Building Information Modelling (BIM) Guide for Structural Engineering

(Version 1.0)

Structural Engineering Branch
Architectural Services Department

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1 Introduction

With the implementation of *DEVB Technical Circular (Works) No. 18/2018 - Adoption of Building Information Modelling for Capital Works Projects in Hong Kong* on 27 December 2018, this guide aims to achieve the following objectives for delivering projects in ArchSD adopting BIM in relation to Structural Engineering discipline.

- To standardize the settings and configurations of BIM structural model
- To facilitate a more standardized output with high quality
- To outline the procedures for using BIM software to prepare a BIM structural model
- To facilitate the production of common set of BIM objects

The primary purpose of this Guide is to provide a common reference on the adoption of BIM for structural engineering in projects undertaken by the Structural Engineering Branch of the Architectural Services Department.

2 Folder Structure and Naming Convention

2.1 Project Folder Structure

- [Project Folder]
  - BIM
    - 01_Working
      - 01_CAD
      - 02_BIM_Model
      - 03_Presentation
        - 01_PQDVC_1
        - 02_PQDVC_2
      - 04_Analytical_Model
      - 05_Project_Objects
    - 02_Shared_Issued
      - 01_AB
        - 01_CAD
        - 02_BIM_Model
        - 03_PDF
      - 02_SE
        - 01_CAD
        - 02_BIM_Model
        - 03_PDF
      - 03_BS
        - 01_CAD
        - 02_BIM_Model
        - 03_PDF
    - 03_Published_Archived
      - 01_ Presentation
        - 01_PQDVC_1
        - 02_PQDVC_2

- 02_SCU_Submission
- 03_Tender
- 04_As_Built

- 04_Incoming
  - 01_Design_consultants
  - 02_Contractor
  - 03_Client

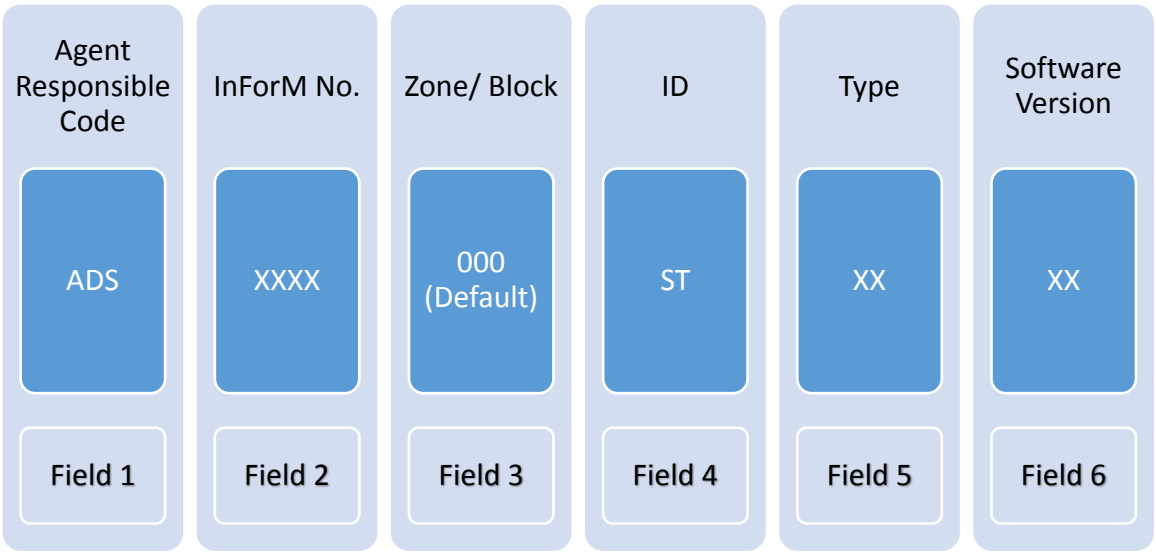
- 05_Resource
  - 01_Shared_Parameters
  - 02_Project_Template

- 06_Document
  - 01_Project_Requirement
  - 02_Progress_Report
  - 03_Contract
  - + 04_Meeting_Notes
  - + 05_Documentation
  - + 06_Photo

2.2 Naming Convention

2.2.1 Model File Naming

16 characters in 6 fields plus version with "-" separation.



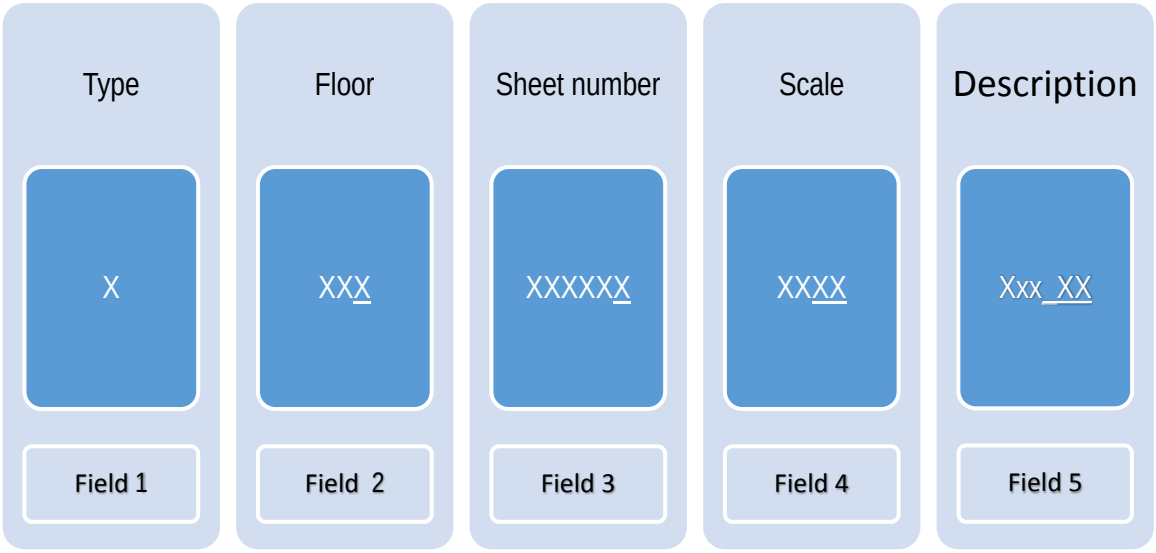
Items	Content
Field 1 (3 characters)	Agent Responsible Code "ADS" stand for Architectural Services Department, Structural Engineer Branch
Field 2 (4 characters)	InForM No. (Project Number)
Field 3 (3 characters)	Zoning / block Required if project is subdivided by zone or block (default=000)
Field 4 (2 characters)	ID (i.e. discipline) "ST" stand for Structural Engineer
Field 5 (2 characters)	Type: MO for Model SH for Framing Plan AW for All Works (i.e. Combined with Model and Drawing)
Field 6 (2 characters)	Software Version 16 for version 2016

Example:

ADS-8282-000-ST-MO-16 for backup model file of project with InForM No. 8282
ADS-8216-BKA-ST-AW-18 for combined file (model and drawings) of block A in project with InForM No. 8216

2.2.2 View Naming

5~14+ characters in 5 fields with "-" separation.



Items	Content
Field 1 (1 character)	Type of view P = Plan S = Section E = Elevation D = Detail I = Isometric 3 = 3D View
Field 2 (2~3 characters)	Particular name of floor (abbreviation defined as follows) KE = Key/ Location Plan SI = Site Plan GF = Ground Floor MF = Mezzanine Floor 01-99 for 1st to 99th Floor RF = Roof UR = Upper Roof LR = Lower Roof UG = Upper Ground Floor LG = Lower Ground Floor LG2 = Lower Ground Floor 2 B0 = Basement B1 = Basement Level 1 P0 = Podium Level P1 = Podium Level 1 C0 = Carpark Level C1 = Carpark Level 1 00 = Unspecified Floor
Field 3 (1/5-6 characters)	Sheet number where applicable and Revision status (use # instead if no specific sheet number)
Field 4 (1~4 characters)	Scale 100 for 1:100, 50 for 1:50, 20 for 1:20, ……etc.
Field 5	Descriptions Divide into two parts: - Part 1: General Description of View - Part 2 (optional) : Suffix for Relational View only ("_PV" for the Primary View with dependant View , "_DV" for Dependant View)

This field indicates that the model file is substituted by a revised version file and to be stored in the "revision" folder, i.e. the current model file does not contain this field.

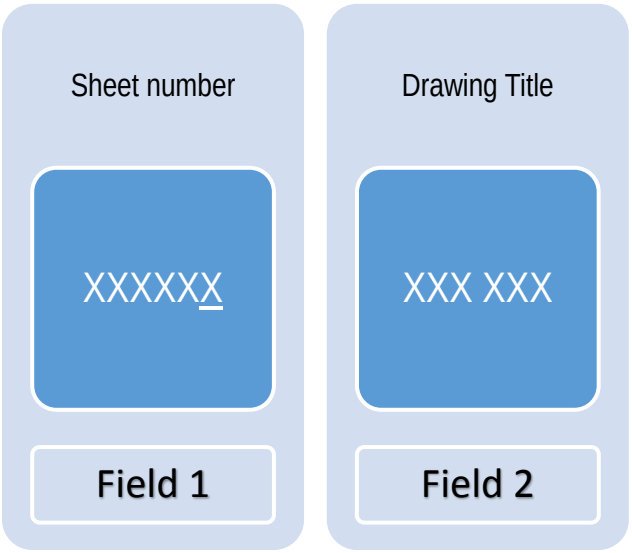
Using symbol "#" to represent not applicable on specific field.

Example:

Foundation plan	P-FN-FP002-50-GT
Block 1 Roof (version A)	P-RF-FP003A-100-B1
Shelter 1 section	S-GF-FP008-100-S1
Shelter 1 joint detail	D-GF-FP008-10-S1_DetailA1
Trellis temp section	S-GF-#-10-Trellis
Foundation part plan in model file (parent)	P-FN-#-100-Part_plan_PV
Foundation part plan in sheet file (dependent)	P-FN-FP002-100-Part_plan_DV

2.2.3 Sheet Naming

5/6+ characters in 2 fields with "-" separation (content will be automatically updated according to the Title Block information).



Items	Content
Field 1 (5/6 characters)	Sheet number (i.e. Drawing Number) Character for revision to be added at the end
Field 2	Title on Sheet (i.e. Drawing Title)

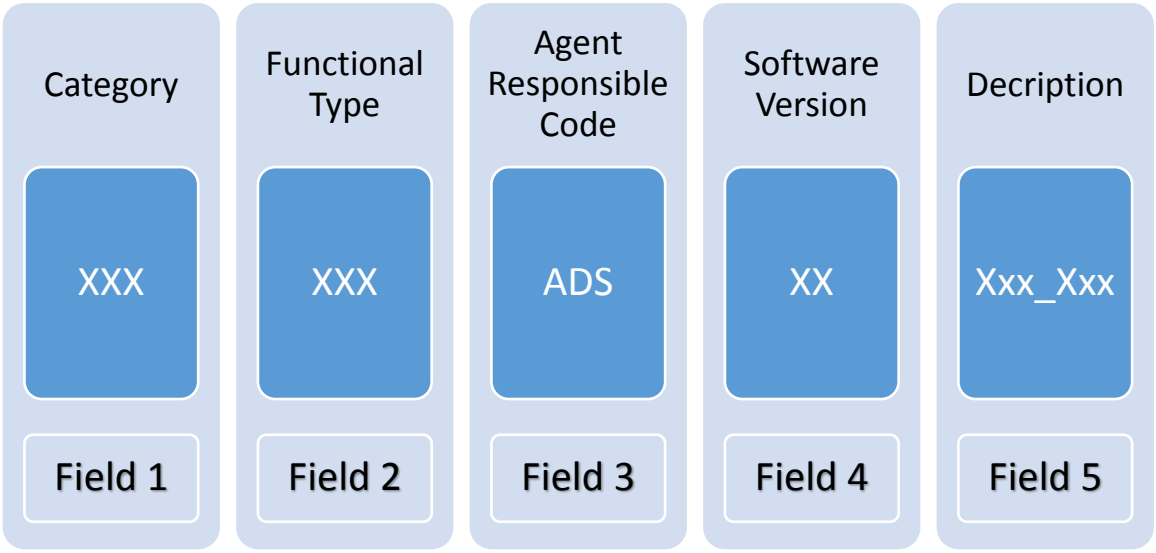
Example:

FP001-GROUND FLOOR PLAN

FP002A-FIRST FLOOR PLAN

2.2.4 Object Naming

11+ characters in 5 fields with "-" separation.



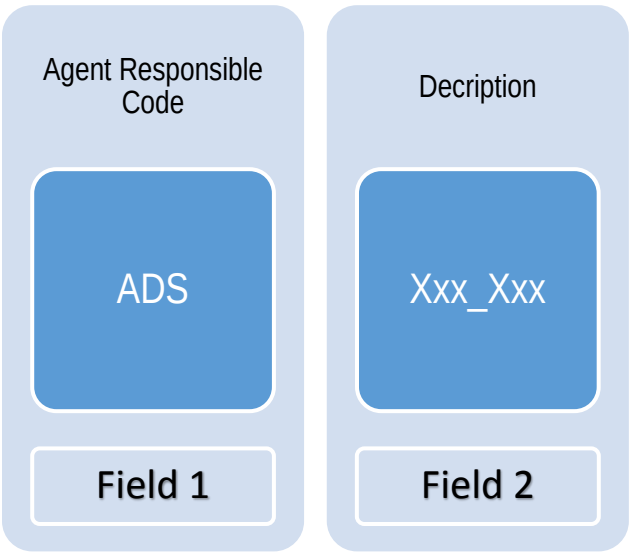
Items	Content
Field 1 (3 characters)	Category of Object / Element Category: ANN for Annotation SCL for Structural Column SCO for Structural Connection (for Steel Component) SFN for Structural Foundation SBM for Structural Framing (i.e. Beam Member) STF for Structural Stiffener (for Steel Component) STR for Structural Truss (for Steel Component) GMD for Generic Model MAS for Conceptual Massing (for Massing & Site Object) WAL for Wall
Field 2 (3 characters)	Functional type under previous category Type: SYM for Symbol (under ANN) DTL for Detail item (under ANN) TAG for Annotation tag (under ANN) TBK for Title Block (under ANN) CON for Concrete (under SCL/SFN/SBM/MAS) STE for Steel (Under SCL/SCO/SBM/STF/STR) OTH for Materials other than concrete/steel (under GMD/MAS)
Field 3 (3 characters)	Agent Responsible Code "ADS" stand for Architectural Services Department, Structural Engineer Branch
Field 4 (2 characters)	Software Version "16" for version 2016
Field 5	Descriptions

Example:

ANN-SYM-ADS-15-Circular_Break_Line	for Annotation item-Circular break line
ANN-TBK-ADS-18-B1_Vertical	for B1 size title block (vertical)
SFN-CON-ADS-16-3pile_Rectangular_Pilecap	for Rectangular foundation with 3 piles
SBM-STE-ADS-17-Tapered_Tbeam	for Steel tapered T-section beam
SCO-STE-ADS-17-Bracing_Tie_Connection	for Steel connection of bracing

2.2.5 Type Naming

Custom type naming of object should start with "ADS-", unless such use is for presentation on sheets (for example on structural framing, wall, column, floor and foundation drawings). Details shown as below:



An example on type properties of object:

A type "ADS-Grid" is customized for the Grid Style Object.

2.2.6 Shared Parameters Naming

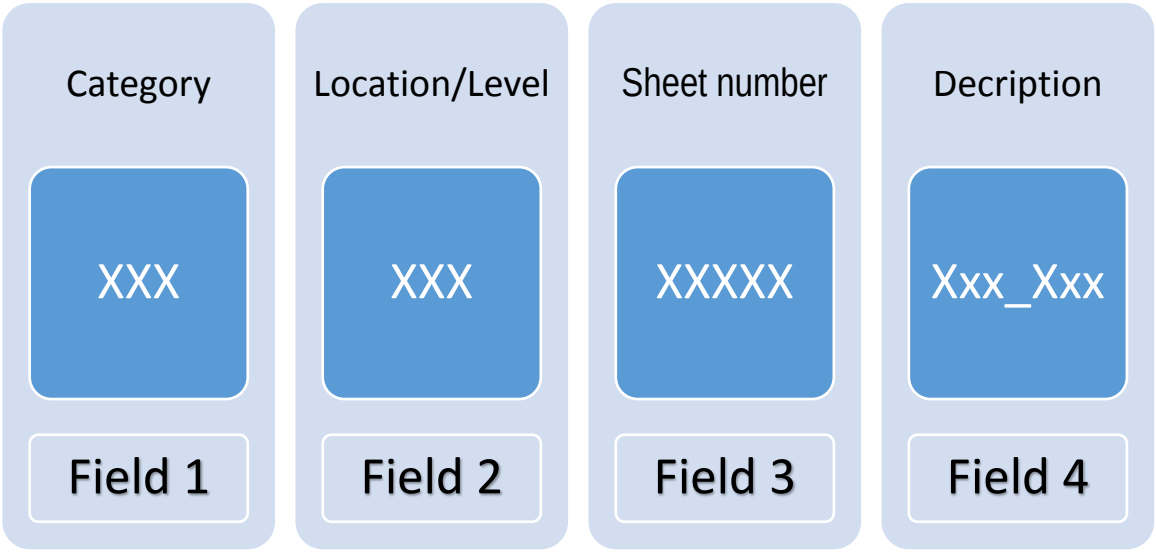
All custom shared parameter group naming should start with "ADS-" and shared parameter naming should start with "s".

2.2.7 Instance Parameters Naming

Custom instance parameters should start with "z" as shown below:

2.2.8 Schedule Naming

11+ characters in 4 fields with "-" separation.



Items	Content
Field 1 (3 characters)	Category of Object / Element Category: ANN for Annotation FLO for Floor SCL for Structural Column SCO for Structural Connection (for Steel Component) SFN for Structural Foundation SBM for Structural Framing (i.e. Beam Member) STF for Structural Stiffener (for Steel Component) STR for Structural Truss (for Steel Component) GMD for Generic Model MAS for Conceptual Massing (for Massing & Site Object) WAL for Wall VIE for Views SHE for Sheets
Field 2 (3 characters)	Location/Level Required if project is subdivided by specific location/level (default=000)
Field 3 (5 characters)	Sheet number Specific sheet number of schedule show (use # instead if no specific sheet number)
Field 4	Descriptions Any descriptions about the schedule such as purpose (e.g. for measurement of QS), properties (fields, sorting, filter, etc…)

Example:

SBM-LG1-FP007-Zone_A	for Structural framing schedule on zone A of LG1/F
SBM-GFB-#-Sort_By_Mark	for Structural framing schedule on zone B of G/F

3 Basic Model settings

3.1 Project Units (Precision for modelling)

Project Units shall be set as below:

Units	Format
Length	mm in 3 decimal places
Area	m^2 in 2 decimal places
Volume	m^3 in 2 decimal places
Angle	degree in 3 decimal places
Slope	degree in 3 decimal places
Mass Density	Kg/m^3 in 2 decimal places

3.2 Location

The location of city should be set as Hong Kong, China (i.e. Latitude: 22.2833°; Longitude: 114.15°)

3.3 Level Head Style

Specific properties of level should be set as below:

Parameter	Value
Line Weight	1
Colour	RBG 127-127-127
Line Pattern	ADS-CenterLine
Information to be included	Name & Elevation of Level
Text Height	2 mm

3.4 Grid Style

Specific properties of grid should be set as below:

Parameter	Value
Line Weight	1
Colour	RBG 127-127-127
Line Pattern	ADS-CenterLine
Information to be included	Name of Grid
Text Height	5 mm

3.5 Line weight

Basically, 6 numbers of Model Line Weights should be set in SEB's project as shown below:

Line 1: 0.13mm	Grid
Line 2: 0.18mm	Dimension, Drawing symbols in varies sizes (thin) and Hatching
Line 3: 0.25mm	Drawing sheet outline, Symbol insertion, Member outline and hidden outline
Line 4: 0.35mm	Member sectional outline, Drawing symbols in varies sizes (medium) and Steelwork outline in framing
Line 5: 0.5mm	Drawing symbols in varies sizes (thick)
Line 6: 0.7mm	Site boundary line
Line 7: 1.0mm	For layer imported from AutoCAD drawing
Line 8: 2.0mm	For layer imported from AutoCAD drawing

3.6 Line Pattern

3 types of line pattern will be created, i.e. Hidden, Hidden_R and Center line.

Example of settings about ADS-Hidden, ADS-Hidden_R and ADS-CenterLine are shown below:

a) ADS-Hidden

	Type	Value
1	Dash	2.5 mm
2	Space	1.25 mm

b) ADS-Hidden_R

	Type	Value
1	Dash	7.5 mm
2	Space	3.75 mm

c) ADS-CenterLine

	Type	Value
1	Dash	12.5 mm
2	Space	2.5 mm
3	Dash	2.5 mm
4	Space	2.5 mm

3.7 Line Style

The line styles are suggested to be created for detail:

Category	Line Weight Projection	Line Color	RGB Reference	Line Pattern
ADS020__	1		101-101-101	ADS-CenterLine
ADS050__	3		127-063-063	Solid
ADS0501_	2		165-145-082	Solid
ADS0502_	4		165-082-103	Solid
ADS0503_	5		145-165-082	Solid
ADS060__	2		102-102-102	Solid
ADS080__	3		255-000-000	Solid
ADS280__	3		095-063-127	Solid
ADS280_B	3		000-255-191	ADS-Hidden
ADS280_C	4		165-124-000	Solid
ADS280_H	3		000-124-165	ADS-Hidden
ADS280_S	4		255-127-223	Solid
ADS292__	4		159-255-127	Solid
ADS292_B	4		082-165-165	Solid
ADS292_C	4		255-255-127	Solid
ADS294__	3		127-255-159	Solid
ADS294_H	3		127-191-255	ADS-Hidden
ADS294_S	4		255-000-255	Solid
ADS2941_	4		159-127-255	Solid
ADS2941S	4		255-127-191	Solid
ADS2942_	3		191-255-127	Solid
ADS2943_	3		063-255-000	Solid

3.8 Arrowhead Style for Text and Dimension Settings

Arrowhead may be set as below:

a) For leader of Text

Parameter	Value
Style	Arrow
Arrow Width Angle	19°
Tick Size	2 mm

b) For dimension

Parameter	Value
Style	Diagonal
Tick Size	2 mm

3.9 Text Assignment and Style

All text shall be assigned as per the following table:

Type Name	Height	Font Name	Width Factor	Colour	RGB Ref.
ADS-2.00-ArialNarrow	2.00 mm	Arial Narrow	1.0		000-127-255
ADS-2.50-ArialNarrow	2.50 mm	Arial Narrow	1.0		217-000-217
ADS-3.50-ArialNarrow	3.50 mm	Arial Narrow	1.0		233-079-000
ADS-5.00-ArialNarrow	5.00 mm	Arial Narrow	1.0		000-159-063
ADS-3.00-MingLiU-Chinese	3.00 mm	MingLiU (細明體)	1.0		000-000-000
ADS-3.75-MingLiU-Chinese	3.75 mm	MingLiU (細明體)	1.0		000-000-000
ADS-5.25-MingLiU-Chinese	5.25 mm	MingLiU (細明體)	1.0		000-000-000

The line weight for all leader of text should be set as 3.

Text sizes are recommended for the following typical applications:

Application	English	Chinese
	Height	Height
Titles, numbering	5.00 mm	5.25 mm
	3.50 mm*	3.75 mm*
Names of rooms, key descriptions	3.50 mm	3.75 mm
	2.50 mm	3.00 mm
Dimensions, notes, descriptions	2.00 mm	3.00 mm

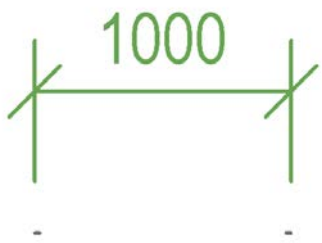
* Recommended for A3 and A4 size drawings only.

3.10 Dimensioning Style

For dimensioning style, settings for angular, radial and diameter are similar to linear dimension style as below table:

Parameter	Value
Tick Mark	Arrowhead style for Dimension to be applied
Line Weight	2
Tick Mark Line Weight	2
Witness Line Gap to Element	2.0 mm
Witness Line Extension	2.0 mm
Centerline Symbol	None (Duplicate dimension type if need)
Color	RGB 103-165-082
Width Factor	1.0
Text Size	2.0 mm
Text Offset	0.38 mm
Text Font	Arial Narrow
Units Format	No decimal

Example:



3.11 Fill patterns

One custom fill pattern for Drafting should be added as below.

Line angle	45°
Line spacing	0.625 mm
Pattern	Parallel lines

3.12 Filled region

Two filled region should be set as below:

Type	Fill Pattern
Filled region for Weld Section	Solid fill for drafting
Filled region for Fillet Weld	Fill pattern added in Section 3.11

3.13 Revision Cloud

The numbering of revision should be alphanumeric and the arc length of cloud should be 10.

3.14 Phasing

Graphic setting of phasing for existing status should be halftone where applicable.

3.15 Object style (Layer Coding System)

Object style in BIM may be set according to Layer Coding System in *CAD Manual for ArchSD Projects*, some major principles are show below:

3.15.1 Model objects:

Lines (Include all sub-elements)	Line weight* (Projection)	Line weight* (Cut)	Line Colour	RGB Reference
Detail Items	4	-		000-127-255
├ Heavy Lines	5	-		127-000-127
├ Hidden Lines	3	-		000-124-165
├ Light Lines	2	-		000-091-000
└ Medium Lines	3	-		191-063-000
Floors	3	4		255-127-255
Generic Models	3	3		191-191-191
Mass	3	4		175-175-175
Ramps	3	4		000-191-000
Stairs	3	4		239-063-031
Structural Columns	4#	4		255-095-015
Structural Connections	3	4		079-127-063
Structural Foundation	3	4		127-079-255
Structural Framing	3	4		000-191-000
Structural Rebar	3	4		255-000-000
Structural Trusses	3	4		047-207-127
Walls	4#	4		127-000-255

*Details of line width control refer to line weight settings.

#Line weight to be set to 3 for elements shown on Section View.

3.15.2 Annotation Objects:

Some annotation objects (e.g. Callout, Grid, Level Head, Revision Cloud, Section Line & Mark and Title Block) can be defined in object style and should be refer to Layer Coding System in *CAD Manual for ArchSD Projects*. Details are shown below:

Category	Line Weight Projection	Line Color	RGB Reference	Line Pattern
Callout Boundary	4		165-082-103	Solid
└ Callout Leader Line	4		165-082-103	Solid
Callout Heads	4		165-082-103	Solid
Generic Annotations	4		233-079-000	Solid
├ ADS-0.20	2		000-127-255	Solid
└ ADS-0.35	4		233-079-000	Solid
Generic Model Tags	3		000-091-000	Solid
Grid Heads	1		127-127-127	Solid
Guide Grid	1		127-127-127	Solid
Level Heads	4		000-000-255	Solid
Mass Tags	3		000-091-000	Solid
Multi-Category Tags	3		000-091-000	Solid
Revision Cloud Tags	3		255-000-000	Solid
Revision Clouds	2		255-000-000	Solid
Schedule Graphics	4		165-082-103	Solid
Section Line	4		145-165-082	Solid
└ Broken Section Line	4		145-165-082	Solid
Section Marks	4		000-000-000	Solid
├ Medium Lines	4		000-000-000	Solid
├ Thin Lines	2		000-000-000	Solid
└ Wide Lines	5		000-000-000	Solid
Span Direction Symbol	4		165-082-103	Solid
Spot Elevation Symbols	4		165-082-103	Solid
Stair Run Tags	3		000-091-000	Solid
Stair Support Tags	3		000-091-000	Solid
Stair Tags	3		000-091-000	Solid
Stair Tread/Riser Numbers	1		165-082-103	Solid
Structural Column Tags	3		000-000-255	Solid
Structural Foundation Tags	3		000-000-255	Solid
Structural Framing Tags	3		000-091-000	Solid
Title Blocks	3		063-127-127	Solid
├ Dot Line	2		063-127-127	Solid
├ Dotted Line	1		063-127-127	Solid
├ Medium Lines	3		063-127-127	Solid
├ Thin Lines	1		063-127-127	Solid
└ Wide Lines	3		063-127-127	Solid
View Reference	3		000-091-000	Solid
View Titles	3		127-000-127	Solid
Wall Tags	1		000-000-255	Solid

3.15.3 Imported Objects

An example for imported layer from 2D drawing AutoCAD to BIM Model:

Category	Line Weight Projection	Line Color	RGB Reference	Line Pattern
ADS010__	3		063-127-127	Solid
ADS020__	1		101-101-101	ADS-CenterLine
ADS030__	2		103-165-082	Solid
ADS050__	3		127-063-063	Solid
ADS060__	2		102-102-102	Solid
ADS080__	3		255-000-000	Solid
ADS280__	3		095-063-127	Solid
ADS280_B	3		000-255-191	ADS-Hidden
ADS280_C	4		162-124-000	Solid
ADS280_H	3		000-124-165	ADS-Hidden
ADS280_S	4		255-127-223	Solid
ADS291__	5		191-255-000	Solid
ADS291_T	3		127-159-255	Solid
ADS292__	4		159-255-127	Solid
ADS292_B	4		082-165-165	Solid
ADS292_C	4		255-255-127	Solid
ADS292__	3		127-255-159	Solid
ADS294_H	3		127-191-255	ADS-Hidden
ADS294_S	4		255-000-255	Solid
ADS294_T	3		255-223-127	Solid
ADS0501_	2		165-145-082	Solid
ADS0502_	4		165-082-103	Solid
ADS0503_	5		145-165-082	Solid
ADS2941_	4		159-127-255	Solid
ADS2941S	4		255-127-191	Solid
ADS2942_	3		191-255-127	Solid
ADS2943_	3		063-255-000	Solid
ADS04011	3		255-223-127	Solid
ADS04012	3		223-255-127	Solid
ADS04013	4		255-127-159	Solid
ADS04014	5		255-255-000	Solid
ADS04015	6		165-082-000	Solid
ADS04016	7		255-159-127	Solid
ADS04017	8		124-165-000	Solid
ADS04021	3		255-223-127	Solid
ADS04022	3		223-255-127	Solid
ADS04023	4		255-127-159	Solid
ADS04024	5		255-255-000	Solid
ADS04025	6		165-082-000	Solid
ADS04026	7		255-159-127	Solid
ADS04027	8		124-165-000	Solid

3.16 3D colour scheme

A colour scheme for 3D views:

Categories	Colour	RGB reference	Pattern	Transparency
Floors		143-143-079	Solid Fill	5%
Generic Models		127-127-127	Solid Fill	-
Mass		063-063-063	Solid Fill	5%
Ramp		000-111-000	Solid Fill	5%
Stairs		063-191-191	Solid Fill	-
Structural Columns		255-159-047	Solid Fill	-
Structural Foundations		175-143-239	Solid Fill	-
Structural Framing		127-233-175	Solid Fill	-
Structural Rebar		255-255-000	Solid Fill	-
Walls		047-047-159	Solid Fill	5%

3.17 Project Information

Project Information can be identified as two types of parameter, i.e. project parameters and shared parameters. Most of them would be shown on sheets/title block.

3.17.1 Project Parameters

Project parameters as shown below should be added in a project. These values will be updated on all title block once they are changed.

Parameter	Discipline	Type	Group	Position in Title Block
sContract_No	Common	Text	General	M
sFile_No	Common	Text	General	N
sInform_No	Common	Text	General	Q
Project Number	(*Default Project Parameter*)			O
Project Name	(*Default Project Parameter*)			P

Remark: position refer to the example of title block on page 26

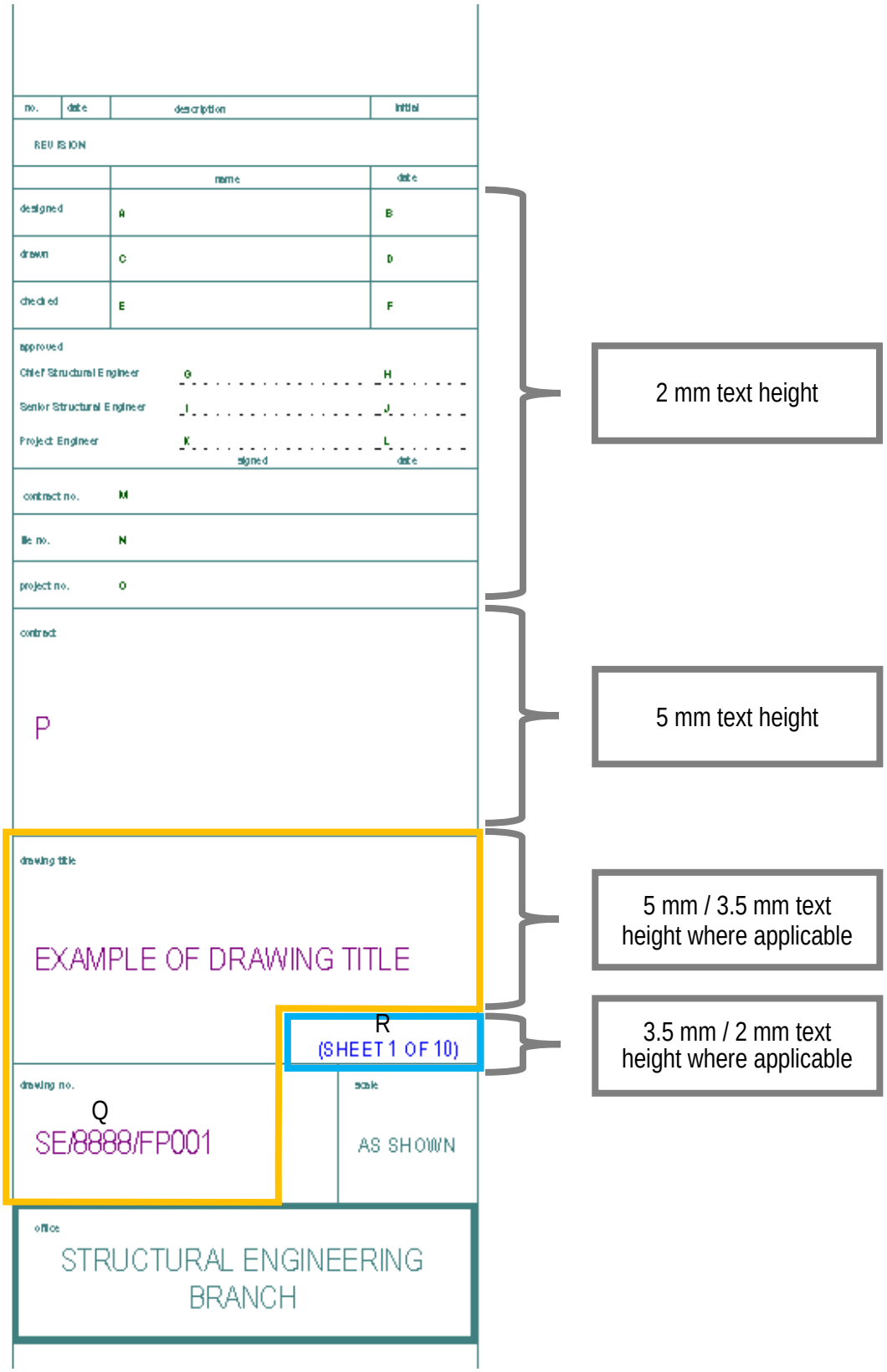
3.17.2 Shared Parameters

Some shared parameters should be defined in a project according to the project details show on title block. The display control of shared parameters is different from project parameters. It should be changed one by one on title block/sheet properties. Examples are shown below:

Parameter	Discipline	Type	Group	Position in Title Block
sDate_Checked	Common	Text	General	F
sDate_Designed	Common	Text	General	B
sDate_Drawn	Common	Text	General	D
sDate_Signed_CSE	Common	Text	General	H
sDate_Signed_PSE	Common	Text	General	L
sDate_Signed_SSE	Common	Text	General	J
sDWG_Title_Suffix	Common	Text	Text	R
sName_Checked	Common	Text	General	E
sName_CSE	Common	Text	General	G
sName_Designed	Common	Text	General	A
sName_Drawn	Common	Text	General	C
sName_PSE	Common	Text	General	K
sName_SSE	Common	Text	General	I

Remark: position refer to the example of title block on page 26

Example of project and shared parameters arrangement.



3.18 View Setting

View should be created and applied on specific views.

3.18.1 Plan

Scale	1:100
Detail level	Coarse
Visual Style	Hidden Line

3.18.2 Section

Scale	1:50
Detail level	Coarse
Visual Style	Hidden Line

3.18.3 Detail

Scale	1:20 / 1:10 / 1:5
Detail level	Fine
Visual Style	Hidden Line

3.18.4 Site Location Plan

Scale	1:1000
Detail level	Coarse
Visual Style	Hidden Line

3.18.5 3D view

Scale	1:100
Detail level	Fine
Visual Style	Shaded

Remark: self-defined view setting may be applied for specific purpose.

3.19 Customized Object Library for Structural Engineering

When a new object is created in a project, details of the new object should be recorded using the template as attached in Appendix A.

3.20 Schedule

Pre-defined schedules are created for BIM operation as below:

Schedule Type	Scheduled fields (in order)	Sorting/ Grouping	Formatting
Floor	1) Object Name 2) Type 3) Level 4) Type Mark 5) Mark 6) Volume	1) Level (Ascending) 2) Mark (Ascending)	Volume (Calculate totals)
Structural Column	1) Object Name 2) Type 3) Top Level 4) Top Offset 5) Base Level 6) Base Offset 7) Column Location Mark 8) Mark 9) Length 10) Volume	1) Base Level (Ascending) 2) Column Location Mark (Ascending)	Volume (Calculate totals)
Structural Foundation	1) Object Name 2) Type 3) Elevation at Bottom 4) Elevation at Top 5) Foundation Thickness 6) Default Thickness 7) Type Mark 8) Mark 9) Width 10) Volume	1) Elevation at Bottom (Ascending) 2) Mark (Ascending)	Volume (Calculate totals)

Structural Framing	1) Object Name 2) Type 3) Structural Usage 4) Reference Level 5) Level 6) Type Mark 7) Mark 8) Length 9) Cut Length 10) Volume	1) Reference Level (Ascending) 1) Mark (Ascending)	Volume (Calculate totals)
Walls	1) Object Name 2) Type 3) Structural Usage 4) Base Constraint 5) Base Offset 6) Top Constraint 7) Top Offset 8) Type Mark 9) Mark 10) Length 11) Width 12) Volume	2) Base Constraint (Ascending) 3) Mark (Ascending)	Volume (Calculate totals)
View List	1) Object Name 2) Type 3) Associated Level 4) Detail Level 5) Scale Value 1: 6) Sheet Name 7) Sheet Number 8) Title on Sheet 9) View Name	1) Object Name (Descending) 2) Associated Level (Ascending) 3) View Name (Ascending)	N/A
Sheet List	1) Sheet Name 2) Sheet Number 3) Current Revision	1) Sheet Number (Ascending)	N/A

Notes: Other available fields may be added to suit project's needs.

3.21 Export Setup

For exporting from BIM Model to 2D drawing format, settings are as follows.

3.21.1 Layers-Model categories

The layer settings for all structural elments should comply with the structural discipline requirement in CAD Manual for ArchSD Projects.

3.21.2 Layers-Annotation categories

The layer settings for annotation related to structural elments should comply with the structural discipline requirement in CAD Manual for ArchSD Projects.

3.21.3 Layers-Others

The layer settings for others (e.g. Grid, Level,Viewport, etc) should comply with the structural discipline requirement in CAD Manual for ArchSD Projects.

3.21.4 Colours

The colours should export as Index colour (255 colours) .

3.21.5 Units & Coordinates

The 2D drawing unit should be millimeter and the coordinate system basis should refer to project internal.

4 Project Settings

4.1 Start a Project

4.1.1 Input Project Information & Project Parameters

Input relevant project information and project parameters

4.1.2 Import / Link 2D drawing, Other BIM Model

Import/link the required 2D drawing or other BIM Model
Define Project Location, Coordinates & Base Point
Specify the project location (the coordinates shall refer to Hong Kong 1980 Grid (HK1980 Grid))
Define the Project Base Point and Survey Point nearest to the project location

4.1.3 Setup Project North

Setup the appropriate Project North for orientation

4.1.4 Define Project Levels (i.e. Structural Plan View)

Copy and monitoring the Levels with BIM architectural model (the level shall refer to Hong Kong Principal Datum (HKPD)), adjust the levels where required

4.1.5 Draw Grid Line

Copy and monitoring the Grid Lines with BIM architectural model

4.1.6 Prepare Central Model File & Create Workset for Collaboration

Prepare the central mode file & create workset for worksharing & collaboration

Scenario for Model Division

Scenario	Project Scope	Example
Greater than 20 nos of sheet in a project	A Model File (MO) shall be created for modelling and Drawing Sheet File (SH) shall link to Model File for drawing sheet production	Hospital, School
Small scaled project (e.g. 1-2 storey building)	Combined model & drawing sheet (AW) in single file	District Open Space

Principal for workset creation

The Workset of model shall be created based on the following scope in project

a) No. of Block/Building
b) Area/Zone

4.2 Backup / Archive Project Model File when necessary

Detach from Central Model to backup / archive the Model when necessary.

5 LOD Requirement for Structural Modelling

The following Level of Development, based on the notations defined in CIC BIM Standard for Structural Model♦, should apply.

Model Element	Level of Development (LOD)				
	WS2	WS3	WS4	WS5	As-built
Foundations (piles, pile caps, tie/ground beams & footings)	100	200	300	400	400
Diaphragm wall, retaining wall	100	200	300	400	400
Excavation & lateral stability system	N/A	200	300	400	400
Beam	N/A	200	300	400	400
Column, post, hangar	N/A	200	300	400	400
Wall	N/A	200	300	400	400
Slab, floor, ramp, roof	N/A	200	300	400	400
Transfer Structure (transfer plate, truss)	N/A	200	300	400	400
Stairs (steps, risers, threads, landings)	100	200	300	400	400
Bracing	N/A	200	300	400	400
Temporary works, temporary structures, platforms	100	200	300	400	400
Tunnel Structure (Tunnel Box, Subway, Utilities Tunnel)	100	200	300	400	400

♦ Excluding non-graphical information and reinforcement details, unless otherwise specified.

6 Reference

- Development Bureau Technical Circular (Works) No. 18/2018
- BIM Standards (Phase One), Hong Kong Construction Industry Council
- CAD Standard for Works Projects (CSWP), Development Bureau
- CAD Manual for ArchSD Projects, Architectural Services Department
- SEBGL-DD2 Drafting Manual for R.C. Structures (Revision 2), Structural Engineering Branch

7 Appendix A – BIM Object Sheet for recording details of new objects

The BIM object shall contain 3D component of geometry, 2D component of symbol and tag / label / annotation. All of these contents are intended for drawing production of presentation drawing, statutory submission drawing and tender / construction drawing. In addition, the BIM object shall be able to schedule in project environment with proper information. The drawing production and schedule production shall follow industry practice and the requirement of project.

Comprehensive BIM object sheet shall be provided after completion of object creation. It enables clients, administrators and users of the BIM object to easily identify the properties, functions and outputs of the BIM object in drawing production.

The BIM object sheet shall contain following items:

Item	Description
1. 3D Geometry	- Views to be shown in the sheet (plan view, front and side elevation view, 3D view) - (2D symbolic items do not show in this part)
2. Property / Parameter	- Property / Parameter set and value
3. 2D – Symbol	- 2D symbolic item for drawing production
4. 2D – Tag / Label / Annotation	- 2D symbolic item for drawing production
5. Drawing Production	- Plan view and elevation view for presentation purpose - Plan view and elevation view for statutory / authority submission purpose - Plan view and elevation view for tender / construction purpose
6. Schedule Production	- Schedule with appropriate property / parameter

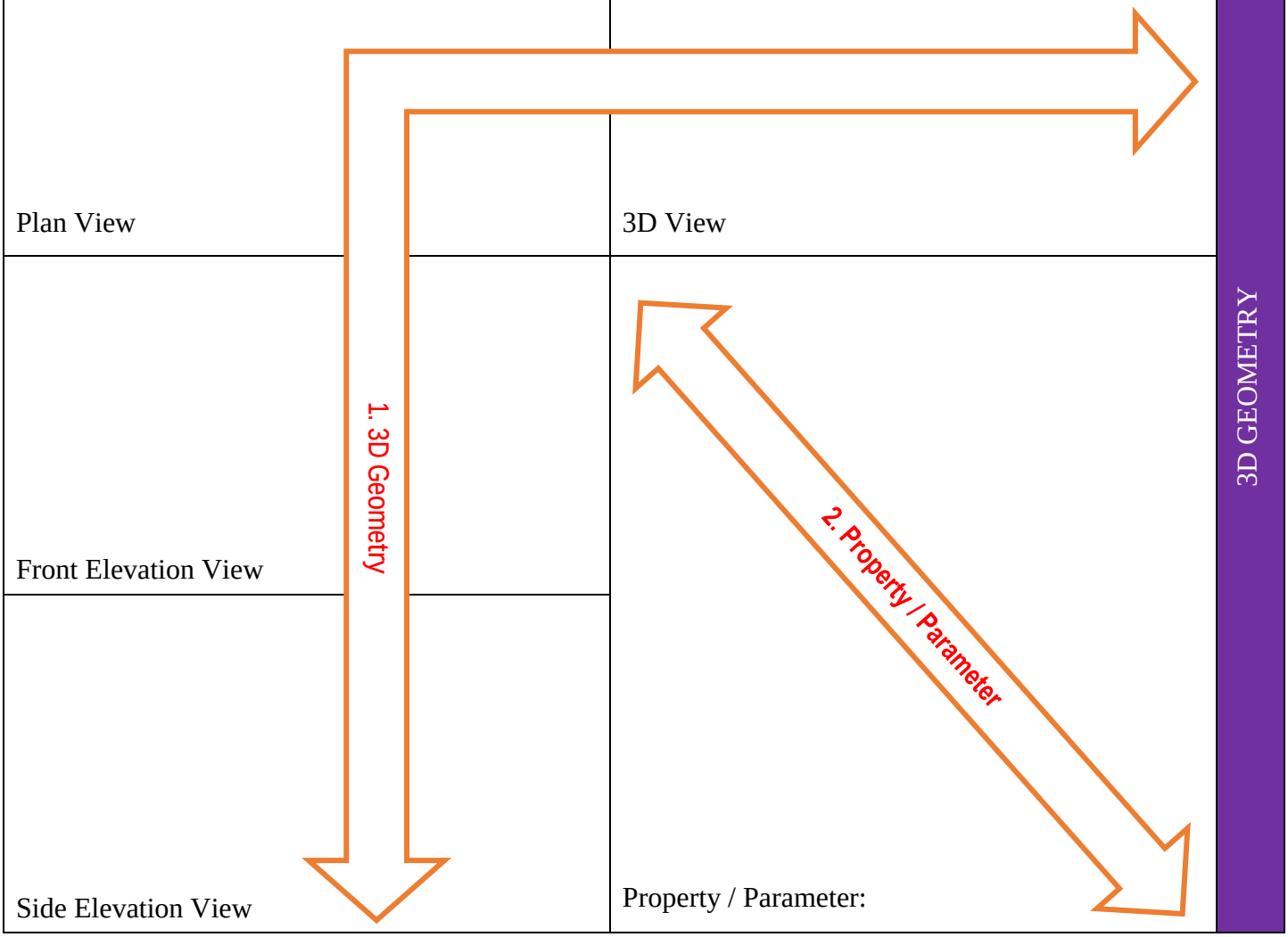
Architectural Service Department

BIM OBJECT SHEET

QR CODE FOR FM	Version: Date:	Reference Number

INPUT

BIM OBJECT NAME	BIM OBJECT CATEGORY	LOD	
Plan View	3D View		3D GEOMETRY
Front Elevation View	Property / Parameter:		
Side Elevation View			



2D Symbol Name	2D SYMBOL
3. 2D – Symbol	

2D Tag /Label/ Annotation	2D TAG/ LABEL/ ANNOTATION
4. 2D – Tag / Label / Annotation	

Remarks	

	Purpose/ Value Driven BIM OBJECT DELIVERABLES

OUTPUT