# Building Information Modelling (BIM) Guide for Facilities Upkeep

**(Version 3.0)**

**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. 02/2021 or the latest version.

# Building Information Modelling (BIM) Guide for Facilities Upkeep

## FIRST EDITION - CURRENT REVISION

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| 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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| 1 | 1 | - Revision of Clauses 1.1 and 1.2. |
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| 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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| 2 | 7 | - Revision of Clause 2.3.2. |
| 2 | 8 | - Revision of Clauses 2.3.3 and 2.3.4 |
| 2 | 9 | - Revision of Clauses 2.3.5 and 2.3.7. |
| 2 | 10-12 | - Revision of Clause 2.4. |
| Appendix 1 | 14 | - Revision of Item 3. |
| Appendix 2 | 20 | - Addition of Examples of Asset Information Spreadsheet |
| Appendix 4 | 23-31 | - General Update of the LOD-G |
| Appendix 5 | 32-34 | - General Update of the Identifier of Appendix 5. |
| Appendix 6 | 40-41 | - Addition of Examples of Special Modelling Requirements |
| Appendix 6 | 44 | - Addition of Examples of Separation between each floor. |
| Appendix 7 | 45-47 | - Addition of As-built Model Colour Coding |

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| 1 | 1 - 3 | - General Update of Clauses 1.1, 1.2 and 1.3. |
| 2 | 4 - 5 | - Revision of Clauses 2.1 & 2.2 |
| 2 | 5 - 8 | - Revision of Clauses 2.3.1, 2.3.4 and 2.3.6 |
| 2 | 9 - 10 | - Revision of Clause 2.4 |
| Appendix 1 | 12 – 18 | - Revision of PSB Standard Parameters. |
| Appendix 2 | 19 | - Revision of Examples of Asset Information Spreadsheets |
| Appendix 3 | 20 - 21 | - Revision of examples of PSB Standard Parameters in Objects |
| Appendix 4 | 22 - 31 | - General Update of Requirements for Non-Graphical Information and Documentation |
| Appendix 5 | 32 - 34 | - General Update of Requirements for Creating Sheet Records |
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| Appendix 7 | 46 - 47 | - Revision of As-built Model Colour Coding |

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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. 02/2021 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 (Version 2.1 – December 2021) issued by Hong Kong Construction Industry Council.
(b) CIC Building Information Modelling Standards for Architecture and Structural Engineering (Version 2.1 – 2021) issued by Hong Kong Construction Industry Council
(c) CIC Building Information Modelling Standards for Underground Utilities (Version 2 -2021) issued by Hong Kong Construction Industry Council.
(d) CIC BIM Standards for Mechanical, Electrical and Plumbing (Version 2 -2021) issued by Hong Kong Construction Industry Council.
(e) CIC Production of BIM Object Guide - General Requirements (Version 2 – 2021) issued by Hong Kong Construction Industry Council.
(f) CIC Building Information Modelling Dictionary (2021) issued by Hong Kong Construction Industry Council
(g) BIM Harmonisation Guidelines for Works Departments (Version 1.0 – October 2021) by Development Bureau
(h) Development Bureau Technical Circular (Works) No. 02/2021 – Adoption of Building Information Modelling for Capital Works Projects in Hong Kong
(i) Development Bureau Technical Circular (Works) No. 08/2021 – Building Information Modelling Harmonisation Guidelines for Capital Works Project in Hong Kong
(j) Computer-Aided-Drafting Standard for Works Projects (CSWP) issued by Development Bureau of the HKSAR Government.
(k) American Institute of Architects (AIA)'s G202-2013 Building Information Modeling Protocol Form.
(l) BS 8536-1:2015 Briefing for Design and Construction. Code of Practice for Facilities Management (Buildings Infrastructure).
(m) 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.

(n) 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.

(o) 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

(p) 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

(q) BS 1192-4:2014 Collaborative Production of Information Part 4: Fulfilling Employers Information Exchange Requirements Using COBie – Code of Practice.

(r) Building Information Modelling for Asset Management (BIM-AM) Standards and Guidelines issued by Electrical & Mechanical Services Department

(s) Building Information Modelling (BIM) Guide for Architectural Design (Version 3.0) issued by Architectural Branch of Architectural Services Department.

(t) Building Information Modelling (BIM) Guide for Building Services Installation (Version 3.0) issued by Building Services Branch of Architectural Services Department.

(u) Building Information Modelling (BIM) Guide for Structural Engineering (Version 3.0) issued by Structural Engineering Branch of Architectural Services Department.

(v) Building Information Modelling (BIM) Guide for Cost Estimation (Version 3.0) issued by Quantity Surveying Branch of the Architectural Services Department.

(w) Drawing Practice Manual – For Outsourcing Projects issued by Architectural Services Department

## 1.3 Terminology and Abbreviation

### 1.3.1 Terminology

The abbreviations and terminology/ glossary shall refer the CIC BIM Dictionary (2021).

### 1.3.2 Abbreviation

The other 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 |

| Abbreviation | Full Name |
|---|---|
| FU | Facilities Upkeep |
| 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. 02/2021 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 and the latest version of the Building Information Modelling (BIM) Guides for Architectural Design, Structural Engineering and Building Services Installation.

**DOC**

**CIC Building Information Modelling Standard's Definition**

*DOC is the description of documentation to be associated with the users to meet the identified requirements.*

**Interpretations in this Guide**

*The BIM object documentation requirements as specified in Appendix 1 and Appendix 4, should be embedded in the model element / object for facilities upkeep use.*

**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.*

**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*

**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 indicating 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.*

## 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.

The naming convention (Model File Naming, View Naming, Object File Naming & Type Naming) should be referred to the latest version of Building Information Modelling (BIM) Guides for Architectural Design, Structural Engineering and Building Services Installation.

### 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[1]" 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[2] 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

[1] ArcGIS is a software by Esri. The version of the ArcGIS shall be Esri ArcGIS Enterprise Standard Edition 10.4.1 or later edition.

[2] 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.

process to the submitted native BIM and IFC file for data conversion and AIS web application by using FME[3] and GIS[4] 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, 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

[3] 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.

[4] Geographic Information System is a system designed to capture, store, manipulate, analyze, manage and present spatial or geographic data.

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.

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 Graphical & Non-graphical 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, unless specifically required by the BEP.

(g) All as-built model files should be checked and purged. The maximum file size for each divided as-

built models should not exceed 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 6.

### 2.3.6 Photographic Record

Photographic record showing the site as-built condition shall be provided including both internal and external areas. Proposed locations for taking photographic record shall be submitted to PSB for comment and approval. The image shall be in good quality with good sharpness, contrast and without blur.

### 2.3.7 3D Digital Point Cloud Scanning

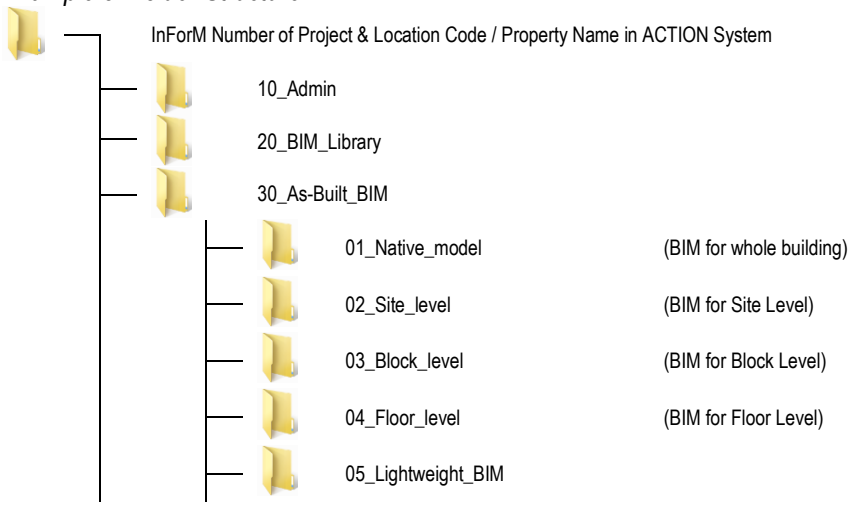
3D digital point cloud scanning shall be arranged for special feature and building structure with historical value as indicated in Appendix 4. A 3D Model shall be created from the point cloud laser scanning (with accuracy ≤5mm) with subsequent 3D rendering showing the realistic colour and texture. The 3D Model integrated with As-build 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.

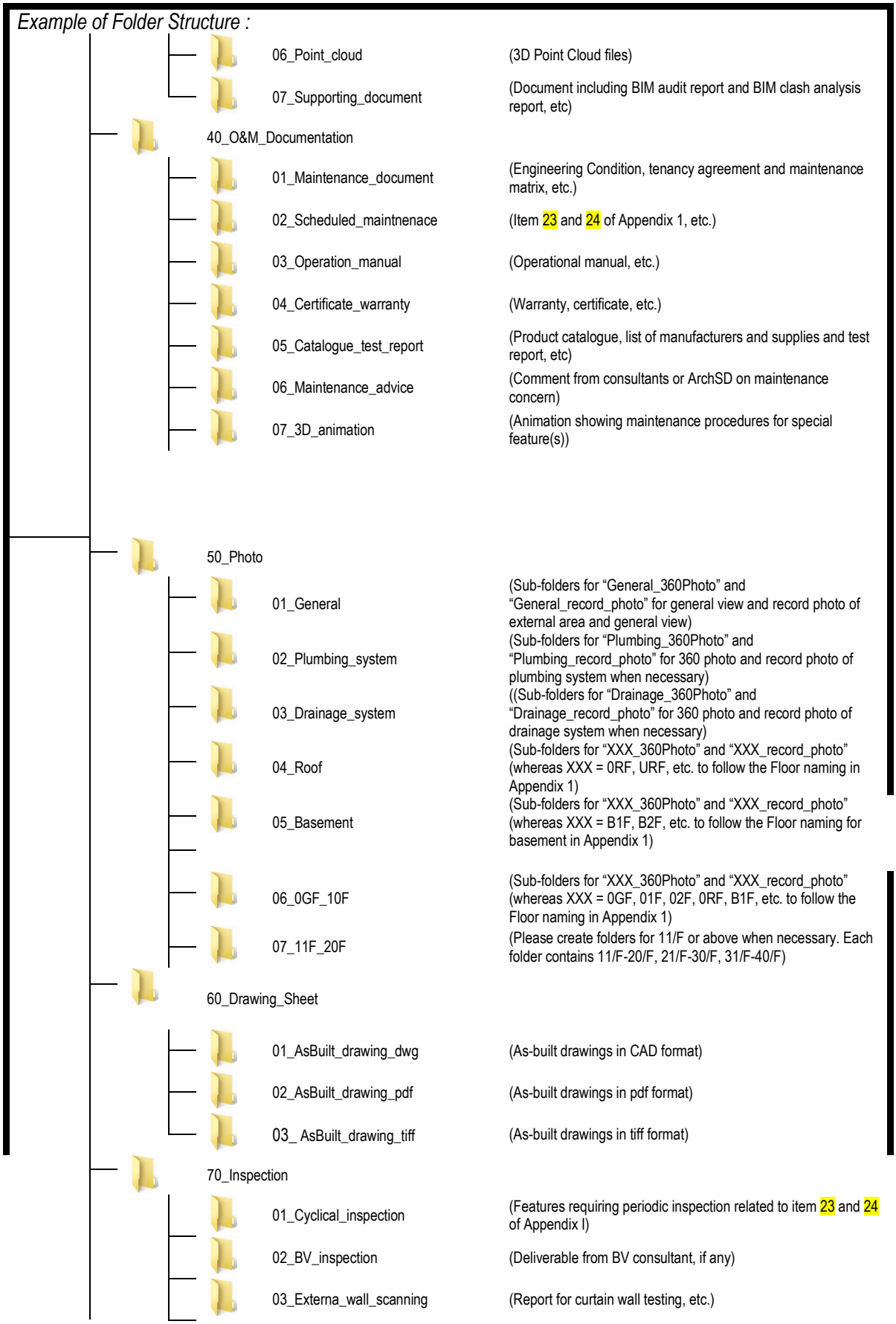
| Tier | Folder Name | Stored Materials |
|---|---|---|
| 1st | InForM Number[5] of Project & Location Code / Property Name in ACTION System | |
| 2nd | 10_Admin | Stores all document for project management, including contract, BIM execution plans, etc. |
| 2nd | 20_BIM_Library | Stores resources files such as Templates, Title Blocks, Line Styles, Fonts, Objects, Material Images and Specific Families |
| 2nd | 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. |
| 2nd | 40_O&M_Documentation | Stores all documents related to operation and maintenance, e.g. testing & commissioning reports, catalogues, literatures, drawings, certificates, warranties, maintenance access proposals for both external and internal elements and O&M manuals, etc. Different system shall be stored in pre-defined structured folder. |
| 2nd | 50_Photo | Stores all photographic record including the 360-view photos. |
| 2nd | 60_Drawing_Sheet | Stores all drawing sheet record. |
| 2nd | 70_Inspection | Stores all manuals containing the requirements on cyclical maintenance inspection. |
| 2nd | 80_Statutory | Stores all documents related to statutory and contract compliance, e.g. certificate of compliance, maintenance certificate, etc. |
| 2nd | 90_Others | Stores all other miscellaneous documents. |

*Example of Folder Structure :*

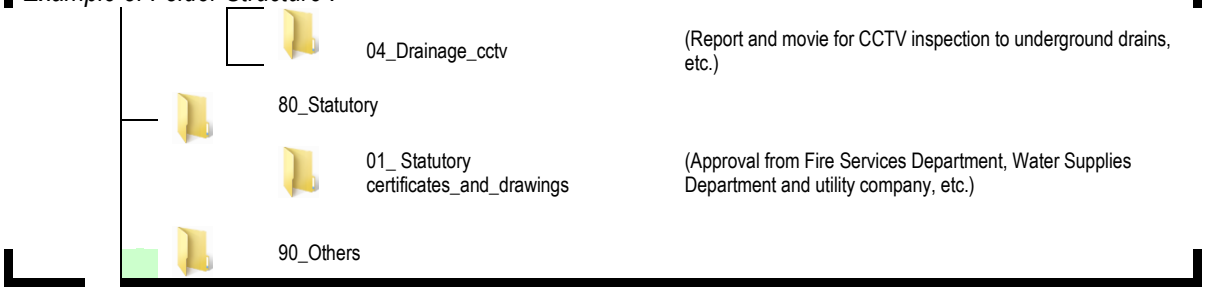



[5] InForM Number is an unique project number for a project generated by ArchSD InForM System.

*Example of Folder Structure :*



*Example of Folder Structure :*



# 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 |

<table>
<tr><th>Item</th><th>Project Parameter</th><th>Data type</th><th>Mandatory</th><th>Remarks</th><th>Explanatory Note</th></tr>
<tr><td>2</td><td>PSB_Floor</td><td>3 characters</td><td>Yes</td><td>Typical data format refer to examples of floor codes under Explanatory Note'.</td><td>The floor level shall be customized project parameters and typical examples are shown in the following table:<br><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>99th 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></td></tr>
<tr><td>3</td><td>PSB_ElementNo</td><td>textual</td><td>Yes</td><td>from 00001 to 99999</td><td>Each PSB_ElementNo of BIM object should be unique for BIM model.</td></tr>
<tr><td>4</td><td>PSB_Element1</td><td>textual</td><td>Yes</td><td>The value shall refer to Elemental Code Relation table.</td><td>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.</td></tr>
<tr><td>5</td><td>PSB_Sub-element1</td><td>textual</td><td>Yes</td><td>The value shall refer to Elemental Code Relation table and its code table.</td><td></td></tr>
<tr><td>6</td><td>PSB_Component1</td><td>textual</td><td>Yes</td><td>The value shall refer to Elemental Code Relation table and its code table.</td><td></td></tr>
<tr><td>7</td><td>PSB_Attribute1</td><td>textual</td><td>Yes</td><td>The value shall refer to Elemental Code Relation table and its code table.</td><td></td></tr>
<tr><td>8</td><td>PSB_Remarks1</td><td>textual</td><td></td><td></td><td></td></tr>
</table>

| 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_Brand1 | textual | | If the element has associated contractual submission from contractor/manufacturer/supplier, relevant information of such contractor/manufacturer/supplier shall be provided to PSB | Brand name/ Model number shall be provided when the element has associated contractual submission requirement stipulated under contract, quotation or schedule of rates. |
| 11 | 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.<br><br>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.<br><br>Documentation other than Item 12, 13 & 14 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.<br><br>Manufacturer or supplier's web site shall be converted to pdf format for submission. |

| Item | Project Parameter | Data type | Mandatory | Remarks | Explanatory Note |
|---|---|---|---|---|---|
| 12 | PSB_Catalogue_Test_Report | textual | | Relative path of the combine file (contractual submission) to retrieve documents.<br><br>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. \\40_O&M_Documentation\05_Catalogue\[FILE NAME]<br><br>Catalogue & approval letter, test certificate/ report and test report upon completion of Works from manufacturer and suppliers shall have combined file 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.<br><br>Manufacturer or supplier's web site shall be converted to pdf format for submission. |
| 13 | PSB_O&M_Manual_Shop_Drawing | textual | | Relative path of the combine file (contractual submission) to retrieve documents.<br><br>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. \\40_O&M_Documentation\03_Operation_manual\[FILE NAME]<br><br>Shop drawing and O&M manual from manufacturer and suppliers shall have combined file 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.<br><br>Manufacturer or supplier's web site shall be converted to pdf format for submission. |
| 14 | PSB_Warranty | textual | | Relative path of the combine file (contractual submission) to retrieve documents.<br><br>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. \\40_O&M_Documentation\04_Certificate_warranty\[FILE NAME]<br><br>Warranty from manufacturer and suppliers shall have combined file 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.<br><br>Manufacturer or supplier's web site shall be converted to pdf format for submission. |
| 15 | PSB_Expiry_of_Warranty | textual | | Only applicable if warranty of the object is required under contract submission requirement | MMM YYYY (e.g. Nov 2014) |

| Item | Project Parameter | Data type | Mandatory | Remarks | Explanatory Note |
|---|---|---|---|---|---|
| 16 | PSB_Additional_Element | textual | | If an object contains more than 1 element under the Elemental Code Relation table. The additional element information shall be provided referring to the Elemental Code Relation table.<br><br>Project team could either input the information in a single Project Parameter container "*PSB_Additional_Element*" or duplicate the items from 4 to 13 in a numerical order, i.e. PSB_Element2 / PSB_Sub-element2…….following the data type mentioned above.<br><br>In case the "*PSB_Additional_Element*" is used, Insert separator "/ " & ',' to divide the elemental code relation and components respectively.<br><br>Using the Door components as an illustration, Door lock (Element 2), Door glass (Element 3), Door closer (Element 4), Door hinge (Element 5) could be inputted in the following format:-<br>FF/DR/IRON/LOC ,<br>FF/DR/GZ/GZS ,<br>FF/DR/IRON/CLOSE ,<br>FF/DR/IRON/HIN | Element 1 shall only be used to input information of major component, such as door, window, wall, etc. Parts or components belong to door shall be input to Additional Element with manufacturer/ catalogue information (if necessary), i.e. Door lock (Element 2), Door glass (Element 3), Door closer (Element 4), Door hinge (Element 5). The corresponding Element, Sub-element, Component, Attribute shall refer to Elemental Code Relation Table and its code table.<br><br>Details should be referred to the Appendix 3 as the examples of PSB Standard Parameters in Objects. |

| Item | Project Parameter | Data type | Mandatory | Remarks | Explanatory Note |
|---|---|---|---|---|---|
| 17 | PSB_ContractNo | textual | | If the element has associated contractual submission from contractor/manufacturer/supplier, relevant information of such contractor/manufacturer/supplier shall be provided to PSB | Contact number of contractor shall be provided when the element has associated contractual submission requirement stipulated under contract, quotation or schedule of rates. |
| 18 | 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. |
| 19 | 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. |
| 20 | 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. |
| 21 | PSB_Cert_Comp_Date | textual | | | MMM YYYY (e.g. Nov 2014) |
| 22 | PSB_Handover_Date | textual | | Only applicable for new project handed over to PSB for maintenance | MMM YYYY (e.g. Nov 2014) |
| 23 | 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. |
| 24 | PSB_Ins_Interval | textual | | 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. |
| 25 | 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. |

| Item | Project Parameter | Data type | Mandatory | Remarks | Explanatory Note |
|---|---|---|---|---|---|
| 26 | 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". |

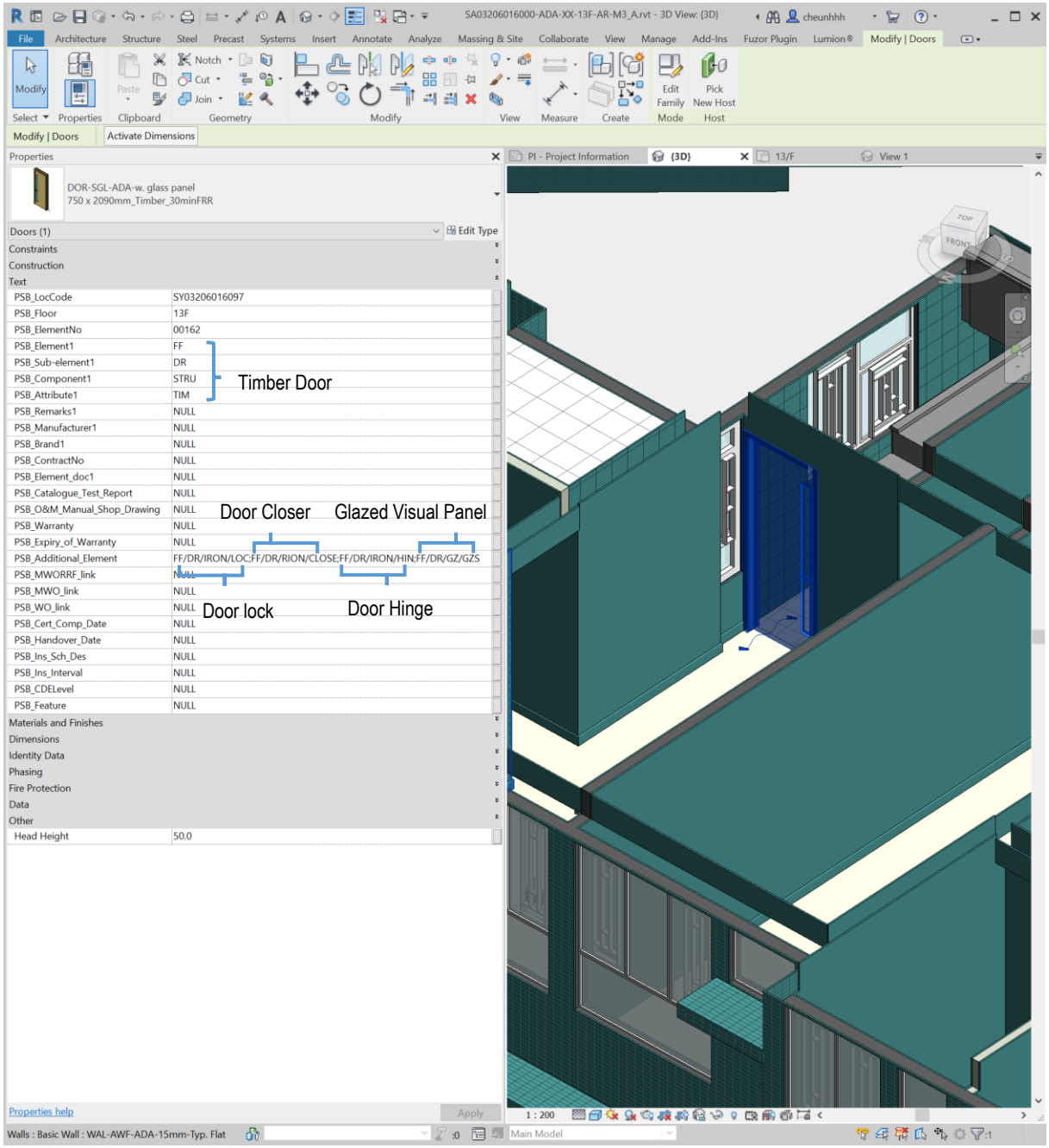
Remark: For the non-applicable project parameters, the Contractor shall input “NULL” to the corresponding BIM element(s) of as-built model.

## Appendix 2 – Examples of Asset Information Spreadsheets

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

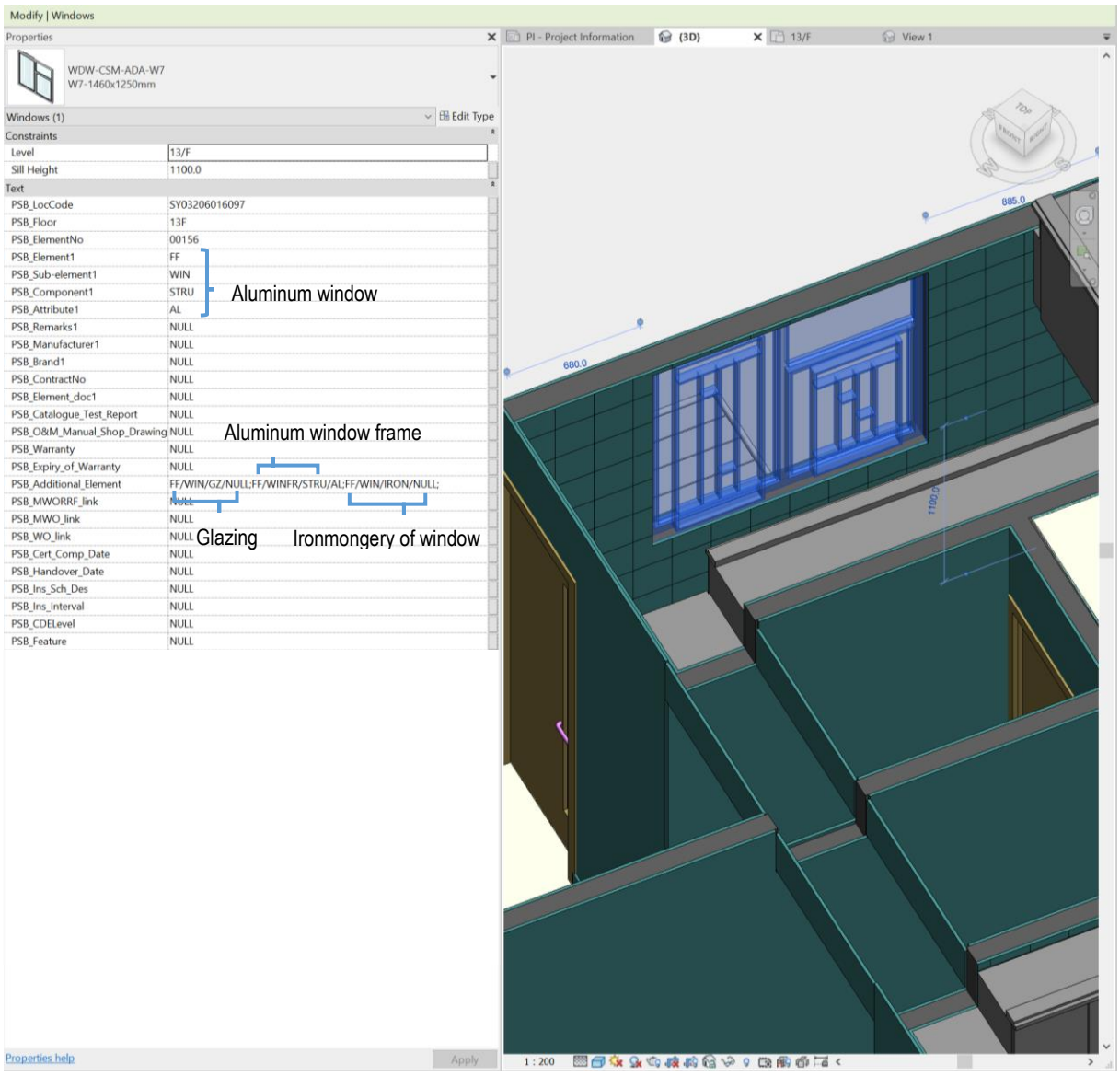
# Appendix 3 – Examples of PSB Standard Parameters in Objects

## Example 1: Door and associated ironmongeries




| | |
|---|---|
| PSB_LocCode | SY03206016097 |
| PSB_Floor | 13F |
| PSB_ElementNo | 00162 |
| PSB_Element1 | FF |
| PSB_Sub-element1 | DR |
| PSB_Component1 | STRU |
| PSB_Attribute1 | TIM |
| PSB_Remarks1 | NULL |
| PSB_Manufacturer1 | NULL |
| PSB_Brand1 | NULL |
| PSB_ContractNo | NULL |
| PSB_Element_doc1 | NULL |
| PSB_Catalogue_Test_Report | NULL |
| PSB_O&M_Manual_Shop_Drawing | NULL |
| PSB_Warranty | NULL |
| PSB_Expiry_of_Warranty | NULL |
| PSB_Additional_Element | FF/DR/IRON/LOC:FF/DR/RION/CLOSE:FF/DR/IRON/HIN:FF/DR/GZ/GZS |
| PSB_MWORRF_link | NULL |
| PSB_MWO_link | NULL |
| PSB_WO_link | NULL |
| PSB_Cert_Comp_Date | NULL |
| PSB_Handover_Date | NULL |
| PSB_Ins_Sch_Des | NULL |
| PSB_Ins_Interval | NULL |
| PSB_CDELevel | NULL |
| PSB_Feature | NULL |
| Head Height | 50.0 |

## Example 2: Window and associated ironmongeries






Aluminium window frame

# 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 | Graphical Model Element *LOD-G* | Non-graphical information *LOD-I* | 3D Animation | BIM Object from original manufacturer | Photo record *(other than 360º photos)* | Other Modelling Requirements | Non-graphical Information and Documentation |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| **1.0** | **Excavation** | | | | | | | |
| 1.1 | Elements under this trade | 300 | 500 | ✕ | ✔ (if available) | ✕ | | |
| | | | | | | | | |
| **2.0** | **Concrete Work** | | | | | | | |
| 2.1 | Elements under this trade | 300 | 500 | ✕ | ✔ (if available) | ✕ | | |
| | | | | | | | | |
| **3.0** | **Brickwork and Blockwork** | | | | | | | |
| 3.1 | Elements under this trade | 300 | 500 | ✕ | ✔ (if available) | ✕ | | |
| | | | | | | | | |
| **4.0** | **Masonry** | | | | | | | |
| 4.1 | Elements under this trade | 300 | 500 | ✕ | ✔ (if available) | ✔ | | |
| | | | | | | | | |

| Item | Element | Graphical Model Element<br>*LOD-G* | Non-graphical information<br>*LOD-I* | 3D Animation | BIM Object from original manufacturer | Photo record *(other than 360° photos)* | Other Modelling Requirements | Non-graphical Information and Documentation |
|---|---|---|---|---|---|---|---|---|
| **5.0** | **Roofing and Waterproofing** | | | | | | | |
| 5.1 | Elements under this trade (unless otherwise specified below) | 300 | 500 | ✗ | ✔ (if available) | ✔ | 1) Showing Maintenance access | 1) Contractor / Specialist Contractor information.<br>2) Brand name and model information.<br>3) Manufacturer/ Supplier information<br>4) Expiry date of warranty<br>5) Catalogue/ Technical literature.<br>6) Warranty.<br>7) Shop drawings<br>8) O&M manual.<br>9) Cyclical maintenance requirement (if applicable). |
| 5.2 | Waterproofing | 300 | 500 | ✗ | ✔ (if available) | ✔ | 1) Ditto (to Item 5.1).<br>2) Showing fixing details including movement/ expansion joints, tiling and insulation, etc. | 1) Ditto (to Item 5.1).<br>2) Infra-red thermograph testing report. |
| 5.3 | Corrugated or Profiled Sheet Roofing | 300 | 500 | ✔ (in LOD 300 or above ; Step-by-step process showing the assemble & disassemble of fixtures) | ✔ (if available) | ✔ | 1) Ditto (to Item 5.1).<br>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).<br>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).<br>2) Structural assessment record by Registered Structural Engineer. |
| | | | | | | | | |

| Item | Element | Graphical Model Element<br>*LOD-G* | Non-graphical information<br>*LOD-I* | 3D Animation | BIM Object from original manufacturer | Photo record *(other than 360° photos)* | Other Modelling Requirements | Non-graphical Information and Documentation |
|---|---|---|---|---|---|---|---|---|
| **6.0** | **Carpentry and Joinery** | | | | | | | |
| 6.1 | Elements under this trade (unless otherwise specified below) | 300 | 500 | ✗ | ✓ (if available) | ✗ | | 1) Brand name and model information.<br>2) Catalogue/ 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).<br>2) Manufacturer/ Supplier information<br>3) Expiry date of warranty<br>4) Warranty.<br>5) Fire Certificate/ Report |
| 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).<br>2) Manufacturer/ Supplier information<br>3) Expiry date of warranty<br>4) Warranty and certificate.<br>5) Specification of the acoustic properties. |
| | | | | | | | | |
| **7.0** | **Ironmongery** | | | | | | | |
| 7.1 | Elements under this trade | 300 | 500 | ✗ | ✓ (if available) | ✗ | | 1) Brand name and model information.<br>2) Manufacturer/ Supplier information<br>3) Catalogue/ Technical literature.<br>4) O&M manual. |
| | | | | | | | | |
| **8.0** | **Steel and Metal Work** | | | | | | | |
| 8.1 | Elements under this trade (unless otherwise specified below) | 300 | 500 | ✗ | ✓ (if available) | ✗ | | 1) Brand name and model information.<br>2) Catalogue/ Technical literature. |
| 8.2 | Fall arrest system | 300 | 500 | ✗ | ✓ (if available) | ✗ | | 1) Ditto (to Item 8.1).<br>2) Contractor / Specialist Contractor information.<br>3) O&M manual.<br>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).<br>2) Contractor / Specialist Contractor information.<br>3) Guarantee and warranty.<br>4) O&M manual. |

| Item | Element | Graphical Model Element<br>*LOD-G* | Non-graphical information<br>*LOD-I* | 3D Animation | BIM Object from original manufacturer | Photo record *(other than 360º photos)* | Other Modelling Requirements | Non-graphical Information and Documentation |
|---|---|---|---|---|---|---|---|---|
| 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).<br>2) Contractor / Specialist Contractor information.<br>3) Guarantee and warranty.<br>4) O&M manual. |
| 8.5 | Aluminium windows and doors | 300 | 500 | ✗ | ✓ (if available) | ✗ | | 1) Ditto (to Item 8.1). |
| | | | | | | | | |
| **9.0** | **Plastering and Finishes** | | | | | | | |
| 9.1 | Elements under this trade (unless otherwise specified below) | 300 | 500 | ✗ | ✓ (if available) | ✗ | | 1) Brand name and model information.<br>2) Catalogue/ Technical literature. |
| 9.2 | Suspended ceiling system | 300 | 500 | ✗ | ✓ (if available) | ✓ | 1) Showing fixing details including frames, etc.<br>2) Showing maintenance access to ceiling void above | 1) Ditto (to Item 9.1).<br>2) Manufacturer/ Supplier information<br>3) Shop drawings<br>4) Test certificates and manufacturer's guarantee. |
| 9.3 | Acoustic plaster / fire resisting fireproofing plaster | 300 | 500 | ✗ | ✓ (if available) | ✗ | | 1) Ditto (to Item 9.1).<br>2) Manufacturer/ Supplier information<br>3) Manufacturer's recommendation on application.<br>4) 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).<br>2) Laying or fixing patterns.<br>3) Configuration and dimension.<br>4) Slip resistance classification and test certificate. |
| 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).<br>2) Laying or fixing patterns.<br>3) Configuration and dimension.<br>4) Slip resistance classification and test certificate. |

| Item | Element | Graphical Model Element<br>*LOD-G* | Non-graphical information<br>*LOD-I* | 3D Animation | BIM Object from original manufacturer | Photo record *(other than 360° photos)* | Other Modelling Requirements | Non-graphical Information and Documentation |
|---|---|---|---|---|---|---|---|---|
| 9.6 | Stone or marble slabs / tiles | 300 | 500 | ✔ (in LOD 300; 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).<br>2) Laying or fixing patterns.<br>3) Configuration and dimension.<br>4) Anti-stain treatment details.<br>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).<br>2) Laying or fixing patterns.<br>3) Configuration and dimension.<br>4) Test certificate and manufacturer's guarantee. |
| | | | | | | | | |
| **10.0** | **Roadwork and Cable Duct** | | | | | | | |
| 10.1 | Elements under this trade | 300 | 500 | ✘ | ✔ (if available) | ✘ | | |
| | | | | | | | | |
| **11.0** | **Plumbing and Drainage** | | | | | | | |
| 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.<br>2) Showing maintenance access for tanks, duct well, pipe-duct, concealed installations, etc. | 1) Brand name and model information.<br>2) Manufacturer/ Supplier information<br>3) Type of joints & jointing method.<br>4) Size, volume, capacity, physical dimension, etc.<br>5) Catalogue/ Technical literature.<br>6) Test Certificate/ Report<br>7) O&M Manual.<br>8) Cyclical maintenance requirement (if applicable). |
| 11.2 | Glass-fibre reinforced plastic water tank | 300 | 500 | ✘ | ✔ (if available) | ✘ | 1) Ditto (to Item 11.1).<br>2) Showing the fixing of the panels, fittings, ladders, overflow, warning pipe, etc. | 1) Ditto (to Item 11.1).<br>2) Structural calculation endorsed by Registered Structural Engineer.<br>3) Test certificates. |

| Item | Element | Graphical Model Element<br>*LOD-G* | Non-graphical information<br>*LOD-I* | 3D Animation | BIM Object from original manufacturer | Photo record *(other than 360° photos)* | Other Modelling Requirements | Non-graphical Information and Documentation |
|---|---|---|---|---|---|---|---|---|
| 11.3 | Pressure Reducing Value | 300 | 500 | ✗ | ✓ (if available) | ✗ | 1) Ditto (to Item 11.1). | 1) Ditto (to Item 11.1).<br>2) Cleaning and maintenance requirements. |
| 11.4 | Sub-soil drain pipes and drain layer | 300 | 500 | ✗ | ✓ (if available) | ✓ | 1) Ditto (to Item 11.1).<br>2) Showing the layers of the sub-soil drain, e.g. filter, pipe, etc. should be shown. | 1) Ditto (to Item 11.1). |
| | | | | | | | | |
| **12.0** | **Glazing** | | | | | | | |
| 12.1 | Elements under this trade (unless otherwise specified below) | 300 | 500 | ✗ | ✓ (if available) | ✗ | 1) Showing fixing details. | 1) Brand name and model information<br>2) Manufacturer/ Supplier information<br>3) Catalogue/ 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.<br>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). |
| | | | | | | | | |
| **13.0** | **Painting** | | | | | | | |
| 13.1 | Elements under this trade | 300 | 500 | ✗ | ✓ (if available) | ✗ | | 1) Brand name and model information<br>2) Manufacturer/ Supplier information<br>3) Expiry date of warranty<br>4) Catalogue/ Technical literature.<br>5) Test certificates and warranty (if applicable). |
| | | | | | | | | |

| Item | Element | Graphical Model Element<br>*LOD-G* | Non-graphical information<br>*LOD-I* | 3D Animation | BIM Object from original manufacturer | Photo record *(other than 360º photos)* | Other Modelling Requirements | Non-graphical Information and Documentation |
|---|---|---|---|---|---|---|---|---|
| **14.0** | **Recreational / Sports Surfacing and Protective Padding** | | | | | | | |
| 14.1 | Elements under this trade (unless otherwise specified below) | 300 | 500 | ✗ | ✓ (if available) | ✗ | | 1) Brand name and model information<br>2) Manufacturer/ Supplier information<br>3) Expiry date of warranty<br>4) Catalogue/ Technical literature.<br>5) Shop drawings |
| 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).<br>2) Certificate of origins.<br>3) Test certificates, warranty and certificate.<br>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).<br>2) Certificate of origins.<br>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).<br>2) Certificate of origins<br>3) Test certificates, warranty and certificate.<br>4) O&M Manual. |
| | | | | | | | | |
| **15.0** | **Fixtures and Fittings** | | | | | | | |
| 15.1 | Elements under this trade (unless otherwise specified below) | 300 | 500 | ✗ | ✓ (if available) | ✗ | | 1) Brand name and model information<br>2) Manufacturer/ Supplier information<br>3) Catalogue/ 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).<br>2) Specification on suitable chemical resistant laboratory-grade material<br>3) Warranty and certificate.<br>4) O&M manual. |

| Item | Element | Graphical Model Element *LOD-G* | Non-graphical information *LOD-I* | 3D Animation | BIM Object from original manufacturer | Photo record *(other than 360° photos)* | Other Modelling Requirements | Non-graphical Information and Documentation |
|---|---|---|---|---|---|---|---|---|
| 15.4 | Flag pole | 300 | 500 | ✗ | ✓ (if available) | ✓ | 1) Showing fixing details including all accessories, foundation, etc. | 1) Ditto (to Item 15.1).<br>2) Warranty and certificate.<br>3) O&M manual. |
| 15.5 | Sanitary fittings | 300 | 500 | ✗ | ✓ (if available) | ✗ | | 1) Ditto (to Item 15.1).<br>2) Specification of the accessories and flush valves.<br>3) O&M manual. |
| 15.6 | Taps and mixers | 300 | 500 | ✗ | ✓ (if available) | ✗ | | 1) Ditto (to Item 15.1).<br>2) WELS information. |
| 15.7 | Braille and tactile map | 300 | 500 | ✗ | | ✓ | | 1) Certificate issued by recognized certifying body. |
| | | | | | | | | |
| **16.0** | **Partitions and Cubicle System** | | | | | | | |
| 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 and model information<br>2) Manufacturer/ Supplier information<br>3) Expiry date of warranty<br>4) Catalogue/ Technical literature.<br>5) Shop drawings |
| 16.2 | Demountable partition system | 300 | 500 | ✗ | ✓ (if available) | ✗ | 1) Ditto (to Item 16.1). | 1) Ditto (to Item 16.1).<br>2) Warranty and certificate.<br>3) O&M manual. |
| 16.3 | Dry wall partition | 300 | 500 | ✗ | ✓ (if available) | ✗ | 1) Ditto (to Item 16.1). | 1) Ditto (to Item 16.1).<br>2) Fire certificate for fire resisting partition. |
| 16.4 | Sliding / folding partition including acoustic partitions | 300 | 500 | ✗ | ✓ (if available) | ✓ | 1) Ditto (to Item 16.1). | 1) Ditto (to Item 16.1).<br>2) Warranty and certificate.<br>3) O&M manual. |
| 16.5 | Toilet cubicle system/ compact laminate/ graphical surface material | 300 | 500 | ✗ | ✓ (if available) | ✗ | 1) Ditto (to Item 16.1). | 1) Ditto (to Item 16.1).<br>2) Warranty and certificate.<br>3) O&M manual. |
| | | | | | | | | |
| **17.0** | **Landscape Work** | | | | | | | |
| 17.1 | Elements under this trade | 300 | 500 | ✗ | ✓ (if available) | ✗ | | |
| | | | | | | | | |

| Item | Element | Graphical Model Element<br>*LOD-G* | Non-graphical information<br>*LOD-I* | 3D Animation | BIM Object from original manufacturer | Photo record *(other than 360° photos)* | Other Modelling Requirements | Non-graphical Information and Documentation |
|---|---|---|---|---|---|---|---|---|
| **18.0** | **Geotechnical Works** | | | | | | | |
| 18.1 | Elements under this trade | 300 | 500 | ✗ | ✓ (if available) | ✗ | | |
| | | | | | | | | |
| **19.0** | **Trees** | | | | | | | |
| 19.1 | Elements under this trade | 200 | 300 | ✗ | ✗ | ✓ | | For i) OVT and ii) trees on registered SIMAR slope only. |
| | | | | | | | | |
| **20.0** | **Curtain Wall/ Window Wall / External Cladding System / Skylight** | | | | | | | |
| 20.1 | Elements under this trade | 400 | 500 | ✓ (in LOD 300 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.<br>2) Showing maintenance access. | 1) Contractor / Specialist Contractor information.<br>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.<br>3) Manufacturer/ Supplier information<br>4) Expiry date of warranty<br>5) Catalogue/ Technical literature.<br>6) Shop drawings<br>7) OTTV calculation (for curtain wall)<br>8) O&M manual.<br>9) Warranty.<br>10) Cyclical maintenance requirement (if applicable). |
| | | | | | | | | |
| **21.0** | **Others (not mentioned above)** | | | | | | | |
| 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. |

| Item | Element | Graphical Model Element<br>*LOD-G* | Non-graphical information<br>*LOD-I* | 3D Animation | BIM Object from original manufacturer | Photo record *(other than 360° photos)* | Other Modelling Requirements | Non-graphical Information and Documentation |
|---|---|---|---|---|---|---|---|---|
| 21.2 | Special feature / Building structure with historical value<br>(*exact feature / structure to be specified by the PSB) | 300 | 500 | ✗<br>(unless otherwise specified) | ✗ | ✔ | 1) Showing maintenance access | 1) Ditto (to Item 21.1).<br>2) 3D digital point cloud scanning. |
| 21.3 | Modular Integrated Construction | 400 | 500 | ✔<br>(in LOD 300 or above; Step-by-step process showing the assemble & disassemble of fixtures) | ✔<br>(if available) | ✔ | 1) Showing details including fixing, joints and gaps, connection, anchorages, supporting system, connection and route of services and fittings, etc.<br>2) Showing Maintenance access. | 1) Ditto (to Item 21.1).<br>2) Contractor / Specialist Contractor information.<br>3) Information, specification and literature of the installations and materials.<br>4) O&M manual.<br>5) Warranty and Certificate. |
| 21.4 | Other items covered in i) Architectural Model & ii) Plumbing & Drainage Model but not listed above. | 300 | 500 | ✗ | ✔<br>(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 |
|---|---|
| | |
| **GP** | **Location Drawings** |
| | (a) List of Drawings |
| | (b) Site / location / block plan showing the size and position of the building and of other buildings in the immediate vicinity, and neighbouring streets |
| | (c) GLA/Lot boundary, lease boundary, right of way, etc. |
| | (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 |
| | (e) Existing layout / demolition plan (if existing works should be shown) |
| | (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 |
| | (g) Drawings showing -<br>-all elevations of the building;<br>-the level of adjacent streets in relation to a known datum and to the levels of the site and the building;<br>-the width of every street adjacent to the site; and<br>-the position, depth and construction of any well; |
| | (h) Plans and sections of the proposed site formation works and associated surface water drainage works |
| | (i) A diagrammatic plan, with full dimensions and calculations, showing:<br>-the height, site coverage, plot ratio and disposition of the building<br>-any open space required<br>-the usable floor area<br>-the number and type of soil fitments and waste fitments to be provided in the building<br>-provision made for persons with a disability<br>-list of modifications and/or exemptions<br>-details of the fire engineering approached adopted<br>-means of escape<br>-fire resisting construction including fire compartments & fire resistant of building elements<br>-travel distance indicated on plan |
| | (j) Canopy, bridge or other projection over a street or unleased Government land, plans showing clearly the nature and dimension of such projection |
| | |
| **PE** | **Principal Elements** |
| | (a) Architectural features / wall sections |
| | (b) Roofing details |
| | (c) Staircases |
| | (d) Lift Shafts |
| | (e) Openings for skylights / escalators, etc. |
| | |
| **CA** | **Component drawings / assembly drawings** |
| | (a) Door schedules and details |
| | (b) Window schedules and details |
| | (c) Glass / metal louvres schedules |
| | (d) Roller shutter schedules |
| | (e) Sliding door / gate schedules |
| | (f) Finishing schedule and details |
| | (g) Ironmongery schedules |
| | (h) Sanitary fittings schedules |
| | (i) Glass block / grille wall schedules and details |
| | (j) Waterproofing and tanking system |

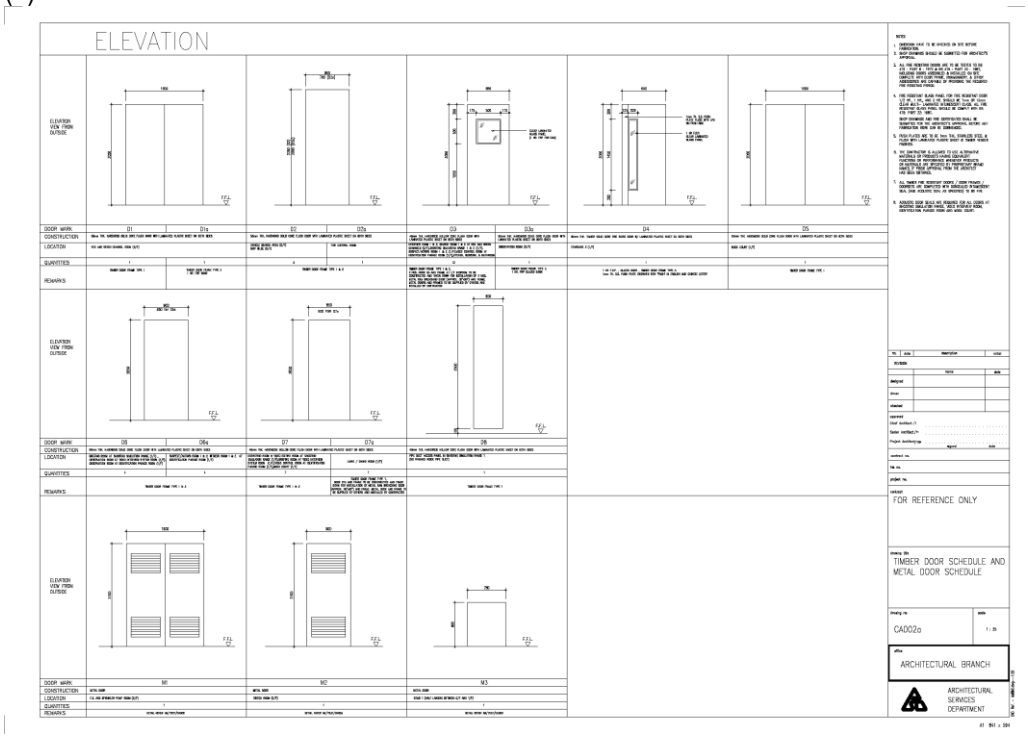
| Identifier | Description |
|---|---|
| | |
| **CF** | **Suspended ceiling system / special flooring system** |
| | (a) Reflected ceiling plans and details |
| | (b) Raised floors and details |
| | (c) Sports flooring system |
| | |
| **SP** | **Sanitary plumbing and drainage system** |
| | (a) Drainage 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 |
| | (b) Vertical diagrams |
| | (c) Manholes schedule |
| | (d) Drainage details (e.g. manholes, BITG, gully trap, surface/stepped channels, channel covers, grease trap, petrol interceptor, septic tanks, etc.) |
| | |
| **WS** | **Water supply system** |
| | (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. |
| | (b) Vertical diagrams |
| | |
| **DL** | **Detailed layouts**<br>**(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.)** |
| | (a) Layout plans |
| | (b) Sections |
| | (c) Elevations |
| | (d) Details |
| | |
| **EW** | **External works**<br>**(showing the detailed location of components and assembly details at external areas, e.g. paving, steps, ramps, planters, benches, arbours, tree pit & grille, perimeter walls, fences, railings, gates, draw pit, earth pit, etc.)** |
| | (a) Layout plans |
| | (b) Sections |
| | (c) Elevations |
| | (d) Details |
| | (e) Landscape plans and details |
| | |
| **MS** | **Miscellaneous**<br>**(showing precise information of components and assemblies for workshop manufacture or on site fabrication.)** |
| | (a) Other unclassified elements (e.g. details of notice board, cat ladders, trap doors, flagpoles, signage system, cabinets, FS inlet / HR cabinets, etc.) |
| | (b) Hidden and exposed structural elements |
| | (c) Skylights |
| | (d) Projections |
| | (e) Railing and parapets |
| | (f) Expansion / Construction / Movement Joints |
| | |
| **OT** | **Others** |
| | (a) List of Proprietary Products, Warranty Period, Scope of Warranty and Details of Suppliers and Manufacturers |
| | (b) List, Details, Dimensions, Respective Locations and Quantity of Spare Materials, Finishes and Parts and their Storage Area; |
| | (c) Management and Maintenance Responsibilities |

| Identifier | Description |
|---|---|
| | (d) Location and Details of Special Feature that need attention |
| | (e) Traffic Impact Assessment, Drainage Impact Assessment, Environmental Impact Assessment, etc. |
| | (f) Engineering Conditions, Assignment, Deed of Mutual Covenants, etc. |

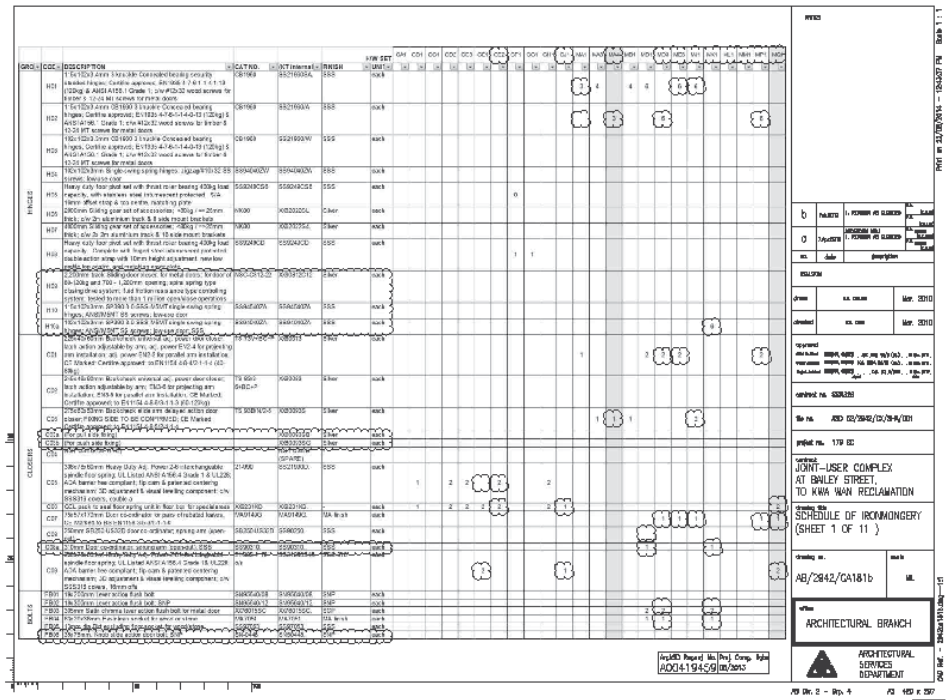
# Appendix 6 – Examples of As-built Modelling

1. Sheet Production - Typical Drawing Schedules

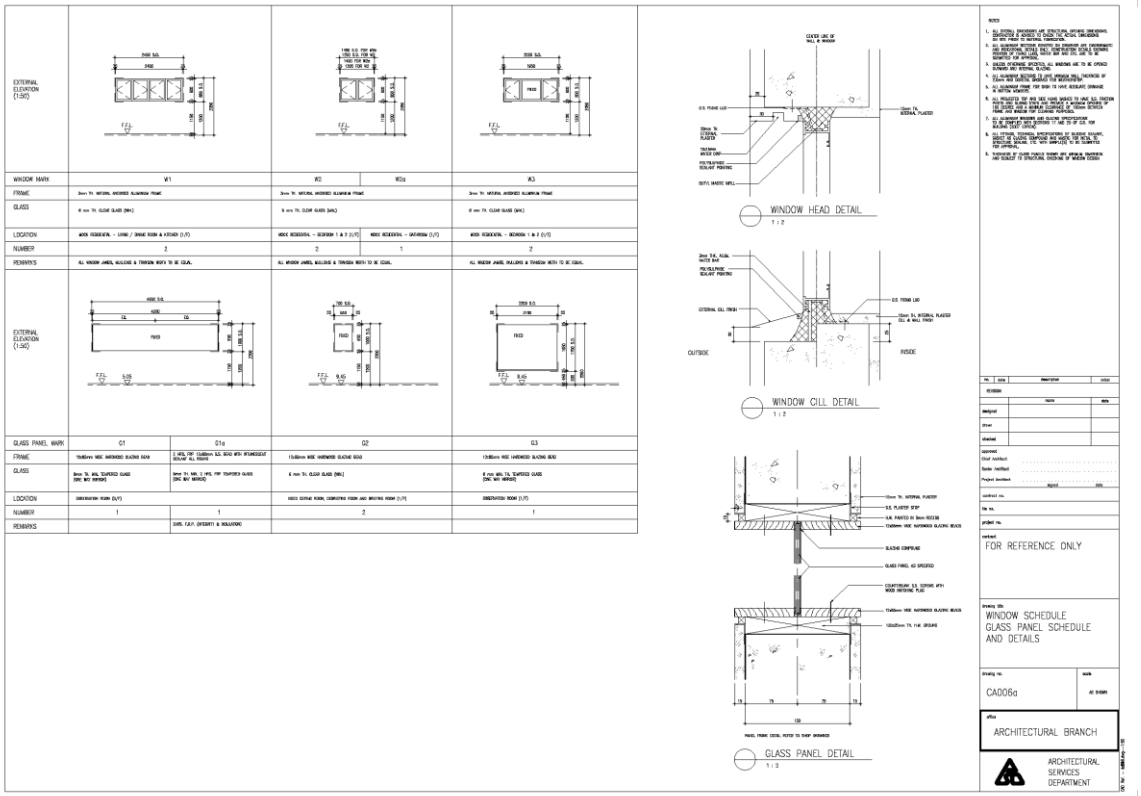
(a) Door schedules



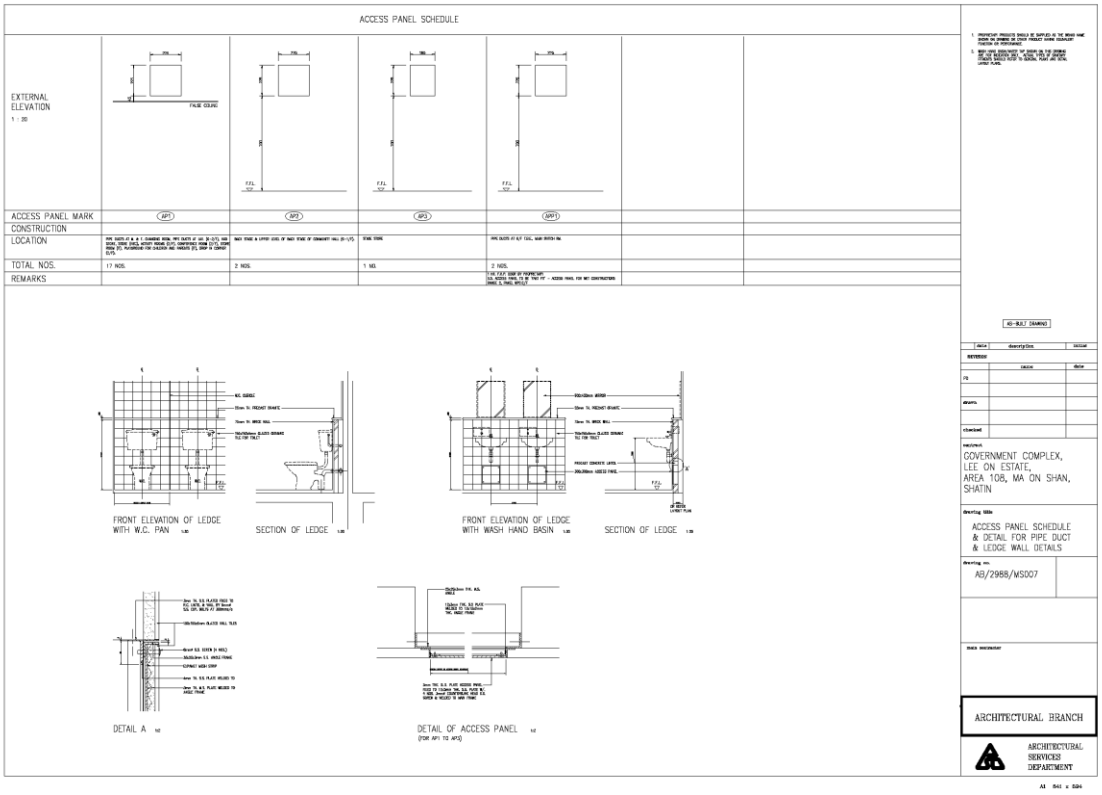

(b) Ironmongery schedules



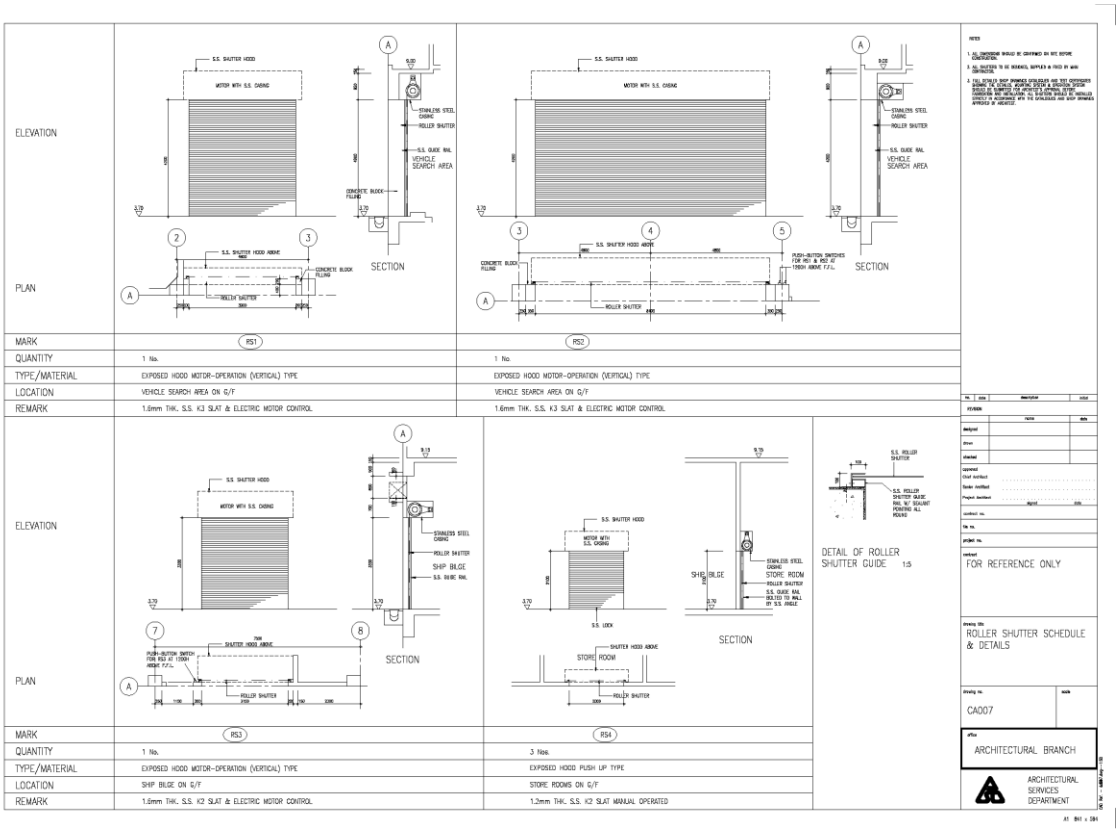
## (c) Window schedules



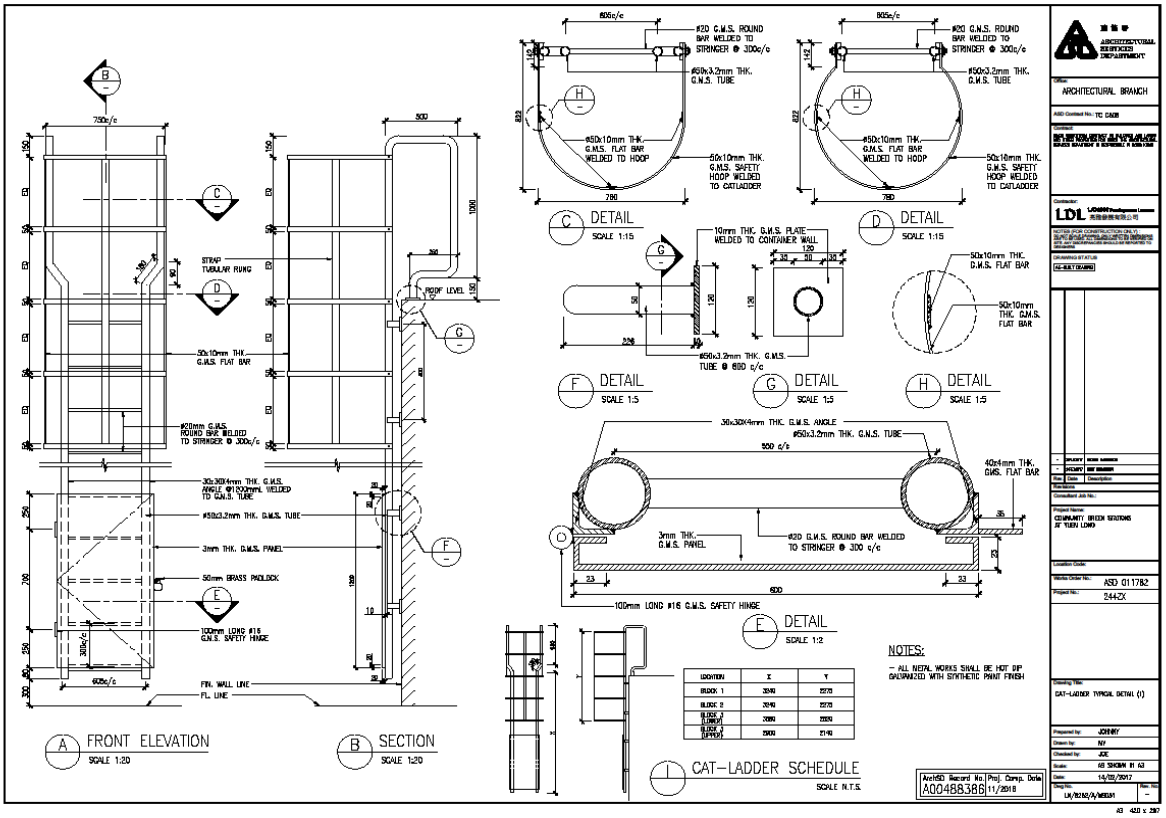

## (d) Access panel schedules



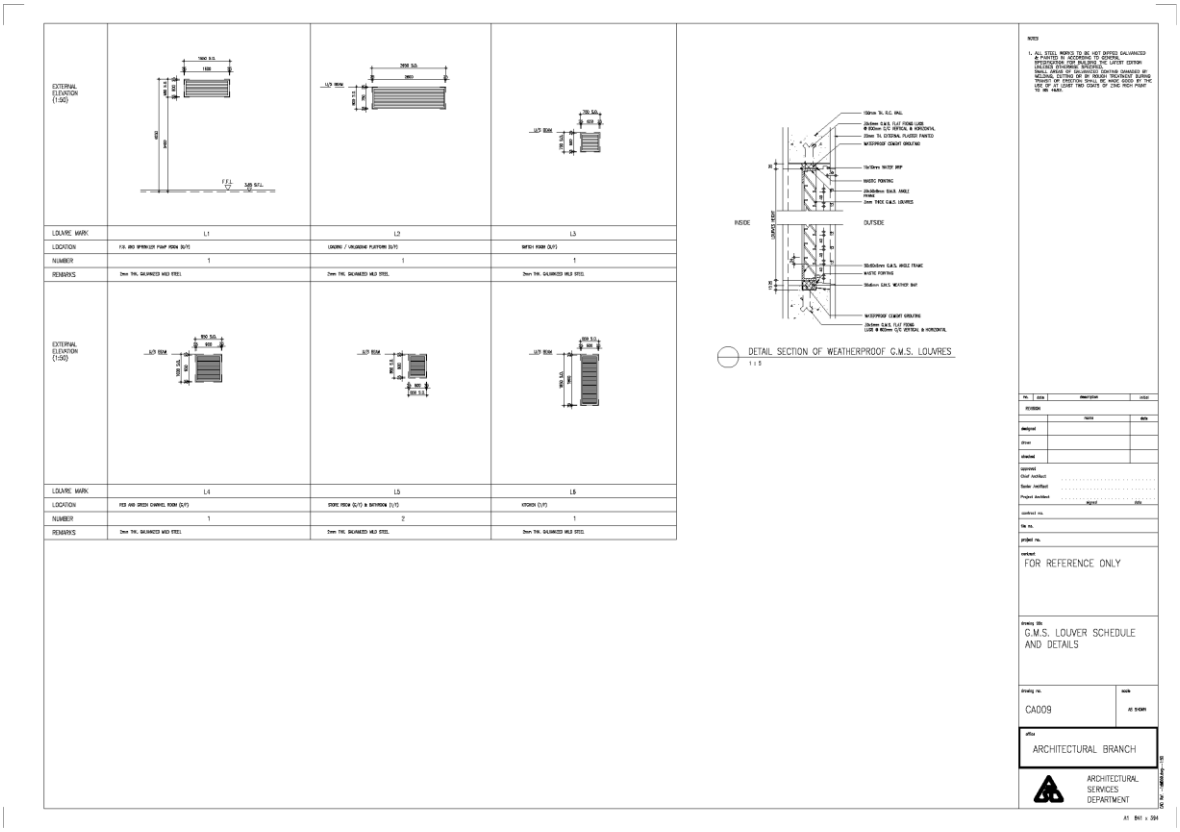
## (e) Roller shutter schedules



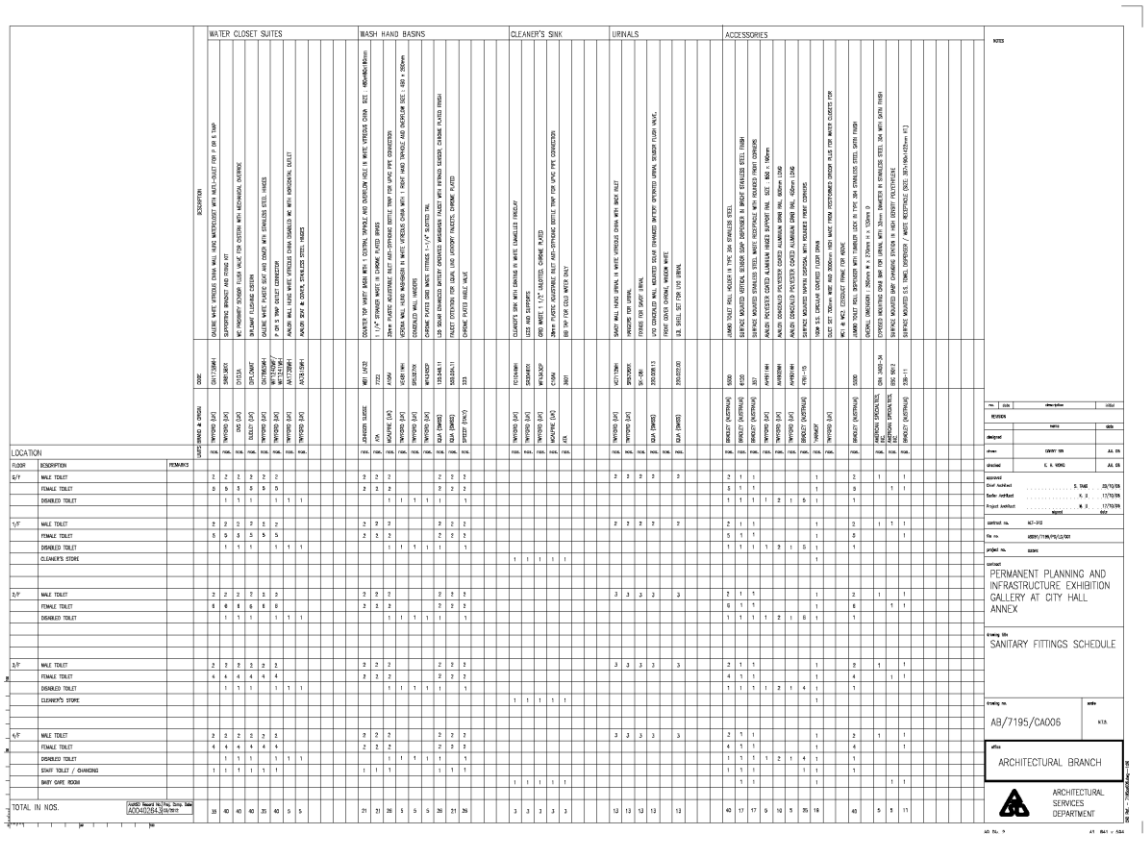

## (f) Cat ladder schedules

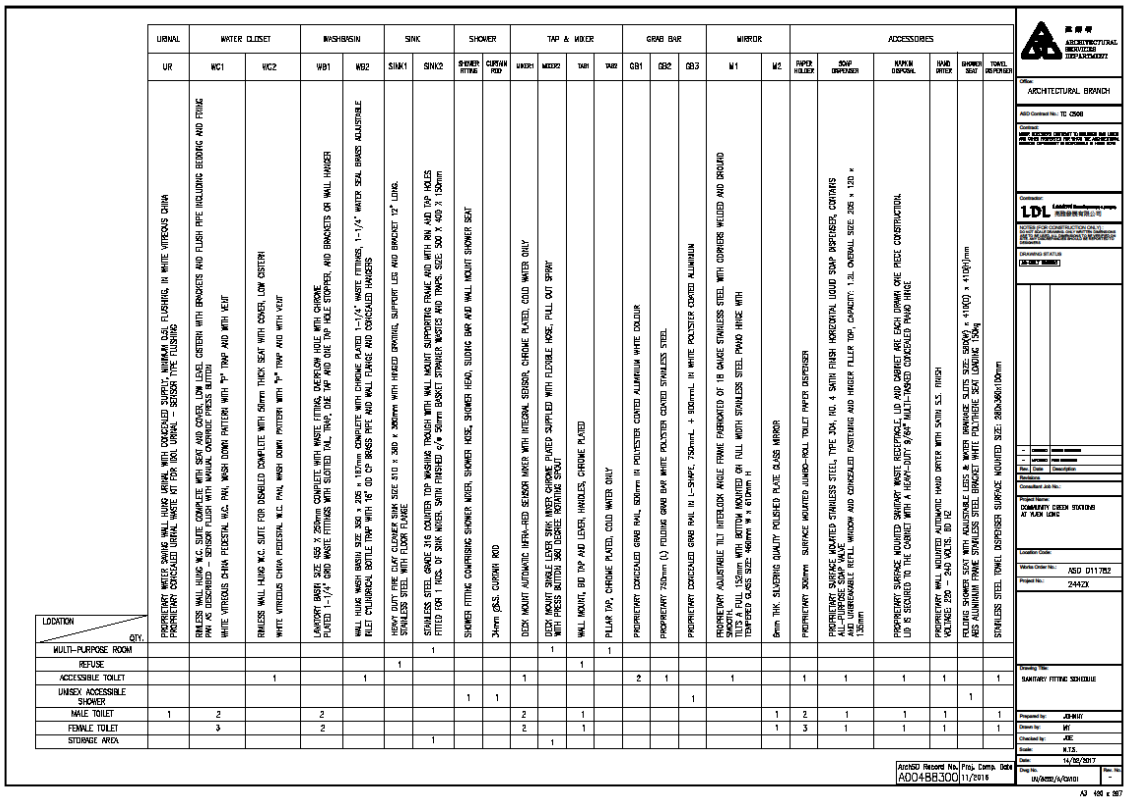


## (g) Lourve schedules




## (h) Sanitary fittings schedules

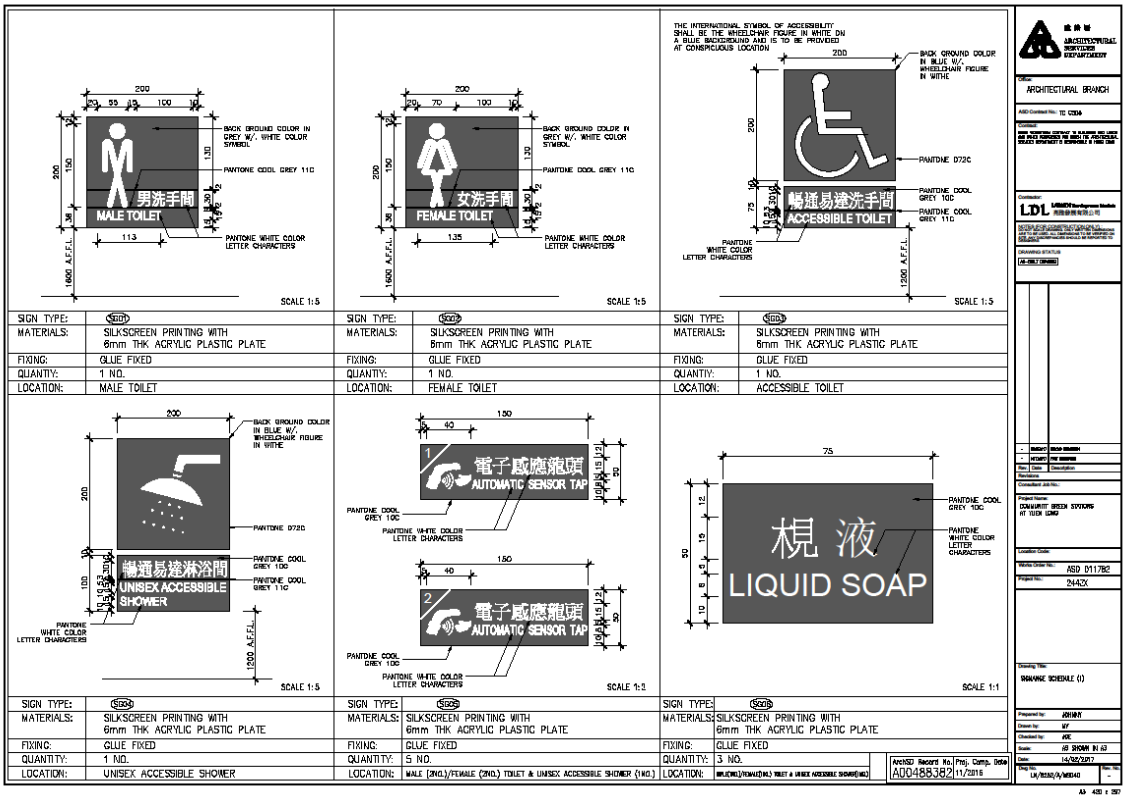




| LOCATION / QTY. | URINAL | WATER CLOSET | | WASHBASIN | | SINK | | SHOWER | | TAP & MIXER | | | | GRAB BAR | | | MIRROR | | ACCESSORIES | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | UR | WC1 | WC2 | WB1 | WB2 | SINK1 | SINK2 | SHOWER FITTING | CURTAIN ROD | MIXER1 | MIXER2 | TAP1 | TAP2 | GB1 | GB2 | GB3 | M1 | M2 | PAPER HOLDER | SOAP DISPENSER | NAPKIN DISPOSAL | HAND DRYER | SHOWER SEAT | TOWEL DISPENSER |
| | PROPRIETARY WHITE 340MM WALL HUNG URINAL WITH CONCEALED SUPPLY, INVARIABLE FLUSHING IN WHITE VITREOUS CHINA PROPRIETARY CONCEALED URINAL WASTE FITTING WITH OVERFLOW - SENSOR PIPE FLUSHING | RIMLESS WALL HUNG W.C. SUITE COMPLETE WITH SEAT AND COVER, LOW LEVEL CISTERN WITH BRACKETS AND FLUSH PIPE INCLUDING BEDDING AND FIXING PAN AS DESCRIBED – SENSOR FLUSH WITH MANUAL OVERRIDE PRESS BUTTON WHITE VITREOUS CHINA PEDESTAL W.C. PAN, WASH DOWN PATTERN WITH "P" TRAP AND WITH VEUT | RIMLESS WALL HUNG W.C. SUITE FOR DISABLED COMPLETE WITH 50mm THICK SEAT WITH COVER, LOW CISTERN WHITE VITREOUS CHINA PEDESTAL W.C. PAN, WASH DOWN PATTERN WITH "P" TRAP AND WITH VEUT | LAVATORY BASIN SIZE: 550 x 395mm COMPLETE WITH WASTE FITTING, OVERFLOW HOLE WITH CHROME PLATED 1-1/4" DIRECT WASTE FITTINGS WITH SLOTTED TAIL TRAP, ONE TAP AND ONE TAP HOLE STOPPED, AND BRACKETS OR WALL HANGER | WALL HUNG WASH BASIN SIZE: 560 x 405 x 175mm COMPLETE WITH CHROME PLATED 1-1/4" WASTE FITTINGS, 1-1/4" WATER SEAL BRASS ADJUSTABLE BOTTLE COUPLING BOTTLE TRAP WITH 16" OD CP BRASS PIPE AND WALL FLANGE AND CONCEALED HANGERS | HEAVY DUTY FIRE CLAY CLEANER SINK SIZE 610 x 360 x 305mm WITH INTEGRAL SUPPORT LEG AND BRACKET 12" LONG. STAINLESS STEEL WITH FLOOR FLANGE | STAINLESS STEEL GRADE 316 COUNTER TOP WASHING TROUGH WITH WALL MOUNT SUPPORTING FRAME AND WITH PAN AND TAP HOLES FITTED FOR 1 PCS. OF SINK MIXER, SMITH FINISHED c/w 50mm BASKET STRAINER WASTES AND TRAPS, SIZE: 1300 X 460 X 150mm | SHOWER FITTING COMPRISING SHOWER MIXER, SHOWER HOSE, SHOWER HEAD, SLIDING BAR AND WALL MOUNT SHOWER SEAT | 34mm Ø.S.S. CURTAIN ROD | DECK MOUNT AUTOMATIC INFRA-RED SENSOR MIXER WITH INTEGRAL SENSOR, CHROME PLATED, COLD WATER ONLY | DECK MOUNT SINGLE LEVER SINK MIXER CHROME PLATED SUPPLIED WITH FLEXIBLE HOSE, PULL OUT SPRAY WITH PRESS BUTTON 360 DEGREE ROTATIVE SPOUT | WALL MOUNT, BIB TAP AND LEVER, HANDLES, CHROME PLATED | PILLAR TAP, CHROME PLATED, COLD WATER ONLY | PROPRIETARY CONCEALED GRAB RAIL, 600mm (L) POLYESTER COATED ALUMINIUM WHITE COLOUR | PROPRIETARY 750mm (L) FOLDING GRAB BAR WHITE POLYESTER COATED STAINLESS STEEL | PROPRIETARY CONCEALED GRAB RAIL IN L-SHAPE, 750mmL + 300mmL IN WHITE POLYESTER COATED ALUMINIUM | PROPRIETARY ADJUSTABLE TILT ANTI-GLARE ANGLE FRAME FABRICATED OF 18 GAUGE STAINLESS STEEL WITH CORNERS WELDED AND GROUND SMOOTH, TILTED A FULL 152mm WITH BOTTOM MOUNTED ON FULL WIDTH STAINLESS STEEL PIANO HINGE WITH TEMPERED GLASS SIZE: 460mm W x 610mm H. | 6mm THK. SILVERING QUALITY POLISHED PLATE GLASS MIRROR | PROPRIETARY 360mm SURFACE MOUNTED JUMBO-ROLL TOILET PAPER DISPENSER | PROPRIETARY SURFACE MOUNTED SANITARY WASTE RECEPTACLE LID AND CABINET ARE EACH DRAWN ONE PIECE CONSTRUCTION. LID IS SECURED TO THE CABINET WITH A HEAVY-DUTY 9/64" MULTI-KNUCKLE CONCEALED PIANO HINGE | PROPRIETARY SURFACE MOUNTED AUTOMATIC INFRA-RED SENSOR TYPE SOAP DISPENSER, CONTAINS ALL-PURPOSE SOAP VALVE AND UNBREAKABLE REFILL WINDOW AND CONCEALED FASTENING AND HINGED FILLER TOP, CAPACITY: 1.2L OVERALL SIZE: 205 x 120 x 130mm | PROPRIETARY SURFACE MOUNTED SANITARY NAPKIN DISPOSAL LID AND CABINET ARE EACH DRAWN ONE PIECE CONSTRUCTION. LID IS SECURED TO THE CABINET WITH A HEAVY-DUTY 9/64" MULTI-KNUCKLE CONCEALED PIANO HINGE | PROPRIETARY WALL MOUNTED AUTOMATIC HAND DRYER WITH SATIN S.S. FINISH VOLUME: 220 ~ 240 VOLTS, 50 HZ | FOLDING SHOWER SEAT WITH ADJUSTABLE LEGS & WATER DRAINAGE SLOTS SIZE: 580(W) x 410(D) x 410(H)mm ABS ALUMINIUM FRAME STAINLESS STEEL BRACKET WHITE POLYTHENE SEAT LOADING: 150kg | STAINLESS STEEL TOWEL DISPENSER SURFACE MOUNTED SIZE: 280x360x100mm |
| MULTI-PURPOSE ROOM | | | | | | | 1 | | | | | | | | | | | | | | | | | | |
| REFUSE | | | | | | 1 | | | | | | | | | | | | | | | | | | | |
| ACCESSIBLE TOILET | | | 1 | | 1 | | | | | 1 | | | | 2 | 1 | | 1 | | 1 | 1 | 1 | 1 | | 1 | |
| UNISEX ACCESSIBLE SHOWER | | | | | | | | 1 | 1 | | | | | | | 1 | | | | | | | 1 | | |
| MALE TOILET | 1 | 2 | | 2 | | | | | | 2 | | 1 | | | | | | 1 | 2 | 1 | 1 | 1 | | 1 | |
| FEMALE TOILET | | 3 | | 2 | | | | | | 2 | | 1 | | | | | | 1 | 3 | 1 | 1 | 1 | | 1 | |
| STORAGE AREA | | | | | | | 1 | | | | 1 | | | | | | | | | | | | | | |

ArchSD Record No. A004BB300 | Proj. Comp. Date 11/2018

## (i) Signage schedules




| | MALE TOILET | FEMALE TOILET | ACCESSIBLE TOILET |
|---|---|---|---|
| SIGN TYPE: | SIGN | SIGN | SIGN |
| MATERIALS: | SILKSCREEN PRINTING WITH 8mm THK ACRYLIC PLASTIC PLATE | SILKSCREEN PRINTING WITH 8mm THK ACRYLIC PLASTIC PLATE | SILKSCREEN PRINTING WITH 8mm THK ACRYLIC PLASTIC PLATE |
| FIXING: | GLUE FIXED | GLUE FIXED | GLUE FIXED |
| QUANTITY: | 1 NO. | 1 NO. | 1 NO. |
| LOCATION: | MALE TOILET | FEMALE TOILET | ACCESSIBLE TOILET |

| | UNISEX ACCESSIBLE SHOWER | AUTOMATIC SENSOR TAP | LIQUID SOAP |
|---|---|---|---|
| SIGN TYPE: | SIGN | SIGN | SIGN |
| MATERIALS: | SILKSCREEN PRINTING WITH 6mm THK ACRYLIC PLASTIC PLATE | SILKSCREEN PRINTING WITH 6mm THK ACRYLIC PLASTIC PLATE | SILKSCREEN PRINTING WITH 6mm THK ACRYLIC PLASTIC PLATE |
| FIXING: | GLUE FIXED | GLUE FIXED | GLUE FIXED |
| QUANTITY: | 1 NO. | 2 NO. | 3 NO. |
| LOCATION: | UNISEX ACCESSIBLE SHOWER | MALE (2NO.)/FEMALE (2NO.) TOILET & UNISEX ACCESSIBLE SHOWER (1NO.) | MALE(1NO.)/FEMALE(1NO.) TOILET & UNISEX ACCESSIBLE SHOWER(1NO.) |

ArchSD Record No. A004BB382 | Proj. Comp. Date 11/2018

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.)

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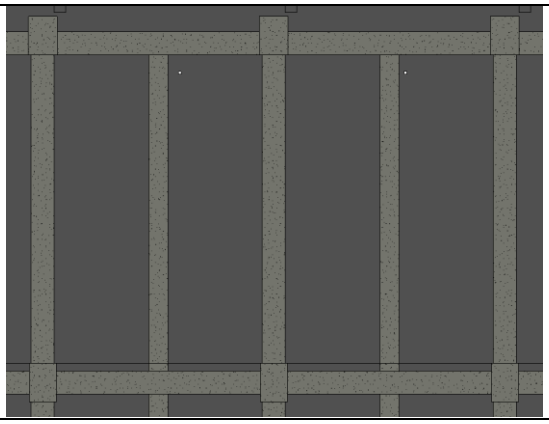
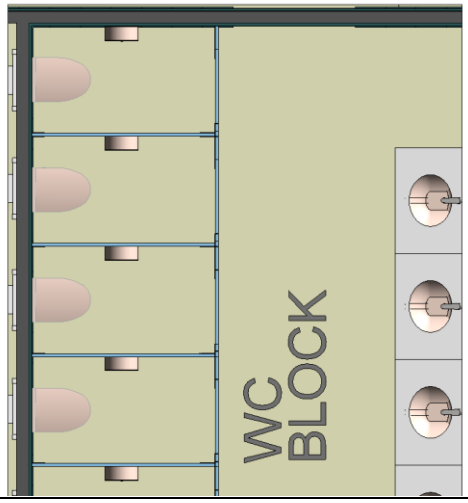
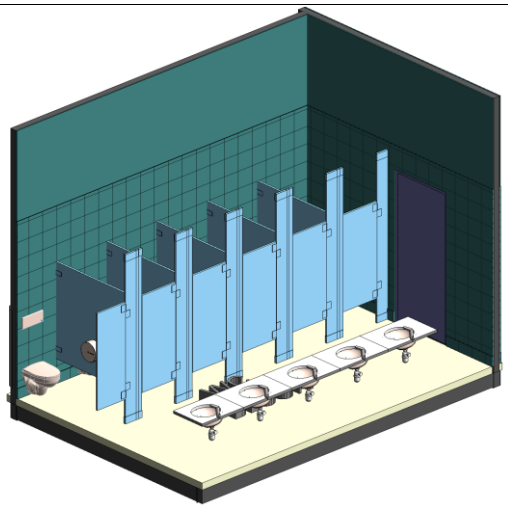
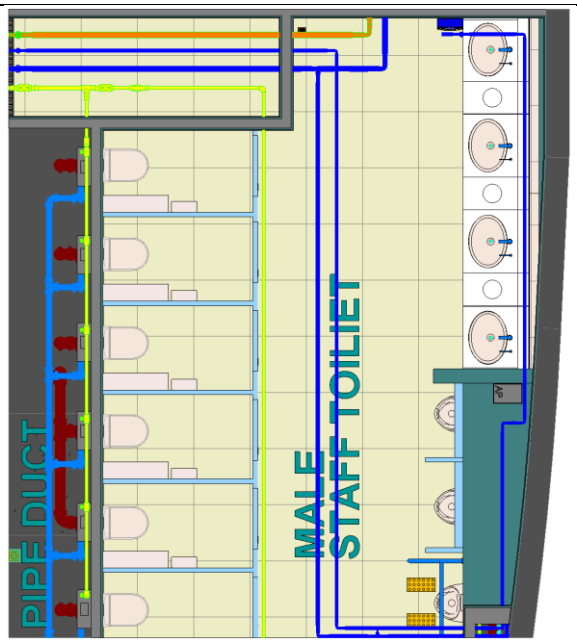
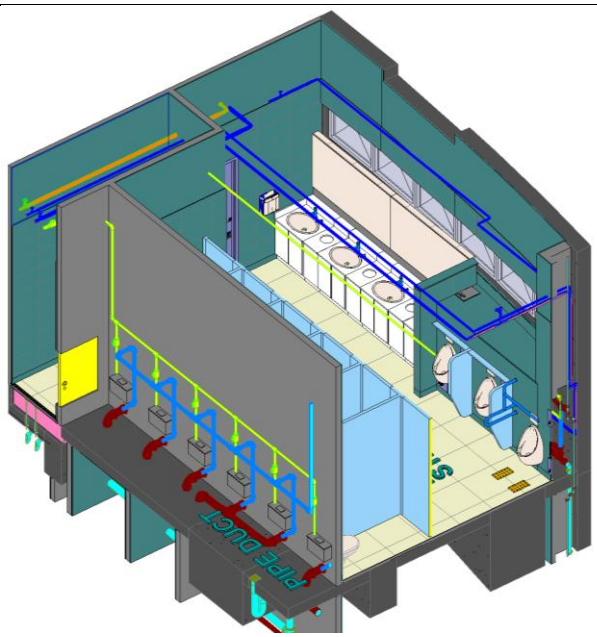
<tr><td rowspan="2">Presentation</td><td>  </td><td>  </td></tr>
<tr><td colspan="2">Example for Structural model</td></tr>
<tr><td rowspan="2">Presentation</td><td> 
</td><td>  </td></tr>
<tr><td colspan="2">Example for Architectural model</td></tr>
</table>

| | | |
|---|---|---|
| Presentation |  |  |
| | Example for MEP model | |

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

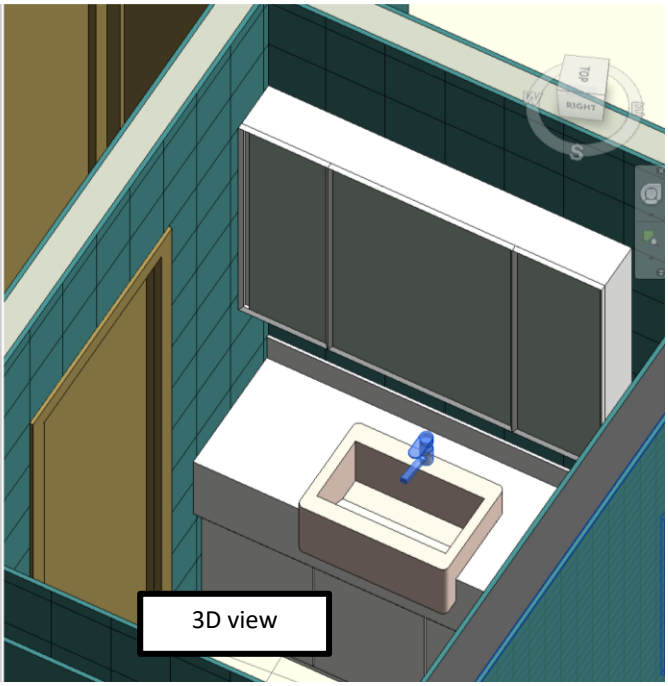
PLM-TUB-ADA-Bathroom faucet
ARC_Faucet_Bath

Plumbing Fixtures (1) | Edit Type

Constraints

Text

| | |
|---|---|
| PSB_LocCode | SY03206016097 |
| PSB_Floor | 13F |
| PSB_ElementNo | 00205 |
| PSB_Element1 | SANI |
| PSB_Sub-element1 | WB |
| PSB_Component1 | T |
| PSB_Attribute1 | NULL |
| PSB_Remarks1 | NULL |
| PSB_Manufacturer1 | NULL |
| PSB_Brand1 | NULL |
| PSB_ContractNo | NULL |
| PSB_Element_doc1 | NULL |
| PSB_Catalogue_Test_Report | NULL |
| PSB_O&M_Manual_Shop_Drawing | NULL |
| PSB_Warranty | NULL |
| PSB_Expiry_of_Warranty | NULL |
| PSB_Additional_Element | NULL |
| PSB_MWORRF_link | NULL |
| PSB_MWO_link | NULL |
| PSB_WO_link | NULL |
| PSB_Cert_Comp_Date | NULL |
| PSB_Handover_Date | NULL |
| PSB_Ins_Sch_Des | NULL |
| PSB_Ins_Interval | NULL |
| PSB_CDELevel | NULL |
| PSB_Feature | NULL |



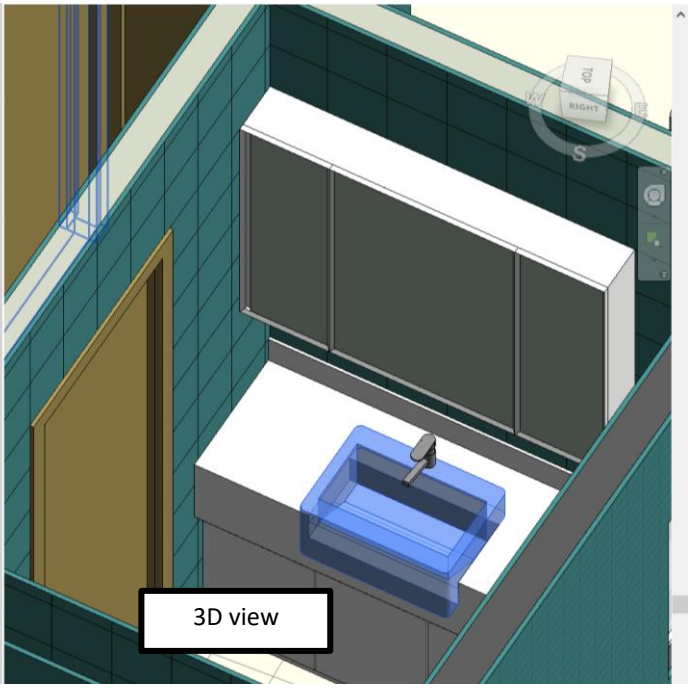

PLM-SNK-ADA-Bathroom Basin
ARC_Sink_Bath

Plumbing Fixtures (1) | Edit Type

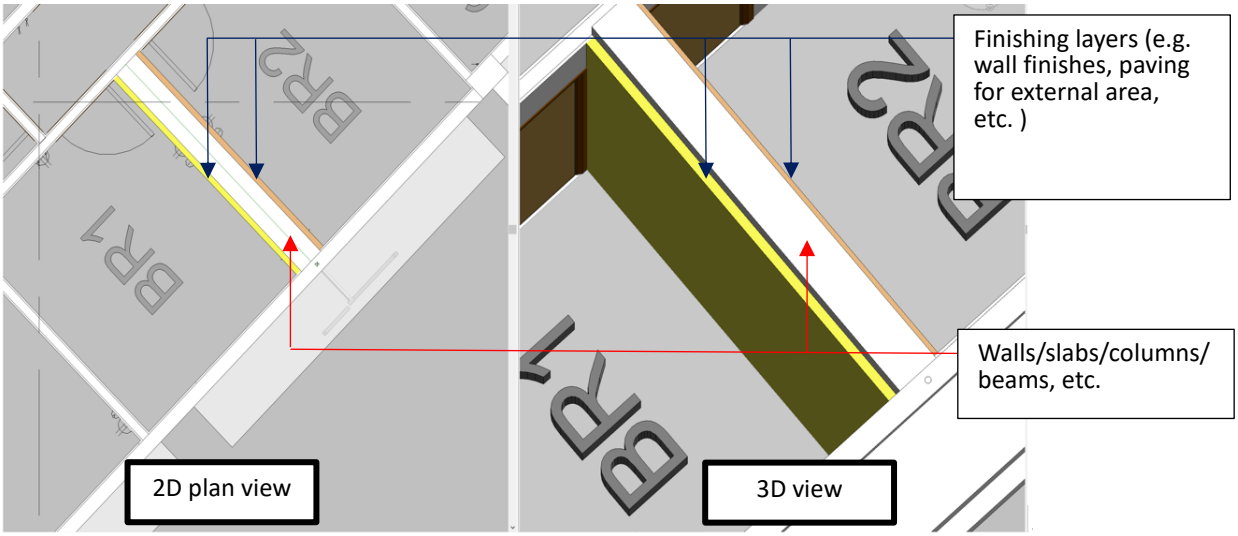
Constraints

Text

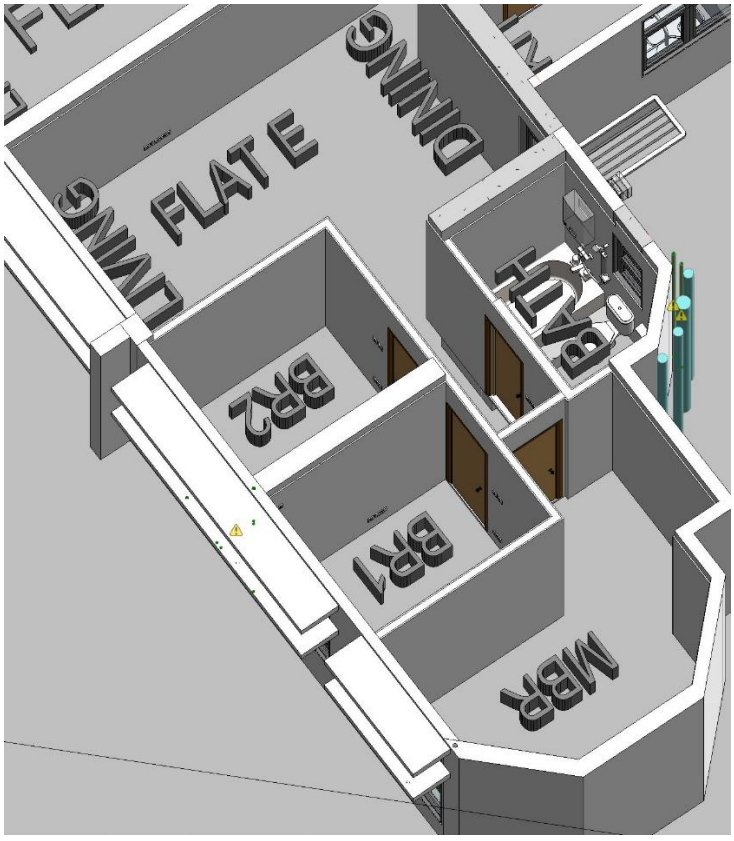
| | |
|---|---|
| PSB_LocCode | SY03206016097 |
| PSB_Floor | 13F |
| PSB_ElementNo | 00204 |
| PSB_Element1 | SANI |
| PSB_Sub-element1 | WB |
| PSB_Component1 | NULL |
| PSB_Attribute1 | NULL |
| PSB_Remarks1 | NULL |
| PSB_Manufacturer1 | NULL |
| PSB_Brand1 | NULL |
| PSB_ContractNo | NULL |
| PSB_Element_doc1 | NULL |
| PSB_Catalogue_Test_Report | NULL |
| PSB_O&M_Manual_Shop_Drawing | NULL |
| PSB_Warranty | NULL |
| PSB_Expiry_of_Warranty | NULL |
| PSB_Additional_Element | NULL |
| PSB_MWORRF_link | NULL |
| PSB_MWO_link | NULL |
| PSB_WO_link | NULL |
| PSB_Cert_Comp_Date | NULL |
| PSB_Handover_Date | NULL |
| PSB_Ins_Sch_Des | NULL |
| PSB_Ins_Interval | NULL |
| PSB_CDELevel | NULL |
| PSB_Feature | NULL |



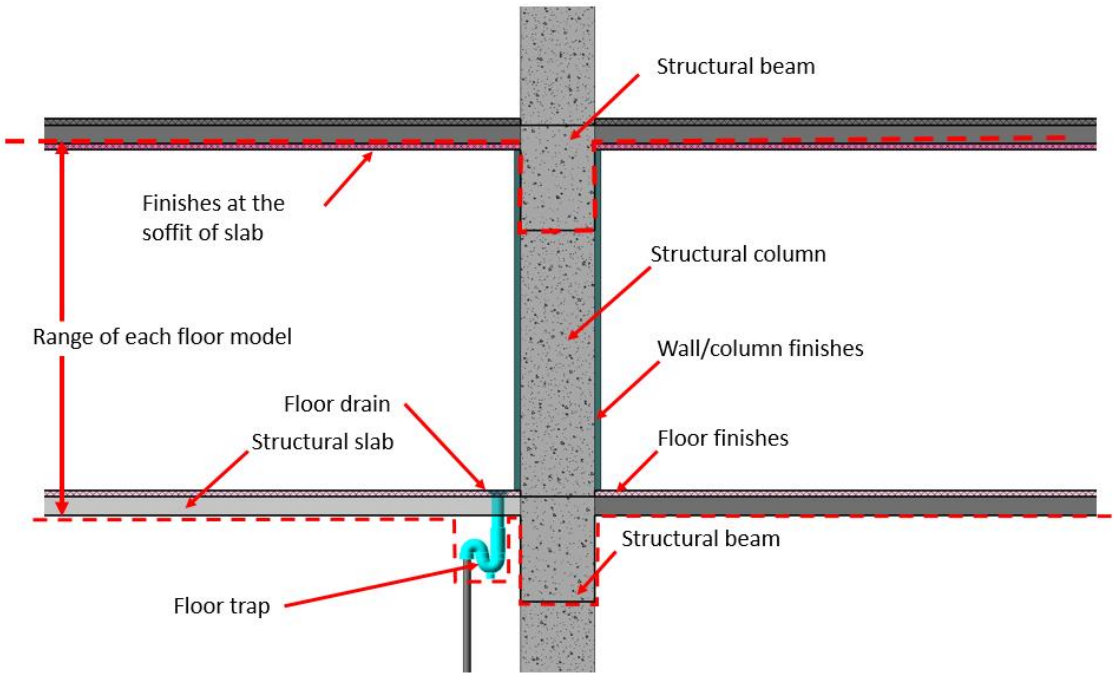
Example (C): Separation between Walls/ Slabs/ Columns/ Beams and Finishes




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 |
| 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 feathers | | 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<br>245-230-220 | 300 | 500 |
| 30 | Tap, Faucet | | 187-187-187 | 300 | 500 |
| 31 | Building maintenance unit | | Default | 300 | 500 |

*Note: Application of actual colour pattern to finishing layer may be considered subject to further agreement of PSB Project Team.

## 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 |