Training of Architectural BIM e-Submission Template (for Revit Users Only)

Based on
Autodesk Revit 2014

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Building and Construction Authority

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Doc Name:
Architecture Template Training Guide – Autodesk Revit 2014

Release Date: November 2013

If you have any comments, suggestions or clarifications, please write to:

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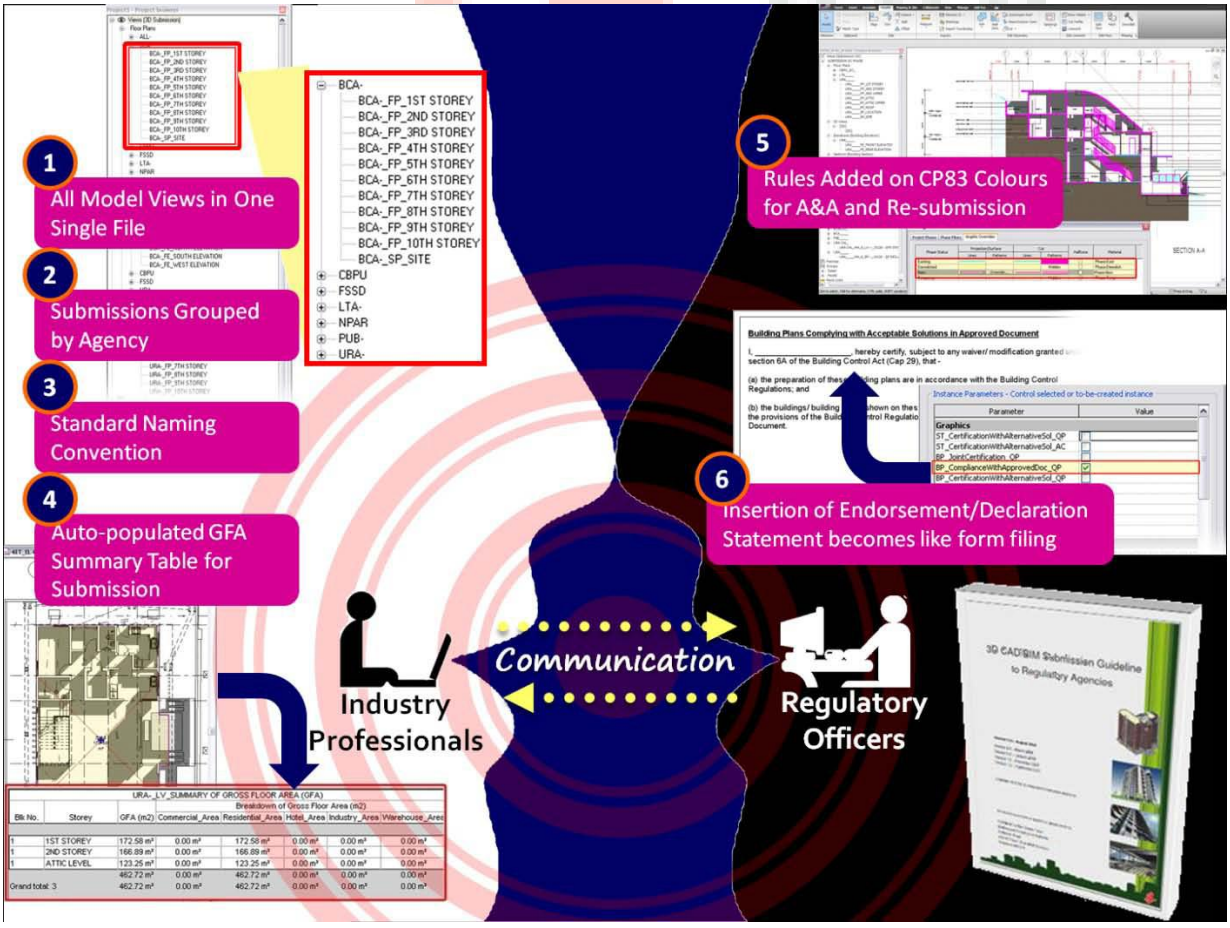
Contents

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 Architectural 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 according to the Architectural BIM e-Submission Guideline. It is by no means an exhaustive template and QPs are allowed to edit/change accordingly to suit their needs.

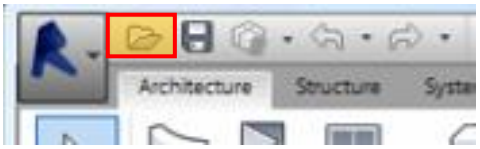
For any additional requirements that require customisations to a certain extent, QPs are also advised to make reference to the training materials distributed or to consult the respective software vendor for any enquiries on the application. If there are contradictions between this submission guideline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

This training material is meant for Autodesk Revit Users reference only. Diagram below summarises the important features available in the submission template.



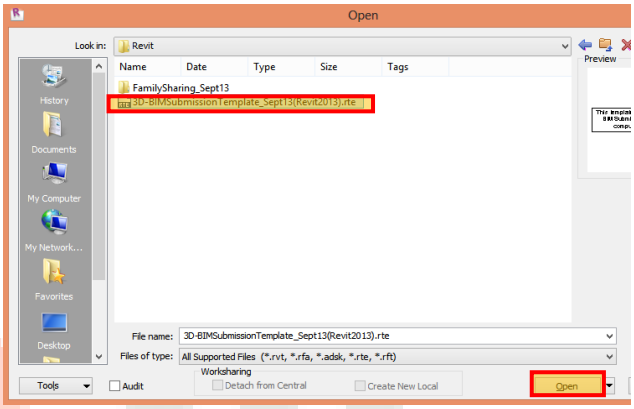
PART I. Getting Started

1 Under the Quick Access Toolbar, click 



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

Note: *To ensure originality, please make sure that you get the BIM Submission Guideline & template from CORENET BIM Support team*

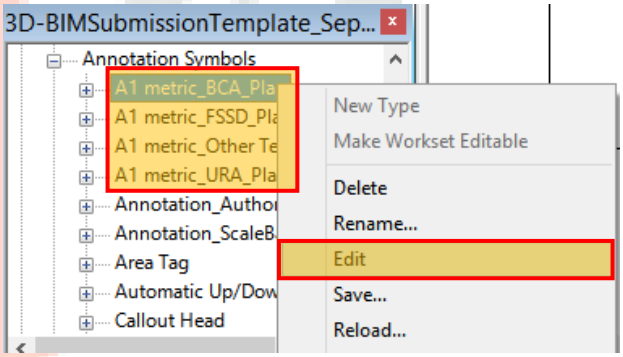


3 Select the template and click Open.

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

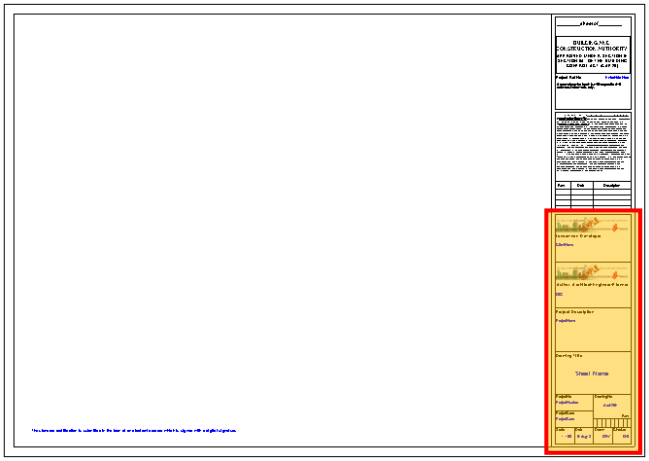
5 Under the Annotation Symbols, select the object library of A1_metric_BCA_Plan. Right click and select Edit.

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

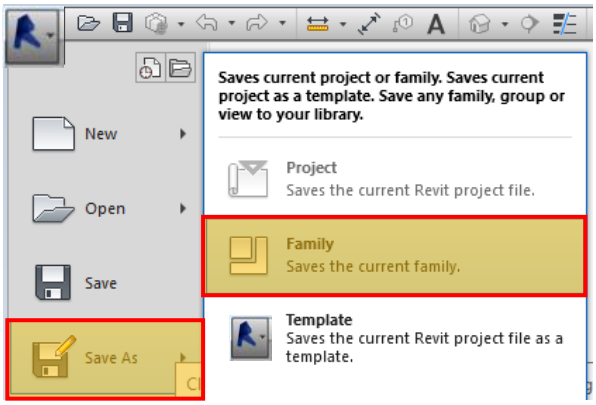


6 When the object library is opened in a separate window for editing, you may navigate to the title block on the right of the sheet/layout (as highlighted in **RED**) to customise it according to your company's standard, including your company's logo.

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



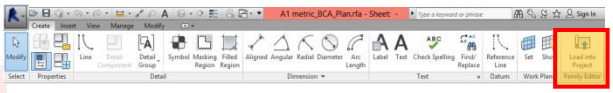
7 Once done, click ➤ Save As ➤ Family. Replace the existing *A1_metric_BCA_Plan* under the *FamilySharing_Nov13 (Release)* folder.



8 Click Create tab ➤ Family Editor panel ➤ Load into Project.

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

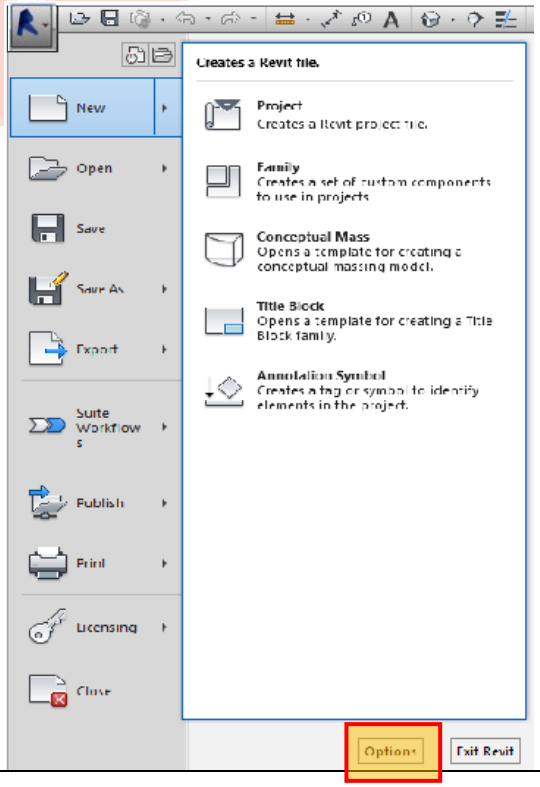
9 Repeat Steps 4-8 for customising the title blocks for URA, FSSD and other technical departments.



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 *3D-BIMSubmissionTemplate_Nov13(Revit2013).rte*

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

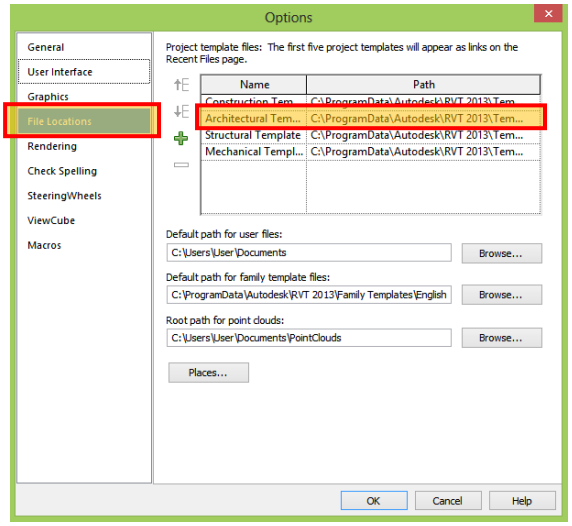


Note: *This is a one-time setting, such that the template is always loaded when you launch the Revit application.*

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

13 Under the Architectural template file, change the path location where you saved the BIM submission template.

14 Click OK.

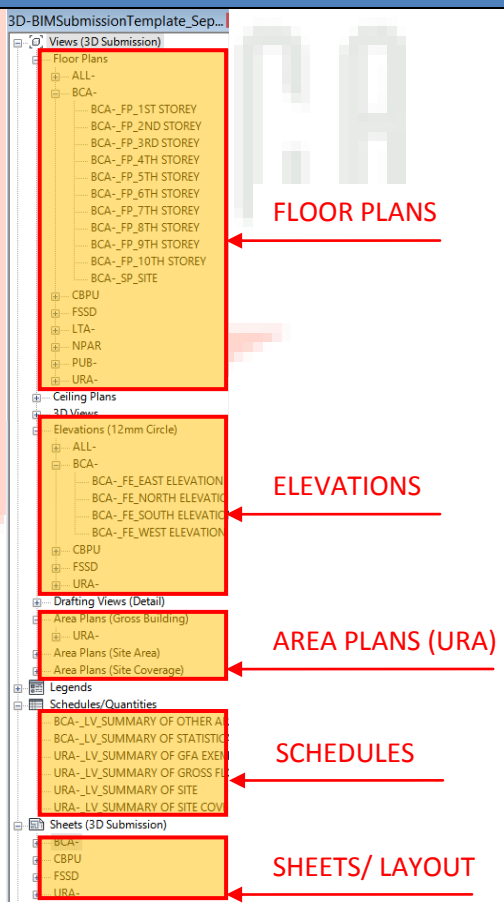


PART II. Project Browser

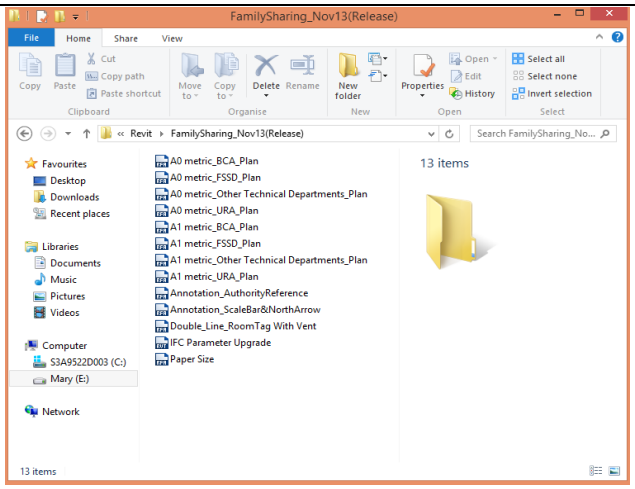
15 To begin new project, click  ➤ New ➤ Project (Ctrl+ N).

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 in the BIM e-Submission Guideline.*



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_Nov13(Release) .*

PART III. Project Elevation/ Datum Level

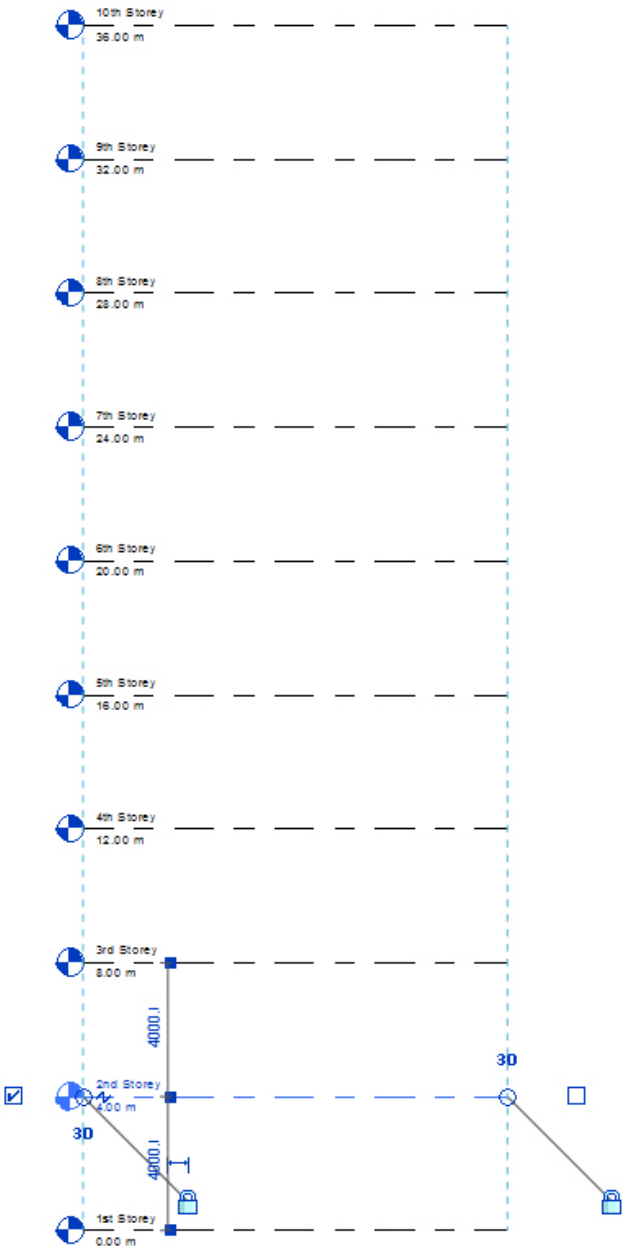
18 Double click on any of the elevation view in the project browser.

19 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 modeling.*

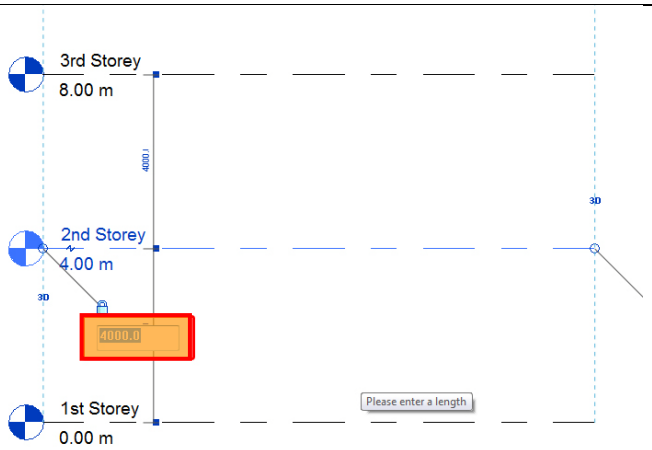
Tips: *If your project have storeys less than 10, highlight the remaining storeys and click Remove button on your keyboard .*

If your project have 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.



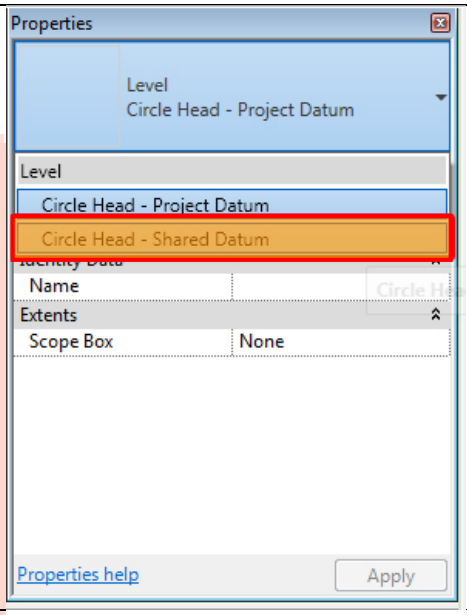
20

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.



21

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".

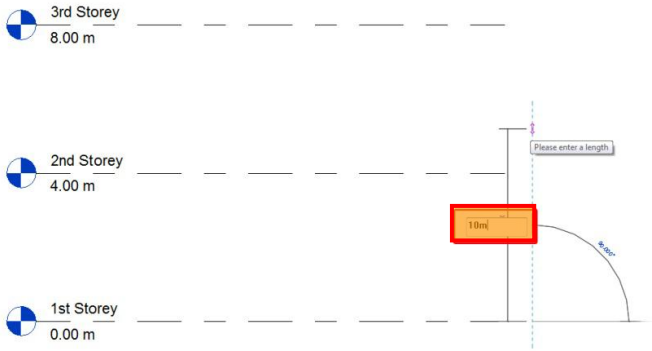


22

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

23

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.

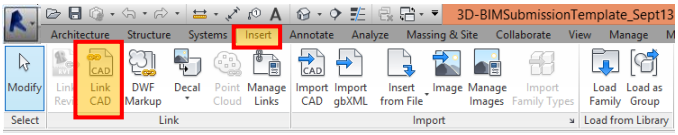


Note: *This is a one-time setting **ONLY** and you can do this on any elevation/sectional view.*

PART IV. Site Configuration

24

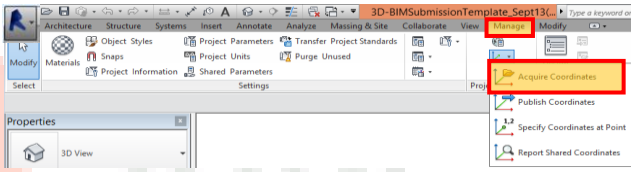
To import the topographic map (.dwg) given by your land surveyor, click Insert tab ➤ Link panel ➤ Link CAD.



Tips: *It is advisable to start requesting your land surveyor to provide you the topographic map with Z-values or contour line. This will facilitate you in auto-creating the 3D topo profile in Revit, using the following steps.*

25

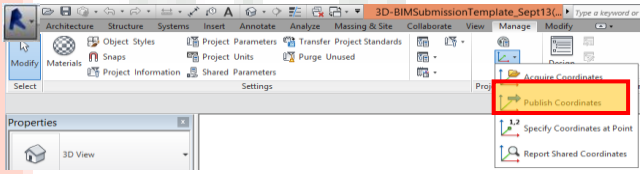
After the CAD topo map is imported, click Manage tab ➤ Project Location panel ➤ Coordinates ➤ Acquire Coordinates.

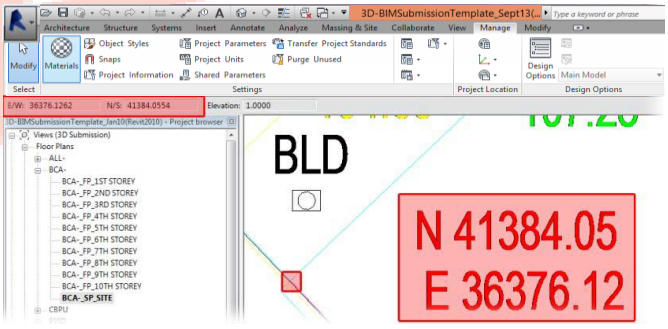


26

Place the cursor on a linked CAD topo map instance, and click.

The model file now has the same shared coordinates as the linked CAD topo map file.

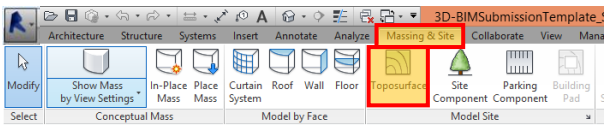




Tips: *To double check if your model file shares the same coordinates system as the land surveyor topo map, Manage tab ➤Project Location panel ➤ Coordinates ➤ Report Shared Coordinates. Then place the cursor on a reference point of the linked CAD topo map (normally the point with indication of numbers given by your land surveyor so that you could verify).*

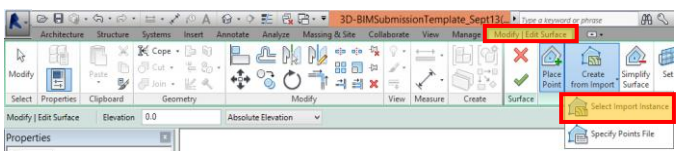
27

To create the 3D topographic, click Massing & Site tab ➤ Model Site panel ➤ Toposurface.

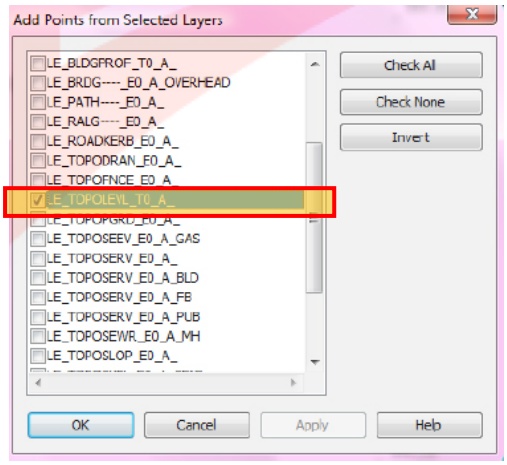


28

Click Edit Surface panel ➤ Tools panel ➤ Create from import ➤ Select Import Instance.



29 Select the imported 3D contour data in the drawing area. The Add Points from Selected Layers dialog displays.



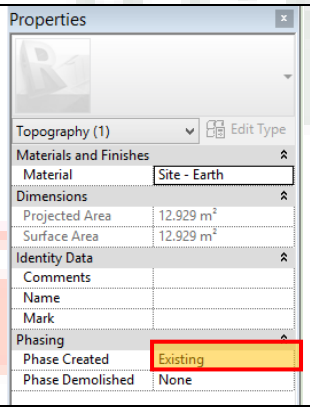
30 Select the layers to which you want to apply elevation points (the CAD layer with points/contours given by your land surveyor), and click OK.

Note: *Revit analyses the imported 3D contour data and generates a toposurface based on the elevation points placed along the contour lines.*

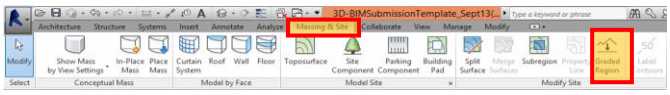
31 Click Finish Surface.

32 To create the proposed topo, first, select the 3D topo created in Step 31.

33 In the Instance Properties dialog , change the Phase Created to Existing. Then click OK.

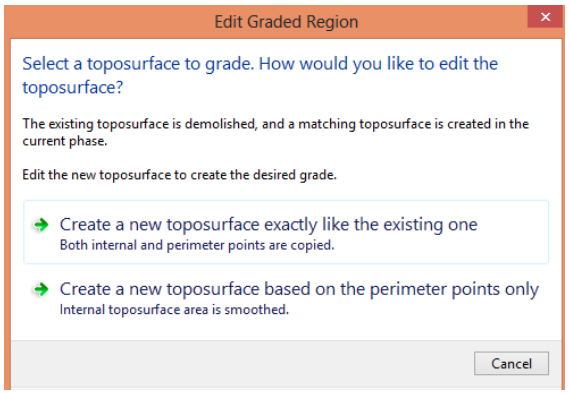


34 Click Massing & Site tab ➤ Modify Site panel ➤ Graded Region.



35 In the Edit Graded Region dialog, select one of the following:

- Create a new toposurface exactly like the existing one.
- Create a new toposurface based on the perimeter points only.



Note: *Select the 1st option in Step 35 if there is drastic change to the existing topo. Select the 2nd option is the change is minor.*

36 Select the existing 3D topo.

> **Note:** *If you are editing the surface, Revit Architecture enters sketch mode. You can add or delete points, change the elevation of points, or simplify the surface.*

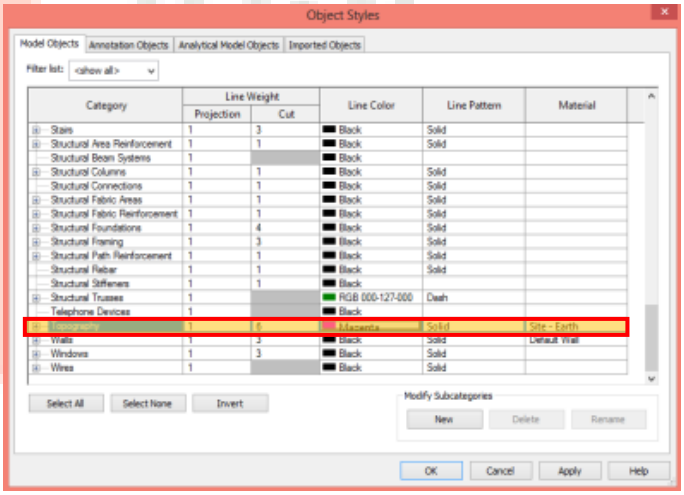
37 Click Finish Surface once done.

> **Note:** *If you drag the new graded region, notice that the original remains and is changed to demolished state (yellow dotted line).*

38 Click Manage tab ➤ Project Settings panel ➤ Settings ➤ Object Styles

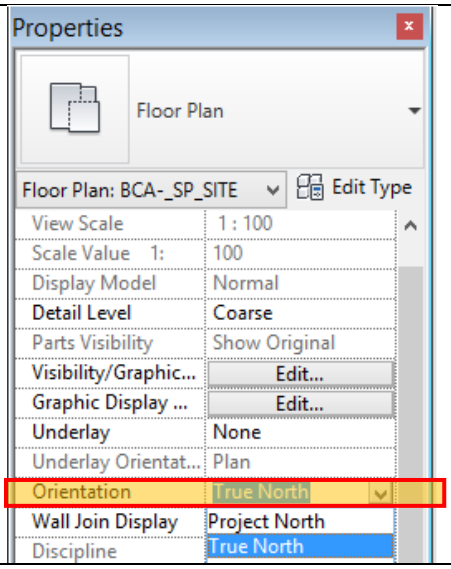
39 In the Object Styles dialog, change the line colour of Topography to magenta. Then click OK.

> **Tips:** *This will make the proposed 3D topo appears magenta in all drawing views.*

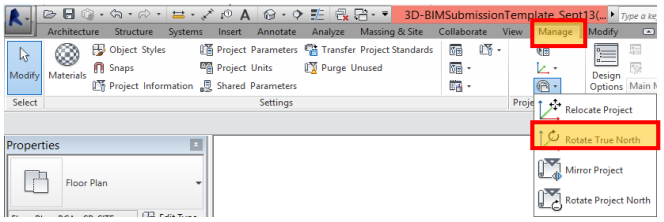


40 To change the building orientation to the true north on site plan, double click on the site plan.

41 In the Instance Properties dialog, for Orientation, select True North, and click OK.



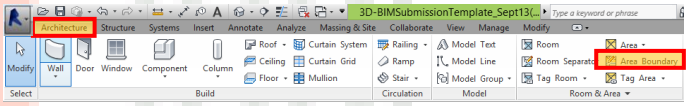
42 Click Manage tab ➤ Project Location panel ➤ Rotate True North.



43 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.*

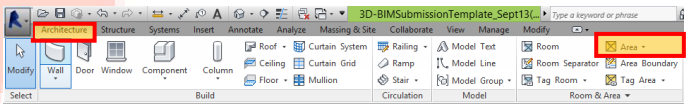
PART V. GFA Tabulation



44 Double click to open the floor plan under Area Plans (Gross Building) in the project browser.

45 Click Architecture Tab ➤ Room & Area panel ➤ Area Boundary Line. Draw or pick the area boundaries of the floor GFA.

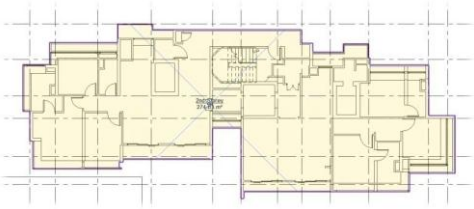
46 Click Architecture Tab ➤ Room & Area panel ➤ Area. Click within the area defines in Step 45 to place the tag.



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

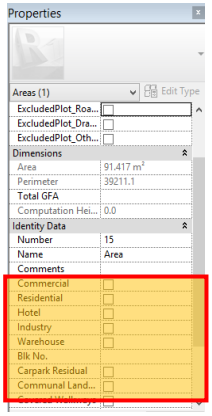
47 Click the area defined.

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



48 Click Modify Areas tab

49 In the instance properties dialog, under Identity Data group parameter, select the correct area type of your project and insert the correct block number, then click OK.



50 Repeat steps 44- 49 to define GFA boundaries of other floors.

51 When done, double click "URA-_LV_SUMMARY OF GROSS FLOOR AREA (GFA)" under the Schedules/Quantities of project browser. The GFA is auto- tabulated for you according to format.

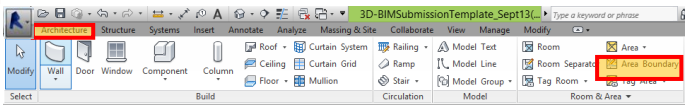
URA-_LV_SUMMARY OF GROSS FLOOR AREA (GFA)

			Breakdown of Gross Floor Area (m2)				
Blk No.	Storey	GFA (m2)	Commercial_Area	Residential_Area	Hotel_Area	Industry_Area	Warehouse_Area
1	Basement	893.43 m²	0.00 m²	893.43 m²	0.00 m²	0.00 m²	0.00 m²
1	1st Storey	897.09 m²	0.00 m²	897.09 m²	0.00 m²	0.00 m²	0.00 m²
1	2nd Storey	274.63 m²	0.00 m²	274.63 m²	0.00 m²	0.00 m²	0.00 m²
1	3rd Storey	274.63 m²	0.00 m²	274.63 m²	0.00 m²	0.00 m²	0.00 m²
1	4th Storey	274.63 m²	0.00 m²	274.63 m²	0.00 m²	0.00 m²	0.00 m²
1	5th Storey	274.63 m²	0.00 m²	274.63 m²	0.00 m²	0.00 m²	0.00 m²
1	6th Storey	274.63 m²	0.00 m²	274.63 m²	0.00 m²	0.00 m²	0.00 m²
1	7th Storey	274.63 m²	0.00 m²	274.63 m²	0.00 m²	0.00 m²	0.00 m²
1	8th Storey	274.63 m²	0.00 m²	274.63 m²	0.00 m²	0.00 m²	0.00 m²
1	9th Storey	274.63 m²	0.00 m²	274.63 m²	0.00 m²	0.00 m²	0.00 m²
1	10th Storey	274.63 m²	0.00 m²	274.63 m²	0.00 m²	0.00 m²	0.00 m²
1	11th Storey	274.63 m²	0.00 m²	274.63 m²	0.00 m²	0.00 m²	0.00 m²
1	12th Storey	274.63 m²	0.00 m²	274.63 m²	0.00 m²	0.00 m²	0.00 m²
1	13th Storey	274.63 m²	0.00 m²	274.63 m²	0.00 m²	0.00 m²	0.00 m²
1	14th Storey	274.63 m²	0.00 m²	274.63 m²	0.00 m²	0.00 m²	0.00 m²
1	15th Storey	274.63 m²	0.00 m²	274.63 m²	0.00 m²	0.00 m²	0.00 m²
1	16th Storey	274.66 m²	0.00 m²	274.66 m²	0.00 m²	0.00 m²	0.00 m²
1	17th Storey	294.01 m²	0.00 m²	294.01 m²	0.00 m²	0.00 m²	0.00 m²
1	18th Storey	219.23 m²	0.00 m²	219.23 m²	0.00 m²	0.00 m²	0.00 m²
		6423.19 m²	0.00 m²	6423.19 m²	0.00 m²	0.00 m²	0.00 m²
Grand total: 19		6423.19 m²	0.00 m²	6423.19 m²	0.00 m²	0.00 m²	0.00 m²

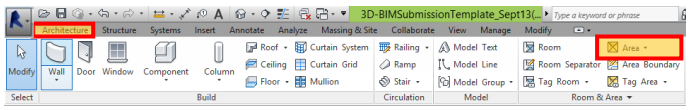
PART VI. Site & Site Coverage Tabulation (only affecting site plan)

52 Double click to open the floor plan under Area Plans (Site Area) of the project browser.

53 Click Architecture tab ➤Room & Area ➤ Area Boundary Line. Draw the area boundaries of the plots to be excluded.

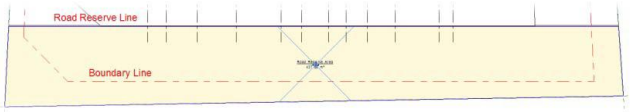


54 Click Architecture tab ➤ Room & Area ➤ Area. Click within the area defined in Step 53 to place the tag.



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

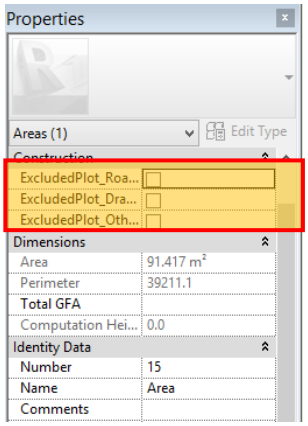
55 Click the area defined.



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

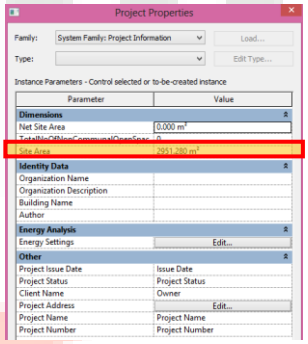
56 Click Modify Areas tab

57 In the instance properties dialog, under Construction group parameter, select the correct excluded area type of your project, then click OK.



58 Click Manage tab ➤ project Settings panel ➤ Project Information.

59 In the instance properties dialog, under Dimensions, insert the value of Site Area that your land surveyor has provided you.



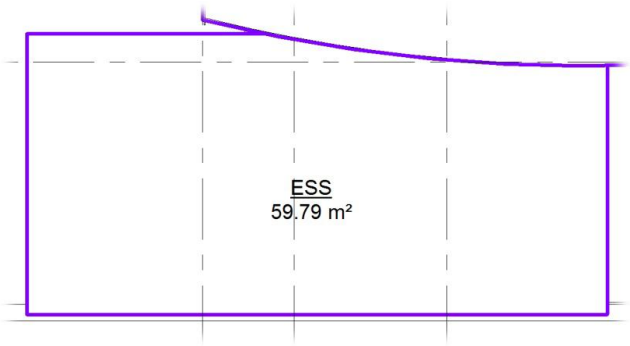
60 When done, double click "URA-_LV_SUMMARY OF SITE" under the Schedules/ Quantities of project browser. The site info and its excluded plots is auto- tabulated for you according to format.

URA-_LV_SUMMARY OF SITE

Site Area (m2)	Plots to be Excluded (m2)			Net Site_Area (m2)
	Road Reserve_Area	Drainage Reserve_Area	Others_Area	
2951.28 m²	427.66 m²	0.00 m²	0.00 m²	2523.62 m²
Grand total	427.66 m²	0.00 m²	0.00 m²	2523.62 m²

61 Double click to open the floor plan under Area Plans (Site Coverage) of the project browser.

62 Repeat steps 53- 54 to define the boundaries of site coverage area.

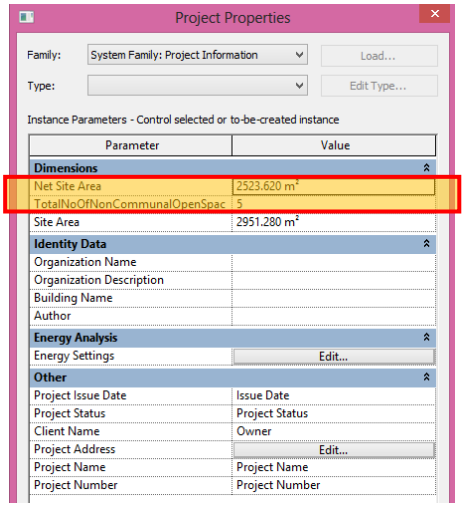


Tips: *You may click on the tag to rename.*

63 When done, double click "URA-_LV_SUMMARY OF SITE COVERAGE & COMMUNAL OPEN SPACE" under the Schedules/ Quantities of project browser.

64 Click Manage tab ➤ Project Settings panel ➤ Project Information.

65 In the Project Properties dialog, under Dimension, insert the value of Net Site Area that you got from Step 61 above (table "URA-_LV_SUMMARY OF SITE" and the total number of label name in table "URA-_LV_SUMMARY OF SITE COVERAGE & COMMUNAL OPEN SPACE").



66 Double click the ''URA-_LV_SUMMARY OF SITE COVERAGE & COMMUNAL OPEN SPACE" under the Schedules/ Quantities of project browser, all the information is auto- tabulated for you according to format.

URA-_LV_SUMMARY OF SITE COVERAGE & COMMUNAL OPEN SPACE

Label Name	Site Coverage Area (m2)	Communal Open Space Area (m2)
Block 1	313.33 m²	191.40 m²
CP 1	70.33 m²	434.40 m²
CP 2	70.33 m²	434.40 m²
CP 3	70.33 m²	434.40 m²
ESS	59.79 m²	444.94 m²
Grand total: 5	584.09 m²	1939.53 m²

PART VII. SGFA Tabulation

67 Double click the '' BCA-_LV_SUMMARY OF OTHER AREAS NOT INCLUDED IN GFA COMPUTATION)" under the Schedules/ Quantities of project browser, all the information is auto- tabulated for you according to format.

Note: *The tabulation is dependent on URA Area Computation.*

BCA-_LV_SUMMARY OF OTHER AREAS NOT INCLUDED IN GFA COMPUTATION

Description	Areas (m2)
Carpark Residual	108.26 m²
Catwalk	23.22 m²
Communal Landscaped	39.65 m²
Other Area 1	25.53 m²
Other Area 2	5.72 m²
Grand total	202.37 m²

68 Double click the '' BCA-_LV_SUMMARY OF STATISTICAL GROSS FLOOR AREA (SGFA)" under the Schedules/ Quantities of project browser, all the information is auto- tabulated for you according to format.

Note: *The tabulation is dependent on URA Area Computation.*

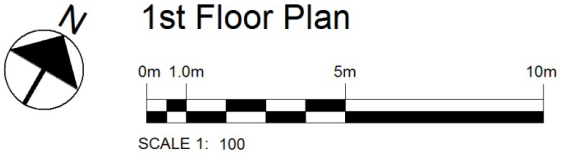
BCA-_LV_SUMMARY OF STATISTICAL GROSS FLOOR AREA (SGFA)

Blk No.	Storey	Name	GFA (m2)	Non_GFA(m2)	Total SGFA
	1st Storey	Catwalk	0.00 m²	23.22 m²	23.22 m²
	1st Storey	Communal Landsc	0.00 m²	16.43 m²	16.43 m²
	1st Storey	Carpark Residual	0.00 m²	108.26 m²	108.26 m²
	1st Storey	Resiential	20.72 m²	0.00 m²	20.72 m²
	1st Storey	Commercial	45.03 m²	0.00 m²	45.03 m²
	1st Storey	Hotel	25.72 m²	0.00 m²	25.72 m²
1st Storey			91.48 m²	147.90 m²	239.38 m²
	2nd Store	Other Area 1	0.00 m²	25.53 m²	25.53 m²
	2nd Store	Other Area 2	0.00 m²	5.72 m²	5.72 m²
	2nd Store	Hotel	108.26 m²	0.00 m²	108.26 m²
	2nd Store	Industry	16.43 m²	0.00 m²	16.43 m²
	2nd Store	Communal Landsc	0.00 m²	23.22 m²	23.22 m²
2nd Storey			124.69 m²	54.47 m²	179.15 m²
			216.16 m²	202.37 m²	418.53 m²
Grand total			216.16 m²	202.37 m²	418.53 m²

PART VIII. Annotations & Symbols

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 in the BIM e-Submission Guideline.*

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



70 Click on the drawing view to place the symbols.

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

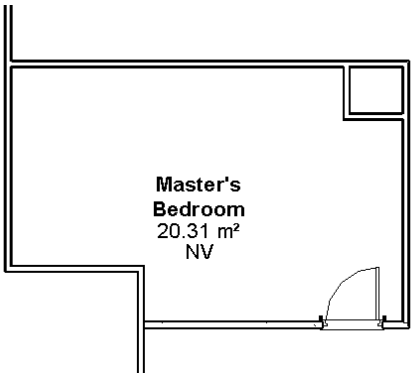
72 To change the angle of north arrow, select the symbol and click Modify Generic Annotations. In the Type Properties, insert the true north angle under Dimension parameter, then click ok.

73 To place the symbol "for reference only" on the plans, elevations and section views, repeat steps 69-70.

Note: *This symbol is specific to re-submission (URA) or 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. For details, please refer to Architectural BIM e-Submission Guideline Section 2.7*

74 To place the room tag with indication of ventilation type, double click to open the floor plan/ section view from project browser, then click Architecture tab ➤ Room & Area panel ➤ Tag Room.

75 Select the appropriate room tag with ventilation (eg. NV, MV, AC) from the type selector, and click in a room to place the room tag.

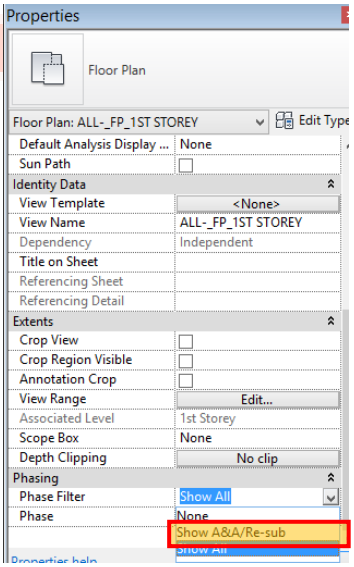


Tips: *Room Tag is different from Area Tag. Room tag indicates the function of the room and it is placed on the floor plans/ sectional views. Area Tag indicates the GFA of the floor/building and it is placed on the area plans (refer to Section V & VI).*

Note: *Room tag cannot be created without Room*

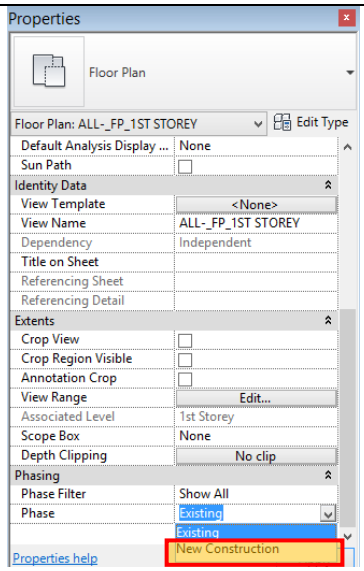
PART IX. A&A Works/ Re- submission (URA)/ Amendments

76 Open the drawing view. In the Instance Properties dialog, select Show A&A/ Re-sub for Phase Filter under 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).*

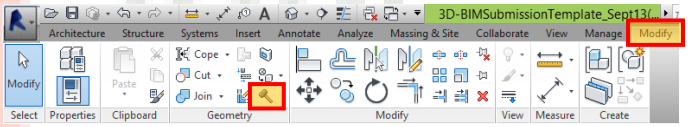
77 By default, the template will assume all building elements as new construction (in magenta). To change the phases of a specific building element to existing mode, select the object and in the Instance Properties dialog, select Existing under the Phasing parameter.



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.*

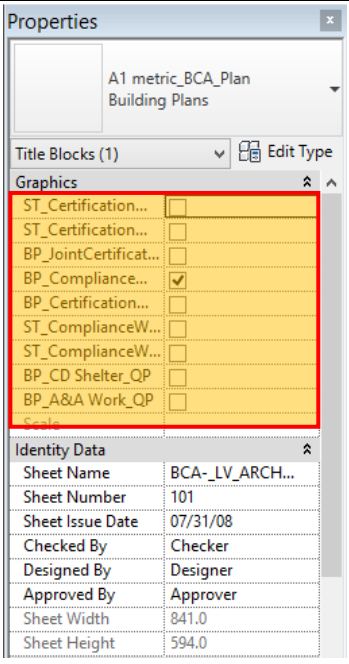
78 To demolish the building object, click Modify tab ➤ Geometry panel ➤ Demolish



79 Click on the object which you wish to knock down. Notice that the colour will change into yellow dotted line.

PART X. Endorsement & Data Information

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



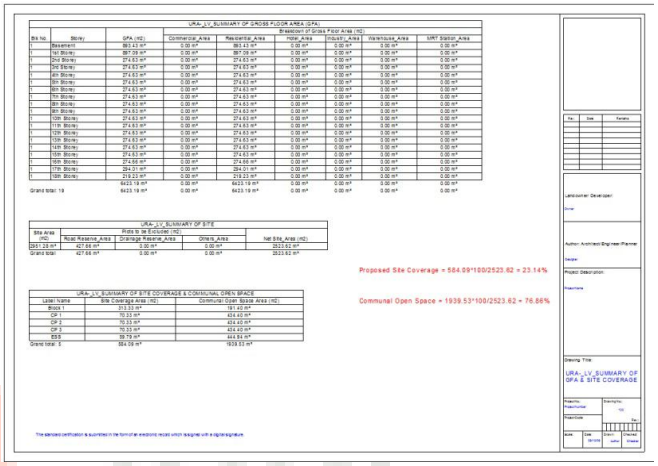
81 In the Instance properties dialog, select the appropriate endorsement statement that matches your submission (refer to Appendix B of Architectural BIM e- Submission Guideline), and click OK.

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.*

82 Fill in the blanks of the endorsement in the sheet using text.

83 Besides endorsement statements and title blocks, the sheet could also contain data information like schedules/ quantities. Drag and drop your GFA summary schedules, etc (as shown in Section V & VI) into the sheet.

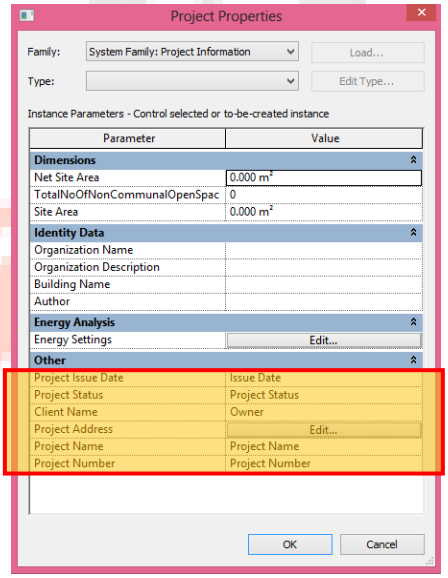
Tips: *To insert the schedule, you must first make the sheet empty. Repeat Steps 70-71 and uncheck all the boxes for the endorsement statements and click OK. Then start to drag and drop your schedule into the sheet.*



84 To insert the basic information in the title block without repetition, click Manage tab ➤ Project Settings panel ➤ Project Information.

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

86 For other specific information, select the sheet in the Project Browser. In the Instance Properties, fill in the information under Identity Data and click OK.



PART XI. Export/ Publish to DWF

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

PART XII. Migrating to latest software version

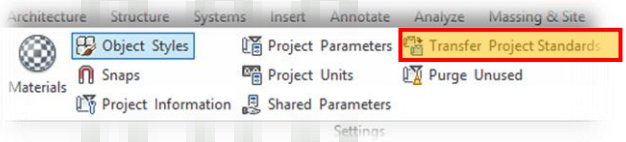
The following step by step tutorial will teach the current users to update the template and migrate all the created standards to the latest version of Autodesk Revit.

1 On the Revit 2014, open the current version 2013 company template and 2014 version of template downloaded from Corenet.

Note: *Two Revit Template files should open in one Revit Application.*

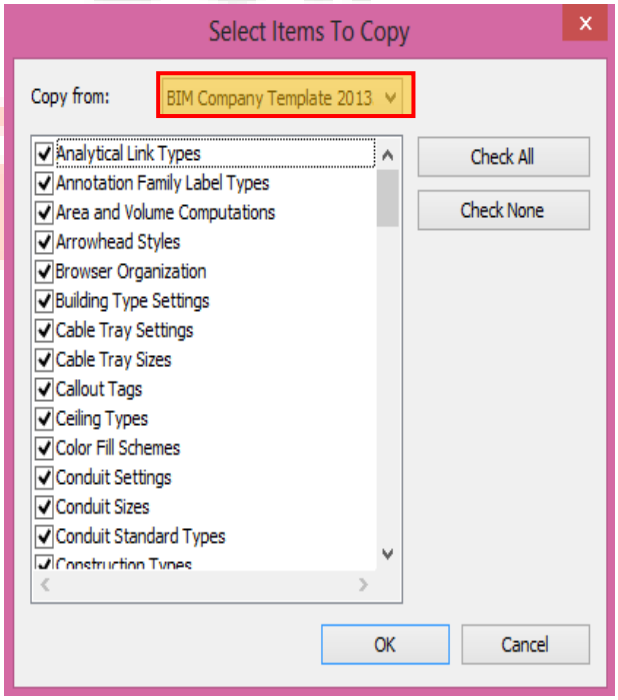
2013 template is the reference file.
2014 template is the destination file.

2 To transfer project standards:
On 2104 template file, Go to Manage Tab ➤ Setting panel ➤ Transfer Project Standards



3 On the pull- down menu, copy from: select the company 2013 template file.

The dialog box will show the list of standards you created on the company 2013 template.



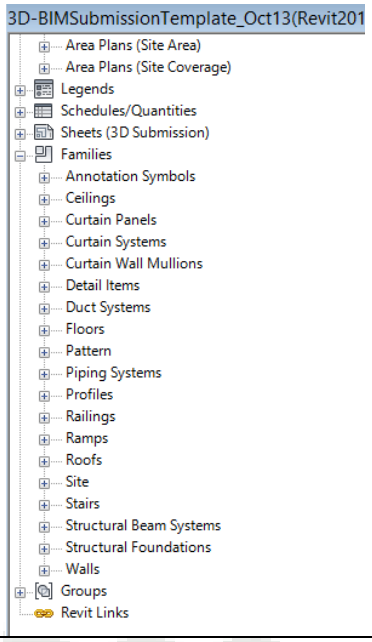
4 From the list of standards, tick the standards to be transferred for the 2014 template version.

Click OK.

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 the reference file once done.



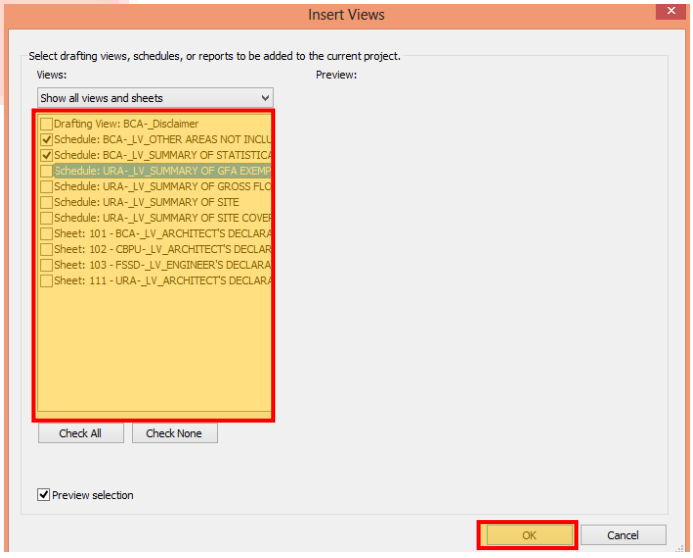
6 To copy views, schedules, reports and sheets from current project:

Go to Insert tab ➤ Import panel ➤ Insert from File ➤ Insert views from File, then browse for any project file (.rvt) and Click Open.

Note: *Only schedules from project file (.rvt) can be copied to a template file (.rte) or another project file (.rvt)*

Select the views, schedules, reports and sheets from the Insert Views dialog and Click OK.

Selected items will be copied directly to the template.



7 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

