5 MODELLING METHODOLOGY

The HABIMSG are designed to specify, manage and assess BIM deliverables by architects, engineers and surveyors. This section of the HKBIMSG provides information on how to enable model development and build-up which will facilitate the efficient use or re-use of BIM data and models with modelling data consistency within a single discipline or across disciplines.

This section covers -

- Definition of "how" each BIM model is to be created, developed and shared with another discipline aiming to enable efficient use and re-use of BIM data with modelling data consistency.
- Model division and model structure (e.g. structure, zones, levels systems, etc)
- Requirement for Statutory submission and tender.
- Difficulties in modelling compared to CADD.

Modelling is the process of creating a digital building information model. Building Information Modelling replaces traditional 2D drafting and documentation. In practice, those who wish to model would need to have modelling tools and those who have responsibility for coordination and construction processes would need to have tools for these purposes.

The purpose of the model shall be clearly and unambiguously defined before construction of a model is commenced: -

- What is the purpose of the model?
- Who will use the model?
- How should the information in the model be communicated to others?

If the purpose is only to make a good visualization or basic drawings, it would hardly be appropriate to model a BIM at a detailed level involving a substantial emphasis on the correct technical construction and the information contained in the model. However, if the purpose of the BIM is to make good drawings, prepare a cost calculation or execute an energy simulation, then the need for a precise and "correctly" modelled BIM is crucial to achieve a simple work process and a good result.

For feasibility and scheme design stages, a model for simple drawings and visualizations may be acceptable. For detailed deigns, construction and as-built models, an accurate BIM is required.

In order to develop a model that will, for example, be used for quantity take-off, it is a requirement that the model should be a close approximation of the building which will actually be built. Good modelling practices thus involves the incorporation of technical solutions which will actually be used in the construction of the building.

This section sets out specific requirements that all disciplines shall follow for the production of the Building Information Models (BIM) for a project. The BIM Coordinators shall create and manage separate models for each design discipline. These system specific models will allow each discipline to model their systems separately and also thorough coordination checks.

D.MET-1 Best BIM Practices

The following good practices shall be followed: -

Language

- Only **English version** of Revit can be used. It should never be opened or manipulated in Chinese version as such operations will implant Chinese parameters and settings into the English file. For example, "Length" and "長度" will be considered as two types of parameters and thus mess up the information integrity.

Open Files

- Never open Revit Files from Window Explorer or My Computer. Only open any file within the application.

Model Maintenance Best Practices

- Conduct weekly selective Purge of Unused elements and Audit of ALL files first thing on (Select a Date).
- Purge should also apply to any linked AutoCAD files.
- Conduct weekly Compaction of the Central file.
- Unnamed or uncategorized views should be deleted weekly.
- All detail groups should be removed and purged as applicable.
- Always check family sizes for large file sizes.
- Design Options – Archive and then accept primary as soon as possible.

Modelling Best Practices

- Never open a file directly by clicking in Window Explorer or My Computer. Always open the file in Revit. In Sharing mode this will allow user to create a New Local File.
- User models should be re-created on daily basis.
- Equipment should show clearance boxes.
- All elements shall be modelled accurately in all three spatial dimensions.
- All dimensions shown on models or CAD drawings shall be generated automatically by the modelling or CAD software and shall not be overwritten or disassociated. Dimensions that are explicitly shown on the Contract Documents will take priority.
- All building elements will be modelled with actual and not nominal dimensions. This rule shall not be applicable to tubular works and plumbing works for sizes of pipes. Nominal size is adopted for pipework and tubular works except pipework for drainage work.
- Only use the "Generic Model" category to create a new object as the last resort, as it reduces the functionality of visibility and graphic overrides. If you must use it, create a subcategory for each major type of element represented. Creating subcategories also applies to the creation of Specialty Equipment.
- Modelling in-place families should be avoided as much as possible, except for custom components generally built "on site" or for building massing during design. Create component families instead.
- Use model groups sparingly and strategically. If a model group is temporarily used and then ungrouped, be sure to Purge the unused group to remove it. Include hosts with hosted elements.
- Use simplified objects as place holding families until the project is developed and more specific pieces are identified.
- Assign the proper level of detail to a given view.
- Close hidden windows to increase computer speed.
- Resolve errors regarding room boundaries overlapping.
- Don't import hatch and patterns from AutoCAD.
- Don't explode AutoCAD files in Revit.
- Don't model exclusively in plan views, be sure to watch the 3D view of elements in order to prevent delays caused by unexpected results.
- Check your available RAM [You should have at least 5 GB free].
- Verify your active Workset each time you begin to add or move things, especially when switching the discipline you are working on.
- Use default view templates. [Coordinate with BIM project coordinator before adjusting views/templates].
- Create reference planes sparingly.
- Create new section views sparingly for coordination purposes [delete once you have finished using them, or NAME them!]
- Always begin your design understanding correct pipe/duct insulation, separation distances, and tolerances.

- Make sure Press + Drag is un-ticked by default (on the options bar) to avoid moving elements by mistake.
- Always draw elements in a consistent direction on plan.
- Either top to bottom or bottom to top. Either left to right or right to left
- Amend rather than delete if possible - If an object is hosting other objects (e.g. a wall hosting windows, doors or ductwork) and needs to be amended, it is best to do just that and avoid deleting and re-drawing the element completely since this will break the associative hosting between objects.
- Use copy/monitor for specific architect-driven building datum like levels and grids. This enables the architect's model to automatically drive major changes [floor-to-floor height, etc.].
- Be clear on what should and should not be modelled. Refer to the project LOD (Level of Development) scope matrix on what you are trying to achieve.
- Minimize view depth, in elevation, plan, and section views.
- The methods adopted for data segregation shall be considered and be agreed by all internal and external disciplines to be involved in the modelling.
- No more than one building shall be modelled in a single file.
- A model file shall contain data from one discipline only (although exceptions may apply to Building Services where multiple disciplines converge).
- Further segregation of the geometry may be required to ensure that model files remain workable on available hardware.
- To avoid duplication or co-ordination errors, clear definition of data ownership throughout the life of the project shall be defined and documented.
- Element ownership may be transferred during the project time-line – this shall be explicitly identified in the Project BIM Execution Plan Document.
- Where multiple models make up a single project, a container model whose function is to link the various assemblies together for coordination / clash detection purpose should be considered.

D.MET-2 System Setup

D.MET-2.1 Folder Structure

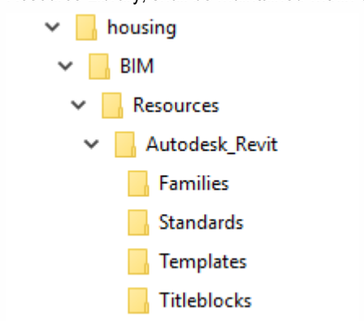
This section defines how BIM data shall be stored within the project filing system. All project model files, drawings, references and data, regardless of project size or type, shall be organised and filed into a standard folder structure on a central server. During daily working of a model, a copy of the model could be placed on a local workstation (local files).

All models should be stored on a central server to ensure that backup and disaster recovery facilities are provided to safeguard the models and databases. Subfolder structure under the central server should be standardized and set up by the System Administrator. In general, other users are restricted from modifying the folder structures. If there are any special needs, project team members can discuss with the administrator to set up optional subfolders.

Resource Folder Structure

Project templates, family library, shared parameter file and other non-project-specific data shall be held within the server based Central Resource Library, with restricted write access.

The Central Resource Library shall be organised by software and version. Resources for each product and version of the Central BIM Resource Library, shall be maintained within each folder.



Project Folder Structure

All project data shall be held within the standard project folder structure located on central network servers. This includes all work in progress files, components or assemblies.

The defined structure may follow the principles of BS1192:2007's 'Work in Progress (WIP)' 'Shared', 'Published' and 'Archived' segregation of data within a designated set of folders.

Where a project comprises of a number of separate elements such as multiple buildings, zones or areas, the BIM structure shall be maintained within a set of designated sub-folder representing the various project elements.

- **[Project Folder]**
  - **BIM** — **[BIM data repository]**
    - 01-WIP — **[BIM data repository]**
      - **CAD** — **[CAD files (incl. 'Modified)]**
      - **BIM** — **[Design Models (incl. 'Modified')]**

- SheetFiles [Sheet/rvt files]
- Export [Export data e.g. gbXML or images]
- Families [Components created during this project]
- WIP_TSA [WIP Temporary Shared Area (TSA)]

- 02-Shared [Verified Shared data]
  - CAD [CAD data/output files]
  - BIM [Design models]
  - CoordModels [Compilation models]

- 03-Published [Published Data]
  - YYYYMMDD-Descriptor [Sample submission folder]
  - YYYYMMDD-Descriptor [Sample submission folder]

- 04-Archived [Archived Data repository]
  - YYYYMMDD-Descriptor [Sample submission folder]
  - YYYYMMDD-Descriptor [Sample submission folder]

- 05-Incoming [Incoming Data repository]
  - Source [Data originator]
    - YYYYMMDD-Descriptor [Incoming folder]
  - Source [Data originator]

- 06-Resource [Project BIM Resource Library]
  - Titleblocks [Drawing borders / titleblocks]
  - Logos [Project Logos]
  - Standards [Project Standards]

Local Folder Structure

Local copies of central project models / drawings do not need to be backed up as changes are regularly synchronised with the central model. They shall be stored on the user's hard drive – not in 'My Documents'-according to the folder structure below.

D.MET-2.2 Naming Conventions

- Use only letters A-Z, hyphen, underscore and numbers 0-9 for all fields.
- All fields shall be separated by a hyphen character '-'. Do NOT use spaces.
- Within a field, either Camel Case or an underscore '_' shall be used instead of a space to separate words.
- A single period character '.' shall be used to separate the file name from the extension. This character should not be used anywhere else in the file name.
- The file extension shall not be amended or deleted.
- An 'XX' shall be used if the file does not refer to a single specific zone or level.
- The scheme for zone and level sub-division shall be agreed with other project professionals.
- For 2-digit code examples for discipline, zone and level refer to 1.1.1 File Name Convention in this section.
- Elements where a naming convention is not explicitly defined by the Standards and Guidelines shall adopt the naming convention of existing elements and prefixed with a 3-character abbreviation to identify corporate author.

(a) File Naming

Referencing & Naming Convention

1.1 Referencing for Modelling

A standardized file numbering system is used for easy identification of models.

1.1.1 File Name Convention

All BIM models and drawing files, regardless of software platforms, should generally follow the naming standard described in section 1.5.5.4 File Naming Convention in CIC Building Information Modelling Standards (Phase One), which is based on existing Works Departments CAD standard convention, with customization to suit the HA's context.

The file name should consist of 7 fields.

	CIC Convention							
	Agent	Project Reference	Zone		ID	Status		
HA Customization	HA Discipline/ external consultant	Project No.	Phase No.	Building Type	Model Code	File Type (standard Code)		Custom description
	123 -	1234 -	12 -	1234 -	12 -	1-2	_	1-8

- Do NOT use spaces.
- Use only uppercase letters A-Z, hyphen, underscore and numbers 0-9 for all fields except Custom Description field.
- Within Custom Description field, either Camel Case or an underscore '_' shall be used to separate words.
- All fields shall be separated by a hyphen character '-' or underscore '_'.
- A single period character '.' shall be used to separate the file name from the extension. This character should not be used anywhere else in the file name.
- The file extension shall not be amended or deleted.
- An 'XX' shall be used if the file does not refer to a single specific zone or level.
- The scheme for zone and level sub-division shall be agreed with other project professionals and documented in Project Execution Plan.
- Elements where a naming convention is not explicitly defined by the Standards and Guidelines shall adopt the naming convention of existing elements and prefixed with a 3-character abbreviation to identify corporate author.

Below are some examples:

HA Disciplines

HA Disciplines		Project No.		Phase No.		Building Type		Model Code		File Type (standard Code)		Custom Description	Description
123	-	1234	-	12	-	1234	-	12	-	1-2	-	1-8	
HAA	-		-		-		-		-		-		Architectural
HAB	-		-		-		-		-		-		Building Services Engineering
HAC	-		-		-		-		-		-		Civil Engineering
HAG	-		-		-		-		-		-		Geotechical Engineering
HAL	-		-		-		-		-		-		Landscaping
HAP	-		-		-		-		-		-		Planning
HAQ	-		-		-		-		-		-		Quantity Surveying
HAS	-		-		-		-		-		-		Structural Engineering
HAV	-		-		-		-		-		-		Land Surveying
CTR	-		-		-		-		-		-		Contractor

Project Number – Public Housing Development Programme (PHDP) Project Reference (4 characters)

Project Number here is referred to as the first 4 characters of the Project Number in HOMES (i.e. without 5th and 6th characters). E.g. TM18

HA Disciplines		Project No.		Phase No.		Building Type		Model Code		File Type (standard Code)		Custom Description	Description
123	-	1234	-	12	-	1234	-	12	-	1-2	-	1-8	
	-	FL07	-		-		-		-		-		Fanling Area 47B
	-	HK16	-		-		-		-		-		Hing Wah
	-	KL13	-		-		-		-		-		Upper Ngau Tau Kok
	-	TM18	-		-		-		-		-		Tuen Mun Area 18
	-	TK13	-		-		-		-		-		Tseung Kwan O

PHASE NUMBER

To denote phase number of the project, align with PHDP.

HA Disciplines	Project No.	Phase No.	Building Type	Model Code	File Type (standard Code)	Custom Description	Description
123	1234	12	1234	12	1-2	1-8	
		01					Phase 1
		02					Phase 2
		03					Phase 3

BUILDING TYPE

To define the types of building. E.g. block no., carpark, etc.
Recommend that the code should reflect the meaning of the blocks/ facilities.

HA Disciplines	Project No.	Phase No.	Building Type	Model Code	File Type (standard Code)	Custom Description	Description
123	1234	12	1234	12	1-2		
Examples of Individual Blocks/Buildings							
			BLK1				Block 1
			BLK2				Block 2, etc.
			CC				Commercial Centre
			CP				Car Park
			CH				Community Hall
			FB				Footbridge
			LP				LP Gas Store
			LT				Lift Tower
			MT				Market
			RCP				Refuse Collection Point
Examples of other Facilities/Information							
			PRJ				Project (*usually a link file for integration of the whole project)
			SITE				Site profile
			EXWK				External Works

Model Code

To denote the content of the model.

HA Disciplines	Project No.	Phase No.	Building Type	Model Code	File Type (standard Code)	Custom Description	Description
123	1234	12	1234	12	1-2	1-8	
				SI			Site/ External
				AR			Architectural General Arrangement & 3D
				IN			Interior Design
				MF			Modular Flat
				CL			Ceiling Layout
				DD			Drainage
				LA			Landscape
				FD			Foundation
				LS			Lateral Support
				SS			Superstructure
				BS			Building Services (Combined)
				MV			MVAC
				FS			FS
				PB			Plumbing
				EE			Electrical
				TR			Trunking
				TG			Gas
				MI			Miscellaneous

File Type

To define the type of file, e.g. drawing file, model file & template.

HA Disciplines		Project No.		Phase No.		Building Type		Model Code		File Type (standard Code)		Custom Description	Description
123	-	1234	-	12	-	1234	-	12	-	1-2	-	1-8	
	-		-		-		-		-	AF	-		Animation
	-		-		-		-		-	CM	-		Combined model
	-		-		-		-		-	CR	-		Clash
	-		-		-		-		-	DR	-		2D Drawing
	-		-		-		-		-	M2	-		2D CAD
	-		-		-		-		-	M3	-		3D Model
	-		-		-		-		-	MR	-		Thermal Analysis
	-		-		-		-		-	VS	-		Visualization
	-		-		-		-		-	BQ	-		Bills of Quantities
	-		-		-		-		-	CA	-		Calculation
	-		-		-		-		-	CO	-		Correspondence
	-		-		-		-		-	CP	-		Cost Plan
	-		-		-		-		-	DB	-		Database
	-		-		-		-		-	FN	-		File Note
	-		-		-		-		-	HS	-		Health and Safety
	-		-		-		-		-	IE	-		Information Exchange
	-		-		-		-		-	MN	-		Minutes / Action Note
	-		-		-		-		-	MS	-		Method Statement
	-		-		-		-		-	PP	-		Presentation
	-		-		-		-		-	PR	-		Programme
	-		-		-		-		-	RD	-		Room Data Sheet
	-		-		-		-		-	RI	-		Request for Information
	-		-		-		-		-	RP	-		Report
	-		-		-		-		-	SA	-		Schedule of Accommodation
	-		-		-		-		-	SH	-		Schedule
	-		-		-		-		-	SN	-		Snagging List
	-		-		-		-		-	SP	-		Specification
	-		-		-		-		-	SU	-		Survey
	-		-		-		-		-	IC	-		ICU Submission
	-		-		-		-		-	FD	-		Computational Fluid Dynamic
	-		-		-		-		-	DL	-		Daylight Analysis
	-		-		-		-		-	LI	-		Lighting Analysis

Custom Description

User defined description for the content of file which may be omitted. Users are recommended to keep the custom description as precise and short as possible (1-8 letters) to mitigate operational error caused by exhaustive file and folder names.

Information Set (not in file name)

Legend to denote the information contained in the model, denoted by { } in Quick Guide Level 2 and Level 3.
In most case, a single file may contain more than one set of information, so it is not a standard field for file naming but a reference for custom description only

animation	Animation
AVA	Air Ventilation Analysis
blg_green	Building greenery
coord	Coordination
dialux	DiaLux lighting analysis
drainage	Drainage
GI	Ground Investigation
GIS	Geographic Information System
hard	Hard landscape
hoarding	Hoarding
layout	General layout
lidar	LiDAR
logistic	Site logistic information
LS	Lateral Support
massing	Massing study
OVT	Old & Valuable Trees
photogmtry	Photogrammetry
rendering	Rendering visualization
road	Road info
scan	Physical 3D scanning
sequence	Construction sequence
SF	Site formation
site_layout	Site layout
site_analys	Site analysis
solar_study	Solar Study
soft	Soft landscape
surround	Surrounding buildings and topography
temp_work	Temporary works
topo	Topographic information
traffic	Traffic information
UG	Underground Conditions
utilities	Public utilities
UU	Underground Utilities
VD	Vertical Diagrams

Note: It is deemed acceptable if the above abbreviations exceeding 8 letters are used for Custom Description of the file name.

(b) Family Naming

As per *section 8 of the FLIP Guidelines (ver. 1.0),* Family Naming Conventions ensure that Families can be identified in FLIP and the Revit software by the real-world items that they create. The naming convention include short forms of functional type and sub-type and descriptors that allow the user to search for Families by elements, by manufacture, and/or by base units.

Guidelines

- Create unique names for each Family. For example, a fixed window Family and a fixed door Family cannot share the same name;
- If possible, do not include the Family category in the Family name unless the functional type is the same as the category (e.g., window)
- Use 'title casing' (as with the tile of a book) for Family names, as they are case sensitive.
- Keep file names as short as possible. Family names must display in dialogs and in the Type Selector.
- When adding optional descriptors to Family file names, consider the order in which the descriptors are listed to ensure that Family files display in the Project Browser in the most logical and intuitive order.
- Do not use space between words in the file names. To separate words within a syntax element (e.g., Manufacturer or Descriptor), use the underscore character (_).
- If a hyphen (-) is used to include a performance range, enclose the range in parentheses, for examples, (23-250_Ton).
- If a type catalogue is to be used with a Family, name the type catalogue (.txt file) with the same name as the Family.

Format

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

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 **F**amily File Extension

- Descriptors 1 & 2 are not necessary for all Family naming. It could be use as the Family Type Naming.

Type Naming Conventions

Refer to *Section 9 of the FLIP Guidelines (ver 1.0)., Family Naming Convention under Section Family Library Component*.

All Families must include one predefined type. Unless they represent nominal sizes, type names should include units or capacity, and include a unit indicator.

When naming a Family type, use the guideline below:

Guidelines

- Do not include the Family name or category in the type name.
- Type names should mirror actual usage.
- Type names should indicate the key differences between types (size, count, material) and, where applicable, reflect standard sizes. In some cases, you may base names on size difference, but use common terms rather than numbers.
- When types are named by size, use dimensions only. Avoid the use of characters or words. (h, w, d, or height, width, depth)
- Type names should include units or capacity and a unit indicator, unless they represent nominal sizes.
- Metric types should reflect the local unit standard, unless the types are intended to be generic.
- Keep type names as short as possible. Type names must display in dialogs and in the Type selector.

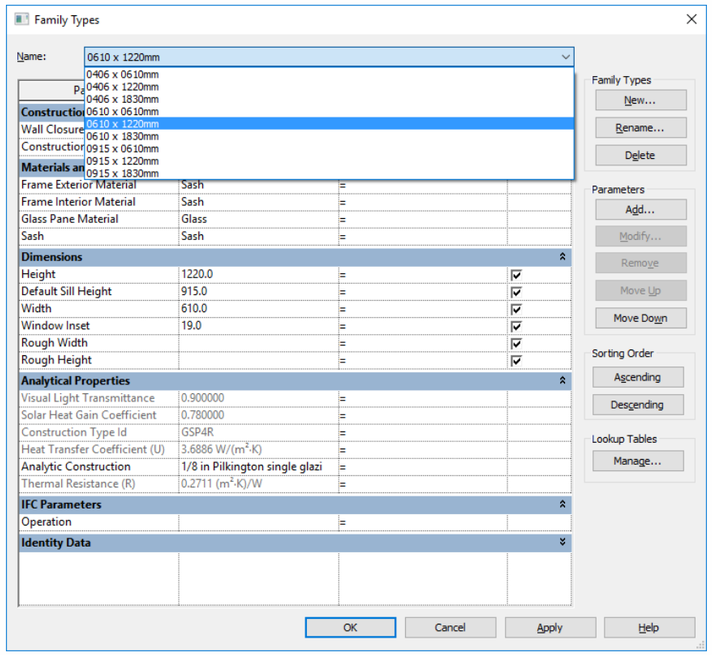
Format

Unless there is a market-specific reason to do otherwise, use the following general order in type names:

For doors and windows: <width> x <height>

For casework and furniture: <width> x <depth> x <height>

Below is an example of a Window Family with different Family Types



(c) Parameter Naming

Guidelings:

- Use Camel Case for parameter naming.
- Use descriptive parameter names; names shall describe the parameter meaning rather than describe the parameter type.
- No space allowed at the end of parameter.
- Use standard approved parameter names when available. (see *Revit Master Shared Parameters*)
- Keep parameter names as short as possible.
- Avoid abbreviation and truncation, if possible.
- Use 'title casing' (as with the title of a book) for parameter names, as they are case sensitive (e.g., Coefficient of Performance; Point of Shipment; High and Low Pressure Gas Connection Diameter).
- Parameters must display in dialogs.
- Do not change label names provided by the Revit family templates.
- Parameter names that you reuse to create equalities should be carefully checked for name coherence.
- Use the most common descriptor for a group of parameters as the first part of the name so that the parameters sort logically (e.g., Filter Face Area; Filter Efficiency).
- Parameters for subsequent items should include a number in the name before the final part of the description, but do not include a number in the name for the first item (e.g., Actual Hot Gas Flow; Actual Hot Gas 2 Flow).
- Avoid using symbols in parameter names, including: + - / \ * ( ) " ' < > | ^ $ { } [ ].
- Do not include units in the name of a parameter (e.g., Supply Air Flow CFM).
- Using the term Actual or Design:
  - **Actual** – describes the actual value the system definition requires. "Actual" parameters are linked to connectors and are often used for parameters that define flow rates, for example, Actual Supply Air Flow; Actual Chilled Water Flow.
  - **Design** – describes what the product is designed to do, for example, Design Ventilation Air Flow; Design Return Air Flow.
- Name Yes/No parameters so they imply that they return a Yes/No value, for example:
  - Has Handle
  - Is Energy Efficient
  - Show Hoods

A) Parameters that apply to the entire Family Format:

<Type of measurement/ Descriptor>

Examples:

Casement Window:

- Height
- Default Sill Height
- Width Engineering Equipment:
- Actual Heater Gas Flow
- Full Load Current
- Compressor Type

B) Parameters that describe a measurement value of a sub-component Format:

<Function/Object> <Type of measurement/ Descriptor>

Examples:

- Heat Pump Coil Face Area
- Exhaust Fan Blade Speed
- Exhaust Fan Drive

C) Parameters that describe the Linear Dimension of a sub-component (Connector) Format:

<Function/Object> Connection <Type of measurement/ Descriptor>

Examples:

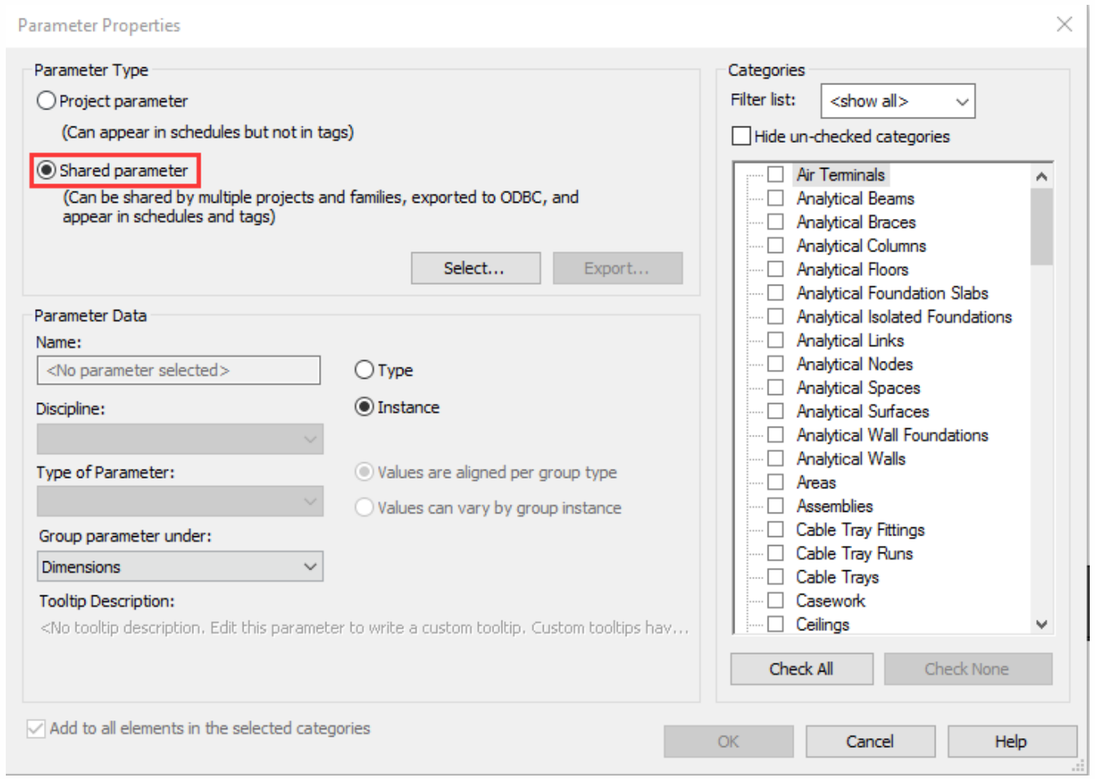
- Hot Gas Bypass Connection Diameter
- Condenser Water Connection Diameter
- Supply Air Connection Width

Examples:

Parameter Name	Description
Door Width	Clear door width
Structural Opening Width	Structural opening on wall for door installation

(d) Shared Parameter

- Shared parameters are definitions of parameters added to families or projects.
- Shared parameter definitions are stored in a file independent of any family files or Revit projects.
- The shared parameter is a definition of a container for information that can be used in multiple families or projects.
- The information defined in one family or project using the shared parameter will not be automatically applied to another family or project using the same shared parameter.
- The purpose of setting up shared parameter instead of project parameter is to show the parameter in the schedule.
- For naming convention of shared parameter, please refer to Parameter Naming.



(e) Material Naming

Finish material naming conventions organize the material by manufacturer, and general description to more specific description. Depending on the type of material, a finish material name may include a colour, code, finish type, or identification number.

Guidelines

Finish names should indicate the key differences between materials (manufacturer, type, colour, finish) and, where applicable, reflect standard sizes. In some cases, you may base names on size difference, but use common terms rather than numbers.

Metric finish names should reflect the local unit standard, unless the materials are intended to be generic.

Keep finish names as short as possible.

RECOMMENDATION: *To optimize the file size for families with a large number of available materials, provide only the most common materials in the family, and provide the remaining materials in a separate finish library. See the Finishes part type guide for more information.*

Individual Finish Materials (Stored Inside Projects) Format:

<Finish Type> - <Manufacturer> - <Code> - <Descriptor>

Examples:

- Paint – AEC Paint – AC440 – Vintage Brown Matte
- Glass – AEC Glazing – Series 1205 – Clear
- Aluminium – AEC Metal – AC120 – Anodized (Clear)
- Fabric – AEC Fabrics –AC F820 – Hounds tooth – Black/White

Individual Finish Materials Using an External Image File

Materials requiring external images, bump maps and cutout should be stored in a location that can be shared by multiple Revit Product installs.

For Windows XP:

C:\Documents and Settings\All Users\Application Data\Revit Manufacturer Library\Materials\<MFG>

Guidelines

Create unique names for each unique material image.

Capitalize the leading letters in each portion of the family name.

Do not use spaces between words in file names. Use the underscore character (_).

Acceptable file formats for material images include: **bmp, jpg, jpeg and png.**

Provide a readme to describe where the image files must be located and how to map Revit to the **"Revit Manufacturer Library"** folder in the Rendering Options dialog.

Individual Finish Materials Images

Format:

Material Image:

<Finish Type>-<Manufacturer>-<Code>-<Descriptor> + file extension

Bump maps:

<Finish Type>-<Manufacturer>-<Code>-<Descriptor>-bump + file extension

Cutouts:

<Finish Type>-<Manufacturer>-<Code>-<Descriptor>-cutout + file extension

Examples:

- Satin–AEC_Windows–Natural_Wood_Finish.jpg
- Satin–AEC_Windows–Natural_Wood_Finish**–bump**.jpg
- Aluminum–AEC_Fencing–AC120–Anodized**–cutout**.jpg

(f) View Naming

Conventions in the naming and use of views are necessary to coordinate team activity and prevent inadvertent changes in the output documents.

This standard is limited to drafting views and sheet views although the Project Browser includes other kinds of elements; Working views do not necessarily follow this.

View naming shall be consistent across all references to that view. Renaming of views shall be carried out with care as any changes will be automatically reflected across all documentation.

1	2	3
View Purpose	Scale	Content

Field 1: **View Purpose**
Purpose of the view (S-GBP, P-Presentation, T-Tender, C-Construction)

Field 2: **Scale**
Scale of the view (50 / 100 / 500)

Field 3: **Content**
Location + Concise description of the content

Examples:

Views (Default)	Name	Description
Floor Plan	S_100_L01	Level 1 floor plan in 1:100 for GBP submission purpose
Reflect Ceiling Plan	T_100_L01	Reflected Ceiling Plan in 1:100 for tender purpose
Detail Plan	C_50_3/F Detail Plan at Elevator 1	Detail plan of Elevator 1 at Level 3 in 1:50 for construction
Elevation	P_100_South	South elevation in 1:100 for presentation purpose
Section	T_100_A	Section A in 1:100 for tender purpose

- The Revit functionality that allows for the Title on Sheet to be different to the view name shall be used.
- The Title on Sheet is subject to the designer, hence a descriptive name of Title on Sheet is preferable.
- Level names are spelled out as they need to appear in a room schedule (as well as how they will appear in sections and elevations.) Do not pad the level number with leading zeros.
- Views shall not be named to make them sort or group more logically in the Project Browser as the grouping and filtering setting will take care of that automatically (i.e., the prefixing of level names by sequential numbers).
- View names shall be written in uppercase.
- Creation of temporary working views is encouraged, but please be sure that WORKING VIEW is added as the prefix of the view name to distinguish from other views.

Special Views

Plan views differ in Revit from other views because they can be duplicated (without reproducing their reference mark as is necessary with elevations and sections.) This results in many special-purpose plans that are temporary or perhaps never placed on title-sheets.

The following are exceptions to the view naming conventions described above.

View Type	Naming Convention	Examples
Colour Plans	**COLOUR - <modifier>**	**COLOUR – L1** **COLOUR – LEVEL 1 PRIMARY**
Views created in order to communicate an information relating to elements which meet specific criteria.		
Export Views	**EXPORT - <modifier>**	**EXPORT – L1** **EXPORT – LEVEL 1 ELECTRICAL BACKGROUND**
Special configurations may be required for supplying graphical information which is specific for a particular discussion. These views shall show information relating to the origin and date/time of the extract as described.		
Import Views	**IMPORT - <modifier>**	**IMPORT – L1** **IMPORT – LEVEL 1 ELECTRICAL**
A dedicated view should be used for attaching linked and imported material that needs to be segregated from other views. (This requirement helps to avoid technical problems and make it easier to control visibility.)		

(g) Sheet Naming

Sheet naming shall be based on the file naming.

Sheet naming shall be based on the Document and Drawing Numbering Protocols established for the project. These names automatically match the text as it appears in the titleblock and any schedules.

PROJECT NUMBER		PHASE NUMBER		BUILDING TYPE		DISCIPLINE		CODE
1 2 3 4		1 2		1 2 3 4		1		1 2 3 4 5 6
FL07		03		BLK1		A		LO-03
Fanling Area 47B		Phase 3		Block 1		Architectural		Typical floor plan (3F-34F)

AGENT	PROJECT NUMBER	ZONE	DISCIPLINE	STATUS	DESCRIPTION
1 2 3	1 2 3 4	1 2	1	1	1 2 3 4 5 6

Below are some examples:

Project Number – Public Housing Development Programme (PHDP) Project Reference (4 character)

- Project Number here is referred to as the first 4 characters of the Project Number in HOMES (i.e. without 5th and 6th characters). E.g. TM18

Project	

								Description
1234	12	1234	1	123	123456	1	123	
FL07	--	----	-	---	------	-	---	Fanling Area 47B
HK16	--	----	-	---	------	-	---	Hing Wah
KL33	--	----	-	---	------	-	---	Upper Ngau Tau Kok
TM18	--	----	-	---	------	-	---	Tuen Mun Area 18
TK13	--	----	-	---	-------	-	---	Tseung Kwan O

Phase Number (2 characters)

- To denote phase number of the project, align with PHDP

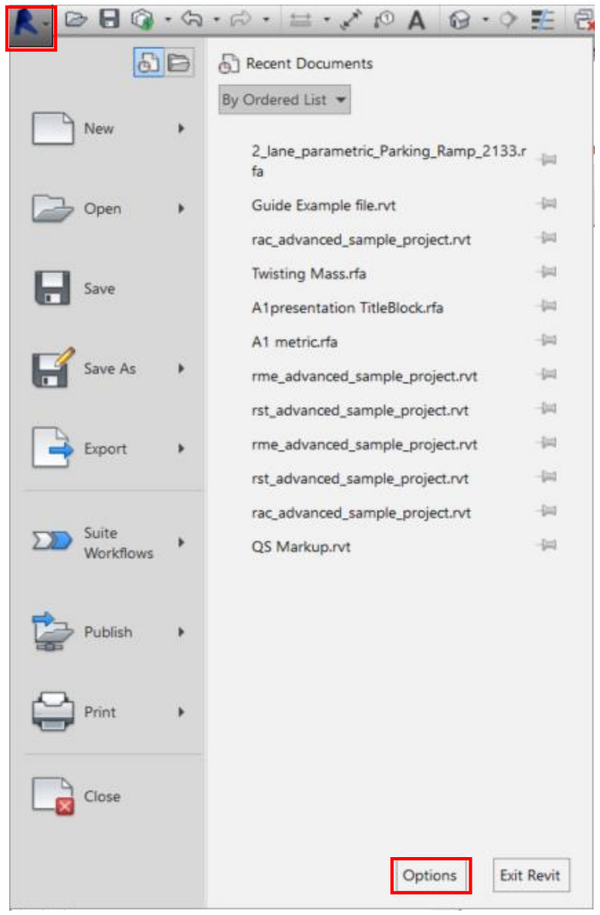
								Description
1234	12	1234	1	123	123456	1	123	
----	01	----	-	---	------	-	---	Phase 1
----	02	----	-	---	------	-	---	Phase 2
----	03	----	-	---	------	-	---	Phase 3

Building Type (4 characters)

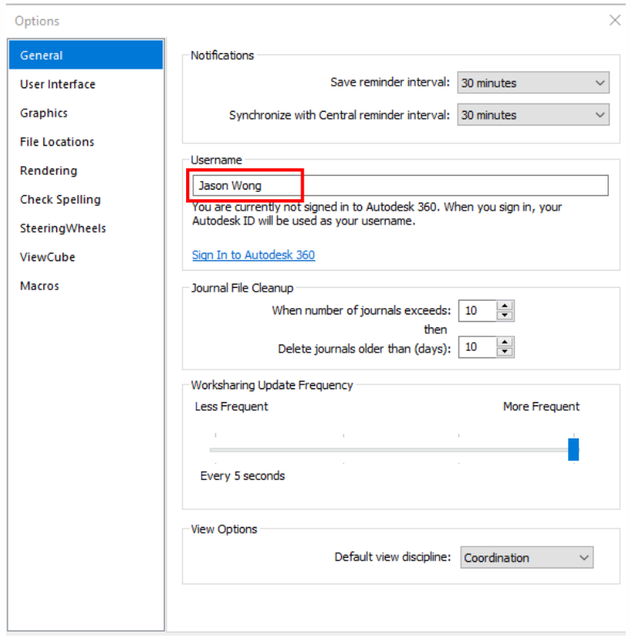
- To define the types of building. E.g. block no., carpark, etc, recommend that the code should be reflect the meaning of the blocks / facilities

D.MET-2.3 System Settings

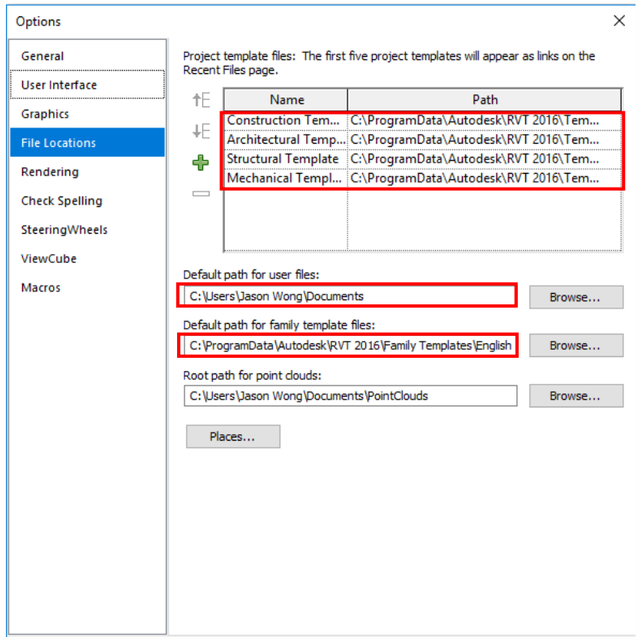
Important System settings are to be observed.
These setting can be found in “Options” tab.



1. Username – this allows identification of ownership in a worksharing file.



2. Project template files locations.
3. Default path for user files and family template files.



D.MET-2.4 View List / Drawing List Scheduling

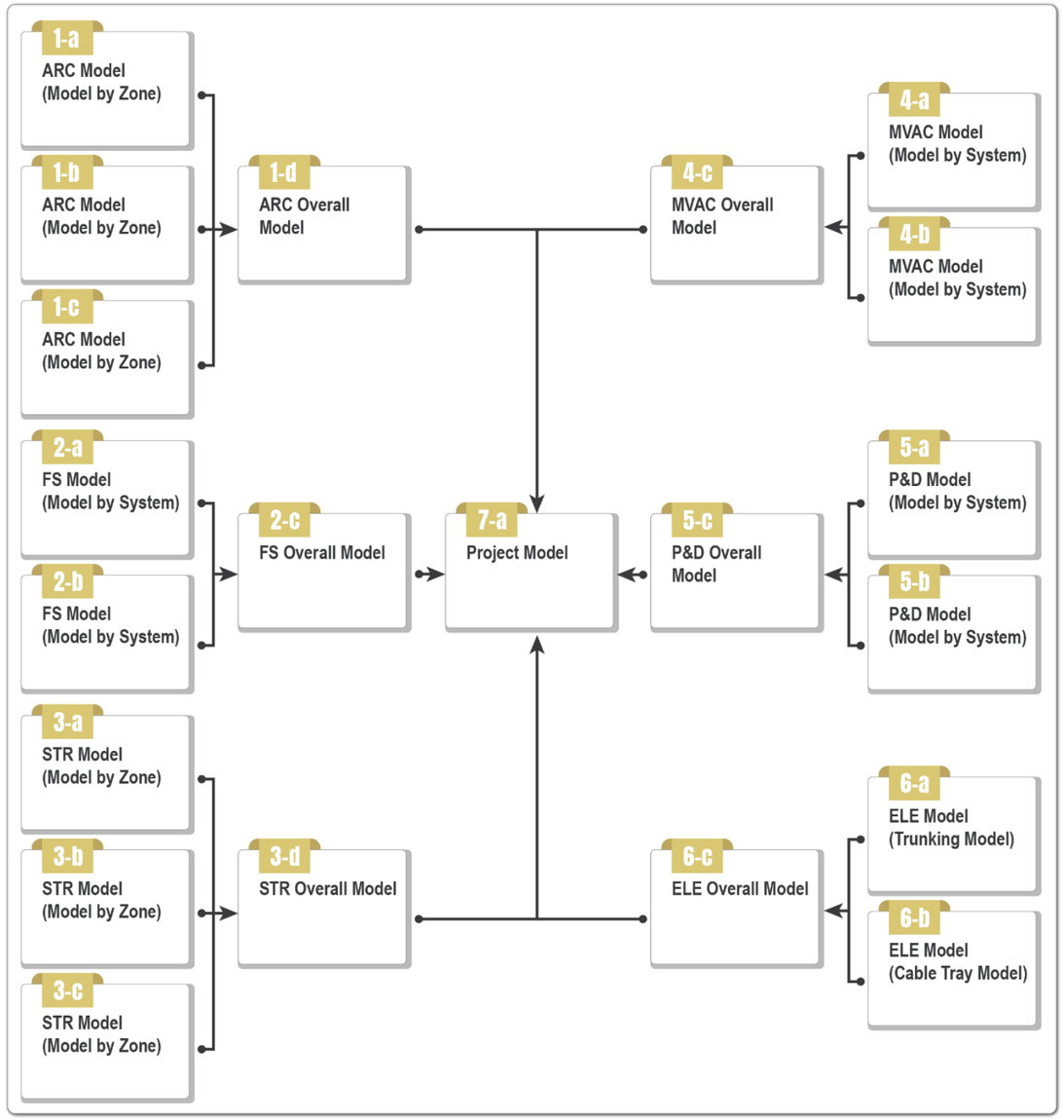
Two pre-defined schedules are included in the templates to manage the views, namely the Publication View List and the WIP View List, which contain columns for the following data:

Publication View List				
View Name	**Title on Sheet**	**Scale Value 1:**	**Sheet Number**	**Sheet Name**

WIP View List		
View Name	**Scale Value 1:**	**Detail Level**

Drawing List					
Drawing number	**Drawing title**	**Revision**	**Issue date**		

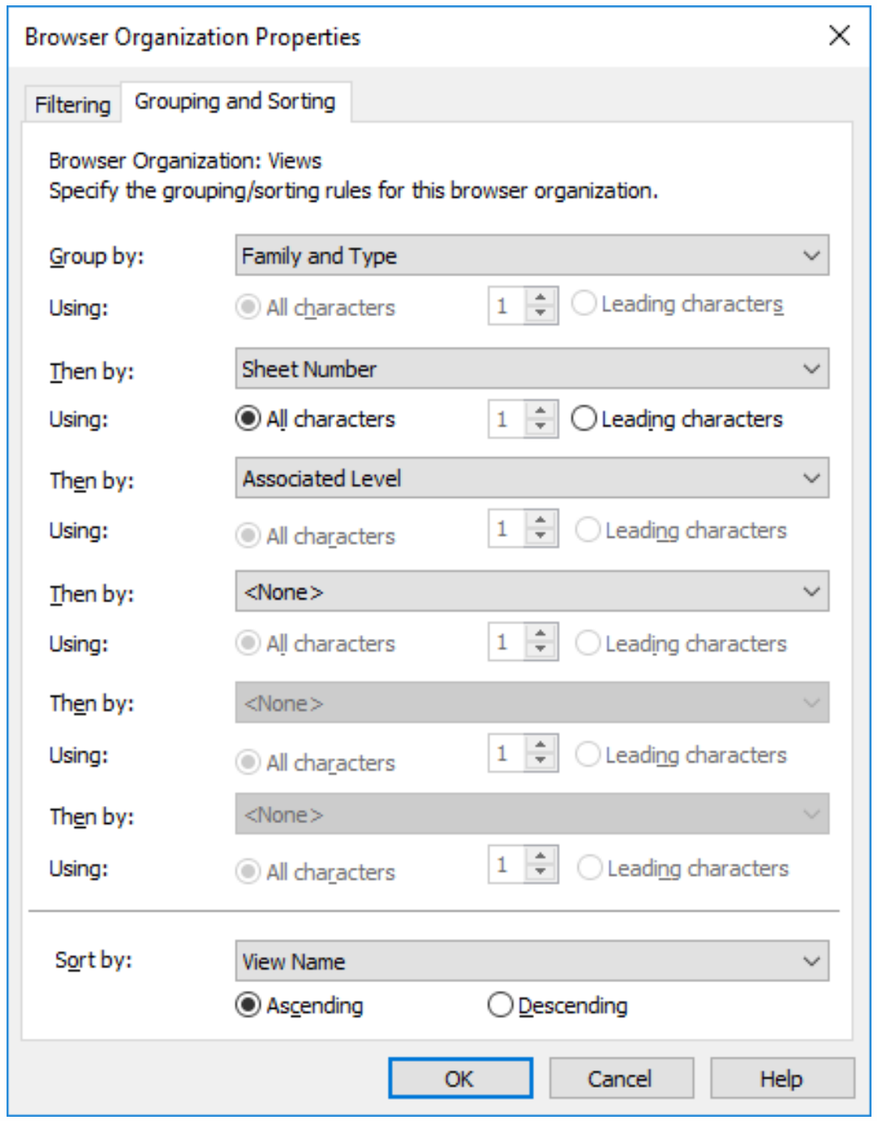
Model Hierarchy & Data Structures



D.MET-2.5 Project Browser Organization

The Project Browser in Revit provides an organisational structure to the views and components within the project. The following rules are defined within the templates to automatically sort WIP views from Publication views.

- View folders shall be grouped by Family and Type and sorted by Associated Level in ascending order.
- The Views shall be filtered by Sheet Name which should be Equal to a value of none. View section will now show only views not allocated to a drawing sheet.
- Sheet folders shall be grouped by Sheet Number using 1 Leading Character and sorted by Sheet Number in ascending order.
- No filters shall be applied to Sheets.



Model Hierarchy & Data Structures

For a BIM project, it is NOT recommended to create a single large model and embed all the details in a single file. The project should be divided into logical groups (e.g. by discipline, by trade) and the models should be linked in logical hierarchy for easy handling.

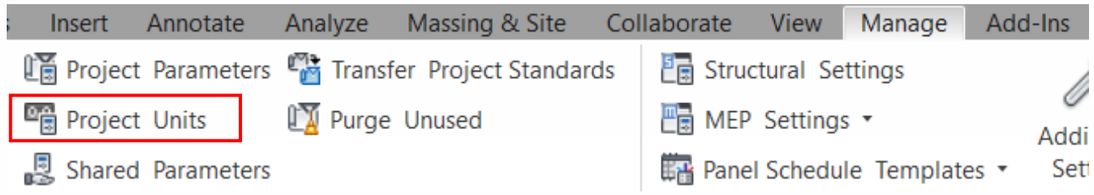
This section deals with the principles of subdividing a model for the purposes of: -

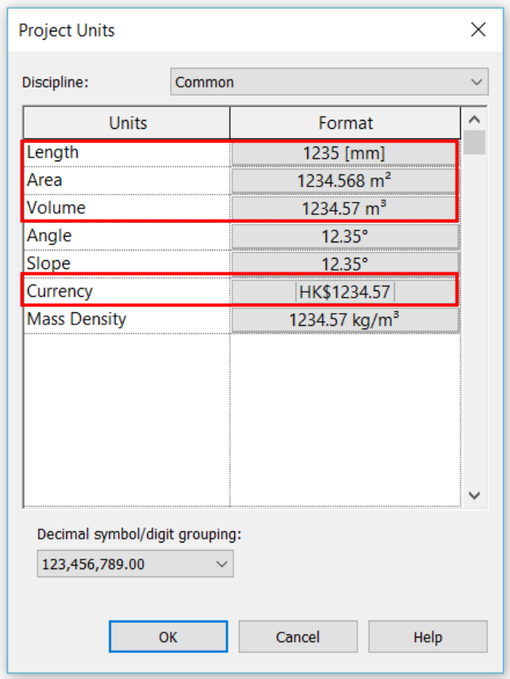
- Multi-user access.
- Operational efficiency on large projects.
- Inter-disciplinary collaboration.

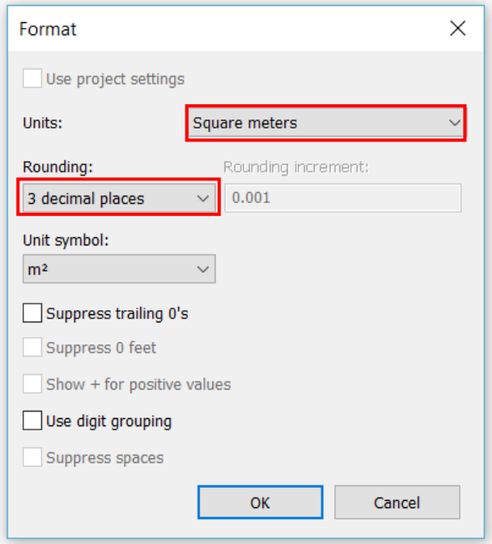
D.MET-3 Project Setup

D.MET-3.1 Project Unit

Set Unit to Metric, with appropriate decimal places. Note: 3 decimal places for areas.







D.MET-3.2 Survey Point & Project Base Point

Discipline	All Disciplines
Family	System Family
Category	Survey Point/ Project Base Point
Workset	N/A
Naming Convention	N/A

Modelling

Every project shall have a project base point and a survey point, although they might not be visible in all views, because of visibility settings and view clippings. They cannot be deleted.

- Survey Point is absolute – It refers to the true co-ordinates of a project surveyed by a Land surveyor; the values shall match exactly as the surveyor information.

- Project Base Point is relative – It refers to a point common to all stakeholders which is typically set at a point in the boundary line, or the intersection of two gridlines. As separate model files are done by different disciplines, the common Project Base Point is of paramount importance.

- The project base point and the survey point can be (clipped) or (unclipped). The following table describes how clipping and unclipping affects these points when you move them in a view.

• Clipped	• Unclipped
• Project Base Point	

• Moving a clipped project base point is the same as using the Relocate Project tool.
  • Project coordinates do not change for the model elements.
  • Shared coordinates change for the model elements.
	• Moving an unclipped project base point repositions the project coordinate system relative to both the model geometry and shared coordinate system.
	  • Project coordinates change for the model elements.
	  • The shared coordinates of the project base point change in the shared coordinate system. (The project coordinates of the project base point never change.)
	  • Shared coordinates do not change for the model elements.

• Project Survey Point	

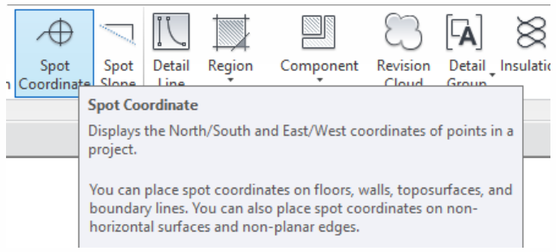
• Moving a clipped survey point repositions the shared coordinate system relative to the model geometry and the project coordinate system.
  • Project coordinates do not change for the model elements.
  • Shared coordinates change for the model elements.
	• Moving an unclipped survey point moves only the survey point relative to the shared coordinate and the project coordinate systems.
	  • Project coordinates do not change for the model elements.
	  • Shared coordinates do not change for the model elements.
	  • Only the shared coordinates of the survey point itself change.

1980 Grid System & Coordinate

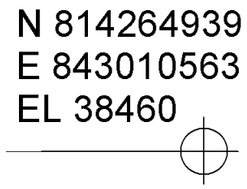
- The origin or base point and orientation of the project shall be based on the project location and its reference to the Hong Kong 1980 Grid.

- Hong Kong 1980 Grid System uses the Hong Kong 1980 geographic 2D CRS as its base CRS and the Hong Kong 1980 Grid (Transverse Mercator) as its projection. Hong Kong 1980 Grid System is a CRS for Large scale topographic mapping, cadastral and engineering survey. It was defined by information from Survey and Mapping Office, Lands Department.

- Spot coordinates report the North/South and East/West coordinates of points in a project. In drawings, you can add spot coordinates on floors, walls, toposurfaces, and boundary lines.



- The correct coordinate should be same as following:



*N=Northing Coordinate, E=Easting Coordinate and EL= Elevation

Drawing Production

Not applicable

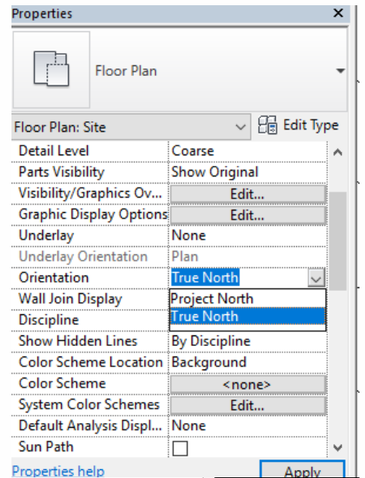
D.MET-3.3 True North & Project North

Discipline	All Disciplines
Family	N/A
Category	N/A
Workset	N/A
Naming Convention	N/A

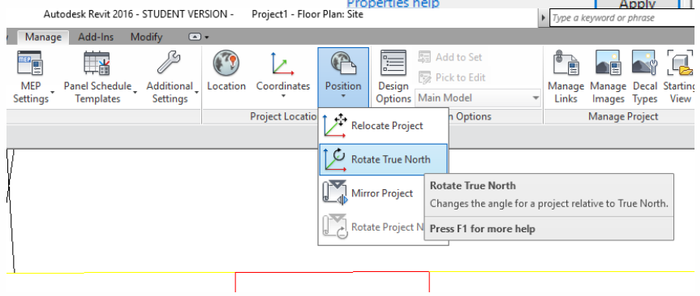
Modelling

Rotating a view to True North ensures that natural light falls on the correct sides of the building model and that the sun's path through the sky is accurately simulated.

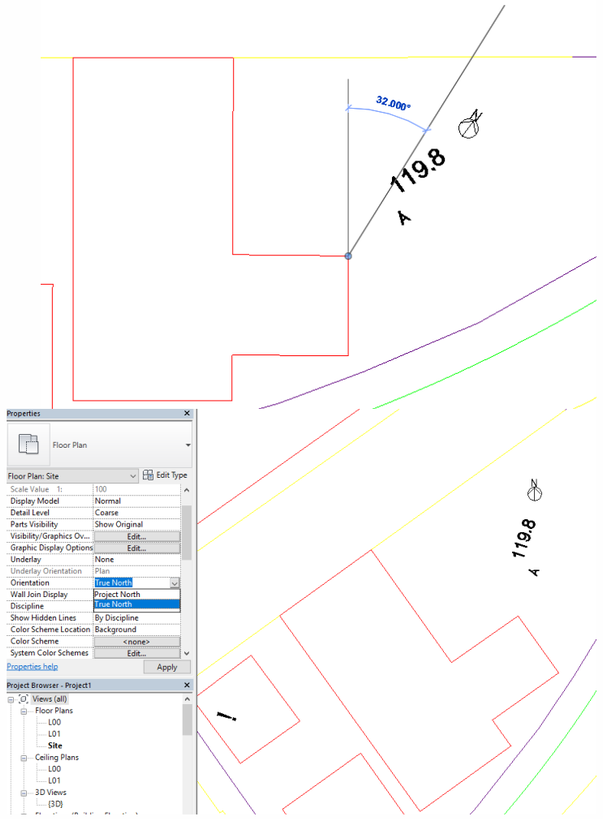
1. Access view properties and change the view orientation to "True North". This change allows you to see accurate shadows in the plan view.



2. Click "Rotate True North" to rotate the orientation of project.



3. Rotating a building model in a plan view that is oriented to True North



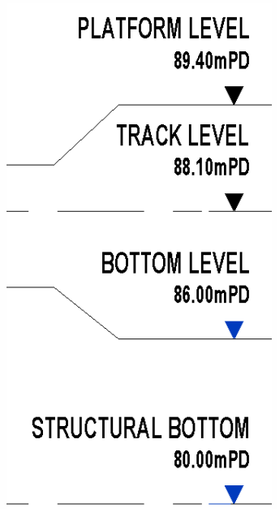
4. Plan view with the building model rotated to True North

D.MET-3.4 Grids and Levels

Workflow

General requirements:

- Make sure the 3D extent of Grids and Levels match the extent of the model
- If tower and podium are built in separate model files, the grids and levels served for these parts of buildings are to be built in separate model files.
- Grid and Levels are included in the Shared Levels and Grids workset and do not require explicit workset definitions due to the standard behaviour of Revit.
- Levels shall be set up in mPD levels.



Essential Parameter

- Project North: The building will be oriented the way an Architect wants to display on a sheet for the ease of dimensions and documentations.

- True North: Actual North in the Real World. With North pointing up vertically in this view, the building will be oriented relative to the North in the Real World.

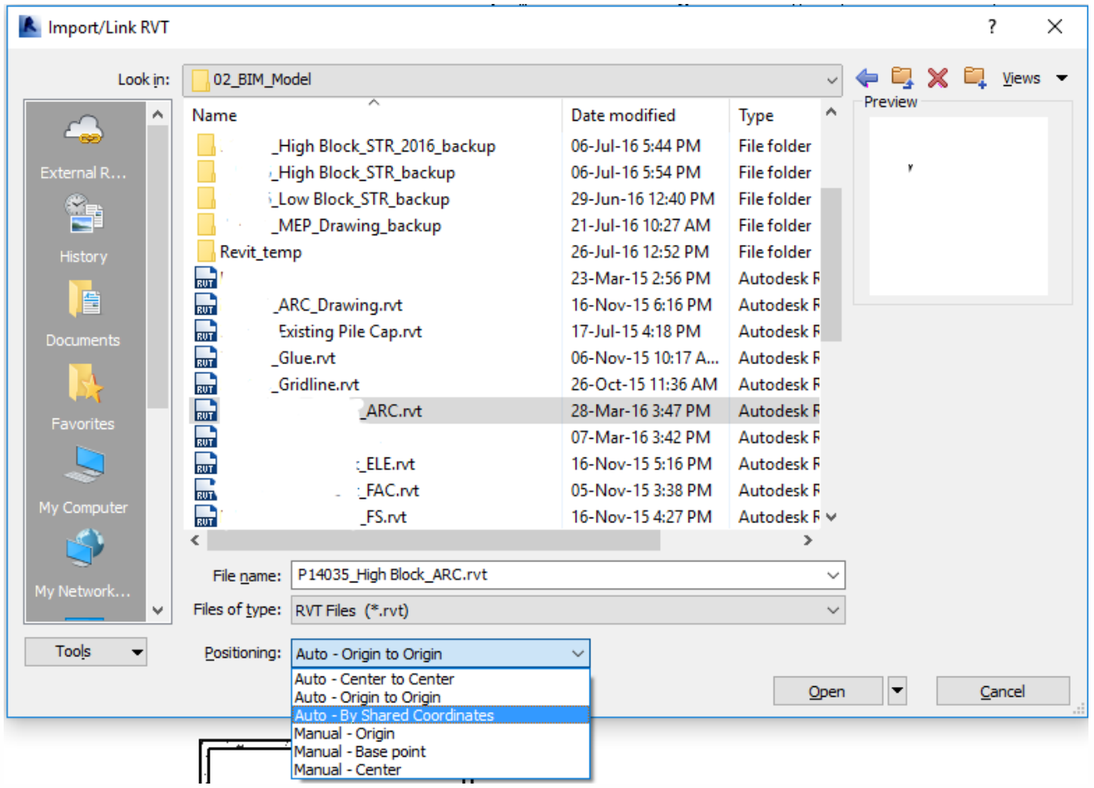
Drawing Production

Not applicable

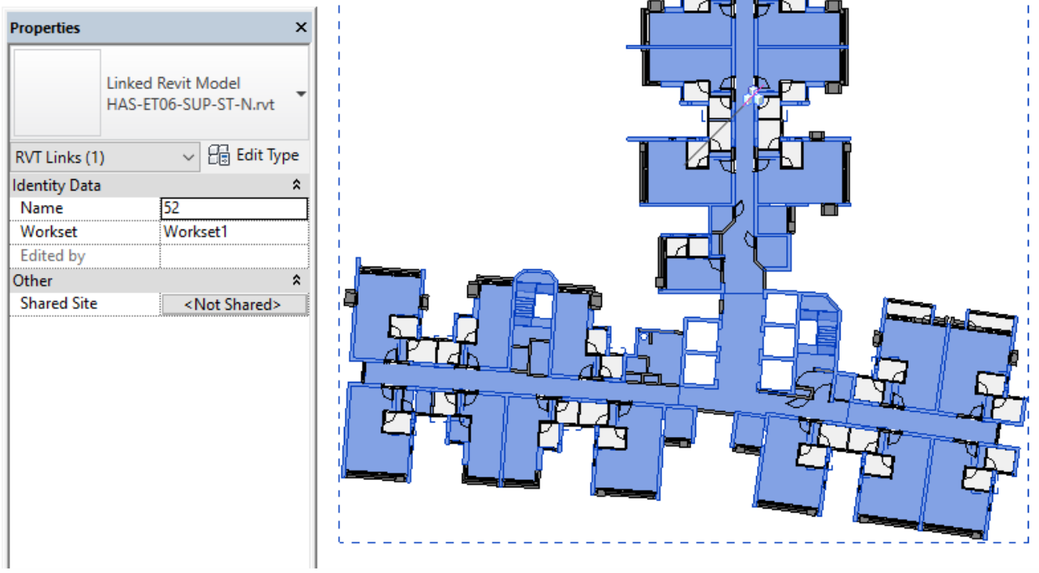
D.MET-3.5 Link Revit File

General Requirements

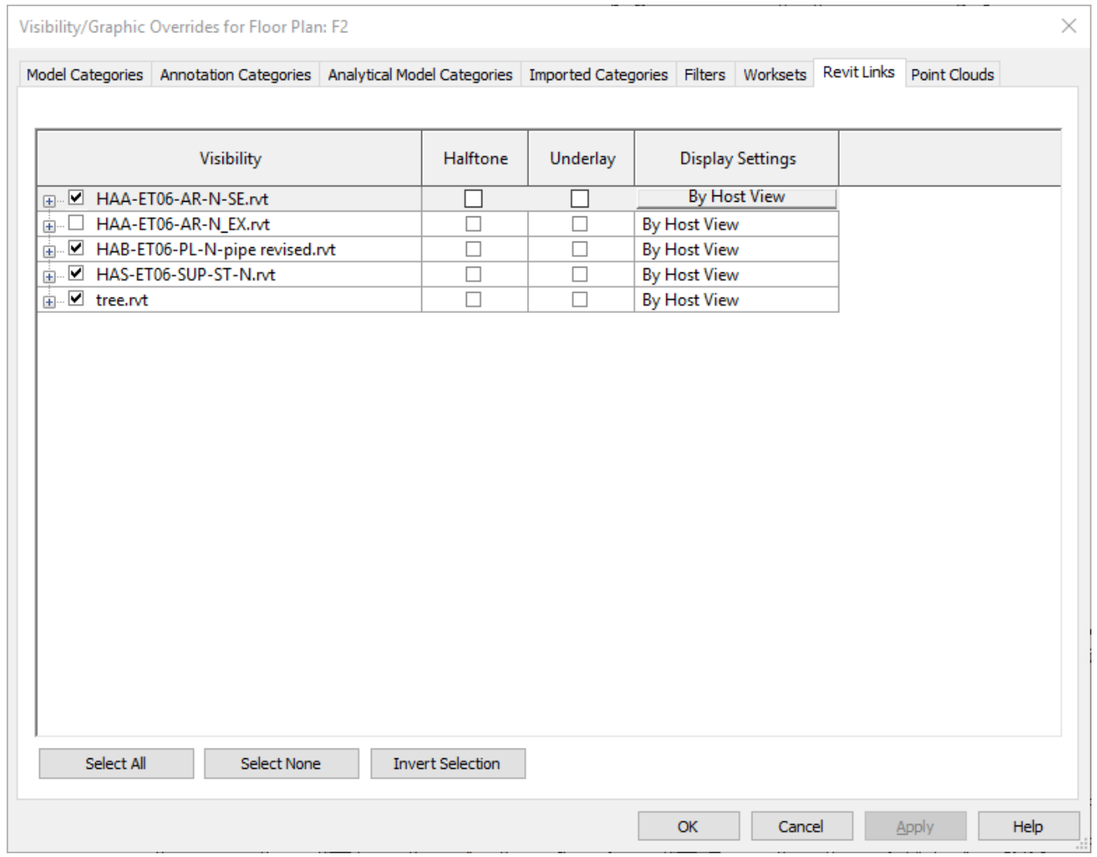
- Shared Coordinates shall be selected for the positioning of a Revit Link File.
  (Please make sure to follow the same methodology in setting up the project coordinates. Refer to D.MET-3.2 and 3.3)



- The most straightforward method to insert a Revit link is to use the Link Revit tool on the Insert tab.
- This will take a different approach instead of using existing geometry in the project and converting it to two Revit links. Linking also provides support for the Interference Check, Copy/Monitor, and Coordination Review tools.



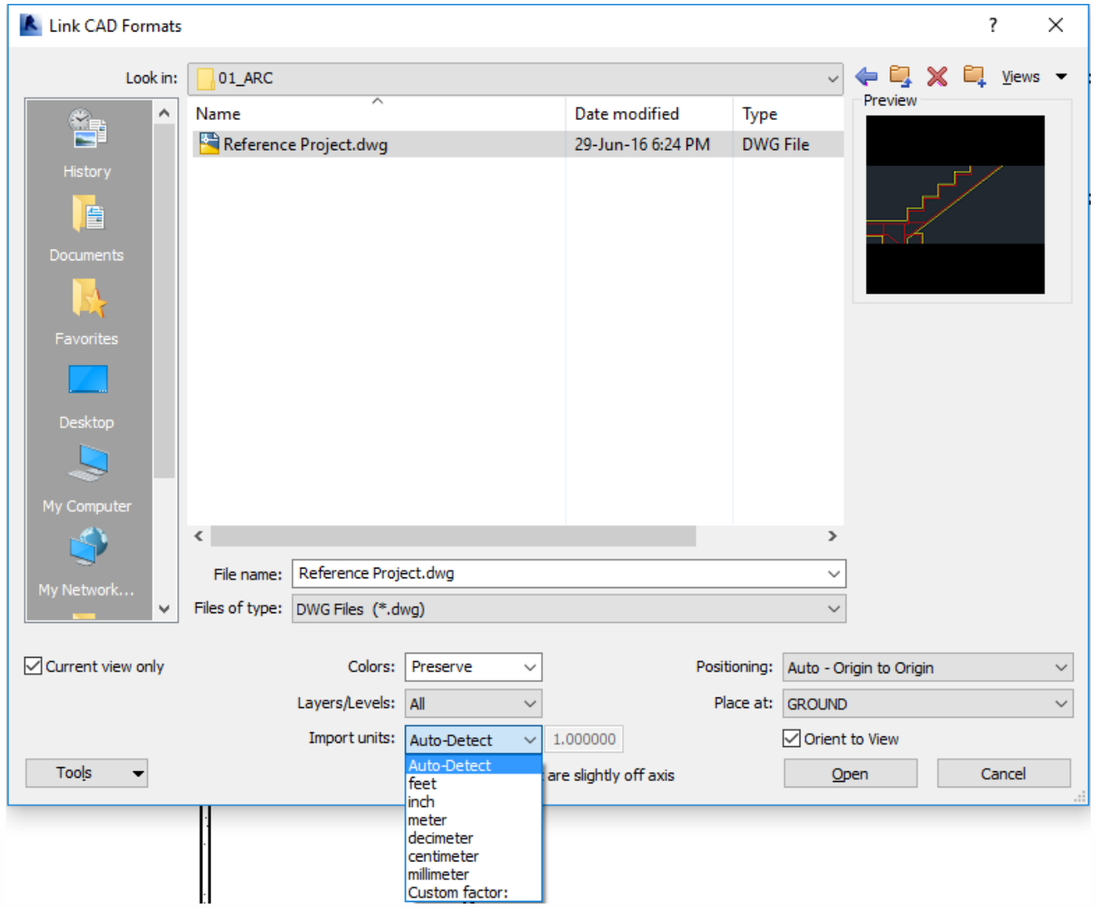
- The data can also be controlled and shown in any manner appropriate to the use.
- In the Visibility/ Graphic Overrides dialog, users can turn it on or off, half-tone and underlay the data, or enhance it with colour or line pattern overrides.



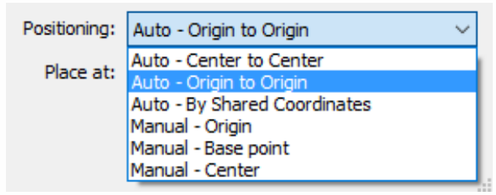
D.MET-3.6 Link CAD File (Survey Map)

General Requirements

- Do not leave Import Units as Auto-Detect if known:

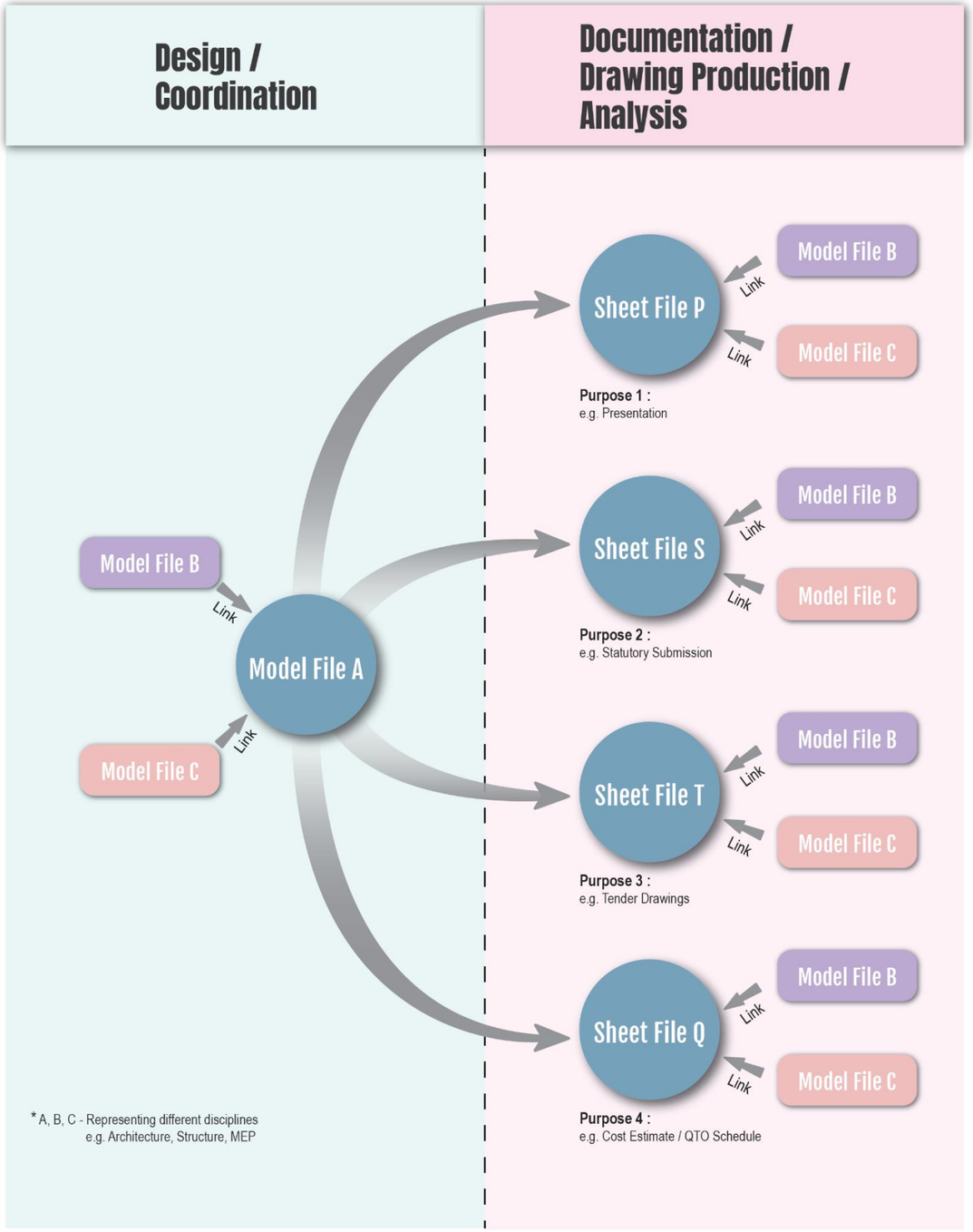


- When positioning of the CAD file:



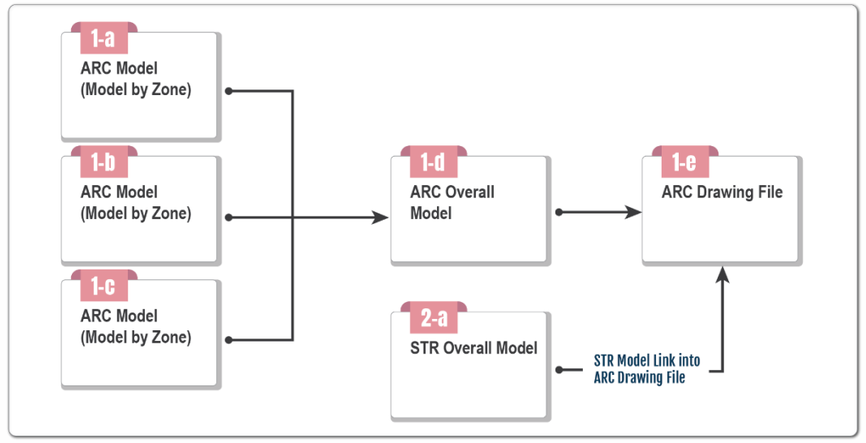
D.MET-3.7

Model Files and Sheet Files Segregation

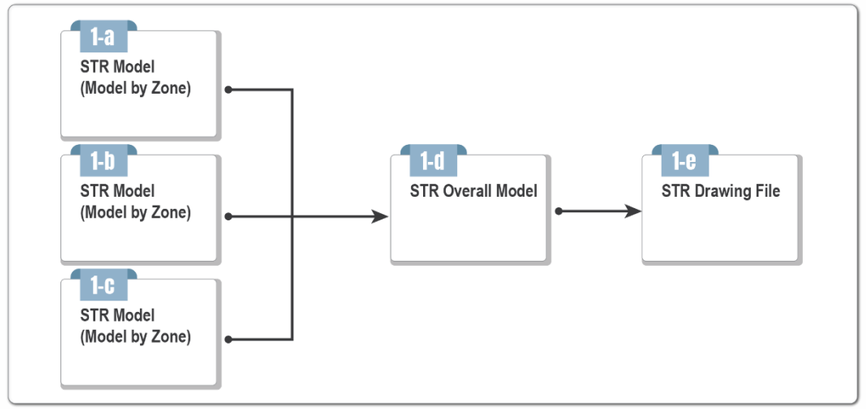


The diagrams for each discipline model and drawing file clearly illustrate the model division as below:

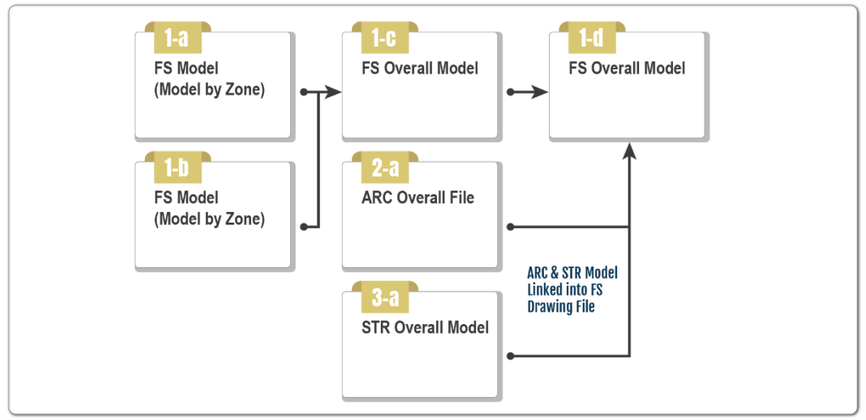
ARC Drawing File:



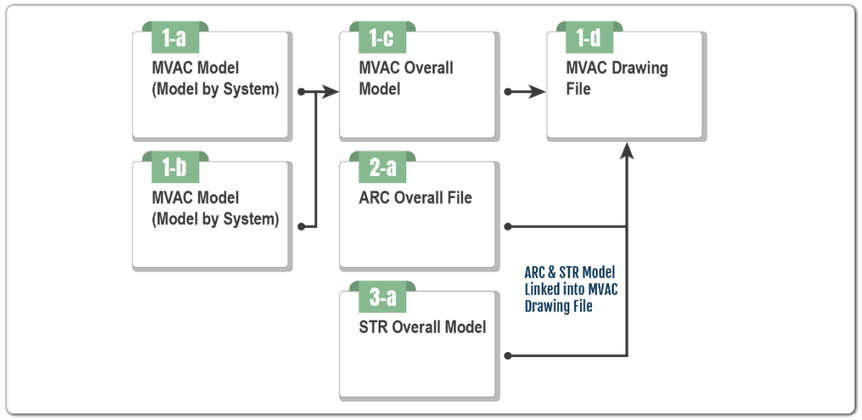
STR Drawing File:



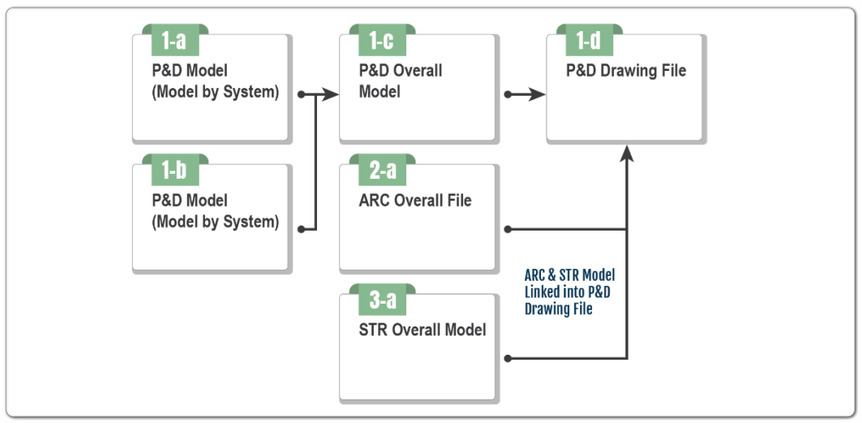
FS Drawing File:



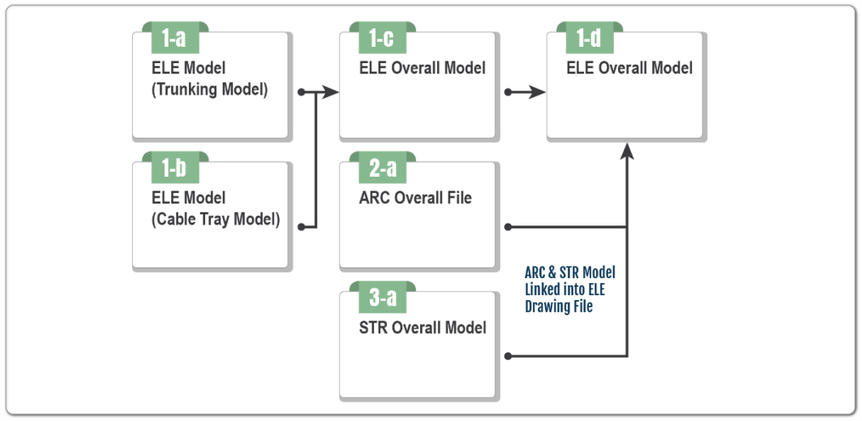
MVAC Drawing File:



P&D Drawing File:



ELE Drawing File:



Workflow: