2 HOW TO USE THIS GUIDE

2.1 Purpose Driven BIM

There is a wide variety of BIM uses for the construction industry and new applications will continue to be adopted over time. However, it is important to be mindful that each BIM application has its own specific sets of requirements in terms of modelling methodologies, types of information required and implementation characteristics which may sometimes be contradictory between different BIM applications.

Careful planning and coordination is therefore essential from the outset of any BIM Projects to first determine what BIM applications are required to meet individual project goals before determining corresponding modelling methodologies, types of information to be included and implementation strategies. This will ensure that BIM models are created and coordinated properly, contain all necessary information, and can be carried through the entire project life cycle to deliver all BIM and project goals, while minimizing effort and human resource. We call this '**Purpose Driven BIM**'.

2.2 Concept of M.I.B

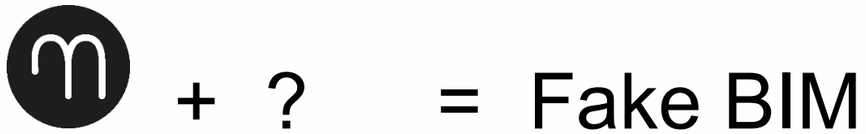
As an acronym, if we rearrange BIM we get MIB which describes the process of implementing Purpose Driven BIM.

M = Modelling

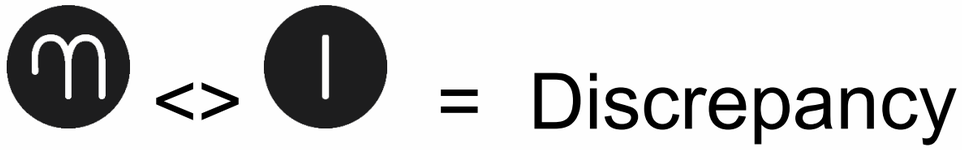
I = Essential Parameters

B = Business: Drawing Production and other Purposes

Fake BIM: M only, no I; for visualisation only, and no significant benefit



Half BIM: M and I are not interrelated; BIM is treated as supplementary information only, which creates double handling and discrepancies



True BIM: Business = M + I

For true BIM, the performance of BIM can be measured by evaluating if BIM fulfils the purposes.

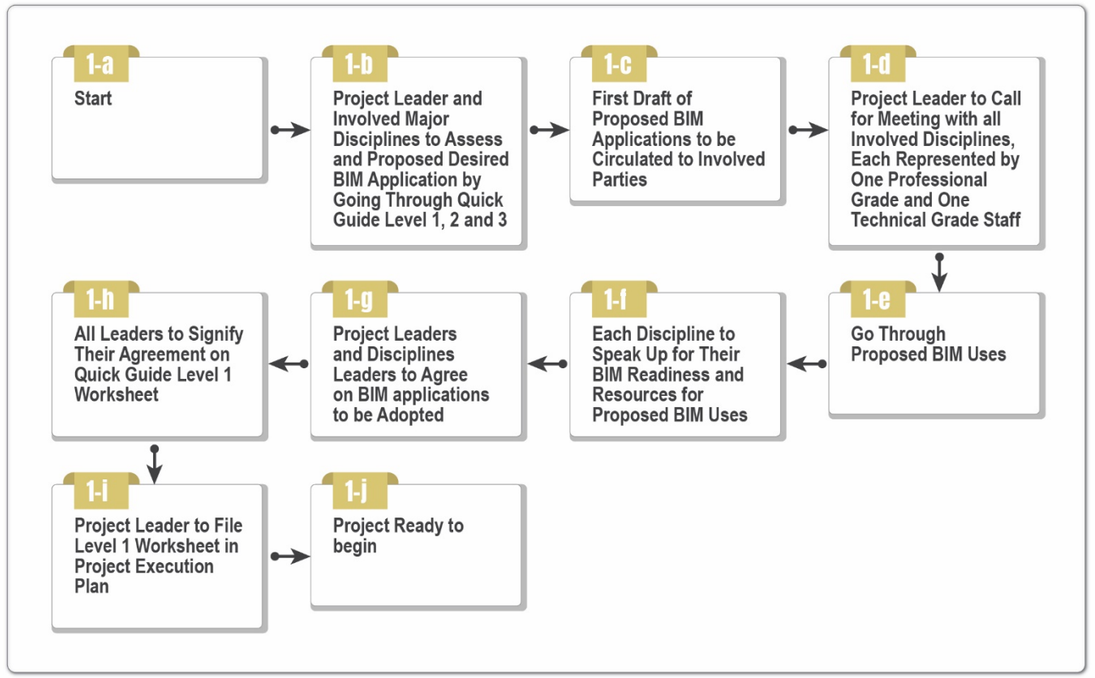
2.3 How to start a BIM Project

The following are essential for the use of BIM in all projects:

- Appoint Project BIM Coordinator for every project.
- Put in place the BIM Project Execution Plan that identifies key project task (BIM Uses), output and model configuration.
- Agree on and conduct BIM Project Reviews regularly to ensure model integrity and project workflow is maintained.
- Develop clear guidelines for internal and external collaborative working which maintain the integrity of electronic data.
- Identify clear ownership of model elements through the life of the project.
- Understand and clearly document what is to be modelled and to what level of detail. Do not over model.
- Sub-divide models between disciplines, and within each individual discipline avoid file sizes getting over 200MB. (quoted from Autodesk current official white paper)
- Carry out all changes to the model as 3D modifications, rather than 2D 'patches' to maintain the integrity of the model.
- Review outstanding warnings regularly and resolve important issues.
- Never open the Central file but only create and work on local files.
- Re-create the Central file at regular intervals in order to eliminate redundant data retention.
- Adopt efficient and minimum detailing, and eliminate detail repetition.

When starting a project adopting BIM workflow, project leader should:

1. Obtain and start with a fresh copy of Project Execution Plan Template (APPENDIX I).
2. Determine BIM Use to be adopted for the project by going through Quick Guide Level 1 to 3 as illustrated in the flowchart, which means in principle:
   a Go through Quick Guide Level 1 BIM Use Overview to tick desired BIM use.
   b From Level 2 BIM Use Detail tables, estimate the ease of changed workflow by assessing the involved effort, involved parties and BIM models to be developed against the team's available time and resources.
   c Be assisted by project technical officers who should go through Quick Guide Level 3 for detail BIM workflow.
   d Revisit Level 1 BIM Use Overview.
3. Call for BIM use kick off meeting with involved disciplines.
4. In meeting, all disciplines to make joint decision on BIM Use for the project.
5. After determining BIM use, fill out other parts of the Project Execution Plan.



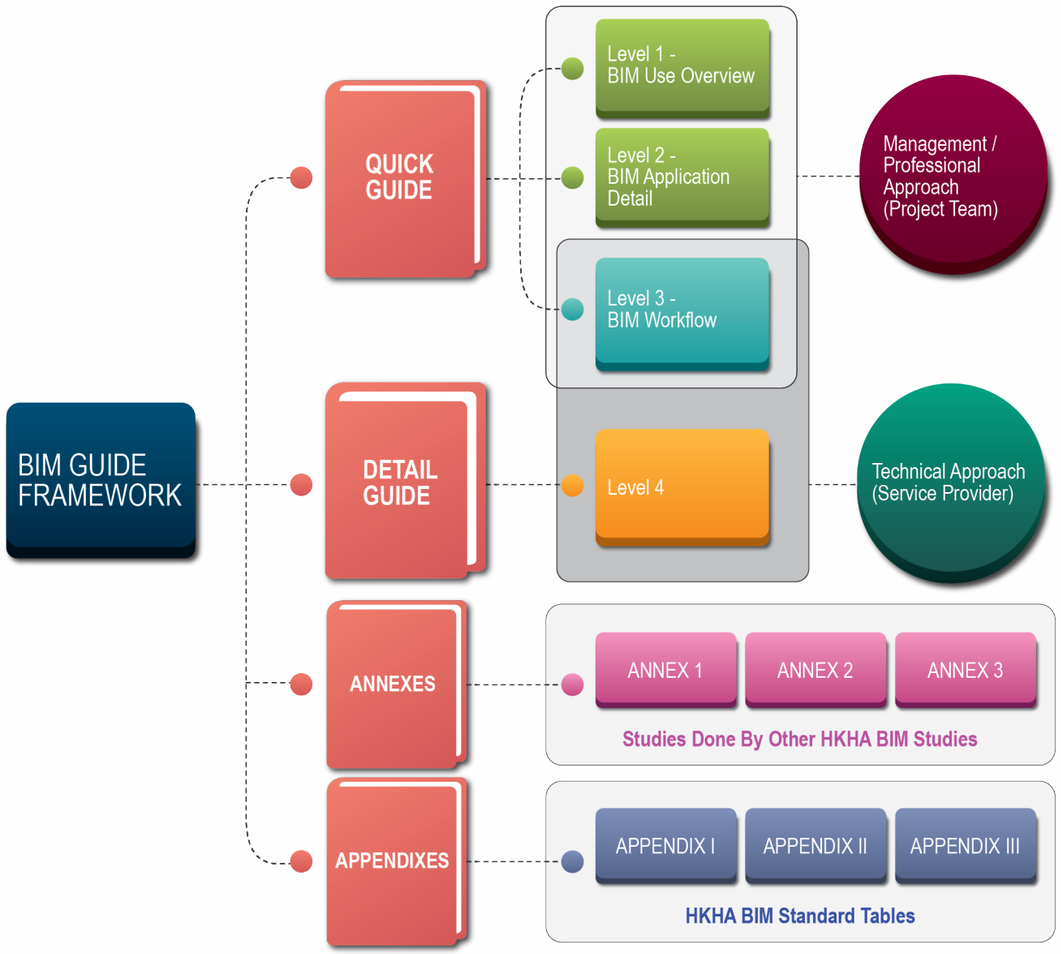
2.4 Structure of this Guide

A key principle of the HABIMSG is that the architect, engineers and others involved in a project can produce good quality and consistent drawings from the model databases for Statutory submission or tendering purposes. All file set-ups and modelling methodologies shall serve the drawing production purpose.

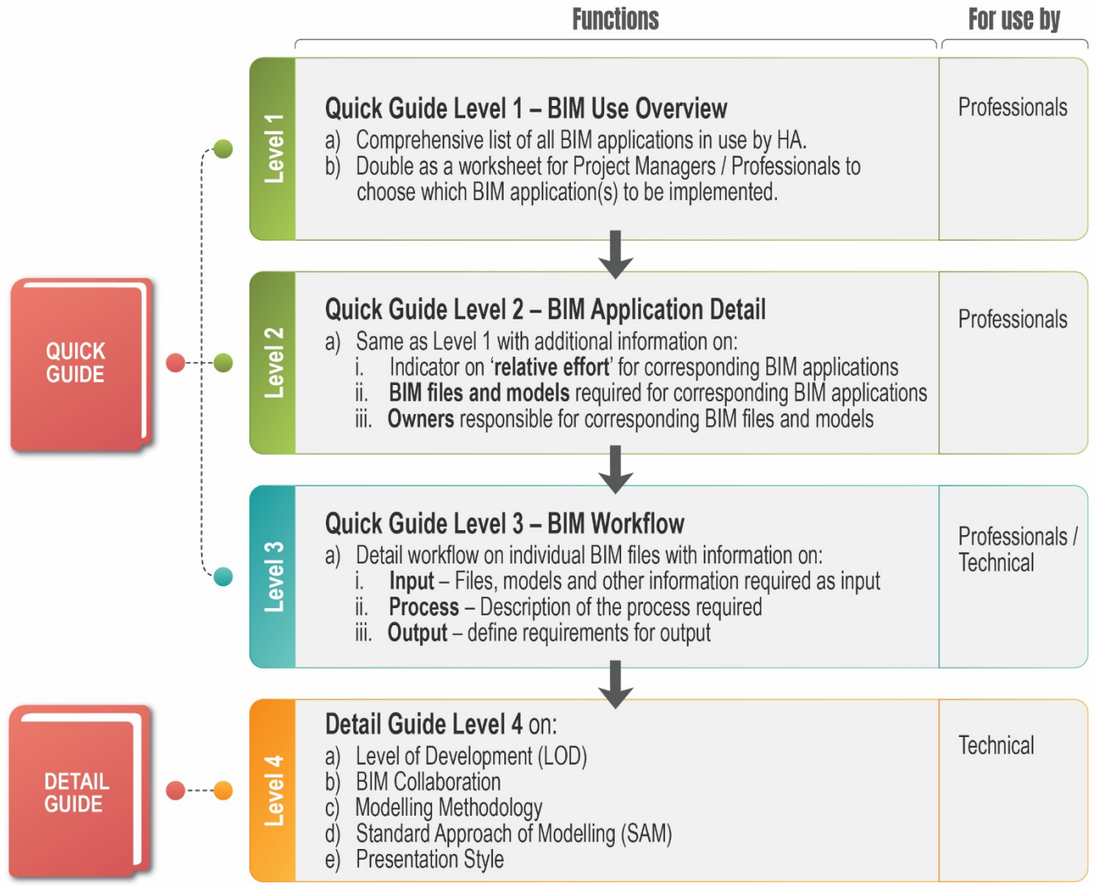
Where drawings are a product of the BIM process, traditional drawing conventions still apply.

- A drawing shall contain design information solely for the purpose of the intended use of the drawing.
- To maximise efficiency, a policy of minimum detailing without compromising quality and integrity shall be adopted.
- Numbers of drawings should be kept to the absolute minimum and organised in a logical manner.
- Avoidance of view duplication is essential to ensure drawings maintain their integrity as the interactive design process progresses and amendments are made.

Following the principles of Purpose Driven BIM, the HABIMSG aims to be a comprehensive guide for project teams to choose which BIM applications to use for their project and provide step-by-step guidance on corresponding workflows, collaboration methods, and standard approach to modelling (refer to diagram below):



The structure of this guide is divided into four sequential levels, each with its own functions. The table below summarizes how each level functions and its target user group.



Explained: Quick Guide Level 1 – BIM Use Overview

Purpose of Level 1

To enable:

1. Project leader to have easy and quick overview of which tasks can be achieved by BIM workflow.
2. Project team to tick their desired BIM workflow to be adopted in the project.

Organization of Level 1 BIM Use Worksheet

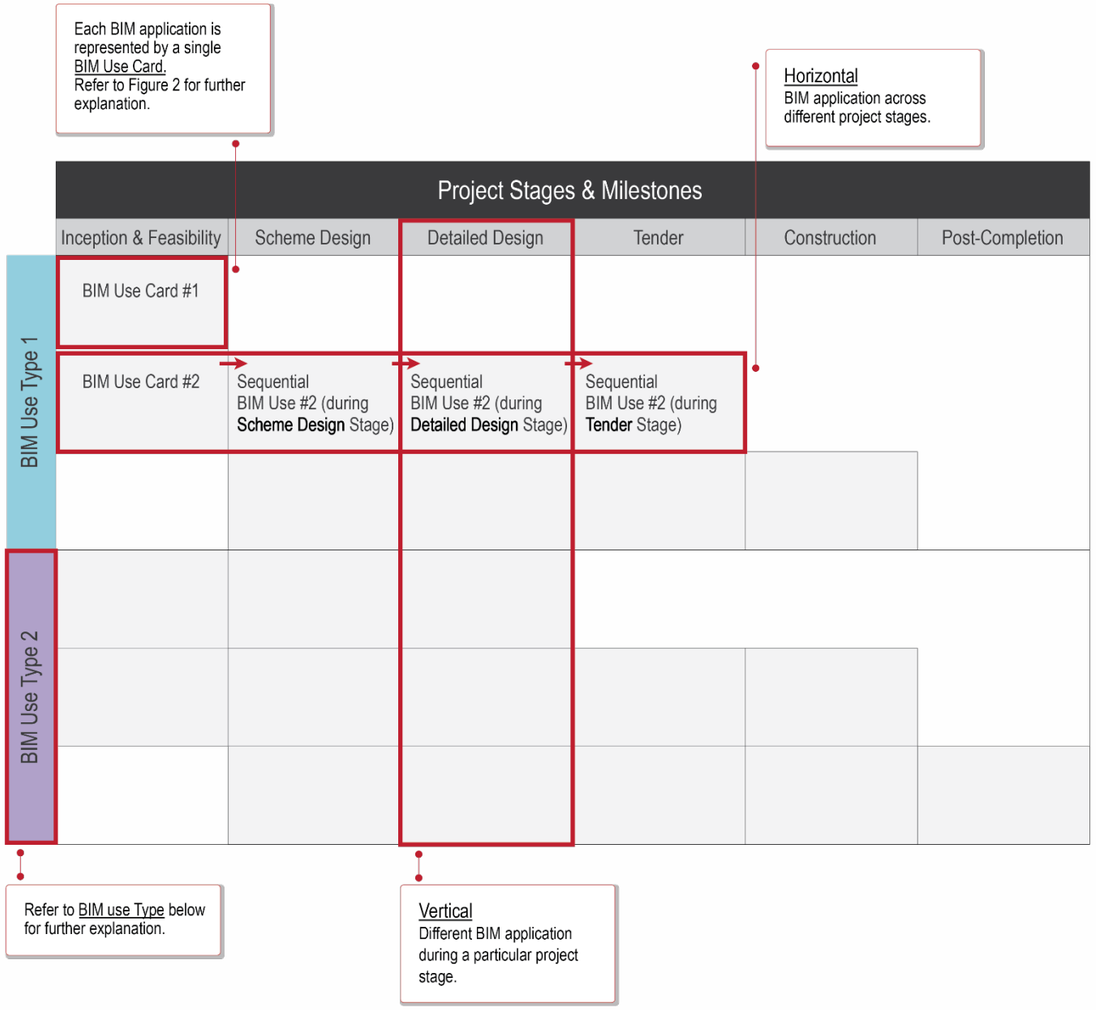


Figure 1 Level 1 BIM Uses organization

Level 1 presents an overview of possible BIM applications with regard to the Department's context such as project types, procedures and milestones. It comes in a worksheet format which, upon completion, should be filed in the Project Execution Plan.

These BIM applications are tabled in a matrix of BIM use types (vertically listed) against project timeline (horizontally listed).

Project Timeline

Project stages with respective milestones and deliverables are listed. Readers should start by identifying their project stages and deliverables to locate their current project along this project timeline.

BIM Use Type

Going down the matrix, BIM Uses are categorized into **Condition Survey, Planning, Design, Analysis & Simulation, Cost Estimate, Documentation & Presentation, Construction Planning, Multi-disciplinary Collaboration and Record Modelling**. Each application is presented as a card.

BIM Uses horizontally arranged (i.e. in the same row) indicate that they have sequential relationship. This means the BIM models and information required for that application are built upon the same from the application of the previous stage (i.e. to the left). It is recommended that for any application to be adopted, such application should start from the earliest stage as indicated in the table.

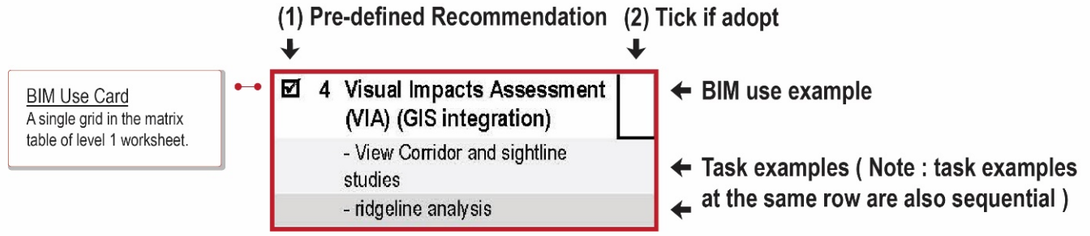


Figure 2 BIM Use Card explained

BIM Use Card

Each application has a pre-defined recommendation for adoption in projects based on the Department's previous project experience and common uses in Hong Kong private sector. These recommendations are:

1. Must-do items, which should be implemented for all projects except for special circumstances;
2. Optional items, which should be implemented on merits of individual project; or
3. Under-development items, which are pending further development for project implementation.

Project team leaders should use the Level 1 worksheets to come up with their first draft of desired BIM applications to be adopted in their project by checking the respective boxes to the right. With this draft, the user may continue to Level 2 worksheets.

How to use

Team Leader

1. to locate the project milestone along the project timeline axis;
2. to go through the possible BIM workflow for their project milestones (along BIM use type axis);
3. to refer to pre-defined recommendation of BIM workflow; and
4. to tick the desired BIM workflow to be adopted for the project.

The completed worksheet shall be filed as **APPENDIX I BIM Project Execution Plan, Section B: Level 1 – BIM Uses.**

Explained: Quick Guide Level 2 – BIM Application Detail

Purpose of Level 2

1. To enable project team leader to estimate resources required for the desired BIM workflow.
2. To give directions to technical officers on which BIM model sets would be involved.

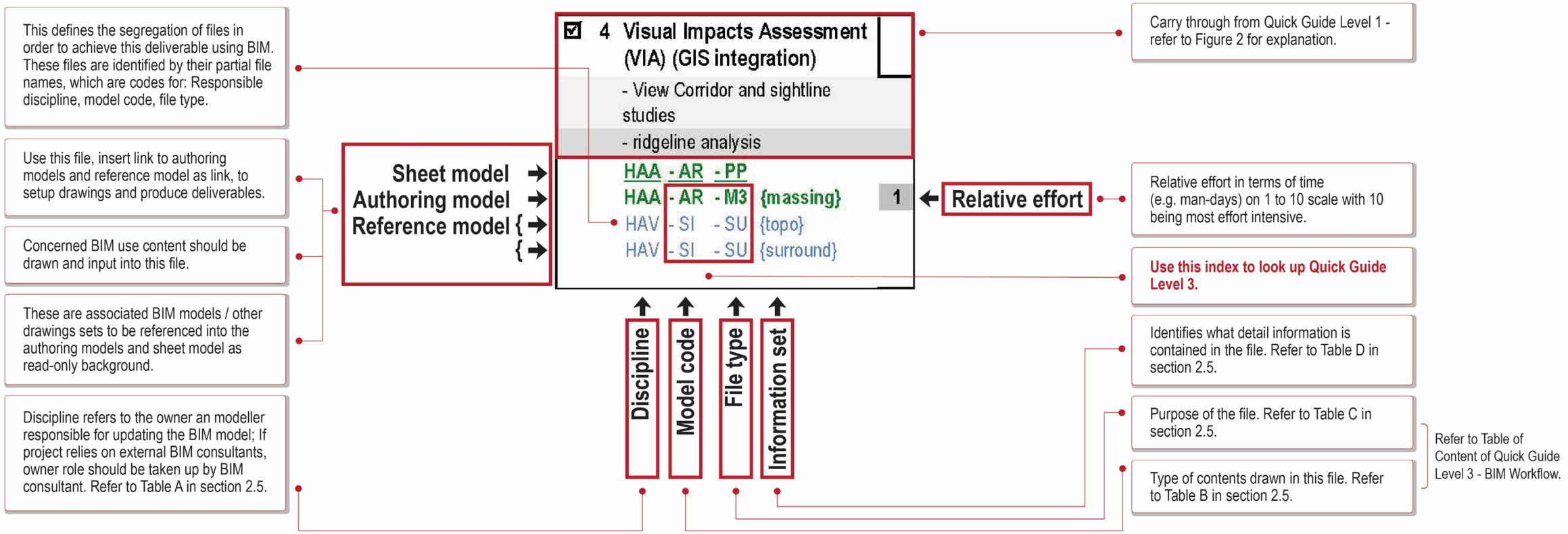


Figure 3 Level 2 BIM Use Detail Card explained

Level 2 BIM Use Detail card is an expanded view of Level 1 BIM Use card. It provides detail information for each Level 1 BIM Use. The information assists users to assess the feasibility of their desired BIM applications to be adopted in their projects.

The information states the following:

1. Information set required to be input;
2. Involved discipline which is responsible for authoring and updating that BIM model;
3. Source of information, i.e. other disciplines involved for providing relevant information;
4. Relative effort in terms of time (e.g. man-days) on a 1 to 10 scale with 10 being most effort intensive. For BIM applications that the users are unfamiliar with, this indicator helps users to project the effort required from the BIM applications they are already familiar with;
5. Segregation of BIM model sets for the respective-
   a. Sheet file for producing the deliverables
   b. Authoring Model file sets to be modelled
   c. Associated BIM model sets to be referenced as read-only background; and
6. Concerned Model file naming

How to use

- These Level 2 tables are pre-defined and for users' reference only. No input is required.
- Project team leader should be able to get a general idea of the degree of complexity and involvement of their desired applications in terms of collaborating parties, information required and expected effort.
- Project team leader should approach and discuss with involved disciplines in meetings for their consensus on providing necessary information and BIM models for the desired BIM uses.
- Project technical officers should also review the BIM model sets involved and advise the project team leader regarding the feasibility of carrying out the desired BIM workflow at the technical level.
- After reviewing the above, project team leader should be able to come up with realistic selection of BIM applications to be adopted. Users should then go back to Level 1 worksheet and tick their final selection of BIM applications to be adopted.
- The table shall be filed as **APPENDIX I BIM Project Execution Plan, Section C: Level 2 – BIM Application Detail.**

Explained: Quick Guide Level 3 – BIM Workflow

Purpose

1. To illustrate technical workflow for model authoring, namely input, process (information creation) and output.
2. To map each workflow steps to Level 4 for detail technical know-how instruction.

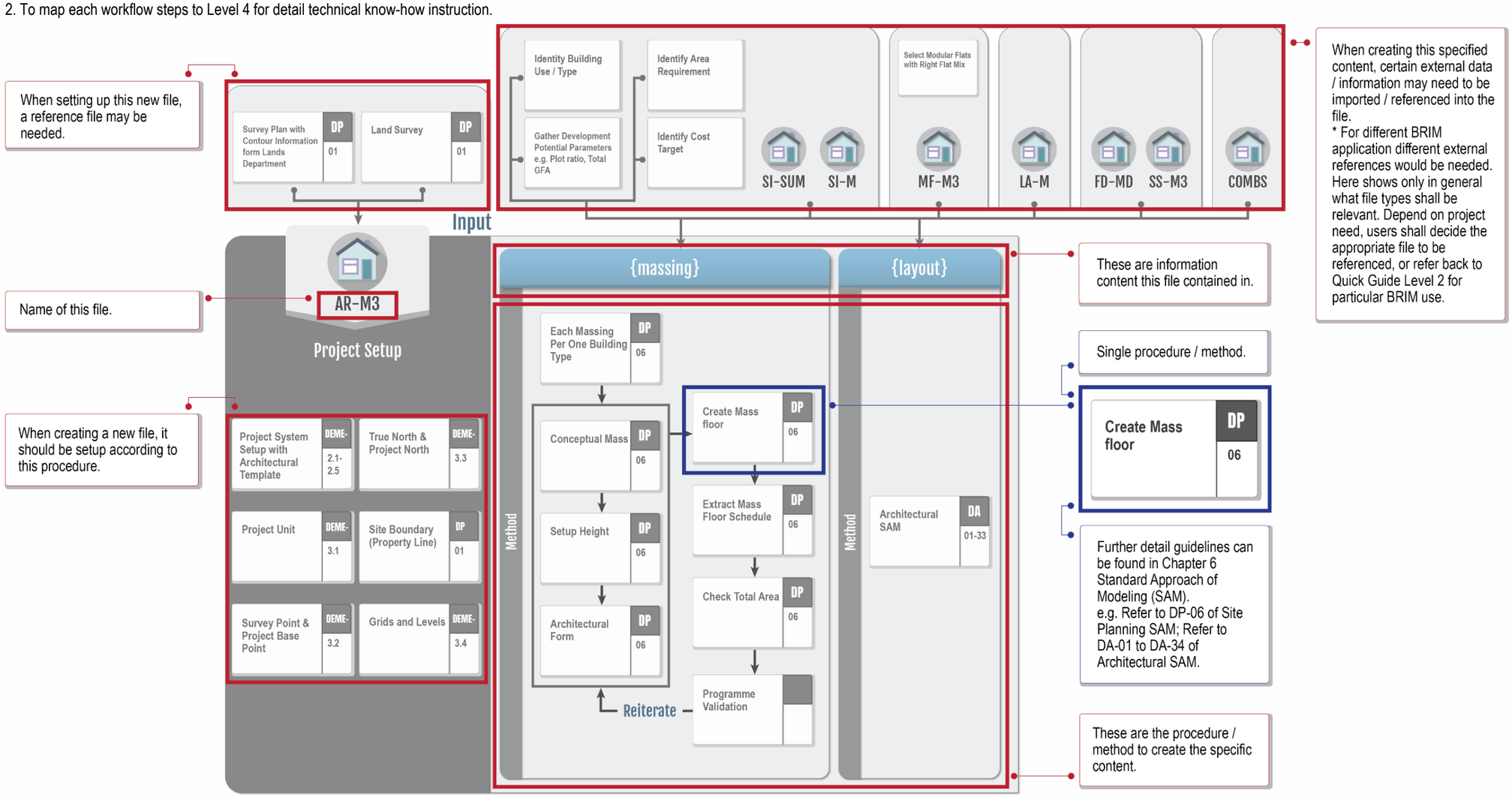


Figure 4 Level 3 diagram explained

From Quick Guide Level 2 BIM Application Detail, sheet models, authoring models, reference models and content set required are identified.

In Level 3, the relationship of these models and information are illustrated in detail, as follows:

Input

These are read-only structured data to be referenced or imported into the authoring model for content creation.

The structured data include BIM models by other parties, schedules, survey data and 3D models, etc.

For each information set creation, different structured data input will be required.

Process

The authoring model is the container of the content creation. It references or imports the input data, undergoes the steps and creates the content set.

That is, users should do the modelling for the concerned content in this model. Model the content with the input data as reference or background.

This authoring model should be set up first according to the steps in the model setup grey box.

There is a checklist of items (or a sequence of items) to be carried out in order to model the content.

Each step has a way-finder pointing to relevant sections of Level 4 Detail Guide for detail instruction.

Output

When the authoring model is a sheet file, drawing sets will be output as deliverables.

Relevant tables shall be filed as **APPENDIX I BIM Project Execution Plan, Section D: BIM Authoring Process.**

Explained: Detail Guide Level 4

Detail Guide Level 4 includes detail explanation on Level of Development (LOD), BIM Collaboration, Modelling Methodology, Standard Approach of Modelling (SAM), Presentation Style, New Issues and Items under Development. Please be reminded that these sections contain several technical terms for operational uses and are intended to be **read mainly by technical staff**. At the same time, for detail operational procedures not written in this Guide, users should refer to the software user manuals on the particular version in use.

From the workflow diagrams in Quick Guide Level 3, technical users shall locate the relevant Level 4 information by using the reference index in the procedure/method box. Refer to 2.5 Quick Start 3C for diagrammatic explanation.

M-I-B

In principle and where applicable, each section follows the structure and sequence of “M” – Modelling method, “I” – Essential Parameter and “B” – Drawing Production, sample of titles as below:

Modelling

Essential Parameter

Parameter	Type / Instance	Description	Schedule
Material	Type	Material	Y

Note:
Under the column “Schedule”, “Y”(Yes) means the parameter can be extracted to schedule, while “N” (No) means the parameter cannot be extracted to schedule.

Drawing Production

Content Coding

The Guide is colour coded in background for different disciplines to enable easy identifications:

Architecture	(Red) R: 255 G: 231 B: 231	
Structure	(Blue R: 221 G: 235 B: 247	
MEP	(Green) R: 221 G: 239 B: 218	
Coordination	(Yellow) R: 255 G: 242 B: 204	
Family	(Lavender Fog) R: 223 G: 213 B: 231	
General	(Orange) R: 251 G: 228 B: 213	

Explained: Annexes

The Annexes outline the previous BIM studies carried out in the HA.

It should be noted that the quality, standard and process of these previous studies may not be in line with the standard in this guide due to continuous development in the industry. Users should refer to the Annexes with care.

Explained: Appendixes

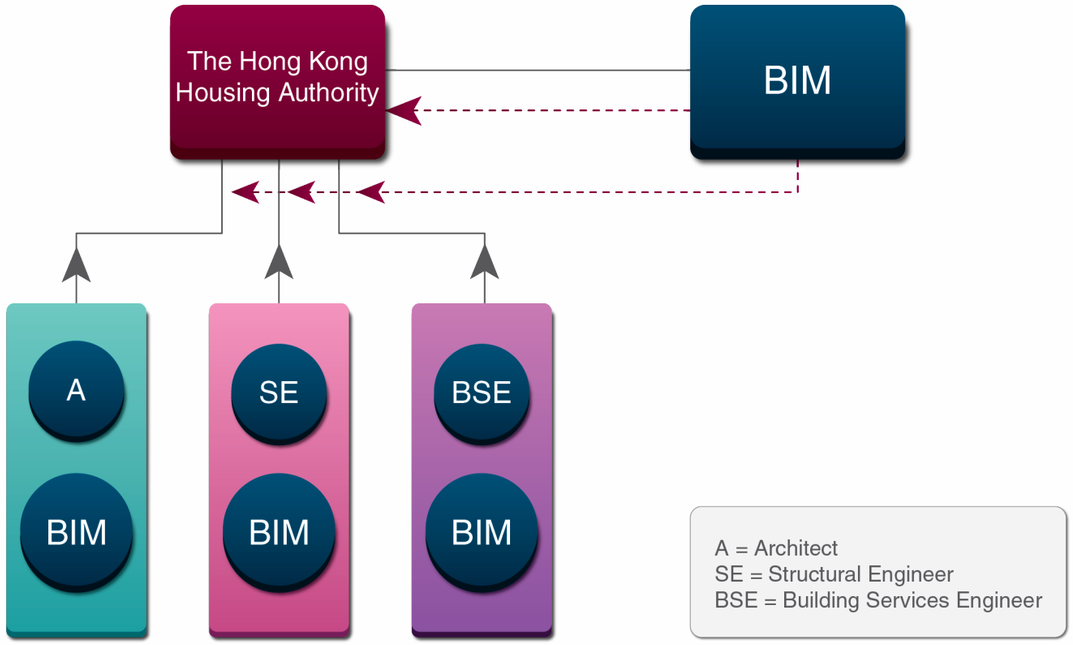
The Appendixes consist of the following:

Appendix I BIM Project Execution Plan
Every BIM project should file its own BIM Project Execution Plan according to the structure as listed in this Appendix.

Appendix II Comparison of Previous HKHA BIM Guides and HABIMSG
Appendix III HKHA Family Library Component

External BIM Consultancy Procurement (Existing vs Ultimate)

Currently most of the DCD's BIM projects rely on external BIM Services Providers. This Guide serves as a guideline or standard that requires the BIM practitioners to follow in order to maintain a high level of consistency for the BIM models created.

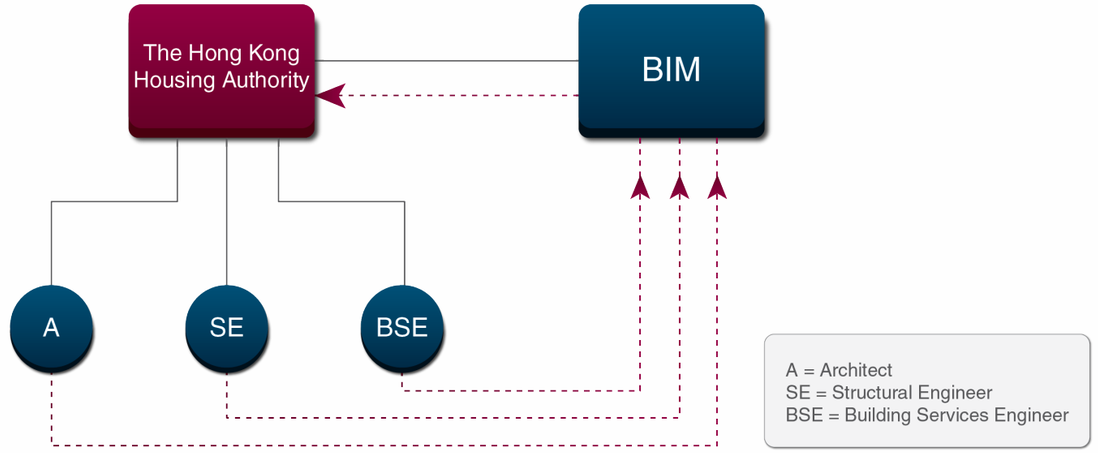


Above diagram shows that the BIM consultant (BIM) requires design information from all professional disciplines – Architect (A), Structural Engineer (SE) and Building Services Engineers (BSE).

The current BIM procurement strategy involving a heavy reliance on BIM Services Providers should only be considered as an interim measure when A, SE and BSE are still not BIM-enabled, as this arrangement has major inherit problems:

1. It assumes the BIM Services Provider (BIMSP) has extensive professional knowledge over all architectural, structural and building services, understands and is able to identify the professional issues that may not have been addressed by the professionals before and draw their attention accordingly.
2. The BIM models or drawings produced do not bear the professional liabilities – not statutory nor contractual binding.
3. The time when the BIMSP has received enough professional information for BIM input is usually at very late stage – e.g. when tender drawings are produced. When BIM process only starts at such late stage, any issues identified will have very little impact to the statutory submissions and contractual drawings. The value of BIM is significantly decreased.
4. Any changes in design reflected in drawings will NOT be automatically reflected in the BIM process.

In the long term, the BIM procurement strategy should be as illustrated in the following diagram:



Here the traditional professionals are BIM-enabled so that they can all produce BIM deliverables such as BIM models and BIM-produced professional drawings including statutory submissions and construction drawings.

The role of the BIM consultant will then act as an auditor to carry out BIM model audit and uphold the BIM Standard as stipulated in this Guide to ensure good quality of BIM deliverables as submitted by the different professionals.

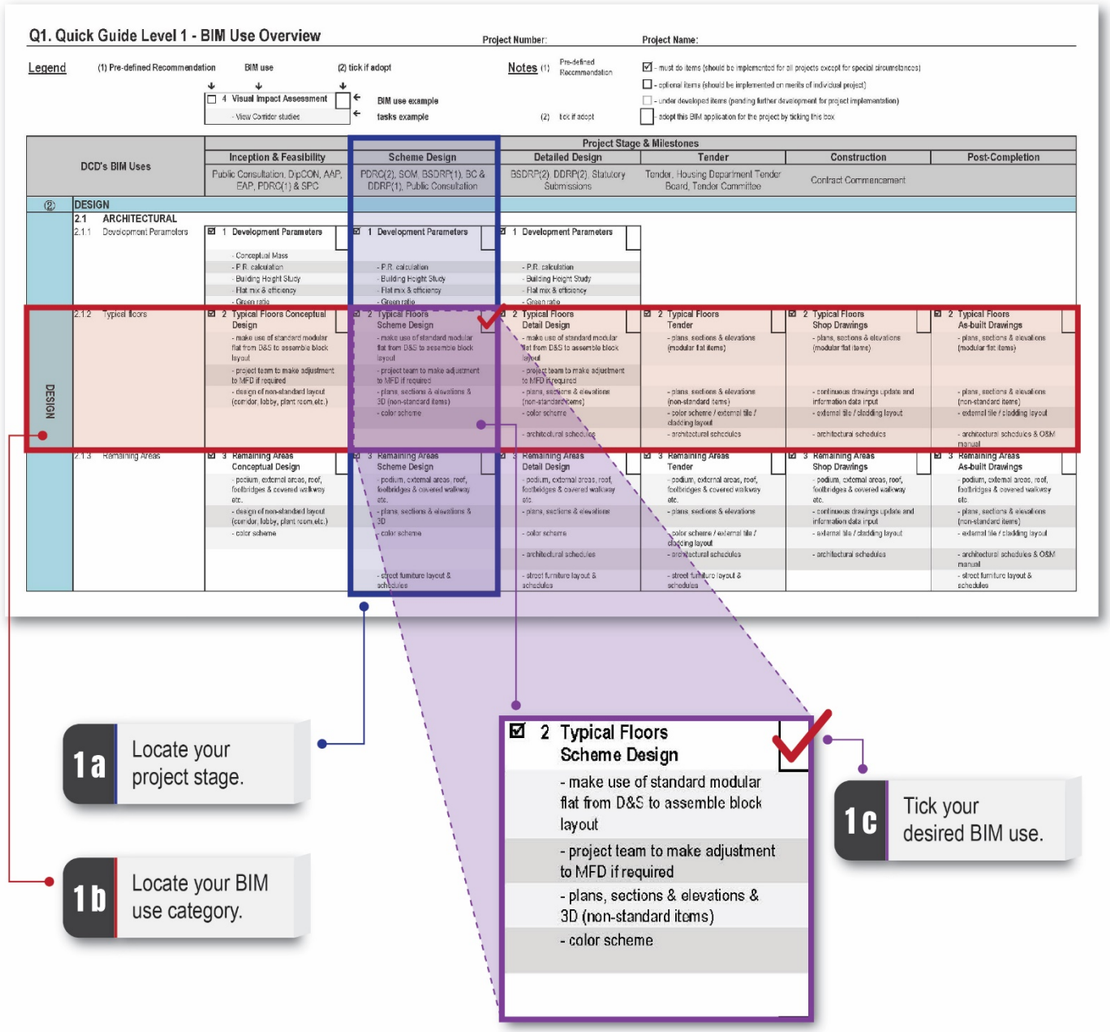
In both current and long-term BIM procurement strategies, all the methodologies, Standard Approach to Modelling and other standards shall apply to ensure good BIM quality.

2.5 Quick Start

This section serves as a step-by-step summary to guide users on how to navigate through the HABIMSG from Level 1 to Level 4.

1 Take out **Quick Guide Level 1 – BIM Use Overview.**

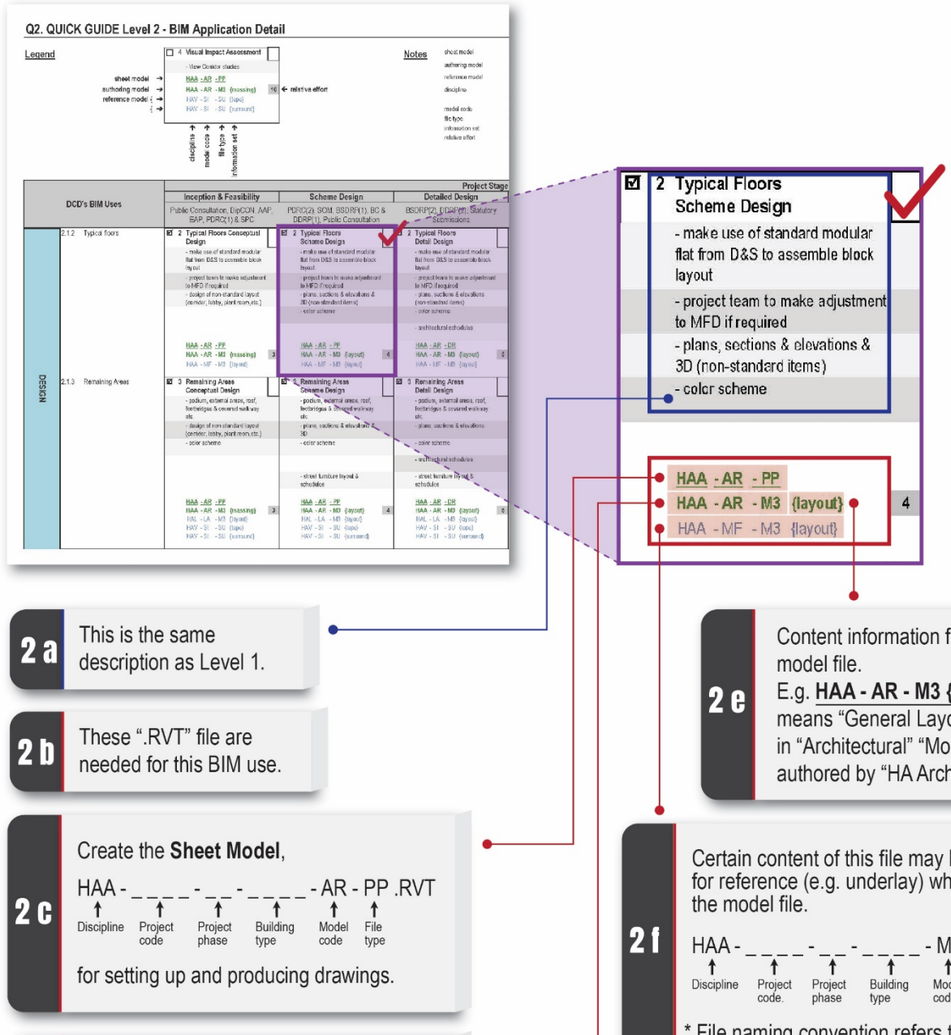
2 Take out **Quick Guide Level 2 – BIM Application Detail.**
Level 2 is expanded view of level 1.



1a Locate your project stage.

1b Locate your BIM use category.

1c Tick your desired BIM use.



2a This is the same description as Level 1.

2b These ".RVT" file are needed for this BIM use.

2c Create the **Sheet Model**,

HAA - _ _ _ _ - _ _ - _ _ _ _ - AR - PP .RVT
(Discipline, Project code, Project phase, Building type, Model code, File type)

for setting up and producing drawings.

2d Create the **Authoring Model**,

HAA - _ _ _ _ - _ _ - _ _ _ _ - AR - M3 .RVT
(Discipline, Project code., Project phase, Building type, Model code, File type)

for constructing the model.

2e Content information for the BIM model file.
E.g. **HAA - AR - M3 {layout}**
means "General Layout"
in "Architectural" "Modelling",
authored by "HA Architect".

2f Certain content of this file may be necessary for reference (e.g. underlay) when authoring the model file.

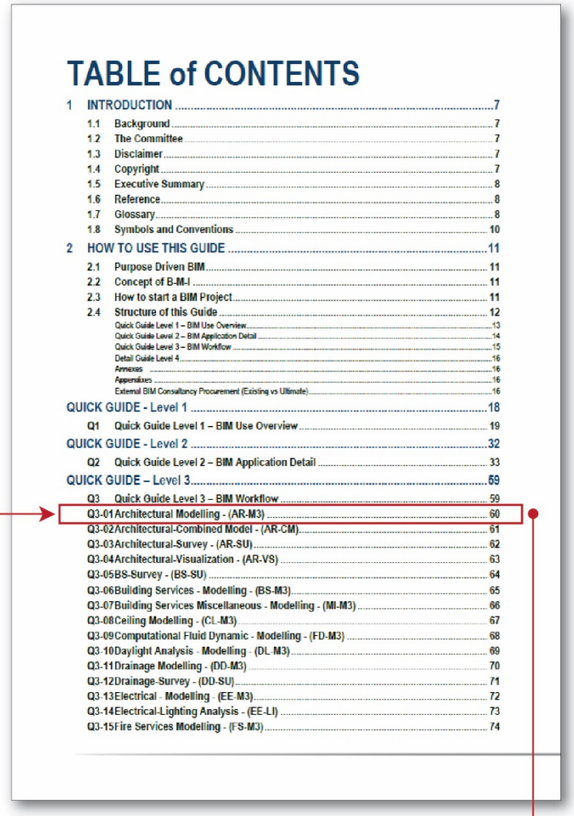
HAA - _ _ _ _ - _ _ - _ _ _ _ - MF - M3 .RVT
(Discipline, Project code., Project phase, Building type, Model code, File type)

* File naming convention refers to D.MET 2.2.

3 Find the file name in **Quick Guide Level 3 – BIM Workflow**.

HAA - AR - PP
HAA - AR - M3 {layout}
HAA - MF - M3 {layout}

From level 2.



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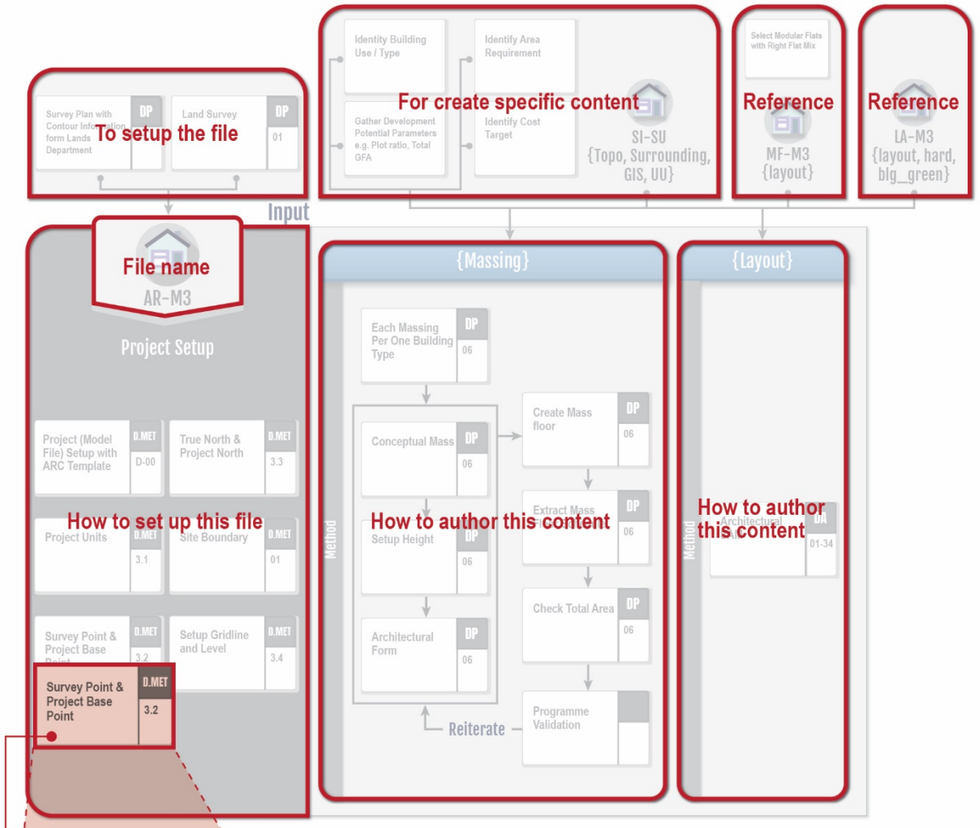
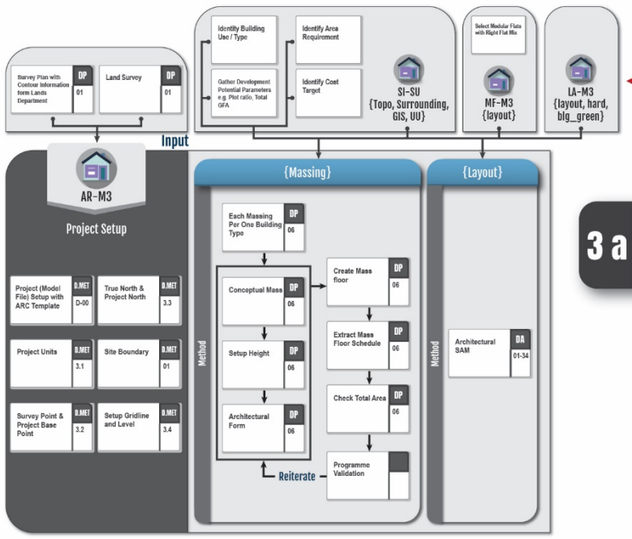
Architectural Modelling - (AR-M3)

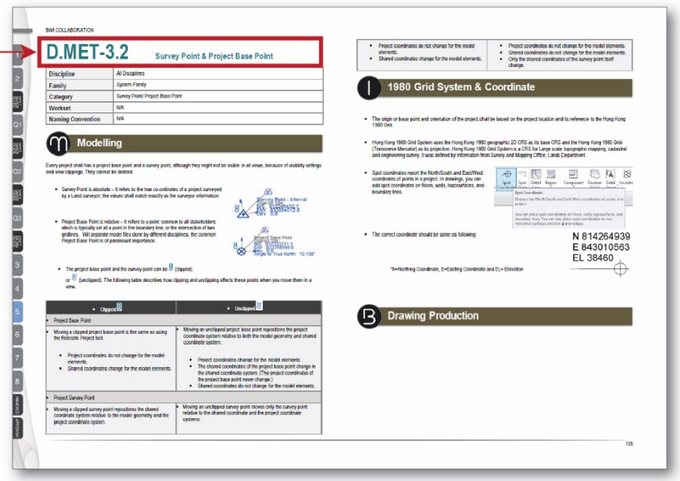




3 a Turn to that page. You will see a graphical representation of this ".RVT" file.

3 b Box like this tells what step is needed.

3 c Follow this index to look for the relevant section in Detail Guide Level 4.



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

1980 Grid System & Coordinate

Drawing Production

N 814264939
E 843010563
EL 38460

List of Codes & Abbreviations

Table A - Disciplines	
Code	Description
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
FM	Facility Manager

Table B - Model Code	
Code	Description
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	Fire Services
PB	Plumbing
EE	Electrical
TR	Trunking
TG	Gas
MI	Miscellaneous

Table C - File Type	
Code	Description
AF	Animation
CM	Combined model
CR	Clash
DR	2D Drawing
M2	2D Model
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
CF	Computational Fluid Dynamic
DL	Daylight Analysis
LI	Lighting Analysis

Table D - Information Set	
Abbreviation	Description
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 (Light Detection and Ranging)
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