REVIT PURE

PRESENTS

BASICS

LEARN THE ESSENCE OF REVIT

SAMPLE CHAPTER #13: RAILINGS

VERSION 3.0 - August 2020 - Revit 2021

By Nicolas Catellier

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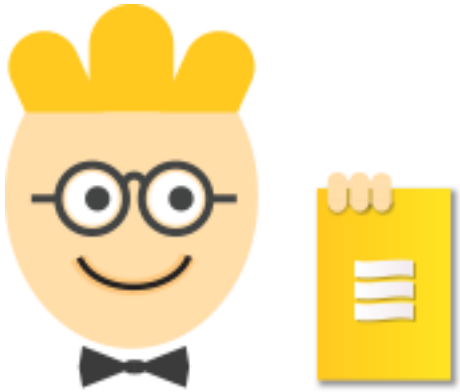
THANKS FOR TRYING BASICS

BASICS

Thanks a lot for trying the BASICS package! The Revit Pure philosophy is to make everything simple and let you have fun while learning. We hope you enjoy this sample chapter about Railings.



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LET'S HAVE FUN

LEARNING REVIT SHOULD BE EXCITING

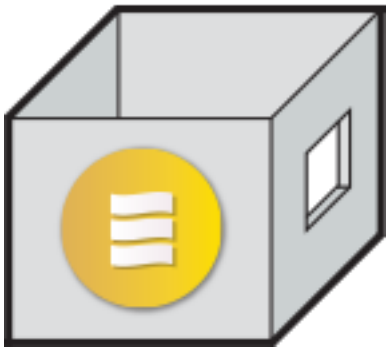
The first time you open Revit, you might feel a wave of confusion at all these commands, icons, buttons and stuff jumping on you. Our goal is simple: take the confused feeling and turn it into fun and curiosity.

GET THE BASICS FIRST

You need to learn 20% of Revit to do 80% of the work. Our goal is to trim the fat and get to this core. If an information is used 1% of the time, you don't need to learn it yet.

GREY ZONE = ADVANCED TIPS

If you feel adventurous, expand your knowledge by checking advanced tips and strategies. You will find them in gray text box like this one. You can skip these tips and come back later if you wish.



HOW TO USE RP BASICS ?

The best setup for RP Basics is to use two screen, one will be used for the PDF and video tutorials, the other will be used for Revit. If you don't have 2 screens, don't worry, everything will still work fine. We recommend that you set the PDF at a 75% zoom on screen for the best visual quality.

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PART 1
MODEL

After an overview of the interface, learn how to model all 3D elements for your project. Also create a site, add rooms and learn how to use materials.

13.1

RAILINGS

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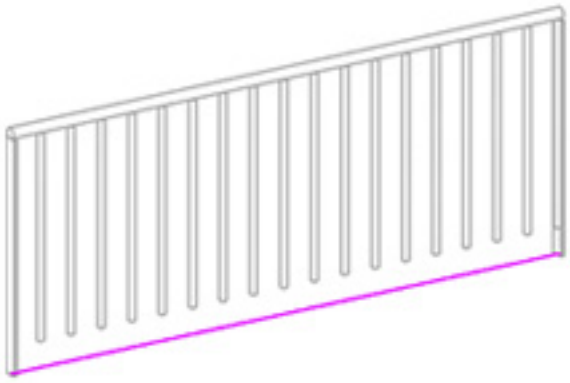
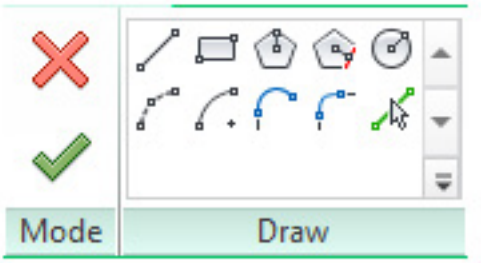
CREATE A RAILING

Railings are located on the architecture tab. Select a railing type, then pick one of two options to create railing: **Sketch on Path** or **Place on Host**.

SKETCH ON PATH

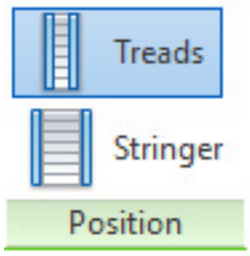
This option allows you to draw a railing outline any way you wish to. Draw a continuous purple line, then click the green check.

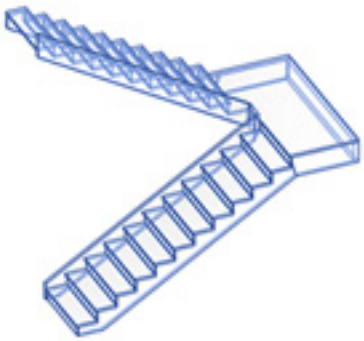




PLACE ON HOST

Choose this option to automatically create the railing based on an existing stair or ramp. Choose placement on treads or stringer.





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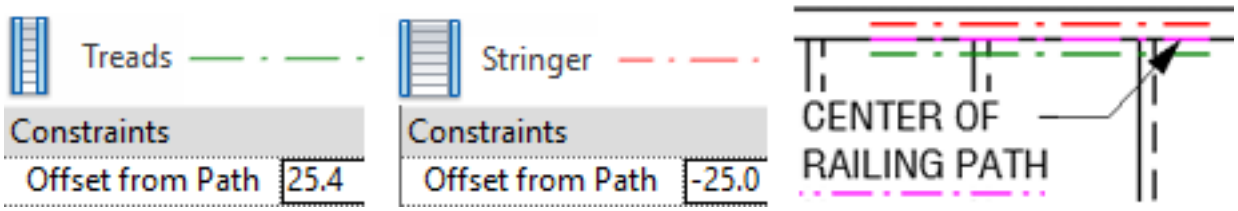
5 RAILINGS CREATION TIPS

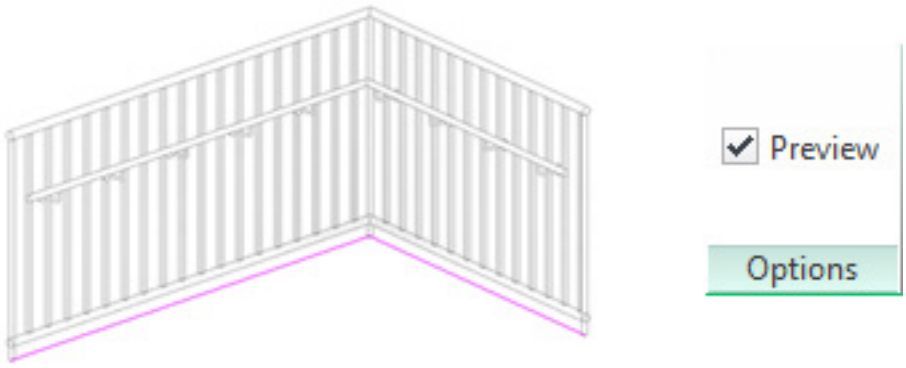
1- ADJUST "OFFSET FROM PATH"

When adding a railing to stair **Treads**, the path offset will be set to 25. When adding a railing to **Stringer**, the path offset will be set to half the value of the stringer width. So -25mm for a 50mm stringer. You can change these values at all time by selecting the railing and checking properties.



2- ACTIVATE RAILING PREVIEW

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



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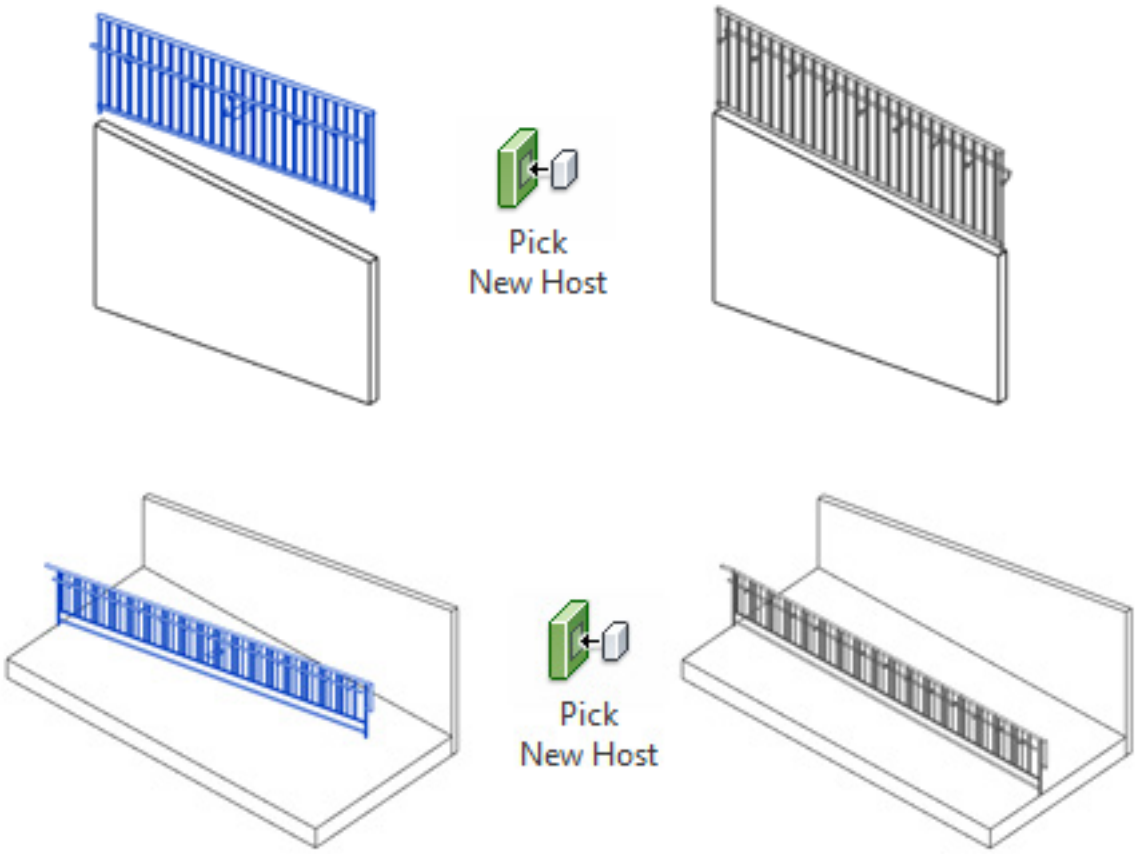
3- HOST RAILINGS TO SLOPED ELEMENTS OR TO A TOPOSURFACE

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.

Create a railing using 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.



13.2

RAILINGS

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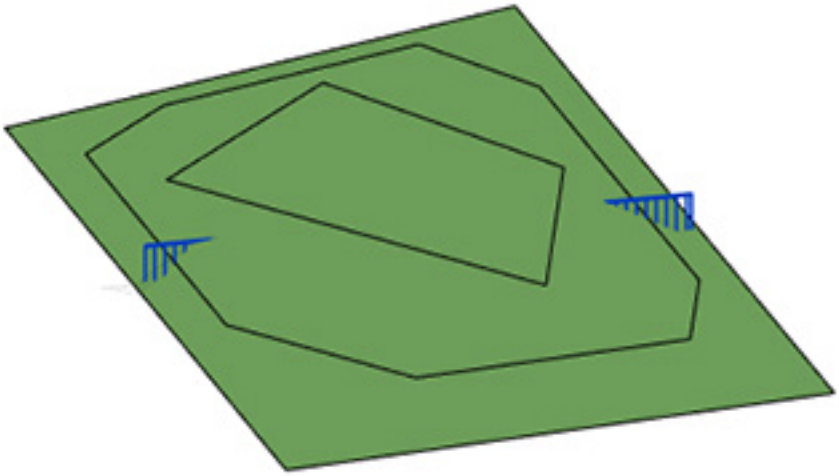
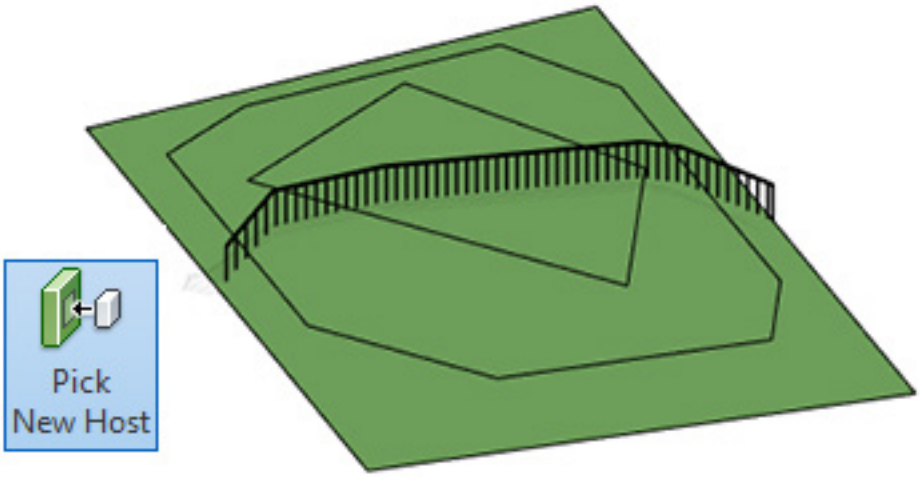
HOST RAILINGS TO TOPOSURFACE: Since Revit 2018, you can host a railing to a toposurface. This feature can be useful to model fences and other site elements. Create the railing, then click on "**Pick New Host**" in the contextual tab. Select the toposurface. Your railing should be following the topography like in the image below.





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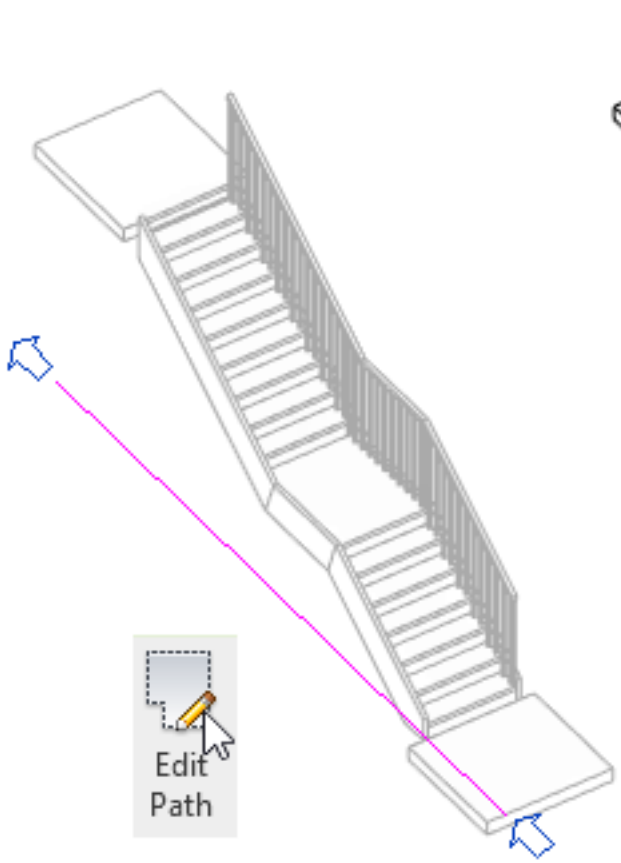
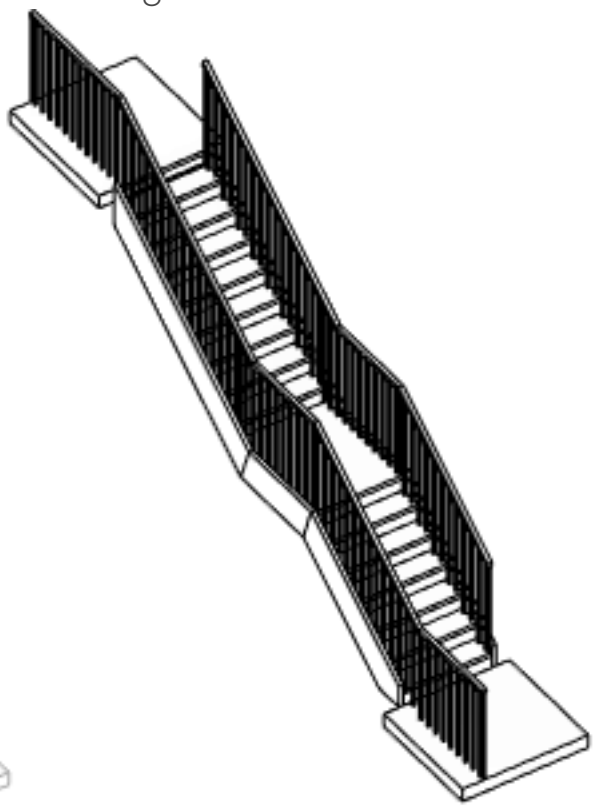
4- RAILING SHAPE WILL ADAPT TO MULTIPLE HOSTS

A railing can be hosted to a stair but still adapt to the shapes of landings and other elements. In the image below, a railing path is modified to include part of the floors. You can see that the railing is sloped above the stairs but becomes flat when above the landing and floors.



EDIT RAILING PATH



RAILING IS EXTENDED TO FLOORS

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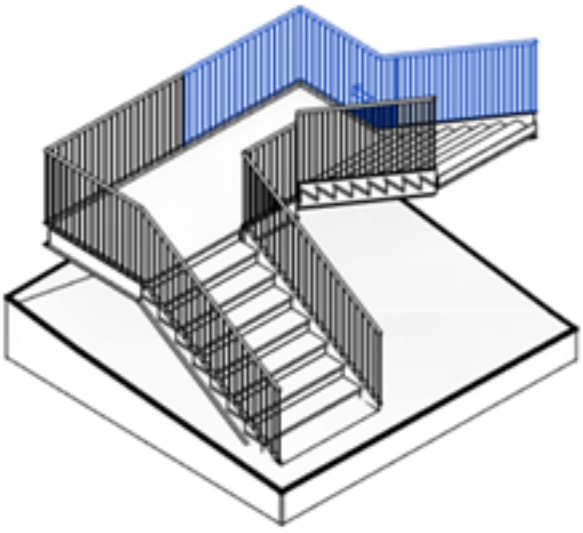
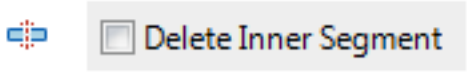
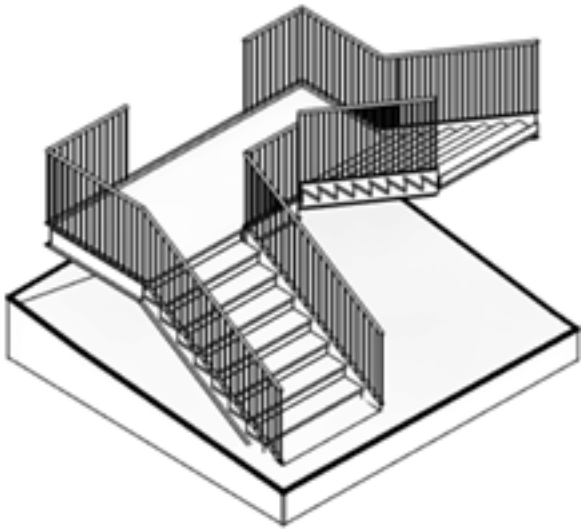
5- USE THE SPLIT TOOL ON A RAILING

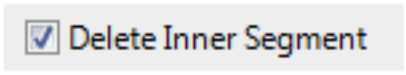
Since the Revit 2019 update, it is possible to use the **Split** tool on railings. You will find this tool in the Modify tab. In the options bar, check the **Delete Inner Segment** tool to remove the railing section between two clicks. That produces a similar effect to the "Split With Gap" tool that can be used with walls or lines.





CLICK ONCE TO SPLIT THE RAILING





CLICK TWICE, THE SECTION BETWEEN THE CLICKS WILL BE DELETED

13.3

RAILINGS

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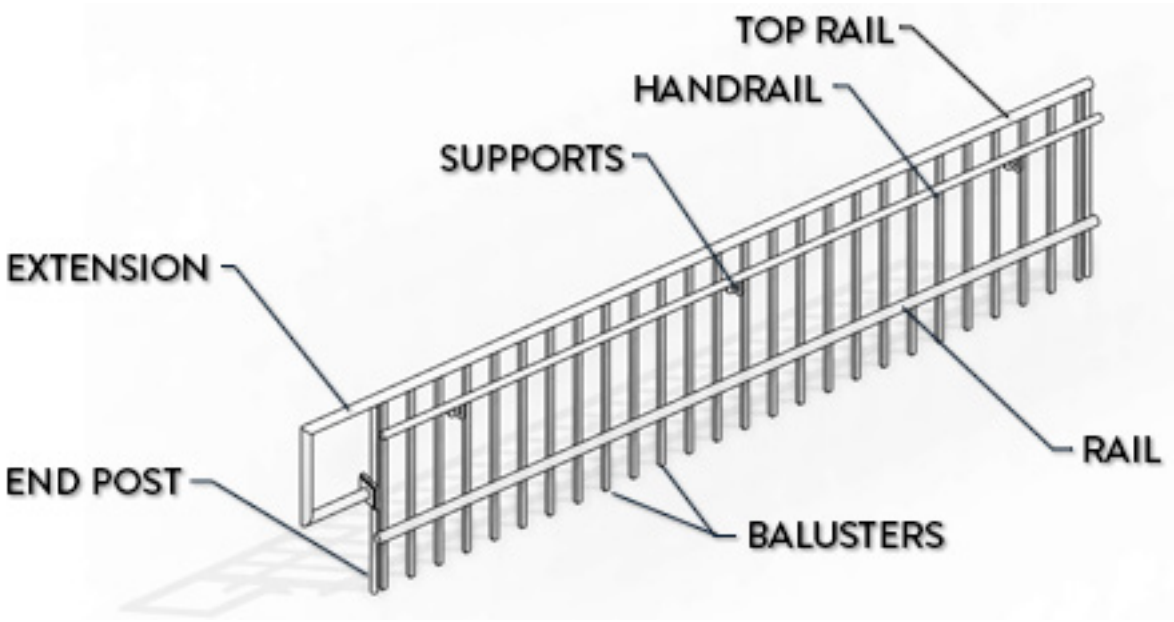
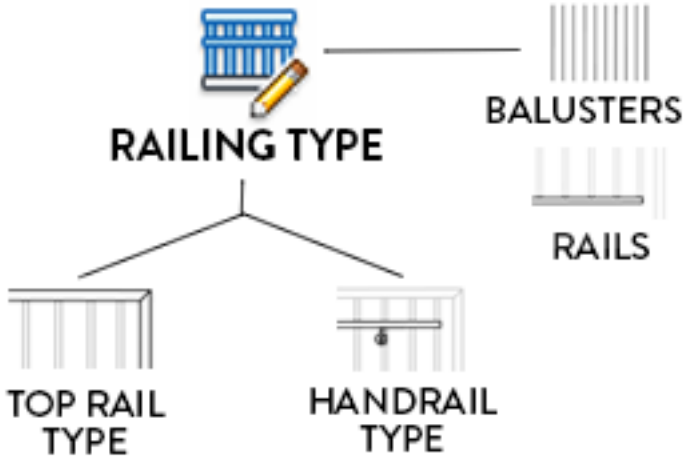
THE ANATOMY OF A RAILING

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



THE HIERARCHY OF A RAILING



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

Read the definitions next page to make sure you understand the Railing basics.

13.3

RAILINGS

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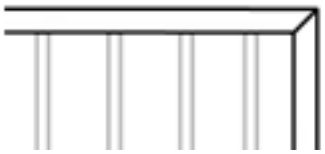
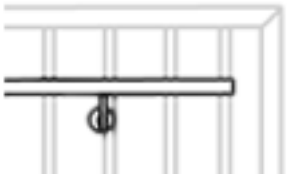
RAIL ELEMENTS



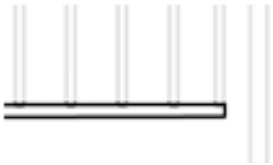
TOP RAIL

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

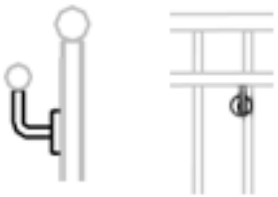
Any horizontal rail other than the **Top Rail** and the **Handrail**. Can be used to constraints balusters.

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.

13.3

RAILINGS

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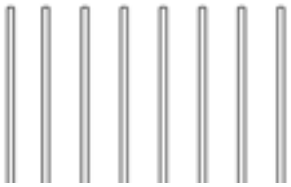
BALUSTER ELEMENTS

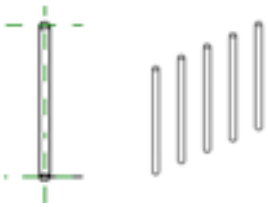


BALUSTERS

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.

RAILING EXAMPLES

SIMPLE WALL MOUNT RAILING

This railing only uses a **Handrail**. It contains no **Balusters** and no **Top Rail**. Located on walls.

COMPLICATED RAILING

This railing use a **Top Rail** with extension on both sides, a **Handrail**, two intermediate **Rails,** and 3 different **Baluster** types. Ouch.

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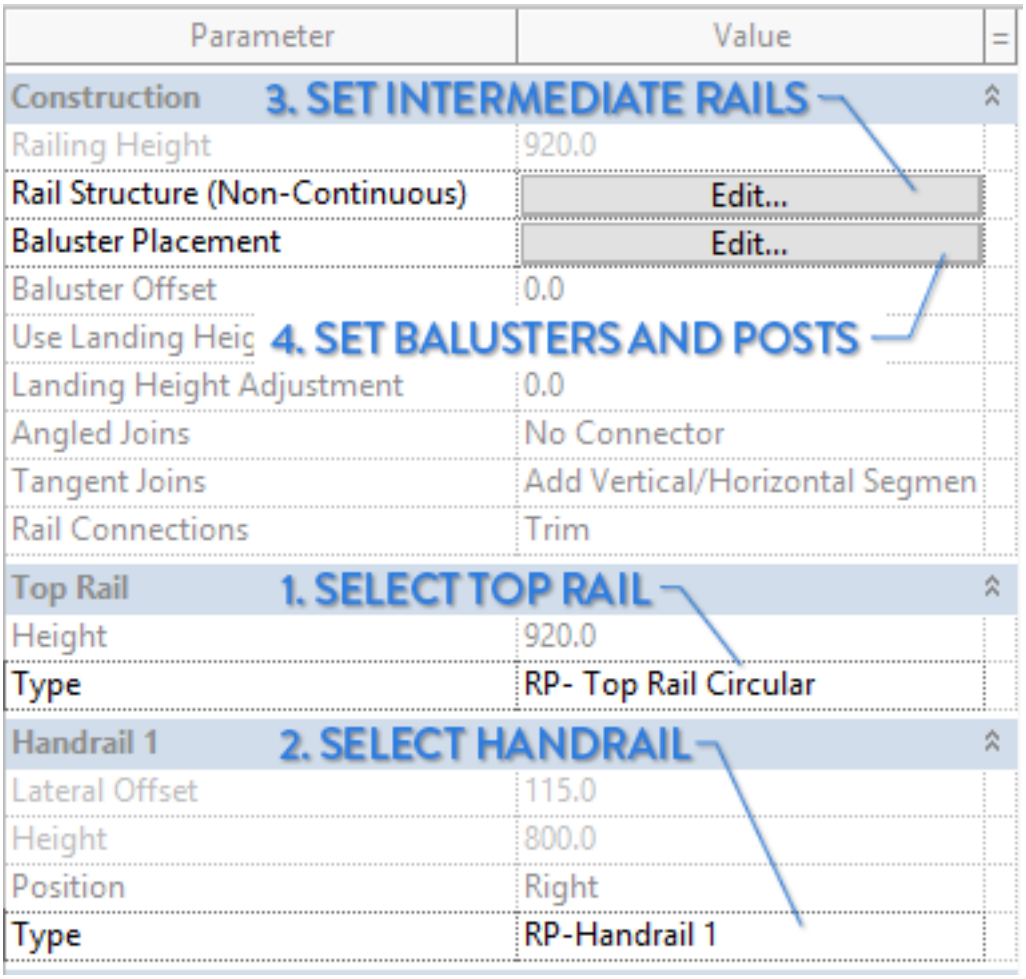
CREATE A RAILING TYPE

To create a railing type, select and duplicate an existing Railing type. Then follow the steps below, which are described in the next pages.



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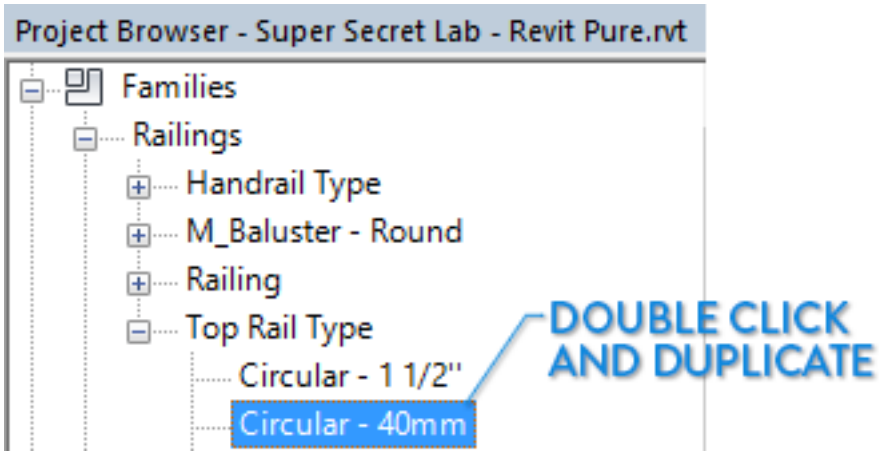
CREATE TOP RAIL AND HANDRAILS

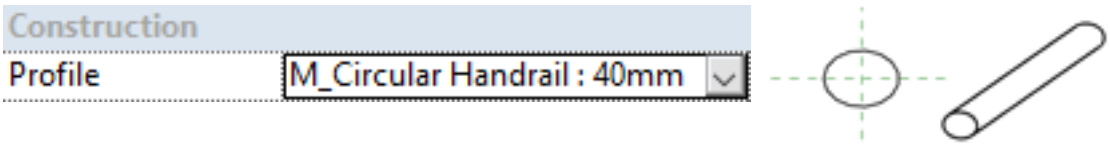
1. CREATE TOP RAIL / HANDRAIL TYPE

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.



2. 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.



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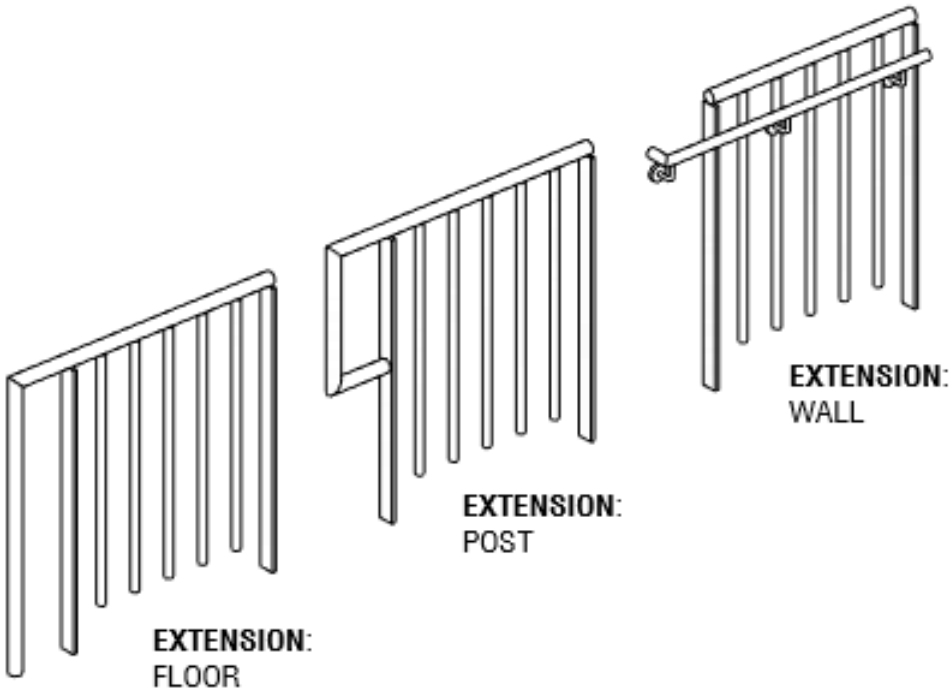
3. SET EXTENSIONS

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	☐
Extension (End/Top)	
Extension Style	Floor
Length	300.0

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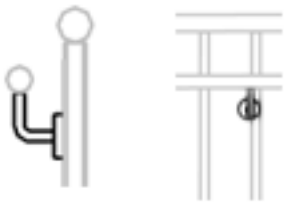
4. SET HANDRAIL SUPPORTS

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	
Family	M_Support - Metal - Circular
Layout	Fixed Distance
Spacing	400.0
Justification	Center
Number	0

HANDRAIL TYPE

Construction	
Height	50.0
Dimensions	
Radius 2	6.0
Radius 1	25.0

SUPPORT TYPE

5. 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 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

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CREATE INTERMEDIATE RAILS

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

1. GO TO RAIL STRUCTURE

In the **Railing Type**, click Rail Structure (Non-Continuous) Edit... .

2. INSERT NEW RAIL

Click the Insert button to add a new rail. Give a name to your rail.

3. 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 Revit default profile family, 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>

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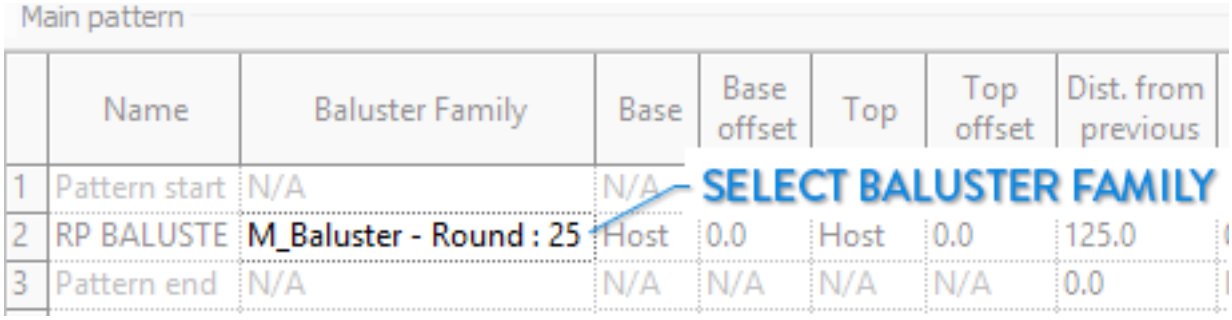
CREATE A BALUSTER PATTERN

1. 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.

2. 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.



3. SET OFFSET TO RAILING CENTER

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

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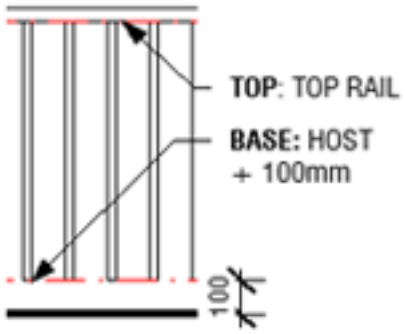
4. SET BASE AND TOP OF THE BALUSTERS

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 indicate 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**.

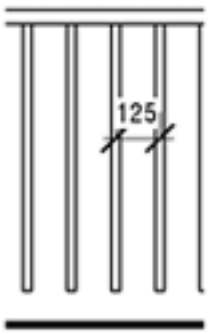
Base	Base offset	Top	Top offset
N/A	N/A	N/A	N/A
Host	100.0	Top Rail Element	0.0
N/A	N/A	N/A	N/A



5. 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



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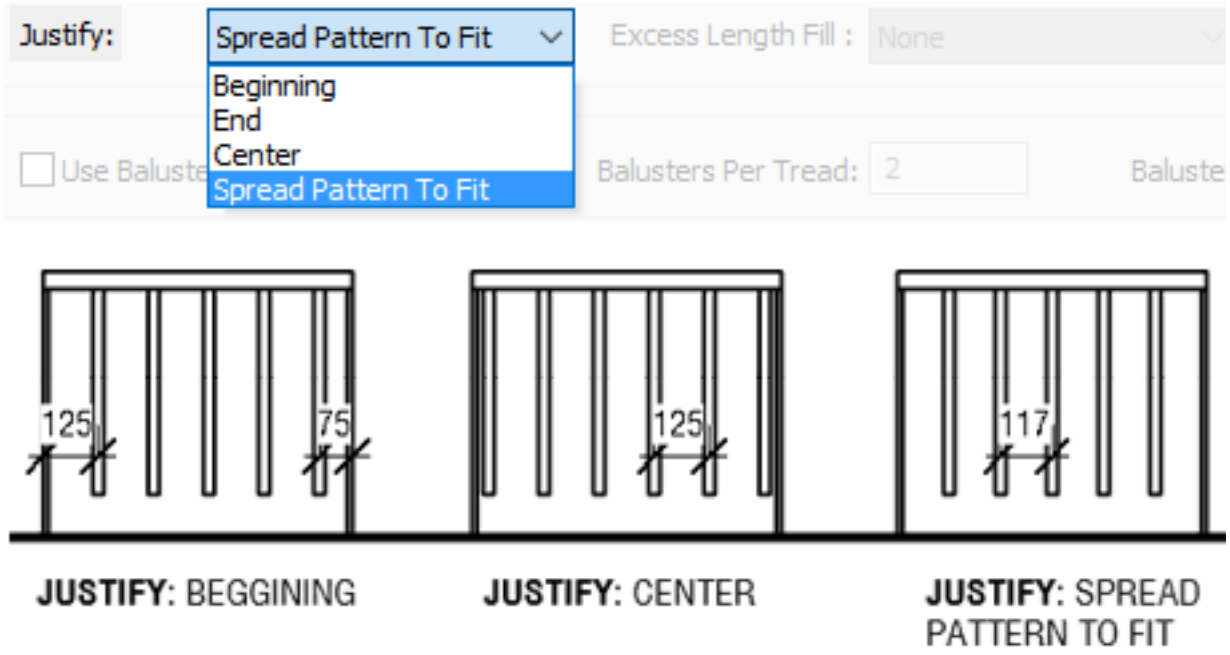
6. SET BALUSTERS JUSTIFICATION

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.



7. 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 intersection.

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

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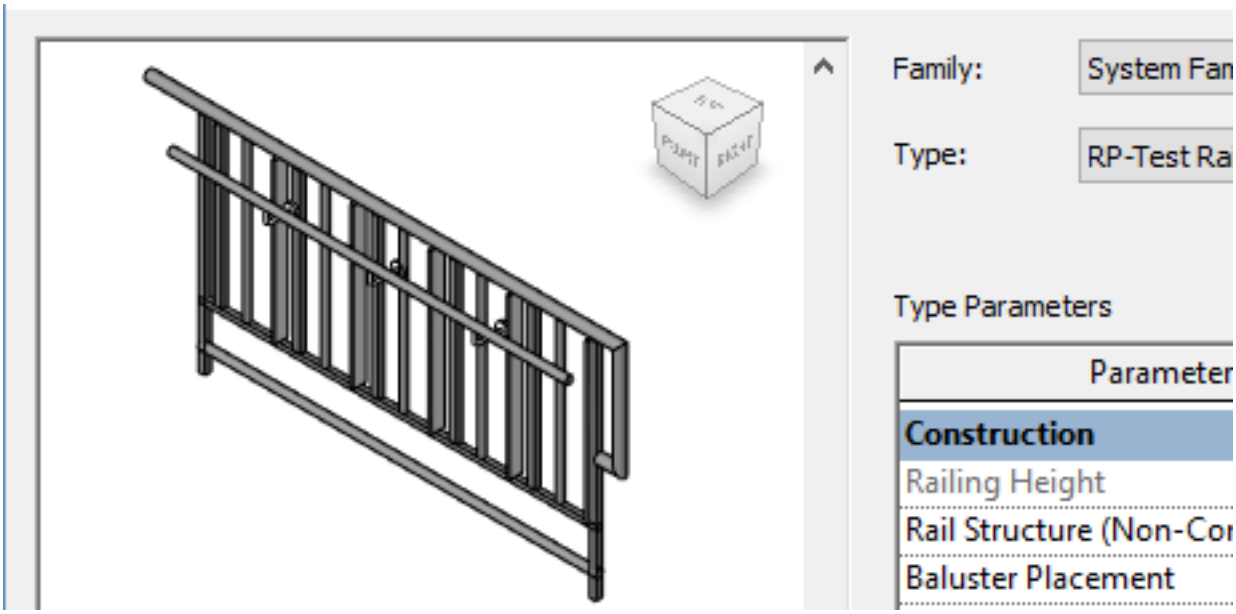
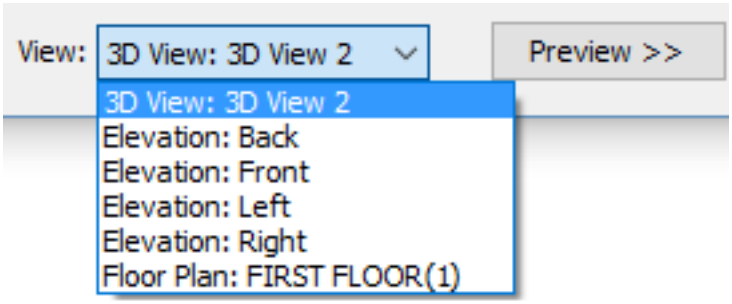
5 TIPS TO CREATE THE PERFECT RAILING TYPE

1- 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 view or elevations.





CLICK PREVIEW AND SELECT A VIEW

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2- USE PROJECT BROWSER TO FIND RAILING PARTS

Go to Families in your project browser, then hop to Railings.

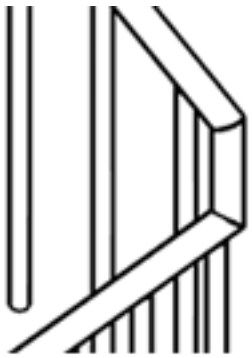
All Railing Type will be in the Railing sub-menu (in red). The Handrail and Top Rail also have their own sub-menu (in blue).

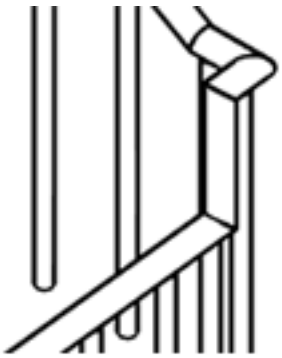
All the others families are directly under the Railings category, including Balusters and Supports. Don't forget that all rails use a 2D Profile that can be found under the Profiles menu in Families. To save time, use CTRL-F in the project browser and type the name of the component you are looking for.

3-ADJUST TOP RAIL TRANSITIONS

Select a **transition** style for Handrail and Top Rail. This is how the rail will behave when a sloped railing change direction.

NONE


SIMPLE


GOOSENECK

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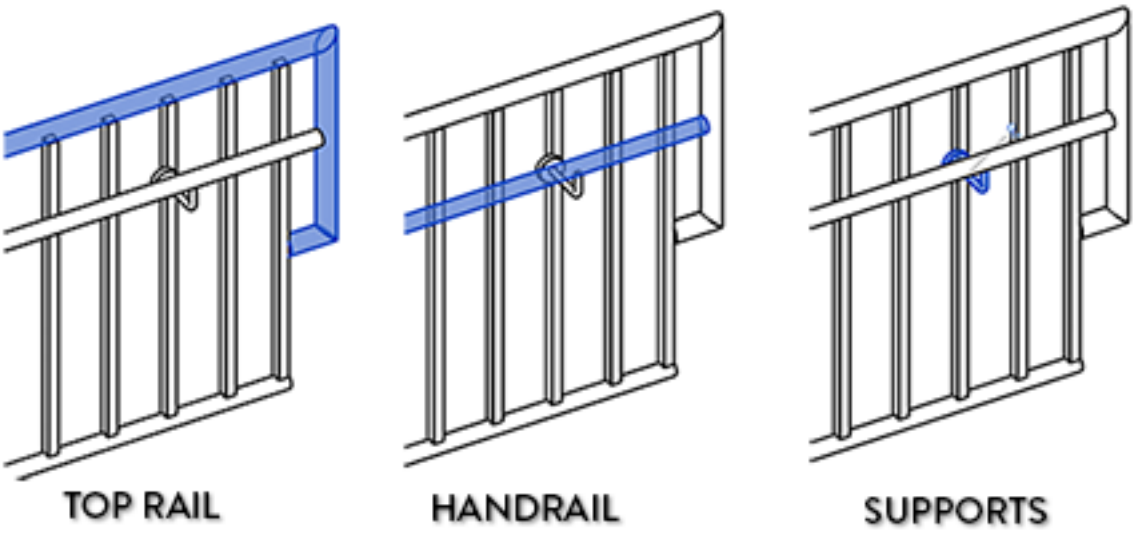
4- USE TAB TO SELECT SPECIFIC RAILING PARTS

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.

5- ADJUST SUPPORTS POSITION

Handrail Supports position is automatically set in Handrail Type. Often, this position is not what we want. Tab-select and unpin the support, then move it to the correct position.

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4 ADVANCED RAILINGS TIPS

1- CREATE GLAZED RAILING WITH GLAZED BALUSTERS

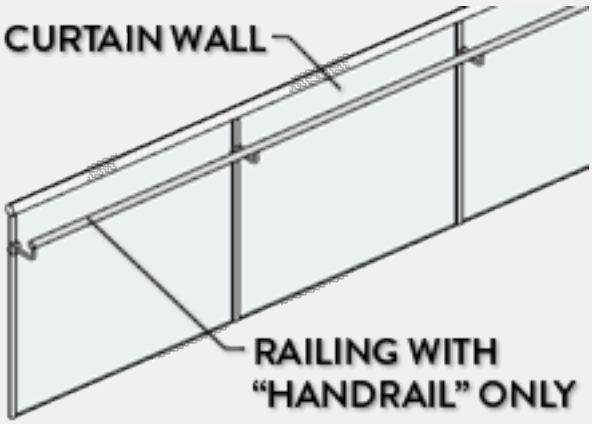
Most of the time, this solution is not very good. The problem is that Revit won't automatically adjust glazing size to fit the length of the railing. If you have super precise railing length and glazing dimension, this can work fine. Use Glazed Baluster instead of Standard Baluster in Baluster Placement.

2	Regular bal	M_Panel - Glazed : 800	Host	0.0

USE GLAZED BALUSTER FAMILY

2- CREATE GLAZED RAILING WITH CURTAIN WALLS

This is the way to go! Curtain walls are easier to use than the labyrinthic railings. The downside is that they won't automatically adjust for stair slope. You have to edit profile and manually draw it. Need fancy glass connectors? Create a custom mullion family. Need a Handrail? Use a railing on top of the curtain wall and group them together.



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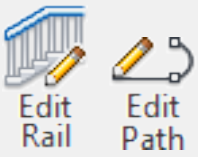
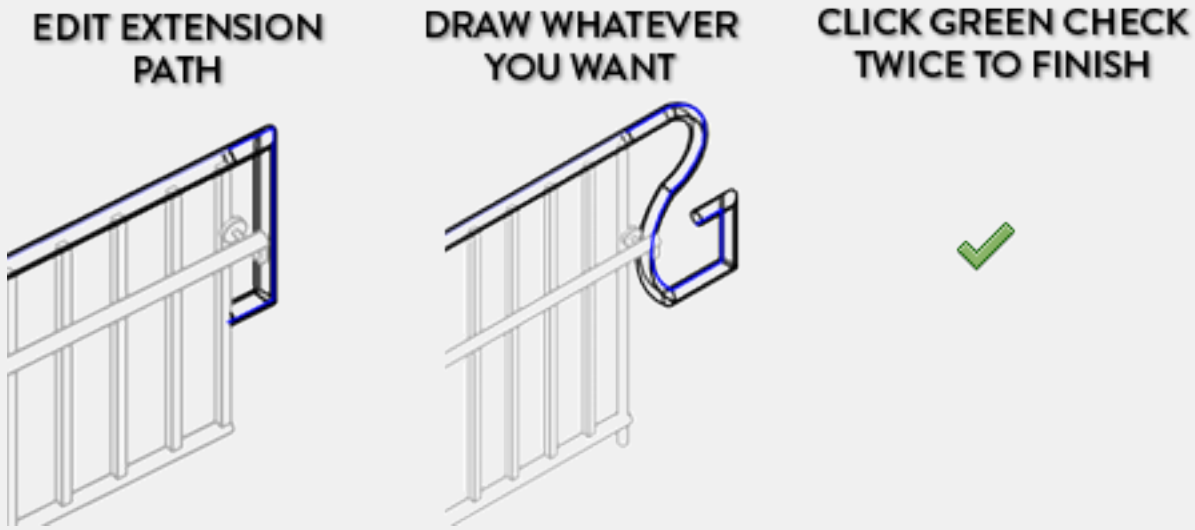
3- CREATE FANCY EXTENSION SHAPES

Remember the extensions we created earlier? They were limited to 3 shapes. Turns out you can customize the shape to whatever you want.



Tab-select the Top Rail, then click the **Edit Rail** button. Then click **Edit Path**.



Changed your mind and want to go back to the original shape? Click the Reset Rail button when the Top Rail is selected.

Editing railing path is limited to the extensions, you cannot modify the main part of the rail. Use this feature for **Top Rail** or for **Handrail**.

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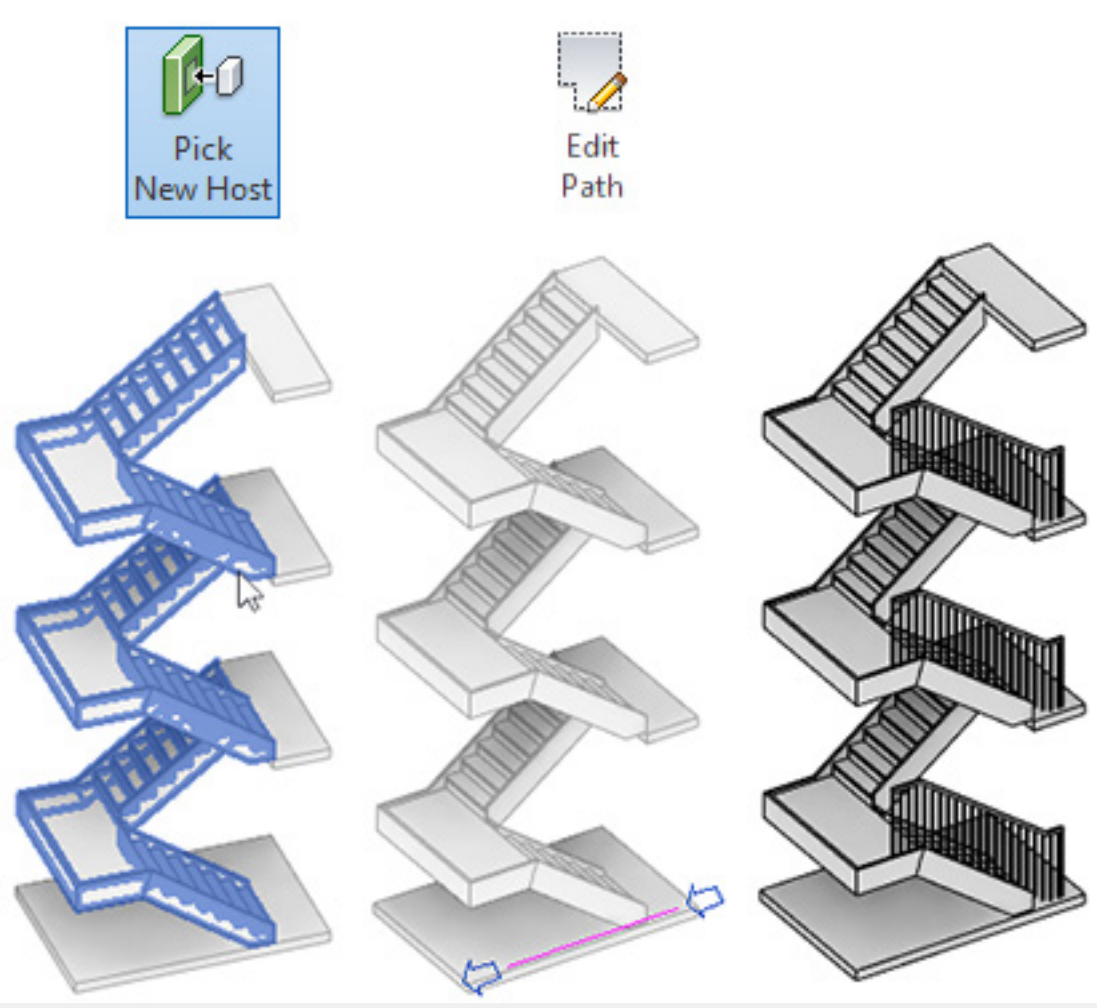
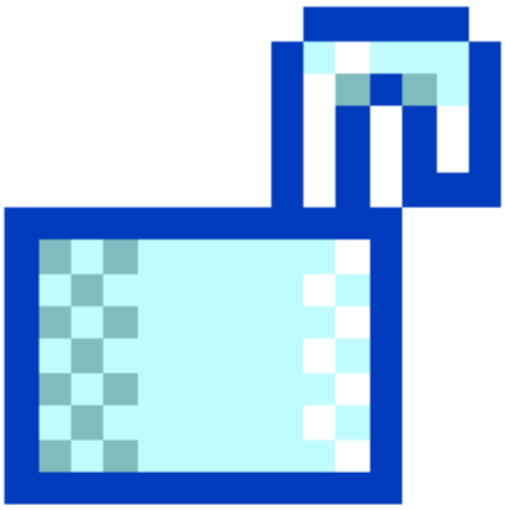
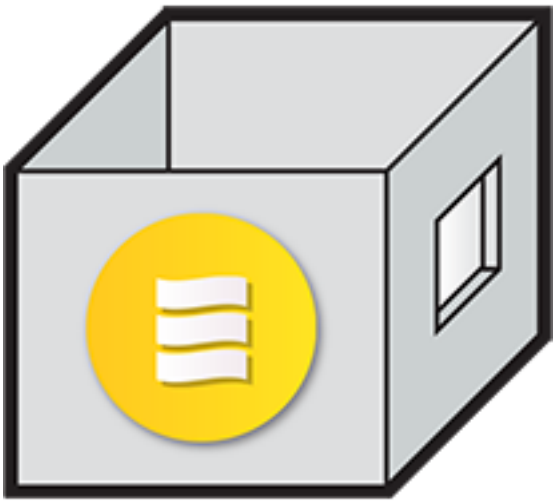
4- CREATE RAILINGS FOR MULTISTORY STAIRS

With a single click, you can add railings to all stairs in a multistory group. It is possible to draw a railing segment that doesn't cover the complete stair like in the image below. The railing will automatically adjust to match the stairs, landing and floors. Modifying one of the railing will affect all railings hosted on stairs of the same height inside the multistory group.



UNLOCK THE REST OF THE PACKAGE





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