

# Building Information Modelling (BIM) Guide for Facilities Upkeep (Version 2.0)



Property Services Branch  
Architectural Services Department

## Objective

The primary purpose of this Guide is to provide a common reference on the adoption of BIM in As-built Modelling for Facilities Upkeep in building projects including capital works projects, entrustment works, subvented capital works projects and works that are undertaken by private parties with project estimates more than \$30 million and will be handed back to ArchSD for maintenance according to Development Bureau Technical Circular (Works) No. 12/2020 or the latest version.

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## Building Information Modelling for Facilities Upkeep

### FIRST EDITION - CURRENT REVISION

<b>Revision No.</b> -		<b>1</b>	<b>Issue Date</b> -	<b>23.01.2019</b>
<b>Part</b>	<b>Page No.</b>	<b>Revision Details</b>		
Cover	Cover	- General update of the version of DevB Technical Circular.		
1	1	- General update of Clause 1.1.		
2	3	- General update of Clause 2.1.		
Appendix 1	15	- Addition of Items 43 to 46 to PSB Standard Parameters.		
Appendix 3	24	- Revision of Item 21.1.		

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<b>Revision No.</b> -		<b>2</b>	<b>Issue Date</b> -	<b>21.5.2020</b>
<b>Part</b>	<b>Page No.</b>	<b>Revision Details</b>		
Revision history		- Revision history is added.		
1	1	- Revision of Clauses 1.1 and 1.2.		
2	4	- Revision of Clause 2.1.		
2	5	- Revision of Clause 2.3.1.		
2	7	- Revision of Clauses 2.3.4 and 2.3.5		
2	8	- Revision of Clause 2.4.		
Appendix 1	12	- Revision of Item 2.		
Appendix 2	18	- Revision of Examples of PSB Standard Parameters in Objects.		
Appendix 3	20	- General Update of the Title of Appendix 3.		
Appendix 5	32	- Addition of Examples of As-built Modelling.		

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<b>Revision No.</b> -		<b>3</b>	<b>Issue Date</b> -	<b>25.5.2021</b>
<b>Part</b>	<b>Page No.</b>	<b>Revision Details</b>		
<b>1</b>	<b>1-3</b>	- Revision of Clauses 1.1, 1.2 and 1.3.		
<b>2</b>	<b>4-6</b>	- Revision of Clauses 2.1, 2.2 and 2.3.1.		
<b>2</b>	<b>7</b>	- Revision of Clause 2.3.2.		
<b>2</b>	<b>8</b>	- Revision of Clauses 2.3.3 and 2.3.4		
<b>2</b>	<b>9</b>	- Revision of Clauses 2.3.5 and 2.3.7.		
<b>2</b>	<b>10-12</b>	- Revision of Clause 2.4.		
<b>Appendix 1</b>	<b>14</b>	- Revision of Item 3.		
<b>Appendix 2</b>	<b>20</b>	- Addition of Examples of Asset Information Spreadsheets		
<b>Appendix 4</b>	<b>23-31</b>	- General Update of the LOD-G		
<b>Appendix 5</b>	<b>32-34</b>	- General Update of the Identifier of Appendix 5.		
<b>Appendix 6</b>	<b>40-41</b>	- Addition of Examples of Special Modelling Requirements		
<b>Appendix 6</b>	<b>44</b>	- Model Division in Floor Level		
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## 1. Introduction

### 1.1 Overview

This Building Information Modelling (BIM) Guide for Facilities Upkeep (FU) by Property Services Branch (PSB) of the Architectural Services Department (ArchSD) (hereinafter as the “Guide”) documented the general requirements and practices in producing BIM as-built models for ArchSD managed Capital Works Projects, entrustment works, subvented capital works projects and works that are undertaken by private parties with project estimates more than \$30 Million and will be handed back to ArchSD for maintenance according to the Development Bureau Technical Circular (Works) No. 12/2020 or the latest version. The aim of this Guide is to provide the general requirements and practice for the processing of BIM model and related deliverables at handover and subsequent operation and maintenance stage as reference. The Guide is formulated base on internationally and locally recognized BIM standards, guidelines and industry practices. The Guide would be subject to regular review and update to suit the latest development on BIM.

### 1.2 Reference BIM Standards and Guidelines

This Guide has made reference to the following standards and guidelines:

- (a) CIC Building Information Modelling Standards General issued by Hong Kong Construction Industry Council.
- (b) CIC Building Information Modelling Standards for Architecture and Structural Engineering issued by Hong Kong Construction Industry Council
- (c) CIC Building Information Modelling Standards for Underground Utilities issued by Hong Kong Construction Industry Council.
- (d) CIC BIM Standards for Mechanical, Electrical and Plumbing issued by Hong Kong Construction Industry Council.
- (e) CIC Production of BIM Object Guide - General Requirements issued by Hong Kong Construction Industry Council.
- (f) Computer-Aided-Drafting Standard for Works Projects (CSWP) issued by Development Bureau of the HKSAR Government.
- (g) American Institute of Architects (AIA)'s G202-2013 Building Information Modeling Protocol Form.
- (h) BS 8536-1:2015 Briefing for Design and Construction. Code of Practice for Facilities Management (Buildings Infrastructure).
- (i) BS EN ISO 19650-1:2018 Organization and Digitization of Information about Buildings and Civil Engineering Works, including Building Information Modelling (BIM) – Information Management using Building Information Modelling, Part 1: Concepts and Principles.
- (j) BS EN ISO 19650-2:2018 Organization and Digitization of Information about Buildings and Civil Engineering Works, including Building Information Modelling (BIM) – Information Management using Building Information Modelling, Part 2: Delivery Phase of the Assets.
- (k) BS EN ISO 19650-3:2020 Organization and Digitization of Information about Buildings and Civil Engineering Works, including Building Information Modelling (BIM) – Information Management using Building Information Modelling, Part 3: Operational Phase of the Assets
- (l) BS EN ISO 19650-5:2020 Organization and Digitization of Information about Buildings and Civil

## Engineering Works, including Building Information Modelling (BIM) – Information Management using Building Information Modelling, Part 5: Security-minded Approach to Information Management

- (m) BS 1192-4:2014 Collaborative Production of Information Part 4: Fulfilling Employers Information Exchange Requirements Using COBie – Code of Practice.
- (n) Building Information Modelling for Asset Management (BIM-AM) Standards and Guidelines issued by Electrical & Mechanical Services Department.
- (o) Level of Development Specification Part I by BIMFORUM.
- (p) Building Information Modelling for General Building Plan Submission (Phase One) Consultancy Report, Feb 2017 issued by Hong Kong Construction Industry Council.
- (q) Building Information Modelling (BIM) Guide for Architectural Design issued by Architectural Branch of Architectural Services Department.
- (r) Building Information Modelling (BIM) Guide for Building Services Installation issued by Building Services Branch of Architectural Services Department.
- (s) Building Information Modelling (BIM) Guide for Structural Engineering issued by Structural Engineering Branch of Architectural Services Department.
- (t) Drawing Practice Manual – For Outsourcing Projects issued by Architectural Services Department

## 1.3 Terminology and Abbreviation

### 1.3.1 Terminology

The common terminologies for BIM process are listed below:

Terminology	Description
3D	Three-dimensional geometry
CAD	Computer-Aided Design
Common Data Environment (CDE)	Common Data Environment (CDE), an electronic information management system platform to manage the collection, creating, sharing and publishing of project information. This is the single source of all information relating to the project and should be set up to facilitate the spatial coordination and information exchange processes described in PAS 1192.
COBie	Construction Operations Building Information Exchange (COBie), an international standard to manage asset data information rather than geometric information such as equipment list and product data. COBie may take several approved formats include spreadsheet and IFC file format.
Federated Model	Compilation of Models from one or more programs that can define a complete or partial data set for a design.

# BIM Guide for Facilities Upkeep

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**Industry Foundation Class (IFC)** A platform neutral, open and object-based file format with specification developed by buildingSMART to facilitate interoperability in the architectural, engineering and construction industry, and is commonly used collaboration format in BIM based projects. The IFC model specification is registered by ISO as ISO 16739:2013.

**LOIN** Level of Information Need (LOIN) described in CIC Building Information Modelling Standards

**Object** An occurrence of a building component in BIM software at a particular location and orientation within a model (e.g. Room.). Elements are also often called objects.

**Object file** A data file that contains building elements. It often contains the geometry and parameters representing the elements. It can be created or loaded into the BIM authoring software to assist design.

## 1.3.2 Abbreviation

The abbreviations adopted in this Guide are listed below.

Abbreviation	Full Name
ACTION System	Automated Communication Technical Information and Operations Network System
AIS	Asset Information System
ArchSD	Architectural Services Department
BIM	Building Information Modelling
CIC	Construction Industry Council
FU	Facilities Upkeep
GIS	Geographic Information System
InForM	ArchSD InForM System
O&M	Operation and Maintenance
PSB	Property Services Branch



## 2. As-built Model for Facilities Upkeep

### 2.1 Coverage of the As-built Model

The BIM applications in public works projects shall be in accordance with the BIM Uses defined by the relevant Technical Circular (Works) No. 12/2020 or the latest version issued by the Development Bureau (DEVB). The following sections describe the requirements and acceptable deliverables in as-built model using BIM for facilities upkeep by PSB.

The as-built model should cover the entire project and it includes well-coordinated architectural, structural and building services models.

The as-built model shall fulfill the following criteria:

- (a) Give to-scale visualization and ability to walkabout within the model;
- (b) Be prepared in the specified formats for data exchange with ArchSD systems including AIS and ACTION System;
- (c) Provide as-constructed information relating to architectural, structural and building services information with links to operation, maintenance, asset data and other essential information;
- (d) Show construction assemblies, actual and accurate in terms of size, shape, location, brand and particulars of products, quantity and orientation in the LOIN as specified;
- (e) Extract and produce meaningful coordinated drawings (including but not limited to BIM output drawing) including locations and dimensions of all reserved maintenance access (i.e. floor and reflected ceiling plans, sectional & elevation drawings, details drawings, and etc.);
- (f) Produce drawings in other formats (e.g. CAD, pdf, dwg, dwf, etc.) and printing;
- (g) Provide data and documentation for planning the maintenance of structure, building fabric, building installations and fixtures during the operational life of a facility;
- (h) Include, unless otherwise specified, non-structural building components not embedded into concrete or building structure;
- (i) Systematically prepare and incorporate the information required in Appendix 4 and Appendix 5 into the as-built model; and
- (j) Fulfill the contract requirements on Particular Specification for Approved Shop Drawings, As-built Drawings, Operation and Maintenance Manual and Records.

### 2.2 Definition of LOIN for As-built Model

The LOIN requirements are referred to the CIC Building Information Modelling Standards. Apart from the CIC requirements, supplementary definition and interpretation of the LOIN requirements, if applicable, are listed below. The LOIN refers to the following three components of Information Model: the Level of Graphics (LOD-G), Level of Information (LOD-I) and Level of Documentation (DOC). The as-built model shall follow the definition and interpretation as shown in this Guide in order to achieve the required purpose of the as-built model in facilities upkeep. For specific requirements of LOD-G of the Architectural, Structural and Underground Utilities model elements, please refer to respective CIC BIM standards.

## LOD-G 300

### CIC Building Information Modelling Standard's Definition

*The model element is graphically represented within the model as a specific system, object, or assembly in terms of quantity, size, shape, location and orientation. The model shall include details of the spaces required for handling installation, operation and maintenance, and the interface details for checking and coordination with other models / objects.*

### Interpretations in this Guide

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

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## LOD-G 400

### CIC Building Information Modelling Standard's Definition

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

### Interpretations in this Guide

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

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## LOD-I

### CIC Building Information Modelling Standard's Definition

*It is the description of non-graphical information in a model element. Please refer to the Standards shown with examples of minimum LOD-I associated with typical elements / objects at five levels from LOD-I 100 to LOD-I 500.*

### Interpretations in this Guide

*Essential information, such as data of fittings, manufacturer, model number, etc. and other as specified in Appendix 1 and Appendix 4, should be embedded in the model element / object for facilities upkeep use.*

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## 2.3 Scope of As-built Modelling

### 2.3.1 General Requirements

An accurate record of the physical conditions and assets of a project shall be provided with reference to the requirements stated in this Guide. The as-built model using BIM shall be based on final and verified information of the project actually built on site. Information on location such as room number and building name, staircase number, washroom number, lift lobby number is required to be incorporated into the as-built model. It is necessary to include the operation data, product catalogues, O&M manuals, maintenance history of installation and building component, etc. and other information as required below into the as-built model.

The as-built model shall contain External Area Label (Site Level), Building Name Label (Site & Block Levels), Room Label (Floor Level) in 3D text object under Architectural BIM model for labelling of all building blocks/ structures/ facilities in Site, Block & Floor Levels as required by PSB for easy identification in facilities upkeep and model viewing. To facilitate identification and drawing generation (e.g. display of Room label), room should be modelled as far as practicable for spaces bounded by architectural and

structural elements. It may also be modelled by either manually assigning the centre point or drawing an enclosed boundary. Room number or Room name should be included as an attribute under “Room” (LOD-I requirement). An example of 3D Room Label is shown in Appendix 6.

### 2.3.2 Integration with ArchSD PSB’s System

#### **Asset Information System (AIS)**

The as-built model and 2D as-built record drawings including pdf shall comprise customized building attributes and file structure for data submission in the format approved by PSB. The as-built model and building attributes will be used for future development on retrieval of asset and works records mapping in AIS, which is based on a software named “ArcGIS<sup>1</sup>” by Esri.

Apart from the as-built model required in this Guide, an additional as-built model in *modified IFC version* for viewing and integration with AIS should be provided. The BIM data shall be in HK1980 Grid Coordinates System<sup>2</sup> and refer to Hong Kong Principal Datum. The data format shall be compatible with the IFC standard (IFC4 or alternative advance format as requested by PSB). Coordination with PSB’s representatives and their information technology vendor is required to further proceed data conversion process to the submitted native BIM and IFC file for data conversion and AIS web application by using FME<sup>3</sup> and GIS<sup>4</sup> using ArcGIS. Relevant schedules and contract documentations stored in pre-defined folder structure shall also be arranged to suit the file display/ downloading functions in AIS.

The IFC files produced for AIS integration shall be able to filter, screen, split or combine to produce models for viewing with information of Site, Block and Floor Levels. The information contained in these levels is required to be filtered suitably for viewing and working in AIS.

Level	Description
Site	One file for all building blocks, landscape, facilities, roads and paths, etc. within the site boundary.
Block	Separate file(s) for each individual building block, facilities and structure, etc.
Floor	Separate file(s) for each individual floor, such as basement, mezzanine floor, cockloft, typical floors and roof, etc.

It shall be agreed with PSB if lower detailing level is preferred and accepted for display in AIS. For projects with less complex scale and subject to PSB’s agreement, the Site/Block/Floor levels may be provided with same IFC file(s). The original as-built model files shall also be submitted to PSB for necessary examination and data conversion purpose.

All contractual documentation submission shall be submitted as attachment files, i.e. dwg, doc, docx, pdf,

<sup>1</sup> ArcGIS is a software by Esri. The version of the ArcGIS shall be Esri ArcGIS Enterprise Standard Edition 10.4.1 or later edition.

<sup>2</sup> HK1980 Grid Coordinates System is a local system by Lands Department of the Government of HKSAR used in cadastral, engineering surveying and large scale mapping in Hong Kong.

<sup>3</sup> FME is a software by Esri for transforming and exchanging data between ArcGIS and other applications. The version of the FME shall be 2017 or later edition.

<sup>4</sup> Geographic Information System is a system designed to capture, store, manipulate, analyze, manage and present spatial or geographic data.

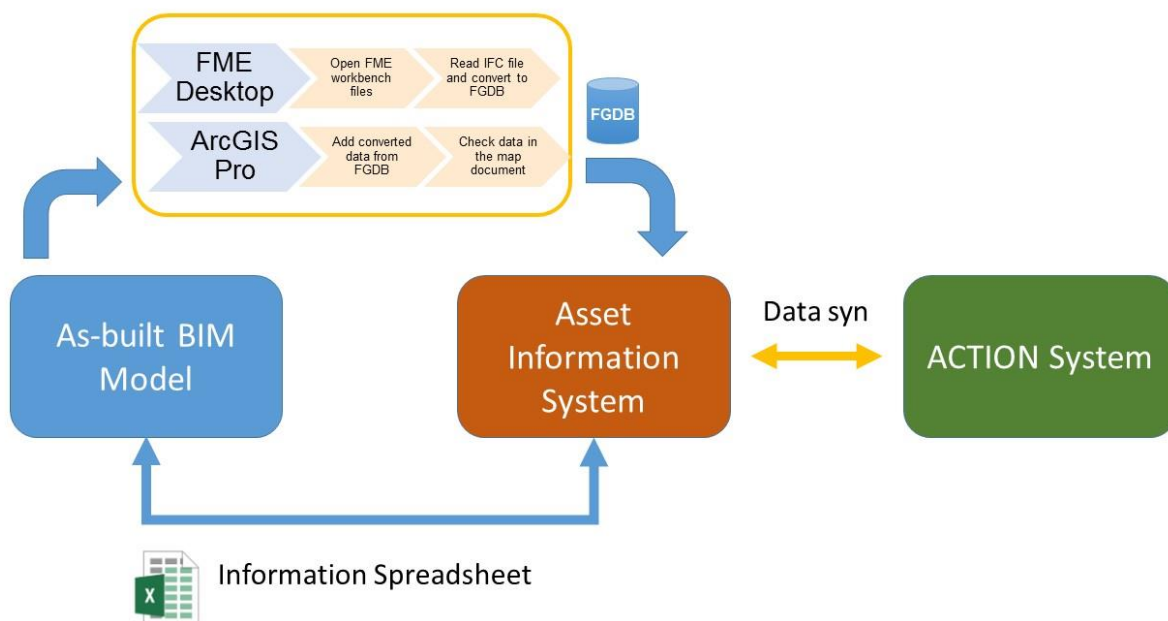
jpeg, jpg, xls, xlsx, mp4, etc. and other format(s) as specified/ commonly use. The submission of hyperlink for documentation retrieval from web page is not allowed and it shall be converted to above format for storage and retrieval in AIS.

### ***Automated Communication Technical Information and Operations Network System (ACTION System)***

In addition, the information of the as-built model shall be modified for integration with ACTION System, which is a property maintenance services management system of ArchSD. The objects of the as-built model shall contain the properties as required in Appendix 1 and one example is shown in Appendix 3. Subject to the complexity of the project, the required properties shall be fine-tuned on request by PSB. The properties of the objects shall be mapped with and input with the codes from the Elemental Code Relation Table provided by the PSB in Microsoft Excel format. The table consists of approx. 5 x 4500 numbers of parameter for elements, sub-elements, components, attributes and remarks. As the Elemental Code Relation Table is restricted solely for data input to the as-built model purpose, PSB shall be approached separately for obtaining the latest version. Also, distribution of this table to third party is not allowed without prior consent of PSB. The table may also be subject to change or amendment without prior notification.

It is required to work with and provide at least 50 hours of technical communication session with PSB, the AIS and ACTION System maintenance teams and/or their information system vendor(s) to ensure the as-built model smoothly integrated with these two systems.

The workflow for integration of BIM model with existing asset management system is shown as below. Apart from the LOD-I requirements listed in Appendix 1, the asset information spreadsheets (separated by architectural, structural engineering & plumbing and drainage system) should be provided as it is essential to map the BIM objects to the objects in the AIS and ACTION systems. Samples of the asset information spreadsheets are included in Appendix 2.



## 2.3.3 3D Animation

The as-built model shall be provided with video clip files with 3D animation showing the assembly, disassembly, repair and replacement method for special component or special building system such as curtain wall system, etc. as specified in the contract and Appendix 3 for viewing in the AIS. The objective of the 3D animation is to illustrate how the special component or special building system can be maintained. In general, the 3D animation shall be generated with LOD ranged from **LOD-G 300 to LOD-G 400 according to Appendix 4**. The 3D animation converted from the as-built model shall be in mp4 format with resolution not lower than 1080p HD 30 fps or alternative format requested by PSB. As the extent of the 3D animation required is depended on the actual design of the building, proposal of the 3D animation shall be subject to PSB's approval.

## 2.3.4 Modelling Requirements for Graphic & Non-graphic Information

The following modelling requirements should be followed:

- (a) The as-built models of the architectural design, structural engineering, plumbing and drainage system shall follow the modelling requirements (e.g. unit of measurement, color code, presentation style and naming conventions, etc.) as stated in the latest BIM Guides for Architectural Design, Structural Engineering and Building Services Installation respectively and the requirements as shown in Appendix 4 of this Guide. In case another requirement in the same contract requests for a higher **LOIN**, a higher **LOIN** of the concerned as-built model shall be provided.
- (b) For underground utilities associated with plumbing and drainage system, the requirements as stipulated in CIC BIM Standards for Underground Utilities should be referred and adopted.
- (c) Special modelling requirements for (A) tap and basin fixtures and (B) wall/ slab/ column/ beam and finishes are shown in Appendix 6. A typical example of BIM modelling requirements at toilet area is also illustrated for reference.
- (d) "Generic Models" should not be used for BIM category **unless otherwise approved**.
- (e) The BIM software version shall be proposed in **BIM Execution Plan (BEP)** and approved before the production of as-built models.
- (f) The names of BIM elements and all the information fields must be in English.
- (g) All as-built model files should be checked and purged. The maximum file size for each divided as-built models should not exceeded 500Mb unless otherwise approved.
- (h) Clash detection and analysis should include the comparison of as-built models of different disciplines so as to identify and eliminate clashes between BIM elements.
- (i) 3D co-ordination should include the checking of headroom requirements, working spaces for building services operation and maintenance activities.

## 2.3.5 Drawing Production

It is a process of producing drawing sheets from the BIM model source. By setting various drawing views (layout or section) in the BIM software tools, drawing sheets could be automatically generated based on the as-built models. As far as it is practicable to generate 2D drawings from the BIM authoring software, non-BIM authoring software should not be used to generate drawings. On the other hand, it is acceptable that certain architectural components, the building services schematic/ control logic diagrams/ drawings, reinforcement details are not generated directly from the BIM model.

The as-built models shall also be arranged to create sheet records and contain information & schedules to meet the requirements indicated in Appendix 5 and ArchSD's Particular Specification for Approved Shop Drawings, As-built Drawings, Operation and Maintenance Manual and Records. Samples of drawing schedules (e.g. door, ironmongery, window and access panel, etc.) are included in Appendix 5.

## 2.3.6 Photographic Record

Photo record showing the site as-built condition (before the move-in of loose furniture) shall be provided in every room including both internal and external. Each photo shall cover not more than 10m x 10m area for each room. At least one photo should be taken for every room and subject to PSB's approval on demand of more photo records to show the details of such area. As the purpose of the photo record is to see through and cover the whole room, additional photo(s) shall be required for any obstruction, recessed area, etc. A spreadsheet with floor plan (in dwg or pdf format) marking the photo taken locations, field of visibility and to list the items (i) the photo filename, (ii) room name, (iii) floor level and (iv) block level shall be in a presentable and agreed format. For building with repetitive floor plan and design (e.g. government quarters, etc.), only one of the typical floor should be selected for taking photo record. Proposed locations for taking photo record shall be submitted to PSB for comment and approval.

The photo shall be stitched into a seamless 360-degree spherical panoramic image (i.e. 360 degree field of view horizontally and 180 degree vertically) with at least 7776x3888 pixels in JPEG format. The file size of each stitched 360-degree panoramic photo shall be less than 7 MB. The image shall be in good quality with good sharpness, contrast and without blur.

## 2.3.7 3D Digital Point Cloud Scanning

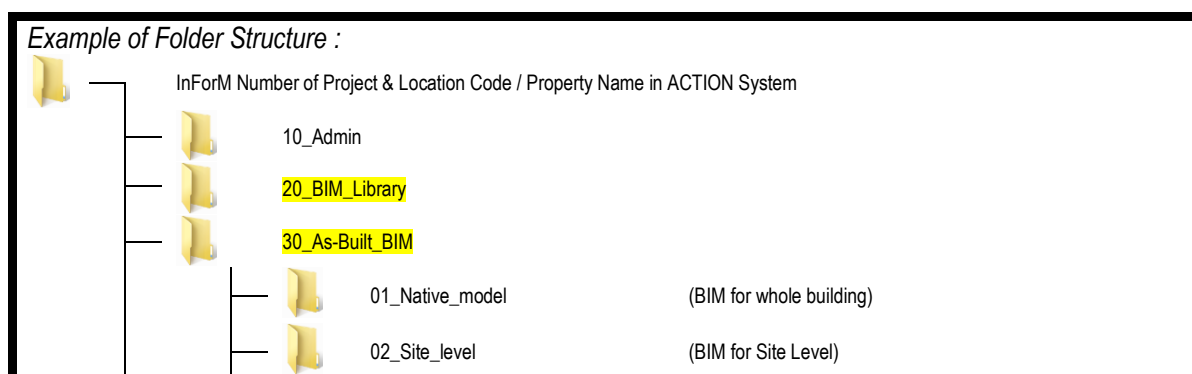
3D digital point cloud scanning shall be arranged for special feature and building structure with historical value as indicated in Appendix 4. A 3D Model shall be created from the point cloud laser scanning (with accuracy  $\leq 5\text{mm}$ ) with subsequent 3D rendering showing the realistic colour and texture. The 3D Model integrated with As-built Model shall accurately reflect the appearance and shape. The as-built condition of the special feature and building structure at the completion of the project shall be shown for facilitating future repair or renovation projects.



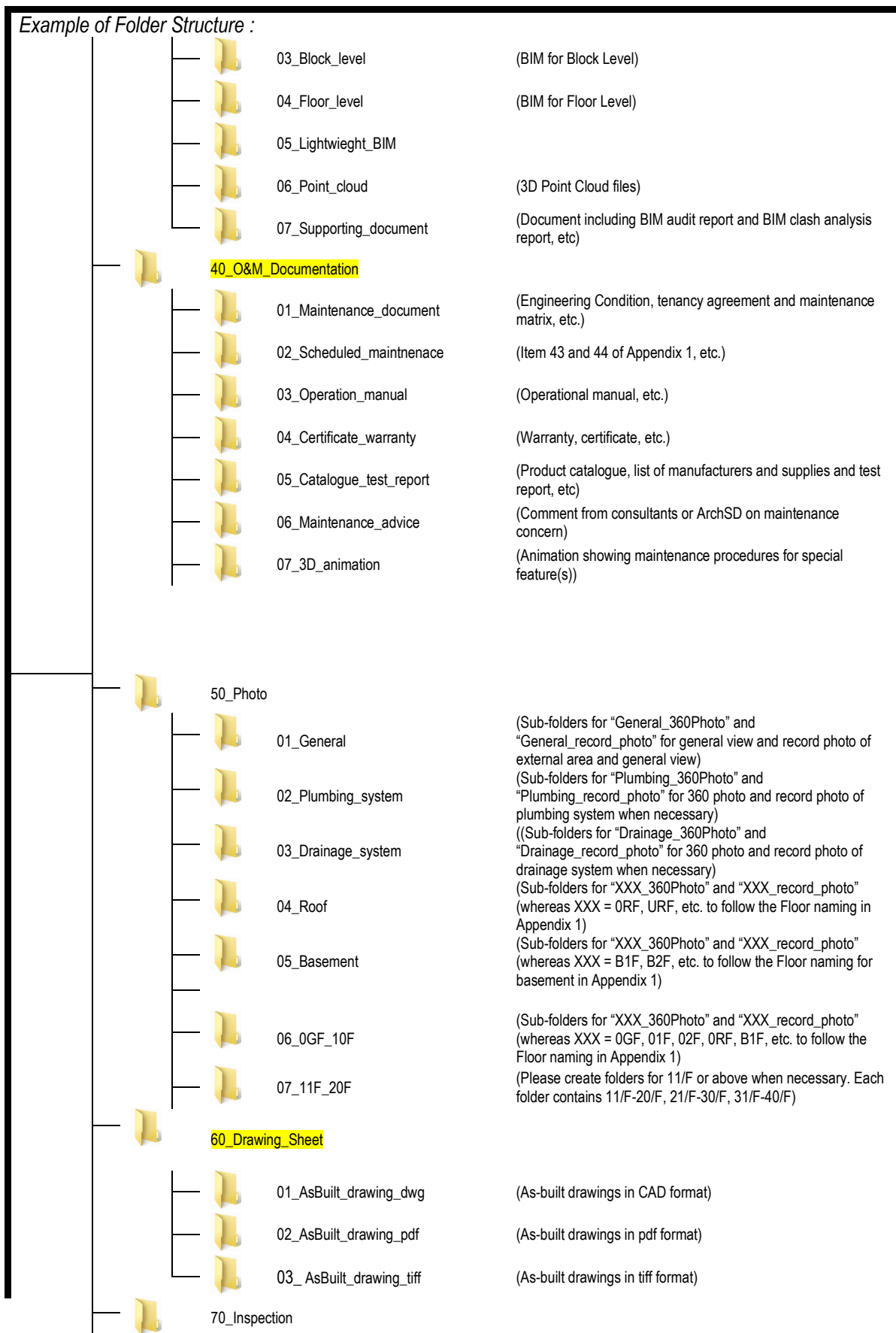
## 2.4 File Folder Structure

The required data and relevant documentations as specified in Appendices of this Guide should be stored in a well-organized file folder structure and the as-built model related materials should be filed in the respective folders. The proposed file folder structure should follow the below standard or in other folder structure in an effective manner to be accepted by PSB.

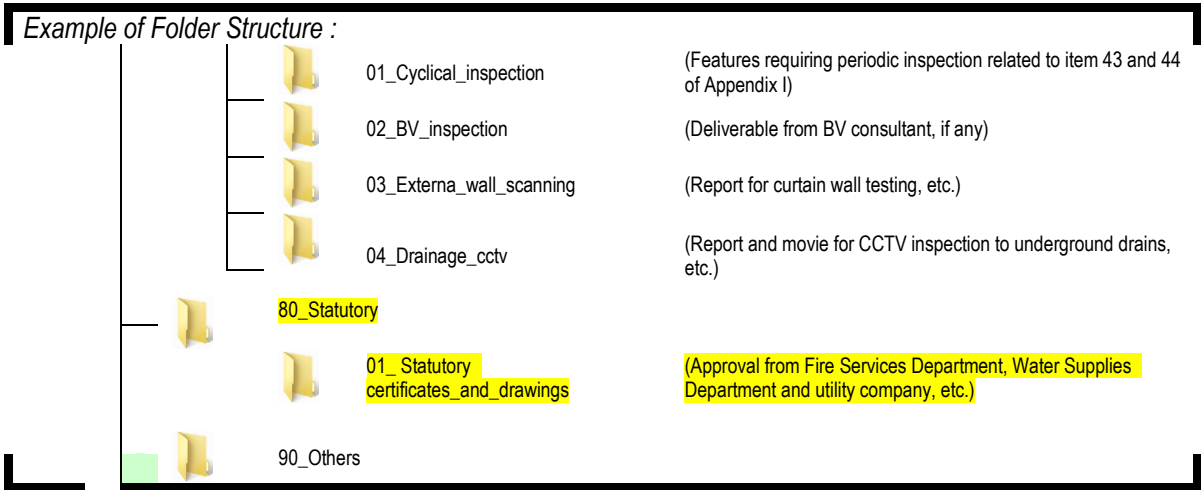
Tier	Folder Name	Stored Materials
1 <sup>st</sup>	InForM Number <sup>5</sup> of Project & Location Code / Property Name in ACTION System	
2 <sup>nd</sup>	10_Admin	Stores all document for project management, including contract, BIM execution plans, etc.
2 <sup>nd</sup>	20_BIM Library	Stores resources files such as Templates, Title Blocks, Line Styles, Fonts, Objects, Material Images and Specific Families
2 <sup>nd</sup>	30_As-Built BIM	Stores as-built BIM models from all disciplines. Models should be in native format (e.g. .rvt). The structure of BIM to follow AIS BIM specification.
2 <sup>nd</sup>	40_O&M Documentation	Stores all documents related to operation and maintenance, e.g. testing & commissioning reports, catalogues, literatures, drawings, certificates, warranties and O&M manuals, etc. Different system shall be stored in pre-defined structured folder.
2 <sup>nd</sup>	50_Photo	Stores all photographic record including the 360-view photos.
2 <sup>nd</sup>	60_Drawing Sheet	Stores all drawing sheet record.
2 <sup>nd</sup>	70_Inspection	Stores all manuals containing the requirements on cyclical maintenance inspection.
2 <sup>nd</sup>	80_Statutory	Stores all documents related to statutory and contract compliance, e.g. certificate of compliance, maintenance certificate, etc.
2 <sup>nd</sup>	90_Others	Stores all other miscellaneous documents.



<sup>5</sup> InForM Number is an unique project number for a project generated by ArchSD InForM System.







## Appendix 1 - PSB Standard Parameters in As-built Model

Item	Project Parameter	Data type	Mandatory	Remarks	Explanatory Note
1	PSB_LocCode	13 characters	Yes	Data format refer to ArchSD's ACTION System's Property Register.	This field is for PSB officer to assign location code(s) to represent whole property/individual building/structure/ floor(s) or individual room(s). Such as QA00200152000

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Item	Project Parameter	Data type	Mandatory	Remarks	Explanatory Note																										
2	PSB_Floor	3 characters	Yes	Typical data format refer to examples of floor codes under Explanatory Note'.	<div>The floor level shall be customized project parameters and typical examples are shown in the following table:</div> <table><tr><th>Floor level</th><th>Example</th></tr><tr><td>5th basement level</td><td>B5F</td></tr><tr><td>lower ground floor level</td><td>LGF</td></tr><tr><td>upper ground floor level</td><td>UGF</td></tr><tr><td>ground floor</td><td>0GF</td></tr><tr><td>1st floor</td><td>01F</td></tr><tr><td>2nd floor</td><td>02F</td></tr><tr><td>99<sup>th</sup> floor</td><td>99F</td></tr><tr><td>1/F mezzanine floor</td><td>M1F</td></tr><tr><td>2/F mezzanine floor</td><td>M2F</td></tr><tr><td>lower roof level</td><td>LRF</td></tr><tr><td>upper roof level</td><td>URF</td></tr><tr><td>flat roof</td><td>0RF</td></tr></table>	Floor level	Example	5th basement level	B5F	lower ground floor level	LGF	upper ground floor level	UGF	ground floor	0GF	1st floor	01F	2nd floor	02F	99 <sup>th</sup> floor	99F	1/F mezzanine floor	M1F	2/F mezzanine floor	M2F	lower roof level	LRF	upper roof level	URF	flat roof	0RF
Floor level	Example																														
5th basement level	B5F																														
lower ground floor level	LGF																														
upper ground floor level	UGF																														
ground floor	0GF																														
1st floor	01F																														
2nd floor	02F																														
99 <sup>th</sup> floor	99F																														
1/F mezzanine floor	M1F																														
2/F mezzanine floor	M2F																														
lower roof level	LRF																														
upper roof level	URF																														
flat roof	0RF																														
3	PSB_ElementNo	5 digits	Yes	from 00001 to 99999	This element number shall be referring to LocCode-Floor-Element1-Subelement1 only.																										
4	PSB_Element1	Textual	Yes	The value shall refer to Elemental Code Relation table.	Element 1 shall only be used to input information of major object, such as door, window, wall, etc. Parts or components belong to door and windows, waterproofing system, shall be input to Element 2 to Element 5 with manufacturer/ catalogue information.																										
5	PSB_Sub-element1	Textual	Yes	The value shall refer to Elemental Code Relation table and its code table.																											
6	PSB_Component1	Textual	Yes	The value shall refer to Elemental Code Relation table and its code table.																											
7	PSB_Attribute1	Textual	Yes	The value shall refer to Elemental Code Relation table and its code table.																											
8	PSB_Remarks1	Textual																													

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Item	Project Parameter	Data type	Mandatory	Remarks	Explanatory Note
9	PSB_manufacturer1	Textual		If the element has associated contractual submission from contractor/manufacturer/supplier, relevant information of such contractor/manufacturer/supplier shall be provided to PSB	Name, contact number of contractor, manufacturer, supplier shall be provided when the element has associated contractual submission requirement stipulated under contract, quotation or schedule of rates.
10	PSB_element_doc1	Textual		Relative path of the zipped files (contractual submission) to retrieve documents. Insert separator ',' to divide path in case of multi-directory.  If the element has associated contractual submission from contractor/manufacturer/supplier, relevant documents of such contractor/manufacturer/supplier shall be provided to PSB	File path storing the contractual submission shall be provided. PSB will convert these zipped file with its system to convert into server's URL for updating the file path in BIM raw file.  Catalogue/warranty/test report/material origin, etc. from manufacturer and suppliers shall have individual file to be categorized and stored in specific file folder/sub-folder structure so that the project officer could upload the documents to a user interface of designated ArchSD system accordingly.  Manufacturer or supplier's web site shall be converted to pdf format for submission.
11	PSB_Element2	Textual		The value shall refer to Elemental Code Relation table and its code table.	The value shall refer to Elemental Code Relation table and its code table.
12	PSB_Sub-element2	Textual		The value shall refer to Elemental Code Relation table and its code table.	The value shall refer to Elemental Code Relation table and its code table.
13	PSB_Component2	Textual		The value shall refer to Elemental Code Relation table and its code table.	The value shall refer to Elemental Code Relation table and its code table.
14	PSB_Attribute2	Textual		The value shall refer to Elemental Code Relation table and its code table.	The value shall refer to Elemental Code Relation table and its code table.
15	PSB_Remarks2	Textual			
16	PSB_manufacturer2	Textual		If the element has associated contractual submission from contractor/manufacturer/supplier, relevant information of such contractor/manufacturer/supplier shall be provided to PSB	Name, contact number of contractor, manufacturer, supplier shall be provided when the element has associated contractual submission requirement stipulated under contract, quotation or schedule of rates.

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Item	Project Parameter	Data type	Mandatory	Remarks	Explanatory Note
17	PSB_element_doc2	Textual		If the element has associated contractual submission from contractor/manufacture/supplier, relevant documents of such contractor/manufacture/supplier shall be provided to PSB	Catalogue/warranty/test report/material origin, etc. from manufacturer and suppliers shall have individual file to be categorized and stored in specific file folder/sub-folder structure so that the project officer could upload the documents to a user interface of designated ArchSD system accordingly.  Manufacturer or supplier's web site shall be converted to pdf format for submission.
18	PSB_Element3	Textual		The value shall refer to Elemental Code Relation table and its code table.	The value shall refer to Elemental Code Relation table and its code table.
19	PSB_Sub-element3	Textual		The value shall refer to Elemental Code Relation table and its code table.	The value shall refer to Elemental Code Relation table and its code table.
20	PSB_Component3	Textual		The value shall refer to Elemental Code Relation table and its code table.	The value shall refer to Elemental Code Relation table and its code table.
21	PSB_Attribute3	Textual		The value shall refer to Elemental Code Relation table and its code table.	The value shall refer to Elemental Code Relation table and its code table.
22	PSB_Remarks3	Textual			
23	PSB_manufacturer3	Textual		If the element has associated contractual submission from contractor/manufacture/supplier, relevant information of such contractor/manufacture/supplier shall be provided to PSB	Name, contact number of contractor, manufacturer, supplier shall be provided when the element has associated contractual submission requirement stipulated under contract, quotation or schedule of rates.
24	PSB_element_doc3	Textual		If the element has associated contractual submission from contractor/manufacture/supplier, relevant documents of such contractor/manufacture/supplier shall be provided to PSB	Catalogue/warranty/test report/material origin, etc. from manufacturer and suppliers shall have individual file to be categorized and stored in specific file folder/sub-folder structure so that the project officer could upload the documents to a user interface of designated ArchSD system accordingly.  Manufacturer or supplier's web site shall be converted to pdf format for submission.

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Item	Project Parameter	Data type	Mandatory	Remarks	Explanatory Note
25	PSB_Element4	Textual		The value shall refer to Elemental Code Relation table and its code table.	The value shall refer to Elemental Code Relation table and its code table.
26	PSB_Sub-element4	Textual		The value shall refer to Elemental Code Relation table and its code table.	The value shall refer to Elemental Code Relation table and its code table.
27	PSB_Component4	Textual		The value shall refer to Elemental Code Relation table and its code table.	The value shall refer to Elemental Code Relation table and its code table.
28	PSB_Attribute4	Textual		The value shall refer to Elemental Code Relation table and its code table.	The value shall refer to Elemental Code Relation table and its code table.
29	PSB_Remarks4	Textual			
30	PSB_manufacturer4	textual		If the element has associated contractual submission from contractor/manufacturer/supplier, relevant information of such contractor/manufacturer/supplier shall be provided to PSB	Name, contact number of contractor, manufacturer, supplier shall be provided when the element has associated contractual submission requirement stipulated under contract, quotation or schedule of rates.
31	PSB_element_doc4	textual		If the element has associated contractual submission from contractor/manufacturer/supplier, relevant documents of such contractor/manufacturer/supplier shall be provided to PSB	Catalogue/warranty/test report/material origin, etc. from manufacturer and suppliers shall have individual file to be categorized and stored in specific file folder/sub-folder structure so that the project officer could upload the documents to a user interface of designated ArchSD system accordingly.  Manufacturer or supplier's web site shall be converted to pdf format for submission.
32	PSB_Element5	textual		The value shall refer to Elemental Code Relation table and its code table.	The value shall refer to Elemental Code Relation table and its code table.
33	PSB_Sub-element5	textual		The value shall refer to Elemental Code Relation table and its code table.	The value shall refer to Elemental Code Relation table and its code table.
34	PSB_Component5	textual		The value shall refer to Elemental Code Relation table and its code table.	The value shall refer to Elemental Code Relation table and its code table.

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Item	Project Parameter	Data type	Mandatory	Remarks	Explanatory Note
35	PSB_Attribute5	textual		The value shall refer to Elemental Code Relation table and its code table.	The value shall refer to Elemental Code Relation table and its code table.
36	PSB_Remarks5	textual			
37	PSB_manufacturer5	textual		If the element has associated contractual submission from contractor/manufacturer/supplier, relevant information of such contractor/manufacturer/supplier shall be provided to PSB	Name, contact number of contractor, manufacturer, supplier shall be provided when the element has associated contractual submission requirement stipulated under contract, quotation or schedule of rates.
38	PSB_element_doc5	textual		If the element has associated contractual submission from contractor/manufacturer/supplier, relevant documents of such contractor/manufacturer/supplier shall be provided to PSB	Catalogue/warranty/test report/material origin, etc. from manufacturer and suppliers shall have individual file to be categorized and stored in specific file folder/sub-folder structure so that the project officer could upload the documents to a user interface of designated ArchSD system accordingly.  Manufacturer or supplier's web site shall be converted to pdf format for submission.
39	PSB_MWORRF_link	textual			This textual value will be replaced by URL(s) by PSB's system to read Repair Request Form generated in Repair Call Centre's Desktop Application in a customized pop-up windows.
40	PSB_MWO_link	textual			This textual value will be replaced by URL(s) by PSB's system to read minor works order generated in ACTION System in a customized pop-up window.
41	PSB_WO_link	textual			This textual value will be replaced by URL(s) by PSB's system to read works order generated in ACTION System in a customized pop-up window.
42	SoR_no	textual			This textual value will be replaced by URL(s) by PSB's system to read schedule of rates record in a customized pop-up windows upon customization of relevant ArchSD's system, such as ACTION System.
43	PSB_Ins_Sch_Des	textual			If this building element is subject to periodic inspection/testing, detailed and accurate description of inspection or testing activities shall be provided.

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Item	Project Parameter	Data type	Mandatory	Remarks	Explanatory Note
44	PSB_Ins_Interval	3 digits		If PSB_Ins_Sch_Des is not null, this field is Mandatory.	The data type shall indicate the number of month for periodic inspection/ testing required.
45	PSB_feature	textual			If this feature has specific elements, say "HERITAGE" for heritage character defining elements or "ASBESTOS" for asbestos containing material. NULL is applied if no specific feature is connected.
46	PSB_CDELevel	textual		If this feature is connected with heritage value, i.e. "HERITAGE" under item 45, the level of significance shall be mandatory.	Level of significance shall be "EXCEPTIONAL", "HIGH", "MODERATE" or "LOW".

Remark: For the non-applicable project parameters, the Contractor shall input "NULL" to the corresponding BIM element(s) of as-built model.

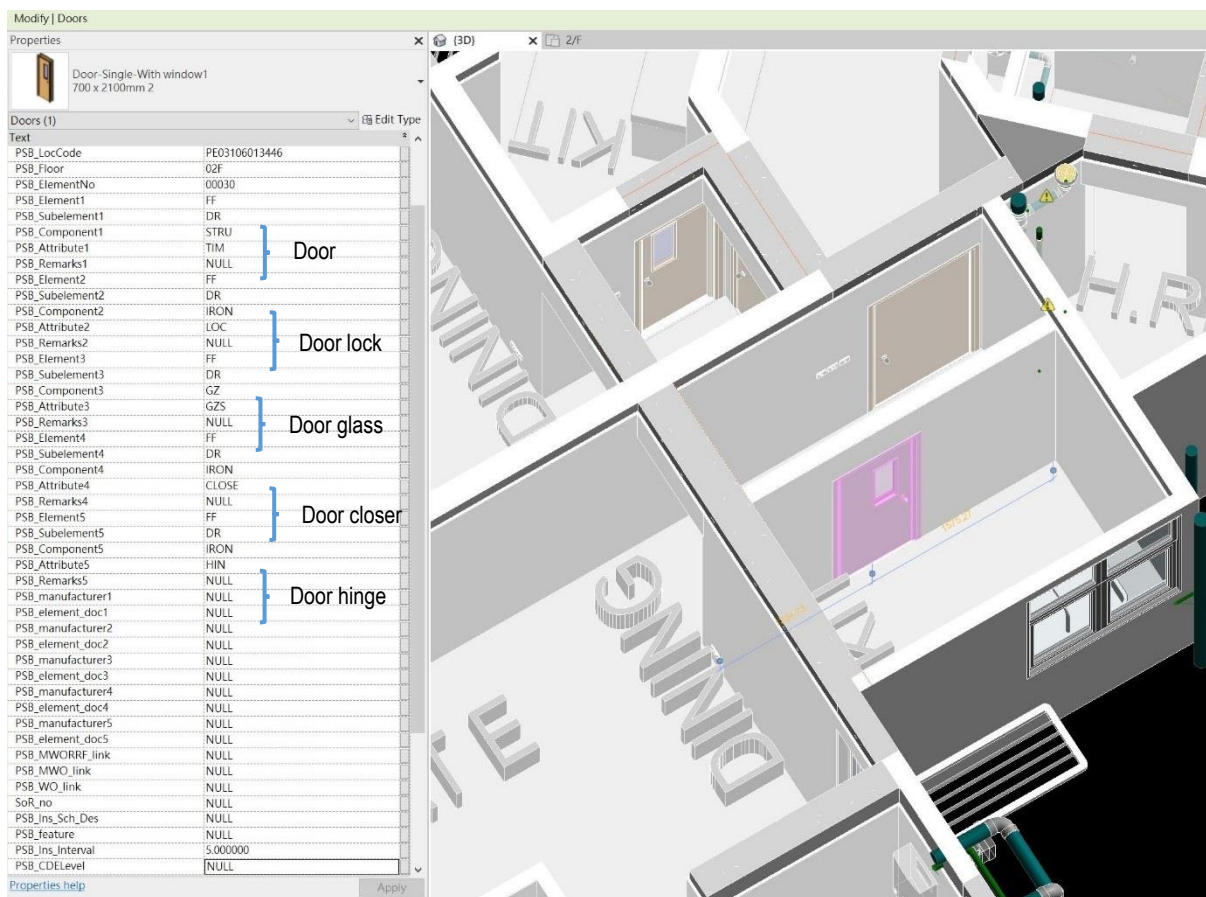


### **Appendix 2 – Examples of Asset Information Spreadsheets**

Please refer to sample templates of Asset Information Spreadsheets (Architectural, Structural, Plumbing & Drainage Elements) required for ArchSD's facilities upkeep.

## Appendix 3 – Examples of PSB Standard Parameters in Objects

### Example 1: Door and associated ironmongeries



## Example 2: Window and associated ironmongeries

The screenshot displays a BIM software interface. On the left, a 'Properties' window is open, showing a list of properties for a selected element. The element is identified as 'TW2a1' and 'TW/2a 2'. The properties are organized into a table with two columns: 'Text' and 'Value'. The properties are grouped into four categories, each indicated by a blue bracket on the right side of the table:

- Aluminium window**: Includes PSB\_LocCode (PE03106013520), PSB\_Floor (02F), PSB\_ElementNo (00051), PSB\_Element1 (FF), PSB\_Subelement1 (WIN), PSB\_Component1 (STRU), and PSB\_Attribute1 (AL).
- Single glazing**: Includes PSB\_Remarks1 (NULL), PSB\_Element2 (FF), PSB\_Subelement2 (WIN), PSB\_Component2 (GZ), and PSB\_Attribute2 (GZS).
- Aluminium window frame**: Includes PSB\_Remarks2 (NULL), PSB\_Element3 (FF), PSB\_Subelement3 (WINFR), PSB\_Component3 (STRU), and PSB\_Attribute3 (AL).
- Ironmongery of window**: Includes PSB\_Remarks3 (NULL), PSB\_Element4 (FF), PSB\_Subelement4 (WIN), PSB\_Component4 (IRON), and PSB\_Attribute4 (NULL).

The right side of the image shows a 3D model of a building with multiple floors and rooms. The model is rendered in a light gray color, with some rooms highlighted in blue and green. The building has a complex, irregular shape with many windows and doors.

## Appendix 4 – Modelling Requirements for As-built Models

- Remarks :
- (i) The elements shown in the table are under the relevant trades with reference to ArchSD General Specification and Schedule of Rates. Reference should also be made to the CIC Building Information Modelling Standards.
  - (ii) This list is not exhaustive, additional element(s) or feature(s) may be required to include for individual project.

Legends :

- ✓ - Required
- ✗ - Not required

Item	Element	Graphic Model Element	Non-graphic information	3D Animation	BIM Object from original manufacturer	Photo record (other than 360° photos)	Other Modelling Requirements	Other Supporting Information
		LOD-G	LOD-I					
<b>1.0</b>	<b>Excavation</b>							
1.1	Elements under this trade	300	500	✗	✓ (if available)	✗		
<b>2.0</b>	<b>Concrete Work</b>							
2.1	Elements under this trade	300	500	✗	✓ (if available)	✗		
<b>3.0</b>	<b>Brickwork and Blockwork</b>							
3.1	Elements under this trade	300	500	✗	✓ (if available)	✗		
<b>4.0</b>	<b>Masonry</b>							
4.1	Elements under this trade	300	500	✗	✓ (if available)	✓		
<b>5.0</b>	<b>Roofing and Waterproofing</b>							
5.1	Elements under this trade (unless otherwise specified below)	300	500	✗	✓ (if available)	✓	1) Showing shop drawings 2) Showing Maintenance access	1) Contractor / Specialist Contractor information. 2) Brand name and model information. 3) Technical literature. 4) Guarantee and warranty. 5) O&M manual. 6) Cyclical maintenance requirement (if applicable).

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Item	Element	Graphic Model Element	Non-graphic information	3D Animation	BIM Object from original manufacturer	Photo record (other than 360° photos)	Other Modelling Requirements	Other Supporting Information
		LOD-G	LOD-I					
5.2	Waterproofing	300	500	✗	✓ (if available)	✓	1) Ditto (to Item 5.1). 2) Showing fixing details including movement/ expansion joints, tiling and insulation, etc.	1) Ditto (to Item 5.1). 2) Infra-red thermograph testing report.
5.3	Corrugated or Profiled Sheet Roofing	300	500	✓ (in LOD 350 or above ; Step-by-step process showing the assemble & disassemble of fixtures)	✓ (if available)	✓	1) Ditto (to Item 5.1). 2) Showing fixing details including joints, provision of subgrid & purlin, fall arrest, etc.	1) Ditto (to Item 5.1).
5.4	Green Roofing System	300	500	✗	✓ (if available)	✓	1) Ditto (to Item 5.1). 2) Showing different layers of the system (e.g. roof barrier, moisture retention layer, drainage layers and inspection chamber, irrigation system, etc.)	1) Ditto (to Item 5.1). 2) Structural assessment record by Registered Structural Engineer.
<b>6.0</b>	<b>Carpentry and Joinery</b>							
6.1	Elements under this trade (unless otherwise specified below)	300	500	✗	✓ (if available)	✗		1) Brand name and model information. 2) Technical literature.
6.2	Fire resisting door set, windows, partition and enclosure	300	500	✗	✓ (if available)	✓	1) Showing fixing details including all accessories, ironmongeries, joints, supporting frames, etc.	1) Ditto (to Item 6.1). 2) Fire certificate.
6.3	Acoustic door, panel, fixtures	300	500	✗	✓ (if available)	✓	1) Showing fixing details including all accessories, ironmongeries, etc.	1) Ditto (to Item 6.1). 2) Warranty and certificate. 3) Specification of the acoustic properties.
<b>7.0</b>	<b>Ironmongery</b>							
7.1	Elements under this trade	300	500	✗	✓ (if available)	✗		1) Brand name and model information. 2) Technical literature. 3) O&M manual.
<b>8.0</b>	<b>Steel and Metal Work</b>							

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Item	Element	Graphic Model Element	Non-graphic information	3D Animation	BIM Object from original manufacturer	Photo record (other than 360° photos)	Other Modelling Requirements	Other Supporting Information
		LOD-G	LOD-I					
8.1	Elements under this trade (unless otherwise specified below)	300	500	✗	✓ (if available)	✗		1) Brand name and model information. 2) Technical literature.
8.2	Fall arrest system	300	500	✗	✓ (if available)	✗		1) Ditto (to Item 8.1). 2) Contractor / Specialist Contractor information. 3) O&M manual. 4) Particular specification for examination, testing and operation training.
8.3	Steel sheet / composite aluminium cladding	300	500	✗	✓ (if available)	✓	1) Showing fixing details including joints, supporting frames, insulation layer, etc.	1) Ditto (to Item 8.1). 2) Contractor / Specialist Contractor information. 3) Guarantee and warranty. 4) O&M manual.
8.4	Proprietary shutter, swing and sliding door	300	500	✗	✓ (if available)	✓	1) Showing fixing details including joints, supporting frames, rail / track, etc.	1) Ditto (to Item 8.1). 2) Contractor / Specialist Contractor information. 3) Guarantee and warranty. 4) O&M manual.
8.5	Aluminium windows and doors	300	500	✗	✓ (if available)	✗		1) Ditto (to Item 8.1).
<b>9.0</b>	<b>Plastering and Finishes</b>							
9.1	Elements under this trade (unless otherwise specified below)	300	500	✗	✓ (if available)	✗		1) Brand name and model information. 2) Technical literature.
9.2	Suspended ceiling system	300	500	✗	✓ (if available)	✓	1) Showing fixing details including frames, etc.	1) Ditto (to Item 9.1). 2) Test certificates and manufacturer's guarantee.
9.3	Acoustic plaster / fire resisting fireproofing plaster	300	500	✗	✓ (if available)	✗		1) Ditto (to Item 9.1). 2) Manufacturer's recommendation on application. 3) Manufacturer's guarantee.
9.4	Floor tiles, slabs, paving blocks	300	500	✗	✓ (if available)	✓	1) Showing fixing details including tiles adhesive, sand filling/bedding, pointing and grouting joint, etc.	1) Ditto (to Item 9.1). 2) Laying or fixing patterns. 3) Configuration and dimension. 4) Slip resistance classification and test certificate.

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Item	Element	Graphic Model Element	Non-graphic information	3D Animation	BIM Object from original manufacturer	Photo record (other than 360° photos)	Other Modelling Requirements	Other Supporting Information
		LOD-G	LOD-I					
9.5	Flexible tiles and sheet finishes	300	500	✗	✓ (if available)	✗	1) Showing fixing details including weld-joints, etc.	1) Ditto (to Item 9.1). 2) Laying or fixing patterns. 3) Configuration and dimension. 4) Slip resistance classification and test certificate.
9.6	Stone or marble slabs / tiles	300	500	✓ (in LOD 350; for marble tiles at external wall/area; Step-by-step process showing the assemble & disassemble of fixtures)	✓ (if available)	✓	1) Showing fixing details including supporting frame/bedding, pointing and grouting joint, edges, etc.	1) Ditto (to Item 9.1). 2) Laying or fixing patterns. 3) Configuration and dimension. 4) Anti-stain treatment details. 5) Calculation endorsed by Registered Structural Engineer for fixing of stone or marble slabs to vertical or sloping surfaces.
9.7	Raised Accessed Flooring	300	500	✗	✓ (if available)	✗	1) Showing fixing details including supporting frame, grids, etc.	1) Ditto (to Item 9.1). 2) Laying or fixing patterns. 3) Configuration and dimension. 4) Test certificate and manufacturer's guarantee.
<b>10.0</b>	<b>Roadwork and Cable Duct</b>							
10.1	Elements under this trade	300	500	✗	✓ (if available)	✗		
<b>11.0</b>	<b>Plumbing and Drainage</b>							
11.1	Elements under this trade (unless otherwise specified below)	300	500	✗	✓ (if available)	✗	1) Showing exposed, underground and concealed pipeworks, valves, cisterns, tanks, brackets, hangers, flexible joints, fittings, manholes, petrol interceptor, traps, gullies, sub-soil drain, etc. 2) Showing maintenance access for tanks, duct well, pipe-duct, concealed installations, etc.	1) Brand name and model information. 2) Type of joints & jointing method. 3) Size, volume, capacity, physical dimension, etc. 4) Technical literature. 5) O&M Manual. 6) Cyclical maintenance requirement (if applicable).



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Item	Element	Graphic Model Element	Non-graphic information	3D Animation	BIM Object from original manufacturer	Photo record (other than 360° photos)	Other Modelling Requirements	Other Supporting Information
		LOD-G	LOD-I					
11.2	Glass-fibre reinforced plastic water tank	300	500	✗	✓ (if available)	✗	1) Ditto (to Item 11.1). 2) Showing the fixing of the panels, fittings, ladders, overflow, warning pipe, etc.	1) Ditto (to Item 11.1). 2) Structural calculation endorsed by Registered Structural Engineer. 3) Test certificates.
11.3	Pressure Reducing Valve	300	500	✗	✓ (if available)	✗	1) Ditto (to Item 11.1).	1) Ditto (to Item 11.1). 2) Cleaning and maintenance requirements.
11.4	Sub-soil drain pipes and drain layer	300	500	✗	✓ (if available)	✓	1) Ditto (to Item 11.1). 2) Showing the layers of the sub-soil drain, e.g. filter, pipe, etc. should be shown.	1) Ditto (to Item 11.1).
<b>12.0</b>	<b>Glazing</b>							
12.1	Elements under this trade (unless otherwise specified below)	300	500	✗	✓ (if available)	✗	1) Showing fixing details.	1) Brand name, model information and technical literature for proprietary product.
12.2	Glazing	300	500	✗	✓ (if available)	✗	1) Ditto (to Item 12.1).	1) Type, size, colour, coating, thickness, u-value, fire rated properties, etc. 2) Test certificate and manufacturer's guarantee.
12.3	Louvre	300	500	✗	✓ (if available)	✓	1) Ditto (to Item 12.1).	1) Ditto (to Item 12.1).
<b>13.0</b>	<b>Painting</b>							
13.1	Elements under this trade	300	500	✗	✓ (if available)	✗		1) Brand name, model information and technical literature. 2) Test certificates, warranty and certificate (if applicable).
<b>14.0</b>	<b>Recreational / Sports Surfacing and Protective Padding</b>							



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Item	Element	Graphic Model Element	Non-graphic information	3D Animation	BIM Object from original manufacturer	Photo record (other than 360° photos)	Other Modelling Requirements	Other Supporting Information
		LOD-G	LOD-I					
14.1	Elements under this trade (unless otherwise specified below)	300	500	✗	✓ (if available)	✗		1) Brand name, model information and technical literature.
14.2	Proprietary sport flooring system	300	500	✗	✓ (if available)	✓	1) Showing fixing details including all accessories, components, finishes, sub-base, joint, etc.	1) Ditto (to Item 14.1). 2) Certificate of origins. 3) Test certificates, warranty and certificate. 4) O&M Manual.
14.3	Protective padding	300	500	✗	✓ (if available)	✗	1) Showing fixing details including all components, finishes, etc.	1) Ditto (to Item 14.1). 2) Certificate of origins. 3) Test certificates, warranty and certificate.
14.4	Impact absorbing surfacing material	300	500	✗	✓ (if available)	✗	1) Showing fixing details including all accessories, components, finishes, sub-base, joint, etc.	1) Ditto (to Item 14.1). 2) Certificate of origins. 3) Test certificates, warranty and certificate. 4) O&M Manual.
<b>15.0</b>	<b>Fixtures and Fittings</b>							
15.1	Elements under this trade (unless otherwise specified below)	300	500	✗	✓ (if available)	✗		1) Brand name, model information and technical literature.
15.2	Cabinets, cupboards, wardrobes, sink cabinets, shelves, rack unit, locker, counter, blinds, curtains, awing, canvas, seating benches / chairs, chess tables, drying rack, etc.	300	500	✗	✓ (if available)	✓	1) Showing fixing details including all accessories, ironmongeries, etc.	1) Ditto (to Item 15.1).
15.3	Proprietary fume cupboards	300	500	✗	✓ (if available)	✓	1) Showing fixing details including all accessories, connection to plumbing / drainage / building services installations, etc.	1) Ditto (to Item 15.1). 2) Specification on suitable chemical resistant laboratory-grade material 3) Warranty and certificate. 4) O&M manual.
15.4	Flag pole	300	500	✗	✓ (if available)	✓	1) Showing fixing details including all accessories, foundation, etc.	1) Ditto (to Item 15.1). 2) Warranty and certificate. 3) O&M manual.

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Item	Element	Graphic Model Element	Non-graphic information	3D Animation	BIM Object from original manufacturer	Photo record (other than 360° photos)	Other Modelling Requirements	Other Supporting Information
		LOD-G	LOD-I					
15.5	Sanitary fittings	300	500	✗	✓ (if available)	✗		1) Ditto (to Item 15.1). 2) Specification of the accessories and flush valves. 3) O&M manual.
15.6	Taps and mixers	300	500	✗	✓ (if available)	✗		1) Ditto (to Item 15.1). 2) WELS information.
15.7	Braille and tactile map	300	500	✗		✓		1) Certificate issued by recognized certifying body.
<b>16.0</b>	<b>Partitions and Cubicle System</b>							
16.1	Elements under this trade (unless otherwise specified below)	300	500	✗	✓ (if available)	✗	1) Showing fixing details including all accessories, ironmongeries, insulation, supporting frame, track, rail, finishes, etc.	1) Brand name, model information and technical literature.
16.2	Demountable partition system	300	500	✗	✓ (if available)	✗	1) Ditto (to Item 16.1).	2) Ditto (to Item 16.1). 3) Warranty and certificate. 4) O&M manual.
16.3	Dry wall partition	300	500	✗	✓ (if available)	✗	1) Ditto (to Item 16.1).	2) Ditto (to Item 16.1). 3) Fire certificate for fire resisting partition.
16.4	Sliding / folding partition including acoustic partitions	300	500	✗	✓ (if available)	✓	1) Ditto (to Item 16.1).	2) Ditto (to Item 16.1). 3) Warranty and certificate. 4) O&M manual.
16.5	Toilet cubicle system	300	500	✗	✓ (if available)	✗	1) Ditto (to Item 16.1).	2) Ditto (to Item 16.1). 3) Warranty and certificate. 4) O&M manual.
<b>17.0</b>	<b>Landscape Work</b>							
17.1	Elements under this trade	300	500	✗	✓ (if available)	✗		
<b>18.0</b>	<b>Geotechnical Works</b>							
18.1	Elements under this trade	300	500	✗	✓ (if available)	✗		
<b>19.0</b>	<b>Trees</b>							

# BIM Guide for Facilities Upkeep

Item	Element	Graphic Model Element	Non-graphic information	3D Animation	BIM Object from original manufacturer	Photo record (other than 360° photos)	Other Modelling Requirements	Other Supporting Information
		LOD-G	LOD-I					
19.1	Elements under this trade	200	300	✗	✗	✓		For i) OVT and ii) tress on registered SIMAR slope only.
<b>20.0</b>	<b>Curtain Wall</b>							
20.1	Elements under this trade	400	500	✓ (in LOD 350 or above; Step-by-step process showing the assemble & disassemble of fixtures)	✓ (if available)	✓	1) Showing details including fixing, connection, anchorages, spandrels & supporting system, type of finishes, water bars, movement joints, etc. 2) Showing maintenance access.	1) Contractor / Specialist Contractor information. 2) Information & specification of the materials, e.g. glazing, ironmongeries, supporting framework, ironmongeries, fire insulation, fixing & connection, coated finishes, water bars, movement joint, sealant, etc. 3) OTTV calculation. 4) O&M manual. 5) Warranty. 6) Cyclical maintenance requirement (if applicable).
<b>21.0</b>	<b>Others (not mentioned above)</b>							
21.1	Elements under this trade	300	500	✗	✓ (if available)	✓		1) Cyclical maintenance requirement (if applicable), e.g. building element is subject to periodic inspection / testing, heritage, asbestos containing materials, etc.
21.2	Special feature / Building structure with historical value (*exact feature / structure to be specified by the PSB)	300	500	✗ (unless otherwise specified)	✗	✓	1) Showing maintenance access	1) Ditto (to Item 21.1). 2) 3D digital point cloud scanning.
21.3	Modular Integrated Construction	400	500	✓ (in LOD 350 or above; Step-by-step process showing the assemble & disassemble of fixtures)	✓ (if available)	✓	1) Showing details including fixing, joints and gaps, connection, anchorages, supporting system, connection and route of services and fittings, etc. 2) Showing Maintenance access.	1) Ditto (to Item 21.1). 2) Contractor / Specialist Contractor information. 3) Information, specification and literature of the installations and materials. 4) O&M manual. 5) Warranty and Certificate.

## BIM Guide for Facilities Upkeep

Item	Element	Graphic Model Element	Non-graphic information	3D Animation	BIM Object from original manufacturer	Photo record (other than 360° photos)	Other Modelling Requirements	Other Supporting Information
		LOD-G	LOD-I					
21.4	Other items covered in i) Architectural Model & ii) Plumbing & Drainage Model but not listed above.	300	500	✗	✓ (if available)	✓		1) Ditto (to Item 21.1).
21.5	Furniture	300	300	✗	✗	✗	1) Showing the layout including the furniture.	

## Appendix 5 – Creating Sheet Record

Identifier	Description	Information Contained in :	
		As-built Model	Sheet Record
<b>GP</b>	<b>Location Drawings</b>		
	(a) List of Drawings	Required	Required
	(b) Site / location / block plan showing the size and position of the building and of other buildings in the immediate vicinity, and neighbouring streets	Required	Required
	(c) GLA/Lot boundary, lease boundary, right of way, etc.	Required	Required
	(d) The existing nature of the site and the surrounds and particulars of structures, foundations, public utilities, drains and sewers and other services on and adjacent to the site	Required	Required
	(e) Existing layout / demolition plan (if existing works should be shown)	Required	Required
	(f) General plans of every floor and of the roof of the building, on which there shall be shown full dimensions, the thickness of walls, the position of all windows, soil fitments, waste fitments and water storage tanks, and the intended use of every part of the building	Required	Required
	(g) Drawings showing - -all elevations of the building; -the level of adjacent streets in relation to a known datum and to the levels of the site and the building; -the width of every street adjacent to the site; and -the position, depth and construction of any well;	Required	Required
	(h) Plans and sections of the proposed site formation works and associated surface water drainage works	Required	Required
	(i) A diagrammatic plan, with full dimensions and calculations, showing: -the height, site coverage, plot ratio and disposition of the building -any open space required -the usable floor area -the number and type of soil fitments and waste fitments to be provided in the building -provision made for persons with a disability -list of modifications and/or exemptions -details of the fire engineering approached adopted -means of escape -fire resisting construction including fire compartments & fire resistant of building elements -travel distance indicated on plan	Required	Required
	(j) Canopy, bridge or other projection over a street or unleased Government land, plans showing clearly the nature and dimension of such projection	Required	Required
<b>PE</b>	<b>Principal Elements</b>		
	(a) Architectural features / wall sections	Required	Required
	(b) Roofing details	Required	Required
	(c) Staircases	Required	Required
	(d) Lift Shafts	Required	Required
	(e) Openings for skylights / escalators, etc.	Required	Required
<b>CA</b>	<b>Component drawings / assembly drawings</b>		
	(a) Door schedules and details	Required	Required
	(b) Window schedules and details	Required	Required
	(c) Glass / metal louvres schedules	Required	Required
	(d) Roller shutter schedules	Required	Required

Identifier	Description	Information Contained in :	
		As-built Model	Sheet Record
	(e) Sliding door / gate schedules	Required	Required
	(f) Finishing schedule and details	Required	Required
	(g) Ironmongery schedules	Required	Required
	(h) Sanitary fittings schedules	Required	Required
	(i) Glass block / grille wall schedules and details	Required	Required
	(j) Waterproofing and tanking system	Required	Required
<b>CF</b>	<b>Suspended ceiling system / special flooring system</b>		
	(a) Reflected ceiling plans and details	Required	Required
	(b) Raised floors and details	Required	Required
	(c) Sports flooring system	Required	Required
<b>SP</b>	<b>Sanitary plumbing and drainage system</b>		
	(a) Drainage plan (including exposed, concealed & underground), showing the size and depth of drains or sewers; connections to a public sewer or drain or nullah, any other method for the disposal of drainage, the position of disconnecting traps, and the means of ventilation	Required	Required
	(b) Vertical diagrams	Required	Required
	(c) Manholes schedule	Required	Required
	(d) Drainage details (e.g. manholes, BITG, gully trap, surface/stepped channels, channel covers, grease trap, petrol interceptor, septic tanks, etc.)	Required	Required
<b>WS</b>	<b>Water supply system</b>		
	(a) Layout plan (including exposed, concealed & underground), showing the size and location of the pipeworks including the associated installation (e.g. meter, valve, pump, tanks, etc.); connections to WSD main / well.	Required	Required
	(b) Vertical diagrams	Required	Required
<b>DL</b>	<b>Detailed layouts (showing the detailed location and precise information of components and assembly details in the project, e.g. toilets, changing rooms, lift lobbies, services rooms, etc.)</b>		
	(a) Layout plans	Required	Required
	(b) Sections	Required	Required
	(c) Elevations	Required	Required
	(d) Details	Required	Required
<b>EW</b>	<b>External works (showing the detailed location of components and assembly details at external areas, e.g. paving, steps, ramps, planters, benches, arbours, tree pit &amp; grille, perimeter walls, fences, railings, gates, draw pit, earth pit, etc.)</b>		
	(a) Layout plans	Required	Required
	(b) Sections	Required	Required
	(c) Elevations	Required	Required
	(d) Details	Required	Required
	(e) Landscape plans and details	Required	Required
<b>MS</b>	<b>Miscellaneous (showing precise information of components and assemblies for workshop manufacture or on site fabrication.)</b>		
	(a) Other unclassified elements (e.g. details of notice board, cat ladders, trap doors, flagpoles, signage system, cabinets, FS inlet / HR cabinets, etc.)	Required	Required
	(b) Hidden and exposed structural elements	Required	Required
	(c) Skylights	Required	Required

Identifier	Description	Information Contained in :	
		As-built Model	Sheet Record
	(d) Projections	Required	Required
	(e) Railing and parapets	Required	Required
	(f) Expansion / Construction / Movement Joints	Required	Required
<b>OT</b>	<b>Others</b>		
	(a) List of Proprietary Products, Warranty Period, Scope of Warranty and Details of Suppliers and Manufacturers	Required	Required
	(b) List, Details, Dimensions, Respective Locations and Quantity of Spare Materials, Finishes and Parts and their Storage Area;	Required	Required
	(c) Management and Maintenance Responsibilities	Required	Required
	(d) Location and Details of Special Feature that need attention	Required	Required
	(e) Traffic Impact Assessment, Drainage Impact Assessment, Environmental Impact Assessment, etc.	Required	Required
	(f) Engineering Conditions, Assignment, Deed of Mutual Covenants, etc.	Required	Required

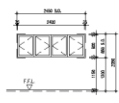
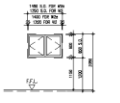
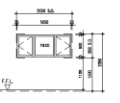
(a) Door schedules

(b) Ironmongery schedules

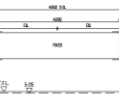
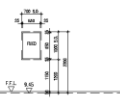
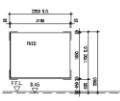
Property Services Branch, ArchSD  
BIM Guide for Facilities Upkeep (Version 2.0)  
Author: PSB SD32



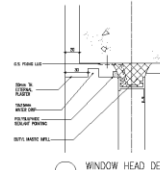
## (c) Window schedules

EXTERNAL ELEVATION (1:50)	W1	W2	W3
			
WINDOW MARK	W1	W2	W3
FRAME	8mm T1 METAL ANODIZED ALUMINUM FRAME	8mm T1 METAL ANODIZED ALUMINUM FRAME	8mm T1 METAL ANODIZED ALUMINUM FRAME
GLASS	6mm T1 CLEAR GLASS (6M)	6mm T1 CLEAR GLASS (6M)	6mm T1 CLEAR GLASS (6M)
LOCATION	WING ROOFTOP - LANE / DRIVE ROAD & AVENUE (1/F)	WING ROOFTOP - LANE / DRIVE ROAD & AVENUE (1/F)	WING ROOFTOP - LANE / DRIVE ROAD & AVENUE (1/F)
NUMBER	2	2	2
REMARKS	ALL WINDOW PANELS INCLUDE A THERMAL BREAK TO BE EQUAL.	ALL WINDOW PANELS INCLUDE A THERMAL BREAK TO BE EQUAL.	ALL WINDOW PANELS INCLUDE A THERMAL BREAK TO BE EQUAL.

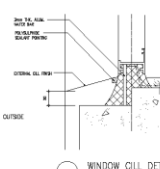
  

EXTERNAL ELEVATION (1:50)	W4	W5	W6
			
GLASS PANEL MARK	G1	G2	G3
FRAME	THERMOPLASTIC VINYL CLAD WITH ALUMINUM FINISH	THERMOPLASTIC VINYL CLAD WITH ALUMINUM FINISH	THERMOPLASTIC VINYL CLAD WITH ALUMINUM FINISH
GLASS	6mm T1 METAL ANODIZED ALUMINUM FRAME	6mm T1 METAL ANODIZED ALUMINUM FRAME	6mm T1 METAL ANODIZED ALUMINUM FRAME
LOCATION	WING ROOFTOP - LANE / DRIVE ROAD & AVENUE (1/F)	WING ROOFTOP - LANE / DRIVE ROAD & AVENUE (1/F)	WING ROOFTOP - LANE / DRIVE ROAD & AVENUE (1/F)
NUMBER	1	2	1
REMARKS	WING THERMOPLASTIC VINYL CLAD WITH ALUMINUM FINISH	WING THERMOPLASTIC VINYL CLAD WITH ALUMINUM FINISH	WING THERMOPLASTIC VINYL CLAD WITH ALUMINUM FINISH

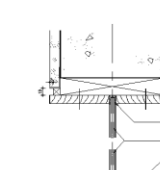
  



WINDOW HEAD DETAIL  
1:2



WINDOW SILL DETAIL  
1:2



GLASS PANEL DETAIL  
1:2

**NOTES**

- ALL WINDOW PANELS ARE TO BE SUPPLIED WITH THERMAL BREAK TO BE EQUAL.
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**REVISIONS**

NO.	DATE	REVISION	BY
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**FOR REFERENCE ONLY**

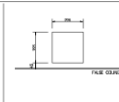
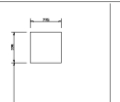
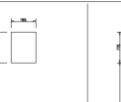

**WINDOW SCHEDULE**  
GLASS PANEL SCHEDULE AND DETAILS

AWING NO. CAD006a

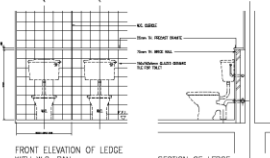
ARCHITECTURAL BRANCH

ARCHITECTURAL SERVICES DEPARTMENT

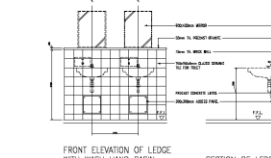
## (d) Access panel schedules

ACCESS PANEL SCHEDULE				
EXTERNAL ELEVATION (1:50)				
ACCESS PANEL MARK	W1	W2	W3	W4
CONSTRUCTION	8mm T1 METAL ANODIZED ALUMINUM FRAME	8mm T1 METAL ANODIZED ALUMINUM FRAME	8mm T1 METAL ANODIZED ALUMINUM FRAME	8mm T1 METAL ANODIZED ALUMINUM FRAME
LOCATION	WING ROOFTOP - LANE / DRIVE ROAD & AVENUE (1/F)	WING ROOFTOP - LANE / DRIVE ROAD & AVENUE (1/F)	WING ROOFTOP - LANE / DRIVE ROAD & AVENUE (1/F)	WING ROOFTOP - LANE / DRIVE ROAD & AVENUE (1/F)
TOTAL NOS.	2 NOS.	2 NOS.	1 NOS.	2 NOS.
REMARKS	WING THERMOPLASTIC VINYL CLAD WITH ALUMINUM FINISH	WING THERMOPLASTIC VINYL CLAD WITH ALUMINUM FINISH	WING THERMOPLASTIC VINYL CLAD WITH ALUMINUM FINISH	WING THERMOPLASTIC VINYL CLAD WITH ALUMINUM FINISH

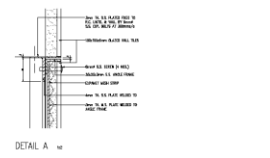
  



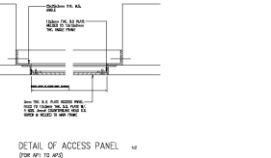
FRONT ELEVATION OF LEDGE WITH W.C. PAN



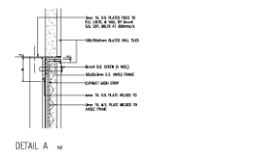
SECTION OF LEDGE



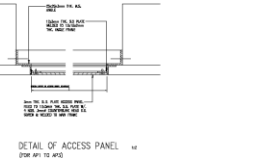
FRONT ELEVATION OF LEDGE WITH WASH HAND BASIN



SECTION OF LEDGE



DETAIL A



DETAIL OF ACCESS PANEL

**NOTES**

- ALL ACCESS PANELS ARE TO BE SUPPLIED WITH THERMAL BREAK TO BE EQUAL.
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**REVISIONS**

NO.	DATE	REVISION	BY
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**FOR REFERENCE ONLY**

**ACCESS PANEL SCHEDULE & DETAIL FOR PIPE DUCT & LEDGE WALL DETAILS**

AWING NO. AB/2988/MS007

ARCHITECTURAL BRANCH

ARCHITECTURAL SERVICES DEPARTMENT



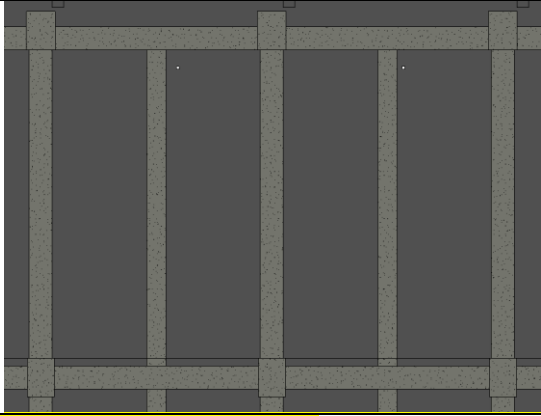
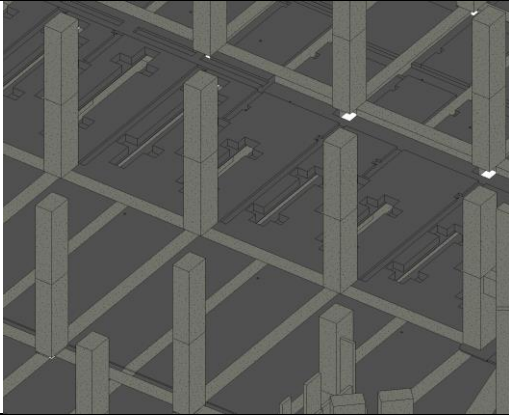
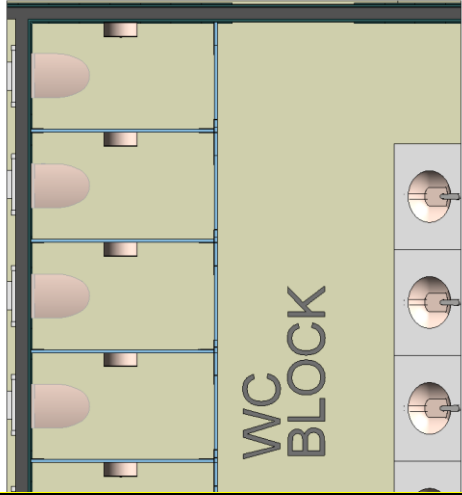
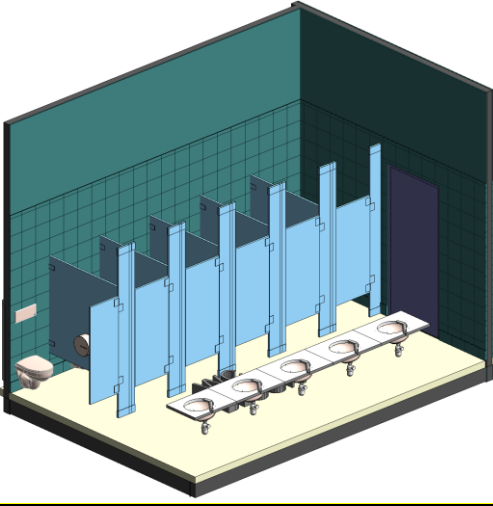


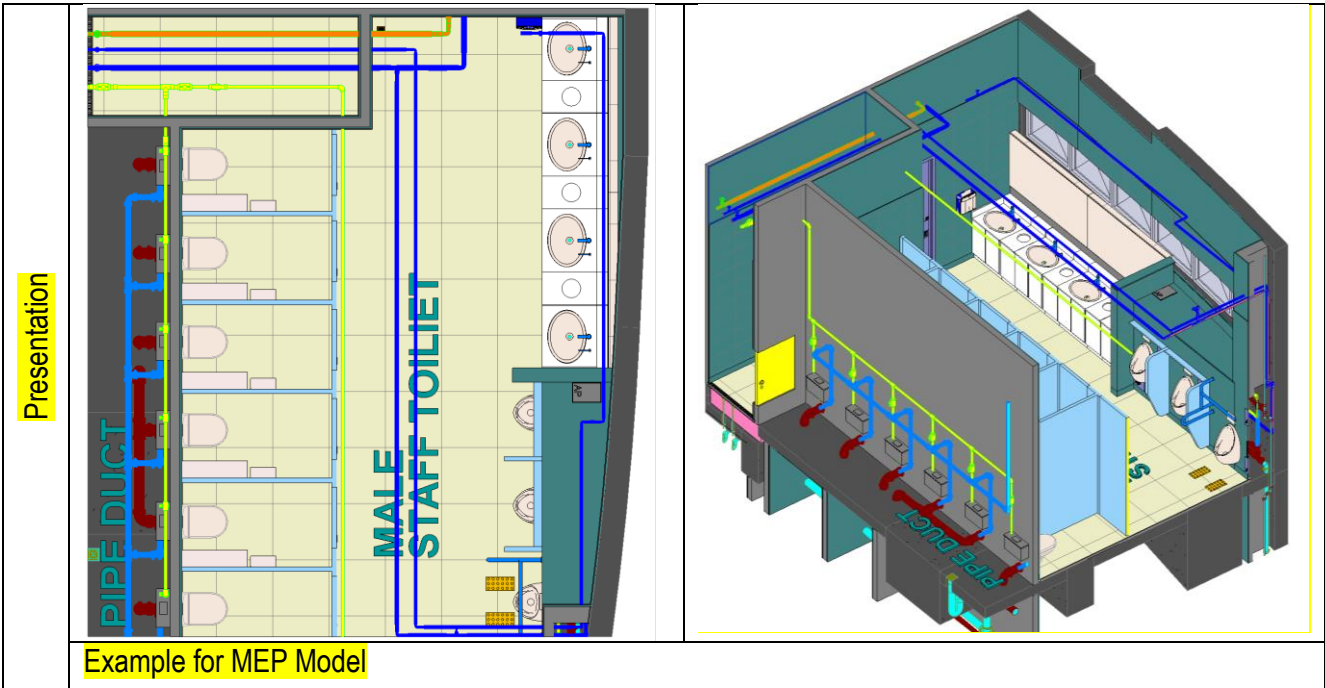
URNAL	WATER CLOSET	WASH/SHOWER	SINK	SHOWER	TAP & MIXER	GENIE SHR	MIRROR	ACCESSORIES																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
UR	WC1	WC2	WB1	WS1	SK1	SK2	SK3	W1	W2	W3	W4	W5	W6	W7	W8	W9	W10	W11	W12	W13	W14	W15	W16	W17	W18	W19	W20	W21	W22	W23	W24	W25	W26	W27	W28	W29	W30	W31	W32	W33	W34	W35	W36	W37	W38	W39	W40	W41	W42	W43	W44	W45	W46	W47	W48	W49	W50	W51	W52	W53	W54	W55	W56	W57	W58	W59	W60	W61	W62	W63	W64	W65	W66	W67	W68	W69	W70	W71	W72	W73	W74	W75	W76	W77	W78	W79	W80	W81	W82	W83	W84	W85	W86	W87	W88	W89	W90	W91	W92	W93	W94	W95	W96	W97	W98	W99	W100	W101	W102	W103	W104	W105	W106	W107	W108	W109	W110	W111	W112	W113	W114	W115	W116	W117	W118	W119	W120	W121	W122	W123	W124	W125	W126	W127	W128	W129	W130	W131	W132	W133	W134	W135	W136	W137	W138	W139	W140	W141	W142	W143	W144	W145	W146	W147	W148	W149	W150	W151	W152	W153	W154	W155	W156	W157	W158	W159	W160	W161	W162	W163	W164	W165	W166	W167	W168	W169	W170	W171	W172	W173	W174	W175	W176	W177	W178	W179	W180	W181	W182	W183	W184	W185	W186	W187	W188	W189	W190	W191	W192	W193	W194	W195	W196	W197	W198	W199	W200	W201	W202	W203	W204	W205	W206	W207	W208	W209	W210	W211	W212	W213	W214	W215	W216	W217	W218	W219	W220	W221	W222	W223	W224	W225	W226	W227	W228	W229	W230	W231	W232	W233	W234	W235	W236	W237	W238	W239	W240	W241	W242	W243	W244	W245	W246	W247	W248	W249	W250	W251	W252	W253	W254	W255	W256	W257	W258	W259	W260	W261	W262	W263	W264	W265	W266	W267	W268	W269	W270	W271	W272	W273	W274	W275	W276	W277	W278	W279	W280	W281	W282	W283	W284	W285	W286	W287	W288	W289	W290	W291	W292	W293	W294	W295	W296	W297	W298	W299	W300	W301	W302	W303	W304	W305	W306	W307	W308	W309	W310	W311	W312	W313	W314	W315	W316	W317	W318	W319	W320	W321	W322	W323	W324	W325	W326	W327	W328	W329	W330	W331	W332	W333	W334	W335	W336	W337	W338	W339	W340	W341	W342	W343	W344	W345	W346	W347	W348	W349	W350	W351	W352	W353	W354	W355	W356	W357	W358	W359	W360	W361	W362	W363	W364	W365	W366	W367	W368	W369	W370	W371	W372	W373	W374	W375	W376	W377	W378	W379	W380	W381	W382	W383	W384	W385	W386	W387	W388	W389	W390	W391	W392	W393	W394	W395	W396	W397	W398	W399	W400	W401	W402	W403	W404	W405	W406	W407	W408	W409	W410	W411	W412	W413	W414	W415	W416	W417	W418	W419	W420	W421	W422	W423	W424	W425	W426	W427	W428	W429	W430	W431	W432	W433	W434	W435	W436	W437	W438	W439	W440	W441	W442	W443	W444	W445	W446	W447	W448	W449	W450	W451	W452	W453	W454	W455	W456	W457	W458	W459	W460	W461	W462	W463	W464	W465	W466	W467	W468	W469	W470	W471	W472	W473	W474	W475	W476	W477	W478	W479	W480	W481	W482	W483	W484	W485	W486	W487	W488	W489	W490	W491	W492	W493	W494	W495	W496	W497	W498	W499	W500	W501	W502	W503	W504	W505	W506	W507	W508	W509	W510	W511	W512	W513	W514	W515	W516	W517	W518	W519	W520	W521	W522	W523	W524	W525	W526	W527	W528	W529	W530	W531	W532	W533	W534	W535	W536	W537	W538	W539	W540	W541	W542	W543	W544	W545	W546	W547	W548	W549	W550	W551	W552	W553	W554	W555	W556	W557	W558	W559	W560	W561	W562	W563	W564	W565	W566	W567	W568	W569	W570	W571	W572	W573	W574	W575	W576	W577	W578	W579	W580	W581	W582	W583	W584	W585	W586	W587	W588	W589	W590	W591	W592	W593	W594	W595	W596	W597	W598	W599	W600	W601	W602	W603	W604	W605	W606	W607	W608	W609	W610	W611	W612	W613	W614	W615	W616	W617	W618	W619	W620	W621	W622	W623	W624	W625	W626	W627	W628	W629	W630	W631	W632	W633	W634	W635	W636	W637	W638	W639	W640	W641	W642	W643	W644	W645	W646	W647	W648	W649	W650	W651	W652	W653	W654	W655	W656	W657	W658	W659	W660	W661	W662	W663	W664	W665	W666	W667	W668	W669	W670	W671	W672	W673	W674	W675	W676	W677	W678	W679	W680	W681	W682	W683	W684	W685	W686	W687	W688	W689	W690	W691	W692	W693	W694	W695	W696	W697	W698	W699	W700	W701	W702	W703	W704	W705	W706	W707	W708	W709	W710	W711	W712	W713	W714	W715	W716	W717	W718	W719	W720	W721	W722	W723	W724	W725	W726	W727	W728	W729	W730	W731	W732	W733	W734	W735	W736	W737	W738	W739	W740	W741	W742	W743	W744	W745	W746	W747	W748	W749	W750	W751	W752	W753	W754	W755	W756	W757	W758	W759	W760	W761	W762	W763	W764	W765	W766	W767	W768	W769	W770	W771	W772	W773	W774	W775	W776	W777	W778	W779	W780	W781	W782	W783	W784	W785	W786	W787	W788	W789	W790	W791	W792	W793	W794	W795	W796	W797	W798	W799	W800	W801	W802	W803	W804	W805	W806	W807	W808	W809	W810	W811	W812	W813	W814	W815	W816	W817	W818	W819	W820	W821	W822	W823	W824	W825	W826	W827	W828	W829	W830	W831	W832	W833	W834	W835	W836	W837	W838	W839	W840	W841	W842	W843	W844	W845	W846	W847	W848	W849	W850	W851	W852	W853	W854	W855	W856	W857	W858	W859	W860	W861	W862	W863	W864	W865	W866	W867	W868	W869	W870	W871	W872	W873	W874	W875	W876	W877	W878	W879	W880	W881	W882	W883	W884	W885	W886	W887	W888	W889	W890	W891	W892	W893	W894	W895	W896	W897	W898	W899	W900	W901	W902	W903	W904	W905	W906	W907	W908	W909	W910	W911	W912	W913	W914	W915	W916	W917	W918	W919	W920	W921	W922	W923	W924	W925	W926	W927	W928	W929	W930	W931	W932	W933	W934	W935	W936	W937	W938	W939	W940	W941	W942	W943	W944	W945	W946	W947	W948	W949	W950	W951	W952	W953	W954	W955	W956	W957	W958	W959	W960	W961	W962	W963	W964	W965	W966	W967	W968	W969	W970	W971	W972	W973	W974	W975	W976	W977	W978	W979	W980	W981	W982	W983	W984	W985	W986	W987	W988	W989	W990	W991	W992	W993	W994	W995	W996	W997	W998	W999	W1000	W1001	W1002	W1003	W1004	W1005	W1006	W1007	W1008	W1009	W1010	W1011	W1012	W1013	W1014	W1015	W1016	W1017	W1018	W1019	W1020	W1021	W1022	W1023	W1024	W1025	W1026	W1027	W1028	W1029	W1030	W1031	W1032	W1033	W1034	W1035	W1036	W1037	W1038	W1039	W1040	W1041	W1042	W1043	W1044	W1045	W1046	W1047	W1048	W1049	W1050	W1051	W1052	W1053	W1054	W1055	W1056	W1057	W1058	W1059	W1060	W1061	W1062	W1063	W1064	W1065	W1066	W1067	W1068	W1069	W1070	W1071	W1072	W1073	W1074	W1075	W1076	W1077	W1078	W1079	W1080	W1081	W1082	W1083	W1084	W1085	W1086	W1087	W1088	W1089	W1090	W1091	W1092	W1093	W1094	W1095	W1096	W1097	W1098	W1099	W1100	W1101	W1102	W1103	W1104	W1105	W1106	W1107	W1108	W1109	W1110	W1111	W1112	W1113	W1114	W1115	W1116	W1117	W1118	W1119	W1120	W1121	W1122	W1123	W1124	W1125	W1126	W1127	W1128	W1129	W1130	W1131	W1132	W1133	W1134	W1135	W1136	W1137	W1138	W1139	W1140	W1141	W1142	W1143	W1144	W1145	W1146	W1147	W1148	W1149	W1150	W1151	W1152	W1153	W1154	W1155	W1156	W1157	W1158	W1159	W1160	W1161	W1162	W1163	W1164	W1165	W1166	W1167	W1168	W1169	W1170	W1171	W1172	W1173	W1174	W1175	W1176	W1177	W1178	W1179	W1180	W1181	W1182	W1183	W1184	W1185	W1186	W1187	W1188	W1189	W1190	W1191	W1192	W1193	W1194	W1195	W1196	W1197	W1198	W1199	W1200	W1201	W1202	W1203	W1204	W1205	W1206	W1207	W1208	W1209	W1210	W1211	W1212	W1213	W1214	W1215	W1216	W1217	W1218	W1219	W1220	W1221	W1222	W1223	W1224	W1225	W1226	W1227	W1228	W1229	W1230	W1231	W1232	W1233	W1234	W1235	W1236	W1237	W1238	W1239	W1240	W1241	W1242	W1243	W1244	W1245	W1246	W1247	W1248	W1249	W1250	W1251	W1252	W1253	W1254	W1255	W1256	W1257	W1258	W1259	W1260	W1261	W1262	W1263	W1264	W1265	W1266	W1267	W1268	W1269	W1270	W1271	W1272	W1273	W1274	W1275	W1276	W1277	W1278	W1279	W1280	W1281	W1282	W1283	W1284	W1285	W1286	W1287	W1288	W1289	W1290	W1291	W1292	W1293	W1294	W1295	W1296	W1297	W1298	W1299	W1300	W1301	W1302	W1303	W1304	W1305	W1306	W1307	W1308	W1309	W1310	W1311	W1312	W1313	W1314	W1315	W1316	W1317	W1318	W1319	W1320	W1321	W1322	W1323	W1324	W1325	W1326	W1327	W1328

# BIM Guide for Facilities Upkeep

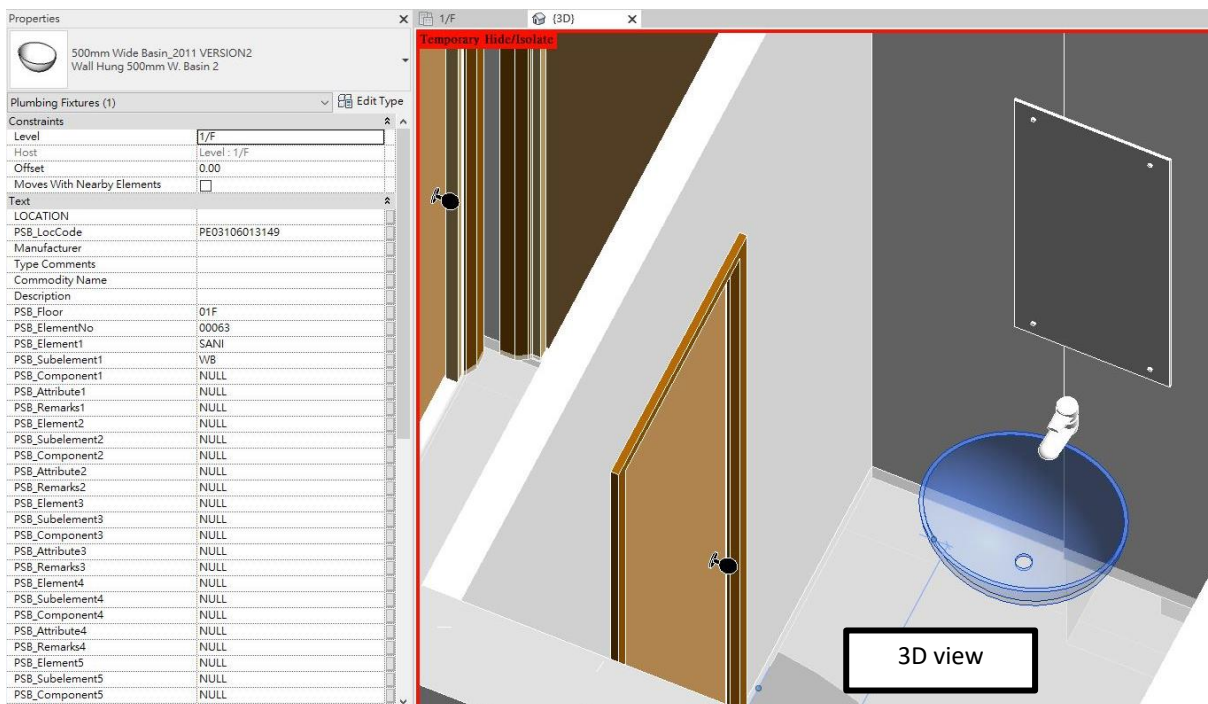
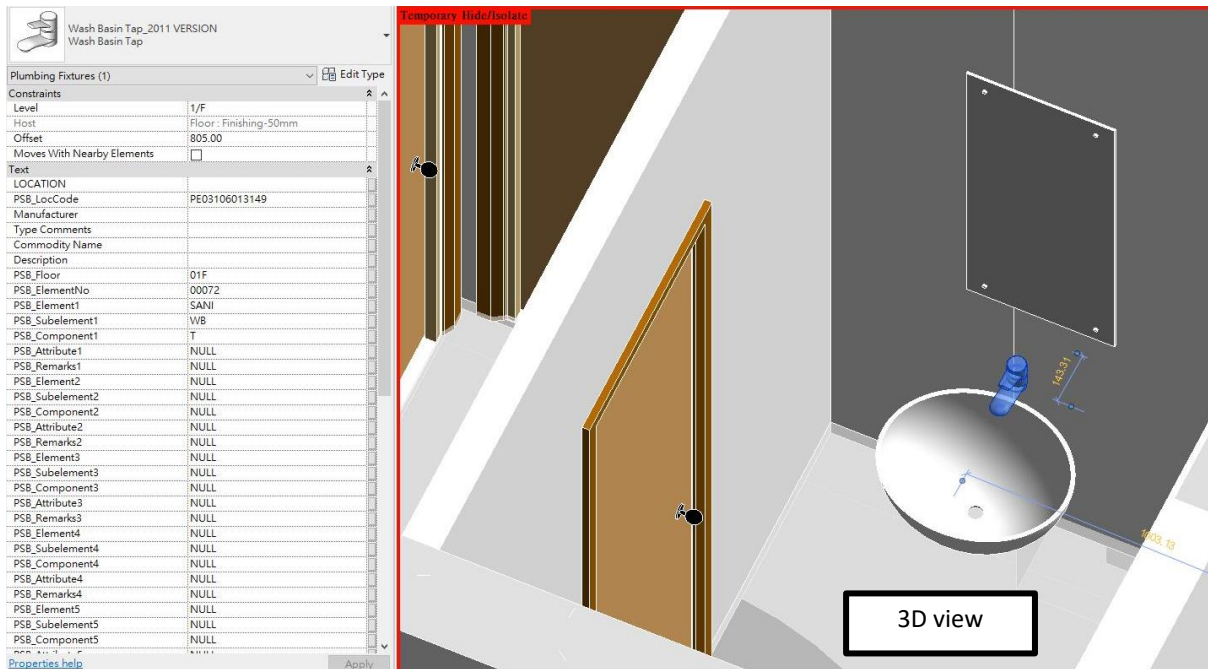
## 2. Special Modelling Requirements (Refer to Clause 2.3.4)

Example (a): Typical example of BIM element modelling at toilet area  
(Note: Different components are highlighted in different colors for illustration.)

	Plan	3D
Presentation		
	Example for Structural Model	
Presentation		
	Example for Architectural Model	

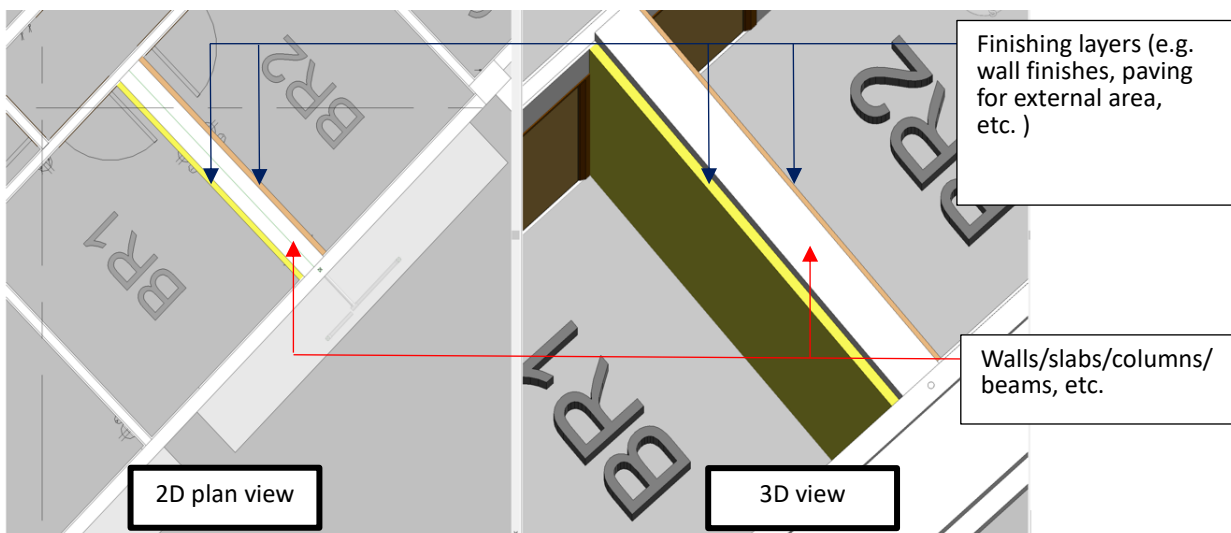


## Example (B): Separation between Tap and Basin

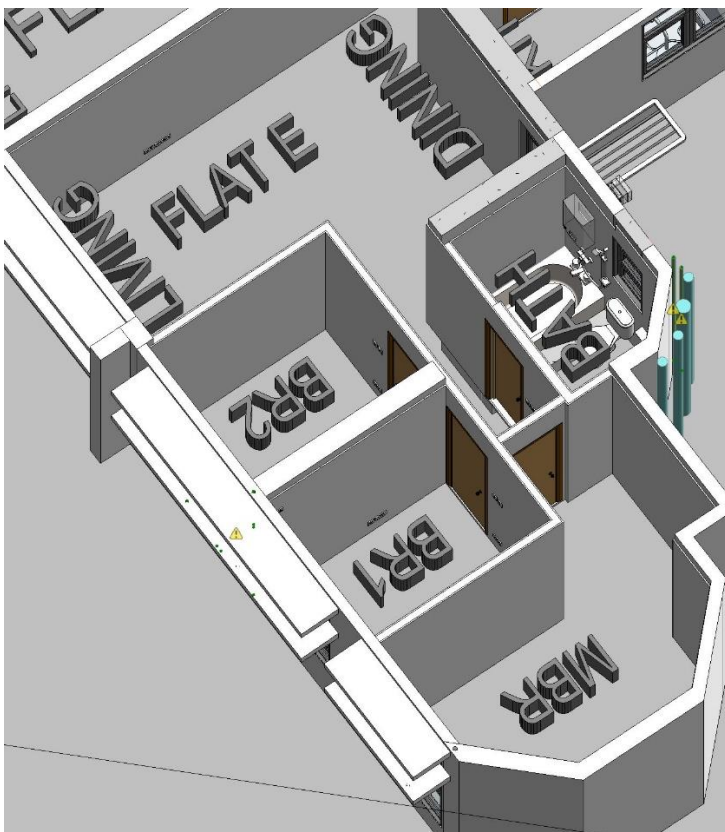




## Example (C): Separation between Walls/ Slabs/ Columns/ Beams and Finishes

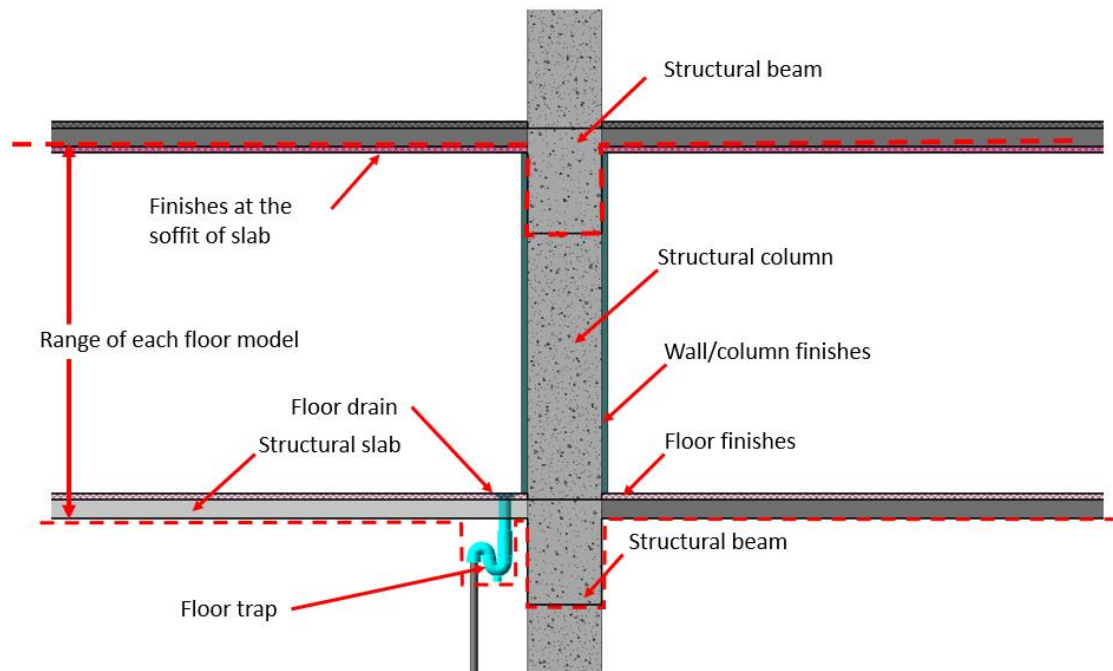


## 3. Typical Example of 3D Room Label (Refer to Clause 2.3.1)





## Example (D): Model Division in Floor Level



## Appendix 7 – As-built Model Colour Coding

### 1 Site Model

	Model Elements	RGB Color	LOD-G	LOD-I
1	Topography (existing site and surrounding land use)	Default	300	1
2	Massing model of adjacent areas or surrounding buildings	192,192,192	300	2
3	Pavement (carriageway, footpath, cycle track)	Default	300	3
4	Tree / Planter	95, 75, 65	300	4

### 2 Structural Model

	Model Elements	RGB Color	LOD-G	LOD-I
1	Floors	80-80-80	300	500
2	Mass	175-175-175	300	500
3	Ramps	175-175-175	300	500
4	Stairs	175-175-175	300	500
5	Structural Columns	131-133-120	300	500
6	Structural Connections	175-175-175	300	500
7	Structural Foundation	175-175-175	300	500
8	Structural Framing	131-133-120	300	500
9	Walls	80-80-80	300	500
1	Floors	80-80-80	300	500

### 3 Architectural Model

	Model Elements	RGB Color	LOD-G	LOD-I
1	Room space, corridor, plant & equipment room	N/A	300	500
2	Elevator shaft space	N/A	300	500
3	Floor, slab, ramp, roof	128-128-128	300	500

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4	Basic architectural column & wall		128-128-128	300	500
5	Basic structural beam & framing		128-128-128	300	500
6	Exterior wall		128-128-128	300	500
7	Interior wall / partition / non-structural wall		128-128-128	300	500
8	Glass walls, including shading devices		200-205-225	300	500
9	Aluminum Cladding		200-205-225	300	500
10	Wall Finishing / Painting / Waterproofing		64-128-128	300	500
11	Floor Finishing / Tiles / Waterproofing		237-237-197	300	500
12	Green Roofing System / Green Wall		000-255-000	300	500
13	Curtain Wall		200-205-225	300	500
14	Precast facade		128-128-128	300	500
15	Smoke curtain or barrier		255-000-000	300	500
16	Fire Shutter and Hood / enclose		255-000-000	300	500
17	Exit sign		255-000-000	300	500
18	Door (exterior and interior)		128-128-195	300	500
19	Window		200-205-225	300	500
20	Louver, decorative louver, sunshading & other architectural features		128-128-195	300	500
21	Skylight		200-205-225	300	500
22	Ceiling		244-255-255	300	500
23	Escalator		200-205-225	300	500
24	Moving walkway		128-128-128	300	500
25	Stairs, steps		128-128-128	300	500
26	Railing, balustrade, handrail		200-205-225	300	500
27	Access ladder, catwalk, maintenance platform		200-205-225	300	500
28	Toilet fixture		150-210-250	300	500
29	Sink, washbasin		237-210-197 245-230-220	300	500
30	Tap, Faucet		187-187-187	300	500
31	Building maintenance unit		Default	300	500

## 4 Plumbing System

	Model Elements	RGB Color	LOD-G	LOD-I
1	Cleansing Water Pipe	000-000-255	300	500
2	Cold Water Pipe	000-000-255	300	500
3	Flushing Water Pipe	255-255-000	300	500
4	Fresh Water Pipe	000-255-000	300	500
5	Hot Water Supply Pipe	255-000-000	300	500
6	Hot Water Return Pipe	255-128-128	300	500
7	Irrigation Water Pipe	000-255-255	300	500
8	Grey Water Pipe	000-128-255	300	500

## 5 Drainage System

	Model Elements	RGB Color	LOD-G	LOD-I
1	Waste Pipe	128-128-000	300	500
2	Soil and Waste Pipe	128-000-000	300	500
3	Vent Pipe	000-128-255	300	500
4	Rainwater Pipe	000-255-255	300	500
5	Pumped Soil & Waste Pipe	064-000-000	300	500
6	Pumped Waste Pipe	064-064-000	300	500
7	Pumped Rainwater Pipe	000-128-128	300	500