



# Structural Submission Template

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## for ARCHICAD 21

**Building and Construction Authority**

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Singapore 608550

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## INTRODUCTION

The objective of this document is to assist structural engineers in developing BIM models collaboratively based on both the *Reference Model* and *One-Model Concepts*.

This is a generic reference guide for typical housing projects and shall not be considered as an extensive document including all project cases. The template and actual workflows may be changed based on certain scenarios and the users are recommended to audit and revise their workflows from project to project.

This document is focusing on the use of GRAPHISOFT ARCHICAD 21 with regard to the requirements of BIM collaboration and it does not include the explanation of ARCHICAD terms in general.

Though the solutions demonstrated in this guide are aligned with the specifications of the Singapore BIM e-Submission Guidelines and Code of Practice, the users are required to check the actual requirements and GRAPHISOFT shall not be held responsible for non-compliance.

Architectural project delivery and submission is not covered in this document, for details refer to the relevant ARCHICAD templates and guides available at the CORENET website.

The current version of the template and its user guide is under constant development and updates may be available at a later time.

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Find the BIM e-Submission Guidelines at the CORENET website here:  
[https://www.corenet.gov.sg/general/building-information-modeling-\(bim\)-e-submission.aspx](https://www.corenet.gov.sg/general/building-information-modeling-(bim)-e-submission.aspx)

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## ONE-MODEL CONCEPT vs. REFERENCE MODEL CONCEPT

Compared to the *Reference Model Concept* where each discipline is able to edit and modify its own model only while using the others' models as protected references alongside their own, the One-Model Concept allows different disciplines to work on one central model. The members of these disciplines have different access rights to edit elements and properties depending on their role in the project.

**The One-Model Concept can be followed in case all three disciplines** (architects, structural engineers and MEP engineers) **are using ARCHICAD as the BIM authoring tool.**

**Working with the One-Model Concept does not mean that there are no links in the project or that there is only one single project file** for the modeling and documentation.

**Creating modules/groups improves the workflow for example by the easier management of repetitive parts.** It also helps by separating the work areas of disciplines if needed, for example in case of combined models of architects and MEP engineers where the two disciplines usually should not change the other domain.

In case of collaboration between architects and structural engineers however, it is necessary that **the structural team has access to certain elements that were originally defined by the architects** (beams, columns, etc.) for refinement. These **refinements are done on the architectural elements directly by the structural engineers** with the One-Model Concept.

The One-Model Concept may also have **file separation for documentation purposes** or performance optimization.

Since the architectural model can be used for structural purposes, the modeling time is significantly shorter as in case of reference modeling, however since the representation requirements are the same, the differences between the two methods require more preparation on the workflows and not the actual modeling work/element settings or documentation process. Hence this guide can be used as a generic reference for both one-model and reference model workflows.

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**Note: No IFC file exchange is necessary when using the One-Model Concept** compared to the Reference Model Concept.

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## STRUCTURAL WORKFLOW

In regular reference-based workflows the structural team provides design consultation during the Conceptual Design stage and is not expected to create BIM content until the Preliminary Design stage.

In the One-Model Concept however - since the architectural elements are directly accessible and no additional modeling of existing elements is needed - the **structural modeling and core information aspects can be set by the structural team in the early phases already**, shortening the overall project delivery time.

- 1 **The architectural team prepares the block (ARCHI - BLOCK FILE), which includes certain structural elements**, like slabs, columns and beams.
- 2 **The structural team** (marked with red in the diagram below) **has access to the core information of these elements and can change the dimensions as well** (red dots). Typically only a few members of the structural team should have access to the architectural teamwork projects. Depending on the project setup, the structural team member will most likely have access to the architectural unit file (ARCHI - UNITS FILE) as well, since structural elements will be included on that level already.
- 3 **The architecturally complete block is *hotlinked* into a structural base project.** The block is linked as a whole teamwork project, there is no need to publish MOD or PLN files.

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**Note:** Certain attributes of the architectural file will be inherited, such as *Layers*; while other attributes, like the *Layer Combinations* will not. To avoid discrepancies, it is recommended to set up/use a *Project Base File* or a template with common attributes hotlinking occurs in the project later. The preparation of these base files is the scope of the BIM Manager. Any interim changes to the attributes should be thoroughly carried out in all related files/projects.

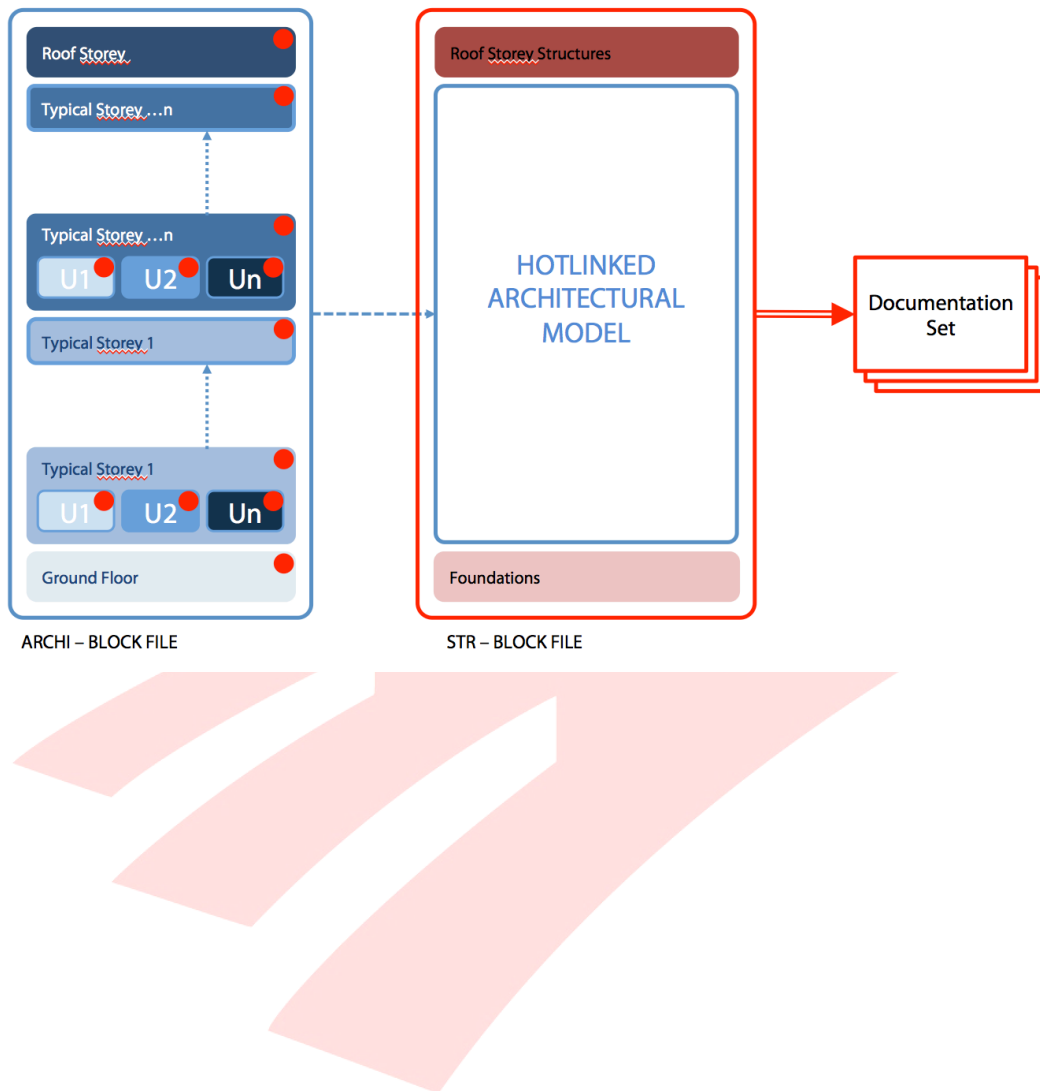
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- 4 **The structural team will complete the architectural model with structural elements**, typically by adding:
  - roof story structures
  - roof levels (preferably should have been defined within the architectural file during the early phases already)
  - foundations

Otherwise **the architectural model is not edited**. If some editing is still needed it will be done in the ARCHI - BLOCK FILE.



- 5 **The structural team then completes the documentation in the STR | BLOCK FILE,** which is a regular teamwork project.  
During the import of the architectural model (including its documentation/annotation elements) unnecessary content will be created that the structural team will have to filter by Layers for example.
- 6 **The structural Documentation Set is produced from the STR | BLOCK FILE project file/teamwork project.**



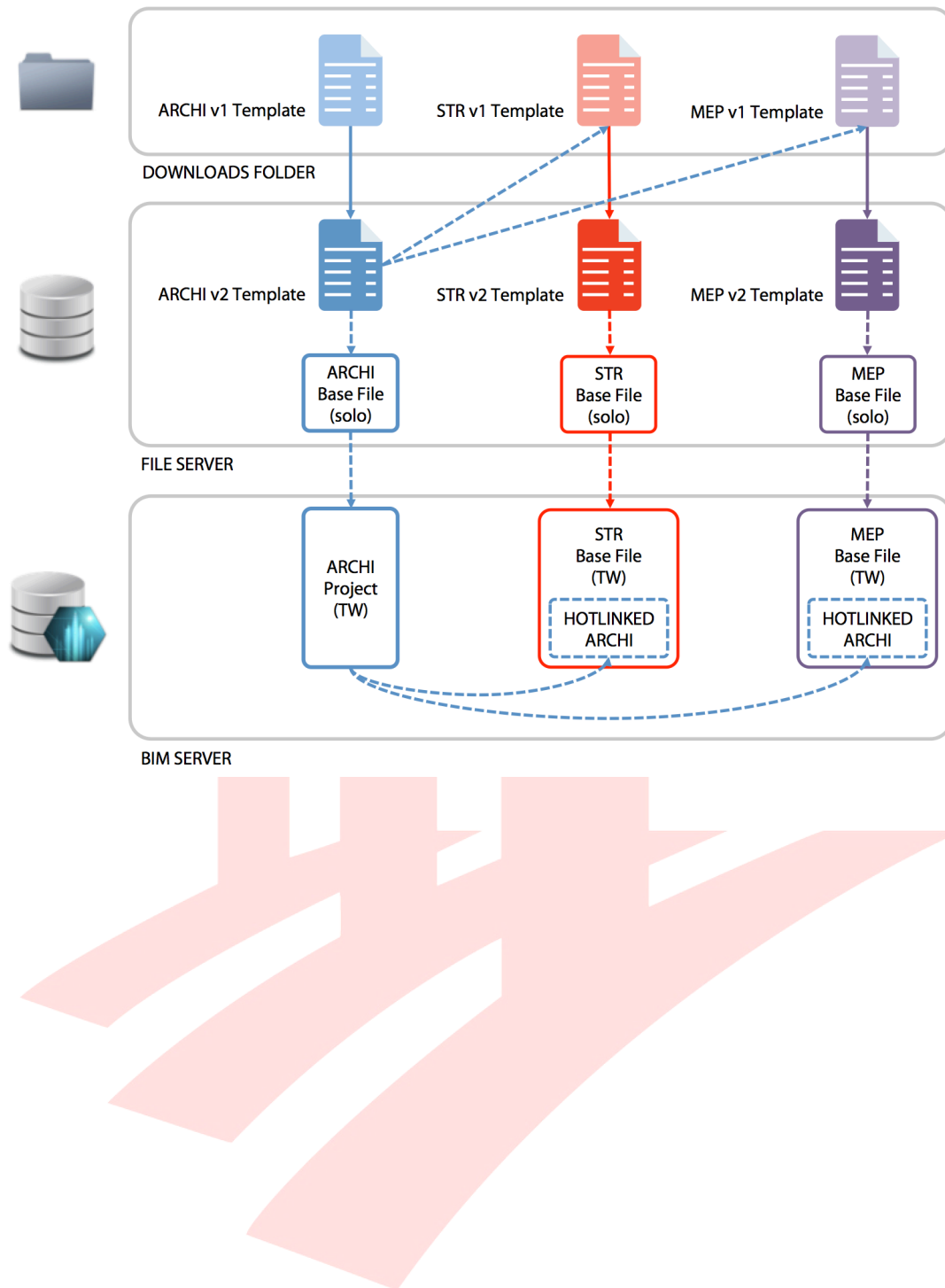
## TEMPLATES AND PROJECT BASE FILES

Project Base Files can be created based on the existing company templates or the templates discussed in this document before the project starts.

The Project Base File allows the different teams to link the model portions smoothly. **Usually the structural and MEP teams use the empty architectural file as a base to inherit its settings and update their templates for the actual project.**

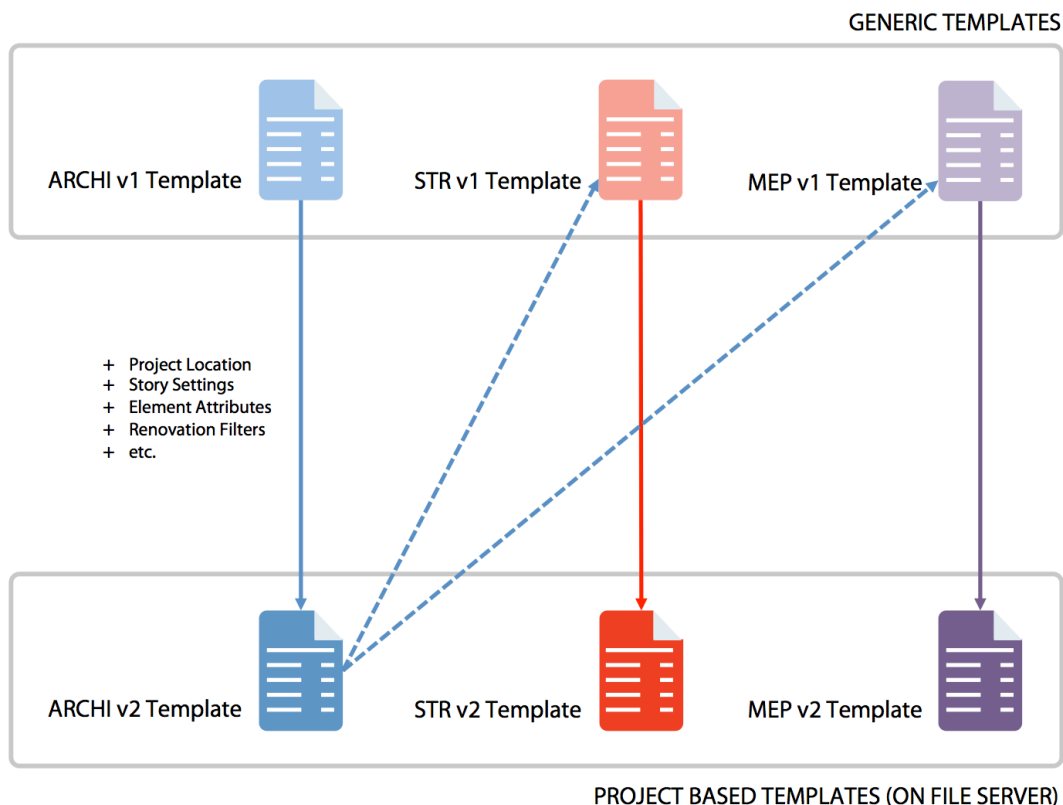
- 1 The BIM Manager should **collect the templates for all the disciplines**. These are generic templates.
- 2 As the **architectural team** leads the project development, they **set the base design and update their template** for the actual project (ARCHI v2 Template).
- 3 **The structural and MEP teams will use this new template as a reference to set the same framework for their projects** (STR v2 Template and MEP v2 Template. These template files are stored in a common folder on the File Server.
- 4 **The new templates have to be used for solo ARCHICAD files, which can be shared** to the BIM Server later. These solo files can still reside on the File Server.
- 5 **Share the architectural solo Base File** and start working on the Teamwork Project.
- 6 Meanwhile **the structural and MEP teams also create a solo Base File based on their updated templates**.
- 7 **The structural and MEP teams share their Base File to the BIM Server** to make it a Teamwork Project.
- 8 **The structural and MEP teams hotlink the architectural projects** into their Teamwork Projects.
- 9 **All disciplines work on their own projects** and create the relevant Documentation Sets onwards.





The following are necessary to be defined in the Project Base Files/Templates:

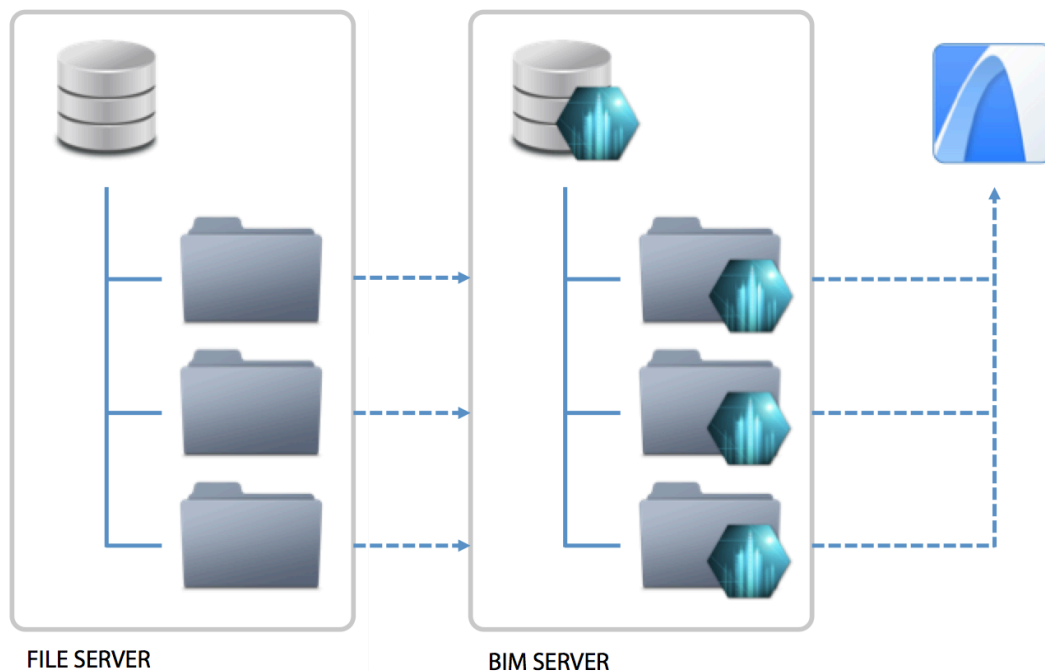
- **Project Location** - based on surveyors' input (external drawings, list of coordinates, point cloud surveys, etc.).
- **Story Settings** - whenever content is hotlinked in ARCHICAD, the Story settings have to match to avoid vertically overlapping of elements (host has smaller story heights than the link), detached elements (elements not linked to stories in a host with bigger story heights) or stretched elements (elements linked to stories in a host with bigger story heights). Since this cannot be defined right before the project it can be set after the architecture is more or less finalized.  
This setup is a **manual process. Stories cannot be imported.** Once created, **make sure that affected View Map Cloned Folders are updated** with the IDs and Names.
- **Element Attributes** - to ensure that the content shows the same in all linked instances. Subsequent additions have to be thoroughly added in all project files.
- **Renovation Filters** - by default the templates come with **New** Renovation Status for the elements and **05 Planned Status** Renovation Filter for the View settings. This should be checked and kept for new projects.



## LIBRARY MANAGEMENT

The **original libraries are placed into one of the file servers**. These will be uploaded to the BIM Server/BIMcloud, then accessed and loaded by ARCHICAD.

**Note:** The file server and the BIM Server are not necessarily separated physically.



- 1 When the libraries are uploaded to the BIM Server/BIMcloud, the originals will remain offline and untouched. Go to **Files/Libraries and Objects/Library Manager...** in ARCHICAD.
- 2 **Reserve** the dialog.
- 3 Click **Add...** to browse the libraries uploaded to the BIM Server/BIMcloud.
- 4 Click **Manage Server Libraries....**
- 5 Click **Upload...** to browse the folders on the file servers.
- 6 Click **Close** when the libraries are uploaded. Now it is possible to choose the libraries as BIM Server/BIMcloud libraries.
- 7 **Select the BIM Server/BIMcloud library** you want to add to the project and click **Add**.

- 8 Click **Release**.
- 9 Click **OK** to close the dialog. ARCHICAD will load the uploaded libraries into the Teamwork projects. If there are other users joined to the project already then they have to be notified about the upload, so they can receive the changes and start using the content of the libraries. Notifications can be sent through Teamwork *Task messages* (**Receive changes**/Send and Receive).



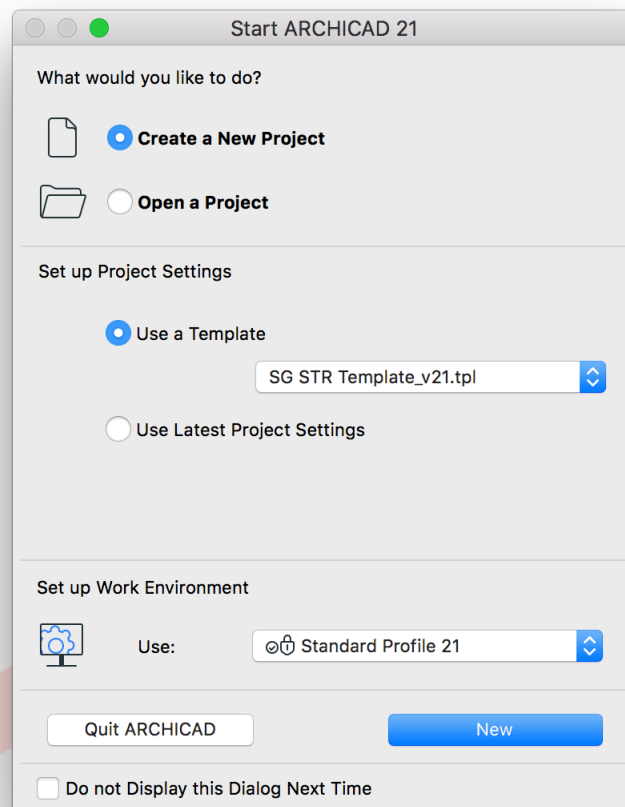
## GETTING STARTED

Once you have downloaded and unpacked the ZIP file from the CORENET website, do the following preparations before using the template for the first time.

- 1 Place the **SG STR Template\_v21.tpl** file to the default settings folder of ARCHICAD (within the folder ARCHICAD was installed to), usually located at **C:/Program Files/GRAPHISOFT/ARCHICAD 21/Defaults/ARCHICAD**.
- 2 Place the **SG STR Library 21.lcf** library container file into a folder where it will not be modified, moved or deleted, for example any folders which you already use for storing libraries or the **C:/Program Files/GRAPHISOFT/ARCHICAD 21** installation folder.
- 3 Launch **GRAPHISOFT ARCHICAD 21** using the desktop shortcuts.



- 4 The Start ARCHICAD 21 dialog appears, choose **Create a New Project** and select **Use a Template**.
- 5 Click into the dropdown list and use the **Browse Template...** option to locate the **SG STR Template\_v21.tpl** template file.
- 6 Click **New**.

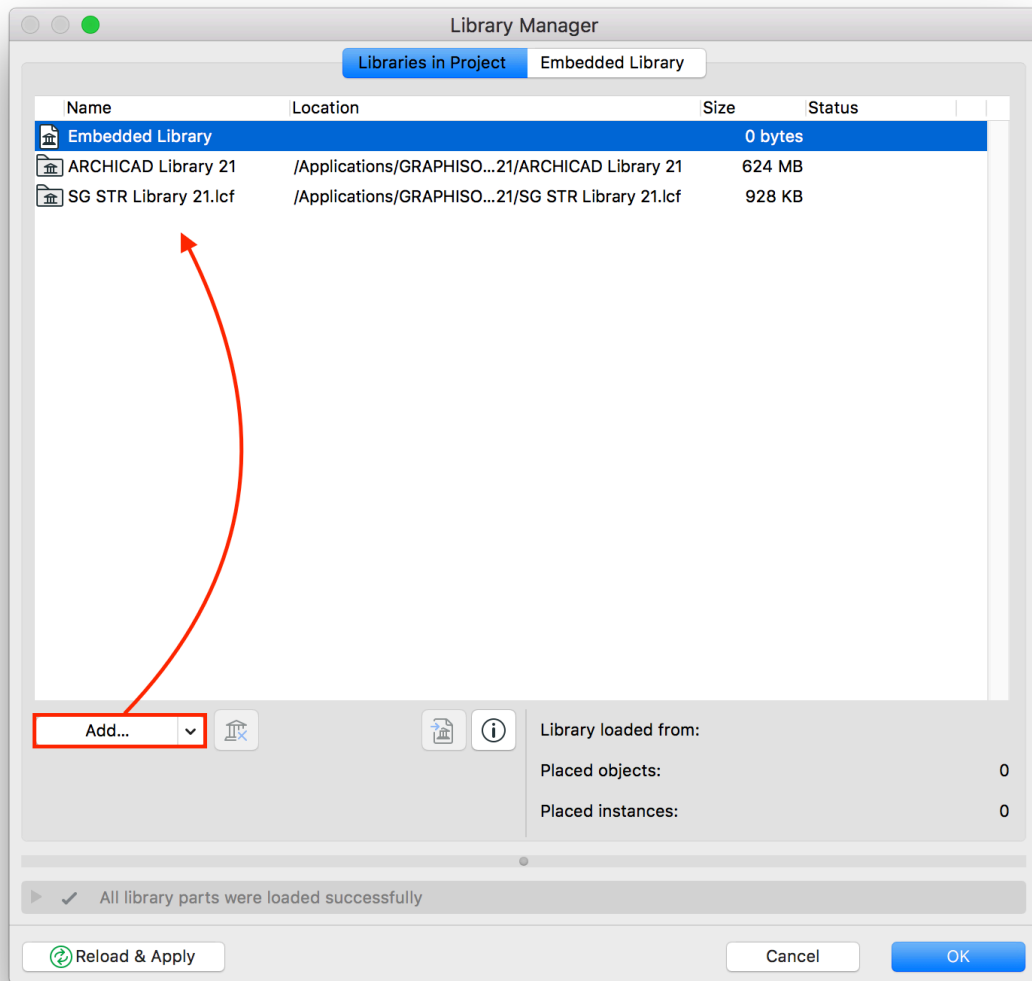


**Note #1:** To ensure the authenticity of the downloaded template file, make sure you obtain it from the CORENET BIM Support Team at:  
[https://corenet.gov.sg/general/building-information-modeling-\(bim\)-e-submission.aspx](https://corenet.gov.sg/general/building-information-modeling-(bim)-e-submission.aspx)

**Note #2:** The template is constantly improved based on user feedback, therefore minor differences may occur between the actual version and the screenshots presented in this guide. Only the latest versions of the template are available on CORENET. The naming of the template file indicates the updates and revisions, such as **...Template\_vXX.tpl** for the initial version, then **...Template\_vXX.1.tpl**, **...Template\_vXX.2.tpl**, etc., if available subsequently.



- 7 Once ARCHICAD 21 is launched, it may prompt for missing elements of the LCF file.



- 8 Click **Add...** Locate the LCF file and click **Open**.
- 9 Click **OK** to close the Library Manager and load the libraries.

## STRUCTURAL MODELING

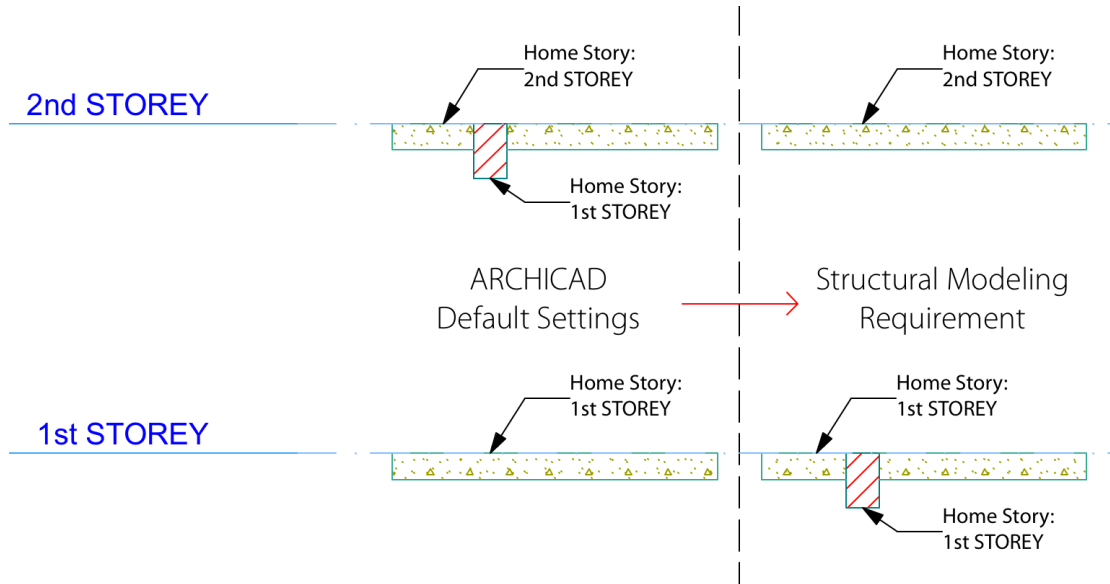
The architectural and structural plans need two significantly different representations of the same elements. ARCHICAD has various options to achieve the desired views, which shall be chosen based on their pros and cons and depending on the project. The display methods may even be combined within a project.

The following settings can be carried out **in the architectural project** by the key members of the structural team by logging in to the Teamwork project or can be done **in individual structural consultants' projects** without any architectural elements linked.

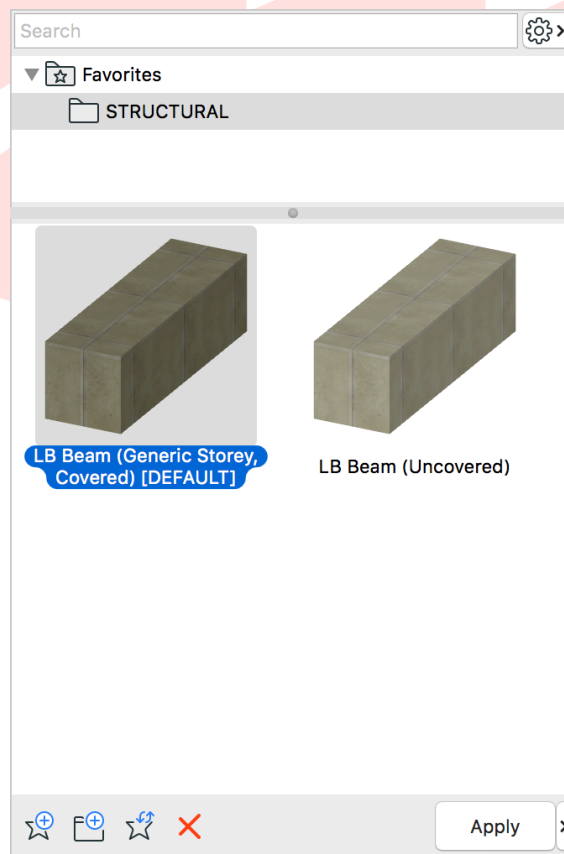


## Beams

- 1 Compared to the default settings of ARCHICAD **the Beams have to be modeled below the actual Home Story**, instead of being placed overhead. If the architectural team is modeling the beams then setting the Beams with correct view-related settings is their responsibility.



- 2 Use the stored **STRUCTURAL Favorites** to ensure proper representation of elements.



**Note #1:** The **Structural Elements Settings** Worksheet contains a summary of the different Favorites settings for reference.

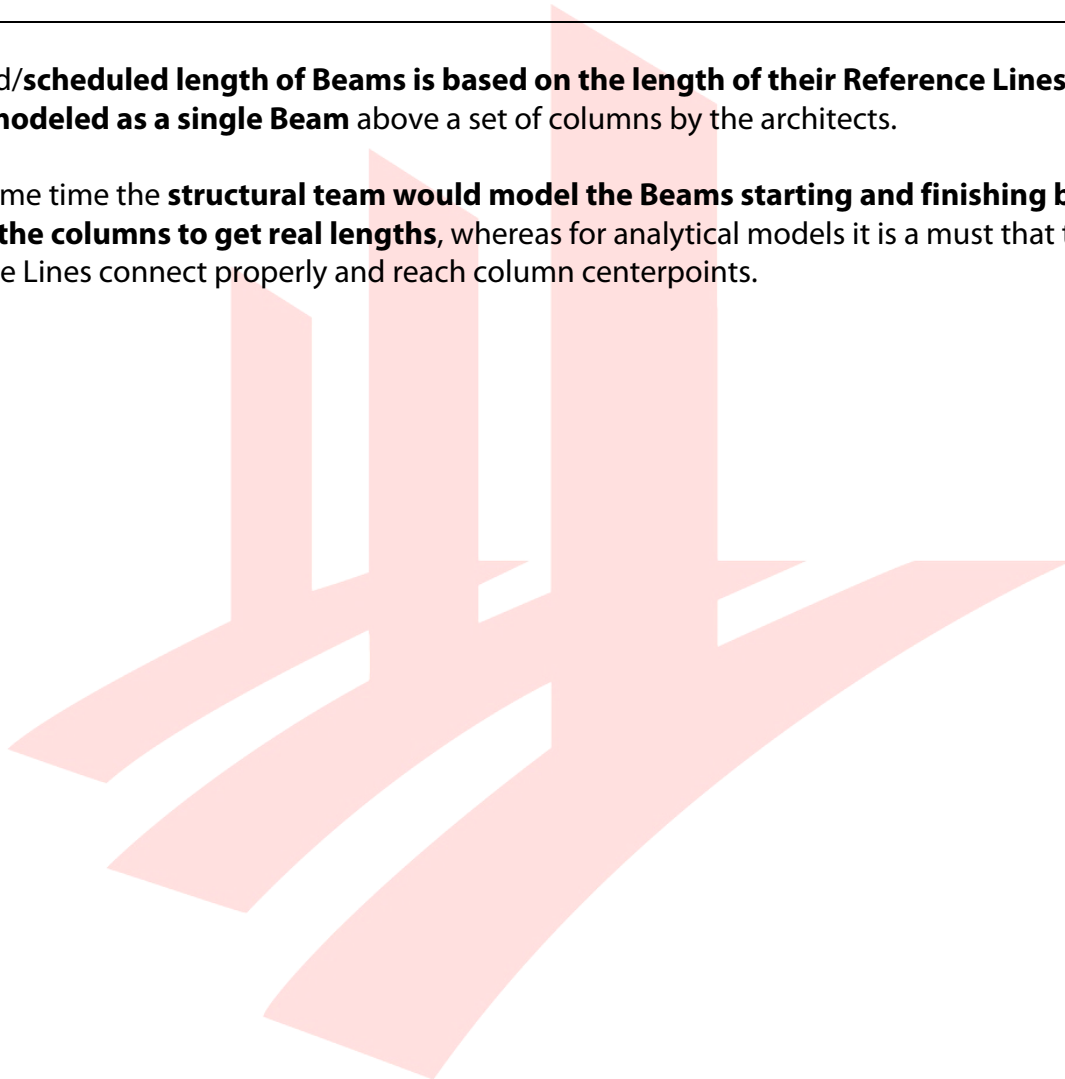
**Note #2:** Beams are set with **Show on Stories: All Relevant Stories** option, which is the default setting. The Show on Stories: **Home Story Only** setting in the structural project might seem to be a good solution, but it **will spoil the architectural representation**.

**It is not recommended to use**, only in projects where the architects are not required to show beams on their plans.

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The listed/**scheduled length of Beams is based on the length of their Reference Lines**, usually **modeled as a single Beam** above a set of columns by the architects.

At the same time the **structural team would model the Beams starting and finishing by the edge of the columns to get real lengths**, whereas for analytical models it is a must that the Reference Lines connect properly and reach column centerpoints.



To fulfil both requirements:

3a If **modeling in an 'architectural' way:**

- model **continuous Beams as one**
- either **send the Beams backward** or **bring the Columns forward at least 3 times**
- **bring the Grids to the Front**
- **Beams can also be simply Sent to Back**, so their *Display Order* is the same as their actual position in 3D.

3b If **modeling in a 'structural' way:**

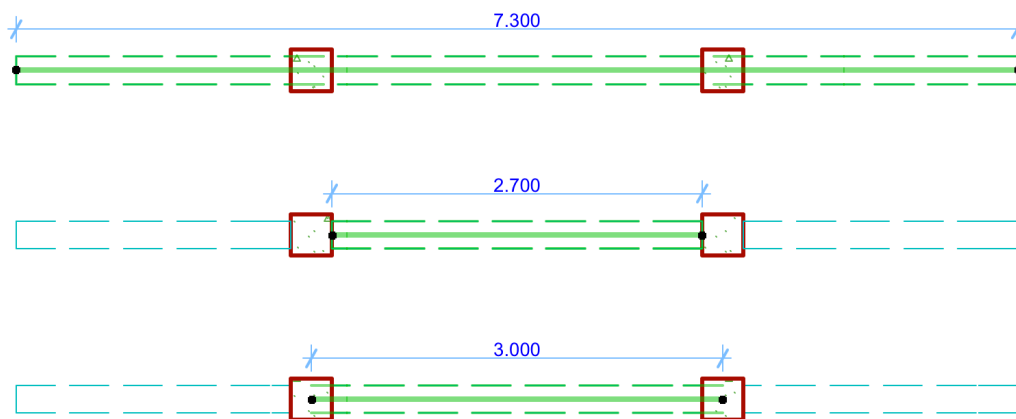
- model the Beams inbetween the Columns as separate elements

**Note:** The beams are **not connected properly for structural analysis.**

3c Modeling with a **combined method:**

- model the Beams **from one Column centerpoint to another, but as separate elements**
- **send the Beams backward** or **bring the Columns forward at least 3 times**
- **bring the Grids to the Front**
- **Beams can also be simply Sent to Back**, so their Display Order is the same as their actual position in 3D.

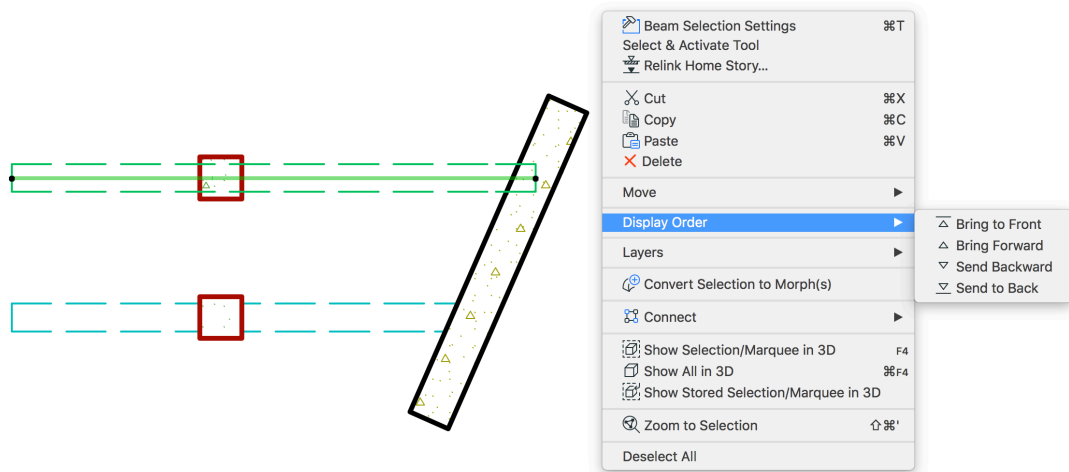
Note the differences between the three methods below:



**Note #1: Beams do not follow the Priority-Based Connections in the floor plan representation,** this has to be compensated with the Display Order settings.

See 'before' and 'after' states on the screenshot below.

If analytical model export is not required then the Beams can be modeled with their real sizes in between the edges of the Columns.





**Note #2:** The following table summarizes the default *Drawing Index* of elements, which determines the Display Order. There are 14 stacks (1-14 - from top to bottom) from which 6 are used initially.

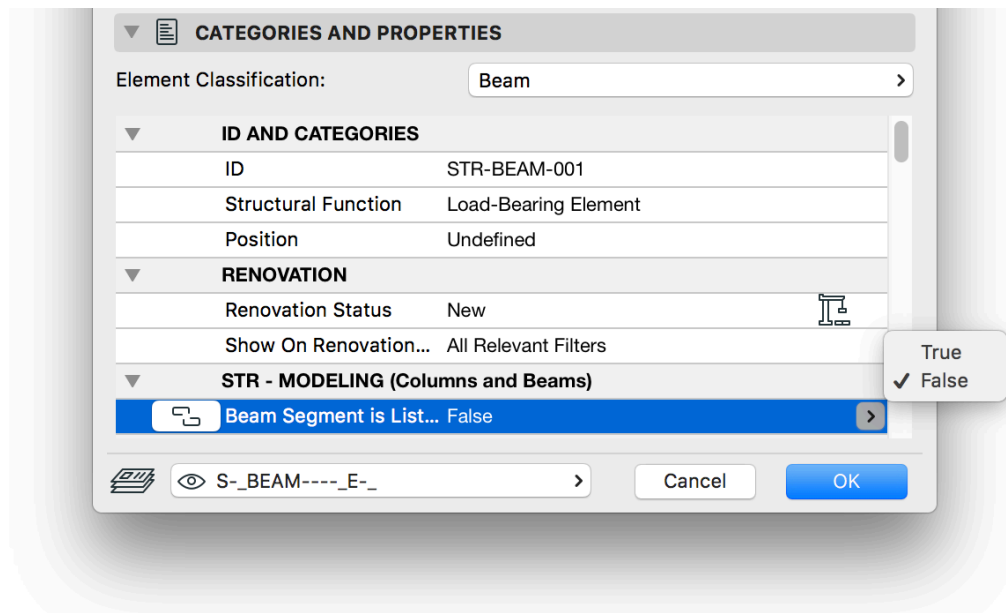
Element Type	Class	Index
Void on purpose		1-4
Text, Label, Section/Elevation Marker, Angle/Radial/Level/Linear Dimensions, Zone Stamp	Annotations	5
Spline, Polyline, Arc, Line, Hotspot, Detail Marker, Beam	2D Artworks + Beam	6
Skylight, Lamp, Stair, Object	Library Parts	7
Roof, Column, Wall, Slab, Mesh	3D Structures	8
Wall End, Window, Door, Corner Window	same as of containing Wall	
Zone Fill, Fill	2D Polygons	9
Figure	Figures	10
Void on purpose		11-14

This also shows that Beams have to be moved from level 6 below level 8 (3 movements) to achieve the required representation.

Beams that are covered are still displayed with Solid outlines as they are shown from above.

Partially covered Beams have to be cut into separate parts for the proper representation and marked using a Property to avoid double-scheduling.

- 4 Set the **Beam Segment to be Listed in Schedules** value to **False** if the Beam is a cut part of another Beam.



**Note:** Beam schedules focus on the reinforcement and are not listing lengths and volumes. These can be listing by creating separate schedules.

- 5 Additional **STR/...** Properties to be filled out according to submission requirements.
- 6 **Set the Layers** if needed.

## Slabs

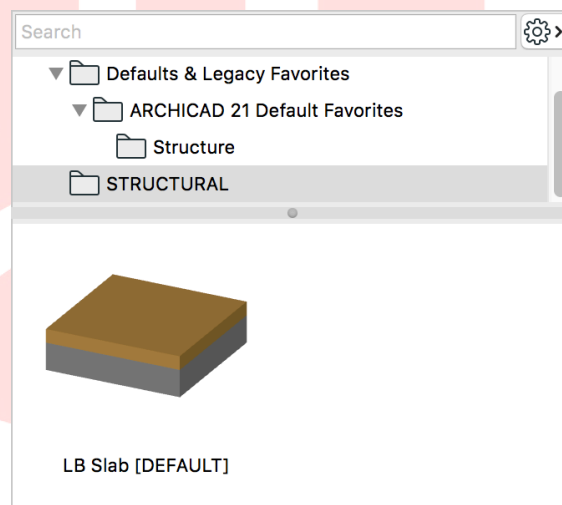
**Slabs have to be shown with transparency** on structural plans, but since they are set by the architectural team, they are likely to have a *Cover Fill* on top. This Cover Fill is visible even when using the *Core of Load-Bearing Elements Only* setting for the *Partial Structure Display*.

Even though the architectural model is likely to be hotlinked eventually, the elements are available for some structural team members for editing in the original architectural project. **It is not recommended however that the structural team changes any other settings of the structural elements than dimensions**, as it will spoil the representation of the elements in the architectural documentation at the same time. **Building Materials may be edited, but the changes must be consistently repeated in the architectural models as well.**

Once **the architectural team set the elements for their needs, the structural team has to adapt to the given conditions by using Graphic Overrides** to override the Slab Cover Fill to Transparent.

The following settings can be carried out **in the architectural project** by the key members of the structural team by logging in to the Teamwork project or can be done **in individual structural consultants' projects** without any architectural elements linked.

- 1 Use the stored **STRUCTURAL Favorite** to ensure proper representation of elements.



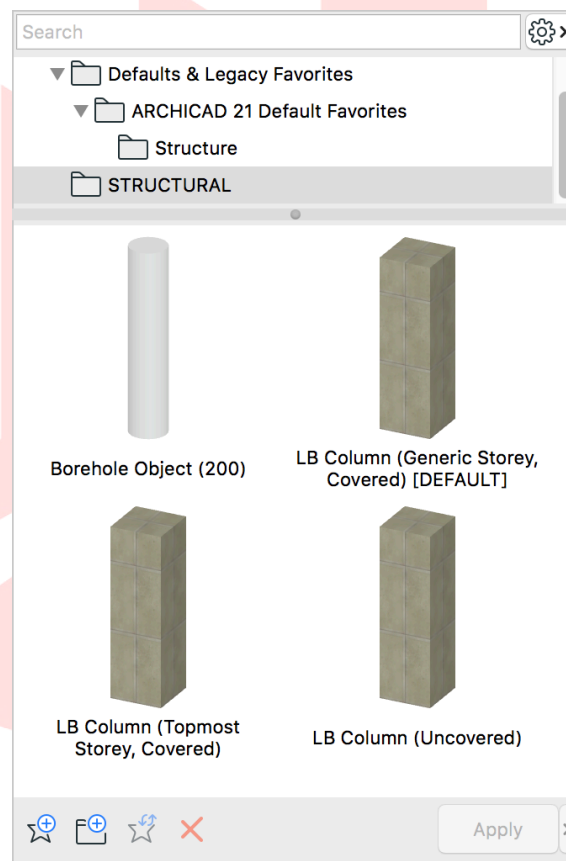
- 2 Set the Slab **Structural Function** to **Load-Bearing Element**.
- 3 Additional **STR/...** Properties to be filled out according to submission requirements.
- 4 **Set the Layers** if needed.

## Columns

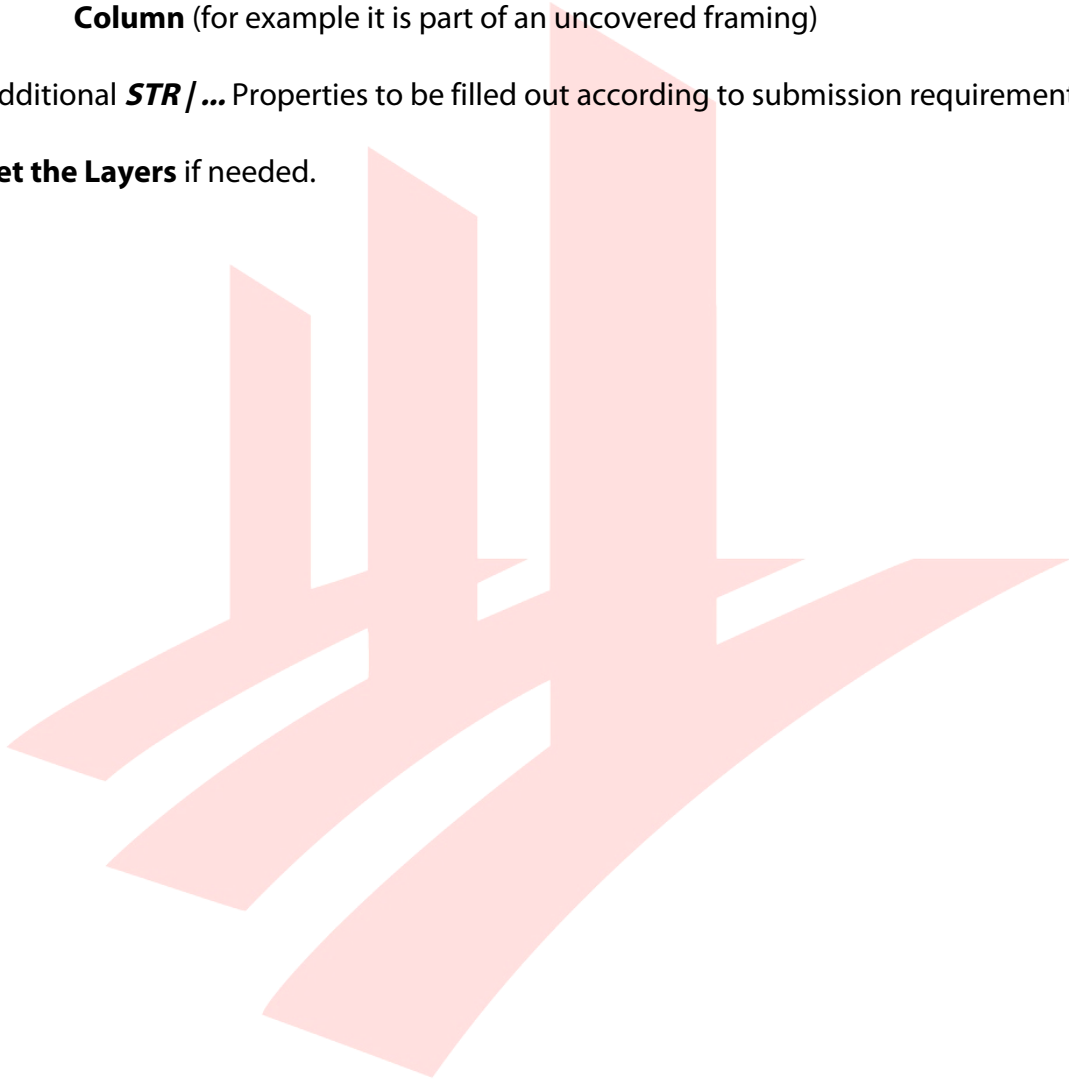
**Columns are also to be modeled with certain predefined settings. Regular columns show solid cut lines on plans, unless the said column is on a topmost storey or if it is not covered by slabs for example it is part of a frame. that Columns are also required to have any special methods of modeling.** In a collaborative work, the settings used by the architectural team will have to be completed by defining some Properties.

The following settings can be carried out **in the architectural project** by the key members of the structural team by logging in to the Teamwork project or can be done **in individual structural consultants' projects** without any architectural elements linked.

- 1 Use the stored **STRUCTURAL Favorite** to ensure proper representation of elements.



- 2 Set the Column **Structural Function** to **Load-Bearing Element**.
- 3 **STR | MODELING (Columns and Beams)/Column Relations** property:
  - **Covered by Slab and/or Column:** this is **the default value**, since on generic stories there is usually always a Slab and Column, or at least a Column above the current story.
  - **Covered by Slab Only:** In most cases at least **a Slab is resting on a Column, in this case there is no Column placed above.**
  - **Uncovered:** Those rare cases **when there is no Slab, nor Column above a Column** (for example it is part of an uncovered framing)
- 4 Additional **STR / ...** Properties to be filled out according to submission requirements.
- 5 **Set the Layers** if needed.



## Grid Systems

Depending on the chosen workflow, the Grids can be defined in two ways for structural representation. Since they have already been defined or placed by the architectural team, let's have an overview on the effects in the structural project.

- **Structural Plan Views with Graphic Overrides:**
  - **Place the Grids onto one Story viewpoint**, such as the Platform Level or the 1st Storey **in the architectural project**.
  - Use the **Show on Stories: All Stories** setting.
  - **Make sure that the Graphic Overrides of the structural project will include the colour override for the Grids** if needed.

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**Note:** The optional **Graphic Overrides for Grids** are not part of the template.

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**If the architectural team has already defined the Grids** - which is highly likely -, **then there are no extra tasks left for the structural team**. If necessary, simply override the colours or Line Type using Graphic Overrides on the regular structural floor plan Views. **A great advantage of this method is that the Grids follow all the architectural project changes automatically, therefore it is highly recommended to use it.**

The **structural team however may decide to place their own Grids for creating the structural plans**. This means no difference compared to the methods used in the architectural projects.



## Favorites

The **structural (and architectural) templates both include structural Favorites** for the convenience of the structural modelers as shown in the examples above as well.

If the practice is **using the one-model concept then these Favorites will be needed in the architectural project**, otherwise - with the reference model workflow - the structural model will be built separately from the architectural model and the Favorites will be used in the structural template directly.

The Favorites store settings of building elements and annotation elements and by no means relate to external/third party content or libraries other than the one provided with this template.

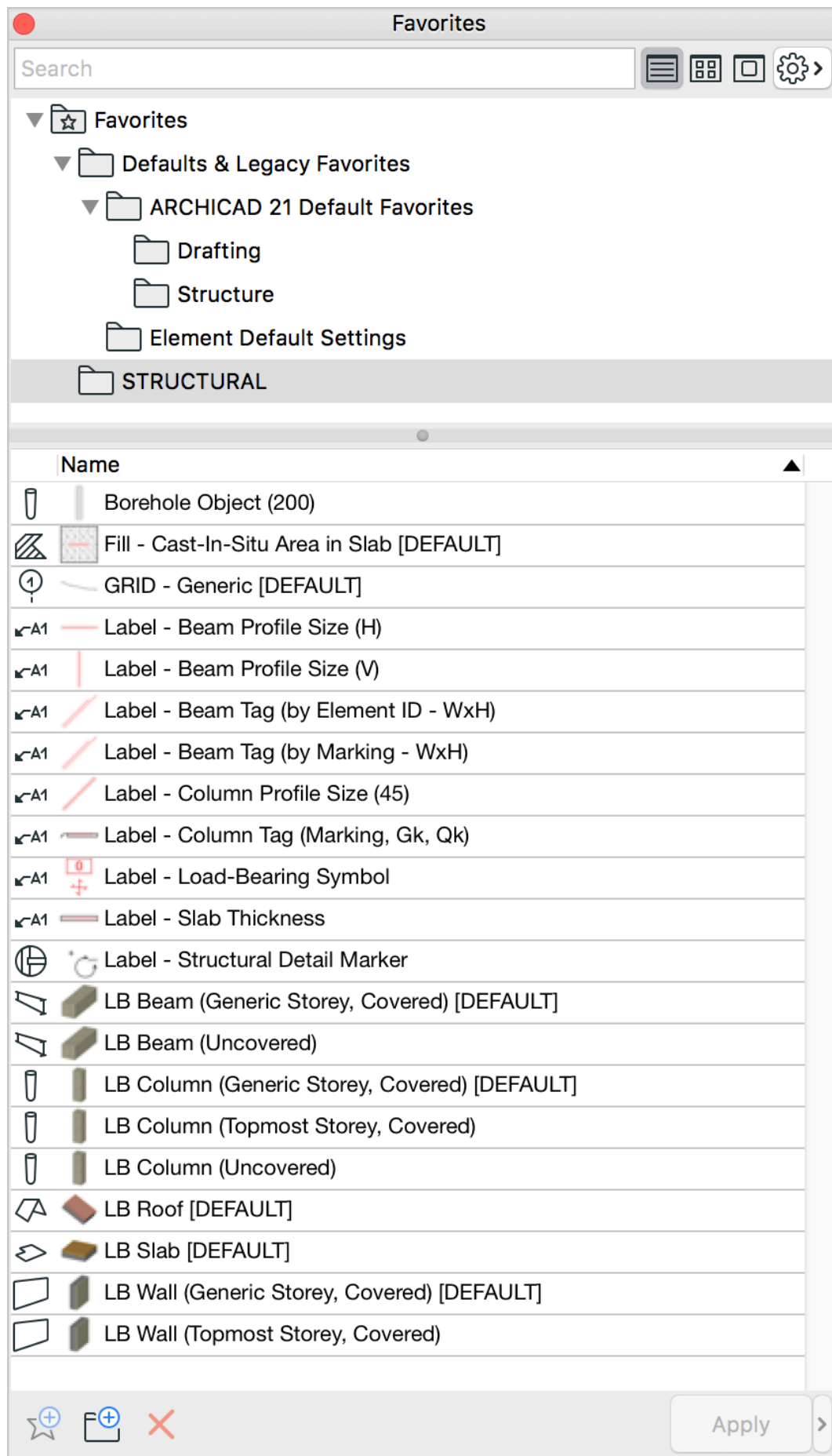
The Favorites are organized into the following hierarchy (in the structural template):

- **Defaults & Legacy Favorites** - contains a portion of the architectural Favorites and **generic default settings**:
  - **ARCHICAD 21 Default Favorites** - These Favorites come with the factory default template of ARCHICAD, **may be deleted**
  - **Element Default Settings** - stores the **initial element settings**

*continued on next page...*

- **STRUCTURAL Favorites** - relevant Favorites **for structural modeling and documentation**:

- **Borehole Object** - needs to be placed separately for structural submission
- **Fill - Cast In-Situ Area in Slab** - for distinguishing CIS areas of Slabs
- **Grid - Generic** - Grid to be placed natively in the structural project (not using the linked architectural Grid)
- **Label - Beam Profile Size (H)** - displays the profile dimensions with a horizontal text
- **Label - Beam Profile Size (V)** - displays the profile dimensions with a vertical text
- **Label - Beam Tag (by Element ID - WxH)** - automatically displays a complex tag, based on an IFC Property, showing the Element ID as the identifier
- **Label - Beam Tag (by Marking - WxH)** - automatically displays a complex tag, based on an IFC Property, showing the STR | Core Information/Beam Marking Property as the identifier
- **Label - Column Profile Size (45)** - displays the profile dimensions with a 45 degree tag
- **Label - Column Tag (Marking, Gk, Qk)** - displays the STR | Core Information/Column Marking Property and the STR | Annotations/Gk and Qk values
- **Label - Load-Bearing Symbol** - displays the thickness of the Core of the Slab with two-way load-bearing direction
- **Label - Slab Thickness** - displays the thickness of the of the Slab
- **Label - Structural Detail Marker** - draws a circular Detail Marker and displays the Reference ID of the Marker.
- **LB Beam (Generic Storey, Covered)** - regular Beams which are covered by Slabs, most of the Beams will have these settings
- **LB Beam (Uncovered)** - Beam without any cover/Slab on top
- **LB Column (Generic Storey, Covered)** - sets the required Properties of regular Columns which are covered by another Column and/or Slab above, most of the Columns will have these settings
- **LB Column (Topmost Storey, Covered)** - Columns placed typically on topmost storeys.
- **LB Column (Uncovered)** - Column without any Slabs and Columns above, used only in special cases
- **LB Roof** - generic structural default
- **LB Slab** - generic structural default
- **LB Wall (Generic Storey, Covered)** - default for placing regular load-bearing walls on generic storeys
- **LB Wall (Topmost Storey, Covered)** - default for placing regular load-bearing walls on the topmost storey.



## CORE INFORMATION (ELEMENT PROPERTIES)

The structural COP has several required Core Information properties that have to be defined for submission. Since **the elements having the properties are part of the architectural project natively, they cannot be edited once they are hotlinked** into the structural project. **Any editing requires the structural team members to log in to the architectural Teamwork project and edit the properties there** directly. The properties are also used in schedules besides the COP requirements, see details in the [Details and Schedules/Schedules](#) chapter.

- 1 Go to **Options/Element Attributes/Property Manager...** to see the available properties (in both architectural and structural projects).

There are two main types of properties available in the structural template on their own (so they can be used directly in case the user works with the reference model workflow and builds the structural model independently from the architecture), differentiated by their prefixes:

- **STR | - required to be filled out correctly for submission.** These are also present in the architectural template partially to be filled out for schedules by the structural team.

**When linking the architectural model into the structural project the architectural Properties will be shown if they are not present** in the structural file yet. These can be:

- **AC21\_ - renamed to indicate the default factory template Properties.** Since this is a very generic set of Properties, the architectural team might have already replaced/filtered these to have relevant Properties only for their needs, therefore **these may be (or may have been) deleted in the architectural project.**  
To make the setup easier, **these properties are arranged to the end of the property list** in the architectural project.
- **ARCH | - the Properties used for the architectural native BIM submission.** These Properties will be irrelevant for the structural workflow.









---

**Note: Properties are not considered as Element Attributes and are identified by the Groups they are in and their Names, not by Index Number.**

---

These imported properties will be greyed out and like any other settings of hotlinked modules **they are uneditable in the host file**. To edit them, **open the external link and make the changes there**.

It is possible **to fully import the properties from the module by clicking the Merge icon** on the right, next to the name of the property. This way the property will be available in the host file as well and it can be set for native elements of the host file. **Merging does not change any property values set in the module file** itself, the connection to the external file for the said property will be broken.

▼ REGULATORY REQUIREMENTS			
Accessible (spaces an...	True/False	False	
Amendment Status	Option Set	Proposed	
Mode of Ventilation	Option Set	Mechanical	
Cluster ID	General		
Accessible Room	True/False	False	
Elderly Friendly	True/False	False	
Detectable Warning S...	True/False	False	

**If a linked property has different settings than in the host file** (for example the value is *General* in the module, but *Option Set* in the host) **then it can be highlighted as a conflict by checking the Show conflicts with Properties in Hotlinks checkbox**. Merging the properties will override the host file property settings.

Find more info on **Element Properties in Hotlinks**  
at the GRAPHISOFT Help Center here:

[https://helpcenter.graphisoft.com/guides/archicad-21/archicad-21-reference-guide/elements\\_of\\_the\\_virtual\\_building/element\\_properties/element\\_properties\\_in\\_hotlinks/exportimport\\_properties\\_between\\_projects/](https://helpcenter.graphisoft.com/guides/archicad-21/archicad-21-reference-guide/elements_of_the_virtual_building/element_properties/element_properties_in_hotlinks/exportimport_properties_between_projects/)

## HOTLINKING THE ARCHITECTURAL PROJECT

Once the architectural elements were adjusted and prepared for documentation, the architectural project is ready for hotlinking.

Assuming that the Structural Template has also been modified as per the base settings of the architectural project, the Structural Project Base File is also ready for sharing.

In a Teamwork environment the following steps are required:

- 1 **Open the Structural Base File** (TPL or PLN format) in ARCHICAD as an offline file and **verify that it has the same settings as the architectural project.**
- 2 **Do not load any additional Libraries** other than the default ARCHICAD Library and the Structural Object Library.
- 3 Go to **Teamwork/Project/Share...** and locate the BIM Server/BIMcloud model servers and project folders to **share the file** to.
- 4 Name it according to the company standards and share it. **The file will be uploaded and the linked Libraries will also be shared at the first occasion when they are shared.** In subsequent cases ARCHICAD will detect **if the Libraries are already present on the server and will use those instead of re-uploading** the content.
- 5 Go to **File/Libraries and Objects/Library Manager...** in ARCHICAD and **add the required BIM Server/BIMcloud Libraries to the project so that the available content is matched with the to-be-linked project** as a minimum requirement.  
(For example ARCHICAD Library, BIM Submission Library and Custom Libraries are linked to the architectural project, whereas for the newly uploaded structural base project only the ARCHICAD Library and the Structural Object Library is available. Select the Submission and Custom Libraries from the BIM Server/BIMcloud and add them to the project to avoid missing elements.)

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**Note:** Usually the two discipline projects would reside on the same model server. In case they are hosted on separate servers, **make sure that the offline Libraries are located on the same location of the file server** to ensure easier update of the uploaded library content.

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- 6 **Go to a plan view** in the structural project and insert the module via the **File/External Content/Place Hotlinked Module...** command.
- 7 **Make sure that there is always a Master ID and Master Layer defined** for each module to make filtering easier later.



**Note: Master ID will add a prefix to the ID** that is set in the Element Settings dialog (*Compact ID*). The Master ID and the Compact ID together will result in the *Full Element ID*. **All elements in the module will get the Master ID prefix when linked**, the source will preserve the Compact IDs of course.

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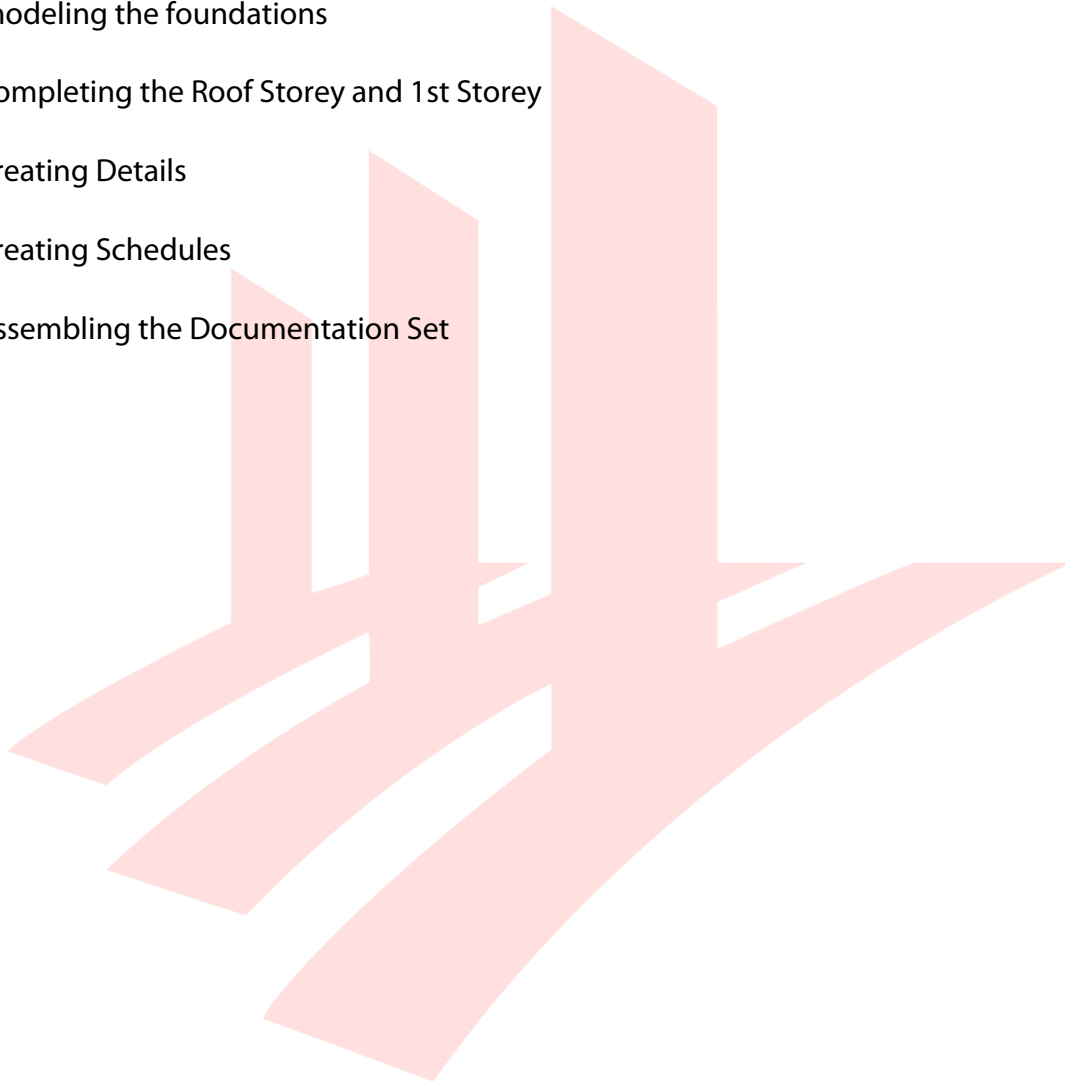
- 8 **Choose Hotlink from Teamwork file** in case of the architectural block. Click **Place Module** when finished with the setup.
- 9 **Insert all stories**, make sure to match the correct ones.



## PLAN REPRESENTATION AND MODELING IN THE STRUCTURAL PROJECT

Once the architectural model is inserted, the predefined Views in the *Navigator* should show the proper representation of the elements on the generic stories. The structural team has to complete the project by:

- modeling the foundations
- completing the Roof Storey and 1st Storey
- creating Details
- creating Schedules
- assembling the Documentation Set



## Structural Object Library

GRAPHISOFT Singapore provides custom, localized content for its users with a software service agreement. The library contains various elements, which will be presented in the following chapters.

The library is named **SG STR Library 21** and has a uniform **\_GSSG** ending for the Objects within.

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Find the **Structural Object Library** on the GRAPHISOFT Singapore website here:

<http://www.graphisoft.com.sg/ssa/>

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Once loaded, the Library Manager shows three folders within the Library:

- **Annotations and Labels**
- **MVO Settings**
- **Piles**

The MVO Settings folder contains non-placeable objects.

## Updating the Libraries

The **custom office library might change frequently** by new Objects being added to it in the early project phases or during the implementation process. These **updates should be distributed to the Teamwork users and projects regularly**.

The **updated/new elements should be replaced on the file server first**. Then **the updated folders have to be uploaded to the server**. The BIM Server/BIMcloud libraries can be easily be updated without deleting and re-uploading existing libraries.



- 1 Go to **Files/Libraries and Objects/Manage BIM Server / BIMcloud Libraries...** in ARCHICAD.
- 2 **Select the library** you wish to update and click **Update from....**

**Note:** If the user has the necessary access rights then there is no need to reserve in order to update the libraries.

- 3 **Browse the updated library** on the file server and click **Choose**.
- 4 Click **Close** and **Reload** when prompted. The new Objects are ready to use.
- 5 Similarly to the newly uploaded libraries, **notify the users to Receive**.

## Annotations and Labels

The following Library Parts shall be used for structural annotations of plans and drawings:

Object	Usage	Tool
Breakline (layout)	Mark the edges of drawings on Layouts. The size can be set in paper space sizes.	Object
Breakline (model space)	Mark the edges of drawings in the Views/Viewpoints already before placing them onto Layouts. The size can be set in model space sizes.	Object
Detail Marker (circular)	Create new Detail Viewpoints using this Marker Head.	Detail
Load-Bearing Direction Symbol	Show the span directions, thickness and any Element Property or IFC Property values of Slabs.	Label
Reinforcement	For generic annotation purposes of reinforcement.	Object
Top Steel	For generic annotation purposes of reinforcement.	Object
Top Steel (2)	For generic annotation purposes of reinforcement.	Object
Tramming Bar	For generic annotation purposes of reinforcement.	Object

## Pile Objects

The pile Objects are for actual modeling purpose. Since structural representation requires specific presentation of such substructures, it is recommended to use these Objects, instead of modeling the piles and pile caps using traditional tools, like Slabs and Columns.

**The pile cap and pile layout plans will be created as normal 2D floor plan Views**, even if the typical storey floor plans are done using 3D Documents.

- 1 Open the **Object tool** settings and browse for the pile Objects.
- 2 Select the desired combination of piles:
  - **Pile** - single pile without a pile cap
  - **Pile Cap with One Row of Piles** - multiple piles under a common pile cap in a single row
  - **Pile Cap with Two Rows of Piles** - multiple piles under a common pile cap in two rows
  - **Pile Cap with Three Rows of Piles** - multiple piles under a common pile cap in three rows
  - **Triangular Pile Cap with Piles** - three piles under a common 'triangular' pile cap

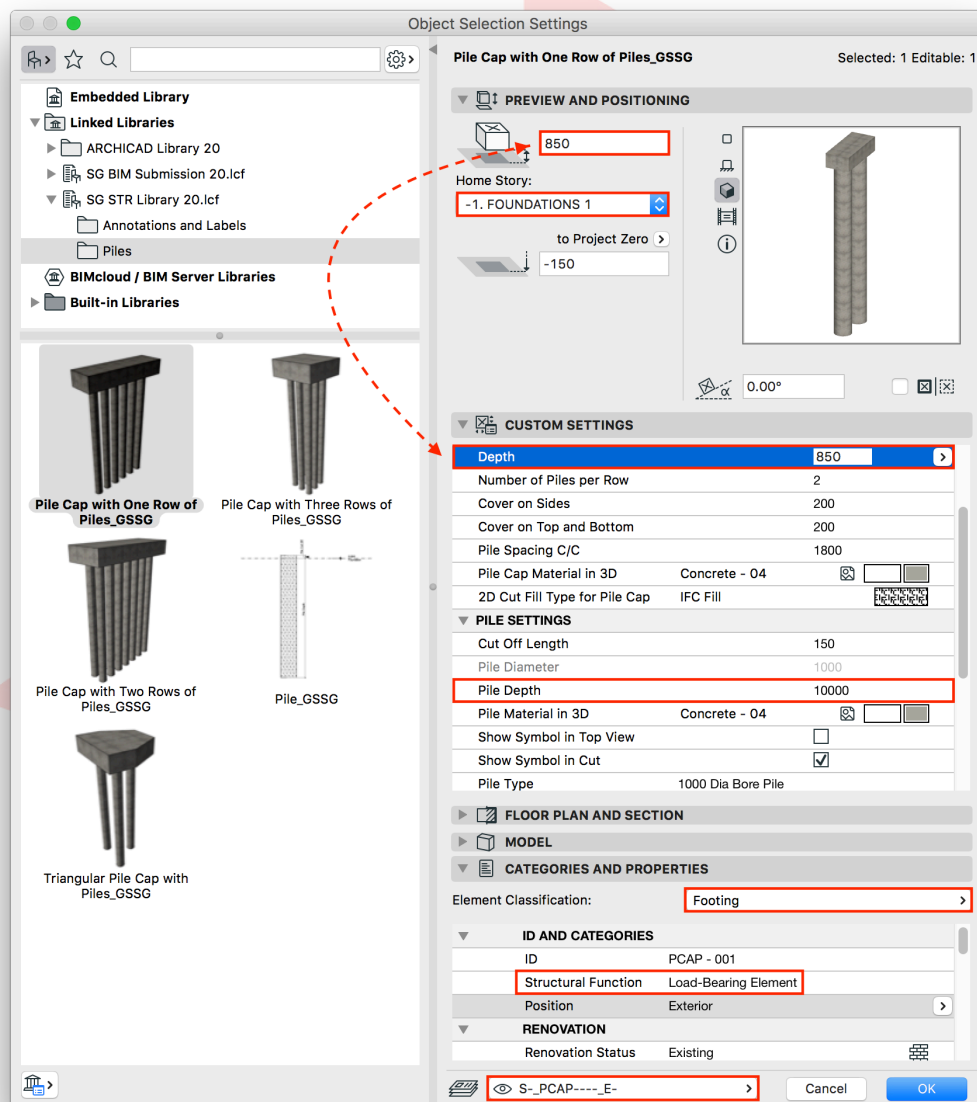
The number of piles per rows can be set for all the Pile Cap... Objects.

- 3 To place the elements onto the -1. Foundation 1 storey, use the following settings:
  - **Bottom Offset to Home Story equals Pile Cap/Depth**  
The value can be calculated by the following formula:  
  

$$\text{Pile Cap Depth} = F1 - (\text{Slab} - \text{PL})$$
 (example in the template:  $850 = 1000 - (200 - 50)$ )
    - F1: height of -1. Foundations 1 storey
    - Slab: Thickness of the Slab Core
    - PL: height of Platform Level
  - **Pile Settings/Pile Depth equals the storey height of -2. Foundations 2 storey**

- 4 Set **Pile Type** under the Pile Settings and fill the **Core Information** Properties at the bottom of the settings dialog.
- 5 Check the Element Classification: **Footing**, the Structural Function as **Load-Bearing Element** and set the Layer to **S-PCAP----\_E-**.

**Note:** The **pile caps** are inserted by the top anchor points.



- 6 **Place the Object** and adjust the position of the numbers using the pink hotspots if necessary.

## NAVIGATOR - PROJECT MAP AND VIEW MAP

The **Project Map** contains sample Stories, Sections, Elevation, Worksheets, 3D Documents and Schedules to start with.

The **View Map** has the following folder structure:

- **S | 3D (Load-Bearing Elements)** - Partial Structure Display filters the view to **show Load-Bearing Elements Only**.
- **REFERENCE VIEWS** - These views show the **architectural representation (overhead Beams shown with dashed lines) of the plans for a reference only** (since these views are only available in the architectural project otherwise) and overall 3D views to provide a better overall understanding of the project. This folder **may be deleted** from the structural template.
  - **A | FLOOR PLANS** - These plans have View Settings very similar to the default ARCHICAD settings with all Layers turned on and an extended architectural Pen Set, originally used for the architectural native BIM submission. The Floor Plan Cut Plane settings are kept as defaults as well.
  - **A | 3D (Entire Model)** - Generic 3D view, without Zones for better understanding the architecture.
  - **A | 3D (Simplified)** - Similar to the previous one.
- **S | WORKING VIEWS** - This folder has a structure for Stories, Sections and Elevations:
  - **STRU\_FP\_** plan views for creating the model
  - **GA PLANS** - Generic **storey plans to show the common areas**.  
In housing projects created for pile layout, pilecaps separately, 1st storey, typical and roof storeys.  
**Except the foundation plans, all storeys have two Views to show** annotations of **top and bottom reinforcements separately**.  
Note that **this folder is not Cloned** as it would not be effective due to the large number of identical typical plans.  
**The pile cap plan also has its own MVO Settings.**
  - **UNIT PLANS** - Similarly to the generic storeys, top and bottom reinforcement Views are available for units.
  - **3D DOCUMENTS** - **samples of plan views** as the GA PLANS and UNITS folder above, **but created with the 3D Document** feature of ARCHICAD. This content may be deleted.
  - **SECTIONS**
  - **ELEVATIONS**
  - **DETAILS**
  - **SCHEDULES**
  - **COVER PAGE**



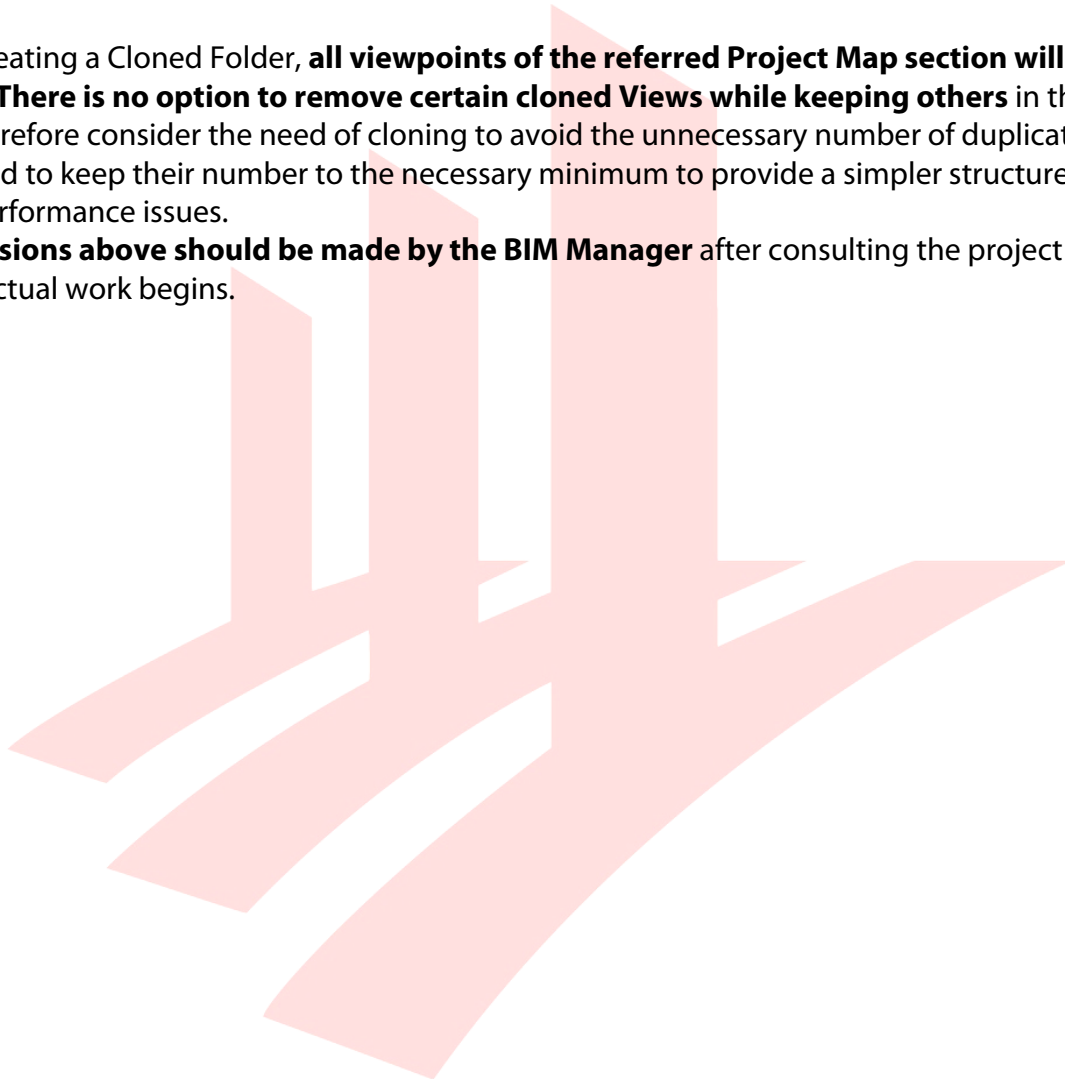
Since some of the folders are *Cloned Folders*, the Views in these folders are automatically created with the preset View Settings, whenever new viewpoints are created in the Project Map.

**The initial View Map structure is merely a sample** that shall be changed and/or completed according to actual project needs:

- 1 Create new regular folders using the **New Folder...** button.
- 2 Select an item to create a folder inside it. Use the **Clone a Folder...** button to **choose a viewpoint folder** from the Project Map and **set its View Settings**.

When creating a Cloned Folder, **all viewpoints of the referred Project Map section will be cloned. There is no option to remove certain cloned Views while keeping others** in the View Map, therefore consider the need of cloning to avoid the unnecessary number of duplicate Views and to keep their number to the necessary minimum to provide a simpler structure and to avoid performance issues.

The **decisions above should be made by the BIM Manager** after consulting the project team before actual work begins.



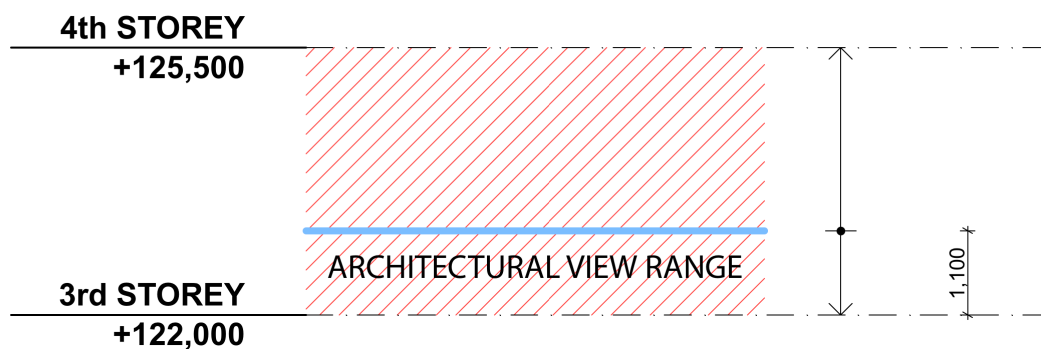
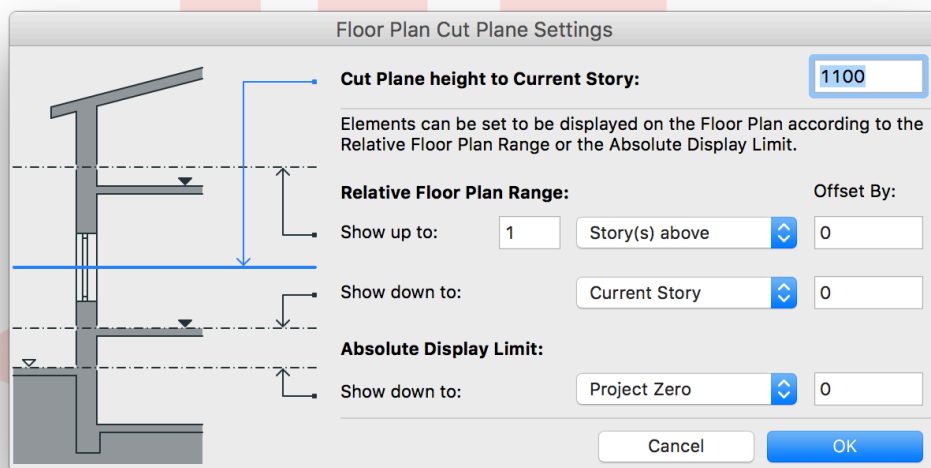
## Floor Plan Cut Plane and Projection Settings

As a generic reference, find the Floor Plan Cut Plane settings of architectural and structural views below.

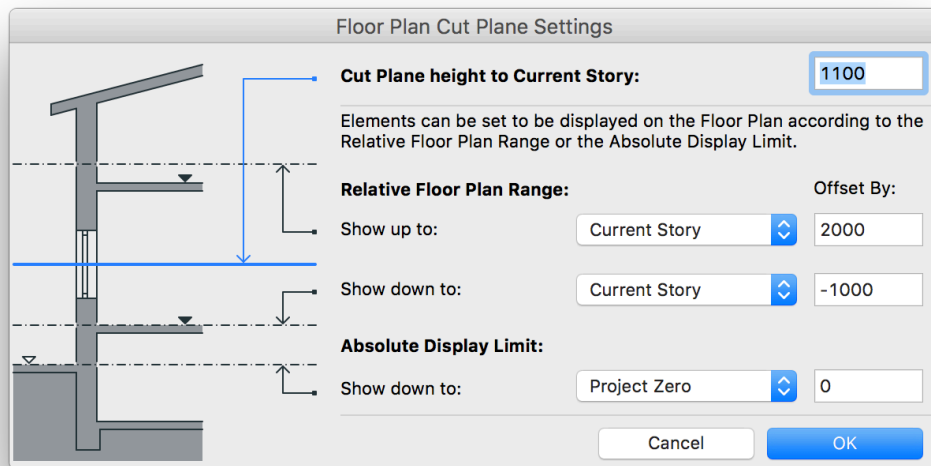
**Depending on the actual Story Settings and the heights of elements these settings might have to be revised.**

To **check the View Settings of the actual Views**:

- 1 **Select a View**/multiple Views or Cloned Folder.
- 2 **Right-click and select View Settings....**
- 3 Go to **Floor Plan Cut Plane Settings....**
  - The **architectural plan views** use the default ARCHICAD settings:



- The **structural plan views offset the view range downward**. Depending on the size of actual elements (typically Beams) and story heights the preset values might be adjusted.  
The ranges above and below the stories should equal the story height when added up.



**4th STOREY**  
**+125,500**

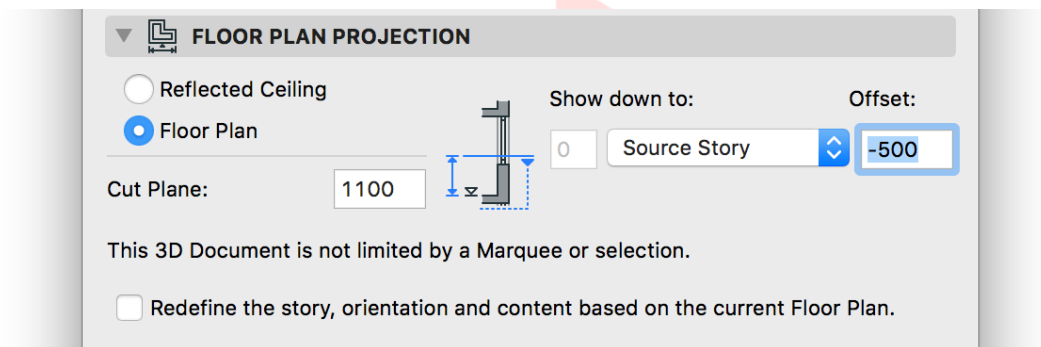
**3rd STOREY**  
**+122,000**

**2nd STOREY**  
**+118,500**



To **check the settings of the 3D Documents**:

- 1 **Select a View**/multiple Views or Cloned Folder.
- 2 **Right-click and select 3D Document Settings....**
- 3 Go to the **Floor Plan Projection** panel.
  - In case of the **3D Document**, projection can be defined by adding an **offset below the current story**. This can be adjusted depending on the actual element sizes.



**4th STOREY**

**+125,500**

**3rd STOREY**

**+122,000**

3D DOCUMENT VIEW RANGE



**2nd STOREY**

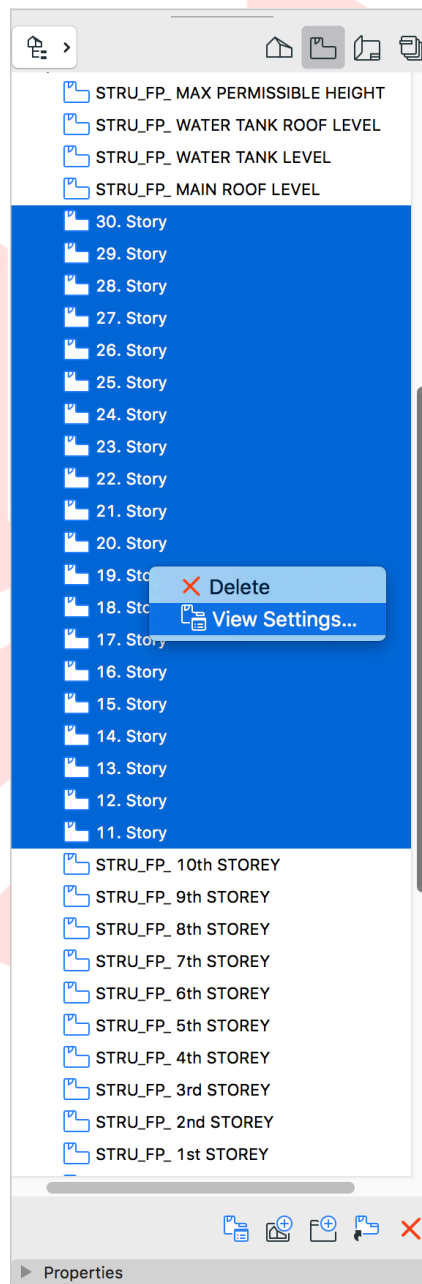
**+118,500**

## Updating the View Map

When creating Cloned Folders, only the ID of the folder can be set, **the individual Views needs to be set manually after they were created.**

The same applies in case of newly created Project Map viewpoints and their cloned Views - the IDs of new items have to be set manually.

- 1 **Select the necessary Views** (not the folders!). Select the topmost item you wish to change and SHIFT+click the bottommost to select all items. **Right-click and choose View Settings....**



- 2 Make sure the ID type is set to **Custom** and **define the IDs.**

Those **View factors that are defined by a name** in the Views Settings are not referred to by the Index Numbers (Layer Combination, Pen Set, Model View Options, Graphic Overrides, Renovation Filter), but **are saved by their names only, therefore if the name is changed, the dialog will show these as missing**. It will still keep the actual View Settings, but **it is highly recommended to pick the renamed option and re-save the View** (click OK).

View Settings

Get Current Window's Settings Selected: 1, Editable: 1

▼ IDENTIFICATION

ID: Custom

Name: Custom

Source: 2. 2nd STOREY

▼ GENERAL

Layer Combination: Missing (S | Typical Top RF (Common Areas))

Scale: 1:100

Structure Display: Core of Load-Bearing Elements Only

Pen Set: STR\_B/W with Overrides

Model View Options: STR\_Plans

Graphic Override: STR\_Plans

Renovation Filter: 05 Planned Status

Note: Regardless of this view's scale, GDL objects will be represented according to the source viewpoint's scale.

► 2D/3D DOCUMENTS

► 3D ONLY

Cancel OK

## GRAPHIC OVERRIDES

The following Rules and Graphic Override Combinations are available in the structural template:

- Combinations and Rules with the prefix **AC21\_** are the defaults coming from the factory template of ARCHICAD. The **Combinations may be deleted from the structural file**, but some of the **Rules are used for structural Combinations as well**, therefore **deleting these will change the representation**.
- **A |** prefix stands for Rules and Combinations **used by the architectural team**, may be deleted from the structural template.
- **S |** prefixed Combinations **must be used for the correct structural representation if using the Graphic Overrides version**.
- **Unmarked Combinations/Rules are present in all discipline templates.**

## Structural Graphic Overrides

The following Combinations and Rules are provided for structural representation:

- **S | Architecture Only** - Generic checking option for the structural team to see the regular architectural representation with the overhead beams shown.
  - **S | Beam Outlines in Architectural View** - Beam outlines are overridden to dashed lines.
- **S | Details** - Changes the fills to transparent and the lines to black, includes the following Rules:
  - **AC21\_All Cover Fills - Transparent**
  - **AC21\_All Cut Fills - Transparent**
  - **AC21\_All Zone Fills - Transparent**
  - **Black and White Transparent Environment**
- **S | Key Elements Highlights** - Shows the marked key elements with the required colours according to the structural code of practice, marking is set using *Properties*.
  - **S | Key Elements - Cantilever**
  - **S | Key Elements - Long Span Structure**
  - **S | Key Elements - Transfer Structures**
  - **S | Key Elements - Permanent ERSS**
  - **Black and White Transparent Environment**
- **S | Plans** - Must be used for correct structural representation.
  - **S | Beams Covered by Slabs** - Beam outlines are overridden to dashed lines.
  - **S | Walls** - Pen override on outlines.
  - **S | Slabs with Transparent Cover Fills** - Slab Cover Fills are overridden to transparent fills.
  - **S | All Cut Fills - Solid White** - Creates an empty fill for cut elements (Walls and Columns typically)
  - **S | Underneath Walls Hidden** - Overrides the outlines of Walls that are below the current story.
- **S | Schedules** - Shows all details that are inserted into the *Plan Previews* cells of the Schedules with transparent fills.
  - **AC21\_All Cut Fills - Transparent**



## DETAILS AND SCHEDULES

### Details

Details can be created in a hybrid workflow, the **Viewpoints are generated from the model, while the actual Details are completed using the 2D documentation tools** of ARCHICAD.

- 1 Choose the **Detail tool** and pick the **LABEL - Structural Detail Marker Favorite** (from the STRUCTURAL FAVORITES folder).
- 2 Set the **Reference ID** according to the company naming standards.
- 3 Set the attributes of the Marker under the **Marker panel**.
- 4 The **Marker Angle options** will either keep the Marker unrotated (Horizontal Marker) or will rotate it (Rotated Marker).

**If the model space orientation is 0 degrees:**

- **Horizontal Marker** keeps the Marker unrotated
- **Rotated Marker (relative)** rotates the Marker with the set angle
- **Rotated Marker (absolute)** rotates the Marker with the set angle (no difference compared to relative)

**If the model space orientation is a certain degree** (for example 30 degrees):

- **Horizontal Marker** keeps the Marker unrotated
- **Rotated Marker (relative)** rotates the Marker with the set angle compared to the horizontal angle (for example 20 degrees)
- **Rotated Marker (absolute)** rotates the Marker with the set angle on top of the angle of the orientation (for example 20 degrees set will result in 30+20 degrees overall rotation).

**In regular cases use the Horizontal Marker. If the View is rotated and you want to follow the rotation** instead of keeping the horizontal direction, change to Rotated Marker (relative) with the same angle or **use Rotated Marker (absolute with 0 degrees)**

- 5 **Place the Marker** and open the new Detail Viewpoint generated from the model.

- 6 **Use regular 2D tools to annotate** (Dimension, Text, Label) **and to draft** (Fill, Line, Arc/Circle, Polyline). **Draw rebars manually.**

To create parallel rebar lines, use the **Offset All Edges** command of the pet palette and **press CTRL** on Windows or **ALT** on MAC **to make copies.**

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**Note:** To make this process faster, **graphical favorites can be created on Worksheets, similar to blocks in AutoCAD** for regular bars, stirrups, tramming bars, etc.

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- 7 **To edit** these elements **use the commands on the Standard Toolbar:**

- **Trim - CTRL/CMD+click to trim directly** or use the icon on the Standard Toolbar and click on the element you want to trim.
- **Split - Select an element, click the Split icon and draw a splitting line or click on an existing geometry** (line, arc, etc.) to use it as a splitting element. Click one of the split portions to have it selected after the splitting.
- **Adjust - Select an element you want to extend. Click on the destination element with CTRL+ - (dash or minus) pressed** or use the icon in the Standard Toolbar and click on the destination element or if there are no such elements define the extension by drawing a line.
- **Intersect - Connects two selected non-parallel linear elements.**
- **Fillet/Chamfer...** - Adjusts the corner connection of two selected linear elements or corners of polygonal elements (Fills).
- **Resize - CTRL/CMD+K** will pop up the resize options of selected elements. Alternatively use the icon on the Standard Toolbar once the to-be-resized elements are selected.

## Schedules

**The template includes sample schedules for Beams at unit and common area levels as well. These samples cannot be used as is, as their actual setup is determined by the actual projects and their Hotlinked Modules names.**

To setup the schedules in a hotlinked workflow:

- 1 **Log in to the architectural Teamwork project** first.
- 2 **Edit the relevant properties** (Core Information, Reinforcement, etc.) you wish to list.
- 3 **Go back to the structural project and update the Hotlinked Modules.** The properties will also be updated, reflecting the latest state in the schedules.

After the initial phases the **structural team shall receive updates from the structural engineers with more accurate specification on reinforcement** after the structural analysis was run. These **updates have to be added to the architectural project again** due to hotlinking.

**The structural engineers are not using ARCHICAD** for structural analysis, therefore the communication gap will be bridged by Microsoft Excel.

**The structural properties have to be exported to Excel, but** the schedules themselves are not available in the architectural project (even though the properties are). Therefore, **first the schedule has to be exported from the structural project to the architectural project.**

- 4 Go to the **Scheme Settings** of the required schedule. Use the **Export** function to create an XML file that can be used to transfer the scheme.
- 5 **Switch back to the architectural project and open the Scheme Settings.** Use **Import** and browse for the XML file to re-create the schedule. Once imported, the properties in the schedule are ready for smart export to Excel.

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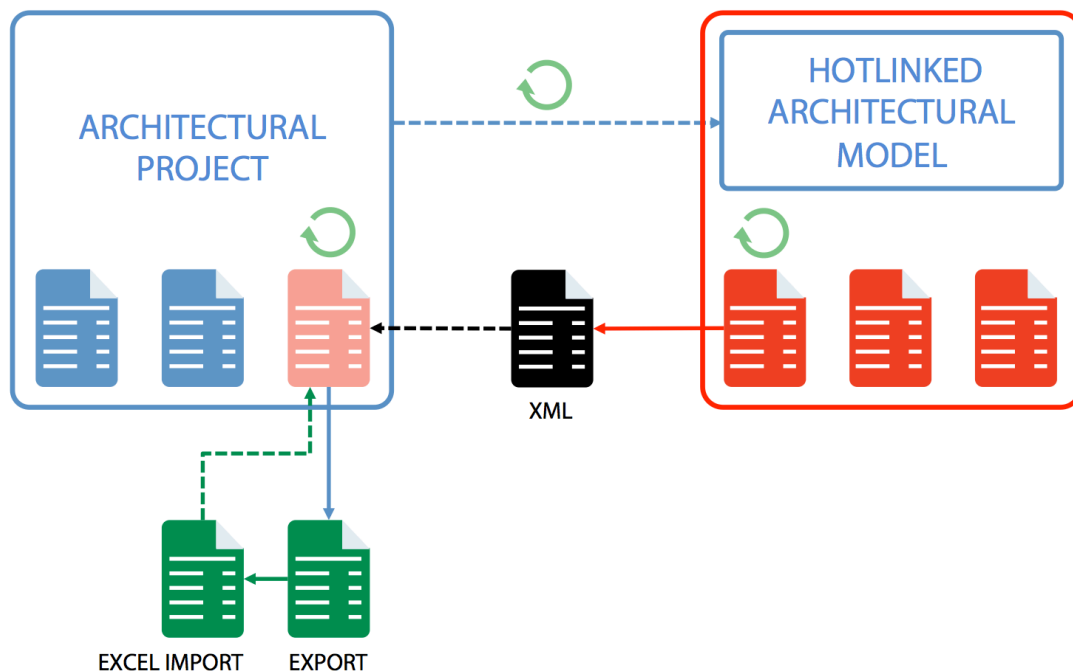
**Note:** Smart export to Excel (exporting Element Properties) is not possible without having the necessary properties listed in a schedule.

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- 6 With the schedule open go to **File/Interoperability/Element Properties/Export Element Property Values from Schedule....**
- 7 **Save the Excel file** and open it.
- 8 **Update the required fields in Excel and save a new file.** It is recommended not to overwrite the imported file to be able to track changes later if necessary.

**Note:** The updated **data must be in the same format (General, Integer, Number, Tags List, Option Set, Tags List or True/False)** as it was defined in ARCHICAD originally, otherwise the Property Manager in the structural file will prompt for conflicts with Hotlinks.

- 9 **Switch back to the architectural ARCHICAD**, which has the previously exported schedule open.
- 10 Go to **File/Interoperability/Element Properties/Import Element Property Values into Elements...**
- 11 **Check the report**, if there are any warning prompts correct the Excel file (usually format conflicts due to misspelling and typos), otherwise **import**.
- 12 **Send and Receive changes and switch to the structural project.**
- 13 Go to **File/External Content/Hotlink Manager...** and **update the source of the architectural project**. The new values will appear in the structural schedules.



Criteria setup of the structural schedules in general are as follows. Please update any schedules with the relevant Story names and Hotlinked Module sources.

- **Beam schedules for specific units:**

- Element Classification is Beam and
- Structural Function is Load-Bearing Element and
- Hotlink Source is ARCHI Units file/project and
- Home Story is the actual storey(s)

- **Beam schedules for common areas:**

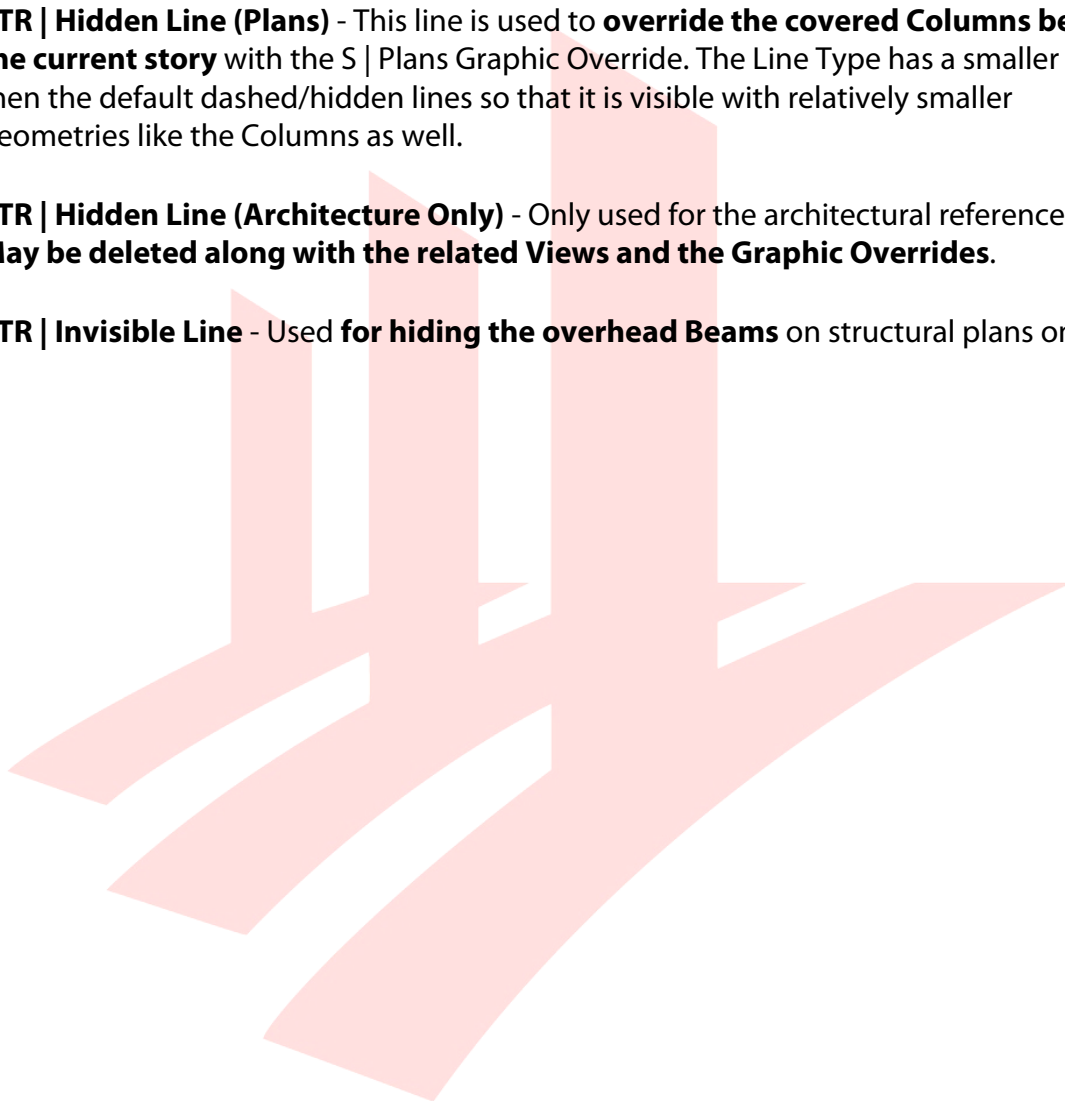
- Element Classification is Beam and
- Structural Function is Load-Bearing Element and
- Hotlink Source is not ARCHI Units file/project and
- Home Story is the actual storey(s)

## ATTRIBUTES

### Line Types and Pen Sets

The following Line Types were created for the structural use of ARCHICAD. These are to be used for the Graphic Overrides of the plan Views.

- **STR | Hidden Line (Plans)** - This line is used to **override the covered Columns below the current story** with the S | Plans Graphic Override. The Line Type has a smaller scale than the default dashed/hidden lines so that it is visible with relatively smaller geometries like the Columns as well.
- **STR | Hidden Line (Architecture Only)** - Only used for the architectural reference views. **May be deleted along with the related Views and the Graphic Overrides.**
- **STR | Invisible Line** - Used **for hiding the overhead Beams** on structural plans only.



## Layer Combinations

The Layer Combinations use the naming convention introduced in previous chapters.

- **S |** prefix marks the required for structural representation
- **unmarked items are generic**, available in all discipline templates

The following Layer Combinations are present in the structural template as a base by purpose (listed in alphabetical order in the Layer Settings):

- Generic purpose:
  - **All Visible Shown Editable** - shows all Layers turned on
- For actual annotated plans there are specific Layer Combinations for separating annotations for bottom and top reinforcements.
  - **S | Pile Cap Plan**
  - **S | Pile Layout Plan**
  - **S | Slab BOT & Beam** - includes the bottom reinforcement of Slabs and all Beam reinforcement
  - **S | SLAB TOP** - includes the top reinforcement of Slabs

## DOCUMENTATION

### Layouts and Master Layouts

The structural Layout Book includes some mandatory items and samples for customization as follows:

- **COVER PAGE** - Required for submission, this Layout includes Project Information and the list of drawings for approval and reference.
- **FOR APPROVAL** - Required for structural submission to BCA.
- **FOR REFERENCE** - Required for structural submission to BCA.
- **TENDER**
- **Sample Subset** - Samples of structural and architectural layouts, the users have to create their own based on their company standards. This folder therefore **may be deleted** from the office template.

**The drawing list is based on the S | DRAWING LIST Project Index.** Project Indexes are similar to Interactive Schedules, but cannot list elements but the items in the Navigator instead.

Criteria setup of the structural drawing list is as follows:

- Layout Subset is .../FOR APPROVAL or
- Layout Subset is .../FOR REFERENCE

As seen it only includes the submission-required drawings, any additional content needs the editing of the above Project Index.

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**Note:** 'Drawings' as a term are usually referred to the drawing sheets, which are called 'Layouts' in ARCHICAD. The **S | DRAWING LIST index therefore lists the Layouts**, not the Drawings as it is called in ARCHICAD terms.

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Project Information is accessible via **File/Info/Project Info**. Use the **Export.../Import...** buttons of the Project Info dialog to transfer project info between projects.

Project Info is referred to by *Autotexts*, which are also available for Layout and Drawing Information.

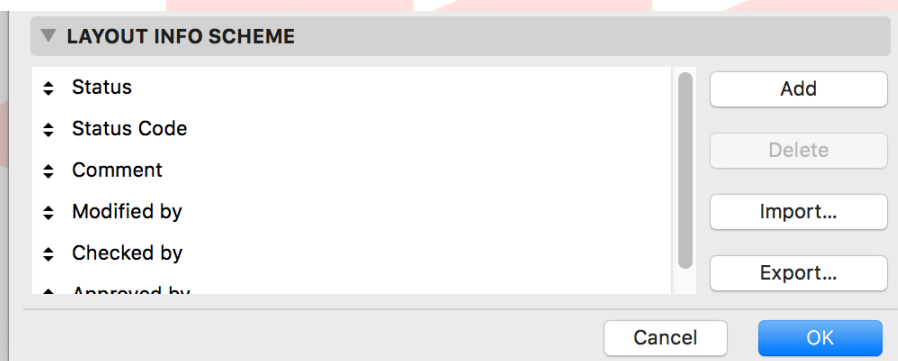
To add these, use the **Text tool** and the **Insert Autotext** icon to add different types of autotexts as part of regular textboxes.

The values of these autotexts can be defined in the Drawing Settings dialog or the Layout Settings.

- 1 **Select the Layout** in the Layout Book.
- 2 **Right-click and choose Layout Settings....**
- 3 **Add values** as needed under the Layout Info panel.

Custom information can be created to be listed under the Layout Info panel.

- 1 **Select the Layout Book** (the topmost item in the Navigator).
- 2 **Right-click and choose Book Settings....**
- 3 Add items as needed under the **Layout Info Scheme panel**. The new fields will be available for all Layouts.

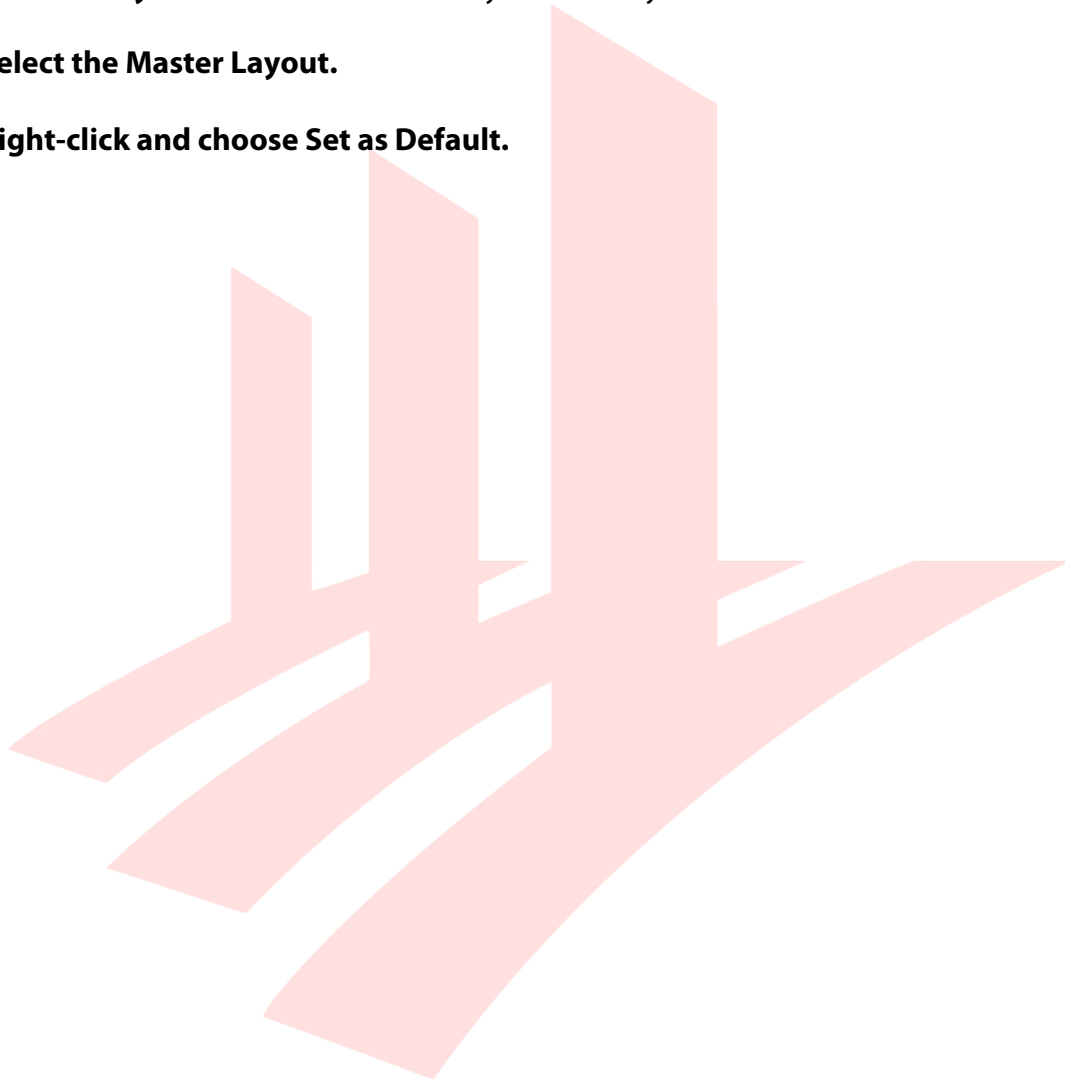


**Master Layouts** are available as references for:

- **ARCH A1 LANDSCAPE** - generic architectural Layouts
- **STR A1 LANDSCAPE** - generic structural Layouts
- **STR A1 COVER PAGE** - cover page only

Additional Master Layouts may be created according to the office standards.  
To **set a Master Layout as a default** for newly created Layouts:

- 1 Select the Master Layout.**
- 2 Right-click and choose Set as Default.**



## Project Info

Project Information is accessible via **File/Info/Project Info**. Use the **Export.../Import...** buttons of the Project Info dialog to transfer project info between projects.

Project Info is referred to by *Autotexts*, which are also available for Layout and Drawing Information.

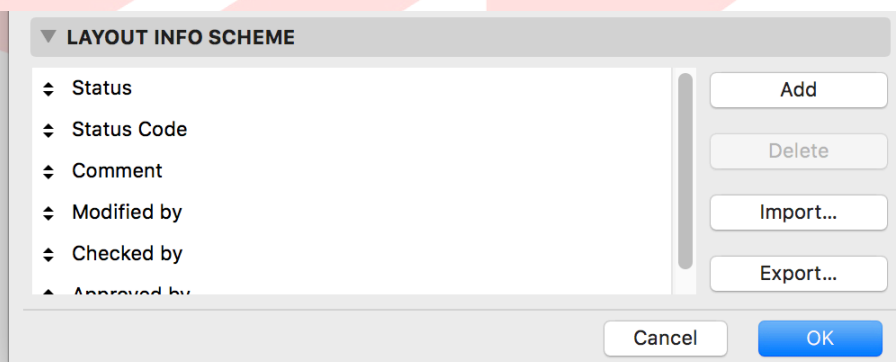
To add these, use the **Text tool** and the **Insert Autotext** icon to add different types of autotexts as part of regular textboxes.

The values of these autotexts can be defined in the Drawing Settings dialog or the Layout Settings.

- 4 **Select the Layout** in the Layout Book.
- 5 **Right-click and choose Layout Settings....**
- 6 **Add values** as needed under the Layout Info panel.

Custom information can be created to be listed under the Layout Info panel.

- 4 **Select the Layout Book** (the topmost item in the Navigator).
- 5 **Right-click and choose Book Settings....**
- 6 Add items as needed under the **Layout Info Scheme panel**. The new fields will be available for all Layouts.



## Publisher

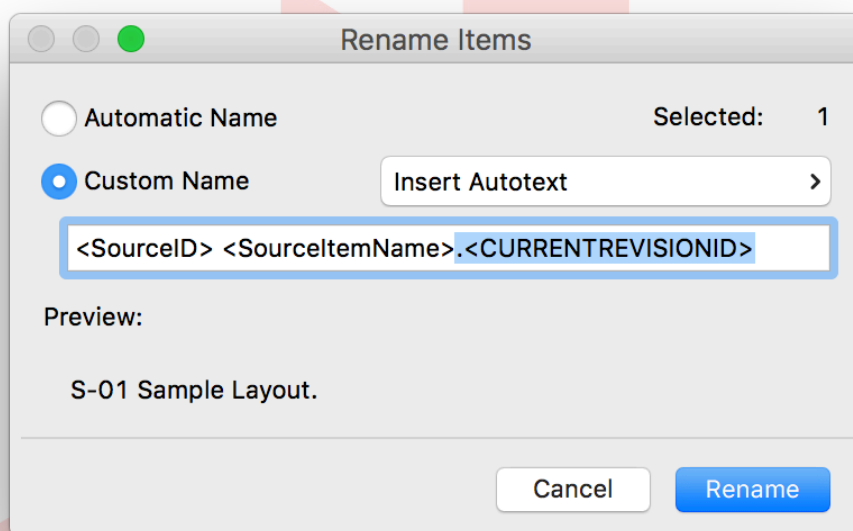
Publisher Sets have to be created manually. Once the Layout Book subsets are created, use the **Add Shortcut »»** button in the Organizer to create continuously updated content within the Publisher Sets.

The default Publisher Sets contain:

- **1 - Views** - the content of the View Map in PDF format
- **2 - Layouts (PDF)** - the content of the Layout Book in PDF format
- **S | Layouts (DWG)** - the content of the Layout Book in DWG format
- **S | Ref.Model for Structure (IFC/DWG)** - the 3D model in IFC and the GA/UNIT PLANS folders in DWG format for export to Revit Structure
- **S | Submission - For Approval (DWG/PDF)** - the content of the Layout Book/FOR APPROVAL folder in DWG and PDF format
- **S | Submission - For Reference (DWG/PDF)** - the content of the Layout Book/FOR REFERENCE folder in DWG and PDF format
- **S | Tender Documents (DWG/PDF)** - the content of the Layout Book/TENDER folder in DWG and PDF format
- **S | Tender Documents (PDF)** - includes the TENDER subset of the Layout Book in PDF format

The Publisher Set item names can also include Autotexts, such as codes, IDs, revision numbers, etc. Those custom fields that were created under the Layout Info Scheme can also be inserted.

- 1 **Select the item**/folder/root folder of the set.
- 2 **Right-click and choose Rename Items....**
- 3 Change to **Custom Name** radiobox.
- 4 **Add Autotexts from the Inster Autotext dropdown list.** Note, that the input field allows custom entries as well (for example project IDs can be used as prefixes - if not set as an autotext).



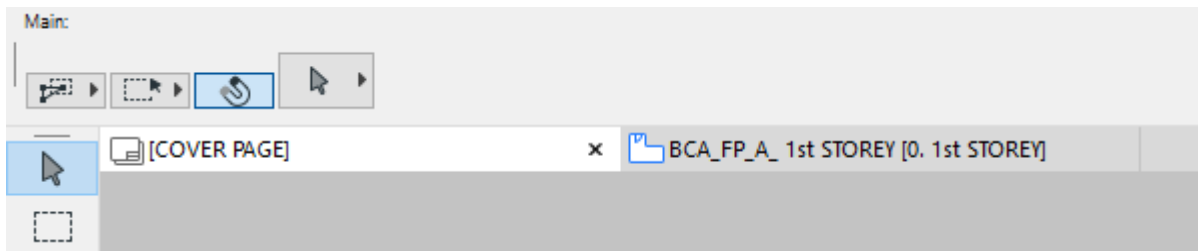
Find more details on **Revision Management** in general  
at the GRAPHISOFT Help Center here:

[https://helpcenter.graphisoft.com/guides/archicad-20/archicad-20-reference-guide/documentation/revision\\_management/](https://helpcenter.graphisoft.com/guides/archicad-20/archicad-20-reference-guide/documentation/revision_management/)

## Submission File Format

Saving the files requires a specific naming format to define the following.

- 1 Make sure that all tabs except a floor plan of the project are closed and that the **COVER PAGE layout is opened** and **moved to the front**. This layout has to be the one that appears when the officers open the file.



**Note:** A floor plan viewpoint or view has to remain open, otherwise ARCHICAD will close the project.

- 2 Use **File/Save as...** menu command and save you file in one of the different formats.

- **BIM native file format and software version in a single file:**

ARCHICAD - **.pla**, **.pln** and/or **.mod**, version **20**, indicated in the file name, for example:

ABCDEF\_S1\_BLK01\_ST01\_**AC21**\_RPP1\_T23456.pla

**Note:** PLA files include all library elements used in a project and make the file management easier for the submission, therefore it is highly recommended to use this format.

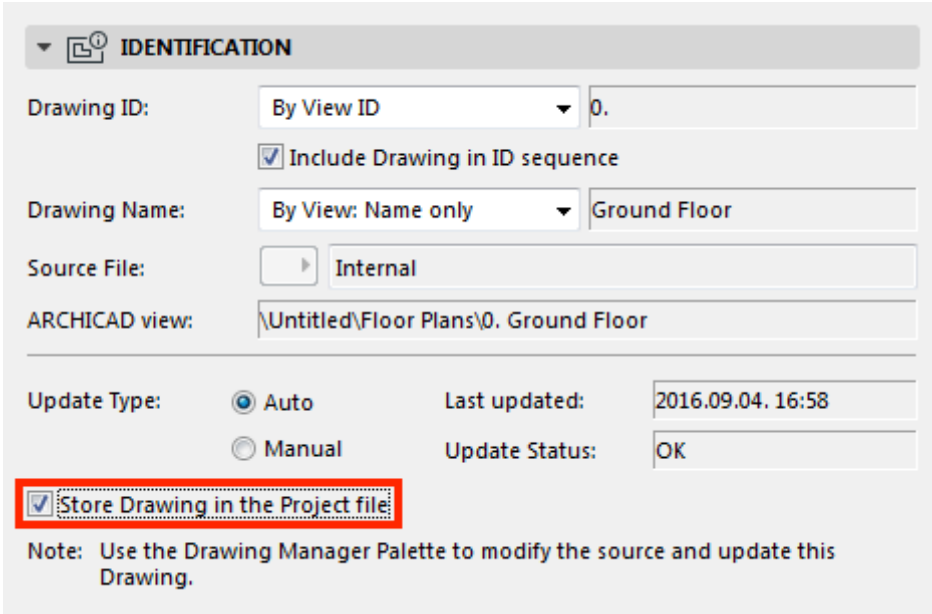
For file naming conventions for submission refer to COP in force:

Project ID						Author		Model Part					Submission Version				Software Version				Related ST				User Defined												
A	B	C	D	E	F	_	S	1	_	B	L	K	0	0	1	_	S	T	0	2	_	A	C	2	0	_	R	P	P	1	_	1	2	3	4	5	6

Before submitting the file make sure all necessary views are set correctly and show the relevant information.

Make sure that all external references (2D drawings) are stored with the project file to ensure that the checking officers will see the same content as the QP.

- 1 Select the linked drawings and open their settings.
- 2 Check the **Store Drawing in the Project file** checkbox for each drawing.



The screenshot shows the 'IDENTIFICATION' dialog box in ARCHICAD 21. The 'Drawing ID' is set to 'By View ID' with a value of '0.'. The 'Include Drawing in ID sequence' checkbox is checked. The 'Drawing Name' is set to 'By View: Name only' with a value of 'Ground Floor'. The 'Source File' is set to 'Internal'. The 'ARCHICAD view' is set to '\\Untitled\\Floor Plans\\0. Ground Floor'. The 'Update Type' is set to 'Auto'. The 'Last updated' date is '2016.09.04. 16:58'. The 'Update Status' is 'OK'. The 'Store Drawing in the Project file' checkbox is checked and highlighted with a red box. A note at the bottom states: 'Note: Use the Drawing Manager Palette to modify the source and update this Drawing.'

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