Advanced
Construction
Information
Development Ltd.

BIM – Management Training

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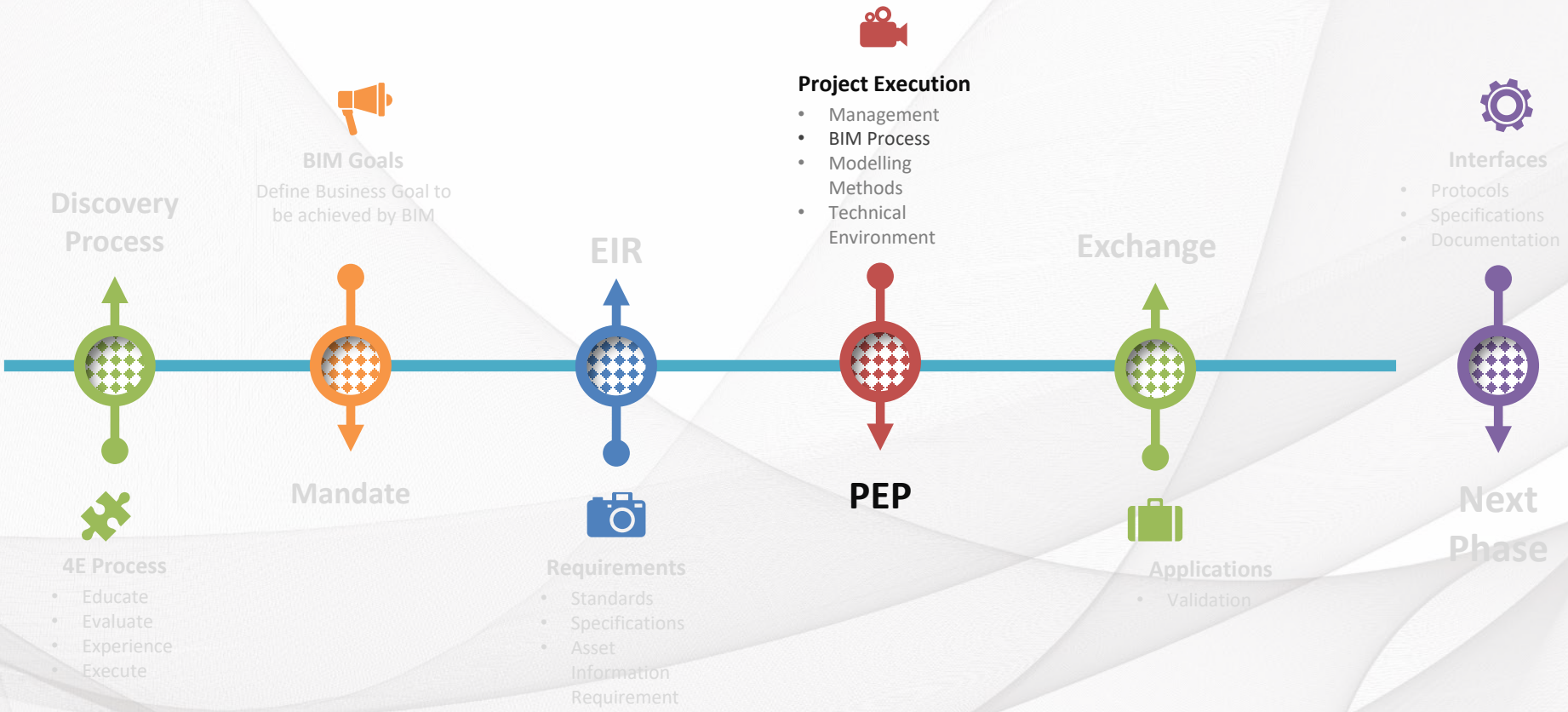
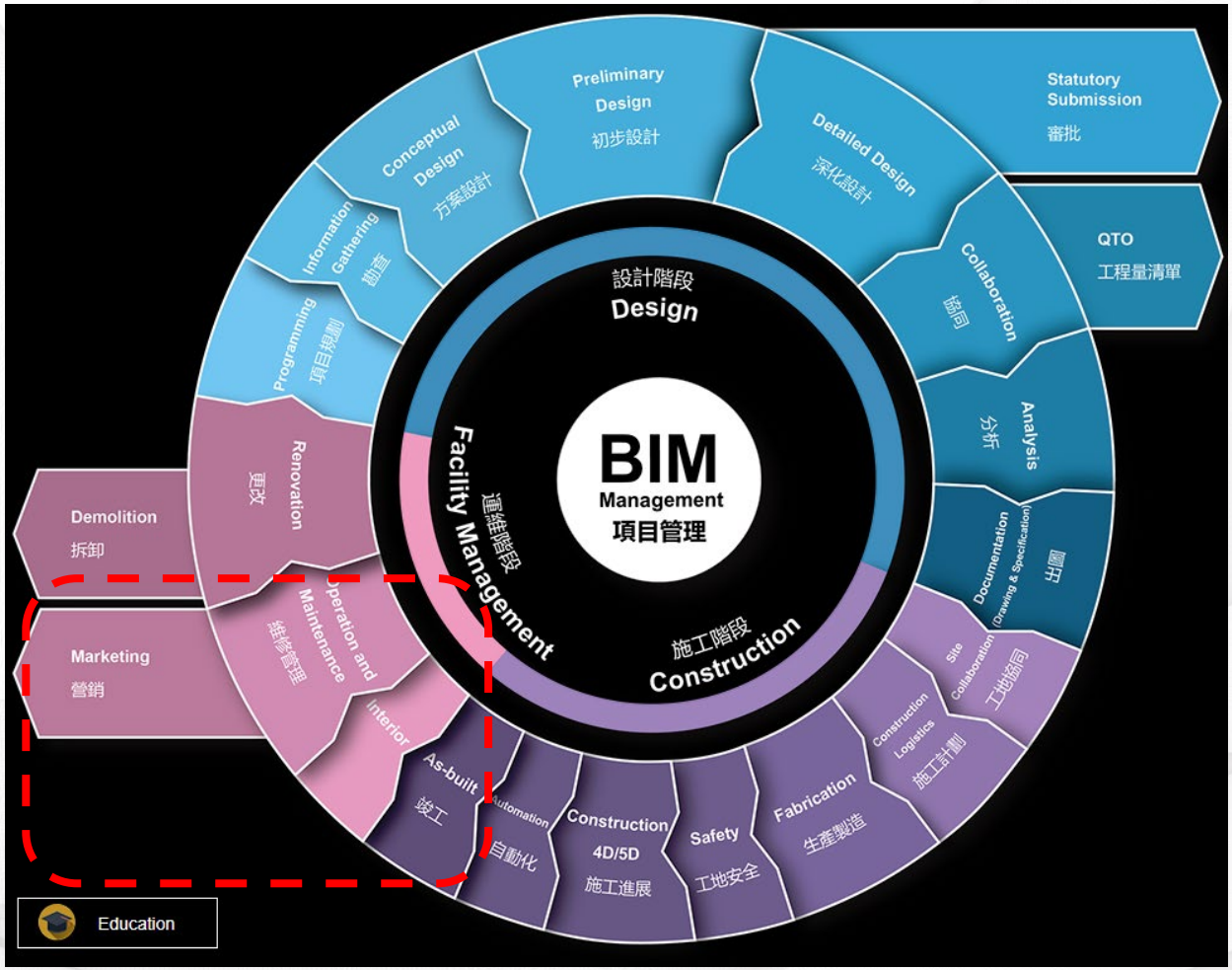
Day 4 - Standards and Practice for Projects Implementation of BIM Technology (Full Day)

1. Project management at different stages (from design to asset/facility management)

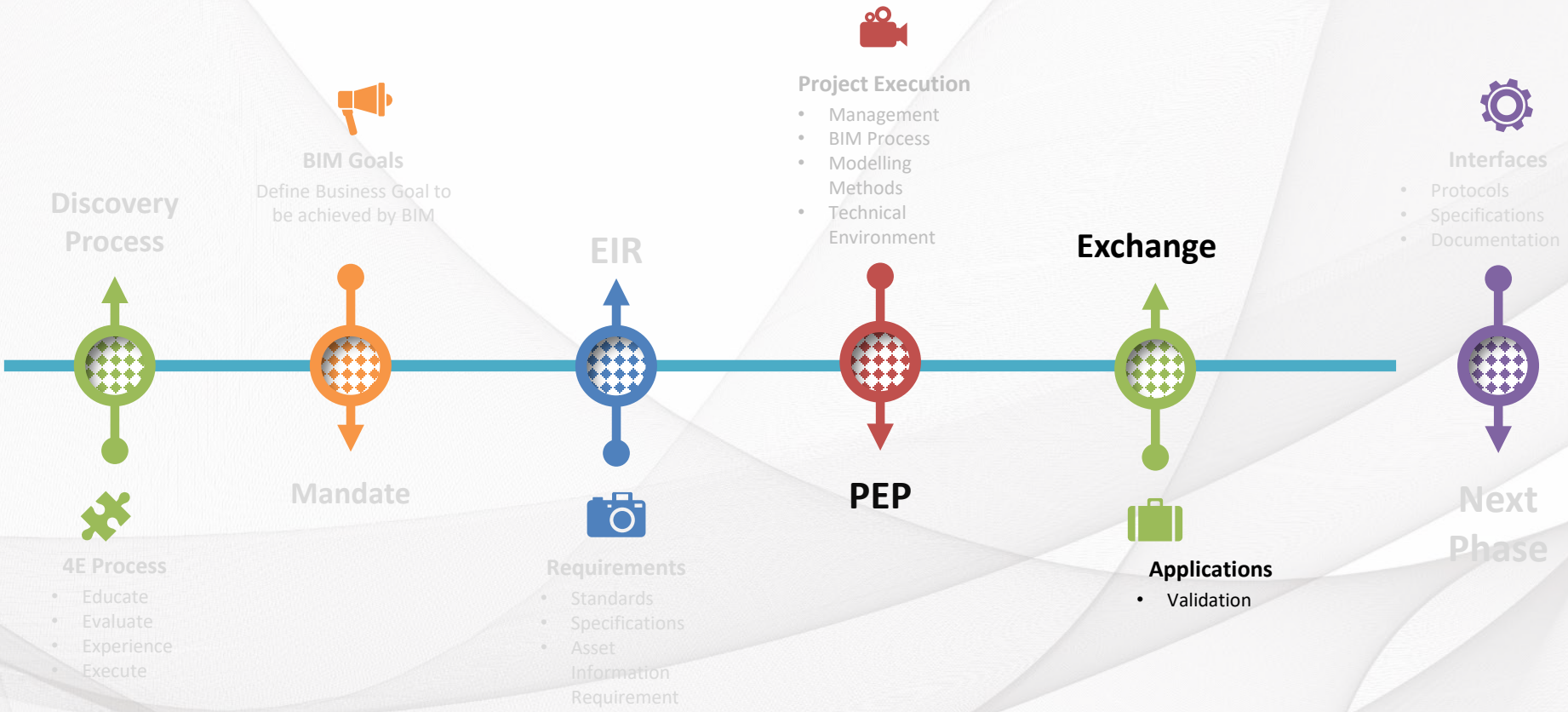


2. Project management at different stages (from design to asset/facility management)



- From As-Built to Facility Management

3. Project Execution – Exchange for BIM Application



4. Format and Software

	C3D	RVT	ORD	ABD	Open Format	Shared Format	Related Tools
Alignment-based Road Model	Y		Y		IFC	XML	
Topography-related Site formation Model	Y		Y			XML	
Strata Models (Plugins)	GEO		GINT			XML	HolebaseSI
Utilities Model	Y	Y	SSU	Y	IFC	XML	
Bridge Segment Model	Y		OBD		IFC		
Bridge Substructure/Superstructure		G		G	IFC		
Tunnel Model	Y				IFC		Sub Assem composer
Retaining Wall Model	Y	G	Y	G	IFC		
4DMS						MP4	NWD/ Sychro
Drawings/Site Sketches	*	*	*	*	DXF	PDF	
3DVR						EXE	3DS/LRT
Asset Information (COBie)		Y		Y		COBIE	

- IFC 4.0
  - Latest Version support ALG
  - XML-based Text file
- COBie
  - BIM/FM Standard
  - PAS 1192-4
  - XLS file 13 tables
- XML
  - Terrain and alignments
  - XML-base Text files

Y - Default Function
G– Generic Solid

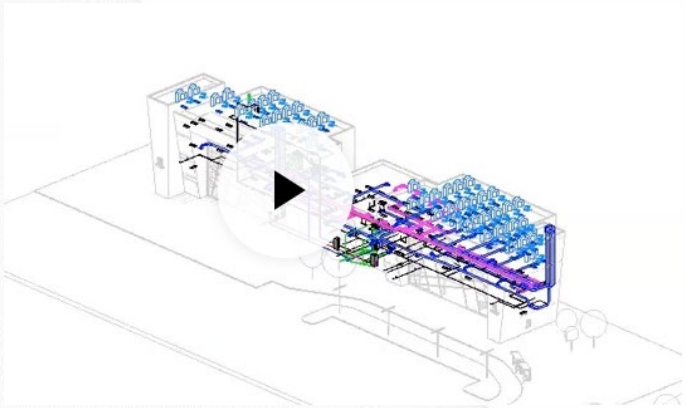
GEO – Geotechnical Module
GINT – GINT Module

SSU: SubSurface Utilities
OBD: OpenBridge Designer

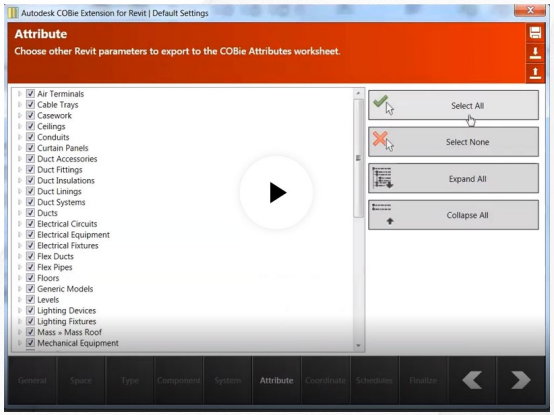
3DS: 3Ds Max
LDT: LumenRT

5. Delivery Information to Facility Management

Construction Operations Building Information Exchange (COBie)

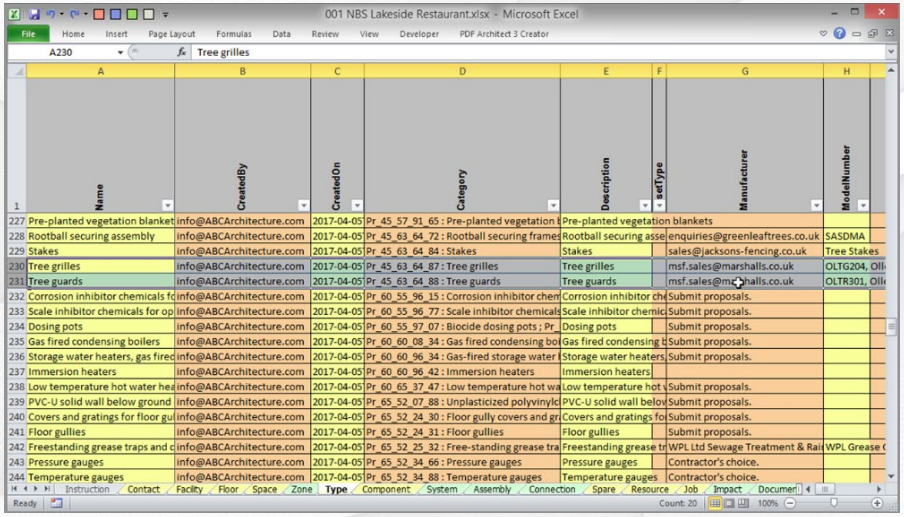


1. Selected attribute in BIM



2. Convert in COBie

- Export Selected Information for Facility Management
- Facility Management team can use the information to check / access for further maintenance



3. Information in Excel format

6. Interchange/inter-linkage of data between BIM database and other applications

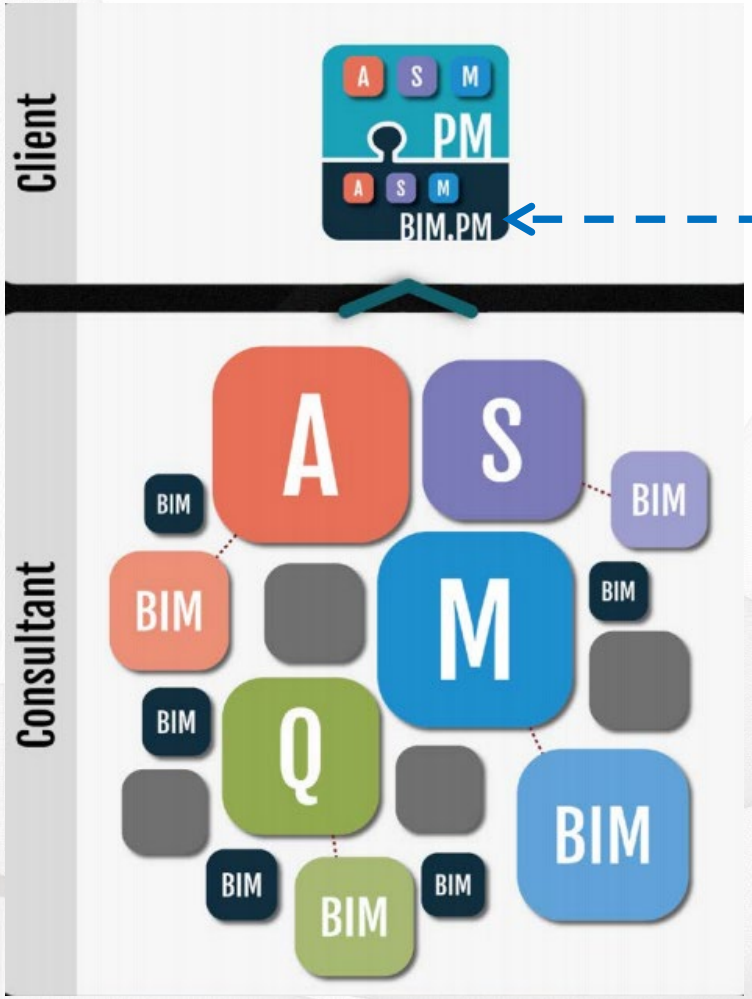
	A	B	C
1	Title	COBie	
2	Version	2	
3	Release	4	
4	Status	IFC2x3	
5	Region	en-UK	
6	Purpose		This COBie spreadsheet is an example file that comes with the COBie Extension 1.0
7	Outline		Individual worksheets are organized by project phase as shown below
8			
9	All Phases	Sheet	Contents
10		Contact	People and Companies
11			
12	Early Design Worksheets	Sheet	Contents
13		Facility	Project, Site, and Facility
14		Floor	Vertical levels and exterior areas
15		Space	Spaces
16		Zone	Sets of spaces sharing a specific attribute
17		Type	Types of equipment, products, and materials
18			
19	Detailed Design Worksheets	Sheet	Contents
20		Component	Individually named or schedule items
21		System	Sets of components providing a service
22		Assembly	Constituents for Types, Components and others
23		Connection	Logical connections between components

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
1	Name	CreatedBy	CreatedOn	TypeName	Space	Description	ExtSystem	ExtObject	ExtIdentifier	SerialNumber	InstallationDate	WarrantyStartDate	TagNumber	BarCode	AssetIdentifier	Area	Length
22	Lighting D	dave@aut	2016-03-1	Lighting D	n/a	n/a	Autodesk	Lighting D	2bf19293-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
23	Lighting D	dave@aut	2016-03-1	Lighting D	n/a	n/a	Autodesk	Lighting D	2bf19293-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
24	Lighting D	dave@aut	2016-03-1	Lighting D	n/a	n/a	Autodesk	Lighting D	2bf19293-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
25	Lighting D	dave@aut	2016-03-1	Lighting D	n/a	n/a	Autodesk	Lighting D	2bf19293-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
26	Lighting D	dave@aut	2016-03-1	Lighting D	n/a	n/a	Autodesk	Lighting D	2bf19293-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
27	Lighting D	dave@aut	2016-03-1	Lighting D	n/a	n/a	Autodesk	Lighting D	2bf19293-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
28	Lighting D	dave@aut	2016-03-1	Lighting D	n/a	n/a	Autodesk	Lighting D	2bf19293	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
29	Lighting D	dave@aut	2016-03-1	Lighting D	n/a	n/a	Autodesk	Lighting D	44772ab3	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
30	Lighting D	dave@aut	2016-03-1	Lighting D	n/a	n/a	Autodesk	Lighting D	e895d30d	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
31	Lighting D	dave@aut	2016-03-1	Lighting D	n/a	n/a	Autodesk	Lighting D	e895d30d	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
32	Lighting D	dave@aut	2016-03-1	Lighting D	n/a	n/a	Autodesk	Lighting D	d6d1a613	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
33	Lighting D	dave@aut	2016-03-1	Lighting D	n/a	n/a	Autodesk	Lighting D	b1d85879	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
34	Lighting D	dave@aut	2016-03-1	Lighting D	n/a	n/a	Autodesk	Lighting D	b1d85879	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
35	Lighting F	dave@aut	2016-03-1	Lighting F	Spaces_2	n/a	Autodesk	Lighting F	badde294	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
36	Lighting F	dave@aut	2016-03-1	Lighting F	Spaces_2	n/a	Autodesk	Lighting F	badde294	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
37	Lighting F	dave@aut	2016-03-1	Lighting F	Spaces_2	n/a	Autodesk	Lighting F	29d80c5d	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
38	Lighting F	dave@aut	2016-03-1	Lighting F	Spaces_2	n/a	Autodesk	Lighting F	29d80c5d	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
39	Lighting F	dave@aut	2016-03-1	Lighting F	Spaces_2	n/a	Autodesk	Lighting F	49433253	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
40	Lighting F	dave@aut	2016-03-1	Lighting F	Spaces_2	n/a	Autodesk	Lighting F	49433253	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
41	Lighting F	dave@aut	2016-03-1	Lighting F	Spaces_2	n/a	Autodesk	Lighting F	49433253	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
42	Lighting F	dave@aut	2016-03-1	Lighting F	Spaces_2	n/a	Autodesk	Lighting F	49433253	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
43	Lighting F	dave@aut	2016-03-1	Lighting F	Spaces_2	n/a	Autodesk	Lighting F	49433253	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Instruction | Contact | Facility | Floor | Space | Zone | Type | Component | System | Assembly | Connection | Spare | Re ...

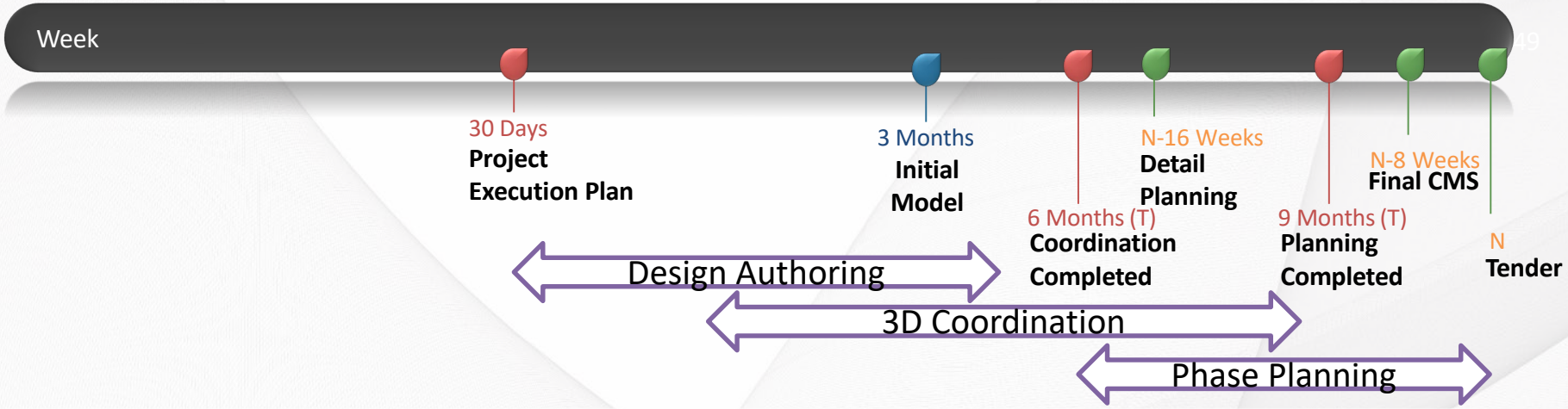
7. Delivery Information to Facility Management

How to select information to Facility Management?



- BIM Manager assist to set up Project Execution Plan with the employer
- The required information for Facility Management team shall ne implied from the design stage
- BIM Manager to supervise the selective information from as-built BIM to transfer / export information to Facility Management Team

8. Challenges managing Process and Deliverables (Design Phase)

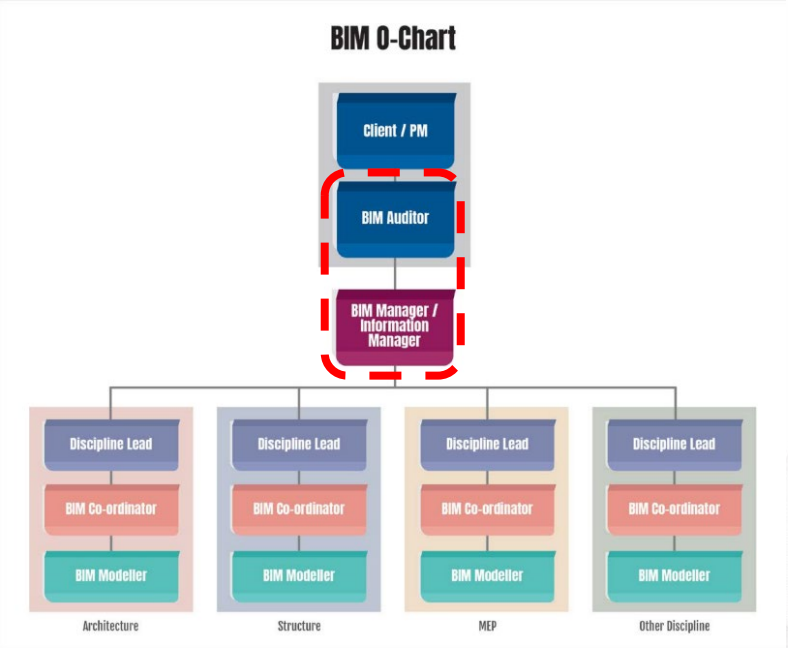


ID	Disciplinary Model	Conceptual Model	Design, Analytical, Visualization Model	Coordinated & Planning Model	Tender Model
ES	Existing Site Model	100	200 - 250	250	250
ER	Road Model	200	200 -300	300 - 350	300 ~ 350
BR	Bridge Model	100	200 - 300	300 - 350	300 ~ 350
UP	Underpass Model	100	200 - 300	300 - 350	300 ~ 350
BD	Building Model	200	200 ~ 300	200 - 300	300 ~ 350

Parallel Iterative Process

- BIM Manager shall set up Project Execution Plan with the employer at the beginning of the project

9. Q : How to make a LOD standard in the PXP?



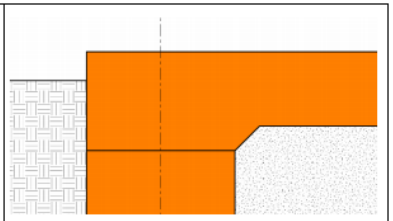
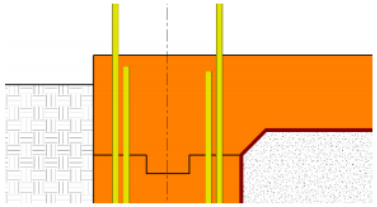
MEETING TYPE	PROJECT STAGE	FREQUENCY	PARTICIPANTS	LOCATION
BIM REQUIREMENTS KICK-OFF				
BIM EXECUTION PLAN DEMONSTRATION				
DESIGN COORDINATION				
CONSTRUCTION OVER-THE-SHOULDER PROGRESS REVIEWS				
ANY OTHER BIM MEETINGS THAT OCCURS WITH MULTIPLE PARTIES				

MODEL DELIVERY SCHEDULE OF INFORMATION EXCHANGE FOR SUBMISSION AND APPROVAL:
Document the information exchanges and file transfers that will occur on the project.

INFORMATION EXCHANGE	FILE SENDER	FILE RECEIVER	ONE-TIME or FREQUENCY	DUE DATE or START DATE	MODEL FILE	MODEL SOFTWARE	NATIVE FILE TYPE	FILE EXCHANGE TYPE
DESIGN AUTHORING - 3D COORDINATION	STRUCTURAL ENGINEER	(FTP POST) (COORDINATION LEAD)	WEEKLY	[DATE]	STRUCT	DESIGN APP	.XYZ	.XYZ .ABC
	MECHANICAL ENGINEER	(FTP POST) (COORDINATION LEAD)	WEEKLY	[DATE]	MECH	DESIGN APP	.XYZ	.XYZ .ABC

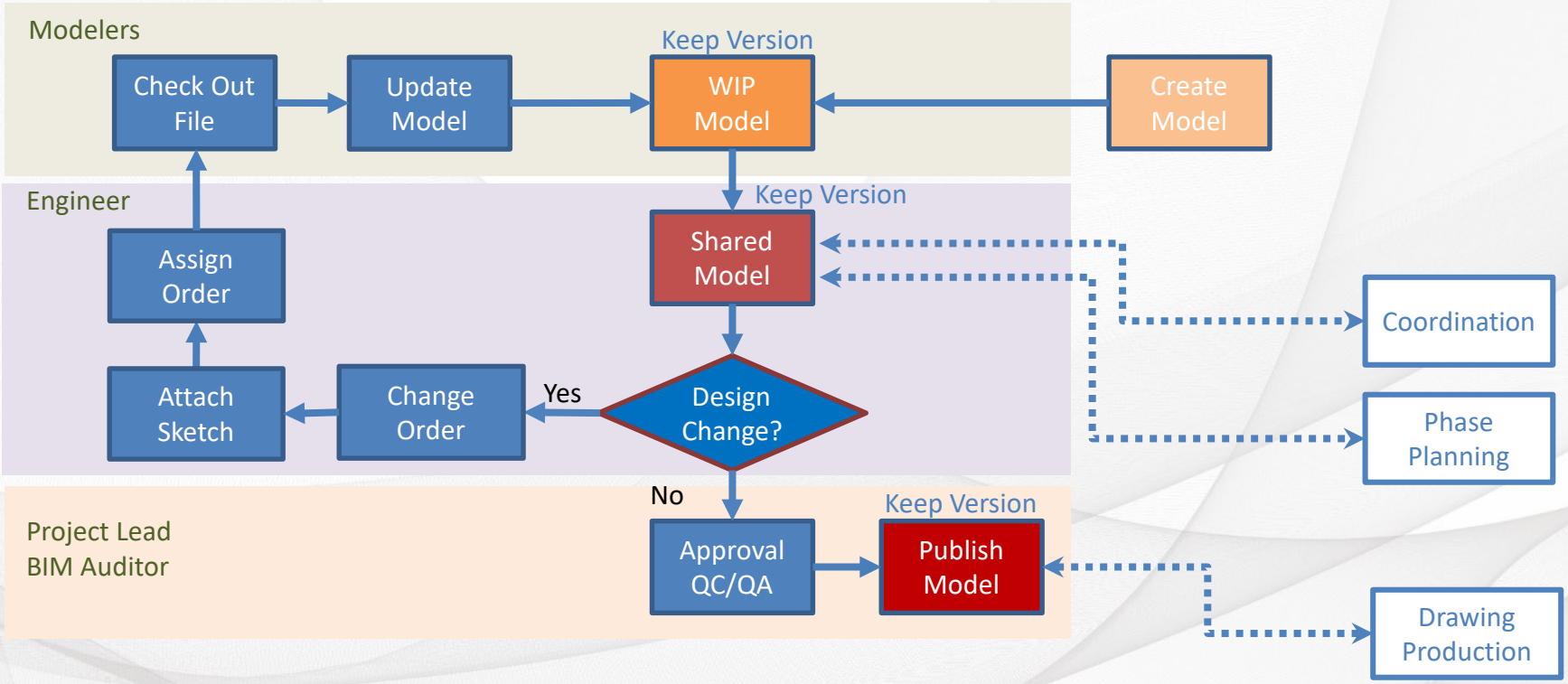
- Project Execution Plan shall be listed out by the BIM Manager / Auditor
- The LOD Standard to be executed in different stages during the project
- Each stages of LOD Standard delivery to be agreed in the PXP

10. Q : How to make a LOD standard in the PXP?

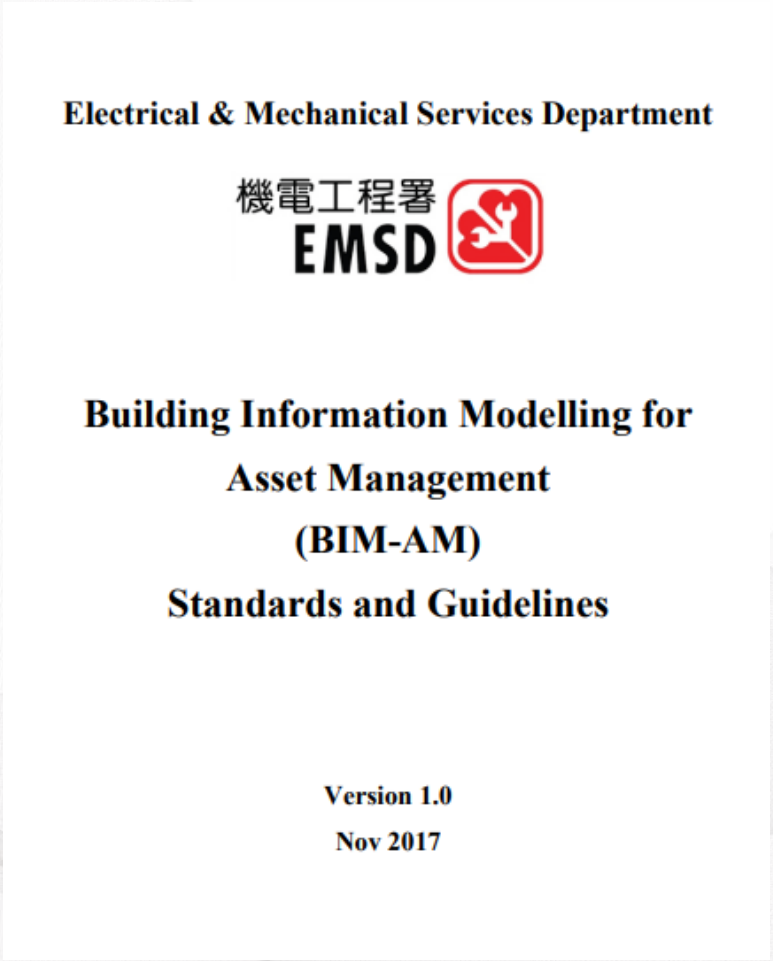
300	Element modeling to include: • Overall size, thickness and geometry of the slab-on-grade • Major openings such as large mechanical elements modeled to nominal dimensions. • Slab depressions • Edge turn downs • All sloping surfaces included in model element with exception of elements affected by manufacturer selection which are not known at this LOD. Such conditions could include floor geometry differences where different specified manufacturers will not be known until the actual system is selected.	 *13 A4020-LOD-300 Structural Slabs-on-Grade*
350	Element modeling to include: • All penetrations modeled to rough opening dimensions. • Pour joints • Control joints • Expansion joints • Water Stops • Rebar and any embedded elements modeled at congested areas where specified by project BXP which is typically with in a set distance from the area of congestion. • Void boxes • Anchor rods • Moisture retarder • Dowels • Post-tension profile and strands modeled if required by the BXP	 *14 A4020-LOD-350 Structural Slabs-on-Grade*
400	Element modeling to include: • Fully modeled rebar • Actual slab dimensions and profiles with fully modeled rebar • Post tensioning components • All joints • Water proofing • Finish	

- The use of CIC Standard / LOD Specification by BIM Forum shall be agreed in PXP
- The LOD Standard shall be specified in different stages during the project
- Each discipline shall achieved their own LOD Standard according to the PXP
- BIM Manager / Auditor to review each discipline model to ensure the LOD Standard can be transferred from one stage to another

11. Design/Changes/Deliverables Management



12. Folder structure, Control Spreadsheets, & Naming Convention



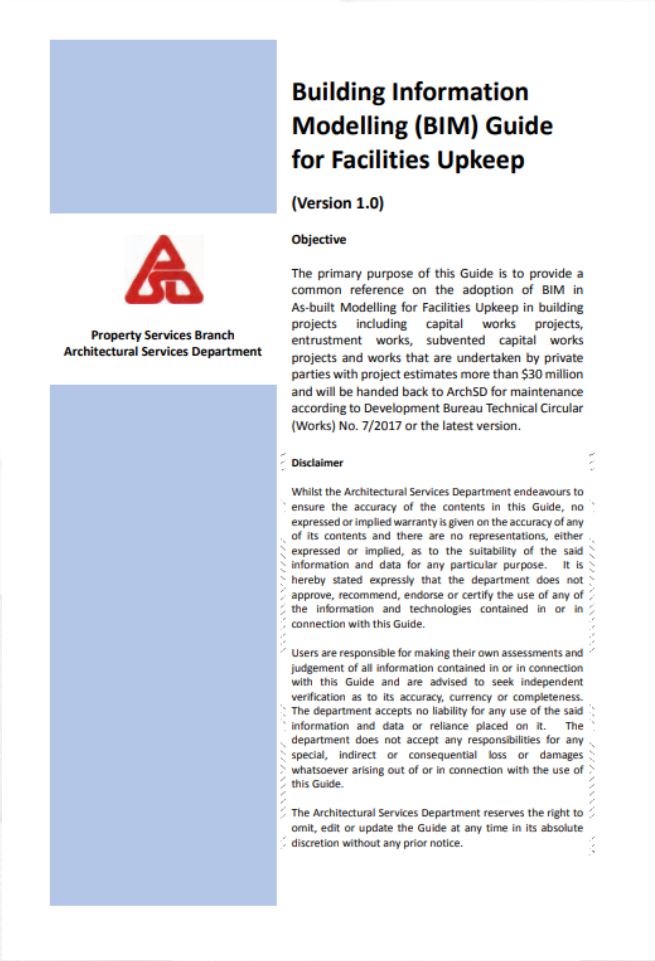
Electrical & Mechanical Services Department

機電工程署
EMSD

Building Information Modelling for Asset Management (BIM-AM) Standards and Guidelines

Version 1.0

Nov 2017



Building Information Modelling (BIM) Guide for Facilities Upkeep

(Version 1.0)

Property Services Branch
Architectural Services Department

Objective

The primary purpose of this Guide is to provide a common reference on the adoption of BIM in As-built Modelling for Facilities Upkeep in building projects including capital works projects, entrustment works, subvented capital works projects and works that are undertaken by private parties with project estimates more than $30 million and will be handed back to ArchSD for maintenance according to Development Bureau Technical Circular (Works) No. 7/2017 or the latest version.

Disclaimer

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Users are responsible for making their own assessments and judgement of all information contained in or in connection with this Guide and are advised to seek independent verification as to its accuracy, currency or completeness. The department accepts no liability for any use of the said information and data or reliance placed on it. The department does not accept any responsibilities for any special, indirect or consequential loss or damages whatsoever arising out of or in connection with the use of this Guide.

The Architectural Services Department reserves the right to omit, edit or update the Guide at any time in its absolute discretion without any prior notice.

- ASD & EMSD issued naming standard for Facilities Upkeep

13. Folder structure, Control Spreadsheets, & Naming Convention

10	**Radar and Navigation System**	Radar and Navigation System (^)	RNS
		Antenna	BRR
		Turning unit	TUU
		Display and processing unit	DPU
		Network Equipment	NEE
		Video camera	VIC
		Accessories	ACC
11	**Microwave Link System**	Microwave Link System (^)	MLS
		Antenna	ANT
		Transceiver	TRAN
		RF Interface Unit	RIU
		Processing unit	PRU
		Network Equipment	NEE
		Accessories	ACC
12	**Timing & Display System**	Timing & Display System (^)	TDS
		Operator Control Console / Workstation, PC	OCC
		Control Unit / Server	CUS
		Sensing Unit	SEU
		Master Clock Unit	MCU
		Video Display Unit	VDU
		Video & Audio Equipment	VAE
		Network Equipment	NEE
		Queue Management Unit	QMU
		Uninterruptible Power Supply	UPS

2.2 Definition of LOD for As-built Model

The LOD requirements are referred to the CIC Building Information Modelling Standard. Apart from the CIC requirements, supplementary definition and interpretation of the LOD requirements, if applicable, are listed below. The as-built model shall follow the definition and interpretation as shown in this Guide in order to achieve the required purpose of the as-built model in facilities upkeep.

LOD 350

CIC Building Information Modelling Standard's Definition

The model element is graphically represented within the model as a specific system, object, or assembly in terms of quantity, size, shape, orientation, and interfaces with other building systems.

Interpretations in this Guide

Element / object is modeled at sufficient detail and accuracy in terms of quantity, size, shape, location, and orientation for construction coordination.

LOD 400

CIC Building Information Modelling Standard's Definition

The model element is graphically represented within the model as a specific system, object or assembly in terms of size, shape, location, quantity, and orientation with detailing, fabrication, assembly, and installation information.

Interpretations in this Guide

Element / object is modeled at sufficient detail and accuracy in terms of quantity, size, shape, location, and orientation for fabrication

LOD 500

CIC Building Information Modelling Standard's Definition

The model element is a field verified representation in terms of size, shape, location, quantity, and orientation.

Interpretations in this Guide

The existence, exact quantity, exact physical dimension, exact shape, approximate orientation, approximate spatial location of the element / object in the model was verified on site. Accuracy of the element / object's setting-out location and its spatial location should be within ± 50mm between the model and the actual verified site installation. The 3D geometry details of the element / object is not less than LOD400 and the shape should be modelled for easy identification. Essential information, such as data of fittings, manufacturer, model number, etc. and other as specified in Appendix 1 and Appendix 3, should be embedded in the model element / object for facilities upkeep use.

- Naming Standard under EMSD
- Definition of LOD for As-built model

14. Folder structure, Control Spreadsheets, & Naming Convention

3.6.1. Line Styles

Category	Line Weight Projection	Line Color	Line Pattern
Lines	3	RGB 000-166-000	Solid
<Area Boundary>	12	RGB 128-000-255	Solid
<Beyond>	3	Black	Dash
<Centerline>	3	Black	AEC_Centre
<Demolished>	3	Black	Demolished
<Fabric Envelope>	1	RGB 127-127-127	Dash
<Fabric Sheets>	1	RGB 064-064-064	Solid
<Hidden>	3	Black	Hidden
<Overhead>	2	Black	Overhead
<Room Separation>	12	Cyan	AEC_Dash_3.0mm
<Sketch>	6	Magenta	Solid
<Space Separation>	12	Green	AEC_Dash_3.0mm
AEC_1-Soild	1	Black	Solid
AEC_3-Soild	3	Black	Solid
AEC_5-Soild	5	Black	Solid
AEC_6-Soild	6	Black	Solid
AEC_7-Soild	7	Black	Solid
AEC_8-RNF_Mesh	8	Black	AEC_DashDot_6.0mm
AEC_8-Soild	8	Black	Solid
AEC_9-Soild	9	Black	Solid
AEC_10-DPC	10	Magenta	Solid
AEC_10-DPM	10	RGB 000-128-000	AEC_DoubleDash
AEC_10-Soild	10	Black	Solid
AEC_11-Rebar	11	Black	Solid
Axis of Rotation	12	Blue	AEC_Centre
Centre	1	Black	AEC_Centre
Dash_1.5	1	Black	AEC_Dash_1.5mm
Dash_3.0	1	Black	AEC_Dash_3.0mm
Dash_3.0_Loose	1	Black	AEC_Dash_3.0mm_Loose
Dash_9.0	1	Black	AEC_Dash_9.0mm
DashDot_3.0	1	Black	AEC_DashDot_3.0mm
DashDot_6.0	1	Black	AEC_DashDot_6.0mm
DashDotDot_6.0	1	Black	DashDotDot_6.0
Demolished	1	Black	Demolished
Dot_1.0	1	Black	Dot_1.0
Dot_2.0	1	Black	Dot_2.0
Dot_4.0	1	Black	AEC_Dot_4.0mm
DoubleDash	1	Black	AEC_DoubleDash
ElevationSwing	1	Black	Elevation Swing
GridLine	1	Black	Grid Line
Hidden	1	Black	Hidden
Hidden Lines	3	RGB 000-161-000	AEC_Dash_3.0mm
Hidden_2.0	1	Black	AEC_Hidden_2.0mm
Insulation Batting Lines	3	Black	Solid
Lines	3	RGB 000-161-000	Solid
Medium Lines	5	Black	Solid
Overhead	1	Black	Overhead
Red Line	8	Red	Aligning Line
Thin Lines	1	Black	Solid
TripleDash	1	Black	AEC_TripleDash
Wide Lines	10	Black	Solid
WindowSwing	1	Black	Window Swing

- Line Styles Standard

3.6.4. E&M Systems Colour Coding

The colour coding shall be assigned for the system types below by configuration of corresponding "Filters" under "Visibility/Graphics Override". For system types not listed below, consultants or contractors are advised to propose new colour coding for new system types with substantiation, where deemed necessary.

System Type	Color Palette	RGB Code
Primary Air Duct		0,255,255
Exhaust Air Duct		0, 255, 0
Fresh Air Duct		0, 0, 255
Supply Air Duct		255, 0, 0
Return Air Duct		255, 0, 255
Transfer Air Duct		0, 128, 255
Smoke Extraction Duct		128, 128, 0
Make Up Air Duct		192, 192, 192
Staircase Pressurization Duct		192, 192, 192
Condensate Drain Pipe		255, 128, 0
Chilled Water Return Pipe		0, 255, 0
Chilled Water Supply Pipe		0, 0, 255
Condening Water Supply Pipe		0, 128, 64
Condening Water Return Pipe		0, 128, 255
Chemical Dosing Pipe		192, 192, 192
Make-up Water Pipe		192, 192, 192
Heating Hot Water Supply Pipe		128, 0, 0
Heating Hot Water Return Pipe		255, 128, 64
Waste Pipe		128, 128, 0
Soil and Waste Pipe		128, 0, 0
Vent Pipe		0, 128, 255
Rain Water Pipe		0, 255, 255
Pumped Soil & Waste Pipe		64, 0, 0
Pumped Waste Pipe		64, 64, 0
Pumped Rainwater Pipe		0, 128, 128
Cleaning Water Pipe		0, 0, 255

- Color Standard

15. Folder structure, Control Spreadsheets, & Naming Convention

2.3.3 3D Animation

The as-built model shall be provided with video clip files with 3D animation showing the assembly, disassembly, repair and replacement method for special component or special building system such as curtain wall system, etc. as specified in the contract and Appendix 3 for viewing in the AIS. The objective of the 3D animation is to illustrate how the special component or special building system can be maintained.

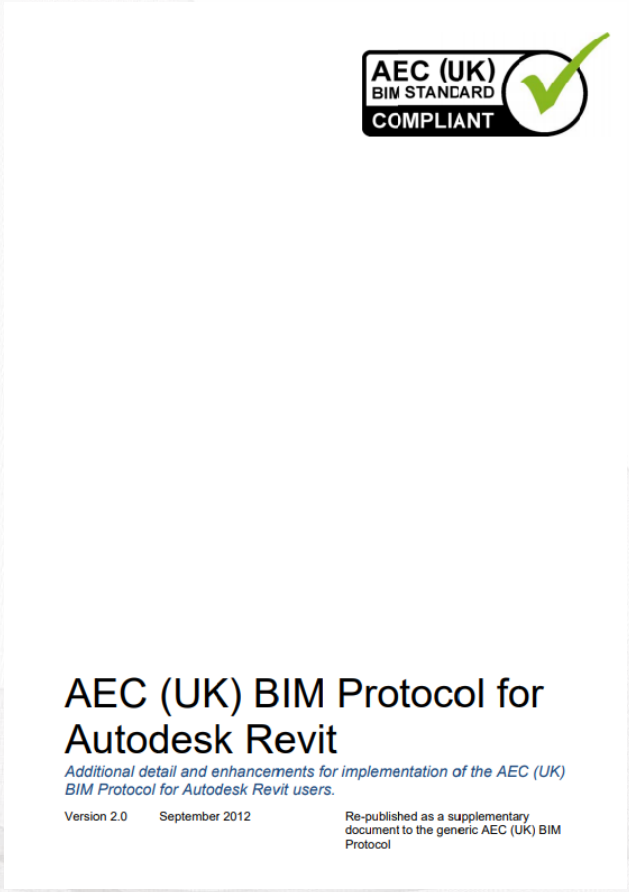
In general, the 3D animation shall be generated with LOD ranged from LOD350 to LOD500 following Appendix 3. The 3D animation converted from the as-built model shall be in mp4 format with resolution not lower than 1080p HD 30 fps or alternative format requested by PSB. As the extent of the 3D animation required is depended on the actual design of the building, proposal of the 3D animation shall be subject to PSB's approval.

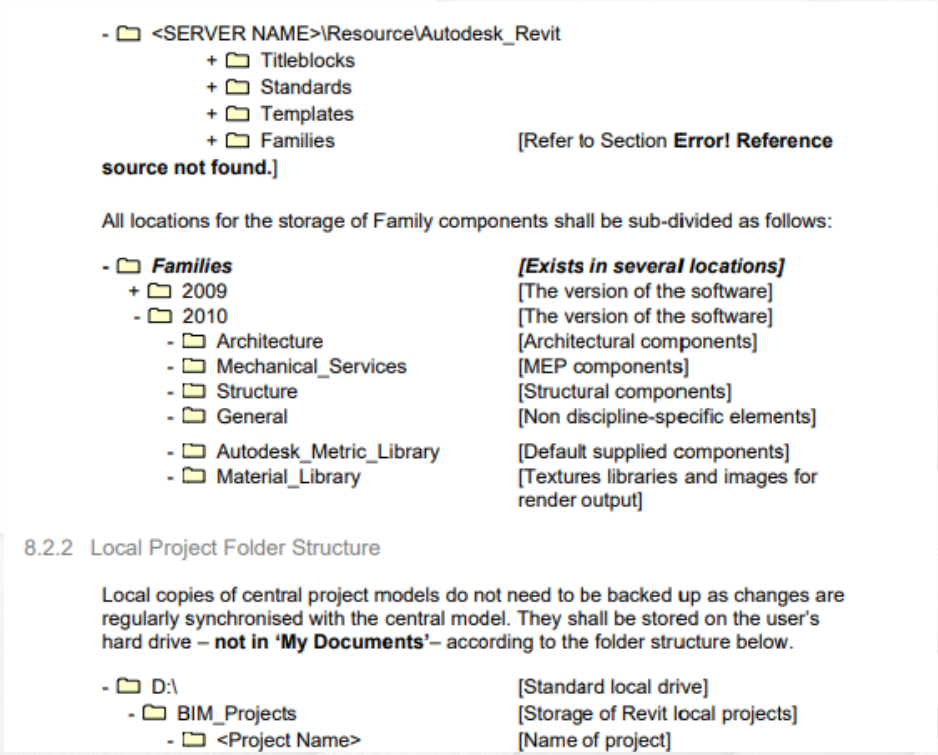
2.3.4 Model Requirement for Graphic & Non-graphic Information

The model requirement of the architectural, plumbing and drainage as-built model shall follow the requirement in Appendix 3. In case another requirement in the same contract requests for a higher LOD, a higher LOD of the concerned as-built model shall be provided. Besides, for plumbing and drainage as-built model, the requirements stated in the Building Information Modelling for Asset Management (BIM-AM) – Standards and Guidelines issued by Electrical & Mechanical Services Department (EMSD) shall also be followed.

- 3D Animation is required for special building system such as: Curtain Wall system which can be delivery to Facility Management for further maintenance if needed.

16. Folder structure, Control Spreadsheets, & Naming Convention





- Folder Structure according to AEC (UK) BIM Standard for family

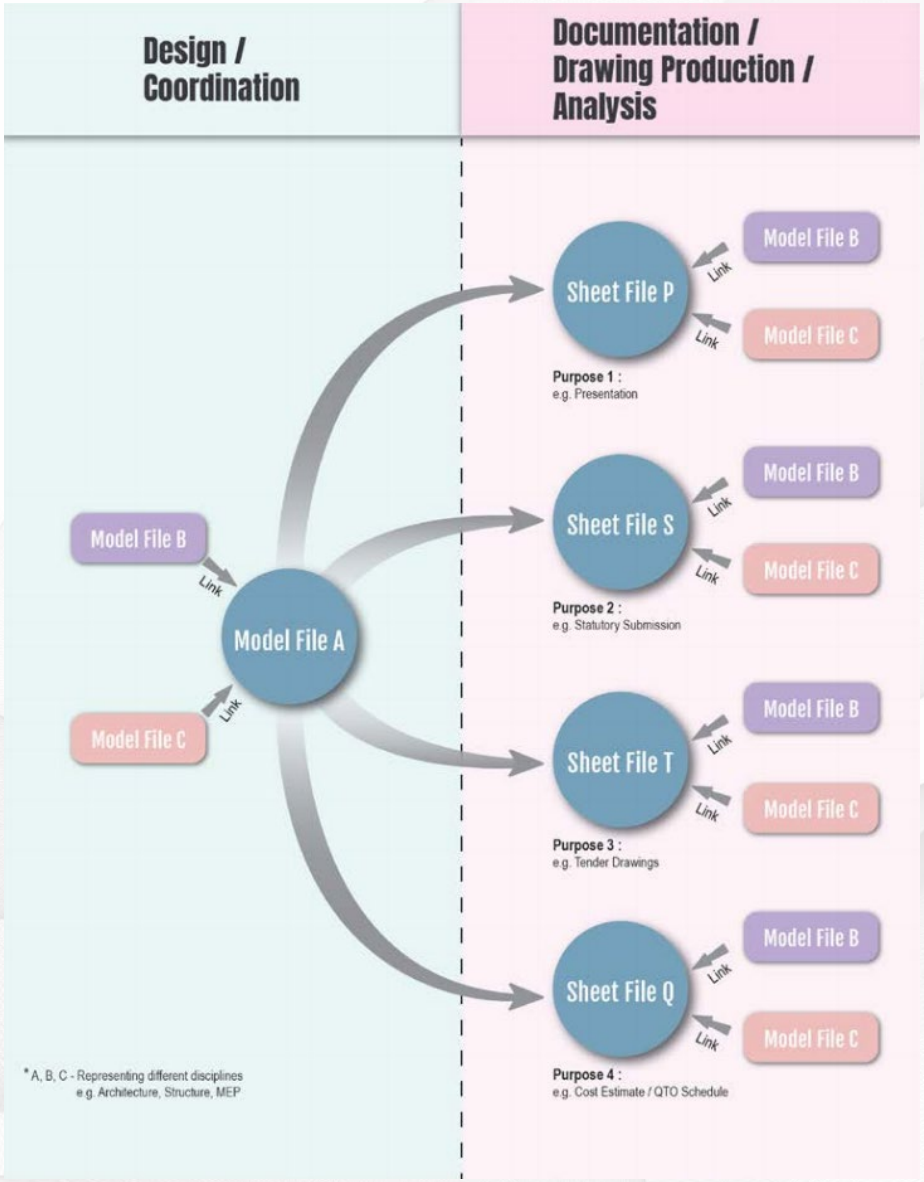
17. Generation of Documentation

- General Concept
  - Link Models > Generate Views > Generate Sheets
  - EXPORT to CAD (civil) /PDF / Light Format
- Extracted from Model
  - Layout
  - General arrangement
  - Sections
- Hybrid CAD/BIM
  - Standard drawings
  - Detail drawings (or in BIM)
- CAD Standard compliance is a BIG Issue

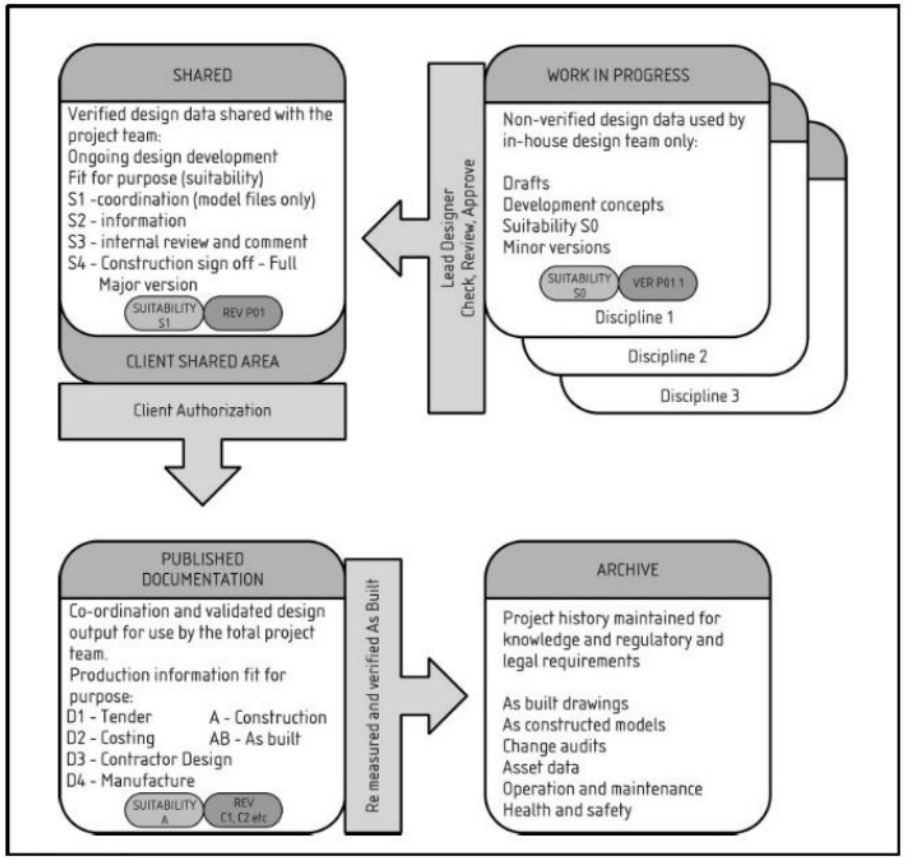
18. BIM Documentation

Model Files vs Drawing Files

Drawing / Model Register



19. Folder structure, Control Spreadsheets, & Naming Convention

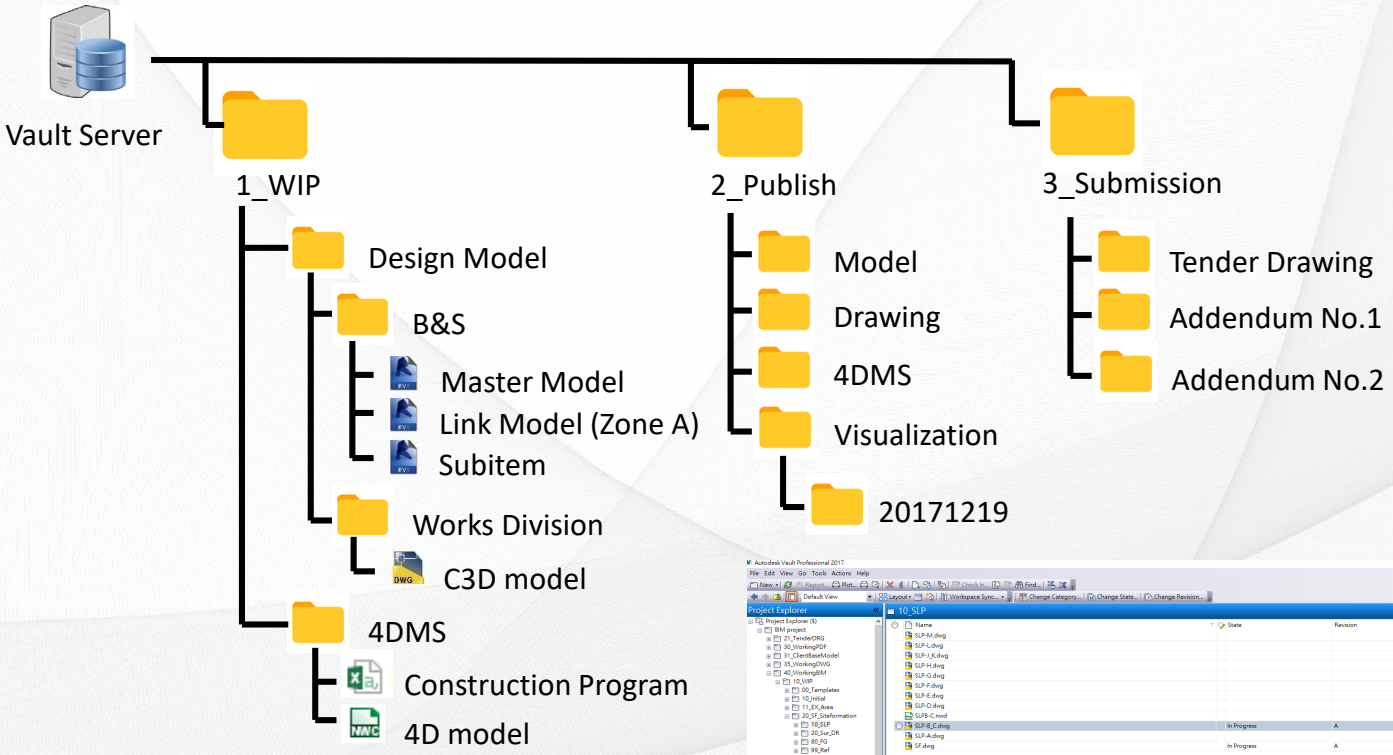


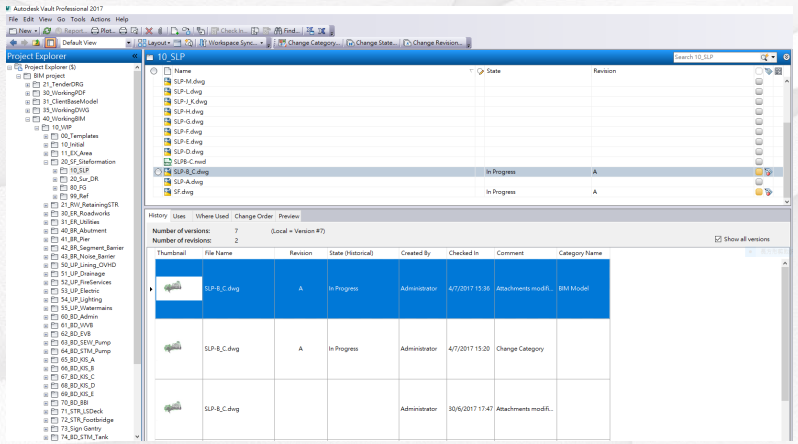
- 🗀 ***[Project Folder]***
  - 🗀 BIM — [BIM data repository]
    - 🗀 **01-WIP** — **[WIP data repository]**
      - 🗀 CAD — [CAD files (incl. 'Modified')]
      - 🗀 BIM — [Design models (incl. 'Modified')]
      - 🗀 SheetFiles — [Sheet/dwg files]
      - 🗀 Export — [Export data e.g. IFC or images]
      - 🗀 Families — [Components created during this project]
      - 🗀 WIP_TSA — [WIP Temporary Shared Area (TSA)]
    - 🗀 **02-Shared** — **[Verified Shared data]**
      - 🗀 CAD — [CAD data/output files]
      - 🗀 BIM — [Design models]
      - 🗀 CoordModels — [Compilation models]
    - 🗀 **03-Published** — ***[Published Data]***
      - + 🗀 YYYYMMDD-Description — [Sample submission folder]
      - + 🗀 YYYYMMDD-Description — [Sample submission folder]
    - 🗀 **04-Archived** — **[Archived Data repository]**
      - + 🗀 YYMMDD-Description — [Archive folder]
      - + 🗀 YYMMDD-Description — [Archive folder]
    - 🗀 **05-Incoming** — **[Incoming Data repository]**
      - 🗀 Source — [Data originator]
        - + 🗀 YYYYMMDD-Description — [Incoming folder]
      - + 🗀 Source — [Data originator]
    - 🗀 **06-Resource** — **[Project BIM Resources Library]**
      - + 🗀 Titleblocks — [Drawing borders/titleblocks]
      - + 🗀 Logos — [Project logos]
      - + 🗀 Standards — [Project standards]

No spaces are to be used in the folder naming as this can potentially interfere with certain file management tools and collaboration across the internet.

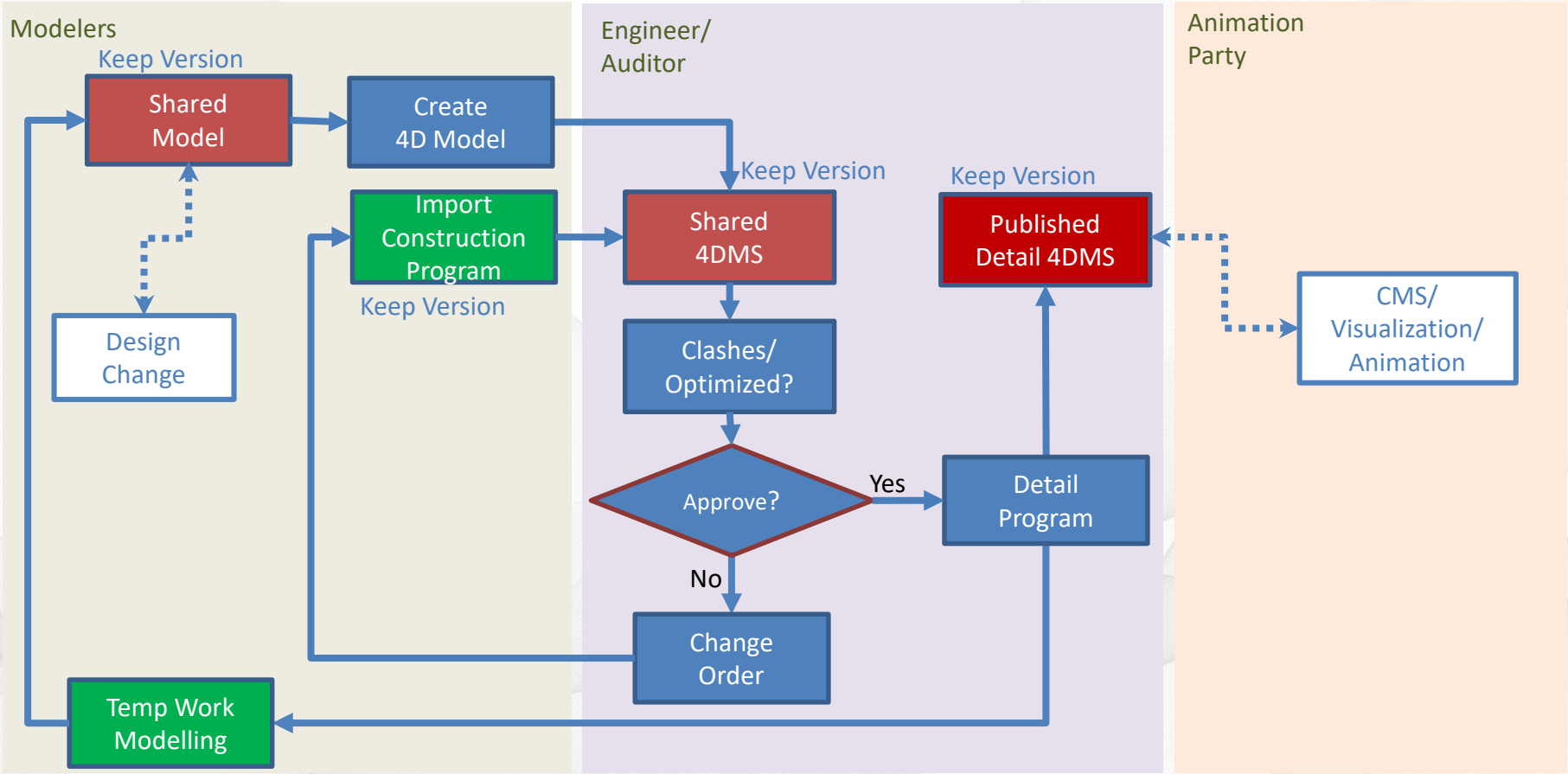
- Common Data Environment (CDE) to define the Folder Structure

20. Common Data Environment

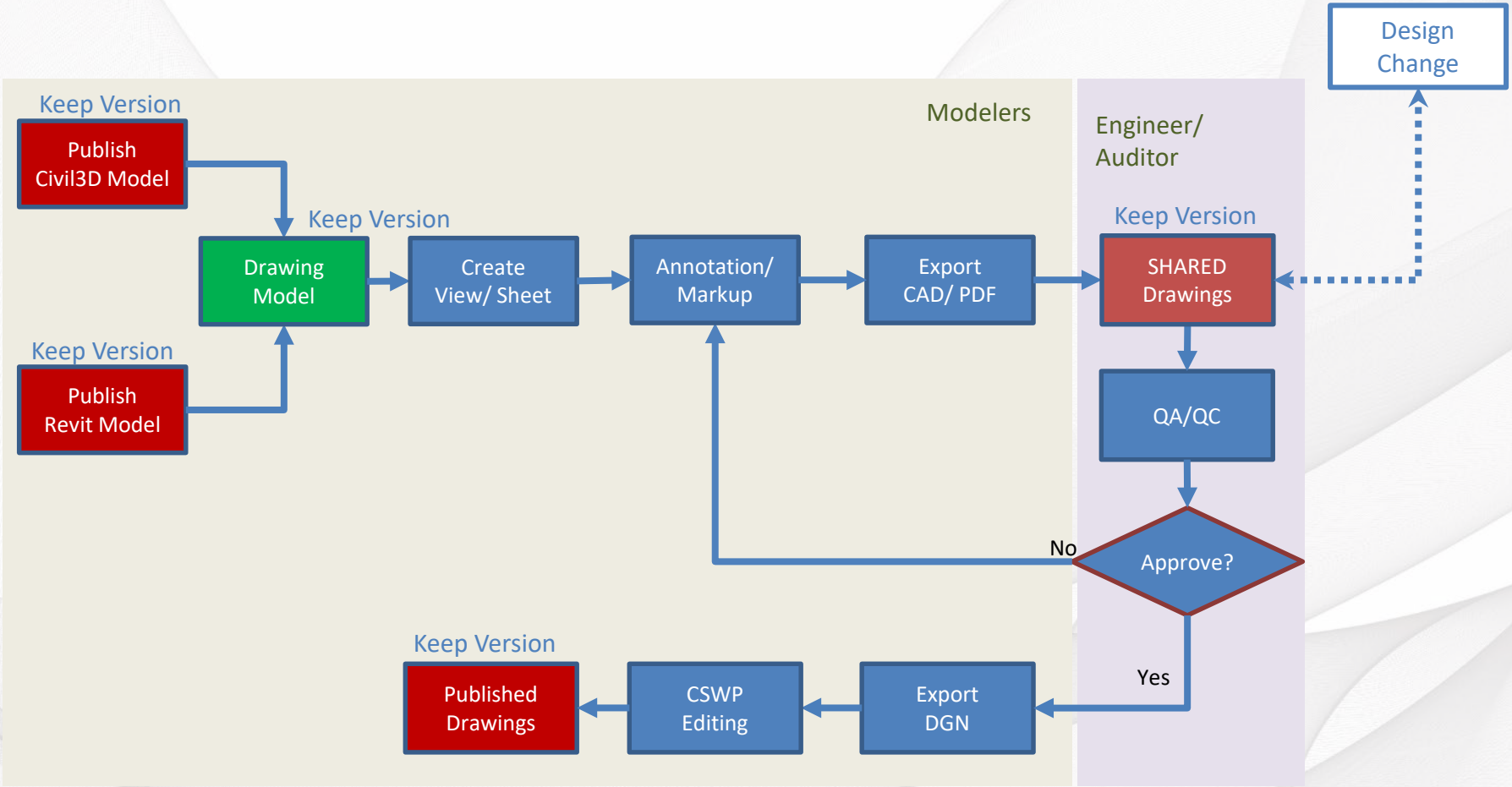




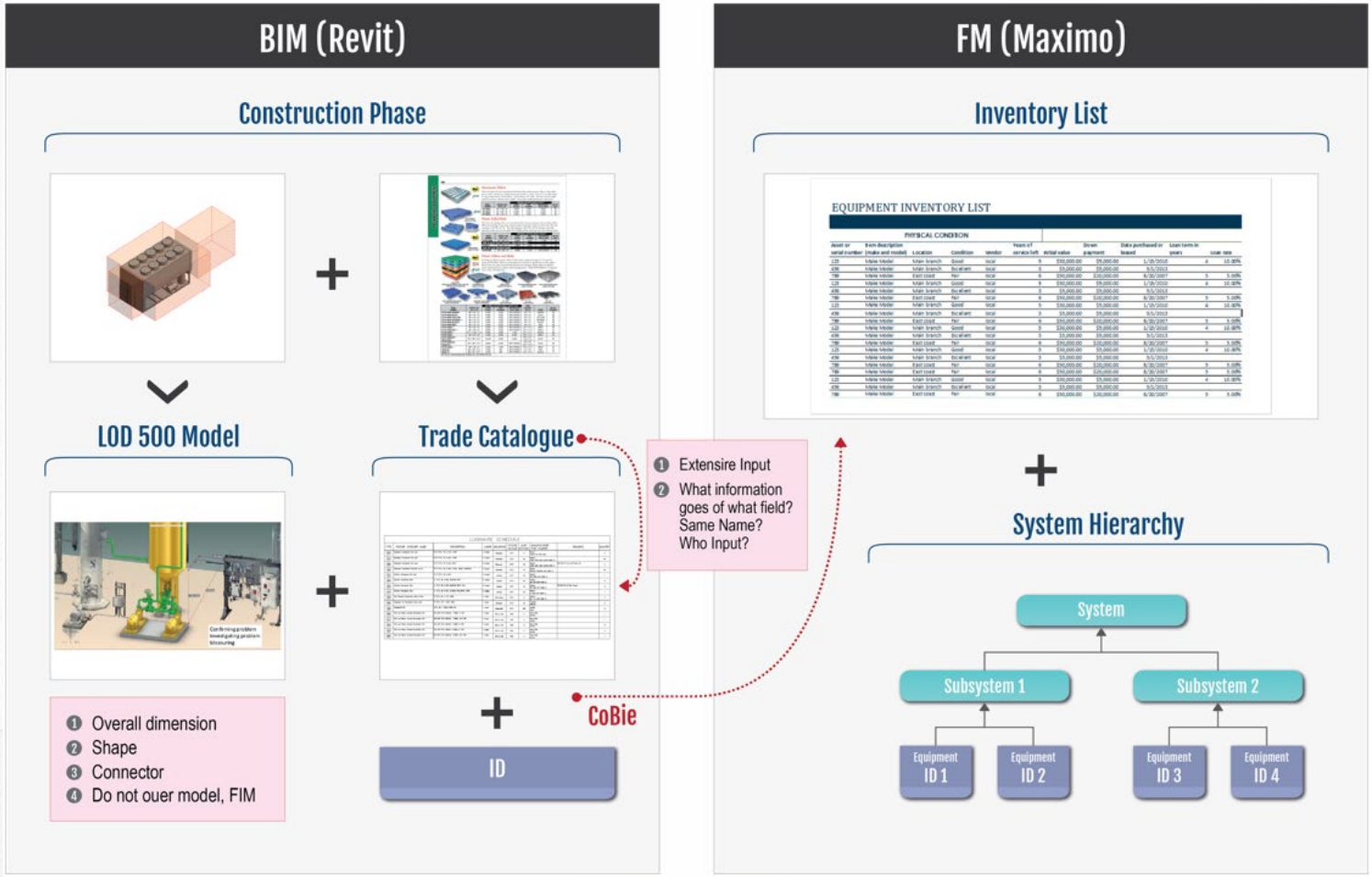
21. Phase Planning Management



22. Drawing Production Process

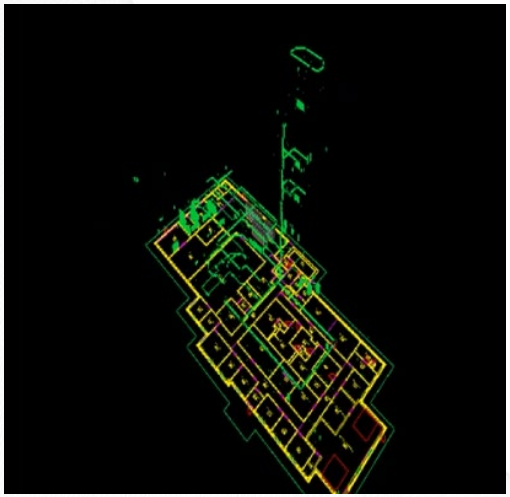


23. Drawing Production Process



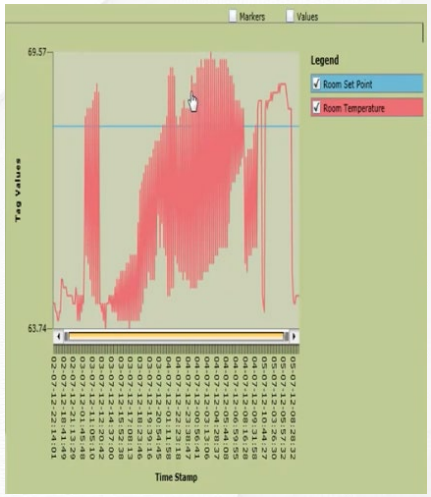
- Drawings production can be filter and generate from BIM to FM by COBie
- The FM shall setup the Standard from the design stage

24. FM Operation

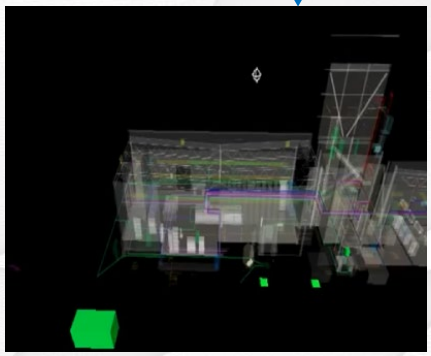


1. Filter to select the area

2. Locate the problem area

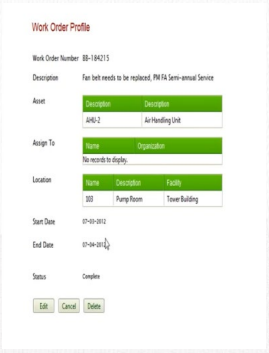


3. Check the data



4. Find the source

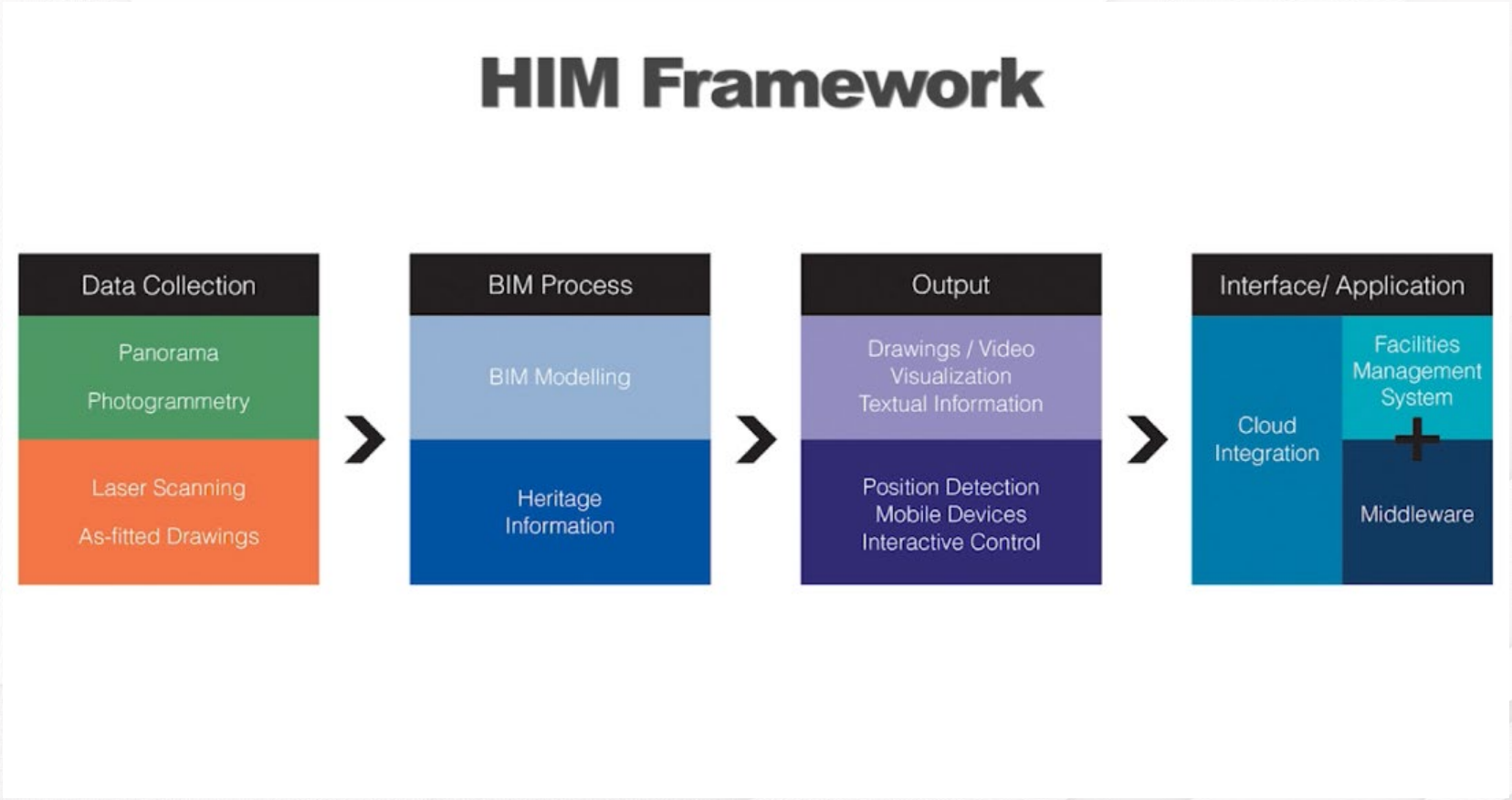
5. Information of the model



6. Place the order

- BIM allow the information can be trackable in 3D virtual world
- Information contained in the model can be referred as a record for FM
- Any replacement of component can be scheduled in FM operator

25. Drawing Production Process



- Output of information can be placed in Cloud for public access
- A Middleware platform between Real & the Virtual World

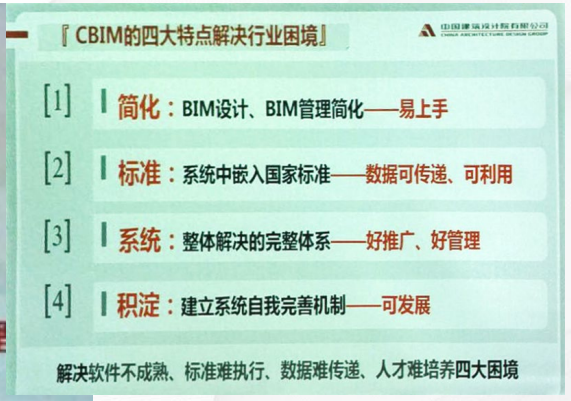
26. CBIM (China BIM) Development

- Project cycle development have divided into six stages categories
- Cloud Platform allow accessibility from different devices
- Extend of Library and Components are extended for China use

27. CBIM (China BIM) Development

- Extend of Library and Components are extended for China use

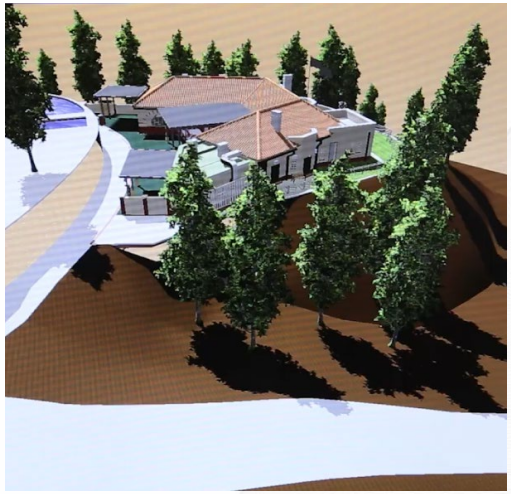
28. CBIM (China BIM) Development



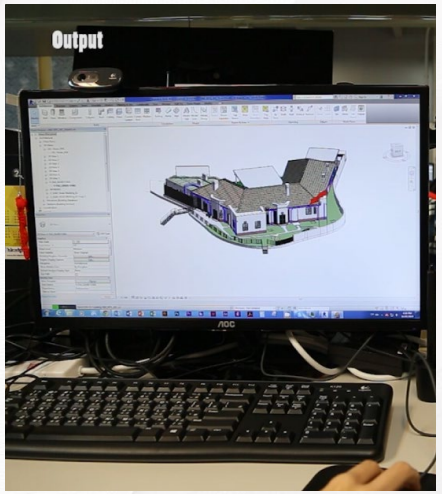
- Online BIM Library in China Standard
- CBIM development : Simplify BIM Platform, BIM Standard, System Management and Self-Improvement System

29. FM in Heritage

1. Laser Scan on site



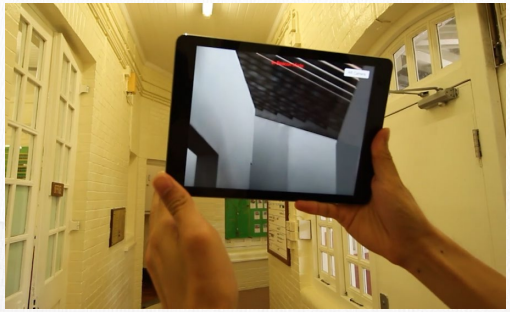
2. Simulate in BIM



3. Input the data

4. VR in the real world

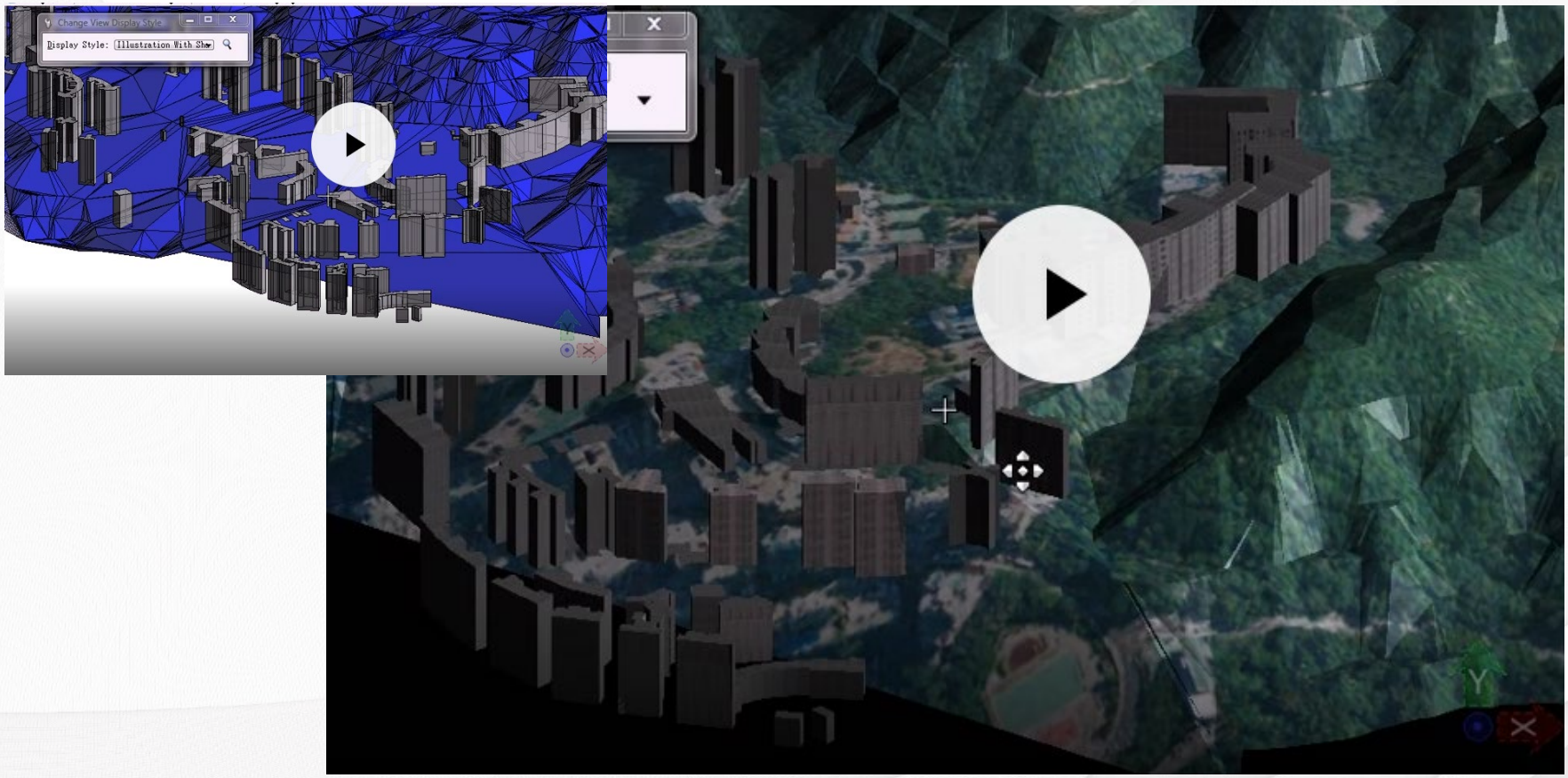
5. Information can be shared



6. Information can be used for checking

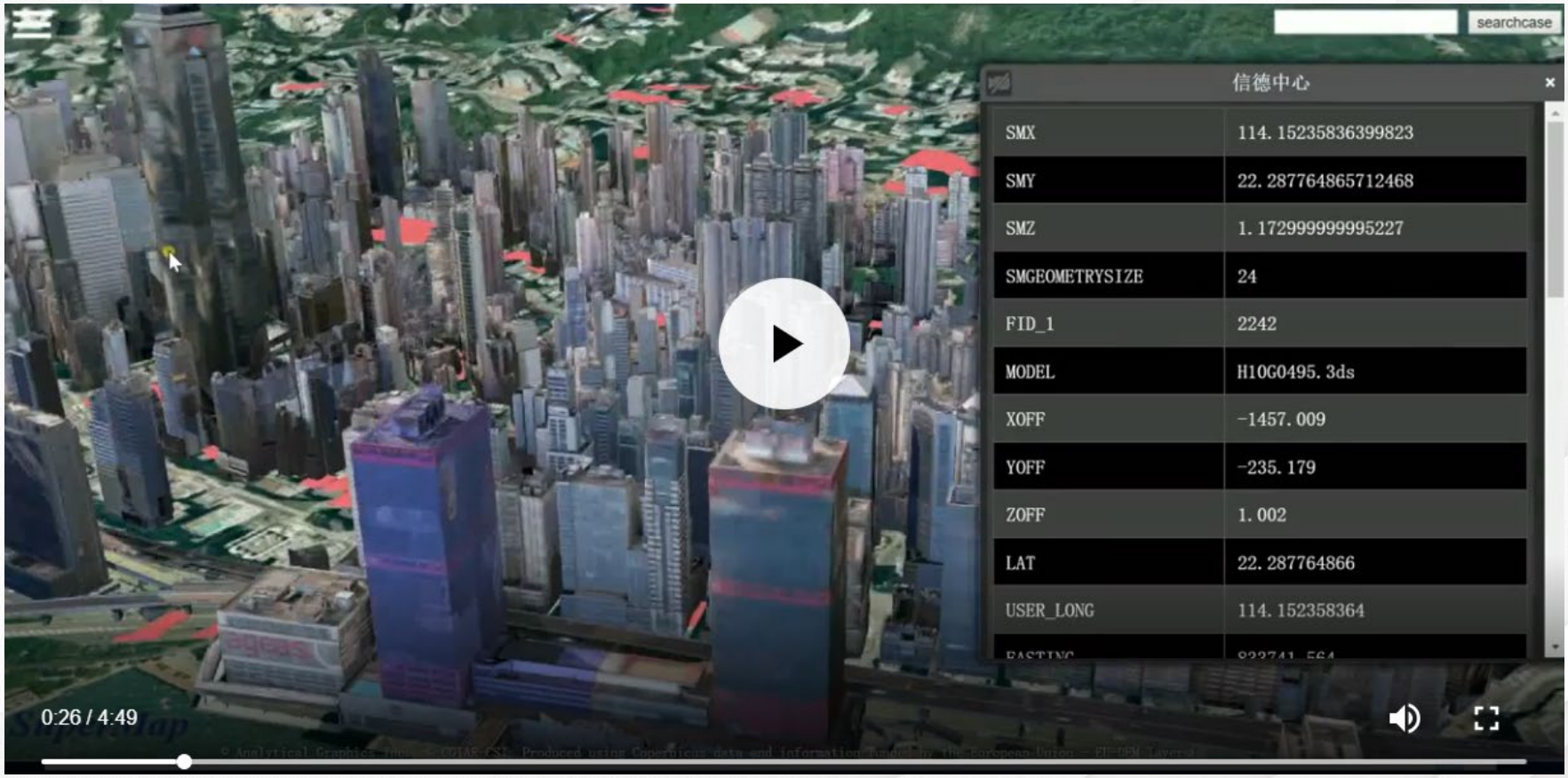
- BIM allow the information can be trackable in 3D virtual world
- Information contained in the model can be referred as a record for FM
- Any replacement of component can be scheduled in FM operator

30. GIS? Smart City



- Hong Kong 3D City GIS
- Information with disposition and topography

31. GIS? Smart City



- Building Massing with basic information

32. GIS? Smart City

智慧城市报告:中国在建数量最多已超过500座

2018-04-02 绚云科技

德勤最新发布的一份《超级智慧城市报告》(Super Smart City:Happier Society with Higher Quality)表示,目前全球已启动或在建的智慧城市已达1000多个,中国在建500个,远超排名第二的欧洲(90个)。

德勤报告称,中国拥有比其他国家更多的智能城市,试点已达290个。

所谓"智慧城市",就是采用物联网技术,例如互联传感器、计量器和路灯,来采集并分析数据,进而改进公共基础设施和服务。智慧城市有望大大改变市民生活、工作和出行方式。

当前智慧城市现状

- China become the fastest growing country to adopt Smart City

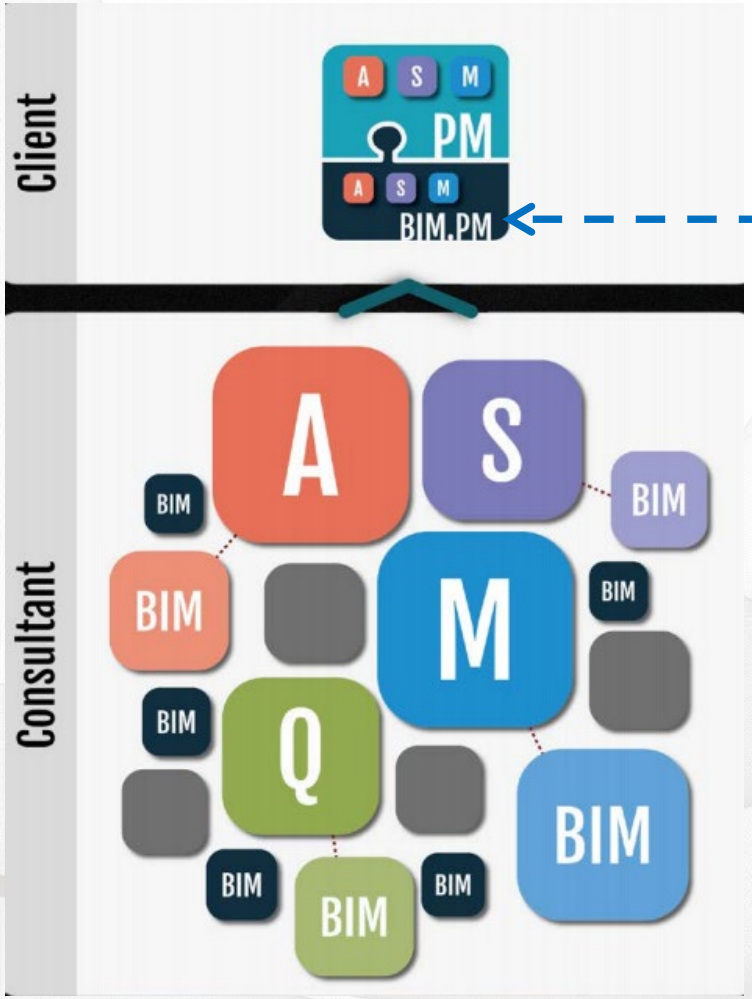
33. VR and Reality

- Mircosoft Hololens to allow BIM/Model to project in reality

https://www.youtube.com/watch?v=qym11JnFQBM

34. BIM Management

BIM Manager to check cross discipline for the whole project

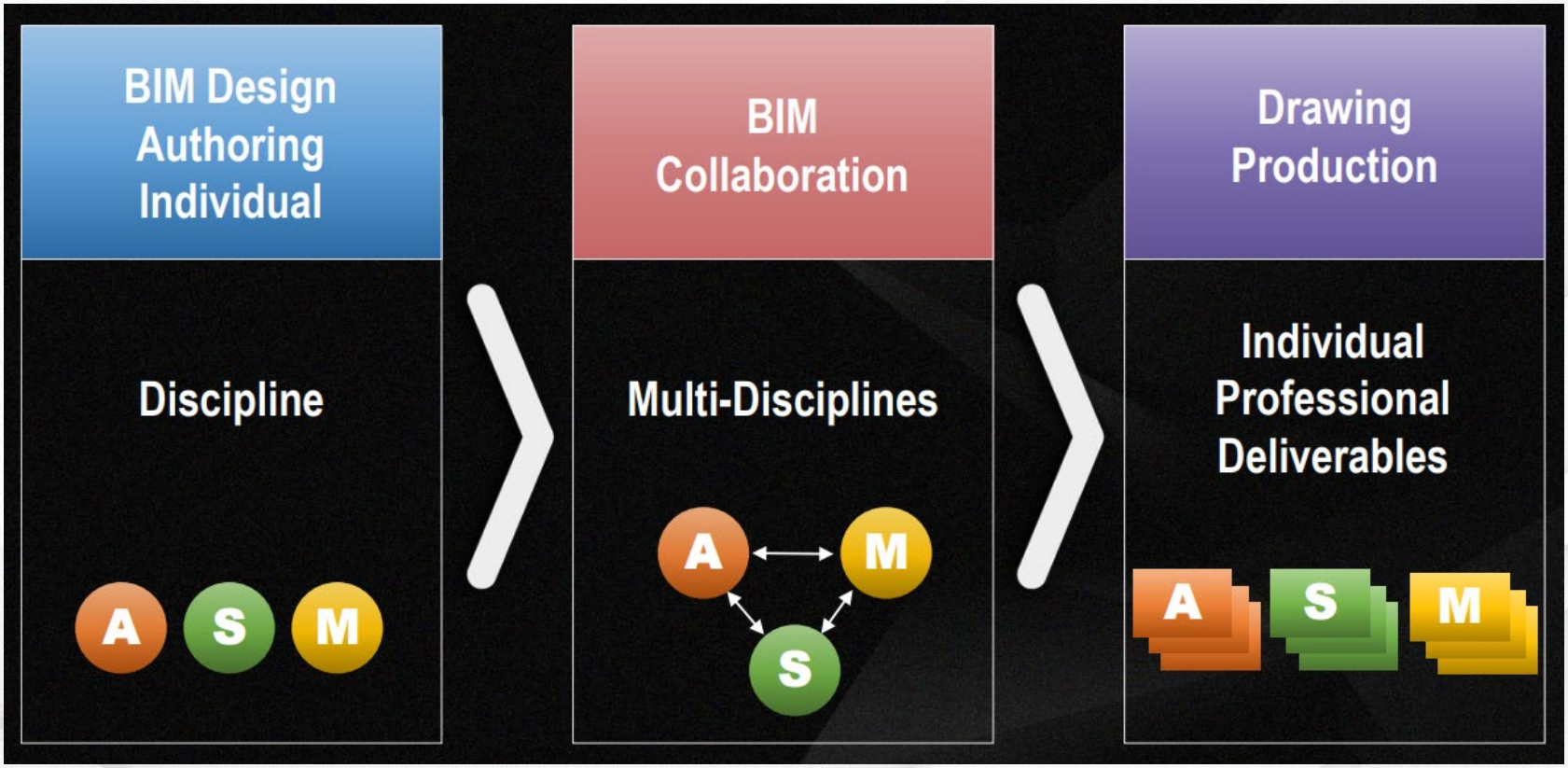


- BIM Manager assist to set up Project Execution Plan with the employer
- Set up requirement in the tender stage for the consultants
- BIM Manager to check each discipline delivery for the project

Question to be answered in future :

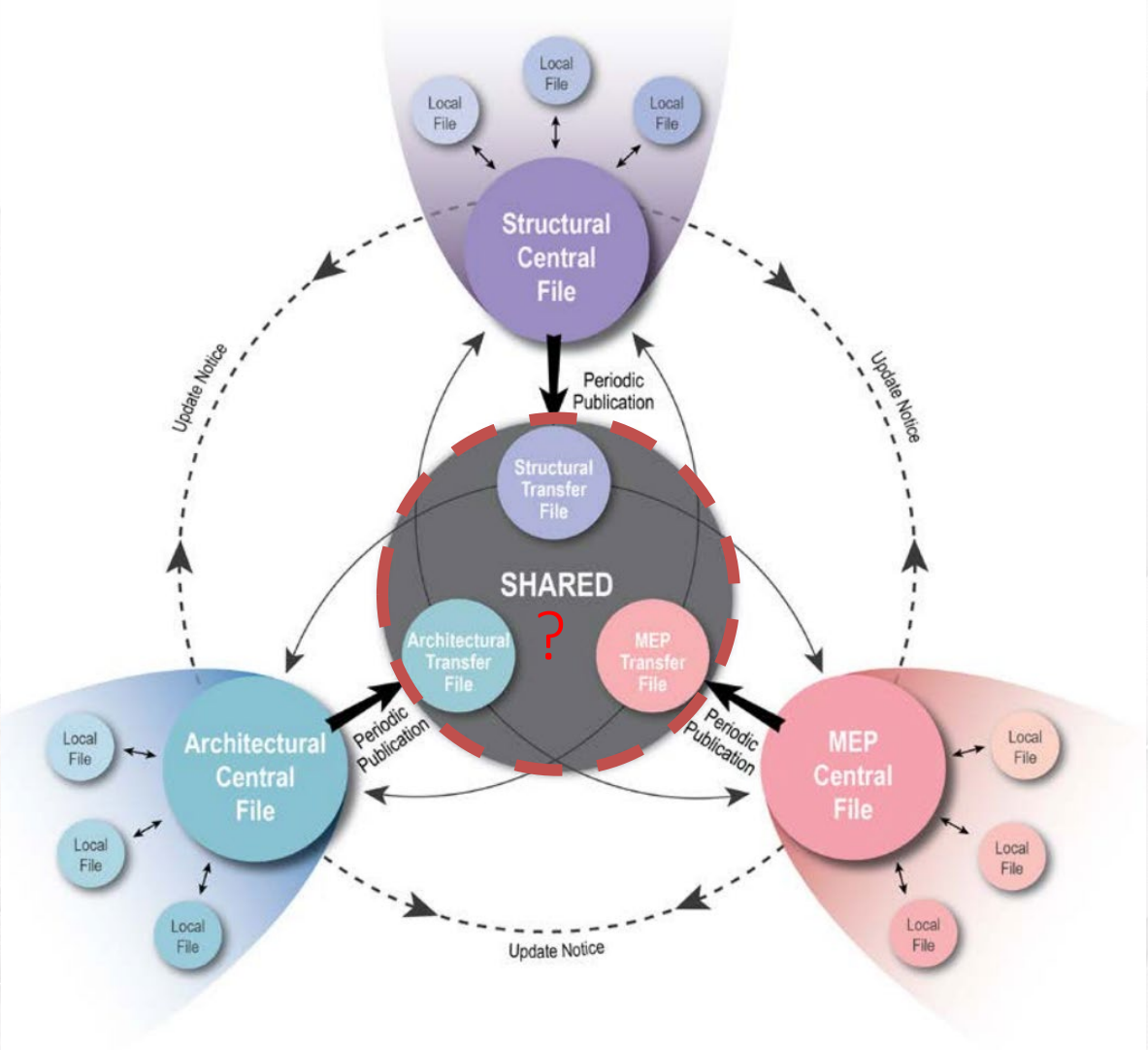
- What if the BIM only imply in construction phase?
- If AI change of design? How to instruct the contractor by BIM?

35. Understanding of cross-disciplinary model collaboration, office standards compliance check, dataset validation, clash analysis and detection

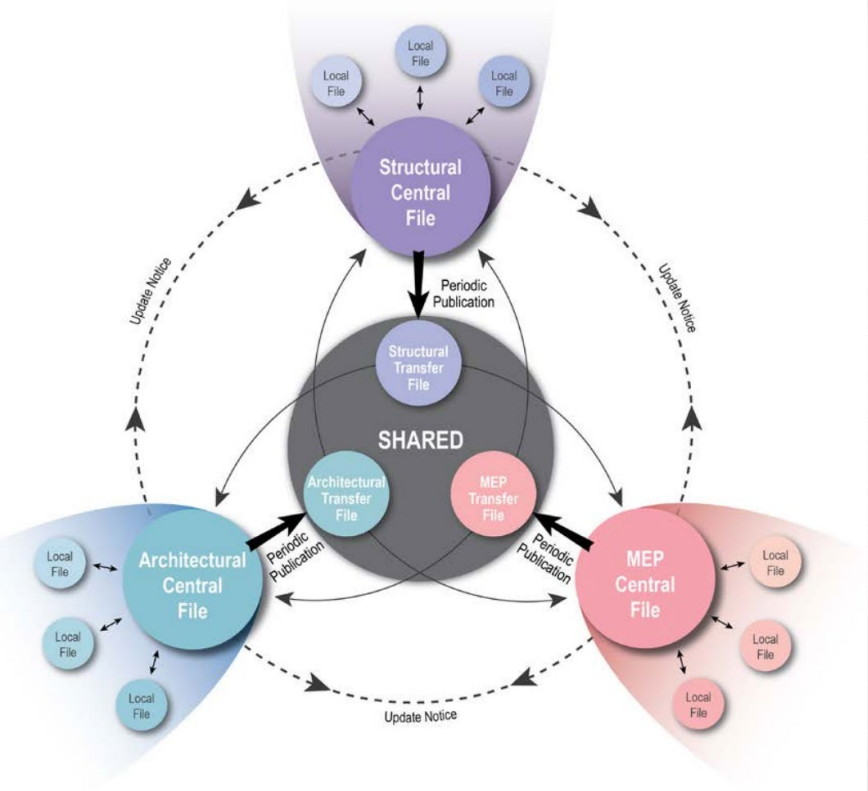


36. CDE (Common Data Environment)

How to share information for collaboration?



37. CDE (Common Data Environment)



Concept of CDE:

- WIP (Work in progress) to share with other discipline / to construction phase
- Publish Information for all discipline to review
- SSOT with record of date and author
- Archive of information from design to completion of project

38. CDE (Common Data Environment)

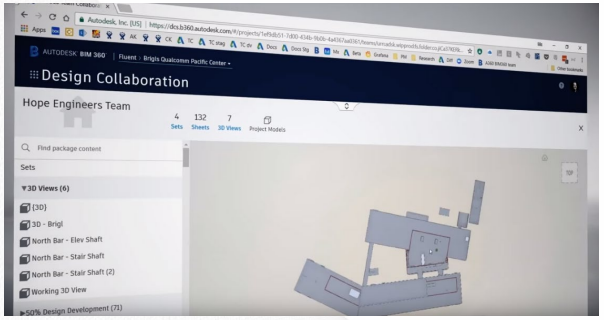
Commercial Platform – BIM360

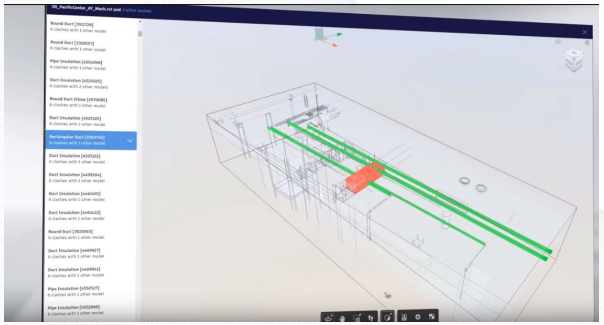
- Common share platform for multi discipline to exchange information
- Can access by different devices online

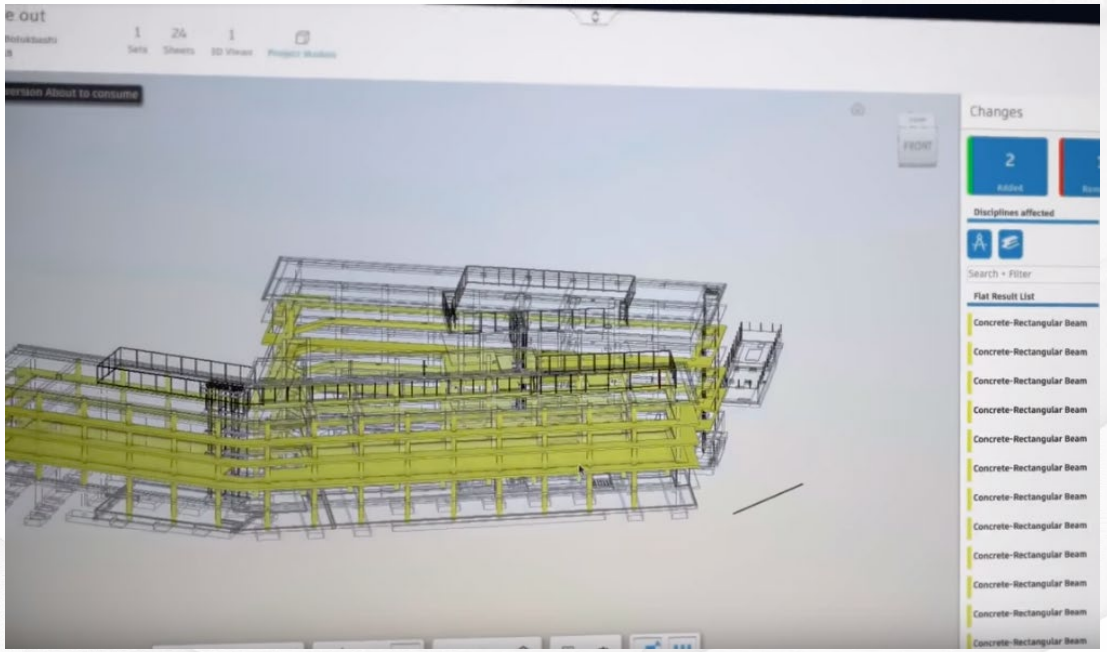
https://www.youtube.com/watch?v=U20tciM4gBk

39. CDE (Common Data Environment)

Commercial Platform – BIM360



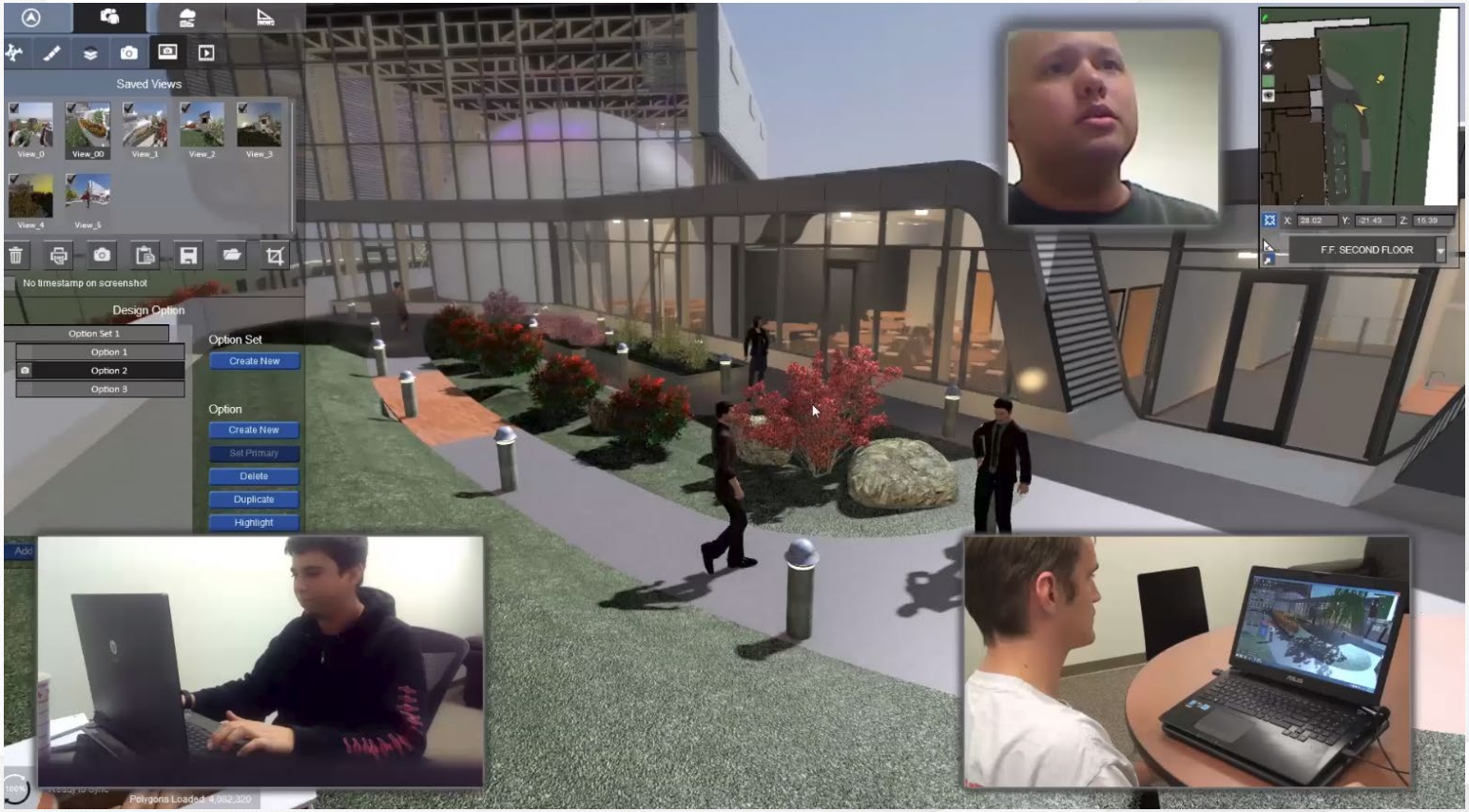




- Change of Model / Information can be recorded with time and author
- Model / Information can be reviewed directly online
- No limit in time and location

https://www.youtube.com/watch?v=U20tciM4gBk

40. Further Development of CDE



Online Multi Discipline platform

- Plugin software to simulate the virtual environment
- Different discipline can involve and revise the design at the same time

https://www.youtube.com/watch?v=DUwBQjjeVsQ

41. Certify of BIM

How to ensure the BIM delivery in Hong Kong?

- Development Bureau Technical Circular (Works) No. 7/2017

BIM Team Structure

The Consultant/Contractor* shall propose and establish a BIM team that are appropriate for the scale and complexity of the Assignment/Contract*, highlighting key roles and responsibilities of each position, within [14] calendar days after commencement of Assignment/Contract*. The team shall be led by a BIM team leader who holds a key position in the Consultant/Contractor's* project team structure. The BIM team shall include sufficient and technically competent resources in order to complete all BIM tasks and deliverables specified in the Assignment/Contract*. Notwithstanding, the BIM team shall at least comprise [3] staff well trained in relevant disciplines. The BIM team leader shall either have corporate membership of an appropriate professional institution or shall have [5] years relevant post-qualification experience plus university degree or equivalent in an appropriate engineering discipline. The BIM team leader shall have a minimum of [3] years of practical experience in management of BIM projects ~~or a professional member of the Hong Kong Institute of Building Information Modelling (HKIBIM) or equivalent~~. The disciplinary BIM coordinators shall have [3] years related construction project experience. The coordinators shall have a minimum of [1] year practical experience in BIM projects ~~or an associate member of the HKIBIM or equivalent~~.

BIM Sub-Consultant/Sub-Contractor*

If the Consultant/Contractor* does not have the necessary expertise, the Consultant/Contractor* shall engage a sub-consultant/sub-contractor* with suitable expertise for the performance of BIM related tasks. If the Consultant/Contractor* intends to or is required to sub-contracts the BIM works to a BIM sub-consultant/sub-contractor*, the Consultant/Contractor* shall obtain approval from the Director/Engineer* before formal engagement and shall indicate this clearly in the project team structure. The positions of the staff members from the BIM sub-consultant/sub-contractor* shall also be indicated clearly in the BIM team organisation structure.

- To ensure the user is knowledgeable in BIM operation
- Proper training to be provided for Design Author

THANK YOU