



# Andhra Pradesh State Skill Development Corporation



# ARCHITECTURAL MODELING USING REVIT

## RAILINGS

## **RAILINGS**

To start with, select the “Architecture” menu and then “Railing”. Notice that the Railing tool has a drop-down which presents 2 options- “Sketch Path” and “Place on Stair/Ramp” Go ahead and select “Sketch Path”.

You use these tools to draw out your Railing path in plan. Here you can sketch the path of your own.

Before we actually create the Railing, we can choose a Type. Hit the Drop-Down Type Selector in the Properties Palette and choose a Railing Type. I’m going to go with “900mm\_Pipe”.

Revit creates the 3D geometry of your Railing. If we switch to a 3D View, we can clearly see the newly-created Railing.

### **PLACE ON HOST (Place on Stair/Ramp)**

The “Place on Stair/Ramp” option of the Railing tool used to add Railings to Stairs and Ramps that currently have NO Railings on them. I emphasize the “NO” in the last sentence, because this tool ONLY works if you have no Railings at all on the Stair or Ramp. If you have a Stair or Ramp that currently has a Railing on ONE side and you want to add one to the other- you first have to DELETE the existing Railing- so that the Stair / Ramp has no Railings at all, BEFORE you can then use this tool to add Railings to BOTH sides.

### **ACTIVATE RAILING PREVIEW**

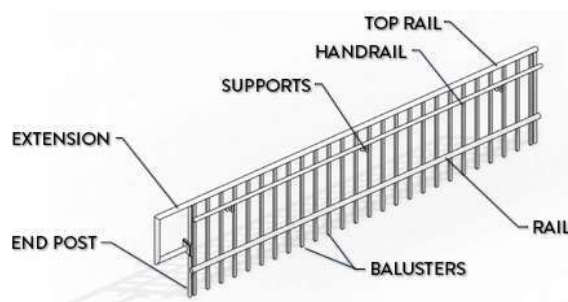
Click the preview icon to show how your railing is going to look like once it is completed. Using a 3D view with preview is the best way to test and adjust your railing.

### **HOST RAILINGS TO SLOPED WALLS AND FLOORS**

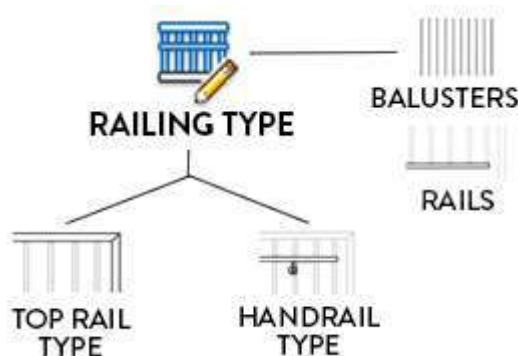
Revit 2017 added the option to host railings to walls and floors. This means if you create a wall with a slope, the railing will follow the shape. To do this create a railing with the “Create Railing Path” option. Then select your railing, click Pick New Host and click the wall or floor. Want to reset the host? Pick New Host and click the empty model space.

### **UNDERSTAND THE ANATOMY AND THE HIERARCHY OF RAILINGS**

Before creating a railing type, you need to understand every part of it.



The **Railing Type** contains everything inside a railing. In each type, you get to select **Top Rail**, **Handrail**, **Rails** and **Balusters**.

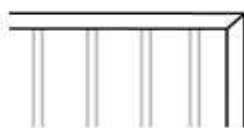


Here is a visual guide to all the parts contained in these types.

## RAIL ELEMENTS:

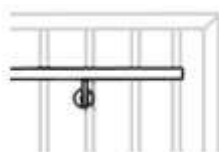
### TOP RAIL

Top rail is the highest horizontal element of a railing. It is created by selecting a 2D profile and a height.

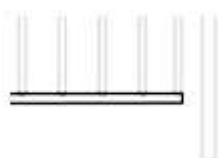


### HANDRAIL

Handrail is an intermediate rail used for hands. They are linked to a wall or to a railing with Supports.



### INTERMEDIATE RAIL

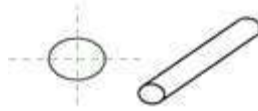


Any horizontal rail other than the Top Rail and the Handrail. Can be used to constraints balusters.

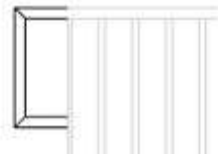
## RAIL 2D PROFILE

Every Rail in Revit is an extrusion from a 2D Profile Family. Use default profiles for simple shapes, or create a custom one for fancy shapes.

### EXTENSION

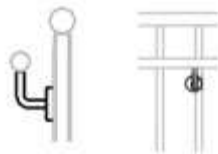


Use extension to add length to Top Rail or Handrail. The extension shape can be customized.

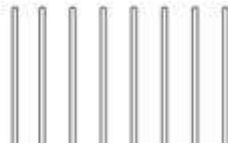


### SUPPORT

The elements that connect the Handrail to the wall or to the railing.

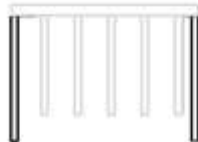


### BALUSTER ELEMENTS



### BALUSTERS

Vertical elements that are part of the railing. Set their shape with Baluster Family. Adjust their spacing in Baluster Placement.



### POSTS

Posts are balusters that are at the Start, the End or the Corner of a railing. They can be added in Baluster Placement.





## BALUSTER FAMILY

Balusters are made from a full 3D Revit family. Unless you want something fancy, you can use the default families.

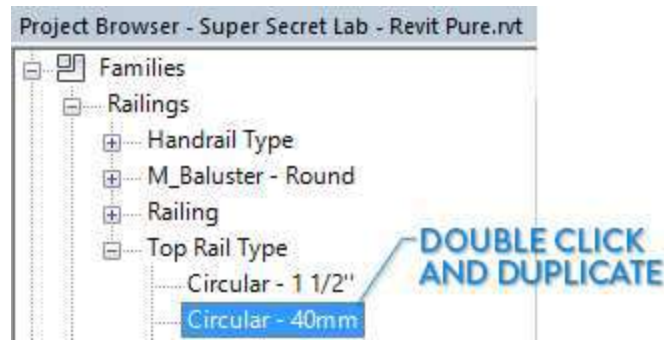
## LEARN WHERE TO FIND EACH RAILING ELEMENTS

To create a railing type, select and duplicate an existing Railing type. Then follow the steps below.

Parameter	Value
<b>Construction 3. SET INTERMEDIATE RAILS</b>	
Railing Height	920.0
Rail Structure (Non-Continuous)	Edit...
Baluster Placement	Edit...
Baluster Offset	0.0
Use Landing Height	0.0
<b>4. SET BALUSTERS AND POSTS</b>	
Landing Height Adjustment	0.0
Angled Joins	No Connector
Tangent Joins	Add Vertical/Horizontal Segmen
Rail Connections	Trim
<b>Top Rail 1. SELECT TOP RAIL</b>	
Height	920.0
Type	RP- Top Rail Circular
<b>Handrail 1 2. SELECT HANDRAIL</b>	
Lateral Offset	115.0
Height	800.0
Position	Right
Type	RP-Handrail 1

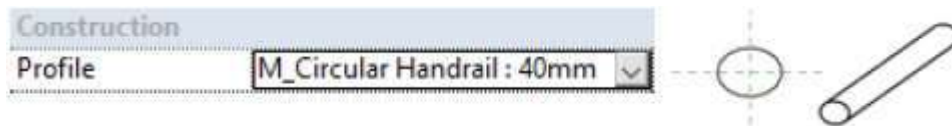
## LEARN HOW TO CREATE A TOP RAIL AND HANDRAIL

In Railing Type properties, you can select Top Rail and Handrail types. But before doing so, we must create new types to fit our needs. Use the **Project Browser**, go to Families. Under **Railings**, you will find **Top Rail Type** and **Handrail Type**. Double-click and duplicate a type to begin.



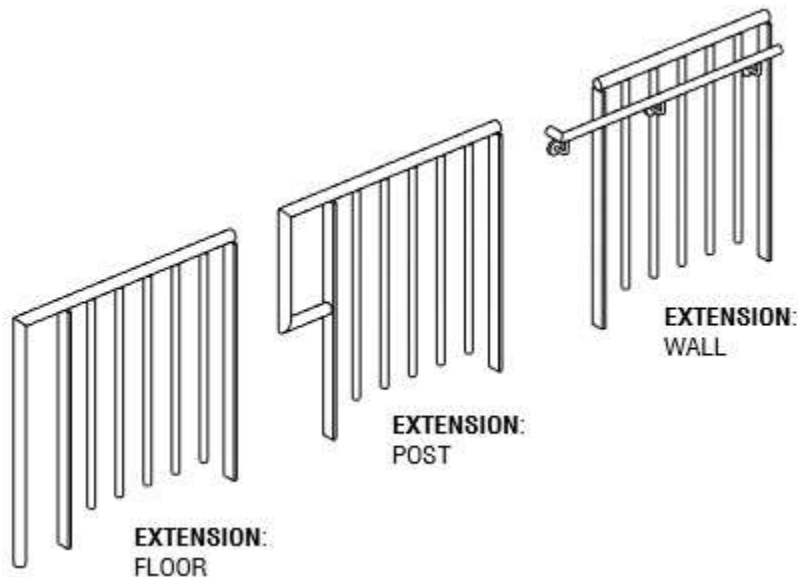
## SELECT PROFILE

Select a 2D profile family. It will be extruded to create your Rail. Use one of Revit default profiles: Round, Elliptical, Square or Rectangular. If you want a more complex shape, you will need a custom profile.



## SET EXTENSIONS

Use extension if you want your rail to go beyond the railing limit. Choose between **Floor**, **Post** and **Wall** extension. You can set an extension at the **Beginning** and **End** of the railing.




Extension (Beginning/Bottom)	
Extension Style	Post
Length	200.0
Plus Tread Depth	<input type="checkbox"/>
Extension (End/Top)	
Extension Style	Floor
Length	300.0

## SET HANDRAIL SUPPORTS

Supports are used to connect Handrails to railings or to walls. Adjust Family type, Layout, Spacing and Justification in Handrail type.

The default Revit family is Circular. In the Support Type properties, you can adjust Radius and Height. If you want a different shape, you will need to create another Support family.

Supports			Construction	
Family	M_Support - Metal - Circular		Height	50.0
Layout	Fixed Distance		Dimensions	
Spacing	400.0		Radius 2	6.0
Justification	Center		Radius 1	25.0
Number	0			
HANDRAIL TYPE		SUPPORT TYPE		

## SET RAILS HEIGHT

The height of Top Rail is set in Railing Type. To change Handrail height, go to Handrail type. Also adjust Hand Clearance, which is the distance between the baluster end and the center of the handrail.

Top Rail	
Height	900.0
Type	Elliptical - 40x30mm

### TOP RAIL HEIGHT

Construction	
Hand Clearance	50.0
Height	800.0

### HANDRAIL HEIGHT + CLEARANCE

## LEARN HOW TO CREATE INTERMEDIATE RAILS

We already covered how to create Top Rails and Handrails. Each Railing can also contain Intermediate Rails (also known as non-continuous rails). Creating them is pretty simple.

## GO TO RAIL STRUCTURE, INSERT NEW RAIL

In the Railing Type, click on Rail Structure (Non-Continuous). Then, click on the Insert

button to add a new rail. Give a name to your rail.

## SET 2D PROFILE FAMILY, HEIGHT AND OFFSET

Profile for intermediate rails work the same way as profiles for Handrail and Top Rail. Select one of the Revit default profile families, or create a custom one for more complexity.

Then, set the rail height and the offset distance to the center of the railing. The rail height can never be higher than the Top Rail. Add a material if you wish to. You are done! Use duplicate to create many intermediate rails.

Rails					
	Name	Height	Offset	Profile	Material
1	RP Rail 1	100.0	0.0	M_Circular Handrail : 30m	<By Category>
2	RP Rail 2	250.0	0.0	M_Square Handrail : 20m	<By Category> ...

## LEARN HOW TO CREATE A BALUSTER PATTERN

### GO TO BALUSTER PLACEMENT

In the Railing Type properties, you will find Baluster Placement. In this tab, you select how to configure the balusters. You might be intimidated by the dialog box that appears. No worry, we will make it simple.

Baluster Placement	Edit...
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### SELECT A BALUSTER FAMILY

In the Baluster Family column, pick a Baluster to use. By default, Revit contains Round, Square, Rectangular shapes. If you want a fancier shape, you will have to make a custom family.

Main pattern							
	Name	Baluster Family	Base	Base offset	Top	Top offset	Dist. from previous
1	Pattern start	N/A	N/A				
2	RP BALUSTE	M_Baluster - Round : 25	Host	0.0	Host	0.0	125.0
3	Pattern end	N/A	N/A	N/A	N/A	N/A	0.0

### SET OFFSET TO RAILING CENTER

Use offset to set a distance between balusters and the purple center line of the railing.

Dist. from previous	Offset
N/A	N/A
0.0	50.0
125.0	0.0



## SET BASE AND TOP OF THE BALUSTERS

Select the base and the top of your balusters. Can be either the **Host** or **Rails** elements. Then adjust the required offset from these elements.

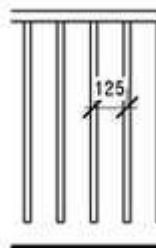
In the image below, the red dashed line indicates the position of the balusters. You can see that the baluster **Base** is 100mm from the **Host** and baluster **Top** is set to the Top Rail.

Base	Base offset	Top	Top offset
N/A	N/A	N/A	N/A
Host	100.0	Top Rail Element	0.0
N/A	N/A	N/A	N/A

## SET DISTANCE FROM PREVIOUS

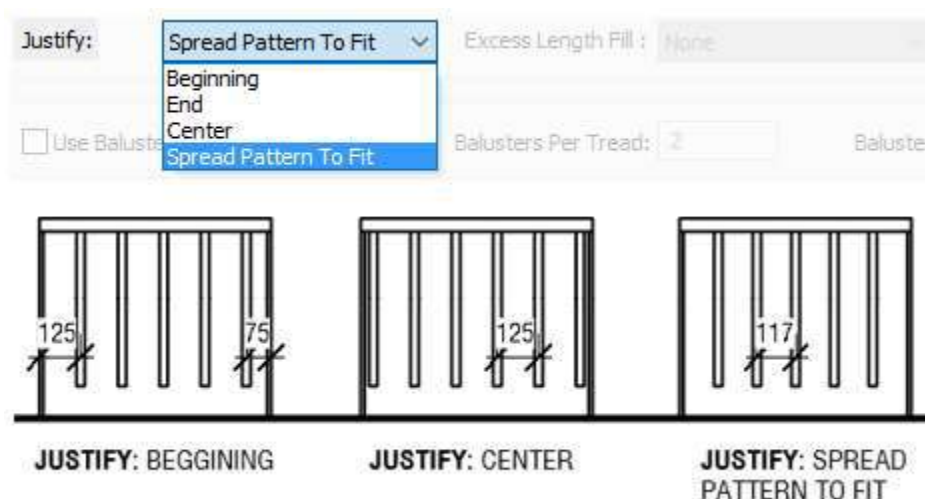
**Distance from Previous** is the default distance between each baluster.

Top offset	Dist. from previous	Offset
N/A	N/A	N/A
0.0	125.0	0.0
N/A	0.0	N/A



## SET BALUSTER JUSTIFICATION

Set **Justify** option to decide how balusters spacing will adjust to railing length. **Beginning**, **End** and **Center** will keep Distance from Previous, while Spread Pattern to Fit will change the value to have an equal spacing.



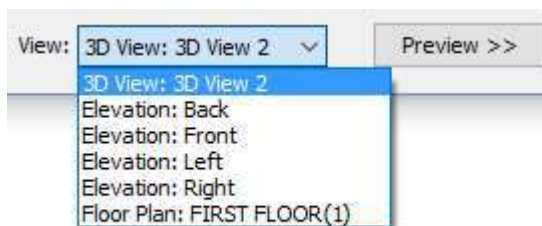
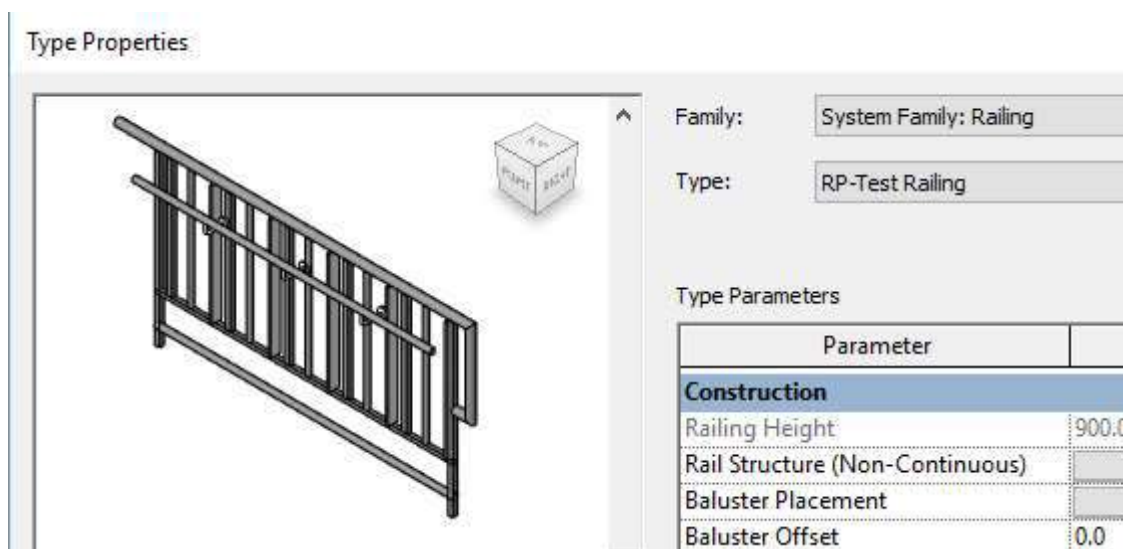
## SELECT POSTS

Posts are special balusters that only appear at the **Start** and **End** of a railing. **Corner** posts are optional. They are used for railing intersections.

1	Start Post	M_Baluster - Steel Flat	Host	0.0	Top Rail El	0.0	6.0	0.0
2	Corner Pos	M_Baluster - Steel Flat	Host	0.0	Top Rail El	0.0	0.0	0.0
3	End Post	M_Baluster - Steel Fl	Host	0.0	Top Rail El	0.0	-6.0	0.0

## SHOW PREVIEW IN RAILING TYPE

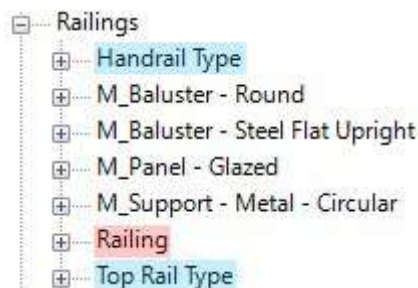
Not sure how your railing is going to turn out? Use preview in Railing Type properties to get a glimpse of what it will look like. You can select 3D views, plan views or elevations.



CLICK PREVIEW AND SELECT A VIEW

## USE PROJECT BROWSER TO FIND RAILING PARTS

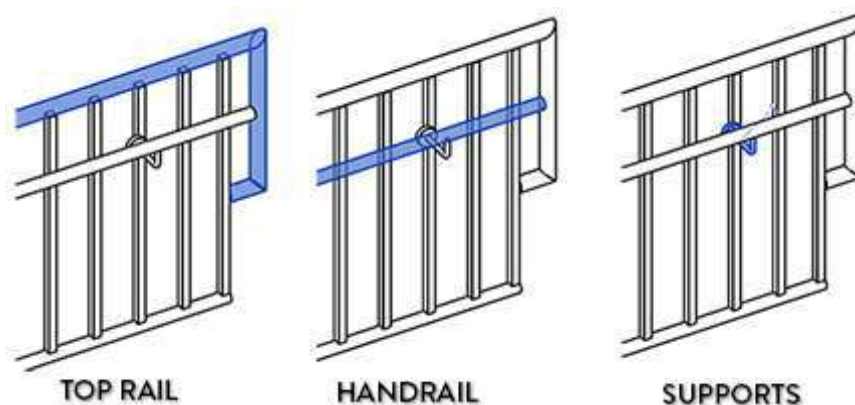
Go to Families in your project browser, then hop to Railings. All Railing Types will be in the Railing sub-menu (in red). The Handrail and Top Rail also have their own submenu (in blue).



All the other families are directly under the Railings category, including Balusters and Supports. Don't forget that all rails use a 2D Profile that can be found under the Profiles menu in Families. To save time, use CTRL-F in the project browser and type the name of the component you are looking for.

## USE TAB TO SELECT SPECIFIC RAILING PARTS

If you click on a railing, the whole thing will be selected. But by using tab, you can cycle through different parts of the railing to individually select and modify them. These are the elements that can be selected:



See the **pin** icon? Clicking it will break the link between the Railing Type and the specific railing element. That means you can change the Top Rail for a specific instance without affecting other railings using this type.