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# Training of MEP BIM e- Submission Template (for Revit Pilot Users ONLY)

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Based on Autodesk  
Revit MEP 2012

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## **INTRODUCTION**

The objective of this Document is to assist qualified persons (QPs) in developing BIM models to meet new requirements of Building Information Model (BIM) submission. It describes the features available inside the MEP BIM e-Submission Template and the step-by-step guide to apply them into the project. The BIM Submission Template creates a basic structure to assist the QPs in preparing the BIM models for regulatory approval. It is by no means an exhaustive template and QPs are allowed to edit/change accordingly to suit their needs.

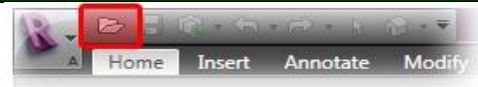
For any additional requirements that require customisations to a certain extent, QPs are also advised to make reference to the training materials distributed or to consult the respective software vendor for any enquiries on the application. If there are contradictions between this submission guideline and vendor's instructions, BCA BIM team shall be contacted for clarification.

This training material is meant for Autodesk Revit Pilot Users reference only.

## PART I: Getting Started

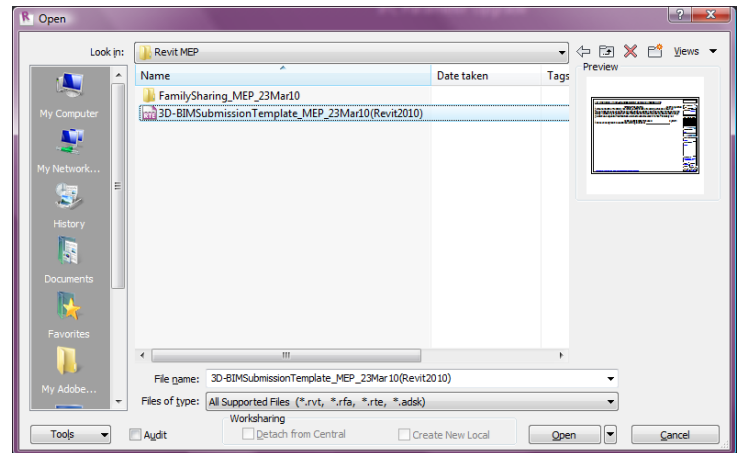
1

Under the Click Access Toolbar, click 



2

In the Open dialog, navigate to the folder where the BIM submission template file (.rte) resides.

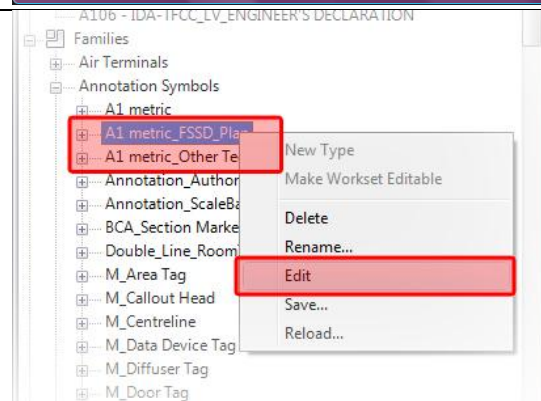


4

Once the template is opened, scroll down to Families of the Project Browser.

5

Under the Annotation Symbols, select the object library of *A1\_metric\_FSSD\_Plan*. Right click and select Edit.

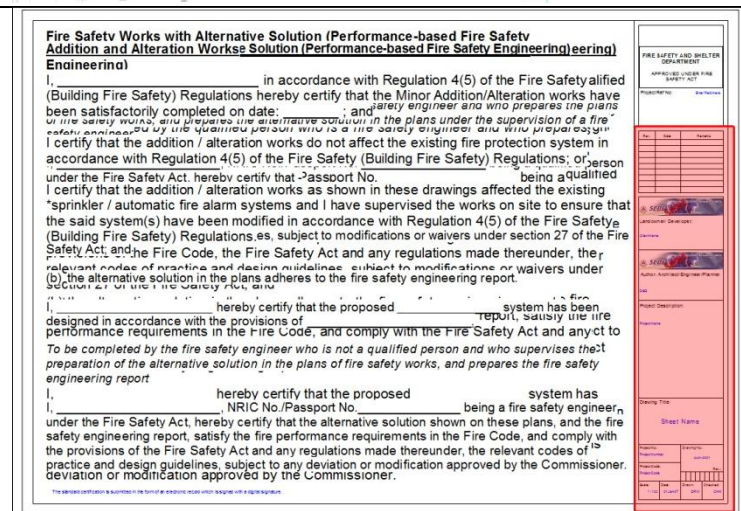


**Tips:** Click Yes when prompted a message whether to open the object library for editing.


6

When the object library is opened in a separate window for editing, you may navigate to the titleblock on the right of the sheet/layout (as highlighted in **RED**) to customise it according to your company's standard, including your company's logo.

**Note:** Please try not changing other parts of the sheet/layout (including the top corner of the titleblock), as this will mess up the automated feature available within the template



7

Once done, click  > Save As > Family. Replace the existing *A1\_metric\_FSSD\_Plan* under the *FamilySharing\_MEP\_01Jul11* folder.

8

Click Create tab > Family Editor panel > Load into Project.


**Tips:** When prompted, select *Overwrite the existing version and its parameter values*.

9


Repeat Steps 4-8 for customising the titleblocks for other technical departments.

**Note:** This is a one-time setting ONLY so that you could apply this in all your future projects.

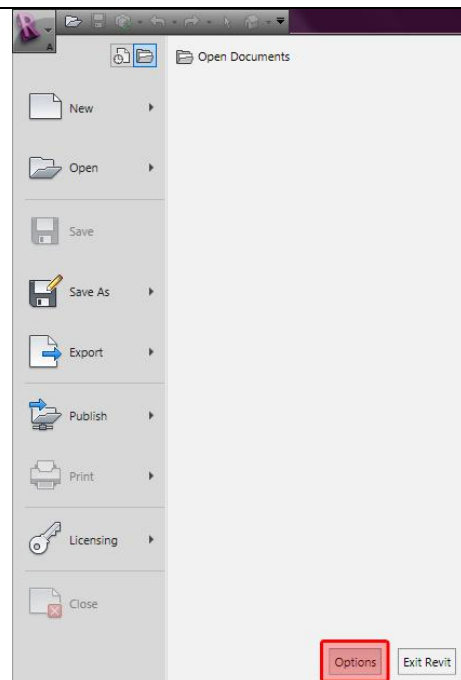
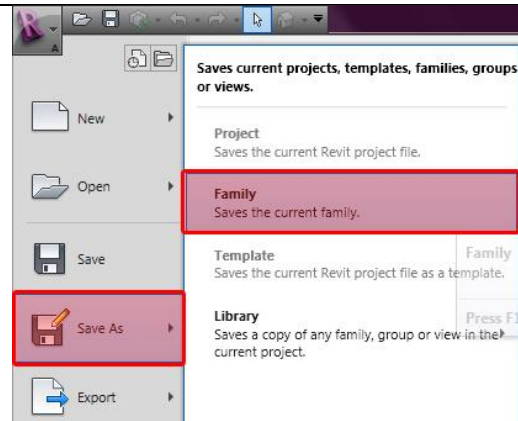
10

Click  > Save As > Template to replace the existing *BIMSubmissionTemplate\_MEP\_Jul2011(Revit2012)* template file.

11

To load the BIM submission template into your Revit application, click  > Options

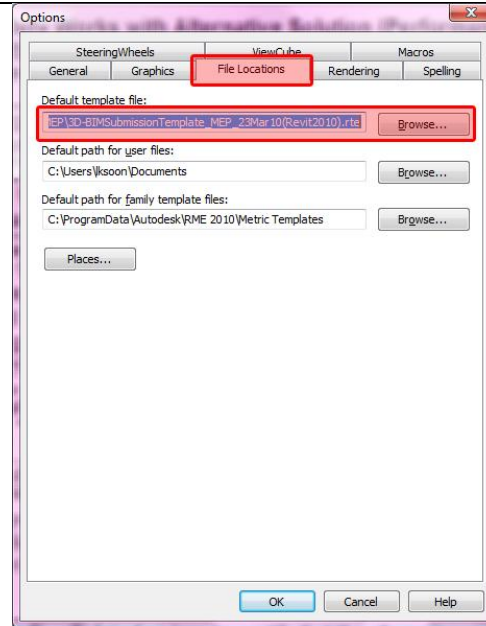
**Note:** This is a one-time setting, such that the template is always loaded when you launch the Revit application



12 In the Options dialog, select the File Locations tab.

13 Under the Default template file, browse the location where you saved the BIM submission template.

14 Click OK.

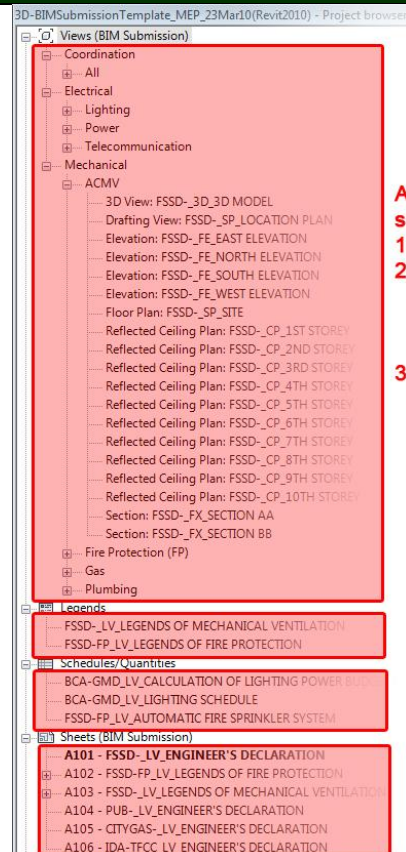


## PART II: Project Browser & Revit Families

15 To begin new project, click  > New > Project (Ctrl N).

16 The first thing you see is the project browser on the left, which should contain a structure organisation for BIM submission (as highlighted in **RED**).

**Note:** The BIM submission template creates a basic platform that could help you in preparing your model for regulatory approval. It is not mandatory and you are free to edit according to our needs, as long as the final results presented to the authorities meet the requirements as specified by the authorities.



### All Model Views

As grouped into different main & sub disciplines:

- 1) Coordination (All)
- 2) Electrical
  - 2.1. Lighting
  - 2.2. Power
  - 2.3. Telecommunication
- 3) Mechanical
  - 3.1. ACMV
  - 3.2. Fire Protection (FP)
  - 3.3. Gas
  - 3.4. Plumbing

### Legends

### Schedules

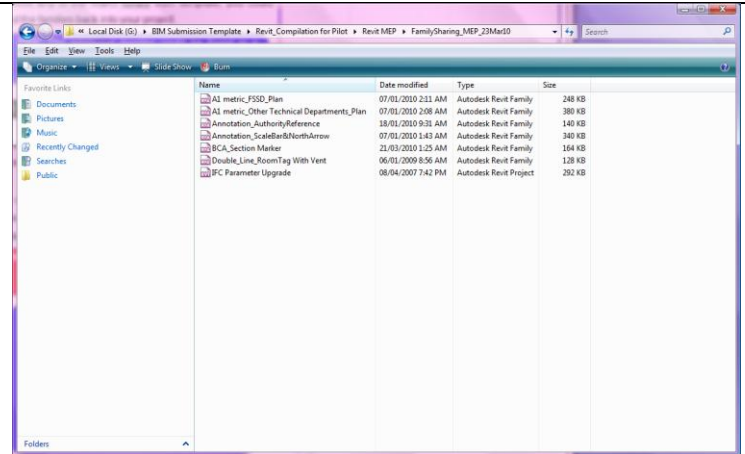
### Sheets/Layout



17

The BIM Submission Template should contain all the basic symbols and endorsement statements for regulatory approval. However, if at any instance, you accidentally remove any of the object library from template, you could load the families back into your project.

**Tips:** The additional families could be found in a separate folder given to you, known as folder FamilySharing\_MEP\_23Mar10.



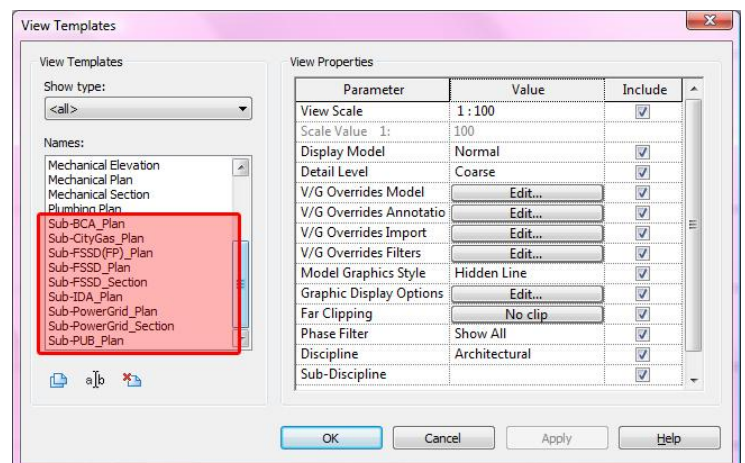
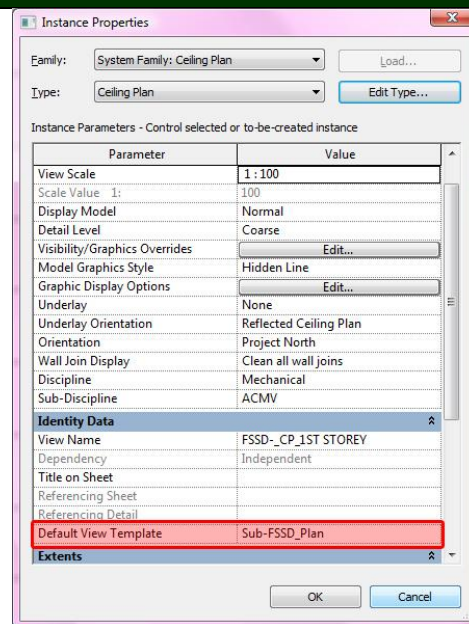
## PART III: View Template

18

All the model views in the browser organisation have their own view template, dependent on the authority.

**Note:** You are free to edit the visibility graphic and view properties of these view templates under the view template settings.

**Tips:** If you have made any changes to the view template, remember to update the relevant views by right clicking on the view and select Apply Default View Template. You may also hold on to the shift key when selecting multiple views.



## PART IV: Project Elevation/ Datum Level

19

Double click on any of the elevation view in the project browser.

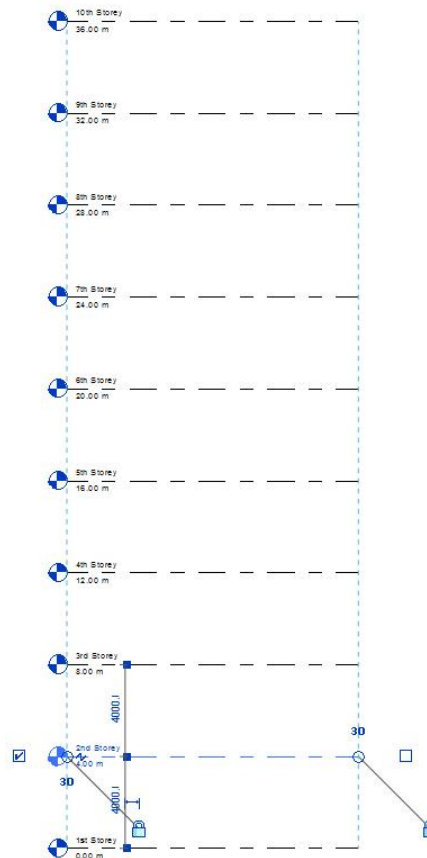
20

By default, the template provides 10 storeys for a project. You may need to edit according to your project requirements.

**Note:** This is a one-time setting ONLY that you should do it before starting your project modelling.

**Tips:** If your project has storeys less than 10, highlight the remaining storeys and click Remove button on your keyboard .

If your project has storeys more than 10, add additional storeys. Click Home tab ► Datum panel ► Level. When new storeys are added, you need to rename the related floor plans according to the naming convention specified in the BIM Submission Guideline.

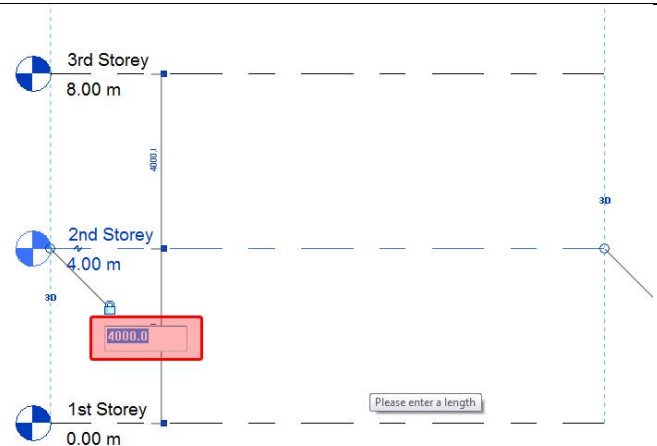


21

By default, the template provides a consistent floor-to-floor height as 4m for all the 10-storeys. You may need to edit according to your project requirements.

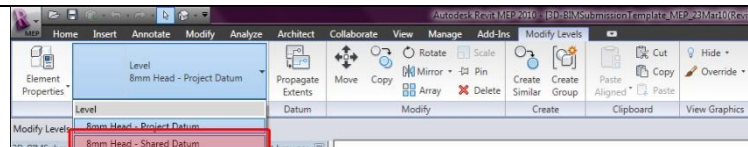
**Note:** This is a one-time setting ONLY that you should do it before starting your project modelling.

**Tips:** To change the floor-to-floor height, click to highlight the level marker, then click on the temporary dimension that appears as BLUE. Type your project floor-to-floor height into the box.



22

To change the project datum level, select all level markers in any of the elevation view. Then, select Modify Level tab ► Element panel ► change the element type to “Circle Head – Shared Datum”.

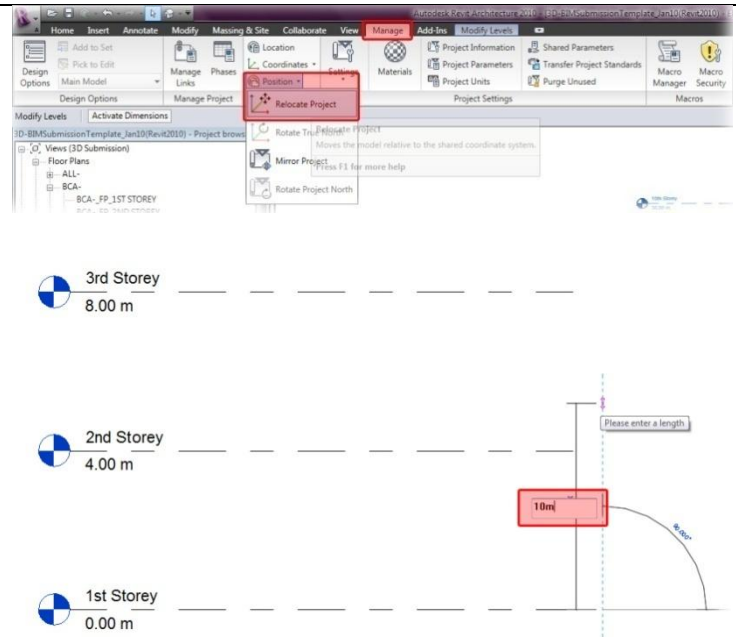




**23** With all the level markers still being selected on elevation view, click Manage tab ➤ Project Location panel ➤ Relocate Project.

**24** Move the project graphically in the view. Click once on the Drawing area to enter a start point for moving. Then move the cursor in the direction that you want the element to move, and click once again to complete the move, or, for more precision, type a value for the distance to move the element and press ENTER.

**Note:** This is a one-time setting ONLY and you can do this on any elevation/sectional view.



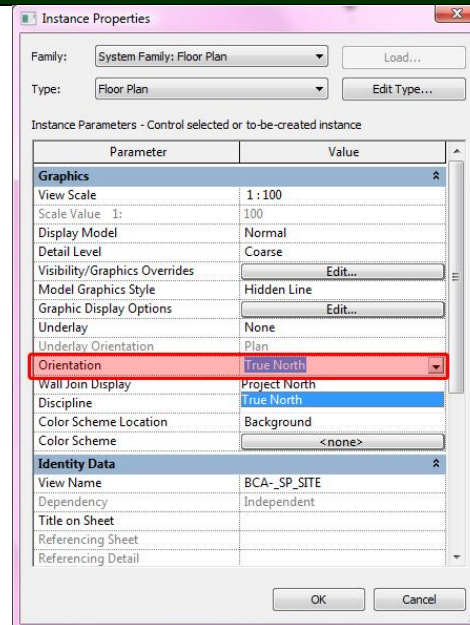
## PART V: Site Configuration

**25** To change the building orientation to the true north on site plan, double click on the site plan, then in the Instance Properties dialog, for Orientation, select True North, and click OK.

**26** Click Manage tab ➤ Project Location panel ➤ Rotate True North.

**27** Click in the site plan view to rotate the model to True North graphically.

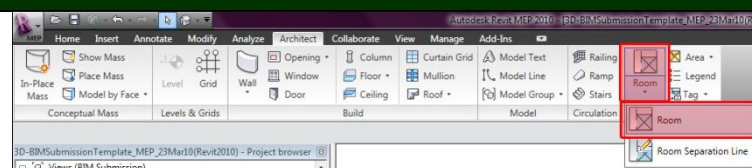
**Note:** This is a one-time setting ONLY and you could apply the same orientation any time at other views. But for submission for regulatory approval, you are only required to orient the site plan view to true north.



## PART VI: Artificial Lighting Schedule

**28** Double click to open the floor plan under Electrical ➤ Lighting of the project browser.

**29** Insert the lighting fixtures on the relevant storeys.



- 30 Click Architect tab ► Room & Area panel ► Room ► Room.  
Click within the room to place the tag.

**Tips:** You may click on the tag to rename.

- 31 Click the area defined.

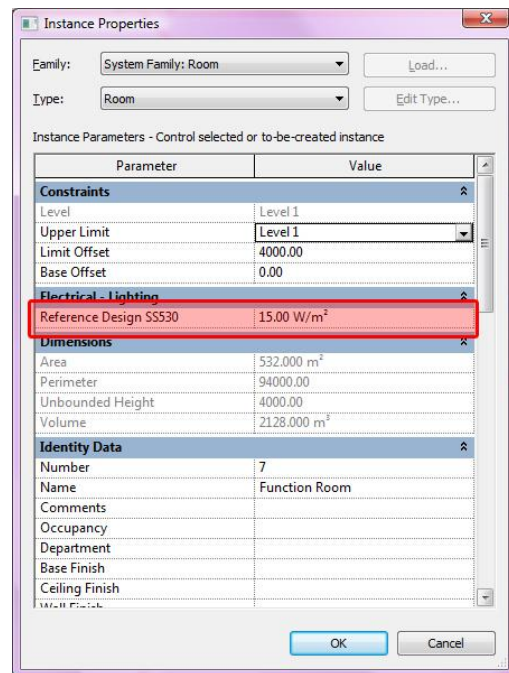
**Tips:** When the defined area is selected, it will be highlighted as shown on the right, with the area crossed.



- 32 Click Modify Rooms tab ► Element Properties.

- 33 In the Instance Properties dialog, under Electrical - Lighting group parameter, insert the value based on Reference Design SS530, then click OK.

- 34 Repeat steps 31-34 to define room functions and lighting reference design of other floors.



- 35 When done, double click “BCA-GMD\_LV\_CALCULATION OF LIGHTING POWER BUDGET OF PROJECT” and “BCA-GMD\_LV\_LIGHTING SCHEDULE” under the Schedules/Quantities of project browser. The lighting power budget of project and the lighting schedule is auto-tabulated for you according to format.

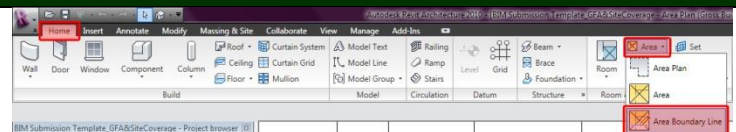
Storey	Type of Usage	Total Area	Light Fixture	No of Light Fitting	Watt per Fitting	Proposed Design (W/m²)	Reference Design SS530 (W/m²)	Proposed Design Load (W)	Reference Design Load (W)	% Improvement
Level 1	Function Room	532.00 m²	M_Plan Recessed Lighting Fixture: 300x120	1	14 W	0.03 W/m²	15.00 W/m²	7440 W	7980 W	6.67%

Storey	Light Fixture	Luminous Flux (lm)	Luminous Intensity (cd)	Illuminance (lux)	Total
Level 1	M_Plan Recessed Lighting Fixture: 300x120	1247 lm	99 cd	11 lx	1

## PART VII: Fire Sprinkler Area Demarcation and Area Tabulation

- 36 Double click to open the floor plan under Mechanical ► Fire Protection (FP) of the project browser.

- 37 Create the fire sprinkler systems on the relevant storeys.



38

Click Architect tab ► Room & Area panel ► Room ► Room.

Click within the room to place the tag.

**Tips:** You may click on the tag to rename.

**Note:** If the room area has already been defined at Step 31 above, then you are only required to place the room tag. Please do not duplicate the definition of room area as this would result inaccuracy of area computation.

39

Click the area defined.

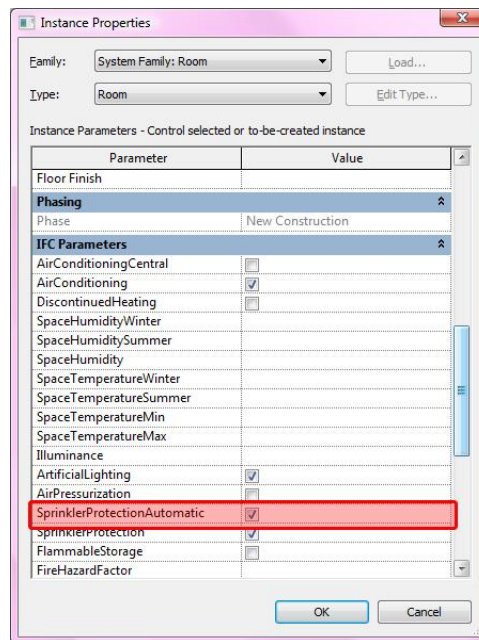
**Tips:** When the defined area is selected, it will be highlighted as shown on the right, with the area crossed.



40

In the Instance Properties dialog, under IFC group parameter, select the SprinklerProtectionAutomatic, then click OK.

**Tips:** Double click to uncheck the box if the room is non-fire sprinkled.

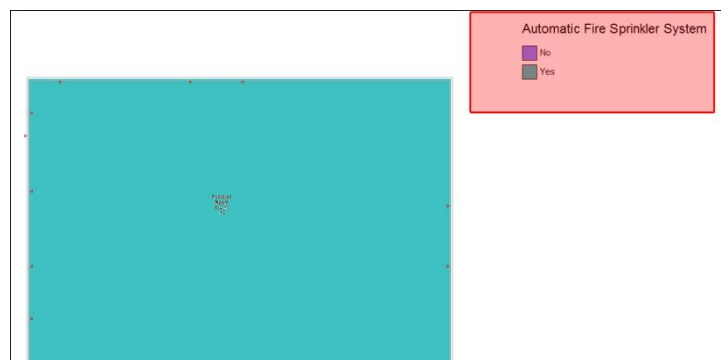


41

Repeat steps 39-42 to define room functions and sprinkler system of other floors.

42

Graphically, the room will be highlighted to differentiate between an automatic fire-sprinkled room and non fire-sprinkled room. A colour legend will also appear on the floor plan.



43

When done, double click "FSSD-FP\_LV\_AUTOMATIC FIRE SPRINKLER SYSTEM" under the Schedules/Quantities of project browser. The fire sprinkled area is auto-tabulated for your reference.

FSSD-FP_LV_AUTOMATIC FIRE SPRINKLER SYSTEM			
Storey	Total Area	Area with Automatic Fire Sprinkler System	Area with no Fire Sprinkler System
Level 1	532 m <sup>2</sup>	532 m <sup>2</sup>	0 m <sup>2</sup>
	532 m <sup>2</sup>	532 m <sup>2</sup>	0 m <sup>2</sup>

## PART VIII: Annotation, Symbols & Legends

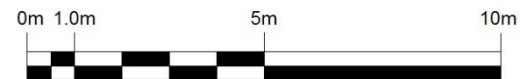
**Note:** The basic annotation and symbols provided in the template only meant to help you in creating elementary annotations for your project submission. They are not exhaustive list and you are free to edit/change according to your needs and the requirements as specified by the authorities.

44

To place the scale bar and north arrow on the floor plan views or elevation and sectional views, click Annotate tab > Detail panel > Symbol > select the appropriate symbols already loaded into the template for you.



1st Floor Plan



SCALE 1: 100

45

Click on the drawing view to place the symbols.

46

Click on the name to rename of the view name (synchronise it with the project browser) and the scale (synchronise it with the scale under View Control Bar).

47

To change the angle of north arrow, select the symbol and click Modify Generic Annotations > Element Properties > Type Properties. Insert the True North angle under Dimension parameter, then click OK.

48

To place the symbol "for reference only" on the plans, elevations and sectional views, repeat Steps 59-60.

**For Reference ONLY**

**Note:** This symbol is specific to amendment plans submission for regulatory approval, in which QP is required to indicate this symbol on the drawings views that are not affected in the amendments.



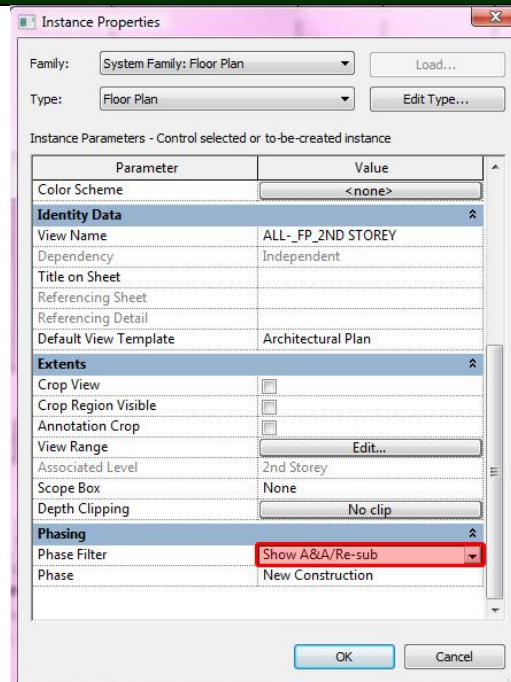


## PART IX: A&A Works/ Amendments

52

Open the drawing view, click View tab ► View Properties. In the Instance Properties dialog, select Show A&A/Re-sub for Phase Filter under the Phasing parameter, and click OK.

**Tips:** To select multiple views at a instance, hold Ctrl key while clicking the views in Project Browser. Right click and select Properties, then change the Phase Filter and click OK. All the selected views will change to the 3-colours mode (magenta, cyan and yellow).

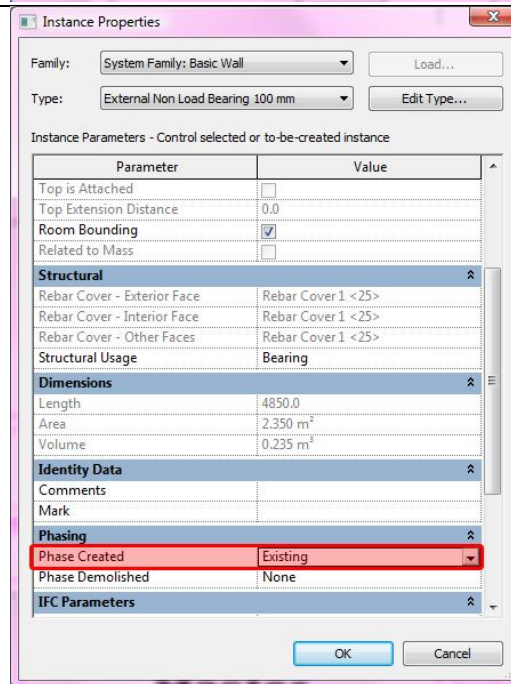


53

By default, the template will assume all building elements as new construction (in magenta). To change the phases of a specific building element to existing mode, select the object in any view, right click and select Element Properties. In the Instance Properties dialog, select Existing under the Phasing parameter.

**Tips:** To select multiple elements at a instance, hold Ctrl key while clicking the objects in the drawing view. Right click and select Element Properties, then change the Phase Created and click OK. All the selected objects will change to CYAN colour.

**Note:** This is a one-time setting ONLY and you can change the element properties at any view.

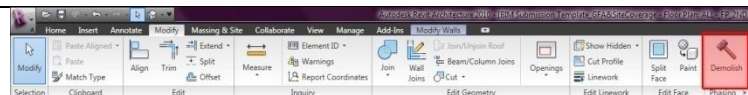


54

To demolish the building object, click Modify Element tab ► Phasing panel ► Demolish.

55

Click on the object which you wish to knock down, colour will be automatically change to yellow dotted line.

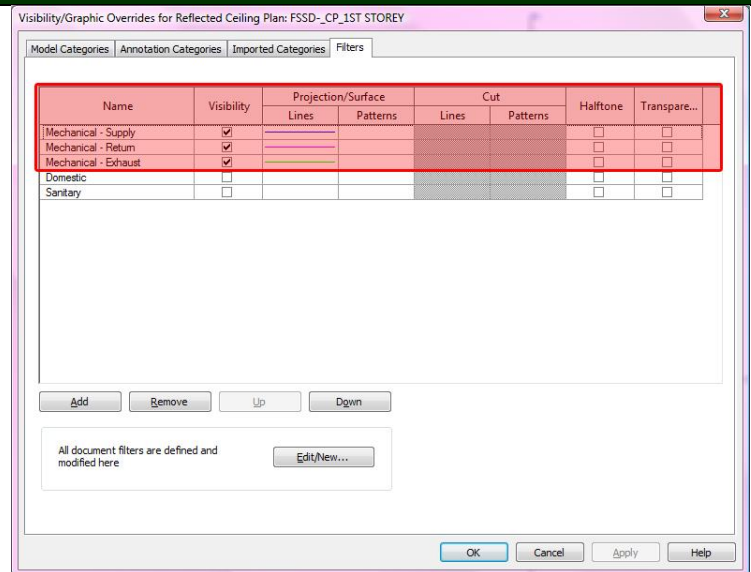




## PART X: Filters

- 56** Some of the model views, eg. for mechanical ventilation under ACMV sub discipline, already have the systems filtered with different colour. The filters feature would change graphical presentation of the piping/ducting on the floor plan, elevation etc.

**Tips:** You may change and add more filters according to the need and the requirements by the authorities.

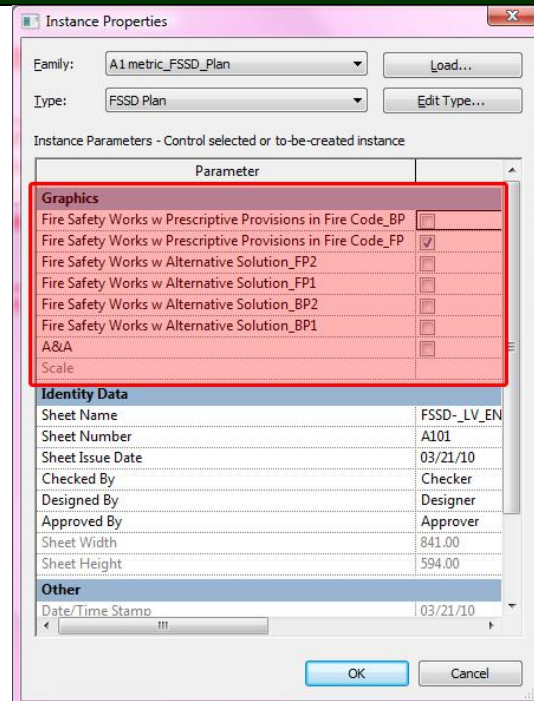


## PART XI: Endorsement & Data Information

- 57** Double click to open the sheets from Project Browser. Click on the sheet on the drawing area and change the type according to the regulatory authority you are submitting to.

- 58** Click Modify Title Blocks tab ► Element panel ► Element Properties. In the Instance Properties dialog, select the appropriate endorsement statement that matches your submission, and click OK.

**Note:** Each sheet could only contain 1 endorsement statement. If you have more than 1 endorsement statement to submit, create more sheets in the Project Browser.



- 59** Fill in the blanks of the endorsement in the sheet using text.

60

Besides endorsement statements and titleblocks, the sheet could also contain data information like schedules/quantities/legends. Drag and drop any of your summary schedules etc for submission into the sheet.

**Tips:** To insert the schedule, you must first make the sheet empty. Repeat Steps 59-60 and uncheck all the boxes for the endorsement statements and click OK. Then start to drag and drop your schedule into the sheet.

The screenshot shows a complex form with multiple sections. On the left, there are several tables with headers like 'LEGENDS', 'ABREVIATIONS', and 'BIBLIOGRAPHY'. The main body contains various endorsement statements and checkboxes. On the right, there is a section for 'FIRE SAFETY AND SHELTER DEPARTMENT' and a 'Project Information' table with fields for Project Name, Project Number, and Project Address.

61

To insert basic project information in the title block without repetition, click Manage tab > Project Settings > Project Information.

62

In the Instance Properties dialog, fill in the information under the Other group parameters, and click OK.

63

For other specific information, right click on the selected sheet at Project Browser and select Properties. Fill in the information under Identity Data and click OK.

**Tips:** To select multiple sheets at a instance, hold Ctrl key while clicking the sheets in Project Browser. Right click and select Properties, then change the Identity Data and click OK. All the selected sheets would have the same information.

The screenshot shows the 'Instance Properties' dialog box. It has a 'Family' dropdown set to 'System Family: Project Information' and a 'Type' dropdown. Below these are 'Instance Parameters - Control selected or to-be-created instance'. The 'Other' group is expanded, showing a table with the following data:

Parameter	Value
DummyNumber	1.000 m <sup>2</sup>
Energy Data	Edit...
Project Issue Date	Issue Date
Project Status	Project Status
Client Name	Owner
Project Address	Edit...
Project Name	Project Name
Project Number	Project Number

At the bottom of the dialog are 'OK' and 'Cancel' buttons.

## PART XII: Export/Publish to DWF

64

Refer to Appendix C of MEP BIM e-Submission Guideline for step-by-step guide to export/ publish to DWF for regulatory submission.

## PART XIII: Migrating to Latest Software Version

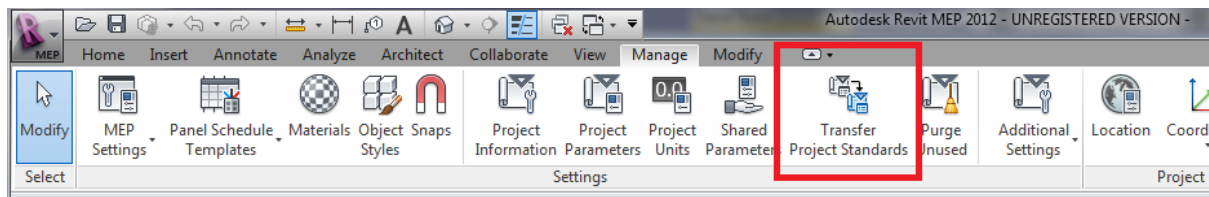
The following step by step tutorial will teach the current users to update the template and migrate all the created standards to the latest version of Revit MEP.

1

On the Revit 2012, open the current version 2011 company template and 2012 version of template that downloaded from Corenet.

2

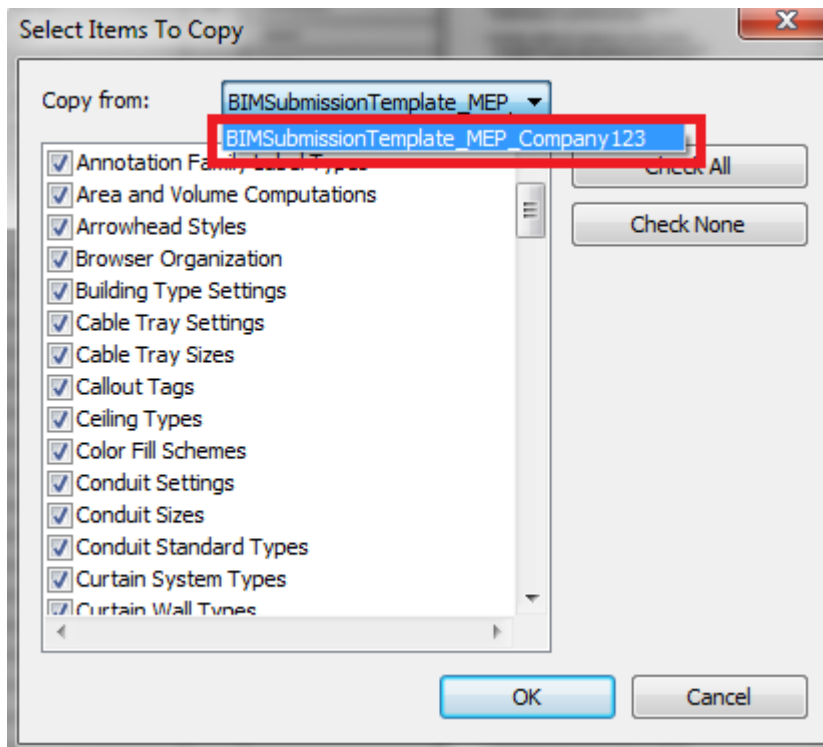
Go to **Transfer Project Standards** from the **Manage** tab



3

On the **Select items to Copy** dialog, choose the name of your current company template from the full-down arrow.

The dialog box will show the list of standards you created on your current version of template.



4

From the list of the standards, tick the standards to be transferred for the new template version. Click **OK** once done.

5

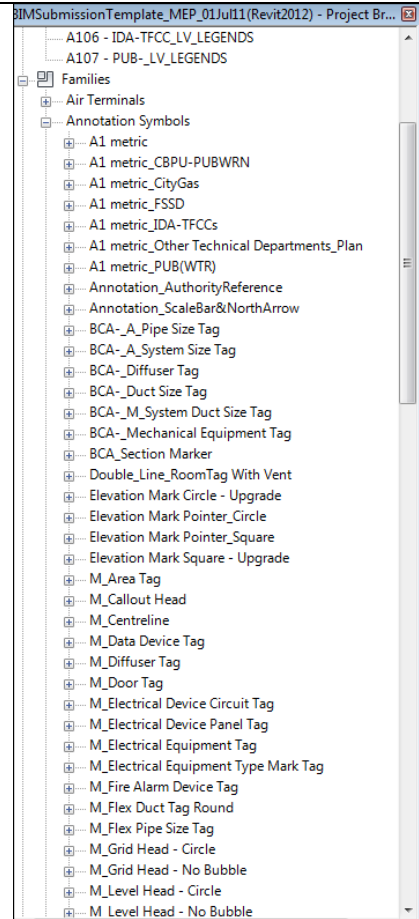
Transferred project standards can be verified from the **Project Browser**.

Once verified, save it as a new template and name it according to your company standard.

Close both files once done.

6

To load the new template for the new project, follow the **steps 11-14 under Part I** of this Manual.



## ACKNOWLEDGEMENT

Special thanks to Autodesk Asia Pte Ltd