



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

Based on
GRAPHISOFT ArchiCAD v18

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We shape a **safe**, **high quality**, **sustainable** and **friendly** built environment.



Copyright @ 2015 Building and Construction Authority Doc Name: Architecture Template Training Guide – GRAPHISOFT ArchiCAD v18 Release Date: June 2015	If you have any comments, suggestions or clarifications, please write to:	
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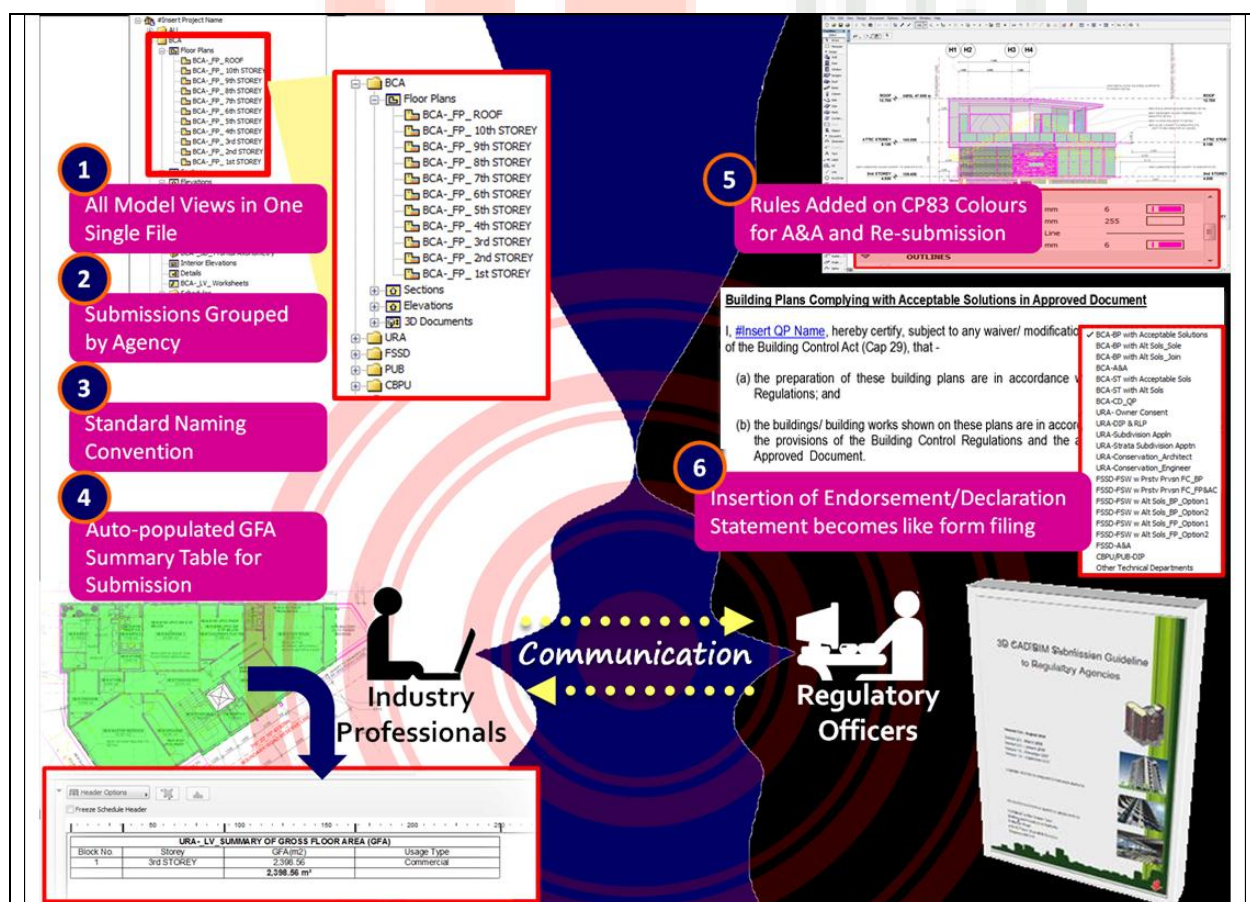
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INTRODUCTION

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 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 GRAPHISOFT ArchiCAD Users reference only. Diagram below summarises the important features available in the submission template.



PART I: Getting Started

1

In the Start ArchiCAD dialog box, under section “What would you like to do?” select **“Create a New Project.”**

2

Tick **“Use a Template,”** and select SG_BIM e-Submission Template_v18.tpl or;

In the file directory dialog, select **Browse Template...** then navigate to the folder where the BIM submission template file (.tpl) resides.

3

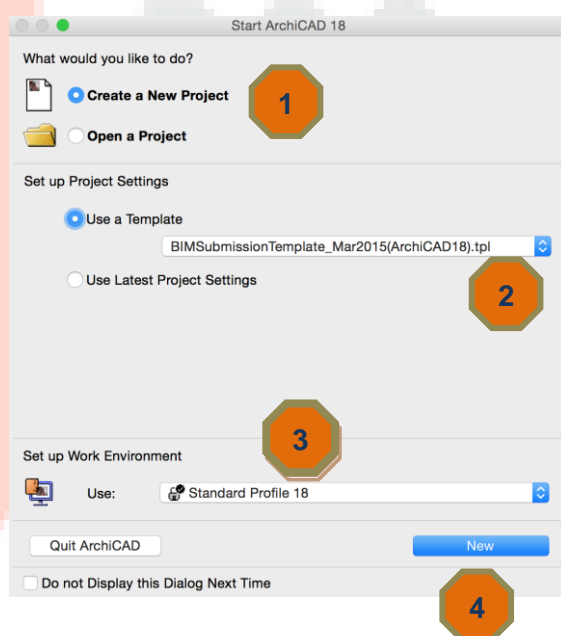
Choose **“Standard Profile 18”** as Work Environment.

4


Select the template and click **New**.

Tips: To see the template file in the file directory dialog, you need to select the File of type as ArchiCAD Project Template (*.tpl).

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



5

Once the template is opened, click the **Layout Book**  at Navigator palette on the right.

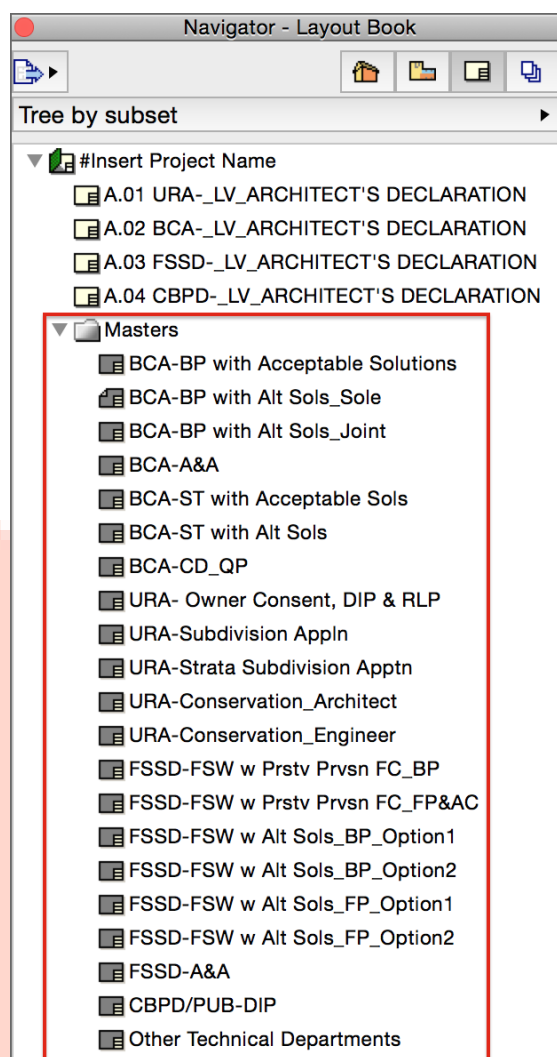
6

Expand the Masters tab; double click the master layout of *BCA-BP with Acceptable Solutions* to open.

7

When the master layout is opened in the drawing area 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 to change 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



8

Repeat Steps 7-8 for customising the titleblocks 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.

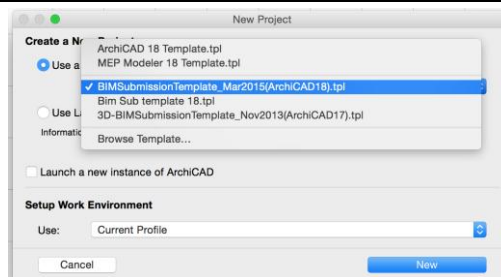
9

Once done, click File menu ➤
Save (Ctrl+S) to replace the existing **SG_BIM e-Submission Template_v18** template file.



10

Now that you have updated your own BIM Submission template, every time you create a new project (File ► New), select the BIM submission template you saved, and click New.



PART II: ArchiCAD Navigator

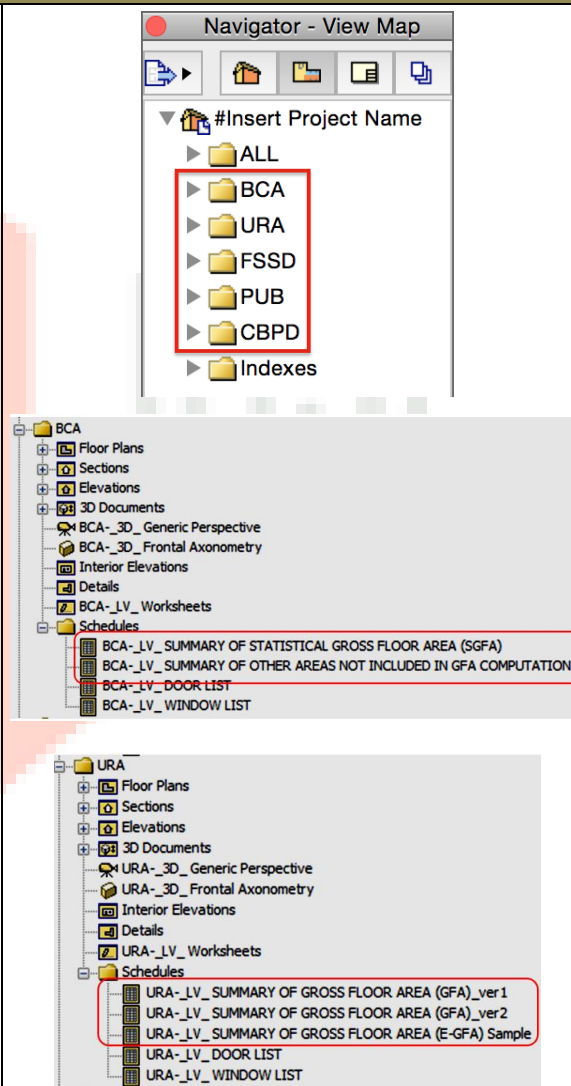
11

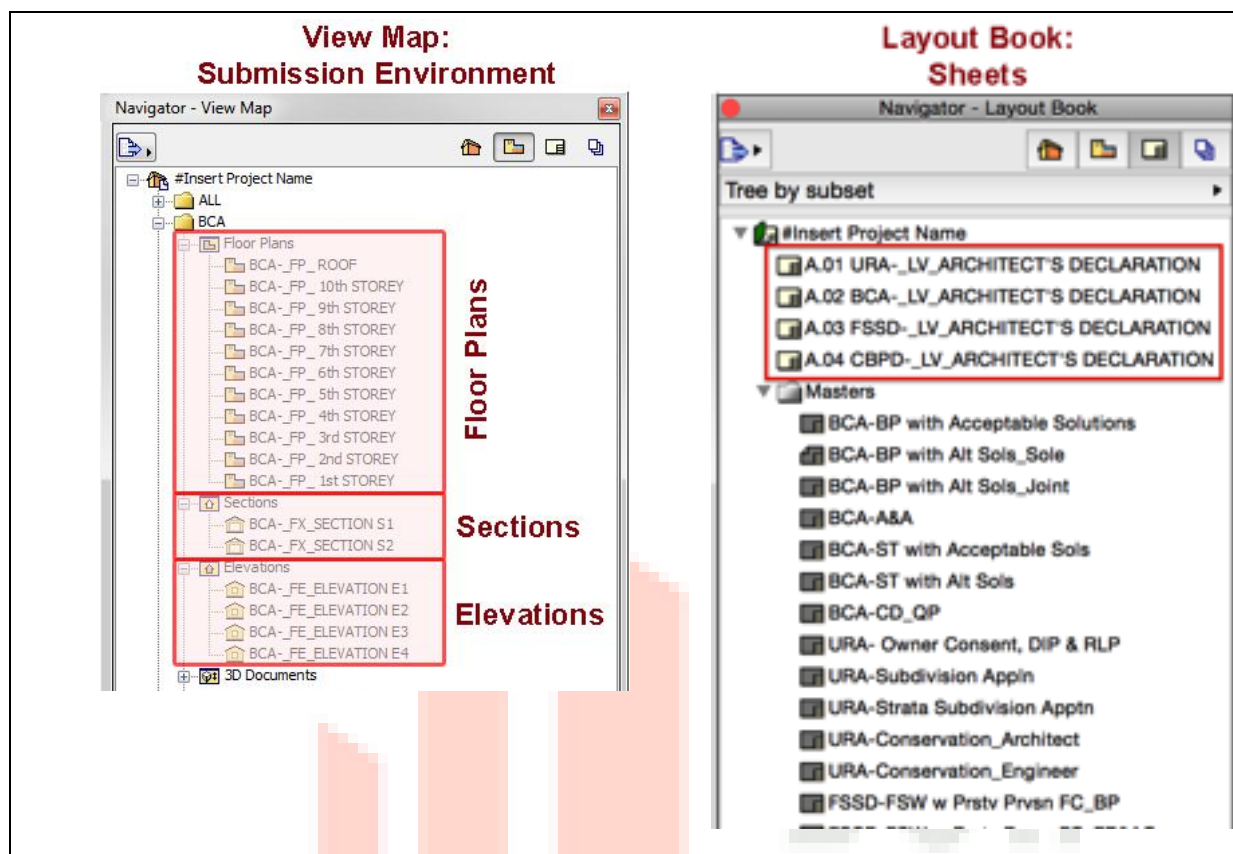
The first thing you see is the navigator palette on the right, which should contain a structure organisation by folder for BIM submission. The images on the next page (highlighted in **RED**) shows **View Map Environment** and **Layout Book: Sheets** prepared for publishing.

Tips: In the Navigator, you can click on the different Map's tab to switch between your working environment and the targeted folders that saved your views for regulatory submission.

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 your needs, as long as the final results presented to the authorities meet the requirements as specified in the BIM e-Submission Guideline.

NEW: Additional Tables for GFA and SGFA are now included under BCA Folder and URA Folder.





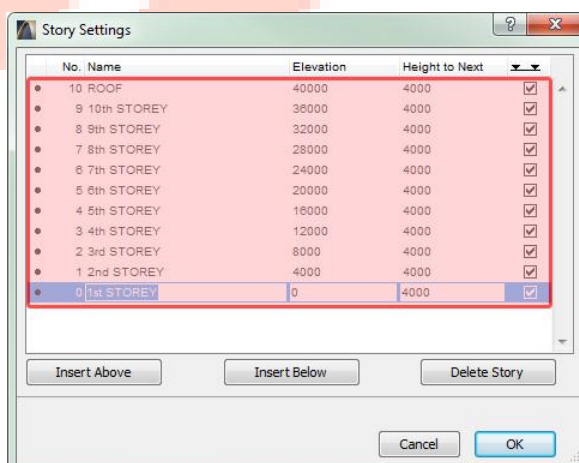
PART III: Project Elevation/ Reference Level

12

Click Design menu ► Story Settings. (CTRL+7 or ⌘7)

13

By default, the template provides 10 storeys for a project and 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: *If your project has storeys less than 10, highlight the remaining storeys and click Delete Story button in the Story Settings dialog.*

If your project has storeys more than 10, click Insert Above or Insert Below to add additional storeys. When new storeys are added, you need to rename the related floor.

14

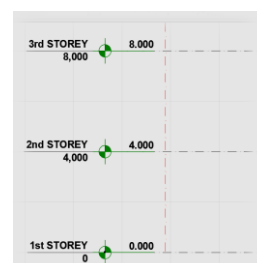
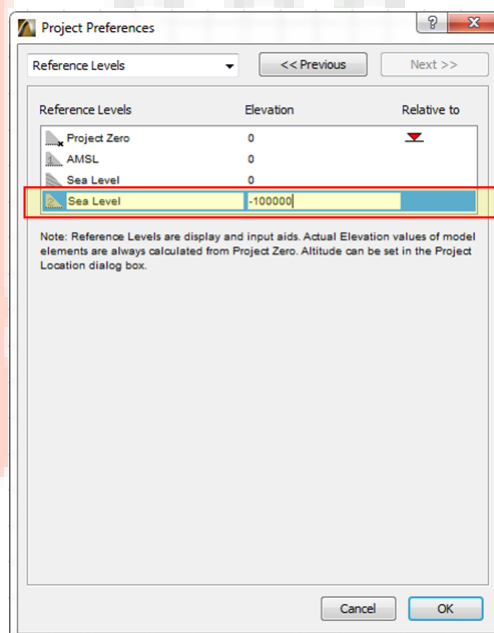
To change project reference levels, click Options menu ► Project Preferences ► Reference Levels...

15

At the bottom section of Project References dialog, select the **“Sea Level”**, then type the project datum value you need in the Elevation field. And click **OK**.

Tips: *Leave the Relative to marker next to the Project Zero.*

The Elevation value follows your settings for working units in your project (by default it should be mm in the template). When inserting the Elevation value of “Sea Level”, this value needs to be entered as a negative number (below your project level).

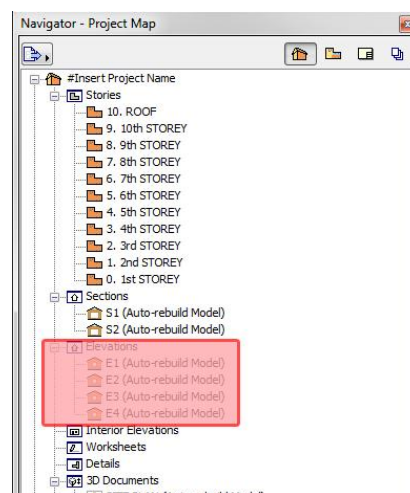


16


Double click to open **Elevation view E1** from the Project Map of the Navigator palette, then use the Arrow tool to select the Elevation marker.

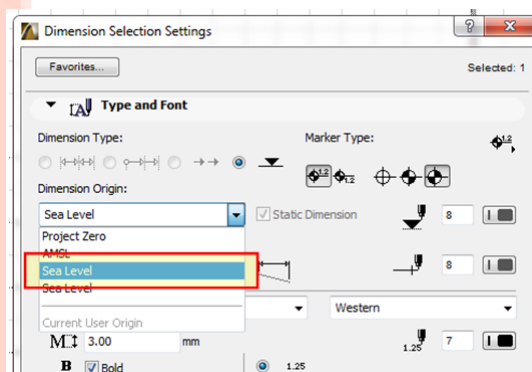
17

Under the Info box, click to open the Settings dialog of Elevation marker.



18

In the  Dimension Selection Settings dialog, select "Sea Level" under the Dimension Origin, and click OK.



19

Repeat Steps 17-19 for the remaining Elevation Views E2, E3 and E4 (or other elevation views you may have).



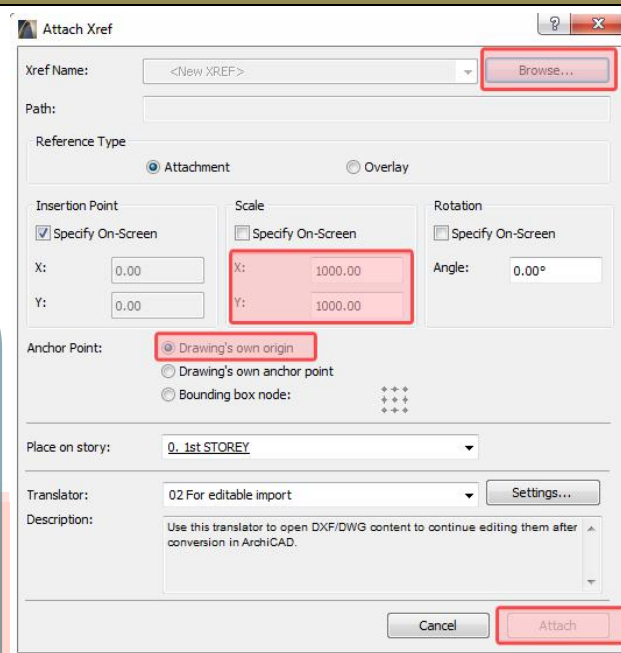
PART IV.a: Site Configuration

20


To import the topographic map (.dwg) given by your land surveyor, click File menu ► External Content ► Attach Xref.

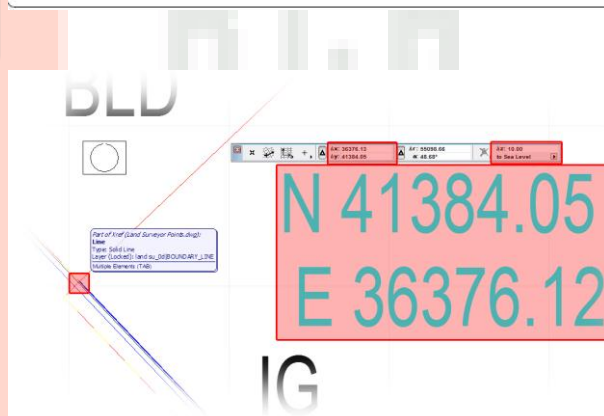
Tips: In the Attach Xref dialog, set the scale as 1:1000 for both x and y axis (if your ArchiCAD working unit is in mm, while your CAD topo map is in meter). Select the Anchor Point as "Drawing's own origin", and place the topo map at 1st storey. Then click Attach.

If prompted for the location of SHX font and shape files, you should click on Skip All unless you have specified font substitution in your Translator.



21

Click on the origin point of your ArchiCAD 1st floor plan to place the topo map. After the CAD topo map is imported, click Fit in Window  at the bottom.



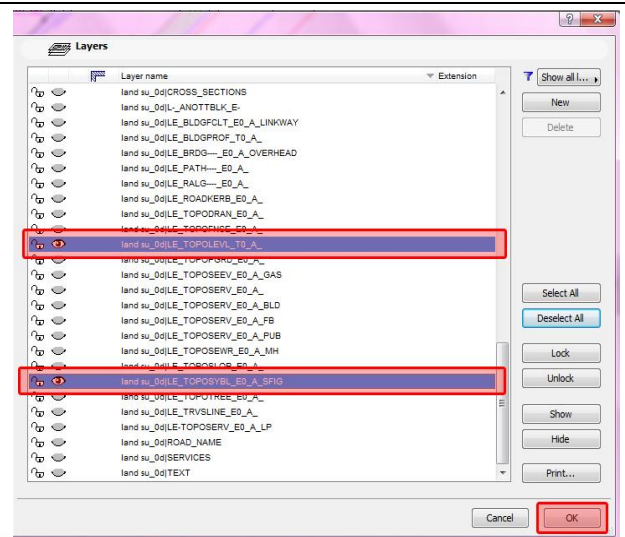
22

Select all the elevation and section markers on the floor plan/elevation and click Drag to move them to the location of your new topography map. Similarly, you need to drag to move the markers and boundary lines on the elevation and sectional views to the new location.

Tips: To double check if your model file shares the same coordinates system as the land surveyor topo map, enable the Coordinates palette by clicking the Window menu ► Palettes ► Coordinates. Then move 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).

23

Click Document menu ► Layers ► Layer Settings (Model Views). In the Layer Settings dialog, turn on only the layers to which you want to apply elevation points (the CAD layer with points/contours given by your land surveyor), and click OK.

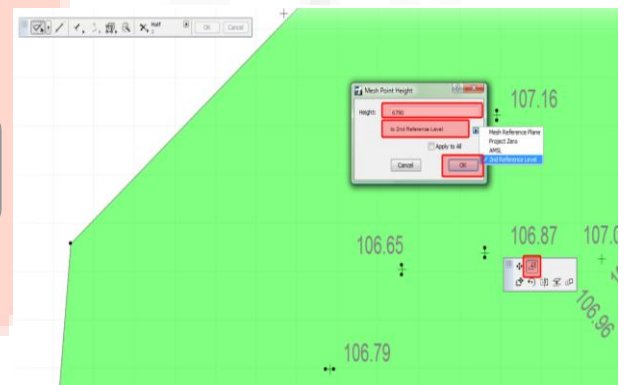


24

To create the 3D terrain, double click the Mesh tool under the Toolbox, and draw the boundaries. After the boundaries are set in the plan, set the height (spot elevations) of each node along the edge of the mesh.

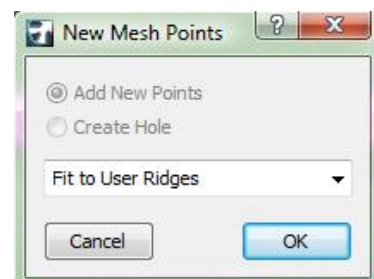


Tips: To enable the Magic Wand Tool, click Window menu ► Palettes ► Control Box.



25

Select the mesh object you just created with the Arrow Tool under Toolbox and then click on the Mesh tool to make sure it is active. Click the Magic Wand Tool in the Control Box palette.



26

If the CAD topo map you have are spots/points, manually insert the points of terrain with the Magic Wand Tool by clicking on one of the survey points after you see the Mercedes cursor. With the Mesh tool still active, press Spacebar + click on each survey point and ArchiCAD will auto-insert a point to the 3D terrain. Each time, a “New Mesh Points” dialog box will come up and make sure the “Fit to User Ridges” option is chosen. Continue Spacebar + clicking on all necessary survey points until finished. (You only have to pick the critical points to create the 3D terrain)

Tips: If the land surveyor provides you DWG topographic map with contour lines, you can simply apply Step 26 to trace contour lines.

That's why it is good to start requesting your land surveyor to provide you the topographic map with contour line. This will facilitate you in auto-trace the contour lines in ArchiCAD.

27

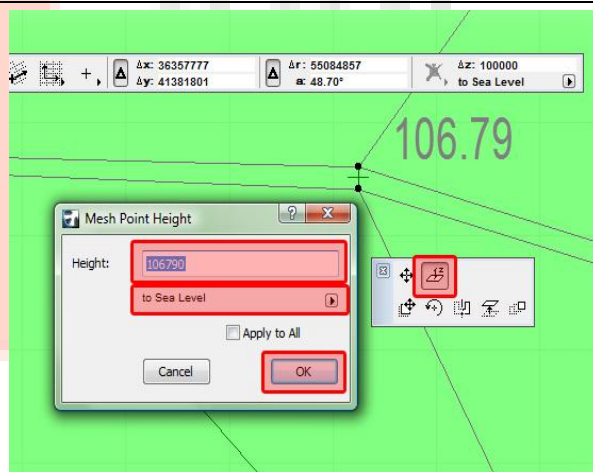
With the 3D Terrain still selected and the Mesh Tool active, click and hold the mouse button down on any node/contour lines and a Pet Palette will appear with options to move the node or give it a Z elevation. Choose the Z elevation option.

28

When the “Mesh Point Height” dialog box appears, insert the height accordingly, based on the value as given by your land surveyor. Select the reference as “to Sea Level” (Ensure that you have inserted the Sea Level in step 15 above). And click OK.

29

Repeat Step 28 for the other nodes/ contour lines of the 3D terrain.



PART IV.b: Importing Surveyors Data...

Tips: If the Land Surveyor provides you DWG topographic map alternatively, you can also request from the Surveyor to give you the topographic file in .TXT or .XYZ format

It is good to start requesting your land surveyor to provide you the topographic map .txt or .xyz file format because it is more convenient and makes it easier to visualize the site model in ArchiCAD.

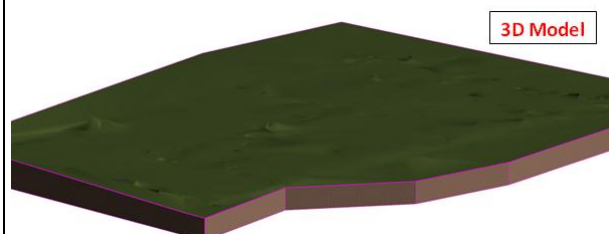
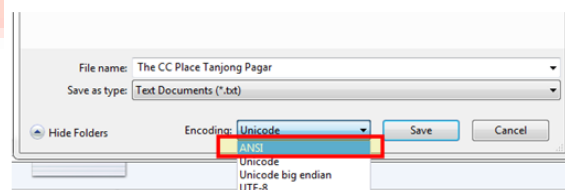
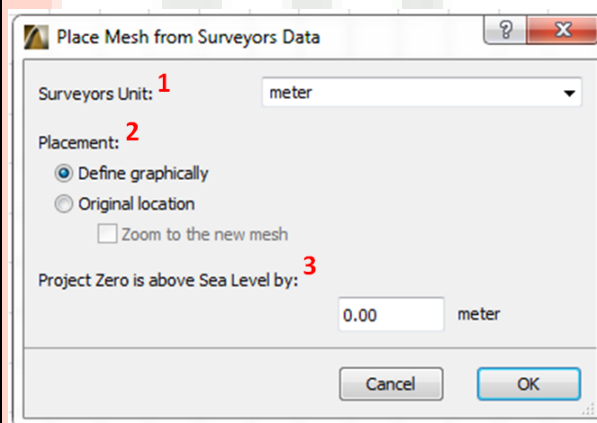
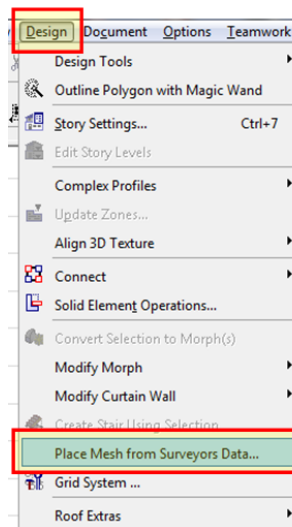
30

Go to Design ► Place Mesh from Surveyors Data...

31

Choose a Surveyor Data file to open. A window dialogue will pop to be configured accordingly then click OK.

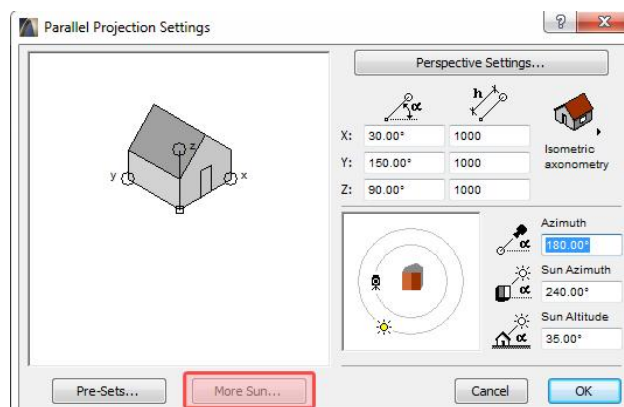
Tips: topographic file in .TXT or .XYZ format must be saved in **ANSI** encoding before importing to ArchiCAD. Otherwise it will not show in the model space.



PART V: Building Orientation to the True North

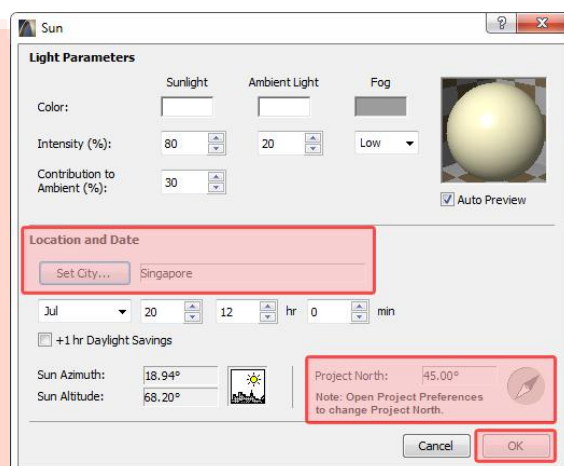
32

To change the building orientation to the true north on site plan, click View menu ► 3D View Mode ► 3D Projection Settings. In the Parallel Projection Settings dialog, click More Sun button at the bottom.



33

In the Sun dialog, set the city as Singapore and change the Project North to the true orientation of your building project. Then click OK.



Note: Though it's called 'Project' north, it's true north, in that it's the only north, and the north used by the sun settings. Archicad doesn't directly support a project north environment variable separate from true north.


PART VI: GFA and SGFA Tabulation

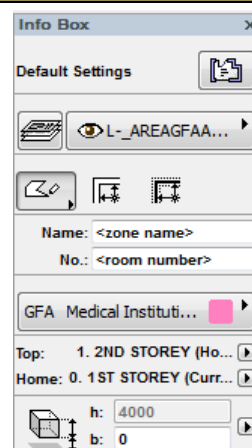
For (URA) GFA Tabulation:

34


Double click to open the floor plan from the navigator palette.

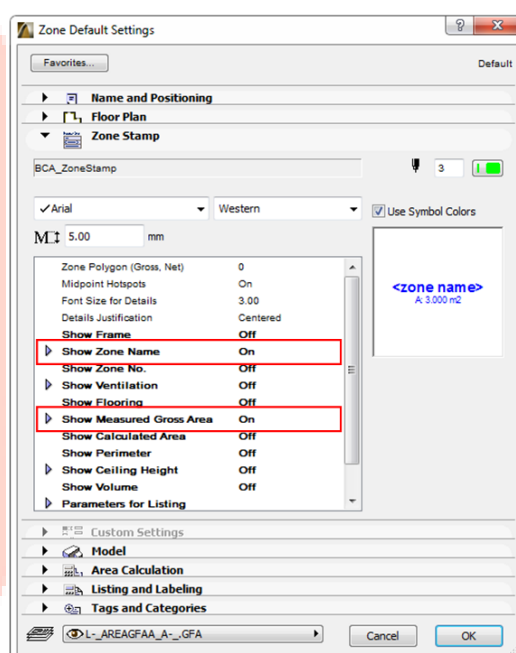
35

From the Toolbox select  Zone tool. In the Info Box of Zone, assign the layer “L-AREAGFAA_A_-”; select the appropriate Zone Category of your project and insert the Zone Name.




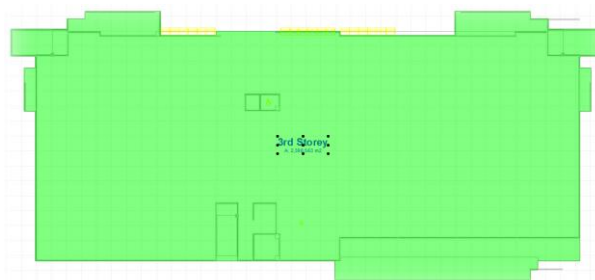
36

Open Zone Setting;  and in the Zone Stamp panel - make sure the **Zone Name** and **Measured Area** are turned **ON** then click OK.



37

In the Info Box, select the Construction Method: Manual  and start to draw the area boundaries of the floor GFA. Then, click to place the zone stamp.



Tips: The Zone boundary must be an enclosed polygon.

38

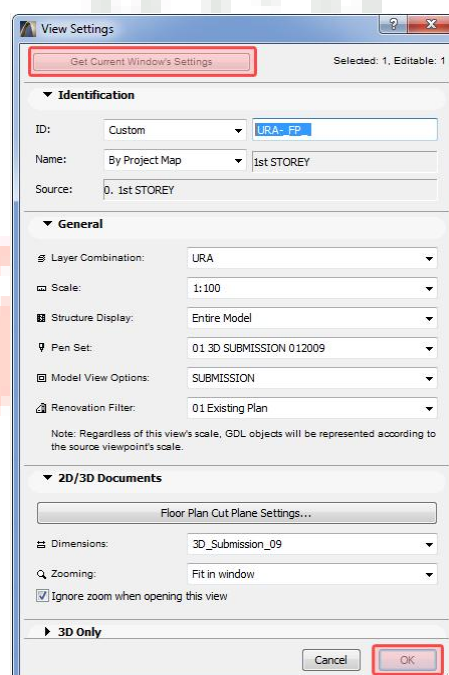
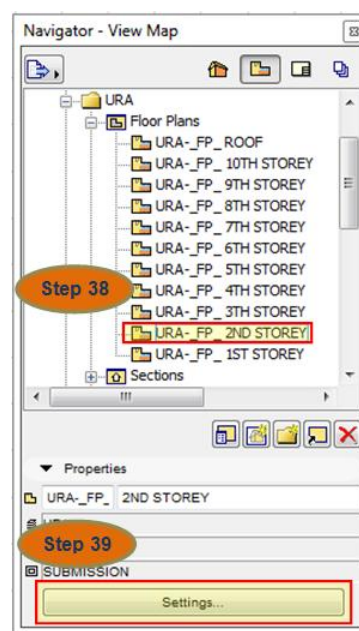
Double click to open the respective floor plan views under the URA folder of the View Map in Navigator palette.

39

At the bottom of the navigator palette (if you are using a standard V18 profile), click the **'Settings'** button. In the View Settings dialog, click Get Current Windows Settings, and click OK.

Tips: If you have added more stories in your project, you can save the new floor plan views from Project Map to View Map. Simply right click on the floor plan under Project Map of the Navigator palette, change the necessary settings and click OK.

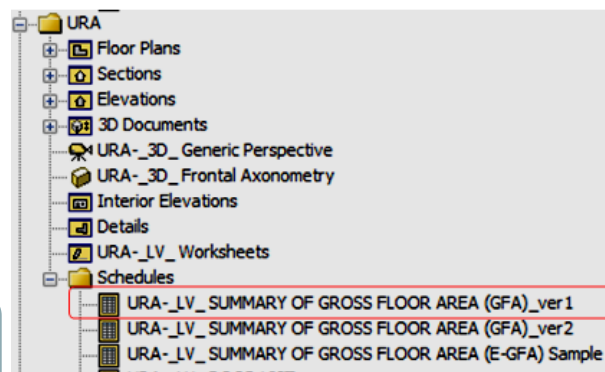
Click to open the View Map, rename the saved view according to the naming convention as specified in the Architectural BIM e-Submission Guideline. Drag and drop the saved view into the appropriate agency's folder.



40

Double click to open the “**URA-LV_SUMMARY OF GROSS FLOOR AREA (GFA)_ver1**” under the Schedules folder. The GFA is auto-tabulated for you according to format.

Tips: To use other URA tabulation, know more about the criteria of each table by opening “**Scheme Settings...**”



41

Alternatively you can use the other tables to suit your need. To configure the settings click the ‘**Scheme Settings...**’ button.



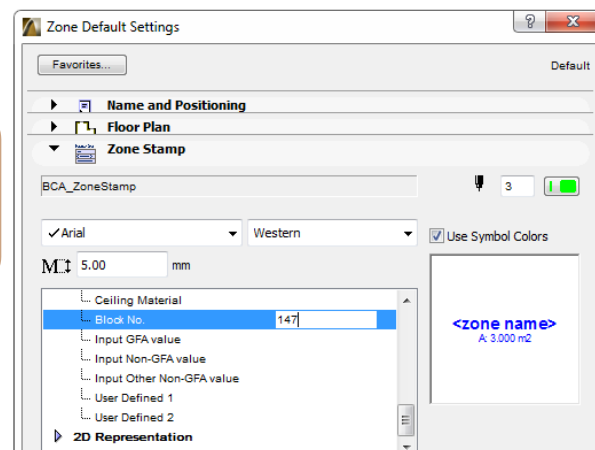
42

To insert the Block No of the respective GFA areas defined. Open the Zone Settings > Zone Stamp > Parameters for Listing > Input Block No.

This way Block No. will auto-generated in the GFA Table.

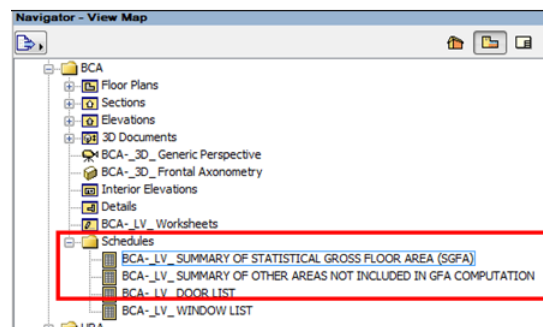
Note: You can choose to drag and drop the tabulated GFA summary into the layout/sheet, or leave it in the Schedule folder.


Block No.	Storey	GFA(m2)	Usage Type
1	3rd STOREY	2,398.56	Commercial
		2,398.56 m ²	



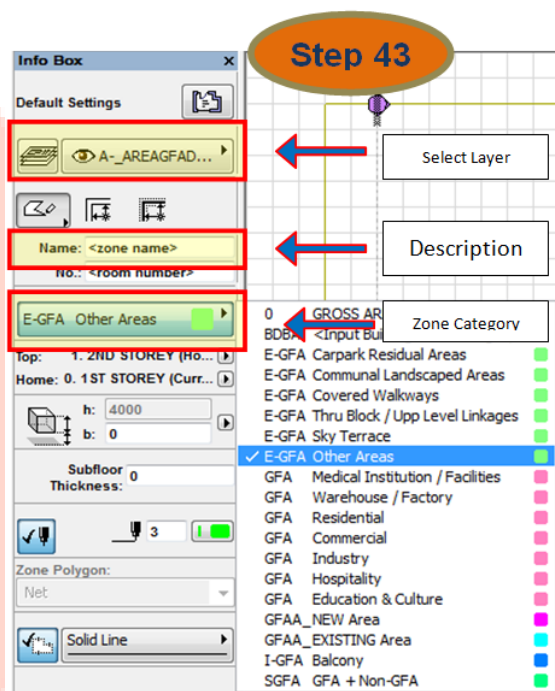
For (BCA) SGFA Tabulation:


Note: *SUMMARY OF STATISTICAL GROSS FLOOR AREA (SGFA) and SUMMARY OF OTHER AREAS NOT INCLUDED IN GFA COMPUTATION* can be viewed from **Navigator > BCA Folder > Schedules**

**43**

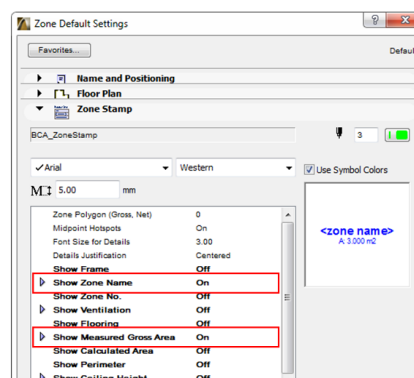
To auto-generate SGFA table; For areas **NOT** counted as GFA, from the Toolbox select  Zone tool. In the Info Box of Zone, assign the layer “**A_-AREAGFAD_A_-NonGFA**”. Select the appropriate **Zone Category** and insert the **Zone Name**.

Note: *Must read the Scheme Settings... content of each table before using. Criteria panel helps you filter the Element type: Zone and Layer that will reflect in the SGFA table. Schedule Fields, contains selected parameters (or information) to reflect in the table i.e. Description, GFA, Non-GFA and Total SGFA.*

**44**

Open Zone Setting;  and in the Zone Stamp panel - make sure the **Zone Name** and **Measured Area** are turned **ON** then click OK.

Tips: *The Zone boundary has to be an enclosed polygon.*

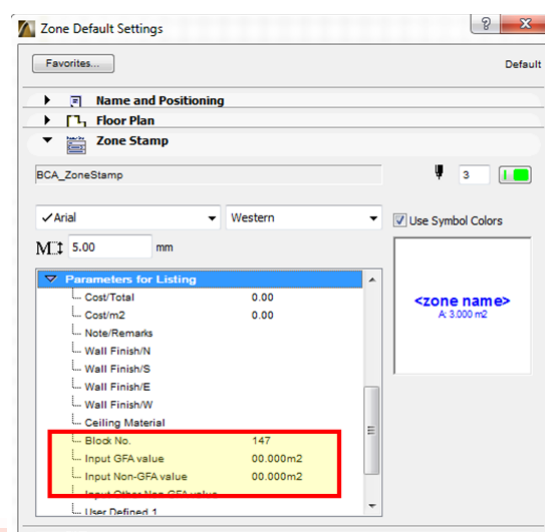


45

After creating a Zone object, select the object and open the Zone Settings > Zone Stamp panel > Parameters for Listing

Indicate the **Block No.** and **GFA** or **Non-GFA** measured value generated for the selected zone.

This way the Block No., GFA and SGFA will auto-generated in the SGFA Table.

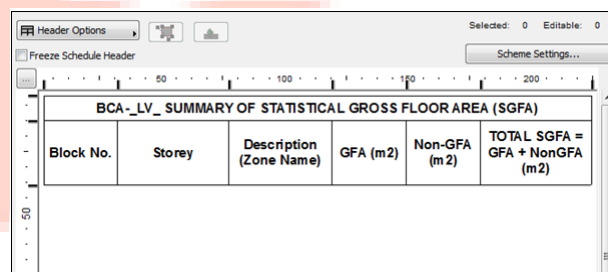
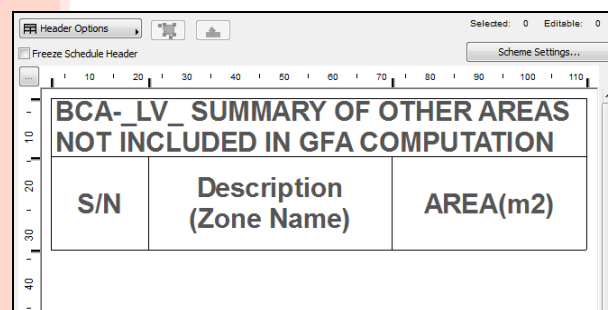


46


Repeat steps 43-45 for all Non-GFA areas (zones).

Note: SUMMARY OF OTHER AREAS NOT INCLUDED IN GFA COMPUTATION will auto-generate the same NonGFA values generated from the SUMMARY of SGFA table, provided you use the same Layer for the Zone objects.

This makes it easy to generate the table without doing it from start again.



47

For areas counted as GFA, from the Toolbox select  Zone tool. In the Info Box of Zone, assign the layer “**A-AREAGFAA_A-.GFA**”. Select the appropriate **Zone Category** of your project and insert the **Zone Name**.

48

Repeat steps 44-45 for all GFA areas (zones).

Tips: To customise Zone Category to suit your need, go to:

Options menu ► Element Attributes ►
Zone Categories...

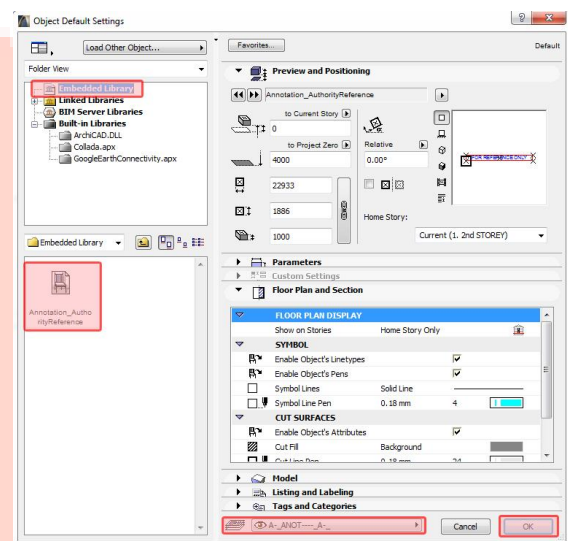
PART VI: Annotation & Symbols

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.

FOR REFERENCE ONLY

49

To place the symbol “for reference only” on the drawing views, double click the Object Tool under the Toolbox. Select the “Annotation_AuthorityReference” symbol under the Embedded Library. Select the placement at appropriate layer and click OK.



50

Click to place the symbol in the drawings.

51

To place the zone stamp with indication of ventilation type, double click the Zone Tool under the Toolbox.

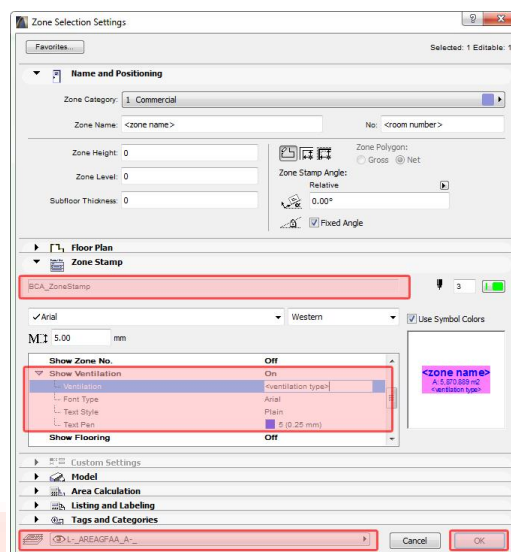


52

In the Zone Default Settings, make sure that the “BCA_ZoneStamp” is available under the Zone Stamp. Then insert the Zone Name, Zone Category and Ventilation Type etc. Select the placement at appropriate layer and click OK.

Note: *BCA_ZoneStamp* is already part of the Embedded Library found in the Library Manager of “SG_BIM e-Submission Template_v18.tpl”.

Click Options menu Element Attributes Zone Categories, select the “BCA_ZoneStamp”, and click OK.

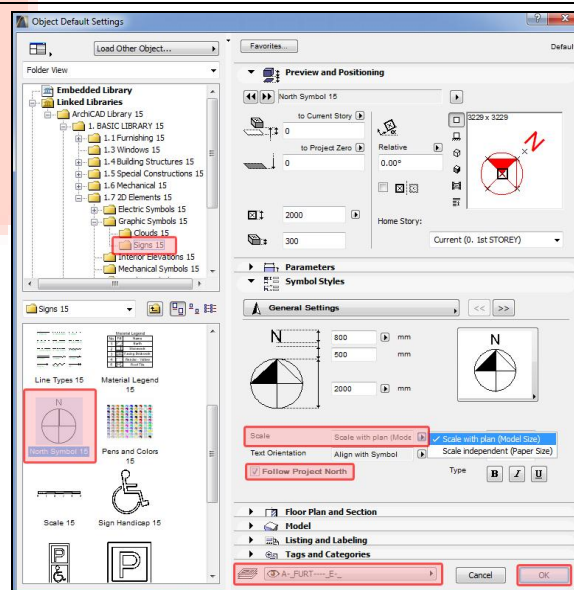


53

To place the north arrow on the floor plan views, double click the Object Tool under Toolbox. Click Libraries > ArchiCAD Library 18 > Object Library 18 > 1.7 2D Elements 18 > Graphic Symbols 18 > Signs 18, then select North Symbol 18.

54

Under the Symbol Styles section, select the “Scale with plan (Model Size), and “Follow Project North”. Then place it at appropriate layer and click OK.



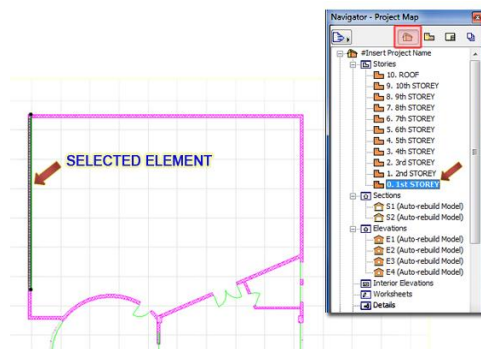
Tips: To ensure that the North Arrow inserted on the floor plans auto-rotate to the Project North, you need to first change the orientation of your project, following Steps 30-31 above.

PART VII: A&A Works/ Re-submission (URA)/ Amendments



48

By default, all elements/objects available inside the template are set as *Existing* (in ArchiCAD term) or *Proposed Element* (in magenta, based on CP83 Part 5). To change or assign new renovation status, open the viewpoint in the Project Map of Navigator Palette, select the element/object you want to change status, right click and select Object Selection Settings (or Ctrl + T).



49

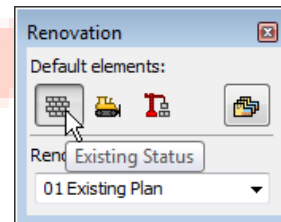
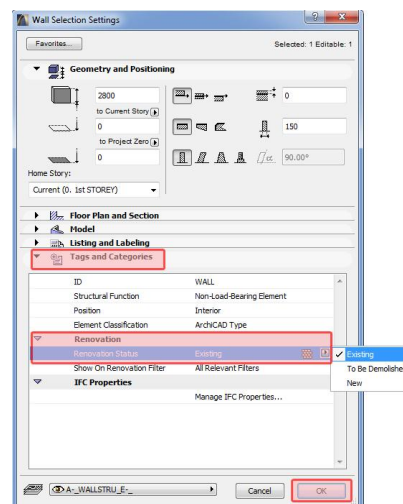
Under Tags and Categories of the Object Selection Settings, go to Renovation and select renovation status (Existing, To Be Demolished or New) accordingly.

50

Click OK.

51

Use Renovation Palette to change/ assign renovation status for multiple elements at one time by selecting elements first then click on the renovation icon representing the status you need under "Default elements:"



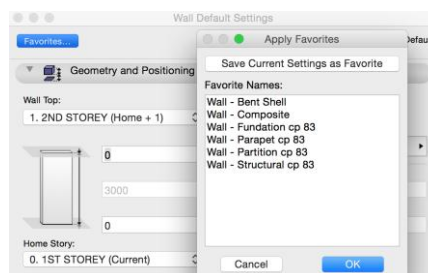
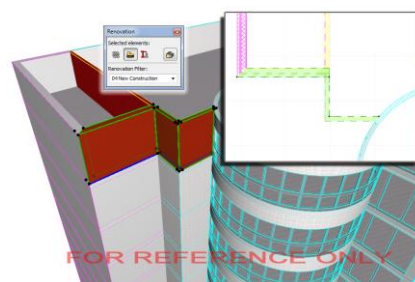
Tips: Use the Renovation Palette to assign a Renovation Status to any number of selected elements, or to set a default status for all elements.

The Renovation Palette can be opened from **Window > Palettes > Renovation Palette**.

Tips: Use the Pre-set favorites on the wall default settings dialog box

The favorites Palette can be opened from **Window > Palettes > favorites**.

And they can be used and saved for any tool. (These settings are part of the template).



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For additional filter options, go to Document menu ► Set Renovation Filter ► Renovation Filter Options under “Filter Settings” (Show, Hide or Override) and “Additional Filter Options for.”

53

To change override styles for each filter settings, click “Renovation Override Styles...” Choose which renovation filter to override (Existing Element, Elements To Be Demolished, or New Elements); Check box to change 2D representation and material on 3D.

54

Click OK.

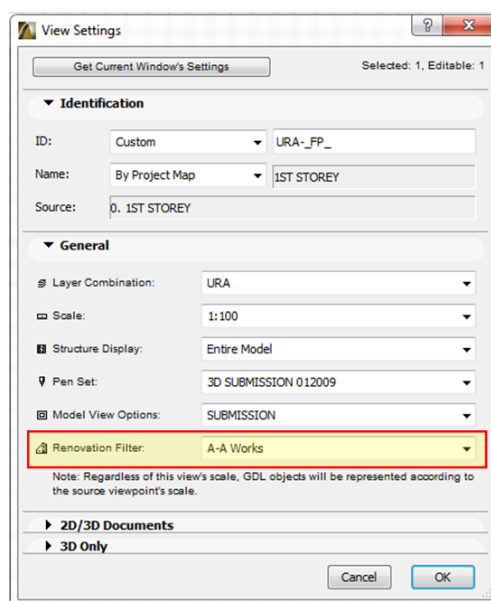
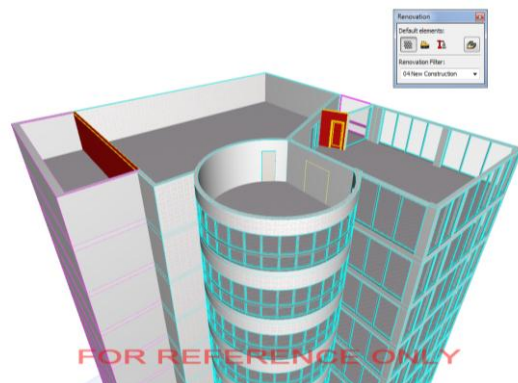
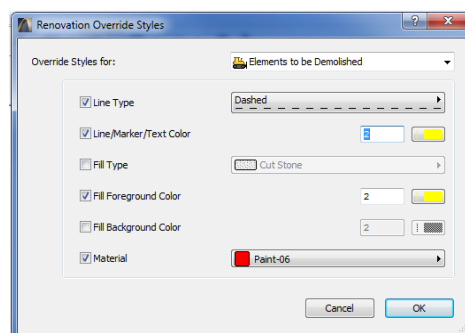
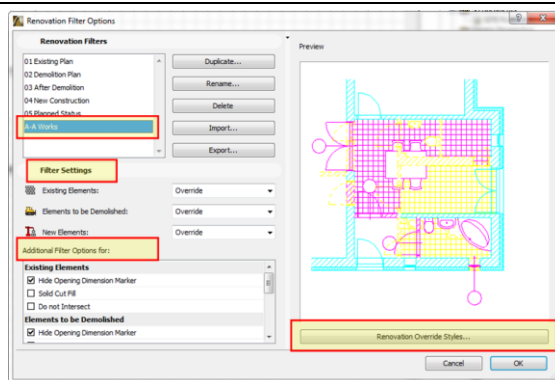
Note: The Renovation Filter colour is based on the three CP83 colour codes for A&A / Re-submission (URA)/ Amendments submission, as specified in the Architectural BIM e-Submission Guideline and is already in the "SG_BIM e-Submission Template_v18.tpl".

Click Document menu ► Set renovation Filter to see Renovation Filter Options.

55

Click to open the respective floor plan views under the URA folder of the View Map in Navigator palette. At the bottom of the navigator palette. Click the Settings button. In the View Settings dialog, under General, select Renovation Filter to represent its A&A Work status, and click OK.

Tips: You can change the Renovation Override Styles in Document menu ► Set renovation Filter ► Renovation Filter Options.



PART VIII: Endorsement & Data Information

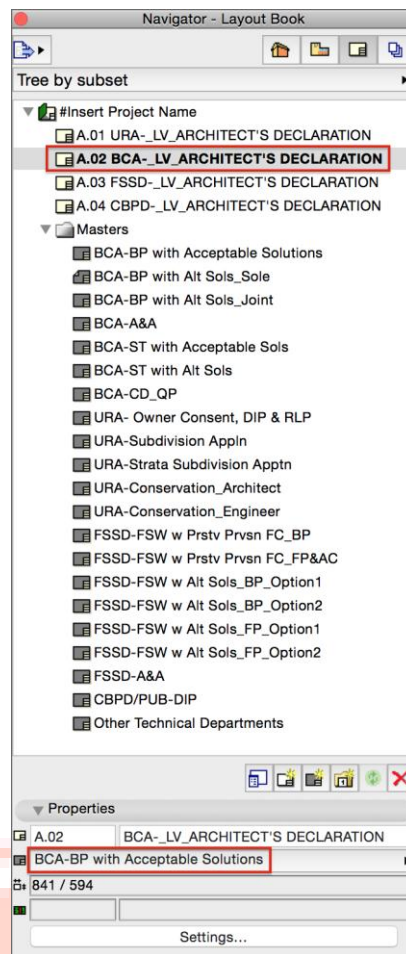
56

Double click to open the sheets from Layout Books of the Navigator palette. Click on the sheet on the drawing area and change the type according to the regulatory authority you are submitting to.

57

Under the Properties palette at the bottom of the Navigator, select the appropriate endorsement statement that matches your submission (refer to Appendix B of BIM e-Submission Guideline).

Note: Each sheet could only contain 1 endorsement statement. If you have more than 1 endorsement statement to submit, create more layouts in the Layout Book of Navigator Palette. However, remember to rename the layout/view according to the naming convention as specified in the Architectural BIM e-Submission Guideline.

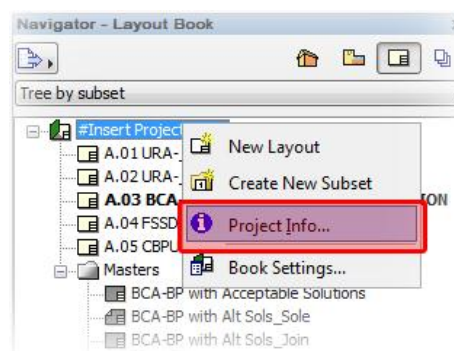


58

To insert basic project information and QP's name in the title block and the endorsement statements without repetition, right click on the Layout tab and select Project Info.

59

In the Project Info dialog, insert all the necessary information of your project, and click OK.



Note: This is a one-time setting ONLY and the same information will appear in all the layouts/sheets created.

60

In some of the endorsement statements, AutoText was not created. You can fill in the blanks using the Text tool from Toolbox.

Tips: If you wish to create more Autotext in your project for future use, you can do so in Part I and customise this template. For steps in doing so, you can refer to the software training guide from your vendor.

No.	Name	Description
1	Client	#Insert Client Name
2	Project Name	#Insert Project Name
3	Project Number	#Insert Project Number
4	Company	#Insert Company Name
5	Street	----
6	City	----
7	State/Country	----
8	Postal Code	----
9	Architect	#Insert QP Name
10	CAD Technician	# Insert DraftPerson
11	Project Status	
12	Date of Issue	
13	Keywords	
14	Notes	
15	Structural Engineer	----
16	Accredited Checker	----
17	Surveyor	#Insert Surveyor Name
18	Architect's Regist...	----
19	Architect's Address	----
20	Mechanical Engin...	----
21	Fire Safety Engin...	----

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Besides endorsement statements and titleblocks, the sheet could also contain data information like schedules. Drag and drop your GFA summary schedules etc. (as shown in Section V) into the sheet. Alternatively, you can retain your schedules in the floor plans, or in the Schedule folder.

PART IX: Export/Publish to PDF

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Refer the relevant [GRAPHISOFT Helpcenter article](#) for step-by-step guide to export/ publish to PDF for regulatory submission.

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