

## COMPANY

Hong Kong Baptist University  
China State Construction Engineering  
(Hong Kong) Limited  
China State Construction Science and  
Technology Limited  
Transcendence Company Limited  
P&T Architects and Engineers Limited

## PROJECT

Jockey Club Campus of Creativity (JC<sup>3</sup>)

## LOCATION

30 Renfrew Road, Kowloon Tong, Kowloon

## TYPE

New Construction of University Hostel and  
Academic Building Complex

## SCHEDULED TIME OF COMPLETION

Q3 2024

“Technological construction is the future development trend of the industry. We have been committed to researching the combination of traditional construction and technological construction, such as the application of BIM technology in the entire construction process. To carry out better quality, safety and progress work, it can bring more efficient managing strategy to the management team.”

— Wang Song

Senior Site Manager,  
China State Construction Engineering  
(Hong Kong) Limited

## AUTODESK PRODUCTS USED

Autodesk® 3ds Max®

Autodesk® Architecture, Engineering &  
Construction Collection

Autodesk® AutoCAD®

Autodesk® BIM 360®

Autodesk® BIM Collaborate Pro

Autodesk® Civil 3D®

Autodesk® Dynamo Studio

Autodesk Forge®

Autodesk® InfraWorks®

Autodesk® Navisworks® Freedom

Autodesk® Navisworks® Manage

Autodesk® ReCap® Pro

Autodesk® Revit®

# Everyone a BIM Soldier!



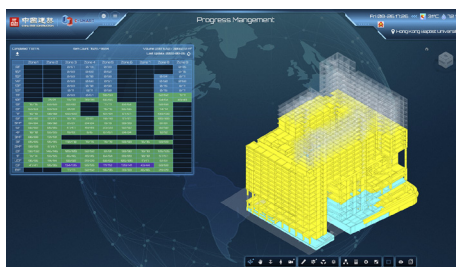
Image Courtesy of Hong Kong Baptist University and China State Construction Engineering (Hong Kong) Limited and China State Construction Science and Technology Limited and Transcendence Company Limited and P&T Architects and Engineers Limited

## History of China State Construction Engineering (Hong Kong) Limited

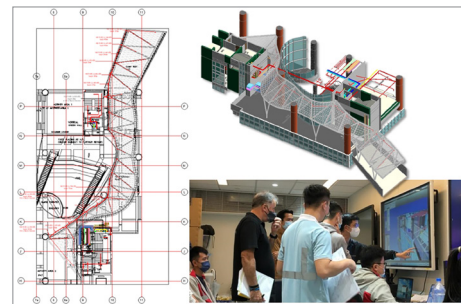
China State Construction Engineering (Hong Kong) Limited started the BIM implementation since 2010.

Starting with the first BIM project of Housing Authority in Yau Tong, besides fulfilling employers' requirements, China State Construction Engineering (Hong Kong) Limited aimed to change the old roles, relationships and the working practice.

BIM team was established and practical evidence shows the benefits and the powerful incentive in communication of BIM. BIM training center established in



C-Smart - Progress Management  
Image Courtesy of Hong Kong Baptist University and China State Construction Engineering (Hong Kong) Limited and China State Construction Science and Technology Limited and Transcendence Company Limited and P&T Architects and Engineers Limited



3D coordination with parties  
Image Courtesy of Hong Kong Baptist University and China State Construction Engineering (Hong Kong) Limited and China State Construction Science and Technology Limited and Transcendence Company Limited and P&T Architects and Engineers Limited

2020, CSHK BIM Standard and 'Everyone a BIM soldier' policy was also published.

BIM is the cornerstone towards Digitalization and Industrialization of Construction. Integration of BIM with digital technologies ensure innovation and process optimization to achieve a sustainable and efficient production.

R&D towards smart site, digital twin and Metaverse will be the company future direction. Also use of advanced hardware tools, including 3D laser scanning to collect as-built data and establish point cloud model for better MEP system coordination, and target that 100% utilization of BIM 4D & 5D in all BIM projects.

Hong Kong Baptist University - Jockey Club Campus of Creativity is located at 30 Renfrew Road, Kowloon Tong. The building development comprising the construction of four 13 to 17-storey student hostels block and 4-storey academic building complex with associated external works.

The contract stated clear BIM requirement in PS up to facility management. The contractor's in-house BIM team utilize BIM in every aspect including 3D life-cycle modelling, 4D simulation, DWSS inspection, BIM 5D quantity take off, laser scanning, and

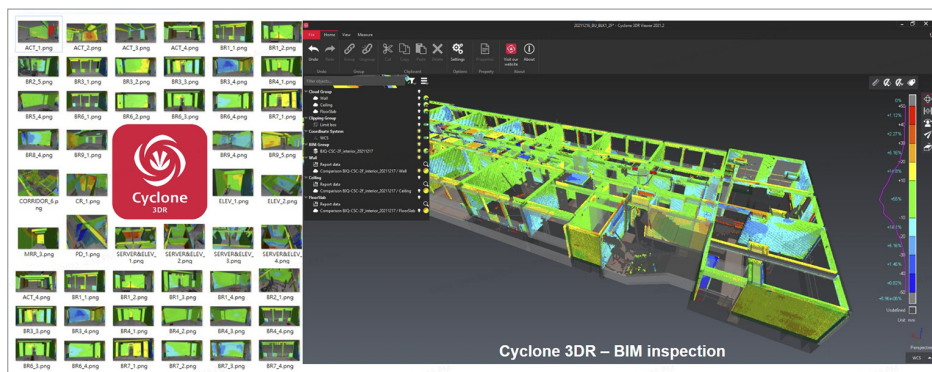


Image Courtesy of Hong Kong Baptist University and China State Construction Engineering (Hong Kong) Limited and China State Construction Science and Technology Limited and Transcendence Company Limited and P&T Architects and Engineers Limited

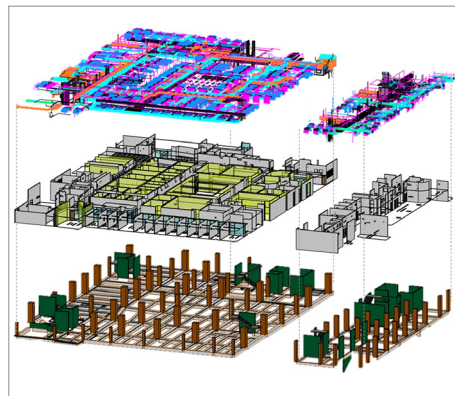


Image Courtesy of Hong Kong Baptist University and China State Construction Engineering (Hong Kong) Limited and China State Construction Science and Technology Limited and Transcendence Company Limited and P&T Architects and Engineers Limited

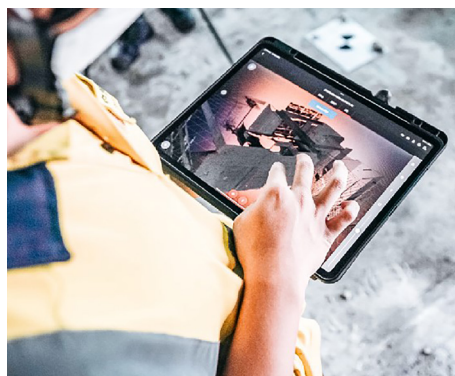


Image Courtesy of Hong Kong Baptist University and China State Construction Engineering (Hong Kong) Limited and China State Construction Science and Technology Limited and Transcendence Company Limited and P&T Architects and Engineers Limited

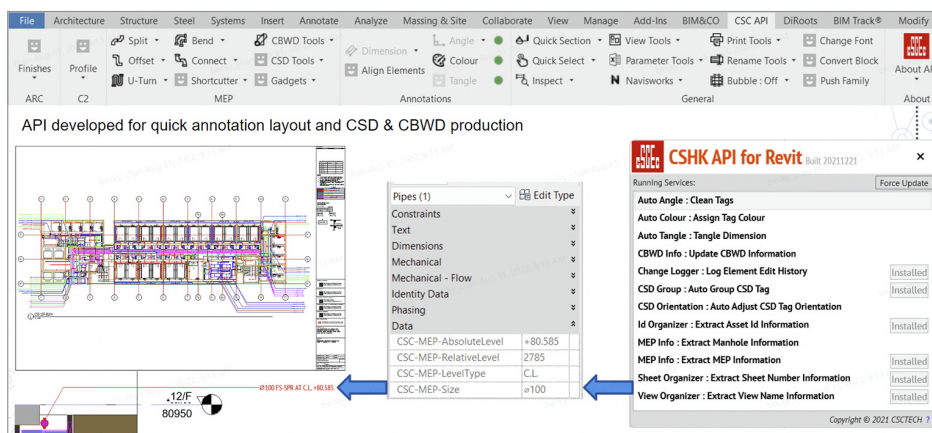


Image Courtesy of Hong Kong Baptist University and China State Construction Engineering (Hong Kong) Limited and China State Construction Science and Technology Limited and Transcendence Company Limited and P&T Architects and Engineers Limited

company-developed smart site system - C-Smart etc.

### Life-cycle Modelling

For 3D BIM Coordination, all drawings, including Combined Service Drawings (CSD) and Combined Builders Works Drawings (CBWD) are produced directly from BIM. The process speeds up coordination compared to paper-based communication, provide a platform to resolve design issue before construction. BIM models in Common Data Environment ensure data consistency, saving time to exchange files and the single source of truth. BIM

coordination meeting hosted regularly to proceed walkthrough and visual checking with appointing party and appointed parties in order to resolve and review issues.

### OpenBIM Clash Resolution

To provide the function of 3D clash resolution, BIM-track openBIM software is adopted. BIM-Track act as a BIM Collaboration Format, it collects all BIM issues and clashes on web-based platform, enable all parties to access and review the issue easily. BCF automatic generate clash report and summary for analysis.

### Common Data Environment

The whole BIM model is working on Autodesk Construction Cloud, a Cloud based CDE. All parties can access the Model and provide comments which will be processed to issue or RFI for site team. BIM Team create project, manage project access, information and the gateways align the standard ISO 19650; other project stakeholders can review both 2D nad 3D with browser, markup and comment individually.

### 4D Simulation

Baseline master programme simulation is produced to reflect the planned programme for engineer review. Also Plan vs Actual comparison is introduced, which reflect the true condition of concreting progress for management. To avoid manual process and human error,



Image Courtesy of Hong Kong Baptist University and China State Construction Engineering (Hong Kong) Limited and China State Construction Science and Technology Limited and Transcendence Company Limited and P&T Architects and Engineers Limited



a sets of dynamo scripting is used for streamlining the workflow of concreting zone allocation.

## 5D Cost Estimation

Project information model is prepared based on Client's 5D Standard, including data of concrete grade, STR Usage, Fire Resistance Period etc.

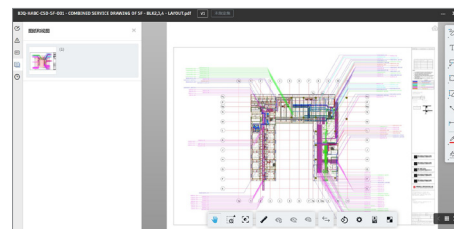
## 6D Laser Scanning

An independent developed drone platform by china state is used for all point cloud models. The construction site is 3D

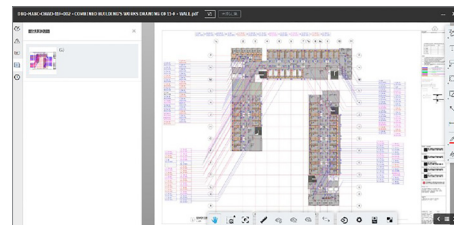
Scanned by laser workstation & drone in a regular basis. Also, Cintoo Cloud platform is used for reading point cloud data and BIM model(s) which is in .ifc format, compare and visualize in order to check the quality of works. Those point cloud and BIM model can be measured and for coordinate if any possible clashes may be occurred.

## API Automation

Company invented API tools enhance the productivity for CSD and CBWD deliverables, also support BIM workflow



Combined Services Drawing in BIM360  
Image Courtesy of Hong Kong Baptist University and China State Construction Engineering (Hong Kong) Limited and China State Construction Science and Technology Limited and Transcendence Company Limited and P&T Architects and Engineers Limited

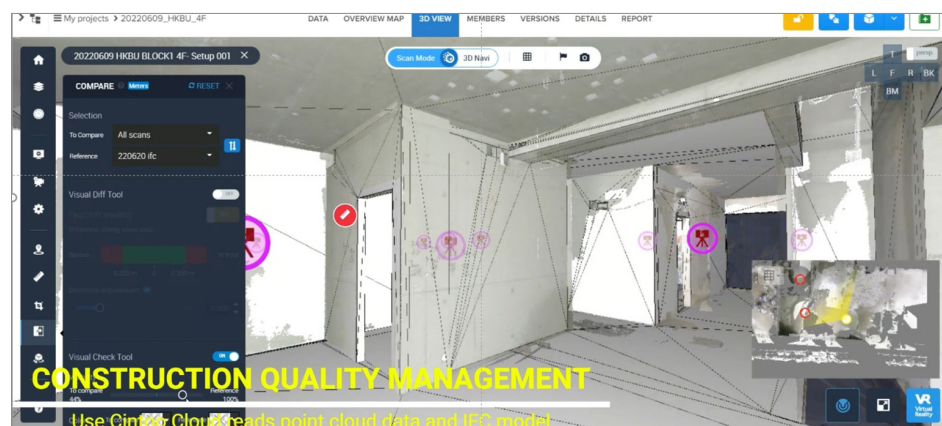


Combined Builder Works Drawing in BIM360  
Image Courtesy of Hong Kong Baptist University and China State Construction Engineering (Hong Kong) Limited and China State Construction Science and Technology Limited and Transcendence Company Limited and P&T Architects and Engineers Limited

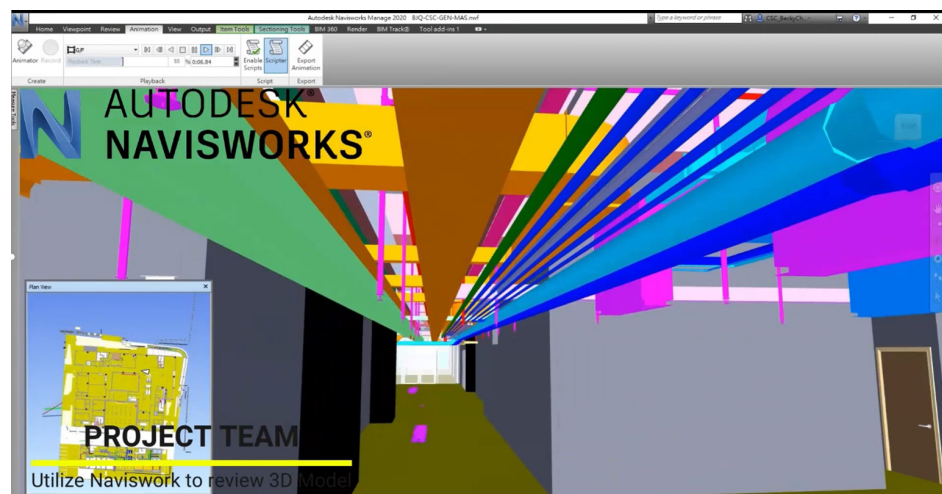
such as NWC output, family rename, and parameter edit.

## C-Smart Site Platform

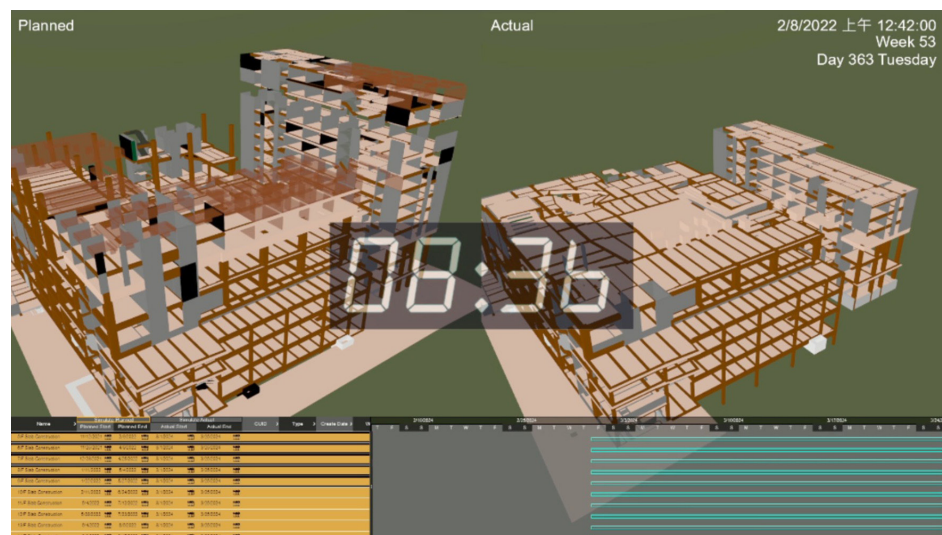
Designated smart site platform developed by China State provide function of Digital Works Supervision System with aid of BIM Modelling & AI technology. Platform used to visual Quality Assurance and Quality Control, report any hazard activity immediately.



Cintoo Cloud Platform - Point Cloud vs IFC Model Overlay  
Image Courtesy of Hong Kong Baptist University and China State Construction Engineering (Hong Kong) Limited and China State Construction Science and Technology Limited and Transcendence Company Limited and P&T Architects and Engineers Limited



3D Walkthrough in Navisworks  
Image Courtesy of Hong Kong Baptist University and China State Construction Engineering (Hong Kong) Limited and China State Construction Science and Technology Limited and Transcendence Company Limited and P&T Architects and Engineers Limited



4D Simulation - Planned vs Actual  
Image Courtesy of Hong Kong Baptist University and China State Construction Engineering (Hong Kong) Limited and China State Construction Science and Technology Limited and Transcendence Company Limited and P&T Architects and Engineers Limited



Image Courtesy of Hong Kong Baptist University and China State Construction Engineering (Hong Kong) Limited and China State Construction Science and Technology Limited and Transcendence Company Limited and P&T Architects and Engineers Limited

## About Hong Kong Baptist University

Hong Kong Baptist University (HKBU) has remained committed to the pursuit of excellence in education, research and service to the community. As one of Asia's finest institutions of higher learning, HKBU is dedicated to nurturing future generations of civically engaged community members, and it provides them with a broad-based, transdisciplinary and creative education. Its eight faculties/schools offer a wide array of programmes across a diverse range of disciplines, from the arts, business, communication, and social sciences to science and technology, Chinese medicine and sport. With its fundamental strengths in the arts and humanities, HKBU offers an education and research environment that fosters technological progress with a focus on the human dimensions. At the same time, the University is using technology to push the envelope of human imagination in the arts and cultural sphere. Coupled with our unceasing efforts to achieve breakthroughs in science and Chinese medicine, HKBU strives to contribute to the building of a better world and a more compassionate society.

## 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.

## About China State Construction Science and Technology Limited

China State Construction Science and Technology Limited (CSCST) adheres to the enterprise spirit to "exercise prudence in the performance of our undertakings, and to build a solid foundation to achieve greater success", and gradually develops into a comprehensive technology enterprise, integrating BIM talent training, BIM application service and digitized engineering management. The company's BIM services cover the entire life cycle of construction projects, including BIM bidding, BIM construction guidance, BIM operation and maintenance programs, corporate BIM team formation consulting, corporate BIM training and consultants. The company adopts Hong Kong CIC BIM standard, which can customize different implementation goals and processes according to the implementation entity, achieve design optimization, construction management improvement, control cost, improve collaborative management, and ensure construction safety. At the same time, it cooperates with many efficient and BIM software vendors in Hong Kong, Macao and the Mainland to provide comprehensive support for digitalization of construction and management.

## About Transcendence Company Limited

Transcendence Company Limited was established in 2014, aiming to integrate and apply technology, such as big data, artificial intelligence (AI), cloud-based analysis, Internet of things (IoT), ultra wideband positioning system, to the construction industry, society, commercial and daily life. In addition to collaborating with different technology companies, as an experienced stakeholder in this industry, we have also developed our own products which being practical and innovative allow us to integrate them to daily and commercial activity, eventually making contribution to our society.

## About P&T Architects and Engineers Limited

P&T Group is an award-winning, global design firm, providing clients with innovative, commercially successful and sustainable design solutions since its inception in 1868. Consistently ranked in the top largest consultancies in the world, our 1600-plus architects, engineers, urban designers and interior designers operate in over 70 cities, on an excess of 10 million square metres of combined floor area, annually. By sheer volume and a shared commitment to design excellence with each and every project, our work has, and will, continue to positively transform communities and improve lives.

Autodesk, the Autodesk logo, 3ds Max, Architecture, Engineering & Construction Collection, AutoCAD, BIM 360, BIM Collaborate Pro, Civil 3D, Dynamo Studio, Forge, InfraWorks, Navisworks Freedom, Navisworks Manage, ReCap Pro and Revit are registered trademarks or trademarks of Autodesk, Inc., and/or its subsidiaries and/or affiliates in the USA and/or other countries. All other brand names, product names, or trademarks belong to their respective holders. Autodesk reserves the right to alter product offerings, and specifications and pricing at any time without notice, and is not responsible for typographical or graphical errors that may appear in this document. © 2022 Autodesk, Inc. All rights reserved.