



NATIONAL BIM e-SUBMISSION (NBeS) Model Import Guidebook – For PSP/SP

FOR  AUTODESK®
REVIT®

MODELING GUIDELINES FOR THE COMPLIANCE OF BUILDING
USING NBES E-CHECKING SYSTEM
DURING BUILDING PLAN SUBMISSION STAGE

VERSION 4.00
(FOR REVIT 2025)

FOR PURPOSE GROUP
I, III, IV, V & VI

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Acknowledgement

The development of the National Building Specification (NBeS) submission marks a significant step in standardizing building practices and enhancing building compliance. Created by CIDB Digital Sdn Bhd in collaboration with Architectural Project's Team Sdn Bhd, the NBeS framework streamlines the submission process by aligning with the **Local Government Ordinance 1961, City of Kota Kinabalu (Building) By-laws 2025** and other regulations. This initiative will streamline the OSC 3+ process II - building plan approval period to within 48 hours. Fast building plan approval can significantly benefit the development industry by streamlining project timelines, reducing costs and human errors. Faster approvals will also minimize delays, allowing developers to initiate construction sooner and capitalize on market opportunities. This efficiency can lead to better cash flow management, enabling projects to be completed on schedule. Additionally, expedited processes can encourage more investment in housing, addressing shortages in urban areas. Overall, quicker approvals foster a more dynamic development landscape, driving economic growth and improving community outcomes.

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EXPECTATION

The expectation of BIM modelers to understand and add parameters into the BIM model as outlined in the Guidebook requires their understanding of the Malaysian Bylaws, managing Revit parameters/properties and the PBT submission requirements. PSP/SP's and their BIM modelers are expected to be properly trained by CIDBD's training program or any CIDBD's authorized training facilities.

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This guideline is only focused for Building Plan Submission by Principal Submitting Person (PSP) - Architect, their BIM modelers and Coordinators. **The Revit models tested are for version 2025. Testing with the latest version of revit may display a different result.**

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1.0 INTRODUCTION

The conception and development of National BIM e-Submission (NBeS) falls under “Productivity” which is one of the “Four Strategic Thrusts” of Construction Industry Transformation Program (CITP) to transform Malaysia’s Construction Industry. With the rise in I.T. technologies in all forms of industries, the use of Building Information Modeling (BIM) in the AEC (Architecture, Engineering & Construction) Industry has become an essential tool to deliver high productivity, collaboration, time & cost saving and accurate building design to construction.

CIDB Malaysia since 2012 has led the way to assist industry construction players to adopt BIM as a delivery platform to improve the construction delivery platform. CIDB has also collaborated closely with design practitioners & education ministry such as PAM, IEM, RISM, REDHA, MOHE etc to make aware of the nation’s CITP vision to successfully deliver this programme by the year 2020.

The current Building Plan Submission to Local PBT is through the “One Stop Centre (OSC)” of each Local Council via OSC 3.1, which involves the local authority and external technical department consultant by PSP/SP prior to submission of the building plan. PSP/SP shall produce the support letter from all the consulted agencies during building plan submission.

The following PBTs have been identified and agreed to participate in the NBeS pilot project in the effort to be part of NBeS building plan submission program. They are :-

- Perbadanan Putrajaya (PPj)
- Majlis Bandaraya Petaling Jaya (MBPJ)
- Majlis Perbandaran Kangar (MPK)
- Majlis Bandaraya Melaka Bersejarah (MBMB)
- Majlis Perbandaran Kulim, Kedah (MPKK)
- Dewan Bandaraya Kuching Utara (DBKU)

NBeS process involves initially with PSP preparing a 3-dimensional LOD 300 model of the project from the NBeS Revit template obtained from the Local PBT. The PSP should first register with the Local PBT to inform of their intention to submit for NBeS’s Building Plan Approval whereby the 3-dimensional ifc model is subjected to digital information processing. The NBeS system can view the 3-D model and the 3-D elements will show both compliance and non compliance data when checked against the UBBL’s & local council’s rulesets. A report can be generated to display the results of the checking.

1.1 About NBeS

National “Building Information Modeling” (BIM) e-Submission (NBeS) modeling guideline compliance builds on procedures and methodologies from a consensus of experienced BIM architectural practitioners. This guideline is developed by a team of consultants appointed by CIDB Digital Sdn Bhd who have more than 10 years knowledge & understanding of BIM process, experienced LAM Registered PSP/SP Architects.

This framework focuses primarily on the adaptation of those standards for practical and optimum utilization of Revit Architecture for internal purpose only. Terminology and reference to functionality is based around the Autodesk Revit platform.

The objectives are:

- Utilization project-based template of BIM model submission for new development under the following Designation of Purpose Group I, III, IV, V & VI
- To ensure the digital BIM model is modeled with the required data/parameters used for NBeS checking against relevant bylaws, standards & PBT technical requirements.
- To standardized naming conventions of parameters used for checking and best modeling practices that will ensure delivery of high quality and uniform BIM modeling output across to NBeS e-Checker System.

1.2 Goals

NBeS is developed to establish a uniform and efficient building plan submission via a BIM model e-checker system which is set up for participating local authorities across the nation. The establishment of “NBeS Revit template” is customized to suit the local building plan submission process, taking into consideration other approved KM parameters such as car park requirements, density, plot-ratio, maximum height of building, KM approval information etc.

NBeS will be the first in Malaysia to take the building plan approvals process to the next level by digitizing the building by- laws, fire regulations and other related local PBT technical compliance into the BIM platform. It is earmarked as an important innovation in Malaysia’s building industry by leveraging on the forward evolution of BIM technology. It is acknowledged to be the tool to enhance competency & productivity levels of our local BIM Modellers, Coordinators and Managers to compete globally.

Henceforth, the effort made by the Malaysian Government through NBeS development will further support the “ease of doing business”; which is one of the criteria introduced by the World Bank. One of the categories was ‘dealing with construction permits’. (PAM,2019) Currently, Malaysia is ranked at third place for the year 2019, in dealing with construction permits, which included all procedures for a business in the construction industry.

1.3 Benefits

A NBeS template is developed to standardize and to optimize for PSP/SP to embark into digital building submission approval to the local PBT across the nation. The approval result shall be automated and time optimized to reduce manual checking by the PBT’s staff and officers henceforth, a more transparent process, increased productivity and confidence to the investors, developers, house owners and the communities.

1.4 Scope and Limitation

NBeS is currently developed to enable BIM model submission for new development designation of purpose groups which includes:

- I - Small Residential
- III - Other Residentials
- IV - Office
- V - Shop
- VI - Factory

1.5 How to use the Guidebook

The order of chapters has been carefully thought out with the intention of following a logical architectural modeling workflow process. The NBeS Revit Template can be used to “jumpstart” the adoption of NBeS by eliminating the need to load each shared parameter individually and manually sort the properties into the correct grouping. It is mandatory for the PSP/SP, their BIM modelers, coordinators and managers to attend CIDB’s or other NBeS’s licensed training centres to learn and understand the 3-d modeling & parameter input process. After the training, this guidebook shall serve as a reference to recall what has been taught during the training sessions. You may be overwhelmed in the beginning but rest assured with help from CIDB and the training centres, you will be able to overcome and understand the NBeS process with ease.

1.6 Guidebook Updates (Period of Revision/Dates)

Registered PSP/SP users with CIDB, NBeS Training Centres or PBTs shall be informed of any revisions to this guidebook. We encouraged the PSP/SP to comment and to feedback any errors or to suggest any technical modeling improvements to the IT developers via a comment section in the NBeS website. These feedbacks shall be compiled, reviewed and may be adopted into the revised NBeS Guidebook. Credit shall be given to feedback contributors for their efforts in making NBeS a successful building plan e-checking and approval software.

1.7 References

Below are a list of by-law, references and guide books which we have referred to in the preparation of this Guidebook. They are:-

- Street, Drainage & Building Act 1974
- Uniform Building by-Law 1984
- MS1183:2015 Fire safety in the Design, management and use of building – Code of Practice :2014 Universal design and accessibility in the built environment – Code of Practice
- AEC (UK) BIM Standard for Autodesk Revit; A workable implementation of the AEC (UK) BIM Standard for the Architectural, Engineering and Construction Industry in the UK. (Version 1.0 and Version 2.0)
- Singapore BIM Guide: BIM Essential Guide for Architectural Consultants
- Singapore BIM Guide : BIM Essential Guide for BIM Adoption in an Organization
- The Aubin Academy; Revit Architecture 2016
- Revit IFC Manual; Detailed Instruction for Handling IFC Files
- Guide to Fire Protection in Malaysia
- Sistem Pengumpulan & Penggunaan Semula Air Hujan - Jabatan Perancangan Bandar & Desa Semenanjung Malaysia

1.8 NBeS Revit Template

A Revit architectural project startup template named “NBeS Revit 2022 Template V3.02” is set up for the NBeS modeling. This template can be downloaded from CIDBD’s website or the Local Council website. Template update versions shall be notified to any registered PSP/SP with CIDBD, Local PBTs or NBeS Training Centres when there is a latest version available for download. PSP/SP may use this template as part of their Office BIM workflow provided that they have registered with the owner of NBeS which is CIDBD, Malaysia. The PSP/SP is advised to always start a BIM 3-d model with the latest available template. PSP/SP who have already developed their standard office template shall be required to import their standard families into the NBeS Revit template and not the other way around to ensure that the set parameters are not changed and may affect the e-checker from functioning properly.

1.9 NBeS BEP

NBeS required accurate modeling, checking & verification protocols to be established early into the project in order to minimize keyed-in errors. The NBeS system has no AI features built-in except for elements that have vectorial parameters which the system can verify and confirm. Therefore, the PSP/SP’s BIM office is recommended to attend NBeS training/workshop organized by CIDBD to help them to understand this Guidebook and to devise an office BEP and change management to verify all required data before any model submissions are made. In the template, NBeS Schedules are prepared to assist the modelers to enter parameters which shall be used in NBeS to check against preset rulesets. PSP/SP shall print and check the parameters before signing off to be used as part of the submission document to Local PBT. The responsibility for ensuring the BEP is followed falls on the shoulder of the firm and the submission person.

1.10 Key Personnel

PSP's key person or persons in the NBeS submission must be identified along with their roles, contributions, and right access, modification and use. This process becomes dramatically more complicated as the circle of key persons expand beyond the design professionals. Responsibilities must be established. Most often, this will focus on a single entity responsible for the model with each contributor responsible for its content, along with a process and schedule for input and validation. The following are the proposed task responsibilities of each key person dealing with NBeS template, including but not limited to :

Table 1 - NBeS Task Responsibility

Key Person	Scope of Work
PSP/ Signing Architect	• Provide final approval for upload to the system • Digitally sign the drawings and forms required for submission
BIM Manager/ Project Architect	• Leads, establishes, and assures development and compliance in NBeS. • Overall responsibility for the proper use, implementation, and deliverables of BIM models conformance with the NBeS. • Assures proper deliverables are met and provided in requirements as specified in NBeS Guidelines. • Present compliance schedules to PSP for approval after verifying and confirming BIM coordinators' task. • Review model before uploading NBeS Model to portal to test, and final upload for Building Plan submission • Monitor approval status and report submission issues to the Local Council. • Report to PSP on status on the submission
BIM Coordinator/ Graduate Architect	• Prepare, monitor NBeS BEP requirements and ensure BEP is followed by BIM modelers. • Train BIM modelers on the NBeS requirements and BIM workflow. • Manage families & all relevant parameters to be updated and used in models. • Develop project information and data. • Coordinate and check BIM processes, file naming structure, file sharing management, parameter input, output submission schedules. • Check ruleset compliances and present them to BIM Manager • Check submission drawings.
BIM Modeler/ Assistant Architect	• Prepare, revise, and update models during the schematic and design development phase. • Prepare NBeS schedule and set NBeS element parameters. • Prepare submission drawings. • (Note: The submission drawings may not be required in the future once the drawings are embedded into the submission model)

1.11 NBeS Technology

BIM models consist of data which are used in NBeS e-Submission to extrapolate and compared with preset UBBL program rulesets. An NBeS template is currently developed inside the Autodesk Revit platform and will be progressively updated and improved from time to time. The latest template shall be uploaded to the CIDB Digital website from time to time. PSP/SP shall always check the NBeS portal for a newly released template and guidebooks.

The system is flexible to allow any modification of rulesets to align with the Local Council deviation requirements and any future changes in the bylaws. It will generate results efficiently without any human interference in the processing hence increase in productivity in processing building plan approvals especially for more complex large projects.

1.12 Master Definition list

The following terms define the concepts of BIM and data structures used in this Standard.

Table 2 - Master definition List

Abbreviation	Definition	Abbreviation	Definition
BIM	Building Information Modeling	SPAH	Sistem Pengumpulan & Penggunaan Semula Air hujan
NBeS	National Building Information Modeling (BIM) e-Submission	BEP	BIM Execution Plan
FSR	Fire Safety Requirement	MS	Malaysian Standard
IFC	Industry Foundation Class	UBBL	Uniform Building by-Law
MVD	Model View Definition	PSP/SP	Principal Submission Person/Submitting Person
PBT	Pihak Berkuasa Tempatan ie Local Council	OSC	One Stop Centre
PSP	Principal Submitting Person	JBPM	Jabatan Bomba & Penyelamat Malaysia
BP	Kelulusan Pelan Bangunan ie Building Plan Approval		
KM	Kebenaran Merancang		
CPS	Car Parking Space		
MPS	Motor Parking Space		
OKU	Orang Kurang Upaya		

2.0 NBeS OVERVIEW

NBeS Building Plan submission/approval process has not changed from the current OSC 3.1 where it still involves the following departments:-

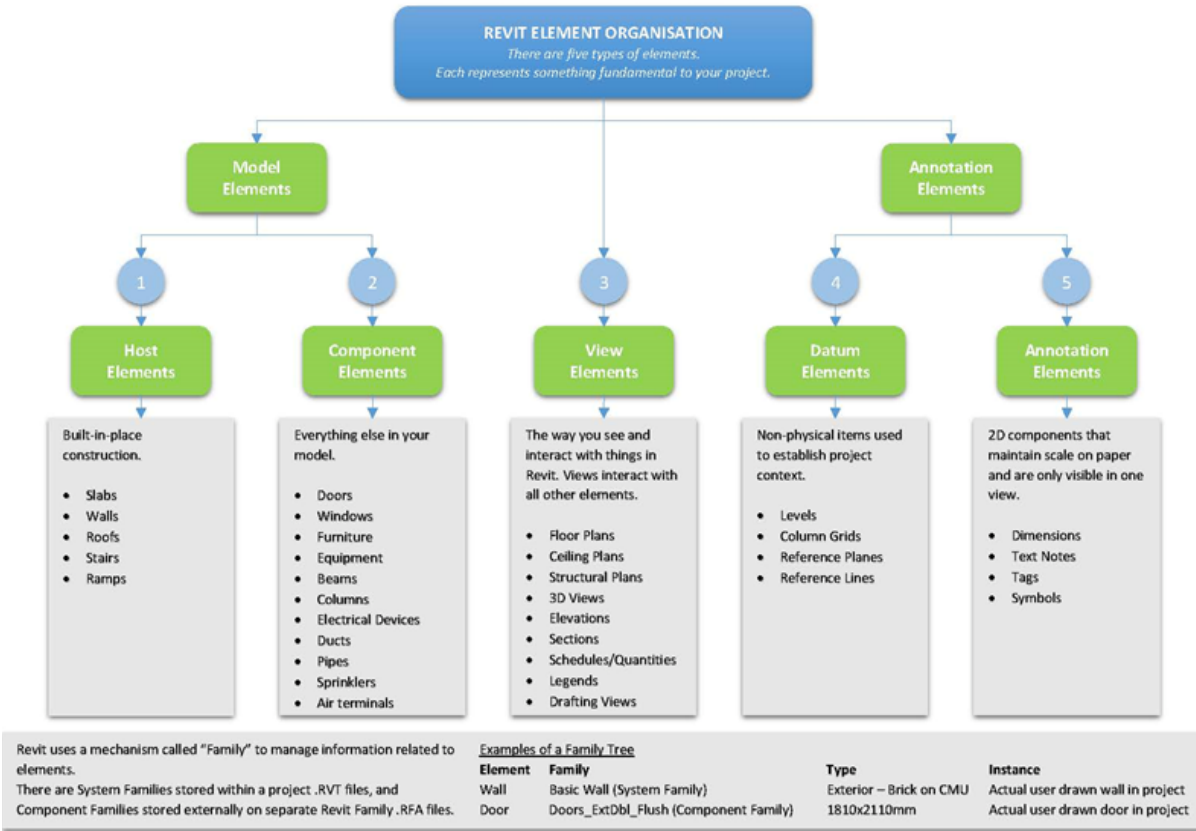
1. Jabatan Bangunan
2. Jabatan Bomba & Penyelamat Malaysia
3. Jabatan Kejuruteraan, Perparitan dan Saliran
4. Department of Civil Aviation (for some high rise building in close proximity to an airport)

Only one (1) exported Revit BIM model saved in ifc format is required to be uploaded to the NBeS e-checker system after registration of the project. A pdf copy of the submission drawings may be required to be uploaded pending on the Local Council you are dealing with.

It was suggested by CIDBD that NBeS be used by the PSP/SP to upload their Building Plan Model for compliance testing before a final model to be officially submitted to the Local PBT for approval. The administrator of Jabatan Bangunan shall forward the relevant models to the officer in-charge of the project. The PSP/SP registration to use the system will be advised by OSC.

The results of the NBeS e-checker will be automatically informed to both PSP/SP and officers in the Local Council. The results may be viewed by both parties. Within a stipulated time, an official approval or comments shall be issued from Local Authority. Any comments which require the model to be amended or written in to comply can be prepared for further NBeS model checking and compliance. Once approved, the PSP/SP shall prepare the hard copies required within the period given for endorsement of the Building Plans for safe keeping.

2.1 Revit Approach



Revit Element Organisation is divided into three (3) categories;
i) Model Element,
ii) View Element and
iii) Annotation Element.

NBeS parameters were created using all these elements based on its required information in relation to building guidelines and regulations. The parameters created in different forms i.e text, area, volume etc, according to its element category.

Figure 1 - ReVIT Elements Organization

The following are some examples of parameters created across the Revit Elements Organisation Category, according to the above diagram:

Table 3 - Element category

Revit Elements Organisation Category	Item
Model Element	Walls Floors Columns & Beams Roofs Doors & Windows Ramps Stairs Railings Specialty Equipment (Fire Hydrant, Hose reel etc.) Line-based family and many more
View Element	Area (Fire Provision) Schedules
Annotation Element	Project, Site, Building, PSP/SP & Client Information Self declaration for Green Building and Fire Protection Information Rooms/Spaces, standard space naming conventions Dimensions

2.2 What is IFC?

IFC is defined as Industry Foundation Classes, an object-based format. IFC enables exchange of information between different BIM authorized software platforms. It is a global standard used to describe, share and exchange construction and facilities management information. IFC format is supported by about 150 software applications worldwide and the flexibility in interoperability is crucial as construction workflow becomes increasingly collaborative. To achieve BIM's full potential the industry requires a robust mechanism to exchange the ever increasing levels of digital data, regardless of what software package or BIM platform is used.

NBeS is being developed based on the IFC2x3 Coordination View Version 2.0 release and models are exported in that format for model checking. According to Revit IFC Manual; Detailed Instruction for Handling IFC files, 2016 , IFC2X3 is currently the most supported and stable format, certified in Revit and recommended for

production. Furthermore, the version is optimised for coordinated exchange of BIM models between the main disciplines in the industry. It is also known as CV 2.0, which was widely used and supported Model View Definition (MVD). The version further supports the rudimentary parametric derivation of building elements when importing to planning tools. The MDV produced through the IFC2X3 is primarily used for exchanging models between architectural, engineering and MEP.

Table 4 - Model tool Export to ifc type

Revit Input Parameter or Architecture Tool to model	Exported ifc Class	Building Element
ifc authoring file Information	ifcProject	-
Project Information	ifcBuilding	-
Project Information	ifcSite	-
Wall Tool	ifcWall	Partition Wall, Retaining Wall
Door Tool	ifcDoor	Door
Window Tool	ifcWindow	Window
Column Tool	ifcColumn	Column
Roof Tool	ifcRoof	Roof
Floor Tool	ifcSlab	Floor, Structural Foundation ie footing, pile-cap
Curtain System Tool	ifcCurtainWall	Curtain wall
Ceiling Tool	ifcCovering	Ceiling
Railing Tool	ifcRailing	Railing
Ramp Tool	ifcRamp	Ramp
Stair Tool	ifcStair	Stair
Room Tool	ifcSpace	Space
Site Tool	ifcSite	Site
Site Tool	ifcBuildingElementProxy	Vehicle Parking Space, Road, Topography
Component Tool - Specialty Equipment Family	ifcFireSuppressionTerminal	Hydrant, Sprinkler, Dry Riser, Wet Riser, Hose Reel, Fire Extinguisher
Component Tool - Specialty Equipment Family	ifcFlowTerminal	Emergency Light, Exit Light Box,
Component Tool - Fire Alarm Family	ifcDistributionControlElement	Smoke Detector, Heat Detector, Fire Alarm

Note: Objects modeled using “Model in-place” tool shall be set to an appropriate family category and ifc class. The ifc output shall be assigned accordingly to the above list.

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3.0 BUILDING LAWS AND REGULATIONS ADOPTION AS NBeS RULESET PARAMETERS

Besides NBeS rulesets being incorporated into the NBeS e-checker system, a NBeS Revit template is prepared with standard parameters and rulesets and modeled elements can be listed out in the element Schedules. These schedules are used by PSP/SP to set the correct parameters and element data display to verify the certain minimum UBBL compliance value found in the BIM model. Some parameter data required are self declared by measuring the distance width, length or height. These required data input will be further explained in this guidebook.

The NBeS ruleset parameters may vary and differ from the UBBL from one Local PBT to another. PSP/SP are required to consult the PBTs or to obtain the Building Department's Technical Compliance Checklist to ensure the BIM model complies to their parameter requirements. An example of such variations are wall fencing height, room height etc. Some extra compliance such as minimum room size for Surau.

3.1 NBeS's Designation of Purpose Group Breakdown

Because of the various sub-types of purpose group which require further classification, NBeS proposed below a detailed breakdown to label these variety building sub-types.

Table 5 - Expanded Designation of Purposed Group

UBBL 2021 FIFTH SCHEDULE & TENTH SCHEDULE - EXPANDED DESIGNATION OF PURPOSE GROUP (BY-LAW 134, 138)						
Group No & Title	Sub-group Title	Building Type	Building Sub-type (Refer to Tenth Schedule, UBBL) (CL = Corner Lot Unit), IL = Intermediate Lot Unit), (EL = End-lot Unit)			
I Small Residential	(i) Private dwelling <u>up to 2 storeys</u>	(a) Terrace/Link House	I-(i)(a)CL	I-(i)(a)IL	I-(i)(a)EL	
			House units with typical front 20', 20' side and rear building setback boundaries to local authority requirement	House units with typical front 20' and rear building setback boundaries to local authority requirement	House units with typical front 20', 0' or 10' side and rear building setback boundaries to local authority requirement	
		(b) Semi-Detached House	I-(i)(b)CL	I-(i)(b)EL		
			House units with typical front 20', 20'/10' sides & 10' rear building setback boundaries	House units with typical front 20', 10' sides & 10' rear building setback boundaries		
		(c) Detached House or Bungalow	I-(i)(c)CL	I-(i)(c)IL	I-(i)(c)ZL	
			House units with typical front 20', 20' & 10' sides & 10' rear building setback boundaries	House units with typical front 20', 10' sides & 10' rear building setback boundaries	House units with Zero building setback for the side boundaries, 20' front & 10' rear building setback boundaries	
		(d) Terrace Town house (2 unit per lot)	I-(i)(d)CL	I-(i)(d)IL	I-(i)(d)EL	
			House units with typical front 20', 20' side and rear building setback boundaries to local authority requirement	House units with typical front 20' and rear building setback boundaries to local authority requirement	House units with typical front 20', 0' or 10' side and rear building setback boundaries to local authority requirement	

UBBL 2021 FIFTH SCHEDULE & TENTH SCHEDULE - EXPANDED DESIGNATION OF PURPOSE GROUP (BY-LAW 134, 138)						
Group No & Title	Sub-group Title	Building Type	Building Sub-type (Refer to Tenth Schedule, UBBL) (CL = Corner Lot Unit), IL = Intermediate Lot Unit), (EL = End-lot Unit)			
I Small Residential	(i) Private dwelling <u>up to 2 storeys</u>	(e) Cluster House (Linked Semi- detached House) 4 Houses linked together	I-(i)(e)CL	I-(i)(e)EL		
			House units with typical front 20',10' & 20' side building setback & no rear building setback boundaries	House units with typical front 20',10' sides building setback & no rear building setback boundaries		

UBBL 2021 FIFTH SCHEDULE & TENTH SCHEDULE - EXPANDED DESIGNATION OF PURPOSE GROUP (BY-LAW 134, 138)						
Group No & Title	Sub-group Title	Building Type	Building Sub-type (Refer to Tenth Schedule, UBBL) (CL = Corner Lot Unit), IL = Intermediate Lot Unit), (EL = End-lot Unit)			
I Small Residential	(ii) Private dwelling of <u>more than 2 storeys</u>	(a) Terrace/Link House	I-(ii)(a)CL	I-(ii)(a)IL	I-(ii)(a)EL	
			House units with typical front 20', 20' side and rear building setback boundaries to local authority requirement	House units with typical front 20' and rear building setback boundaries to local authority requirement	House units with typical front 20', 0' or 10' side and rear building setback boundaries to local authority requirement	
		(b) Semi- Detached House	I-(ii)(b)CL	I-(ii)(b)EL		
			House units with typical front 20', 20'/10' sides & 10' rear building setback boundaries	House units with typical front 20',10' sides & 10' rear building setback boundaries		
		(c) Detached House or Bungalow	I-(ii)(c)CL	I-(ii)(c)IL	I-(ii)(c)ZL	
			House units with typical front 20', 20' & 10' sides & 10' rear building setback boundaries	House units with typical front 20', 10' sides & 10' rear building setback boundaries	House units with Zero building setback for the side boundaries, 20' front & 10' rear building setback boundaries	
		(d) Terrace Town house (2 unit per lot)	I-(ii)(d)CL	I-(ii)(d)IL	I-(ii)(d)EL	
			House units with typical front 20', 20' side and rear building setback boundaries to local authority requirement	House units with typical front 20' and rear building setback boundaries to local authority requirement	House units with typical front 20', 0' or 10' side and rear building setback boundaries to local authority requirement	

UBBL 2021 FIFTH SCHEDULE & TENTH SCHEDULE - EXPANDED DESIGNATION OF PURPOSE GROUP (BY-LAW 134, 138)						
Group No & Title	Sub-group Title	Building Type	Building Sub-type (Refer to Tenth Schedule, UBBL) (CL = Corner Lot Unit), IL = Intermediate Lot Unit), (EL = End-lot Unit)			
I Small Residential	(ii) Private dwelling of <u>more than 2 storeys</u>	(e) Cluster House (Linked Semi-detached House) 4 Houses linked together	I-(ii)(e)CL	I-(ii)(e)EL		
			House units with typical front 20',10' & 20' side building setback & no rear building setback boundaries	House units with typical front 20',10' sides building setback & no rear building setback boundaries		

UBBL 2021 FIFTH SCHEDULE - EXPANDED DESIGNATION OF PURPOSE GROUP (BY-LAW 134, 138)						
Group No & Title	Sub-group Title	Building Type	Building Sub-type (Refer to Tenth Schedule, UBBL)			
II Institutional	1 Education Occupancy	(a) Building used for the instructional purpose only	II-1(a)(i)(aa)	II-1(a)(i)(ab)	II-1(a)(i)(ac)	
			Open corridor design - Two storey & below	Open corridor design - Three to five storeys	Open corridor design - Six storeys & above	
			II-1(a)(ii)(aa)	II-1(a)(ii)(ab)	II-1(a)(ii)(ac)	II-1(a)(ii)(ad)
			Other designs - = or < 500sq.m per floor	Other designs - > 500 to = & = or < 1,000sq.m per floor	Other designs - > 1000 to = or < 2,000sq.m per floor or 18m to 30m in height	Other designs - > 2,000sq.m per floor or above 30m in height
		(b) Canteen detached or kitchen detached				
		(c) Laboratory or workshop (total flr area per block)	II-1(c)(i)	II-1(c)(ii)	II-1(c)(iii)	
			= or < 1,000sq.m.	> 1,000 to = or < 2,000sq.m.	> 2,000sq.m.	
		(d) Library (total floor area)	II-1(d)(i)	II-1(d)(ii)	II-1(d)(iii)	II-1(d)(iv)
			= or < 500sq.m.	> 500 to = or < 1,000sq.m.	> 1,000 to = or < 2,000sq.m.	> 2,000sq.m.
		(e) Detached Multi-purpose hall (total floor area)	II-1(e)(i)	II-1(e)(ii)	II-1(e)(iii)	
			Single storey and = or < 2000sq.m.	Two storeys and above or = or > 2000sq.m.	Central air conditioning (total flr area) = or > 2000sq.m.	
		(f) Educational Institution in a commercial complex	II-1(f)			
			To be considered as part of an overall risk within the complex.			

UBBL 2021 FIFTH SCHEDULE - EXPANDED DESIGNATION OF PURPOSE GROUP (BY-LAW 134, 138)						
Group No & Title	Sub-group Title	Building Type	Building Sub-type (Refer to Tenth Schedule, UBBL)			
II Institutional	2 Hospital or nursing home (total flr area)	(a) Clinic - day care	II-2(a)(i)	II-2(a)(ii)	II-2(a)(iii)	II-2(a)(iv)
			= or < 750 sq.m.	> 750sq.m. to = or < 1,000 sq.m.	> 1,000sq.m. to = or < 2,000 sq.m.	> 2,000 sq.m.
		(b) Patient accommodation (total flr area)	II-2(b)(i)			
			To be considered as part of an overall risk with a special requirement for the emergency lighting, stretcher lift and so forth.			
			II-2(b)(ii)(aa)	II-2(b)(ii)(ab)	II-2(b)(ii)(ac)	
			Single storey - = or < 750sq.m.	Single storey - > 750sq.m. to = or < 1,000sq.m.	Single storey - > 1,000sq.m.	
			II-2(b)(iii)(aa)	II-2(b)(iii)(ab)	II-2(b)(iii)(ac)	
			Two storey and above - = or < 750sq.m.	Two storey and above - > 750sq.m. to = or < 1,000sq.m.	Two storey and above - > 1,000sq.m.	

UBBL 2021 FIFTH SCHEDULE - EXPANDED DESIGNATION OF PURPOSE GROUP (BY-LAW 134, 138)						
Group No & Title	Sub-group Title	Building Type	Building Sub-type (Refer to Tenth Schedule, UBBL)			
III Other Residentials	1 Hotel	(a) Open Corridor w/ open staircase, extended lobby or tower staircase	III-1(a)(i)(aa) (2-3 storeys) 50 rooms or less per block	III-1(a)(i)(ab) (2-3 storeys) exceeding 50 rooms per block	III-1(a)(ii)(aa) (4 storeys & above) 100 rooms or less per block	III-1(a)(ii)(ab) (4 storeys & above) exceeding 100 rooms per block
		(b) other designs	III-1(b)(i)(aa) (2-3 storeys) less than 20 rooms per block	III-1(b)(i)(ab) (2-3 storeys) 20 - 100 rooms per block	III-1(b)(i)(ac) (2-3 storeys) Exceeding 100 rooms per block	
			III-1(b)(ii)(aa) (4 storeys & above) less than 50 rooms per block	III-1(b)(ii)(ab) (4 storeys & above) 50 rooms and over per block		
		(c)	III-1(c)(i) above shop occupancy	III-1(c)(ii) Above office occupancy		
	2 Hostel or Dormitory		III-2(i) 2 storeys & below			
		(ii) Open corridor design	III-2(ii)(aa) 3 - 5 storeys	III-2(ii)(ab) 6 - 10 storeys and total GFA not exceeding 5,000 m2	III-2(ii)(ac) Above 10 storeys and total GFA exceeding 5,000 m2	
		(iii) Other designs	III-2(iii)(aa) 3 - 5 storeys and total GFA not exceeding 3,000m2	III-2(iii)(ab) Above 5 storeys or total GFA exceeding 3,000m2		
III	3	(a)	III-3(a)			

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UBBL 2021 FIFTH SCHEDULE - EXPANDED DESIGNATION OF PURPOSE GROUP (BY-LAW 134, 138)						
Group No & Title	Sub-group Title	Building Type	Building Sub-type (Refer to Tenth Schedule, UBBL)			
Other Residentials	Apartment or Flats	5 storey & below				
		(b) Open corridor design	III-3(b)(i) 6 to 40 storeys <u>or</u> less than 120m in height	III-3(b)(ii) above 40 storeys <u>or</u> exceeding 120m in height		
		(c) Internal staircase or a core design	III-3(c)(i) 6 - 10 storeys <u>or</u> less than 30m in height	III-3(c)(ii) 11 - 40 storeys <u>or</u> less than 120m in height	III-3(c)(iii) above 40 storeys <u>and</u> exceeding 120m in height	
	4 Service Apartment		III-4(i) 10 storeys and below per block or less than 30m in height	III-4(ii) Above 10 storeys <u>or</u> exceeding 30m in height		

UBBL 2021 FIFTH SCHEDULE - EXPANDED DESIGNATION OF PURPOSE GROUP (BY-LAW 134, 138)						
Group No & Title	Sub-group Title	Building Type	Building Sub-type (Refer to Tenth Schedule, UBBL)			
IV Office			IV-1	IV-2	IV-3	IV-4
			4 storeys and below <u>or</u> GFA less than 1,000 m2	5 storeys & above <u>or</u> GFA exceeding 1,000 m2.	Exceeding 18 m in height <u>and</u> GFA less than 10,000 m2	30 m and above in height <u>or</u> GFA exceeding 10,000 m2

UBBL 2021 FIFTH SCHEDULE - EXPANDED DESIGNATION OF PURPOSE GROUP (BY-LAW 134, 138)						
Group No & Title	Sub-group Title	Building Type	Building Sub-type (Refer to Tenth Schedule, UBBL)			
V Shop	1 Floor area not exceeding 250m2 per floor built as separate compartment		V-1(a)	V-1(b)		
			Less than 4.5 storeys <u>or</u> 18 m in height	Less than 4.5 storeys <u>or</u> 18 m in height w/ combination grd shop and residential or office upper floor		
	2 Single Storey		V-2(a)	V-2(b)	V-2(c)	
			GFA less than 1,000 m2	GFA 1,000-2,000 m2	GFA exceeding 2,000 m2	
	3 2 storeys and above		V-3(a)	V-3(b)	V-3(c)	V-3(d)
			GFA less than 750 m2	GFA 750-1,000 m2	GFA exceeding 1,000-3,000 m2	GFA exceeding 3,000 m2
	4 Hawker centre, food court, wet or dry market		V-4(a)	V-4(b)		
			Detached bldg less than 2,000 m2 w/ open structure & natural ventilated design	Exceeding 2,000 m2		
	5 Combination shop		V-5(a)	V-5(b)		
			& hotel occupancy	Office occupancy		

UBBL 2021 FIFTH SCHEDULE - EXPANDED DESIGNATION OF PURPOSE GROUP (BY-LAW 134, 138)						
Group No & Title	Sub-group Title	Building Type	Building Sub-type (Refer to Tenth Schedule, UBBL)			
VI Factory	1 Single storey unit	(i) Detached unit	VI-1(i)(a)	VI-1(i)(b)	VI-1(i)(c)	VI-1(i)(d)
			GFA less than 750 m2	GFA 750-1,000 m2	GFA 1,000-2,000 m2	GFA exceeding 2,000 m2
		(ii) Semi-detached unit	VI-1(ii)(a)	VI-1(ii)(b)	VI-1(ii)(c)	VI-1(ii)(d)
			GFA less than 750 m2	GFA 750-1,000 m2	GFA 1,000-2,000 m2	GFA exceeding 2,000 m2
		(iii) Terrace unit	VI-1(iii)(a)	VI-1(iii)(b)	VI-1(iii)(c)	VI-1(iii)(d)
			GFA less than 750 m2	GFA 750-1,000 m2	GFA exceeding 1,000-2,000 m2	GFA exceeding 2,000 m2
	2 Open structure design		VI-2(a)	VI-2(b)	VI-2(c)	
			Steel fabrication work & metal fabrication engineering work or sim low fire risk establishment	Saw Mill	Steel Mill	
	3 Two storeys and above. Each floor is built as a separate compartment	(i) Detached unit	VI-3(i)(a)	VI-3(i)(b)	VI-3(i)(c)	
			GFA Less than 500 m2 per floor	GFA 500 to 1,000 m2 per floor	GFA exceeding 1,000 m2 per floor	
		(ii) Semi-detached unit	VI-3(ii)(a)	VI-3(ii)(b)	VI-3(ii)(c)	
			Less than 500 m2 per floor	500 to 1,000 m2 per floor	Exceeding 1,000 m2 per floor	
		(iii) Terrace unit	VI-3(iii)(a)	VI-3(iii)(b)	VI-3(iii)(c)	
			Less than 500 m2 per floor	500 to 1,000 m2 per floor	Exceeding 1,000 m2 per floor	
UBBL 2021 FIFTH SCHEDULE - EXPANDED DESIGNATION OF PURPOSE GROUP (BY-LAW 134, 138)						

Group No & Title	Sub-group Title	Building Type	Building Sub-type (Refer to Tenth Schedule, UBBL)			
VI Factory	4 Flatted factory block (two storeys and above)		VI-4(a)	VI-4(b)	VI-4(c)	
			per floor GFA Less than 500 m2	per floor GFA 500 to 1,000 m2	per floor GFA Exceeding 1,000 m2 or of exceeding 7,000 m3 per compartment	
	5 Vehicle assembly or a similar plant		VI-5(a)	VI-5(b)	VI-5(c)	VI-5(d)
			Total GFA Less than 1,000 m2	Total GFA 1,000 to 2,000 m2	Total GFA 2,000 to 5,000 m2	Total GFA Exceeding 5,000 m2
	6 Special structure		VI-6(a)	VI-6(b)	VI-6(c)	
			Factory complex such as palm oil mill complexes, palm oil refineries, sugar mills, or cement work	Wet process	Hazardous process	

UBBL 2021 FIFTH SCHEDULE - EXPANDED DESIGNATION OF PURPOSE GROUP (BY-LAW 134, 138)						
Group No & Title	Sub-group Title	Building Type	Building Sub-type (Refer to Tenth Schedule, UBBL)			
VII Places of Assembly	1		VII-1			
			Place of assembly below the level of exit discharge of exceeding 1,000 square metres (total floor area)			
	2	(i) Convention Centre	VII-2(i)(a) total floor area not exceeding 1,000 sq.m.	VII-2(i)(b) total floor area 1,001 to 2,000 sq.m.	VII-2(i)(c) total floor area exceeding 2,000 q.m.	
		(ii) Community Centre	VII-2(ii)(a) total floor area not exceeding 1,000 sq.m.	VII-2(ii)(b) total floor area 1,001 to 2,000 sq.m.	VII-2(ii)(c) total floor area exceeding 2,000 q.m.	
		(iii) Private club	VII-2(iii)(a) total floor area not exceeding 1,000 sq.m.	VII-2(iii)(b) total floor area 1,001 to 2,000 sq.m.	VII-2(iii)(c) total floor area exceeding 2,000 q.m.	
		(iv) Exhibition Centre	VII-2(iv)(a) total floor area not exceeding 1,000 sq.m.	VII-2(iv)(b) total floor area 1,001 to 2,000 sq.m.	VII-2(iv)(c) total floor area exceeding 2,000 q.m.	
		(v) Museum	VII-2(v)(a) total floor area not exceeding 1,000 sq.m.	VII-2(v)(b) total floor area 1,001 to 2,000 sq.m.	VII-2(v)(c) total floor area exceeding 2,000 q.m.	
		(vi)	VII-2(vi)(a)	VII-2(vi)(b)	VII-2(vi)(c)	

UBBL 2021 FIFTH SCHEDULE - EXPANDED DESIGNATION OF PURPOSE GROUP (BY-LAW 134, 138)						
Group No & Title	Sub-group Title	Building Type	Building Sub-type (Refer to Tenth Schedule, UBBL)			
		Art Gallery	total floor area not exceeding 1,000 sq.m.	total floor area 1,001 to 2,000 sq.m.	total floor area exceeding 2,000 q.m.	
VII Places of Assembly	3	(i) Theatre	VII-3(i)(a)	VII-3(i)(b)	VII-3(i)(c)	
			total floor area not exceeding 1,000 sq.m.	total floor area 1,001 to 2,000 sq.m.	total floor area exceeding 2,000 q.m.	
		(ii) Cinema	VII-3(ii)(a)	VII-3(ii)(b)	VII-3(ii)(c)	
			total floor area not exceeding 1,000 sq.m.	total floor area 1,001 to 2,000 sq.m.	total floor area exceeding 2,000 q.m.	
		(iii) Concert Hall	VII-3(iii)(a)	VII-3(iii)(b)	VII-3(iii)(c)	
			total floor area not exceeding 1,000 sq.m.	total floor area 1,001 to 2,000 sq.m.	total floor area exceeding 2,000 q.m.	
		(iv) Auditorium	VII-3(v)(a)	VII-3(iv)(b)	VII-3(iv)(c)	
			total floor area not exceeding 1,000 sq.m.	total floor area 1,001 to 2,000 sq.m.	total floor area exceeding 2,000 q.m.	
	4 Amusement Centre		VII-4(a)	VII-4(b)	VII-4(c)	
			total floor area not exceeding 1,000 sq.m.	total floor area 1,001 to 2,000 sq.m.	total floor area exceeding 2,000 q.m.	
	5	(i) Bus Terminal	VII-5(i)(a)	VII-5(i)(b)	VII-5(i)(c)	
			total floor area not exceeding 1,000 sq.m.	total floor area 1,001 to 2,000 sq.m.	total floor area exceeding 2,000 q.m.	
		(ii) Ferry Terminal	VII-5(ii)(a)	VII-5(ii)(b)	VII-5(ii)(c)	
			total floor area not exceeding 1,000 sq.m.	total floor area 1,001 to 2,000 sq.m.	total floor area exceeding 2,000 q.m.	

UBBL 2021 FIFTH SCHEDULE - EXPANDED DESIGNATION OF PURPOSE GROUP (BY-LAW 134, 138)						
Group No & Title	Sub-group Title	Building Type	Building Sub-type (Refer to Tenth Schedule, UBBL)			
VII Places of Assembly		(iii) Train Station	VII-5(iii)(a)	VII-5(iii)(b)	VII-5(iii)(c)	
			total floor area not exceeding 1,000 sq.m.	total floor area 1,001 to 2,000 sq.m.	total floor area exceeding 2,000 q.m.	
	5	(iv) Airport	VII-5(iv)(a)	VII-5(iv)(b)	VII-5(iv)(c)	
			total floor area not exceeding 1,000 sq.m.	total floor area 1,001 to 2,000 sq.m.	total floor area exceeding 2,000 q.m.	
	6 Purely for Worship	(i) Mosque	VII-6(i)			
		(ii) Church	VII-6(ii)			
		(iii) Indian Temple	VII-6(iii)			

UBBL 2021 FIFTH SCHEDULE - EXPANDED DESIGNATION OF PURPOSE GROUP (BY-LAW 134, 138)						
Group No & Title	Sub-group Title	Building Type	Building Sub-type (Refer to Tenth Schedule, UBBL)			
VIII Storage & General	1 Car park	(a) Open structure car park above the ground	VIII-1(a)(i) Single storey or less than 750 sq.m.	VIII-1(a)(ii) Two storeys and above or of exceeding 750 sq.m. per floor		
			VIII-1(c) Automated multilevel car park			
		(b) Enclosed car park or underground car park	VIII-1(b)(i) Less than 2,000 sq.m. (total floor area)	VIII-1(b)(ii) Exceeding 2,000 sq.m. (total floor area)		
		(c) Automated multilevel	VIII-1(c)			
	2 Warehouse of non-combustible product or storage of non-combustible product such as clay or bleaching earth	(a) Single storey	VIII-2(a)(i) Less than 2,000 sq.m.	VIII-2(a)(ii) Exceeding 2,000 sq.m.		
		(b) Two Storey & above	VIII-2(a)			
	3 Warehouse of combustible product or storage of combustible product	(a) Single storey	VIII-3(a)(i) Total floor area open sided of exceeding 1,000 sq.m.	VIII-3(a)(ii) Total floor area less than 250 sq.m.	VIII-3(a)(iii) Total floor area 250 to 500 sq.m.	VIII-3(a)(iv) Total floor area 501 to 1,000 sq.m. and less than 7,000 cub.m.

UBBL 2021 FIFTH SCHEDULE - EXPANDED DESIGNATION OF PURPOSE GROUP (BY-LAW 134, 138)						
Group No & Title	Sub-group Title	Building Type	Building Sub-type (Refer to Tenth Schedule, UBBL)			
VIII Storage & General	3 Warehouse of combustible product or storage of combustible product	(a) Single storey	VIII-3(a)(v)	VIII-3(a)(vi)		
			Total floor area 1,001 sq.m. to 10,000 sq.m. and 7,001 cub.m. to 70,000 cub.m.	Total floor area exceeding 10,000 sq.m. or of exceeding 70,000 cub.m.		
		(b) Two storeys and over	VIII-3(b)(i)	VIII-3(b)(ii)		
			Total floor area less than 1,000 sq.m. or less than 7,000 cub.m.	Total floor area exceeding than 1,000 sq.m. or exceeding than 7,000 cub.m.		

3.2 Uniform Building Bylaw 1984 & Selangor Uniform Building Bylaw 1986

NBeS focuses on the building bylaw requirements from the following sections of the UBBL:-

- Part III - Space, Light & Ventilation
- Part V - Structural Requirement
- Part VI - Constructional Requirements
- Part VII - Fire Requirements
- Part VIII - Fire Detection, Fire Alarm & Fire Extinguishment
- Part IX - Miscellaneous
 - Fifth Schedule: Designation of Purpose Group
 - Sixth Schedule: Calculation of Permitted Limits of Unprotected Areas
 - Seventh Schedule: Maximum Travel Distance and Calculation of Occupant Load and Capacity of Exits
 - Eighth Schedule: Classification of Restriction of Spread of Flame over Surfaces of Walls & Ceilings
 - Ninth Schedule: Limit of Compartments and Minimum Periods of Fire Resistance for Elements of Structure
 - Tenth Schedule: Table of Requirements for Fire Detection, Fire Alarm and Fire Extinguishment Systems.

3.3 Malaysian Standard (MS) 1184:2014 Universal design and accessibility in the built environment - Code of practice (2nd. Revision)

This MS code of practice focuses on detailed designs and parameters related to Handicapped & disabled persons from parking requirements, horizontal & vertical circulation and accessibility including ramp designs, toilet design & layout, handrail design requirements, furnishing & signages and fire safety, protection & evacuation. NBeS shall incorporate some aspects of the design requirements for compliance.

3.4 Local PBT Design Technical Requirements

PSP/SP shall obtain from the Local PBT's Design Technical Manual/Checklist before embarking in the modeling process. This is to understand and comply with the required element parameters and data besides what is required by the other reference bylaws and MS standards.

3.5 NBeS Ruleset Element Parameters Summary List

Table 6 - Ruleset Parameters

No	Elements	Required NBeS Ruleset Parameters	Section/Reference
1	Partition Wall	Wall Type Wall Height Construction Function Fire Rating Wall Thickness	UBBL bylaw 70, 71, 86, 98, 139, 141, 149, 158, (refer to Section 4.16)
2	Fence	Fence Type Fence Height Construction Function	UBBL bylaw 98 (refer to Section 4.17.2)
2	Separating Wall/ Party Wall	Wall Type Wall Height Construction Function Fire Rating Wall Thickness	UBBL bylaw 86, 141 (refer to Section 4.16)
3	Separating Wall Above Roof/ Party Wall Above Roof	Wall Type Wall Height Construction Function Fire Rating Wall Thickness	UBBL bylaw 86, 141 (refer to Section 4.16 F)
4	Door	Door ID Door Fire Rating Door Position Door Dimensions Door Openable Area Door Glazing Area Door Material - Frame, Leaf & Glazing	UBBL bylaw 39, 163, 165, 167, 169, 171, 173, (refer to Section 4.8)
5	Window	Window ID Window Position Window Dimensions Window Openable Area Window Glazing Area Window Material - Frame & Glazing	UBBL bylaw 39, 191, 196, 197B, 198 (refer to Section 4.9)

No	Elements	Required NBeS Ruleset Parameters	Section/Reference
6	Stair & steps	Stair Type Stair Location Total no of risers Total no of risers-Flight 1 Total no of risers-Flight 2 Total no of risers-Flight 3 Total no of risers-Flight 4 Stair Width-Flight 1 Stair Width-Flight 2 Stair Width-Flight 3 Stair Width-Flight 4 Stair Landing Depth 1 Stair Landing Depth 2 Stair Landing Depth 3	UBB bylaw 126, 167, 168, 194, 195 Distance between storey exit doors more than 5m (refer to Section 4.13)
7	Railing	Railing Location Railing Type Railing Height	Ubbi bylaw 107, 116, 126 (refer to Section 4.14)
8	Ramp	Ramp Type Ramp Width Ramp Length Ramp Rise	UBBL bylaw 38, 192 (refer to Section 4.12)
9	Room Minimum Floor Area, Height & Minimum Natural Ventilation Requirement x`	Unit Lot, Block No, Unit No Room No. Space Use Type Habitable Proposed Room Area Room Width Proposed Room Length Proposed Proposed Room Height Ventilation Type Lighting Type Finishes - Floor, Wall, Ceiling, Skirting Fire Detection System Potable Extinguisher	UBBL bylaw 39,41 42, 43,44, 45, 46, 47, 111, 151, 196, 197B, 198, 199, 200, 202 (refer to Section 4.17)

No	Elements	Required NBeS Ruleset Parameters	Section/Reference
10	SPAH	SPAH Type Roof Collection Area Tank size	UBBL bylaw 115
11	Parking Provision	Parking Type Length Width No of parking spaces provided & required	UBBL bylaw 136, 137, 138, 139 MS 1184, JPBP & PBT Guidelines (refer to Section 4.17.3)
12	Road	Road Type Road Length	UBBL bylaw 140 (refer to Section 4.17.3)
13	Swimming pool	Pool depth	UBBL bylaw 125, 128, 129, 130, 131
FIRE REQUIREMENTS (note: These requirements are not implemented at this stage of NBeS Development)			
14	Portable Extinguisher, Hose Reel, Dry Riser, Wet Riser, Sprinkler, Fire detection & alarm system		UBBL bylaw 226, 227, 228, 230, 231, 239, 253
15	Compartment Volume	Compartment Purpose Group Height Fire Protection Provision Occupant Load sq.m. per "Aras Purata Ketinggian Isipadu Bumbung" Storey Level	
16	Hydrant	Object & Marker ID No of hydrants provided Distance Markers	UBBL bylaw 225
17	Dead end Turning Provision	Road Type Dead End Distance	UBBL bylaw 140
18	Topmost Building Peak Level	Storey Level	KM compliance
19	Fire Appliance Access Levels & Building Height	Fire Appliance Access Level Fire Appliance Access Level-Tower Fire Appliance Access-Topmost Usage Level Fire Appliance Access-Topmost Usage Level-Tower	18m UBBL bylaw 144, 197, 197A, 200, 229, 230 30m UBBL bylaw 137, 195, 231,

No	Elements	Required NBeS Ruleset Parameters	Section/Reference
		4.5m Head Clearance Compliance 6m Back Lane Access	
19	No of Storey	No. of Habitable Floors No of Lift	UBBL bylaw 113, 124, 167, 174, 189, 194, 199, 211
20	Fire Appliance Access way requirement by Building Volume	Building Perimeter Length Front Building Perimeter Length Right Side Building Perimeter Length Rear Building Perimeter Length Left Side Fire Appliance Access Min. Proportion Building Perimeter Unit Areas Common Areas Roof Area	UBBL bylaw 113
21	Dead End Limit Alternative Exit	Maximum Travel Distance Type Distance Markers & ID	UBBL bylaw 165, 166, 167, 170

3.6 Local PBT Technical Design Reference or Checklist

NBeS template is prepared based on the Uniform Building by-Law 1984 and other generic requirements throughout the architectural practice. The guidebook has incorporated detailed requirements from specific local authorities:-

- le Perbadanan Putrajaya (PPj)
- Majlis Bandaraya Petaling Jaya (MBPJ)
- Majlis Perbandaran Kangar (MPK)
- Majlis Bandaraya Melaka Bersejarah (MBMB)
- Majlis Perbandaraan Kulim (MPKK)
- Dewan Bandaraya Kuching Utara (DBKU)

PSP/SP is advised to obtain the “Checklist” and understand the Local PBT technical requirements during consultation with them. If available in the PBT website, PSP/SP may download the “BIM Technical Compliance Checklist” for reference while modeling the construction element.

3.7 Fire Performance Based Assessment (PBA) / Special requirement exclusion

NBeS model submitted is not applicable for PBA uses because the assessment only focuses on ‘prescriptive’ requirements which are objective and may be limited to certain building complexity.

The PBA approach is subjective and is assessed by Putrajaya after the PSP has obtained approval from zone or state level, depending on where they are submitting. Because of this, PBA is not considered as part of this NBeS. Although the NBeS process delivers a 3D model, a project pursuing PBA is advised to develop the PBA model separately to avoid modeling confusion.

4.0 MODELING METHODOLOGY AND DATA INPUT

This section outlines the modeling methodologies for inputting BIM non-graphical data and BIM element parameters by using the developed NBeS Revit template provided by CIDBD. This template shall enable PSP/SP to prepare the Building Plan (BP) submission model. PSP/SP is required to use the Revit template of similar version or later. The BIM submission model shall either be modeled from the beginning using the NBeS template or transfer the template parameters into the PSP/SP’s completed Revit model. The process for transferring the template parameters shall be explained further in this guidebook. PSP/SP **shall backup** the original model before transferring NBeS template parameters into the submission model. Modification to the NBeS template parameters is not advisable as it may affect the system from working properly. CIDBD and their development teams shall not be liable for any file or data being damaged or corrupted during the template transferring process.

All revit individual and linked models will be required to be upgraded to the same Revit template version before transferring of NBeS parameters and project standards. BIM models which were being developed in worksharing mode must also first be detached from the central model. PSP/SP shall use the PBT’s NBeS Revit template and not from another PBT as they may differ from one Local Authority to another. Good modeling practice shall be adhered throughout the process to ensure the model integrity and accuracy are achieved before exporting for submission.

4.1 Non-Graphical Input Sheet

Many BIM software allows PSP/SP to add non-graphical parameters such as project, PSP/SP, client and land information. Developed in NBeS Revit template, a sheet layout has been added to input information required by the Local PBT. Therefore, PSP/SP shall fill up all the required information inside the template accordingly before exporting the IFC model for model compliance checking and print out for hardcopy submission.

Figure 2 Project Information Sheet

BUILDING INFORMATION				PSP INFORMATION			
Project Name				PSP-SP Name		Ar Mohd Azizan	
Input Project Title				PSP-SP Regr No		PSP-SP IC No	
				PSP-SP Position		PSP-SP Tel No	
				PSP-SP CompName			
				PSP-SP Comp Addr			
				PSP-SP Comp Reg			
PSP-SP Comp Tel				PSP-SP Fax No			
PSP-SP Email							
CLIENT INFORMATION							
OSC File No				Client's Name		Input Client Name	
BP Subm Date		BP Subm Date 1		Client's Comp Name			
BP Subm Date 2				Client's Comp Addr			
KM Approval No				Client's Comp Reg			
KM Approval Date				Client's Comp Tel		Client's Comp Fax	
BP Approval No				Client's Comp Email			
BP Approval Date				Client's IC no		Client's Tel	
Purpose Group No	Refer to NBeS Guidebook	Ttl. Residential Units		Client's Position			
Ttl. Comm. Units		Ttl. Industry Units					
Plot Ratio Allowed		Plot Ratio Prop.					
Total GFA Allowed		Total GFA Prop.					
Total CPA GFA							
No. Storey abv Grd		No. Storey bel Grd					
Bldg. Height abv Grd		Bldg. Height bel Grd					
No CPS Req'd		No CPS Prov.					
No CPS-OKU Req'd		No CPS-OKU Prov.					
No MPS Req'd		No MPS Prov.					
Total GFA CPS		Total GFA Prov.					
Total Bldg Volume							
Total Building Submission Fees							
LAND INFORMATION							
Title Type		Title No					
State		Area					
City/Town/District		Lot no					
Land Area		Landuse Category					
Owner Name							
Owner Comp Name							
Owner Comp Addr							
Owner Tel No		Owner IC No					
Owner Email							
		PBT LOGO		Model name		NBeS Revit 2022 Template V2.02-2	
				Submission date		02/13/24	
LAM Stamp							

4.2 Units and Measurement

The unit measurement used in the BIM model shall be consistent throughout the project. Default project units shall be in millimeters without any decimal points in order to display accuracy in the temporary dimensions. Angular dimensions shall be in decimal degrees.

4.3 Modeling Using The Correct Tool

Elements modeled are categorized into “Site Elements” & “Building Elements”. Site elements are modeled on “NBeS Site/Fire Appliance Access Level” while building elements are modeled on building storey levels. If “Component” > “Model in Place” tool is used to model an element, the modeler shall make sure that the elements modeled are classified to the correct “Family Category”. Furthermore, NBeS parameters are set to the correct family category to input the required data.

The table below outlines the model elements, tools used and export IFC classes.

Table 7 - Site elements & exported IFC Classes

No	Site Elements	Modeled using specified Revit Tool	Exported ifc Classes
1	Site Topography/Geometry	In-Place Mass	ifcSite
2	Flat/Sloping Roads	Slab	ifcSlab
3	Kerb & other road furnitures	In-Place Mass	ifcBuildingElementProxy
4	Ramp	Ramp	ifcRamp
5	Fences - Solid	Wall	ifcWall
6	Fences - metal grille	Railing	ifcRailing
7	Fences	Curtain wall (not recommended tool)	ifcCurtainWall
8	Fire hydrant & hose, Bridging inlet	Insert Component	ifcBuildingElementProxy
9	Street & Landscape Light	Insert Component	ifcBuildingElementProxy
10	External Wall	Wall	ifcWall
11	Parking	Insert Component	ifcBuildingElementProxy
12	Dimension markers	Insert Component	ifcBuildingElementProxy
13	Landscape Element	Hide element & do not export out	
14	Transport Element	Hide element & do not export out	
15	Underground Service	Hide element & do not export out	

Table 7 - Building elements & exported IFC Classes

No	Building Elements	Modeled using specified Revit Tool	ifc Classes
1	Internal full and low wall	Wall	ifcWall
2	Door	Door	ifcDoor
3	Window	Window (curtain wall tool not recommended)	ifcWindow
4	Floor or roof slab	Slab	ifcSlab
5	Sloping roof	Roof	ifcRoof
6	Staircase	Stair	ifcStairFlight, ifcSlab (landing)
7	Steel Handrail & guard rail	Railing	ifcRailing
8	Column	Column	ifcColumn
9	Beam	Beam	ifcBeam
10	Ceiling	Ceiling	ifcCeiling
11	Sanitary fitting	Insert Component	ifcSanitaryTerminal
12	Internal Ramp	Ramp	ifcRamp
13	Furniture	Hide element & do not export out	

4.4 Project North & True North

North is always pointing up. True North is the actual geographic direction of North. Daylighting rendering and shadow casting in Revit is oriented to true north (except those set to the "Lighting" scheme). Therefore, site plan orientation shall reflect the exact true north in order to get a realistic scenario of actual building completed on site. So to set True North go to :-

Manage Tab > Project Location > Rotate True North

This command behaves like a rotate command except that the rotation may go opposite of what is expected.

Project North is typically parallel to the building footprint and oriented for convenience when composing sheets. By default, floor plan views are oriented to Project North. Each plan view can be set either Project North or True North as required.

4.5 Importing NBeS Parameters and Standards into Existing Revit Model

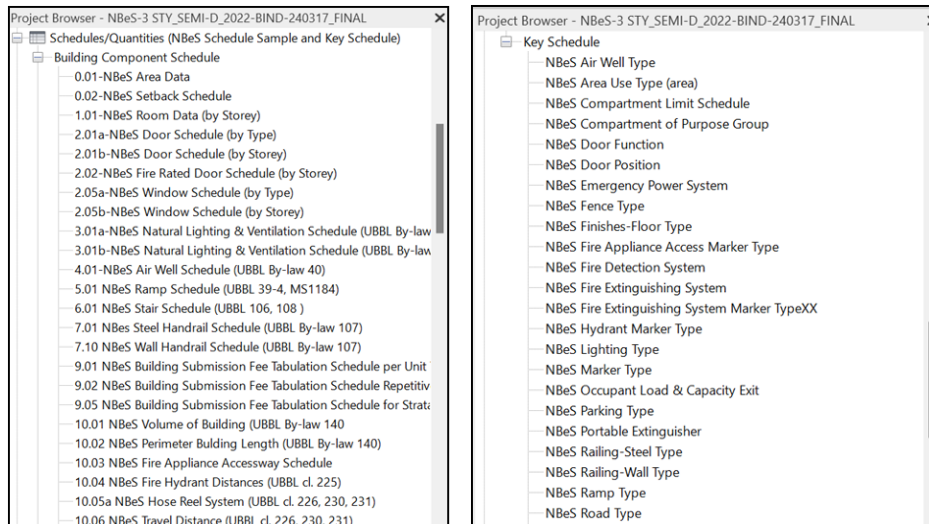


Figure 3 NBeS Project Browser

If the submission model consists of several linked Revit models into a central model, you are required to update each of the linked models to the same version. Once upgraded, transfer the NBeS parameters and standards to the central and every linked revit models.

Before the importing process, download the latest “NBeS Revit 2022 or 2023 Template” file. Open a “New” Revit project file and select the NBeS template file to open. Once opened, save the new project with the same file name. The saved file should be a “.rvt” file format and not “.rte” file format.

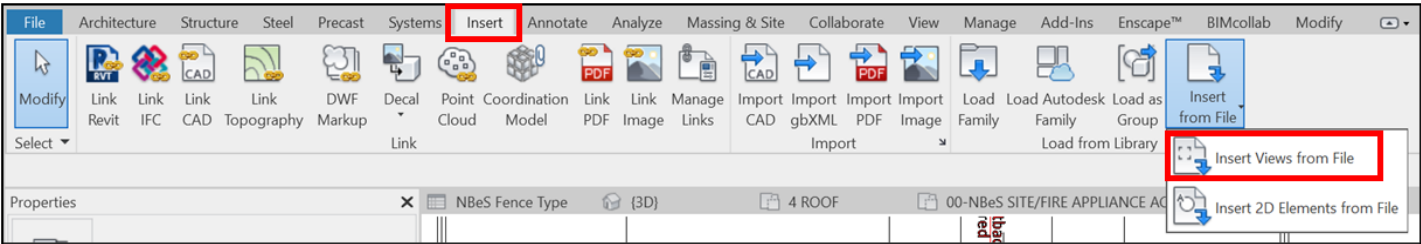
If your model has the previous version of NBeS template, you are required to delete all Building Component & Key Schedules that have “NBeS” heading in the schedule.

You will be required to populate the data using the new parameters and schedules provided from the latest version of the NBeS Revit template

For PSP/SP who are interested to submit their Building Plans using NBeS e-Checker system is most likely to have a 3D Revit model which has not incorporated the required NBeS parameters & standards. Therefore, the submission model is required to import these NBeS parameters & standards followed by assigning the element parameters and input the data required for ruleset checking. The following chapters explain the process of transferring the NBeS template parameters and standards into an existing model.

Open the submission model in Revit 2022 or 2023 version and if the model is not this version and of older version, make a duplicate copy of the model and open the model in Revit 2022 or 2023 version. Save the converted submission model by renaming the model by stating the revit version.

4.5.1 Insert Views from File



With the submission model file opened, go to

“Insert” menu > “Insert Views from File” and an “Open” dialog box will appear.

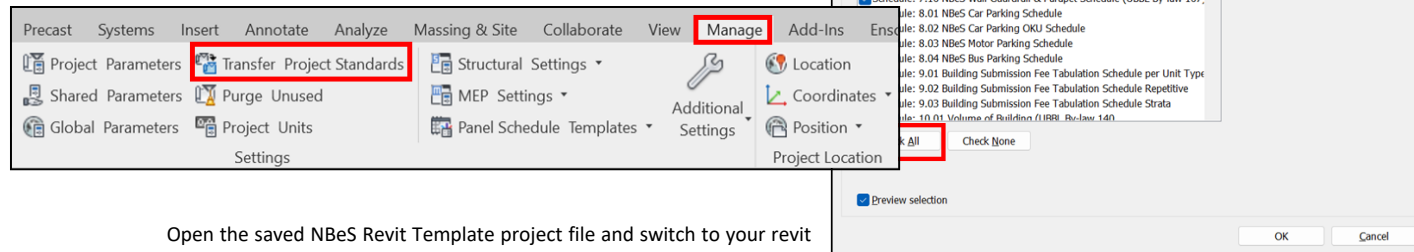
Find the earlier saved NBeS Revit Template project file and open the file.

Click the “Check All” to transfer the NBeS views and sheets into your project.

To complete click “OK”.

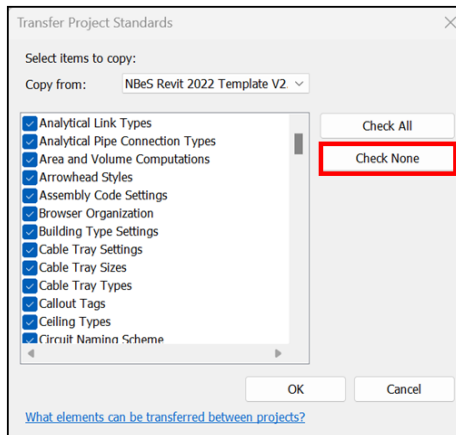
Verify in the “Project Browser” of your submission project that all schedules & sheets have been transferred.

4.5.2 Transferring NBeS Template Project Standards into Submission Model



Open the saved NBeS Revit Template project file and switch to your revit submission model.

Click the “Manage” menu > “Transfer Project Standards and the following dialog box will appear.

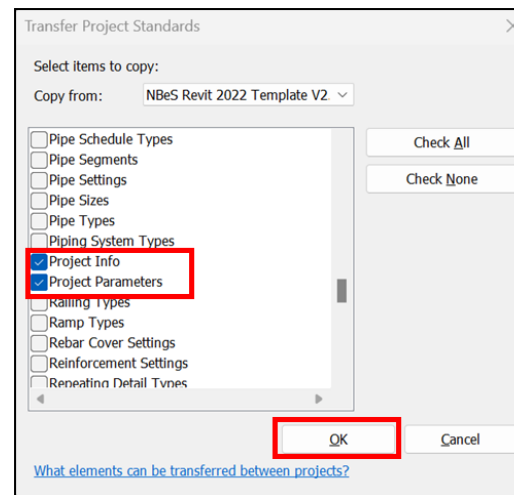
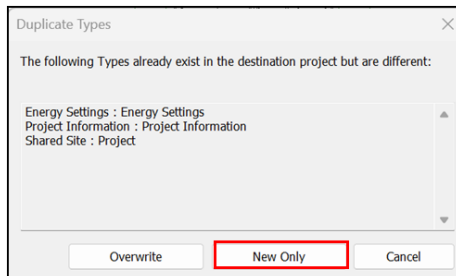


Click “Check None” to deselect all elements to be transferred.

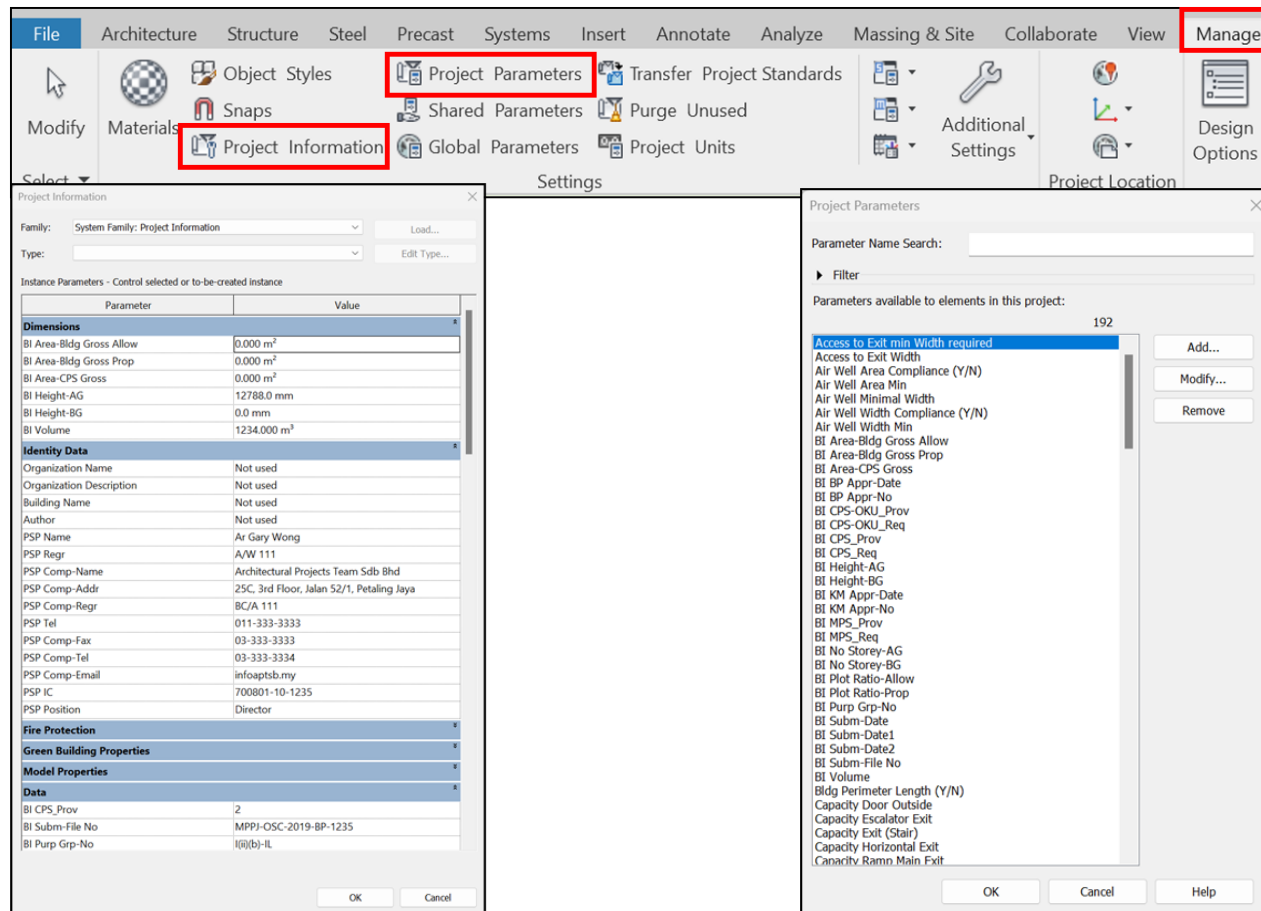
Scroll down and select “Project Info” and “Project Parameters”.

Click “OK” to proceed.

A “Duplicate Types” dialog will appear. Click “New Only” to complete the transfer



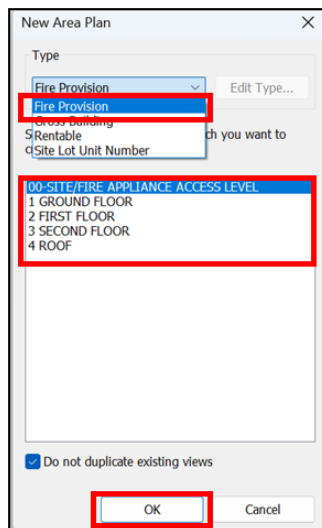
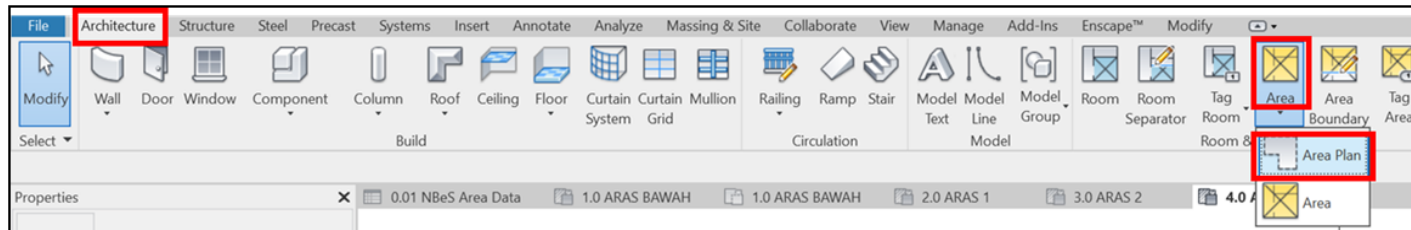
Verify that the “Project Information” and “Project Parameters” have been transferred into your submission project.



4.6 Create “Area Plan” views

In NBeS, “Area Plan” is created for the purpose of calculating the following:-

- Total gross building floor area for every unit, car parking, facilities, circulations & services.
- Total building volume calculation for fire fighting requirements.
- Total building submission plan fee calculations.



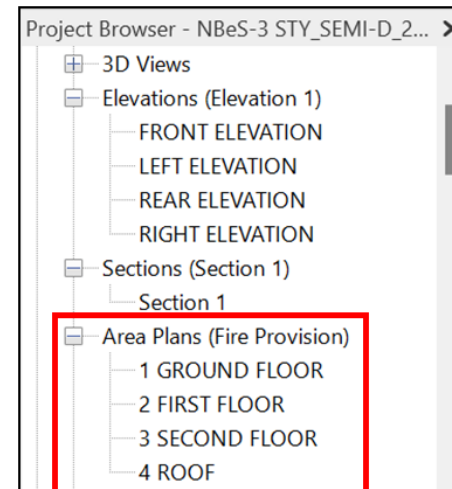
To create the "Area Plans", click on the

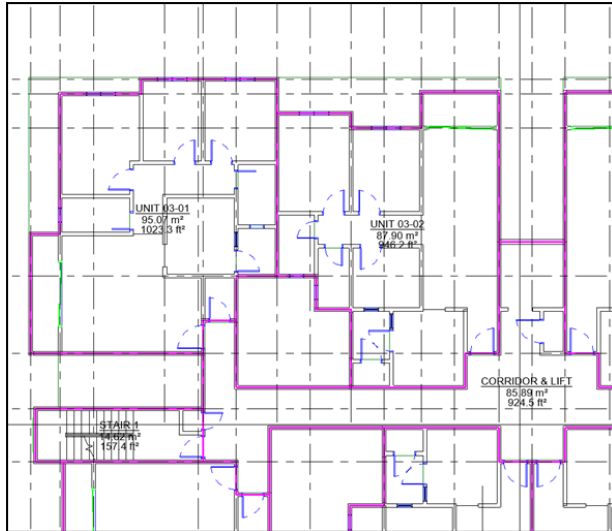
"Architecture" menu > "Area" > "Area Plan" to open up the "New Area Plan" dialog box.

Select the "Fire Provision" type, followed by the required floor levels (inclusive of Roof Level) to create the area plans. Click "OK" to complete.

Confirm the creation of the area plans by going to

"Project Browser" > "Views" > Area Plans (Fire Provision)





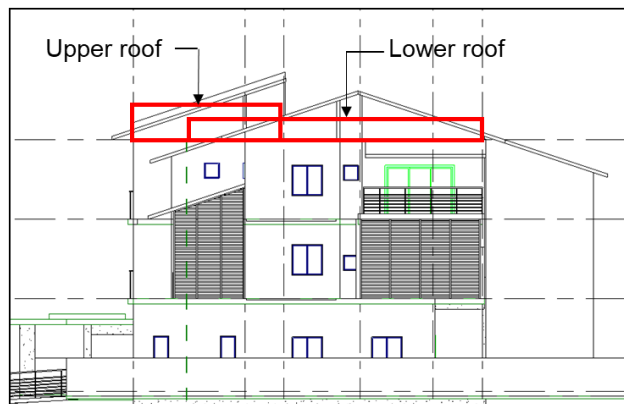
Create floor areas for units, car park areas, facilities, circulation and services depending on your building type. Complete all areas on every floor level.

For Strata development, model the areas of individual units and common spaces depending on the area space types listed on the right figure.

For landed development, model the areas based on each of the units.

A
Area Use Types
Car Park-Above Ground
Car Park-Basement
Circulation & Services-Enclosed
Circulation & Services-Open
Roof Space
Usable Area-Facility
Usable Area-Office
Usable Area-Residential
Usable Area-Shop
Void

The roof areas are modeled and if the roof is a pitch roof, the height of the roof shall be half of the total height of the roof. Indicate the floor to floor height in the "0.01 NBeS Area Data" schedule.



Note:

For the roof area type, set the parameter to "Void". The "Void" parameter in the schedule is filtered off just to indicate the floor area of the unit and for the building fee calculation.

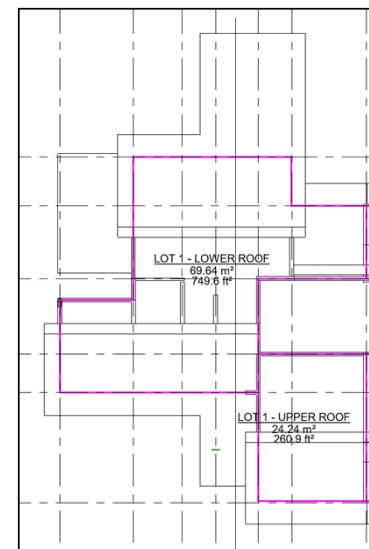
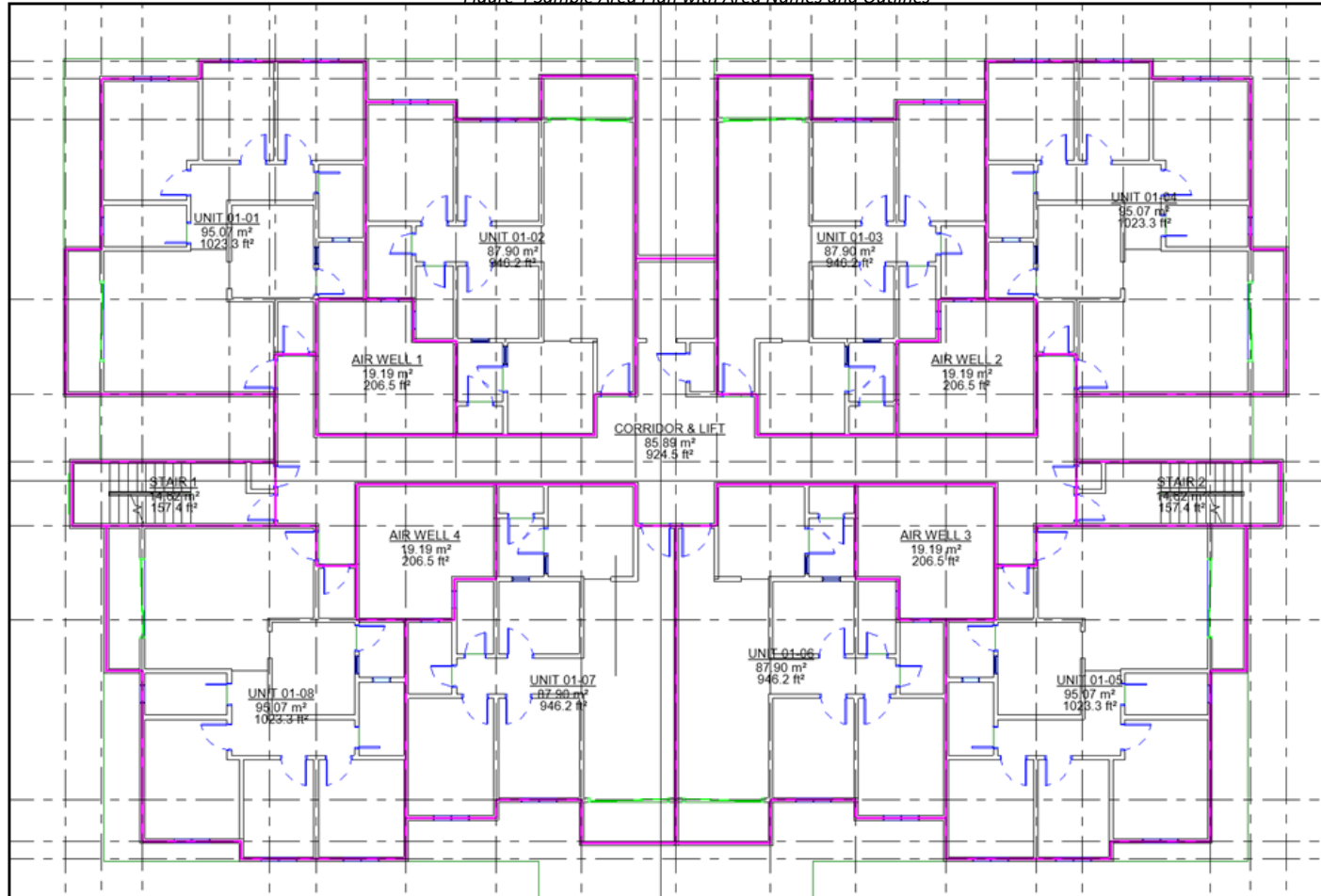
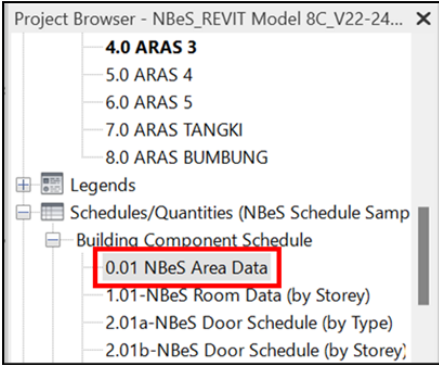


Figure 4 Sample Area Plan with Area Names and Outlines





The area plans are used both to determine the Building Plan Submission fees and the Total Building Volume.

Go to the “Project Browser” and open the “0.01 NBeS Area Data” schedule.

<NBeS Area Type (area)>	<NBeS Fire Extinguishing System>
A	A
Area Types	Key Name
Car Park-Above Ground	Automatic Sprinkler & Hose Reel Systems
Car Park-Basement	Automatic Sprinkler, Dry Riser & Hose Reel Systems
Circulation & Services-Enclosed	Automatic Sprinkler, Wet Riser & Hose Reel Systems
Circulation & Services-Open	Dry Riser & Hose Reel Systems
Roof Space	Foam System
Usable Area-Facility	Gaseous System
Usable Area-Housing	Hose Reel System
Usable Area-Office	Other Automatic Extinguishment System
Usable Area-Shop	Water Spray System
Void	Wet Riser & Hose Reel Systems

A	B	C	D	E	F	G	H
UNIT LOT/BLOCK	UNIT TYPE	UNIT NO	AREA NAME	AREA TYPE	AREA	FLOOR TO FLOOR HEIGHT	FIRE EXTINGUISHING SYSTEM
1.0 ARAS BAWAH							
A			CAR PARK	Car Park-Above Ground	930.28 m²	4,000 mm	Hose Reel System
A			LOBI & LIFT	Circulation & Services-Open	68.09 m²	4,000 mm	Hose Reel System
A			MAIL & OFFICE	Usable Area-Facility	26.90 m²	4,000 mm	Hose Reel System
A			STAIR 1	Circulation & Services-Enclosed	14.19 m²	4,000 mm	Hose Reel System
A			STAIR 2	Circulation & Services-Enclosed	14.19 m²	4,000 mm	Hose Reel System
A			SURAU	Usable Area-Facility	44.60 m²	4,000 mm	Hose Reel System
2.0 ARAS 1					1,098.25 m²		
A			CORRIDOR & LIFT	Circulation & Services-Open	85.89 m²	3,000 mm	Hose Reel System
A			STAIR 1	Circulation & Services-Enclosed	14.62 m²	3,000 mm	Hose Reel System
A			STAIR 2	Circulation & Services-Enclosed	14.62 m²	3,000 mm	Hose Reel System
A	B1	UNIT 01-01	UNIT 01-01	Usable Area-Housing	95.07 m²	3,000 mm	Hose Reel System
A	A1	UNIT 01-02	UNIT 01-02	Usable Area-Housing	87.90 m²	3,000 mm	Hose Reel System
A	A2	UNIT 01-03	UNIT 01-03	Usable Area-Housing	87.90 m²	3,000 mm	Hose Reel System
A	B2	UNIT 01-04	UNIT 01-04	Usable Area-Housing	95.07 m²	3,000 mm	Hose Reel System
A	B1	UNIT 01-05	UNIT 01-05	Usable Area-Housing	95.07 m²	3,000 mm	Hose Reel System
A	A1	UNIT 01-06	UNIT 01-06	Usable Area-Housing	87.90 m²	3,000 mm	Hose Reel System
A	A2	UNIT 01-07	UNIT 01-07	Usable Area-Housing	87.90 m²	3,000 mm	Hose Reel System
A	B2	UNIT 01-08	UNIT 01-08	Usable Area-Housing	95.07 m²	3,000 mm	Hose Reel System
					846.99 m²		

Table 8 Area Schedule & Input Data

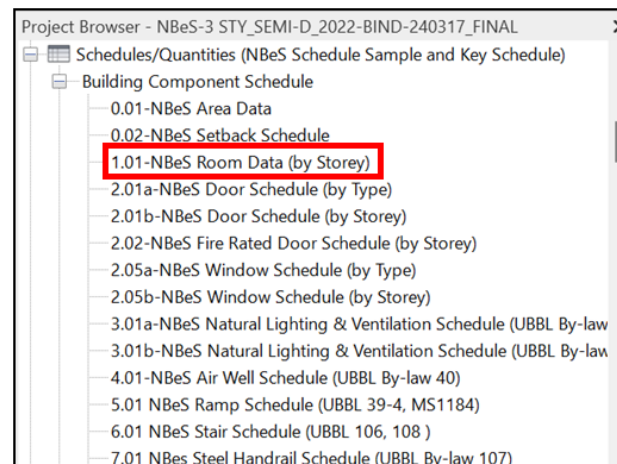
COLUMN	HEADER	DESCRIPTION	EXAMPLE
A	UNIT LOT/ BLOCK NO	Area /Identity Data / Unit Lot or Block No / For repetitive Bungalow, Semi-D or Terrace houses, enter the unit lot no For repetitive Apartments, enter the block name. (Note: apartment blocks should a separate revit model file if they do not share the same podium block)	LOT 1, LOT PT 32154 A, A1,

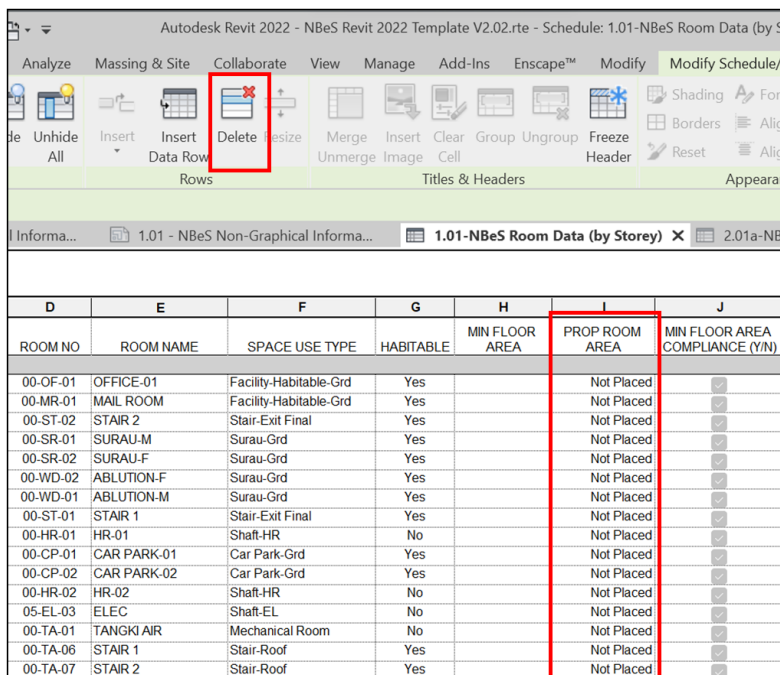
B	UNIT TYPE	Area / Identity Data / Unit Type / Represent individual unit type which can be used for sorting out rooms within each unit.	A1, B1, C
C	UNIT NO	Area / Identity Data / Unit No / Represent the address of the unit. (Floor Level-Unit no). Shared spaces will not have any numbering (00 - Ground Floor, 01 - First Floor, MZ - Mezzanine).	00-01, 01-01
D	AREA NAME	Area / Identity Data / Name / Represent Unit/ Space Name.	UNIT 01-01, STAIR
E	AREA TYPE	Select from the list of "Area Types".	
F	AREA	Areas are automatically calculated	
G	FLOOR TO FLOOR HEIGHT	Enter the floor to floor height of the area	
H	FIRE EXTINGUISHING SYSTEM	Select from the list of "Fire Extinguishing System". Set to "None" if no systems are used for the project.	

4.7 Set Room Parameters in “NBeS Room Data Schedule”

The Revit submission model should already have the “Room” created on every space in the floor plan. To view all created rooms, go to :-

“Project Browser” and double click on “1.01 - NBeS Room Data (by Storey)” to open the Storey room data schedule.





The screenshot shows the Autodesk Revit 2022 interface. The 'Collaborate' ribbon tab is active, and the 'Delete' button is highlighted with a red box. Below the ribbon, the '1.01-NBeS Room Data (by Storey)' schedule is open. A red box highlights the 'PROP ROOM AREA' column in the schedule table.

D	E	F	G	H	I	J
ROOM NO	ROOM NAME	SPACE USE TYPE	HABITABLE	MIN FLOOR AREA	PROP ROOM AREA	MIN FLOOR AREA COMPLIANCE (Y/N)
00-OF-01	OFFICE-01	Facility-Habitable-Grd	Yes		Not Placed	☒
00-MR-01	MAIL ROOM	Facility-Habitable-Grd	Yes		Not Placed	☒
00-ST-02	STAIR 2	Stair-Exit Final	Yes		Not Placed	☒
00-SR-01	SURAU-M	Surau-Grd	Yes		Not Placed	☒
00-SR-02	SURAU-F	Surau-Grd	Yes		Not Placed	☒
00-WD-02	ABLUTION-F	Surau-Grd	Yes		Not Placed	☒
00-WD-01	ABLUTION-M	Surau-Grd	Yes		Not Placed	☒
00-ST-01	STAIR 1	Stair-Exit Final	Yes		Not Placed	☒
00-HR-01	HR-01	Shaft-HR	No		Not Placed	☒
00-CP-01	CAR PARK-01	Car Park-Grd	Yes		Not Placed	☒
00-CP-02	CAR PARK-02	Car Park-Grd	Yes		Not Placed	☒
00-HR-02	HR-02	Shaft-HR	No		Not Placed	☒
05-EL-03	ELEC	Shaft-EL	No		Not Placed	☒
00-TA-01	TANGKI AIR	Mechanical Room	No		Not Placed	☒
00-TA-06	STAIR 1	Stair-Roof	Yes		Not Placed	☒
00-TA-07	STAIR 2	Stair-Roof	Yes		Not Placed	☒

In the schedule, if there are any spaces that are labeled as “**Not Placed**” shown in column “I”, select all these rooms and click, “Delete” button in the ribbon bar to delete all these non-boundaried rooms.

4.7.1 Set NBeS Room Data schedule by Unit Type

Modify | Rooms

Properties

Multiple Families Selected

Rooms (15) Edit Type

Identity Data

Number	<varies>
Name	<varies>
Lighting Type	(none)
Ventilation Type	(none)
Emergency Power Sy...	(none)
Portable Extinguisher	(none)
Fees for Level	(none)
Space Use Type	<varies>
Series of rows	(none)
Air Well Type	(none)
Fire Detection System	(none)
Finishes-Floor Type	(none)
Image	
Comments	
Occupancy	
Department	
Base Finish	
Ceiling Finish	
Wall Finish	
Floor Finish	
Corridor Opening Le...	
Quantity Text	
Unit No	
Capacity Horizontal E...	
Capacity Stair Exit	
Exit per Unit Width	
Capacity Door Outside	
Unit Type	A
Fire Requirement	
Unit Lot or Block No	LOT 1

Properties help Apply

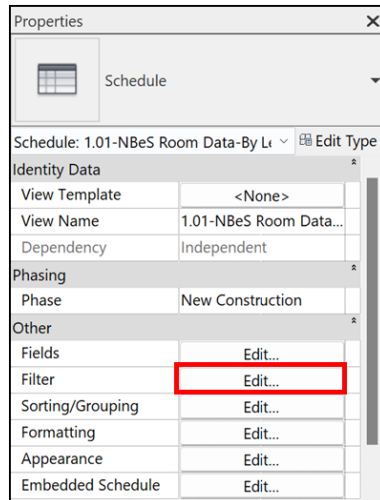
1 GROUND FLOOR 1.00 - NBES SUBMISSION INFORM... 1.00 - NBES SUBMISSION INFORM...

In a project where you have multiple similar unit types, lot designation and unit no, it's best to make sure all the repetitive units are pointed to the correct unit parameters. These parameter headers are already set in your project where you can enter your desired naming parameters.

Select all rooms of the same unit type or lot and input the appropriate data.

Repeat the unit assignments for every unit type and on other floors before moving to the next section of this guidebook.

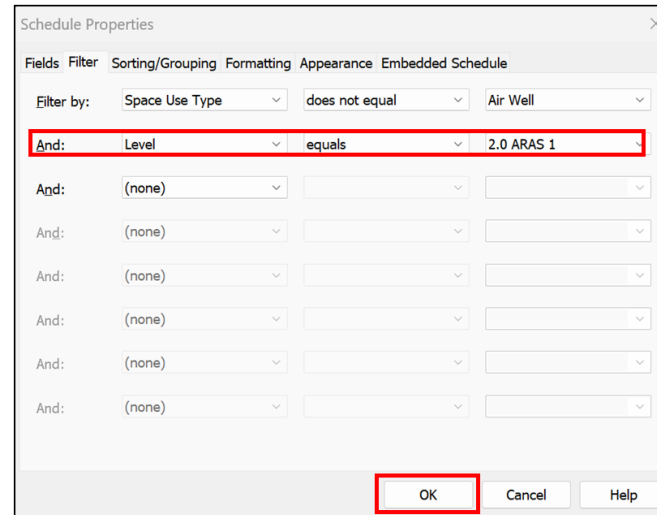
4.7.2 Set NBeS Room Data Schedule By Individual Levels



Duplicate the NBeS Room Data (by Storey) and rename the new schedule with your desired storey level.

E.g. "1.01 - NBeS Room Data-Aras 1"

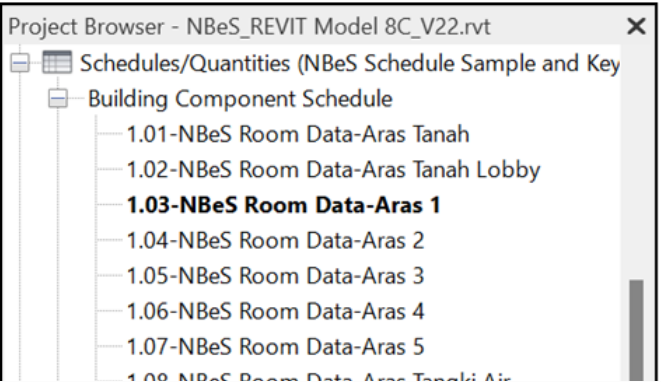
In the "Properties" > "Other" > "Filter" >, Click on the "Edit" button to open the Schedule Filter Properties.



Add “Level”, “equal” & “(your storey)” filter to list the Room Data schedule by level.

Click “OK” to complete the setting for the room data by level.

Duplicate the NBeS Room Data Schedule for each floor level by adjusting the filter to match the floor level required. (see sample “Project Browser” on the right)



A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
UNIT LOT/ BLOCK NO	UNIT TYPE	UNIT NO	ROOM NO	ROOM NAME	SPACE USE TYPE	HABITABLE	MIN FLOOR AREA	PROP ROOM AREA	MIN FLOOR AREA COMPLIANCE (Y/N)	MIN ROOM WIDTH	ROOM WIDTH PROP	MIN ROOM WIDTH COMPLIANCE (Y/N)	MIN ROOM LENGTH	ROOM LENGTH PROP	MIN ROOM LENGTH COMPLIANCE (Y/N)
1 GROUND FLOOR															
LOT 1	A		G-06	BATH 5	Bathroom-Open	Yes	2.00 m²	4.71 m²	✓	900 mm	1,720 mm	✓			✓
LOT 1	A		G-12	BATH 6	Bathroom-Open	Yes	2.00 m²	4.70 m²	✓	900 mm	1,650 mm	✓			✓
LOT 1	A		G-05	BEDROOM 5	Habitable Room Other	Yes	6.50 m²	19.56 m²	✓	2,150 mm	3,600 mm	✓			✓
LOT 1	A		G-11	BEDROOM 6	Habitable Room Other	Yes	6.50 m²	11.79 m²	✓	2,150 mm	2,825 mm	✓			✓
LOT 1	A		G-01	CAR PORCH	Car Park-Grd	Yes		21.37 m²	✓			✓			✓
LOT 1	A		G-16	CORRIDOR	Circulation-Residential	No		10.35 m²	✓			✓			✓
LOT 1	A		G-07	DINING	Dining-Residential	Yes		22.87 m²	✓			✓			✓
LOT 1	A		G-10	KITCHEN	Kitchen-Residential	Yes	4.50 m²	12.54 m²	✓	1,650 mm	2,850 mm	✓			✓
LOT 1	A		G-03	LIVING	Living-Residential	Yes		38.33 m²	✓			✓			✓
LOT 1	A		G-04	STORE	Other-Residential Non Ha	No		3.84 m²	✓			✓			✓
LOT 1	A		G-14	STR-GRD	Stair-Single	Yes		12.54 m²	✓			✓			✓
LOT 1	A		G-02	TERRACE	Exterior	No		17.67 m²	✓			✓			✓
LOT 1	A		G-13	UTILITY	Other-Residential Non Ha	No		5.43 m²	✓			✓			✓
LOT 1	A		G-15	YARD	Other-Residential Non Ha	No		11.52 m²	✓			✓			✓
							197.23 m²								

Table 9 Room Schedule & Input Data

COLUMN	HEADER	DESCRIPTION	EXAMPLE
A	UNIT LOT/ BLOCK NO	Room /Identity Data / Unit Lot or Block No / For repetitive Bungalow, Semi-D or Terrace houses, enter the unit lot no	LOT 1, LOT PT 32154

		For repetitive Apartments, enter the block name. (Note: apartment blocks should a separate revit model file if they do not share the same podium block)	A, A1,
B	UNIT TYPE	Room / Identity Data / Unit Type / Represent individual unit types which can be used for sorting out rooms within each unit.	A1, B1, C
C	UNIT NO	Room / Identity Data / Unit No / Represented the address of the unit. (Floor Level-Unit no). Shared general spaces will not have any no. (00 - Ground Floor, 01 - First Floor, MZ - Mezzanine).	00-01, 01-01
D	ROOM NO	Room / Identity Data / Number / Represented the room no of a specific unit (Floor Level-Unit No-Room no) or general shared rooms (Floor Level-Room name abbreviation-Room no).	.

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
UNIT LOT/ BLOCK NO	UNIT TYPE	UNIT NO	ROOM NO	ROOM NAME	SPACE USE TYPE	HABITABLE	MIN FLOOR AREA	PROP ROOM AREA	MIN FLOOR AREA COMPLIANCE (Y/N)	MIN ROOM WIDTH	ROOM WIDTH PROP	MIN ROOM WIDTH COMPLIANCE (Y/N)	MIN ROOM LENGTH	ROOM LENGTH PROP	MIN ROOM LENGTH COMPLIANCE (Y/N)
1 GROUND FLOOR															
LOT 1	A		G-06	BATH 5	Bathroom-Open	Yes	2.00 m²	4.71 m²	☑	900 mm	1,720 mm	☑			☑
LOT 1	A		G-12	BATH 6	Bathroom-Open	Yes	2.00 m²	4.70 m²	☑	900 mm	1,650 mm	☑			☑
LOT 1	A		G-05	BEDROOM 5	Habitable Room Other	Yes	6.50 m²	19.56 m²	☑	2,150 mm	3,600 mm	☑			☑
LOT 1	A		G-11	BEDROOM 6	Habitable Room Other	Yes	6.50 m²	11.79 m²	☑	2,150 mm	2,825 mm	☑			☑
LOT 1	A		G-01	CAR PORCH	Car Park-Grd	Yes		21.37 m²	☐			☐			☐
LOT 1	A		G-16	CORRIDOR	Circulation-Residential	No		10.35 m²	☐			☐			☐
LOT 1	A		G-07	DINING	Dining-Residential	Yes		22.87 m²	☐			☐			☐
LOT 1	A		G-10	KITCHEN	Kitchen-Residential	Yes	4.50 m²	12.54 m²	☑	1,650 mm	2,850 mm	☑			☑
LOT 1	A		G-03	LIVING	Living-Residential	Yes		38.33 m²	☐			☐			☐
LOT 1	A		G-04	STORE	Other-Residential Non Ha	No		3.84 m²	☐			☐			☐
LOT 1	A		G-14	STR-GRD	Stair-Single	Yes		12.54 m²	☐			☐			☐
LOT 1	A		G-02	TERRACE	Exterior	No		17.67 m²	☐			☐			☐
LOT 1	A		G-13	UTILITY	Other-Residential Non Ha	No		5.43 m²	☐			☐			☐
LOT 1	A		G-15	YARD	Other-Residential Non Ha	No		11.52 m²	☐			☐			☐
							197.23 m²								

Table 9 Room Schedule & Input Data

COLUMN	HEADER	DESCRIPTION	EXAMPLE
E	ROOM NAME	Room name as per your original naming convention.	

COLUMN	HEADER	DESCRIPTION	EXAMPLE
F	SPACE USE TYPE	Select the appropriate space use type from the list (refer to Appendix A).	
G	HABITABLE	By selecting the space use type, the habitable “Yes or No” data will be automatically displayed.	
H	MIN FLOOR AREA	By selecting the space use type, the minimum floor area data will be automatically displayed.	
I	PROP ROOM AREA	Each room floor area proposed data is generated from the room. Otherwise, adjust the design to meet the minimum floor area required.	
J	MIN FLOOR AREA COMPLIANCE (Y/N)	Compare the area in column H & I. If the proposed area is larger than the minimum, click to check off for compliance.	☒
K	MIN ROOM WIDTH	By selecting the space use type, the minimum room width required data will be automatically displayed.	
L	ROOM WIDTH PROP	Room / Dimensions / Room Width Prop / Input your proposed room clear width next to the minimum room width required.	

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
UNIT LOT/ BLOCK NO	UNIT TYPE	UNIT NO	ROOM NO	ROOM NAME	SPACE USE TYPE	HABITABLE	MIN FLOOR AREA	PROP ROOM AREA	MIN FLOOR AREA COMPLIANCE (Y/N)	MIN ROOM WIDTH	ROOM WIDTH PROP	MIN ROOM WIDTH COMPLIANCE (Y/N)	MIN ROOM LENGTH	ROOM LENGTH PROP	MIN ROOM LENGTH COMPLIANCE (Y/N)
1 GROUND FLOOR															
LOT 1	A		G-06	BATH 5	Bathroom-Open	Yes	2.00 m²	4.71 m²	☒	900 mm	1,720 mm	☒			☒
LOT 1	A		G-12	BATH 6	Bathroom-Open	Yes	2.00 m²	4.70 m²	☒	900 mm	1,650 mm	☒			☒
LOT 1	A		G-05	BEDROOM 5	Habitable Room Other	Yes	6.50 m²	19.56 m²	☒	2,150 mm	3,600 mm	☒			☒
LOT 1	A		G-11	BEDROOM 6	Habitable Room Other	Yes	6.50 m²	11.79 m²	☒	2,150 mm	2,825 mm	☒			☒
LOT 1	A		G-01	CAR PORCH	Car Park-Grd	Yes		21.37 m²	☒			☒			☒
LOT 1	A		G-16	CORRIDOR	Circulation-Residential	No		10.35 m²	☒			☒			☒
LOT 1	A		G-07	DINING	Dining-Residential	Yes		22.87 m²	☒			☒			☒
LOT 1	A		G-10	KITCHEN	Kitchen-Residential	Yes	4.50 m²	12.54 m²	☒	1,650 mm	2,850 mm	☒			☒
LOT 1	A		G-03	LIVING	Living-Residential	Yes		38.33 m²	☒			☒			☒
LOT 1	A		G-04	STORE	Other-Residential Non Ha	No		3.84 m²	☒			☒			☒
LOT 1	A		G-14	STR-GRD	Stair-Single	Yes		12.54 m²	☒			☒			☒
LOT 1	A		G-02	TERRACE	Exterior	No		17.67 m²	☒			☒			☒
LOT 1	A		G-13	UTILITY	Other-Residential Non Ha	No		5.43 m²	☒			☒			☒
LOT 1	A		G-15	YARD	Other-Residential Non Ha	No		11.52 m²	☒			☒			☒
							197.23 m²								

Table 9 Room Schedule & Input Data

COLUMN	HEADER	DESCRIPTION	EXAMPLE
M	MIN ROOM WIDTH COMPLIANCE (Y/N)	Compare the minimum room width with the proposed room width in column K & L. If the proposed width is larger than the minimum, click to check off for compliance. Otherwise, adjust the design to meet minimum required.	☒
N	MIN ROOM LENGTH	Room / Dimensions / Room Length Prop / Input your proposed room clear length next to the minimum room width required.	
O	PROP ROOM LENGTH	Proposed room length is the value from the finish floor level to the bottom of suspended ceiling level or bottom of the slab level or bottom of beam if there are beams crossing under the space.	
P	MIN ROOM LENGTH COMPLIANCE (Y/N)	Compare the minimum room length with the proposed room width in column N & O. If the proposed width is larger than the minimum, click to check off for compliance. Otherwise, adjust the design to meet minimum required..	☒

Q	R	S	T	U	V	W	X	Y	Z	AA	AB
MIN ROOM HEIGHT	PROP ROOM HEIGHT	MIN ROOM HEIGHT COMPLIANCE (Y/N)	DAYLIGHTING & VENTILATION TYP								
			VENTILATION	LIGHTING	FLOOR	SKIRTING	WALL	CEILING	FIRE DETECTION SYSTEM	EMERGENCY POWER SYSTEM	PORTABLE EXTINGUISHER
2,000 mm	3,000 mm	☒	Natural	Natural					(none)	(none)	(none)
2,000 mm	3,000 mm	☒	Natural	Natural					(none)	(none)	(none)
2,500 mm	3,200 mm	☒	Natural	Natural					(none)	(none)	(none)
2,500 mm	3,400 mm	☒	Natural	Natural					(none)	(none)	(none)
2,500 mm	2,850 mm	☒	(none)	(none)					(none)	(none)	(none)
2,000 mm	2,438 mm	☐	(none)	(none)					(none)	(none)	(none)
2,500 mm	3,200 mm	☒	Natural	Natural					(none)	(none)	(none)
2,250 mm	3,200 mm	☒	Natural	Natural					(none)	(none)	(none)
2,500 mm	3,200 mm	☒	Natural	Natural					(none)	(none)	(none)
	3,200 mm	☐	(none)	(none)					(none)	(none)	(none)

Table 9 Room Schedule & Input Data

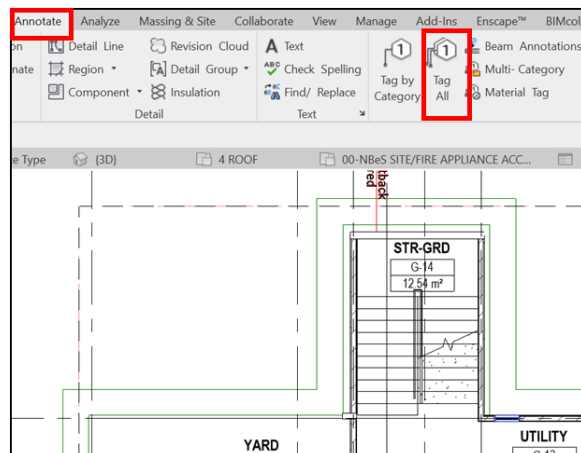
COLUMN	HEADER	DESCRIPTION	EXAMPLE
Q	MIN ROOM HEIGHT	By selecting the space use type, the minimum room width required data will be automatically displayed.	
R	PROP ROOM HEIGHT	Proposed room height is the value from the finish floor level to the bottom of suspended ceiling level or bottom of the slab level or bottom of beam if there are beams crossing under the space.	
S	MIN FLOOR AREA COMPLIANCE (Y/N)	Compare the minimum room height with the proposed room height in column N & O. If the proposed width is larger than the minimum, click to check off for compliance. Otherwise, adjust the design to meet minimum required.	
T	VENTILATION TYPE	Select the room ventilation type (Natural or Mechanical)	
U	LIGHTING TYPE	Select the room lightning type (Natural or Artificial)	
V,W,X,Y	FINISHES (FLOOR, WALL, CEILING, SKIRTING)	Insert the finishes for each room according to your office standards	

Q	R	S	T	U	V	W	X	Y	Z	AA	AB
MIN ROOM HEIGHT	PROP ROOM HEIGHT	MIN ROOM HEIGHT COMPLIANCE (Y/N)	DAYLIGHTING & VENTILATION TYP VENTILATION	LIGHTING	FLOOR	SKIRTING	WALL	CEILING	FIRE DETECTION SYSTEM	EMERGENCY POWER SYSTEM	PORTABLE EXTINGUISHER
2,000 mm	3,000 mm	☒	Natural	Natural					(none)	(none)	(none)
2,000 mm	3,000 mm	☒	Natural	Natural					(none)	(none)	(none)
2,500 mm	3,200 mm	☒	Natural	Natural					(none)	(none)	(none)
2,500 mm	3,400 mm	☒	Natural	Natural					(none)	(none)	(none)
2,500 mm	2,850 mm	☒	(none)	(none)					(none)	(none)	(none)
2,000 mm	2,438 mm	☒	(none)	(none)					(none)	(none)	(none)
2,500 mm	3,200 mm	☒	Natural	Natural					(none)	(none)	(none)
2,250 mm	3,200 mm	☒	Natural	Natural					(none)	(none)	(none)
2,500 mm	3,200 mm	☒	Natural	Natural					(none)	(none)	(none)
	3,200 mm	☒	(none)	(none)					(none)	(none)	(none)
	3,200 mm	☒	(none)	(none)					(none)	(none)	(none)
	3,500 mm	☒	(none)	(none)					(none)	(none)	(none)
	3,200 mm	☒	(none)	(none)					(none)	(none)	(none)
	3,400 mm	☒	(none)	(none)					(none)	(none)	(none)

Table 9 Room Schedule & Input Data

COLUMN	HEADER	DESCRIPTION	EXAMPLE
Z	FIRE DETECTION SYSTEM	Select from the list of fire detection systems. (Automatic Fire Detection System, Heat Detector, Manual Electric Fire Alarm System, Signal Indicator Alarm System, Smoke Detector)	
AA	EMERGENCY POWER SYSTEM	Select from the list of emergency power system (Emergency Light, Emergency Light & Keluar Sign, Keluar Sign)	
AB	PORTABLE EXTINGUISHER	Select from the list of portable extinguishers (Air-Pressurised Water Fire Extinguisher, CO2 Fire Extinguisher, Dry Powder Fire Extinguisher, Foam Chemical Fire Extinguisher)	

4.8 Set NBeS Door Tags



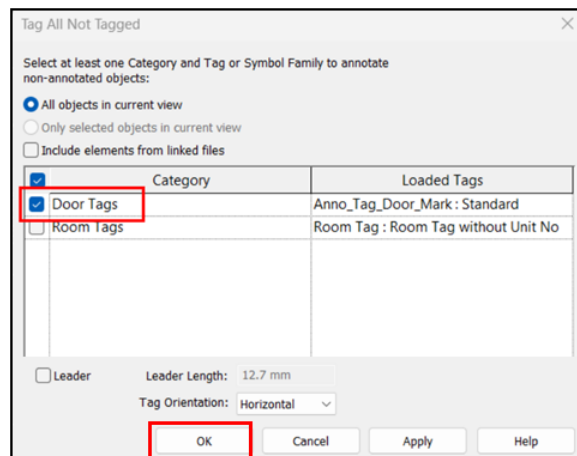
If the doors in your model are all tagged, you may skip this step.

Click on “Annotate” menu > “Tag All” > to open up the “Tag All Not Tagged” dialog box

If the Door Tag family is not available, load in the family annotation type by placing it on a door.

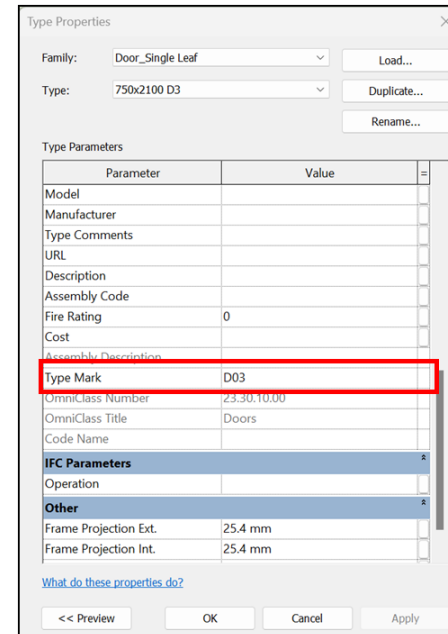
Repeat the “Tag all” to open to open up the “Tag All Not Tagged” dialog box

Checked the “Door Tags” and finish by clicking on “Ok”

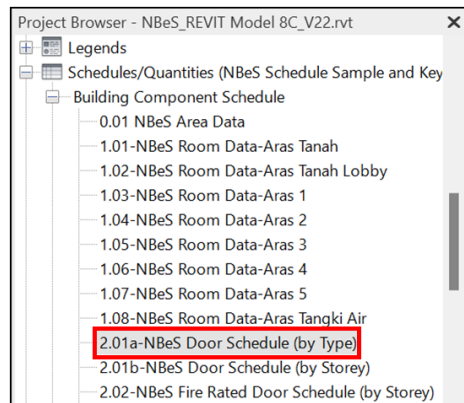


Select a door to open the “Type Properties”. Under the “Identity Data”, ensure that your “Door ID” is displayed using the door family “Type Mark” parameter and not other parameters. (Note: Only “Type Mark” parameters are used in NBeS

Note: For door opening element to label as “OPNG”. This door type shall be filtered off from the schedule listing.



4.8.1 Set Door Parameters (by type)



In the “Project Browser”, scroll down to “Schedules/Quantities”.

Double click on “2.01a NBeS Door Schedule (by Type)” to display the type of doors used.

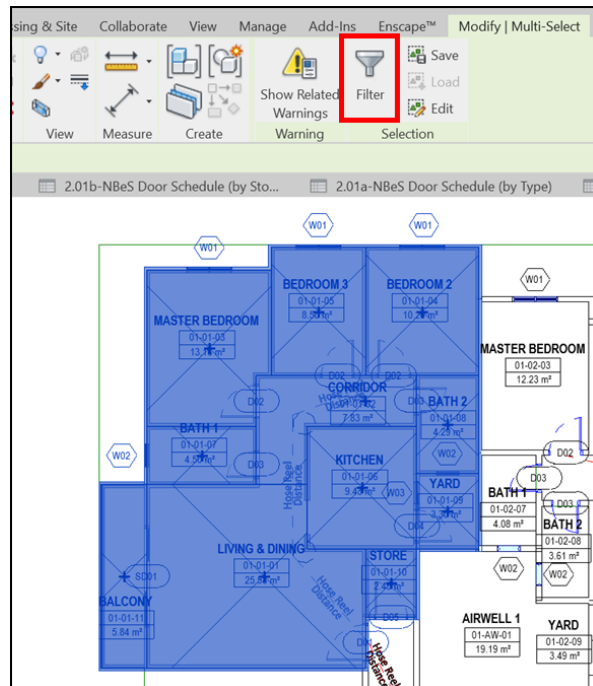
A	B	C	D	E	F	G	H	I	J	K	L
FAMILY	FAMILY & TYPE	DOOR ID	FIRE RATING (1, 2) (hr)	DOOR POSITION	DOOR DIMENSIONS		DOOR AREA		DOOR MATERIAL		
					WIDTH	HEIGHT	OPENABLE	GLAZING	FRAME	LEAF	GLAZING
DOOR_SINGLE LEAF_VENTIL	DOOR_SINGLE LEAF_VENTILATION OPENING: 750x2100	D05		Internal	750 mm	2,100 mm	1.58 m²				
M_Door-Double-Flush_Panel	M_Door-Double-Flush_Panel: 1800 x 2100mm	D01		External	1,800 mm	2,100 mm	3.78 m²				
M_Single-Flush	M_Single-Flush: 900 x 2100mm (Int)	D02		Internal	900 mm	2,100 mm	1.89 m²				
M_Single-Flush	M_Single-Flush: 750 x 2100mm (Int)	D03		Internal	750 mm	2,100 mm	1.58 m²				
M_Single-Flush	M_Single-Flush: 900 x 2100mm (Ext)	D04		External	900 mm	2,100 mm	1.89 m²				
NBeS_3 Panel Sliding Door1	NBeS_3 Panel Sliding Door1: 2700x2100	SD01		External	2,700 mm	2,100 mm	3.78 m²	5.67 m²			

Table 10 Door Schedule (by type)

COLUMN	HEADER	DESCRIPTION	EXAMPLE
C	DOOR ID	Door number tagging can follow your office standard numbering system. For wall opening, enter Type Mark “OPNG”	D01, SD01, FD01
D	FIRE RATING (1, 2) HRS	Key in the door fire rating	0,1,2

COLUMN	HEADER	DESCRIPTION	EXAMPLE
E	DOOR POSITION	Enter "Internal" or "External". External doors open to external areas and the opening will contribute to natural ventilation calculation.	
F,G	DOOR DIMENSIONS (WIDTH, HEIGHT)	The door dimensions are automatically inserted	
H	DOOR AREA - OPENABLE AREA	Calculate and enter the clear openable area.	
I	DOOR AREA - GLAZING AREA	Calculate and enter the clear glazing area.	
J, K, L	DOOR MATERIAL - FRAME, LEAF & GLAZING	Key in the door and glazing materials used for all the doors	

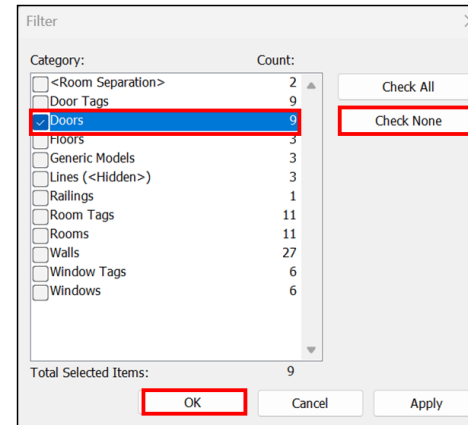
4.8.2 Set Door “Unit No” & “Unit Type” Parameter



Select all elements of one unit and click “Filter” to open the “Filter” dialog box

Click “Check None” followed by checking off “Doors” to only select the door elements.

Click “OK” to list the schedule.



With the door elements still selected, enter parameters for “Unit No”, “Unit Type” & “Unit Lot or Block No”. Repeat the same process for each unit.

Doors (9) Edit Type

Identity Data

Door Function	<varies>
Door Location	<varies>
Image	
Comments	
Mark	<varies>
Unit No	01-01
Unit Type	B1
Unit Lot or Block No	A

Phasing

Phase Created	New Construction
Phase Demolished	None

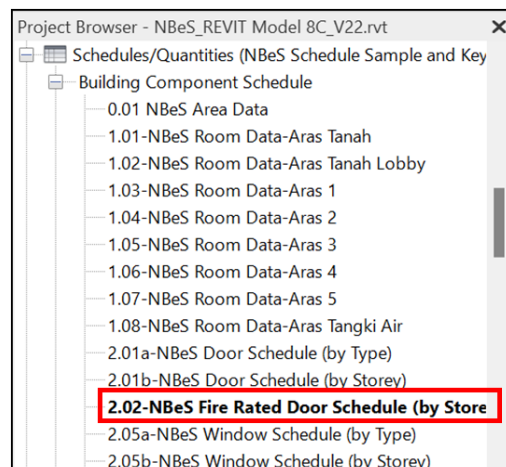
General

Door Glazing Material	<varies>
Door Leaf Material	<varies>

Other

[Properties help](#) Apply

4.8.3 Set Fire Rated Door Parameters



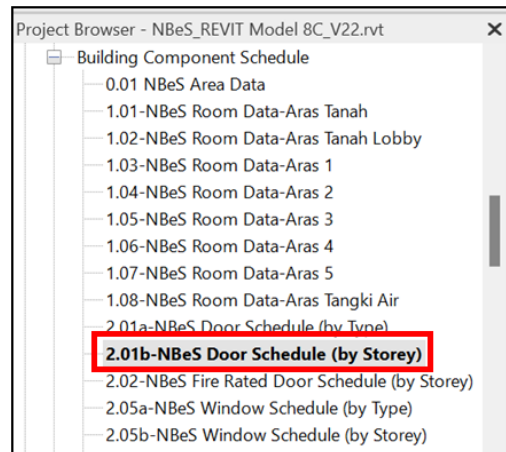
In the “Project Browser”, scroll down to “Schedules/Quantities” and double click on “2.02-NBeS Fire Rated Door Schedule (by Storey)” to display the type of fire rated door used.

A	B	C	D	E	F	G	H	I	J	K	L	M
UNIT LOT/ BLOCK NO	UNIT TYPE	UNIT NO	ROOM NAME	DOOR ID	FIRE RATING (1, 2) (hr)	DOOR LOCATION	DOOR DIMENSIONS		DOOR AREA	DOOR MATERIAL		
							WIDTH	HEIGHT	GLAZING	FRAME	LEAF	GLAZING
1.0 ARAS BAWAH												
A			STAIR 1	FD01	1	External	900 mm	2,100 mm		1 hr fire Bomba app	1 hr fire Bomba app	
A			STAIR 2	FD01	1	External	900 mm	2,100 mm		1 hr fire Bomba app	1 hr fire Bomba app	
1.1 ARAS BAWAH LOBI												
A			LIFT LOBBY	FD02	2	External	1,000 mm	2,100 mm		2 hr fire Bomb a ap	2 hr fire Bomba app	
2.0 ARAS 1												
A			ELEC	FD02	2	External	1,000 mm	2,100 mm		2 hr fire Bomb a ap	2 hr fire Bomba app	
A			STAIR 1	FD01	1	External	900 mm	2,100 mm		1 hr fire Bomba app	1 hr fire Bomba app	
A			STAIR 2	FD01	1	External	900 mm	2,100 mm		1 hr fire Bomba app	1 hr fire Bomba app	
3.0 ARAS 2												
			ELEC	FD02	2	External	1,000 mm	2,100 mm		2 hr fire Bomb a ap	2 hr fire Bomba app	
A			STAIR 1	FD01	1	External	900 mm	2,100 mm		1 hr fire Bomba app	1 hr fire Bomba app	
A			STAIR 2	FD01	1	External	900 mm	2,100 mm		1 hr fire Bomba app	1 hr fire Bomba app	

Table 11 Fire Rated Door Schedule

COLUMN	HEADER	DESCRIPTION	EXAMPLE
A	UNIT LOT/ BLOCK NO	Enter this parameter where the fire door belong to (if required)	
D	ROOM NAME	Adjust the room name parameter which the door opens into by clicking on the name & “down arrow” and switch to the appropriate room name.	
E	DOOR ID	Enter the fire door number	FD01
F	FIRE RATING	Enter the fire rating	1, 2
G	DOOR POSITION	This parameter will display either “Internal” or “External” parameter following the door type parameter setting.	
K	DOOR FRAME MATERIAL	Enter the fire door frame material specified	
L	DOOR LEAF MATERIAL	Enter the fire door leaf material specified	

4.8.4 Set Door Parameters (by Storey)



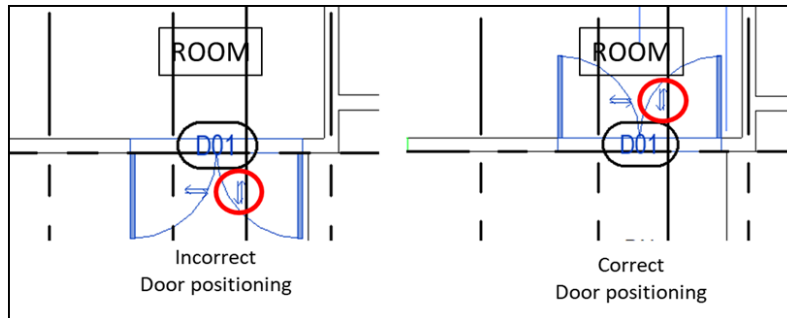
In the “Project Browser”, open to “2.01b-NBeS Door Schedule (by Storey)” to display all the doors used in the project.

A	B	C	D	E	F	G	H	I	J	K	L	M	N
UNIT LOT/ BLOCK NO.	UNIT TYPE	UNIT NO	ROOM NAME	DOOR ID	FIRE RATING (1, 2) (hr)	LOCATION	DOOR DIMENSIONS		Door Openable Area	GLAZING AREA	DOOR MATERIAL		
							WIDTH	HEIGHT			FRAME	LEAF	GLAZING
2.0 ARAS 1													
			ELEC	FD02	2	External	1,000 mm	2,100 mm	2.10 m²		2 hr fire Bomb a ap	2 hr fire Bomba app	
			HR-01	D06	0	External	750 mm	2,100 mm	1.58 m²		0.8 mm thk. zincalu	Hollow core laminat	
			HR-02	D06	0	External	750 mm	2,100 mm	1.58 m²		0.8 mm thk. zincalu	Hollow core laminat	
			STAIR 1	FD01	1	External	900 mm	2,100 mm	1.89 m²		1 hr fire Bomba app	1 hr fire Bomba app	
			STAIR 2	FD01	1	External	900 mm	2,100 mm	1.89 m²		1 hr fire Bomba app	1 hr fire Bomba app	
01-01													
A	B1	01-01	BATH 1	D03	0	Internal	750 mm	2,100 mm	1.58 m²		0.8 mm thk. zincalu	Hollow core laminat	
A	B1	01-01	BATH 2	D03	0	Internal	750 mm	2,100 mm	1.58 m²		0.8 mm thk. zincalu	Hollow core laminat	
A	B1	01-01	BEDROOM 2	D02	0	Internal	900 mm	2,100 mm	1.89 m²		0.8 mm thk. zincalu	Hollow core laminat	
A	B1	01-01	BEDROOM 3	D02	0	Internal	900 mm	2,100 mm	1.89 m²		0.8 mm thk. zincalu	Hollow core laminat	
A	B1	01-01	LIVING & DINING	SD01	0	External	2,700 mm	2,100 mm	3.78 m²	5.67 m²	1.0mm thk bronze a	1.0mm thk bronze a	8 mm thk tempered
A	B1	01-01	LIVING & DINING	D01	0	External	1,000 mm	2,100 mm	2.10 m²		0.8 mm thk. zincalu	Hollow core laminat	
A	B1	01-01	MASTER BEDROOM	D02	0	Internal	900 mm	2,100 mm	1.89 m²		0.8 mm thk. zincalu	Hollow core laminat	
A	B1	01-01	STORE	D05	0	Internal	900 mm	2,100 mm	1.89 m²		0.8 mm thk. zincalu	Hollow core laminat	
A	B1	01-01	YARD	D04	0	External	900 mm	2,100 mm	1.89 m²		0.8 mm thk. zincalu	Hollow core laminat	

Table 12 Door Schedule (By Storey)

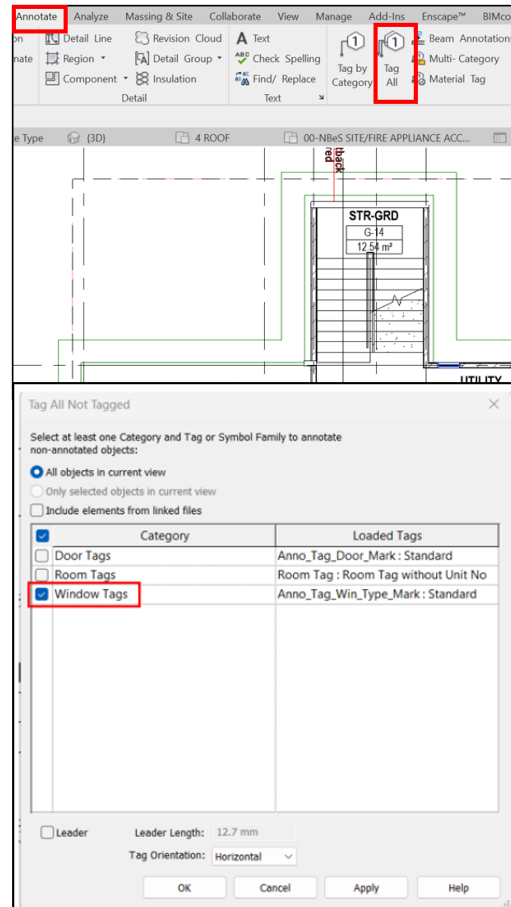
COLUMN	HEADER	DESCRIPTION	EXAMPLE
D	ROOM NAME	Adjust the room name parameter which the door opens into by clicking on the name & “down arrow” and switch to the correct room name.	
F	FIRE RATING (0, 1, 2)	Enter the Door Fire Rating	
G	DOOR LOCATION	This parameter will display either “Internal” or “External” parameter following the type parameter setting.	
J	DOOR OPENABLE AREA	This parameter will display the openable area following the type parameter setting.	
K	DOOR GLAZING AREA	This parameter will display the glazing area following the type parameter setting.	
L, M, N	DOOR MATERIAL FRAME/LEAF/ GLAZING	This parameter will display the materials set in the type parameter setting.	

4.8.5 Set Door Position to Room



The door arrow as shown in the red circle shall be flipped into the room in order for the door schedule to list out the space the door belongs to.

4.9 Set NBeS Window Tags



If the windows in your model are all tagged, you may skip this step.

Click on “Annotate” menu > “Tag All” > to open up the “Tag All Not Tagged” dialog box

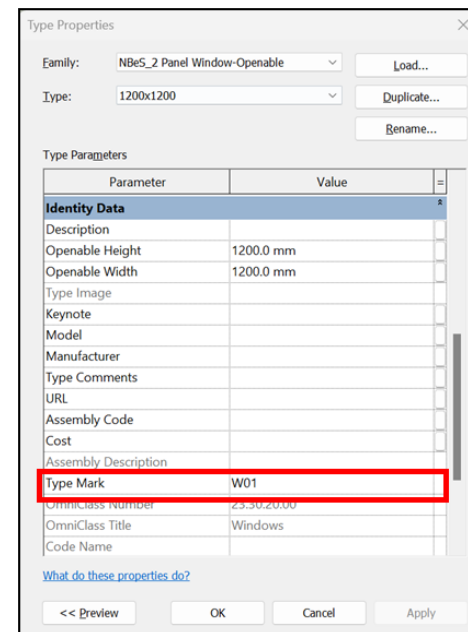
If the Window Tag family is not available, load in the family annotation type by placing it on a window.

Repeat the “Tag all” to open to open up the “Tag All Not Tagged” dialog box

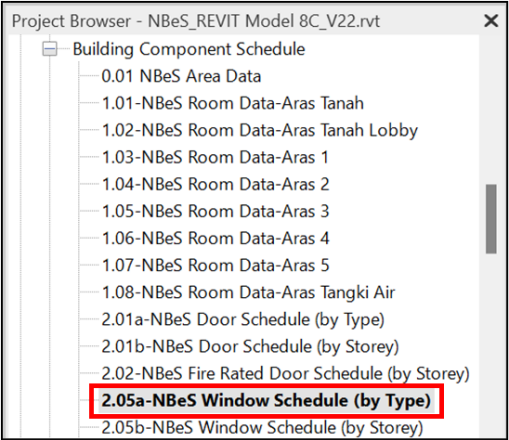
Checked the “Window Tags” and finish by clicking on “OK”

Select a window to open the “Type Properties”. Under the “Identity Data”, ensure that your “Window ID” is displayed using the window family “Type Mark” parameter and not other parameters.

Note: For window opening element to label as “OPNG”. This window type shall be filtered off from the schedule listing



4.9.1 Set Window Parameters (by type)



In the “Project Browser”, scroll down to “Schedules/Quantities” and double click on “2.05a NBeS Window Schedule (by Type)” to display the type of windows used.

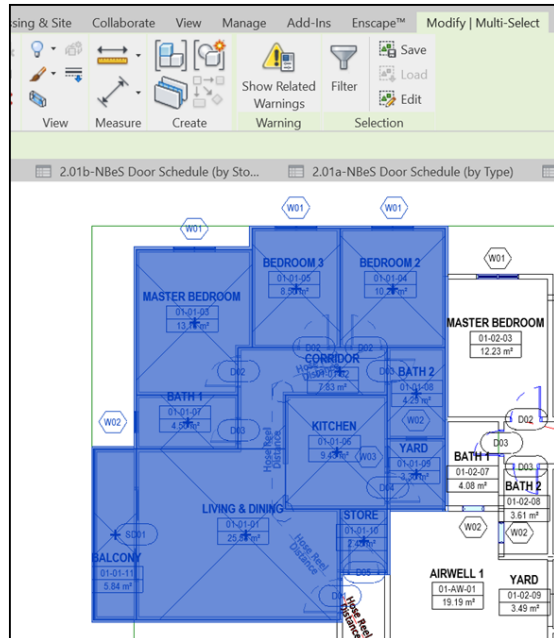
A	B	C	D	E	F	G	H	I	J	K
FAMILY	FAMILY & TYPE	WINDOW ID	WINDOW LOCATION	WINDOW DIMENSIONS		WINDOW AREA			WINDOW MATERIALS	
				WIDTH	HEIGHT	OPENING	GLAZING	OPENABLE	FRAME	GLAZING
NBeS_1 Panel Window-Openable	NBeS_1 Panel Window-Openable: 600x600	W02	External	600 mm	600 mm	0.36 m²	0.36 m²	0.36 m²	6mm thk bronze anodised alu	6mm tks clear float glass
NBeS_1 Panel Window-Openable	NBeS_1 Panel Window-Openable: 600x1200	W03	External	600 mm	1,200 mm	0.72 m²	0.72 m²	0.72 m²	6mm thk bronze anodised alu	6mm tks clear float glass
NBeS_2 Panel Window-Openable	NBeS_2 Panel Window-Openable: 1200x1200	W01	External	1,200 mm	1,200 mm	1.44 m²	1.44 m²	1.44 m²	6mm thk bronze anodised alu	6mm tks clear float glass
Windows_Dbl_Plain	Windows_Dbl_Plain: 1360x1210mm	W04	<varies>	1,360 mm	1,210 mm	1.65 m²	1.65 m²	1.65 m²	6mm thk bronze anodised alu	6mm tks clear float glass

Table 13 Fire Rated Door Schedule

COLUMN	HEADER	DESCRIPTION	EXAMPLE
C	WINDOW ID	Window number tagging can follow your office standard numbering system.	W01
D	WINDOW POSITION	Select either “External” or “Internal” which the window opens out to. Window opening area with the “External” setting shall be used for natural lighting & ventilation calculation for habitable rooms.	

COLUMN	HEADER	DESCRIPTION	EXAMPLE
G	WINDOW OPENABLE AREA	Calculate and enter the clear openable area.	
H	WINDOW GLAZING AREA	Calculate and enter the glazing area.	
I	WINDOW FRAME MATERIAL	Enter window frame material used.	
J	WINDOW GLAZING MATERIAL	Enter window glazing material used.	

4.9.2 Set Window “Unit No” & “Unit Type” Parameters

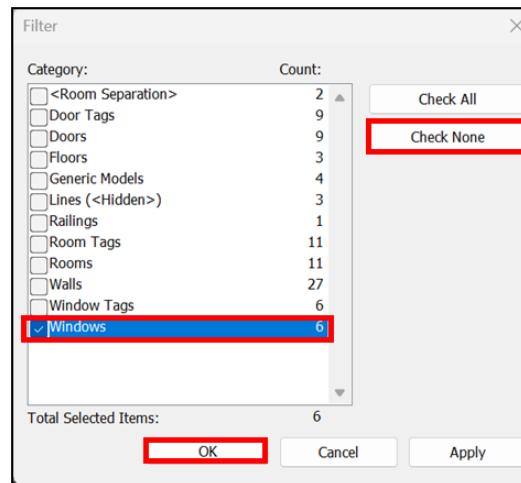


Select all elements of one unit and click “Filter” to open the “Filter” dialog box

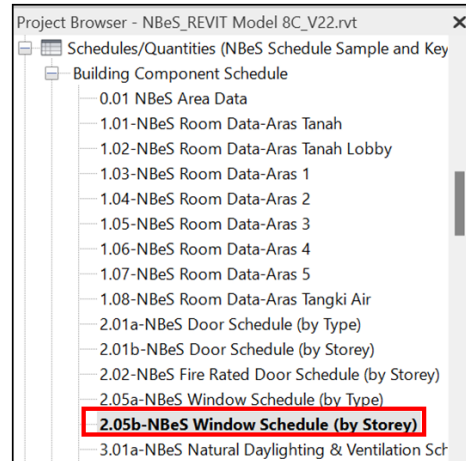
Click “Check None” followed by checking off “Windows” to only select the window elements.

Click “OK” to list the schedule.

Repeat it for all units.



4.9.3 Set Window Parameters (By Storey)



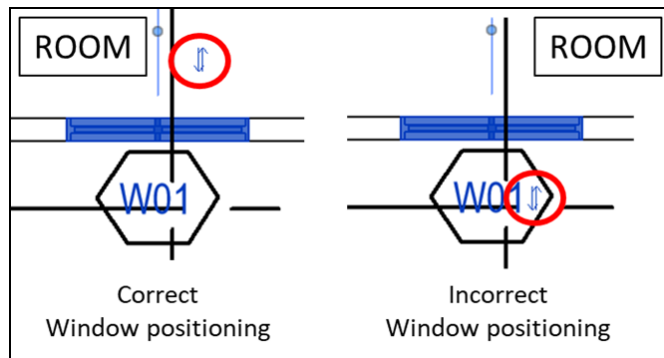
In the “Project Browser”, scroll down to “Schedules/Quantities” and double click on “2.05b NBeS Window Schedule (by Storey)” to display all the windows used in the project.

A	B	C	D	E	F	G	H	I	J	K	L	M
UNIT LOT/ BLOCK NO	UNIT TYPE	UNIT NO	ROOM NAME	WINDOW ID	WINDOW LOCATION	WINDOW DIMENSIONS		WINDOW AREA			WINDOW MATERIALS	
						WIDTH	HEIGHT	OPENING	GLAZING	OPENABLE	FRAME	GLAZING
01-01												
A	B1	01-01	BATH 1	W02	External	600 mm	600 mm	0.36 m²	0.36 m²	0.36 m²	1.0mm thk bronze a	6mm tks clear float
A	B1	01-01	BATH 2	W02	External	600 mm	600 mm	0.36 m²	0.36 m²	0.36 m²	1.0mm thk bronze a	6mm tks clear float
A	B1	01-01	BEDROOM 2	W01	External	1,200 mm	1,200 mm	1.44 m²	1.44 m²	1.44 m²	1.0mm thk bronze a	6mm tks clear float
A	B1	01-01	BEDROOM 3	W01	External	1,200 mm	1,200 mm	1.44 m²	1.44 m²	1.44 m²	1.0mm thk bronze a	6mm tks clear float
A	B1	01-01	KITCHEN	W03	External	600 mm	1,200 mm	0.72 m²	0.72 m²	0.72 m²	1.0mm thk bronze a	6mm tks clear float
A	B1	01-01	MASTER BEDROOM	W01	External	1,200 mm	1,200 mm	1.44 m²	1.44 m²	1.44 m²	1.0mm thk bronze a	6mm tks clear float
01-02												
A	B1	01-02	BATH 1	W02	External	600 mm	600 mm	0.36 m²	0.36 m²	0.36 m²	1.0mm thk bronze a	6mm tks clear float
A	B1	01-02	BATH 2	W02	External	600 mm	600 mm	0.36 m²	0.36 m²	0.36 m²	1.0mm thk bronze a	6mm tks clear float
A	B1	01-02	BEDROOM 2	W01	External	1,200 mm	1,200 mm	1.44 m²	1.44 m²	1.44 m²	1.0mm thk bronze a	6mm tks clear float
A	B1	01-02	BEDROOM 3	W03	External	600 mm	1,200 mm	0.72 m²	0.72 m²	0.72 m²	1.0mm thk bronze a	6mm tks clear float
A	B1	01-02	KITCHEN	W03	External	600 mm	1,200 mm	0.72 m²	0.72 m²	0.72 m²	1.0mm thk bronze a	6mm tks clear float
A	B1	01-02	MASTER BEDROOM	W01	External	1,200 mm	1,200 mm	1.44 m²	1.44 m²	1.44 m²	1.0mm thk bronze a	6mm tks clear float

Table 14 Window Door Schedule (By Storey)

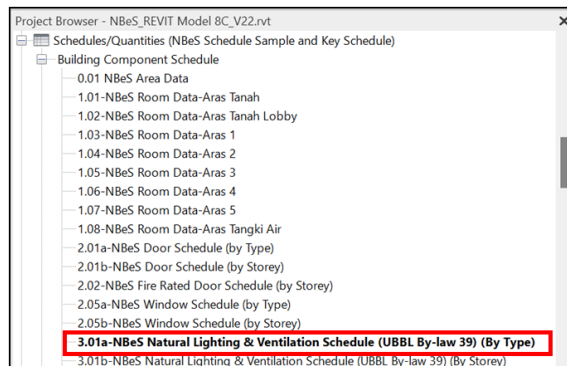
COLUMN	HEADER	DESCRIPTION	EXAMPLE
A	UNIT LOT/ BLOCK NO	Enter this parameter where the fire door belong to (if required)	
D	ROOM NAME	Adjust the room name parameter which the window is attached to by clicking on the name & "down arrow" and switch to the appropriate room name.	
F	WINDOW POSITION	This parameter will display either "Internal" or "External" parameter following the type parameter setting.	
H, J	WINDOW AREA OPENABLE/ GLAZING	This parameter will display the openable & glazing area following the type parameter setting.	
K, L	WINDOW MATERIAL FRAME/ GLAZING	This parameter will display the frame & glazing materials following the type parameter setting.	

4.9.4 Set Window Position To Room



The window arrow as shown in the red circle shall be flipped into the room in order for the door schedule to list out the space the window belongs to.

4.10 Natural Lighting & Ventilation Calculation Schedule (by Lot or Type)



In the “Project Browser”, scroll down to “Schedules/Quantities” and double click on “3.01a - NBeS Natural Lighting & Ventilation Calculation Schedule (By Type)” to open the habitable room natural lighting & ventilation schedule by “Unit Lot” or “Unit Type” or “Unit No”. Use the filter option to filter ventilation by “Unit Type”.

Repeat the process for other unit types by duplicating the previous schedule and modify the parameters.

A	B	C	D	E	F	G	H	I
UNIT LOT OR BLOCK NO	UNIT NO	UNIT TYPE	ROOM NAME	DOOR/WINDOW ID	NATURAL LIGHTING AREA		NATURAL UNINTERRUPTED VENTILATION AREA	
					DOOR GLAZING	WINDOW GLAZING	DOOR OPENABLE	WINDOW OPENABLE
1 GROUND FLOOR								
LOT 1								
LOT 1			BATH 5	W03		0.36 m²		0.36 m²
					0.00 m²	0.36 m²	0.00 m²	0.36 m²
LOT 1			BATH 6	W03		0.36 m²		0.36 m²
					0.00 m²	0.36 m²	0.00 m²	0.36 m²
LOT 1			BEDROOM 5	W01		1.44 m²		1.44 m²
					0.00 m²	1.44 m²	0.00 m²	1.44 m²
LOT 1			BEDROOM 6	W01		1.44 m²		1.44 m²
LOT 1			BEDROOM 6	W01		1.44 m²		1.44 m²
					0.00 m²	1.44 m²	1.89 m²	1.44 m²
LOT 1			LIVING	D01			3.78 m²	
LOT 1			LIVING	W02		0.72 m²		0.72 m²
LOT 1			LIVING	W02		0.72 m²		0.72 m²
LOT 1			LIVING	SD01		5.67 m²	3.78 m²	
					5.67 m²	1.44 m²	7.56 m²	1.44 m²

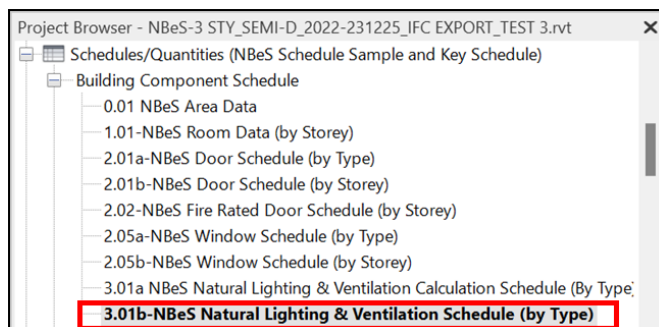
Total natural lighting area
= 5.67 + 1.44
= 7.11

Total uninterrupted
ventilation area
= 7.56 + 1.44 = 9.00

Table 15 Natural Lighting & Ventilation Calculation Schedule (By Type)

COLUMN	HEADER	DESCRIPTION	EXAMPLE
E	DOOR & WINDOW ID	Check each Room to make sure that the window and doors are correctly placed into the room. If a window ID is missing from the schedule, go to the floor plan and make sure the door or window are correctly placed.	
F	DOOR GLAZING AREA	Each room will show the glazing area for every "External" door attached and will total the opening areas below.	
G	WINDOW GLAZING AREA	Each room will show the glazing area for every "External" window attached and will total the window openable areas below	
F&G		Adding the total area of column F & G will provide the glazing area provision for the room. This figure will be transferred to the next schedule.	
H	DOOR OPENABLE AREA	Each room will show the openable area for every "External" door attached and will total the opening areas below.	
I	WINDOW OPENABLE AREA	Each room will show the openable area for every "External" window attached and will total the window openable areas below	
H&I		Adding the total area of column H & I will provide the openable area provision for the room. This figure will be transferred to the next schedule.	

4.10.1 Natural Lighting & Ventilation Schedule (by Type)



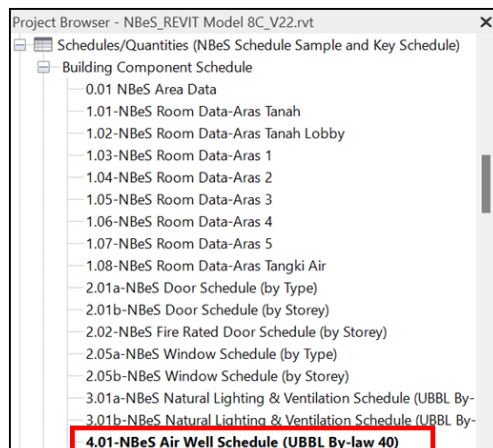
In the “Project Browser”, scroll down to “Schedules/Quantities” and double click on “3.01b - NBeS Natural Lighting & Ventilation Schedule (UBBL By-law 39)” to open all the habitable rooms on every unit.

A	B	C	D	E	F	G	H	I	J	K	L	M	N
UNIT LOT/ BLOCK NO.	UNIT TYPE	UNIT NO.	ROOM NAME	DOOR & WINDOW NO. FOR LIGHTING & VENTILATION	ROOM AREA	SANITARY UNIT (TOTAL NO WC, UB, BATH)	MIN TOILET VENTILATION REQUIRED	SPNG AREA NATURAL LIGHTING & VENTILATION REQUIRED (10%)	SPNG AREA NATURAL LIGHTING & VENTILATION PROVIDED	NATURAL LIGHTING & VENTILATION COMPLIANCE (%)	SPNG AREA UNINTERRUPTED AIR REQUIRED (5%)	SPNG AREA UNINTERRUPTED AIR PROVIDED	UNINTERRUPTED AIR PASSAGE COMPLIANCE (%)
LOT 1													
1 GROUND FLOOR													
LOT 1			BATH 5	W03	4.82 m²	1	0.20 m²	0.48 m²	0.36 m²	✓	0.24 m²	0.36 m²	✓
LOT 1			BATH 6	W03	4.70 m²	1	0.20 m²	0.47 m²	0.36 m²	✓	0.24 m²	0.36 m²	✓
LOT 1			BEDROOM 5	W01, W01	19.78 m²			1.98 m²	2.88 m²	✓	0.99 m²	2.88 m²	✓
LOT 1			BEDROOM 6	W01, W01	11.97 m²			1.20 m²	2.88 m²	✓	0.60 m²	2.88 m²	✓
LOT 1			CAR PORCH	all open	21.68 m²			2.17 m²		✓	1.08 m²		✓
LOT 1			DINING	W01, SD01	22.87 m²			2.29 m²	5.22 m²	✓	1.14 m²	7.11 m²	✓
LOT 1			KITCHEN	W01, D04	12.54 m²			1.25 m²	3.33 m²	✓	0.63 m²	1.44 m²	✓
LOT 1			LIVING	D01, SD01, W02, W02	38.33 m²			3.83 m²	9.00 m²	✓	1.92 m²	7.11 m²	✓
LOT 1			STR 1	W04	12.54 m²			1.25 m²	2.16 m²	✓	0.63 m²	2.16 m²	✓
LOT 1			UTILITY	W02	5.55 m²			0.56 m²	0.72 m²	✓	0.28 m²	0.72 m²	✓
2 FIRST FLOOR													
LOT 1			BATH 3	W03	4.58 m²	1	0.20 m²	0.46 m²	0.36 m²	✓	0.23 m²	0.36 m²	✓
LOT 1			BATH 4	W03	3.89 m²	1	0.20 m²	0.39 m²	0.36 m²	✓	0.19 m²	0.36 m²	✓
LOT 1			BEDROOM 3	W01, W01, SD01	24.24 m²			2.42 m²	6.66 m²	✓	1.21 m²	8.55 m²	✓
LOT 1			BEDROOM 4	W01, SD01	14.62 m²			1.46 m²	5.22 m²	✓	0.73 m²	7.11 m²	✓
LOT 1			FAMILY AREA 1	SD01, W01	19.49 m²			1.95 m²	5.22 m²	✓	0.97 m²	7.11 m²	✓
LOT 1			STR 1	W04	12.54 m²			1.25 m²	2.16 m²	✓	0.63 m²	2.16 m²	✓
LOT 1			STUDY 1	W01, W01	8.10 m²			0.81 m²	2.88 m²	✓	0.40 m²	2.88 m²	✓

Table 16 Natural Lighting & Ventilation Schedule (By Type)

COLUMN	HEADER	DESCRIPTION	EXAMPLE
E	DOOR & WINDOW ID	List out all Door & Window ID that contribute to the natural ventilation & lighting as shown from the previous schedule	
G	SANITARY UNIT	Enter no of sanitary unit based on the total no of water closets and urinals	
H	MIN TOILET VENTILATION REQUIRED	By entering the no of sanitary units, the minimum ventilation opening areas shall be automated based on 1 sanitary unit = 0.2 sq.m.	
I	OPENING AREA NATURAL LIGHTING & VENTILATION REQUIRED	Minimum required opening areas of each space are automatically calculated based on the room area.	
J	OPENING AREA NATURAL LIGHTING & VENTILATION PROVIDED	The provided opening areas tabulated from the previous schedule, place the total opening areas in this column.	
K	OPENING AREA NATURAL LIGHTING COMPLIANCE (Y/N)	1) For Habitable Rooms - Compare the opening areas from Column I & J 2) For Toilets or Bathrooms - Compare the opening areas from Column H & J When the minimum opening area is in compliance, check-off compliance in Column K. Otherwise, to re-design the room to meet the required natural lighting opening requirement.	☒
L	OPENING AREA UNINTERRUPTED AIR PASSAGE REQUIRED	Minimum required opening area of each spaces are automatically calculated based on the room area	
M	OPENING AREA UNINTERRUPTED AIR PASSAGE PROVIDED	Use the previous table to tabulate the required openable areas for each space.	
N	OPENING AREA UNINTERRUPTED AIR PASSAGE COMPLIANCE (Y/N)	1) For Habitable Rooms - Compare the opening areas from Column L & M 2) For Toilets or Bathrooms - Compare the opening areas from Column H & M When the minimum opening area is complied, check-off compliance in Column N. Otherwise, to re-design the room to meet the required openable requirement.	☒

4.11 NBeS Air Well Schedule



Air well shall be modeled on every level including the roof level.

In the “Project Browser”, scroll down to “Schedules/Quantities” and double click on “4.01 - NBeS Air Well Schedule (UBBL By-law 40)” to open the air well schedule

The “Air Well Type” (refer to the “Air Well Type” schedule below) shall be determined by the number of stories. The number of stories shall be tabulated from Ground floor to the topmost habitable floor level and shall open to the sky.

A	B	C
Air Well Type	Air Well Area Min	Air Well Width Min
General-more than 8 storey	15.00 m²	2,500.0 mm
General-up to 2 storey	7.00 m²	2,500.0 mm
General-up to 4 storey	9.00 m²	2,500.0 mm
General-up to 6 storey	11.00 m²	2,500.0 mm
General-up to 8 storey	13.00 m²	2,500.0 mm
Toilet-more than 8 storey	5.50 m²	2,000.0 mm
Toilet-up to 2 storey	3.50 m²	2,000.0 mm
Toilet-up to 4 storey	4.00 m²	2,000.0 mm
Toilet-up to 6 storey	4.50 m²	2,000.0 mm
Toilet-up to 8 storey	5.00 m²	2,000.0 mm

Note:

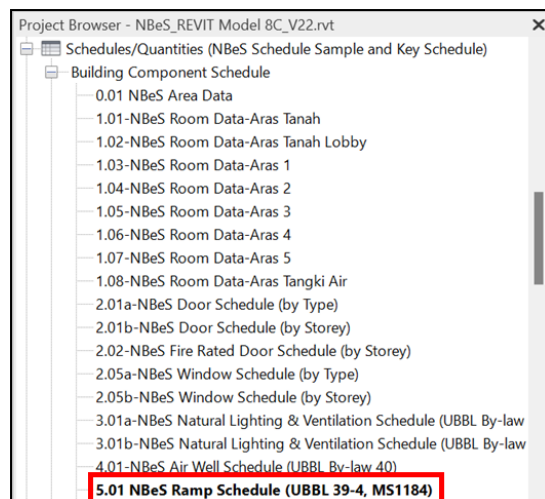
PSP to make sure that the opening areas are consistent floor by floor. If any opening areas above are smaller than below, the small opening areas shall be used for comparison.

A	B	C	D	E	F	G	H	I
UNIT LOT/	ROOM NAME	AIR WELL TYPE	OPNG AREA (MIN)	OPNG AREA (PRO)	AIR WELL AREA COMPLIANCE	AIR WELL WIDTH (MI)	AIR WELL WIDTH (P)	AIR WELL WIDTH COMPLIANCE
2.0 ARAS 1								
A	AIRWELL 1	General-up to 6 storey	11.00 m²	19.19 m²	☒	2,500 mm	3,165 mm	☒
A	AIRWELL 2	General-up to 6 storey	11.00 m²	19.19 m²	☒	2,500 mm	3,165 mm	☒
A	AIRWELL 3	General-up to 6 storey	11.00 m²	19.19 m²	☒	2,500 mm	3,165 mm	☒
A	AIRWELL 4	General-up to 6 storey	11.00 m²	19.19 m²	☒	2,500 mm	3,165 mm	☒
3.0 ARAS 2								
A	AIRWELL 1	General-up to 6 storey	11.00 m²	19.19 m²	☒	2,500 mm	3,165 mm	☒
A	AIRWELL 2	General-up to 6 storey	11.00 m²	19.19 m²	☒	2,500 mm	3,165 mm	☒
A	AIRWELL 3	General-up to 6 storey	11.00 m²	19.19 m²	☒	2,500 mm	3,165 mm	☒
A	AIRWELL 4	General-up to 6 storey	11.00 m²	19.19 m²	☒	2,500 mm	3,165 mm	☒

Table 17 Air Well Schedule

COLUMN	HEADER	DESCRIPTION	EXAMPLE
A	UNIT LOT/ BLOCK NO	Enter this parameter where the air well belongs to (if required).	
B	ROOM NAME	Enter the name of the air well. The room name shall be named consistently at every floor.	
C	AIR WELL TYPE	Select the air well type based on the no of stories from ground to the top-most habitable floor level.	
D	OPENING AREA (MIN)	The opening area is automatically set based on the air well type which you have selected.	
E	OPENING AREA (MIN)	The opening area is automatically set based on the design opening area modeled.	
F	AIR WELL AREA COMPLIANCE (Y/N)	Compare areas in Column D & E and when the areas provided are higher than the minimum, check-off for compliance.	☒
G	AIR WELL OPENING WIDTH (MIN)	The opening area width is automatically set based on the air well type which you have selected.	
H	AIR WELL OPENING WIDTH (PROVIDED)	Enter the minimum clear opening width measuring.	
I	AIR WELL OPENING WIDTH COMPLIANCE (Y/N)	Compare areas in Column G & H and when the width provided is higher than the minimum, check-off for compliance.	☒

4.12 NBeS Ramp Schedule (UBBL By-law 39-4, MS1184)



In the “Project Browser”, scroll down to “Schedules/Quantities” and double click on “5.01 - NBeS Ramp Schedule (UBBL By-law 39-4, MS1184)” to open the ramp schedule using the Revit Ramp tool to model.

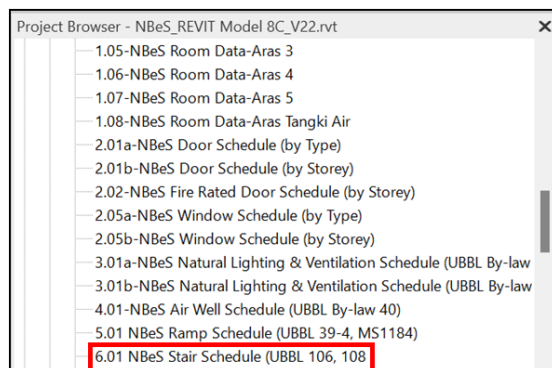
<NBeS Ramp Type>			
A	B	C	D
Key Name	Ramp Slope Allow (1/X)	Ramp Min Width	Ramp Max Length
Ramp-Bomba-Curve	15	6,000 mm	
Ramp-Bomba-Straight	15	4,500 mm	
Ramp-Car Park-Curve	10	3,700 mm	
Ramp-Car Park-Straight	7	3,200 mm	
Ramp-OKU-Riser 150mm	12	1,200 mm	1,800 mm
Ramp-OKU-Riser 150mm-315mm	15	1,200 mm	4,500 mm
Ramp-OKU-Riser 315mm-500mm	20	1,200 mm	6,000 mm
Ramp-Pedestrian	12	1,200 mm	
Ramp-Service-Curve	12	3,700 mm	
Ramp-Service-Straight	12	3,200 mm	

A	B	C	D	E	F	G	H	I	J	K	L	M
UNIT LOT/	RAMP TYPE	RAMP NAM	WIDTH (MIN)	WIDTH (PROP)	WIDTH COMPLA	LENGTH (MAX)	LENGTH (PROP)	LENGTH COMP	RISE (PROP)	GRADIENT (MAX)	GRADIENT (PRO)	GRADIENT COMPL
1.0 ARAS BAWAH												
A	Ramp-OKU	RAMP OKU	1,000 mm	1,200 mm	☒	4,500 mm	4,500 mm	☒	300 mm	15	15	☒
A	Ramp-OKU	RAMP OKU	1,000 mm	1,200 mm	☒	4,500 mm	3,000 mm	☒	200 mm	15	15	☒

Table 18 Ramp Schedule

COLUMN	HEADER	DESCRIPTION	EXAMPLE
A	UNIT LOT/ BLOCK NO	Enter this parameter where the ramp belongs to (if required).	
B	RAMP TYPE	Select the ramp type.	
C	RAMP ID	Enter the name of the ramp.	
D	RAMP WIDTH (MIN)	Ramp width is automatically set by selecting the ramp type.	
E	RAMP WIDTH (PROP)	Enter ramp width proposed.	
F	RAMP WIDTH COMPLIANCE (Y/N)	Compare ramp minimum width (Column D) & proposed width (Column E). If it complies, check off for compliance.	☒
G	RAMP LENGTH (MAX)	Ramp length is automatically set by selecting the ramp type.	
H	RAMP LENGTH (PROPOSED)	Enter ramp length proposed.	
I	RAMP LENGTH COMPLIANCE (Y/N)	Compare ramp minimum length (Column G) & proposed length (Column H). If it complies, check off for compliance.	☒
J	RAMP RISE HEIGHT	Enter ramp rise height.	
K	RAMP GRADIENT (MAX)	Ramp gradient is automatically set by selecting the ramp type.	
L	RAMP GRADIENT (PROPOSED)	Ramp gradient proposed is automatically calculated.	
M	RAMP GRADIENT COMPLIANCE (Y/N)	Compare ramp maximum gradient (Column K) & proposed gradient (Column L). If it complies, check off for compliance. The higher the number means the less gradient the ramp is.	☒

4.13 NBeS Stair Schedule (UBBL By-law 106, 108)

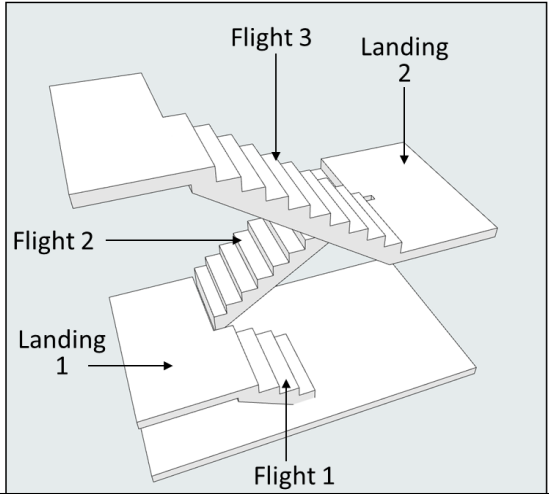


In the “Project Browser”, scroll down to “Schedules/Quantities” and double click on “6.01 - NBeS Stair Schedule (UBBL By-law 106, 108)” to open the stair schedule.

<NBeS Stair Type>		
A	B	C
Stair Type	Stair Riser Height Max	Stair Tread Depth Min
Stair-External	180 mm	275 mm
Stair-Fire-Basement	180 mm	275 mm
Stair-Fire-Upper	180 mm	275 mm
Stair-Open	180 mm	275 mm
Stair-Protected-Basement	180 mm	275 mm
Stair-Protected-Upper	180 mm	275 mm
Stair-Single-Residential	180 mm	275 mm
Steps-External	150 mm	275 mm

Note:

For designation of purpose group I - residential housing, use “Stair-Single-Residential” stair type.



The diagram on the left represents a non-typical staircase design that has more than two (2) flights and one (1) landing. The naming of the flights and landing are indicated as such.

The riser height design shall be consistent from one landing to another to comply to the Uniform Building Bylaw (UBBL).

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
UNIT LOT/ BLOCK NO.	NAME	TYPE	LOCATION	STAIR DIMENSIONS		RISER HEIGHT COMPLIANCE	STAIR DIMENSIONS		RISER THREAD COMPLIANCE	STAIR RISER NO					FLIGHT RISER NO (MAX) COMPLIANCE
				RISER (MAX)	RISER (PROP)		THREAD (MIN)	THREAD (PROP)		TOTAL/STAIR	FLIGHT 1	FLIGHT 2	FLIGHT 3	FLIGHT 4	
A															
1.0 ARAS BAWAH															
A	STAIR 1	Stair-Escape	Interior	180 mm	173 mm	✓	275 mm	300 mm	✓	20		10	10		✓
A	STAIR 1	Stair-Escape	Interior	180 mm	138 mm	✓	275 mm	300 mm	✓	4	4				✓
A	STAIR 2	Stair-Escape	Interior	180 mm	173 mm	✓	275 mm	300 mm	✓	20		10	10		✓
A	STAIR 2	Stair-Escape	Interior	180 mm	138 mm	✓	275 mm	300 mm	✓	4	4				✓
A	STAIR LOBBY	Stair Open	Interior	180 mm	110 mm	✓	275 mm	300 mm	✓	5					✓
A	STAIR LOBBY	Stair Open	Interior	180 mm	110 mm	✓	275 mm	300 mm	✓	5					✓
2.0 ARAS 1															
A	STAIR 1	Stair-Escape	Interior	180 mm	150 mm	✓	275 mm	300 mm	✓	20	10	10			✓
A	STAIR 2	Stair-Escape	Interior	180 mm	150 mm	✓	275 mm	300 mm	✓	20	10	10			✓

Table 19 Stair Schedule

COLUMN	HEADER	DESCRIPTION	EXAMPLE
A	UNIT LOT/ BLOCK NO	Enter this parameter where the stair belongs to (if required).	
B	STAIR NAME	Enter a stair name.	
C	STAIR TYPE	Refer to stair types table as shown in the previous page	
D	STAIR LOCATION	Enter the stair location whether the stair has direct ventilation to the building external.	
E	STAIR RISER HEIGHT (MAX)	The riser height is by default set by the Revit which is 180mm high.	
F	STAIR RISER HEIGHT (PROPOSED)	The riser height is automatically set by the design riser height of your staircase.	
G	STAIR RISER HEIGHT COMPLIANCE (Y/N)	Compare riser height maximum allowed (Column D) & proposed(Column E). If proposed riser height complies, check off for compliance.	☒
H	STAIR TREAD DEPTH (MIN)	The tread depth is by default set by the Revit which is 275mm deep.	
I	STAIR TREAD DEPTH (PROPOSED)	The tread depth is automatically set by the design tread depth of your staircase.	
J	STAIR TREAD DEPTH COMPLIANCE (Y/N)	Compare tread depth minimum allowed (Column H) & proposed(Column I). If proposed tread depth complies, check off for compliance.	
K	TOTAL NO OF RISERS	Total no of risers per stair element.	
L	TOTAL NO OF RISERS-FLIGHT 1	Total no of risers for 1st flight.	
M	TOTAL NO OF RISERS-FLIGHT 2	Total no of risers for 2nd flight.	
N	TOTAL NO OF RISERS-FLIGHT 3	Total no of risers for 3rd flight.	
O	TOTAL NO OF RISERS-FLIGHT 4	Total no of risers for 4th flight.	
P	FLIGHT RISER NO (MAX) COMPLIANCE (Y/N)	If the number of risers for each flight is not less than 2 and not more than 16. Check off for compliance.	☒
Q	STAIR WIDTH - FLIGHT 1	Enter the stair width proposed for flight 1. Minimum compliance width is 750mm.	

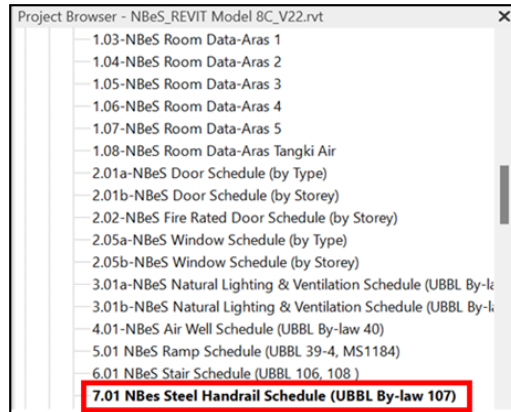
A	B	C	D	E	F					
UNIT LOT/ BLOCK NO.	NAME	TYPE	LOCATION	STAIR DIMENSIONS						
				RISER (MAX)	RISER (PROP)					
A										
1.0 ARAS BAWAH										
A	STAIR 1	Stair-Escape	Interior	180 mm	173 mm					
A	STAIR 1	Stair-Escape	Interior	180 mm	138 mm					
A	STAIR 2	Stair-Escape	Interior	180 mm	173 mm					
A	STAIR 2	Stair-Escape	Interior	180 mm	138 mm					
A	STAIR LOBBY	Stair Open	Interior	180 mm	110 mm					
A	STAIR LOBBY	Stair Open	Interior	180 mm	110 mm					
2.0 ARAS 1										
A	STAIR 1	Stair-Escape	Interior	180 mm	150 mm					
A	STAIR 2	Stair-Escape	Interior	180 mm	150 mm					

Q	R	S	T	U	V	W	X	Y
STAIR FLIGHT WIDTH				FLIGHT WIDTH COMPLIANCE (Y/N)	STAIR LANDING DEPTH			LANDING DEPTH (MIN) COMPLIANCE
FLIGHT 1	FLIGHT 2	FLIGHT 3	FLIGHT 4		LANDING 1	LANDING 2	LANDING 3	
	975 mm	975 mm		☒	0 mm	1,200 mm		☒
975 mm				☒	1,650 mm			☒
	975 mm	975 mm		☒	0 mm	1,200 mm		☒
975 mm				☒	1,650 mm			☒
				☒				☒
				☒				☒
975 mm	975 mm			☒	1,200 mm			☒
975 mm	975 mm			☒	1,200 mm			☒

COLUMN	HEADER	DESCRIPTION	EXAMPLE
R	STAIR WIDTH - FLIGHT 2	Enter the stair width proposed for flight 2. Minimum compliance width is 750mm.	
S	STAIR WIDTH - FLIGHT 3	Enter the stair width proposed for flight 3. Minimum compliance width is 750mm.	
T	STAIR WIDTH - FLIGHT 4	Enter the stair width proposed for flight 4. Minimum compliance width is 750mm.	
U	STAIR WIDTH COMPLIANCE (Y/N)	The flight width min width compliance is calculated based on the floor occupancy discharged rate. The calculation is not incorporated in this version of the NBeS Template.	
V	STAIR LANDING DEPTH 1	Enter the stair landing depth proposed for Landing 1 which is after the first flight of stairs. The depth shall be equal or longer than the width of stair flight.	
W	STAIR LANDING DEPTH 2	Enter the stair landing depth proposed for Landing 2 which is after the first flight of stairs. The depth shall be equal or longer than the width of stair flight.	
X	STAIR LANDING DEPTH 3	Enter the stair landing depth proposed for Landing 3 which is after the first flight of stairs. The depth shall be equal or longer than the width of stair flight.	
Y	STAIR LANDING DEPTH (MIN) COMPLIANCE (Y/N)	When stair landing depths are complied, check off for compliance.	☒

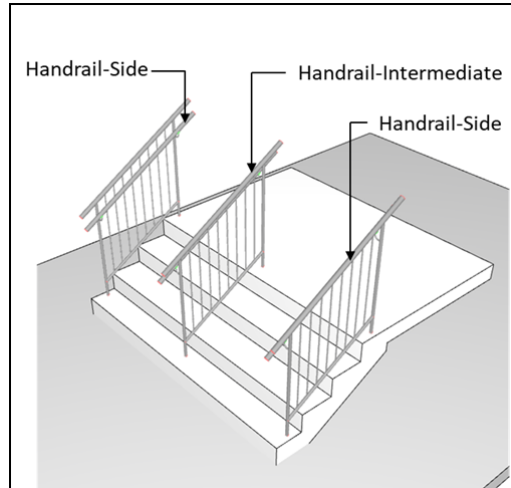
Table 19 Stair Schedule

4.14 NBeS Steel Handrail Schedule (UBBL By-law 107)



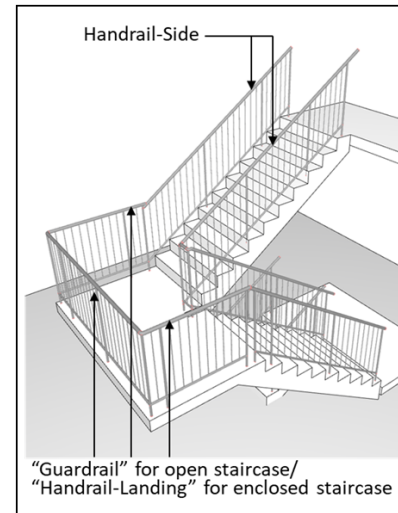
In the “Project Browser”, scroll down to “Schedules/Quantities” and double click on “7.01 - NBeS Steel Handrail Schedule (UBBL By-law 107)” to open the handrail schedule.

<NBeS Railing-Steel Type>		
A	B	C
Railing Type	Railing Height Min	Railing Height Max
Guardrail	1,050 mm	
Handrail-Intermediate	825 mm	900 mm
Handrail-Landing	825 mm	900 mm
Handrail-Side	825 mm	900 mm
Handrail-Side-Bottom Rail	600 mm	750 mm
Handrail-Side-Top Rail	850 mm	1,000 mm



The diagram shows the type of handrails applied to types of staircase

“Handrail-Landing” type applies to enclose staircase and “Guardrail” applies to landing areas that are opened to the outside.



A	B	C	D	E	F	G
UNIT LOT/	UNIT NO	LOCATION	TYPE	HEIGHT (MIN)	HEIGHT (PROP)	Railing Height Com
A		01-STAIR 1	Handrail-Side	900 mm	1,000 mm	☒
A		01-STAIR 2	Handrail-Side	900 mm	1,000 mm	☒
A		02-STAIR 1	Handrail-Side	900 mm	1,000 mm	☒
A		02-STAIR 2	Handrail-Side	900 mm	1,000 mm	☒
A		03-STAIR 1	Handrail-Side	900 mm	1,000 mm	☒
A		03-STAIR 2	Handrail-Side	900 mm	1,000 mm	☒
2.0 ARAS 1						
A	01-02	BALCONY	Guardrail	1,050 mm	1,100 mm	☒
A	01-01	BALCONY	Guardrail	1,050 mm	1,100 mm	☒
A	01-03	BALCONY	Guardrail	1,050 mm	1,100 mm	☒
A	01-04	BALCONY	Guardrail	1,050 mm	1,100 mm	☒
A	01-06	BALCONY	Guardrail	1,050 mm	1,100 mm	☒
A	01-05	BALCONY	Guardrail	1,050 mm	1,100 mm	☒
A	01-07	BALCONY	Guardrail	1,050 mm	1,100 mm	☒
A	01-08	BALCONY	Guardrail	1,050 mm	1,100 mm	☒

Table 20 Steel Handrail Schedule

COLUMN	HEADER	DESCRIPTION	EXAMPLE
A	UNIT LOT/ BLOCK NO	Enter this parameter where the stair belongs to (if required).	
B	UNIT NO	Railing / Identity Data / Unit No / Railing located in which unit	01-01
C	LOCATION	Railing / General / Railing Location / Enter the railing location	
D	TYPE	Enter the railing type from the drop-down list	
E & F	HEIGHT (MIN) & HEIGHT (PROP)	The railing dimensions are displayed based on the element modeled	
G	RAILING HEIGHT COMPLIANCE (Y/N)	When the proposed railing height is higher than the minimum height, check off for compliance	☒

4.15 NBeS Wall Handrail Schedule (UBBL By-law 107)

A	B	C	D	E	F
UNIT LOT/ B	UNIT NO	WALL TYPE	HEIGHT (MIN)	HEIGHT (PROP)	WALL HEIGHT COMPLIANCE (Y/N)
2.0 ARAS 1					
A		Wall-Guardrail	1,050 mm	1,100 mm	☒
A		Wall-Guardrail	1,050 mm	1,100 mm	☒
A		Wall-Guardrail	1,050 mm	1,100 mm	☒
A		Wall-Guardrail	1,050 mm	1,100 mm	☒
A		Wall-Guardrail	1,050 mm	1,100 mm	☒
A		Wall-Guardrail	1,050 mm	1,100 mm	☒
A		Wall-Guardrail	1,050 mm	1,100 mm	☒
A		Wall-Guardrail	1,050 mm	1,100 mm	☒
A		Wall-Guardrail	1,050 mm	1,100 mm	☒
A	01-01	Wall-Guardrail	1,050 mm	1,100 mm	☒
A	01-02	Wall-Guardrail	1,050 mm	1,100 mm	☒

Table 21 Wall Handrail Schedule

COLUMN	HEADER	DESCRIPTION	EXAMPLE
A	UNIT LOT/ BLOCK NO	Enter this parameter where the stair belongs to (if required).	
B	UNIT NO	Wall / Identity Data / Unit No / Railing located in which unit.	01-01
C	WALL TYPE	Change wall to "Wall-Guardrail"	
D & E	HEIGHT (MIN) & HEIGHT (PROP)	The wall height dimensions are displayed based on the element modeled	
F	WALL HEIGHT COMPLIANCE (Y/N)	When the proposed wall height is higher than the minimum height, check off for compliance	☒

4.16 Wall Elements

Modeled wall elements shall be assigned with the following parameters :-

- A. Wall Type - Instance Parameter
- B. Wall Height (for railing, guardrail & vehicle barrier) - Instance Parameter
- C. Construction Function - Type Parameter
- D. Fire Rating - Type Parameter
- E. Wall Thickness (for party or separating walls) - Type Parameter

- A. **Wall Type**
This wall types are derived from the following Uniform Building Bylaw :-
UBBL cl. 70 Parapets & Balustrades
UBBL cl. 71 Vehicle Barriers for Car Park
UBBL cl. 98 Fences & Boundary Walls
UBBL cl. 136 Provision of Compartment Wall & Compartment Floors
UBBL cl. 141 Separating Walls

Select the wall type parameter list from

Wall’s Properties Browser > Identity Data > Wall type

- B. **Wall Height**
The following table lists the “Wall types”.

Wall height shall be entered in “Unconnected Height” when “Wall-Guardrail”, “Wall-Parapet” & “Wall-Vehicle Barrier” are selected.

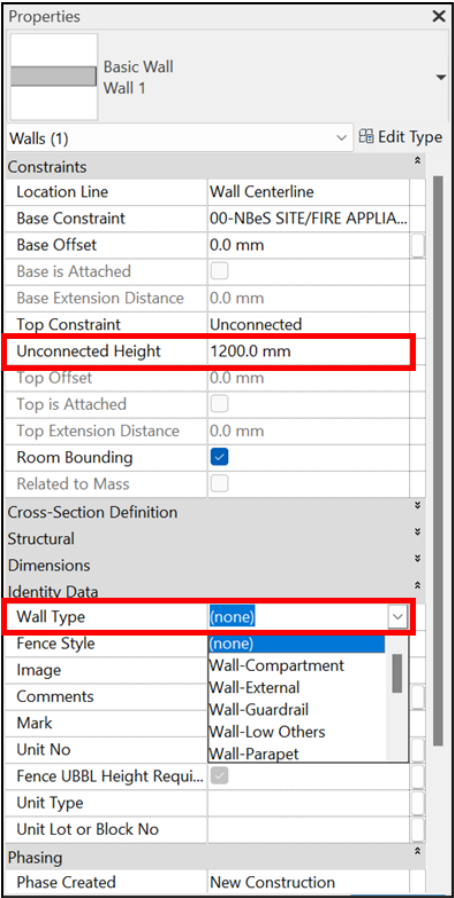


Table 22 Wall types

No.	Wall Type	Remarks
1	Wall-Compartment	Provision of Compartment Walls & Compartment Floors and Fifth Schedule. Wall type is used for perimeter compartment walls of units, protected staircase, shaft, high risk areas ie TNB, Genset Room, Consumer Switch Room, AHU Room etc
2	Wall-Fence	Choose the Fence Type from the list
3	Wall-General	Wall type assigned to walls which are not subjected to any NBeS ruleset checking.
4	Wall-Guardrail	Low wall partition along floor edges on habitable floors.
5	Wall-Parapet	Low wall partition along roof edges on roof level.
6	Wall-Party	Model internal party wall individually for each residential housing unit or shop lots. Thickness of wall shall be subjected to NBeS ruleset checking.
7	Wall-Retaining Wall	Wall type assigned to walls which are not subjected to any NBeS ruleset checking.
8	Wall-Separating	Wall type assigned to walls separate between two (2) units sharing a wall in a multistory building.
9	Wall-Vehicle Barrier	Separating Walls (3). Minimum thickness of protrusion required in bylaw is 225mm.

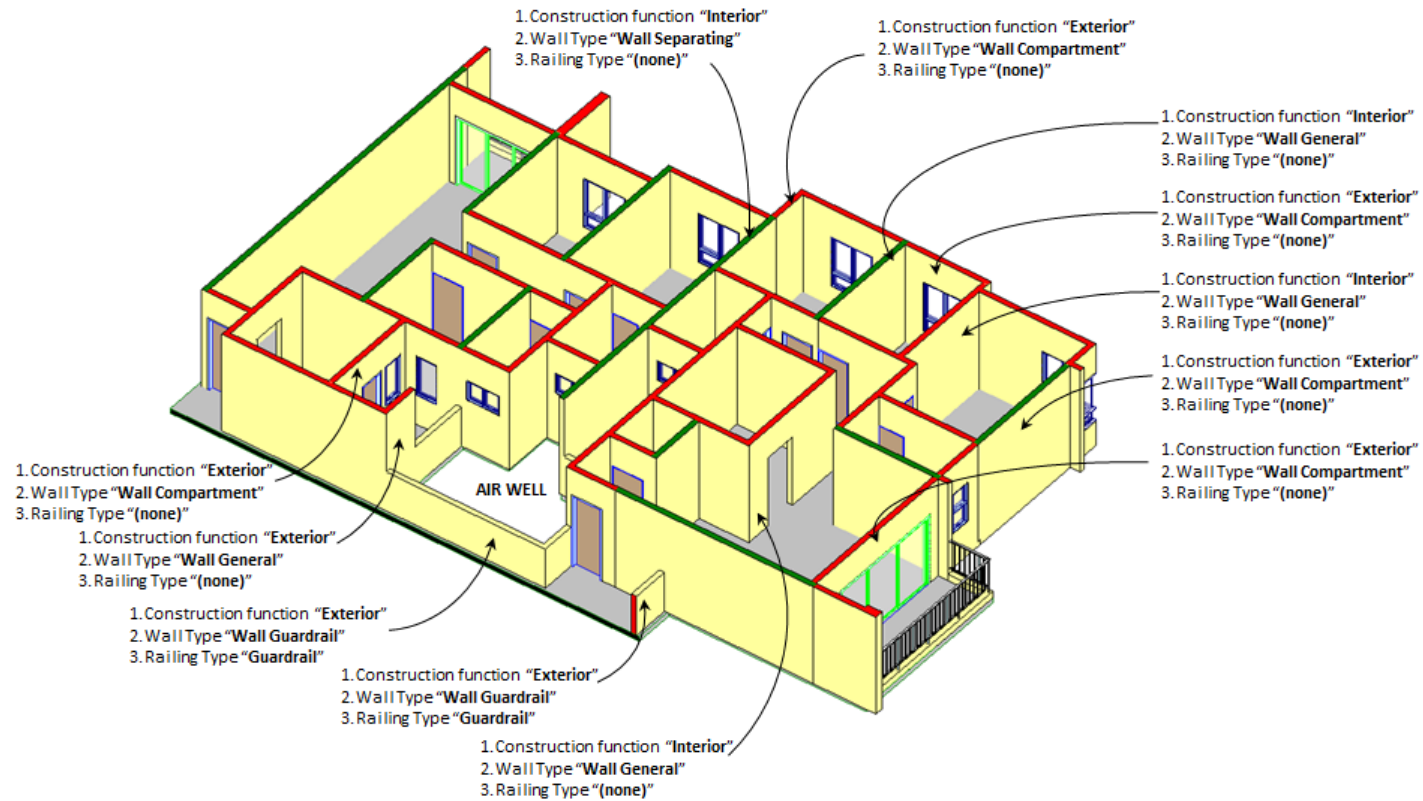


Figure 4 "Wall Type" Parameter Settings

C. Construction Function

Select walls & click on “Edit Type” to open the “Type Properties” of the wall .

Under Construction > Function > select the parameter list that represents the wall.

For walls that will contributing to natural lighting & ventilation of the internal habitable space, select “Exterior”

The Function list are as follows :-

No	Function
1	Interior
2	Exterior
3	Foundation

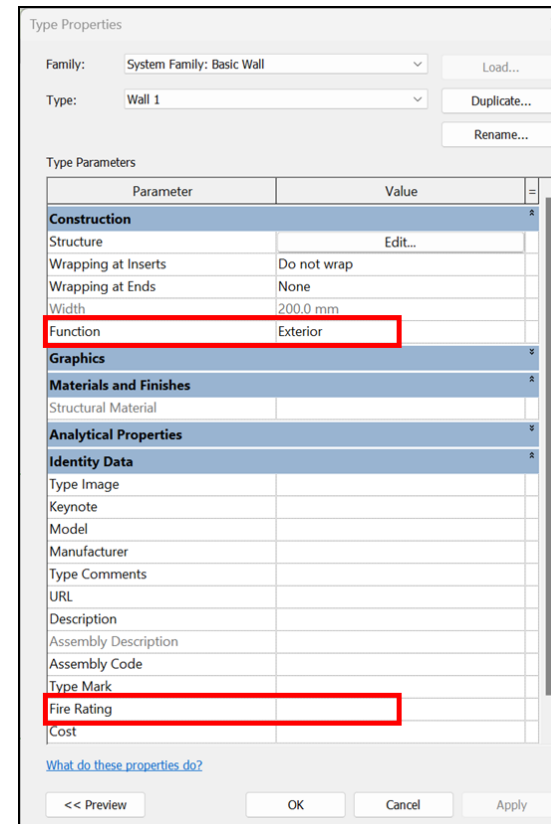
No	Function
4	Retaining
5	Soffit
6	Core-Shaft

D. Fire Rating

Enter the material “Fire Rating” value based on the UBBL material fire rating schedule.

E. Wall Thickness (for party or separating walls)

In Construction > Structure > Click Edit button to modify the thickness of the material used. The thickness of the walls shall be used to check the required UBBL minimum thickness for this wall type setting.



Type Properties

Family: System Family: Basic Wall Load...

Type: Wall 1 Duplicate... Rename...

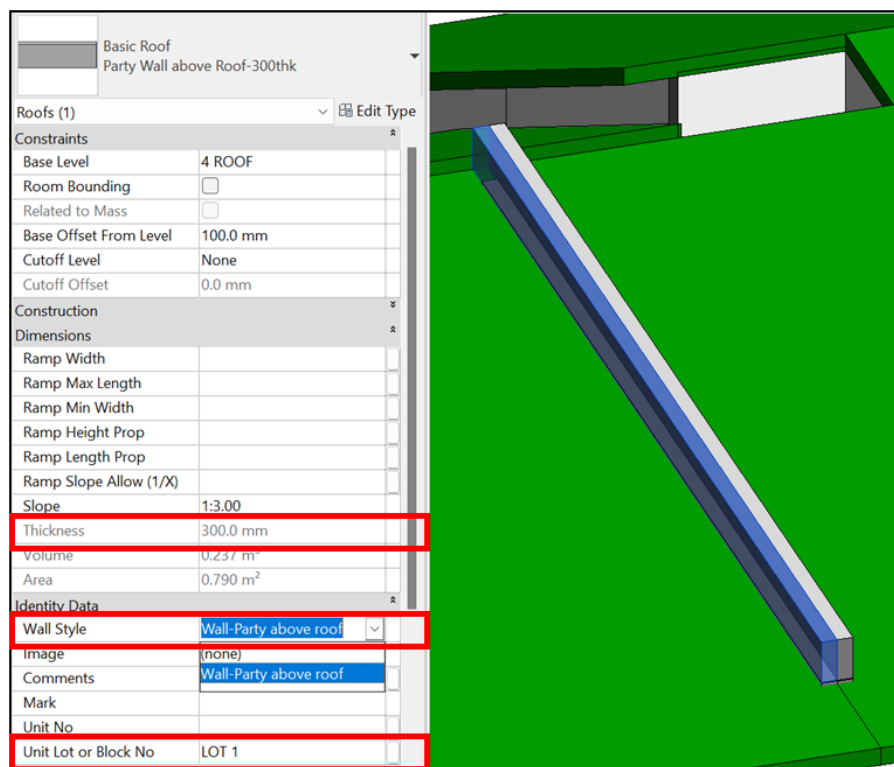
Type Parameters

Parameter	Value
Construction	
Structure	Edit...
Wrapping at Inserts	Do not wrap
Wrapping at Ends	None
Width	200.0 mm
Function	Exterior
Graphics	
Materials and Finishes	
Structural Material	
Analytical Properties	
Identity Data	
Type Image	
Keynote	
Model	
Manufacturer	
Type Comments	
URL	
Description	
Assembly Description	
Assembly Code	
Type Mark	
Fire Rating	1
Cost	

[What do these properties do?](#)

<< Preview OK Cancel Apply

F. Party Walls Above Roof



For party walls, each unit shall be modeled separately using the roof tool. Duplicate a basic roof and name the roof as “Party Wall above Roof”.

Click Construction > Structure > Edit button to change the structure material and thickness.

Click the roof tool and draw the wall outline to complete the element.

In Identity Data > Wall Style > select “Wall-Party above roof” for house or shop units. Select “Wall-Separating above roof” for multi-story strata units.

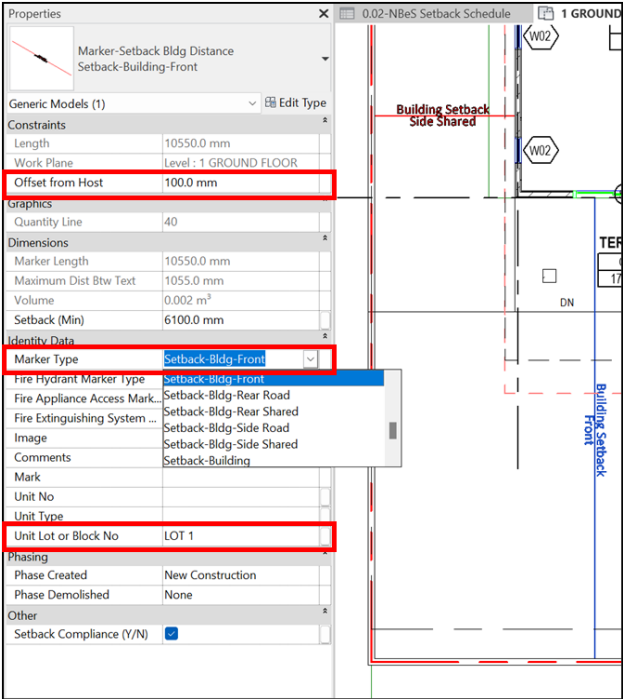
Identify the “Unit Lot” where the wall belongs to.

4.17 Site Elements

Site elements are elements modeled in the “SITE/FIRE APPLIANCE ACCESS” level. The elements are as follows:-

1. parking spaces for cars, motorcycles, buses, lorries, roads, building setbacks etc. ,
2. perimeter fences, external ramps and stairs, drains, aprons, swimming pool, children playground etc.,
3. the Fire Appliance Access roads and turnarounds, fire hydrants, etc
4. External dimension markers for building setbacks, road width, fire fighting fittings, etc.

4.17.1 Site Boundary Setback Line Marker



Site boundary lines & setback lines are usually represented as 2d lines on the storey plan. BIM modelers are required to use the family distance makers found in the NBeS Template to model these setback lines. Using these marker dimensions to indicate the building setback dimensions for the closest elements to the boundary lines. Table below represents the building setback types.

Enter the dimension “Offset from Host” followed by selecting the appropriate “Marker Type”

Lastly, indicate the markers for which “Unit Lot or Block No”.

Draw all setbacks on every storey level required.

Setback-Bldg-Front
Setback-Bldg-Rear Road
Setback-Bldg-Rear Shared
Setback-Bldg-Side Road
Setback-Bldg-Side Shared
Setback-Car Porch-Front
Setback-Car Porch-Side
Setback-Roof Front
Setback-Roof Rear
Setback-Roof Side

Table 23 Setback Marker Types

4.17.2 Fences & Boundary Fencing Walls (UBBL 98)

Basic Wall
Wall 1

Walls (1) Edit Type

Base Constraint	00-NBeS SITE/FIRE APPLIA...
Base Offset	0.0 mm
Base is Attached	☐
Base Extension Distance	0.0 mm
Top Constraint	Unconnected
Unconnected Height	1500.0 mm
Top Offset	0.0 mm
Top is Attached	☐
Top Extension Distance	0.0 mm
Room Bounding	☒
Related to Mass	☐

Cross-Section Definition

Structural

Dimensions

Identity Data

Wall Type	(none)
Fence Type	(none)
Image	(none)
Comments	Wall-Fence Open-Front & Rear
Mark	Wall-Fence Open-Shared
Unit No	Wall-Fence Open-Side
Fence UBBL Height Requi.	Wall-Fence Solid-Front & Rear
	Wall-Fence Solid-Shared

Unit Type

Unit Lot or Block No

Phasing

General

Data

Fence % Opening Provid...	
---------------------------	--

Other

Fences shall be modeled within the lot area and set to “00-NBeS SITE/FIRE APPLIANCE ACCESS LEVEL”. Fences can either be modeled using Revit’s “Wall” tool, “Railing” tool or “Component” tool. The height parameters of the fences are required for NBeS to check for height compliance against UBBL or PBT’s requirements. The fence types shall be assigned within the Wall or Railing properties setting. (Note: If “Component” tool is used to model the fence, PSP/SP shall select the correct ifc classification which is “ifcWall”)

PSP/SP may be required to enter the following data :-

For fence height:-

Wall Property > Constraints > Unconnected Height > enter height

For fence type :-

Wall Property > Identity Data > Fence Type > select from the list

For % opening provided type :-

Wall Property > Data > Fence % Opening Provided > enter the number

Table 24 Fence Type

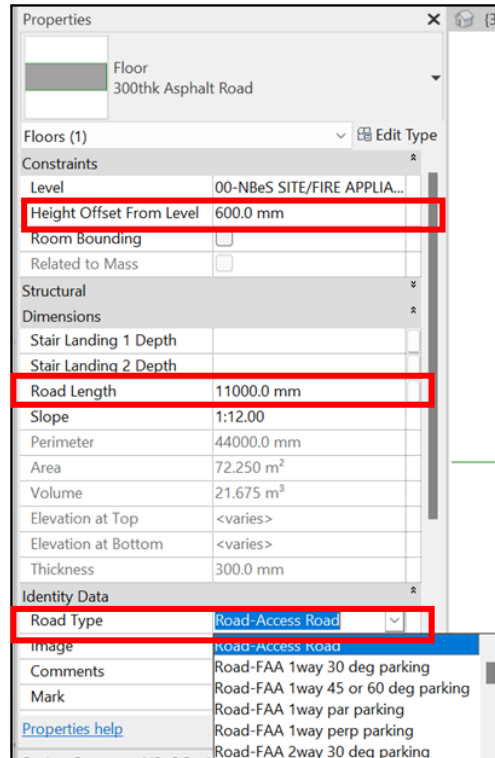
A	B
Key Name	Fence Height Max
Fence-Open-Front	2,750 mm
Fence-Open-Rear	2,750 mm
Fence-Open-Shared	2,750 mm
Fence-Open-Side	2,750 mm
Fence-Solid-Front	1,800 mm
Fence-Solid-Rear	1,800 mm
Fence-Solid-Shared	1,800 mm
Fence-Solid-Side	1,800 mm

4.17.3 Road Type & Gradient (UBBL cl. 140)

Road elements shall be modeled using the Revit's "Floor" and tool either on the "00-NBES SITE/FIRE APPLIANCE ACCESS LEVEL" level and shall be assigned with the following types:-

Table 25 Road types & Gradient

No	Road Types	Min Road Width	Usage	Min. road gradient	Min road width (m)
1	Road-Local		Assigned to all roads that are outside of project boundaries.	N/A	N/A
2	Road-General		Assigned to all non-fire appliance access road surfaces inside of project boundaries.	Varies from PBT to PBT PBT to input minimum gradient	one way w/ 30 deg. parking = 3.7 m two way w/30 deg. parking = 6.1 m one way w/ 45 or 60 deg. parking = 4.8 m two way w/45 or 60 deg. parking = 7.0 m one way w/ 90 deg. parking = 6.1 m two way w/90 deg. parking = 7.5 m one way w/ parallel parking = 3.7 m two way w/ parallel parking = 6.1 m
3	Road-Fire Appliance Access Front	6000	Assigned to all internal fire appliance front access road	Gradient 1:15 (UBBL 1986) Gradient 1:12 (UBBL 1984)	one way w/ 30 deg. parking = 6.1 m two way w/30 deg. parking = 6.1 m
4	Road-Fire Appliance Access Right Side	6000	Assigned to all internal fire appliance right side access road		one way w/ 45 or 60 deg. parking = 6.1 m two way w/45 or 60 deg. parking = 7.0 m
5	Road-Fire Appliance Access Rear	6000	Assigned to all internal fire appliance rear access road		one way w/ 90 deg. parking = 6.1 m two way w/90 deg. parking = 7.5 m
6	Road-Fire Appliance Access Left Side	6000	Assigned to all internal fire appliance left access road		one way w/ parallel parking = 6.1 m two way w/ parallel parking = 6.1 m
7	Road-Fire Appliance Turnaround-Hammer Head		Assigned to all fire appliance turnaround road type		
8	Road-Fire Appliance Turnaround-3 Point Turn		Assigned to all fire appliance turnaround road type		
9	Road-Fire Appliance Turnaround-Turning Circle		Assigned to all fire appliance turnaround road type		
10	Surface parking		Assigned to non-circulation surfaces such as car parking/motorcycle parking spaces		

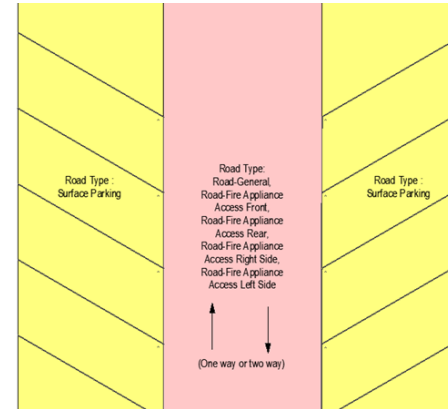


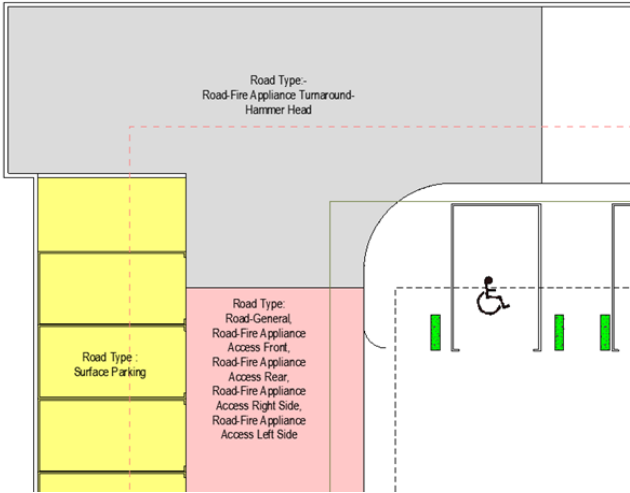
Flat roads & roads with a gradient shall be modeled using the “Floor” tool.

Select a road and set the “Height Offset from Level” parameter followed by the “Road Length” parameter.

In the Property > Identity Data > Road Type> select from the list of road types that best represent the element.

The model samples below show how the road element shall be modeled for the road and car parking.





PSP/SP shall make sure that the minimal road width if for fire appliance access of 6m is complied. For non fire appliance access roads, the road width shall comply with the PBT road width requirements for various car parking scenarios.

The table below shows the types of roads available for selection.

Table 26 Gradient of Roads

One-Way Road - Single or Double loaded parking (for non fire appliance access road)			Two-Way Road - Single or Double loaded parking (for non fire appliance access road)		
No	Parking Type	Min. Road Width (m) required	No	Parking Type	Min. Road Width (m) required
1	30° angle parking	3.7	1	30° angle parking	6.1
2	45° angle parking	4.8	2	45° angle parking	7.0
3	60° angle parking	4.8	3	60° angle parking	7.0

4	90° angle parking	6.1
5	Parallel parking	3.7

4	90° angle parking	7.5
5	Parallel parking	6.1

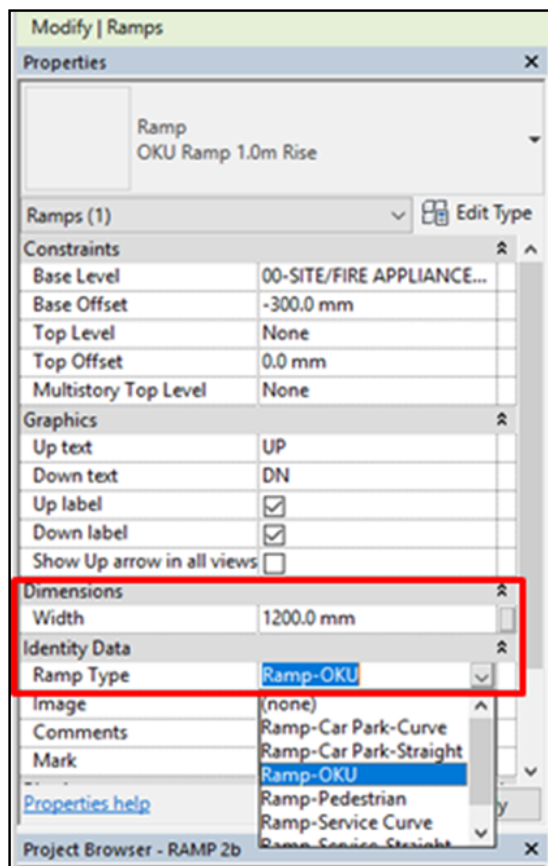
4.17.4 External & Internal Ramp

UBBL cl.38 and MS1184:2014 - 8 is referred to.

Ramp elements shall be modeled with Revit's "Ramp" tool and shall be assigned with the following types:-

Property browser > Dimension >

Property browser > Identity Data > Ramp Type >



NO	RAMP TYPES	DESCRIPTION
1	(None)	
2	Ramp-OKU	to comply ramp width & gradient in accordance to MS 1184
3	Ramp-Pedestrian	Internal or external general ramp
3	Ramp-Car Park-Straight	Internal Ramp with min. clear width, gradient and clear height for cars according to Local PBT
4	Ramp-Car Park-Curve	Internal Ramp with min. clear width, gradient and clear height for cars according to Local PBT
5	Ramp-Service-Straight	Internal Ramp with min. clear width, gradient and clear height for service truck according to Local PBT
6	Ramp-Service-Curve	Internal Ramp with min. clear width, gradient and clear height for service truck according to Local PBT

Table 27 Ramp Types

RAMP TYPE	RAMP FAMILY TYPE	MAX RISE	MAX SLOPE	MAX LENGTH	MIN WIDTH
Ramp-OKU	OKU 1 (slope 1/15)	315mm	1:15	4500	1200
Ramp- Pedestrian		500mm	1:12	no limit	1200
Ramp- Pedestrian		more than 500mm	1:20	no limit	1200
Ramp-CarPark- Straight			1:8		3000
Ramp-CarPark- Curve			1:10		3600
Ramp-Service- Straight			1:10		3600
Ramp-Service- Curve			1:10		3600

Table 28 Ramp Data

5.0 BUILDING SUBMISSION FEE CALCULATION

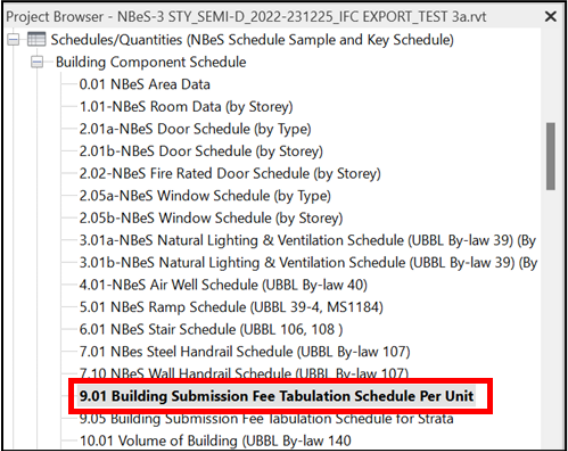
With the Area Plans (Fire Provision) setup earlier, you can prepare the building submission fee by going to -

Project Browser > Schedules/Quantities > 9.01 Building Submission Fee Tabulation Schedule Per Unit.

Or,

Project Browser > Schedules/Quantities > 9.05 Building Submission Fee Tabulation Schedule for Strata

A	B
Key Name	Submission Fees per 9 Sq.m
Basement	6
First	12
Fourth & Above	6
Ground Floor	14
Second	10
Third	8



A	B	C	D	E	F	G	H	I
UNIT LOT/ BLOCK NO	UNIT NO	UNIT TYPE	AREA NAME	AREA USE TYPE	AREA	SUBMISSION FEE		
						PER STOREY	PER 9 SQ.M.	SUB-TOTAL
1 GROUND FLOOR								
LOT 1	1	A	UNIT 1	Usable Area-Residential	211.93 m²	Ground Floor	14.00	329.67
LOT 2	2	A(M)	UNIT 2	Usable Area-Residential	211.93 m²	Ground Floor	14.00	329.67
								659.35
2 FIRST FLOOR								
LOT 1	1	A	UNIT 1	Usable Area-Residential	140.11 m²	First	12.00	186.82
LOT 2	2	A(M)	UNIT 2	Usable Area-Residential	140.11 m²	First	12.00	186.82
								373.63
3 SECOND FLOOR								
LOT 1	1	A	UNIT 1	Usable Area-Residential	123.24 m²	Second	10.00	136.93
LOT 2	2	A(M)	UNIT 2	Usable Area-Residential	123.24 m²	Second	10.00	136.93
								273.87
								1306.85

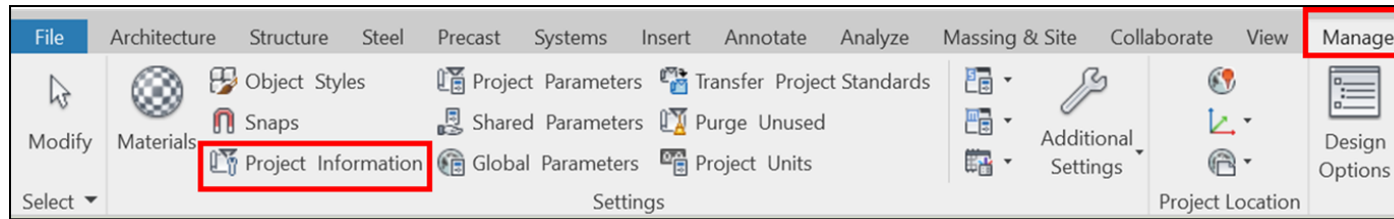
Set the correct “Area Use Type” and if there is a floor void area to set to “Void”.

A	B	C	D	E	F	G	H
UNIT LOT/ BLOCK NO	UNIT NO	AREA NAME	AREA	PER STOREY	PER 9 SQ.M	SUB-TOTAL	AREA USE TYPE
1.0 ARAS BAWAH							
A		CAR PARK	930.28 m²	Ground Floor	14.00	1447.10	Car Park-Above Ground
A		LOBI & LIFT	68.09 m²	Ground Floor	14.00	105.92	Circulation & Services-Open
A		MAIL & OFFICE	26.90 m²	Ground Floor	14.00	41.84	Usable Area-Facility
A		STAIR 1	14.19 m²	Ground Floor	14.00	22.07	Circulation & Services-Enclosed
A		STAIR 2	14.19 m²	Ground Floor	14.00	22.07	Circulation & Services-Enclosed
A		SURAU	44.60 m²	Ground Floor	14.00	69.37	Usable Area-Facility
2.0 ARAS 1						1708.38	
A		CORRIDOR & LIFT	85.89 m²	First	12.00	114.51	Circulation & Services-Open
A		STAIR 1	14.62 m²	First	12.00	19.49	Circulation & Services-Enclosed
A		STAIR 2	14.62 m²	First	12.00	19.49	Circulation & Services-Enclosed
A	01-01	UNIT 01-01	95.07 m²	First	12.00	126.75	Usable Area-Residential
A	01-02	UNIT 01-02	87.90 m²	First	12.00	117.20	Usable Area-Residential
A	01-03	UNIT 01-03	87.90 m²	First	12.00	117.20	Usable Area-Residential
A	01-04	UNIT 01-04	95.07 m²	First	12.00	126.75	Usable Area-Residential
A	01-05	UNIT 01-05	95.07 m²	First	12.00	126.75	Usable Area-Residential
A	01-06	UNIT 01-06	87.90 m²	First	12.00	117.20	Usable Area-Residential
A	01-07	UNIT 01-07	87.90 m²	First	12.00	117.20	Usable Area-Residential
A	01-08	UNIT 01-08	95.07 m²	First	12.00	126.75	Usable Area-Residential
						1129.32	

Table 29 Building Submission Fee Schedule

COLUMN	HEADER	DESCRIPTION	EXAMPLE
E	PER STOREY	Select the correct storey setting to set the correct fees. The sub-total cost and the grand total cost will be automatically calculated at the bottom of the schedule.	

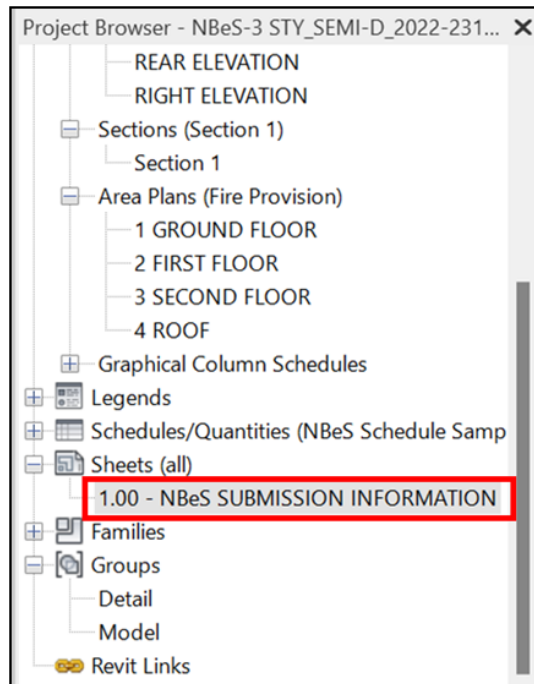
6.0 PROJECT INFORMATION



To input “Project Information”, goto

“Manage” menu > “Project Information” > and click to open the “Project Information” dialog box. The relevant NBeS information are grouped into 4 information grouping namely:-

1. “Building Information” grouped under “Data” parameter grouping
2. “Client Information” grouped under “Other” parameter grouping
3. “Land Information” grouped under “Other” parameter grouping
4. “PSP/SP Information” grouped under “Identity Data” parameter grouping



NBeS has created a sheet layout to enter all the required submission information.

Goto “Project Browser” > “Sheets” > click on “1.00 - NBeS Submission Information” > to open the A4 sheet layout.

Enter the data where required by clicking on each cell. This data sheet is a generic input sheet and may vary from one PBT to another.

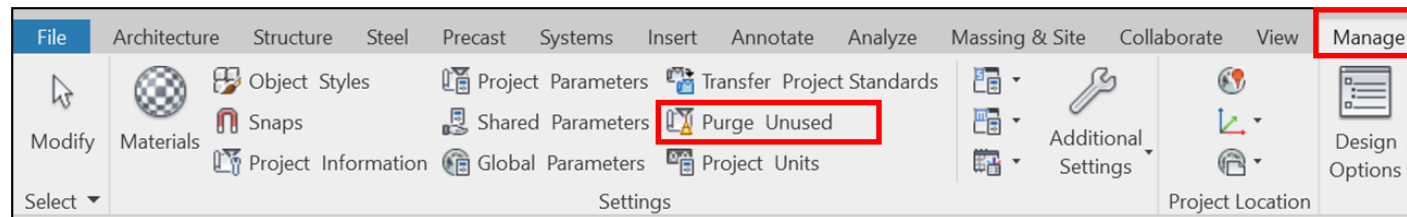
For the model submission, PSP shall enter the parameters required to be embedded within the model. The data sheet consist the following project parameters:-

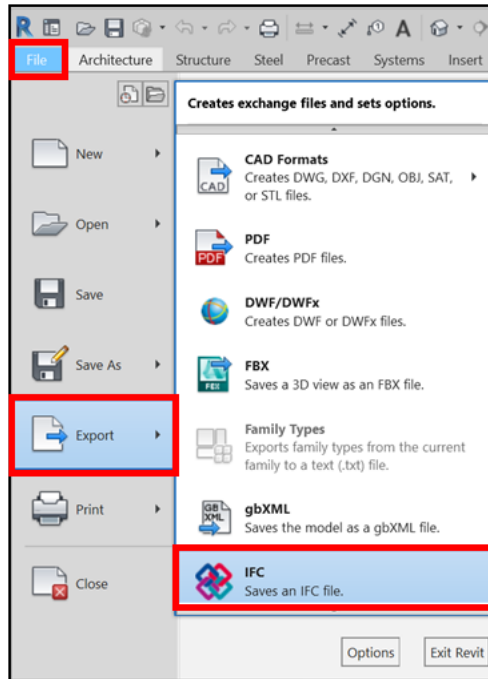
1. Building Information
2. Land Information
3. PSP Information
4. Client Information
5. PSP Signature & LAM Stamp

7.0 EXPORTING IFC MODEL FOR SUBMISSION

Before exporting, PSP shall review the 3d model to ensure elements required for UBBL code checking are visible. Furniture & landscaping elements can be hidden before exporting out to IFC to reduce the IFC file size. The final model should be purged before exporting out.

To purge, goto “Manage” > “Purge unused” and click “Ok” to purge all. You may be required to do this a few times until the “Number of Items selected” shows “0” signifying that all items have been purged.





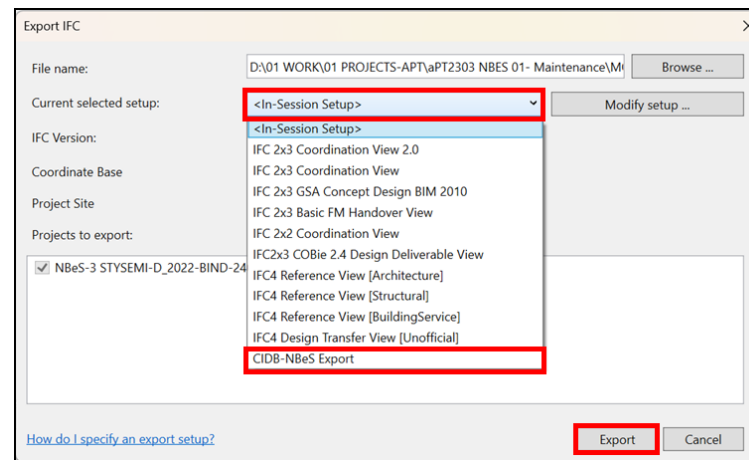
Open up the 3D view and make sure that all elements to be exported are visible. To export,

click “File” > “Export” > “iFC” > to open up the “Export iFC” dialog box

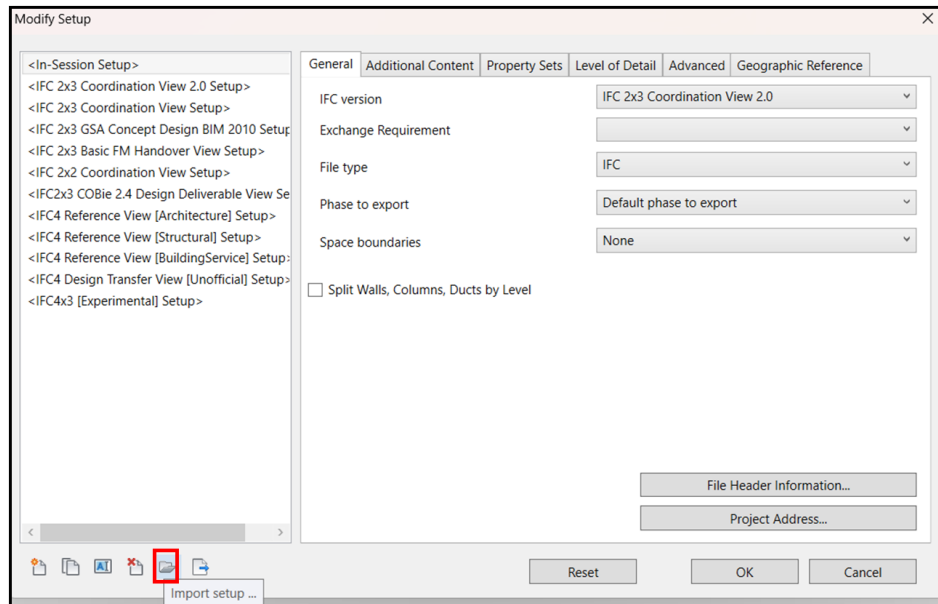
Select “CIDB-NBeS” Export setup

Click “Browse” to select where the iFC file to be exported to.

Click “Export” and wait until the export is completed.



Open the saved iFC file using an iFC viewer app to check and confirm that all elements are exported out.



In event if the “CIDB-NBeS Export” setup is not available, click on “Modify Setup” and click on to import setup and select import file named “CIDB-NBeS Export”. Click open to complete the import.

Complete the IFC export of the 3D model.

8.0 SUBMISSION FILE & DOCUMENTS

Name the submission ifc model file with the following file naming convention

Table 30 File naming convention

Majlis Code	Under score _	BIM Authoring Tool (rvt, pln)	Dash -	NBeS Template Version	Under score _	PSP Code & Ref no (open format)	Dash -	Model Revision No	Dash -	Date Exported (YYMMDD)	Extension
Refer to Appx B	_	rvt	-	3.01	_	aPT2403	-	00	-	240615	.ifc

Note: Do not use characters which are not allowed in file naming such as / \ : * ?

9.0 APPENDIXES

9.1 Appendix A - Space Use Types for Residential including Shophouse

NBES SPACE USE TYPE (RESIDENTIAL & SHOPHOUSE)								
No.	Space Use Type	Ventilation (Natural /Mech)	Min Room Height (m)	Min Room Width (m)	Min Room Length (m)	Min Floor Area (sq.m)	UBBL Section	Notes (Room height shall be modeled to either ceiling or bottom of beam)
1	Air Well-General			2500		7.0	40 (1) (a) & (b)	Width clear dimension & self declaration
2	Air Well-Gen to 4 Sty			2500		9.0	40 (1) (a) & (b)	Width clear dimension & self declaration
3	Air Well-Gen to 6 Sty			2500		11.0	40 (1) (a) & (b)	Width clear dimension & self declaration
4	Air Well-Gen to 8 Sty			2500		13.0	40 (1) (a) & (b)	Width clear dimension & self declaration
5	Air Well-Gen more than 8 Sty			2500		15.0	40 (1) (a) & (b)	Width clear dimension & self declaration
6	Air Well-Toilet to 2 Sty			2000		3.5	40 (2) (a) & (b)	Width clear dimension & self declaration
7	Air Well-Toilet to 4 Sty			2000		4.0	40 (2) (a) & (b)	Width clear dimension & self declaration
8	Air Well-Toilet to 6 Sty			2000		4.5	40 (2) (a) & (b)	Width clear dimension & self declaration
9	Air Well-Toilet to 8 Sty			2000		5.0	40 (2) (a) & (b)	Width clear dimension & self declaration
10	Air Well-Toilet more than 8 Sty			2000		5.5	40 (2) (a) & (b)	Width clear dimension & self declaration
11	Auditorium	M	= > 3000				44(4)	
12	Balcony-Residential		= > 2500					
13	Bathroom-Open	✓	= > 2500	= > 900		= > 2000	43 (a) 44 (1) (c)	Bathroom with no compartments
14	Bathroom-Water Closet	✓	= > 2500	= > 900		= > 2500	43 (a) 44 (1) (c)	Bathroom with wc compartment
15	Car Park-Basement	M	= > 2500	Refer to Local PBT's requirements			46 (2)	
16	Car Park-Grd	✓	= > 2500	Refer to Local PBT's requirements			46 (3)	
17	Car Park-Upper	✓	= > 2500	Refer to Local PBT's requirements			46 (1)	

NBES SPACE USE TYPE (RESIDENTIAL & SHOPHOUSE)								
No.	Space Use Type	Ventilation (Natural /Mech)	Min Room Height (m)	Min Room Width (m)	Min Room Length (m)	Min Floor Area (sq.m)	UBBL Section	Notes (Room height shall be modeled to either ceiling or bottom of beam)
18	Circulation-Common		= > 2000				44 (1) (c)	Non-fire protected corridors
19	Circulation-Protected		= > 2000				44 (1) (c)	Fire protected corridors
20	Circulation-Unit		= > 2000	x			44 (1) (c)	Circulation within a unit
21	Circulation-Service		= > 2000				44 (1) (c)	Non-fire protected corridors
22	Covered Garden		= > 2500				46 (3)	
23	Covered Porch		= > 2500				46 (3)	Car park or drop-off area
24	Dining-Residential	✓	= > 2500				44 (1) (a)	Residential unit dining
25	Dining-Basement	M	= > 2500				46 (2)	Hall for banquet, restaurant cafeteria, canteen, etc
26	Dining-Grd	✓	= > 3000				46 (1)	Hall for banquet, restaurant cafeteria, canteen, etc
27	Dining-Upper	✓	= > 2750				46 (1)	Hall for banquet, restaurant cafeteria, canteen, etc
28	Electrical Room						139, 162, 163	Switch room, TNB, SDF, MDF
29	Exterior							Outdoor uncovered spaces
30	Facility-Basement	✓	= > 2500				46 (4)	Change room, library, reading, study, games, training etc (teaching room not included)
31	Facility-Grd	✓	= > 3000				46 (1)	Change room, library, reading, study, games, training etc (teaching room not included)
32	Facility-Upper	✓	= > 2750				46 (1)	Change room, library, reading, study, games, training etc (teaching room not included)
33	Fire Command Room	✓	= > 2500				46 (4), 238	
34	Garage-Residential		= > 2500					

NBES SPACE USE TYPE (RESIDENTIAL & SHOPHOUSE)								
No.	Space Use Type	Ventilation (Natural /Mech)	Min Room Height (m)	Min Room Width (m)	Min Room Length (m)	Min Floor Area (sq.m)	UBBL Section	Notes (Room height shall be modeled to either ceiling or bottom of beam)
35	Habitable Room 1	✓	= > 2500	= > 2000		= > 11	42, 44 (1) (a)	Master Bedroom
36	Habitable Room 2	✓	= > 2500	= > 2000		= > 9.3		Second Bedroom
37	Habitable Room Hotel	✓	= > 2500	= > 2000		= > 6.5		Hotel rooms
38	Habitable Room Other	✓	= > 2500	= > 2000		= > 6.5		Third & Other bedrooms
39	Hall-Basement	M	= > 2500				46(2)	Sports, Multipurpose, Prayer, Exhibition, etc
40	Hall-Grd	✓	= > 3000				46 (1)	Sports, Multipurpose, Prayer, Exhibition, etc
41	Hall-Upper	✓	= > 2750				46 (1)	Sports, Multipurpose, Prayer, Exhibition, etc
42	Hazardous Room		= > 2500				139, 162, 163	Laundry, Repair Shop, LPG Store, Cold Room, Fuel Store 2 hour fire rated door
43	Kitchen-Basement	M	= > 2500				46 (2)	For commercial, healthcare & factory bldg. restaurant, hostel, cafeteria etc
44	Kitchen-Grd	✓	= > 3000				46 (1)	For commercial, healthcare & factory bldg. restaurant, hostel, cafeteria etc
45	Kitchen-Upper	✓	= > 2750				46 (1)	For commercial, healthcare & factory bldg. restaurant, hostel, cafeteria etc
46	Kitchen-Residential	✓	= > 2500	= > 1650		= > 4.5	46 (1) (b)	Residential unit kitchen
47	Lift-Fire						243	FAA height > 18m
48	Lift-General						124	no of storey above & below > 4
49	Living-Residential	✓	= > 2500	= > 2000			42 (2), 44 (1) (a)	Residential unit Living, Family Area
50	Lobby-Fire-Basement	✓	= > 2500			= > 6.0	46 (2), 153, 162, 163, 197	Ground & upper FAA height > 18m permanent window opening area more than 25% of lobby area Basement -FAA height > 9m
51	Lobby-Fire-Grd	✓	= > 3000			= > 6.0	46 (2), 153, 162, 163, 197	Ground & upper FAA height > 18m permanent window opening area more than 25% of lobby area Basement -FAA height > 9m

NBES SPACE USE TYPE (RESIDENTIAL & SHOPHOUSE)								
No.	Space Use Type	Ventilation (Natural /Mech)	Min Room Height (m)	Min Room Width (m)	Min Room Length (m)	Min Floor Area (sq.m)	UBBL Section	Notes (Room height shall be modeled to either ceiling or bottom of beam)
52	Lobby-Fire-Upper	✓	= > 2500			= > 6.0	46 (2), 153, 162, 163, 197	Ground & upper FAA height > 18m permanent window opening area more than 25% of lobby area Basement -FAA height > 9m
53	Lobby-Basement	✓	= > 2500				46 (2), 153, 162, 163, 196	For waiting area, reception area etc
54	Lobby-Grd	✓	= > 3000				46 (1), 153, 162, 163, 196	For waiting area, reception area etc
55	Lobby-Upper	✓	= > 2750				46 (1), 153, 162, 163, 196	For waiting area, reception area etc
56	Lobby-Smoke	M	= > 2500				46 (2), 153, 162, 163, 196	permanent window opening area more than 1 sq.m
57	Mechanical Room						139, 160, 162	AHU, boiler room, tank room
58	Meeting Room-Basement	M	= > 2500				46 (2)	For bldgs other than education & factory
59	Meeting Room-Grd	✓	= > 3000				46 (1)	For bldgs other than education & factor
60	Meeting Room-Upper	✓	= > 2750				46 (1)	For bldgs other than education & factory
61	Office-Basement	✓	= > 2500				46 (2)	Common office spaces or rooms
62	Office-Grd	✓	= > 3000				46(1)	Common office spaces or rooms
63	Office-Upper	✓	= > 2750				46(1)44 (1)(a)	Common office spaces or rooms
64	Other-Non Habitable		= > 2000				46 (4)	Non habitable spaces not listed
65	Pantry-Public	✓	= > 2500					
66	Pantry-Residential	✓	= > 2500					
67	Porch-Residential		= > 2500					
68	Prayer Room-Basement	M	= > 2500	Refer to Local PBT's requirements			46 (2)	Prayer room
69	Prayer Room-Grd	✓	= > 3000	Refer to Local PBT's requirements			46 (1)	Prayer room

NBeS SPACE USE TYPE (RESIDENTIAL & SHOPHOUSE)								
No.	Space Use Type	Ventilation (Natural /Mech)	Min Room Height (m)	Min Room Width (m)	Min Room Length (m)	Min Floor Area (sq.m)	UBBL Section	Notes (Room height shall be modeled to either ceiling or bottom of beam)
70	Prayer Room-Upper	✓	= > 2750	Refer to Local PBT's requirements			46 (1)	Prayer room
71	Refuse Room-General	✓	= > 2000	Refer to Local PBT's requirements			46 (4)	
72	Shaft-DR						230	FAA height > 18m > 30m
73	Shaft-EL						139 (g), 162, 163	2 hour fire rated door
74	Shaft-HR						226A	
75	Shaft-Others							ELV, Tel, IT, Chiller, Water shafts
76	Shaft-WR						231	FAA height > 30m
77	Shed-Residential		= > 2500					
78	Shop-Retail-Basement	M	= > 2500				44 (3)	
79	Shop-Retail-Grd	✓	= > 3000				44 (3)	
80	Shop-Retail-Upper	✓	= > 2750				44 (3)	
81	Stair-Fire-Basement	M					190, 197A	
82	Stair-Fire-Exit	✓					169, 174A, 190, 197A	
83	Stair-Fire-Roof	✓					195, 197A	
84	Stair-Fire-Upper	✓					197A (1), 162, 163, 197A	FAA height > 18m, FAA height-basement > 9m
85	Stair-Open						170	
86	Stair-Protected-Basement	✓						
87	Stair-Protected-Exit	✓					169, 174A, 190	
88	Stair-Protected-Roof	✓					195, 162, 163	
89	Stair-Protected-Upper	✓					195, 162, 163	

NBES SPACE USE TYPE (RESIDENTIAL & SHOPHOUSE)								
No.	Space Use Type	Ventilation (Natural /Mech)	Min Room Height (m)	Min Room Width (m)	Min Room Length (m)	Min Floor Area (sq.m)	UBBL Section	Notes (Room height shall be modeled to either ceiling or bottom of beam)
90	Stair-Single						194	FAA height < 12m for dwelling, building not exceed 2 storey high & first floor does not exceed 6m from ground level
91	Store-Food		= > 2000					Dry or cold food
92	Store-General		= > 2000				46(4)	Furniture, office supply, garden tools records etc
93	Store-LPG							External covered storage space
94	Store-Residential		= > 2000					For residential unit only
95	Toilet-OKU A	✓	= > 2500	= > 2200	= > 2300		46 (1) & (2) MS 1184:2014 25.4.2	
96	Toilet-OKU B	✓	= > 2500	= > 1900	= > 2750		46 (1) & (2) MS 1184:2014 25.4.3	
97	Toilet-OKU C	✓	= > 2500	= > 1700	= > 2200		46 (1) & (2) MS 1184:2014 25.4.4	
98	Toilet-Public	✓	= > 2500				46 (1) & (2)	
99	Toilet-Residential	✓	= > 2500	= > 900			43 (b), 44 (1) (c)	For residential unit only
100	Utility-General		= > 2000				46 (4)	For all building types ie Utility Rm, Janitor, washing, pantry
101	Verandahway-Grd		= > 3000	= > 2100			38 (1), 46 (5)	
102	Verandahway-Upper		= > 2750	= > 2100			38 (1), 46 (5)	
103	Wuduk		= > 2000				43 (a) 44 (1) (c)	
104	Verandah-Residential		= > 2500					

9.2 Appendix A - Space Use Types for Education

NBeS SPACE USE TYPE (EDUCATION)								
No.	Space Use Type	Ventilation (Natural /Mech)	Min Room Height (m)	Min Room Width (m)	Min Room Length (m)	Min Floor Area (sq.m)	UBBL Section	Notes (Room height shall be modeled to either ceiling or bottom of beam)
1	Air Well-Gen to 2 Sty			2500		7.0	40 (1) (a) & (b)	Width clear dimension & self declaration
2	Air Well-Gen to 4 Sty			2500		9.0	40 (1) (a) & (b)	Width clear dimension & self declaration
3	Air Well-Gen to 6 Sty			2500		11.0	40 (1) (a) & (b)	Width clear dimension & self declaration
4	Air Well-Gen to 8 Sty			2500		13.0	40 (1) (a) & (b)	Width clear dimension & self declaration
5	Air Well-Gen more than 8 Sty			2500		15.0	40 (1) (a) & (b)	Width clear dimension & self declaration
6	Air Well-Toilet to 2 Sty			2000		3.5	40 (2) (a) & (b)	Width clear dimension & self declaration
7	Air Well-Toilet to 4 Sty			2000		4.0	40 (2) (a) & (b)	Width clear dimension & self declaration
8	Air Well-Toilet to 6 Sty			2000		4.5	40 (2) (a) & (b)	Width clear dimension & self declaration
9	Air Well-Toilet to 8 Sty			2000		5.0	40 (2) (a) & (b)	Width clear dimension & self declaration
10	Air Well-Toilet more than 8 Sty			2000		5.5	40 (2) (a) & (b)	Width clear dimension & self declaration
11	Auditorium	✓	= > 3000				44(4)	
12	Bathroom-Open	✓	= > 2500	= > 900		= > 2000	43 (a) 44 (1) (c)	Residential bathroom with no compartments
13	Bathroom-Water Closet	✓	= > 2500	= > 900		= > 2500	43 (a) 44 (1) (c)	Residential bathroom with wc compartment
14	Car Park-Basement	✓	= > 2500	Refer to Local PBT's requirements			46 (2)	
15	Car Park-Grd	✓	= > 2500	Refer to Local PBT's requirements			46 (3)	
16	Car Park-Upper	✓	= > 2500	Refer to Local PBT's requirements			46 (1)	

NBeS SPACE USE TYPE (EDUCATION)								
No.	Space Use Type	Ventilation (Natural /Mech)	Min Room Height (m)	Min Room Width (m)	Min Room Length (m)	Min Floor Area (sq.m)	UBBL Section	Notes (Room height shall be modeled to either ceiling or bottom of beam)
17	Circulation-Edu-Common		= > 2000	Refer to PBT			46 (4)	Non-fire protected corridors in education building
18	Circulation-Edu-Protected		= > 2000	Refer to PBT			46 (4)	Fire protected corridors in education building
19	Circulation-Protected		= > 2000				46 (4)	Fire protected corridors
20	Circulation-Service		= > 2000				46 (4)	Non-fire protected corridors
21	Classroom-Edu	✓	= > 3000				44(4)	For non JKR school project
22	Classroom-Edu JKR	✓	= > 3000				44(4)	For JKR school project
23	Covered Garden		= > 2500				46 (3)	
24	Covered Porch		= > 2500				46 (3)	Car park or drop-off area
25	Dining-Basement	✓	= > 2500				46 (2)	For non JKR school dining hall
26	Dining-Grd	✓	= > 3000				46 (1)	For non JKR school dining hall
27	Dining-Upper	✓	= > 2750				46 (1)	For non JKR school dining hall
28	Dining-Edu JKR-Grd	✓	= > 3000				JKR	For JKR school dining hall
29	Dining-Edu JKR-Upper	✓	= > 3000				JKR	For JKR school dining hall
30	Electrical Room						139, 162, 163	Switch room, TNB, SDF, MDF, Generator
31	Exterior							Outdoor uncovered spaces
32	Facility-Basement	✓	= > 2500				46 (4)	General habitable facilities ie Games, Gymn, Reading, Change Room, Bookstore, Health Room etc (teaching room not included)
33	Facility-Grd	✓	= > 3000				46 (1)	General habitable facilities ie Games, Gymn, Reading, Change Room,

NBeS SPACE USE TYPE (EDUCATION)								
No.	Space Use Type	Ventilation (Natural /Mech)	Min Room Height (m)	Min Room Width (m)	Min Room Length (m)	Min Floor Area (sq.m)	UBBL Section	Notes (Room height shall be modeled to either ceiling or bottom of beam)
								Bookstore, Health Room etc (teaching room not included)
34	Facility-Upper	✓	= > 2750				46 (1)	General habitable facilities ie Games, Gymn, Reading, Change Room, Bookstore, Health Room etc (teaching room not included)
35	Facility-Edu JKR-Grd	✓	= > 3000				JKR	For JKR education building only ie Change Room, Bookstore, Health Room
36	Facility-Edu JKR-Upper	✓	= > 3000				JKR	For JKR education building only ie Change Room, Bookstore, Health Room
37	Fire Command Room	✓	= > 2500				46 (4), 238	
38	Hall-Basement	✓	= > 2500				46 (2)	Sports, Multipurpose, Prayer, Exhibition, etc
39	Hall-Grd	✓	= > 3000				46 (1)	Sports, Multipurpose, Exhibition, etc
40	Hall-Upper	✓	= > 2750				46 (1)	Sports, Multipurpose, Exhibition, etc
41	Hall-Edu JKR Grd	✓	= > 3000				46 (1)	Sports, Multipurpose, Exhibition, etc
42	Hall-Edu JKR Upper	✓	= > 3000				46 (1)	Sports, Multipurpose, Exhibition, etc
45	Hazardous Room						139, 162, 163	Laundry, Repair Shop, LPG Store, Cold Room, Fuel Store 2 hour fire rated door
46	Kitchen-Basement	✓	= > 2500				46 (2)	For non JKR education, commercial, healthcare & factory bldg. restaurant, hostel, cafeteria etc
47	Kitchen-Grd	✓	= > 3000				46 (1)	For non JKR education, commercial, healthcare & factory bldg. restaurant, hostel, cafeteria etc
48	Kitchen-Upper	✓	= > 2750				46 (1)	For non JKR education, commercial, healthcare & factory bldg. restaurant, hostel, cafeteria etc
49	Kitchen-Edu JKR-Grd	✓	= > 3000				JKR, 46 (1)	For JKR education building only
50	Kitchen-Edu JKR-Upper	✓	= > 3000				JKR, 46 (1)	For JKR education building only

NBeS SPACE USE TYPE (EDUCATION)								
No.	Space Use Type	Ventilation (Natural /Mech)	Min Room Height (m)	Min Room Width (m)	Min Room Length (m)	Min Floor Area (sq.m)	UBBL Section	Notes (Room height shall be modeled to either ceiling or bottom of beam)
51	Lab-Edu	✓	= > 3000				44(4)	For non JKR school building only
52	Lab-Edu JKR	✓	= > 3000				44(4)	For non JKR school building only
53	Library-Edu-Basement	✓	= > 3000				44(4)	For non JKR school building only
54	Library-Edu	✓	= > 3000				44(4)	For non JKR school building only
55	Library-Edu JKR	✓	= > 3000				44(4)	For non JKR school building only
56	Lift-Fire						243	FAA height > 18m
57	Lift-General						124	no of storey above & below > 4
58	Lobby-Basement	✓	= > 2500				46 (2), 153, 162, 163, 196	For waiting area, reception area etc
59	Lobby-Fire-Basement	✓	= > 2500			= > 6.0	46 (2), 153, 162, 163, 197	Ground & upper FAA height > 18m permanent window opening area more than 25% of lobby area Basement -FAA height > 9m
60	Lobby-Fire-Grd	✓	= > 3000			= > 6.0	46 (2), 153, 162, 163, 197	Ground & upper FAA height > 18m permanent window opening area more than 25% of lobby area Basement -FAA height > 9m
61	Lobby-Fire-Upper	✓	= > 2500			= > 6.0	46 (2), 153, 162, 163, 197	Ground & upper FAA height > 18m permanent window opening area more than 25% of lobby area Basement -FAA height > 9m
62	Lobby-Grd	✓	= > 3000				46 (1), 153, 162, 163, 196	For waiting area, reception area etc
63	Lobby-Upper	✓	= > 2750				46 (1), 153, 162, 163, 196	For waiting area, reception area etc
64	Lobby-Smoke	✓	= > 2500				46 (2), 153, 162, 163, 196	permanent window opening area more than 1 sq.m
65	Mechanical Room	✓					139, 160, 162	AHU, boiler room, tank room

NBeS SPACE USE TYPE (EDUCATION)								
No.	Space Use Type	Ventilation (Natural /Mech)	Min Room Height (m)	Min Room Width (m)	Min Room Length (m)	Min Floor Area (sq.m)	UBBL Section	Notes (Room height shall be modeled to either ceiling or bottom of beam)
66	Meeting Room-Basement	✓	= > 2500				46 (2)	For non JKR school, healthcare, factory building only
67	Meeting Room-Grd	✓	= > 3000				46 (1)	For non JKR school, healthcare, factory building only
68	Meeting Room-Upper	✓	= > 2750				46 (1)	For non JKR school, healthcare, factory building only
69	Meeting Room-Edu JKR-Grd	✓	= > 3000				JKR, 44(4)	For JKR education building only
72	Meeting Room-Edu JKR- Upper	✓	= > 3000				JKR, 44(4)	For JKR education building only
72	Office-Basement	✓	= > 2500				46 (2)	For non JKR school, healthcare, factory building only
73	Office-Grd	✓	= > 3000				46 (1)	For non JKR school, healthcare, factory building only
74	Office-Upper	✓	= > 2750				46 (1)	For non JKR school, healthcare, factory building only
75	Office-Edu JKR-Grd	✓	= > 3000				JKR	For JKR education building only
76	Office-Edu JKR-Upper	✓	= > 3000				JKR	For JKR education building only
77	Other-Non Habitable		= > 2000				46 (4)	Non habitable spaces not listed
78	Pantry-Public	✓	= > 2500					
79	Prayer Room-Basement	✓	= > 2500	Refer to Local PBT's requirements			46 (2)	Prayer room
80	Prayer Room-Grd	✓	= > 3000	Refer to Local PBT's requirements			46 (1)	Prayer room
81	Prayer Room-Upper	✓	= > 2750	Refer to Local PBT's requirements			46 (1)	Prayer room
82	Refuse Room-General	✓	= > 2000	Refer to Local PBT's requirements			46 (4)	
83	Shaft-DR						230	FAA height > 18m > 30m
84	Shaft-EL						139 (g), 162, 163	2 hour fire rated door
85	Shaft-HR						226A	
86	Shaft-Others							ELV, Tel, IT, Chiller, Water shafts

NBeS SPACE USE TYPE (EDUCATION)								
No.	Space Use Type	Ventilation (Natural /Mech)	Min Room Height (m)	Min Room Width (m)	Min Room Length (m)	Min Floor Area (sq.m)	UBBL Section	Notes (Room height shall be modeled to either ceiling or bottom of beam)
87	Shaft-WR						231	FAA height > 30m
88	Stair-Fire-Basement						190, 197A	
89	Stair-Fire-Exit						169, 174A, 190, 197A	
90	Stair-Fire-Roof	✓					195, 197A	
91	Stair-Fire-Upper	✓					197A (1), 162, 163, 197A	FAA height > 18m, FAA height-basement > 9m
92	Stair-Open						170	
93	Stair-Protected-Basement							
94	Stair-Protected-Exit						169, 174A, 190	
95	Stair-Protected-Roof	✓					195, 162, 163	
96	Stair-Protected-Upper	✓					195, 162, 163	
97	Store-Food		= > 2000				46(4)	Dry or cold food
98	Store-General		= > 2000				46(4)	Furniture, office supply, garden tools records etc
99	Store-Lab		= > 2000				46(4)	Chemical, equipment etc
100	Store-LPG		= > 2000				46(4)	External covered storage space
101	Store-Medical		= > 2000				46(4)	
102	Store-Workshop		= > 2000				46(4)	
103	Studio-Basement	✓	= > 2500				46 (2)	Non education
104	Studio-Grd	✓	= > 3000				46 (1)	Non education
105	Studio-Upper	✓	= > 2750				46 (1)	Non education

NBeS SPACE USE TYPE (EDUCATION)								
No.	Space Use Type	Ventilation (Natural /Mech)	Min Room Height (m)	Min Room Width (m)	Min Room Length (m)	Min Floor Area (sq.m)	UBBL Section	Notes (Room height shall be modeled to either ceiling or bottom of beam)
106	Studio-Edu	✓	= > 3000				44(4)	For non JKR education building only
107	Studio-Edu JKR	✓	= > 3000				46(4)	For non JKR education building only
108	Toilet-OKU A	✓	= > 2500	= > 2200	= > 2300		46 (1) & (2) MS 1184:2014 25.4.2	
109	Toilet-OKU B	✓	= > 2500	= > 1900	= > 2750		46 (1) & (2) MS 1184:2014 25.4.3	
110	Toilet-OKU C	✓	= > 2500	= > 1700	= > 2200		46 (1) & (2) MS 1184:2014 25.4.4	
111	Toilet-Public	✓	= > 2500				46 (1) & (2)	
112	Utility-General		= > 2000				46 (4)	For all building types ie Utility Rm, Janitor, washing, pantry, dirty, clean
113	Verandahway-Grd		= > 3000	= > 2100			38 (1), 46 (5)	
114	Verandahway-Upper		= > 2750	= > 2100			38 (1), 46 (5)	
115	Workshop-Edu	✓	= > 3000				44 (4)	For non JKR education building only
116	Workshop-Edu JKR	✓	= > 4000				JKR	For JKR education building only
	Wuduk		= > 2500				43 (a) 44 (1) (c)	

9.4 Appendix A - Space Use Types for Healthcare

NBeS SPACE USE TYPE (HEALTHCARE)								
No.	Space Use Type	Ventilation (Natural /Mech)	Min Room Height (m)	Min Room Width (m)	Min Room Length (m)	Min Floor Area (sq.m)	UBBL Section	Notes (Room height shall be modeled to either ceiling or bottom of beam)
1	Air Well-Gen to 2 Sty			2500		7.0	40 (1) (a) & (b)	Width clear dimension & self declaration
2	Air Well-Gen to 4 Sty			2500		9.0	40 (1) (a) & (b)	Width clear dimension & self declaration
3	Air Well-Gen to 6 Sty			2500		11.0	40 (1) (a) & (b)	Width clear dimension & self declaration
4	Air Well-Gen to 8 Sty			2500		13.0	40 (1) (a) & (b)	Width clear dimension & self declaration
5	Air Well-Gen more than 8 Sty			2500		15.0	40 (1) (a) & (b)	Width clear dimension & self declaration
6	Air Well-Toilet to 2 Sty			2000		3.5	40 (2) (a) & (b)	Width clear dimension & self declaration
7	Air Well-Toilet to 4 Sty			2000		4.0	40 (2) (a) & (b)	Width clear dimension & self declaration
8	Air Well-Toilet to 6 Sty			2000		4.5	40 (2) (a) & (b)	Width clear dimension & self declaration
9	Air Well-Toilet to 8 Sty			2000		5.0	40 (2) (a) & (b)	Width clear dimension & self declaration
10	Air Well-Toilet more than 8 Sty			2000		5.5	40 (2) (a) & (b)	Width clear dimension & self declaration
11	Auditorium	✓	= > 3000				44(4)	
12	Bathroom-Open	✓	= > 2500	= > 900		= > 2000	43 (a) 44 (1) (c)	Patient bathroom with no compartments
13	Bathroom-Water Closet	✓	= > 2500	= > 900		= > 2500	43 (a) 44 (1) (c)	Patient bathroom with wc compartment
14	Car Park-Basement	✓	= > 2500	Refer to Local PBT's requirements			46 (2)	
15	Car Park-Grd	✓	= > 2500	Refer to Local PBT's requirements			46 (3)	
16	Car Park-Upper	✓	= > 2500	Refer to Local PBT's requirements			46 (1)	
17	Circulation-Common		= > 2000				46 (4)	Non-fire protected public corridors

NBes SPACE USE TYPE (HEALTHCARE)								
No.	Space Use Type	Ventilation (Natural /Mech)	Min Room Height (m)	Min Room Width (m)	Min Room Length (m)	Min Floor Area (sq.m)	UBBL Section	Notes (Room height shall be modeled to either ceiling or bottom of beam)
18	Circulation-Protected		= > 2000				46 (4)	Fire protected corridors
19	Circulation-Service		= > 2000				46 (4)	Non-fire protected non-public corridors
20	Covered Garden		= > 2000				46 (3)	
21	CSSD-Basement	✓	= > 2500				46 (2)	Central sterile supply dept ie cleaning & sterilisation of equipments
22	CSSD-Grd	✓	= > 3000				46 (1)	Central sterile supply dept ie cleaning & sterilisation of equipments
23	CSSD-Upper	✓	= > 2750				46 (1)	Central sterile supply dept ie cleaning & sterilisation of equipments
24	Covered Porch		= > 2500				46 (3)	Car park or drop-off area
25	Dining-Basement	✓	= > 2500				46 (2)	Hall for banquet, restaurant cafeteria, canteen, etc
26	Dining-Grd	✓	= > 3000				46 (1)	Hall for banquet, restaurant cafeteria, canteen, etc
27	Dining-Upper	✓	= > 2750				46 (1)	Hall for banquet, restaurant cafeteria, canteen, etc
28	Electrical Room						139, 162, 163	Switch room, TNB, SDF, MDF, Generator
29	Examination Room-Basement	✓	= > 2500				46 (2)	Medical consultation room
30	Examination Room-Grd	✓	= > 3000				46 (1)	Medical consultation room
31	Examination Room-Upper	✓	= > 2750				46 (1)	Medical consultation room
32	Exterior							Outdoor uncovered spaces
33	Facility-Basement	✓	= > 2500				46 (4)	Change room, drug dispensary, sterilization, preparation etc (teaching room not included)
34	Facility-Grd	✓	= > 3000				46 (1)	Change room, drug dispensary,, preparation etc (teaching room not included)

NBES SPACE USE TYPE (HEALTHCARE)								
No.	Space Use Type	Ventilation (Natural /Mech)	Min Room Height (m)	Min Room Width (m)	Min Room Length (m)	Min Floor Area (sq.m)	UBBL Section	Notes (Room height shall be modeled to either ceiling or bottom of beam)
35	Facility-Upper	✓	= > 2750				46 (1)	Change room, drug dispensary,, preparation etc (teaching room not included)
36	Fire Command Room	✓	= > 2500				46 (4), 238	
37	Hall-Basement	✓	= > 2500				45(1)	Sports, Multipurpose, Prayer, Exhibition, etc
38	Hall-Grd	✓	= > 3000				46 (1)	Sports, Multipurpose, Prayer, Exhibition, etc
39	Hall-Upper	✓	= > 2750				46 (1)	Sports, Multipurpose, Prayer, Exhibition, etc
40	Hazardous Room						139, 162, 163	Laundry, Repair Shop, LPG Store, Cold Room, Fuel Store 2 hour fire rated door
41	Imaging Room-Basement	✓	= > 2500				46 (2)	X-ray, CT scan, MRI, Ultrasound
42	Imaging Room-Grd	✓	= > 3000				46 (1)	X-ray, CT scan, MRI, Ultrasound
43	Imaging Room-Upper	✓	= > 2750				46 (1)	X-ray, CT scan, MRI, Ultrasound
44	Kitchen-Basement	✓	= > 2500				46 (2)	For commercial, healthcare & factory bldg. restaurant, hostel, cafeteria etc
45	Kitchen-Grd	✓	= > 3000				46 (1)	For commercial, healthcare & factory bldg. restaurant, hostel, cafeteria etc
46	Kitchen-Upper	✓	= > 2750				46 (1)	For commercial, healthcare & factory bldg. restaurant, hostel, cafeteria etc
47	Lab-Med-Basement	✓	= > 2500				46 (2)	
48	Lab-Med-Grd	✓	= > 3000				46 (1)	
49	Lab-Med-Upper	✓	= > 2750				46 (1)	
50	Lift-Fire						243	FAA height > 18m
51	Lift-General						124	no of storey above & below grd > 4
52	Lobby-Fire-Basement	✓	= > 2500			= > 6.0	46 (2), 153, 162, 163, 197	Ground & upper FAA height > 18m permanent window opening area more than 25% of lobby area Basement -FAA height > 9m

NBES SPACE USE TYPE (HEALTHCARE)								
No.	Space Use Type	Ventilation (Natural /Mech)	Min Room Height (m)	Min Room Width (m)	Min Room Length (m)	Min Floor Area (sq.m)	UBBL Section	Notes (Room height shall be modeled to either ceiling or bottom of beam)
53	Lobby-Fire-Grd	✓	= > 3000			= > 6.0	46 (2), 153, 162, 163, 197	Ground & upper FAA height > 18m permanent window opening area more than 25% of lobby area Basement -FAA height > 9m
54	Lobby-Fire-Upper	✓	= > 2500			= > 6.0	46 (2), 153, 162, 163, 197	Ground & upper FAA height > 18m permanent window opening area more than 25% of lobby area Basement -FAA height > 9m
55	Lobby-Basement	✓	= > 2500				46 (2), 153, 162, 163, 196	For waiting area, reception area, registration etc
56	Lobby-Grd	✓	= > 3000				46 (1), 153, 162, 163, 196	For waiting area, reception area, registration etc
57	Lobby-Upper	✓	= > 2750				46 (1), 153, 162, 163, 196	For waiting area, reception area, registration etc
58	Lobby-Smoke	✓	= > 2500				46 (2), 153, 162, 163, 196	permanent window opening area more than 1 sq.m
59	Mechanical Room	✓					139, 160, 162	AHU, boiler room, tank room
60	Meeting Room-Basement	✓	= > 2500				46 (2)	For non JKR school, healthcare, factory building only
61	Meeting Room-Grd	✓	= > 3000				46 (1)	For non JKR school, healthcare, factory building only
62	Meeting Room-Upper	✓	= > 2750				46 (1)	For non JKR school, healthcare, factory building only
63	Mortuary-Basement	✓	= > 2500				46 (2)	Body storage, autopsy
64	Mortuary-Grd	✓	= > 3000				46 (1)	Body storage, autopsy
65	Mortuary-Upper	✓	= > 2750				46 (1)	Body storage, autopsy
66	Office-Basement	✓	= > 2500				46 (2)	For non JKR school, healthcare, factory building only
67	Office-Grd	✓	= > 3000				46 (1)	For non JKR school, healthcare, factory building only
68	Office-Upper	✓	= > 2750				46 (1)	For non JKR school, healthcare, factory building only
69	Other Non Habitable		= > 2000				46 (4)	Non habitable spaces not listed

NBeS SPACE USE TYPE (HEALTHCARE)								
No.	Space Use Type	Ventilation (Natural /Mech)	Min Room Height (m)	Min Room Width (m)	Min Room Length (m)	Min Floor Area (sq.m)	UBBL Section	Notes (Room height shall be modeled to either ceiling or bottom of beam)
70	Patient Room	✓	= > 3000				44 (5)	For accommodation
71	Prayer Room-Basement	✓	= > 2500					Prayer room other that Surau
72	Prayer Room-Grd	✓	= > 3000				46 (1)	Prayer room other that Surau
73	Prayer Room-Upper	✓	= > 2750				46 (1)	Prayer room other that Surau
74	Refuse Room-General	✓	= > 2000	Refer to Local PBT's requirements			46 (4)	
75	Refuse Room-Hazardous	✓	= > 2000				46 (4)	For hazardous waste ie bio, chemical, medical etc
76	Shaft-DR						230	FAA height > 18m > 30m
77	Shaft-EL						139 (g), 162, 163	2 hour fire rated door
78	Shaft-HR						226A	
79	Shaft-Others							ELV, Tel, IT, Chiller, Water shafts
80	Shaft-WR						231	FAA height > 30m
81	Shop-Retail-Basement	✓	= > 2500				46 (2)	
82	Shop-Retail-Grd	✓	= > 3000				46 (1)	
83	Shop-Retail-Upper	✓	= > 2750				46 (1)	
84	Stair-Fire-Basement						190, 197A	
85	Stair-Fire-Exit						169, 174A, 190, 197A	
86	Stair-Fire-Roof	✓					195, 197A	
87	Stair-Fire-Upper	✓					197A (1), 162, 163, 197A	FAA height > 18m, FAA height-basement > 9m

NBeS SPACE USE TYPE (HEALTHCARE)								
No.	Space Use Type	Ventilation (Natural /Mech)	Min Room Height (m)	Min Room Width (m)	Min Room Length (m)	Min Floor Area (sq.m)	UBBL Section	Notes (Room height shall be modeled to either ceiling or bottom of beam)
88	Stair-Open						170	
89	Stair-Protected-Basement							
90	Stair-Protected-Exit						169, 174A, 190	
91	Stair-Protected-Roof	✓					195, 162, 163	
92	Stair-Protected-Upper	✓					195, 162, 163	
93	Store-Food		= > 2000				46(4)	Dry or cold food
94	Store-General		= > 2000				46(4)	Furniture, office supply, garden tools records etc
95	Store-Hazardous		= > 2000				46(4)	Store for chemical, flammable etc
96	Store-Lab		= > 2000				46(4)	Dental, drug, equipment etc
97	Store-LPG		= > 2000				46(4)	External covered storage space
98	Store-Medical		= > 2000				46(4)	
99	Surgery Room-Grd	✓	= > 3000				46 (1)	
100	Surgery Room-Upper	✓	= > 2750				46 (1)	
101	Toilet-OKU A	✓	= > 2500	= > 2200	= > 2300		46 (1) & (2) MS 1184:2014 25.4.2	
102	Toilet-OKU B	✓	= > 2500	= > 1900	= > 2750		46 (1) & (2) MS 1184:2014 25.4.3	
103	Toilet-OKU C	✓	= > 2500	= > 1700	= > 2200		46 (1) & (2) MS 1184:2014 25.4.4	
104	Toilet-Public	✓	= > 2500				46 (1) & (2)	
105	Training Room-Basement	✓	= > 2500				46 (2)	General training rooms
106	Training Room-Grd	✓	= > 3000				46 (1)	General training rooms

NBes SPACE USE TYPE (HEALTHCARE)								
No.	Space Use Type	Ventilation (Natural /Mech)	Min Room Height (m)	Min Room Width (m)	Min Room Length (m)	Min Floor Area (sq.m)	UBBL Section	Notes (Room height shall be modeled to either ceiling or bottom of beam)
107	Training Room-Upper	✓	= > 2750				46 (1)	General training rooms
108	Treatment Room-Basement	✓	= > 2500				46 (2)	Non sterile room ie resuscitation, vaccine, counseling, dentist, emergency, minor surgery, endoscopy
109	Treatment Room-Grd	✓	= > 3000				46 (1)	Non sterile room ie resuscitation, vaccine, counseling, dentist, emergency, minor surgery, endoscopy
110	Treatment Room-Upper	✓	= > 2750				46 (1)	Non sterile room ie resuscitation, vaccine, counseling, dentist, emergency, minor surgery, endoscopy
111	Utility-General	✓	= > 2000				46 (4)	For all building types ie Utility Rm, Janitor, washing, pantry, dirty, clean, autoclave
112	Verandahway-Grd		= > 3000	= > 2100			38 (1), 46 (5)	
113	Verandahway-Upper		= > 2750	= > 2100			38 (1), 46 (5)	
114	Wuduk		= > 2500				44 (2)	

9.5 Appendix A - Space Use Types for Office & Shop

NBeS SPACE USE TYPE (OFFICE & SHOP)								
No.	Space Use Type	Ventilation (Natural /Mech)	Min Room Height (m)	Min Room Width (m)	Min Room Length (m)	Min Floor Area (sq.m)	UBBL Section	Notes (Room height shall be modeled to either ceiling or bottom of beam)
1	Air Well-Gen to 2 Sty			2500		7.0	40 (1) (a) & (b)	Width clear dimension & self declaration
2	Air Well-Gen to 4 Sty			2500		9.0	40 (1) (a) & (b)	Width clear dimension & self declaration
3	Air Well-Gen to 6 Sty			2500		11.0	40 (1) (a) & (b)	Width clear dimension & self declaration
4	Air Well-Gen to 8 Sty			2500		13.0	40 (1) (a) & (b)	Width clear dimension & self declaration
5	Air Well-Gen more than 8 Sty			2500		15.0	40 (1) (a) & (b)	Width clear dimension & self declaration
6	Air Well-Toilet to 2 Sty			2000		3.5	40 (2) (a) & (b)	Width clear dimension & self declaration
7	Air Well-Toilet to 4 Sty			2000		4.0	40 (2) (a) & (b)	Width clear dimension & self declaration
8	Air Well-Toilet to 6 Sty			2000		4.5	40 (2) (a) & (b)	Width clear dimension & self declaration
9	Air Well-Toilet to 8 Sty			2000		5.0	40 (2) (a) & (b)	Width clear dimension & self declaration
10	Air Well-Toilet more than 8 Sty			2000		5.5	40 (2) (a) & (b)	Width clear dimension & self declaration
11	Auditorium	✓	= > 3000				44(4)	
12	Bathroom-Open	✓	= > 2500	= > 900		= > 2000	43 (a) 44 (1) (c)	Bathroom with no compartments
13	Bathroom-Water Closet	✓	= > 2500	= > 900		= > 2500	43 (a) 44 (1) (c)	Bathroom with wc compartment
14	Car Park-Basement	✓	= > 2500	Refer to Local PBT's requirements			46 (2)	
15	Car Park-Grd	✓	= > 2500	Refer to Local PBT's requirements			46 (3)	
16	Car Park-Upper	✓	= > 2500	Refer to Local PBT's requirements			46 (1)	
17	Circulation-Common		= > 2000				46 (4)	Non-fire protected corridors
18	Circulation-Protected		= > 2000				46 (4)	Fire protected corridors

NBeS SPACE USE TYPE (OFFICE & SHOP)								
No.	Space Use Type	Ventilation (Natural /Mech)	Min Room Height (m)	Min Room Width (m)	Min Room Length (m)	Min Floor Area (sq.m)	UBBL Section	Notes (Room height shall be modeled to either ceiling or bottom of beam)
19	Circulation-Unit		= > 2000	x			44 (1) (c)	Circulation within a shop or office unit
20	Circulation-Service		= > 2000				46 (4)	Non-fire protected corridors
21	Covered Garden		= > 2500				46 (3)	
22	Covered Porch		= > 2500				46 (3)	
23	Dining-Basement	✓	= > 2500				46 (2)	Dining other than residential
24	Dining-Grd	✓	= > 3000				46 (1)	Dining other than residential
25	Dining-Upper	✓	= > 2750				46 (1)	Dining other than residential
26	Electrical Room						139, 162, 163	Switch room, TNB, SDF, MDF, Generator
27	Exterior							Outdoor uncovered spaces
28	Facility-Basement	✓	= > 2500				46 (2)	General habitable facilities ie Games, Gymn, Kindergarten, Reading etc (teaching room not included)
29	Facility-Grd	✓	= > 3000				46 (1)	General habitable facilities ie Games, Gymn, Kindergarten, Reading, Change Room etc (teaching room not included)
30	Facility-Upper	✓	= > 2750				46 (1)	General habitable facilities ie Games, Gymn, Kindergarten, Reading, Change Room etc (teaching room not included)
31	Fire Command Room	✓	= > 2500				46 (4), 238	
32	Hall-Basement	✓	= > 2500				46 (2)	Sports, Multipurpose, Prayer, Exhibition, etc
33	Hall-Grd	✓	= > 3000				46 (1)	Sports, Multipurpose, Prayer, Exhibition, etc
34	Hall-Upper	✓	= > 2750				46 (1)	Sports, Multipurpose, Prayer, Exhibition, etc
35	Hazardous Room						139, 162, 163	Laundry, Repair Shop, LPG Store, Cold Room, Fuel Store

NBeS SPACE USE TYPE (OFFICE & SHOP)								
No.	Space Use Type	Ventilation (Natural /Mech)	Min Room Height (m)	Min Room Width (m)	Min Room Length (m)	Min Floor Area (sq.m)	UBBL Section	Notes (Room height shall be modeled to either ceiling or bottom of beam)
								2 hour fire rated door
36	Kitchen-Basement	✓	= > 2500				46 (2)	For commercial, healthcare & factory bldg. restaurant, hostel, cafeteria etc
37	Kitchen-Grd	✓	= > 3000				46 (1)	For commercial, healthcare & factory bldg. restaurant, hostel, cafeteria etc
38	Kitchen-Upper	✓	= > 2750				46 (1)	For commercial, healthcare & factory bldg. restaurant, hostel, cafeteria etc
39	Lift-Fire						243	FAA height > 18m
40	Lift-General						124	no of storey above & below > 4
41	Lobby-Fire-Basement	✓	= > 2500			= > 6.0	46 (2), 153, 162, 163, 197	Ground & upper FAA height > 18m permanent window opening area more than 25% of lobby area Basement -FAA height > 9m
42	Lobby-Fire-Grd	✓	= > 3000			= > 6.0	46 (2), 153, 162, 163, 197	Ground & upper FAA height > 18m permanent window opening area more than 25% of lobby area Basement -FAA height > 9m
43	Lobby-Fire-Upper	✓	= > 2500			= > 6.0	46 (2), 153, 162, 163, 197	Ground & upper FAA height > 18m permanent window opening area more than 25% of lobby area Basement -FAA height > 9m
44	Lobby-Basement	✓	= > 2500				46 (2), 153, 162, 163, 196	For waiting area, reception area etc
45	Lobby-Grd	✓	= > 3000				46 (1), 153, 162, 163, 196	For waiting area, reception area etc
46	Lobby-Upper	✓	= > 2750				46 (1), 153, 162, 163, 196	For waiting area, reception area etc
47	Lobby-Smoke	✓	= > 2500				46 (2), 153, 162, 163, 196	permanent window opening area more than 1 sq.m
48	Mechanical Room	✓					139, 160, 162	AHU, boiler room, tank room
49	Meeting Room-Basement	✓	= > 2500				46 (2)	

NBeS SPACE USE TYPE (OFFICE & SHOP)								
No.	Space Use Type	Ventilation (Natural /Mech)	Min Room Height (m)	Min Room Width (m)	Min Room Length (m)	Min Floor Area (sq.m)	UBBL Section	Notes (Room height shall be modeled to either ceiling or bottom of beam)
50	Meeting Room-Grd	✓	= > 3000				46 (1)	
51	Meeting Room-Upper	✓	= > 2750				46 (1)	
52	Office-Basement	✓	= > 2500				46 (2)	
53	Office-Grd	✓	= > 3000				46 (1)	
54	Office-Upper	✓	= > 2750				46 (1)	
55	Other-Non Habitable		= > 2000				46 (4)	Non habitable spaces not listed
56	Pantry-Public	✓	= > 2500					
57	Prayer Room-Basement	✓	= > 3000					Prayer room other that Surau
58	Prayer Room-Grd	✓	= > 3000				46 (1)	Prayer room other that Surau
59	Prayer Room-Upper	✓	= > 2750				46 (1)	Prayer room other that Surau
60	Refuse Room-General	✓	= > 2000	Refer to Local PBT's requirements			46 (4)	
61	Shaft-DR						230	FAA height > 18m > 30m
62	Shaft-EL						139 (g), 162, 163	2 hour fire rated door
63	Shaft-HR						226A	
64	Shaft-Others							ELV, Tel, IT, Chiller, Water shafts
65	Shaft-WR						231	FAA height > 30m
66	Shop-Basement	✓	= > 2500				46 (2)	
67	Shop-Grd	✓	= > 3000				46 (1)	
68	Shop-Upper	✓	= > 2750				46 (1)	
69	Stair-Fire-Basement						190, 197A	

NBeS SPACE USE TYPE (OFFICE & SHOP)								
No.	Space Use Type	Ventilation (Natural /Mech)	Min Room Height (m)	Min Room Width (m)	Min Room Length (m)	Min Floor Area (sq.m)	UBBL Section	Notes (Room height shall be modeled to either ceiling or bottom of beam)
70	Stair-Fire-Exit						169, 174A, 190, 197A	
71	Stair-Fire-Roof	✓					195, 197A	
72	Stair-Fire-Upper	✓					197A (1), 162, 163, 197A	FAA height > 18m, FAA height-basement > 9m
73	Stair-Open						170	
74	Stair-Protected-Basement							
75	Stair-Protected-Exit						169, 174A, 190	
76	Stair-Protected-Roof	✓					195, 162, 163	
77	Stair-Protected-Upper	✓					195, 162, 163	
78	Store-Food		= > 2000				46(4)	Dry or cold food
79	Store-General		= > 2000				46(4)	Furniture, office supply, garden tools records etc
80	Store-LPG		= > 2000				46(4)	External covered storage space
81	Store-Workshop		= > 2000				46(4)	
82	Toilet-OKU A	✓	= > 2500	= > 2200	= > 2300		46 (1) & (2) MS 1184:2014 25.4.2	
83	Toilet-OKU B	✓	= > 2500	= > 1900	= > 2750		46 (1) & (2) MS 1184:2014 25.4.3	
84	Toilet-OKU C	✓	= > 2500	= > 1700	= > 2200		46 (1) & (2) MS 1184:2014 25.4.4	
85	Toilet-Public	✓	= > 2500				46 (1) & (2)	
86	Training Room-Basement	✓	= > 2500				46 (2)	General training rooms
87	Training Room-Grd	✓	= > 3000				46 (1)	General training rooms
88	Training Room-Upper	✓	= > 2750				46 (1)	General training rooms

NBeS SPACE USE TYPE (OFFICE & SHOP)								
No.	Space Use Type	Ventilation (Natural /Mech)	Min Room Height (m)	Min Room Width (m)	Min Room Length (m)	Min Floor Area (sq.m)	UBBL Section	Notes (Room height shall be modeled to either ceiling or bottom of beam)
89	Utility-General		= > 2000				46 (4)	For all building types ie Utility Rm, Janitor, washing
90	Verandahway-Grd		= > 3000	= > 2100			38 (1), 46 (5)	
91	Verandahway-Upper		= > 2750	= > 2100			38 (1), 46 (5)	
92	Workshop	✓	= > 3000				46 (1)	For non education & factory building only
93	Wuduk		= > 2000				44 (4)	

9.6 Appendix A - Space Use Types for Factory

NBES SPACE USE TYPE (FACTORY)								
No.	Space Use Type	Ventilation (Natural /Mech)	Min Room Height (m)	Min Room Width (m)	Min Room Length (m)	Min Floor Area (sq.m)	UBBL Section	Notes (Room height shall be modeled to either ceiling or bottom of beam)
1	Air Well-Gen to 2 Sty			2500		7.0	40 (1) (a) & (b)	Width clear dimension & self declaration
2	Air Well-Gen to 4 Sty			2500		9.0	40 (1) (a) & (b)	Width clear dimension & self declaration
3	Air Well-Gen to 6 Sty			2500		11.0	40 (1) (a) & (b)	Width clear dimension & self declaration
4	Air Well-Gen to 8 Sty			2500		13.0	40 (1) (a) & (b)	Width clear dimension & self declaration
5	Air Well-Gen more than 8 Sty			2500		15.0	40 (1) (a) & (b)	Width clear dimension & self declaration
6	Air Well-Toilet to 2 Sty			2000		3.5	40 (2) (a) & (b)	Width clear dimension & self declaration
7	Air Well-Toilet to 4 Sty			2000		4.0	40 (2) (a) & (b)	Width clear dimension & self declaration
8	Air Well-Toilet to 6 Sty			2000		4.5	40 (2) (a) & (b)	Width clear dimension & self declaration
9	Air Well-Toilet to 8 Sty			2000		5.0	40 (2) (a) & (b)	Width clear dimension & self declaration
10	Air Well-Toilet more than 8 Sty			2000		5.5	40 (2) (a) & (b)	Width clear dimension & self declaration
11	Bathroom-Open	✓	= > 2500	= > 900		= > 2000	43 (a) 44 (1) (c)	Bathroom with no compartments
12	Bathroom-Water Closet	✓	= > 2500	= > 900		= > 2500	43 (a) 44 (1) (c)	Bathroom with wc compartment
13	Car Park-Basement	✓	= > 2500	Refer to Local PBT's requirements			46 (2)	
14	Car Park-Grd	✓	= > 2500	Refer to Local PBT's requirements			46 (3)	
15	Car Park-Upper	✓	= > 2500	Refer to Local PBT's requirements			46 (1)	
16	Circulation-Common		= > 2000				46 (4)	Non-fire protected corridors
17	Circulation-Protected		= > 2000				46 (4)	Fire protected corridors
18	Circulation-Service		= > 2000				46 (4)	Non-fire protected corridors

NBeS SPACE USE TYPE (FACTORY)								
No.	Space Use Type	Ventilation (Natural /Mech)	Min Room Height (m)	Min Room Width (m)	Min Room Length (m)	Min Floor Area (sq.m)	UBBL Section	Notes (Room height shall be modeled to either ceiling or bottom of beam)
19	Covered Garden		= > 2000				46 (3)	
20	Covered Porch		= > 2500				46 (3)	
21	Dining-Basement	✓	= > 2500				46 (2)	Hall for banquet, restaurant cafeteria, canteen, etc
22	Dining-Grd	✓	= > 3000				46 (1)	Hall for banquet, restaurant cafeteria, canteen, etc
23	Dining-Upper	✓	= > 2750				46 (1)	Hall for banquet, restaurant cafeteria, canteen, etc
24	Electrical Room						139, 162, 163	Switch room, TNB, SDF, MDF
25	Exterior							Outdoor spaces
26	Facility-Basement	✓	= > 2500				46 (4)	Staff room, change/locker room, first-aid etc (teaching room not included)
27	Facility-Grd	✓	= > 3000				46 (1)	Staff room, change/locker room, first-aid etc (teaching room not included)
28	Facility-Upper	✓	= > 2750				46 (1)	Staff room, change/locker room, first-aid etc (teaching room not included)
29	Factory	✓	= > 3000				44 (6)	
30	Fire Command Room	✓	= > 2500				46 (4), 238	
31	Hall-Basement	✓	= > 2500				46 (2)	Sports, Multipurpose, Prayer, Exhibition, etc
32	Hall-Grd	✓	= > 3000				46 (1)	Sports, Multipurpose, Prayer, Exhibition, etc
33	Hall-Upper	✓	= > 2750				46 (1)	Sports, Multipurpose, Prayer, Exhibition, etc
34	Hazardous Room						139, 162, 163	Laundry, Repair Shop, LPG Store, Cold Room, Fuel Store 2 hour fire rated door
35	Kitchen-Basement	✓	= > 2500				46 (2)	For commercial, healthcare & factory bldg. restaurant, hostel, cafeteria etc

NBeS SPACE USE TYPE (FACTORY)								
No.	Space Use Type	Ventilation (Natural /Mech)	Min Room Height (m)	Min Room Width (m)	Min Room Length (m)	Min Floor Area (sq.m)	UBBL Section	Notes (Room height shall be modeled to either ceiling or bottom of beam)
36	Kitchen-Grd	✓	= > 3000				46 (1)	For commercial, healthcare & factory bldg. restaurant, hostel, cafeteria etc
37	Kitchen-Upper	✓	= > 2750				46 (1)	For commercial, healthcare & factory bldg. restaurant, hostel, cafeteria etc
38	Lab-Factory-Grd	✓	= > 3000				44 (6)	
39	Lab-Factory-Upper	✓	= > 3000				44 (6)	
40	Lift-Fire						243	FAA height > 18m
41	Lift-General						124	no of storey above & below > 4
42	Living-Residential	✓	= > 2500	= > 2000			42 (2), 44 (1) (a)	Residential Living, Family Area
43	Lobby-Fire-Basement	✓	= > 2500			= > 6.0	46 (2), 153, 162, 163, 197	Ground & upper FAA height > 18m permanent window opening area more than 25% of lobby area Basement -FAA height > 9m
44	Lobby-Fire-Grd	✓	= > 3000			= > 6.0	46 (2), 153, 162, 163, 197	Ground & upper FAA height > 18m permanent window opening area more than 25% of lobby area Basement -FAA height > 9m
45	Lobby-Fire-Upper	✓	= > 2500			= > 6.0	46 (2), 153, 162, 163, 197	Ground & upper FAA height > 18m permanent window opening area more than 25% of lobby area Basement -FAA height > 9m
46	Lobby-Basement	✓	= > 2500				46 (2), 153, 162, 163, 196	For waiting area, reception area etc
47	Lobby-Grd	✓	= > 3000				46 (1), 153, 162, 163, 196	For waiting area, reception area etc
48	Lobby-Upper	✓	= > 2750				46 (1), 153, 162, 163, 196	For waiting area, reception area etc
49	Lobby-Smoke	✓	= > 2500				46 (2), 153, 162, 163, 196	permanent window opening area more than 1 sq.m
50	Factory-Assembly							
51	Factory-General	✓	= > 3000				44 (6)	

NBES SPACE USE TYPE (FACTORY)								
No.	Space Use Type	Ventilation (Natural /Mech)	Min Room Height (m)	Min Room Width (m)	Min Room Length (m)	Min Floor Area (sq.m)	UBBL Section	Notes (Room height shall be modeled to either ceiling or bottom of beam)
52	Factory-Packaging							
53	Factory-Manufacturing	✓	= > 3000				44 (6)	
54	Mechanical Room	✓					139, 160, 162	AHU, boiler room, tank room
55	Meeting Room-Basement	✓	= > 2500				46 (2)	
56	Meeting Room-Grd	✓	= > 3000				46 (1)	
57	Meeting Room-Upper	✓	= > 2750				46 (1)	
58	Office-Basement	✓	= > 2500				46 (2)	
59	Office-Grd	✓	= > 3000				46 (1)	
60	Office-Upper	✓	= > 2750				46 (1)	
61	Other Non Habitable		= > 2000				46 (4)	Non habitable spaces not listed
62	Pantry-Public	✓	= > 2500					
63	Prayer Room-Basement	✓	= > 3000					
64	Prayer Room-Grd	✓	= > 3000	Refer to Local PBT's requirements			46 (1)	
65	Prayer Room-Upper	✓	= > 2750	Refer to Local PBT's requirements			46 (1)	
66	Refuse Room-General	✓	= > 2000	Refer to Local PBT's requirements			46 (4)	
67	Refuse Room-Hazardous	✓	= > 2000				46 (4)	For hazardous waste ie bio, chemical, medical etc
68	Shaft-DR						230	FAA height > 18m > 30m
69	Shaft-EL						139 (g), 162, 163	2 hour fire rated door
70	Shaft-HR						226A	
71	Shaft-Others							ELV, Tel, IT, Chiller, Water shafts

NBeS SPACE USE TYPE (FACTORY)								
No.	Space Use Type	Ventilation (Natural /Mech)	Min Room Height (m)	Min Room Width (m)	Min Room Length (m)	Min Floor Area (sq.m)	UBBL Section	Notes (Room height shall be modeled to either ceiling or bottom of beam)
72	Shop-Basement	✓	= > 2500				46 (2)	
73	Shop-Grd	✓	= > 3000				46 (1)	
74	Shop-Upper	✓	= > 2750				46 (1)	
75	Stair-Fire-Basement						190, 197A	
76	Stair-Fire-Exit						169, 174A, 190, 197A	
77	Stair-Fire-Roof	✓					195, 197A	
78	Stair-Fire-Upper	✓					197A (1), 162, 163, 197A	FAA height > 18m, FAA height-basement > 9m
79	Stair-Open						170	
80	Stair-Protected-Basement							
81	Stair-Protected-Exit						169, 174A, 190	
82	Stair-Protected-Roof	✓					195, 162, 163	
83	Stair-Protected-Upper	✓					195, 162, 163	
84	Store-Food		= > 2000				46(4)	Dry or cold food
85	Store-General		= > 2000				46(4)	Furniture, office supply, garden tools records etc
86	Store-Hazardous		= > 2000				46(4)	Store for chemical, flammable etc
87	Store-Lab		= > 2000				46(4)	Dental, drug, equipment etc
88	Store-LPG		= > 2000				46(4)	External covered storage space
89	Store-Workshop		= > 2000					
90	Toilet-OKU A	✓	= > 2500	= > 2200	= > 2300		46 (1) & (2) MS 1184:2014 25.4.2	
91	Toilet-OKU B	✓	= > 2500	= > 1900	= > 2750		46 (1) & (2)	

NBeS SPACE USE TYPE (FACTORY)								
No.	Space Use Type	Ventilation (Natural /Mech)	Min Room Height (m)	Min Room Width (m)	Min Room Length (m)	Min Floor Area (sq.m)	UBBL Section	Notes (Room height shall be modeled to either ceiling or bottom of beam)
							MS 1184:2014 25.4.3	
92	Toilet-OKU C	✓	= > 2500	= > 1700	= > 2200		46 (1) & (2) MS 1184:2014 25.4.4	
93	Toilet-Public	✓	= > 2500				46 (1) & (2)	
94	Training Room-Basement	✓	= > 2500				46 (2)	General training rooms
95	Training Room-Grd	✓	= > 3000				46 (1)	General training rooms
96	Training Room-Upper	✓	= > 2750				46 (1)	General training rooms
97	Utility-General		= > 2000				46 (4)	For all building types ie Utility Rm, Janitor, washing
98	Verandahway-Grd		= > 3000	= > 2100			38 (1), 46 (5)	
99	Verandahway-Upper		= > 2750	= > 2100			38 (1), 46 (5)	
100	Wuduk		> 2500				43 (a) 44 (1) (c)	

9.7 Appendix A - Space Use Types for Place of Assembly

NBeS SPACE USE TYPE (PLACE OF ASSEMBLY)								
No.	Space Use Type	Ventilation (Natural /Mech)	Min Room Height (m)	Min Room Width (m)	Min Room Length (m)	Min Floor Area (sq.m)	UBBL Section	Notes (Room height shall be modeled to either ceiling or bottom of beam)
1	Air Well-Gen to 2 Sty			2500		7.0	40 (1) (a) & (b)	Width clear dimension & self declaration
2	Air Well-Gen to 4 Sty			2500		9.0	40 (1) (a) & (b)	Width clear dimension & self declaration
3	Air Well-Gen to 6 Sty			2500		11.0	40 (1) (a) & (b)	Width clear dimension & self declaration
4	Air Well-Gen to 8 Sty			2500		13.0	40 (1) (a) & (b)	Width clear dimension & self declaration
5	Air Well-Gen more than 8 Sty			2500		15.0	40 (1) (a) & (b)	Width clear dimension & self declaration
6	Air Well-Toilet to 2 Sty			2000		3.5	40 (2) (a) & (b)	Width clear dimension & self declaration
7	Air Well-Toilet to 4 Sty			2000		4.0	40 (2) (a) & (b)	Width clear dimension & self declaration
8	Air Well-Toilet to 6 Sty			2000		4.5	40 (2) (a) & (b)	Width clear dimension & self declaration
9	Air Well-Toilet to 8 Sty			2000		5.0	40 (2) (a) & (b)	Width clear dimension & self declaration
10	Air Well-Toilet more than 8 Sty			2000		5.5	40 (2) (a) & (b)	Width clear dimension & self declaration
11	Auditorium	✓	= > 3000				44(4)	
12	Bathroom-Open	✓	= > 2500	= > 900		= > 2000	43 (a) 44 (1) (c)	Bathroom with no compartments
13	Bathroom-Water Closet	✓	= > 2500	= > 900		= > 2500	43 (a) 44 (1) (c)	Bathroom with wc compartment
14	Car Park-Basement	✓	= > 2500	Refer to Local PBT's requirements			46 (2)	
15	Car Park-Grd	✓	= > 2500	Refer to Local PBT's requirements			46 (3)	
16	Car Park-Upper	✓	= > 2500	Refer to Local PBT's requirements			46 (1)	
17	Circulation-Common		= > 2000				46 (4)	Non-fire protected corridors
18	Circulation-Protected		= > 2000				46 (4)	Fire protected corridors

NBES SPACE USE TYPE (PLACE OF ASSEMBLY)								
No.	Space Use Type	Ventilation (Natural /Mech)	Min Room Height (m)	Min Room Width (m)	Min Room Length (m)	Min Floor Area (sq.m)	UBBL Section	Notes (Room height shall be modeled to either ceiling or bottom of beam)
19	Circulation-Service		= > 2000				46 (4)	Non-fire protected corridors
20	Covered Garden		= > 2500				46 (3)	
21	Covered Porch		= > 2500				46 (3)	
22	Electrical Room						139, 162, 163	Switch room, TNB, SDF, MDF, Generator
23	Exterior							Outdoor uncovered spaces
24	Facility-Basement	✓	= > 2500				46 (2)	Change room, projector room, stages, treatment room, control room, media room, stage, etc (teaching room not included)
25	Facility-Grd	✓	= > 3000				46 (1)	Change room, projector room, stages, treatment room, control room, media room, stage, etc (teaching room not included)
26	Facility-Upper	✓	= > 2750				46 (1)	Change room, projector room, stages, treatment room, control room, media room, stage, etc (teaching room not included)
30	Fire Command Room	✓	= > 2500				46 (4), 238	
31	Hall-Basement	✓	= > 2500				46 (2)	Sports, Multipurpose, Prayer, Exhibition, etc
32	Hall-Grd	✓	= > 3000				46 (1)	Sports, Multipurpose, Prayer, Exhibition, etc
33	Hall-Upper	✓	= > 2750				46 (1)	Sports, Multipurpose, Prayer, Exhibition, etc
34	Jenazah Cleaning Room	M						
35	Kitchen-Basement	✓	= > 2500				46 (2)	For commercial, healthcare & factory bldg. restaurant, hostel, cafeteria etc
36	Kitchen-Grd	✓	= > 3000				46 (1)	For commercial, healthcare & factory bldg. restaurant, hostel, cafeteria etc
37	Kitchen-Upper	✓	= > 2750				46 (1)	For commercial, healthcare & factory bldg. restaurant, hostel, cafeteria etc
38	Lift-Fire						243	FAA height > 18m

NBes SPACE USE TYPE (PLACE OF ASSEMBLY)								
No.	Space Use Type	Ventilation (Natural /Mech)	Min Room Height (m)	Min Room Width (m)	Min Room Length (m)	Min Floor Area (sq.m)	UBBL Section	Notes (Room height shall be modeled to either ceiling or bottom of beam)
39	Lift-General						124	no of storey above & below > 4
40	Lobby-Fire-Basement	✓	= > 2500			= > 6.0	46 (2), 153, 162, 163, 197	Ground & upper FAA height > 18m permanent window opening area more than 25% of lobby area Basement -FAA height > 9m
41	Lobby-Fire-Grd	✓	= > 3000			= > 6.0	46 (2), 153, 162, 163, 197	Ground & upper FAA height > 18m permanent window opening area more than 25% of lobby area Basement -FAA height > 9m
42	Lobby-Fire-Upper	✓	= > 2500			= > 6.0	46 (2), 153, 162, 163, 197	Ground & upper FAA height > 18m permanent window opening area more than 25% of lobby area Basement -FAA height > 9m
43	Lobby-Basement	✓	= > 2500				46 (2), 153, 162, 163, 196	For waiting area, reception area etc
44	Lobby-Grd	✓	= > 3000				46 (1), 153, 162, 163, 196	For waiting area, reception area etc
45	Lobby-Upper	✓	= > 2750				46 (1), 153, 162, 163, 196	For waiting area, reception area etc
46	Lobby-Smoke	✓	= > 2500				46 (2), 153, 162, 163, 196	permanent window opening area more than 1 sq.m
47	Mechanical Room	✓					139, 160, 162	AHU, boiler room, tank room
48	Meeting Room-Basement	✓	= > 2500				46 (2)	
49	Meeting Room-Grd	✓	= > 3000				46 (1)	
50	Meeting Room-Upper	✓	= > 2750				46 (1)	
51	Office-Basement	✓	= > 2500				46 (2)	
52	Office-Grd	✓	= > 3000				46 (1)	
53	Office-Upper	✓	= > 2750				46 (1)	
54	Other-Non Habitable		= > 2000				46 (4)	Non habitable spaces not listed

NBes SPACE USE TYPE (PLACE OF ASSEMBLY)								
No.	Space Use Type	Ventilation (Natural /Mech)	Min Room Height (m)	Min Room Width (m)	Min Room Length (m)	Min Floor Area (sq.m)	UBBL Section	Notes (Room height shall be modeled to either ceiling or bottom of beam)
55	Pantry-Public	✓	= > 2500					
56	Prayer Hall-Basement	✓	= > 2500					
57	Prayer Hall-Grd	✓	= > 3000					
58	Prayer Hall-Upper	✓	= > 2750					
59	Refuse Room-General	✓	= > 2000	Refer to Local PBT's requirements			46 (4)	
60	Shaft-DR						230	FAA height > 18m > 30m
61	Shaft-EL						139 (g), 162, 163	2 hour fire rated door
62	Shaft-HR						226A	
63	Shaft-Others							ELV, Tel, IT, Chiller, Water shafts
64	Shop-Retail-Basement	✓	= > 2500				46 (2)	
65	Shop-Retail-Grd	✓	= > 3000				46 (1)	
66	Shop-Retail-Upper	✓	= > 2750				46 (1)	
67	Stair-Fire-Basement						190, 197A	
68	Stair-Fire-Exit						169, 174A, 190, 197A	
69	Stair-Fire-Roof	✓					195, 197A	
70	Stair-Fire-Upper	✓					197A (1), 162, 163, 197A	FAA height > 18m, FAA height-basement > 9m
71	Stair-Open						170	
72	Stair-Protected-Basement							
73	Stair-Protected-Exit						169, 174A, 190	
74	Stair-Protected-Roof	✓					195, 162, 163	

NBES SPACE USE TYPE (PLACE OF ASSEMBLY)								
No.	Space Use Type	Ventilation (Natural /Mech)	Min Room Height (m)	Min Room Width (m)	Min Room Length (m)	Min Floor Area (sq.m)	UBBL Section	Notes (Room height shall be modeled to either ceiling or bottom of beam)
75	Stair-Protected-Upper	✓					195, 162, 163	
76	Store-Food		= > 2000				46(4)	Dry or cold food
77	Store-General		= > 2000				46(4)	Furniture, office supply, garden tools records etc
78	Store-LPG		= > 2000				46(4)	External covered storage space
79	Store-Workshop		= > 2000				46(4)	
80	Studio-Basement	✓	= > 2500				46(2)	
81	Studio-Grd	✓	= > 3000				46(1)	
82	Studio-Upper	✓	= > 2750				46(1)	
83	Toilet-OKU A	✓	= > 2500	= > 2200	= > 2300		46 (1) & (2) MS 1184:2014 25.4.2	
84	Toilet-OKU B	✓	= > 2500	= > 1900	= > 2750		46 (1) & (2) MS 1184:2014 25.4.3	
85	Toilet-OKU C	✓	= > 2500	= > 1700	= > 2200		46 (1) & (2) MS 1184:2014 25.4.4	
86	Toilet-Public	✓	= > 2500				46 (1) & (2)	
87	Training Room-Basement	✓	= > 2500				46 (2)	General training rooms
88	Training Room-Grd	✓	= > 3000				46 (1)	General training rooms
89	Training Room-Upper	✓	= > 2750				46 (1)	General training rooms
90	Utility-General		= > 2000				46 (4)	For all building types ie Utility Rm, Janitor, washing
91	Verandahway-Grd		= > 3000	= > 2100			38 (1), 46 (5)	
92	Verandahway-Upper		= > 2750	= > 2100			38 (1), 46 (5)	
93	Workshop	✓	= > 3000				44 (2)	

NBeS SPACE USE TYPE (PLACE OF ASSEMBLY)								
No.	Space Use Type	Ventilation (Natural /Mech)	Min Room Height (m)	Min Room Width (m)	Min Room Length (m)	Min Floor Area (sq.m)	UBBL Section	Notes (Room height shall be modeled to either ceiling or bottom of beam)
94	Wuduk		= > 2000				44 (4)	

9.8 Appendix B - Majlis Code

No	Name of Local Authority	Majlis Code
1	Perbadanan Putrajaya	PPj
2	Majlis Bandaraya Petaling Jaya	MBPJ
3	Majlis Perbandaran Kangar	MPK
4	Majlis Bandaraya Melaka Bersejarah	MBMB

No	Name of Local Authority	Majlis Code
5	Majlis Perbandaran Kulim Kedah	MPKK
6	Dewan Bandaraya Kuching Utama	DBKU
		MDT
		MPPD