R H A
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REVIT STANDARDS

Contents

Version 1 2023

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Revit

Manual

The intent of this manual is to have a central location for all standards regarding Revit.

This manual will explain how we as an office use the tools, set up views, apply correct nomenclature, model accurately, present material, etc.

This manual is **supplement** to the information found on the start up page of every Revit project and is meant to be thoroughly understood. See the BIM Manager if you have any questions.

Starting a New Revit File

To start a new Revit file click **New** under the **MODELS** title and a dialog box will appear suggesting using the "RHA_Template". If this does not occur, contact the BIM Manager immediately.
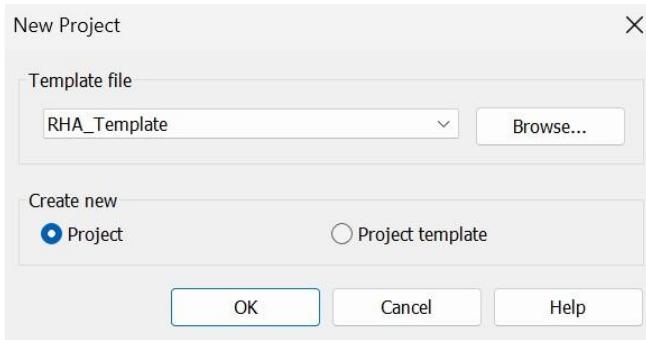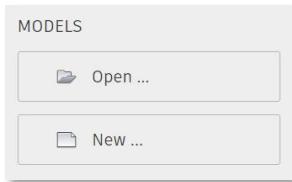
The checkbox next to Project should be checked and the other unchecked.

On the start up page find and zoom in to the Worksets title on your screen and set up your *Collaborate > Worksets* accordingly to the instructions.

Save the project in the correct folder following the proper nomenclature. See **Appendix A** for more information. Close the file, re-open it and synchronize for the first time. You are now ready to start working.

Revit files

NEVER copy a Revit file!

This can result in irreparable damage to the original file and should always be avoided. A copied file could still save back and override information in the original file.

Setting Up a Project

Project and file setup will vary from project to project. Involve the BIM Manager in this process.

Opening Revit Files

NEVER double click a Revit file to open it.

A file must always be opened through Revit. When selecting a file through Revit a thumbnail will appear and let you know which version of Revit this file is catered towards.

Unless approved by the Project Manager, do not upgrade the file to a newer version as a consultant might depend on the current version you're using.

Opening a file through Revit will also ensure you will have the latest information from the central Revit file on the server.

If you have thumbnails of previous projects and families on the front screen, notify the BIM Manager as soon as possible as these need to be turned off.

Template

The Revit Template is configured with a custom browser organization for working with Views and Sheets in an effective manner.

The objective is to enable a logical filing methodology to Views and Sheets. Organizing these into smaller, logical and project specific groups allows the typical large number of views and sheets to be more easily searched and worked with.

Changes to the Standards and Template

If you have any suggestions/comments refer to the BIM Manager before any changes are made.

This Manual will be regularly updated and evaluated for best practices – **refer to it frequently.**

If there are major changes concerning the Template, Graphic Standards, View Naming, and Sheet setup this should be brought up as a group discussion with the Department Directors and BIM Manager.

Minor deviations and changes can be made on a per project basis as the Project Manager deems necessary, to better serve the product and client.

It is the responsibility of the Project Manager to understand client standards and how they might deviate from RHA standards of documenting. This includes but is not limited to sheet and view naming, sheet numbering, sheet order, the amount of information, title block etc.
It is the Project Manager's obligation to discuss this with the Department Director and the BIM Manager **prior** to implementation in the Project.

1 Views

Views serve as the primary means of presenting and documenting the building's design and information.

New Plan View

1. Go to *View* > *Plan Views* > **Floor Plan**
2. Choose an appropriate Type.
3. Then pick a level you want your floor plan based on and click **OK.**
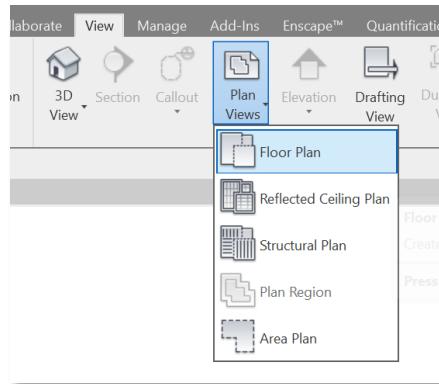
Renaming a Plan View

Any view in Revit view has two names. The **View Name** is to be unique project wide with modified sentence case and follow nomenclature convention. The other is the **Title on Sheet**. This must be ALL CAPS and should follow an appropriate nomenclature rationale.

After renaming a new view, you might be asked to rename the corresponding level if it is connected to a level of the Revit Model. Check the box that says, "**Do not show me this message again**" and click **No.**

If you accidentally clicked Yes notify the BIM Manager immediately.
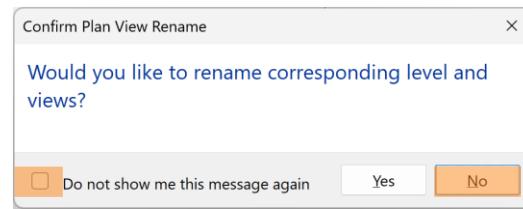
1.1 View Nomenclature

Prefix:
- (**your initials**)_ for any User Views *(working views)*
- **SD_** for any **S**chematic **D**esign Views
- **X_** for any Coordination Views. These views are e**X**ported
- No prefix for any Construction Document View

Floor Plans and Ceiling Plans:
(Prefix)_(Plan # *or* Building # *if applicable*) (Elevation Style)_(Floor Level)
Example:
- **SD_P02C_Level 4** - *for a* **S**chematic **D**esign Plan *for a* **P**lan **02** *with Elevation style* **C** *on* **Level 4.**
- **SD_B02_Level 4** - *for a* **S**chematic **D**esign Plan for **B**uilding **02 Level 4** *when Elevation style does not apply.*
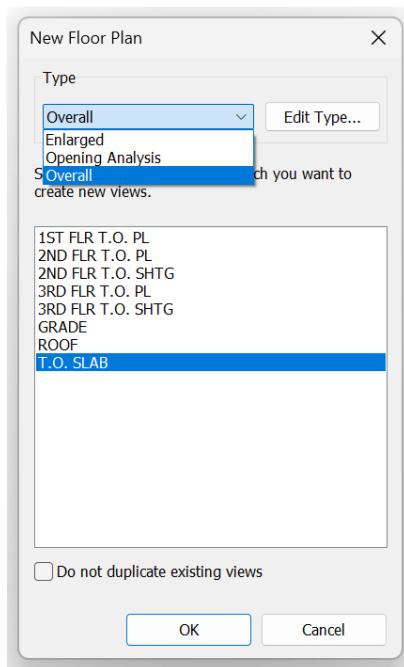
Enlarged Floor Plans and Enlarged Ceiling Plans:
(Prefix)_(Plan # *or* **Building #** *if applicable***) (Elevation Style)_(Floor Level) - (View Category) - (Location** or **Room)**
Example:

- **B03_Level 4 - Enlarged - Stair 02** - *for an enlarged CD Plan in Building 03 on Level 4 at Stair 02.*
- **SD_P05_Level 4 – Overall** - *for an Overall Schematic Design plan for Plan 05 on Level 4 when Elevation style does not apply.*

Exterior Elevations:
(Prefix)_(Building # *if applicable***) (Elevation Style)_(Orientation** *use cardinal naming if applicable***)**
Example:

- **B02B_Front Elevation** - *for a plot Front Elevation for Building 02 with Elevation style B.*
- **B02B_North Elevation** - *for a plot Elevation facing North for Building 02 with Elevation style B when cardinal naming is applicable or*
- **B02_South Elevation** - *for a plot Elevation facing South for Building 02 when Elevation style does not apply.*

Sections:
(Prefix)_(Building # *if applicable***) (Elevation Style)_(Type of Section** *i.e., Wall, Building, Site***)**
Example:

- **B01B_Building Section 01** - *for a plot Building Section 01 for Building 01 with Elevation style B.*
- **SD_B03_Building Section 03** - *for a Schematic Design Building Section 03 for Building 03.*
- **B04A_Wall Section 02** - *for a Wall Section 02 for Building 04 with Elevation style A.*

1.2 View Name vs Title on Sheet

These parameters are to be found in the **Properties** window under the Identity Data section.

View Name is a unique name for every view within its category and must follow the above-forementioned standards, e.g.:

- **SD_B01_Section 03**
- **B01A_East Elevation**

Title on Sheet can share names and are always written in capital letters. Discuss with your Project Manager for proper naming convention since this can be project specific. I.e.:

- **SECTION 3 - BUILDING 1**

EAST ELEVATION - BUILDING 1A

1.3 Creating Views

Creating a New Elevation

When creating a new Elevation refrain from duplicating an existing Elevation as the marker will copy and place itself right on top of the other.

This can easily lead to confusion as it can get tricky to find the right elevation in plan.

Always create a new *View* > **Elevation** when a new Elevation is needed and make sure you select the proper Elevation type (Overall, Enlarged, Interior and Opening Analysis) of Elevation you need.
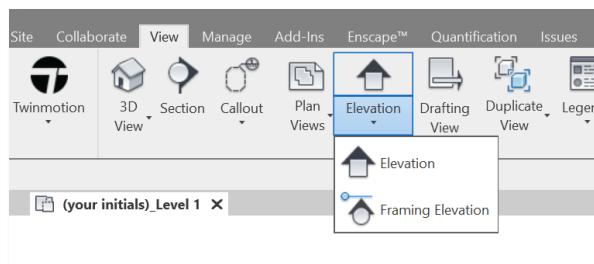
Creating a New Section

When creating a new Section refrain from duplicating an existing Section as the marker will copy and place itself right on top of the other.

This can easily lead to confusion as it can get tricky to find the right Section in a plan.

Always create a new *View* > **Section** when a new Section is needed and make sure you select the proper type (Building Section, Building Section - User or Wall Section) of Section you need.
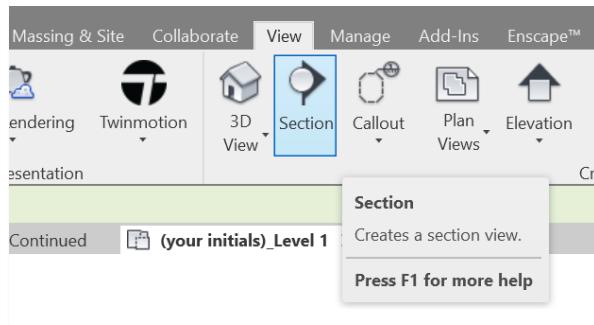
Possible issues if duplicating Elevations and/or Sections

When creating multiple Elevations and Sections, it is highly inadvisable to use "Duplicate", "Duplicate with Detailing" or "Duplicate as Dependent".

Duplicating elevations and sections in Revit, as opposed to creating them manually, can create issues, and this practice should generally be avoided.

<u>**Some of those issues are:**</u>

- **View Marker Duplication**: When you duplicate an Elevation or Section, Revit tends to copy the view markers associated with the original view. View markers are the symbols that indicate the orientation of Elevation or Section views on your sheets. Duplicating them can lead to confusion on your sheets, making it challenging to identify the correct views.
- **Loss of Intent when using "Duplicate as Dependent"**: This can result in unintended changes or inconsistencies in your project. Revit may carry over specific view settings, such as the detail level, scale, or even view specific annotations. These settings may not align with the requirements of the new view, leading to discrepancies and errors in your documentation.
- **Documentation Errors:** Duplicating views may lead to errors in your project documentation. If you forget to update some duplicated views with the correct information, you risk presenting inaccurate or conflicting information.

To avoid these issues; create Elevations and Sections manually.

This will give you full control over the view settings, where the marker is placed and can ensure that they align with the specific requirements of your project.
This approach helps maintain clarity, accuracy, and consistency in your project documentation while reducing the risk of redundancy, errors, and confusion.

2 xReference Planes and Views

2.1 xReference Planes

The inner xReference Planes you see in Plan are **Reference Planes** which act as guidelines to help you place the initial dimension string **5'** from building edge.

Revise them accordingly to always maintain this relation. As the design progresses and settles lock them in place by **pinning** them.

The same Reference Planes will also serve as guides for *Annotate > Region >* **Filled Regions** to place the left and right extents of your filled region in sections and exterior elevations.

2.2 Elevations

The outer xReference Planes you see in the plan are **Reference Planes** set at **20'** from building edge and there to help you to always place the **Elevation Line** at a precise 20' away from building edge.

This is not to be confused with the **Elevation Markers**. These can be placed anywhere you see fit.
When selecting the circle portion of the elevation marker, you only move the marker. By selecting the **filled triangular** portion, you move the **Elevation Line**.

View Templates which have the **Depth Cueing** enabled are graphically dependent upon the **20'** distance from building edge.

Revise them accordingly to always be at **20'** from building edge as the design progresses and lock them in place when settled.

This is the default setting. Exceptions to this rule may occur depending on building/massing size.

The **Far Clip Offset** is a line indicating the extent of your view. This can be manipulated to be within 1" and infinity.

xReference Plane - Keep this 5' away from building face
(Delete this text when you're done)

Elevation Line placement 20' from building edge
(Delete this text when you're done)

5'-0"   15'-0"

20'-0"

Far Clip Offset
Elevation Line
Elevation
Elevation Marker
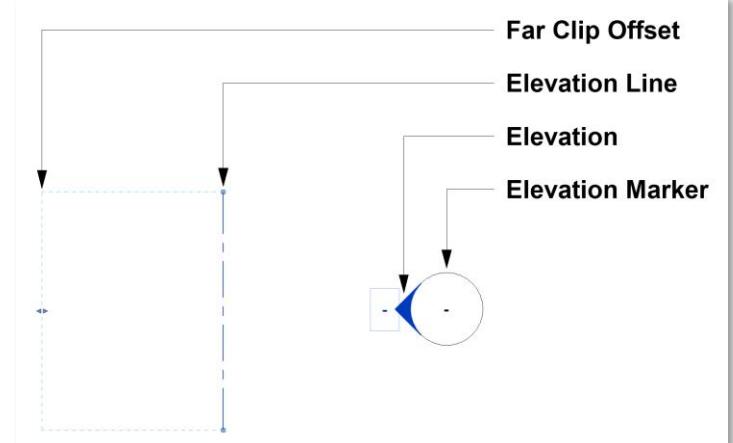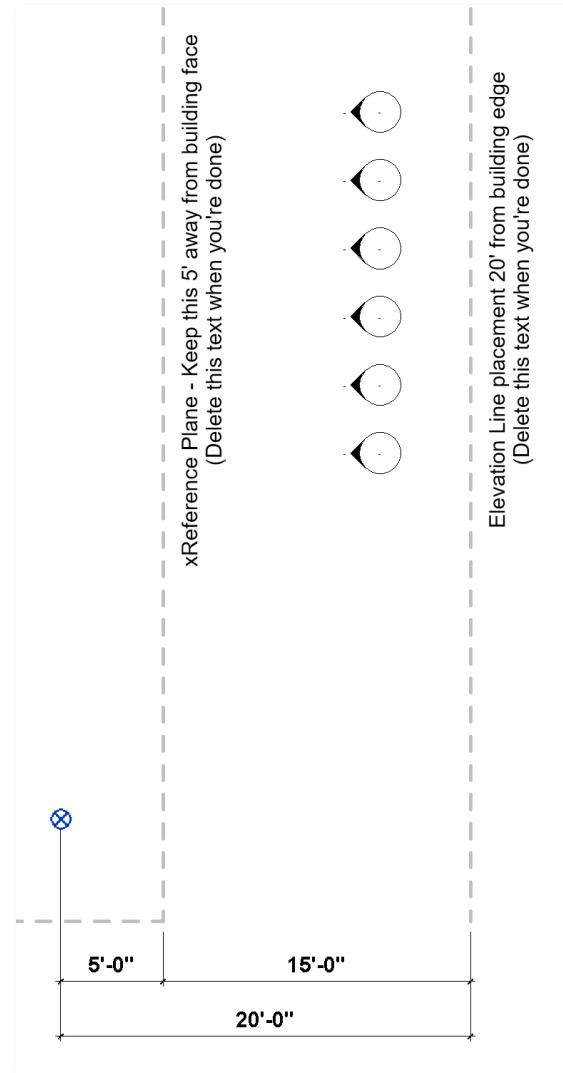
3 Browser Organization for Views

3.1 View Properties

The view and sheet parameters are accessed via the **Properties** window.

Two (2) Parameters used in labeling views are to be found in the **Identity Data** category.

Along with the **View Name**, for each new view if used for Construction Documents and Schematic Design we must also set up a **Title on Sheet** value (**See 1.1 for nomenclature**), along with the **Discipline** and **View Type.** The **View Type** is typically set up by the View Template once applied as shown in the example.

3.2 View Organization

One (1) Parameter **View Type** is used to organize your view and must be used for all views.

To ensure correct designation and proper organization these conventions are to be carefully managed and followed and are mandatory.

Newly created Views that have no proper organization will be grouped under '**???**'. Best practive is to avoid any '**???**' by filling out **View Type**.

When a View is added to a sheet, it will live on the sheet only.
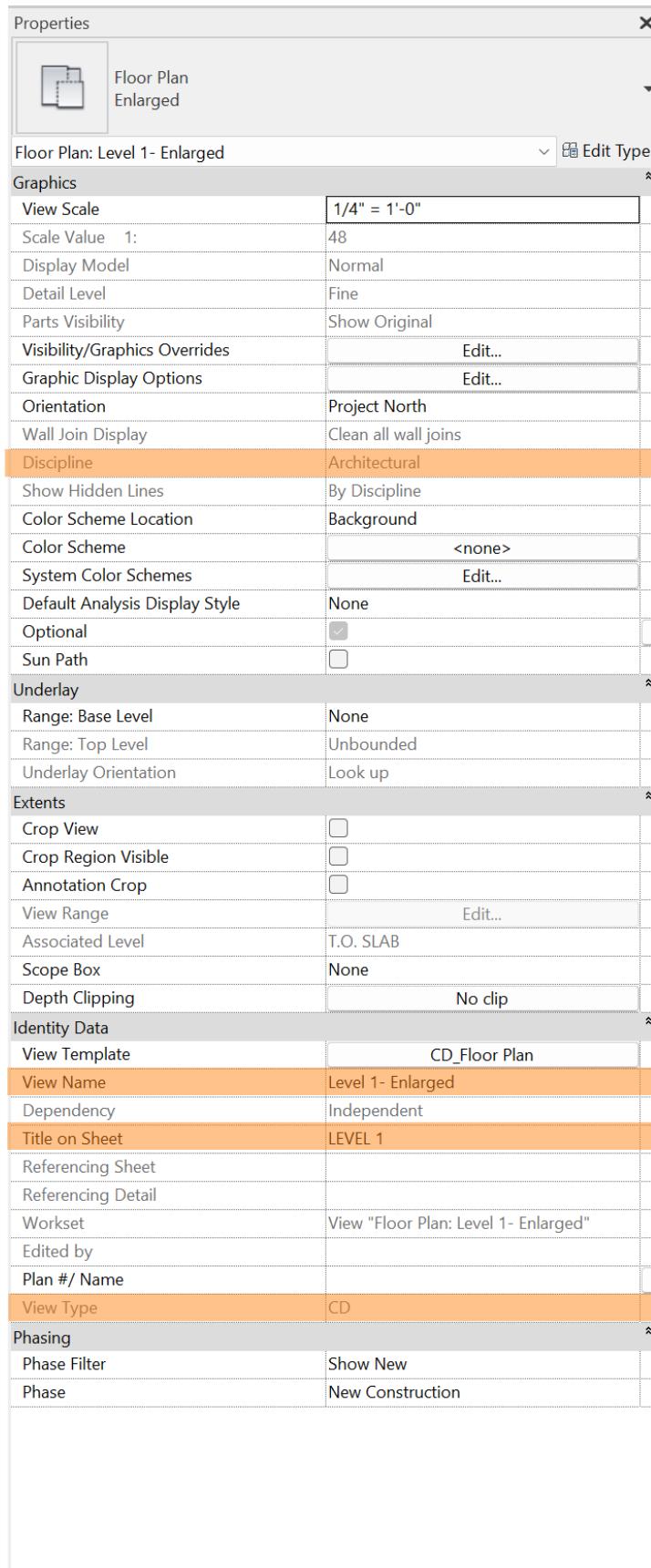
Properties	
Floor Plan Enlarged	
Floor Plan: Level 1- Enlarged	✓ Edit Type
Graphics	
View Scale	1/4" = 1'-0"
Scale Value 1:	48
Display Model	Normal
Detail Level	Fine
Parts Visibility	Show Original
Visibility/Graphics Overrides	Edit...
Graphic Display Options	Edit...
Orientation	Project North
Wall Join Display	Clean all wall joins
Discipline	Architectural
Show Hidden Lines	By Discipline
Color Scheme Location	Background
Color Scheme	<none>
System Color Schemes	Edit...
Default Analysis Display Style	None
Optional	☑
Sun Path	☐
Underlay	
Range: Base Level	None
Range: Top Level	Unbounded
Underlay Orientation	Look up
Extents	
Crop View	☐
Crop Region Visible	☐
Annotation Crop	☐
View Range	Edit...
Associated Level	T.O. SLAB
Scope Box	None
Depth Clipping	No clip
Identity Data	
View Template	CD_Floor Plan
View Name	Level 1- Enlarged
Dependency	Independent
Title on Sheet	LEVEL 1
Referencing Sheet	
Referencing Detail	
Workset	View "Floor Plan: Level 1- Enlarged"
Edited by	
Plan #/ Name	
View Type	CD
Phasing	
Phase Filter	Show New
Phase	New Construction

3.2 Organization

The purpose of a custom Browser organization is to enable a logical filing methodology to Views and Sheets. Grouping these into their respective types allows a large amount of Views and Sheets to be readily available.

Most all modeling is to be done in "User" views.

Graphics and scales can be customized to your liking and will not affect views on sheets.

<u>A few notes on views:</u>
- Any annotations i.e., text, 2d linework, dimensions etc. live locally on a view and will not appear anywhere else.
- **View Name** can only be unique and is mainly for Project Browser and organization purposes. By ensuring proper nomenclature (**See 1.1 for more information**) they will be easy to find i.e., creating detail callouts and you are asked to find the view in a scroll down menu.
- **Title on Sheet** is utilized for views going on sheets. This can be left blank for all other views.

Identity Data	
View Template	CD_Floor Plan
View Name	Level 1- Enlarged
Dependency	Independent
Title on Sheet	LEVEL 1
Referencing Sheet	

3.3 Starting View

There is a View set to appear when files open.
Leave as is.

When opening Revit, it will reduce the amount of time and resources required to open the files as well as providing useful tips and necessary project and team information.

4 Browser Organization for Sheets

4.1 Sheet Properties

Sheets as well as Views will place itself under the '**???**' category unless given the proper **Sheet Category** and **Sheet Sub Category** which are to be found in the **Properties** window.

4.2 Organization

All sheets are organized by **Sheet Category** first and **Sheet Sub Category** later.
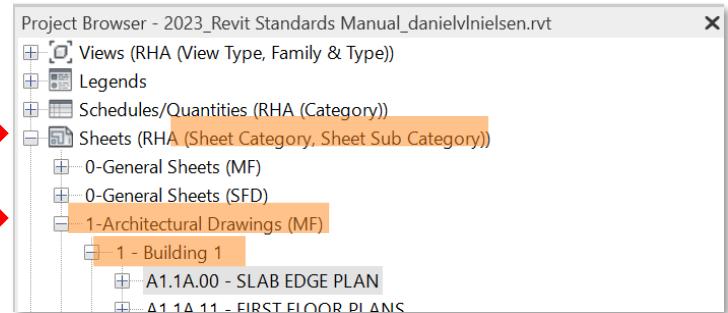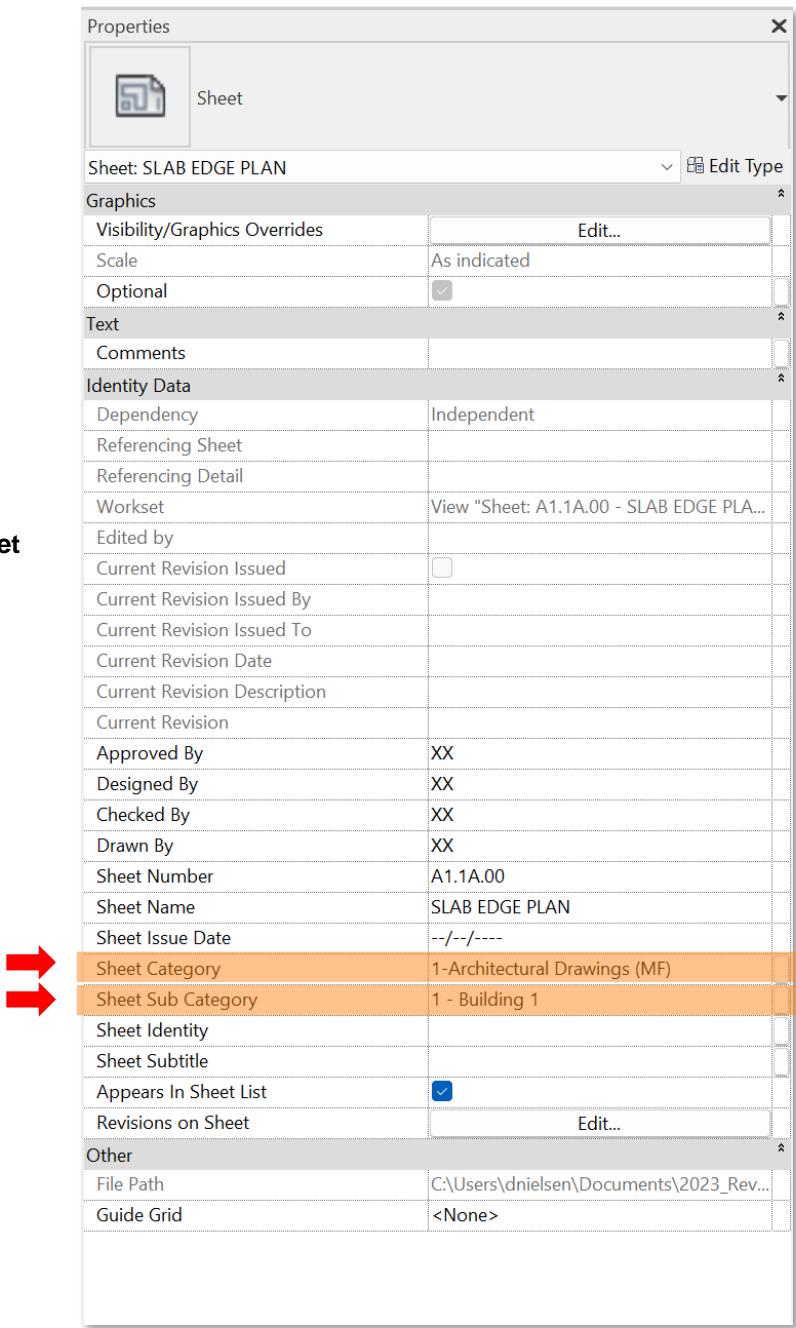
5 Legends and Schedules

5.1 Legends

Legends are Views that can exists on multiple pages. The nomenclature for **Legends** are meant to be as easy to comprehend as possible.

No abbreviations or cryptic acronyms are acceptable!

Remember, you are not the only one working on projects and to save time on deducing options or asking questions, **be as descriptive as possible.**

Legends can also be used for Notes and the same rationale for naming rules apply.

A new **Legend** must always start with the word '**Legend –** ' and then a Title or Description in a modified sentence case format. Note that this will typically not appear anywhere else except in the Browser.

A new note must always start with the word '**Notes –** ' and then a Title or Description also in a modified sentence case format.

Note: The blue checked box indicates that a Legend is being used on one or more sheets.
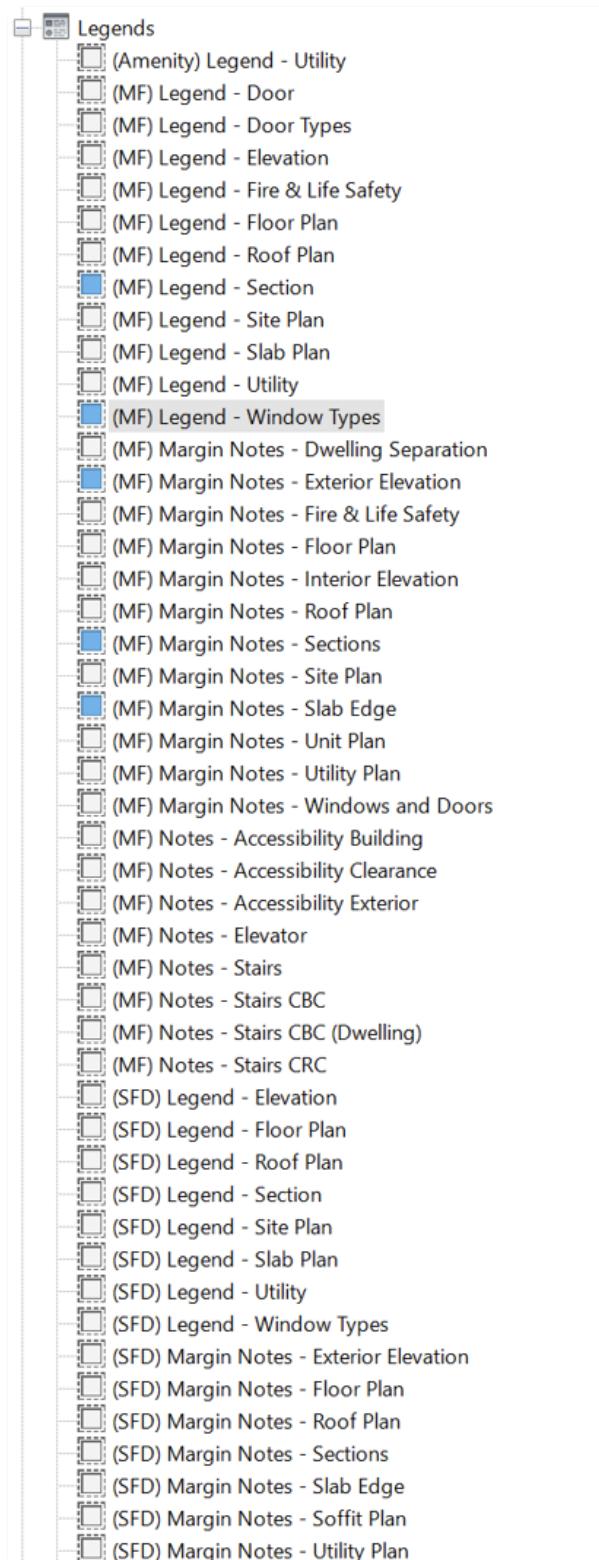
5.2 Schedules

Schedules can access and display most data in your model. They are to be found in the Project Browser and are grouped automatically per their Category. This is done per the Browser organization setup.

The naming convention for **Schedules** differs from Legends.

For **ALL Area Schedules,** without exception, the name **MUST** be in a modified sentence case format and must **ALWAYS** contain the default nomenclature given by Revit when creating the Schedule.

5.2.1 Renaming

To change the name/title you must double-click the Schedule, click in the **Title** cell and use the button **Clear Cell**.

This will maintain the name and conform to the aforementioned rule but allows you to change the Title that would appear on the sheet.

The reason this is important is because all Area Schedules are tied to an Area Scheme and can only be tracked via the name. Once altered it becomes difficult to track and find the correct Schedule.

For any other Schedules you are free to change the name as you see fit without using the **Clear Cell button**.

Note: The blue checked box indicates that a schedule is being used on one or more sheets.
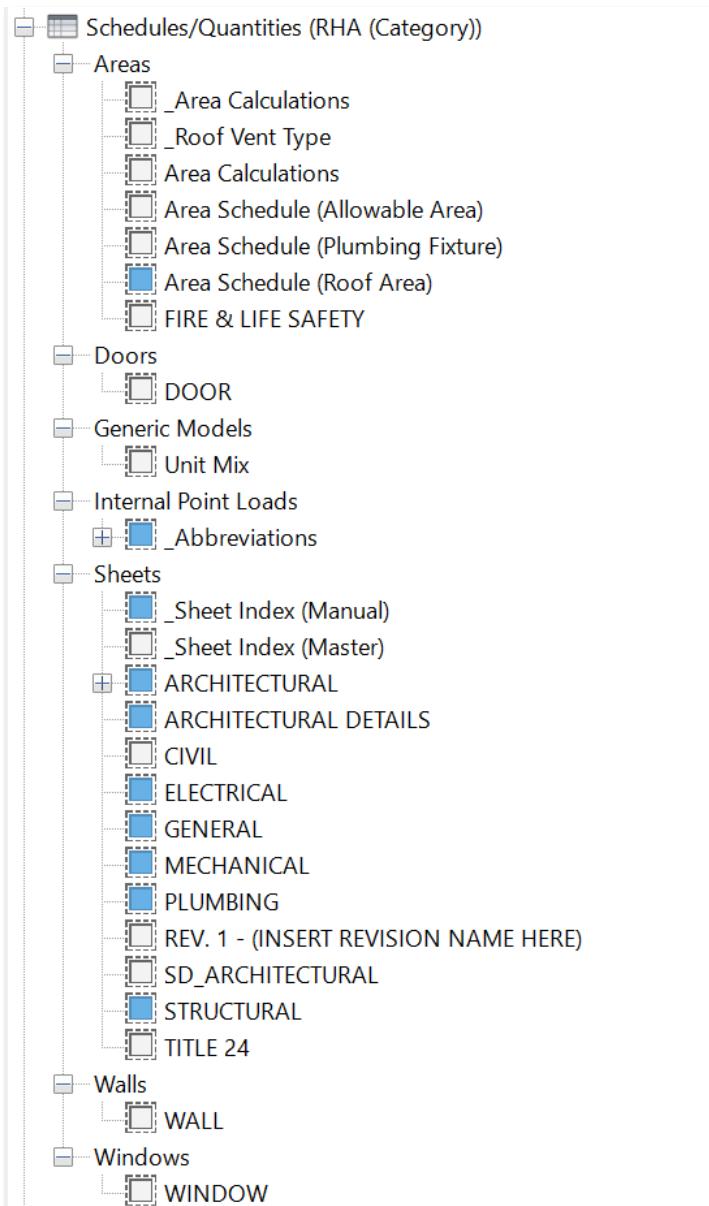
6 Areas and Area Schemes

6.1 Areas

Areas and **Area Plans** are all tied to an **Area Scheme**. The **Area Scheme** is the main hub that holds all data concerning Color Legends, Schedules, Views etc.

NEVER copy an existing Area Plan!

An **Area Schedule X** which extracts information from an **Area Plan X** are both using the same **Area Scheme X**. **Area Schemes** must be considered prior to creating an **Area Plan** and **Area Schedule** in both naming and *Properties > Areas > Other > Area Type* (read: Gross Area or any others).
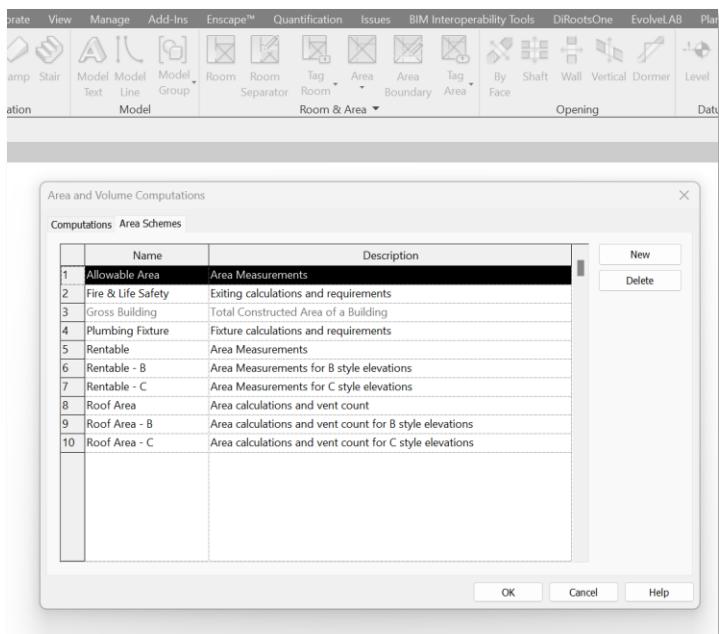
6.2 Area Nomenclature

Area Scheme

Architecture > Room and Area > Area and Volume Computations > Area Schemes > New > Choose either **Rentable Area Scheme** or **Gross Area Scheme** all depending on which Area Types you need available and then name it 'Area Name X' and 'Description'.

Area Plan

View > Plan View > Area Plan > Type > Choose **'Area Name X' and 'Description'** and the Level you want the area plan to depict.

Do NOT uncheck "Do not duplicate existing views."

Area Schedule

View > Schedules > Schedule / Quantities > Choose **'Area Name X' and 'Description'**

Below are the only two built-in Area Schemes with the following default Area Types.

Rentable Area Scheme

Area Types:
- Building Common Area (Garages, corridors, lobbies etc.)
- Office Area (Service areas, utility spaces etc.)
- Exterior Area (Covered spaces)
- Floor Area (Inside habitable space)
- Major Vertical Penetration (Any shafts, chases etc.)
- Storage Area (Hopefully self-explanatory)

Gross Area Scheme

Area Types:
- Gross Building Area (Any enclosed area)
- Exterior Area (Covered areas)

These Area Types must be utilized to their fullest extent to satisfy Grouping/Sorting/Filtering when creating Schedules. Area Schemes along with their respective Area Plans in the template by default are:

Allowable Area
- Use this to determine allowable areas for your building.

Fire and Life Safety
- Use this to calculate egress and ingress of your building.
- It will also calculate the number of exits required.

Gross Building
- Use this to calculate overall square footage of your building's footprint.
- By default, the lines are drawn at the face of slab but make sure to talk to your Project Manager to determine where these lines are drawn.

Plumbing Fixture
- Use this to calculate the number of fixtures required.

Rentable *(conditioned space for SF projects)*
- Use this to calculate rentable/sellable/useable areas.

Roof Area
- Use this to calculate the Roof Area and assist in determining the number of vents required for attic ventilation.

Area Tags extracts data from your Area. If there is no data, the tags will not work. For any area calculations to work, information is required by you to supply.
All this is filled out by selecting your area and looking at the Properties for that area.
Make sure to talk to your Project Manager concerning the information needed.

6.3 Area Footprint Variations via Design Options

If a building footprint changes in the same model from one **Design Option** to another, a separate **Area Scheme** is **REQUIRED** for these optional areas to work independently from each other.

This triggers you to create brand new Area Plans tied to these Area Schemes for areas in all Design Options to work.
Below is a diagram to show what this means:
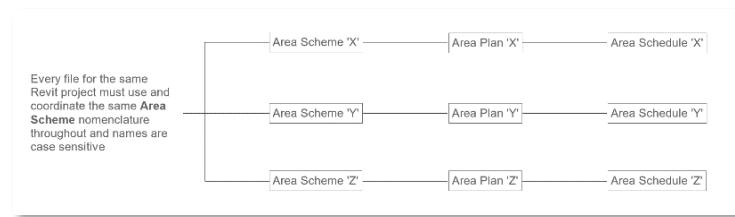
6.4 Area Tags

The template is set with a variety of **Area Tags**. They are reliant on the information added to an area and will calculate results directly to the tag.

Below are a few examples:

Fire, Life and Safety analysis

Plumbing Fixture Count

7 Modeling Standards

Model as they would build it. If you're unsure as to how they will build it? Start a conversation and gain a clear understanding of the condition you're unsure of.

Be very mindful, understand details and building systems before you initiate modeling. Revit will not solve things but merely point out what is wrong.

Do not model what you don't know!

Having this understanding will resolve the issue and help you to model correctly.

7.1 Walls

Any wall should always be constrained between two levels and almost never reach past levels.

Correct method:
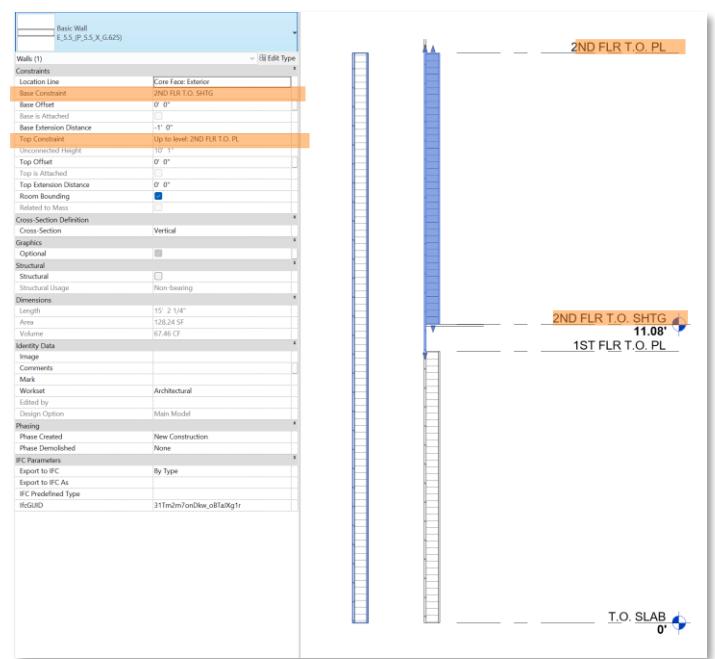
Incorrect method:
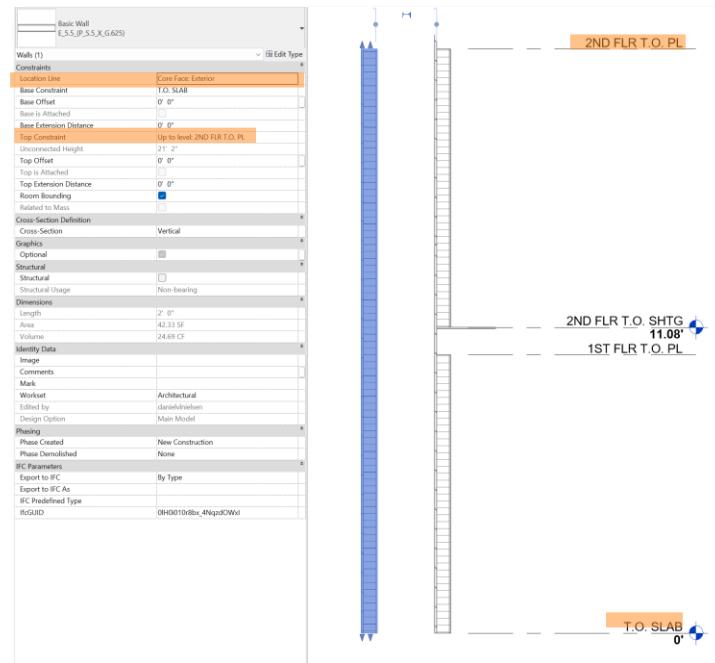
The pros and cons of making one wall commit to several levels.

Pros:
    a. This is also true if you do <u>not</u> commit to several levels. This information is redundant and confusing and can be dismissed.
    b. Stacking is always ensured.

Cons:
    a. Inaccurate graphic reading in plans
    b. Inability to correctly join with other walls
    c. Inability to let one color reach past a level and change mid level on the floor above
    d. Little to no flexibility in design
    e. Walls have a tendency to ovelap and issue warnings which can bog down your model.
    f. Openings or holes at walls joints/junctions in elevation
    g. Additional manual cleanup in aforementioned areas

7.2 Ceilings

When drawing a ceiling, avoid the **Automated Ceiling** feature and rely on **Sketch Ceiling** instead. This gives the designer precision and control over the room and ceiling interaction.
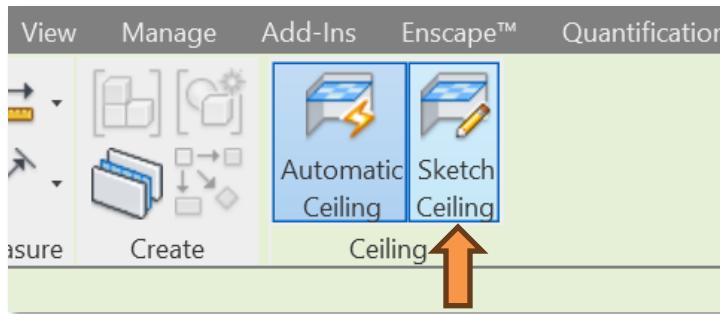
The **Automated Ceiling** feature does not always work and comes with its own issues:
    a. It will create a sketch for every individual ceiling.
    b. It will tie itself to the perimeter walls.
    c. If any of these walls should move, change, be trimmed or modified the ceiling might break and delete itself along with all of its content.
    d. It does not always work.

The **Sketch Ceiling** tool is a lot more forgiving, flexible, less unpredictable and able to host multiple ceilings at the same **Height Offset From Level** in one sketch.

7.3 Roofs

Roofs are created using the **Pick Wall** tool and makes sure the sketch lines are associated to the wall above the plate level below. **For ANY sketch line defining a roof slope this must always be used without expection.**
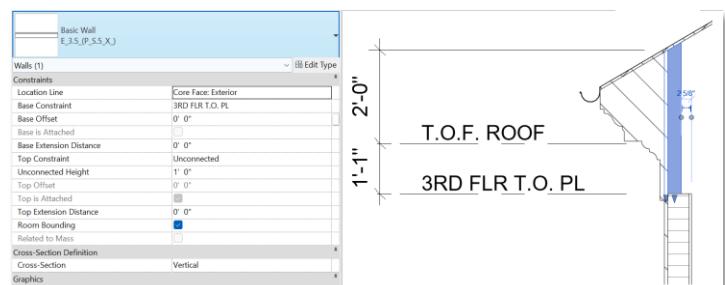
This ensures accuracy for eave overhang, heels, plate location and reliability in your roof.

The **Extend into wall (to core)** for all sketch lines must always be checked.

If you find a sketch line without this feature, this means you haven't used the **Pick Wall** tool for that particular sketch line.
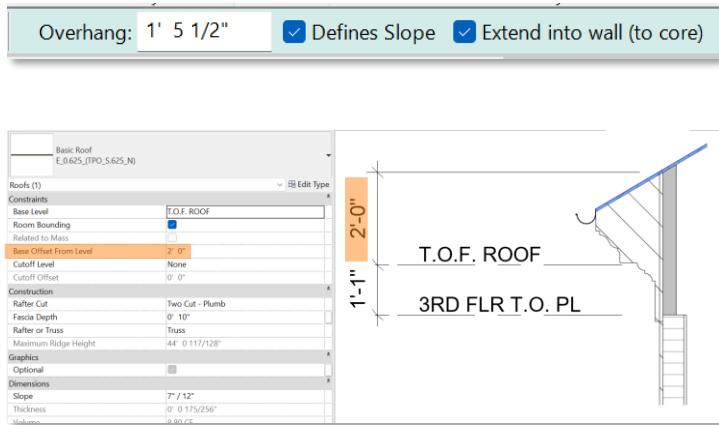
7.4 Slabs

Slabs are drawn in a similar way as the Roof using the **Pick Wall** tool. This will help to create a relationship between the Structural Foundation and Wall. This relationship/connection between the two is no guarantee and must always be checked and verified to see if it remains true.

8 Dimensioning Standards

8.1 How To

Typical dimensioning is **LEFT** to **RIGHT** and **TOP** to **BOTTOM**.

<u>**LEFT** to **RIGHT**</u>:
You start from the **LEFT** side of the structure and as you move to the right, you catch the **RIGHT** side of the **stud wall**.

<u>**TOP** to **BOTTOM**</u>:
You start from the **TOP** of the structure and as you move down you catch the **BOTTOM** side of the **stud wall**.

As with any rule, there are exceptions. Some of them apply to dimensioning:
- An important shaft size
- A corridor wall
- A clearance which could relate to e.g., Accessibility

Consult with your Project Manager if you have any doubts.

<u>**A few notes on Dimensioning:**</u>
- Be sure to pick the correct point to dimension to. (i.e., face of stud or slab edge and **not finish**).
- Dimensions need to be **legible** and should follow a **logical** sequence.
- Dimensions should <u>never</u> cross over each other.

8.2 Dimension Hierarchy

<u>Any building</u>
The hierarchy of the dimensions are:
1. Overall
2. Major Plane Breaks
3. Perpendicular Interior Walls
4. Openings

<u>Any building with Grid Lines</u>
If you have grids the hierarchy is:
1. Grids Overall
2. Grid Line to Grid Line
3. <add extra room here>
4. Overall with a tie to a Grid Line
5. Major Plane Breaks
6. Perpendicular Interior Walls
7. Openings

<u>Any Multi-Family building</u>
If you have a Multi-Family building with more than two or more units along a building edge the hierarchy is:
1. Grids Overall *(if applies)*
2. Grid Line to Grid Line *(if applies)*
3. <add extra room here>
4. Overall with a tie to a Grid Line *(if applies)*
5. Demising walls *(This will dimension each unit and refer back to the uni plans. Starting from the far exterior wall to the inside face of the air gap to the inside face of the airgap etc. till the other far side of the exterior walls. The initial and the last dimension will typically anchor to the 4. Overall on each side)*
6. Major Plane Breaks
7. Perpendicular Interior Walls
8. Openings

9 ADA/Accessibility

9.1 Families

All pertinent Families have clearances built in to them. The dashed line in the example below is the clearance per Code and the solid line *(only appears when hovering over a family)* is a 3" offset line meant to be used during the Design phase as a safer guideline.
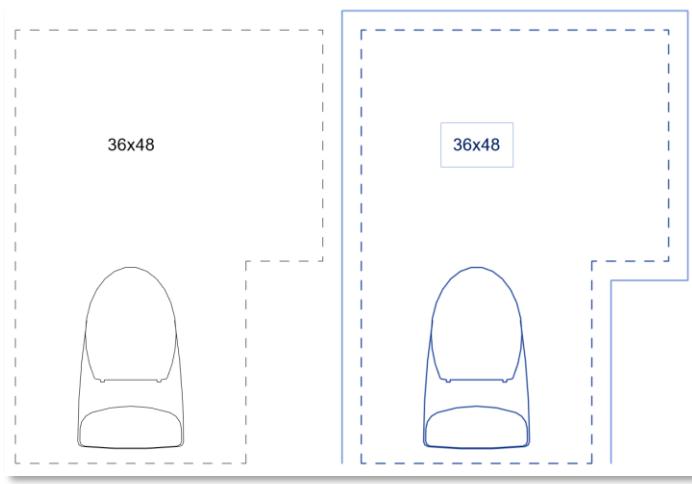
The solid lines are meant to be used as guidelines only and must be considered in the Design phase. It allows for a larger clearance than necessary and will be easier to address during Design Development.

The dashed lines will only appear if the **Detail Level** for a view is set to **Medium**. The same goes for the solid design guide line *(but it will never print).*
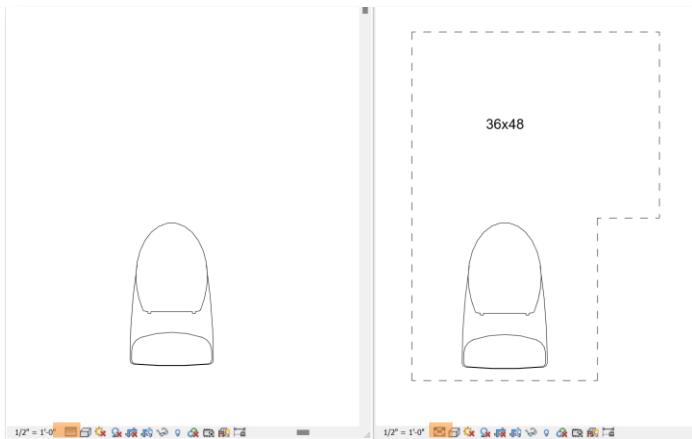
You can manually turn the clearance lines on or off in the **Properties** window if needed. It is your responsibility to know when to have them on and when to have them off.

Consult with your Project Manager if you are uncertain. Projects requirement for Accessibility will differ from product type to product type.
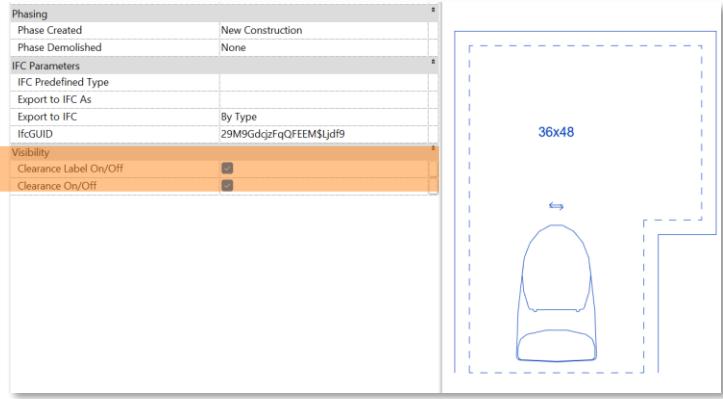
If you find any discrepancies, anything that does not seem to work or a Code change that might impact these clearances, notify the BIM Manager **immediately**.

These Families are ever evolving to serve better, act faster, and contain more features etc. Any suggestions and/or feedback is always appreciated.

9.2 Views and Templates

Any Views depicting Accessibility clearances have their own **View Template**.

This ensures the View is set with a **Detail Level** set to **Medium** and turns on any other graphics not needed from all non-accessiblity views.

This includes specifically turning wall layers/finishes back on, along with door clearances and so on.

The checkmark for the scale in the accessibility **View Template** is set to 3/8" but can be changed <u>after</u> a conversation with your Project Manager.
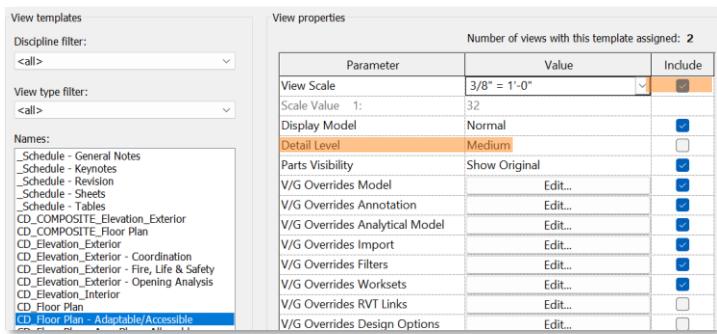
The check mark for the scale for all other **View Templates** are **unchecked** by default <u>and should be left unchecked</u>.

This lets the **View Template** know not to control the scale of your drawing since this same **View Template** could be used for a different view with a different scale.
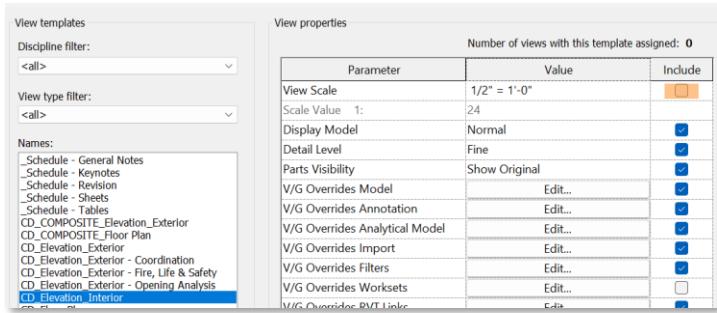
When the same **View Template** can be used for multiple views, we can minimize the number of **View Templates.**

10 Coordinating with CAD

10.1 Linking vs Import

Any CAD detail **must always be linked** and **NEVER imported**. An imported CAD drawing will add **Line Styles** to the Revit project and ultimately make it challenging to find the right **Line Style** for the right condition.

A **linked Detail** will update by one of two ways; either you go to *Manage* > **Manage Links** and reload the CAD detail or the next time you open your project Revit will automatically reload any linked CAD file.

It is crucial that a CAD detail in use in your project:
   a. **Does not move from its stored location on the server.**
   b. **Does not get renamed.**
   c. **Does not have its folder where it is stored renamed.**

Any one of these would trigger you to reload the CAD detail manually by finding it under *Manage* > **Manage Links** and click the **Reload From** button.

Revit will let you know when opening a project if any linked CAD file has been moved or renamed. **Do not** ignore this but go to *Manage* > **Manage Links** a resolve the issue.

10.2 Prepare CAD Before Linking

Before you link in a CAD file, a few steps need to take place in order for Revit to interpret CAD lineweights, linestyles and hatch patterns correctly.

Open your detail in CAD and in **Model Space** set the
   1. **PSLTSCALE to 0**
   2. **MSLTSCALE to 0**
   3. **LTSCALE to 1**

All detail lines should be drawn with Detail layer names that begin with A-DETL not A-ELEV. This will help further clarify what linetypes were used while in Revit (A-ELEV is typically reserved for Elevation layers in CAD).

Hatching will need to match the properties of the individual hatch required from the **Revit Detail Template** here **L:\Templates\CAD\Detail Layouts** - Revit Hatch Scales.dwg.

When closing a detail in CAD, **always use the CLL command**. This is a tool that Saves, purges, cleans the file of errors, and sets the CAD view back to 0,0 so the view can be seen in the view window in the 'Open File Window'.

10.3 Initial Setup in Revit Prior to Linking

For any CAD detail to be used, a certain protocol must be followed in order for the line weights to appear as intended.
   1. Locate the little downward facing arrow in the right corner next to the word **Import**.
   2. Click the **arrow**.
   3. In the dialog box click **load**
   4. Go to *M:\Revit\Source Files and select the 'RHA_DWG Import Lineweight Settings* text file
   5. Click **Open** and then click the **Ok** button in the dialog box.

This is a one-time setup for your machine and need not be done again for the particular project on your machine.
You are now ready to **Link** in details. See **Appendix D** for Video tutorials on how to properly link a CAD detail.

10.4 Consultant CAD Files

Working **Consultant CAD** file should always live here:
…_Links\Site

The **original file**(s) received from the Consultant(s) should still be stored in **…\Consultants\In\...**

Before linking in any Consultant CAD file these files **must** be cleaned up and free of any **xrefs** and **xclipping**.

Files must have all layers turned on, thawed and items you do not wish to see should be deleted, purged and audited.

Revit have a max geometry range of 20 miles total distance. If the drawing is beyond that limit from the cartesian origin (0,0,0), establish a reference point in the Consultant drawing which will never change (ie., centerline of an established out-of-scope Intersetion) and use that reference point to move everything in the drawing to the actual 0,0,0 point.

Revit has a difficult time reading a CAD drawing if any line is far away from the actual 0,0,0.

This process is required for Revit to correctly read and interpret layers, line weights and other graphics.

10.5 Two Ways of Linking Consultant Files

Make sure you know your intent before you link in any CAD drawing (other than Details).

<u>**All Views including 3D setting**</u>:

This will display the CAD drawing <u>everywhere</u> and act as any other 3D component e.g., walls, doors, etc.

Make sure this is your intent before if you choose this.

<u>**Current View only setting**</u>:
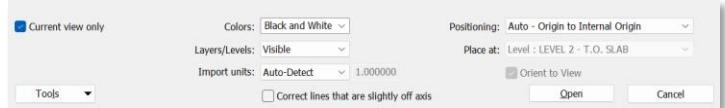
This will display the CAD drawing <u>exclusively</u> in the View you are currently in and nowhere else.

Make sure this is the view you want the CAD drawing to live in.

10.6 Exporting and Coordinating CAD files

All Views for coordination purposes are to be found grouped under _**Coordination** and they have a **X_** as a prefix. They also have their own **View Template** which handles the graphics suitable for a coordination view.
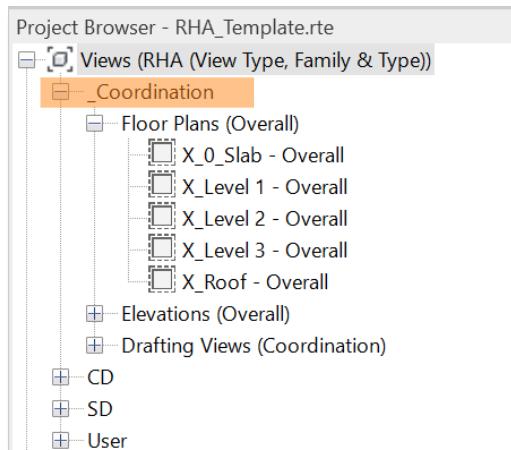
To **export** a CAD drawing, go to *File > Export > CAD Formats > DWG*. A dialog box will appear -make sure **Select Export Setup** is set to "**RHA Export".**
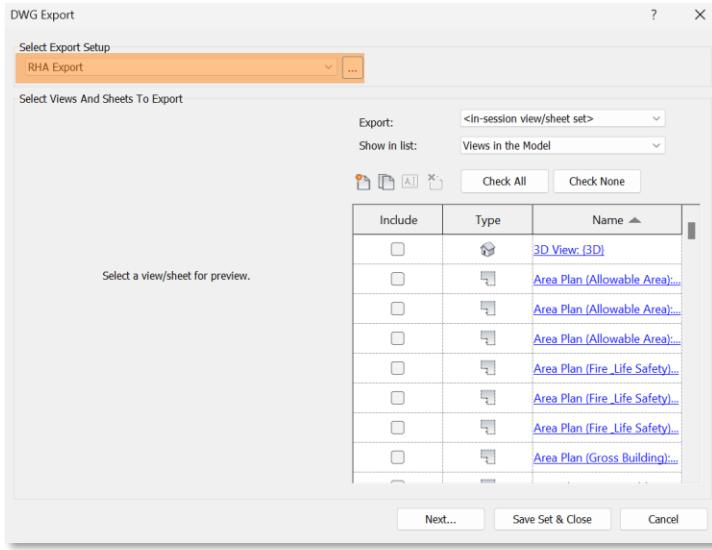
10.7 Before Sharing CAD Files Externally

After a View has been exported, the CAD file needs to be opened and have an **LTSCALE** of **48** in Model Space.

Use **CLL command** to recenter your drawing, purge, save, and close file - it is now ready to be distributed to Consultants.

11 Filters

Filters are a great resource for any views and should be utilized in conditions where the **View Template** falls short.

Filters are named verbatim per which **Category** is assigned and which **Rules** are applied. This is crucial for legibility and helps both you and your team members understand what the filter is trying to include simply by reading the name of the **Filter**.

11.1 Examples

A Filter under the category **Walls** looking for the **Structural Material** to not be equal to **Concrete** should read:

- **Walls – Structural Material ≠ Concrete**

Or a Filter under the category **Floors** looking for the **Function** to be equal to **Interior** should read:

- **Floors – Function = Interior**
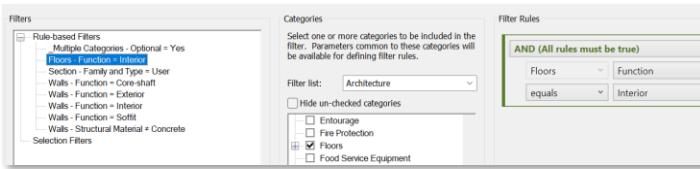
Below is an example of the aforementioned filter in use. The **Visibility** and **Enable Filter** boxes should be checked.
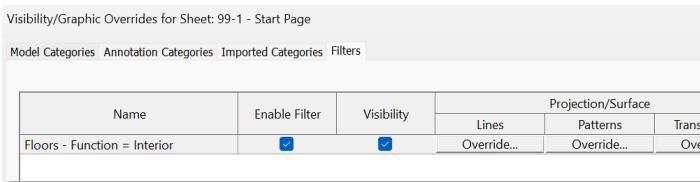
12 View Templates

View Templates can set graphics, scale, etc. for any view and help to format schedules. They also help to organize your Views into the correct locations and alleviate the need for you to manually categorize them.

Anything with a checked box will be controlled via the View Template and unavailable/greyed out when using the traditional Visibility Graphics (VG).

Follow the naming convention currently set in place.
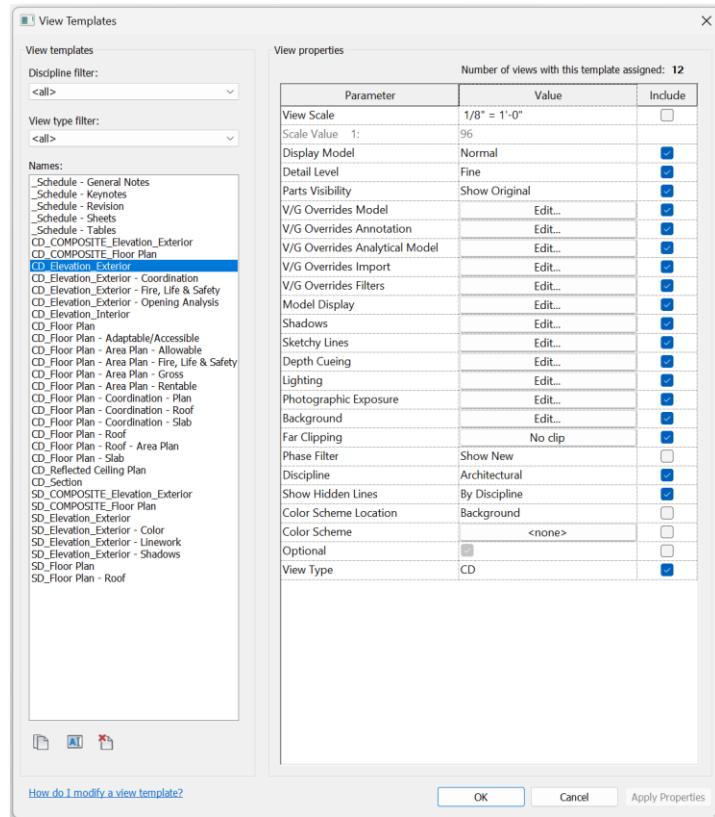
Typically the scale is not determined by the View Template and can, as a result, be individually set for Views using the same View Template. This helps to maintain graphic consistency throughout the set.

The **View Templates** that come natively with the Template are tried, vetted and true but can be modified to some extent to fit your project and/or client needs.

Any View Template with **CD_** as a prefix are meant to be used for any **C**onstruction **D**ocument views.

And any View Template with **SD_** as a prefix are for any and all **S**chematic **D**esign views.

13 Groups

Groups can help you edit multiple instances at the same time but…
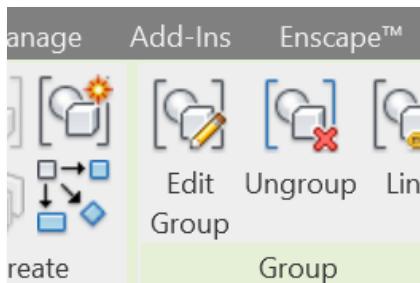
…the **Edit Group** and **Ungroup** buttons are *dangerously* close to each other and **ungrouping renders no warning**.

…and it is possible to *mistakenly* click **Ungroup**, make the revisions, and *incorrectly* assume all other groups are updated.

The assumption in this case would prove to be wrong and you'll now be left with redundant elements and forensic work which will negatively impact time and budget constraints.

13.1 3D Elements

Exercise caution and limit the usage of Groups containing 3D elements.

They should preferably never be used as they are temperamental and can easily be manipulated **not** to always correspond with its intent.

3D elements in a group can lose their host but still appear as a phantom element and not easily deterred /removed /dismissed.

These phantom elements have been known to also appear in Schedules, leaving you with an incorrect count.

13.2 2D Annotative Elements

Groups with only 2D elements. This includes, but limited to:
- Notes
- Detail Lines
- Dimensions
- Tags
- Filled Regions
- Etc.

The consequences are not near as dire at the aforementioned 3D elements but a nuisance and time consumer nonetheless – **proceed with caution**.

14 Submittals vs Revisions

The features in Revit for both Submittals and Revisions, should be utilized properly in order for the Title Block, Revision Schedule and Revision Clouds to work as intended.

They live in two different lists and act coherently as a log to file when sheets were submitted/issued and when they have been revised.

14.1 Submittals

The **Submittals** on the Title Block are turned on via its **Type** properties.
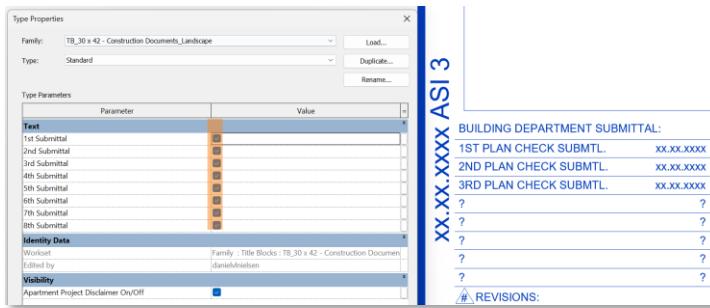
This list is meant for any official Building Department submittals and/or governing organization.

It will keep a log of when submittals were issued/sent and should not be confused with the **Revision** list below it.
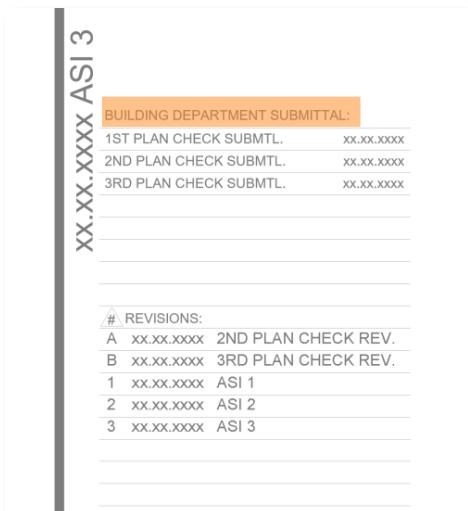
14.2 Revision Numbering

The Revision coding system should be agreed upon as part of the numbering system. (**See Appendix B**).

The most common revision systems are based on a numeric (1, 2, 3 …) or alphabetic sequence (A, B, C …). Unless otherwise directed, **letters** are to be used for revisions **up to** the '*For Construction*' issue of documents (read: Permits have been pulled), with numbers used for revisions from that point on.

Numbers are to be used for Bulletins/ASI's, and/or revisions that **follow** the *Issued For Construction* Set.

Select a single and simple revision system and be sure all parties/disciplines on the project use the same.
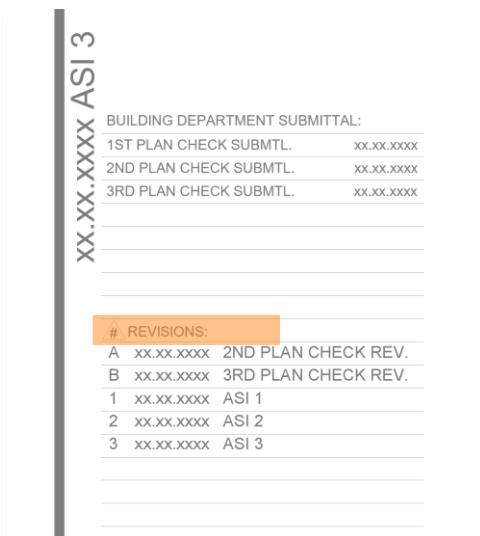
Appendix A

A.1 View Name Prefixes

These are to be created or modified as necessary for each specific project, using the convention and concepts herein.

A.2 Coordination

X_ - For any discipline *(MEP, Landscape, etc., etc.)*

Refer to 1.1 for more information.

A.3 Design Development and Construction Documents

No prefix required as any View without a prefix is intended to go on a sheet.

Refer to 1.1 for more information.

A.4 Schematic Design

SD_ - For any View

Refer to 1.1 for more information.

A.5 Sheet and View Categories

Refer to Template.

A.6 File Location

Your files should live in the:
…\03 – Drawings\Technical\Revit\Links
and/or:
…\03 – Drawings\Technical\Revit\Composite

Consult with your Project Manager and BIM Manager on what goes where. This will depend on the project type entirely and can vary quite a bit.

Files that have been *received* or *distributed* must follow RHA conventions for file storing.

A.7 File Naming

And the proper naming for:
Unit:
(Job #)_Unit (X)
Plan:
(Job #)_Plan (X)
Building:
(Job #)_Building (X)
Composite:
(Job #)_Composite

Appendix B

The document numbering system should be agreed upon at the initial stages of a project.

Clients may insist on implementing their own document numbering system, or participating disciplines may combine to create a new system. Regardless of the approach, it's important to select a single method and ensure all parties are clear on the usage of the same system.

The RHA Template is set up to meet our inhouse standards and should only be manipulated/revised in conversation with the Project Manager and Principal in charge.

B.1 Single Family Sheet Setup

Sheet Number	Sheet Name
CS	COVER SHEET
IN-1	SHEET INDEX, PROJECT DIRECTORY and PROJECT DATA
IN-2	REVISION NARRATIVES
GN-1…	GENERAL NOTES
CG-1…	CAL GREEN NOTES
FC-1…	FHSZ/WILDLAND-URBAN INTERFACE FIRE AREA NOTES
PL-1…	PRODUCT LITERATURE
SP-1…	SITE PLAN(S) FOR REFERENCE ONLY
SZ-1…	SOLAR ZONES
Axx1-x	SLAB EDGE
Axx2-x	FLOOR PLANS (BLDG. FLOOR PLANS and BLDG. ROOF PLANS *for townhomes*)
Axx3-x	ROOF PLANS (UNIT PLANS *for townhomes*)
Axx4-x	SECTIONS
Axx5-x	EXTERIOR ELEVATIONS
Axx6-x	UTILITY PLANS
Axx7-x	INTERIOR ELEVATIONS
Axx8-x	OPTIONS (*or* SCHEDULES *if needed*)
Axx9-x	RCP's (*or* SCHEDULES *if needed*)
AD0-x	WALL ASSEMBLIES/TYPES
AD1-x	ROOF DETAILS

Sheet Number	Sheet Name
AD2-x	WINDOW DETAILS
AD3-x	DOOR DETAILS
AD4-x	EXTERIOR DETAILS
AD5-x	BALCONIES
AD6-x	INTERIOR, GENERAL MEP
AD7-x	STAIRS, GENERAL MISC.
AD8-x	ACCESSIBILITY (*Only if applicable*)
Amenity	(*if included in submittal package*)
A0.10	SITE PLAN
A0.20	EGRESS PLANS – AMENITY
A8.01	AMENITIES - BUILDING SLAB PLAN
A8.11	AMENITIES – FLOOR PLAN
A8.12	AMENITIES – ROOF PLAN
A8.2x	AMENITIES – ELEVATIONS
A8.3x	AMENITIES – SECTIONS
A8.3x	AMENITIES – WALL SECTIONS
A8.4x	AMENITIES – ENLARGED PLANS
A8.5x	AMENITIES – INTERIOR ELEVATIONS
A8.60	AMENITIES – RCP
A9.xx	MISC SITE STRUCTURES – (*Building name*)
A12.x	SCHEDULES
AD0-0x	WALL ASSEMBLIES
AD1-0x	ROOF DETAILS
AD2-0x	WINDOW DETAILS
AD3-0x	DOOR DETAILS
AD4-0x	EXTERIOR DETAILS
AD5-0x	BALCONIES / DECKS
AD6-0x	INTERIOR / GENERAL MEP
AD7-0x	STAIRS, MISC.
AD8-0x	ACCESSIBILITY

Diagram
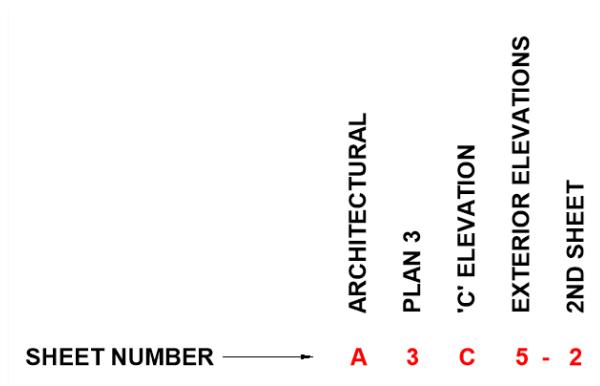
B.2 Multi-Family Sheet Setup – Multiple Buildings

Sheet Number	Sheet Name
G-00	COVER SHEET
G-01	SHEET INDEX, PROJECT DIRECTORY and PROJECT DATA
G-02	REVISION INDEX
G-10	GENERAL NOTES
G-11	RESIDENTIAL CA, GREEN BUILDING REQUIREMENTS
G-12	NON-RESIDENTIAL CA, GREEN BUILDING REQUIREMENTS
G-20	CONDITIONS OF APPROVAL
G-30	ACOUSTICAL REPORTS
G-40	ADDRESSING PLAN
G-41	CIVIL SITE PLAN FOR REFERENCE
G-50	CODE SUMMARY
G-5x	EGRESS PLAN BLDG x
G-60	ALLOWABLE OPENING
A-010	ARCHITECTURAL SITE PLAN
A-1x(*level*)(*letter*)	BLDG x - PLANS (*Slab*=0, *Floor*=1 and up and Roof) (*Segment letter, if needed, starting with* A)
A-2x(*number*)	BLDG x - EXTERIOR ELEVATIONS (*Number of sheets starting with* 0)
A-3x(*number*)	BLDG x - SECTIONS (*Number starting with* 1)
A-3x(*number*)	BLDG x - WALL SECTIONS (*Next number after building sections*)
A-4xx	UNIT x - PLANS and RCP's
A-5xx	UNIT x - INTERIOR ELEVATIONS
A-6x(*number*) *if multiple buildings*	BLDG x - (*) SCHEDULES (*DOOR, DOOR HARDWARE, WINDOW, STOREFRONT, FINISH *in that order starting with* 0)
A-6(number)0 *if only 1 building*	(*) SCHEDULES (*DOOR, DOOR HARDWARE, WINDOW, STOREFRONT, FINISH *in that order starting with* 1)
A-7x(*number*)	BLDG x – (STAIR, ELEVATOR and TRASH *in that order starting with* 1) PLANS and SECTIONS
A-81x	AMENITY – PLANS
A-82x	AMENITY – EXTERIOR ELEVATIONS
A-83x	AMENITY – BLDG SECTIONS
A-84x	AMENITY – ENLARGED PLANS and ELEVATIONS
A-85x	AMENITY – INTERIOR ELEVATIONS
A-86x	AMENITY – (*) SCHEDULES (*DOOR, DOOR HARDWARE, WINDOW, STOREFRONT, FINISH *in that order starting with 0*)
A-9x1	ACCESSORY x – PLANS, RCP's, etc.
A-9x2	ACCESSORY x – SECTIONS, EXTERIOR ELEVATIONS, etc.
AD-1xx	CONSTRUCTION ASSEMBLIES
AD-2xx	EXTERIOR FINISHES
AD-3xx	EXTERIOR OPENING FLASHING
AD-4xx	PATIOS and BALCONIES
AD-5xx	ROOFS
AD-6xx	EXTERIOR ELEMENTS
AD-7xx	VERTICAL CIRCULATION
AD-8xx	INTERIORS
AD-9xx	ACCESSIBILITY and SIGNAGE

Diagram

B.3 Multi-Family Sheet Setup – Single Building

Diagram
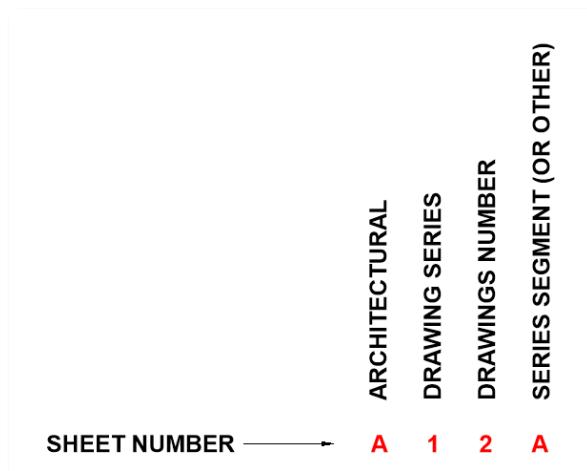
Sheet Number	Sheet Name
(See B.2 for all G-xx General Sheets)	
A-01	ARCHITECTURAL SITE PLAN
A-1x(*letter*)	BLDG PLANS (*Slab*=0, *Floor*=1 and up and Roof) (*Segment letter, if needed, starting with* A)
A-2x	EXTERIOR ELEVATIONS (*Number of sheets starting with* 0)
A-3x	BLDG - SECTIONS (*Number starting with* 1)
A-3x	BLDG - WALL SECTIONS (*Next number after building sections*)
A-4x	UNIT x - PLANS and RCP's
A-5x	UNIT x - INTERIOR ELEVATIONS
A-6x	(*) SCHEDULES (*DOOR, DOOR HARDWARE, WINDOW, STOREFRONT, FINISH *in that order starting with* 0)
A-7x	ENLARGED (STAIR, ELEVATOR and TRASH *in that order starting with* 0) PLANS and SECTIONS
A-8x	AMENITY – PLANS (*Slab*=0, *Floor*=1, *Roof*=2 and RCP=3)
A-84	AMENITY – EXTERIOR ELEVATIONS
A-85	AMENITY – BLDG SECTIONS
A-86	AMENITY – ENLARGED PLANS and ELEVATIONS
A-87	AMENITY – INTERIOR ELEVATIONS
A-88	AMENITY – DOOR, DOOR HARDWARE, WINDOW and STOREFRONT SCHEDULE
A-89	AMENITY – FINISH SHCEDULE
A-90	ACCESSORY 1 – PLANS, RCP's, etc.
A-91	ACCESSORY 1 – SECTIONS, EXTERIOR ELEVATIONS, etc.

(See B.2 for all AD-xxx Detail Sheets)

Diagram showing SHEET NUMBER breakdown: A (ARCHITECTURAL), 1 (DRAWING SERIES), 2 (DRAWINGS NUMBER), A (SERIES SEGMENT (OR OTHER))

Appendix C - Best Practices in Autodesk Revit

Administration and Maintenance

- **Synchronize** often *(every 5 min.).*
- **Read and understand any Warnings** - Revit will notify you and address them appropriately to ensure a lean model.
- **Read and understand Properties** for all things Revit - especially **System Families** (e.g., Walls, Roof, Ceilings, Floors etc.)
- **Eliminate unused families** using *Manage* > **Purge Unused**
- Explore **Instance Parameters** and **Type Parameters** thoroughly and understand the difference. *Rule of thumb…* **Instance Parameters** can have several different values of the same Type and **Type Parameters** are several different types but can have the same instance value. I.e., 100 types of a 2046 Single-Hung Window with different **Marks** or **Comments**.
- **Avoid multiple sessions of Revit.** Failure to synchronize can occur and human error increases.
- **Avoid opening multiple files at the same time when collaborating with multiple team members on the same project/files.** Synchronization errors can occur and quite often, failure to synchronize any collaboration file might result in link error.
- **Do not Copy + Paste** Families from one project to another as Revit does not always recognize a new item being a new item and will add a '1' as a suffix leading to redundant Families in the project file.
- **Create** as many *View* > **Section**(s) as needed. Any Section should be set to *Properties* > *Graphics* **Detail Level = Fine** and practice *Properties* > *Extents* > **Far Clipping** and **Far Clip Offset** to remove any unwanted graphics/information for a clearer depiction.

- **Practice** using *View* > **Scope Box**(es) for *View* > *Elevation* > **Interior Elevations**. The steps to take should be:
    - *View* > **Scope Box** first and then,
    - adjust **Scope Box** to fit view using a 3d view.
    - Pin **Scope Box.**
    - Create *View* > *Elevation* > **Interior Elevation** next and
    - assign correct *Properties* > *Identity Data* > **View Name** and **Title on Sheet** nomenclature.
    - Apply *Properties* > **View Template** to view and
    - document the view.
- **Avoid manually hiding elements in views.** Use *View* > **Visibility Graphics** (VG) to hide **Model Categories** as needed. If a *Manage* > *Object Styles* > *Model Objects* > **Category** or subcategory cannot be found inform the BIM Manager to revise the family.

Areas

- Use correct *Architecture* > *Room and Area* > *Area and Volume Computations* > **Area Schemes** for applicable *View* > *Plan Views* > **Area Plans** and *View* > *Schedules* > **Schedule/Quantities**
- Use correct *Architecture* > *Room and Area* > *Area and Volume Computations* > **Area Schemes** for applicable *View* > *Plan Views* > **Area Plans** and *View* > *Schedules* > **Schedule/Quantities**
- *Never* copy an Area Plan. Create a new *View* > *Plan Views* > **Area Plans** if needed. *Architecture* > **Area Boundary** can be copied from view to view but *Architecture* > **Area**(s) cannot.

Modeling

- **Limit the use of joining geometry** as components retain their relationship even after cutting, moving, and copying components left and right.
- **Practice accurate and precise modeling** and dimension often to keep relationships clean.
- **Do not over constrain your model**. Minimize locking element relationships.
- **Avoid excessive modeling**. Understand the expectations for model LOD and do not over-deliver. Details will govern as the model is meant to show the **design intent**.

Floors and Slabs

- Use **Pick Wall** tool when creating a Slab Plan.
- Use *Structure* > *Slab* > **Structural Foundation: Slab** for any slab on grade and *Architecture* > *Floor* > **Floor: Structural** for any structural floors above slab on grade and *Architecture* > *Floor* > **Floor: Architectural** for any finished floor materials, e.g., carpet, tile, wood etc.
- Floor assemblies *Properties* > *Edit Type* > *Type Parameters* > *Construction* > *Structure* > *Layers* must only contain layers needed above any structural joists. E.g., sheathing, acoustical layer(s), Gypcrete etc. to the underside of finishes. E.g., Tile, Carpet, Wood etc.

Roofs

- *Always* use **Pick Wall** tool when creating a *Roof* > **Roof by Footprint** Roof Plan.
- Make sure walls in question have the nomenclature 'Roof' in its *Walls* > *Properties* > **Rename** Type Name. *View* > **View Templates** will have a *View* > **Filters** which picks up Walls with this feature and can be independently graphically controlled.

Filter and View Templates

- Maintain nomenclature and spell out *View* > **Filter** names fully.
- Use **Filters** when **View Templates** can no longer provide you with the graphics you need.

Dimensioning

- Avoid or minimize fractions on Slab Plans (Diagonal reference dimension excluded).
- Avoid fractions on Grid Lines.
- **Never change dimension rounding from 1/256"**. As an exception, diagonal slab dimensions can have a dimension rounding of 1/16" to allow for building tolerances.

CAD

- **ALWAYS** *Insert* > **Link CAD** and **NEVER** *Insert* > **Import CAD** or **Explode CAD.**
- **Clean up CAD files prior to linking.** Especially Consultant files. Create a Save-As. Unfreeze and unhide every layer, bind or detach xrefs as needed, remove x-clipping, delete any unwanted layers and purge and audit.
- When closing CAD files, use the **CLL** command.

Ceilings

- For any *Architecture* > **Ceiling** assemblies, include all pertaining layers as they occur. This includes but is not limited to resilient channels, additional layers of gypsum for sounds, etc.
- *Always* leave the plenum vacant in floor and ceiling assemblies.
- Offset any *Architecture* > **Ceiling** by its full thickness from the desired location.
- *Always* constrain *Architecture* > **Ceiling**(s) to its nearest upper level and then offset down as needed.

Walls

- **Maintain standard nomenclature for walls.**
- Double framed walls are always (2) separate walls unless it is a Fire/rated Wall.
- Walls must be associated to a *Properties* > *Walls* > **Base Constraint** and *Properties* > *Walls* > **Top Constraint**. Use *Properties* > *Walls* > **Base/Top Offset** and *Properties* > *Walls* > **Base/Top Extension Distance** as needed.
- **Eliminate wall overlaps.**
- Reference planes for walls must always be set to face of stud (e.g., rough framing).

Miscellaneous

- Minimize *Architecture* > **Model Line** and understand the difference from *Annotate* > **Detail Line.**

- **Room** *Properties* > *Constraints* must be from the View's **Associated Level** to **Level Above** and use *Properties* > *Constraints* > **Limit Offset** as needed. Adjust as needed after placement of any **Room**. By tying constraints to the levels correctly will help workflow and eliminate extra work if levels change. The Height value in the Room Tag will read the *Properties* > *Dimensions* > **Unbounded Height** which is an automatic calculation based on the previously mentioned.

- **Avoid** *Architecture* > *Component* > **In-Place** families as they rarely schedule correctly and require manually created parameters and *Manage* > **Object Styles** assigned.

- **Groups** can bog down a model and **Groups** are highly prone to human error. **Only use Groups as a last resort.**

- *Always* *Modify* > **Pin** when an important element is in place. This pertains especially but not limited to Linked Files, Structural Members, Grid Lines and Levels.

- When transitioning from the Design Phase to the more technical DD and CD Phases, **ALWAYS thoroughly audit the model** for completeness and accuracy, **BEFORE** continuing and/or adding additional information. Identify Families currently in use and **determine their applicability** in the future technical phases.

- **Families are generated in-house.** Consult 1st with your Project Manager and BIM Manager for any unique needs. **Do not download or create your own.**

Appendix D – Videos and Tutorials

For any additional help and guides refer to this folder for videos and instructions:

L:\Tutorials\Revit\Revit Videos

Appendix E – Keyboard Shortcuts

Annotations

Linework	LW
Detail Line	DL
Find/Replace	FR
Text	TX
Grid	GR
Model Line	LI
Place Room	RM
Tag Room	RT
Level	LL
Reference Plane	RP
Spot Elevation	EL
Dimension	DI

Modifier

Align	AL
Move	MV
Offset	OF
Copy	CO
Mirror - Pick Axis	MM
Mirror - Draw Axis	DM
Rotate	RO
Trim/Extend to Corner	TR
Split Element	SL
Array	AR
Scale	RE
Pin	PN
Unpin	UP
Match Type Properties	MA

Snaps

Snap Off	SO
Tangents	ST
Centers	SC
Midpoints	SM
Intersections	SI
Perpendicular	SP

Modeling

Door	DR
Window	WN
Wall	WA
Floor	FL
Structural Slab	SB
Place a Component	CM
Create Similar	CS
Paint	PT
Lighting Fixture	LF

Visibility

Hide Element	HH
Unhide Element	EU
Toggle Reveal Hidden Elements	RH
Hide Category	HC
Unhide Category	VU
Isolate Element	HI
Isolate Category	IC
Visibility/Graphics	VG or VV
Hide in View: Hide Elements	EH
Hide in View: Hide Category	VH
Thin Lines	TL

Work Space

Tile Views	WT
Tab/Untile Views	TW
Tab Scrolling	Ctrl + Tab
Reverse Tab Scrolling	Ctrl + Shift + Tab

Zoom

Zoom All to fit / Zoom Extents	ZA
Zoom to fit	ZE
Zoom in Region	ZR
Zoom Sheet Size	ZS
Previous Pan/Zoom	ZP

Version 1 2023