



Surveying

A 3D illustration of a puzzle. A large purple puzzle piece is in the foreground, with the text 'R&D' written on it in white. In the background, a grey puzzle piece is missing from a larger assembly, and a white puzzle piece is being inserted into the gap. The background is a light grey with a faint grid pattern.

R&D

Mr. YEUNG Ka-man
Chief Quantity Surveyor/2

R&D Activities - Surveying

- (A) Electronic Dissemination of Tender Documents
- (B) HA General Conditions of Contract
- (C) Three Envelope System
- (D) Dispute Avoidance and Resolution Advisor
- (E) BIM Applications in Quantity Surveying



(A) Electronic Dissemination of Tender Documents

Background

- Electronic dissemination of tender document (by L10Pro) had been implemented in many building tenders **since April 2011**
- Up to end September 2017, there were 26 building tenders and 22 foundation tenders adopted this electronic process for dissemination of tender documents



Electronic Dissemination of Tender Documents

Tender Distribution (L10Pro System)

Traditional Tender



2 sets Tender Documents





+



Additional Form of Tender



Electronic Tender Dissemination

- Disc A  - Front Part, etc. including Form of Tender
- Disc B  - BQ in L10Pro format
- Disc C  - L10Pro Software Installation Programme
- Disc D  - Drawings, ref. document

+



Additional Form of Tender





Electronic Dissemination of Tender Documents

Tender Addendum (L10Pro System)

Traditional Tender



- Addendum to be inserted to the original Tender Documents by hand



Electronic Dissemination of tender

Disc A#



- Addendum for Front Part, etc.

Disc B#



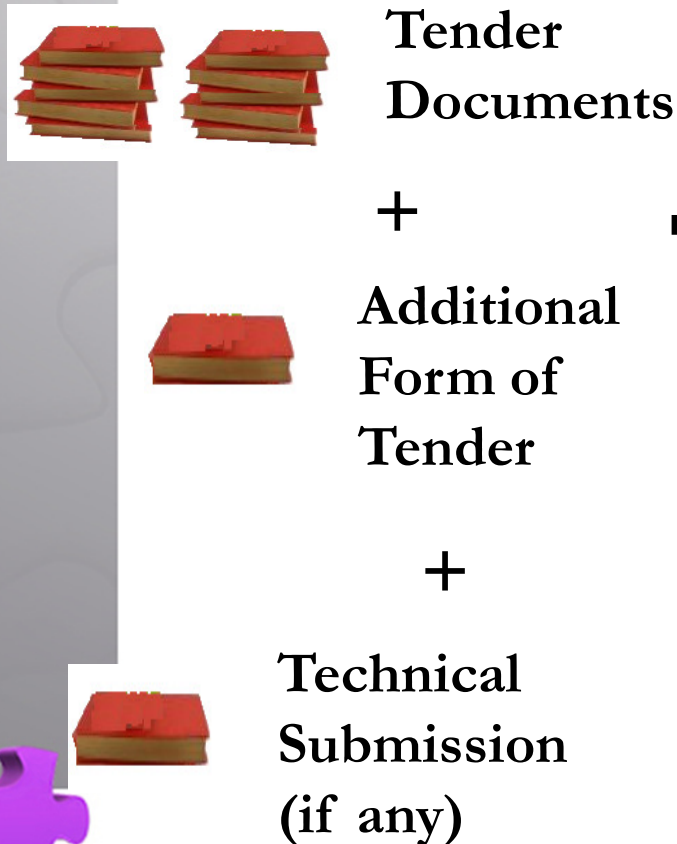
- Addendum for BQ to be merged with the original BQ by L10Pro



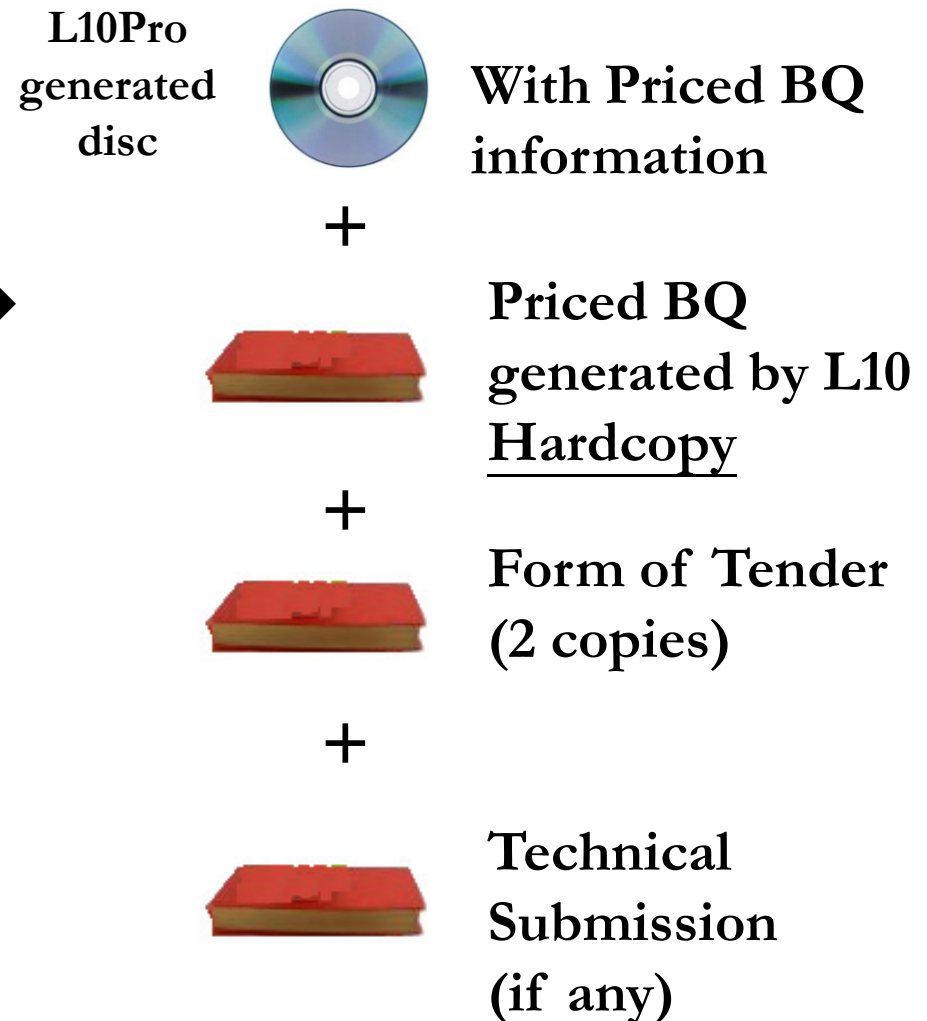
Electronic Dissemination of Tender Documents

Tender Submission (L10Pro System)

Traditional Tender



Electronic Dissemination of tender





Electronic Dissemination of Tender Documents

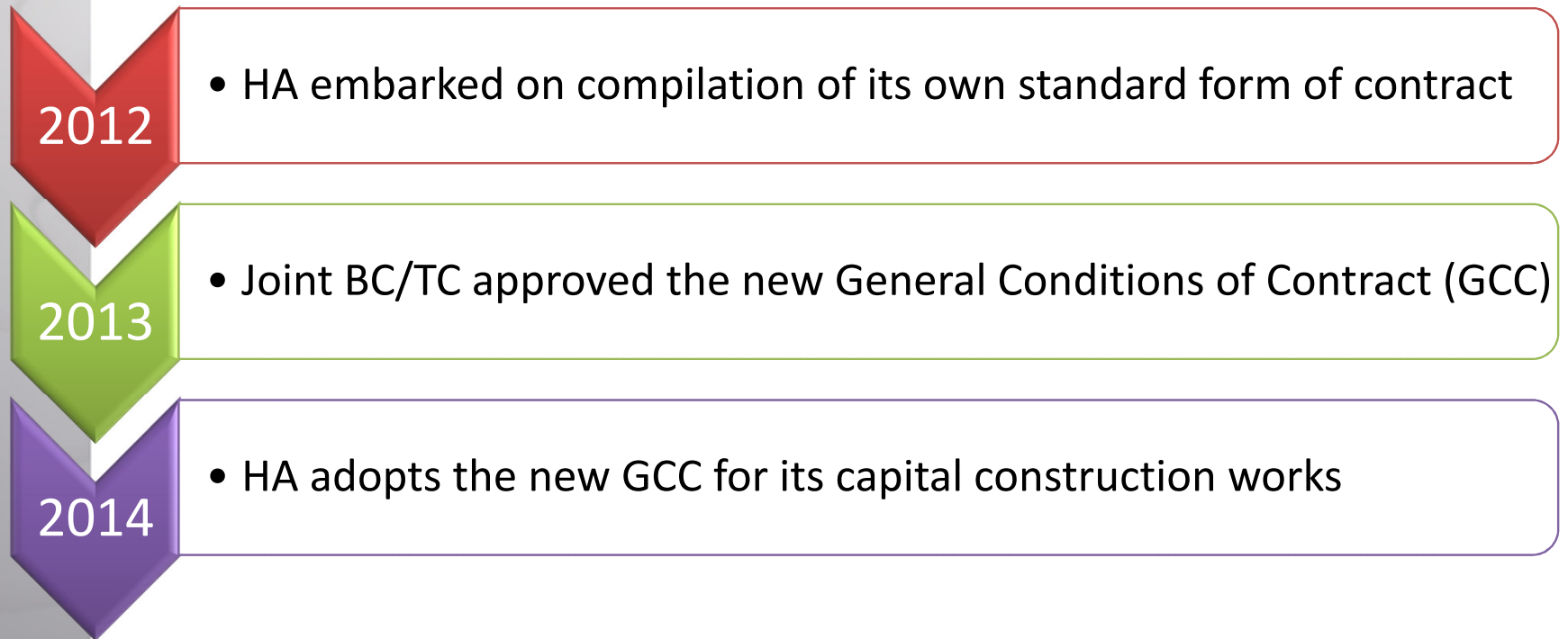
Achievement in Time & Resources and Way Forward

- an average of **153 man-hours** per building tender or **19 man-hours** per foundation tender **could be saved** after the use of L10Pro;
- the **average paper saving** per building tender was **68,543 pages**, while in the foundation tender, the reduction in the use of paper was **13,147 pages** per tender;
- Achieved the **Excellence Certificate** of the Hong Kong Green Organization Certification (HKGOC) in 2016;
- Tenderers have no adverse comments on the use of L10Pro;
- New development on **L10Excel** that can convert BQ in Excel format into L10Pro environment is under development by the software developer.




(B) HA General Conditions of Contract

Development Timeline



HA's Vision

- 
- To adopt its own contract form which can best cater for HA's circumstances and requirements
 - To excel in fair risk-sharing and dispute avoidance

HA General Conditions of Contract

Objectives

- Preserve contractors' experience with HA's previous contract forms and terms
- Embody HA's partnering principles and procurement policies
 - fostering collaboration
 - equitable risk- sharing
 - encouraging Contractor's innovative input
 - dispute avoidance and prompt dispute resolution

The set of HA GCC can be downloaded from

www.housingauthority.gov.hk/en/business-partnerships/index.html





HA General Conditions of Contract

	GCC for Building Works	GCC for Foundation Works	GCC for Miscellaneous Works	GCC for Civil Engineering Works
General				
Provisions for Nominated Sub-contracts	√	X	X	√
Provisions for Specialist Sub-contracts	√	X	X	X
Insurance				
Provisions for Care of the Works Insurance	√	X	X	X
Measurement, Variations and Claims				
Provisions for Contractor's Requested Variation	√	X	X	X
Provisions for robust time frame for processing variations and other time/cost claims	√	√	X	X
Provisions for cost and/or time compensation for Change in Law	√	√	√	√
Fluctuation				
Provisions for fluctuation adjustment	√	X*	X	√
Work after completion				
Provisions for Enhancement Works to be ordered within 180 days after certified completion	√	X	X	X
Provisions for staged maintenance works and staged release of retention money	√	X	X	X
Dispute Resolution				
Provisions for Dispute Avoidance and Resolution	√	√	X	X



Statistics since May 2014	36 Building Contracts	29 Foundation Contracts	4 Demolition & 19 Landscape Contracts	4 Civil Engineering Contracts
---------------------------	-----------------------	-------------------------	---------------------------------------	-------------------------------

(C) Three Envelope System

- To encourage innovations for HA projects through suitable and sizable projects
- Three envelopes
 - Design and technical proposals
 - **Innovative proposals**
 - Price proposals
- Innovative Procurement Approach (IPA) Contracts
 - Kai Tak Site 1B
 - Anderson Road Sites 1 and 2 Phases A and B

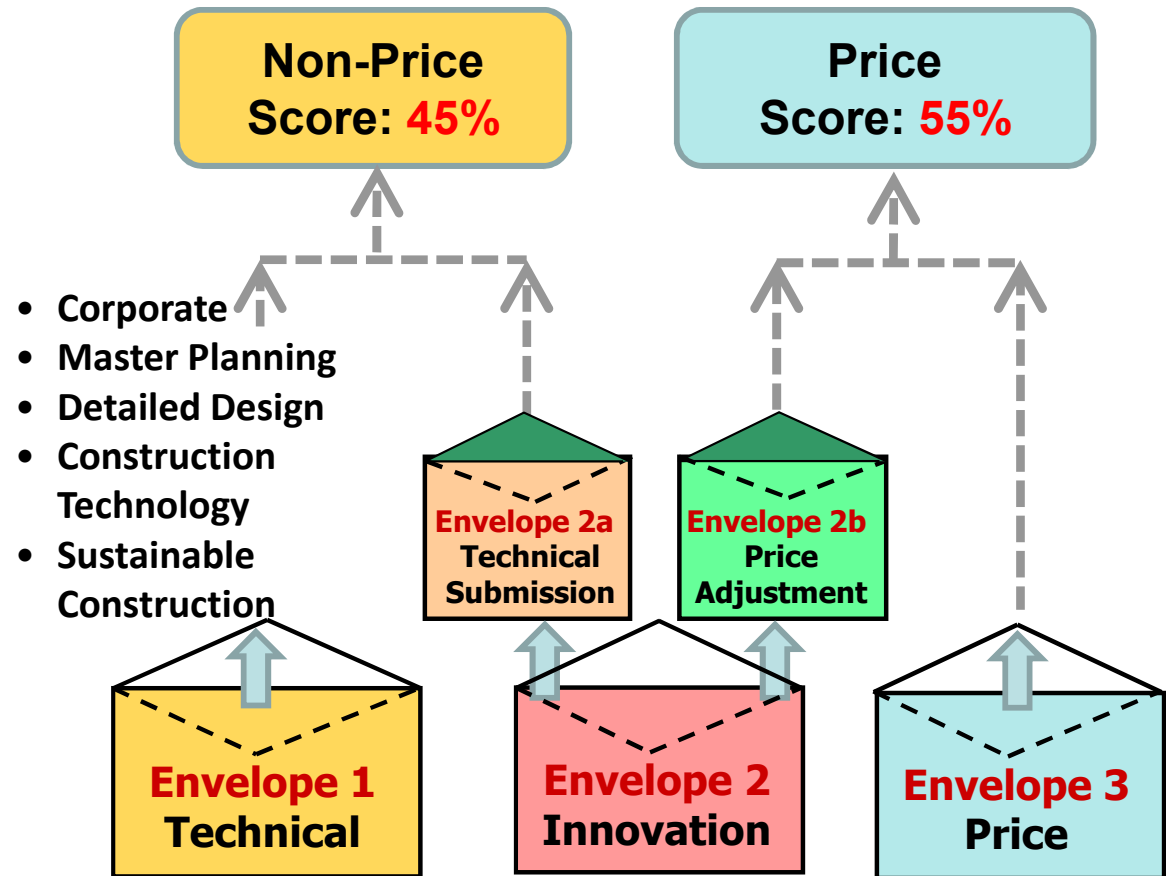


Three Envelope System

Design-Tender-Build Two Envelope



Design and Build Three Envelope



Three Envelope System

- Kai Tak Site 1B (9 domestic blocks / 8,164 flats) **all-in-one** Contract : Foundation + Building + BS (domestic sub-contract) + Soft Landscape
- 88 innovative proposals from **three** tenderers, e.g.
 - “i-Crete System” for concrete production for low-rise structure
 - Cold form fabric steel reinforcement
 - Precast concrete water tank at G/F
- Design-and-build lump sum contract **without BQ** (tender : model schedule of rates, contract : breakdown of Contractor’s Prices)
- **One-off** lump sum honorarium to each of the conforming but unsuccessful tenderers : HA acquires the **intellectual property right** to the design proposals



(D) Dispute Avoidance and Resolution Advisor

Evolution of DARA System



2001

- Pilot **Dispute Resolution and Advisor (DRAd)** System in two contracts



2004

- Implement DRAd System in all **foundation** contracts and **building** contracts (including nominated sub-contracts)



2009
&
2012

- Dispute Avoidance Advisor (DAA) was employed for two IPA projects



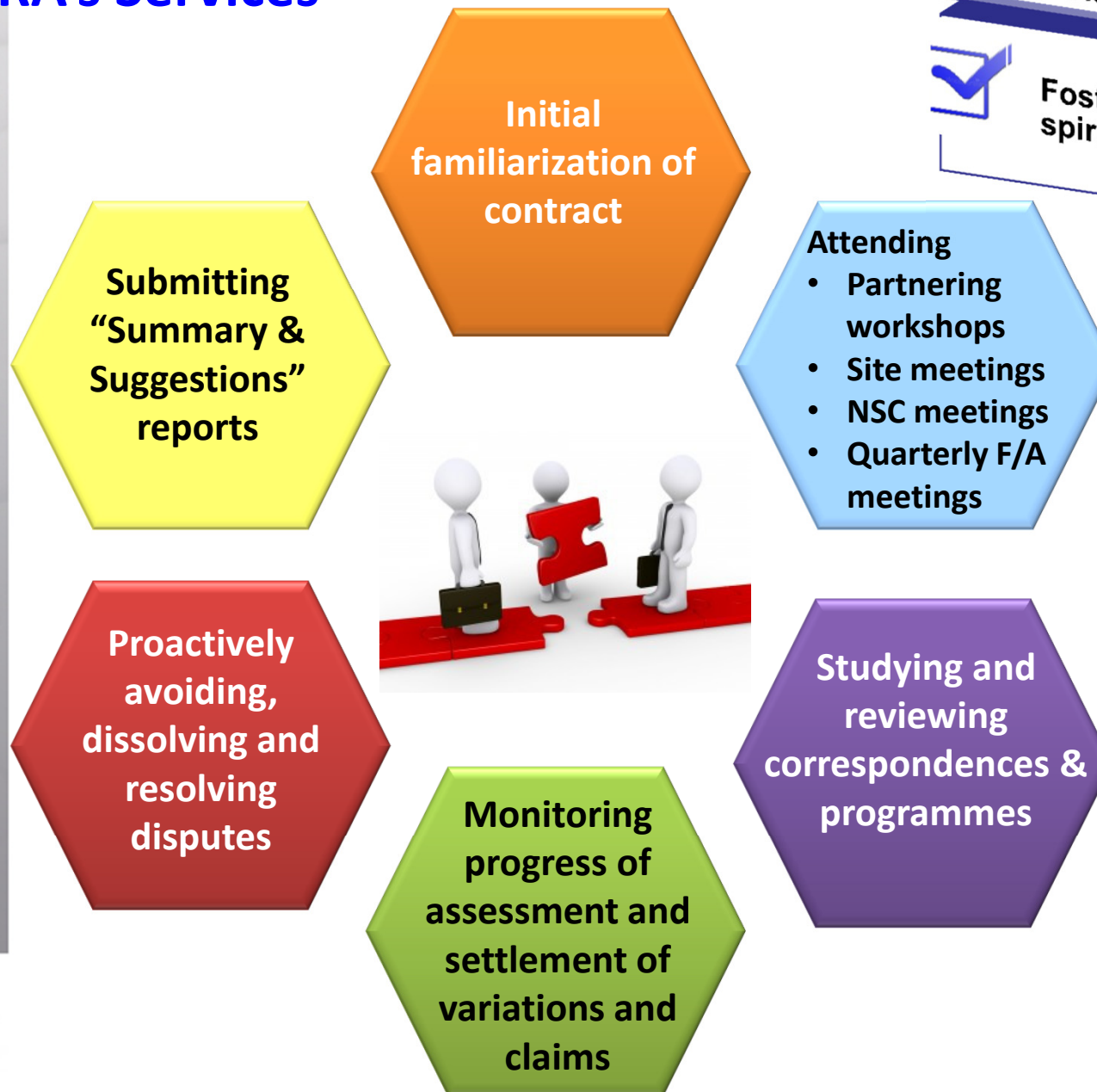
2014

- Launch of HAGCC (2013 Edition)
- Rename as **Dispute Avoidance and Resolution Advisor (DARA)**
- Prevention is better than cure



DARA System

DARA's Services



- Resolute time frames for submission and assessment, e.g. variations, claims
- Fostering partnering spirit



DARA System

Statistics on DARA Appointment

Number of Appointment **189** [from 2004 to 11/2017]

Number of Appointment **12** [2017/18 (up to 11/2017)]

Number of Available DARA **61** [up to 11/2017]

Number of DARA with Active Tenure **17** [up to 11/2017; for 64 active agreements]

**Annual
consultation for
continuous
improvement**



(E) BIM Applications in Quantity Surveying

Background

1. QS has great concern on the “**I**” in BIM models when adopting BIM.
2. BIM objects contain information such as **dimension** and **quantity** which are the basis for measurement.
3. In 2012, the HA’s QS had pioneered the idea of setting up “standard approach of modelling” to enhance information transfer from designers.
4. QS are not asking for models built up solely for measurement, but models that contain “**correct, consistent and complete** (adequate for the purpose)” design information.

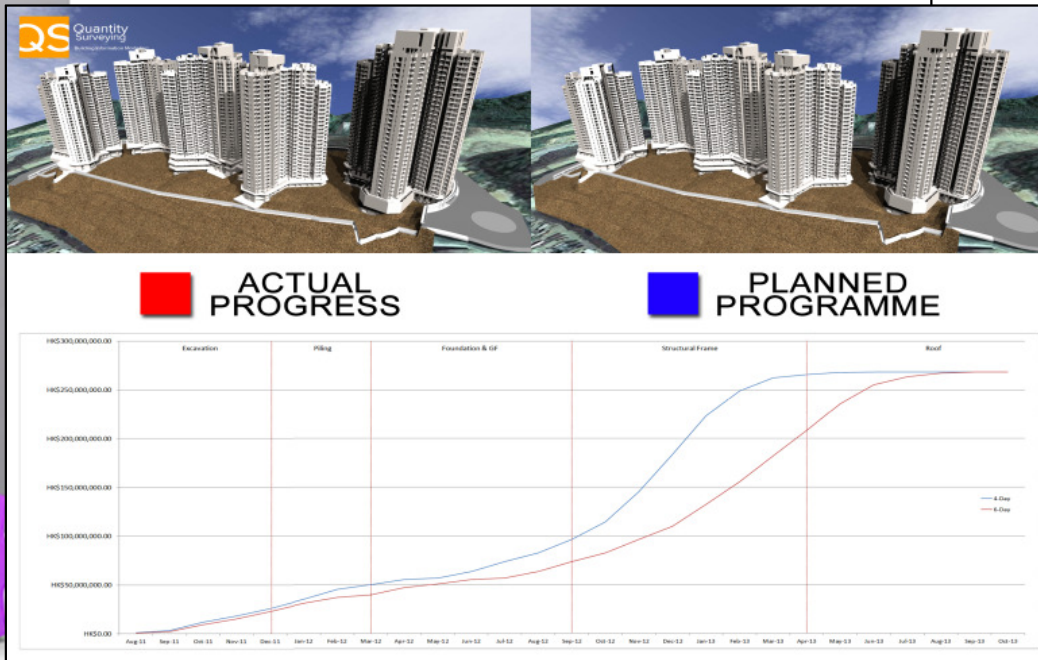
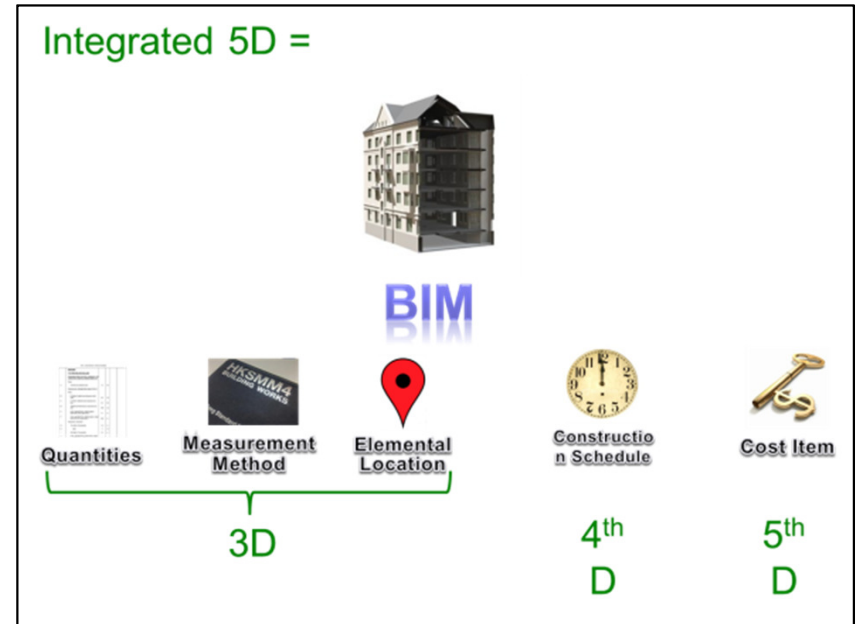


Applying BIM to Quantity Surveying

2012 - Pilot Study of 5D BIM

Integrate quantities from models (3D), with project schedule (4D) and cost (5D) for:

- a) Interim payment, and
- b) Cost budget simulation.



Autodesk Hong Kong BIM Awards 2012

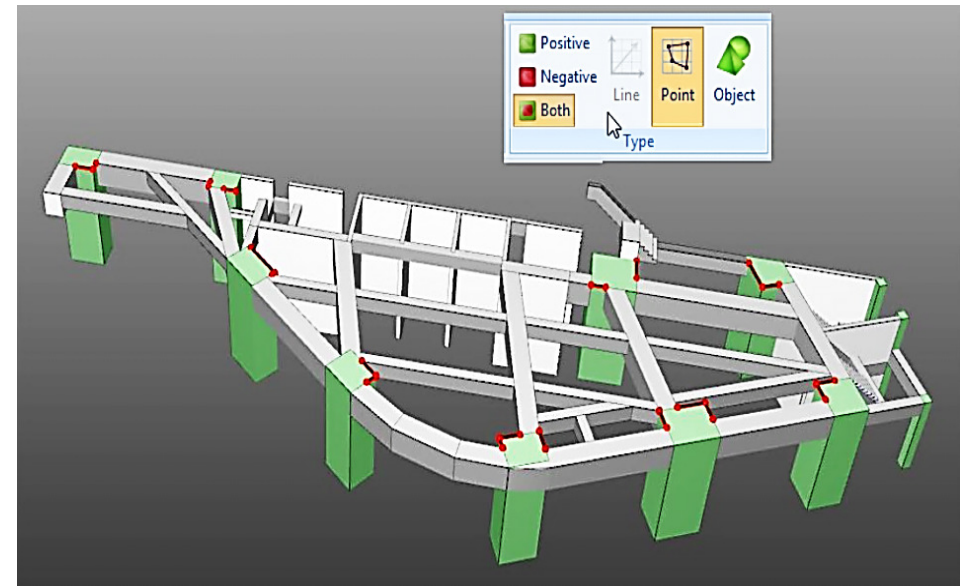
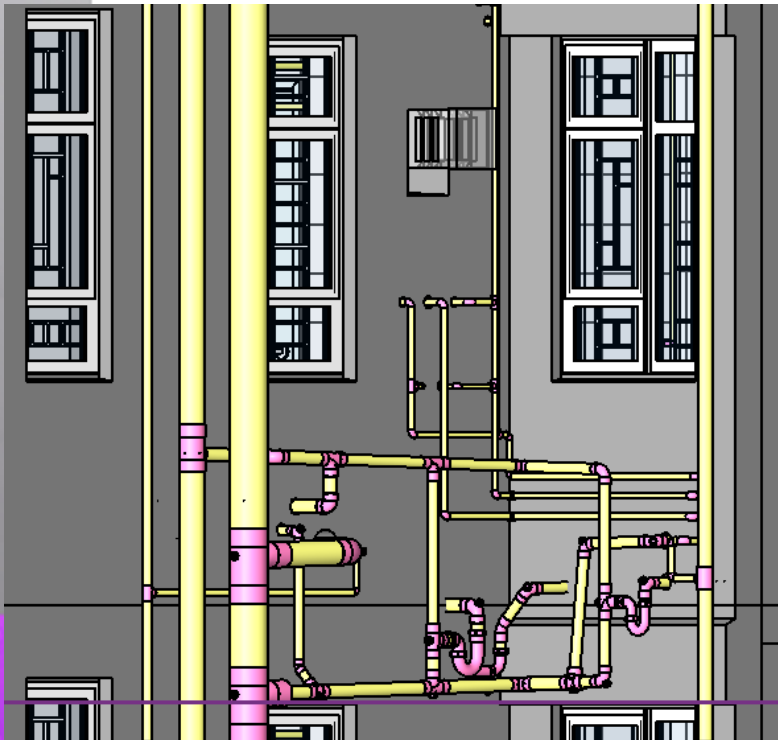
- **Pioneering BIM for QS**



Applying BIM to Quantity Surveying

2014/15 – The First Trial of BIM QTO in Hin Tin Street Project

1. Collaborate with BIM consultant in building the models for **structural frame** and **plumbing / drainage** installations based on 2D drawings.
2. Extract quantities from BIM models for comparison with project QS.
3. Evaluate the **trial measurement** by four QTO software – Exactal's CostX, Glodon's TAS, RIB's iTWO and isBIM's EqBq.
4. Identify the suitable QTO software for HA measurement works.



Applying BIM to Quantity Surveying

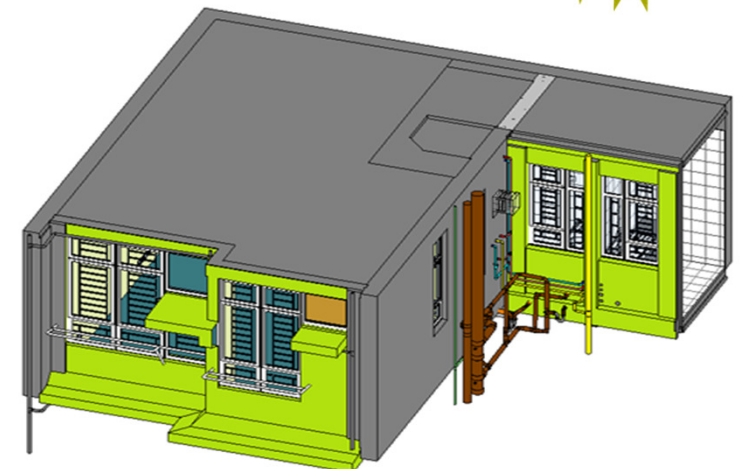
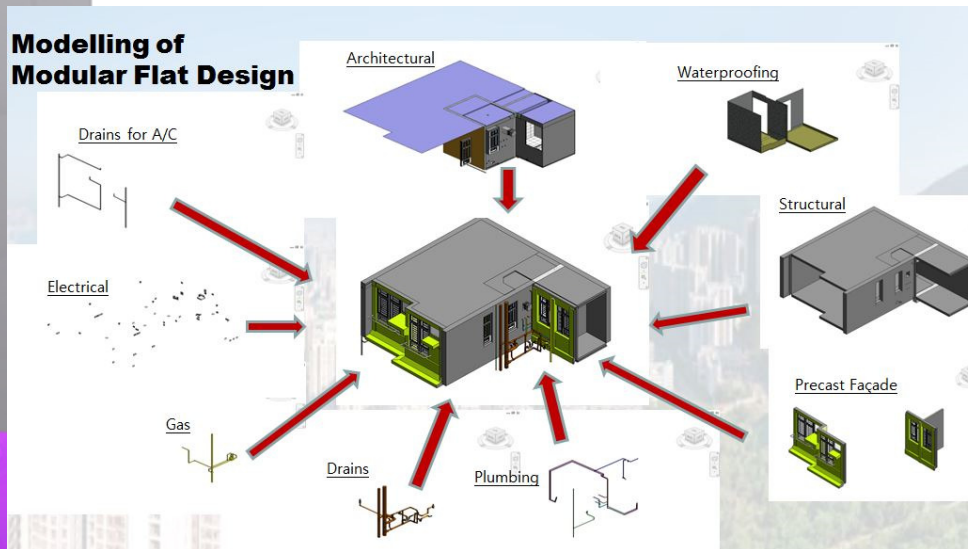
2016/17 – Quantitative Information Modelling

1. Seamless collaboration among A, SE, BSE, QS and BIM consultant.
2. Create Modular Flat Design models that can best fit multiple purposes – design, tender and construction.
3. The quantitative information generated from models can serve the purpose of quantity take-off and cost estimating.

**buildingSMART HK
International Award**

2017

- **Information
Management Award**



Thank you !

