



BIM in Hong Kong: What is your Contribution?

Ms. Ada FUNG, BBS, JP



香港房屋委員會
Hong Kong Housing Authority



CONSTRUCTION INDUSTRY COUNCIL
建造業議會



The Association of Consulting Engineers of Hong Kong
Hong Kong Club

14 July 2017



01. Introduction

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05. What is your contribution ?

Content



01. Introduction



Deputy Director (Development and Construction)

- ▶ To supervise the Development & Construction Division of the Housing Department; and
- ▶ To oversee all facets of public housing development work in Hong Kong



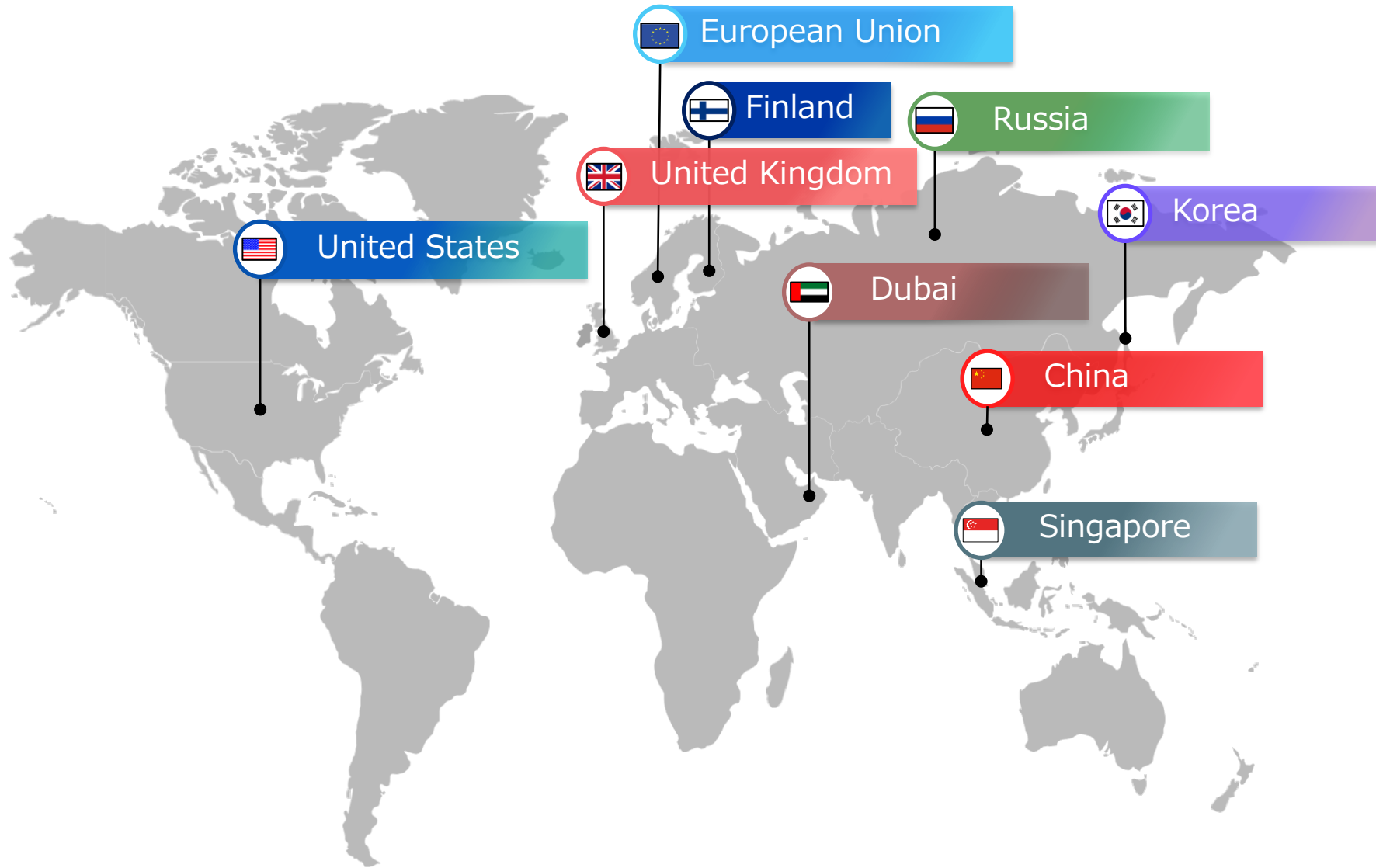
Chairperson, Committee on BIM

- ▶ To formulate strategies for market transformation, promote the use and facilitate the application of BIM, digital construction, and its related technologies in construction industry; and
- ▶ To promote cross-disciplinary collaboration and adoption of BIM



**Ms. Ada FUNG, BBS, JP
Registered Architect, FHKIA,
BEAM Professional,
APEC Architect**

02. Global BIM Development



02. Global BIM Development

European Union

Finland

Russia

4th Government BIM Symposium was held in Beijing in Oct 2016



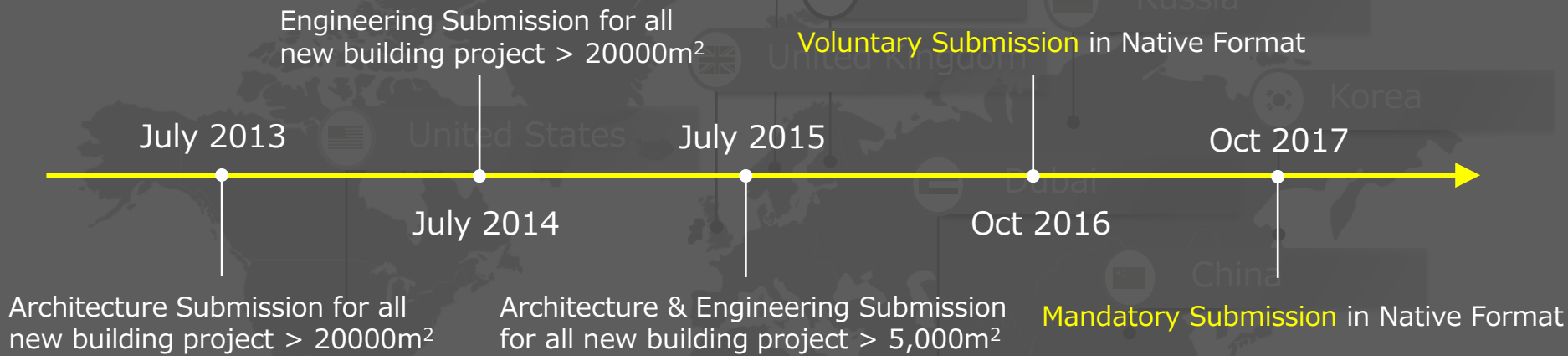
02. Global BIM Development

Source: BCA of Singapore



Building and Construction Authority (BCA)

Regulatory Approval (BIM Requirements)



02. Global BIM Development

 European Union



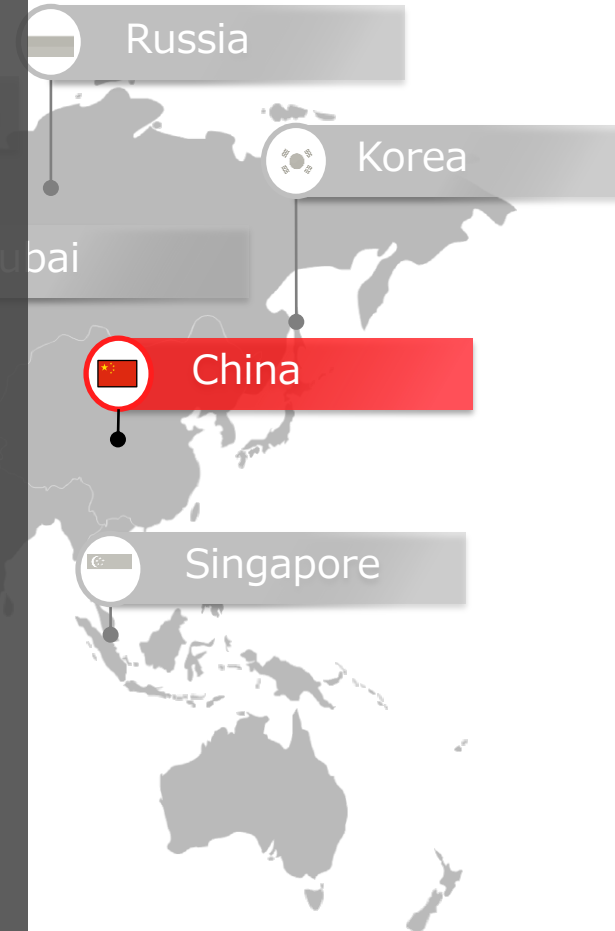
中華人民共和國住房和城鄉建設部 (MOHURD, PRC)

到2020年末，建築行業甲級勘察、設計單位以及特級、一級房屋建築工程施工企業應掌握並實現BIM與企業管理系統和其他信息技術的一體化集成應用。

到2020年末，以下新立項項目勘察設計、施工、運營維護中，集成應用BIM的項目比率達到90%：

1. 以國有資金投資為主的大中型建築；
2. 申報綠色建築的公共建築和綠色生態示范小區。

Source: MOHURD of PRC official website
http://www.mohurd.gov.cn/wjfb/201507/t20150701_222741.html



02. Global BIM Development

 European Union



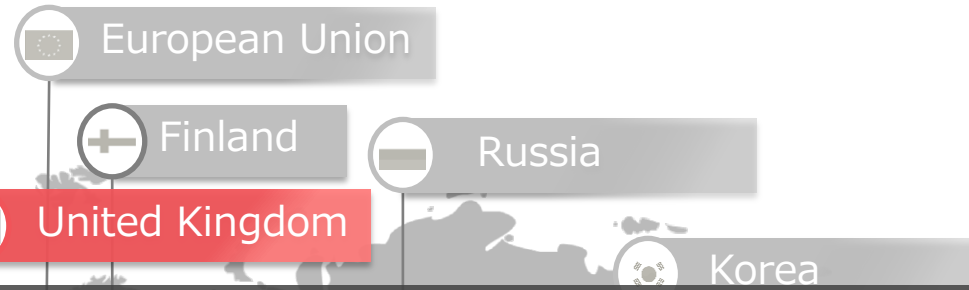
EUBIM Task Group

The European Commission recently awarded the EU BIM Task Group funding for two years (2016-2017) to deliver a common European network aimed at aligning the use of Building Information Modelling in public works. The group will be communicating its ambition at conferences around Europe and holding a launch event in Brussels to grow its public sector membership and engage with industry.



Source: EU BIM Task Group Official Website: <http://www.eubim.eu/>

02. Global BIM Development



2.32 Government will require **fully collaborative 3D BIM**

(with all project and asset information, documentation and data being electronic) as a minimum by 2016. A staged plan will be published with mandated milestones showing measurable progress at the end of each year.



The U.K. mandate for the **implementation of Level 2 BIM on all government infrastructure projects by 2016**

Level 2 BIM requirements include: -

- “provision of a single environment to store shared asset data and information,
- accessible to all individuals who are required to produce, use and maintain it”; and
- “the shared use of individually authored models in a common data environment.”

02. Global BIM Development

Dubai to make BIM software mandatory for major projects



Construction Feature



Related Headlines

CONSTRUCTION NEWS

Two UAE projects win Tekla Global BIM Awards 2015

EU truck fuel efficiency has stalled for a decade

Al Khalij Cement line raises production by 50%

Wasi begins leasing new development in Muhaisnah

Ooredoo Kuwait trains employees on fire evacuation

UNITED ARAB EMIRATES NEWS

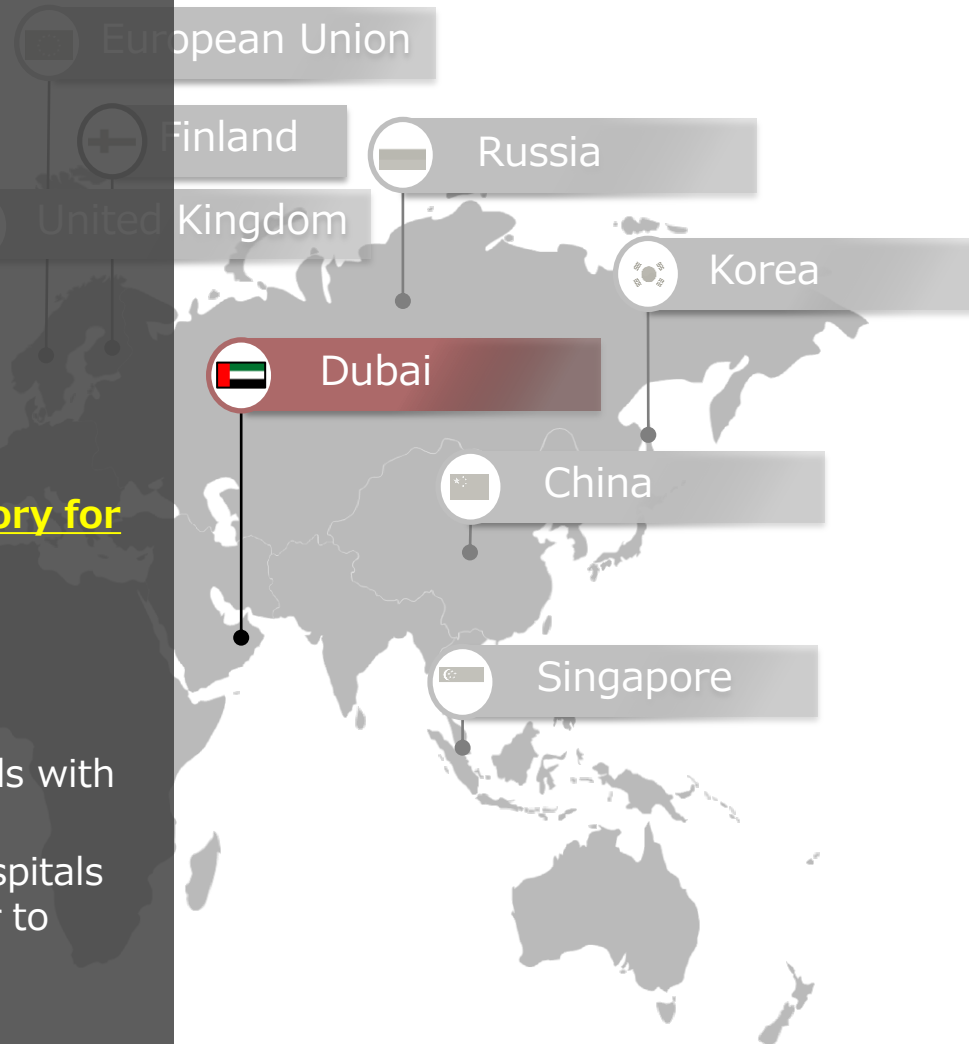
Dance Music Conference reveals

Dubai to make BIM Software mandatory for major projects in 2015

Mandatory use of BIM extended to their construction projects for:

- buildings that are above 20 floors;
- buildings and facilities and compounds with areas larger than 200,000 sq. ft.;
- buildings and special facilities like hospitals and universities and all that is similar to that;
- all governmental projects;
- all buildings and projects that are requested from a foreign office.

Sources: <http://www.constructionweekonline.com/article-34893-revealed-dubai-municipalities-updated-bim-mandate/>



02. Global BIM Development

RUSSIAN GOVERNMENT SETS UP PILOT PROJECTS TO INCREASE BIM USAGE

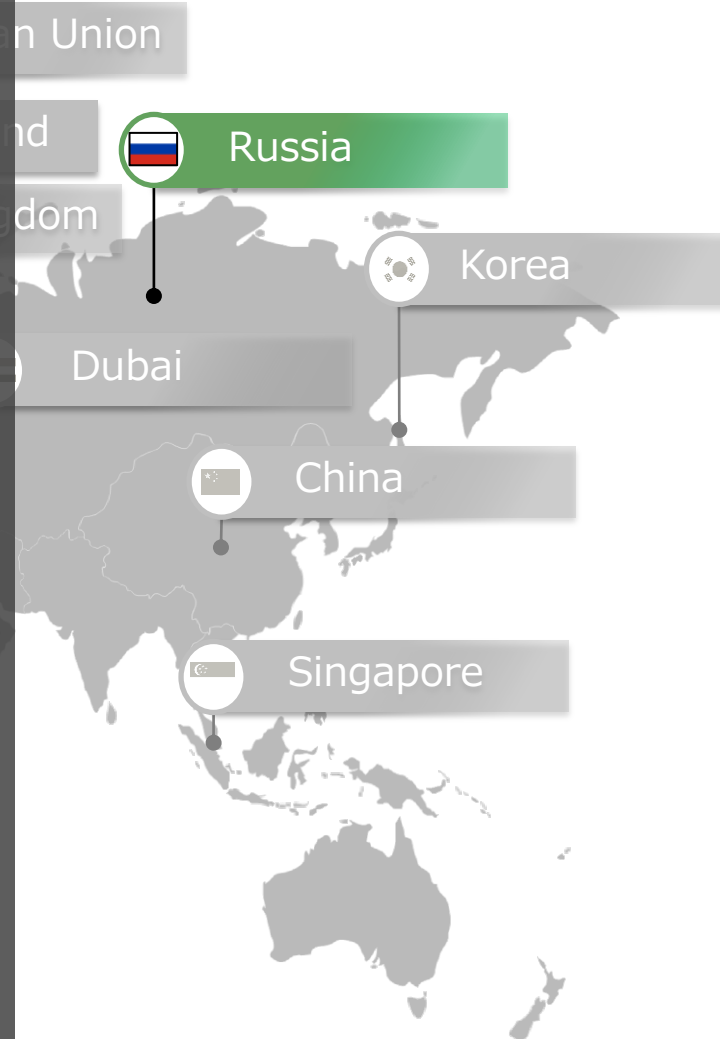


The pilots form part of a multi-year BIM implementation plan in Russia, begun at end of December 2014 aiming at identifying how construction regulation could be changed to facilitate widespread BIM use.

The use of building information modelling (BIM) is set to become compulsory on all construction projects commissioned by the Russian government after 2018.

(The announcement was made by Mikhail Menn, head of the Construction, Housing and Utilities ministry, during the ProEstate Forum for international property companies in Moscow on 14 September 2016).

Source:
<http://www.bimplus.co.uk/news/> &
<http://www.globalconstructionreview.com/news>



02. Global BIM Development

Senate Properties, Finland

2007:
Requires IFC/BIM in its projects and intends to have integrated model-based operation in future

Finland

European Union

United Kingdom

Korea

Public Procurement Service, the Prime Minister's Office, Korea

2016:
Using BIM compulsory for all projects >S\$50M and for all public sector projects

United States

U.S. GSA
U.S. Army Corp of Engineers

2008 :
Mandatory BIM Submission for major federal government building projects

02. Global BIM Development



03. BIM in Hong Kong



2017 Policy Address



• Policy Address

• Policy Agenda

• Highlights

• Webcast

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Published on 18 Jan 2017

Technology Application and Innovation

130 **Building Information Modelling** technology allows construction professionals to carry out design and construction works in a virtual environment, which helps avoid changes in the construction process as far as possible, reduce risks and render clarity to project costs in various stages. **The Government will actively seek to require consultants and contractors to use this modelling technology when undertaking design of major government capital works projects from next year onwards.**

131 The Construction Industry Council will set up an innovation and technology application centre to provide a platform for introducing innovative technologies into the industry to enhance productivity. The centre will commence operation in the second half of this year.



03. BIM in Hong Kong

CIC as a Coordinator in BIM Development

Professionals / Specialists



Academia



Project Clients



03. BIM in Hong Kong

BIM Implementation in Various Sectors

Professionals / Specialists

Academia

Development Bureau



- 1) 40 Trial BIM Projects under various works departments
- 2) Set up of a Steering Committee on BIM with support from the Works Departments



Development Bureau

03. BIM in Hong Kong

BIM Implementation in Various Sectors



Buildings Department

(New PNAP ADV-34 on BIM Submission released on 9 Sep 2016)

(Government Department)

Buildings Department

Practice Note for Authorized Persons,
Registered Structural Engineers and
Registered Geotechnical Engineers

ADV-34

Building Information Modelling

The use of Building Information Modelling (BIM) is a relatively new and innovative approach to building design and construction. The Buildings Department (BD) encourages authorized persons (AP), registered structural engineers (RSE) and registered geotechnical engineers (RGE) to consider adopting BIM in their building projects under the Buildings Ordinance. This practice note provides general guidelines on BIM submissions for building proposals as supplementary information to facilitate plan processing by the BD.

BIM Submissions

2. There is a wide range of applications of BIM on new building development and alteration and addition works which are considered useful to facilitate the BD in processing plan submissions. Some examples of BIM applications are given in Appendix A and the project AP/RSE/RGE are encouraged to provide the BD with a soft copy of the computer modelling information under the specified format for consideration.

PNAP ADV-34

On 9th September 2016, Buildings Department issued a PNAP ADV-34 on **BIM submissions as Reference Material** for building proposals submitted to BD.

03. BIM in Hong Kong

BIM Implementation in Various Sectors

Drainage Services Department (BIM for Asset Management)

Academia

(Government Department)

COMPANY
Drainage Services Department, HKSAR Government

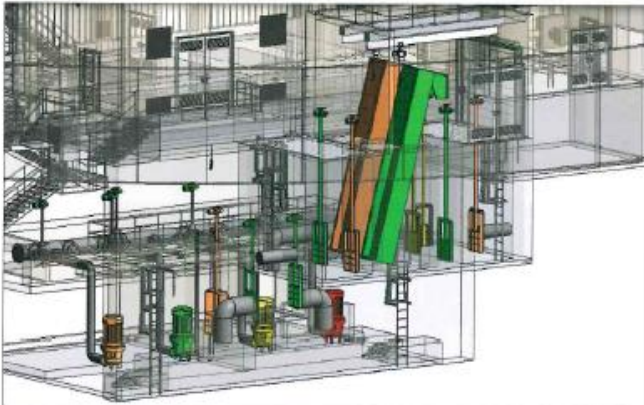
PROJECT
Adoption of Knowledge-based Building Information Modeling for E&M Asset Management Supplemented with Mobile Technology - A Case Study in Public Sewage Pumping Facilities

LOCATION
Ma On Shan Area 108 Sewage Pumping Station, Sai Sha Road, Ma On Shan, Shatin, Hong Kong

TYPE
Knowledge-based BIM-Integrated E&M Asset Management


SCHEDULED TIME OF COMPLETION
Nov 2014 to May 2016

Drainage Services Getting Pumped About BIM

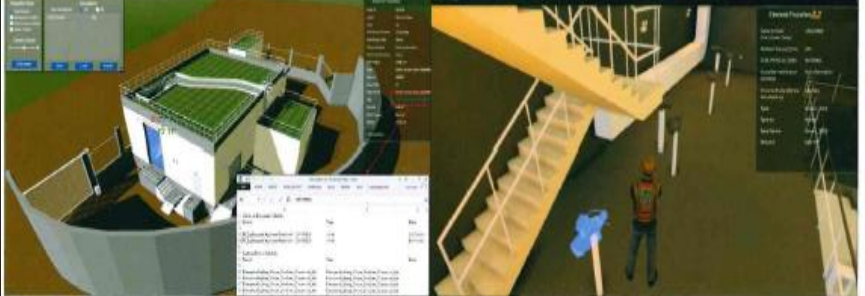


"We have discussed what the model should include, with maintenance staff - there are lots of workflows, and we need to compromise and streamline the process by merge & convert approach so they will be happy to use BIM-integrated platform."

— Dr. Jeff H. Tse
Electrical & Mechanical Engineer, Drainage Services Department



Entity Location	Main Pumping Station	COBie Component Area	
Entity Classification	Submersible Pump No. 11	COBie Component Serial Number	
COBie	Yes	Mark	110101
Phase Created	New Construction	Service Data (Serial No.)	01020 00
System Name		Category	Pipe/Mechanical Equipment
COBie Component Length		Comments	
Entity Type	Sewage Pump	Entity Location	New Creation
PM Job Type	Supplier Maintenance (Replacement)	Entity Classification	Mechanical Bar Screen
System Classification	Hydraulic Supply	COBie	Yes
DCI Current (A)	1.431 A	Phase Created	New Construction
Level	1.141111	Entity Location/Name	



The digital asset information embedded in each model element.
Image courtesy of Drainage Services Department, HKSAR Government

03. BIM in Hong Kong

BIM Implementation in Various Sectors

Professionals / Specialists



香港建築師學會

Water Supplies Department
(BIM for Utilities Design)

Academia



(Government Department)



Autodesk Hong Kong BIM Awards 2016

Honorable Mentions

COMPANY
Water Supplies Department, HKSAR Government

PROJECT
Improvement of water supply to Sheung Shui and Fanling

LOCATION
Sheung Shui and Fanling, New Territories, Hong Kong

TYPE
Water Supply

SCHEDULED TIME OF COMPLETION
2020

BIM Helps New Reservoir Blend With the Landscape



Proposed Table Hill No. 2 Fresh Water Service Reservoir
Image courtesy of Water Supplies Department, HKSAR Government

About Water Supplies Department, HKSAR Government

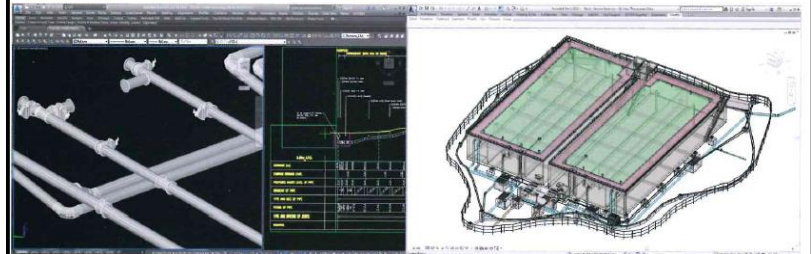
Water Supplies Department (WSD) is responsible for supplying fresh water and seawater (for flushing) for consumption by Hong Kong's population of 7.3 million for domestic and non-domestic use. In 2015, the WSD supplied 973 million cubic metres (Mm³) of fresh water. In the same year, WSD supplied 274 Mm³ of seawater for flushing. As of March 2016, WSD administered 2.91 million water accounts.

The Project

In order to cope with the increasing water demand within the Sheung Shui and Fanling supply zone and to enhance the reliability of water supply to the areas, a new service reservoir with a storage capacity of 24 000 cubic metres and associated water mains must be constructed. The proposed works also require laying about 4.2 Kilometres of fresh water mains, with the diameter ranging from 100 millimetres (mm) to 700mm. The project is our first in-house project adopting BIM workflow without any assistance from BIM consultants.

The Challenges

In Hong Kong, designing alignments of large-diameter water mains to fit in the limited underground space available without conflicting with the existing facilities is always a big challenge. Traditionally, we only prepare 2D alignment plans and longitudinal profiles for the



Longitudinal Profile of Proposed Water Mains
Image courtesy of Water Supplies Department, HKSAR Government

Proposed Table Hill No. 2 Fresh Water Service Reservoir
Image courtesy of Water Supplies Department, HKSAR Government



香港建造商會
Hong Kong Construction Association



香港機場管理局
AIRPORT AUTHORITY HONG KONG



03. BIM in Hong Kong

BIM Implementation in Various Sectors

Professionals / Specialists

Academia



Architectural Services Department (BIM for Statutory Submissions)

(Government Department)

Autodesk Hong Kong BIM Awards 2016

Honorable Mentions

COMPANY
Architectural Services Department,
HKSAR Government

PROJECT
Fishermen Cultural Centre

LOCATION
Aberdeen Promenade

TYPE
Park facilities

Pioneering BIM-assisted Statutory Submission



BIM PARTNERS INVOLVED

Advanced Construction Information
Development Limited
Building Information Technology
Limited

About Architectural Services
Department, HKSAR
Government

The Project

This was a Signature Project proposed in Southern District in 2014, to capitalise on the unique characteristics of Aberdeen and promote tourism. The project was proposed by Home Affairs Department (HAD) with the support of Southern District Council and Home Affairs Bureau.

The Challenges

It was proposed that the project would be built within existing park facilities. It involves complex construction sequence including permanent strengthening works, partial demolition of existing buildings and construction of new structures.

Autodesk Hong Kong BIM Awards 2016

Award Winners

COMPANY
Architectural Services Department,
HKSAR Government

PROJECT
Eastern District Cultural Square

LOCATION
Shau Kei Wan, Hong Kong

TYPE
Public Open Space and Amphitheatre

SCHEDULED TIME OF COMPLETION
2018

BIM Enables Sound Checks and More for Signature Project

"BIM allowed accurate specification of sizes and costing. Also, we used BIM to test whether more identical panels can fit the design, and eventually standardised 30 percent of the panels."

— Kevin Li
Senior Architect, Architectural
Services Department

BIM PARTNERS INVOLVED
Shen Milson & Wilke Limited



香港機場管理局
AIRPORT
AUTHORITY
HONG KONG



03. BIM in Hong Kong

BIM Implementation in Various Sectors

Professionals / Specialists

Academia

(Government Department)



Electrical and Mechanical Services Department (BIM for Asset Management)

Autodesk Hong Kong BIM Awards 2016

Honorable Mentions

COMPANY
Electrical and Mechanical Services
Department, HKSAR Government

PROJECT
Lifecycle Building Information Modelling
- Asset Management (BIM-AM) System for
Buildings Operation and Maintenance

LOCATION
EMSD Headquarters Building

TYPE
Pilot

SCHEDULED TIME OF COMPLETION
December 2015

Visually Intuitive and Cross-Referenceable Next-Generation O&M Tools



About Electrical and Mechanical Services Department, HKSAR Government

The Electrical and Mechanical Services
Department (EMSD) of the HKSAR
Government discharges its services
to the public in Hong Kong via two
separate teams: Regulatory Services
and Trading Services.

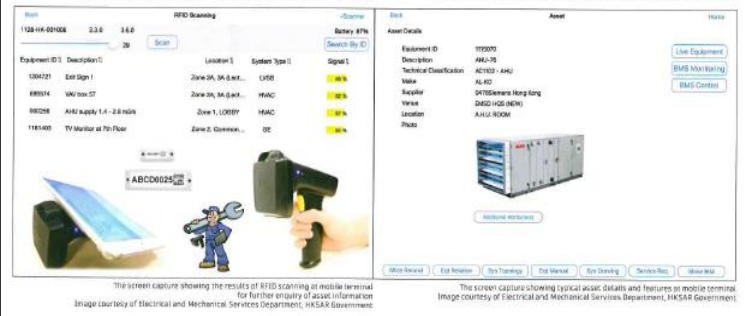
The Project

EMSD has proposed and implemented a novel architecture for exploiting BIM in integrating asset management (AM) and other operation and maintenance (O&M) systems/tools, including Building Management System (BMS), Closed Circuit Television (CCTV) system, Radio Frequency Identification (RFID) scanning tool, Real Time Location System (RTLS), and wireless ad-hoc devices. An integrated lifecycle BIM-AM System has been developed to implement the novel architecture, and the results have successfully demonstrated the system capabilities and potential for next-generation building O&M services.



The BIM model of the Lecture Theatre of EMSD Headquarters
Image courtesy of Electrical and Mechanical Services Department, HKSAR Government

The BIM model of the AHU room providing HVAC services to the Lecture Theatre
Image courtesy of Electrical and Mechanical Services Department, HKSAR Government



The screen capture showing the results of RFID scanning at mobile terminal
For further enquiry of asset information
Image courtesy of Electrical and Mechanical Services Department, HKSAR Government

The screen capture showing typical asset details and features at mobile terminal
Image courtesy of Electrical and Mechanical Services Department, HKSAR Government



AIRPORT
AUTHORITY
HONG KONG



03. BIM in Hong Kong

BIM Implementation in Various Sectors



CLP Power Hong Kong Limited
(BIM for Safety Management)

(Public Utilities Company)

Autodesk Hong Kong BIM Awards 2016

Award Winners

COMPANY
CLP Power Hong Kong Limited

PROJECT
Refurbishment of External Façade at CLP Shatin Centre

LOCATION
6 On Lai Street, Shatin, New Territories, Hong Kong

TYPE
Building Refurbishment

SCHEDULED TIME OF COMPLETION
2016

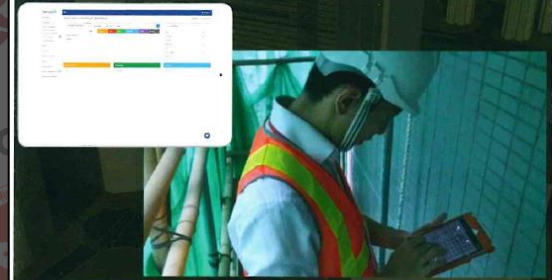
BIM Can Do For Bamboo Too

"We want to challenge the belief that BIM is only for mega projects, it matches our values, our concern for safety. The subcontractors really appreciate our work, which has been eye opening for them."

— Mr C.L. Mak
Deputy Director
- Substation Implementation,
CLP Power



PAPERLESS INSPECTIONS FOR QUALITY ASSURANCE



Paperless Inspection by Electrical Recording System
Image courtesy of CLP Power Hong Kong Limited

VIRTUAL ENVIRONMENT - IN CASE OF FIRE



Sharing of BIM with frontline staffs during Regular Progress Meetings
Image courtesy of CLP Power Hong Kong Limited

03. BIM in Hong Kong

BIM Implementation in Various Sectors

Professionals / Specialists

Academia

Contractors



Gammon Construction Ltd.



Yau Lee Group



Chun Wo Construction & Engineering Co., Ltd.



China States Construction Engineering Corporation Ltd.



Hip Hing Construction Co. Ltd.

and more...

03. BIM in Hong Kong

We are at a very important stage for BIM Development in HK

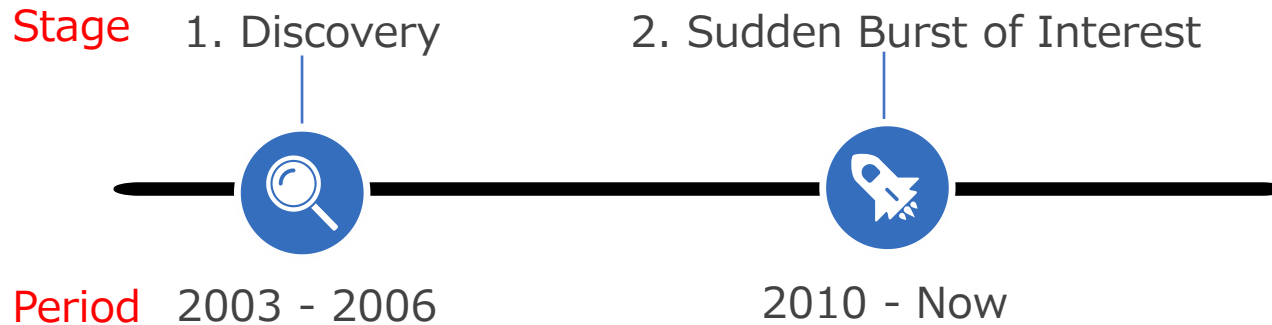


Photo 01

Stages of BIM Development in HK

03. BIM in Hong Kong

What CIC has done to lead for BIM development in Hong Kong?

Roadmap for BIM Strategic Implementation in Hong Kong's Construction Industry

Started in 2011...Published in Sep 2014



Identification

Current benefits and constraints of BIM implementation



Establishment and Set Out

A blueprint and Industry-wide BIM implementation strategies



16 Recommended Initiatives in 9 areas

- Collaboration
- Incentive and Proven Benefit
- Standard and Common Practice
- Promotion and Education
- Global Competitiveness
- Legal and Insurance
- Information Sharing and Handover
- Compliant BIM Tool
- Audit Risk Management



3 Suggested Imminent Actions

- Awareness Programs
- Industry Standards
- Training



03. BIM in Hong Kong

What CIC has done to lead for BIM development in Hong Kong?

3 Suggested Imminent Action

1 Industry Standards

HKCIC's BIM Standards (Phase 1)

Standard & Common Practice –
Published in Sep 2015



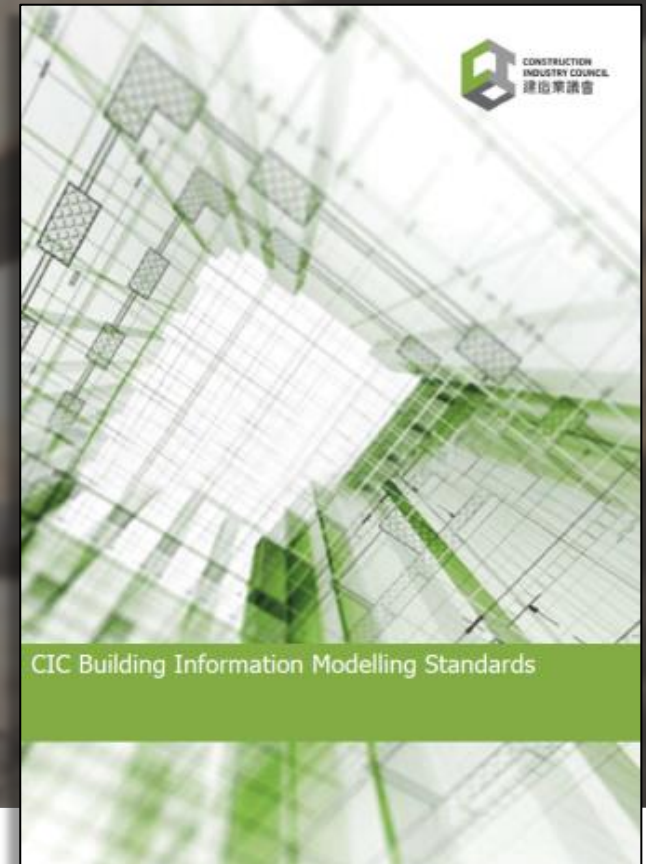
Establishment

A set of industrial specifications & common practice to facilitate the wider use of BIM in construction projects



4 Major Chapters

- Project Execution Plan
- Modeling Methodology
- Level of Development
- Presentation Style & Data Organization



03. BIM in Hong Kong

What CIC has done to lead for BIM development in Hong Kong?

3 Suggested Imminent Action

1 Industry Standards

Project Clients Summit: Development of BIM Implementation Strategies Workshop and Summit Report

3 Major Sectors

- Government
- Public Developer
- Private Developer

Methodology and Approach of the Workshop

1. Scientific and Evidence-based Information
2. Practical Methodologies from Global Perspective
3. Purpose-based and Performance-based Template for Strategy Development



03. BIM in Hong Kong

What CIC has done to lead for BIM development in Hong Kong?

3 Suggested Imminent Action

1 Industry Standards

BIM Standards on GBP Submission (Phase 1) *(To be published in 2017)*

Aim

With local practice, to provide a quick third party method in quality checking of drawings using BIM technology before General Building Plan (GBP) submission to statutory authorities & concerned Government Departments.

Benefits

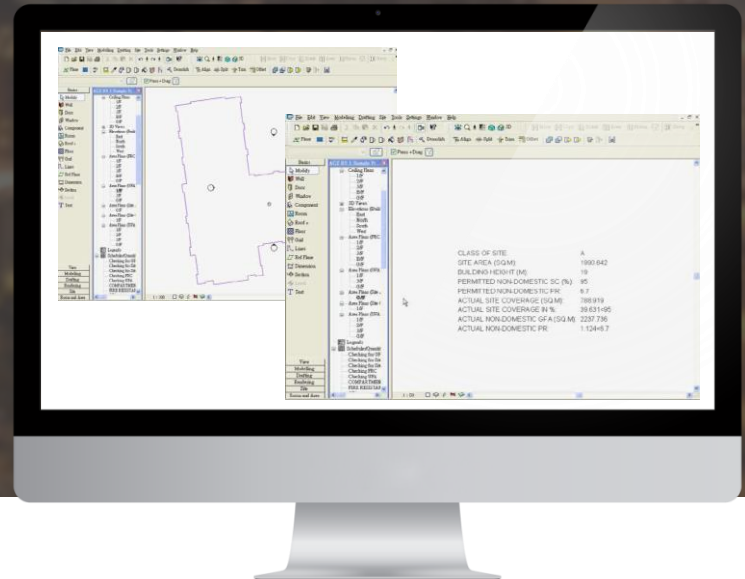
- Reduce time in manual checking
- Avoid errors and rejections

Deliverables

- Set of specifications, steps and
- Methods to achieve a semi-automatic computational solution

Scopes

- Fundamental standards as per current Practice Notes issued by statutory authorities and concerned Government
- Gross Floor Area
- Means of Escape
- Sanitary Fitment Provision
- Fire Compartment
- Fire Resisting Construction



03. BIM in Hong Kong

What CIC has done to lead for BIM development in Hong Kong?

3 Suggested Imminent Action

1 Industry Standards

Specification for Building Services (To be published in 2017)



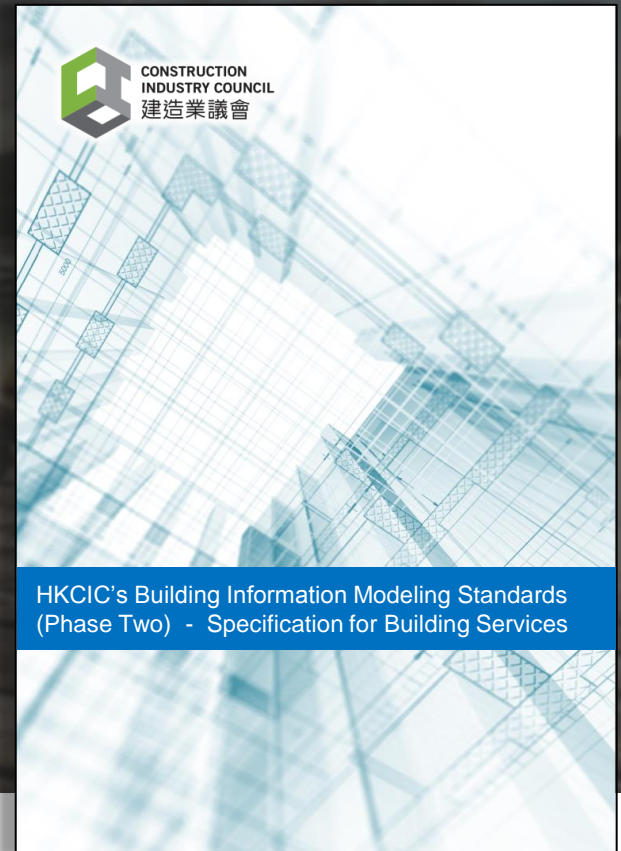
Aim

To establish a set of industrial specifications & common practice to facilitate Mechanical, Electrical and Plumbing (MEP) professional on the use of BIM in construction projects.



Tentative chapters for MEP Standards

- Specifications for plant, equipment & fittings;
- Work practices (i.e. standard operating procedures);
- Guideline documents; and
- Workflows



03. BIM in Hong Kong

What CIC has done to lead for BIM development in Hong Kong?

3 Suggested Imminent Action

2 Training

BIM Innovation & Development Centre (Opened in April 2016)



Training Courses

- BIM Management for senior executives
- BIM Modeling for individual disciplines of: architectural, structural, and MEP
- Understand of BIM for construction workers and site supervisors
- Use of BIM and BIM awareness
- Workshop of Hong Kong's BIM Standards



Up Coming Training Context

- Corporate strategy of the transformation of BIM adoption
- Management decision making support by BIM
- Project management and BIM
- BIM manager and BIM coordinator
- Use of BIM data in built model
- 3D technology and BIM
- BIM data management
- GBP submission by BIM



BIM Innovation & Development Centre

03. BIM in Hong Kong

What CIC has done to lead for BIM development in Hong Kong?

3 Suggested Imminent Action

3 Awareness Programs

HKCIC's Awareness Programs



Conferences, Seminars, Exhibitions, Official meetings



Publication and Media Exposure



BIM Excellence Awards

- An industry-wide BIM excellence awards
- BIMer of the Year, Young BIMer of the Year, Construction Innovator by BIM
- To recognize practitioners who have spearheaded an effort in the harnessing of BIM technology & process



03. BIM in Hong Kong

What CIC has done to lead for BIM development in Hong Kong?

Committee on BIM

-  To **formulate** strategies for market transformation, **promote** the use and facilitate the application of BIM, digital construction, and its related technologies in construction industry
-  To **promote cross-disciplinary collaboration and adoption** of "BIM" in project delivery processes including planning and design, construction, facility and asset management.
-  To develop CIC as a **Centre of Excellence for "BIM"** in the form of a central hub and of the open sharing platform of "BIM" with specific focus
-  To **identify** areas which require further investigation, **promote research & development** for "BIM".

04. BIM in Housing Authority

Hong Kong Housing Authority (HKHA) implements one of the world's largest public housing programme

Housing Estates in Hong Kong

- Adopt **functional and cost-effective design** in the Planning, Design, Construction and Management of housing projects;
- Promote **healthy living and green environment** in the work;
- Act with **caring and partnering** culture beyond baseline performance.

2,140,000 (30%) population

14,000+ workers daily

99 listed contractors

80+ active suppliers

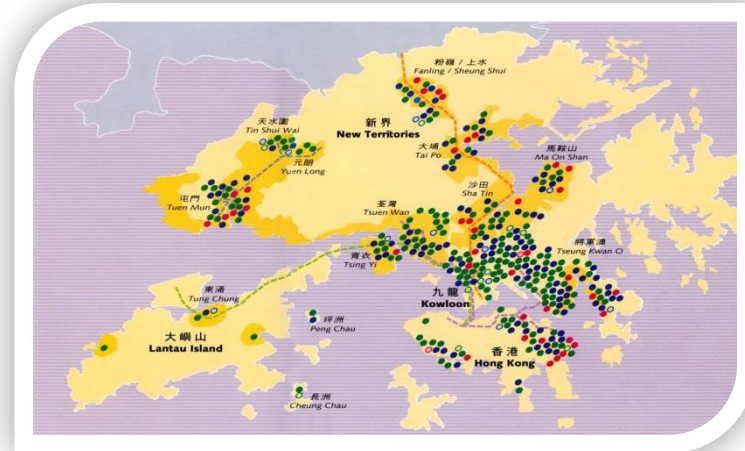
9,000+ HA staff



756,000 flats in use



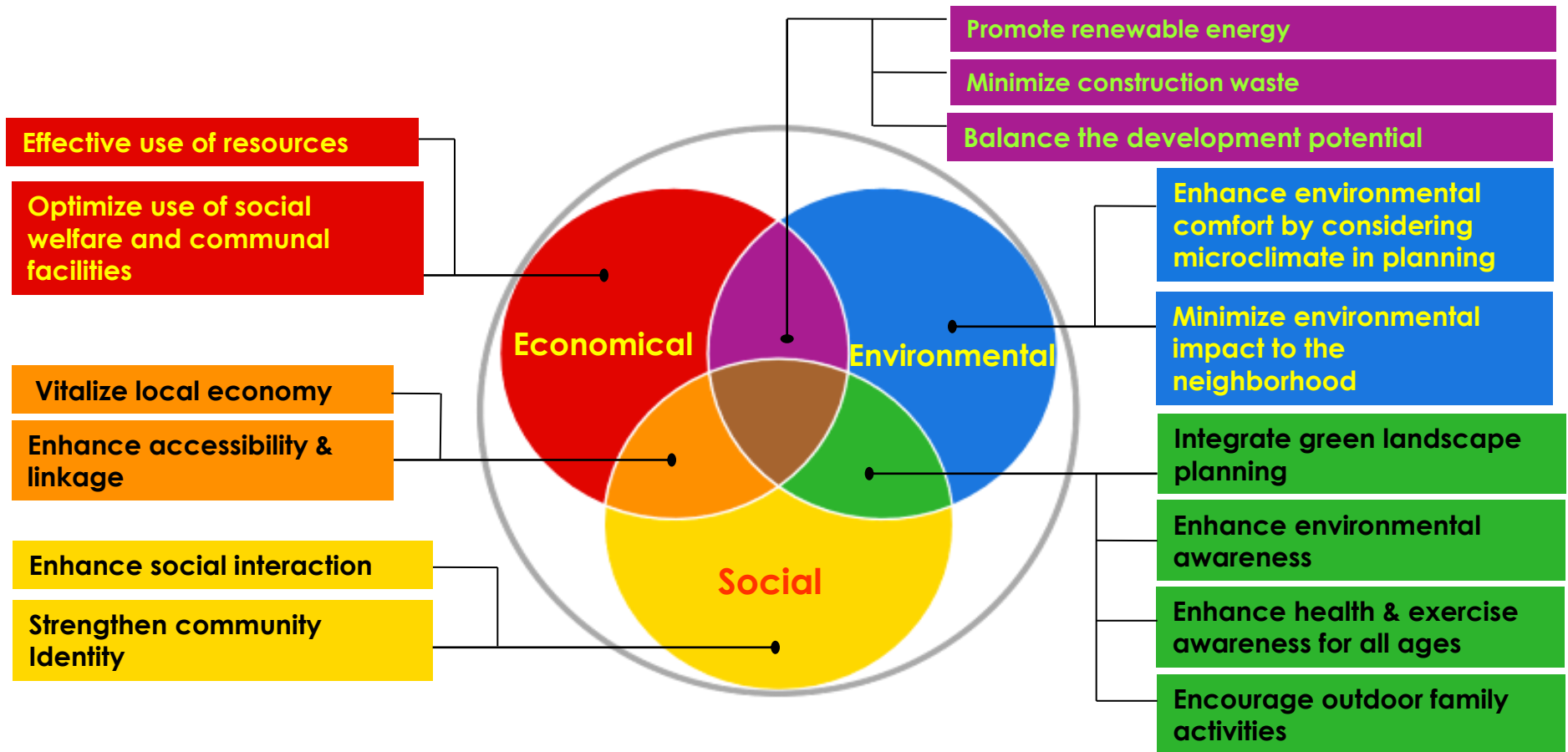
280,000 new rental & subsidized sale flats from 2017/18 to 2026/27



04. BIM in Housing Authority

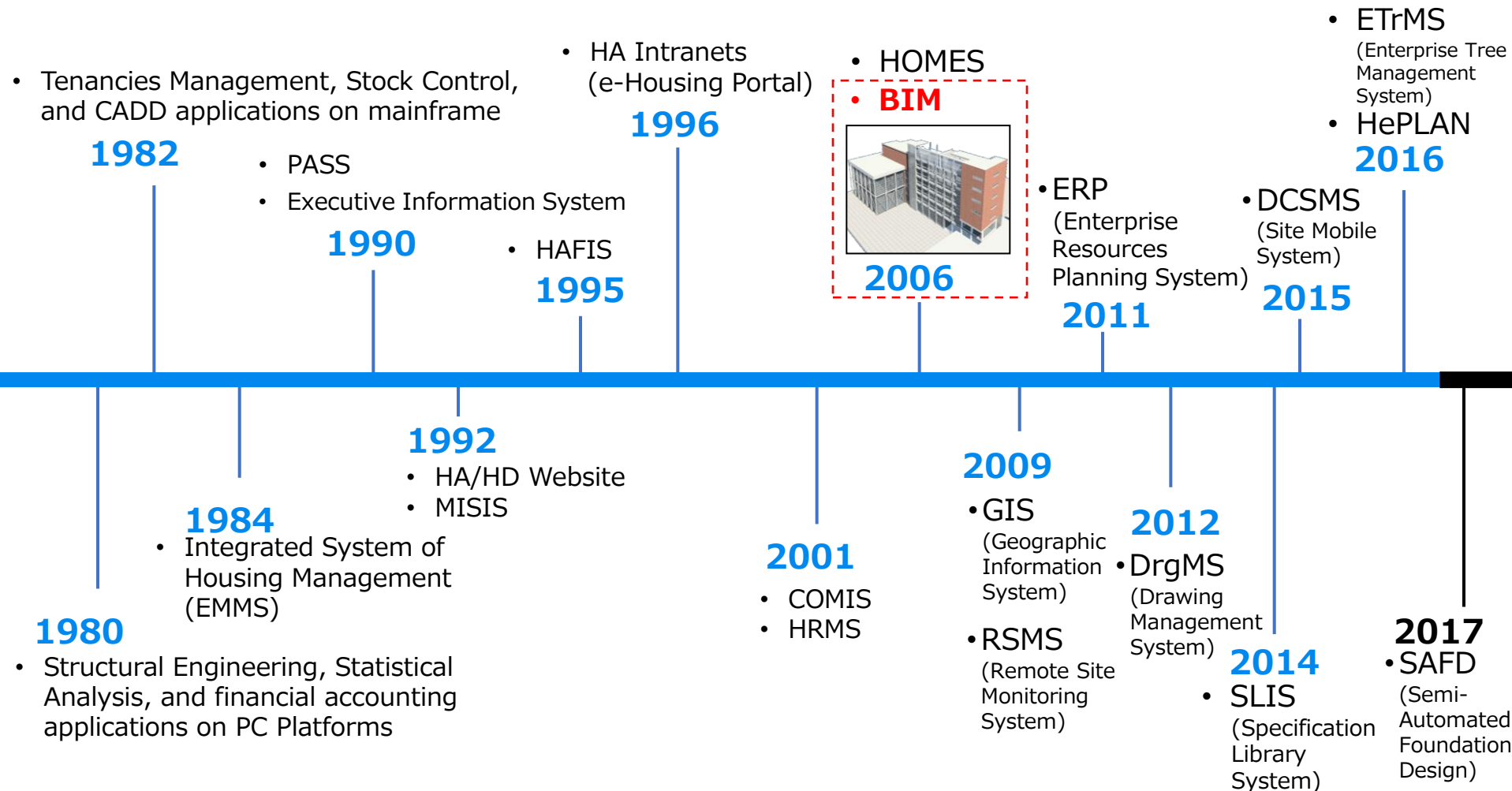
Building a Sustainable Community

To meet present social, economic and environmental needs but NOT at the expense of future generations.



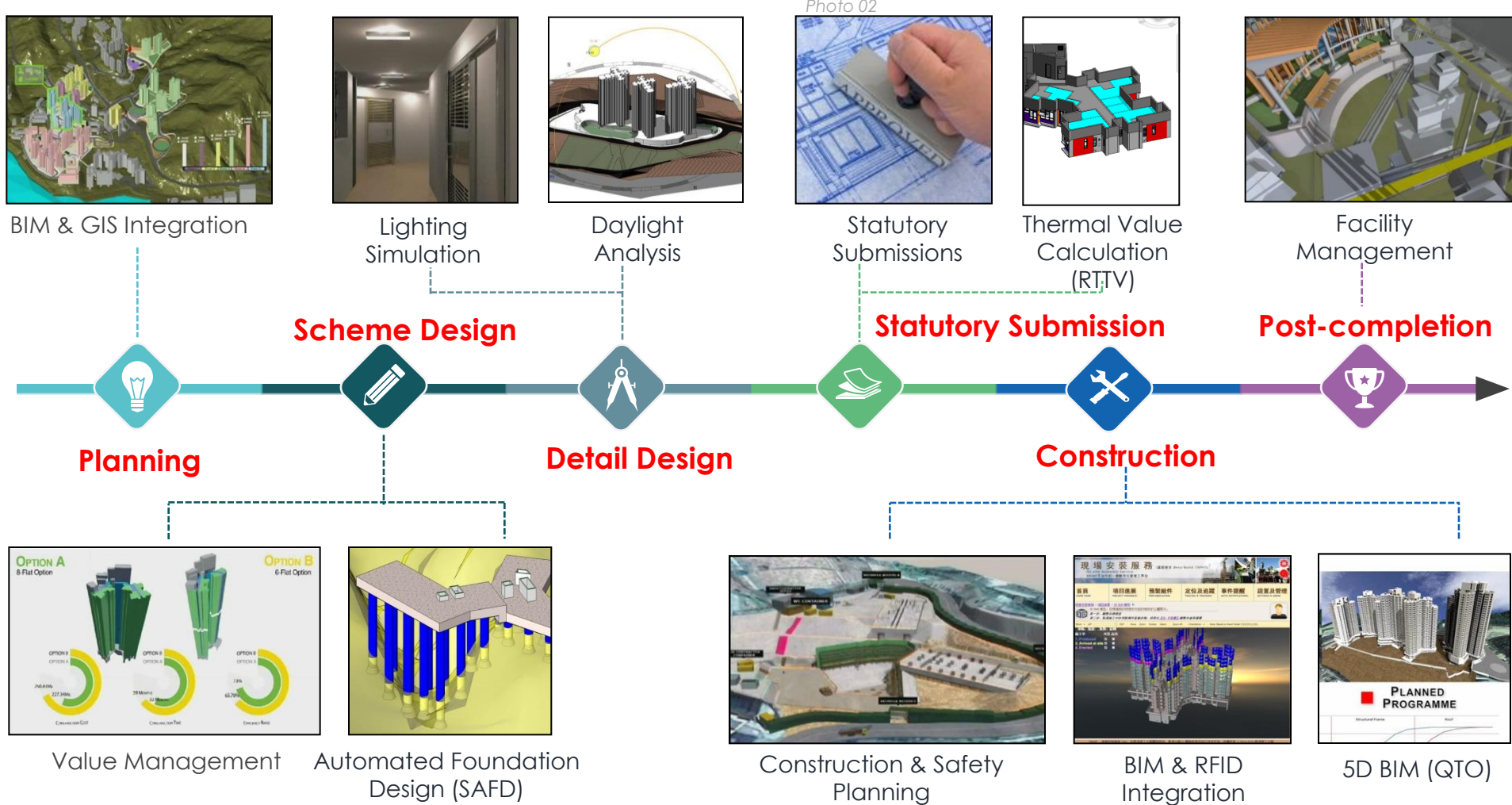
04. BIM in Housing Authority

Integrating IT to Enhance Productivity



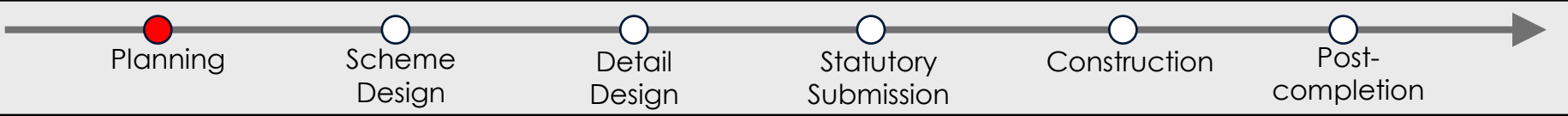
04. BIM in Housing Authority

HA's BIM Applications Encompass Full Design and Construction Cycle



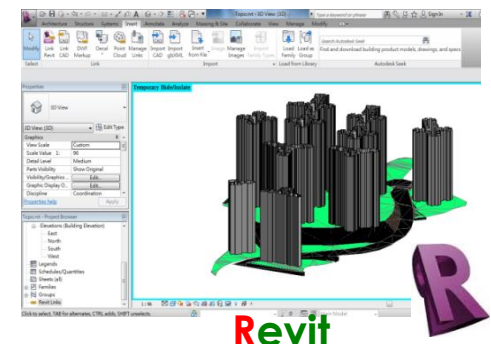
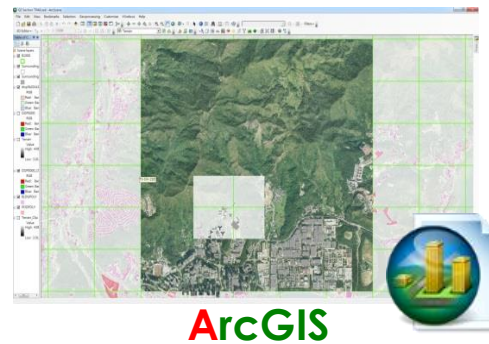
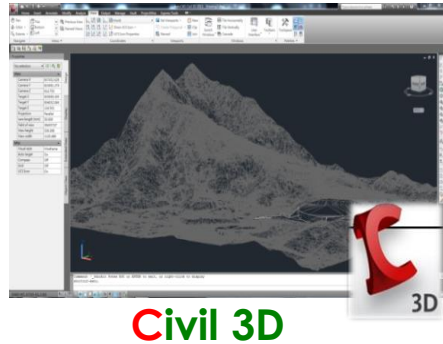
04. BIM in Housing Authority

Planning Stage

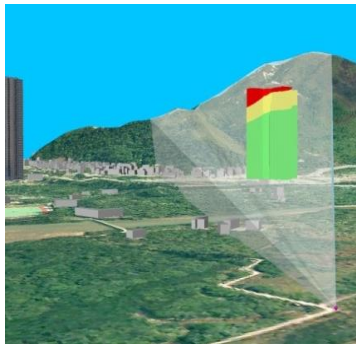


Integrated Use of BIM and GIS

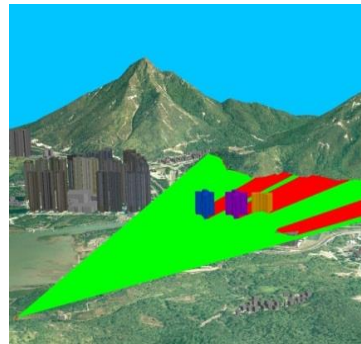
Innovation in Integrating Civil 3D, ArcScene and Revit (CAR)



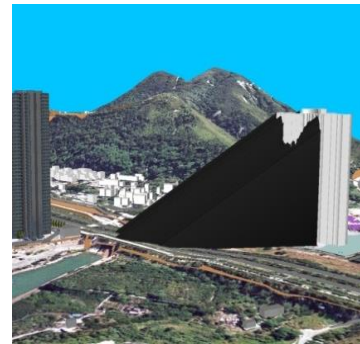
Ridge Line Analysis



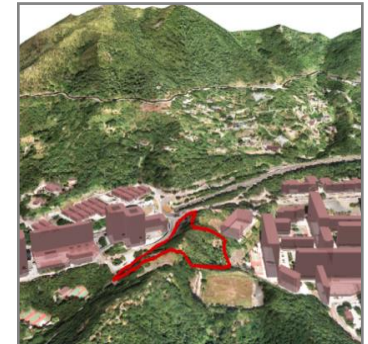
Vantage Point Analysis



Shadow Analysis



Site Appraisals

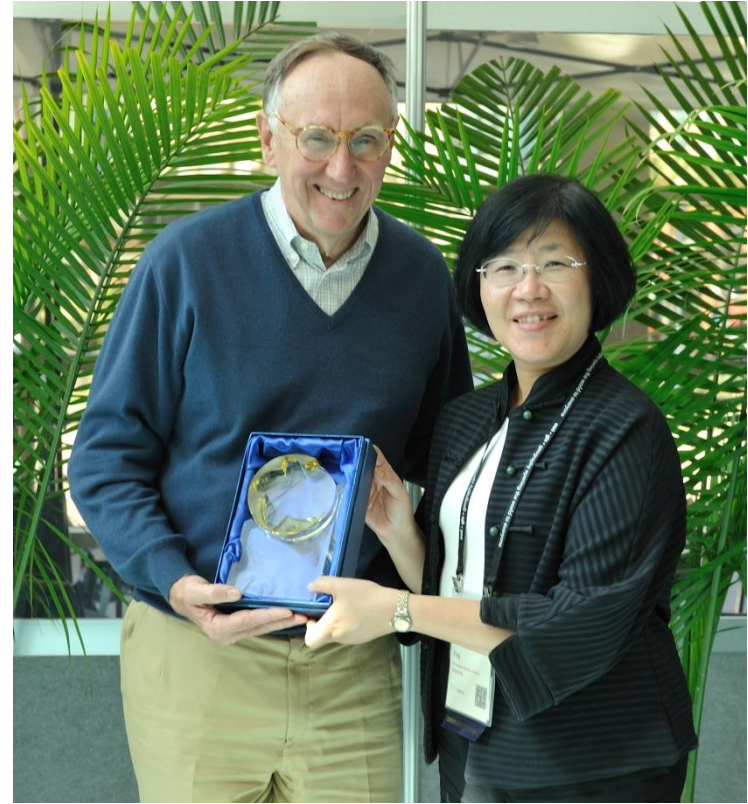


04. BIM in Housing Authority

Integrated Use of BIM and GIS



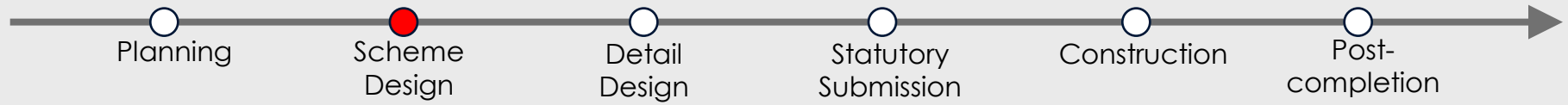
**Meeting with Carl Bass,
Former CEO of Autodesk (2009)**



**Meeting with Jack Dangermond,
President of ESRI (2010)**

04. BIM in Housing Authority

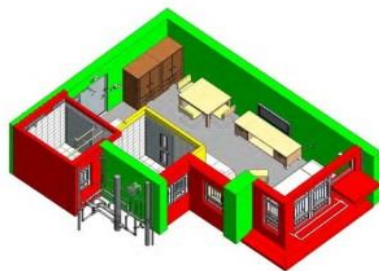
Scheme Design Stage



Standardized building components (building facades, bathrooms, kitchens)



 1-2 Person Flat



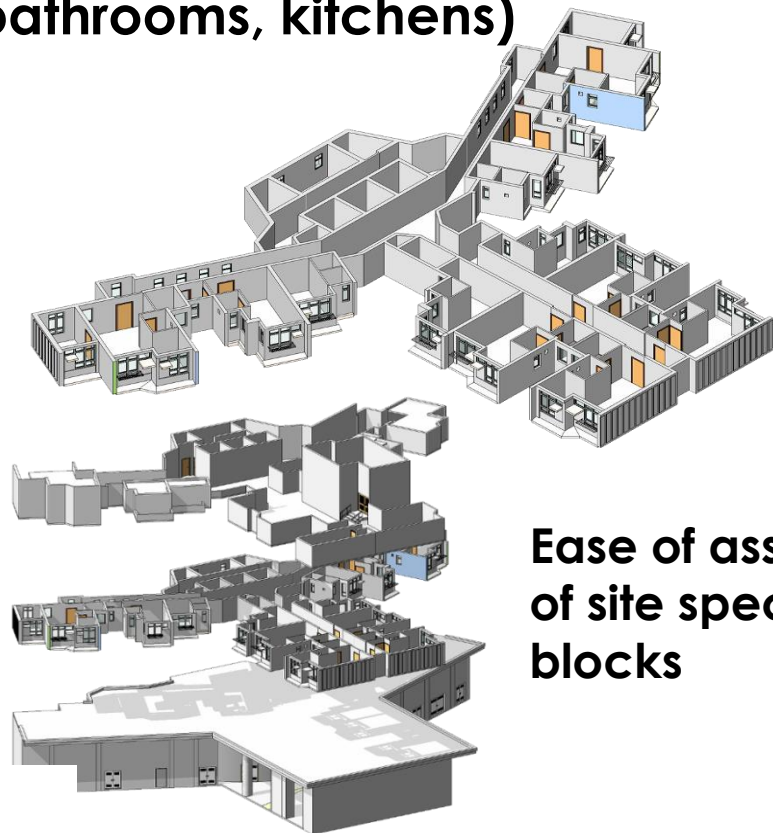
 2-3 Person Flat



 1 Bedroom Flat



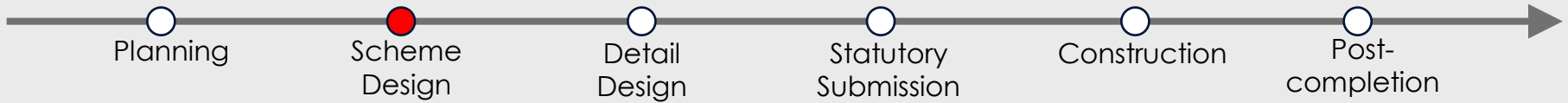
 2 Bedroom Flat



**Ease of assembly
of site specific
blocks**

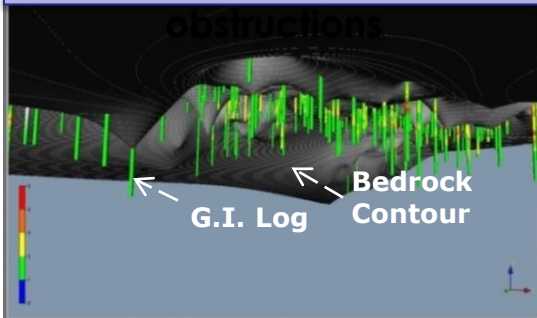
04. BIM in Housing Authority

Scheme Design Stage

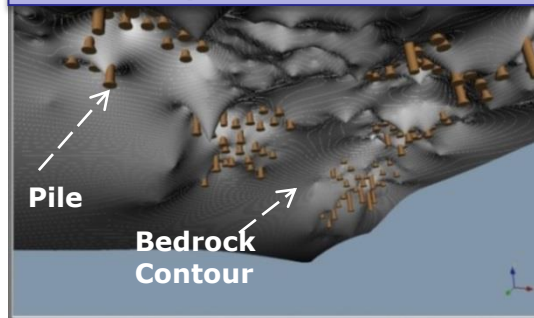


Semi-Automated Foundation Design

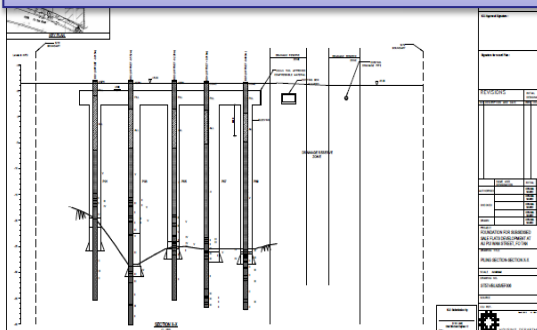
Visualization of G.I. logs and underground



Visualization of pile socket



2D drop-off for statutory submission



Visualization of problematic pile socket

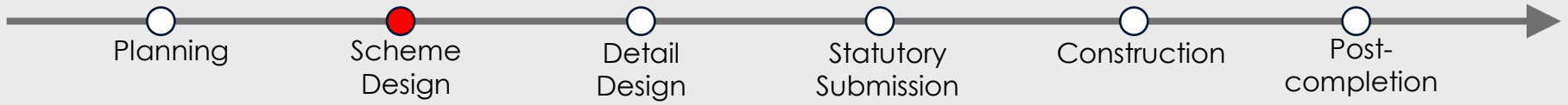


Optimize Foundation Design

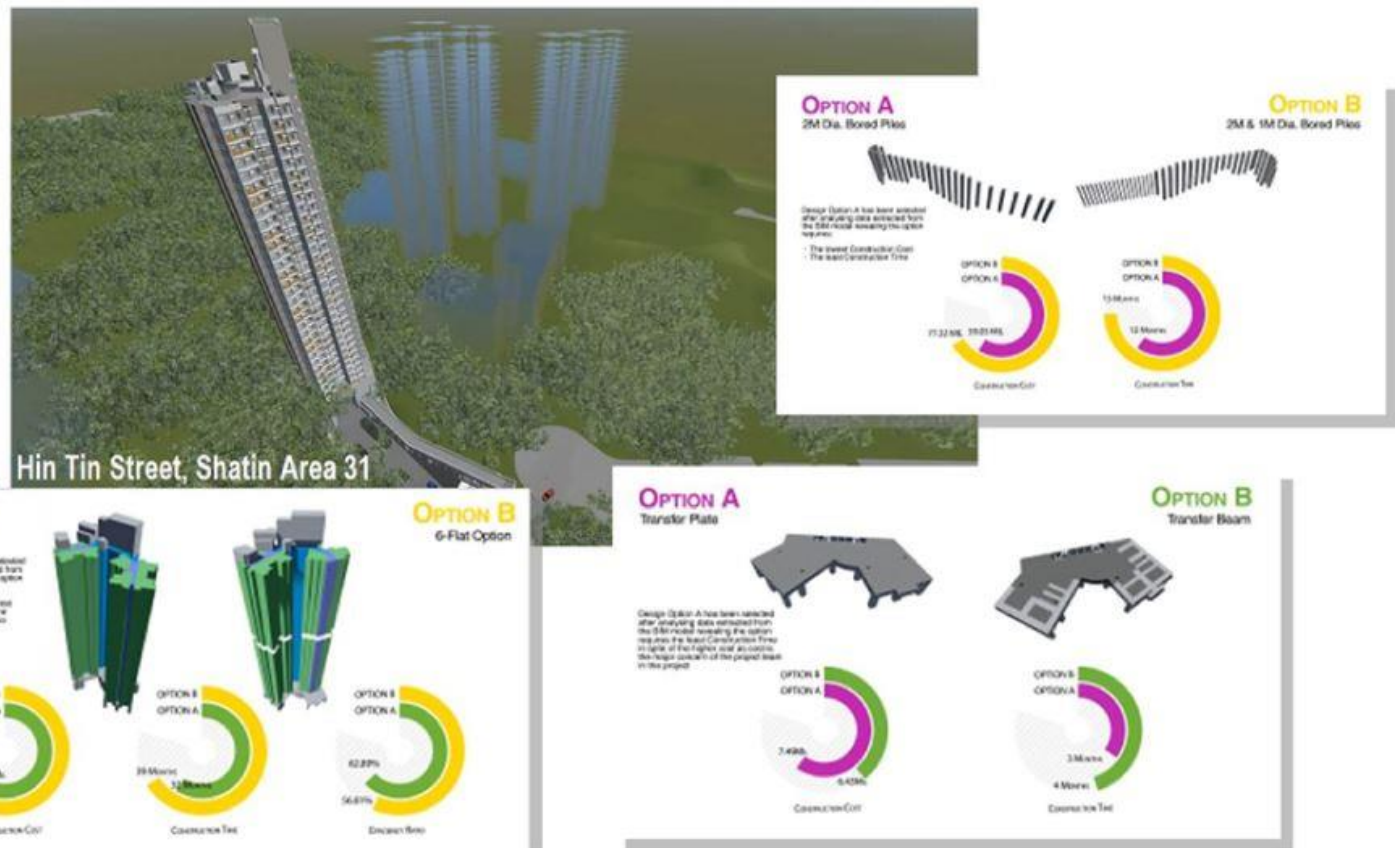
1. 3D Visualization;
2. 2D Drop-off for True BIM statutory submission;
3. Multi-directional exchange of BIM data;
4. Automatic update of Piling Schedule and Material Tables; and
5. Quantity Take Off.

04. BIM in Housing Authority

Scheme Design Stage

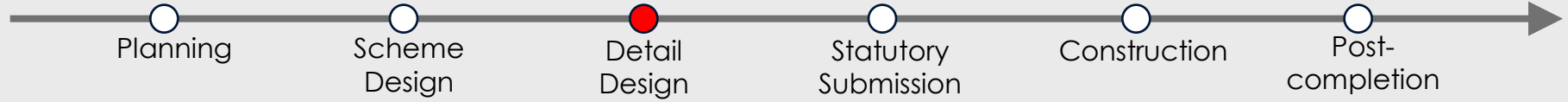


Value Management



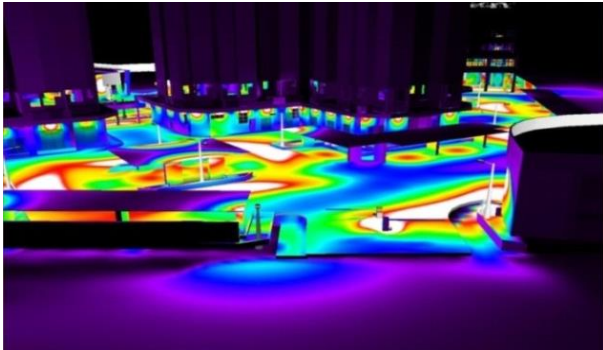
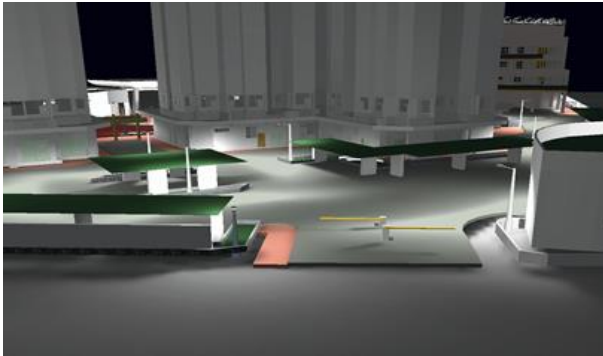
04. BIM in Housing Authority

Detail Design Stage



Environmental Analysis

Optimize Lighting Design for Energy Saving

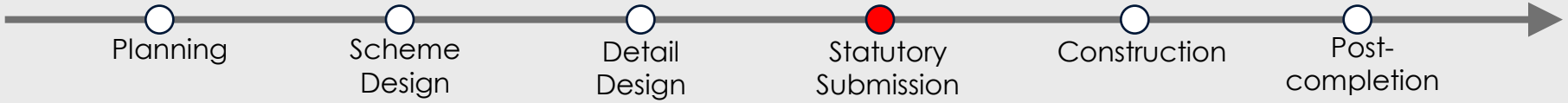


Development of more energy efficient lighting operation mode (Two-level lighting design)

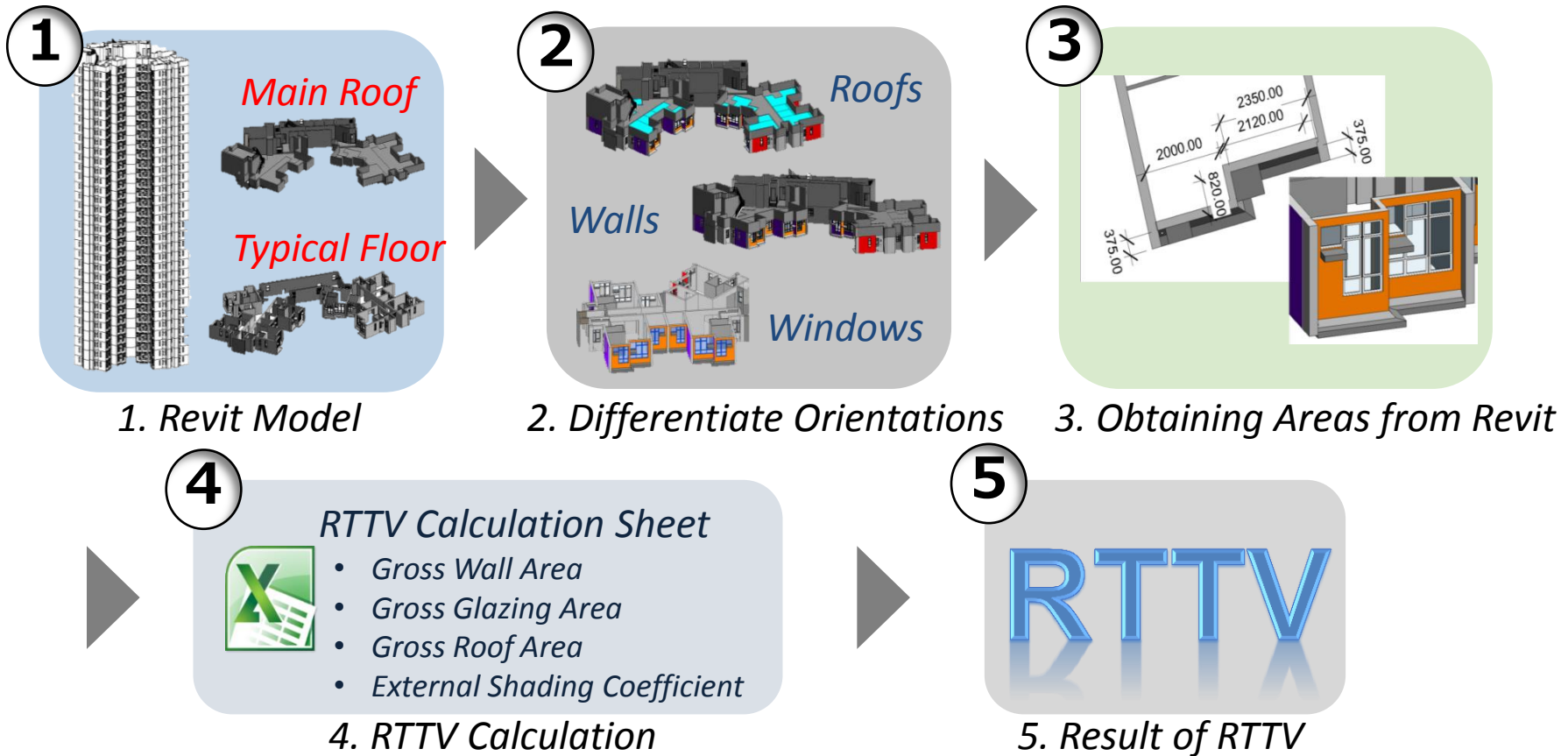


04. BIM in Housing Authority

Statutory Submission Stage

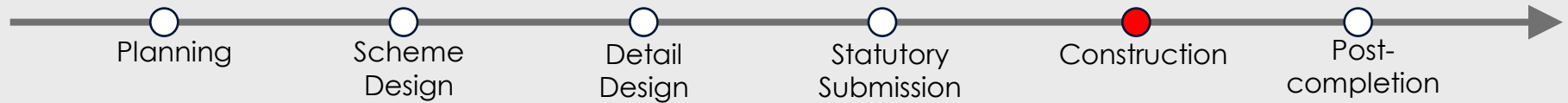


Residential Thermal Transfer Value (RTTV)



04. BIM in Housing Authority

Construction Stage – Construction Planning

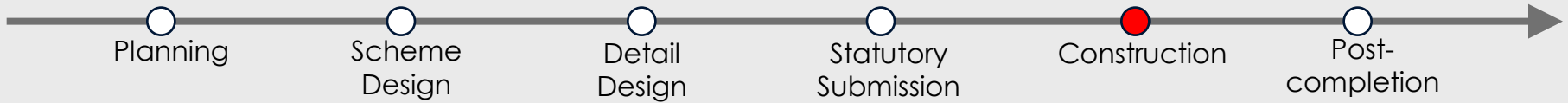


Construction planning for a long-span footbridge

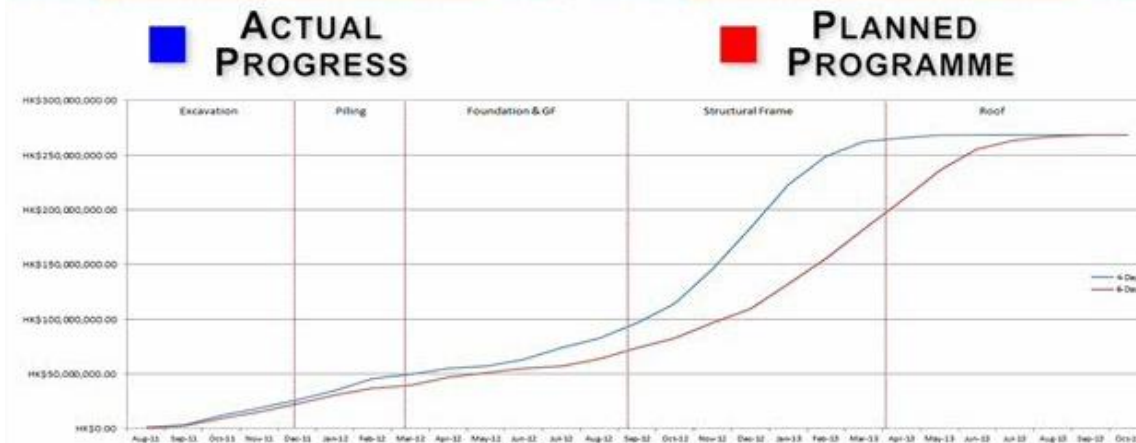


04. BIM in Housing Authority

Construction Stage



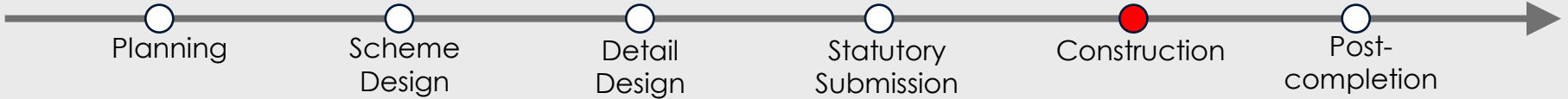
5D BIM Model for Construction Cash Flow Simulation



- Cash flow simulation was created by the integration of **quantities** extracted from the BIM model, construction **programme** and **cost** information.
- Reveals **actual** and **predicted** cash flow of the project.
- **Better understanding** of project cash flow.

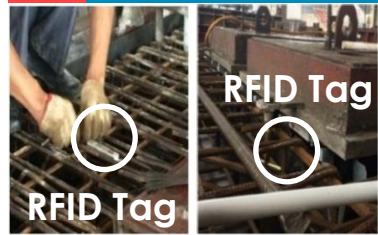
04. BIM in Housing Authority

Construction Stage



Integrated Use of BIM and RFID for Logistic and Supply Chain Management of Precast Elements

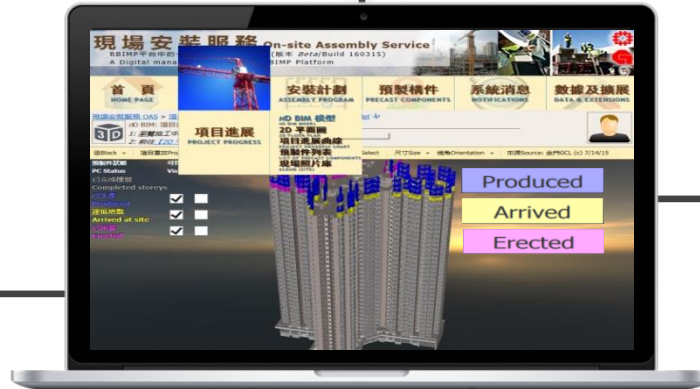
1 Fabrication



Reading RFID tag after concreting



2 Transportation



3 Assembly



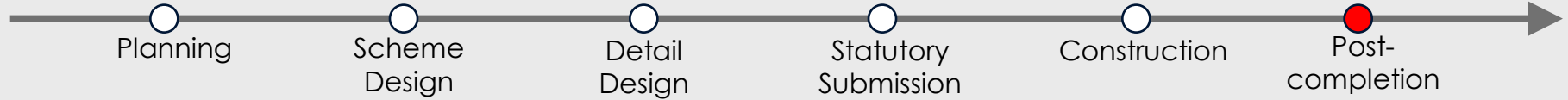
Reading RFID tag after installation



Planning and monitoring via a web platform with BIM visualization functions

04. BIM in Housing Authority

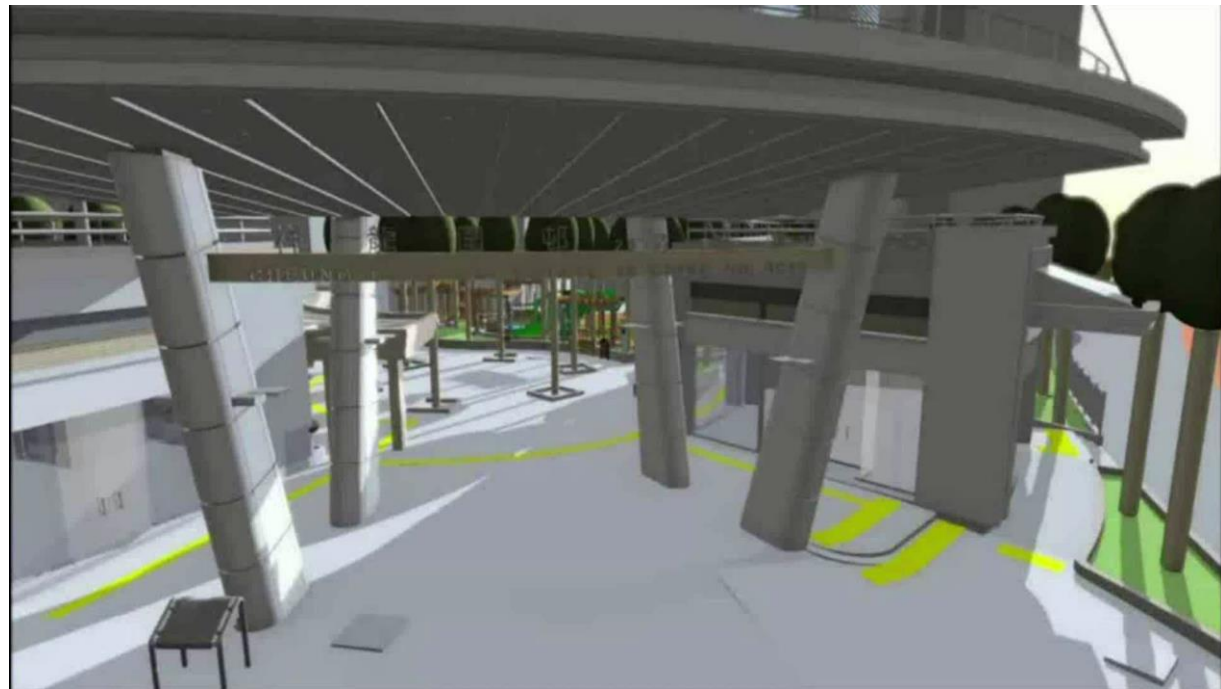
Post-completion Stage



Visualization of Underground Utilities

The contractor documented all the detail underground utilities and structure in the BIM model at construction stage.

This as-constructed BIM model will be handed over to the Estate Management Division to assist them in carrying out future maintenance work.



04. BIM in Housing Authority

How Hong Kong Housing Authority has contributed to BIM developments in Hong Kong since 2006

We are revising our BIM Guide to align with the framework of HKCIC's BIM Standards (Phase I) and it will be published in late 2017.

We share our BIM Standards and Guidelines to all via the HA website:



BIM Standard Manual



BIM User Guide



BIM Library Components Design Guide and Reference



BIM Project Execution Guide (BIMPEG)



<http://www.housingauthority.gov.hk/en/business-partnerships/resources/building-information-modelling/>



04. BIM in Housing Authority

How Hong Kong Housing Authority has contributed to BIM developments in Hong Kong since 2006

We share our experience with others

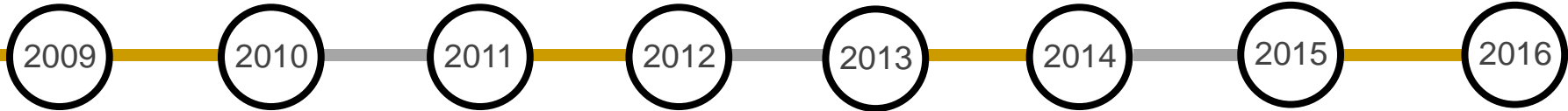
Visitors to HKHA BIM Center since 2009

Government (Overseas)	Government (China)	Government (Local)	Academia	Other Parties (Local & Overseas)
<ul style="list-style-type: none"> • Singapore <ul style="list-style-type: none"> ➢ Building and Construction Authority (BCA) ➢ Defence Science & Technology Agency (DSTA) ➢ Ministry of Education (MOE) ➢ Urban Redevelopment Authority (URA) ➢ Housing Development Board (HDB) Singapore 	<ul style="list-style-type: none"> • 深圳市羅湖區發展和改革局 (2016) • 住房和城鄉建設部 • 北京市住房保障辦公室 • 北京市公共租賃住房發展中心 • 北京市規劃委員會委員 • 深圳市人居環境委員會 	<ul style="list-style-type: none"> • URA (2017) • BD (2016) • DevB (2016) • ArchSD • CEDD • EMSD • PlanD • WSD 	<ul style="list-style-type: none"> • CityU (2017) • JA Job Shadow Day (2016 & 2017) • HKU • HKUST • Primary & Secondary Schools 	<ul style="list-style-type: none"> • Ascendas-Singbridge, Singapore (2015) • Walt Disney • 中國建築設計研究院 • 萬達文化集團 • 中國石油天然氣管道工程 • 國家住宅與居住環境工程技術研究中心

04. BIM in Housing Authority Achievements and Awards

Autodesk BIM Award from 2009 - 2015

- 2009: Towards Customization with Standard Modular flats in Mass Housing Design
- 2010: Transforming the Business Practice in the Delivery of Public Housing
- 2011: Versatile BIM / What You See is What You Can Do
- 2012: Pioneering 5D BIM for Quantity Surveying
- 2013: BIM Benefits Soar from Underground to Tower Cranes
- 2014: Innovative Integrations Boost Designing with BIM
- 2015: BIM Culture A New Paradigm Towards Partnering for Change**



CIC BIM Excellence Award

2014



- BIMer of the Year,
- Young BIMer of the Year,
- Construction Innovator by BIM – 3 Teams

buildingSMART International BIM Award

2015



- Best BIM Application Prize (Enterprise)
- Pioneering BIM for Quantity Surveying

2016



- Management of Precast Element Production through the Integrated Use of BIM and RFID

05. What is your contribution ?

Contractors

Government Departments

Suppliers

Developers/ Project Clients

***There is so much more we can all contribute to
BIM development in Hong Kong.***

BIM Institutes



Photo 03

Utilities Company

Academia

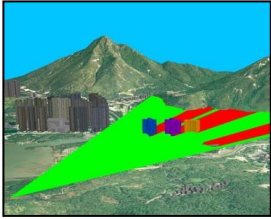
Software Developers

Professional Institutes

Hardware Suppliers

05. What is your contribution ?

BIM development areas which you can contribute on

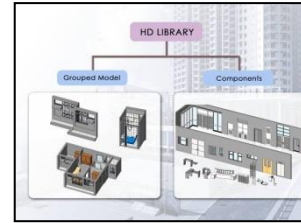


BIM & GIS Integration

Photo 04



Statutory Submission



Families

Construction Planning

Site Safety Planning

Integration with RFID

Scheme Design

Tender

Post- Completion



Feasibility Studies

Detail Design

Construction



BIM to assist BEAM Plus Certification

Environmental Studies with BIM

- CFD Assessment
- Solar Radiation Analysis
- Lighting Simulation
- Daylight Analysis

BIM Related Contracts

Integration with Specification?

Quantity Take-off?



Photo 06

Facility Management
Asset Management

Photo 05

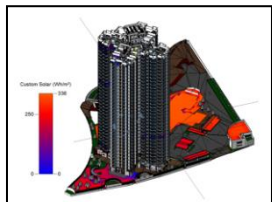
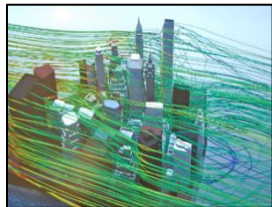


Photo 07



Please contact CIC or myself:

Thank you

Referenced Photos:

Photo No.	References	Location
Photo 01	http://www.outsidetheboxsolutions.com.au/chaos-and-order-best-friends-or-mortal-enemies/	Slide 24
Photo 02	http://www.plananddesign.co.uk/planning-permission-application-submission	Slide 36
Photo 03	http://tw.gigacircle.com/1372994-1	Slide 52
Photo 04	http://www.plananddesign.co.uk/planning-permission-application-submission	Slide 53
Photo 05	http://www.greenbim-eng.com/services/computational-fluid-dynamics-cfd/	
Photo 06	http://www.escoladominio.com.br/produto/curso-de-design-grafico/	
Photo 07	http://www.123gite.com/asset-management/	
Photo 08	http://www.siriuscom.com/solutions/collaboration/	Slide 54