

BIM for Safety and Construction Planning of Public Housing Development

Presented by
Ir John KL Chui (BIM Service Team)



香港房屋委員會
Hong Kong Housing Authority

22 May 2019



Agenda

Part 1: BIM in Housing Authority

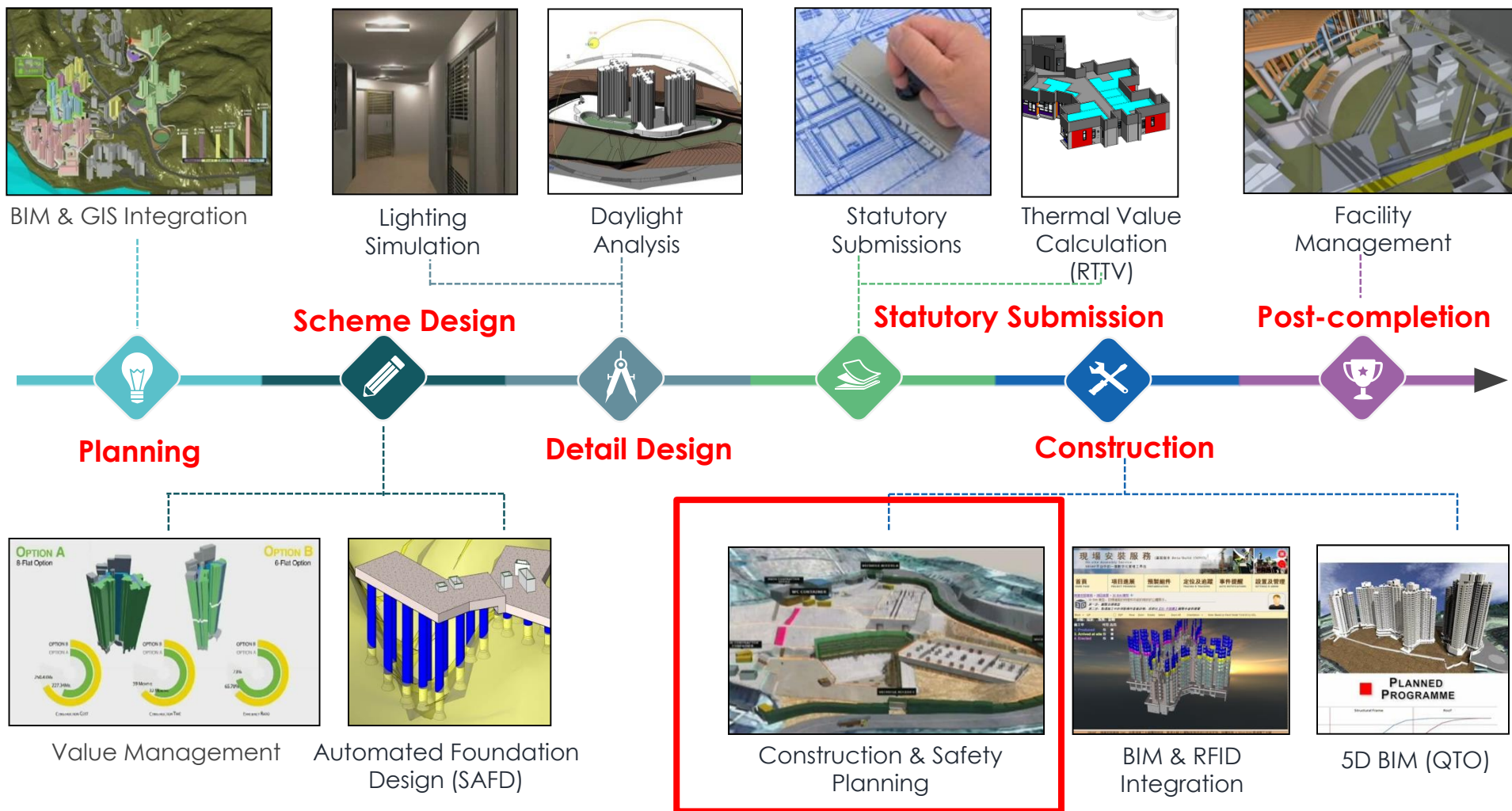
Part 2: Project Showcases for BIM Applications

Part 3: Way Forward



Part 1- BIM in Housing Authority

A. HA's BIM Applications Encompass Full Design and Construction Cycle

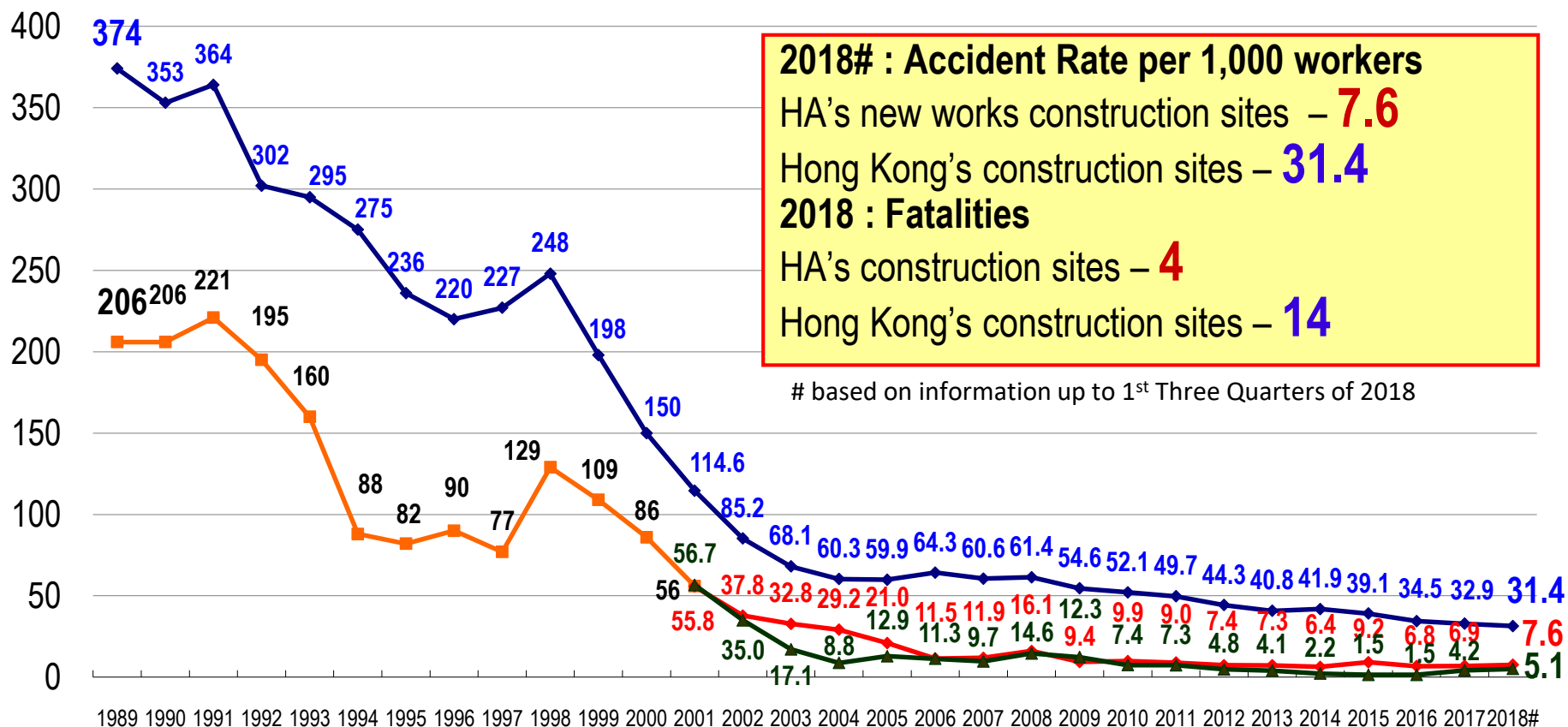


Part 1- BIM in Housing Authority

B. Our Achievement on Safety

The **accident rate** has been decreased from **86** nos. per 1,000 workers in 2000 to **7.6** nos. per 1,000 workers in 1st Three Quarters of 2018

Accident Rate per 1000 Workers



Source of information: Labour
Department, Census & Statistics
Department and Housing Department

香港房屋委員會

Hong Kong Housing Authority

Part 1- BIM in Housing Authority

C. Our 3-Tier BIM Management Structure

Tier 1 **BIM Project Steering Committee (BIM PSC)**

To plan strategically the implementation of BIM. The BIM PSC plays an important role at the management level giving direction and support to staff



Tier 2 **BIM Working Group (BIM WG)**

To work on specific implementation and technical details. The BIM WG underpins the BIM PSC and is represented by all professional disciplines



Tier 3 **BIM Service Team (BIMST)**

To act as central support to project teams on BIM implementation. The BIMST not only builds up in-house BIM experts, but also accelerates skill development within the department.



Part 1- BIM in Housing Authority

D. Our BIM Centre

Setting up a **BIM Centre** at 12/F, Block 3, with meeting and training rooms to provide a dedicated venue for project teams to learn and apply BIM to their projects. The BIM Centre also serves as a showcase and meeting place for outside visitors.

BIM Central Support - BIM Service Team and BIM Centre

Act as in-house consultant and support, collect feedbacks, facilitate training and skill exchange



Centralized BIM Team



Training



Discussion



Hardware and software support



3D Printers

39



Part 2- Project Showcases



2. PRH at Tung Tau Cottage Area East (TTCAE)



4. PRH at Kai Tak Site 1B



6. SSF at Sheung Lok Street

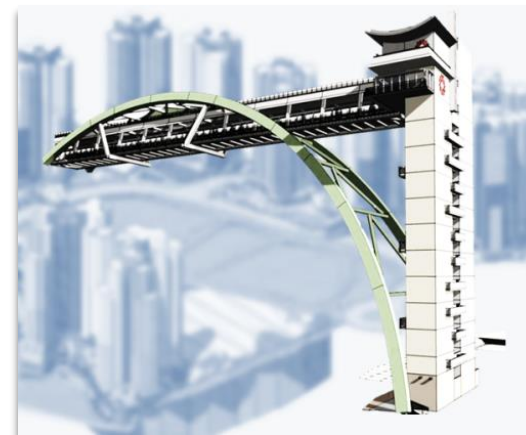
2019



1. PRH at Tai Pak Tin Street



3. Redevelopment of Lower Ngau Tau Kok (II) Estate



5. Footbridge at Shui Chuen O Ph.2

Abbreviation: PRH stands for Public Rental Housing Development, SSF stands for Sale of Subsidized Flats Development



Part 2- Project Showcases

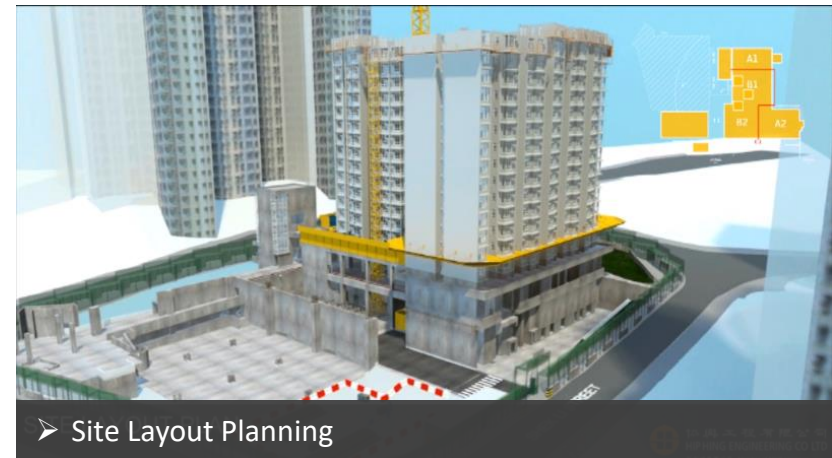
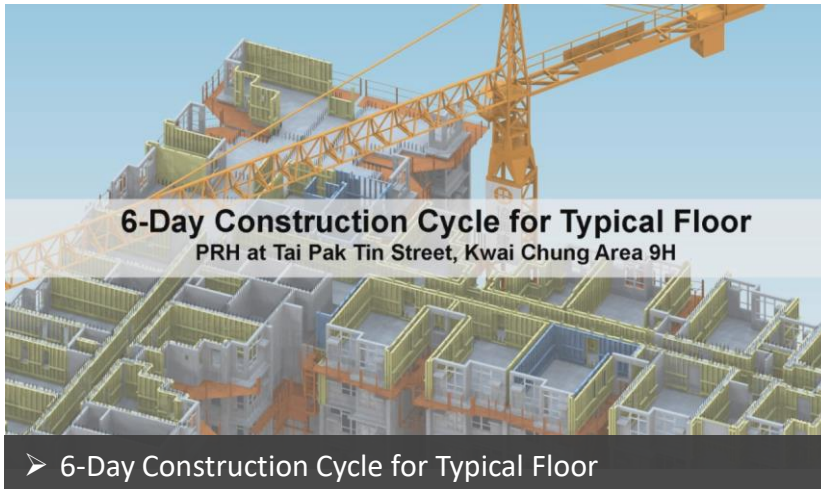
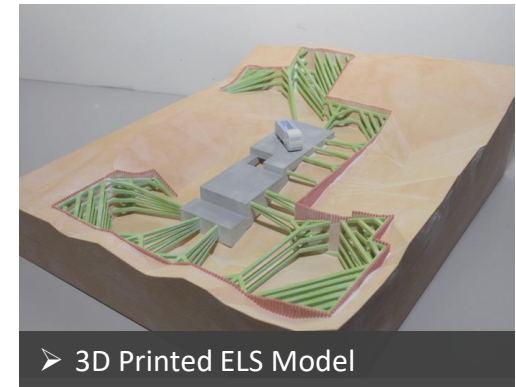
1. PRH at Tai Pak Tin Street, Kwai Chung Area 9H

Quick Facts:

1. 1 no. 41-storey Domestic Block;
2. 839 Flat nos;
3. Completed in 08/2013.

BIM Applications:

1. 6-Day Construction Cycle Simulation for Typical Floor;
2. Safety Access Planning;
3. Site Layout Planning; and
4. 3D Printed ELS Model.



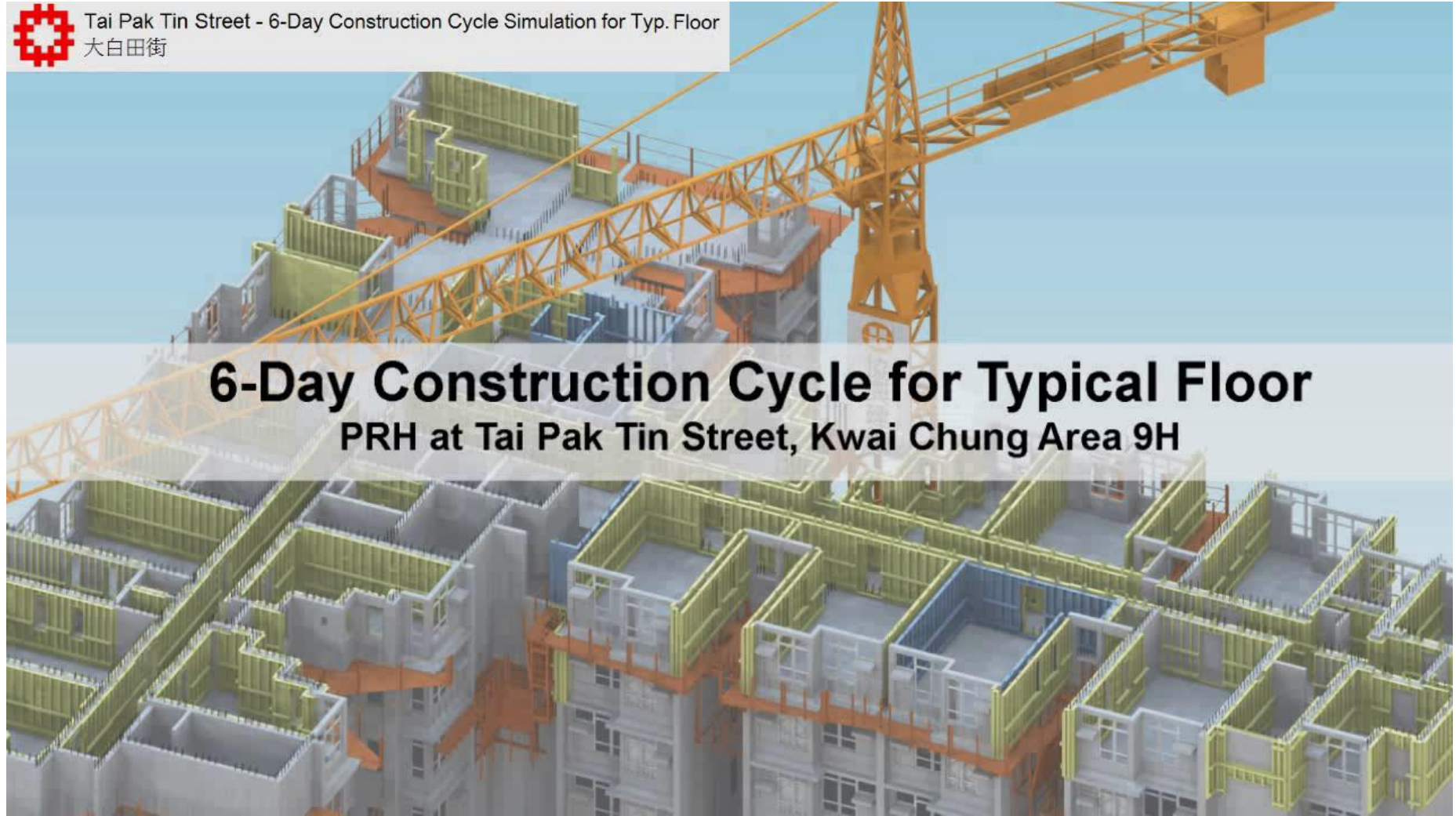
Part 2- Project Showcases

1. PRH at Tai Pak Tin Street, Kwai Chung Area 9H



Tai Pak Tin Street - 6-Day Construction Cycle Simulation for Typ. Floor
大白田街

6-Day Construction Cycle for Typical Floor PRH at Tai Pak Tin Street, Kwai Chung Area 9H



Part 2- Project Showcases

2. PRH at Tung Tau Cottage Area East (TTCAE)

Quick Facts:

1. 1 no. Domestic Block;
2. 990 Flats nos.; and
3. Completed in 06/2014.

BIM Applications:

1. 6-Day Construction Cycle Simulation for Typical Floor;
2. Site Layout Planning;
3. ELS and its Safety Planning; and
4. 4D BIM Application and Simulation.



Part 2- Project Showcases

2. PRH at Tung Tau Cottage Area East (TTCAE)



Tung Tau Cottage Area East-6-Day Construction Cycle Simulation for Typ. Floor
東頭平房 東區



Part 2- Project Showcases

3. Redevelopment of Lower Ngau Tau Kok (II) Estate



Part 2- Project Showcases

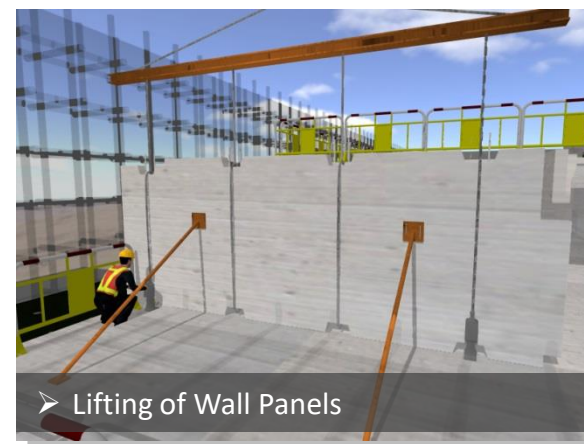
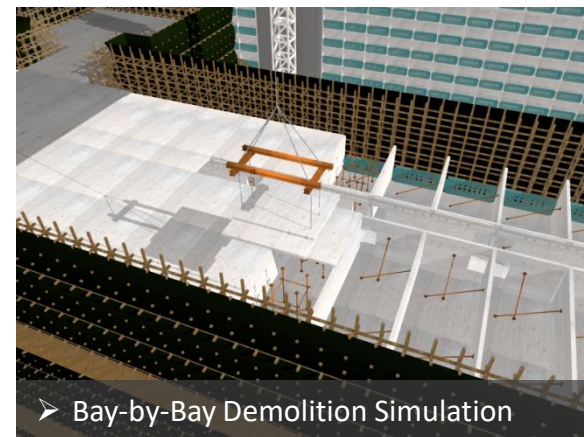
3. Redevelopment of Lower Ngau Tau Kok (II) Estate



Part 2- Project Showcases

3. Redevelopment of Lower Ngau Tau Kok (II) Estate

- ① Refine demolition sequence & method;
- ② Review safety measures of demolition sequence;
- ③ Workers familiarization of demolition sequence; and
- ④ Quantity of C&D wastes to be disposed of.

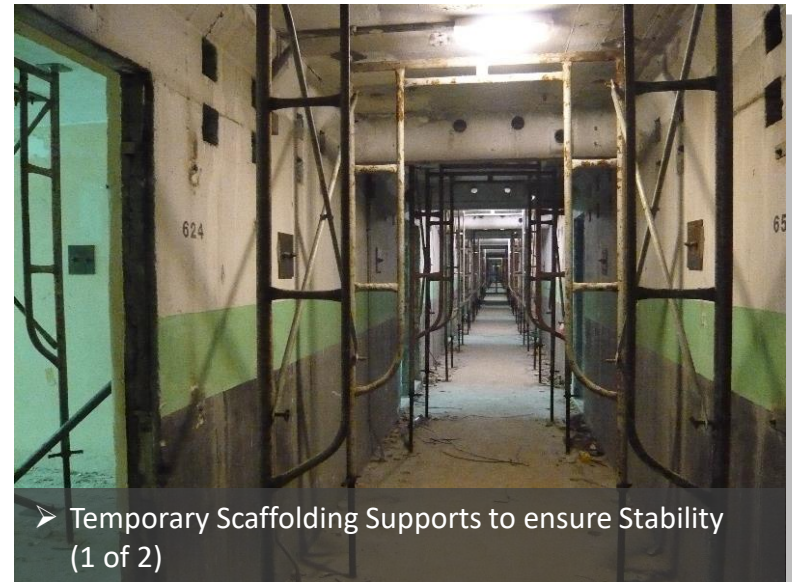


Part 2- Project Showcases

3. Redevelopment of Lower Ngau Tau Kok (II) Estate



➤ Lifting Frame for Removal of Precast Slabs (1 of 2)



➤ Temporary Scaffolding Supports to ensure Stability (1 of 2)



➤ Lifting Frame for Removal of Precast Slabs (2 of 2)



➤ Temporary Scaffolding Supports to ensure Stability (2 of 2)

Part 2- Project Showcases

3. Redevelopment of Lower Ngau Tau Kok (II) Estate

 Lower Ngau Tau Kok Estate - Demolition and its Safety Planning
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Part 2- Project Showcases

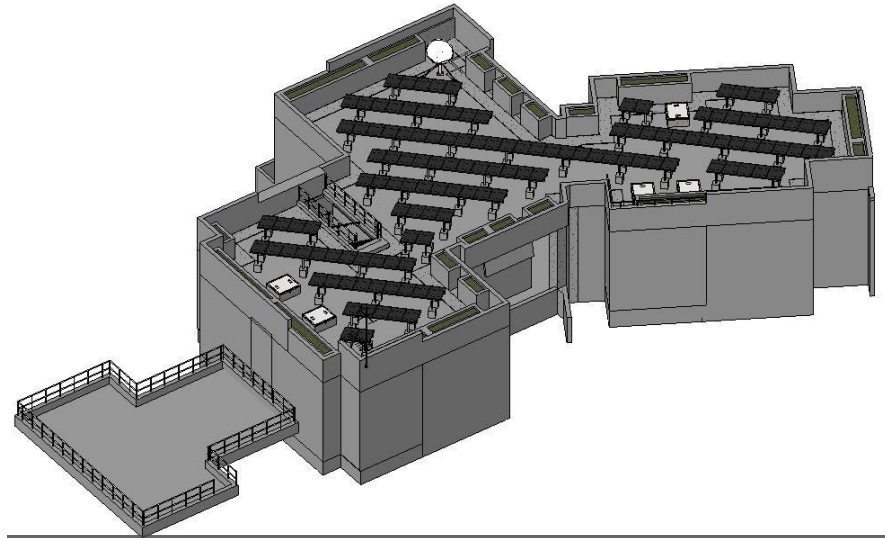
4. PRH Development at Kai Tak Site 1B

Quick Facts:

1. 9 nos. Domestic Blocks;
2. 8,164 Flat nos; and
3. Completed in 09/2013.

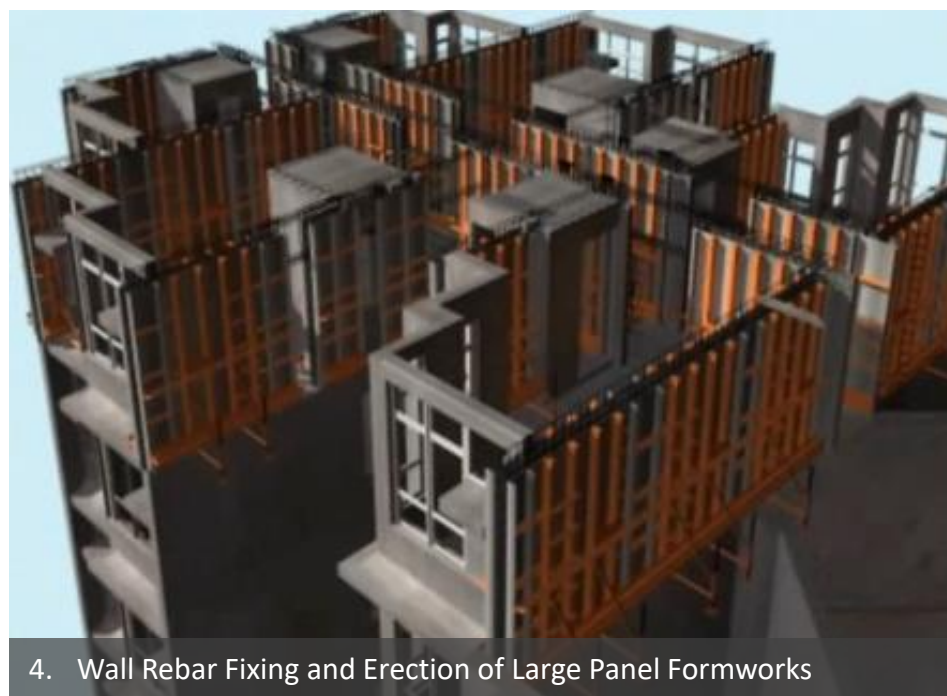
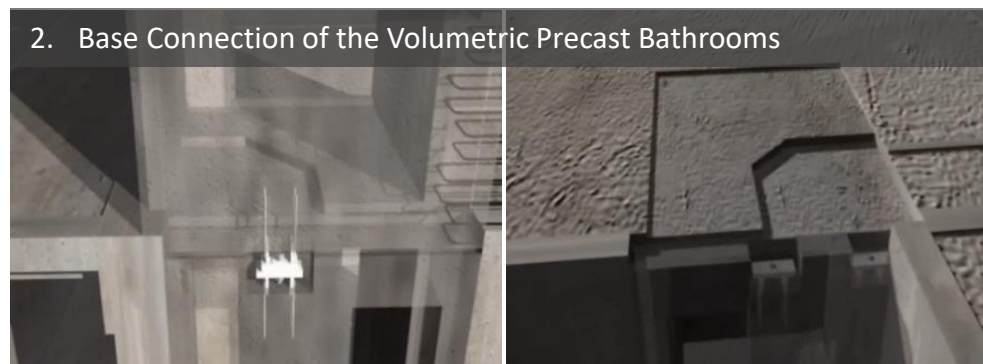
BIM Applications:

1. 6-Day Cycle Floor Construction;
2. Installation and its Safety Planning of Volumetric Precast Components; and
3. Maintenance Access Planning at Roof Level.



Part 2- Project Showcases

4. PRH Development at Kai Tak Site 1B

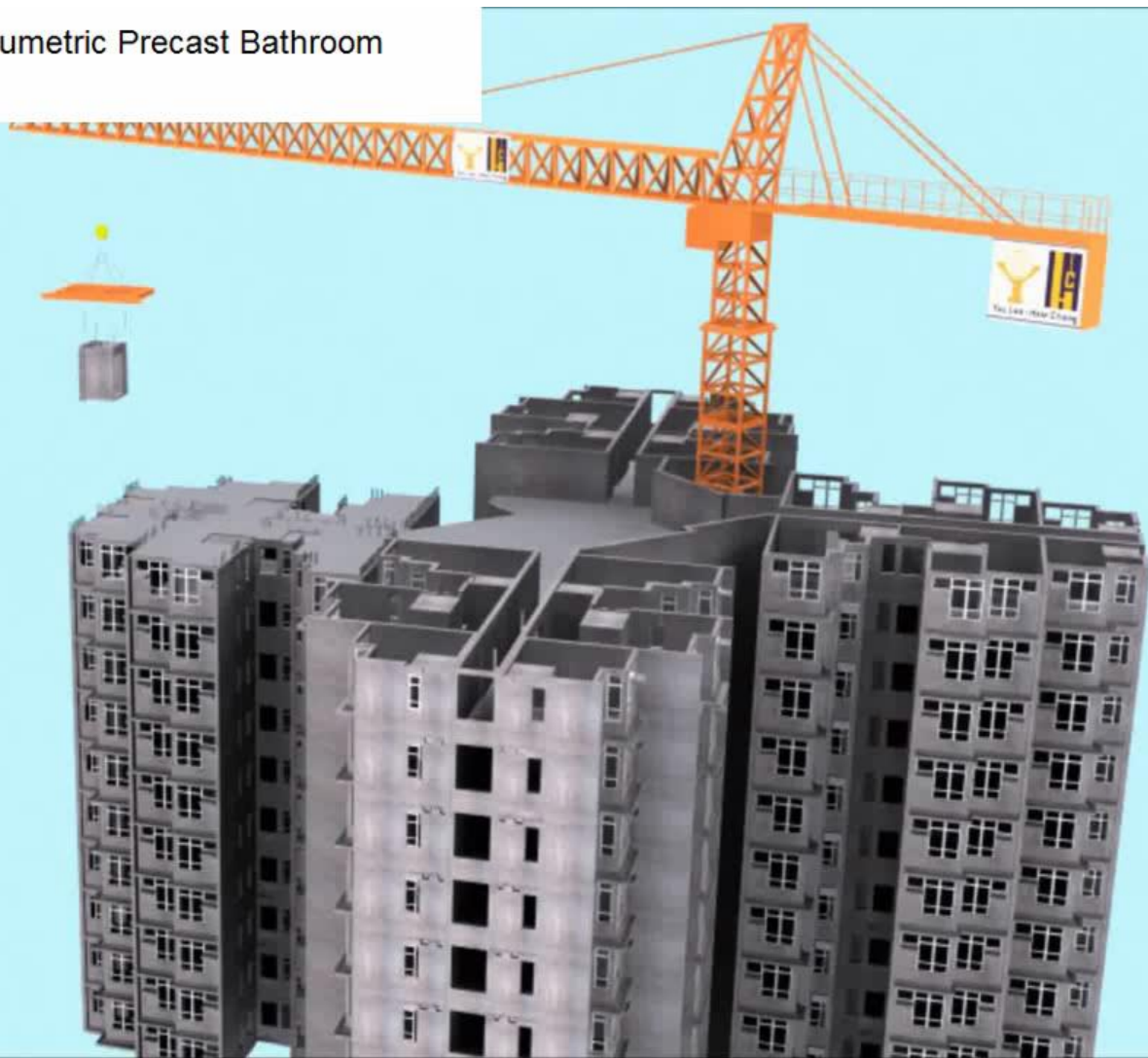


Part 2- Project Showcases

4. PRH Development at Kai Tak Site 1B



Kai Tak Site 1B - Installation of Volumetric Precast Bathroom
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Part 2- Project Showcases

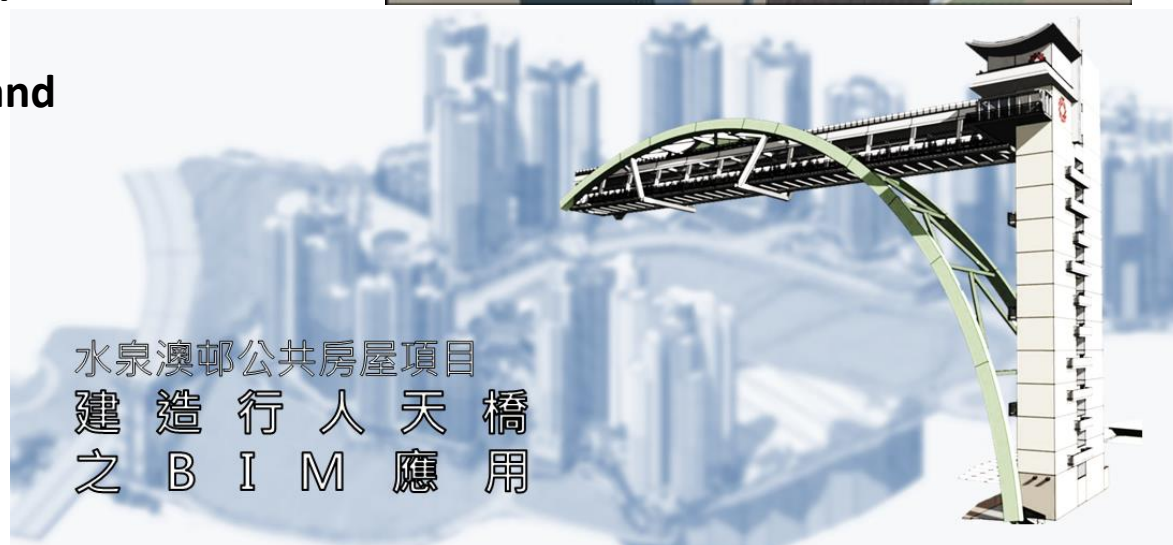
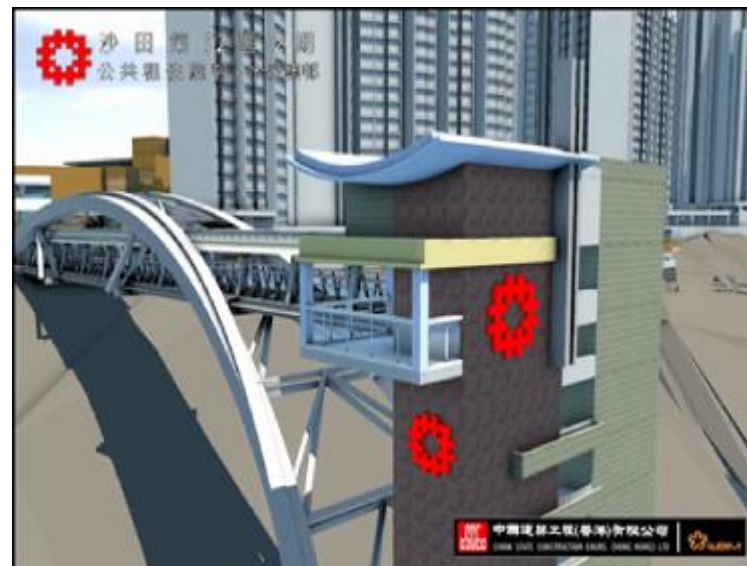
5. Footbridge of PRH Development at Shui Chuen O Ph. 2, Shatin Area 52

Quick Facts of the Footbridge:

1. 78m Long Single-span;
2. 51m Height Lift Tower;
3. Natural Slope and Stream nearby; and
4. Congested Construction Space.

BIM Applications:

1. Footbridge Construction Sequence Analysis;
2. Safety Measures Planning; and
3. Clashing Analysis.



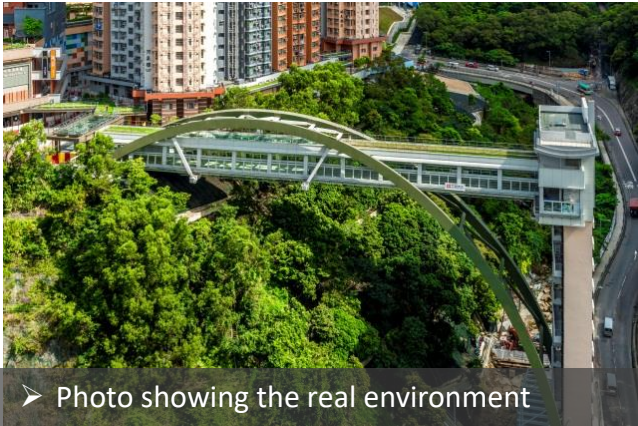
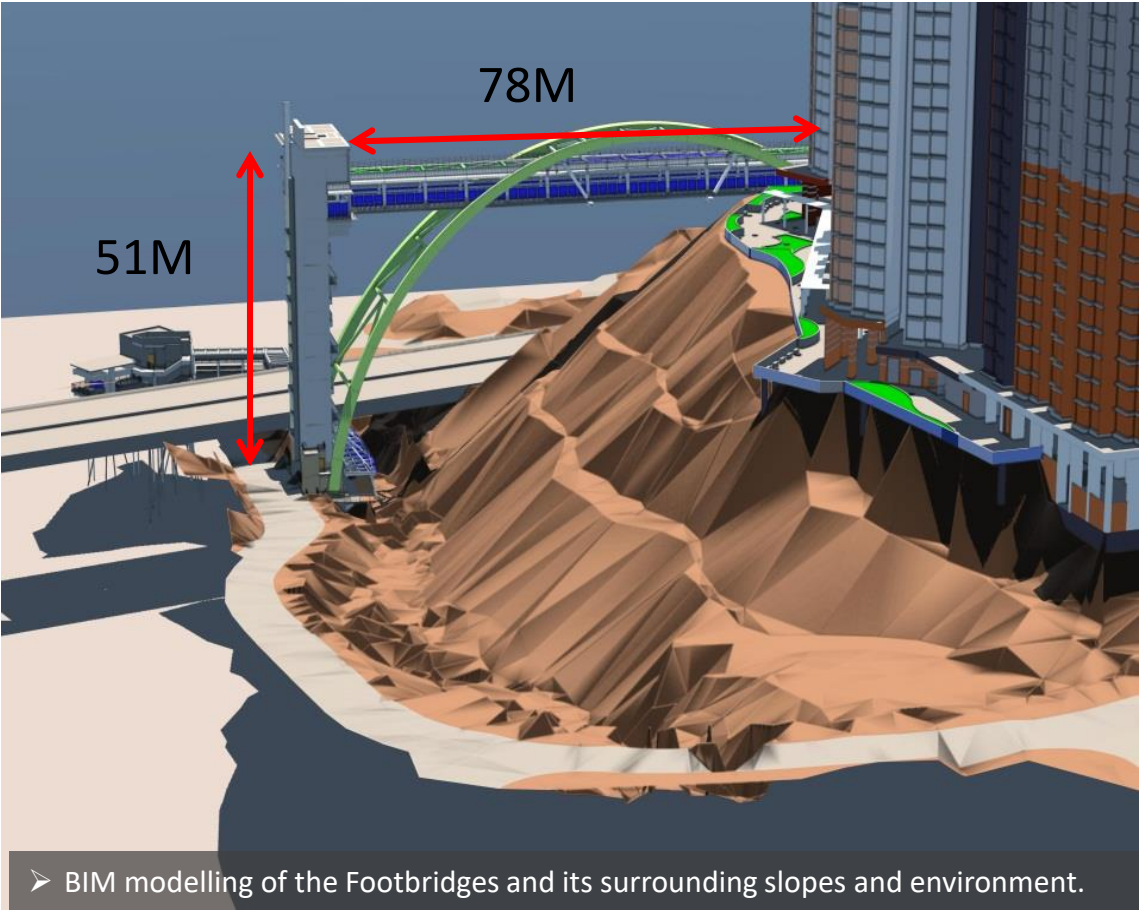
Part 2- Project Showcases

5. Footbridge of PRH Development at Shui Chuen O Ph.2, Shatin Area 52



Part 2- Project Showcases

5. Footbridge of PRH Development at Shui Chuen O Ph. 2, Shatin Area 52



Part 2- Project Showcases

5. Footbridge of PRH Development at Shui Chuen O Ph. 2, Shatin Area 52



➤ Simulation of Temporary Supporting Steel Structure.



➤ The Photo showing the Erection of Temporary Supporting Steel Structure




➤ The Photo showing the Erection of Temporary Supporting Steel Structure

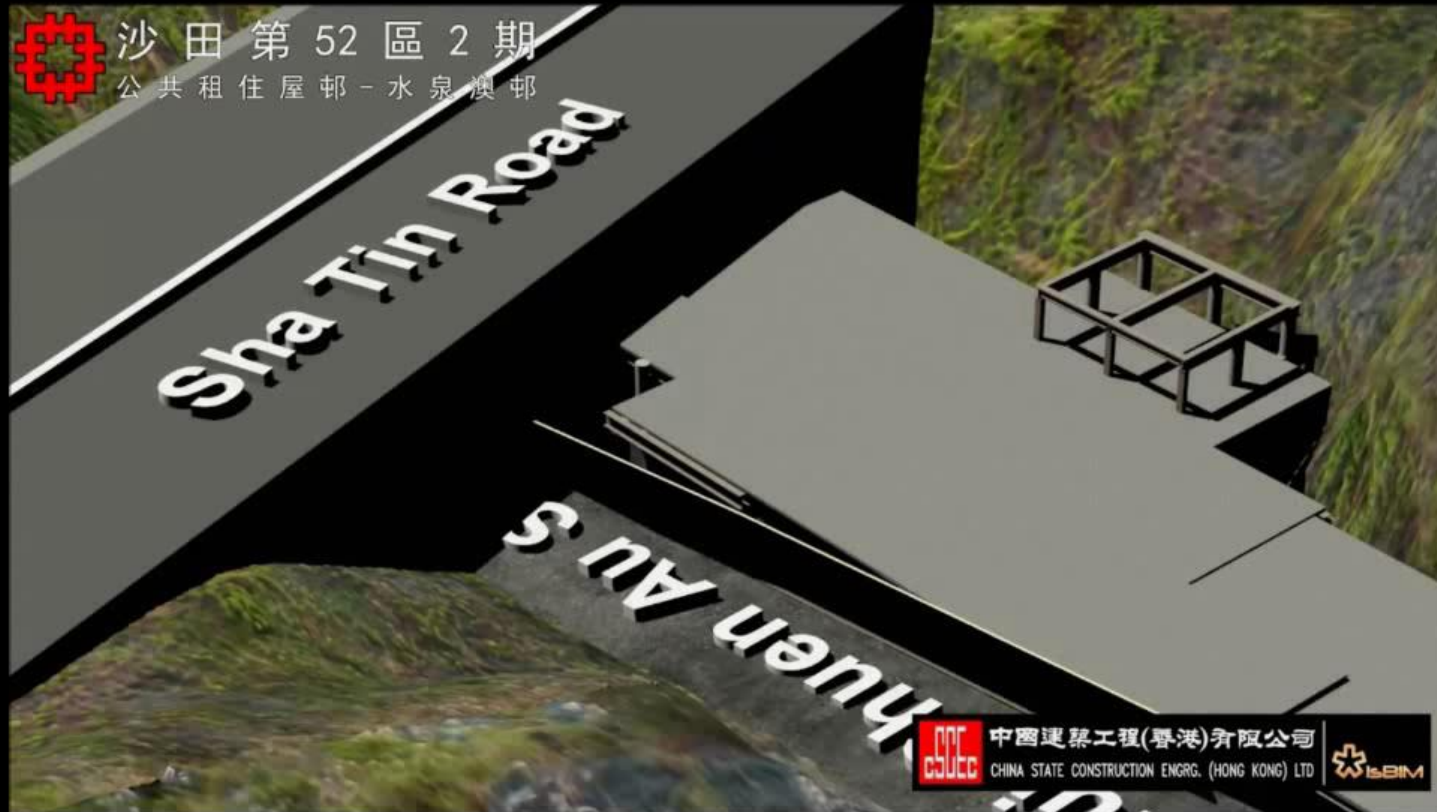
4D Construction Sequence Analysis



Part 2- Project Showcases

5. Footbridge of PRH Development at Shui Chuen O Ph. 2, Shatin Area 52

 Sha Tin Area 52 Phase 2 - Footbridge Construction and Safety Planning
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Construction of Base Slab for Lift Tower

6. Sale of Subsidized Flat (SSF) at Sheung Lok Street, Homantin

Quick Facts:

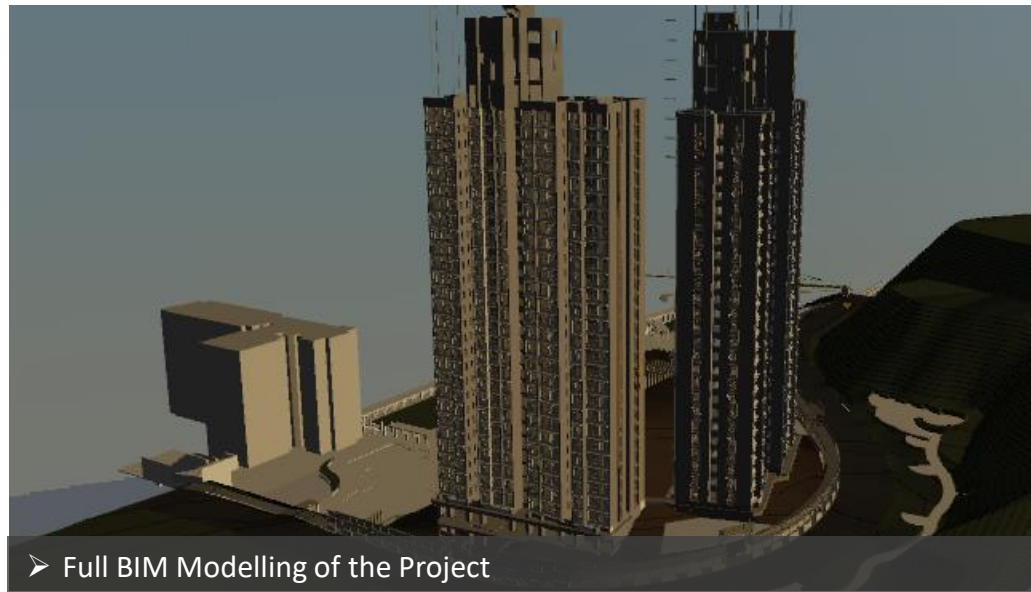
1. 3 nos. Domestic Blocks;
2. 1 no. Carport Podium;
3. 603 Flat nos; and
4. Completed in 2019.

BIM Applications:

1. 4D BIM Modelling and Applications;
2. Construction and Safety Planning of Multiple Activities in a Congested Site;
3. Demonstration of Removal of an Existing Vertical “Soil-Nailed” Retaining Wall; and
4. ELS/Foundation Works Sequencing and its Safety Planning.



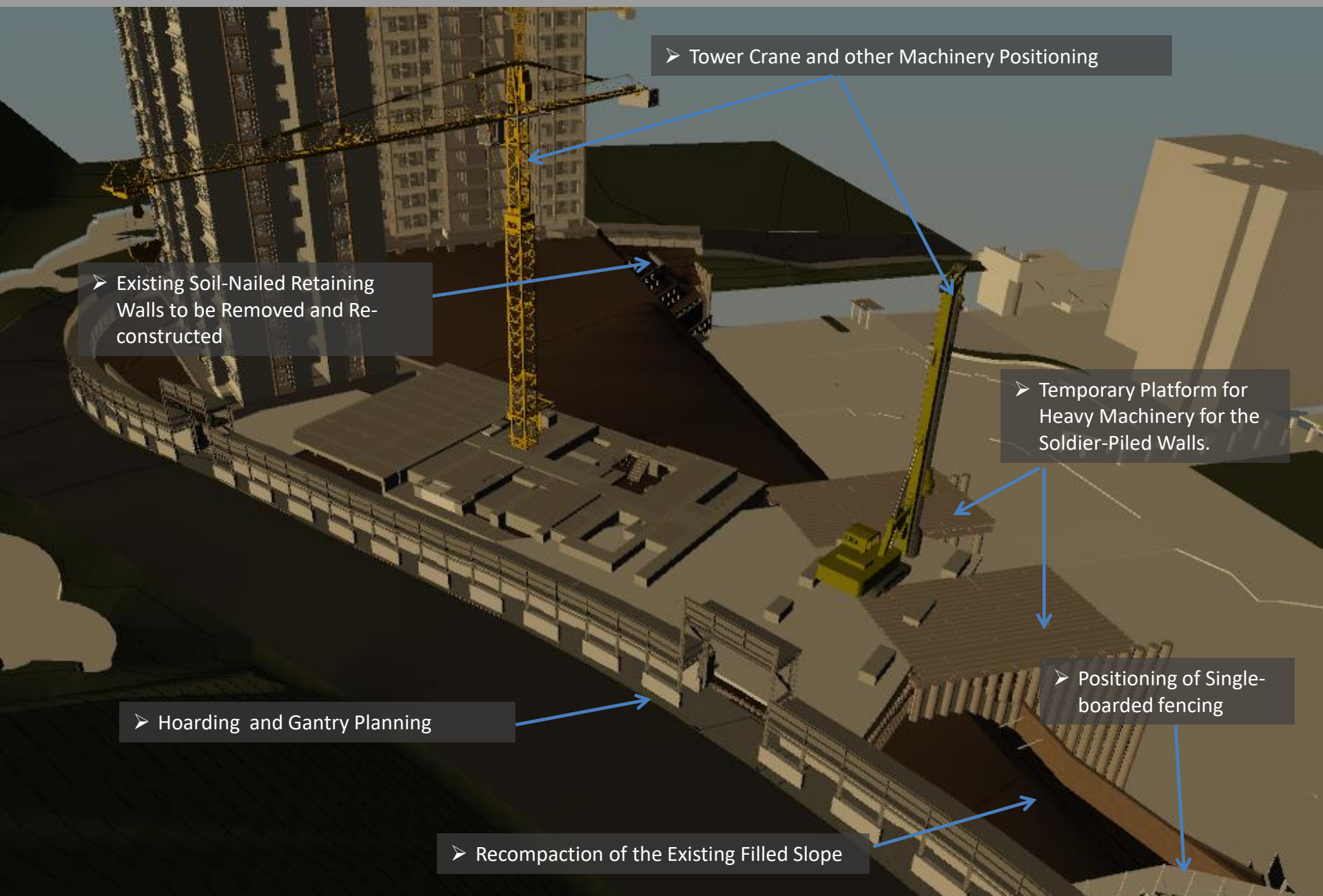
➤ The Photo View of the Completed SSF Project, now named as “冠德苑”



➤ Full BIM Modelling of the Project

Part 2- Project Showcases

6. Sale of Subsidized Flat (SSF) at Sheung Lok Street, Homantin



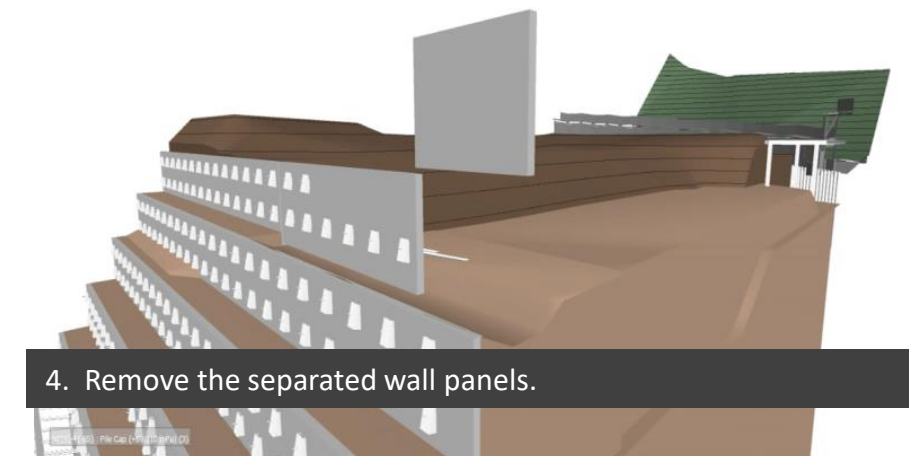
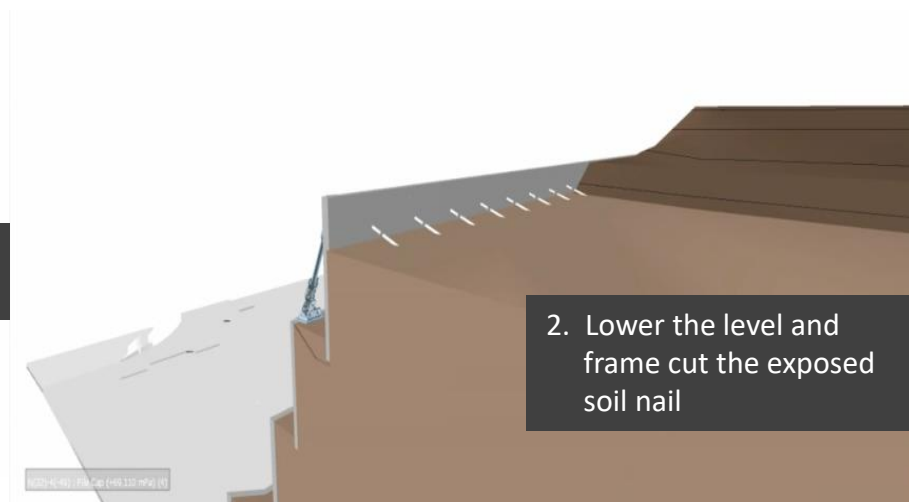
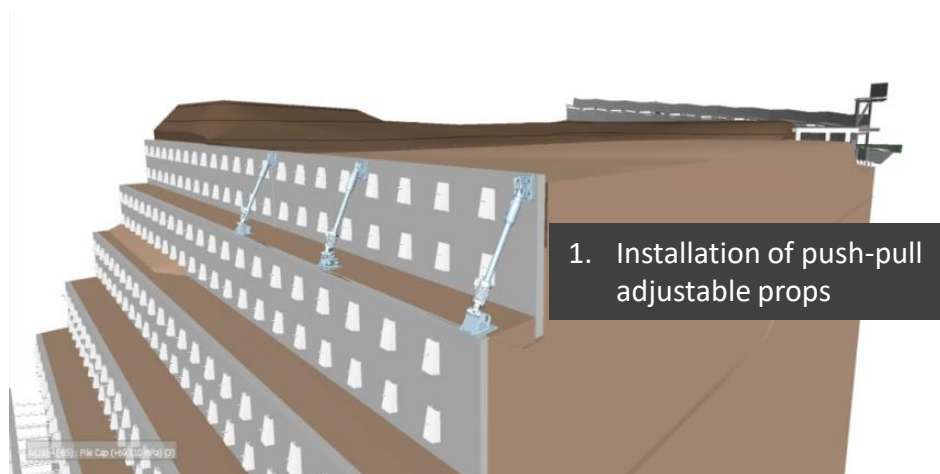
➤ Demolition Sequencing of Existing Soil-nailed Retaining Walls



Part 2- Project Showcases

6. Sale of Subsidized Flat (SSF) at Sheung Lok Street, Homantin

➤ Demolition Sequencing of Existing Soil-nailed Retaining Walls



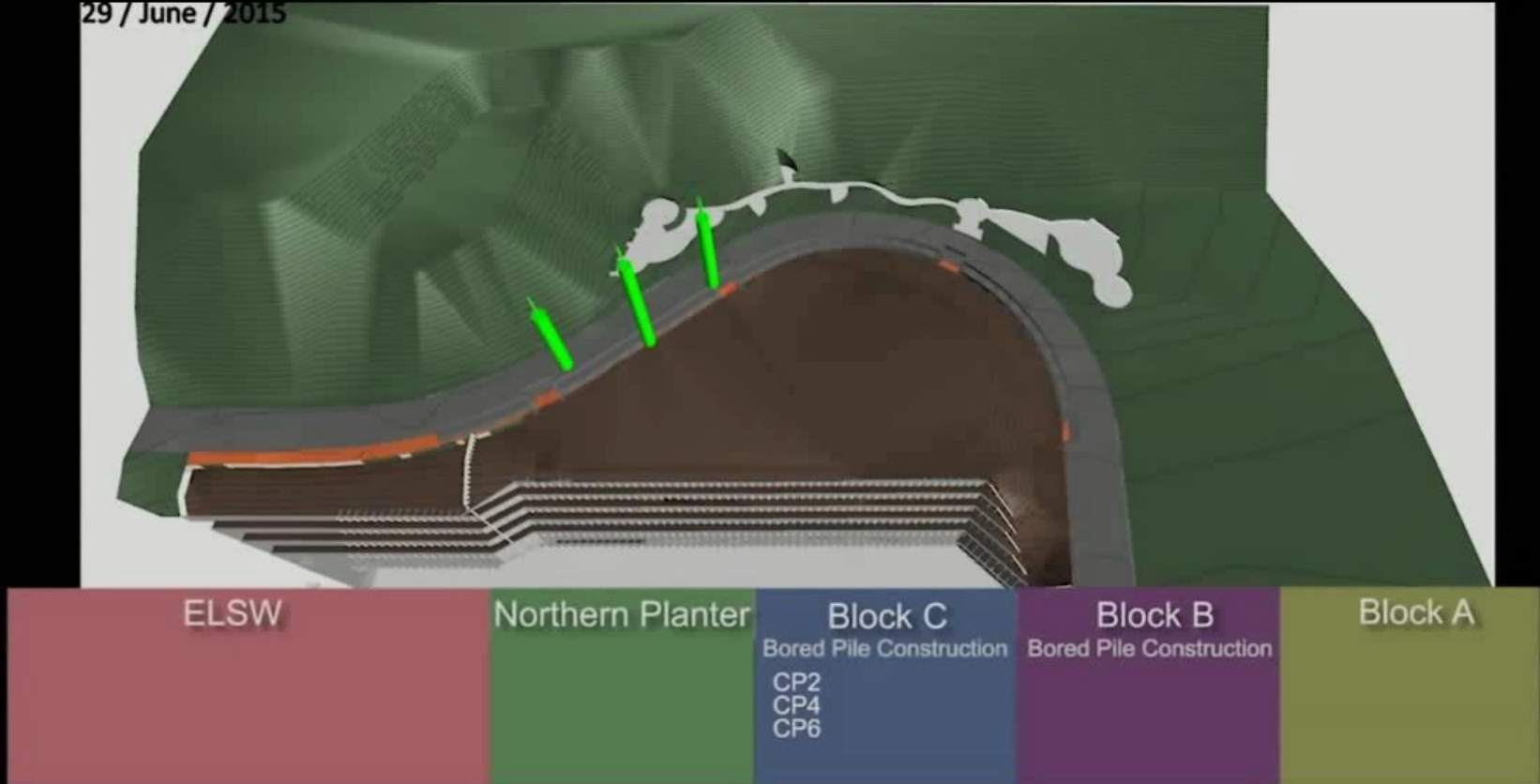
Part 2- Project Showcases

6. Sale of Subsidized Flat (SSF) at Sheung Lok Street, Homantin



Sheung Lok Street - Construction and Safety Planning of Multiple Activities in a Congested Site
常樂街

29 / June / 2015



Part 3- Way Forward

- 1) There is **imminency** to do BIM ourselves. The time is right, things are ready.
“Learn how to swim before the tide come.”
- 2) **Encourage** all stakeholders (i.e. Clients, Main Contractors, Consultants) to apply BIM in the field of Safety and Construction Planning.
- 3) Cultivate the **culture** of using BIM for Safety in the Department; and
- 4) **Trainings**.



Thank You

Caring, Customer-focused, Creative, Committed

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