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

- **Annexes**

Version 4.0
September 2024

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:

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Housing Authority Headquarters
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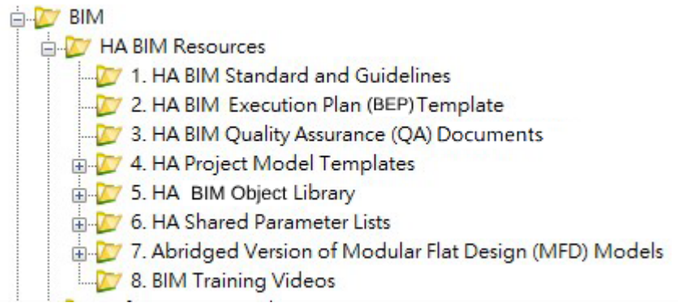
ANNEXES

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):



1.3a

ANN-1.1. HA BIM Execution Plan (BEP) Template

ProjectWise Location of BEP Template:
\Documents\HD Library\BIM\HA BIM Resources\2. HA BIM Execution Plan (BEP) Template\

Hong Kong Housing Authority

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

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

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

`

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Guidance Notes:

Note 1 - Delete all notes in purple and italics.

Note 2 - To suit the project specific situation and requirements, author of this BEP 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				

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)
LOIN	Level of Information Need
LOD-G	Level of Graphics
LOD-I	Level of Information
MEP	Mechanical, Electrical and Plumbing
N/A	Not Applicable
BEP	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 (BEP), 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 BEP 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	*[Fill in if applicable, e.g. when author of this BEP is under a main contractor]*
Relevant departments	*[Input Relevant departments for Government Entrusted Works if applicable]*
Project Name	*[Input Project Name]*
Project Code	*[Input Project Code]*
Phase No.	*[Fill in if applicable]*
Development Type	*[Public Rental Housing, Subsidised-Sale Flats]*
Project Location	*[Input Project Address]*
Appointed Parties	
Project Manager (Lead Appointed Party)	*[Name of Project Manager]*
Design Architect	*[Name of Project Architect]*
Civil Engineer	*[Name of Project Civil Engineer]*
Structural Engineer	*[Name of Project Structural Engineer]*
Geotechnical Engineer	*[Name of Project Geotechnical Engineer]*
Building Services Engineer	*[Name of Project Building Services Engineer]*
Landscape Architect	*[Name of Landscape Architect]*
Quantity Surveyor	*[Name of Quantity Surveyor]*
BIM Consultant	*[Name of BIM Services Providers (BIMSPs)]*
Main Contractor	*[Name of Main Contractor]*
Project Description	*[Input Project Description]*

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	*[Reduce Risks]*	*[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]*
2	*[Enhance Coordination]*	*[Enhancing and improving the coordination amongst various stakeholders during the investigation, design, construction and operation phases of the Assignment; and]*
3	*[Constructability]*	*[Demonstration of constructability of the design]*
4	*[Input other BIM Goals if applicable]*	*[E.g. Improve Visualisation, Enable Digital Fabrication, Conduct BIM Quantity Take-off Trials, Conduct Asset Information Model Trials, etc.]*

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

Fill in Level 1 table for both HA portion and government entrusted portion, refer to the relevant clauses in the project-specific agreements/ Works Contracts. Attach the table as appendix.

Refer to *[Appendix I]* for Level 1 BIM Use Overview to BIM Uses definition and adoption by work stages.

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 BEP]*					
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.

For Government Entrusted Works, please refer to the relevant departments/ bureau's BIM standards and guidelines.

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
3	BIM Standards and Modelling Guidelines for Statutory and Building Control Submission of General Building Plan, Foundation Plan and Superstructure Plan	Independent Checking Unit	*[2022]*	*[-]*	Prevailing standard as stipulated by contract
[4]	*[Input Relevant departments/ bureau's BIM standards and guidelines if applicable]*	*[Input if applicable]*	*[Input if applicable]*	*[Input if applicable]*	*[input if applicable. e.g. Standard for the Government Entrusted Works, please refer to the demarcation plan below.]*

For Government Entrusted Works, provide a demarcation plan below with area highlighted and labelled such as the image below.

BIM PROJECT EXECUTION PLAN (BEP)

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	Hong Kong Housing Authority	*[Name of Third Party]*	*[Name of Leading Discipline]*	*[Name of other discipline 1]*	*[Name of other discipline 2]*	*[Name of other discipline 3]*
Appointment							
5.4.1	Confirm the delivery team's BIM execution plan	I	N/A	R; A	I	I	I
5.4.2	Establish the delivery team's detailed responsibility matrix	I	N/A	R; A	R; A	R; A	R; A
5.4.3	Establish the appointed party's exchange information requirements	I	C	R; A	I	I	I
5.4.4	Establish the task information delivery plan(s)	I	I	R; A	C	C	C
5.4.5	Establish the master information delivery plan	I	I	R; A	C	C	C
5.4.6	Complete appointed party's appointment documents	R; A	N/A	I	I	I	I
Mobilization							
5.5.1	Mobilize resources	I	N/A	*[R; A]*	*[R; A]*	*[R; A]*	*[R; A]*
5.5.2	Mobilize information technology	I	N/A	*[R; A]*	*[R; A]*	*[R; A]*	*[R; A]*

		Employer (Appointing Party)	Third Party	Leading Discipline (Appointed Party)	Other disciplines (Appointed Party)		
ISO Sec. Ref.	Task	Hong Kong Housing Authority	*[Name of Third Party]*	*[Name of Leading Discipline]*	*[Name of other discipline 1]*	*[Name of other discipline 2]*	*[Name of other discipline 3]*
5.5.3	Test the project's information production methods and procedures	C	N/A	*[R; A]*	*[R; A]*	*[R; A]*	*[R; A]*
Collaborative production of information							
5.6.1	Check availability of reference information and shared resources	*[C]*	*[N/A]*	*[R; A]*	*[R; A]*	*[R; A]*	*[R; A]*
5.6.2	Generate information	*[I]*	*[N/A]*	*[R; A]*	*[R; A]*	*[R; A]*	*[R; A]*
5.6.3	Undertake quality assurance check	*[I]*	*[N/A]*	*[R; A]*	*[R; A]*	*[R; A]*	*[R; A]*
5.6.4	Review information and approve for sharing	I	I	R; A	R; A	R; A	R; A
5.6.5	Information model review	I	N/A	R; A	R; A	R; A	R; A
Information model delivery							
5.7.1	Submit information model for appointed parties' authorization	I	N/A	I	R; A	R; A	R; A
5.7.2	Review and authorize the information model	C	N/A	R; A	I	I	I
5.7.3	Submit information model for appointing party acceptance	I	N/A	R; A; I	R; A; I	R; A; I	R; A; I

		Employer (Appointing Party)	Third Party	Leading Discipline (Appointed Party)	Other disciplines (Appointed Party)		
ISO Sec. Ref.	Task	Hong Kong Housing Authority	*[Name of Third Party]*	*[Name of Leading Discipline]*	*[Name of other discipline 1]*	*[Name of other discipline 2]*	*[Name of other discipline 3]*
5.7.4	Review and accept the information model	R; A	N/A	R; A	I	I	I
Project close-out							
5.8.1	Archive the project information model	I	I	R; A	R; A	R; A	R; A
5.8.2	Capture lessons learned for future projects	R; A	I	R; A	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.

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 BEP.

4.7 LOD Responsibility Matrix

Fill in LOD Responsibility Matrix Template per the latest version of HABIMSG.

Refer to *[Appendix II]* for project-specific LOD Responsibility Matrix.

4.8 LOIN Specifications

BIM data required within each model element should be specified as part of the Level of Information Need (LOIN) Specification, which should follow latest adoption of the LOIN definitions in HABIMSG Level 4 – Detail Guide.

Unless otherwise specified, HA currently adopts Hong Kong CIC BIM Standards, which contains prevailing LOIN 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 Master Information Delivery Plan

The Master Information Delivery Plan (MIDP), which consolidates the Task team's Task Information Delivery Plans (TIDP), serves the function of a Schedule of BIM Deliverables. It documents the tasks carried out by the BIM Author and encompasses the entire project lifecycle, including planned and actual dates, along with the associated BIM deliverables. Additionally, it records the exchange formats, revisions, and file names/numbers (which serve as unique IDs) in compliance with the Project Agreement to enhance file management efficiency.

Remove inapplicable stages as appropriate.

Alternatively, a Gantt chart can be adopted but actual dates shall not be omitted.

This Master Information Delivery Plan is a Live document and shall be updated at every milestone.

Refer to *[Appendix III]* for Master Information Delivery Plan.

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				

4.13 High Level Responsibility Matrix

Complete the Matrix using the provided Appendix IV High Level Responsibility Matrix template for both HA portion and government entrusted portion. Attach the tables as appendices.

Refer to *[Appendix IV]* for indicating the responsibilities for the key deliverables and authoring items within information containers (i.e., models) for stakeholders throughout various project stages and milestones.

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]*
Schedules or Spreadsheets	*[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.

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 #] / [other sharing methodologies 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.

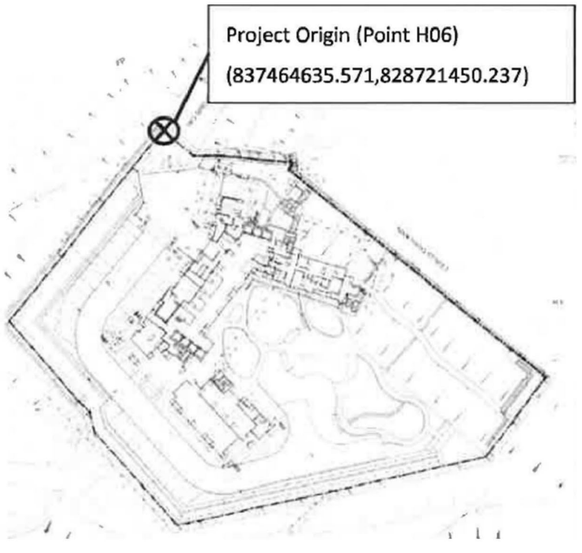
6.2 Model Coordinates

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.

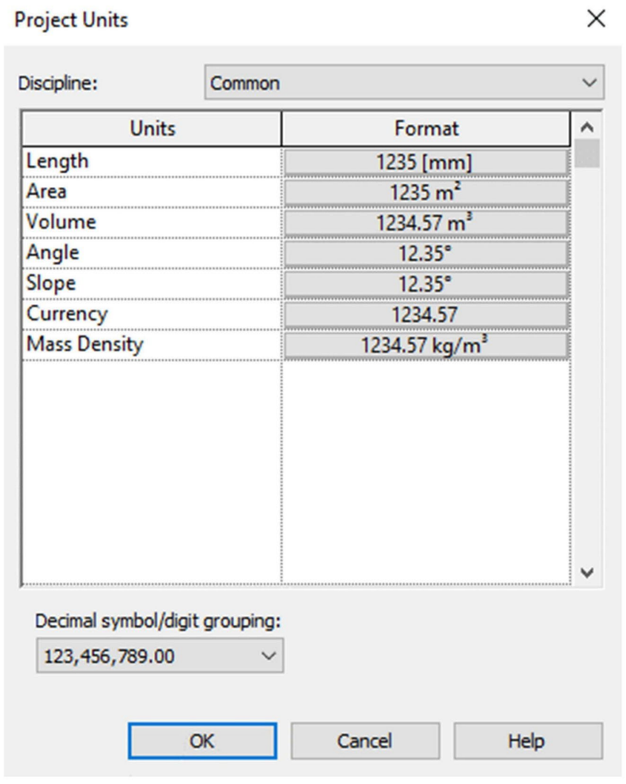
The project-specific level is set per image below:
Provide a screen capture of level settings such as the image below.

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 D.MET 3.3 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 of Federation Strategy for Field 3.2 (System): Building

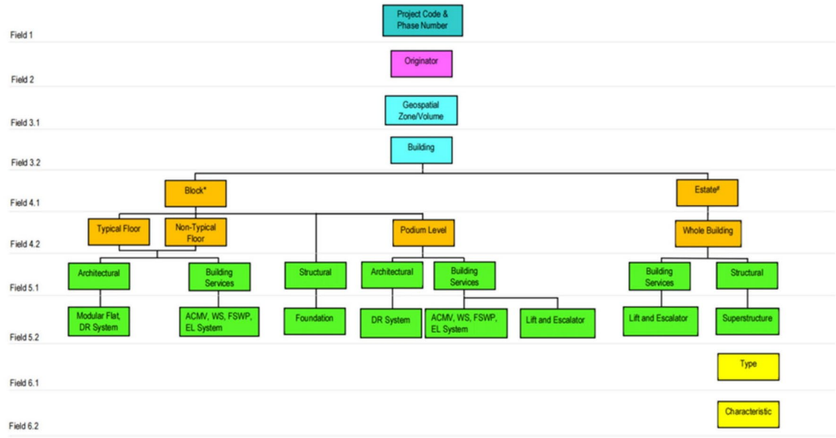


Figure 4-6 Federation Strategy for Field 3.2 (System): Building

Remark:
* Block represents a project model for single block or tower in accordance with D3.2 Model Segregation Strategy.
# Estate represents a project model for Estate Segregation in accordance with D3.2 Model Segregation Strategy.

Example [Design Stage / Construction Stage]:

Example of Federation Strategy for Field 3.2 (System): General Site Information, Geotechnical, Landscape, Civil

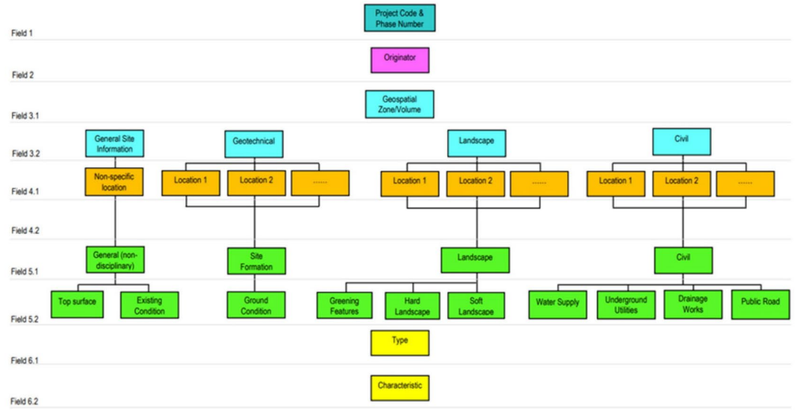


Figure 4-7 Federation Strategy for Field 3.2 (System): General Site Information, Geotechnical, Landscape, Civil

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)	*\Documents\HD Library\BIM\HA BIM Resources\4. HA Project Model Templates\Arc*
Structural (SE)	*\Documents\HD Library\BIM\HA BIM Resources\4. HA Project Model Templates\Str*
Building Services (BSE)	*\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.

7 Collaboration Procedures

This section describes how PT / BIMSP / PSP various disciplines, Consultants, Contractor and BIM Consultant interact.

7.1 Collaboration Workflow

Describe how PT / BIMSP / PSP / Contractor or responsible parties for BIM authoring coordinate with others.
Describe also intradisciplinary coordination or collaboration within teams (e.g. between General Contractor and Sub-contractors).
If any deviation from HABIMSG Level 3 (Q3), attach a workflow diagram in similar format.

See below for the project-specific collaboration workflow diagram.

7.2 Clash Management

Describe how PT / BIMSP / PSP / Contractor or responsible parties carry out the Clash Management.
The clash matrix, clash rules, clash report & summary, and corresponding tolerance is listed in this section.
All disciplines shall be included. Include sub-disciplines when applicable.

See table below for the project-specific clash matrix:

location:		ARCHITECTURE							STRUCTURE						PL		EL			PSWP		ACMV		
		ARC WALL	ARC FLOOR	CEILING	HEADROOM	DOOR	CURTAIN WALL	WINDOW	STAIRCASE	STR WALL	STR FLOOR	STR FOUNDATION	COLUMN	BEAM	STAIRCASE	PIPE	EQUIPMENT	CABLE TRAY	DUCT (TRUNKING)	EQUIPMENT	PIPE	EQUIPMENT	DUCT	PIPE	EQUIPMENT
ARCHITECTURE	ARC WALL	20	0	10	-	0	0	0	0	0	0	-	10	0	0	300	0	200	80	0	300	0	200	300	0
	ARC FLOOR	-	0	0	-	0	0	0	0	0	0	-	0	0	0	500	0	50	20	0	180	0	140	200	0
	CEILING	-	-	2	-	2	2	1	0	0	0	-	10	1	0	100	0	21	0	0	200	0	0	0	0
	HEADROOM	-	-	-	-	-	-	-	10	-	-	-	-	1	10	200	0	20	5	0	200	0	10	20	0
	DOOR	-	-	-	-	0	0	0	0	0	0	-	2	0	0	5	0	6	0	0	0	0	0	0	0
	CURTAIN WALL	-	-	-	-	-	0	-	0	0	0	-	0	5	0	10	-	-	-	-	-	-	-	-	-
	WINDOW	-	-	-	-	-	-	0	0	0	0	-	0	0	0	0	0	0	0	0	0	0	0	0	0
	STAIRCASE	-	-	-	-	-	-	-	0	0	0	-	0	0	0	5	0	0	0	0	0	0	0	0	0
STRUCTURE	STR WALL	-	-	-	-	-	-	-	-	0	0	5	0	0	0	100	0	80	0	0	180	0	100	150	0
	STR FLOOR	-	-	-	-	-	-	-	-	0	0	2	0	0	0	500	0	50	20	0	180	0	140	20	0
	STR FOUNDATION	-	-	-	-	-	-	-	-	-	-	10	0	0	-	-	-	-	-	-	-	-	-	-	-
	COLUMN	-	-	-	-	-	-	-	-	-	-	-	0	0	0	5	0	0	0	0	0	0	0	0	0
	BEAM	-	-	-	-	-	-	-	-	-	-	-	0	0	0	150	0	0	0	0	0	0	0	0	0
	STAIRCASE	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0	0	0	0	0	0	0	0	0
PL	PIPE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100	20	10	8	0	30	0	80	100	0
	EQUIPMENT	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0	0	0	0	0	0	0
EL	CABLE TRAY	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20	15	5	10	0	30	25	0
	DUCT (TRUNKING)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10	2	0	0	20	10	0
	EQUIPMENT	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0	0	0	0
PSWP	PIPE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50	0	150	200	0	
	EQUIPMENT	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0	0	
ACMV	DUCT	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	150	100	0	
	PIPE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	200	0	
	EQUIPMENT	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	

See the sample of Clash Summary below:

Clash Summary (Updated date : 20 Feb 2024)

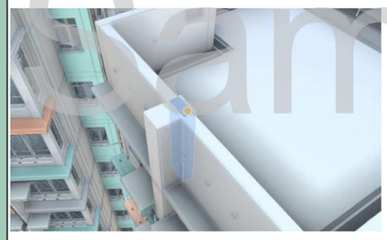
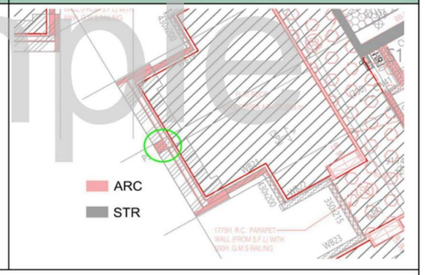
	Latest Status of Clashes					
	Block A	Block A (resolved)	% resolved	Block B	Block B (resolved)	% resolved
Total Entire Building	12361	11348	87.90%	9818	8452	83.48%
For Each Floor						
***UG	217	0	0.00%	116	72	45.00%
**G/F	155	549	77.98%	448	447	99.78%
M/F (for Block A)	60	57	95.00%		N/A	
P1 (for Block B)		N/A		57	46	80.70%
P2 (for Block B)		N/A		60	52	86.67%
P3 (for Block B)		N/A		617	617	100.00%
P4 (for Block B)		N/A		158	158	100.00%
TR	6	0	0.00%	381	381	100.00%
1/F	303	0	0.00%	85	82	96.47%
*6/F-26/F (for block B)		N/A		7896	6432	81.46%
*2/F-29/F (for Block A)	11620	10324	88.85%	NA	NA	NA
Lift machine room floor (for block A)	104	104	100.00%	NA	NA	NA
RF (for block A)	314	314	100.00%	15	0	0.00%

Note 1: Typical Floor 6F-26F of BLK B, F-29F BLK A (which considered as the same number of Clash)

**Note 2: New crash amount has been updated from the revised model (the exact figure would be updated accordingly)*

***Note 3: Coordination is under processing with Main Contractor*

See the sample of Clash Report below:

CR01	Clash Report		
Project	Construction of Public Housing Development at XXX Street Area XX		
Issue Date	20/2/2024	Issue By	BIMSP
Recipients	HA		
Clash No.	Clash01	Discipline	ARC & STR
Severity	Major	Grid	BLK B, Main Roof. B17/BP
Location	Main Roof. Refuge Area		
Descrption	Architectural layout does not match with structural layout.		
View	3D View	Plan View	
			
Client's Reply/Comment:	The revised drawings to be provided.		
Follow Up Action	ARC and STR Models to be updated.		
Status	Active	Updated By	BIMSP

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:

The file name consists of 7 fields:

Field	1	2	3	4	5	6	7
HA Customization	Project code	Originator	Volume (_system)	Location (_sub-location)	Discipline (_Subdiscipline)	Type (_characteristic)	Sequential number

Remark: For fields 3 to 6, the item within brackets indicates the optional sub-field for input.

Justify deviations from HABIMSG, if any.

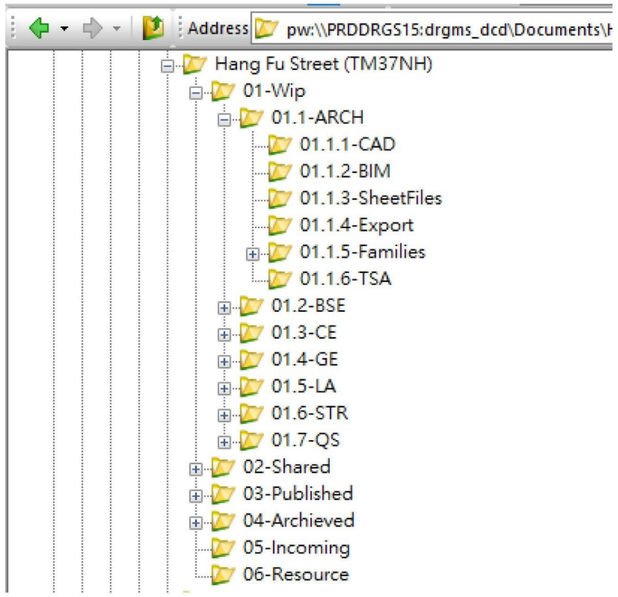
Provide a Model File List as Appendix:

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

Model Name	Description

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**	**R**evit 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 Assurance & 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 BEP.

Project-specific quality control checks are as followed:

No	Checks	Definition	Responsible Party	Methodology	Reference document	Frequency
1	Visual Check	Ensure there are no unintended model components and the design intent has been followed; Observe unreasonable modelling errors. Geometry satisfied required LOD-G level at the corresponding phase.	*[e.g. Own Discipline BIM Coordinator]*	*[Please Specify. e.g., Walk Through Meetings among stakeholders using Authoring, Viewing or collaboration platform / CDE}*	*[**Please** Specify]*	*[e.g. Bi-Weekly or before Information exchange and end of each work stage.]*
2	Interference check, Clash detection (LOD-G)	Detect problems in the model where two building components are clashing including soft and hard	*[e.g. BIM Coordinator / BIM Manager of party responsible for federating the BIM models]*	*[Please Specify. e.g. Utilising Clash Detection Software or Collaboration Platform, CDE Discuss and review during BIM Coordination Meeting]*	*[Please Specify]*	*[e.g. Bi-Weekly or before Information exchange and the end of each work stage.]*
3	Standards Check	Ensure that Project Agreement / Works Contract, HABIMSG and BIM BEP have been followed (e.g. fonts, dimensions, line styles, levels, file	*[e.g. Own Discipline BIM Coordinator]*	*[Please Specify. e.g., Review standards;*	*[Please Specify]*	*[e.g. Bi-Weekly or before Information exchange*

		naming and room numbering.) Object Standards Object Naming, Classification, Consist of 3D Geometry, Property / Parameters, 2D Symbol, Tag / Label / Annotation		*Utilising automated plugin tools / code-checking software*		*and the end of each work stage.]*
4	Model data Integrity check (LOD-I)	The process used to ensure that the project data set has no undefined, incorrectly defined or duplicated elements and satisfied the required LOD-I at the corresponding phase. Reporting process on non-compliant elements and corrective action plans.	*[e.g. Own Discipline BIM Coordinator]*	*[Please Specify e.g. Scheduling out from the Information Model for each category with metadata; Use of data analytic tools to compare with controlling standards and information requirements. Use of customised Automated plugins.]*	*[Please Specify]*	*[e.g. Bi-Weekly or before Information exchange and the end of each work stage.]*
5	Document Deliverable Check	Ensure documentations are generated from the Single Source of Truth Information Model.	*[e.g. Own Discipline Leader. Corresponding domain knowledge required.]*	*[Verify published documentation such as drawings and reports with Information directly generated from the BIM models]*	*[Please Specify]*	*[e.g. Monthly or follow BIM Progress]*
6	Model Check	Spot checks of the above four checks (items 1 - 4)	*[e.g. BIM Manager of the party responsible for delivering the BIM models under HA's agreement/ contract]*	*[Please Specify. e.g. Verify published documentation such as drawings and reports with Information directly generated from the BIM models]*	*[Please Specify]*	*[e.g. Monthly or follow BIM Progress]*

9.2 BIM QA Documents

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

Use HABIMSG Annex ANN-1.2 HA BIM Quality Assurance (QA) Documents as the basis, attach the templates of the project-specific BIM Checklist (and the BIM As-built Model Verification Report [for contractor only]) 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) Documents.

ANN-1.2a. BIM Project Startup Checklist

ProjectWise Location of BIM QA Documents:

\Documents\HD Library\BIM\HA BIM Resources\3. HA BIM Quality Assurance (QA) Documents\

TIER 1 - BIM PROJECT STARTUP CHECKLIST

Project Title:		Checklist no.:	PS- xx
Agreement#/ Contract# no.	(#delete as necessary) (For in-house BIM projects without BIMSP nor PSP support, fill in "In-house" in this cell.)		
Company:	(To be completed by each party responsible for delivering the BIM models under HA's agreement/ contract, refer to HABIMSG v4.0 section D6.2 in Volume 2.) (For in-house BIM projects without BIMSP nor PSP support, fill in "In-house" in this cell.)		
Submitted by:	BIM Manager: (Name of the BIM Manager from the above party) (For in-house BIM projects without BIMSP nor PSP support, fill in "In-house XXX" in this cell, where XXX is the respective discipline, i.e. A/ SE/ BSE/ CE/ GE/ LA)	Date:	

Notes:

Reference Documents

When completing these checklists:

- Please refer to the HABIMSG for the BIM QA guidelines and the sample BIM Project Startup Checklist
- For Government Entrusted Works, please refer to the relevant departments/ bureau's BIM standards and guidelines

Abbreviations:

Y - Yes, checked and compliance item **NA** - Not Applicable

	Items		HABIMSGv.4.0 Reference	Y / NA
A	**Collecting HA BIM Resources:** This is to confirm that the following items have been collected:			
A1	HA BIM Standards and Guidelines (HABIMSG)		Volume 1: 2.4 Starting a BIM Project Annex: ANN-1 HA BIM Resources	
A2	HA BIM Execution Plan (BEP) Template			
A3	BIM Model Compliance Checklist	ANN-1.2b		
	BIM As-Built Model Verification Report	ANN-1.2c		
A4	HA Project Model Templates			
A5	HA Family Library			
A6	HA Shared Parameter Lists			
A7	Abridged Version of Modular Flat Design (MFD) Models			
A8	BIM Training Videos			
A9	Projects' Design BIM Model, if available (to be obtained from PT)			

	Items	HABIMSG Reference	Y / NA
B	**Compliance with the HABIMSG for HA portion of the Works:** This is to confirm that the HABIMSG would be followed as far as practicable, in particular on the following items: (Please provide justification at the appendix of this checklist if the item does not comply with HABIMSG)		
B1	Application of BIM Uses in the project and HA BIM Workflows	Volume 1: 3 Quick Guide (Level 1 – Level 3) Q1 Quick Guide Level 1– BIM Use Overview Q2 Quick Guide Level 2– BIM Application Detail Q3 Quick Guide Level 3– Overall BIM Workflow	

TIER 1 - BIM PROJECT STARTUP CHECKLIST

	Items	HABIMSG Reference	Y / NA
B2	HA Level of Information Need (LOIN)	Volume 2: D1 Level of Information Need (LOIN)s	
B3	HA collaboration procedures	Volume 2: D2 BIM Collaboration	
B4	HA Model Segregation Strategy	Volume 2: D3.2 Model Segregation Strategy	
B5	HA Modelling Approach	Volume 2: D4 Standard Approach of Modelling (SAM)	
B6	HA Folder, Model, Drawing, Views and BIM Object naming convention	Volume 2: D3.3 System Setup	
B7	Requirement for HA drawing production	Volume 2: D5 Presentation Style	
B8	Scope and requirements of QTO as listed in HABIMSG Annex (ANN-1.4), including the adoption of SAM and the HA Shared Parameter Lists	Volume 2: D4 Standard Approach of Modelling (SAM) D4.17 Information Extraction SAM D4.18 Family Library Component: FL-03 Parameters Annex: ANN-1.4 HA BIM QTO Scope	
B9	HA BIM Quality Control and Quality Assurance requirement	Volume 1: Q3-05 BIM Quality Assurance (QA) Volume 2: D6 BIM Quality Assurance Annex: ANN-1.2 HA BIM Quality Assurance (QA) Documents	

	Items	Reference	Y / NA
C	**Compliance with the relevant client department/ bureau's BIM requirements and standards for Government Entrusted Works:** This is to confirm that the relevant BIM guidelines would be followed and documented in the BEP, and confirmed with the client departments on any deviations, if any, including the following:		
C1	Requirements of BIM models for Government Entrusted Works	The relevant client department/ bureau's BIM requirements and standards, e.g. Development Bureau's Technical Circular (Works) No. 2/2021 or subsequent revisions for the requirements, including the BIM guidelines, such as DEVB BIM Harmonisation Guidelines.	

	Items	HABIMSG Reference	Y / NA
D	**Setup requirements of Project BIM models:** This is to confirm that the following requirements were noted and would be followed accordingly: (Please provide justification at the appendix of this checklist if the item not complying with HABIMSG)		
D1	Setup requirements of Project BIM models	Volume 2: D3.4 Project Setup	

ANN-1.2a

TIER 1 - BIM PROJECT STARTUP CHECKLIST

	Items	HABIMSG Reference	Y / NA
E	**(For party responsible to develop the BIM Execution Plan (BEP) , e.g.. BIMSP in BIMSP agreement, ASP in PSP agreement, and contractor in Works Contract, etc.)** **The BEP has been developed based on the HA BEP template, and will execute the BEP accordingly:**		
E1	BIM Execution Plan	Annex: ANN-1.1 HA BIM Execution Plan (BEP)	

ANN-1.2b. BIM Model Compliance Checklist

ProjectWise Location of BIM QA Documents:

pw:\\PRDDRGS15:drgms_dcd\Documents\HD Library\BIM\HA BIM Resources\3. HA BIM Quality Assurance (QA) Documents\

TIER 1 - BIM MODEL COMPLIANCE CHECKLIST

Project Title:		Checklist no.:	MC- xx
Agreement#/ Contract# no.	(#delete as necessary) (For in-house BIM projects without BIMSP nor PSP support, fill in "In-house" in this cell.)		
Submission Stage:	(input one of the followings: within 3 months of commencement of the agreement#/ works#, BC, DDRP1, DDRP2, building tender out (excluding Design and Build projects), finalised Design BIM model and As-built BIM models at project completion. . e.g. "Between building tender out and finalised Design BIM models")		
Company:	(To be completed by each party responsible for delivering the BIM models under HA's agreement/ contract, refer to HABIMSG v4.0 section D6.2 in Volume 2.) (For in-house BIM projects without BIMSP nor PSP support, fill in "In-house" in this cell.)		
Submitted by:	BIM Manager: (Name of the BIM Manager from the above party) (For in-house BIM projects without BIMSP nor PSP support, fill in "In-house XXX" in this cell, where XXX is the respective discipline, i.e. A/ SE/ BSE/ CE/ GE/ LA)	Date:	

Notes:

Reference Documents

When completing these checklists:

- Please refer to the HABIMSG for the BIM QA guidelines and the sample BIM Model Compliance Checklist
- For Government Entrusted Works, please refer to the relevant departments/ bureau's BIM standards and guidelines

Abbreviations:

Y - Yes, checked and compliance item **N** - Non-compliance item **NA** - Not Applicable

(The response shall reflect the BIM model at that particular project stage, input "NA" for check items that is not applicable.)

* Supporting materials are not required for check items with grey cell at this column.

\# Supporting materials of this check item shall be submitted at the 1st and final submission of this checklist. Check items without the # mark shall include supporting materials at each submission of this checklist.

	Items	HABIMSGv.4.0 Reference	Y / N/ NA	Supporting Materials*	Justification for "N"
A	**Model-Related Documentation**				
A1	All model files, sheet files and reference files used are submitted together with this checklist. (Models should be exported by packaging tool such as Etransmit, which creates a package of all model dependent files in the form of a folder.)			Appendix 1	
B	**Model Compliance and Modelling Methodology**				
B1	**Software and File Format**				
B1.1	The software version and format are as specified in the BIM execution plan (BEP).	Annex: ANN-1.1 ANN-1.6d		Appendix 1#	
B2	**Model Files**				
B2.1	Folder structure, naming of model files and file size are complied with the BIM standards as specified in the BEP.	Vol 1: 2.4 Vol 2: D3.3		Appendix 1#	
B2.2	Colour code applied in models are complied with the BIM standards as specified in the BEP.	Vol 2: D5.5 D4.7			
B3	**Modelling Methodology**				
B3.1	The modelling approaches are complied with the BIM standards as specified in the BEP.	Vol 2: D4			

TIER 1 - BIM MODEL COMPLIANCE CHECKLIST

B3.2	HA BIM Project Templates are applied and HA BIM objects are adopted according to the BIM standards as specified in the BEP..	Vol 1: 2.4C Vol 2: D3, D4			
B3.3	HA Shared Parameter Lists are adopted for project modelling, such as creation of BIM object, schedules; and for facilitating BIM QTO scope as listed in HABIMSG Annex.	Vol 1:Q3-01.3 Vol 2:D4.18: FL-03 Annex: ANN-1.3c ANN-1.4		Appendix 2#	
B3.4	All coordinate system points are based on Hong Kong 1980 Grid and Datum, and are setup with a correct project coordinate as per BEP.	Vol 2: D3.4: D.MET-4.2		Appendix 3#	
B3.5	Project Base Point is at the same location as Internal Origin Point.	Training Video: 2.1a(1), 2.1b(1),2.2a		Appendix 3#	
B3.6	Levels and Grids are aligned with different discipline models by "Copy/ Monitor" from ARC model.	Vol 2: D2.7: D.COL-2.2		Appendix 4#	
B3.7	Project information (e.g. Project Code, Project Title, Submission Purpose etc.) are inputted correctly.	Vol 1: Q3-01.3			
B3.8	Naming for Object, Level, Material, Sheets, Views, View Templates and Worksets are complied with the BIM standards as specified in the BEP.	Vol 2: D2.6: D.COL-1.3. D3.3:D.MET-3.2 D5.3: PS-08			
B3.9	Elements are placed in correct Worksets, e.g. Placeholder, Vertical Transportation, Foundation, etc.	Vol 2: D2.6: D.COL-1.3. D2.7: D.COL-2.3. D3.2		Appendix 5	
B3.10	Indoor spaces are modelled using “Room”, and with unique room numbers, room names and correct height or headroom. (for architectural models only)	Vol 2: D4.3: DA-32		Appendix 6	
B3.11	Model elements are set to “room bounding” in properties appropriately. (for architectural models only)	Vol 2: D4.3: DA-01, DA-10, DA-32			
B3.12	MEP elements are assigned to correct systems.	Vol 2: D4.7 – D4.13			
B3.13	Maintenance space is modelled for MEP equipment.	Vol 2: D4.18: FL-04			
B3.14	Annotation requirements (e.g. line types, font size, etc.) aligned with the requirements documented in the BEP.	Vol 2: D5.3: PS-10			
B3.15	Federation strategy complied with the requirements documented in the BEP.	Vol 2: D3.3: DMET-3-3			
B3.16	The project units complied with the requirements documented in the BEP.	Vol 2: D3.4 DMET-4.1			
C	**Geometrical Information**				
C1	BIM models are prepared according to the LOD Responsibility Matrix in BEP.	Vol 2: D1			
C2	Clash detections have been carried out to detect and resolve interference/clashes between building components virtually.	Vol 1: Q3-03.2			
D	**Non-geometrical Information**				

ANN-1.2b

TIER 1 - BIM MODEL COMPLIANCE CHECKLIST

D1	BIM models are prepared according to the LOD Responsibility Matrix in BEP.	Vol 2: D1			
D2	All naming and data in BIM Models are English.	Vol 2: D3.1			
D3	Information requirements (essential parameters, see example below) as mentioned on SAM are prepared in the BIM models. e.g. 1. Modelling items for QTO scope (Annex: ANN-1.4)	Vol 2: D4 D4.17 D4.18: FL-03 Annex: ANN-1.4			
D4	All information containers have an information container ID with the naming and information container ID fields complied with the BIM standards as specified in the BEP.	Vol 2: D3.3: DMET-3.2			
D5	Project-specific codes used comply with those specified by the BEP.	Vol 2: D3.3: DMET-3.2			
E	**Drawing Generation**				
E1	Drawings are generated from the BIM models. The submission in this QA period are: (e.g. PDRC, BC, DDRP1, DDRP2, statutory submission drawings, Foundation/ Building Tender, Construction, Approved statutory drawings, As-Built drawings, etc.). Please fill in here:_____ A table of summary for drawing types generated from BIM models is submitted in the Appendix.	Vol 2: D5		Appendix 7	
F	**Model Quality**				
F1	**General Housekeeping**				
F1.1	Sheets and views naming complied with the BIM standards as specified in the BEP.	Vol 2:D3.3: D.MET-3.5			
F1.2	Categories of BIM elements (e.g. structural columns, doors, cable trays, trees, etc) are assigned correctly with reference to the BIM standards as specified in the BEP.	Vol 2: D1.2, D3, D4			
F1.3	All outdated CAD / Model drawings, reference model and unused contents are purged (to minimize model size).	Vol 2: D3.1			
F1.4	All relevant External References models are assigned with appropriate path type (i.e. “Attachment” and “Overlay”).	Vol 2: D3.2			
F2	**Visual Check, Continuity Check, Model and Drawing Overlay**				
F2.1	No missing elements, flying objects or misplacement. e.g. flat roof, external staircases, external parking lots, gantry, outdoor areas, canopies, cantilever, kiosks, etc.	Vol 1: Q3-05.2 Vol 2: D1.2 D.LOD-2.1 to D.LOD-2.6			
F2.2	No overlapping elements nor visible clashes.				
F2.3	No discontinuous elements or disconnected systems.				
F2.4	No inconsistency between 2D drawing and 3D model.				
F2.5	No large-spanning continuous elements.				
F2.6	No objects authored in generic model category.				
F2.7	No special elements imported from other software and no complex geometry.				
G	**Model Quality Check for Cross Disciplines Federated Models (For Party responsible for the federated models)**				
G1	Cross disciplines clash detections had been carried out to detect and resolve interference/clashes between building components virtually.	Vol 1: Q3-03.2			

TIER 1 - BIM MODEL COMPLIANCE CHECKLIST

G2	BIM models of different disciplines, such as architectural, landscape, structural, MEP systems, ELV systems and interior fitting-out models (if any) should be checked if they have all been provided and aligned correctly in 3D space e.g. in x-y-z axis, and if any major components/ assets are missing.				
H	**Project Archive**				
H1	Archive package has been created according to the BIM standards as specified in the BEP (including the design BIM model, the finalised design BIM model, federated BIM model, as-built model, and BIM objects, etc. as required).	Vol 1: Q3-08		Appendix 8	
H2	BIM files have been archived according to the BIM standards as specified in the BEP in the specified format and have been submitted together with this checklist.	Vol 1: Q3-08			
	a. Native format (e.g. rvt)			Appendix 8	
	b. Viewer format (e.g. nwc, nwf, nwd)				
	c. Open format (e.g. IFC)				
J	**Open Format**				
J1	The openBIM approach has been followed according to the BIM standards as specified in the BEP.	Vol 2: D7. IE-01, IE-02			

ANN-1.2c. BIM As-built Model Verification Report

ProjectWise Location of BIM QA Documents:
\Documents\HD Library\BIM\HA BIM Resources\3. HA BIM Quality Assurance (QA) Documents\

ANN-1.2c

TIER 1 - BIM AS-BUILT MODEL VERIFICATION REPORT

Project Title: _____ Verification Report no.: AB- xx

Contract no. _____

Company: (To be completed by the contractor responsible for delivering the BIM models under HA's contract, refer to HABIMSG v4.0 section D6.2 in Volume 2)

Submitted by: BIM Manager: (Name of the BIM Manager from the above party) Date:

Notes:

Reference Documents

When completing these checklists:

- Please refer to the HABIMSG for the BIM QA guidelines and the sample As-built Model Verification Report.
- For Government Entrusted Works, please refer to the relevant departments/ bureau's BIM standards and guidelines

Abbreviations:

Y - Yes, checked and compliance item **N** - Non-compliance item **NA** - Not Applicable

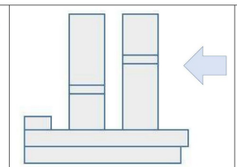
Item A		**Y / N/ NA**	**Supporting Materials**	**Justification for "N"**
Documents to be submitted together with this report:				
A1	The completed BIM Model Compliance (MC) Checklist		*Submitted together with this report*	
A2	A full set of as-built models		*Appendix 1 of the MC Checklist, with as-built models highlighted.*	

Item B

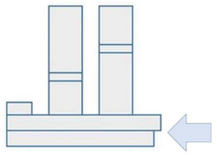
Geometry Integrity

Geometry integrity shall be demonstrated by comparing the Federated as-built BIM models and as-built condition on-site photos. The as-built BIM models should generally reflect the actual physical conditions of the Works. Matching camera angles for the BIM models and site photos should be provided.

The contractor's BIM manager is required to liaise with project team to set out the sampling area before filling this verification report.

Type of Area			**Areas / Elements to be Selected for Sampling**	**Sampling Area/ Percentage (approx.)**
B1.		Repetitive Area (e.g. typical floor)	One typical floor per block (randomly selected by Project Team (PT)) (A sample floor plan (Ref 01) showing the proposed camera angles is attached in the sample as-built model verification report for reference) For other type of repetitive areas, PT can use the similar approach for sampling selection.	1. Interior of one flat unit per flat type (randomly selected by project team) 2. Lift lobby 3. Common corridors PT may add sample area/ angle as required to suit project specific needs, e.g. acoustic balcony.

TIER 1 - BIM AS-BUILT MODEL VERIFICATION REPORT

B2.		Non Repetitive Area All areas apart from the repetition areas and concealed areas in items A and C. (e.g. non domestic area, external area, etc.) Both roof and ground floors shall be selected as part of the sampling areas.	For the selection of sampling area, PT could include the model elements, as listed in the **LOD Responsibility Matrix** tables in the BEP, for reference. (such as Cladding, Door, Exterior Wall, etc.)	Approx.10% of the non repetitive area, in 10 locations to be selected by PT.
B3.		Concealed Area (e.g. Underground utilities)	For the selection of sampling area, PT could include the model elements, as listed in the **LOD Responsibility Matrix** tables in the BEP, for reference. (such as underground utilities items etc.)	Approx. 10% of the concealed floor area, in 10 locations, to be selected by PT

Item no.	Area/ Building (e.g. Block/ Floor Level)	Location (e.g. Grid/ Room)	Image from the Federated As-built BIM Model	Site Photo
B1. Repetitive Area				
1.				
2.			*add more items as needed*	
B2. Non Repetitive Area				
1.				
2.			*add more items as needed*	
B3. Concealed Area				
1.				*record photos of the final condition before cover up/ backfilling works shall be used*
2.			*add more items as needed*	

	Items	Y / N/ NA	Supporting Materials	Justification for "N"
C	**Information Integrity**			
C1	The as-built BIM models are prepared according to the required Level of Information (LOD-I) in accordance with BEP. These are demonstrated by Data Sheets (refer to Vol. 2, IE-02) as Appendix A, which displays all the required attributes (e.g. location, materials, OmniClass, brand name, etc.) in accordance with the LOD-I table. The Data Sheet shall be submitted in both exchange formats (i.e., .xlsx, .pdf).		*Appendix A*	

ANN-1.2d. Feedback form of BIM Model Compliance Checklist

ProjectWise Location of BIM QA Documents:

\Documents\HD Library\BIM\HA BIM Resources\3. HA BIM Quality Assurance (QA) Documents\

TIER 2 - FEEDBACK FORM FOR BIM MODEL COMPLIANCE CHECKLIST

Project Title:	Feedback no.: FMC- xx
Company:	(To be completed by the independent checker, e.g. Central BIMSP)
Submitted by:	BIM Manager: (Name of the BIM Manager from the above party)
Feedback:	Dated:
Feedback is based on the Tier 1 checklist no. MC – XX submitted by XX (company name) dated XXX.	
*1st Response to Comments (RtC) was submitted by the model author on:	date
*Comments on the 1st RtC by the independent checker issued on:	date
*No further comments by the independent checker:	date

*Delete/ revise/ add to suit as appropriate

Notes:

Reference Documents

When completing these feedback forms:

- Please refer to the HABIMSG for the BIM QA guidelines including section D6.3 of Vol 2 and the sample BIM Model Compliance Checklist
- Please refer to the relevant departments/ bureau's BIM standards and guidelines for Government Entrusted Works,

Resubmissions

- The model author shall follow up on the comments provided by the independent checker and resubmit the revised models and documents as required, along with RtC as attachment, within 2 weeks (or as agreed with the project team) of receiving the feedback. This process shall continue until all comments have been addressed.

Abbreviations:

C - Checked and no comment **F** – Checked, with comments for follow up **NA** - Not Applicable

(The response shall reflect the BIM model at that particular project stage, input "NA" for check items that is not applicable.)

Items (to be read in conjunction with the submitted BIM Model Compliance Checklist, the items number of this feedback form shall align with the submitted BIM Model Compliance Checklist)

	Feedback		Comments on the 1st RtC	
	C / F/ NA	**Comments**	**C / F/ NA**	**Comments**
A1		comments, with examples as attached in appendix A1 (if any)		comments, with examples as attached in appendix
B1.1		comments, with examples as attached in appendix B1.1 (if any)		comments, with examples as attached in appendix
B2.1		ditto		ditto
B2.2				
B3.1				
B3.2				
B3.3				
B3.4				
B3.5				
B3.6				
B3.7				
B3.8				
B3.9				

TIER 2 - FEEDBACK FORM FOR BIM MODEL COMPLIANCE CHECKLIST

B3.10				
B3.11				
B3.12				
B3.13				
B3.14				
B3.15				
B3.16				
C1				
C2				
D1				
D2				
D3				
D4				
D5				
E1				
F1.1				
F1.2				
F1.3				
F1.4				
F2.1				
F2.2				
F2.3				
F2.4				
F2.5				
F2.6				
F2.7				
G1				
G2				
H1				
H2				
J1				

ANN-1.2e. Feedback form of BIM As-built Verification Report

ProjectWise Location of BIM QA Documents:
\Documents\HD Library\BIM\HA BIM Resources\3. HA BIM Quality Assurance (QA) Documents\

ANN-1.2e

TIER 2 - FEEDBACK FORM FOR BIM AS-BUILT MODEL VERIFICATION REPORT

Project Title:	Feedback no.: FAB- xx
Company:	(To be completed by the independent checker, e.g. Central BIMSP)
Submitted by: BIM Manager:	(Name of the BIM Manager from the above party) Date:
This feedback is based on the Tier 1 As built Model Verification Report no. AB – XX submitted by XX dated XXX	
*1st Response to Comments (RtC) was submitted by the model author on:	date
*Comments on the 1st RtC by the independent checker issued on:	date
*No further comments by the independent checker:	date

*Delete/ revise/ add to suit as appropriate

Notes:

Reference Documents

When completing these feedback forms:

- Please refer to the HABIMSG for the BIM QA guidelines and the sample BIM As-built Model Verification Report
- For Government Entrusted Works, please refer to the relevant departments/ bureau's BIM standards and guidelines

Resubmissions

- The model author shall follow up on the comments provided by the independent checker and resubmit the revised models and documents as required, along with RtC as attachment, within 2 weeks (or as agreed with the project team) of receiving the feedback. This process shall continue until all comments have been addressed.

Abbreviations:
C - Checked and no comment **F** – Checked, with remarks for follow up **NA** - Not Applicable

Items (to be read in conjunction with the submitted BIM Model Compliance Checklist, the items number of this feedback form shall align with the submitted BIM Model Compliance Checklist)

	Feedback		*Comments on the 1st RtC	
	C / F/ NA	Comments	C / F/ NA	Comments
A1				
A2				
B1.1				
B1.2.				
…				
B2.1				
B2.2.				
…				
B3.1				
B3.2.				
…				
C1				

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)	\Documents\HD Library\BIM\HA BIM Resources\4. HA Project Model Templates\Arc\
Structural (SE)	\Documents\HD Library\BIM\HA BIM Resources\4. HA Project Model Templates\Str\
Building Services (BSE)	\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 Object Library

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

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

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

Discipline	ProjectWise Location Path
Architectural (ARCH)	\Documents\HD Library\BIM\HA BIM Resources\5. HA Object Library\ARCH\
Structural (SE)	\Documents\HD Library\BIM\HA BIM Resources\5. HA Object Library\SE\
Building Services (BSE)	\Documents\HD Library\BIM\HA BIM Resources\5. HA Object Library\BSE\

ANN-1.3c. HA Shared Parameter Lists

ProjectWise Location of HA Shared parameter lists:

Discipline	ProjectWise Location Path
Architectural (ARCH)	\Documents\HD Library\BIM\HA BIM Resources\6. HA Shared Parameter Lists\Arc\
Structural (SE)	\Documents\HD Library\BIM\HA BIM Resources\6. HA Shared Parameter Lists\Str\
Building Services (BSE)	\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)	\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 Quick 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
Architecture (A)	**Architectural Works** **A. All Areas** • Doors • Windows • Cat Ladder • Water Tank Handrails **B. Domestic Floors** • Brickwork & blockwork • Panel walls • Non-structural concrete walls • Tactile • Signage • Sanitary fittings (wash basin, sink units and W.C. only) in domestic flats • Cloth drying and curtain rails, grab rails, laundry rack, cooking bench units in domestic flats • Mirror • Staircase Handrails Excluding reinforcements, formwork (*) and any other items not listed above	**D4.3 Architecture SAM** • DA-07 • DA-09 • DA-24 • DA-34 • DA-01 • DA-01 • DA-01 • DA-18 • DA-30 • DA-20 • DA-31 • DA-35 • DA-17 **D3.5 From Modular Flat to Project** D.MET-5.1
Structural Engineering (SE)	**Foundation Works** **A. Piling works** • Bored piles, driven steel H piles, socketed steel H piles and mini-piles **B. Concrete works** • Pile caps, tie/strap beams, footings and retaining walls **C. Excavation works** • 3D terrain model for topography of existing levels Excluding reinforcements, formworks(*) and any other items not listed above	**D4.5 Structure - Foundation SAM** D4.6 Structure-Excavation and Lateral Support SAM • DS-F 01-06 • DS-F 07-09 • DS-E 02 • DS-F 01
Structural Engineering (SE)	**Superstructure Works** **A. Domestic Typical Floors** • In-situ concrete works for slabs, walls, columns and beams Excluding reinforcements, formworks(*) and any other items not listed above	**D4.4 Structure - Superstructure SAM**

Note:

(*) Modelling of formwork separately is not required, but it is required to include QTO information as much as possible in objects of concrete works.

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://elearning.int.housingauthority.gov.hk/HAELP/portal/lms/viewKnowledgeSubject?subjectCode=0000002145

Access from other locations:

https://elearning.housing.gov.hk/HAELP/portal/lms/viewKnowledgeSubject?subjectCode=0000002145

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

\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, large multidisciplinary projects (except for the in-house BIM projects) are recommended to refer to the following hardware specifications which are based on the Guideline for BIM Modelling Computer issued by Development Bureau, as the minimum specifications for efficiency.

Processor	Multi-core CPU with performance benchmark score[(1)] ranging from 20,000 or above depending on modelling details and complexity of the projects.
Memory	64 GB RAM
Boot Drive	1st Hard: 2TB SSD M.2 2nd Hard: 2TB SSD M.2
Video card	Video performance benchmark [(2)] score ranging from 15,000 to 26,000 depending on modelling details and complexity of the projects. At least 8GB GDDR6 GPU Memory At least two Display Ports
LCD Monitor	27 inches or larger and use of 4K monitor
Green Factor	Comply with Energy Star, or obtained an Energy Label under the Energy Efficiency Labelling Scheme of EMSD Product components should comply with RoHS.
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	Microsoft® Windows 10 (or newer) Professional Edition 64-bit Operating System

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.
- When selecting software, project information requirements and support of open format such as IFC should be considered.

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	• Model Authoring • Drawing production • Simple walkthrough video • Rendering perspective • Information extraction	• CAD formats • DWF • NWC/ NWD (Navisworks) • ADSK • IFC • gbXML	• Revit files • CAD formats • DWF • ADSK • NWC • gbXML • IFC • FBX • TXT (schedule)
Navisworks	• 3D coordination • Walkthrough video • Construction simulation • Animation	• Revit files • Most of 3D file formats	• Navisworks format
Design Review	• DWF drawing review • DWF drawing comparison and comment	• DWF	• DWF

ANN-1.7. Common Errors and Recommendations

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

List of Common Errors and Recommendations:

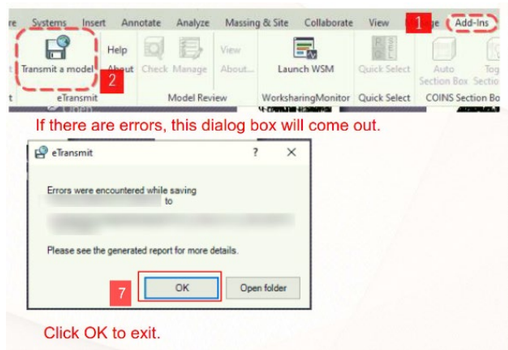
Category	Nature	Topic
Standards and Submission Requirements (SSR)	Recommendation	How to e-transmit (for single Master Files)
		How to e-transmit (for multiple Master Files)
		Opening E-transmit Error Reports:
		How to e-transmit properly:
	Error	SSR 01: Not all models are enabled Worksharing
		SSR 02: Family naming did not follow HABIMSG
		SSR 03: Naming Management for Group
		SSR 04: Extensively used in-place families
		SSR 05: Do NOT over model
Project Setup (PS)	Error	PS 01: Overlapping of levels
		PS 02: Typical floor link is not duplicated for block in master model
		PS 03: Double check reference models position
Wrong Category (WC)	Error	WC 01: Model Category - Railing
		WC 02: Model Category - curtain wall
		WC 03: Over-modelling by using wrong model category
		WC 04: Wrong category assignment
		WC 05: Site Equipment should be created in a family file, not model in place.
		WC 06: Wrong Category for Road Markings
ARC Modelling (ARC)	Error	ARC 01: Duplicate Walls found in the model
		ARC 02: Wall layers not aligned with each other.
		ARC 03: Duplicated wall finishes are modelled for doors
		ARC 04: Wall finishes are not joined
		ARC 05: Unconnected/Flushed Wall
		ARC 06: Wrong top/ base constraints for walls and columns *especially in areas with level differences
		ARC 07: Be careful of reference level setting for wall and window near staircase.
		ARC 08: Be careful of reference level setting for wall and window near staircase.
		ARC 09: Vertical transportation especially stair should be model in Architectural non- typical floor (block) model instead of typical floor model.
		ARC 10: Railing Modelling Error
		ARC 11: True condition of stairs cannot be displayed properly, which lead to undesirable manual editing.
		ARC 12: There are gaps between stairs and floor, and stairs and wall.
		ARC 13: Unplaced Rooms
		ARC 14: 3D Room Name should not be prepared by Model Text and Staircase Line showing in 3D ?
SE Modelling (SE)	Recommendation	SE 01: Modelling approaches
		SE 02: Be aware of modelling approach
		SE 03: Beam should not be overlapped with unjoin.
		SE 04: Better to "Cope" connected Structural steel elements.
		SE 05: Not suggest using fill region for mass concrete fill hatching
BS Modelling (BS)	Error	BS 01: Inconsistent pipe type used & missing pipe connection (broken pipe).
		BS 02: Disconnected pipes
3D Coordination (3DC)	Error	3DC 01: STR elements not placed in Placeholder workset.
		3DC 02: STR elements not placed in Placeholder workset
		3DC 03: STR elements not placed in Placeholder workset
	Recommendation	3DC 04: Detail check and review the federated model - ARC model and STR model
		3DC 05: Detail check and review the federated model - ARC stair vs STR stair.
		3D 06: Detail check and review the federated model - ARC ceiling vs BS pipe.
		3DC 07: Double check clashes between ARC features and BS elements.
		3DC 08: Clash Review
		3DC 09: Coordination
	Error	3DC 10: Unconnected Beam to Column
		3DC 11: Water meter cabinet clashed with walls

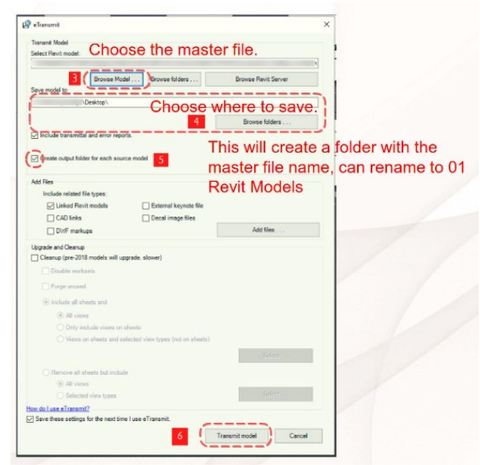
Category	Nature	Topic
		3DC 12: Ramp blocked the door.
		3DC 13: Ramp clashed with hose reel
		3DC 14: Railing shall be adjusted
		3DC 15: Floating Tile shall be removed
	Recommendation	3DC 16: Good approach using 'Clearance block' inside staircase for headroom verification. (Parametric Block)
		3DC 17: Recommend to place under a separate workset “Headroom" for better management.
Housekeeping (HK)	Error	HK 01: Lack of CAD file management – (not placing CAD in the proper workset, not linking CAD by ‘current view only’)
		HK 02: Lack of “CAD" file management – (using ‘import CAD’ instead of ‘link CAD’)
	Recommendation	HK 03: Remove unnecessary CAD drawing
		HK 04: Prepare drawing by using Tag /Annotate instead of overlaying CAD drawing.
	Error	HK 05: Floating objects
		HK 06: Model Line floating
Good Sample (GS)	Sample	GS 01: Good modelling, model is clean.
		GS 02: Good modelling technique
		GS 03: Make good use of Filter for model editing, review and coordination
Drawing Preparation	Recommendation	Recommendation for Revit 2018 Drawing Production
		Recommendation for Revit 2020 or above Drawing Production
Demonstration on applying view template	Demonstration	NA
Recommendation for Section	Demonstration	NA

Standards and Submission Requirements (SSR)

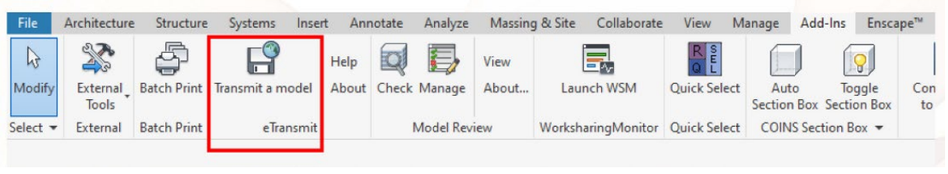
How to e-transmit (for single Master Files)

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





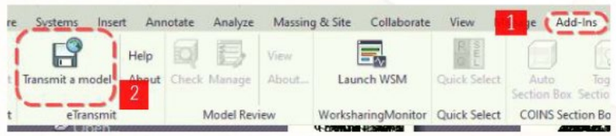
- All submitted BIM models should be consolidated via “eTransmit" in order to sustain the relationship between the external link models.
- Use e-transmit to send files with links intact.



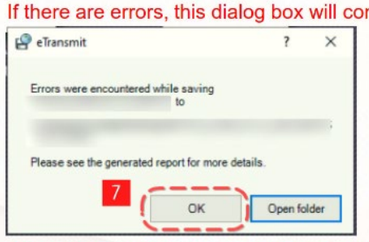
How to e-transmit (for multiple Master Files)

Before starting:

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

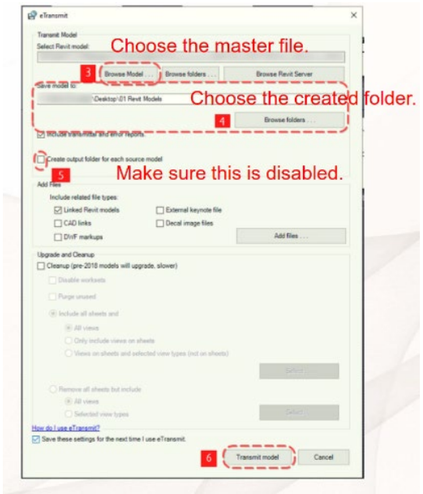


If there are errors, this dialog box will come out.

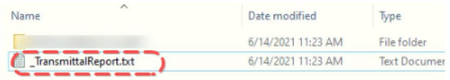


Click OK to exit.

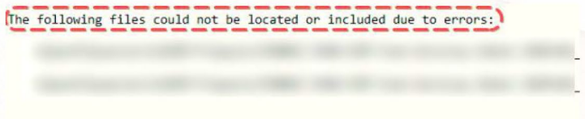
Repeat steps 3-7 for all the master files.



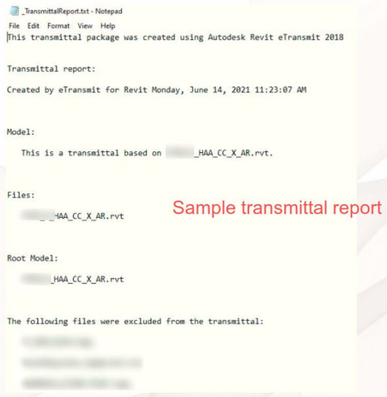
Opening E-transmit Error Reports:



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



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

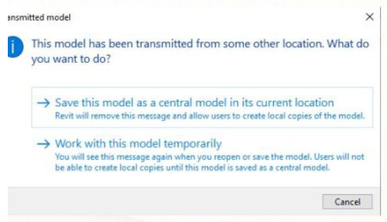


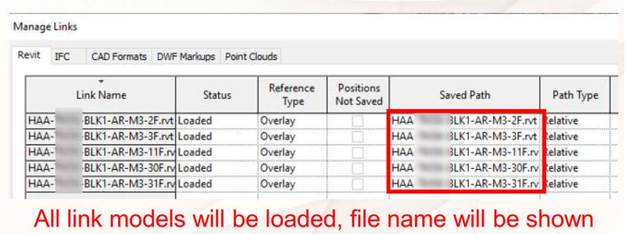
Sample transmittal report

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:

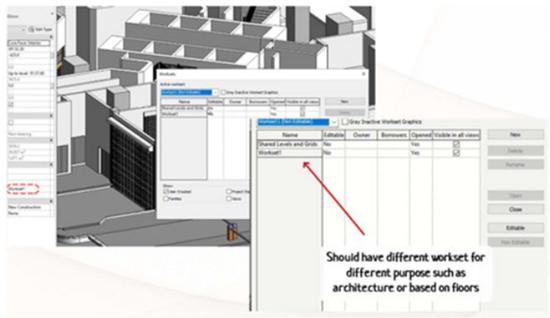




All link models will be loaded, file name will be shown under “Saved Path”, instead of file directory.

SSR 01: Not all models are enabled Worksharing

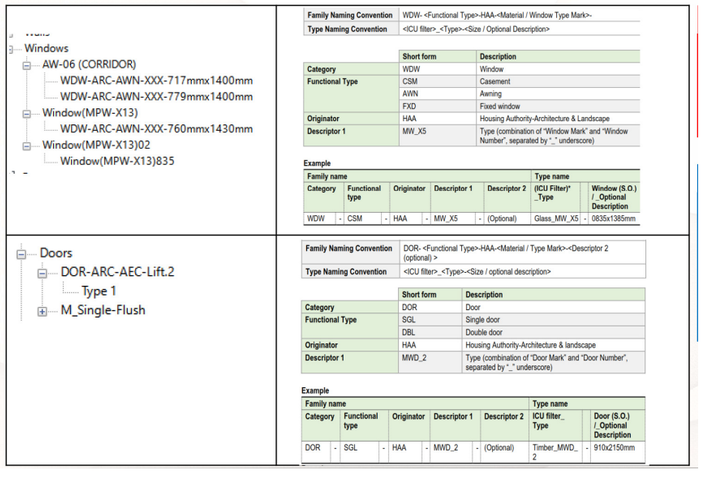
- Set the model as work sharing and prepare appropriate worksets and assign objects to suitable worksets (serving similar function as "layer" in AutoCAD).



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.

SSR 02: Family naming did not follow HABIMSG



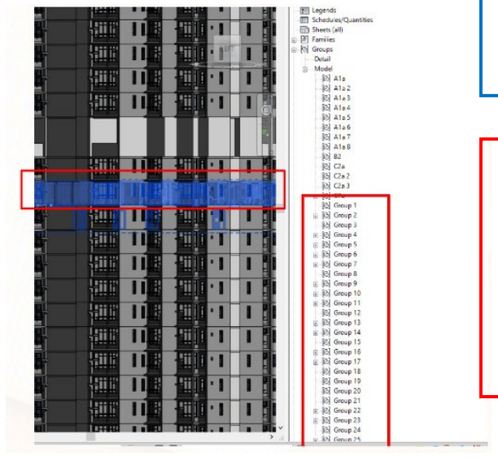
Drawback

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

Recommendation

- Follow the naming convention and requirement stated in HABIMSG.

SSR 03: Naming Management for Group



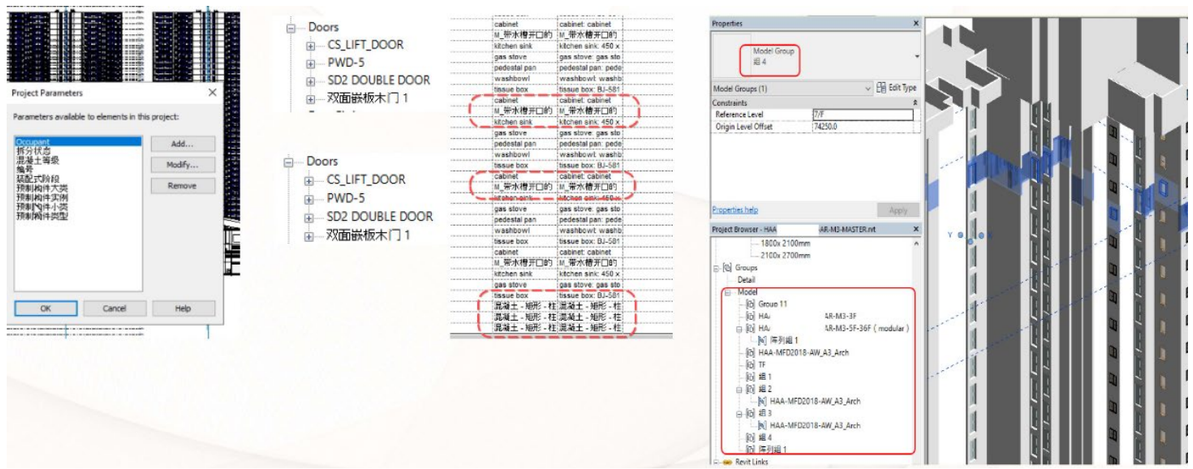
Drawback

- Unclear group name may lead to 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)

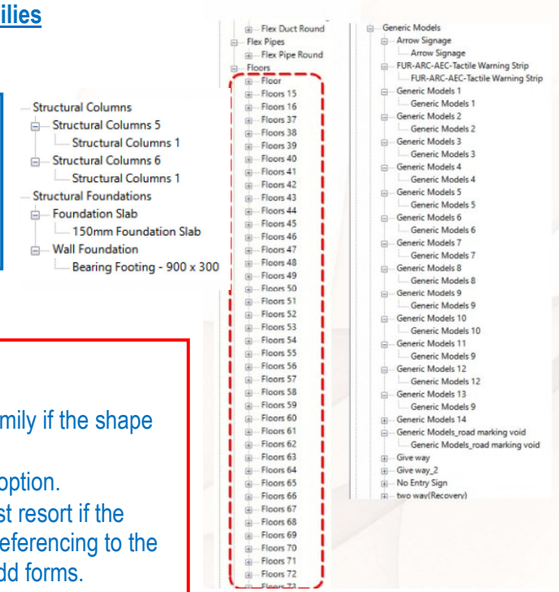
- No Chinese Version Software is allowed for this agreement
- Parameters, obiect name, type name should be in English.



SSR 04: Extensively used in-place families

Drawback

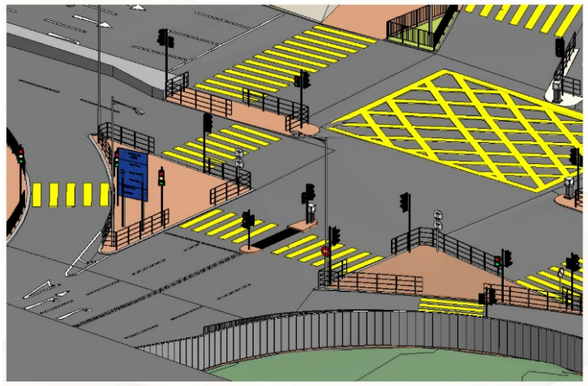
- Model-in-place would enlarge the model file size.
- Could not reuse again



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.

SSR 05: 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

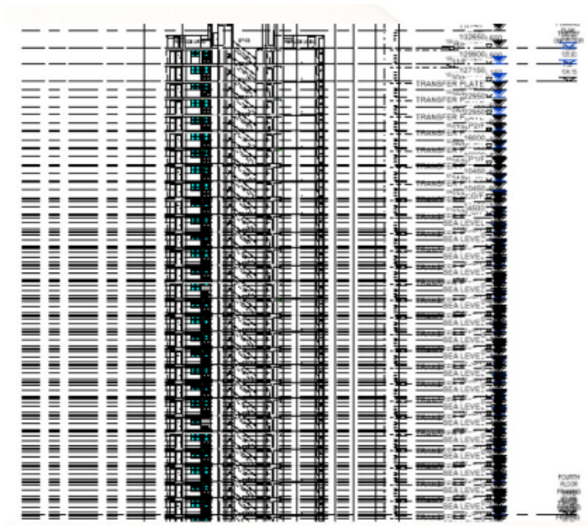
PS 02: Typical floor link is not duplicated for block in master model

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

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

Project Setup (PS)

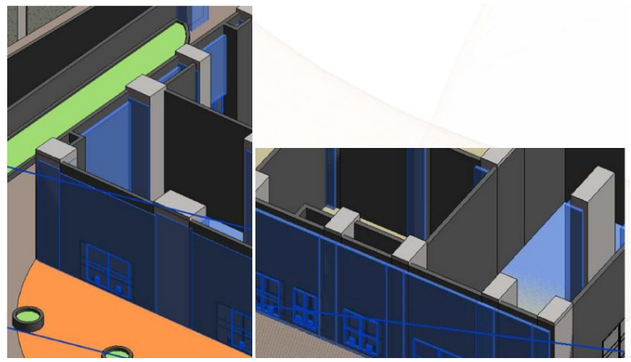
PS 01: Overlapping of levels



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.

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

PS 03: Double check reference models position.



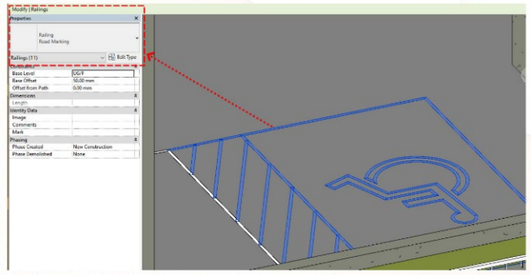
Drawback
- Confusion of element reference.

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

Wrong Category (WC)

WC 01: Model Category - Railing

➢ Prepare family using Parking category instead of Railing



Drawback

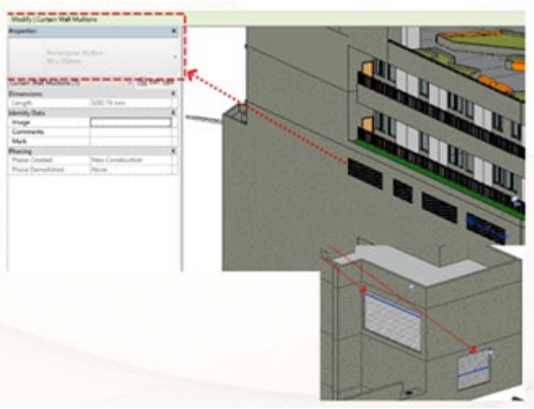
- Wrong category would create confusions to successor/end-users.
- Railing could not retrieve the count number of "balustrade".
- After the QTO results (without giving prior notice to related parties / handover)

Recommendation

- Prepare an individual family for the parking symbol.

WC 02: Model Category - curtain wall

➢ Misuse of curtain wall

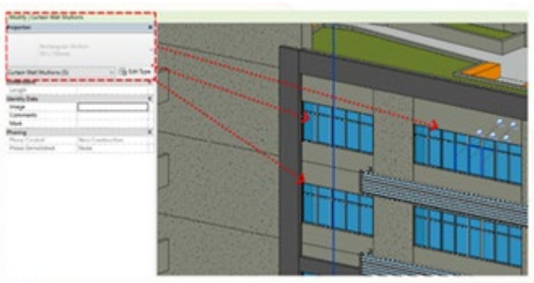


Drawback

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

Recommendation

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



Drawback

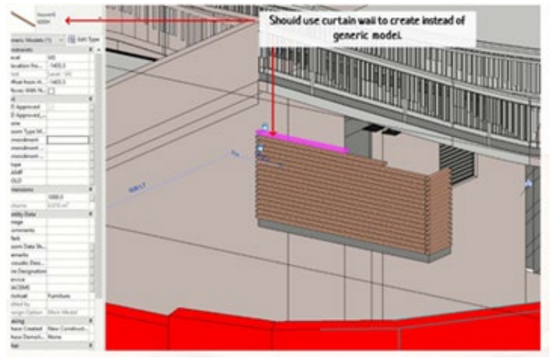
- Curtain Wall vs Glass Wall vs Louver Window (different trade)
- Data of window could not be stored or retrieved for window schedule.

Recommendation

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

WC 03: Over-modelling by using wrong model category

➢ Over-modelling



Drawback

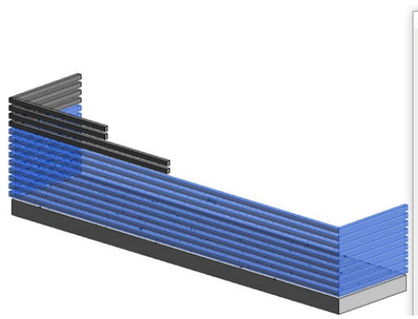
- Too time consuming to model piece-by-piece

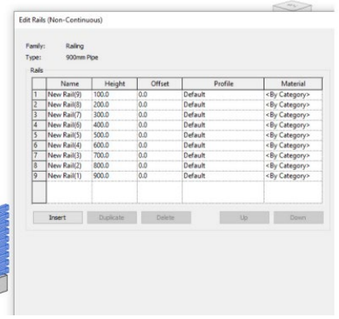
Recommendation

- 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.

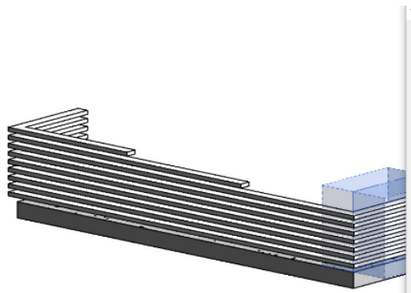
Recommendation

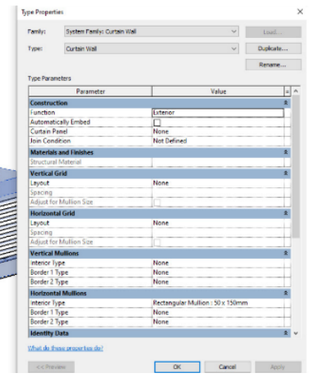
- For facade feature, you may consider using curtain wall / railing for better efficiency.
- Need to report to project team of using special category / model skill.



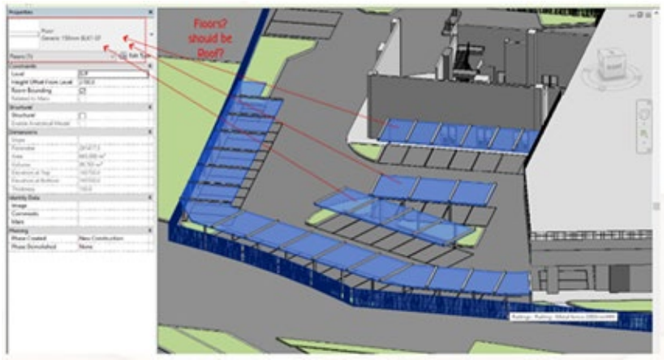


- For facade feature, you may consider using curtain wall / railing for better efficiency
- Need to report to project team of using special category / model skill.





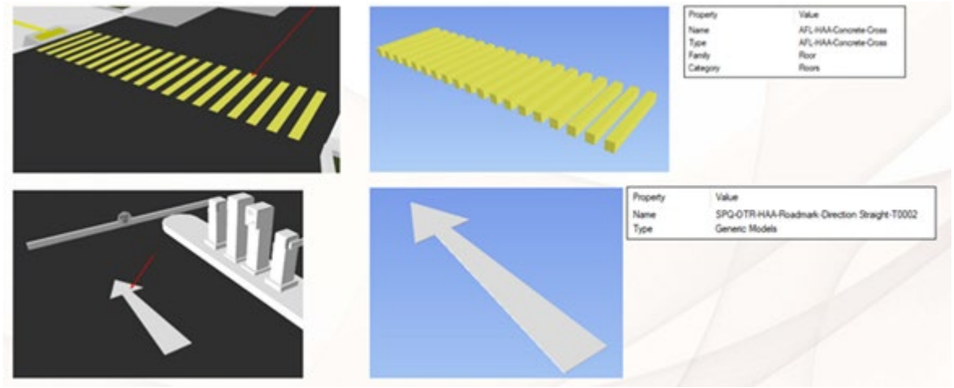
WC 04: Wrong category assignment



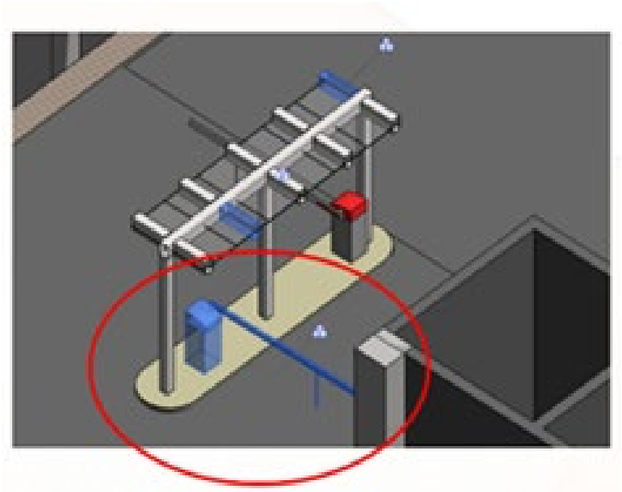
Drawback
- This would affect the integrity of the models.

Recommendation
- Make use of roof or even a parametric family to model

WC 06: Wrong Category for Road Markings



WC 05: Site Equipment should be created in a family file, not model in place.

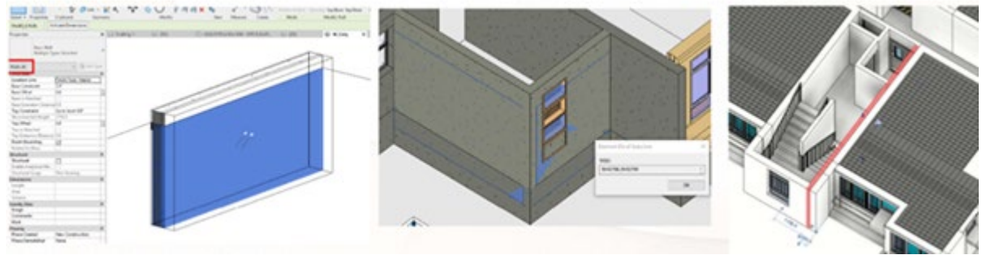


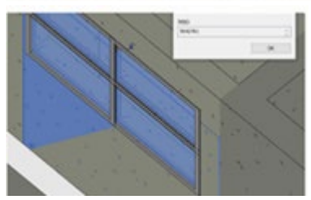
Drawback
- The family may be placed repeatedly. Model-in-place would enlarge the model file size.

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

ARC Modelling (ARC)

ARC 01: Duplicate Walls found in the model

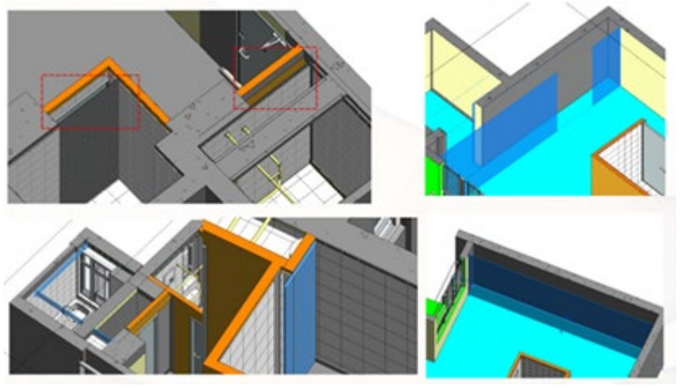




Drawback
- Duplicated elements affect the integrity of the models.
- Confusion of element reference and control.

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

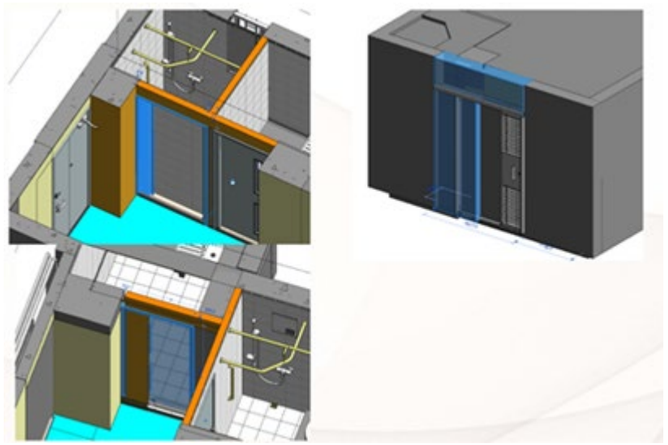
ARC 02: Wall layers not aligned with each other.



Drawback
- Wrong Modelling.
- Lead misconception in coordination.

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

ARC 03: Duplicated wall finishes are modelled for doors

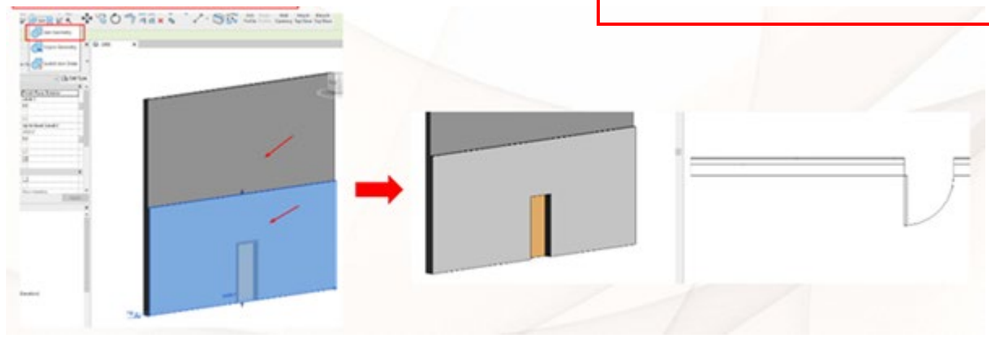


Drawback
- Invalid clash due to modelling error.
- Double count in wall materials.

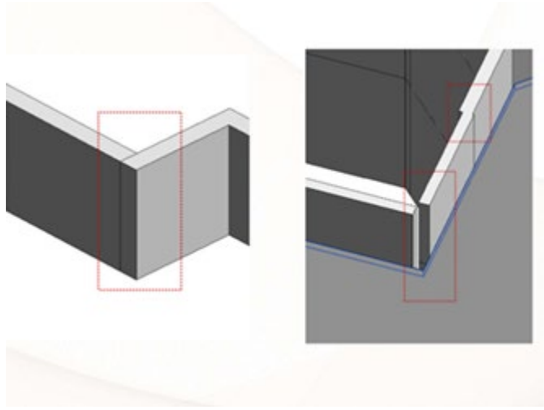
Recommendation
- Join the wall (ARC) and wall finishing.
- Remove duplicated wall.

ARC 04: Wall finishes are not joined

Recommendation
- Join the wall (ARC) and wall finishing.



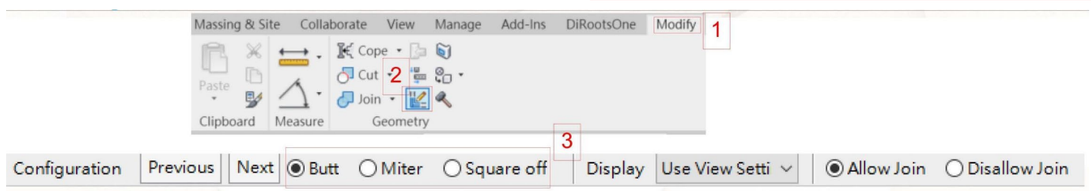
ARC 05: Unconnected/Flushed Wall



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

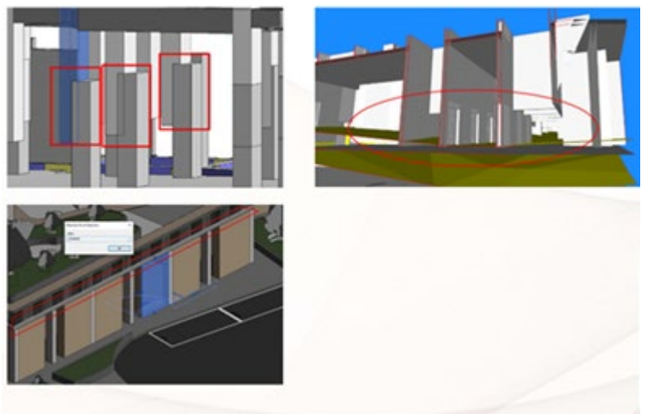
Recommendation
- Do not use "unjoin" for wall modelling, unless necessary for design intent in rare occasion
- Joining walls by various join types:
  1. After selecting a wall, click the 'Modify' tab.
  2. Select the 'Wall Joins' icon.
  3. Choose between the different join types **('Butt', 'Miter', or 'Square Off')** for joining.

  (Steps refer to the image below.)
- Double check wall alignment on floor plan.



ARC 06: Wrong top/ base constraints for walls and columns

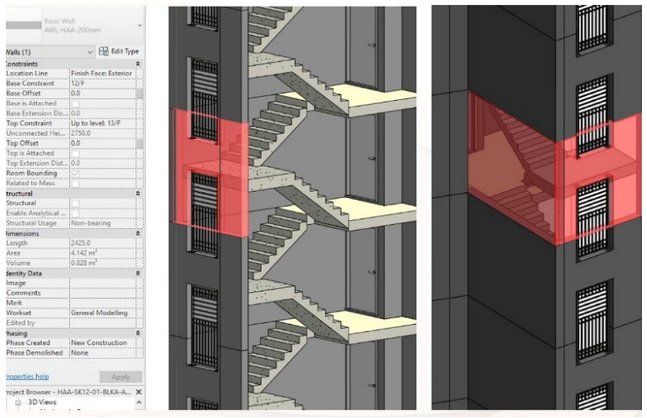
***especially in areas with level differences**



Recommendation

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

ARC 07: 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.

ARC 08: Be careful of reference level setting for wall and window near staircase.

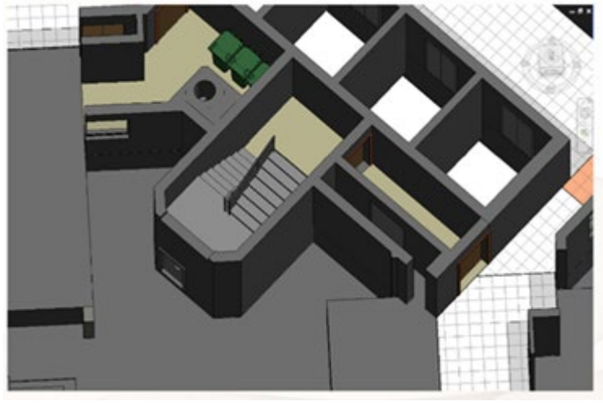
Drawback

- Overlooked design issue

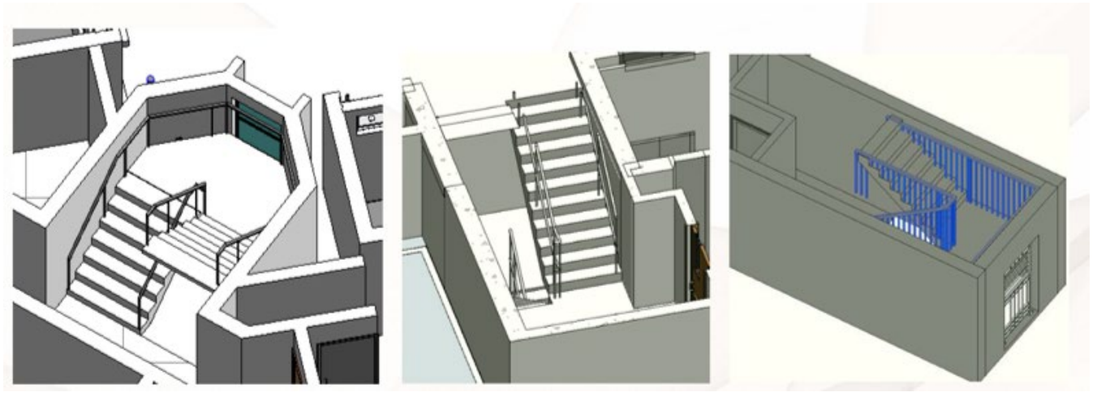
Recommendation

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

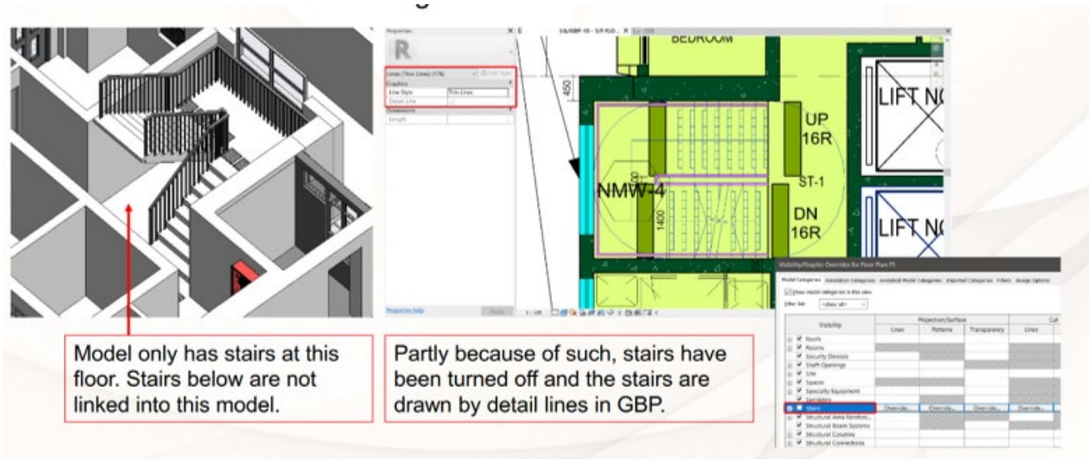
ARC 09: Vertical transportation especially stair should be model in Architectural non- typical floor (block) model instead of typical floor model.



ARC 10: Railing Modelling Error



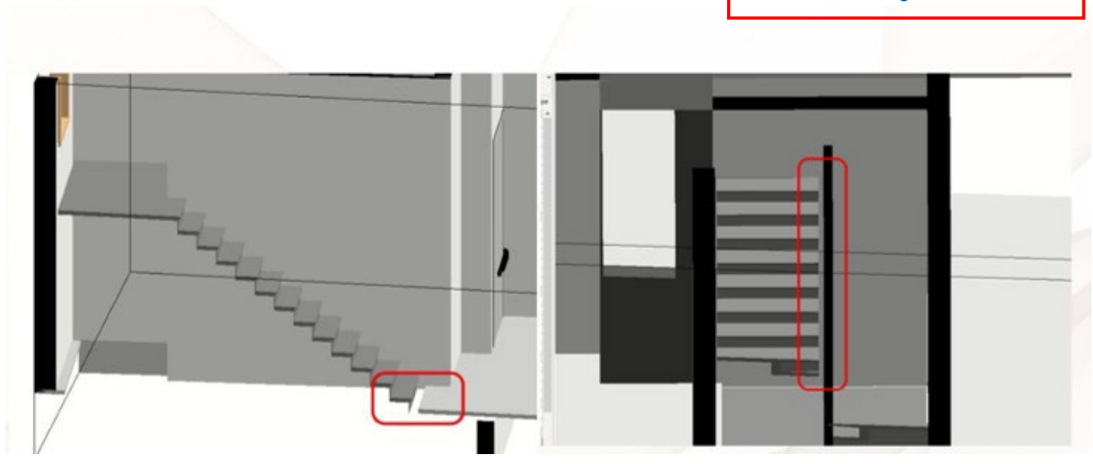
ARC 11: True condition of stairs cannot be displayed properly, which lead to undesirable manual editing.



ARC 12: There are gaps between stairs and floor, and stairs and wall.

Recommendation

- The slab edge should be connected with the toe of the stair flight.



ARC 13: Unplaced Rooms

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

A	B
Number	Area
Bath	Not Placed

Schedule Properties

Fields | Filter | Sorting/Grouping | Formatting | Appearance | Embedded Schedule

Filter by: Area — has no value

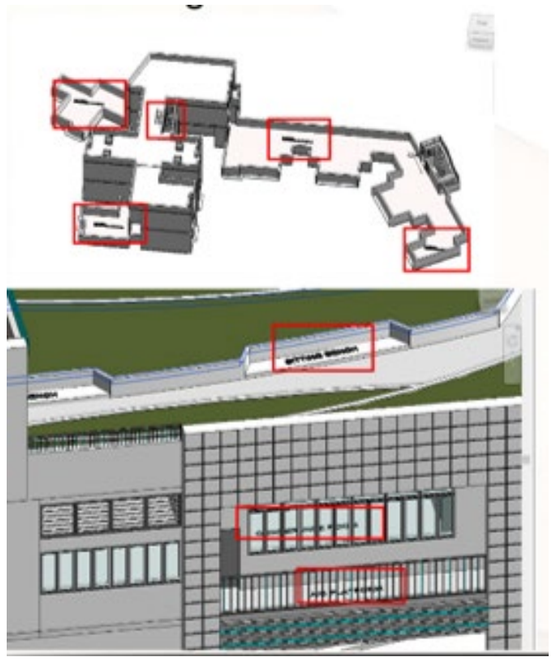
Drawback

- 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

ARC 14: 3D Room Name should not be prepared by Model Text and Staircase Line showing in 3D ?



Drawback

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

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.

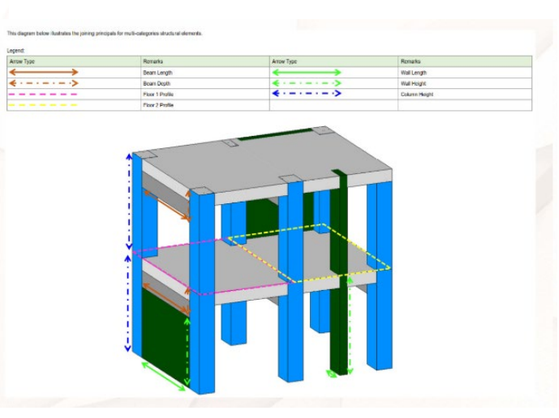
SE Modelling (SE)

SE 01: Modelling approaches

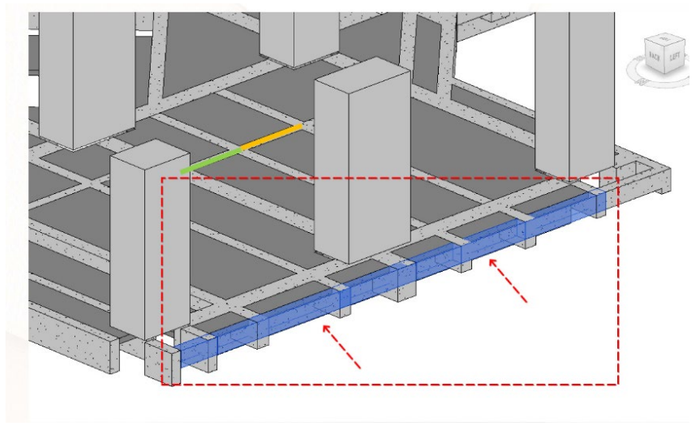
➢ Structural Floor

Recommendation

- Slab should be modelled piece-by-piece in order to assign unique span mark.
- Refer to HABIMSG Vol 2 of 2 – Detail Guide of chapter”DS-U05” at P.2-177 for Structural Floor modelling.



SE 02: Be aware of modelling approach
SE 03: Beam should not be overlapped with unjoin.



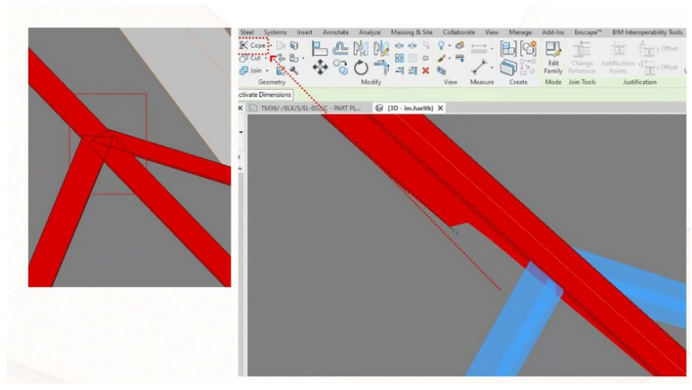
Drawback

- 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).

SE 04: Better to “Cope" connected Structural steel elements.



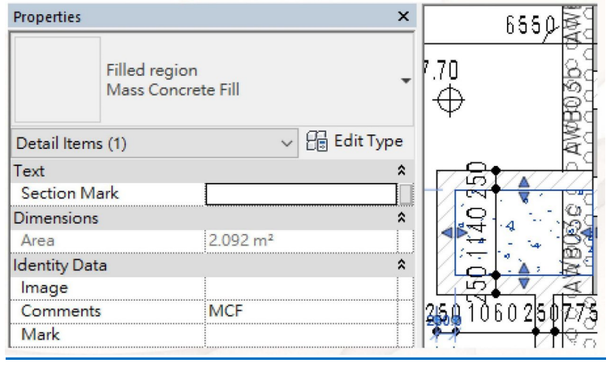
Drawback

- False alarm during clash detection.

Recommendation

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

SE 05: Not suggest using fill region for mass concrete fill hatching

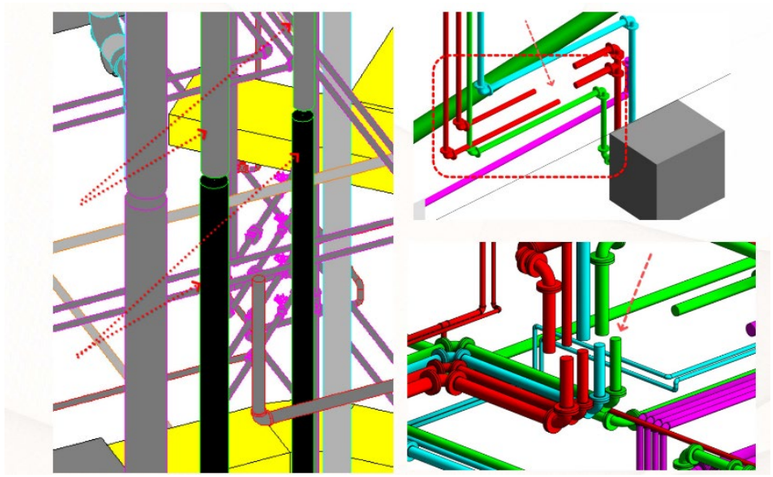


Recommendation

- Model a slab and add filter for the mass concrete fill hatching

BS Modelling (BS)

BS 01: Inconsistent pipe type used & missing pipe connection (broken pipe).



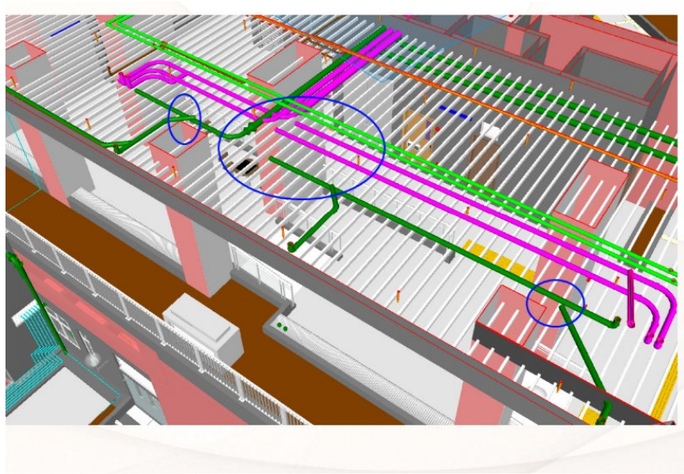
Drawback

- 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.

BS 02: Disconnected pipes

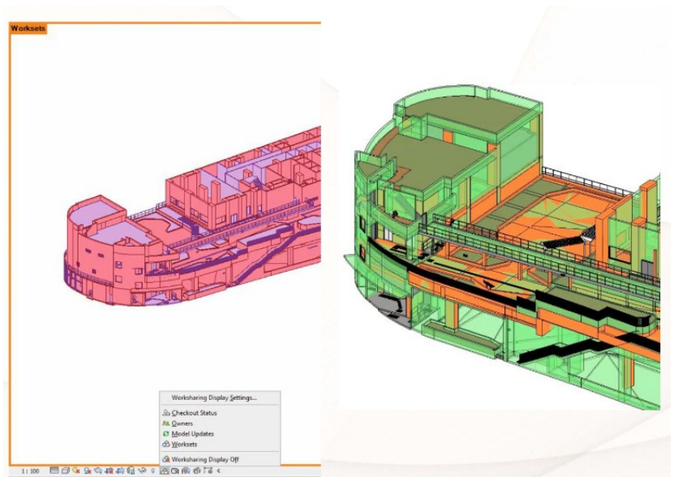


Recommendation

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

3D Coordination (3DC) Error

3DC 01: STR elements not placed in Placeholder workset.



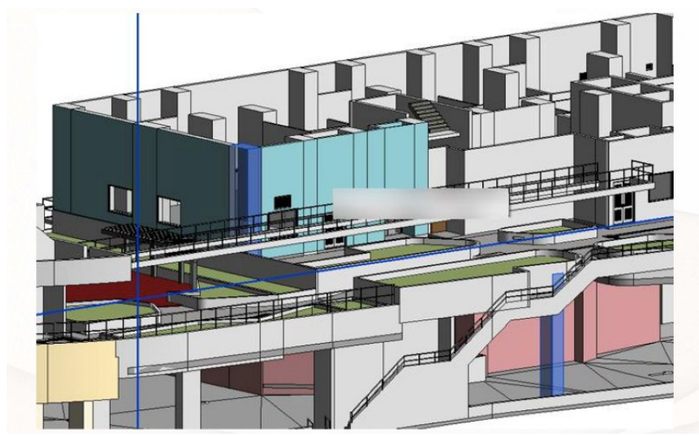
Drawback

- 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.

3DC 02: STR elements not placed in Placeholder workset



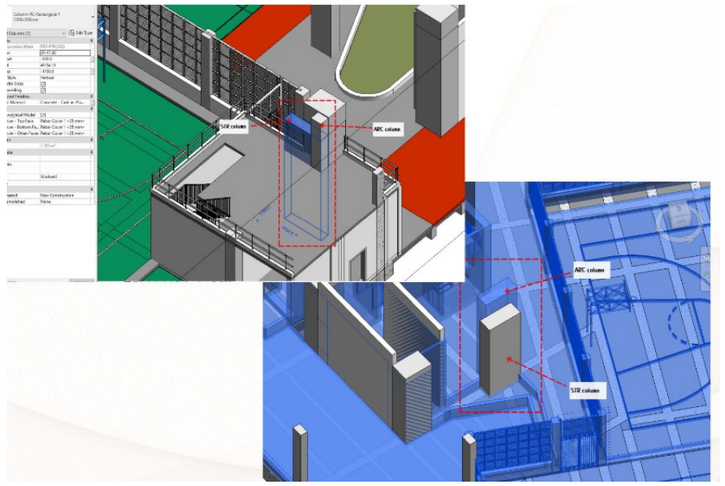
Drawback

- Difficult to differentiate ARC and STR elements within project.

Recommendation

- Assign STR elements to "Placeholder" workset.

3DC 03: STR elements not placed in Placeholder workset



Drawback

- Difficult to differentiate ARC and STR elements within project.

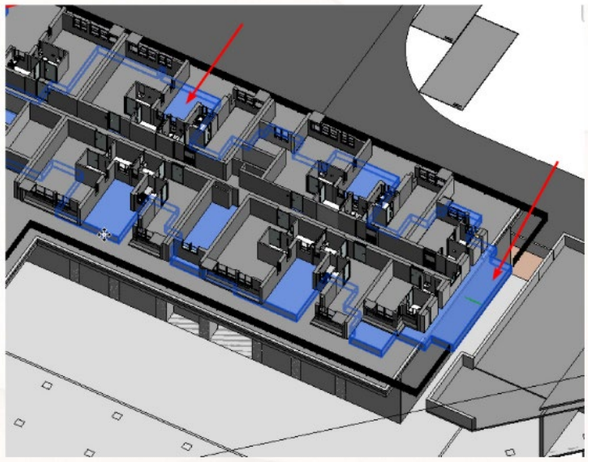
Recommendation

- Assign STR elements to "Placeholder" workset.

3DC 04: Detail check and review the federated model - ARC model and STR model

Discrepancy / coordination between ARC model and STR model

[Floor layout vs transfer plate]

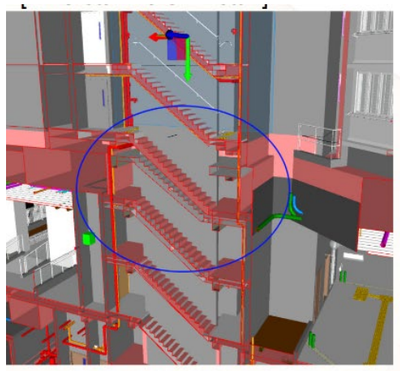


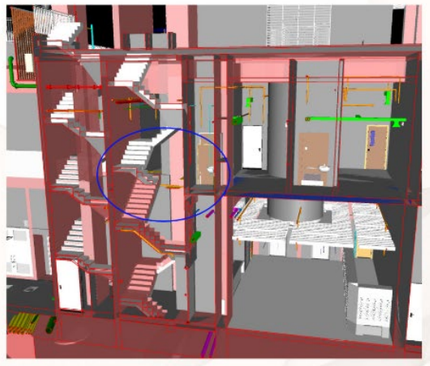
Recommendation

- Make use of Clash detection to check for the design discrepancy

3DC 05: Detail check and review the federated model - ARC stair vs STR stair.

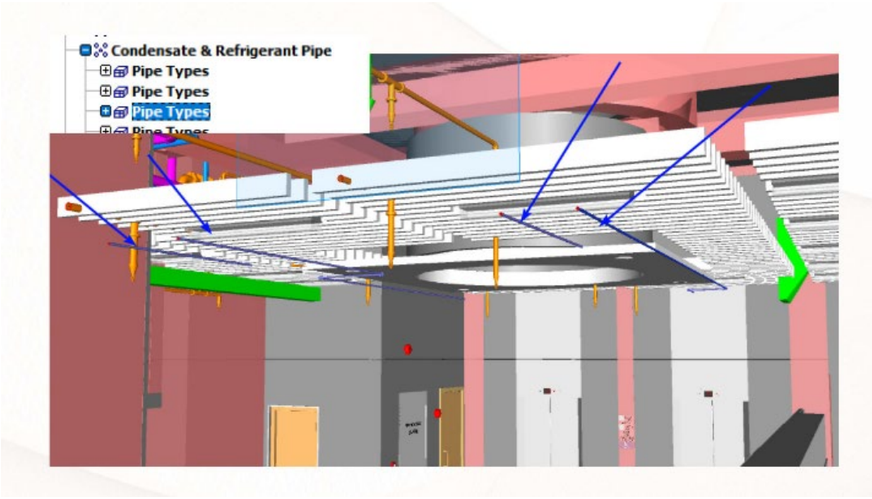
Discrepancy / coordination between ARC model and STR model.
[ARC stair vs STR stair]



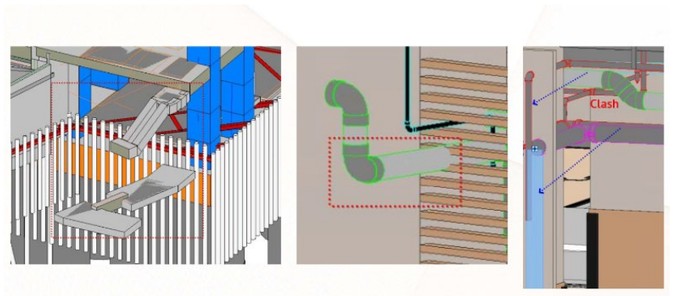


3D 06: Detail check and review the federated model - ARC ceiling vs BS pipe.

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



3DC 07: Double check clashes between ARC features and BS elements.



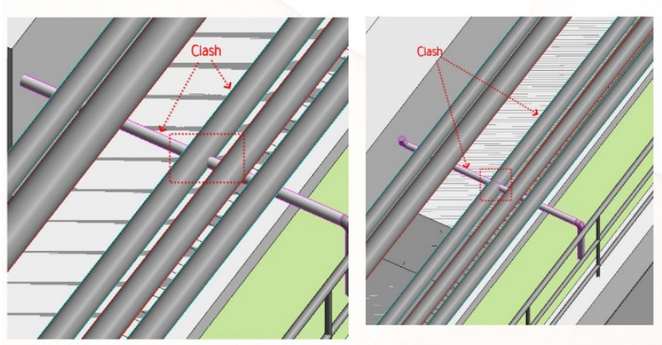
Drawback

- 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.

3DC 08: Clash Review



Drawback

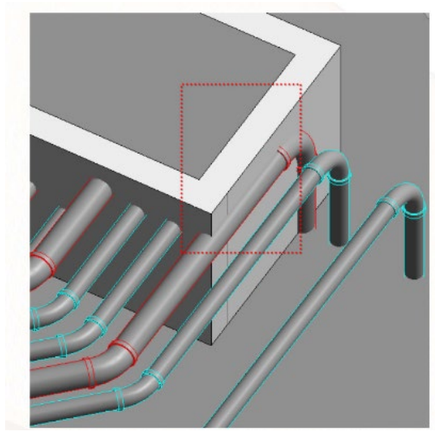
- Clashes in critical area may have implication to the design and the installation in construction stage.

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

3DC 09: Coordination

➢ Clash Review



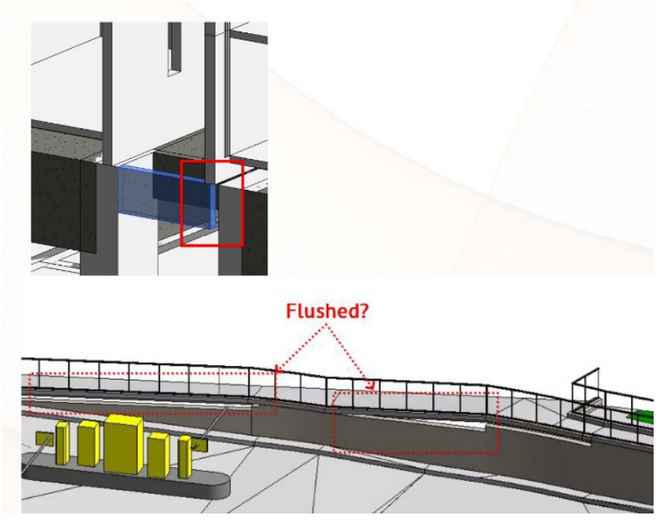
Recommendation

- 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

3DC 10: Unconnected Beam to Column



Drawback

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

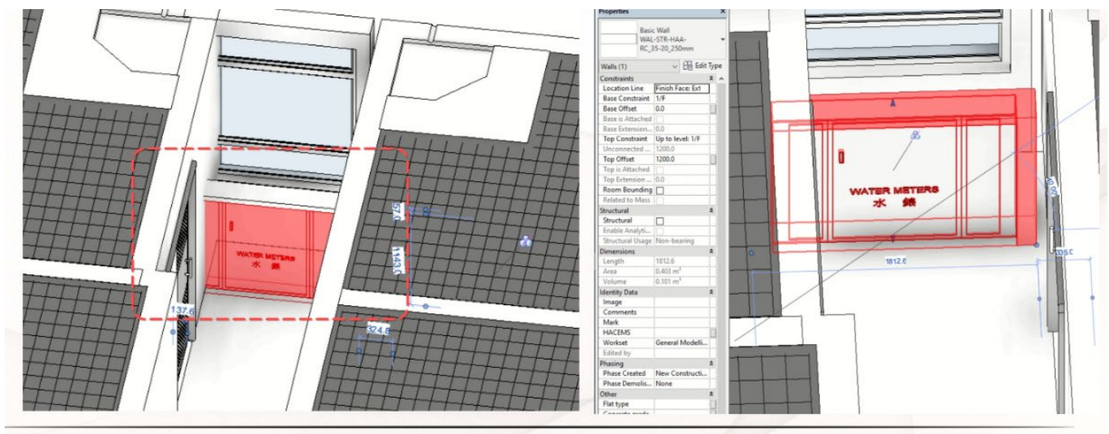
Recommendation

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

3DC 11: Water meter cabinet clashed with walls

Recommendation

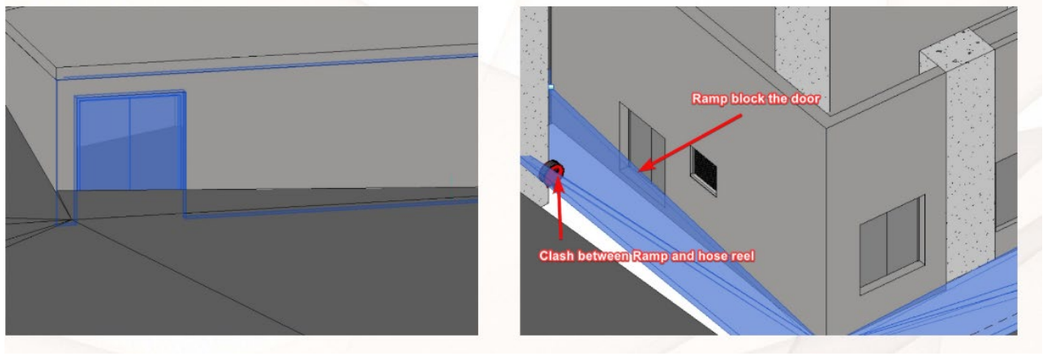
- Verify the geometry in the 3D views after modelling the elements on layout plan.



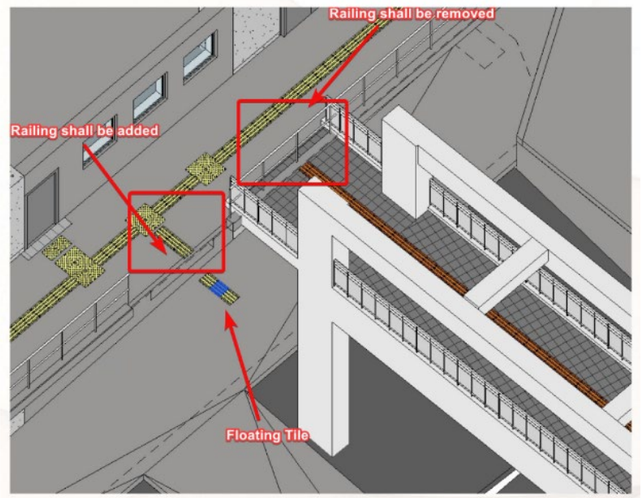
3DC 12: Ramp blocked the door.
3DC 13: Ramp clashed with hose reel.

Recommendation

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



3DC 14: Railing shall be adjusted
3DC 15: Floating Tile shall be removed



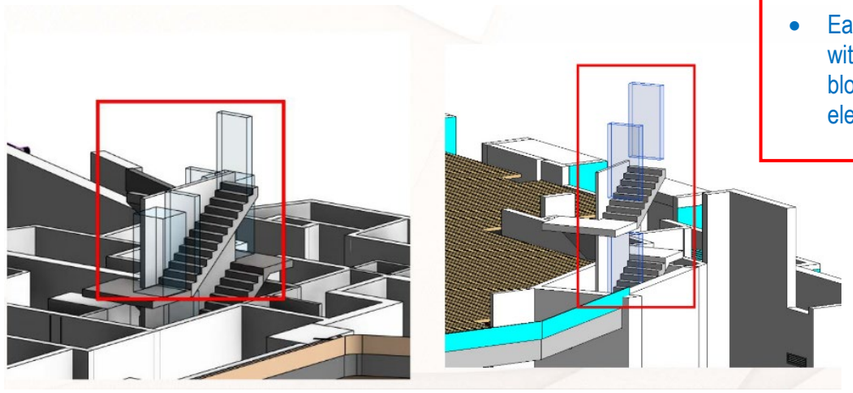
Recommendation

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

3DC 16: Good approach using 'Clearance block' inside staircase for headroom verification. (Parametric Block)

Good Sample

3DC 17: Recommend to place under a separate workset “Headroom" for better management.

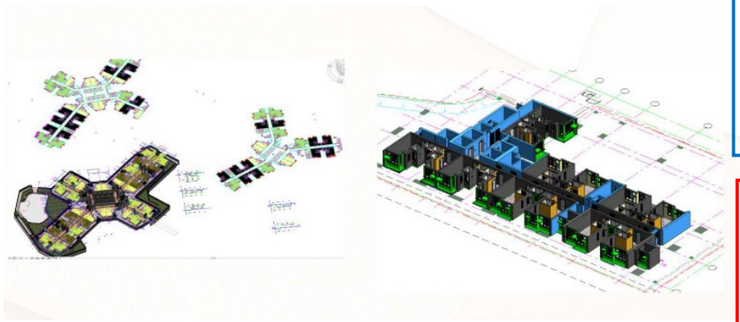


Recommendation

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

Housekeeping (HK)

HK 01: Lack of CAD file management – (not placing CAD in the proper workset, not linking CAD by 'current view only')



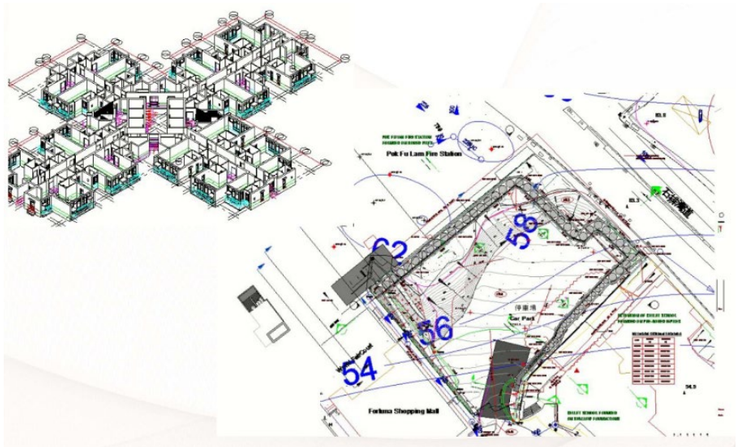
Drawback

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

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.

HK 02: Lack of "CAD" file management – (using 'import CAD' instead of 'link CAD')



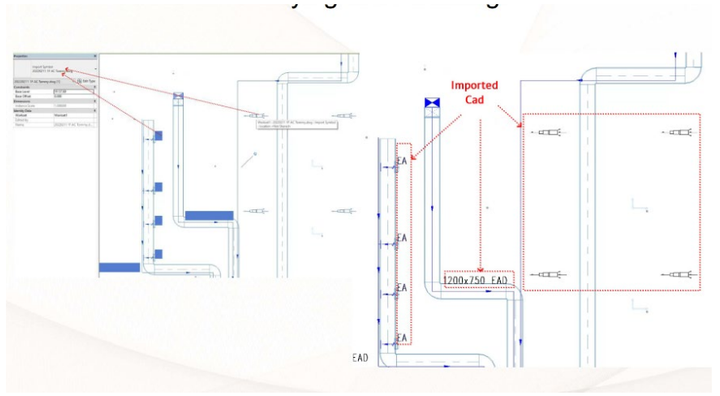
Drawback

- 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.

HK 03: Remove unnecessary CAD drawing
HK 04: Prepare drawing by using Tag /Annotate instead of overlaying CAD drawing.



Drawback

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

Recommendation

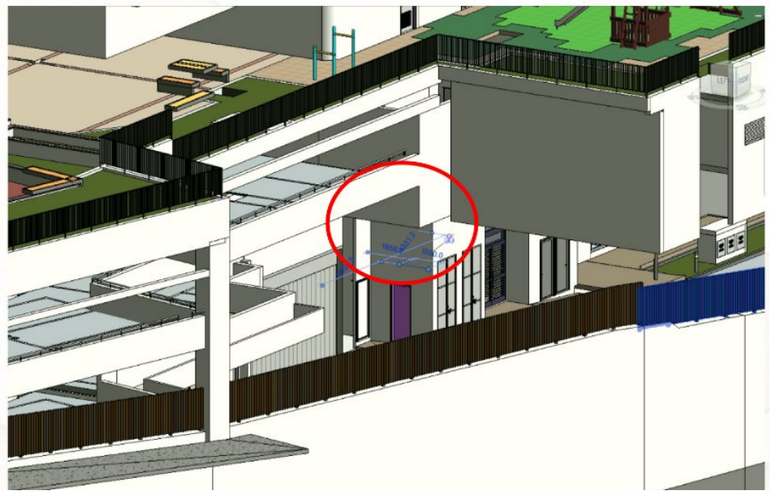
- The annotation should be prepared by "TAG" in Revit, retrieving the real data from the BS elements such as width, depth and system etc of the BS elements.

HK 05: Floating objects

Recommendation

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

HK 06: Model Line floating



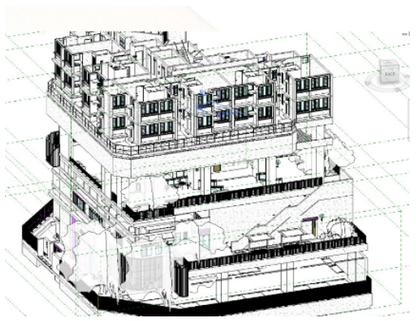
Recommendation

- 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 (GS)

Good Sample

GS 01: Good modelling, model is clean.



Pros

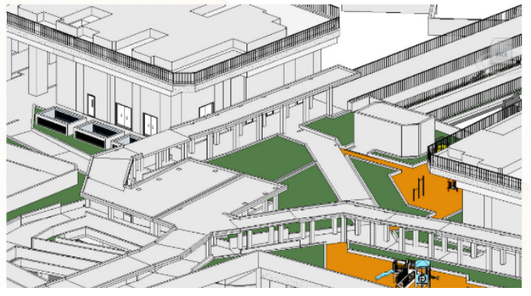
- Good alignment of wall and floor.
- Correct categories assignment.

Recommendation

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

GS 02: Good modelling technique

Good Sample

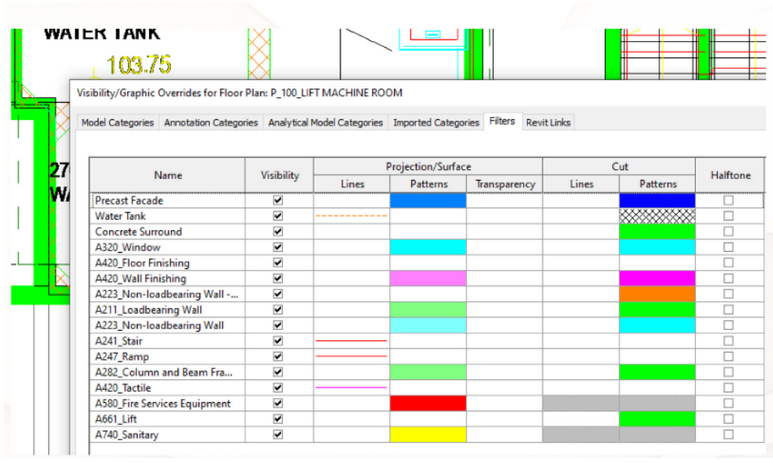


Pros

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

GS 03: Make good use of Filter for model editing, review and coordination

Good Sample



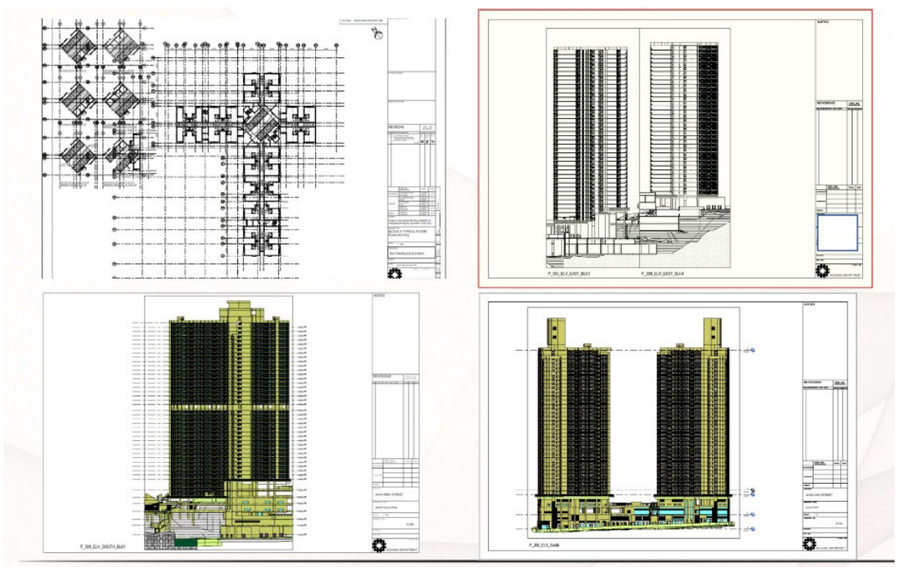
Pros

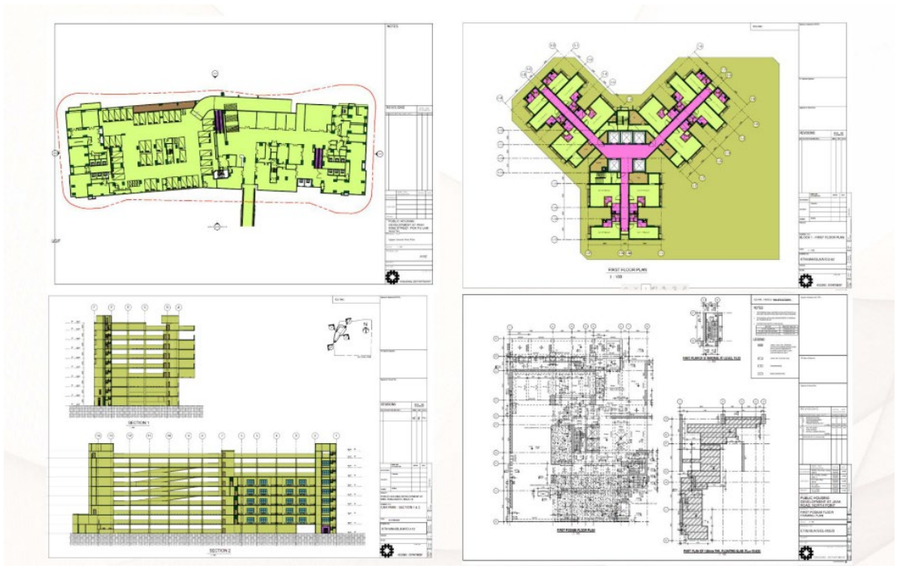
- Easy control for color setting and visibility setting according to different purposes

Drawing Preparation

Good Sample of Drawing Setup for Typical Plan and Elevation

- No redundant elements (such as reference planes, linked model's grid lines/levels).
- Clean presentation.
- Proper scale.
- Ready for drawing production.

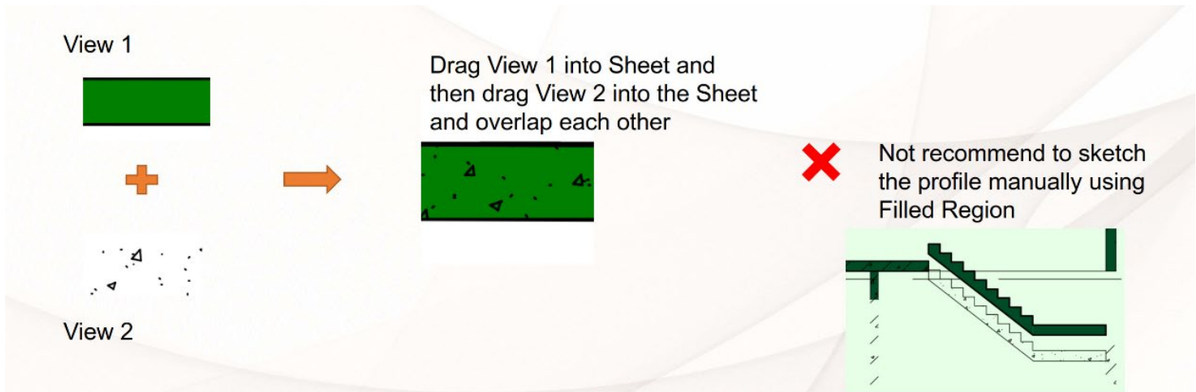




Recommendation for Revit 2018 Drawing Production

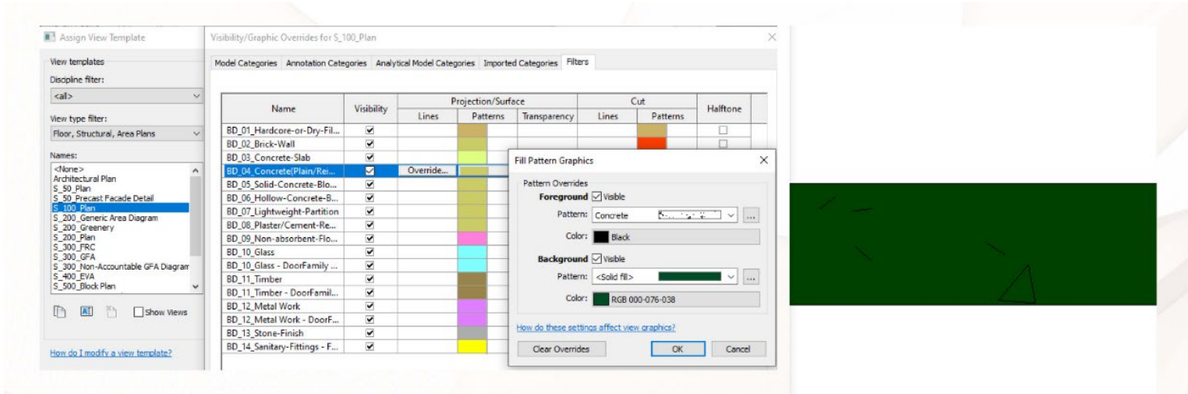
- Since Revit 2018 only have 1 set of layer setting color override, it is recommended to prepare 2 identical views, 1 of them shall be set with transparent background but with concrete hatch pattern.

- Both views shall be overlapped into the sheet to 2 layers of hatch for drawing submission.



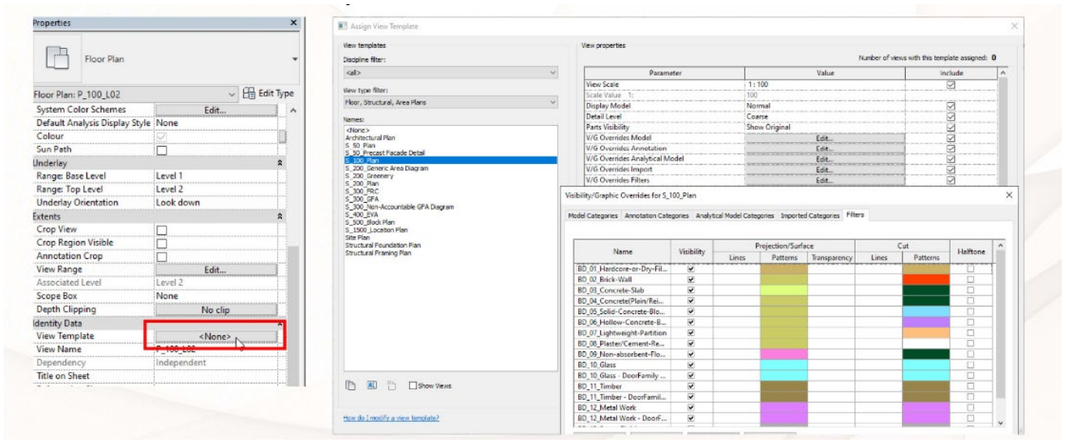
Recommendation for Revit 2020 or above Drawing Production

- In "Visibility Graphics Override" Dialog box, Revit 2020 or above can set hatch and background color separately



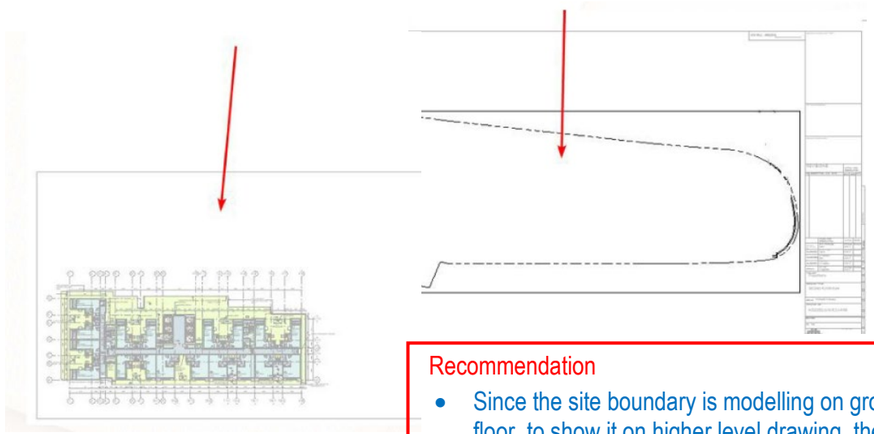
Demonstration on applying view template

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



Overlapping viewports technique

- @ for



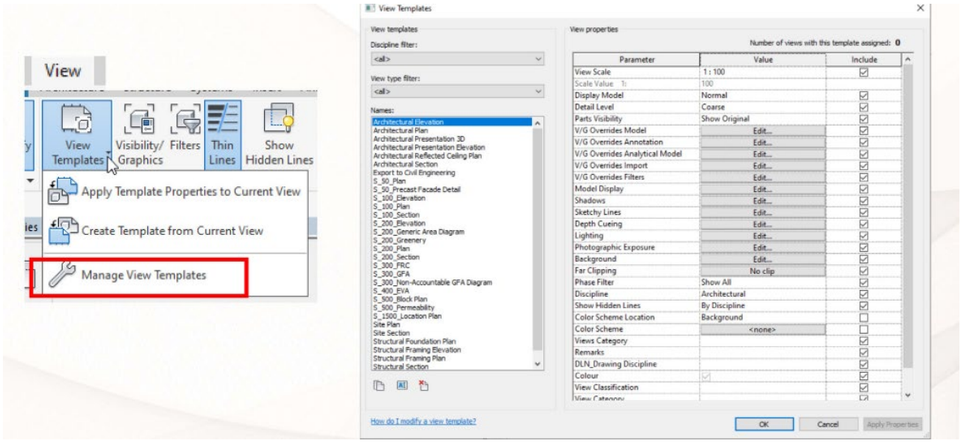
Recommendation

- 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 title block.

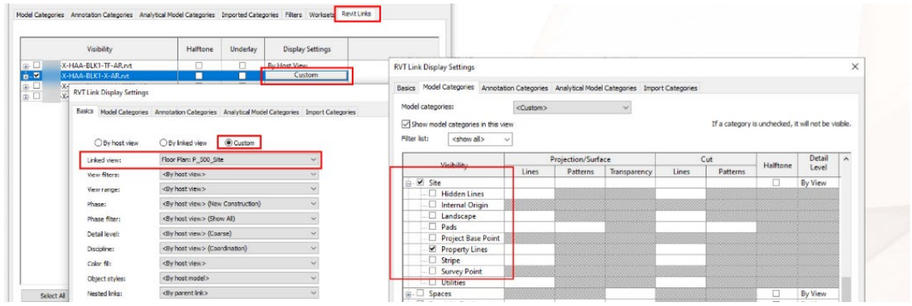
Demonstration on applying view template

Advantage:

Batch modify the setting by controlling the view template



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



Recommendation

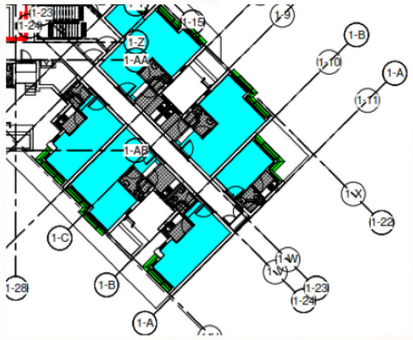
- Specifying a site view from link model and showing the Property Lines only to serve a background the layout plan.

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

Recommendation

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

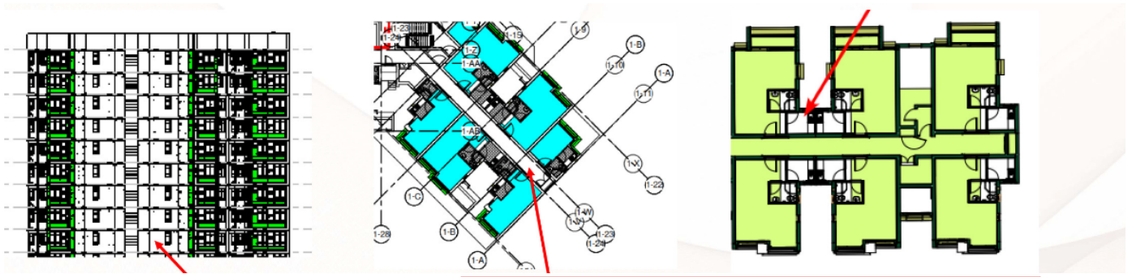
- Visibility of grid control



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.)

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

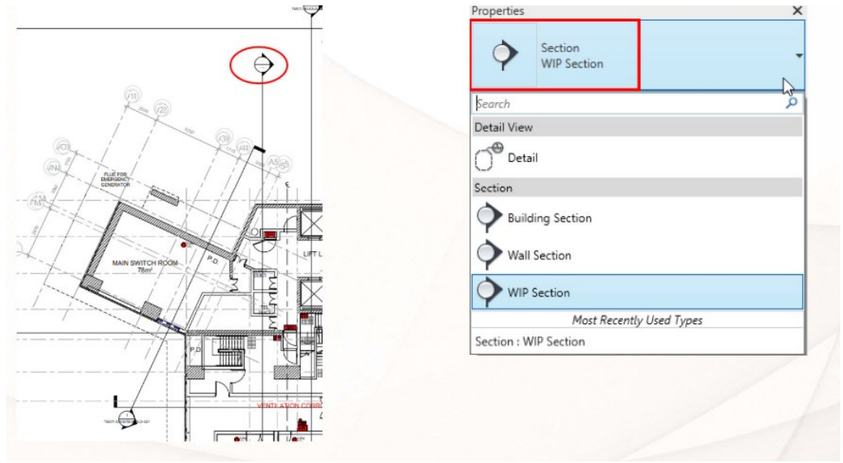


Recommendation

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

Recommendation for Section

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

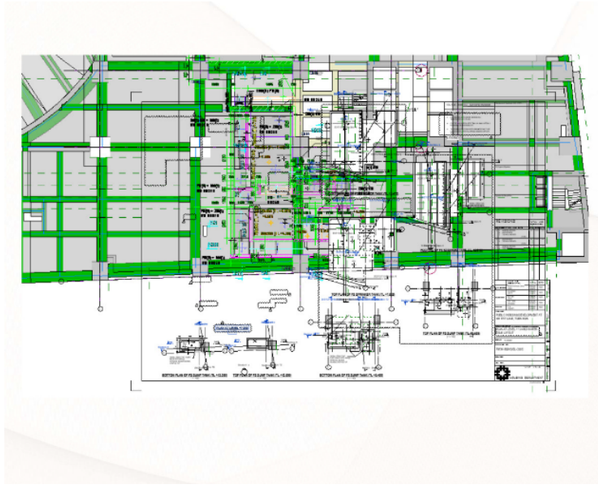


- Tracing or drafting should NOT be prepared on the drawing view.

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.

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



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- Printing Setup