



AECOM
platform
HKS

HONG KONG HOUSING AUTHORITY

Building Information Modelling Standards and Guidelines (HABIMSG)

- Volume 1 of 2 – Introduction and Quick Guide
- Volume 2 of 2 – Detail Guide
- Annex

Version 3.1

Important Points to Note:

The primary purpose of this Guide is to standardize various practices on the adoption of BIM in HA projects. It is therefore necessary to prescribe a set of standardized requirements on the modelling methodology and technical details for various parties engaged in HA projects to follow. Some of the requirements listed in this Guide are mandatory while others are recommended best practices only.

However, it is hereby stressed that whilst HA endeavours to ensure the accuracy and adequacy of the content in this Guide, user has the ultimate responsibility over the work they produced and should ensure that it meets project requirements. The use of this guide shall not relieve the users from such liabilities or obligations and HA accepts no responsibilities in this regards.

Comments and suggestions to improve this Guide are most welcome and should be addressed to:

Building Information Modelling Service Team
Building Information Technology Unit (Construction)
The Hong Kong Housing Authority
Housing Authority Headquarters
6/F, Block 3, 33 Fat Kwong Street
Kowloon

Email: bimenquiry@housingauthority.gov.hk

© 2022 Hong Kong Housing Authority

Copyright Notice

The copyright of the material published in this HABIMSG (the “Material”) is owned by the HA unless otherwise stated. Extracts or small parts or portions of the Material may be used, copied, reproduced, reprinted, modified, reviewed or translated for research or other educational purposes. Neither reproduction nor translation of substantial parts or portions of the Material for educational purposes, nor use of the Material for purposes other than educational purposes, shall be permitted without the prior written authorisation of the HA. Copyright exists on other documents referred to in HABIMSG. Reproduction of content from those documents must adhere to their reproduction requirements and necessary copyrights.

TABLE of CONTENTS

Annex

ANNEXES2

ANN-1. HA BIM Resources2

ANN-1.1. HA BIM Project Execution Plan (PxP) Template..... 2

ANN-1.2. HA BIM Quality Assurance (QA) Checklists 18

ANN-1.2a. Project Startup Checklist18

ANN-1.2b. Model Compliance Checklist18

ANN-1.3. HA Modelling Resources..... 19

ANN-1.3a. HA Project Model Templates19

ANN-1.3b. HA Family Library19

ANN-1.3c. HA Shared Parameter Lists19

ANN-1.3d. Abridged Version of Modular Flat Design (MFD) Models20

ANN-1.4. HA BIM QTO Scope..... 21

ANN-1.5. BIM Training Videos..... 22

ANN-1.5a. List of video by DCD on HA modelling22

ANN-1.5b. List of Video by ICU on GBP, Foundation Plan and Superstructure Plan Submission.....22

ANN-1.6. I.T. Setup Recommendation 23

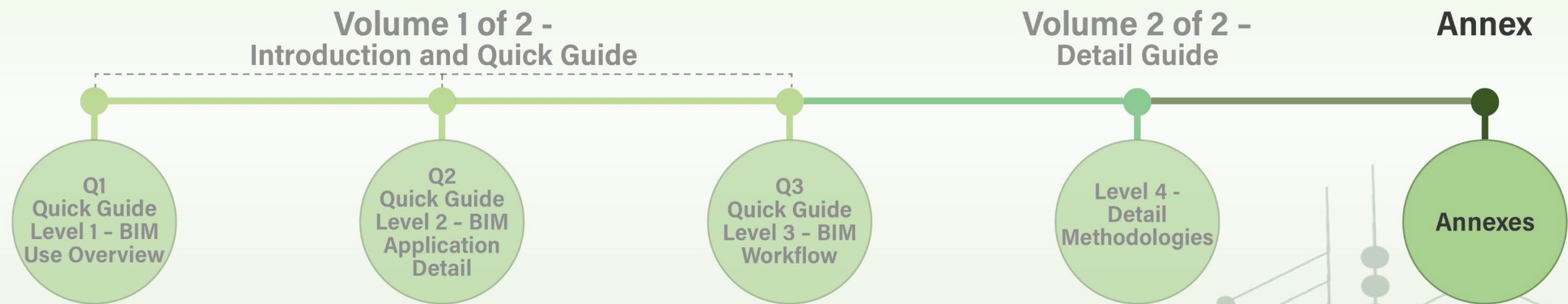
ANN-1.6a. Hardware23

ANN-1.6b. Operating System23

ANN-1.6c. Network.....23

ANN-1.6d. Software23

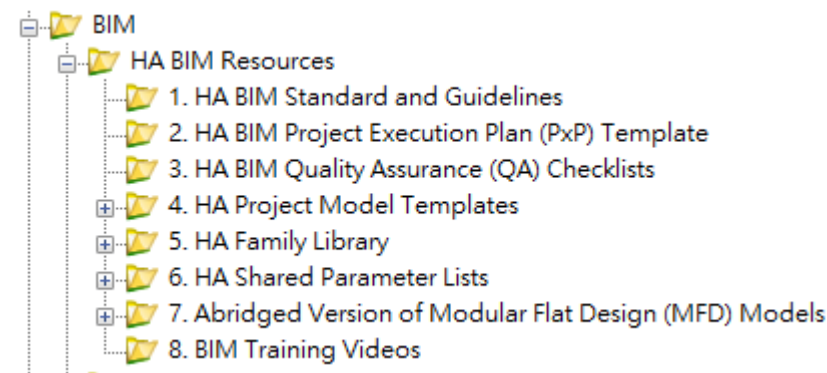
ANN-1.7. Common Errors and Recommendations 24



ANNEXES

ANN-1. HA BIM Resources

The following HA specific supplementary BIM resources can be obtained in Project Wise. BIMSPs, PSPs, consultants and Contractors, shall obtain these materials from their corresponding HA Project Team Senior Technical Officer (STO):



ANN-1.1. HA BIM Project Execution Plan (PxP) Template

ProjectWise Location of PxP Template:
pw:\\PRDDRG15:drgms_dcd\\Documents\\HD Library\\BIM\\HA BIM Resources\\2. HA BIM Project Execution Plan (PxP) Template\\



Hong Kong Housing Authority

**Project-specific Building Information Modelling (BIM) Execution
Plan (PxP)
For
[Insert Project Name]
*[Contract No.]***

Date: YYYY-MMM-DD
Ver. XX.X

Purple italic formatting contains instructions on how to fill out this PxP template.

Table of Contents

1 Introduction 6

2 Project Information..... 6

 2.1 General 6

 2.2 BIM Goals 7

 2.3 BIM Scope of Works (SOW) and Services 7

3 BIM Uses 8

 3.1 BIM Uses and Tasks 8

4 BIM Management..... 9

 4.1 Contact List..... 9

 4.2 BIM Team Resources, Competency and Training..... 9

 4.3 BIM Personnel Change Management.....10

 4.4 Standards Referenced.....10

 4.5 Information Management Assignment Matrix10

 4.6 BIM Workflow.....14

 4.7 LOD Responsibility Matrix14

 4.8 LOD Specifications.....14

 4.9 Schedule of BIM Deliverables.....14

 4.10 Approval of BIM Deliverables15

 4.11 Meeting Schedule15

 4.12 WIP BIM File Exchange Schedule16

5 BIM Infrastructure 17

 5.1 Hardware Specifications17

 5.2 Software Use.....17

 5.3 Software Upgrade17

 5.4 Exchange Formats.....18

 5.5 Common Data Environment (CDE)18

 5.6 Data Security and Backup Protocols18

6 BIM Setup..... 19

 6.1 Model Template.....19

 6.2 Model Coordinates19

 6.3 Grid Line.....20

 6.4 Level20

 6.5 Modelling Units.....21

 6.6 Federation22

 6.7 Drawing Sheet Templates23

 6.8 Annotation, Dimensions, Abbreviations and Symbols.....23

 6.9 Colour Scheme23

7 Collaboration Procedures.....24

 7.1 Collaboration Workflow24

 7.2 Clash Management.....24

8 BIM File Naming 25

 8.1 Model Naming25

 8.2 Folder Naming and Folder Structure26

 8.3 BIM Object (Family) Naming27

 8.4 Naming of Drawing Generated from BIM.....27

9 Quality Control 28

 9.1 Quality Control Workflow.....28

 9.2 BIM Checklist.....29

10 Asset Management (if applicable) 30

BIM PROJECT EXECUTION PLAN (PXP)

Guidance Notes:

- Note 1 - Delete all notes in purple and italics.
- Note 2 - To suit the project specific situation and requirements, author of this PxP may amend or adjust as appropriate the text contained between two brackets [].

Document Version

Version	Issue Date		Prepared By	Checked By	Approved By	Remarks
0	[DD-MM-YYYY]	Name				
		Signature				
1	[DD-MM-YYYY]	Name				
		Signature				
2	[DD-MM-YYYY]	Name				
		Signature				

BIM PROJECT EXECUTION PLAN (PXP)

Abbreviations

Abbreviation	Definition
4D	4-dimensional Construction Sequence Simulation
BIM	Building Information Modelling
BIMSP	BIM Services Provider
BIMST	BIM Service Team (of HA)
BIM SOW	BIM Scope of Works
CDE	Common Data Environment: agreed source of information for any given project or asset, for collecting, managing and disseminating each information container through a managed process. A CDE workflow describes the processes to be used and a CDE solution can provide the technology to support those processes. (Source: ISO 19650-1:2018)
CIC	Construction Industry Council
DCD	Development and Construction Division
EMD	Estate Management Division
GIS	Geographic Information System
HA	Hong Kong Housing Authority
HABIMSG	Housing Authority Building Information Modelling Standards and Guidelines
HKSAR	Hong Kong Special Administrative Region of the People's Republic of China
ICU	Independent Checking Unit (of HA)
LOD	Level of Development
LOD-G	Level of Graphics
LOD-I	Level of Information
MEP	Mechanical, Electrical and Plumbing
N/A	Not Applicable
PxP	Project-specific BIM Execution Plan
UU	Underground Utilities
WIP	Work in Progress

1 Introduction

This document, the Project-specific Building Information Modelling (BIM) Execution Plan (PxP), establishes the processes, workflow, BIM standard including minimum Levels of Development (LOD), Scope, Deliverable, tentative working programme and uses of BIM for the captioned project.

This PxP is applicable to *[Planning, Design, Construction, As-built, and/or Operations]* stages.

2 Project Information

2.1 General

Depending on project status, delete inapplicable rows as necessary.

End Client (Appointing Party)	Hong Kong Housing Authority
Client	<i>[Fill in if applicable, e.g. when author of this PxP is under a main contractor]</i>
Project Name	<i>[Input Project Name]</i>
Project Code	<i>[Input Project Code]</i>
Phase No.	<i>[Fill in if applicable]</i>
Development Type	<i>[Public Rental Housing, Subsidised-Sale Flats]</i>
Project Location	<i>[Input Project Address]</i>
Appointed Parties	
Project Manager (Lead Appointed Party)	<i>[Name of Project Manager]</i>
Design Architect	<i>[Name of Project Architect]</i>
Civil Engineer	<i>[Name of Project Civil Engineer]</i>
Structural Engineer	<i>[Name of Project Structural Engineer]</i>
Geotechnical Engineer	<i>[Name of Project Geotechnical Engineer]</i>
Building Services Engineer	<i>[Name of Project Building Services Engineer]</i>
Landscape Architect	<i>[Name of Landscape Architect]</i>
Quantity Surveyor	<i>[Name of Quantity Surveyor]</i>
BIM Consultant	<i>[Name of BIM Services Providers (BIMSPs)]</i>
Main Contractor	<i>[Name of Main Contractor]</i>
Project Description	<i>[Input Project Description]</i>

2.2 BIM Goals

State BIM Goals and descriptions. BIM Goals shall not deviate from project Agreement/Contract or its appendices.

The adoption of BIM technology aims to facilitate the *[Site Inception & Acceptance, Feasibility Study & Conceptual Layout, Master Layout & Project Budget, Detailed Design & Spec., Tender, Construction (Foundation, Demolition, Site Formation), Construction (Building)]* stage. The technology will be fully utilized in order to achieve the following objectives:

No.	BIM Goal	Description
1	<i>[Reduce Risks]</i>	<i>[Reducing risks and costs of projects as well as enhancing reliability and productivity throughout the project life-cycle from planning, design and construction to operation and maintenance stages]</i>
2	<i>[Enhance Coordination]</i>	<i>[Enhancing and improving the coordination amongst various stakeholders during the investigation, design, construction and operation phases of the Assignment; and]</i>
3	<i>[Constructability]</i>	<i>[Demonstration of constructability of the design]</i>
4	<i>[Input other BIM Goals if applicable]</i>	<i>[E.g. Improve Visualisation, Enable Digital Fabrication, Conduct BIM Quantity Take-off Trials, Conduct Asset Information Model Trials, etc.]</i>

2.3 BIM Scope of Works (SOW) and Services

Summarise BIM SOW as compliant with Agreement/ Contract.

The *[Designer/ Contractor]* shall adopt BIM to enhance and improve the design and coordination amongst various stakeholders for the *[Services / Works]*. The *[Designer/ Contractor]* shall ensure the *[design/ construction/ as-built]* model with accurate information and drawings shall be submitted to *[PTs/ CM]* for acceptance.

The *[design/ construction]* BIM shall show elements in a true representation of the actual conditions for checking critical dimensions for *[design/ construction]*. It shall be used to ensure that there are *[no spatial conflicts such as head-room problems to ensure constructability]*.

The *[Designer/ Contractor]* shall cooperate, work closely with and the stakeholders to ensure that the Works are carried out in full compliance with the *[scope of works/ contract documents]*. The *[Designer/ Contractor]* shall ensure that the BIM requirements are achieved and that the BIM are submitted on time. The *[Designer/ Contractor]* is required to resolve any modelling issues during the *[design/ construction]* stage and to ensure that the BIM are up-to-date and accurate.

The Contractor shall use the BIM to develop the Contractor's design items in accordance with Preliminaries, including elements being manufactured for the Works. The Contractor shall also incorporate all design changes instructed by the CM into the BIM.

3 BIM Uses

3.1 BIM Uses and Tasks

Fill in Level 1 and Level 2 tables per the latest version of HABIMSG for both HA portion and government entrusted portion. Attach the tables as appendices.

Refer to [Appendix I] for Level 1 BIM Use Overview to BIM Uses definition and adoption by work stages.
Refer to [Appendix II] for Level 2 BIM Application Detail as quick reference.

4 BIM Management

4.1 Contact List

The contact point from design team would also serve as Disciplinary BIM Coordinator. At least three contacts shall be provided for BIM Consultant team (BIMSP): BIM Director, BIM Team Leader, BIM Modeller(s).

Role	Entity	Name	Position	Email	Tel. No.
Architectural					
Structural Engineering					
Building Services Engineering					
Landscape					
Civil Engineering					
Geotechnical Engineering					
Quantity Surveying					
Contractor [Remove for Design PxP]					
BIM Consultant [Input BIMSP, if any]			BIM Director		
			BIM Team Leader		
			BIM Modeller		

4.2 BIM Team Resources, Competency and Training

Provide table of planned training sessions, topics and trainer(s).
No. of session shall match Preliminaries Clauses.

Session	Category	Topic	Description	Duration
1.	[e.g. Architectural Modelling and Drawing Production]	[e.g. Project start-up]	[e.g. How to use HA BIM Template to start a project; ...]	[e.g. 4 hours]
2.	[e.g. Structural Modelling and Drawing Generation]	[e.g. Individual Discipline Input]		[e.g. 4 hours]
3.	[e.g. Collaboration with other disciplines]	[e.g. Interdisciplinary Coordination]		[e.g. 4 hours]

4.3 BIM Personnel Change Management

State protocols for informing End Client, Client and PT when BIM personnel changes occur, including minimum notification lead time.

4.4 Standards Referenced

All projects shall prioritise its reference to the latest version of HABIMSG. The version of HABIMSG to be used as a baseline reference shall be the version in force at the time of tender out of the Consultancy Agreement or Works Contract. Exceptions and reasons shall be stated with other standards referenced listed below.

No.	Standard Name	Publisher	Year	Version	Justification for Referencing This Standard
1	Housing Authority BIM Standards and Guidelines	Housing Authority	[2021]	[V2.1]	Prevailing standard as stipulated by contract
2	Guidelines for using Building Information Modelling in General Building Plans Submission.	Buildings Department	[2019]	[-]	Prevailing standard as stipulated by contract

4.5 Information Management Assignment Matrix

Below is a matrix derived from ISO 19650's Assignment Matrix for reference and PTs / BIMSPs / PSPs / Contractors may customize to suit project specific requirement.

		Employer (Appointing Party)	Third Party	Leading Discipline (Appointed Party)	Other disciplines (Appointed Party)		
ISO Sec. Ref.	Task	HA		[Name of Leading Discipline]	[Name of other discipline 1]	[Name of other discipline 2]	[Name of other discipline 3]
5.1.1	Appoint individuals to undertake the information management function	[R, A]	N/A	[]	[]	[]	[]
5.1.2	Establish the project's information requirements	[R, A]	N/A	[]	[]	[]	[]
5.1.3	Establish the project's information delivery milestones	[R, A]	N/A	[]	[]	[]	[]
5.1.4	Establish the project's information standard	[R, A]	N/A	[]	[]	[]	[]

		Employer (Appointing Party)	Third Party	Leading Discipline (Appointed Party)	Other disciplines (Appointed Party)		
ISO Sec. Ref.	Task	HA		[Name of Leading Discipline]	[Name of other discipline 1]	[Name of other discipline 2]	[Name of other discipline 3]
5.1.5	Establish the project's information production methods and procedures	[]	N/A				
5.1.6	Establish the project's reference information and shared resources	[]	N/A				
5.1.7	Establish the project's common data environment	[]	N/A				
5.1.8	Establish the project's information protocol	[]	N/A				
5.2.1	Establish the appointing party's exchange information requirements	[C]	[C]				
5.2.2	Assemble reference information and shared resources	[C]	[C]				
5.2.3	Establish tender response requirements and evaluation criteria	[]	N/A				
5.2.4	Compile invitation to tender information	[]	N/A				
5.3.1	Nominate individuals to undertake the information management function	[]	N/A				
5.3.2	Establish the delivery team's (pre-appointment) BIM execution plan	N/A	N/A				
5.3.3	Assess each task team capability and capacity	[]	N/A				
5.3.4	Establish the delivery team's capability and capacity	[]	N/A				

BIM PROJECT EXECUTION PLAN (PXP)

		Employer (Appointing Party)	Third Party	Leading Discipline (Appointed Party)	Other disciplines (Appointed Party)		
ISO Sec. Ref.	Task	HA		<i>[Name of Leading Discipline]</i>	<i>[Name of other discipline 1]</i>	<i>[Name of other discipline 2]</i>	<i>[Name of other discipline 3]</i>
5.3.5	Establish the delivery team's mobilization plan	<i>[I]</i>	N/A				
5.3.6	Establish the delivery team's risk register	<i>[I]</i>	N/A				
5.3.7	Compile the delivery team's tender response	<i>[I]</i>	N/A				
5.4.1	Confirm the delivery team's BIM execution plan	<i>[I]</i>	N/A				
5.4.2	Establish the delivery team's detailed responsibility matrix	<i>[I]</i>	N/A				
5.4.3	Establish the appointed party's exchange information requirements	<i>[I]</i>	<i>[C]</i>				
5.4.4	Establish the task information delivery plan(s)	<i>[I]</i>	<i>[I]</i>				
5.4.5	Establish the master information delivery plan	<i>[I]</i>	<i>[I]</i>				
5.4.6	Complete appointed party's appointment documents	<i>[R; A]</i>	N/A				
5.5.1	Mobilize resources	<i>[I]</i>	N/A				
5.5.2	Mobilize information technology	<i>[I]</i>	N/A				
5.5.3	Test the project's information production methods and procedures	<i>[C]</i>	N/A				
5.6.1	Check availability of reference information and shared resources	<i>[C]</i>	N/A				
5.6.2	Generate information	<i>[I]</i>	N/A				

BIM PROJECT EXECUTION PLAN (PXP)

		Employer (Appointing Party)	Third Party	Leading Discipline (Appointed Party)	Other disciplines (Appointed Party)		
ISO Sec. Ref.	Task	HA		<i>[Name of Leading Discipline]</i>	<i>[Name of other discipline 1]</i>	<i>[Name of other discipline 2]</i>	<i>[Name of other discipline 3]</i>
5.6.3	Undertake quality assurance check	<i>[I]</i>	N/A				
5.6.4	Review information and approve for sharing	<i>[I]</i>	<i>[I]</i>				
5.6.5	Information model review	<i>[I]</i>	N/A				
5.7.1	Submit information model for appointed parties' authorization	<i>[I]</i>	N/A				
5.7.2	Review and authorize the information model	<i>[C]</i>	N/A				
5.7.3	Submit information model for appointing party acceptance	<i>[I]</i>	N/A				
5.7.4	Review and accept the information model	<i>[R; A]</i>	N/A				
5.8.1	Archive the project information model	<i>[I]</i>	<i>[I]</i>				
5.8.2	Capture lessons learned for future projects	<i>[R; A]</i>	<i>[I]</i>				

Key – R: Responsible for undertaking activity
A: Accountable for activity completion
C: Consulted during activity
I: Informed following activity completion
N/A: Not applicable for this project

*Employer (Appointing Party) shall be HA.
Third Party is a party appointed by Appointing Party directly and not under Lead Appointed Party. Third Party, under authorisation of Appointing Party, may oversee information management functions such as CDE hosting, management and support. Therefore, Third Party may be consulted or informed on information management-related requirement establishment.
"Third Party" column may be deleted if N/A for this project.*

BIM PROJECT EXECUTION PLAN (PXP)

4.6 BIM Workflow

Project BIM Workflow shall follow Overall Workflow Diagram of HABIMSG Quick Guide Level 3 (Q3).
*Provide explanations for any deviation from workflows as outlined in HABIMSG Quick Guide Level 3 (Q3).
The BIM Workflows in Level 3 were mainly developed for design stages. They shall be served as reference for contractors to further develop the workflows made fit for the project conditions and requirements, and provide explanation in the Construction Stage BIM PxP.*

4.7 LOD Responsibility Matrix

Fill in LOD Responsibility Matrix Template per the latest version of HABIMSG.
Refer to [Appendix III] for project-specific LOD Responsibility Matrix.

4.8 LOD Specifications

BIM data required within each model element should be specified as part of the Level of Development (LOD) Specification, which should follow latest adoption of the LOD definitions in HABIMSG Level 4 – Detail Guide.
Unless otherwise specified, HA currently adopts Hong Kong CIC BIM Standards, which contains prevailing LOD specifications under different publications (CIC BIM Standards for *Architectural and Structural Engineering, MEP and Underground Utilities*)
LOD-I specifications: BIM parameters / attributes may be considered as the information required for drawing production or for other BIM Use, shall be input in the model. Minimum requirement on parameters for each BIM element are specified in HABIMSG Level 4 – Detail Guide (Information Requirements).

4.9 Schedule of BIM Deliverables

*Include full lifecycle of planned dates, actual dates and corresponding BIM deliverables per Project Agreement. Grey out past dates without deleting.
Remove inapplicable stages as appropriate.
Alternatively, a bar chart can be shown but actual dates shall not be omitted in the bar chart. This schedule shall be updated at every milestone.*

No.	Milestone	Planned Start	Planned End	Actual Start	Actual End	BIM Deliverables
Feasibility Stage						
	DipCon					
	SPC					
	AAP					
	EAP					
Design Stage						
	PDRC(1)					
	PDRC(2)					
	DRP					
	BSDRP(1)					
	BSDRP(2)					

BIM PROJECT EXECUTION PLAN (PXP)

No.	Milestone	Planned Start	Planned End	Actual Start	Actual End	BIM Deliverables
	BC					
	DDRP(1)					
	DDRP(2)					
	ICU Submissions (GBP)					
	ICU Submissions (Foundation)					
	ICU Submissions (Superstructure)					
Tender Stage						
	Piling Tender Out					
	Building Tender Out					
Construction Stage						
	Combined Services Drawing (CSD) and Model					
	Combined Builders Work Drawing (CBWD) and Model					
	Individual Service (Shop) Drawing					
	As-built BIM Model and Data					

4.10 Approval of BIM Deliverables

Describe approval protocols – which team member is responsible for approval in more detail compared to items 5.7.2 and 5.7.4 of Section 4.5 – Information Management Assignment Matrix.

BIM Deliverables shall be submitted for approval by [Responsible Department during design stage; PT during construction stage; or other responsible parties]. Upon review, revisions shall be provided by responsible BIM author within [10 working days; 20 working days] for further review and endorsement.

4.11 Meeting Schedule

List regular meetings and milestone meetings.

Meeting Type	Project Stage	Frequency	Participants	Description
BIM Kick-off Meeting	[e.g. DipCon]	One time on [DD- MMM-YYYY]		
ICU Submission Preparation	[e.g. PDRC(1)]	Bi-weekly starting [DD- MMM-YYYY]		

4.12 WIP BIM File Exchange Schedule

List BIM WIP file exchange timing.
Use abbreviation (e.g. AR, SE, BSE, LA, CE, GE, BIMSP...) for Author and Receiver.

BIM File Type	Author	Receiver	Frequency	File Format
AR Model Files			[Weekly, Bi-weekly, Monthly] starting [DD-MMM-YYYY] OR one time on [DD-MMM-YYYY]	
SE Model Files				
BSE Model Files				
ICU Drawing Files				
Construction-stage BIM Model Files				
CSD/ CBWD Drawing in Construction Stage				

5 BIM Infrastructure

5.1 Hardware Specifications

Hardware specifications shall be equivalent to or better than Agreement's / Contract's minimum requirements.

Operating System:	[e.g. Microsoft® Windows 10 (or newer) Professional Edition 64-bit Operating System]
CPU Type	[e.g. Intel or AMD CPU, equivalent or better than Core i9-9900k CPU @3.6GHz]
Memory:	[e.g. 64 GB RAM]
Disk Space	[e.g. 1TB SSD + 2TB HDD free disk space]
Video Card:	[e.g. NVIDIA® Quadro RTX 4000 graphics card or equivalent]
LCD Monitor:	[e.g. Video Display 1,920 x 1,080 with true colour]
Media:	[e.g. DVD9 or USB key]
Pointing Device:	[e.g. Mouse or 3Dconnexion® compliant device]
Browser:	[e.g. Microsoft® Edge / Google Chrome]
Connectivity:	[e.g. Internet connection for communication with Project Teams]

5.2 Software Use

DCD latest working version software shall be used to deliver the project. Upon completion of as-built model, an additional set of model(s) upgrade to the latest version that is available in the market shall be provided.

Software	Version	Purpose	Native Format
[Please Specify]	DCD Latest version	Model Authoring [list disciplines, e.g. AR, SE, BSE, LA, QS, LS, CE, GE]	[Please Specify]
[Please Specify]	DCD Latest version	Model Authoring [list disciplines, e.g. LS, CE, GE]	[Please Specify]
[Please Specify]	DCD Latest version	Model Review, 4D Simulation	[Please Specify]
[Please Specify]	[Please Specify]	Simulation Video Viewer	[Please Specify]
[Please Specify]	[Please Specify]	Document/ Report/ Drawing Reader	[Please Specify]
[Please Specify]	[Please Specify]	Data Exported from BIM Files	[Please Specify]
[Others, please specify]	[Please Specify]	[E.g. Software or plugins for trial projects for Quantity Surveying, etc.]	[Please Specify]

5.3 Software Upgrade

Software upgrade shall be executed within [15, 30] working days upon receipt of written request from [PT/CM]. Premature upgrade of individual discipline(s) is not allowed.

5.4 Exchange Formats

In addition to file formats listed in [Section 5.2 – Software Use], the following exchange formats shall be provided at each milestone:

	Native Formats	Exchange File Formats
Models	[Please Specify]	[Please Specify]
Clash Reports	[Please Specify]	[Please Specify]
Drawings	[Please Specify]	[Please Specify]
Final Drawing Format	[Please Specify]	[Please Specify]
Phase Planning (4D Modelling)	[Please Specify]	[Please Specify]

5.5 Common Data Environment (CDE)

PSPs shall establish a BIM collaboration and information sharing methodologies and workflows according to the requirement under PSP agreement. If PSP decides to respond to the requirement by adopting a CDE, the propose CDE shall be specified here.

Contractors shall propose appropriate CDE according to the requirement under the Works contract preliminaries specifications.

[ProjectWise] / [other CDE as proposed] is the project-specific CDE.

PT / BIMSP / PSP / Contractor shall use [ProjectWise Desk Version #10.00.02.265] / [other CDE as proposed]

List additional provisions as applicable, such as version/ revision control, security protocols, user management, access control, BIM collaboration methodology and workflow, model information sharing, project archive, etc.

5.6 Data Security and Backup Protocols

Describe data backup frequency, method and any additional data security protocols.

Data will be backed up [weekly, bi-weekly] to a secure local server location by [BIM Coordinator; other responsible party; automatic mechanism (please describe)].

6 BIM Setup

6.1 Model Template

Refer to HABIMSG Q3-01 and D3.1, state names and versions of template(s) used for each discipline.

HA BIM Template shall be used to create models.

6.2 Model Coordinates

Refer to D.MET-4.2 & 4.3 of D3.4 Model coordinates shall follow the latest version of HABIMSG. State any deviations and rationale. Clearly state relationship between True North and Project North.

Survey Point or Project Base Point coordinate is as follows:

Survey Point coordinate:

Northing: [#####.0mm]

Easting: [#####.0mm]

Elevation: [0.0mm]

Project Base Point coordinate:

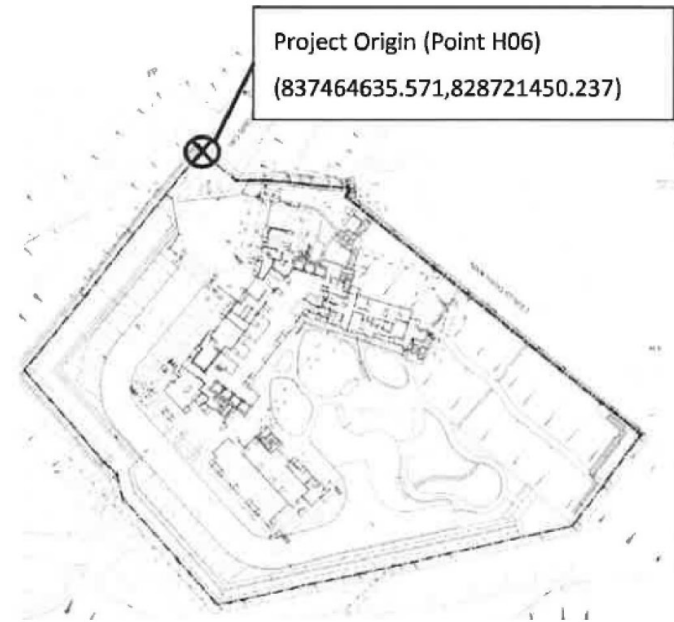
Northing: [#####.0mm]

Easting: [#####.0mm]

Elevation: [0.0mm-Propose GF Level]

Angle to True North: [###.000] degrees

Provide a site plan below with model coordinates highlighted and labelled such as the image below.



6.3 Grid Line

Refer to D.MET-4.2 of D3.4 Survey point, project base point and grid shall follow the latest version of HABIMSG. State any deviations and rationale.

The site plan below shows Project-specific Grid Line arrangement.

Provide a site plan below with model coordinates highlighted and labelled.

6.4 Level

Refer to D.MET-4.4 of D3.4 state project-specific level.

The project-specific level is set per image below:

Provide a screen capture of level settings such as the image below.

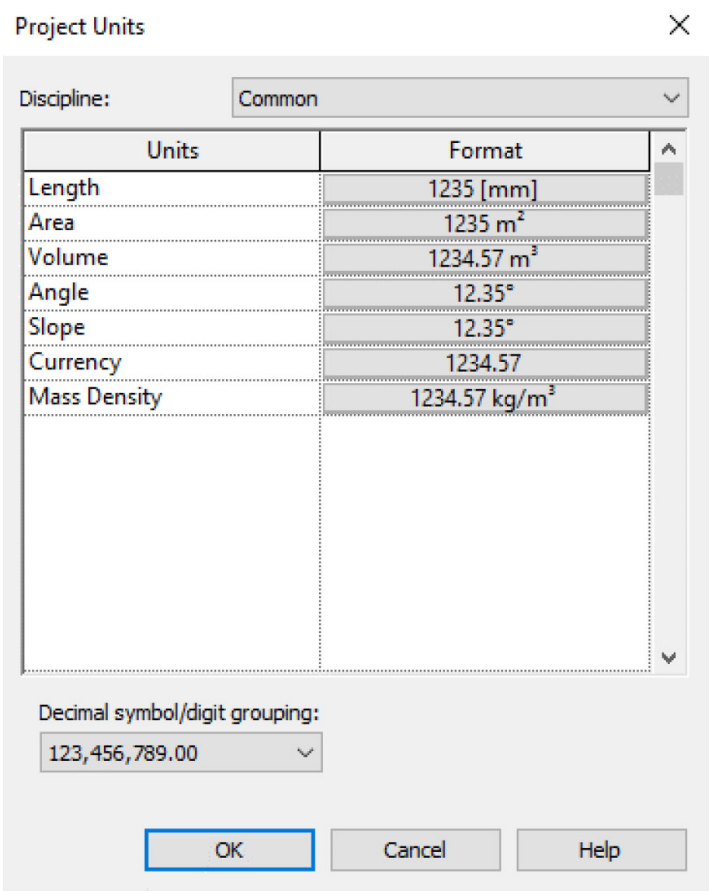


6.5 Modelling Units

Refer to D.MET-4.1 of D3.4 Modelling units shall follow the latest version of HABIMSG.

Below screen capture shows units used in this project.

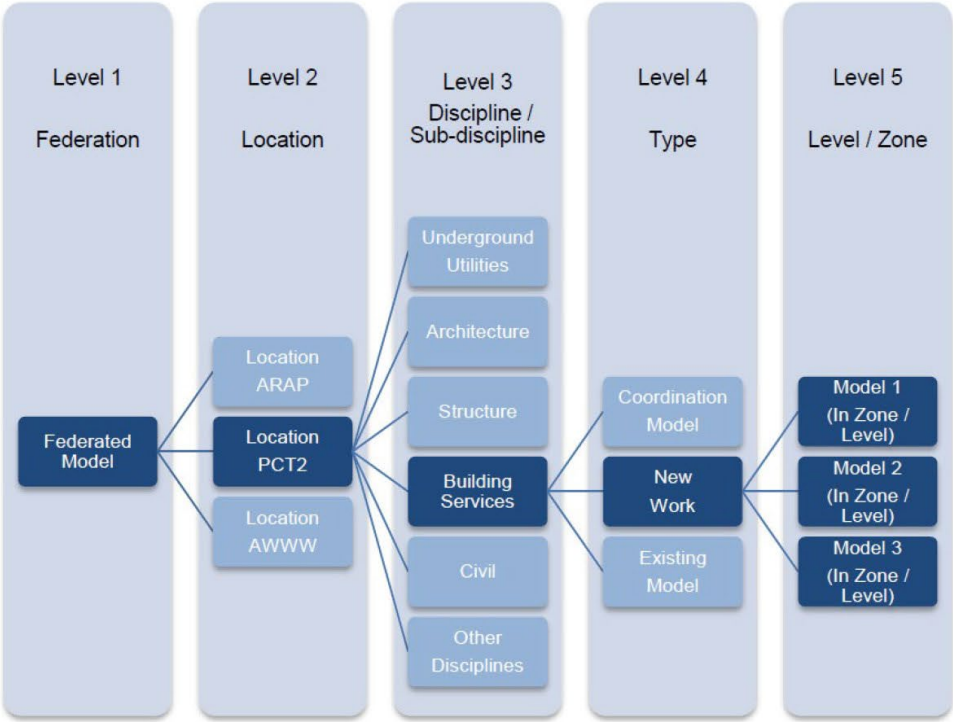
Provide a screen capture of modelling units such as the image below.



6.6 Federation

Refer to D3.2 provide a federation tree diagram showing the federation structure and relationship between files. See example below.

Federation map below shows project-specific BIM file federation structure.
Provide a federation tree diagram similar to the example diagram below:
Example [Design Stage / Construction Stage]:



6.7 Drawing Sheet Templates

The following table lists the scales for this project associated drawing type(s) and template(s):

Scale	Description
[1:100]	[Input template name and description]
[1:500]	[Input template name and description]
[1:1000]	[Input template name and description]

ProjectWise (PW) link on drawing sheet templates can be found via this link:

Discipline	ProjectWise Location Path
Architectural (ARCH)	pw:\PRDDRG15:drms_dcd\Documents\HD Library\BIM\HA BIM Resources\4. HA Project Model Templates\Arc\
Structural (SE)	pw:\PRDDRG15:drms_dcd\Documents\HD Library\BIM\HA BIM Resources\4. HA Project Model Templates\Str\
Building Services (BSE)	pw:\PRDDRG15:drms_dcd\Documents\HD Library\BIM\HA BIM Resources\4. HA Project Model Templates\MEP\

6.8 Annotation, Dimensions, Abbreviations and Symbols

There shall be no deviations from annotation, dimensions, abbreviations and symbols as specified in the latest version of HABIMSG.

Annotation style can be further inputted by PT based on individual project and the latest version of HABIMSG. State deviations and rationales if applicable.

6.9 Colour Scheme

Colour scheme of submission shall follow the colour standard requirement as stipulated in PNAP ADM-19.

PT can assign their custom colour for the purpose of model review and clash detection. CAD Standards for DCD provides reference of colour on different elements of each discipline.

8 BIM File Naming

Adopt HA BIM Naming Standard as compliant with the latest version of HABIMSG. State reasons if there are any deviations.

8.1 Model Naming

Project-specific Model Naming is as followed:

Field	1	2	3	4	5	6	7
HA Customization	Job Number	Phase	Author	Building Type	Level/ Zone	Model Code	Custom Description
No. of Characters in HA Standard	4	2	3	2-4	2-3	2	1-8

Justify deviations from HABIMSG, if any.

Provide a Model File List as Appendix:

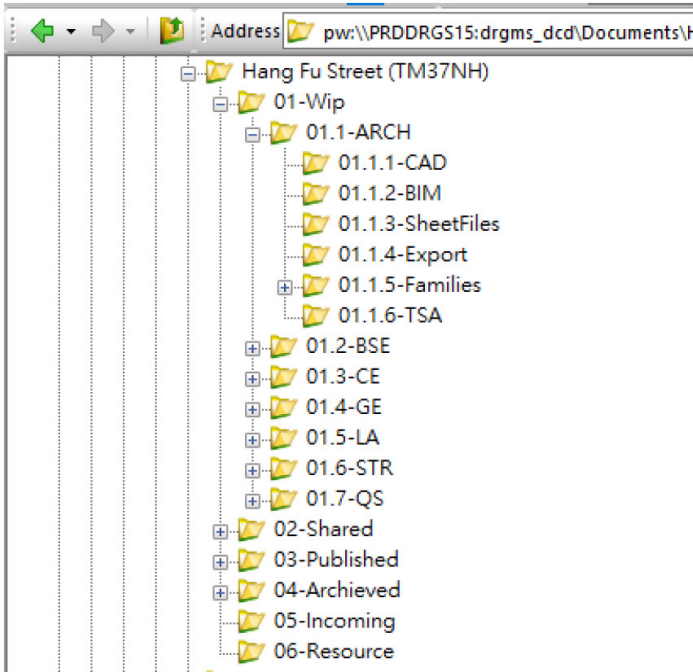
See table below for the project specific BIM models and corresponding description:

Model Name	Description

24

8.2 Folder Naming and Folder Structure

In addition to folder naming, add a folder structure description similar to the example below.



Justify deviations from HABIMSG, if any.

8.3 BIM Object (Family) Naming

In accordance with HABIMSG, family naming format shall be as followed:

<Category> - <Functional Type> - <Originator> - <Descriptor 1> - <Descriptor 2>

Actual examples of families used in this project include:

Family	DOR-SGL-HAA-Wood-w_Louver.rfa	Descriptions
Functional Type*	DOR-SGL-HAA-Wood-w_Louver.rfa	A Door, DOR is the short form of the functional type "door"
Sub-Type*	DOR-SGL-HAA-Wood-w_Louver.rfa	A Single Door, SGL is the short form of the sub-type "single"
Originator	DOR-SGL-HAA-Wood-w_Louver.rfa	HAA is the short form of the Housing Authority Architecture . It can be replaced by the name of the creator in short form of three characters.
Descriptor 1 #	DOR-SGL-HAA-Wood-w_Louver.rfa	A door is made of Wood (Material). An optional descriptive text.
Descriptor 2 #	DOR-SGL-HAA-Wood-w_Louver.rfa	A door is built with Louver . This text further describes the Family
File Extension	DOR-SGL-HAA-Wood-w_Louver.rfa	Revit Family File Extension

Justify deviations from HABIMSG, if any.

8.4 Naming of Drawing Generated from BIM

Naming of drawings generated from BIM shall follow HA's *Document and Drawing Naming Protocols*.

Justify deviations if any.

9 Quality Control

9.1 Quality Control Workflow

[Design] Establish Quality Assurance Plan to ensure appropriate checks on information and data accuracy, and demonstrate quality control checking has been done. Based on Level 3 Workflow of Quality Control in the latest version of HABIMSG, propose a project-specific quality control workflow diagram.

[Construction] Establish Quality Assurance Plan to ensure appropriate checks on information and data accuracy, and demonstrate quality control checking has been done. The BIM Workflow in Level 3 are mainly for design stage. Contractors shall further develop the workflow, which fits with the project conditions, based on the existing Workflow of Quality Control in Quick Guide Level 3 (Q3). and provide explanation in the Construction Stage BIM PxP.

Project-specific quality control checks are as followed:

Checks	Definition	Responsible Party	Software / reference document	Frequency
Standards Check	Check that the models have been created in compliance with the prevailing HA BIM modelling standards, rules and guidelines	<i>[e.g. BIM Manager or BIM Modeller]</i>	<i>[Please Specify]</i>	Once Every 2 weeks
Model Check	Check and validate that the information is align with drawings project team provided	<i>[e.g. BIM Manager or BIM Modeller]</i>	<i>[Please Specify]</i>	Once a week
Drawing Check	All drawing produced from models meet the submission requirement	<i>[e.g. BIM Manager or BIM Modeller]</i>	<i>[Please Specify]</i>	Once a week
Dataset Validation	Ensure that the datasets are populated with correct data	<i>[e.g. BIM Manager or BIM Modeller]</i>	<i>[Please Specify]</i>	Once Every 2 weeks
BIM Checklist	Documents the quality assurance for the BIM deliverables including BIM models and drawings etc,	<i>[e.g. BIM Manager]</i>	<i>HA BIM Checklist (xlsx)</i>	Each deliverable submission
<i>[Construction Stage]</i> Asset Attributes	Ensure that the asset information is entered into models and asset template <i>[COBie worksheets or other tools to be used]</i>	<i>[e.g. BIM Manager or BIM Modeller]</i>	<i>[Please Specify]</i>	<i>[Please Specify]</i>

9.2 BIM Checklist

Refer to *[Annex ANN-1.2 HA BIM Quality Assurance (QA) Checklist]* – BIM checklists for project-specific BIM quality assurance checks.

Use HABIMSG Annex ANN-1.2 HA BIM Quality Assurance (QA) Checklist as the basis, attach project-specific BIM Checklist here or as an appendix.

10 Asset Management (if applicable)

*Describe methodology and process to convert Project Information Model into Asset Information Model.
Delete if Asset Management is not a required BIM Use.
This section is only applicable to trial projects with AM scope. Delete section if inapplicable.*

The BIM model will be used for maintenance scheduling and asset management in construction stage or O&M stage. *[COBie worksheets or other tools to be used]*, which are containing the attribute information of model elements, will be exported from BIM models for asset management. For the details of attribute information for some model elements at respective LOD, it should be referred to *[Appendix # - input appendix number and title]* from HA EMD on Asset Code Naming. The Contractor should coordinate with HA EMD team to define the attributes which are not specified in HA EMD on Asset Manual and propose for CM's approval.

All attributes of HA's assets should be classified into *[two]* types, common attributes and specific attributes. The attributes for asset management should be incorporated in the BIM elements or models as shared parameters.

Common Attributes include:

- Asset Code
- CAT Code
- Location Code

All HA's assets should contain these *[three or other number]* common attributes.

ANN-1.2. HA BIM Quality Assurance (QA) Checklists.

ANN-1.2a. Project Startup Checklist

This checklist should be submitted before the Kick-off Meeting and along with WIP BIM submission until BIM Project execution Plan (PxP) approval or all the check items have been settled. BIM models submitted to HA or should be accompanied by this Checklist with the self-check portion completed.

ProjectWise Location of BIM QA Checklist:

pw:\\PRDDRG15:drgms_dcd\\Documents\\HD Library\\BIM\\HA BIM Resources\\3. HA BIM Quality Assurance (QA) Checklists\\

ANN-1.2b. Model Compliance Checklist

This checklist is mandatory for all work in progress (WIP) submission for each stage and at each milestone submission. Frequency of submission of the BIM Quality Assurance Report shall normally be every 3 months, or as agreed by the Project Team. BIM models submitted to HA or should be accompanied by this HA BIM Checklist with the self-check portion completed. HA or BIMSPs may further check the conformance between models and the Checklists and then reject / send back to authoring parties if significant non-conformance occurs.

ProjectWise Location of BIM QA Checklist:

pw:\\PRDDRG15:drgms_dcd\\Documents\\HD Library\\BIM\\HA BIM Resources\\3. HA BIM Quality Assurance (QA) Checklists\\

ANN-1.3. HA Modelling Resources

The following modelling resources can be found from the following location in HA ProjectWise.
(BIMSPs, PSPs, consultants and Contractors, shall obtain these relevant materials from their corresponding HA Project Team Senior Technical Officer (STO)).



ANN-1.3a. HA Project Model Templates

ProjectWise Location of HA Project model templates:

Discipline	ProjectWise Location Path
Architectural (ARCH)	pw:\\PRDDRG15:drgms_dcd\\Documents\\HD Library\\BIM\\HA BIM Resources\\4. HA Project Model Templates\\Arc\\
Structural (SE)	pw:\\PRDDRG15:drgms_dcd\\Documents\\HD Library\\BIM\\HA BIM Resources\\4. HA Project Model Templates\\Str\\
Building Services (BSE)	pw:\\PRDDRG15:drgms_dcd\\Documents\\HD Library\\BIM\\HA BIM Resources\\4. HA Project Model Templates\\MEP\\

The Project templates files shall contain the essential file setup. The same template files shall be used for respective discipline to create both the Authoring Models (actual modelling) and Sheet Models (for drawing production).

Name	Description	Discipline	WorkStage
HAA-ARC_Template	Architectural template	Architecture	All stages
HAS-STR_Template	Structural template	Structure	All stages
HAB-MEP_Template	BS template	Building Services	All stages

ANN-1.3b. HA Family Library

ProjectWise Location of HA Family Library (QTO-enabled):

Discipline	ProjectWise Location Path
Architectural (ARCH)	pw:\\PRDDRG15:drgms_dcd\\Documents\\HD Library\\BIM\\HA BIM Resources\\5. HA Family Library\\ARCH\\QTO (List of QTO enabled families)\\
Structural (SE)	pw:\\PRDDRG15:drgms_dcd\\Documents\\HD Library\\BIM\\HA BIM Resources\\5. HA Family Library\\SE\\QTO (List of QTO enabled families)\\
Building Services (BSE)	pw:\\PRDDRG15:drgms_dcd\\Documents\\HD Library\\BIM\\HA BIM Resources\\5. HA Family Library\\BSE\\QTO (List of QTO enabled families)\\

ProjectWise Location of HA Family Library (non QTO-enabled):

Discipline	ProjectWise Location Path
Architectural (ARCH)	pw:\\PRDDRG15:drgms_dcd\\Documents\\HD Library\\BIM\\HA BIM Resources\\5. HA Family Library\\ARCH\\
Structural (SE)	pw:\\PRDDRG15:drgms_dcd\\Documents\\HD Library\\BIM\\HA BIM Resources\\5. HA Family Library\\SE\\
Building Services (BSE)	pw:\\PRDDRG15:drgms_dcd\\Documents\\HD Library\\BIM\\HA BIM Resources\\5. HA Family Library\\BSE\\



ANN-1.3c. HA Shared Parameter Lists

ProjectWise Location of HA Shared parameter lists:

Discipline	ProjectWise Location Path
Architectural (ARCH)	pw:\\PRDDRG15:drgms_dcd\\Documents\\HD Library\\BIM\\HA BIM Resources\\6. HA Shared Parameter Lists\\Arc\\
Structural (SE)	pw:\\PRDDRG15:drgms_dcd\\Documents\\HD Library\\BIM\\HA BIM Resources\\6. HA Shared Parameter Lists\\Str\\
Building Services (BSE)	pw:\\PRDDRG15:drgms_dcd\\Documents\\HD Library\\BIM\\HA BIM Resources\\6. HA Shared Parameter Lists\\MEP\\

The Shared Parameter List shall contain the essential shared parameters. The parameters shall be used for creation of BIM objects and schedules and for drawing preparation.



ANN-1.3d. Abridged Version of Modular Flat Design (MFD) Models

ProjectWise Location of the Abridged Version of Modular Flat Design (MFD) models for incorporation in project models:

Discipline	ProjectWise Location Path
Architectural (ARCH)	pw:\\PRDDRGs15:drgms_dcd\\Documents\\HD Library\\BIM\\HA BIM Resources\\7. Abridged Version of Modular Flat Design (MFD) Models\\

ANN-1.4. HA BIM QTO Scope

This Annex list out the modelling items in Design BIM models that shall be under the BIM Quantity Take-off (QTO) scope currently implemented by HA. PTs, PSPs and BIMSPs shall refer to the BIM QTO scope listed in the below table, follow **the modelling and information requirements listed in relevant SAM sections of HABIMSG** and **shared parameter lists** provided (details refer to **Vol.1 Detail Guide 2.4 Starting a BIM project**) to create BIM models that enable BIM QTO.

For HA QTO enabled families, the QTO parameters are prepared by Shared Parameters. It is required to assign the same Shared Parameters with correct name and type from HA Shared Parameter Lists to the constraints. Otherwise, the pre-set schedule and formula may not retrieve the correct data from the family. Implications refer to Shared Parameter under section **D4.18 HA Family Library Component FL-03 Parameters**.

Discipline	Modelling items for QTO	Reference section(s) in this HABIMSG
Structural Engineering (SE)	<p><u>Foundation Works</u></p> <p>A. Piling works</p> <ul style="list-style-type: none">Bored piles, driven steel H piles, socketed steel H piles and mini-piles <p>B. Concrete works</p> <ul style="list-style-type: none">Pile caps, tie/strap beams and footings <p>C. Excavation works</p> <ul style="list-style-type: none">3D terrain model for topography of existing levels <p>Excluding reinforcements, formworks(*) and any other items not listed above</p>	<p><u>D4.5 Structure - Foundation SAM</u></p> <ul style="list-style-type: none">DS-F 01-06DS-F 07-09DS-F 01
Structural Engineering (SE)	<p><u>Superstructure Works</u></p> <p>A. Domestic Typical Floors</p> <ul style="list-style-type: none">In-situ concrete works for slabs, walls, columns and beams (#) <p>Excluding reinforcements, formworks(*) and any other items not listed above</p>	<p><u>D4.4 Structure - Superstructure SAM</u></p>

Note:

- (#) The designated BIM QTO scope is only applicable to in-house Projects by PTs and BIMSPs.
- (*) Modelling of formwork separately is not required, but it is required to include QTO information as much as possible in objects of concrete works.

Discipline	Modelling items for QTO	Reference section(s) in this HABIMSG
Architecture (A)	<p><u>Architectural Works</u></p> <p>A. All Areas</p> <ul style="list-style-type: none">DoorsWindows <p>B. Domestic Floors</p> <ul style="list-style-type: none">Brickwork & blockworkPanel wallsNon-structural concrete walls (#)SignageSanitary fittings (wash basin, sink units and W.C. only) in domestic flatsCloth drying and curtain rails, grab rails, laundry rack, cooking bench units in domestic flats <p>Excluding reinforcements, formwork (*) and any other items not listed above</p>	<p><u>D4.3 Architecture SAM</u></p> <ul style="list-style-type: none">DA-07DA-09DA-01DA-01DA-01DA-30DA-20DA-31 <p><u>D3.5 From Modular Flat to Project</u> D.MET-5.1</p>

ANN-1.5. BIM Training Videos

The BIM training videos serve as additional resources to supplement the application of HABIMSG Vol.2.

ANN-1.5a. List of video by DCD on HA modelling

HA-Training Videos prepared by BIMST focus on HA-specific practices, key execution toolkits and important techniques during modelling, coordination and drawing production etc for users experienced in DCD projects. For BIM software’s basic functions and commands in detail, users shall refer to the software manual or user guide.



This icon locates in various topics in HABIMSG, users may refer to the listed training video’s chapter “X”.

For HA staff, the videos can be accessed via the e-Learning Portal.

Website:

Access from office:

<https://elearn.int.housingauthority.gov.hk/HAELP/portal/directAccess?viewKnowledgeSubjectDetail=0000002145>

Access from other locations:

https://www.staff.housing.gov.hk/elearning_jct/HAELP/portal/directAccess?viewKnowledgeSubjectDetail=0000002145

BIMSPs, PSPs, consultants and Contractors shall obtain these videos from their corresponding HA Project Team’s Senior Technical Officer (STO) from Projectwise:

pw:\\PRDDRG15:drms dcd\\Documents\\HD Library\\BIM\\HA BIM Resources\\8. BIM Training Videos\\



ANN-1.5b. List of Video by ICU on GBP, Foundation Plan and Superstructure Plan Submission



Furthermore, there is list of videos in conjunction with the BIM Standards and Modelling Guidelines for Statutory and Building Control Submission of General Building Plan, Foundation Plan and Superstructure Plan prepared by Independent Checking Unit (ICU) focusing on preparation of ICU GBP, Foundation Plan and Superstructure Plan Submission. PSPs / Contractors / BIMSPs shall contact ICU through PTs and sign the disclaimer form in order to acquire the tutorial videos

ANN-1.6. I.T. Setup Recommendation

ANN-1.6a. Hardware

Hardware shall refer to the latest HA hardware specifications and as per contract conditions.

Hardware requirements vary according to the number of participants, various building stages and complexity of projects. As a reference, for large multidisciplinary projects, the following hardware specifications are recommended as minimum for efficiency.

CPU type	CPU with performance benchmark ⁽¹⁾ score of 18,000 or above. <i>Note: Revit productions will use multiple cores for many tasks, using up to 16 cores for near-photorealistic rendering operations. It should be noted, however, that up to Revit 2018 version, still only single core is being utilized for Revit operations.</i>
Memory	Min 32GB (2 x 16) DDR4 2666 UDIMM NECC Memory. <i>Note:</i> <ul style="list-style-type: none">- As a general rule of thumb, RAM = 20 x Total File Size (Including Link Files)- This estimate is based on internal testing and customer reports. Individual models will vary in their use of computer resources and performance characteristics.- Models created in previous versions of Revit may require more available memory for the one-time upgrade process.- As projects progress, the amount of information and RAM used will increase through time. More RAM such as 64GB may be needed to ensure the practicality of the models. Performance tests on RAM is being carried out at the time of this publication Nov 2017 and may be subject to review.
Video display	2 x 27" 1920 x 1080 LCD monitors.
Video adapter	Dual-display Graphics Card with video performance benchmark ⁽²⁾ score higher than 8000 and, at least 6 GB GDDR5 GPU Memory.
Disk space	<ul style="list-style-type: none">- 1TB SSD (1st Hard Drive)- 2TB 7200rpm SATA HDD (2nd Hard Drive)
Connectivity	Internet connection for license registration and prerequisite component download

⁽¹⁾ High End CPU score - https://www.cpubenchmark.net/high_end_cpus.html

⁽²⁾ High End Video Card score - https://www.videocardbenchmark.net/high_end_gpus.html

ANN-1.6b. Operating System

Operating system	<ul style="list-style-type: none">• Microsoft® Windows® 10 Pro or later version, 64-bit
-------------------------	---

ANN-1.6c. Network

Giga bit Network is preferred, especially when the team is working in a worksharing mode as there are live monitoring of every user's activity by the central file.

ANN-1.6d. Software

- It should be aware that BIM software is NOT backward compatible, i.e. cannot be saved as an earlier version. Once an older version file is read by later version software and saved, it will no longer be compatible with the older version software. The whole team has to upgrade to that later version software. Do discuss with whole project team before any software upgrade is launched.
- A strategy should be established among the project team on the software upgrades.
- For drawing production or analysis purposes, it is suggested that a consistent software platform should be adopted for the collaboration of BIM projects.
- If 3rd party applications are used, originators should ensure the all file versions are compatible.

Major software and files types:

For information, table below lists out the major software and file types that HA adopts currently.

Software	Major function	Compatible file format (could be imported / linked)	Applicable file output
Revit	<ul style="list-style-type: none">• Model Authoring• Drawing production• Simple walkthrough video• Rendering perspective• Information extraction	<ul style="list-style-type: none">• CAD formats• DWF• NWC/ NWD (Navisworks)• ADSK• IFC• gbXML	<ul style="list-style-type: none">• Revit files• CAD formats• DWF• ADSK• NWC• gbXML• IFC• FBX• TXT (schedule)
Navisworks	<ul style="list-style-type: none">• 3D coordination• Walkthrough video• Construction simulation• Animation	<ul style="list-style-type: none">• Revit files• Most of 3D file formats	<ul style="list-style-type: none">• Navisworks format
Design Review	<ul style="list-style-type: none">• DWF drawing review• DWF drawing comparison and comment	<ul style="list-style-type: none">• DWF	<ul style="list-style-type: none">• DWF

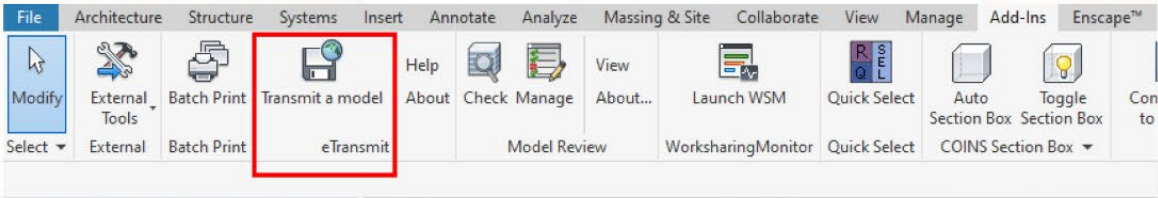
ANN-1.7. Common Errors and Recommendations

Common errors are consolidated in this chapter and recommendations are listed for users' reference.

Standards and Submission Requirements

Slide 1

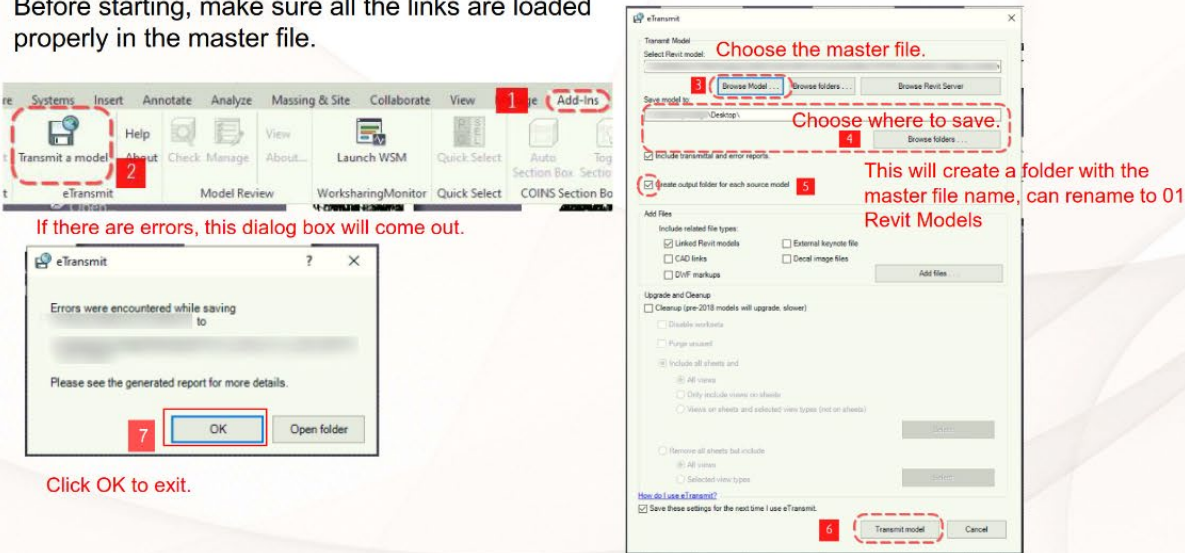
- All submitted BIM models should be consolidated via “eTransmit” in order to sustain the relationship between the external link models.
- Use e-transmit to send files with links intact.



Slide 2

How to e-transmit (for single Master Files)

Before starting, make sure all the links are loaded properly in the master file.

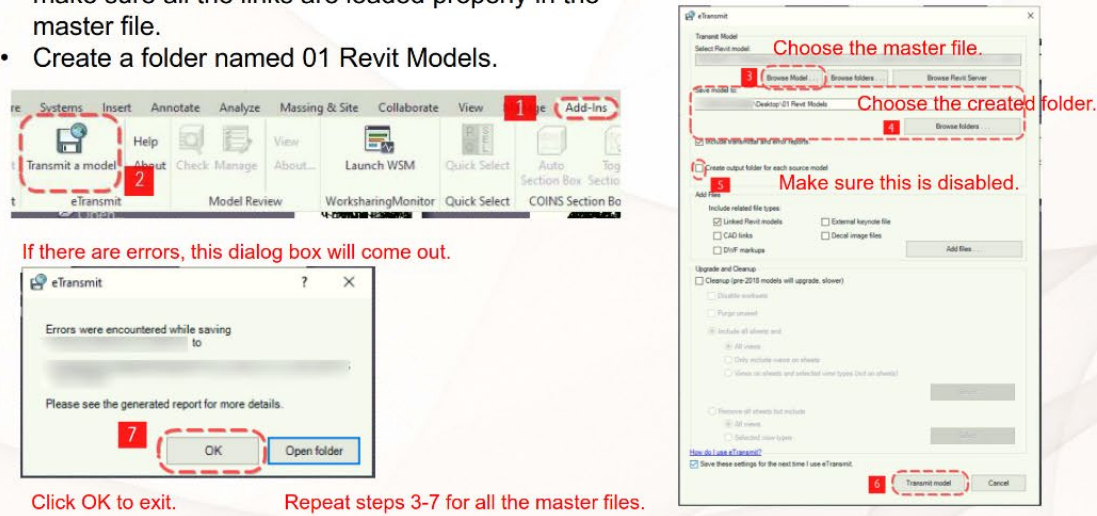


Slide 3

How to e-transmit (for multiple Master Files)

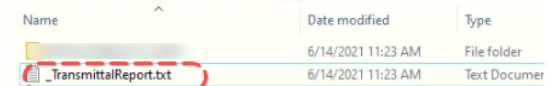
Before starting:

- make sure all the links are loaded properly in the master file.
- Create a folder named 01 Revit Models.



Slide 4

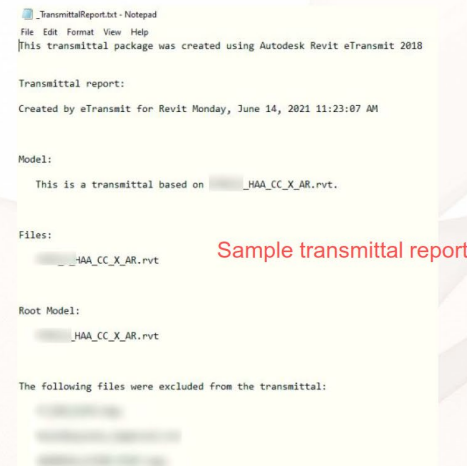
Opening E-transmit Error Reports:



Open the transmittal Report to check if there are any errors.

The following files could not be located or included due to errors:

Check if there are missing models in this section, the models might be not linked properly.



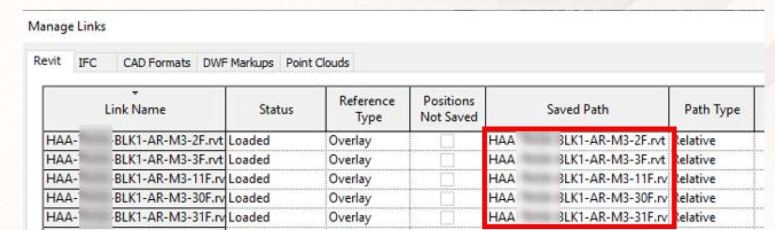
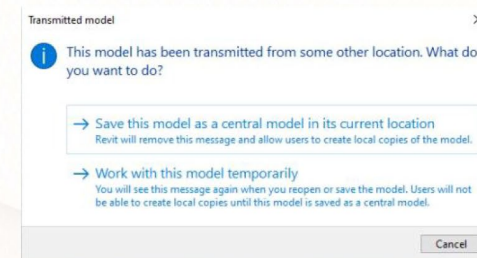
Sample transmittal report

Slide 5

How to e-transmit properly:

Note:

- Do not move or rename the files in the folder.
- If the e-transmitted files are edited or tampered, the link will break.
- Make sure to use the master file that has all the links linked in.
- No need to open or detach the file, just open e-transmit and select the central file from server.
- If e-transmit is successful, the model will show this dialogue when opening:

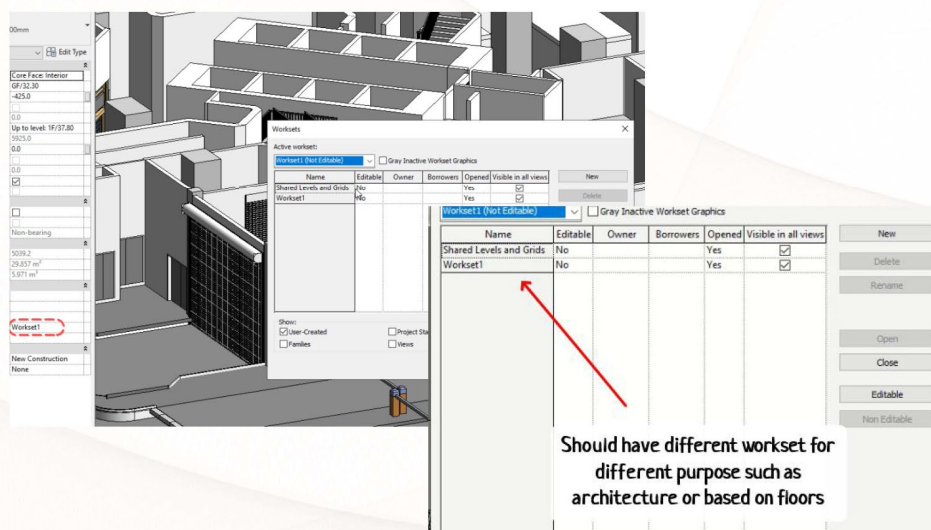


All link models will be loaded, file name will be shown under "Saved Path", instead of file directory.

Slide 6

- Worksharing

- Set the model as worksharing and prepare appropriate worksets and assign objects to suitable worksets (serving similar function as “layer” in AutoCAD).



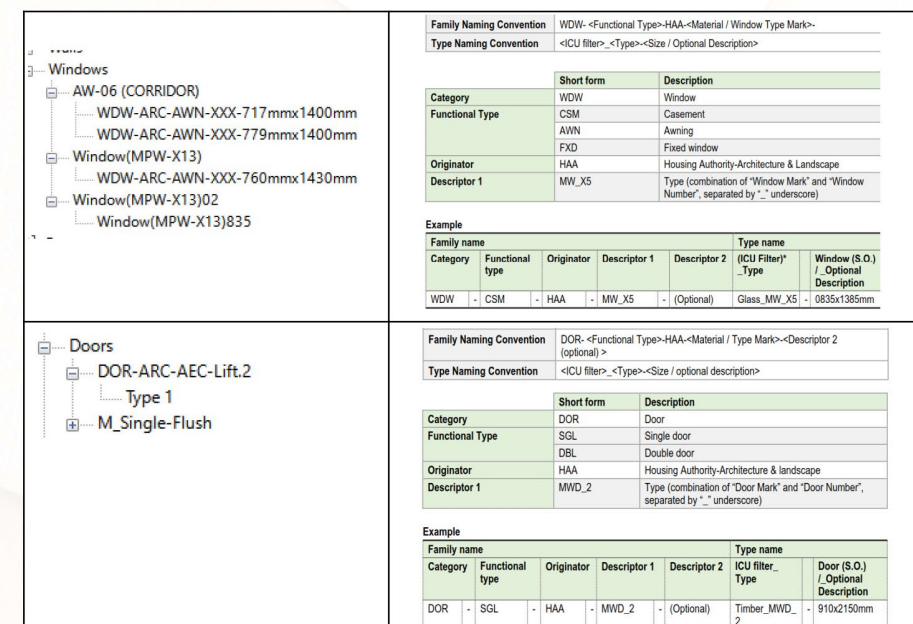
Should have different workset for different purpose such as architecture or based on floors

Recommendation

- All project models (except MFD) should be saved as worksharing model to allow multiple users to access and modify the file at the same time.
- Better control on the backup.
- Worksets served as an extra information container for the elements for filtering and visibility control.
- Rename “Workset1” to “General Modelling”
- “Placeholder” in ARC model for structural elements.

Slide 7

- Family naming did not follow HABIMSG.



Recommendation

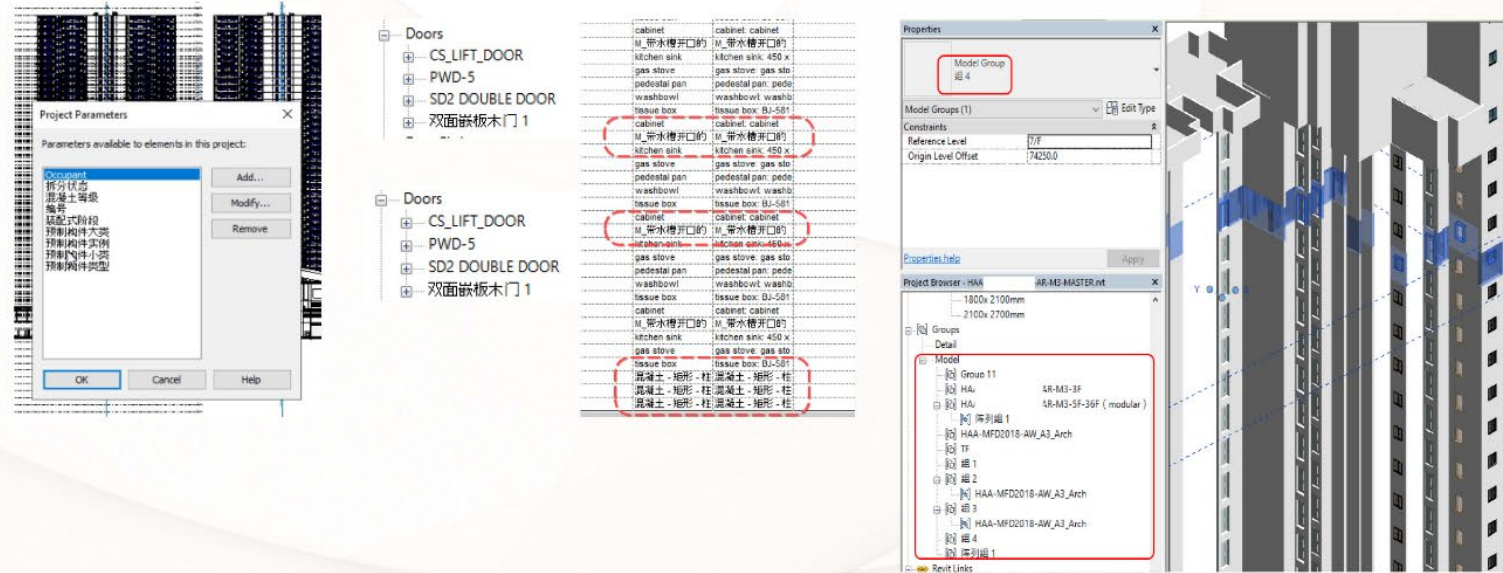
- Follow the naming convention and requirement stated in HABIMSG.

Drawback

- May affect the default view template's filter settings.
- Improper family naming increased the burden on HA family management.

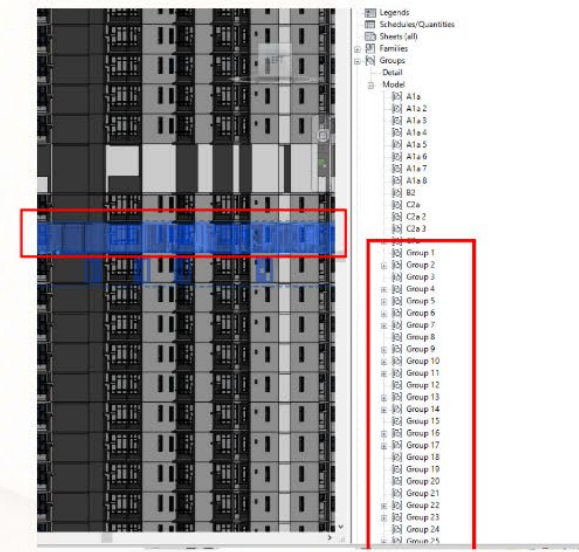
Slide 8

- No Chinese Version Software is allowed for this agreement.
- Parameters, object name, type name should be in English.



Slide 9

- Naming Management for Group



Drawback

- Unclear group name may lead confusion when reuse the model group.

Recommendation

- Suggest to rename groups clearly according to the purpose.
- Be careful of the grouped elements (which are not located in same level)

Slide 10

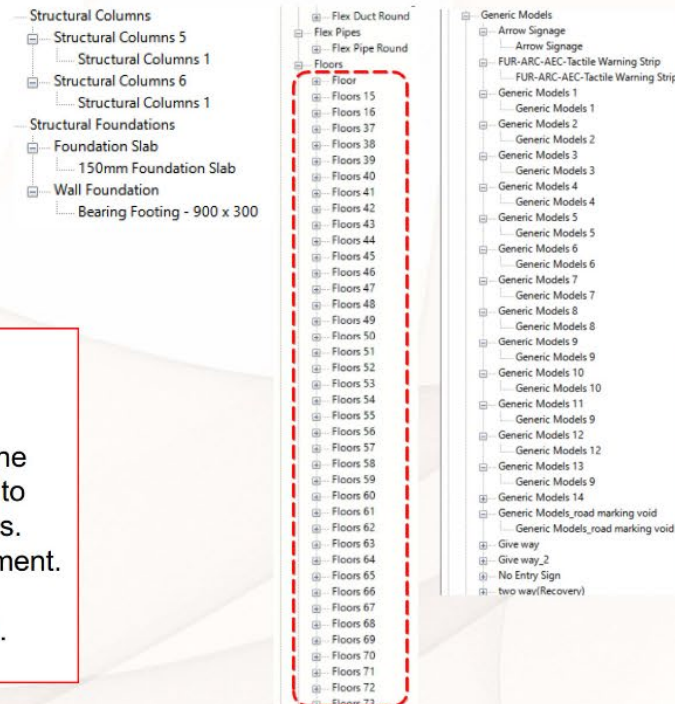
- Extensively used in-place families

Drawback

- Model-in-place would enlarge the model file size.
- Could not reuse again

Recommendation

- Prepare an individual parametric family if the shape or form will be used repetitively.
- Generic Model category is the last option.
- "In-place" family approach is the last resort if the shape is designed and developed referencing to the curved site condition, or irregular odd forms.
- Family name should follow HABIMSG requirement. It is recommended to indicate the location or special purpose as the last family naming field.



Slide 11

- Do NOT over model.



Drawback

- Increase the model file size.

Recommendation

- Double check on the purpose of modelling and LOD-G requirement.
- It is not recommended to model the existing site condition in this detail level.

Slide 12

Project Setup

Slide 13

- Overlapping of levels



Recommendation

- Make use of view template to turn off the levels from link files.

Drawback

- If view template is not used, then repetitive "Level" visibility off setting may be needed.
- Overlapping levels from Typical Floor Link Model may block the elevations and lead confusion.

Slide 14

- Typical floor link is not duplicated for block in master model.



Drawback

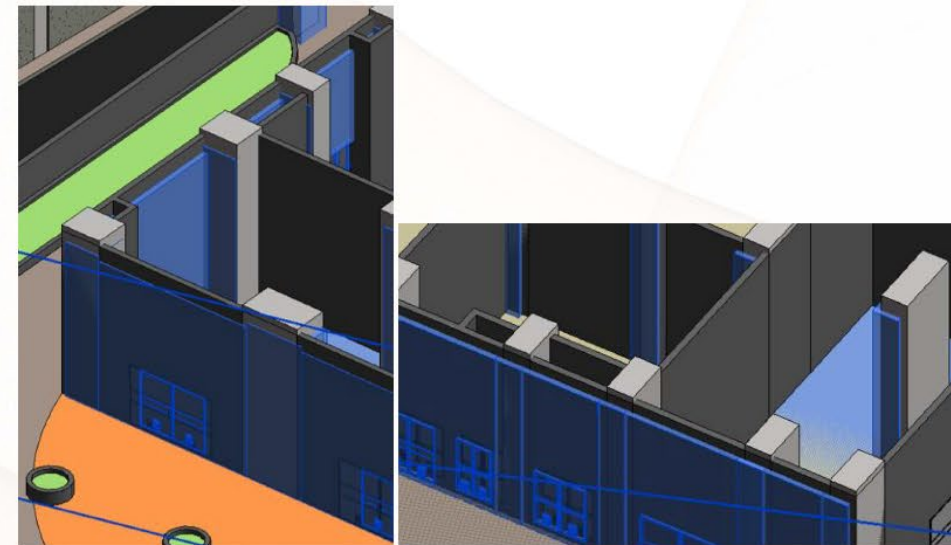
- Cannot see the connection for whole systems.
- Affect element's count in schedules.

Recommendation

- Array/ copy the link for the typical floor (or same design levels).

Slide 15

- Double check reference models' position.



Drawback

- Confusion of element reference.

Recommendation

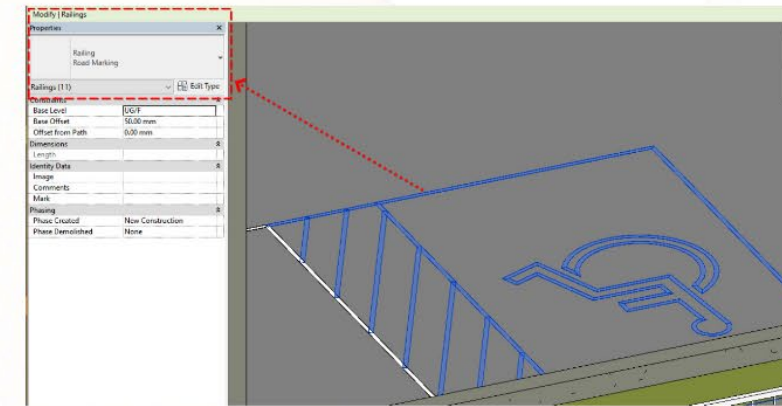
- Double check the project coordinates according to ARC Master Model (Project base point, survey point, (and internal origin if possible)).
- Double check the link models' coordinates.
- Pin the link model after link.

Slide 16

Wrong Category

Slide 17

- Model Category
 - Prepare family using Parking category instead of Railing



Drawback

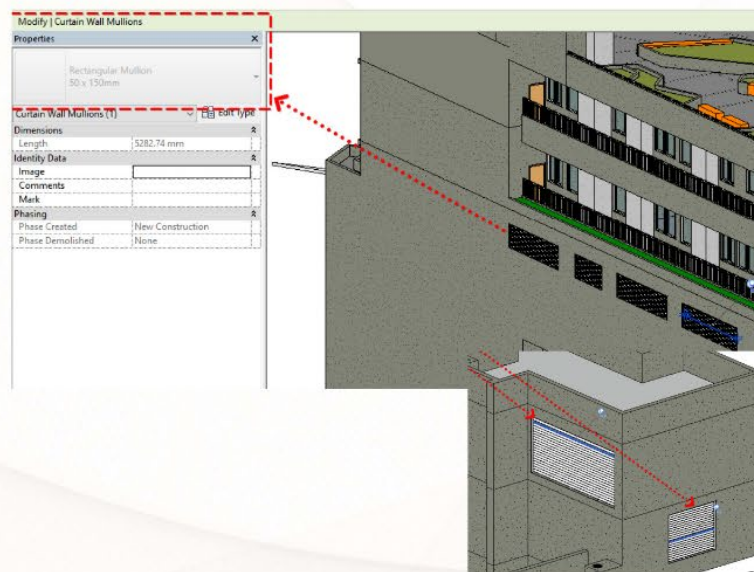
- Wrong category would create confusions to successor / end-users.
- Railing could not retrieve the count number of “balustrade”.
- After the QTO results (without giving prior notice to related parties / handover)

Recommendation

- Prepare an individual family for the parking symbol.

Slide 18

- Model Category
 - Misuse of curtain wall



Drawback

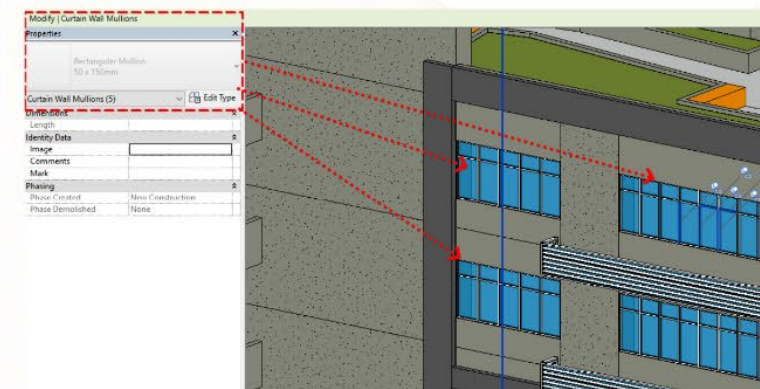
- Curtain Wall vs Glass Wall vs Louver (different trade)
- Data of louver could not be stored or retrieved for louver schedule, such Louver Height, Framing Size etc.

Recommendation

- Prepare a Louver family using window category.
- Geometry should be controlled by parameters.

Slide 19

- Model Category
 - Misuse of curtain wall



Drawback

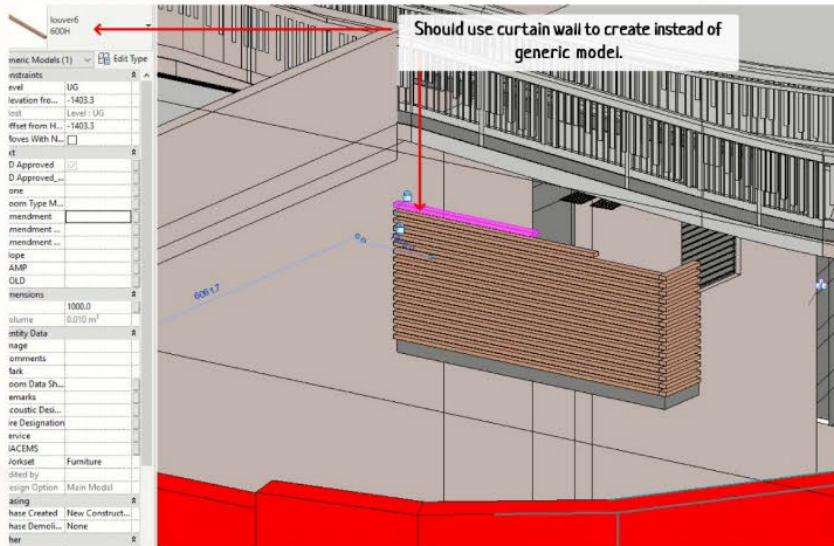
- Curtain Wall vs Glass Wall vs Louver vs Window (different trade)
- Data of window could not be stored or retrieved for window schedule.

Recommendation

- Prepare a window family using window category.
- Geometry should be controlled by parameters.

Slide 20

- Model Category
 - Over-modelling



Drawback

- Too time consuming to model piece-by-piece

Recommendation

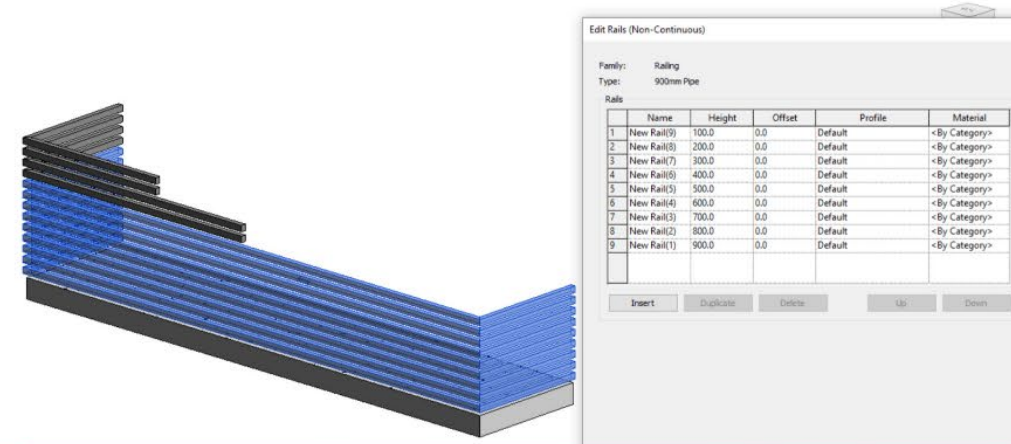
- For feature wall, you may consider using curtain wall / railing for better efficiency.
- Need to report to project team of using special category / model skill.

Slide 21

- Model Category
 - Over-modelling

Recommendation

- For façade feature, you may consider using curtain wall / railing for better efficiency.
- Need to report to project team of using special category / model skill.

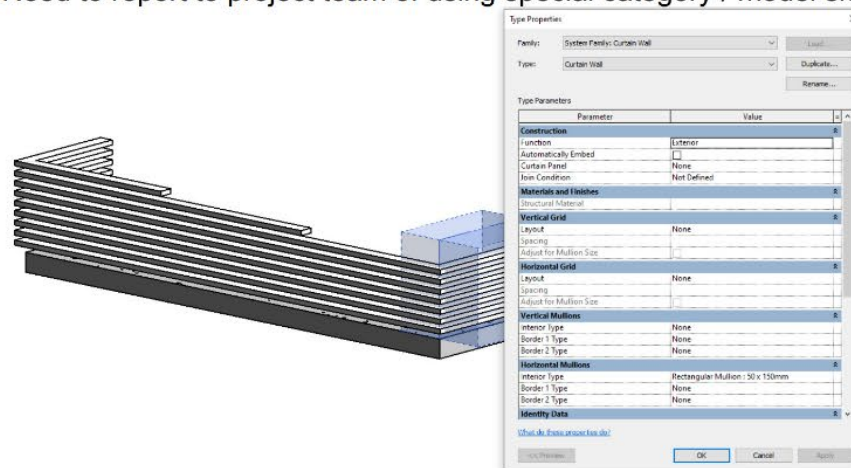


Slide 22

- Model Category
 - Over-modelling

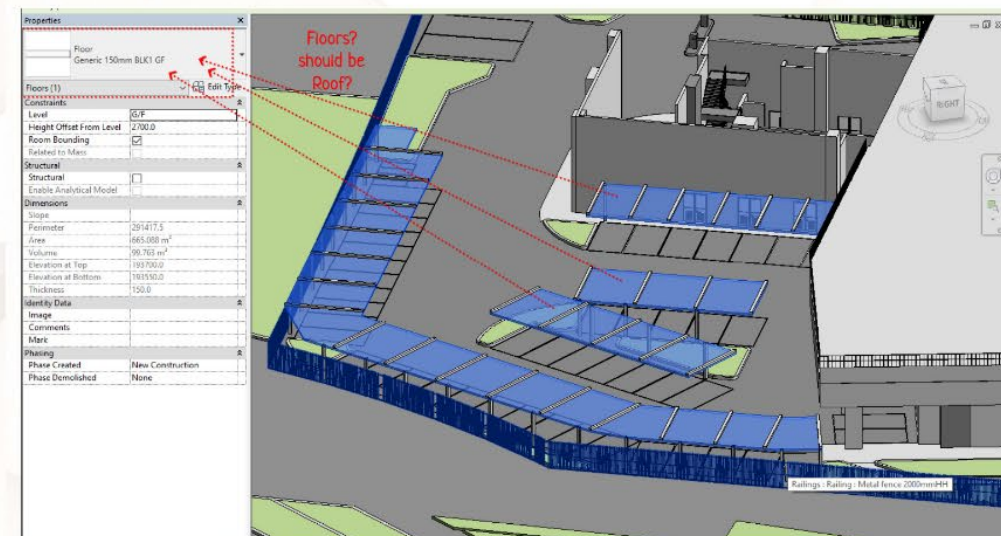
Recommendation

- For façade feature, you may consider using curtain wall / railing for better efficiency.
- Need to report to project team of using special category / model skill.



Slide 23

- Wrong category assignment



Drawback

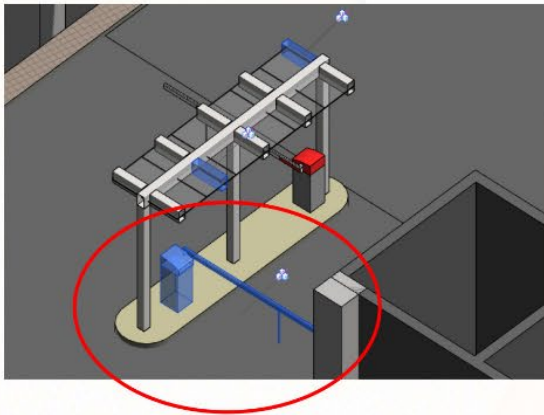
- This would affect the integrity of the models.

Recommendation

- Make use of roof or even a parametric family to model the walkway cover.

Slide 24

- Site Equipment should be created in a family file, not model in place.



Drawback

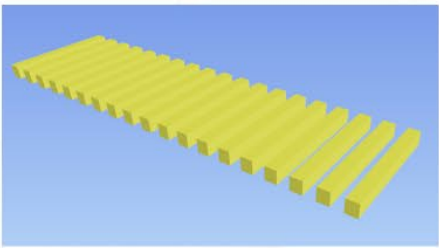
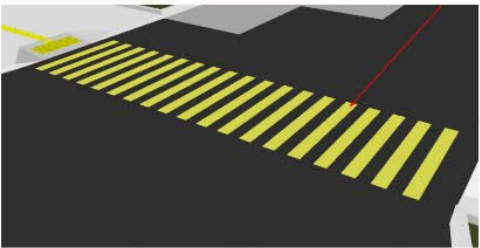
- The family may be placed repeatedly. Model-in-place would enlarge the model file size.

Recommendation

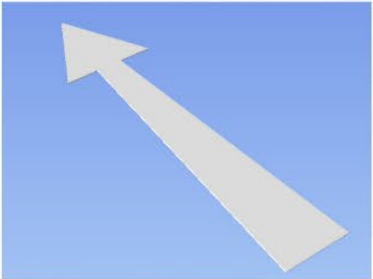
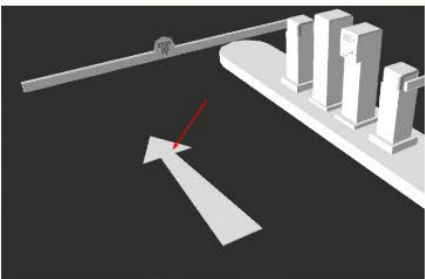
- Prepare as custom family and reuse it in the project.
- Avoid **OVER-MODELLING**.

Slide 25

- Wrong Category for Road Markings



Property	Value
Name	AFL-HAA-Concrete-Cross
Type	AFL-HAA-Concrete-Cross
Family	Floor
Category	Floors



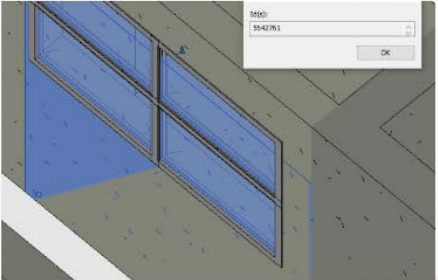
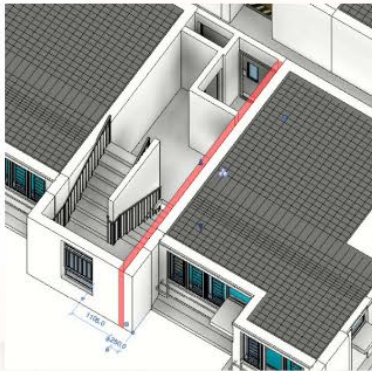
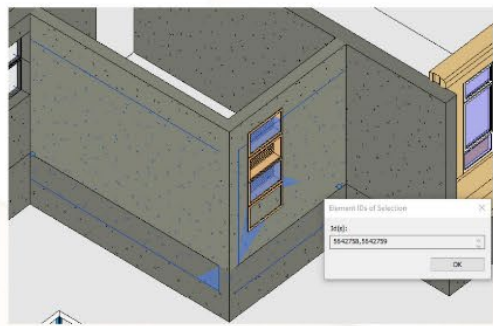
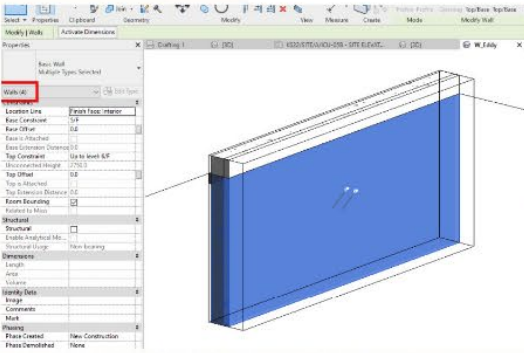
Property	Value
Name	SPQ-OTR-HAA-Roadmark-Direction Straight-T0002
Type	Generic Models

Slide 26

ARC Modelling

Slide 27

- Duplicate Walls found in the model



Drawback

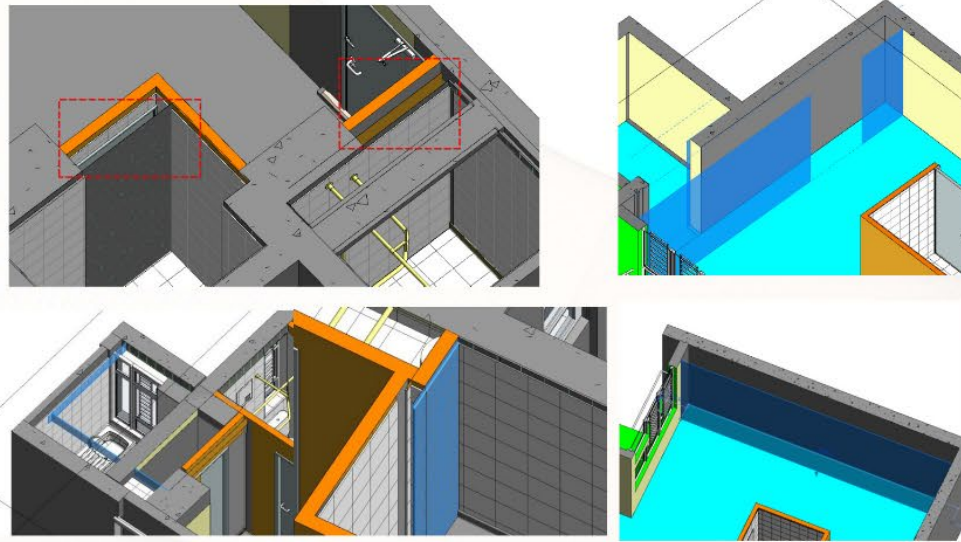
- Duplicated elements affect the integrity of the models.
- Confusion of element reference and control.

Recommendation

- Make use of “Clash Detection – Duplicates Type” in Navisworks to find out the duplicated elements.

Slide 28

- Wall layers not aligned with each other.



Drawback

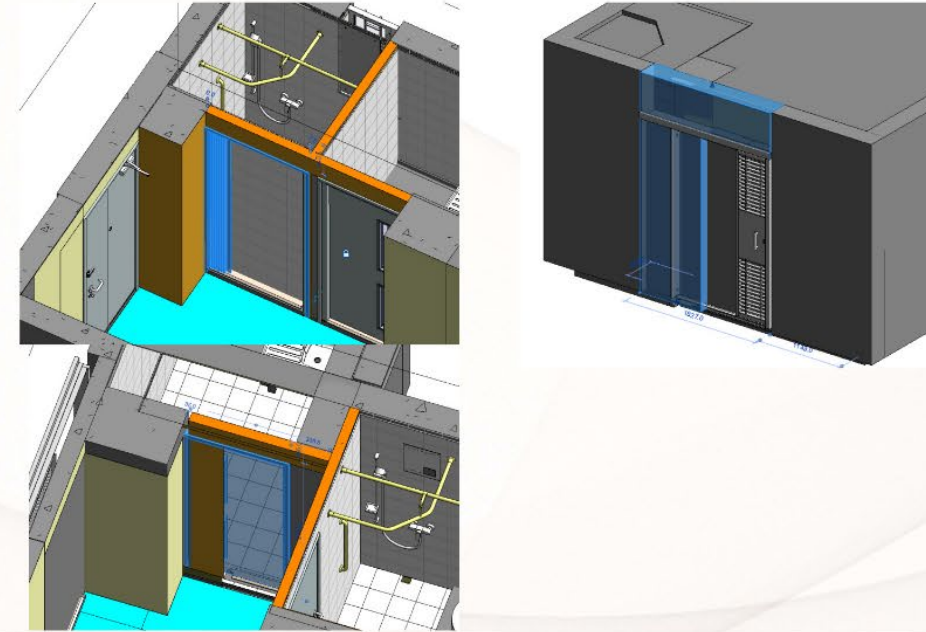
- Wrong Modelling.
- Lead misconception in coordination.

Recommendation

- Double check after binding modular flat model and design change in modular flat model.

Slide 29

- Wall finishes are not made for door.



Drawback

- Invalid clash due to modelling error.
- Double count in wall materials.

Recommendation

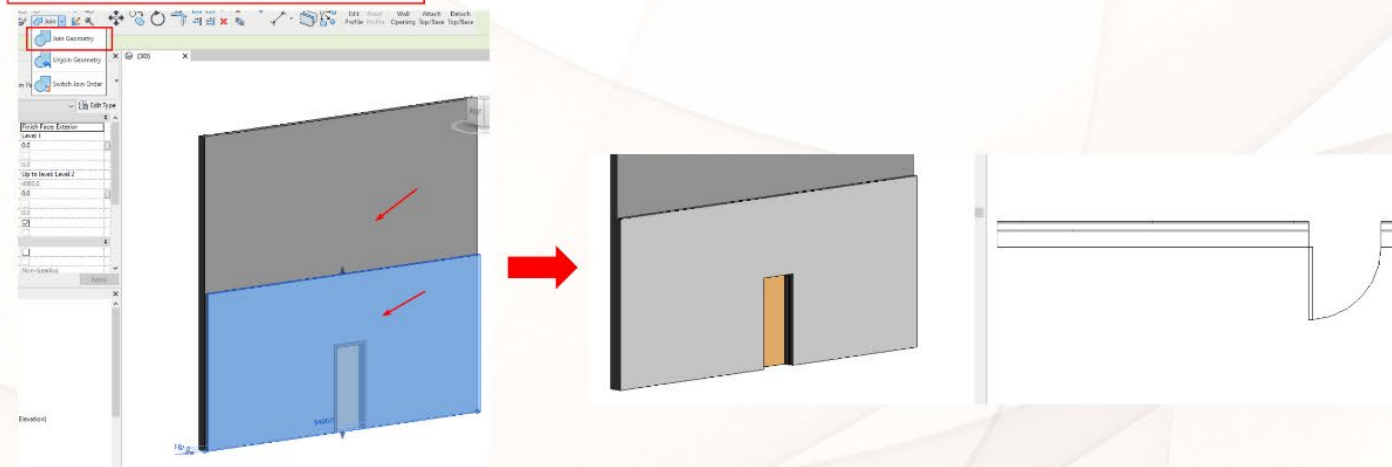
- Join the wall (ARC) and wall finishing.
- Remove duplicated wall.

Slide 30

- Wall finishes are not made for door.

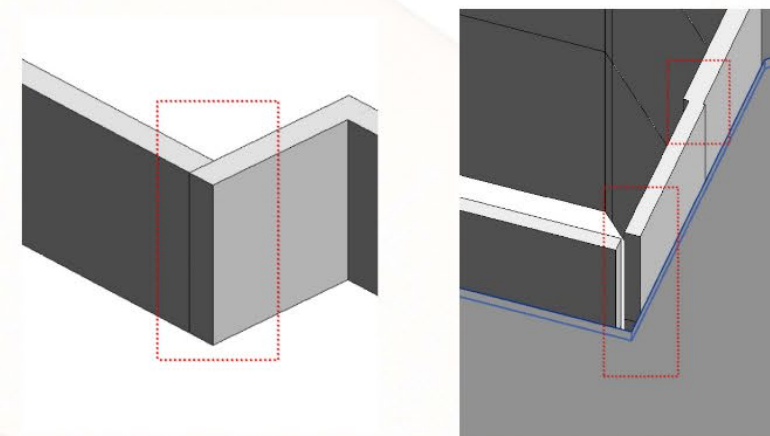
Recommendation

- Join the wall (ARC) and wall finishing.



Slide 31

- Unconnected/Flushed Wall



Drawback

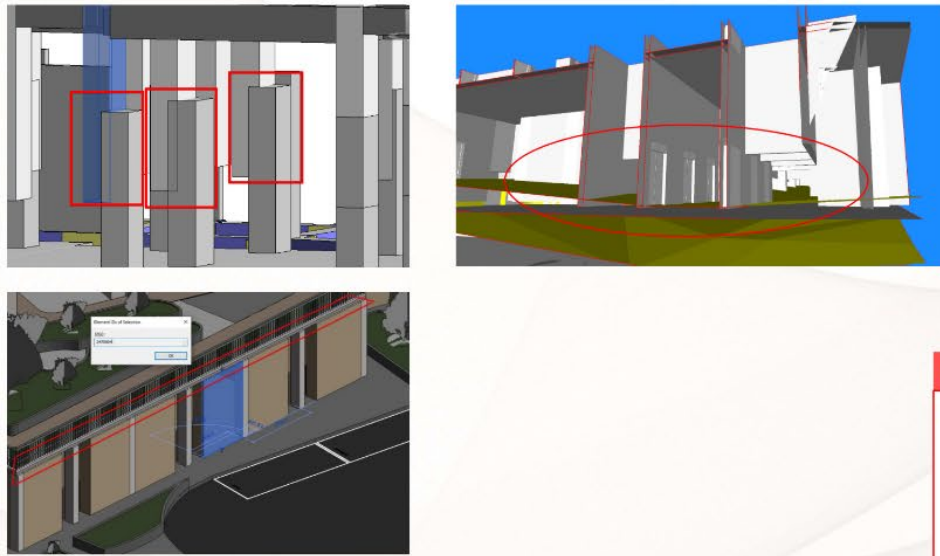
- Extra line will be shown on plan which is not acceptable for drawing production.
- Affect the accuracy on wall's volume.

Recommendation

- Do not use "unjoin" for wall modelling, unless necessary for design intent in rare occasion
- Double check wall alignment on floor plan.

Slide 32

- Wrong top/ base constraints for walls and columns.
*especially in areas with level differences.

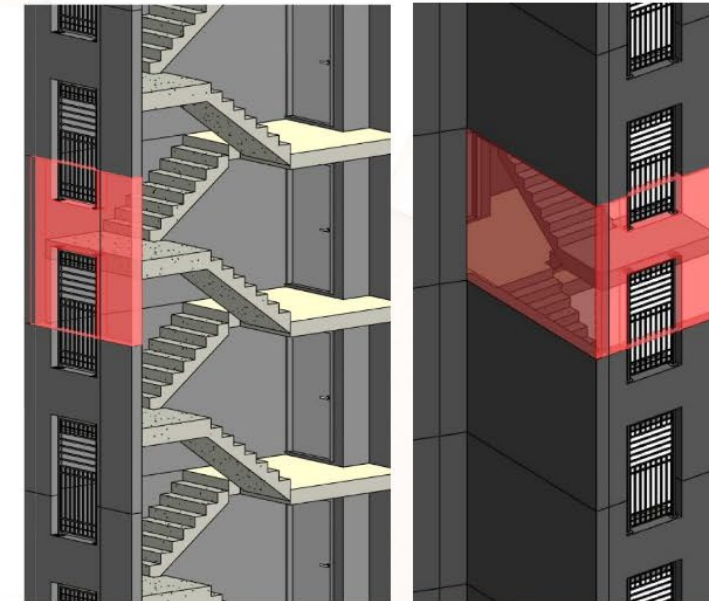
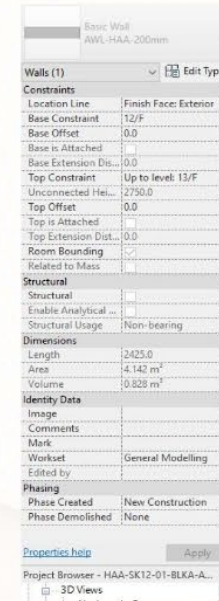


Recommendation

- Verify the geometry in the 3D views after modelling the elements on layout plan.

Slide 33

- Be careful of reference level setting for wall and window near staircase.

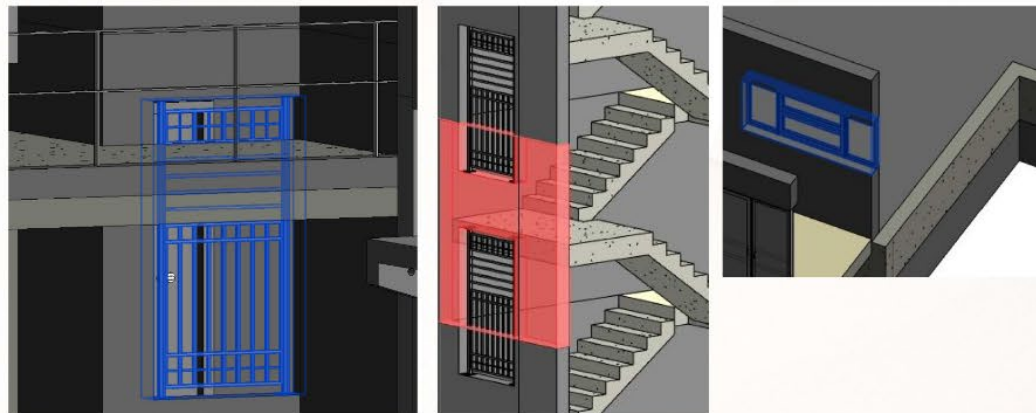


Recommendation

- Windows are located at stair landings.
- Walls' top & bottom are at floor to floor level.

Slide 34

- Be careful of reference level setting for wall and window near staircase.



Drawback

- Overlooked design issue

Recommendation

- Detail check and review the model in 3D view / federated model after modelling.

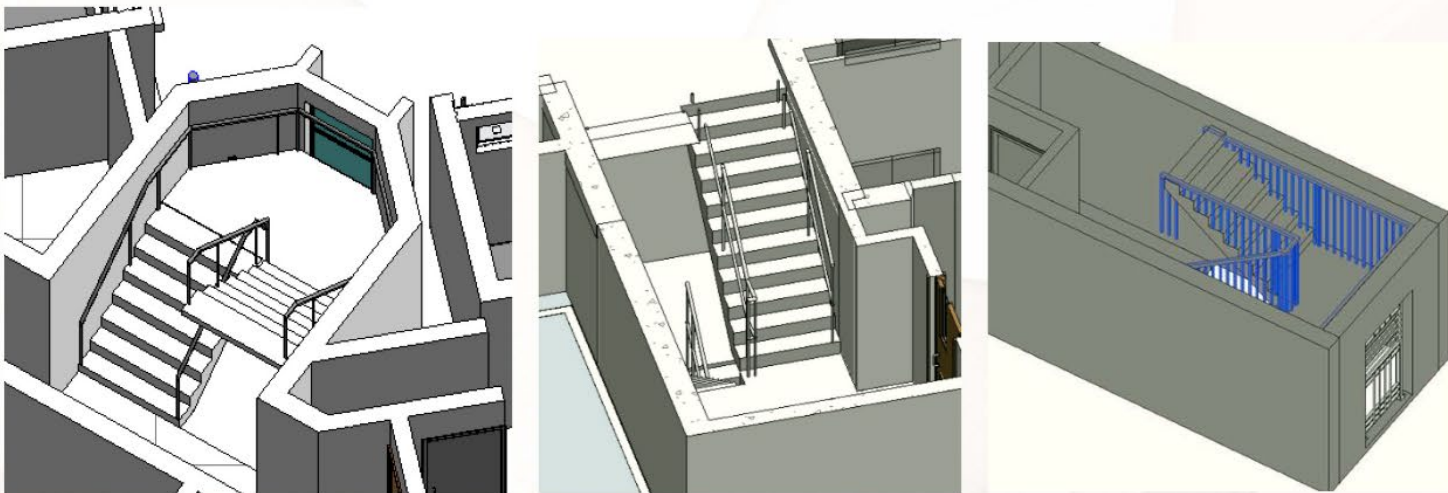
Slide 35

- Vertical transportation especially stair should be model in Architectural non-typical floor (block) model instead of typical floor model.



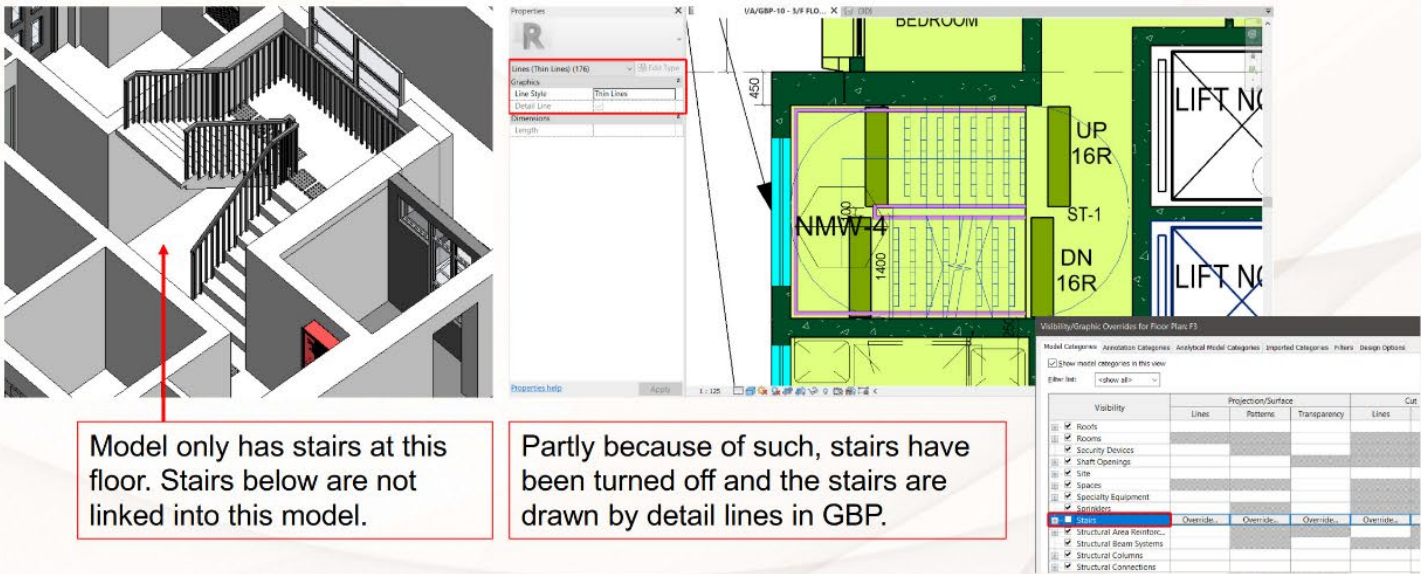
Slide 36

• Railing Modelling Error



Slide 37

• True condition of stairs cannot be displayed properly, which lead to undesirable manual editing.



Slide 38

• There are gaps between stairs and floor, and stairs and wall.



Slide 39

• Unplaced Rooms

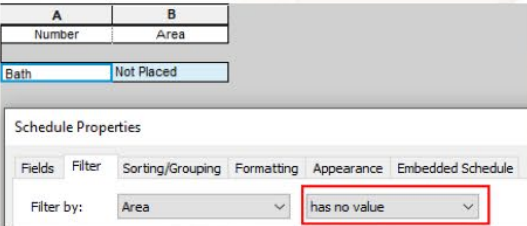
AREA FOR PV PA	Not Placed	8	LIVING / DINING	Not Placed	106
BALCONY	Not Placed	65	LIVING/ DINING	Not Placed	4
BATH	Not Placed	107	M	Not Placed	2
Bath	Not Placed	2	MAIN ROOF D	Not Placed	1
BOOSTER PUMP R	Not Placed	1	MASTER WATER	Not Placed	2
BUFFER TANK	Not Placed	6	METER ROOM	Not Placed	6
DAY CARE CENTR	Not Placed	2	MR	Not Placed	4
ELECT.	Not Placed	2	P.D.	Not Placed	36
ELECT.	Not Placed	5	PD	Not Placed	3
ELECT.METER RO	Not Placed	2	PLANTER	Not Placed	4
ELECTRIC METER	Not Placed	1	PV CONTROL ROO	Not Placed	1
EMERGENCY GEN	Not Placed	5	RETAIL	Not Placed	4
F.S. WATER TANK	Not Placed	1	Room	Not Placed	74
FLAT ROOF	Not Placed	14	RS & MRR	Not Placed	8
FLUSH WATER TA	Not Placed	2	SERVICE CORRIDO	Not Placed	7
FRESH WATER TA	Not Placed	5	ST-2	Not Placed	20
HR	Not Placed	4	TELECOM ROOM	Not Placed	6
JCP	Not Placed	2	VENT DUCT ROOM	Not Placed	1
KITCHEN	Not Placed	125	W.M.	Not Placed	25

Drawback

- Poor BIM data management
- Inaccurate information and quantity

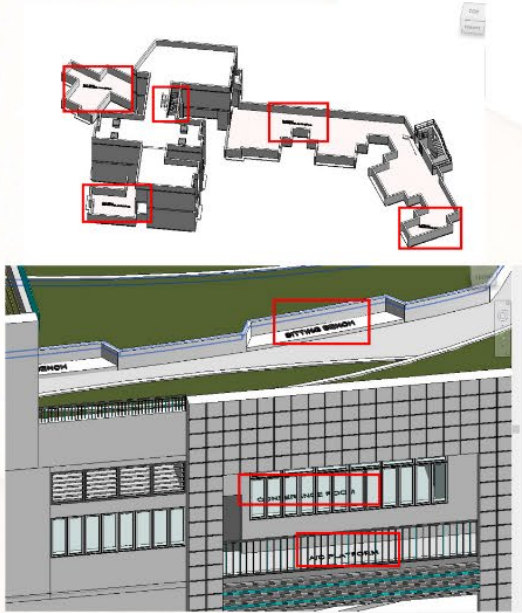
Recommendation

- Filter out "Not Placed" room via Schedule and delete it regularly.
- Sample filter rule:
Area has no value



Slide 40

- 3D Room Name should not be prepared by Model Text and Staircase Line showing in 3D ?



Recommendation

- Room name is suggested to be presented using “Room Tag” for drawing production.
- If the 3D Room Names are for coordination / review purpose, it is suggested to be placed under “Coordination” or “3D Text” workset.

Drawback

- 3D text geometry would increase the file size and low the navigation speed.

SE Modelling

Slide 41

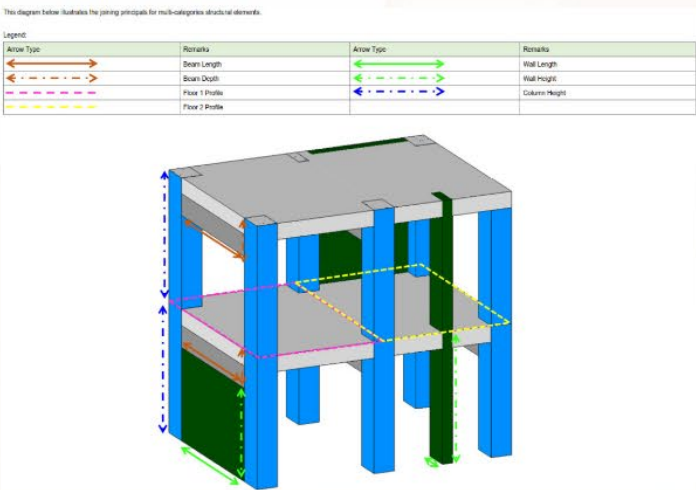
Slide 42

- Modelling approaches
 - Structural Floor



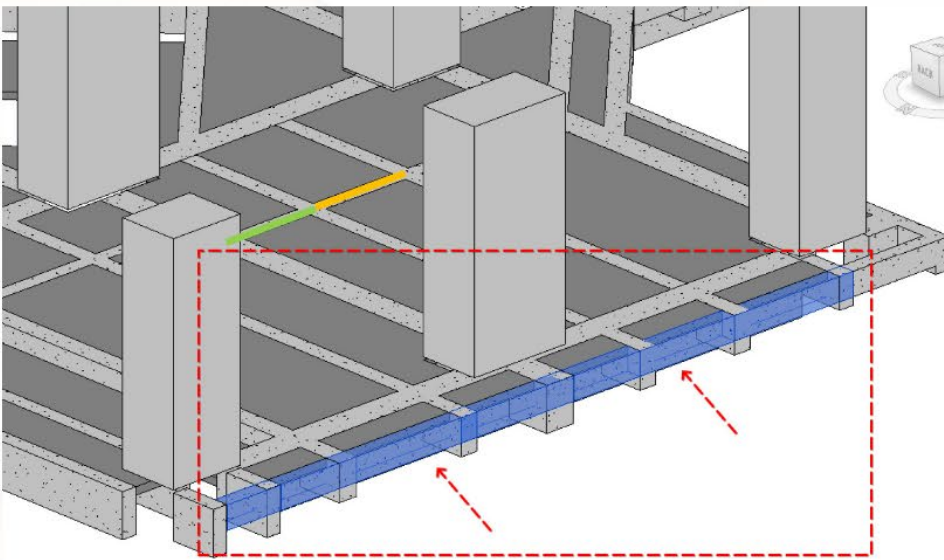
Recommendation

- Slab should be modelled piece-by-piece in order to assign unique span mark.
- Refer to HABIMSG on STR element modelling



Slide 43

- Be aware of modelling approach!
- Beam should not be overlapped with unjoin.



Drawback

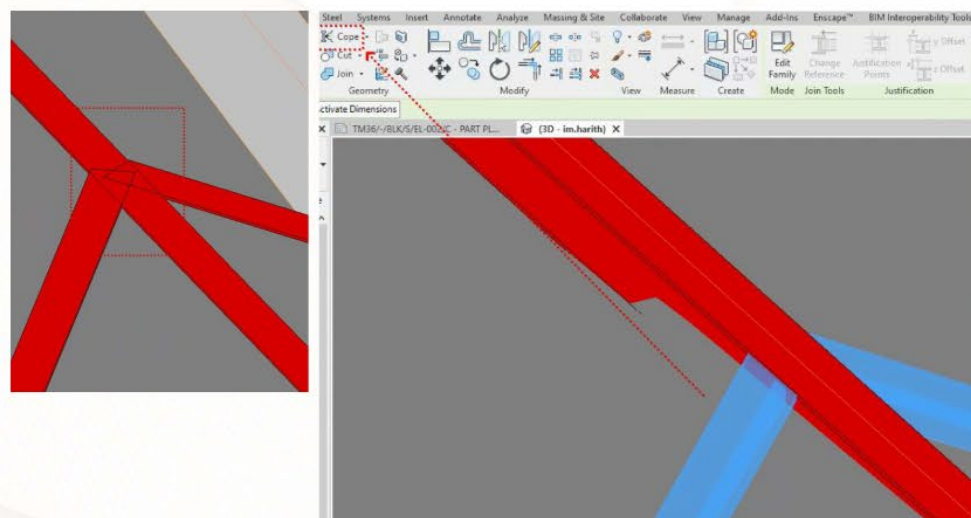
- Double count in volume.
- May lead to wrong assignment of beam mark.

Recommendation

- Secondary beam shall be dragged to the center of the main beam under “join” condition.
- Secondary beam should be split by the main beam (refer to green and orange lines).

Slide 44

- Better to “Cope” connected Structural elements.



Drawback

- False alarm during clash detection.

Recommendation

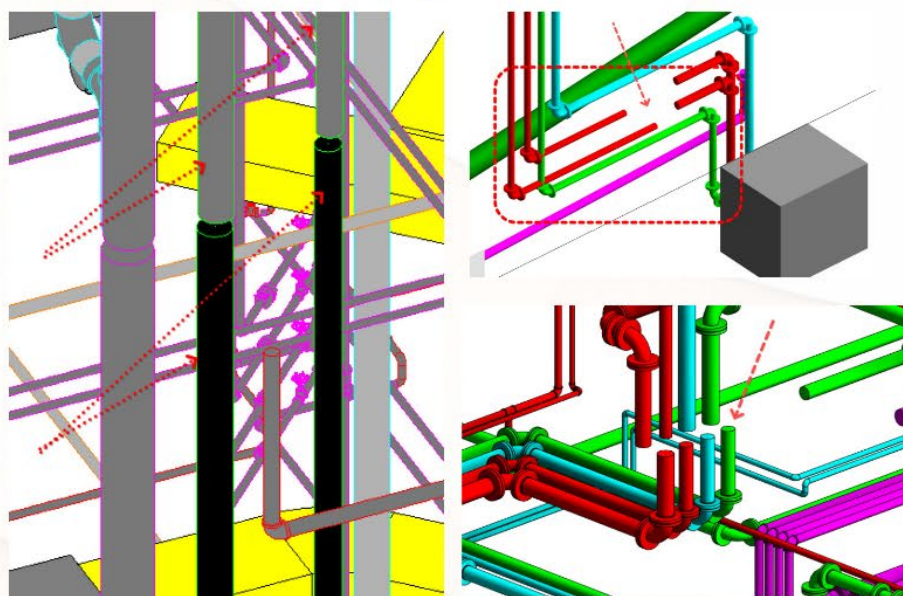
- Make use of “Cope” to manage the connection especially for steel members.

BS Modelling

Slide 45

Slide 46

- Inconsistent pipe type used & missing pipe connection (broken pipe).



Drawback

- Affect the integrity of the models.
- Cannot see the connection for whole systems.

Recommendation

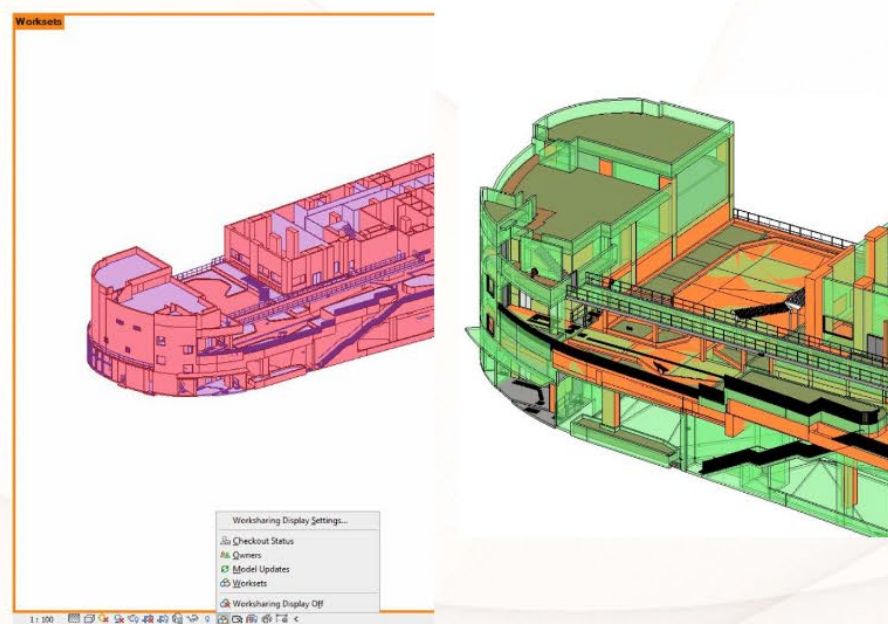
- Verify the geometry in the 3D views after modelling the elements on layout plan.
- Double check assigned pipe type through schedules.

3D Coordination

Slide 47

Slide 48

- STR elements not placed in Placeholder workset.



Drawback

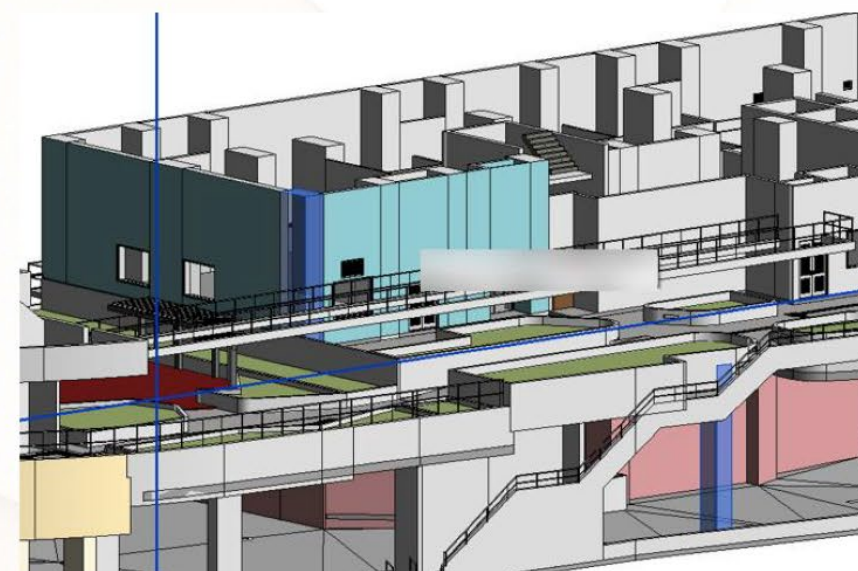
- Difficult to differentiate ARC and STR elements within project.

Recommendation

- Assign STR elements to "Placeholder" workset.
- Architect / Structural Engineer could isolate the "Placeholder" workset to check for the design discrepancy.

Slide 49

- STR elements not placed in Placeholder workset.



Drawback

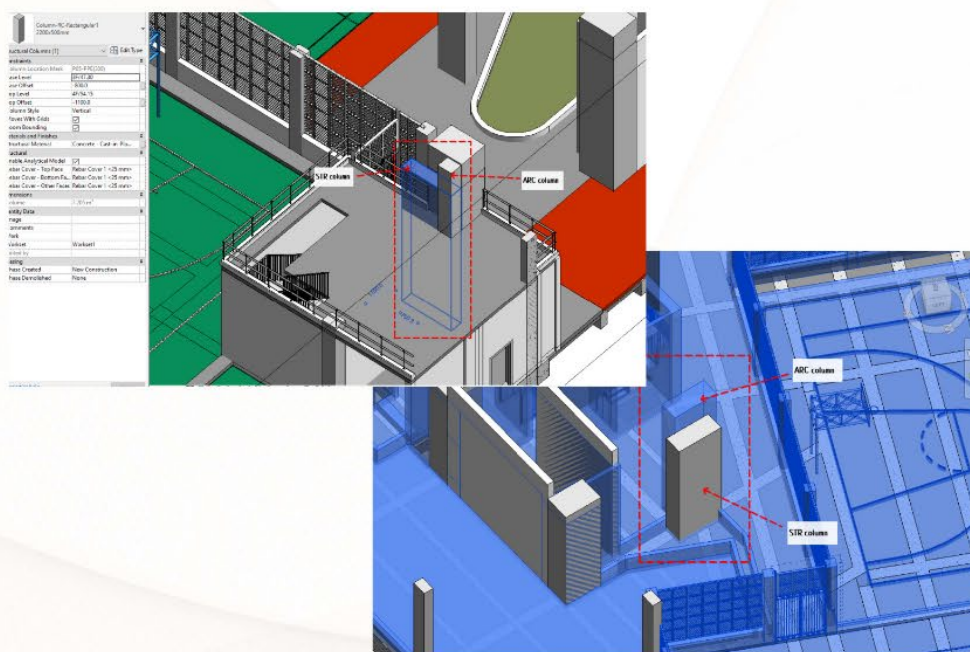
- Difficult to differentiate ARC and STR elements within project.

Recommendation

- Assign STR elements to "Placeholder" workset.

Slide 50

- STR elements not placed in Placeholder workset.



Drawback

- Difficult to differentiate ARC and STR elements within project.

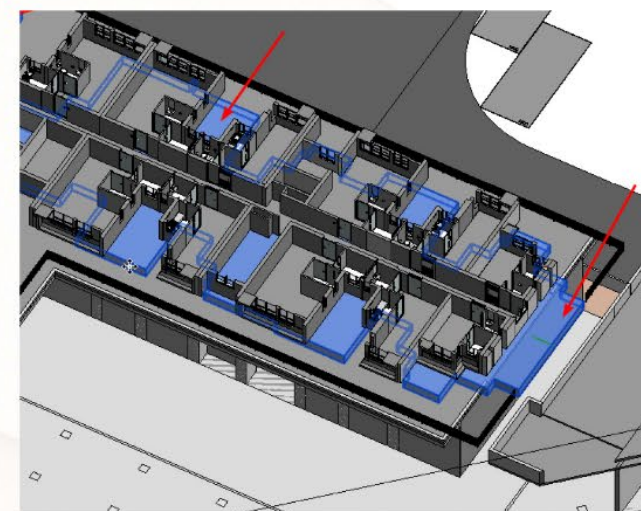
Recommendation

- Assign STR elements to "Placeholder" workset.

Slide 51

- Detail check and review the federated model.

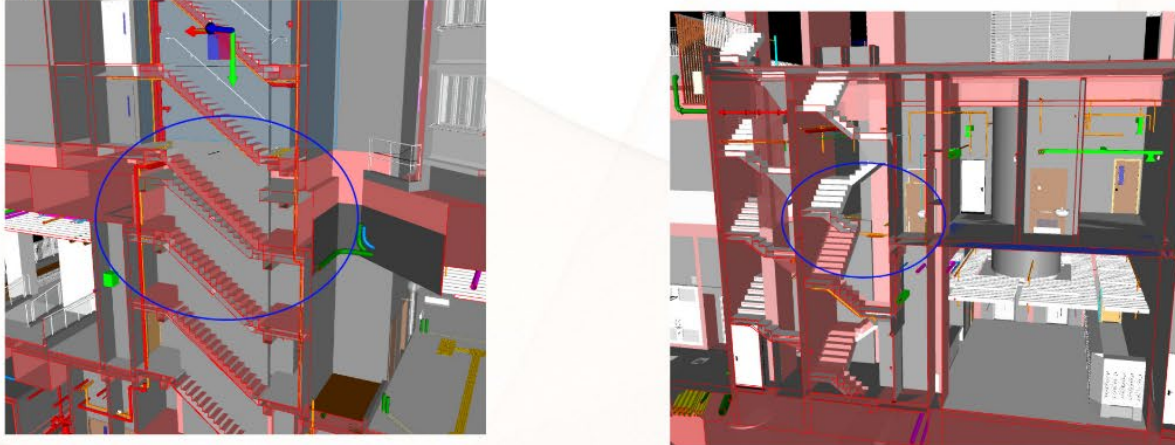
Discrepancy / coordination between ARC model and STR model.
[Floor layout vs transfer plate]



Slide 52

- Detail check and review the federated model.

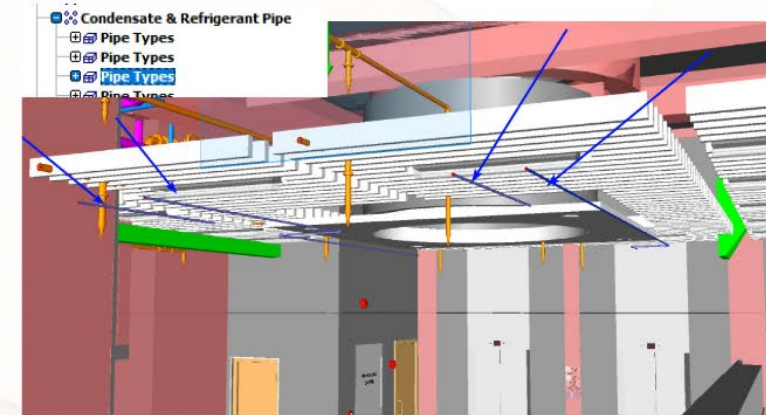
Discrepancy / coordination between ARC model and STR model.
[ARC stair vs STR stair]



Slide 53

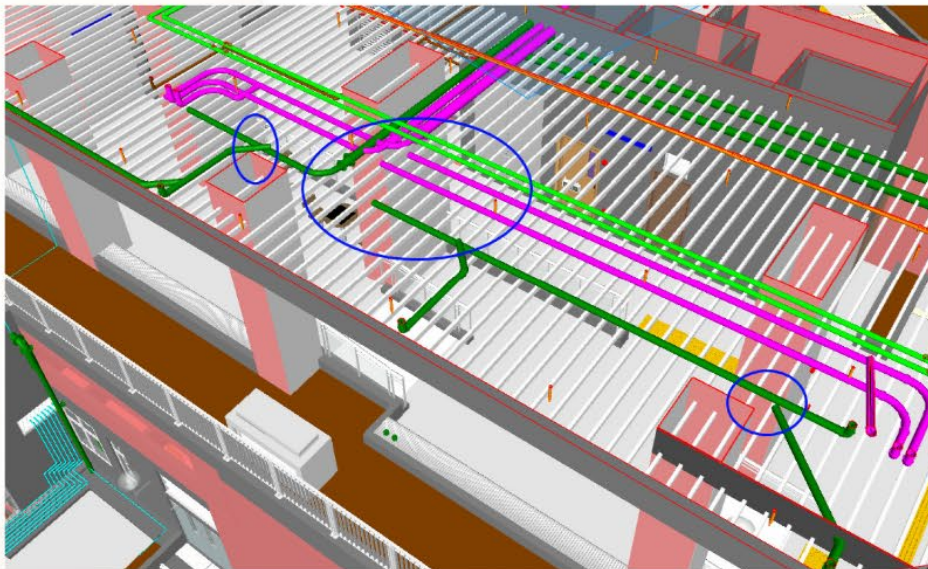
- Detail check and review the federated model.

Discrepancy / coordination between ARC model and BS model.
[ARC ceiling vs BS pipe]



Slide 54

- Disconnected pipes

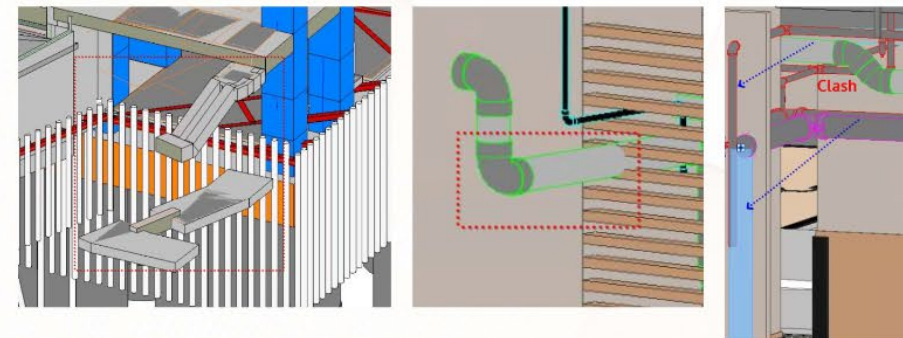


Recommendation

- Verify the geometry in the 3D views after modelling the elements on layout plan.

Slide 55

- Double check clashes between ARC features and BS elements.



Drawback

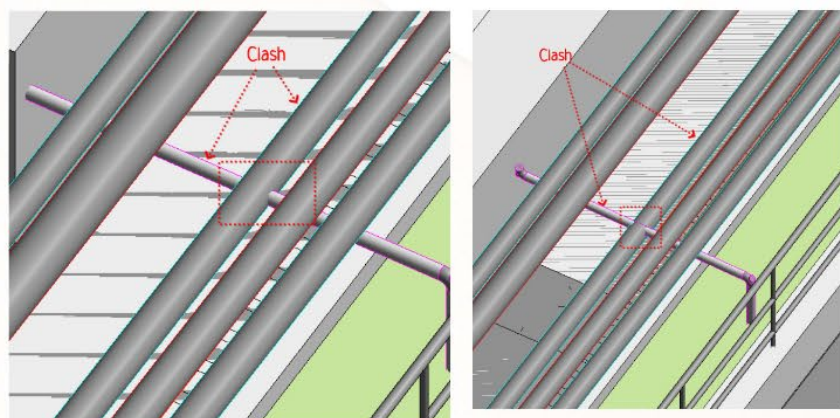
- Clashes with ARC features may affect the design.
- Exposure BS elements shall be further reviewed with designers.

Recommendation

- Make use of "Clash Detection" in Navisworks to find out the clashed elements.
- Verify the geometry in the 3D views after modelling the elements on layout plan with linked other discipline models.

Slide 56

• Clash Review



Recommendation

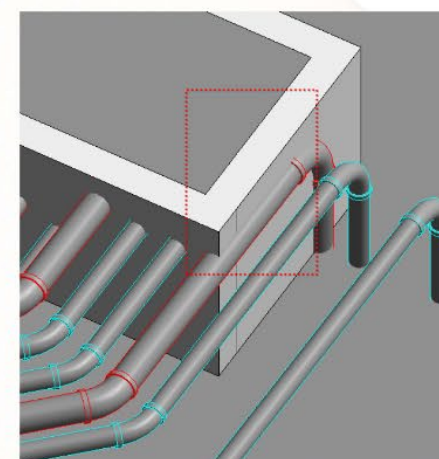
- Designers / modelers shall review the 3D model after layout design and adjust the arrangement if there is clash.
- At least, “visual clash review” should be carried out frequently.

Drawback

- Clashes in critical area may have implication to the design and the installation in construction stage.

Slide 57

• Coordination ➤ Clash Review



Recommendation

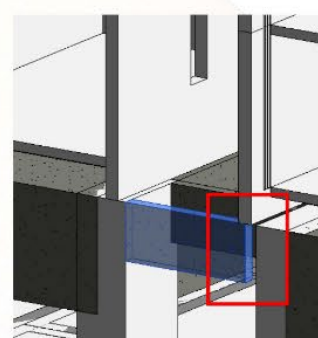
- Cross discipline clash review should be carried out regularly
- Clash detection: STR (wall, column, framing, stair etc.) vs MEP

Drawback

- Impractical design / installation layout
- Missed chance to review pipeduct (PD) size

Slide 58

• Unconnected Beam to Column

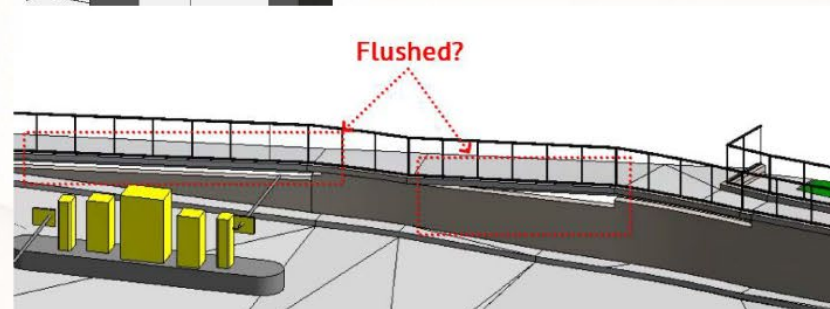


Drawback

- Duplicated elements affect the integrity of the models.
- Extra line will be shown on plan.

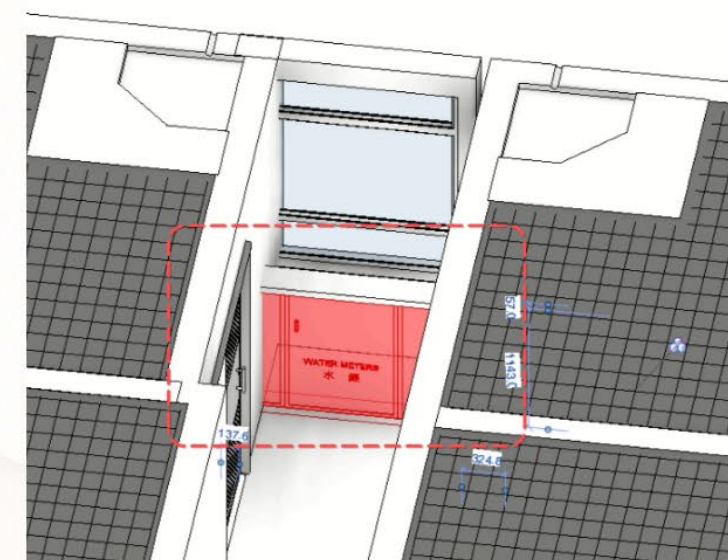
Recommendation

- Double check alignment on floor plan before drawing production.
- Verify the geometry in the 3D views after modelling the elements on layout plan.



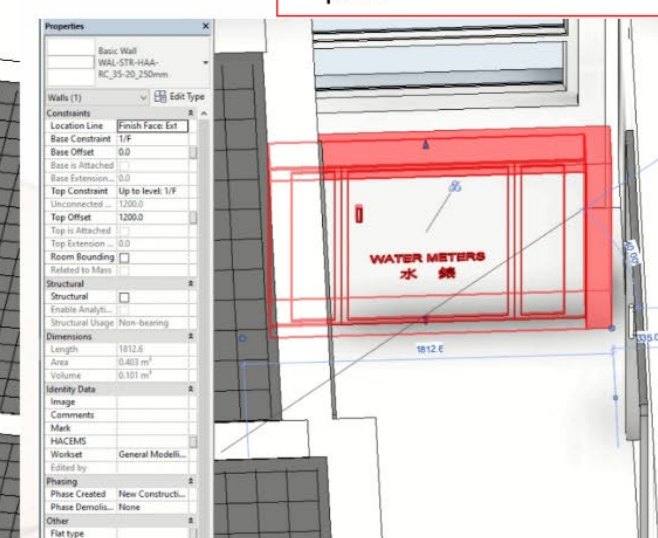
Slide 59

• Water meter cabinet clashed with walls



Recommendation

- Verify the geometry in the 3D views after modelling the elements on layout plan.

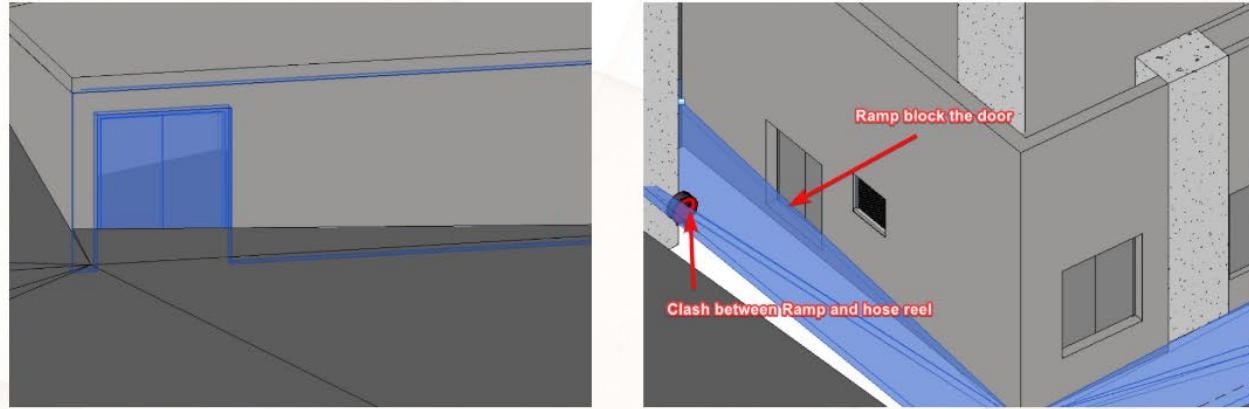


Slide 60

- Ramp blocked the door.
- Ramp clashed with hose reel.

Recommendation

- Verify the geometry in the 3D views after modelling the elements on layout plan.

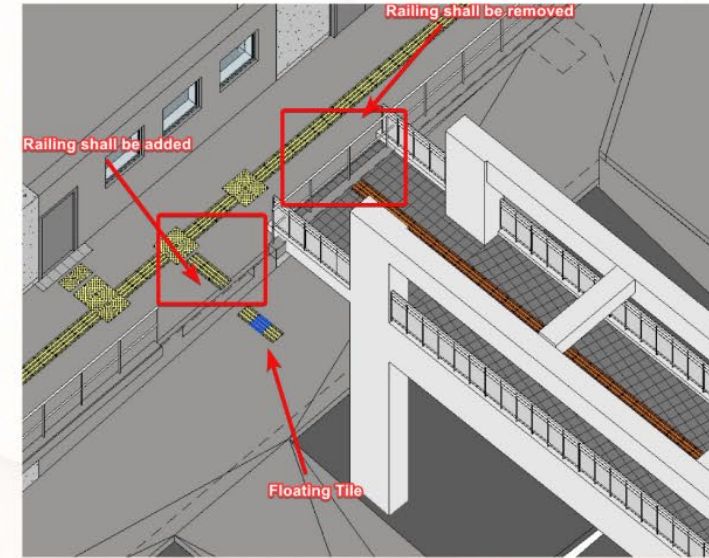


Slide 61

- Railing shall be adjusted
- Floating Tile shall be removed

Recommendation

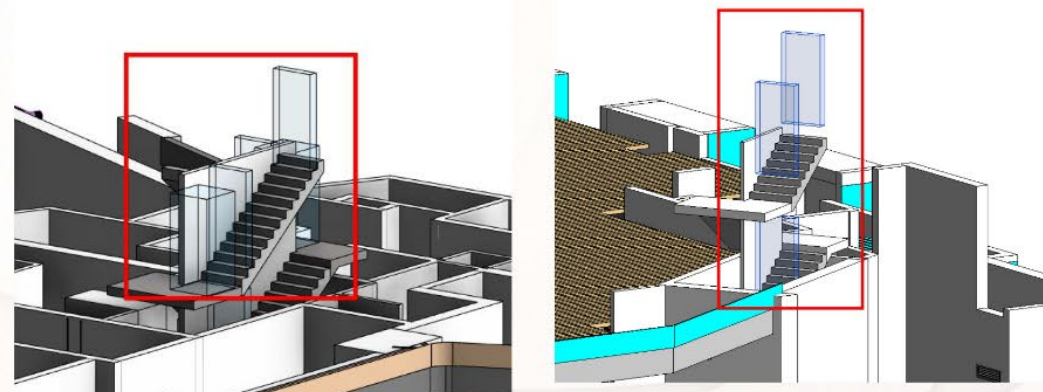
- Verify the geometry in the 3D views after modelling the elements on layout plan.



Slide 62

- Good approach using 'Clearance block' inside staircase for headroom verification.
*(Parametric Block)
- Recommend to place under a separate workset "Headroom" for better management.

Good Sample



Pros

- Easy way to detect clashes with the stair "Clearance block" with other services elements.

Slide 63

Housekeeping

Slide 64

• “CAD” file management



Drawback

- Some CAD drawing may contain tiny elements which locate far from the project site.
- Enlarge view coverage.
- Less reliable/accurate graphical representation of elements.

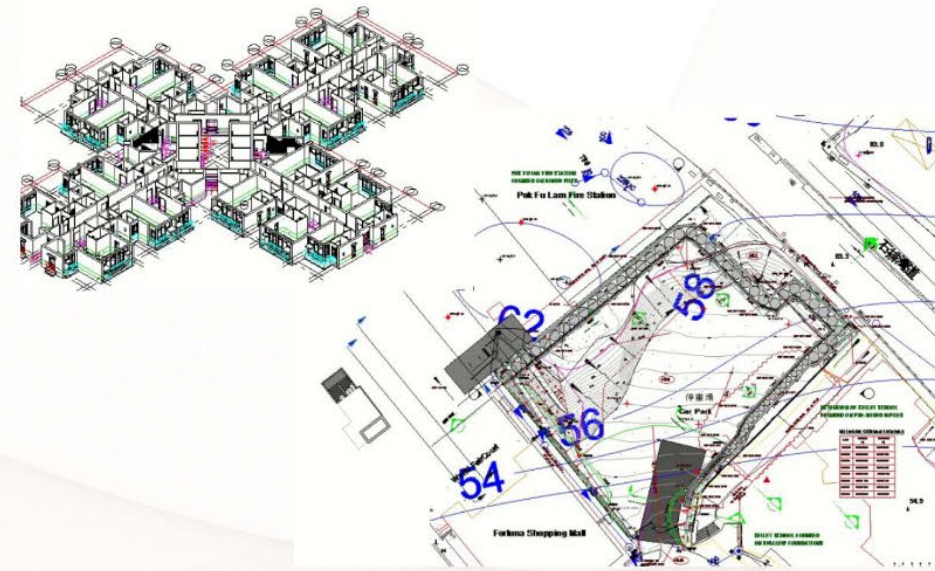
Recommendation

- Ensure link/ insert CAD “in current view” only, not for all project views.
- All CAD drawings shall be under “CAD” workset.
- Unload / remove CAD file after use.

<https://knowledge.autodesk.com/support/revit/troubleshooting/caas/sfdcarticles/sfdcarticles/Revit-20-mile-origin-limit-for-imported-and-model-geometry.html>

Slide 65

• “CAD” file management



Drawback

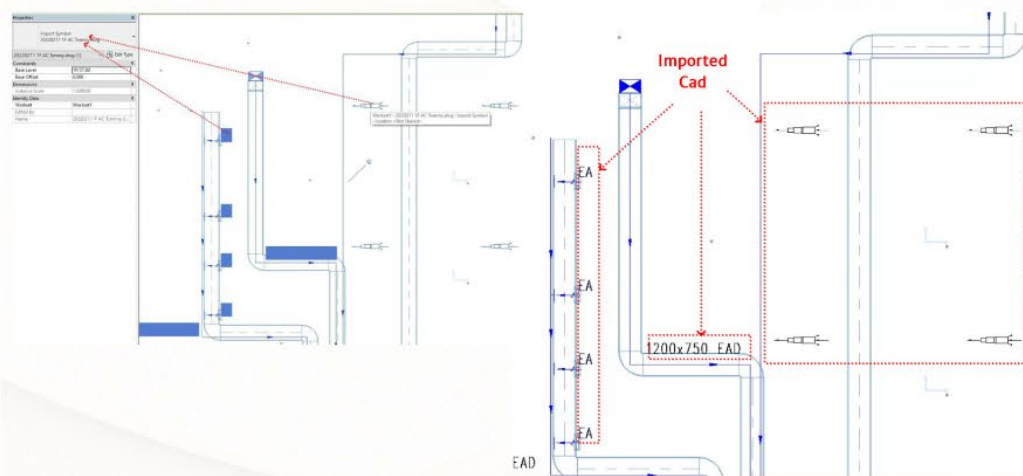
- Confusion of overlapped CAD for model reference.
- Need extra control of CAD reference in all views.

Recommendation

- Link the CAD file to specific floor plan only.
- Assign the CAD link into a “Link CAD” workset in order to turn off all the CAD drawings before drawing production in one go.

Slide 66

- Remove unnecessary CAD drawing
- Prepare drawing by using Tag / Annotate instead of overlaying CAD drawing.



Drawback

- If design changes, the CAD annotation will not be updated.

Recommendation

- The annotation should be prepared by “TAG” in Revit, retrieving the real data from the BIM elements such as width, depth and system etc of the BS elements.

Slide 67

• Floating objects

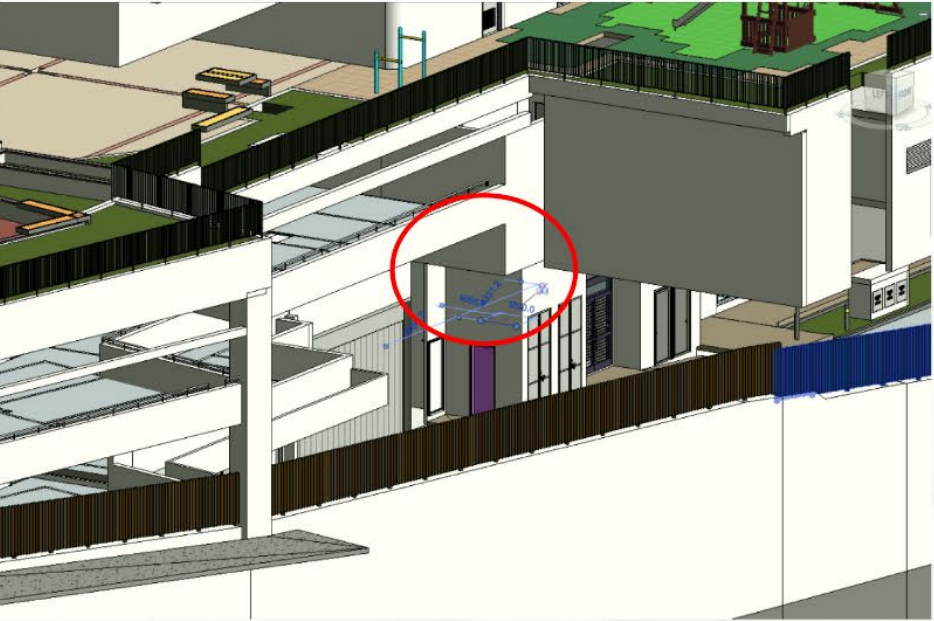


Recommendation

- Verify the geometry in the 3D views after modelling the elements on layout plan.

Slide 68

- Model Line floating



Recommendation

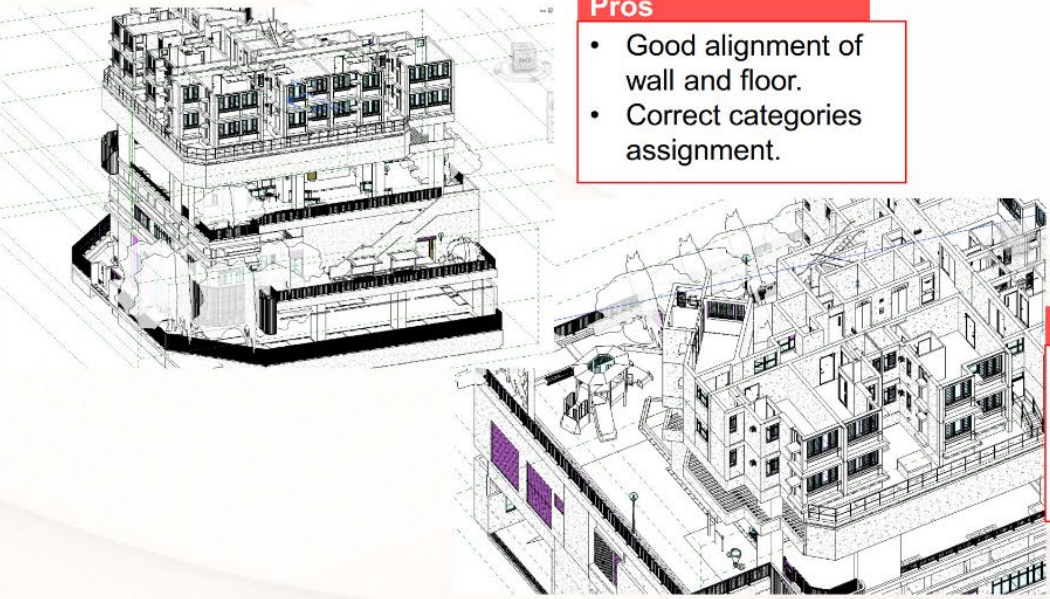
- Verify the geometry in the 3D views after modelling the elements on layout plan.
- Isolate model line in 3D views for self checking.

Good Sample

Slide 69

Slide 70

- Good modelling, model is clean.



Pros

- Good alignment of wall and floor.
- Correct categories assignment.

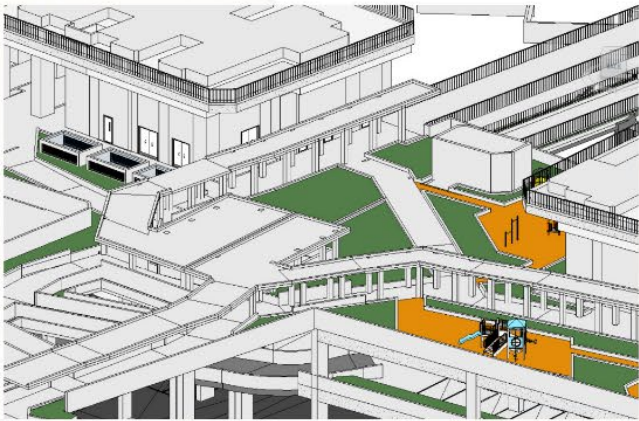
Good Sample

Recommendation

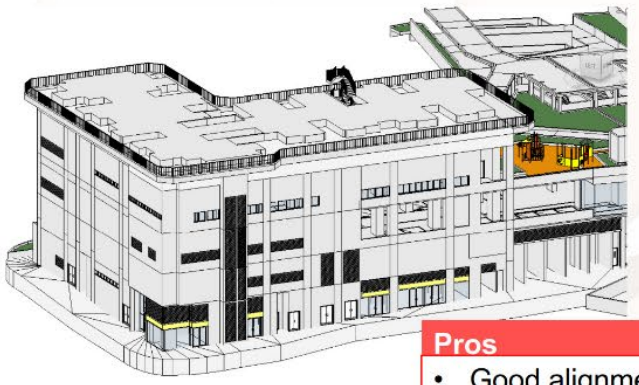
- Turn off the “Scope Box” in the 3D view for better navigation and review.
- Rename “Scope Box”

Slide 71

- Good modelling technique



Good Sample



Pros

- Good alignment of wall and floor.
- No extra CAD reference or 3D model line in the 3D view.

Slide 72

- Make good use of Filter for model editing, review and coordination.

Good Sample

- Pros
- Easy control for color setting and visibility setting according to different purposes.

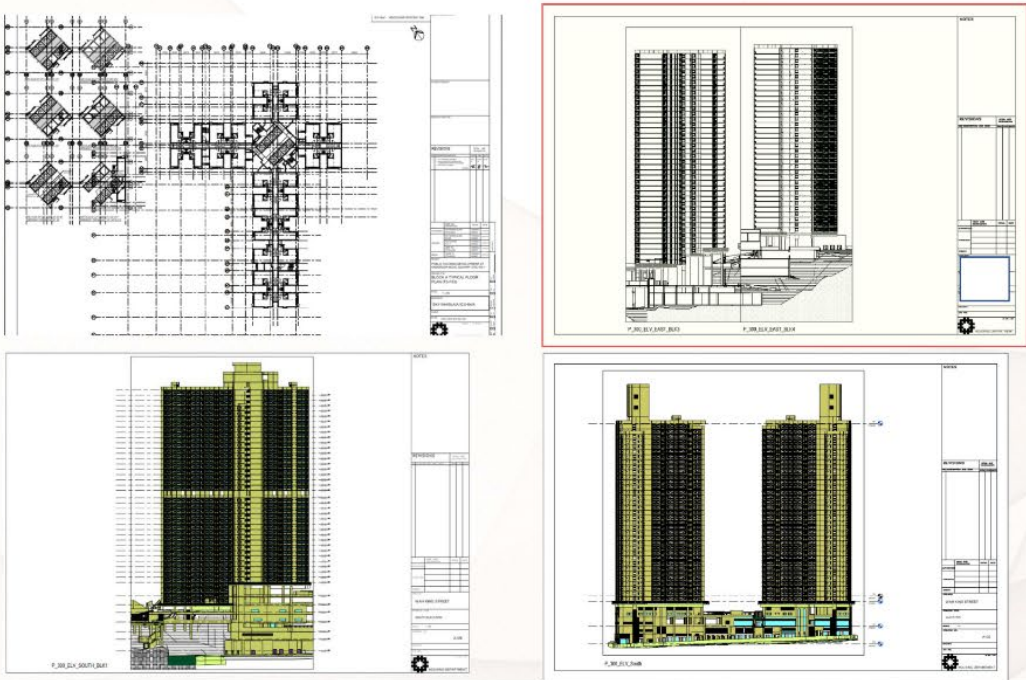
Drawing Preparation

Slide 73

Slide 74

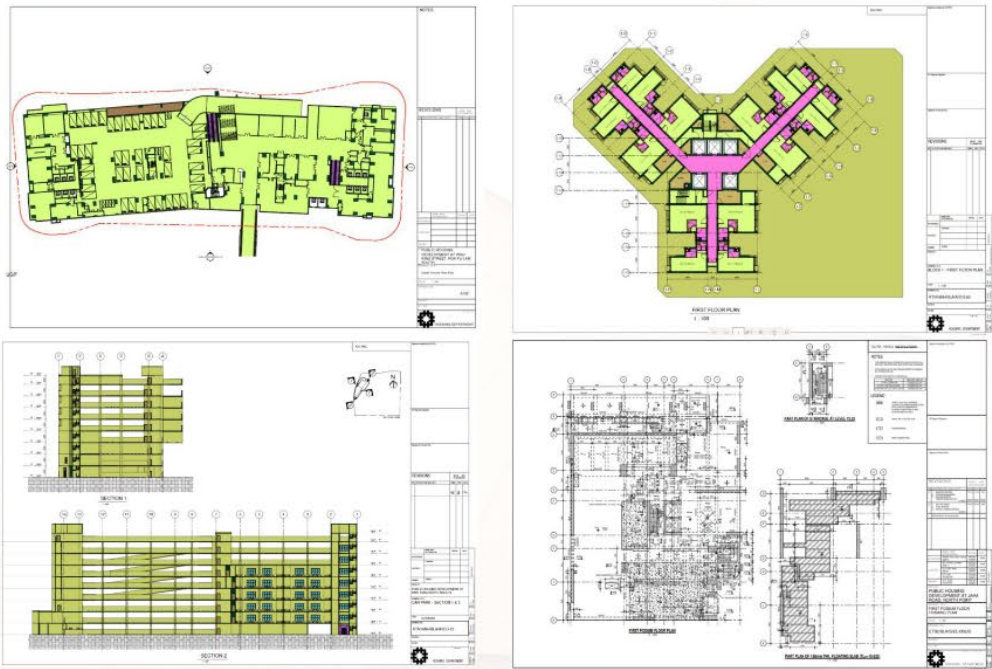
#7

Good Sample of Drawing Setup for Typical Plan and Elevation



Slide 75

Good Sample of Drawing Setup for Typical Plan and Elevation



Slide 76

Recommendation for Revit 2018 Drawing Production

- Since Revit 2018 only have 1 set of layer setting in color override, it is recommended to prepare 2 identical view, 1 of them shall be set with transparent background but with concrete hatch pattern.
- Both views shall be overlapped into the sheet to 2 layers of hatch for drawing submission.

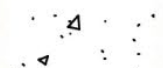
View 1



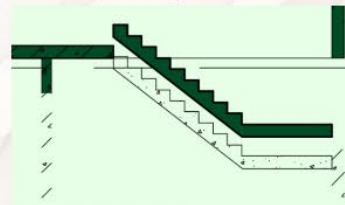
Drag View 1 into Sheet and then drag View 2 into the Sheet and overlap each other



View 2



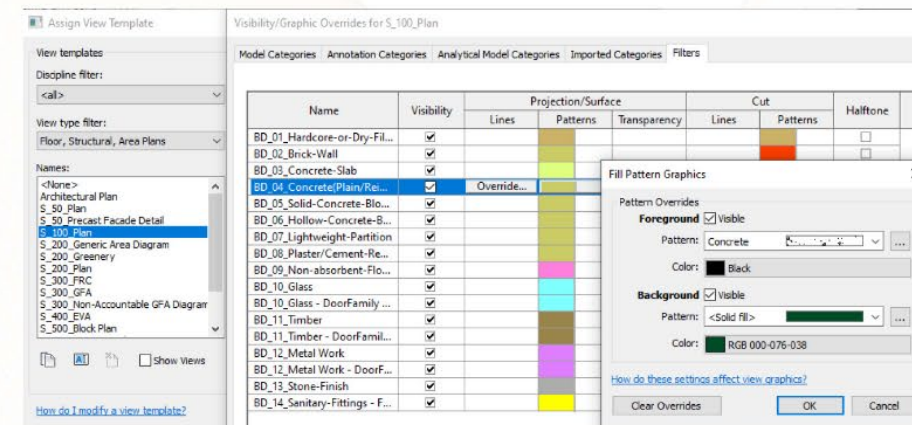
Not recommend to sketch the profile manually using Filled Region



Slide 77

Recommendation for Revit 2020 Drawing Production

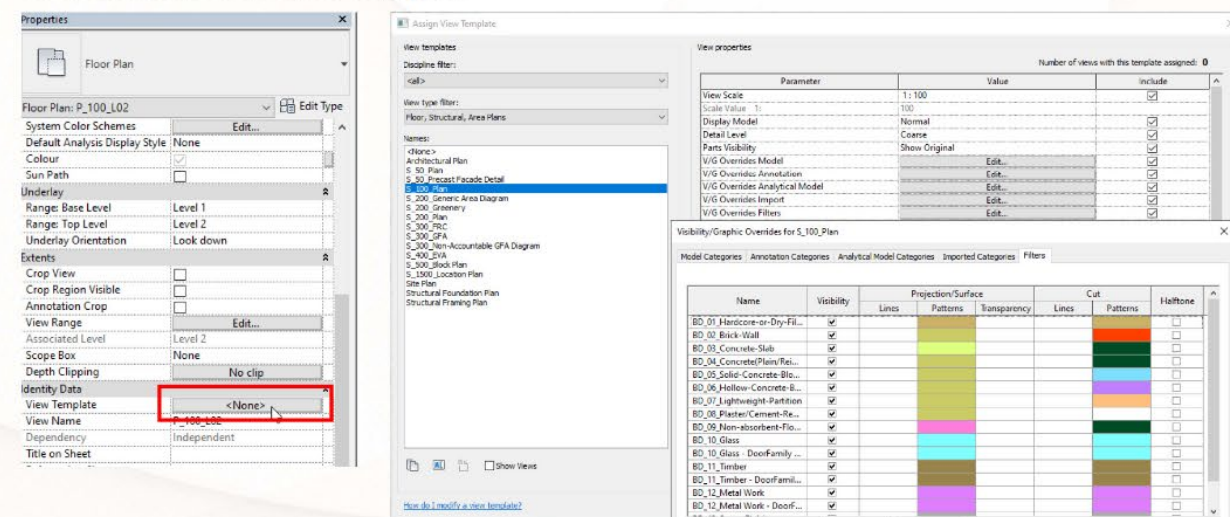
- Revit 2020 or above can set hatch and background color separately.



Slide 78

Demonstration on applying view template

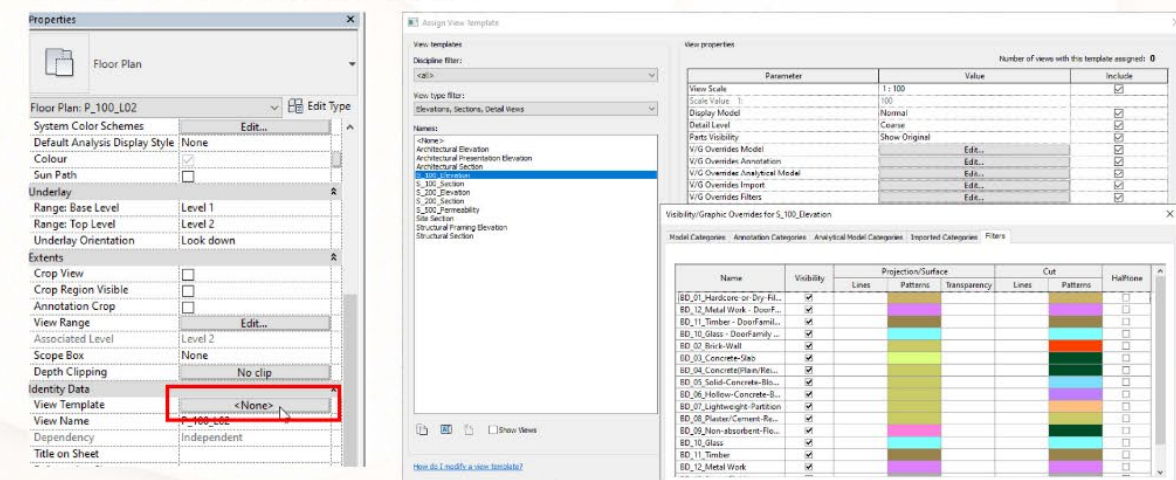
1. Go to the floor plan / elevation view
2. @ Properties Panel => View Template
3. Select suitable View Template



Slide 79

Demonstration on applying view template

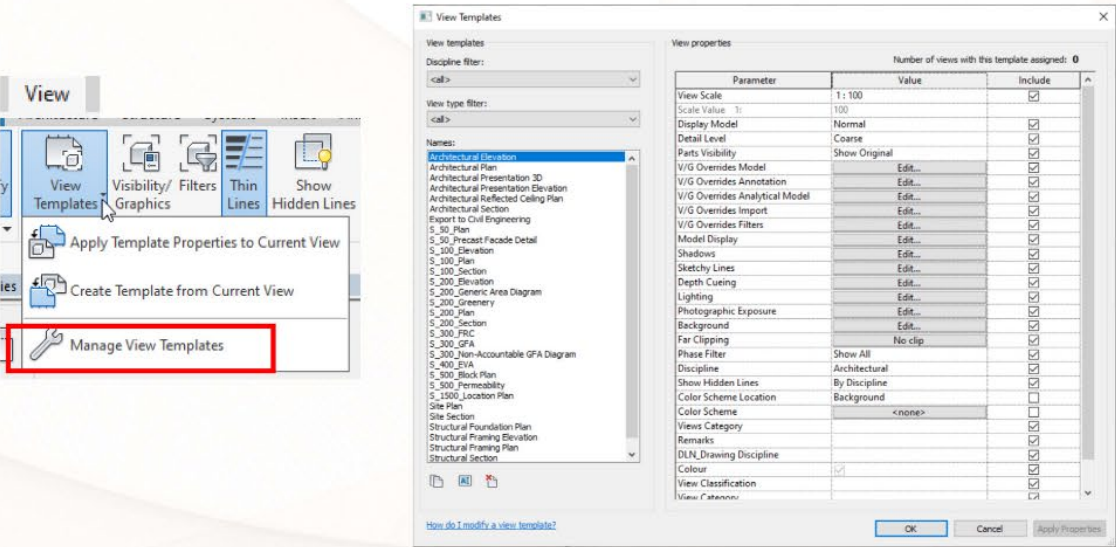
1. Go to the floor plan / elevation view
2. @ Properties Panel => View Template
3. Select suitable View Template



Slide 80

Demonstration on applying view template

Advantage:
Batch modify the setting by controlling the view template



Slide 81

- Overlapping viewports technique
@drawings are prepared in model file

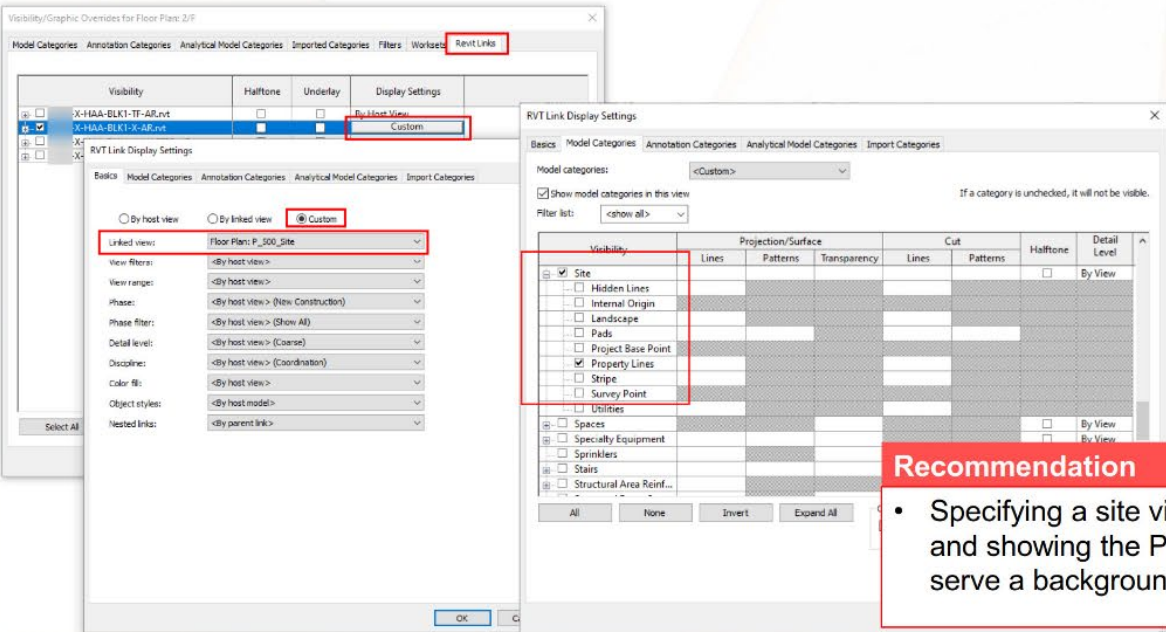


Recommendation

- Since the site boundary is modelling on ground floor, to show it on higher level drawing, the view range setting is not feasible. However, it can be prepared by overlapping 2 viewports [a view only contains site boundary + layout floor plan] within the titleblock.

Slide 82

- Show the site boundary from link model by custom setting
@drawings are prepared in sheet file



Recommendation

- Specifying a site view from link model and showing the Property Lines only to serve a background the layout plan.

Slide 83

- Used filled region (manual hatch) for the drawing presentation.



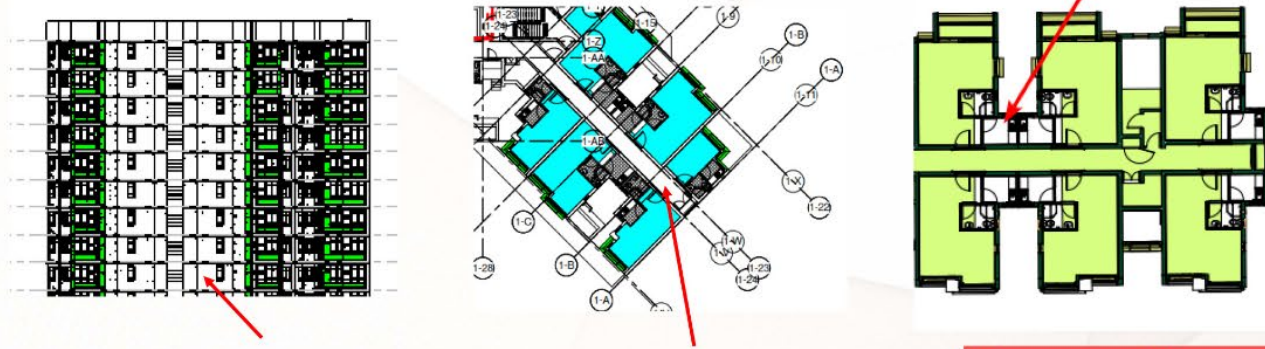
Recommendation

- Set the presentation by filter rules.
- Refer to the following slides.

Slide 84

#8

- The model elements were not colored correctly after assigning the view template.



Recommendation

- Double check the element parameter (such as naming, type name etc.) vs filter rule setting of the view template.

Slide 85

- Visibility of grid control



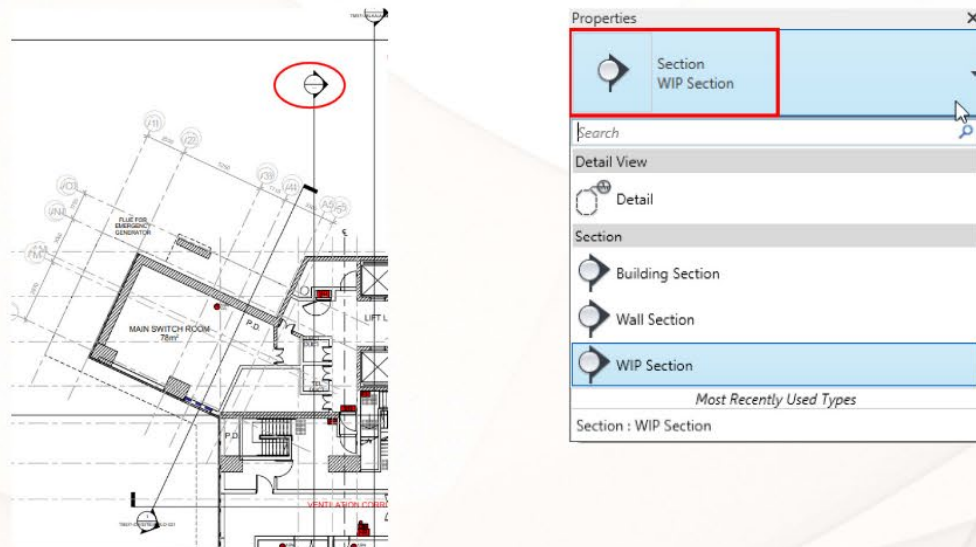
Recommendation

- Turn on the grid in host model (sheet file) and turn off the grid visibility from all the link models (such as MFD, typical floor model, site model etc.)

Slide 86

Recommendation for Section

- Advise to create new section type "WIP Section" to facilitate visibility control in drawing preparation (turn off all WIP sections).



Slide 87

- Tracing or drafting should NOT be prepared on the drawing view.



Drawback

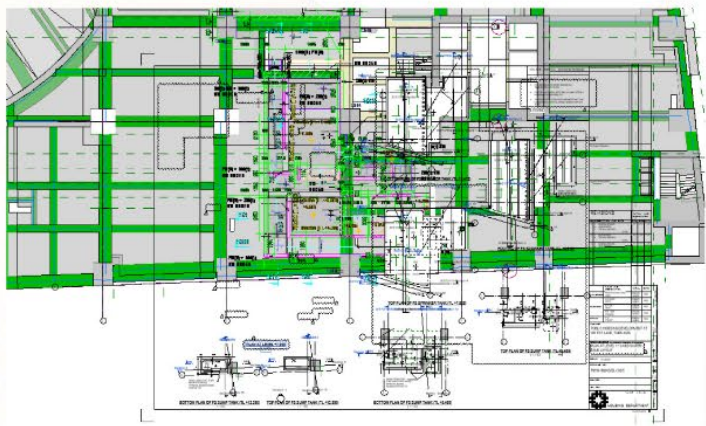
- The drafting work will affect the drawing production.
- Extra time and step for checking the presentation are required before generating the drawing.

Recommendation

- Modeller shall have a "WIP" or "Checking" set of view for the tracing purpose.
- If the information of the drawing setup are useful for tracing, you are recommended to "Duplicate with Detailing" for the specific views.

Slide 88

- Tracing or drafting should NOT be prepared on the drawing view.



Drawback

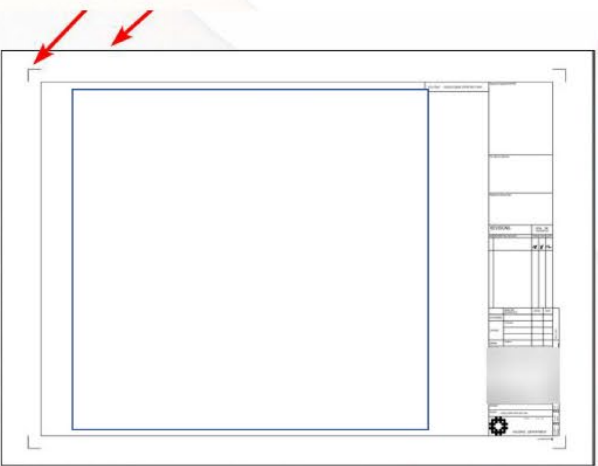
- The drafting work will affect the drawing production.
- Extra time and step for checking the presentation are required before generating the drawing.

Recommendation

- Modeller shall have a “WIP” or “Checking” set of view for the tracing purpose.
- If the information of the drawing setup are useful for tracing, you are recommended to “Duplicate with Detailing” for the specific views.

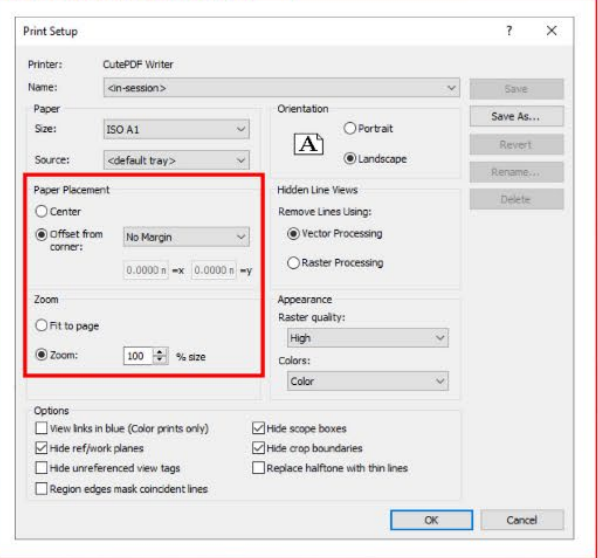
Slide 89

Printing Setup



Printing Not in scale

Recommendation



Slide 90