0	0	0	0	0			
DR	0	0	15	12	5	0	0		
PL	0	0	8	5	13	0	0	0	
MG	0	0	0	0	0	0	0	0	0

Accurate design coordination with BIM enhanced design and construction efficiency.
Image Courtesy of Architectural Services Department, HKSAR and Shui On Joint Venture and WSP Hong Kong Limited

BIM software to simulate the delivery, lifting and installation processes, providing clear picture and work flow for supervising staff and workers to minimize the risk.
Image Courtesy of Architectural Services Department, HKSAR and Shui On Joint Venture and WSP Hong Kong Limited

ensuite toilet/consultation rooms, MiMEP (Mechanical, Electrical, and Plumbing) systems, and DfMA (Design for Manufacture and Assembly) construction methods, when combined with BIM, significantly raise construction efficiency. 3D scanners capture accurate as-built data, enabling seamless integration with BIM models for clash detection and coordination. MiMEP systems streamline the installation of complex building services, reducing installation time. DfMA construction methods promote off-site manufacturing and modular construction, leading to faster assembly on-site. These technologies enhance communication, minimize rework and uplift construction efficiencies.

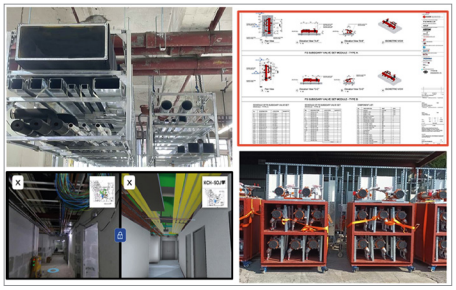
BIM on Site Safety and Planning

BIM plays a vital role in enhancing site safety during the construction process.

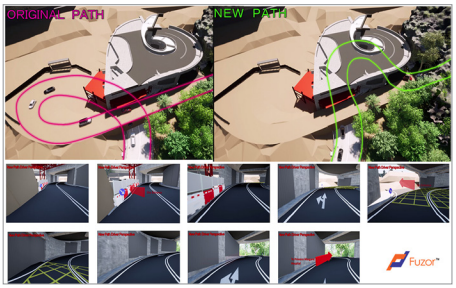
Virtual Safety Simulations: BIM allows for the creation of virtual construction simulations, enabling project teams to identify and mitigate potential safety hazards before they occur on-site. By visualizing the construction process in a digital environment, safety risks, such as clashes, falls, or material handling issues, can be identified and addressed, reducing the likelihood of accidents and injuries.

Construction Sequencing and Planning: BIM enables the creation of detailed construction schedules and sequencing plans. This helps project teams identify potential safety risks associated with construction, such as working at height, heavy lifting, or hazardous material handling. By incorporating safety considerations into the construction plan, proactive measures can be taken to mitigate risks and ensure a safe working environment.

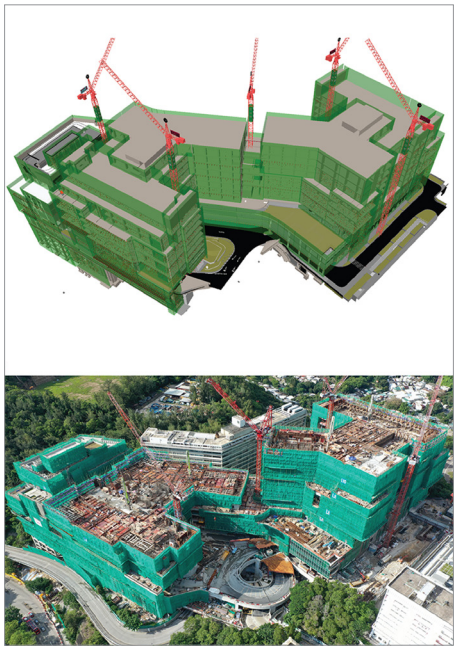
Enhanced Communication and Training: BIM provides a visual and interactive safety training and communication platform. Safety procedures, hazard identification, and emergency evacuation plans can be integrated into the BIM model, allowing workers to familiarize themselves with safety protocols before setting foot on the construction site. This improves overall safety awareness and compliance.



BIM facilitated accurate coordination for off site fabrication providing good quality and workmanship.
Image Courtesy of Architectural Services Department, HKSAR and Shui On Joint Venture and WSP Hong Kong Limited



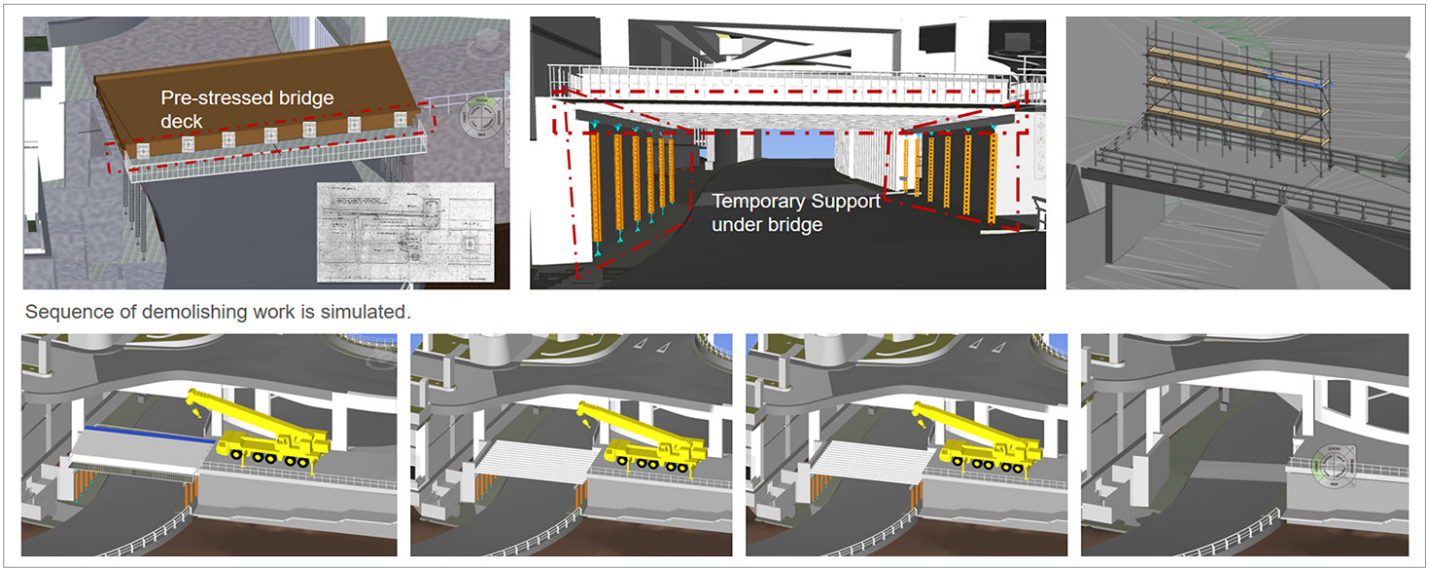
Traffic flow simulation by BIM technology for temporary traffic arrangement coordination with hospital users.
Image Courtesy of Architectural Services Department, HKSAR and Shui On Joint Venture and WSP Hong Kong Limited



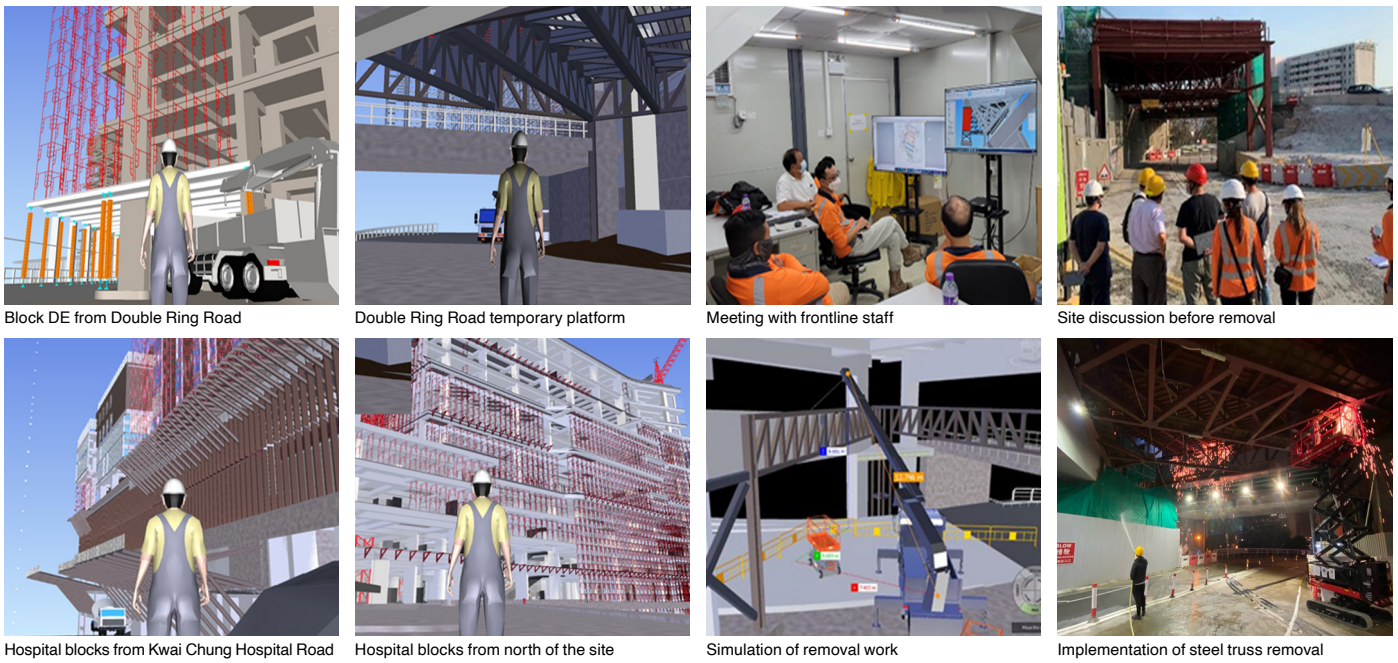
4-D BIM provided clear pictures of site conditions for bamboo scaffolding planning.
Image Courtesy of Architectural Services Department, HKSAR and Shui On Joint Venture and WSP Hong Kong Limited

Site Logistics and Access Planning: BIM assists in optimizing site logistics, including material delivery, storage areas, and worker access routes. By carefully planning and visualizing these aspects, potential hazards, such as congested areas or unsafe access points, can be identified and mitigated, ensuring a safer working environment.

In conclusion, BIM significantly enhances site safety during construction by enabling virtual safety simulations, clash detection, improved coordination, construction sequencing and planning, enhanced communication and training, site logistics optimization, and ongoing safety monitoring.



BIM Technology to assist planning of demolition of existing pre-stressed bridge.
Image Courtesy of Architectural Services Department, HKSAR andShui On Joint Venture and WSP Hong Kong Limited



Site Safety – Discuss the high risk activities among all workers and frontline supervising staff and simulate the procedures by BIM model and Naviswork walk through.
Image Courtesy of Architectural Services Department, HKSAR and Shui On Joint Venture and WSP Hong Kong Limited

建築署
Architectural Services Department

瑞安建業
SOCAM DEVELOPMENT

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Redevelopment of Kwai Chung Hospital - creating a supportive environment for patient-focused mental healthcare
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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 Shui On Joint Venture (HKSE 00983.HK)

A member of SOCAM Development Limited, SOJV is a joint venture of Shui On Building Contractors Limited and Shui On Construction Co., Ltd., combining solid and extensive experience in the construction of public housing, commercial, and institutional projects for the government and major institutions. SOJV has integrated the client, design consultants, and various specialist contractors into a single work team so that the design intent and buildability are recognized by all parties throughout the entire development process. The Shui On corporate culture is based on its commitment to integrity, quality, innovation, and excellence, on a set of corporate governance principles, and it is our quest for perfection that has brought Shui On so far. The “Better Tomorrow 2021-2030” strategy sets out what SOJV aims to achieve as the company moves to create a positive impact on the economy, environment, and the community.

About WSP Hong Kong Limited

WSP is one of the world’s leading engineering consulting firm, provides engineering design and technological services in the Transportation & Infrastructure, Property & Buildings, Sustainable Development & Environment, Digital & Smart. With our integrated service offerings across sectors, WSP develops creative, comprehensive and sustainable engineering solutions to uniquely complex problems, creating a future where both society and people can thrive. Our achievements have long been recognised by the industry through close partnerships with clients and awards. With ISO 19650 certification, we strengthen our BIM capability and operations as we step up our efforts in offering more innovative, integrated digital solutions, from new construction approaches to digital twin applications.