



UNIVERSITÀ DI PARMA

DIPARTIMENTO DI INGEGNERIA E ARCHITETTURA
CORSO DI LAUREA IN ARCHITETTURA E CITTA' SOSTENIBILI

**BUILDING INFORMATION MODELING:
DIGITAL MODELING OF ARCHITECTURE
DIGITAL VISUALIZATION OF PROJECT**

A.A. 2022-2023, Prof. Sandra Mikolajewska
09/05/2023

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THE CONTENT OF THESE SLIDES IN NO WAY REPLACES THE RECOMMENDED REFERENCE BIBLIOGRAPHY.

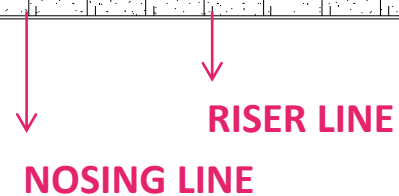
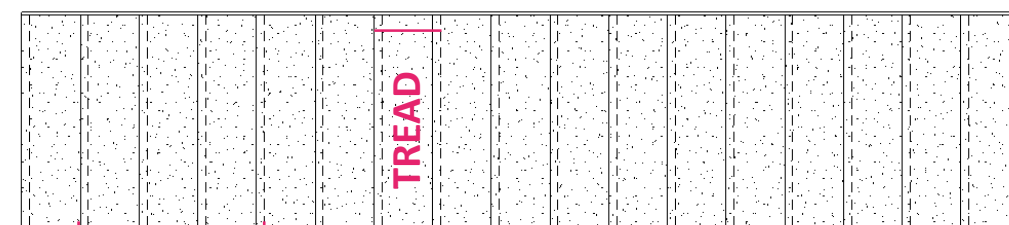
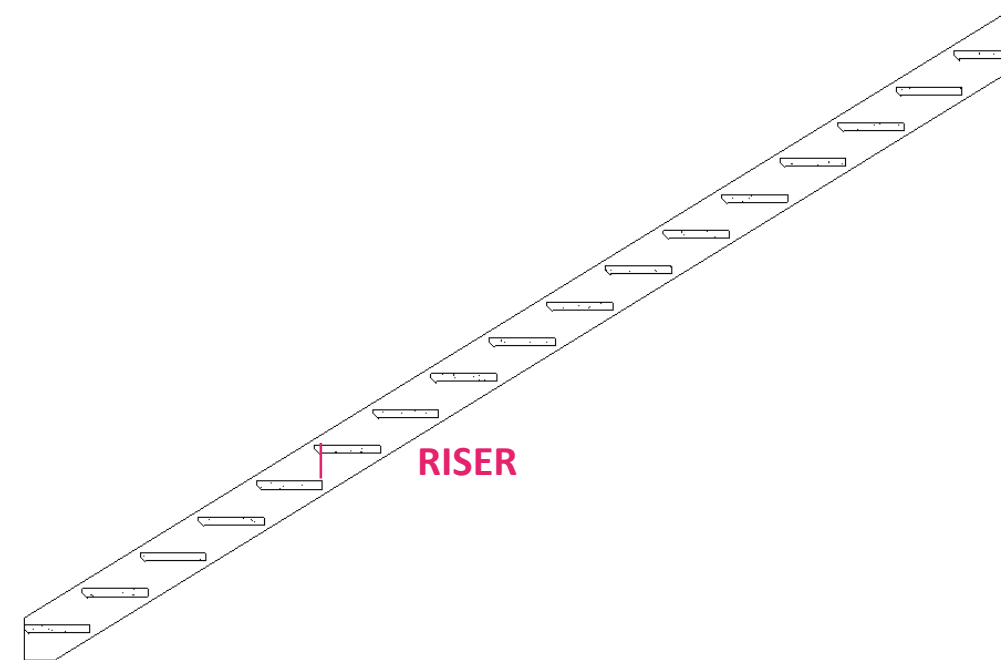


TOPICS OF TODAY: REVIT. PART 5. STAIRS, RAMPS AND RAILINGS

- HOW TO MANAGE TRADITIONAL STAIRS IN REVIT;
- HOW TO CUSTOMIZE STAIRS;
- HOW TO CHANGE THE STAIR CALCULATION RULES;
- HOW TO CHANGE THE GRAPHIC VISIBILITY INFORMATION;
- HOW TO MANAGE TRADITIONAL RAMPS IN REVIT;
- HOW TO MANAGE TRADITIONAL RAILINGS IN REVIT;
- HOW TO CUSTOMIZE RAILINGS;



- STAIR
- RUN
- LANDING
- RAILING
- RISER
- TREAD
- CUT MARK
- NOSING LINE
- NOSING LENGHT
- NOTCH CONNECTION
- STRINGER
- CARRIAGE
- BALAUSTERS
- TOP RAIL
- HANDRAIL



Properties

Cast-In-Place Stair
Insitu_Concrete_150mm_Waist

Search

1 Assembled Stair

- Commercial-Ext_Steel_Fire_Escape
- Private
- Residential-Left_Saddled

2 Cast-In-Place Stair

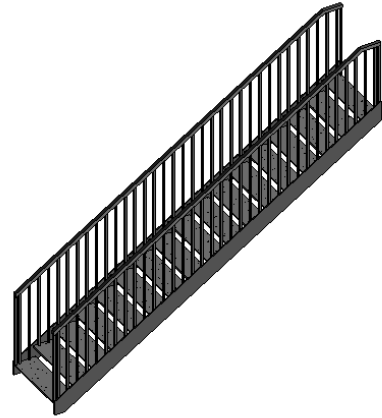
- Insitu_Concrete_150mm_Waist

3 Precast Stair

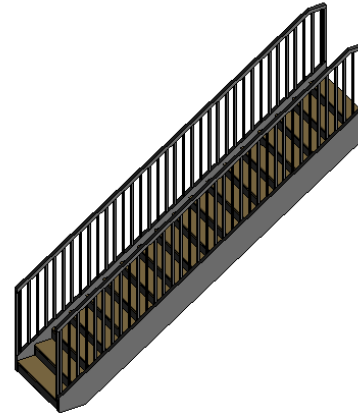
- Precast_Stair

Most Recently Used Types

- Cast-In-Place Stair : Insitu_Concrete_150mm_Waist
- Precast Stair : Precast_Stair
- Assembled Stair : Residential-Left_Saddled
- Assembled Stair : Private
- Assembled Stair : Commercial-Ext_Steel_Fire_Escape



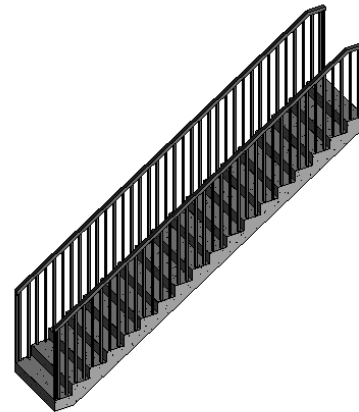
ASSEMBLED STAIR:
COMMERCIAL_EXT_STEEL



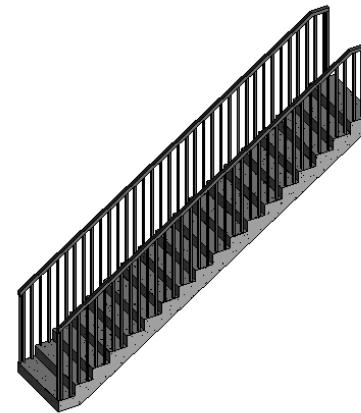
ASSEMBLED STAIR:
PRIVATE



ASSEMBLED STAIR:
RESIDENTIAL



CAST-IN-PLACE STAIR:
INSITU_CONCRETE



PRECAST STAIR:
PRECAST STAIR

STAIR TYPE PROPERTIES

Type Properties

Family: System Family: Cast-In-Place Stair Load...

Type: Insitu_Concrete_150mm_Waist Duplicate...

Rename...

Type Parameters

Parameter	Value
Calculation Rules	
Maximum Riser Height	17.00
Minimum Tread Depth	25.00
Minimum Run Width	100.00
Calculation Rules	Edit...
Construction	
Run Type	1mm_Tread-150mm_Depth
Landing Type	200mm_Thickness
Function	Interior
Supports	
Right Support	None
Right Support Type	<None>
Right Lateral Offset	0.00
Left Support	None
Left Support Type	<None>
Left Lateral Offset	0.00
Middle Support	<input type="checkbox"/>
Middle Support Type	<None>

[What do these properties do?](#)

<< Preview OK Cancel Apply



STAIR CALCULATION RULES

Stair Calculator

Use Stair Calculator for slope calculation

Results are used for stair creation only. They will not modify existing stairs.

Calculation Rule for target slope:

2 * Rise + 1 * Depth = 63.50

Value Range for valid calculation result:

Maximum Result for Stair Calculator = 64.77

Actual Result of Stair Calculation: 64.00

Minimum Result for Stair Calculator = 58.42

Min./max. values for Rise and Depth:

Maximum Riser Height = 18.00

Minimum Tread Depth = 28.00

<< Preview OK Cancel Help

Stair Calculator

Use Stair Calculator for slope calculation

Results are used for stair creation only. They will not modify existing stairs.

Calculation Rule for target slope:

2 * Rise + 1 * Depth = 64.00

Value Range for valid calculation result:

Maximum Result for Stair Calculator = 64.00

Actual Result of Stair Calculation: 64.00

Minimum Result for Stair Calculator = 62.00

Min./max. values for Rise and Depth:

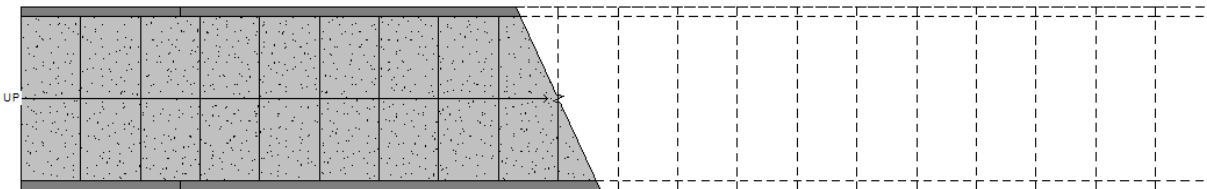
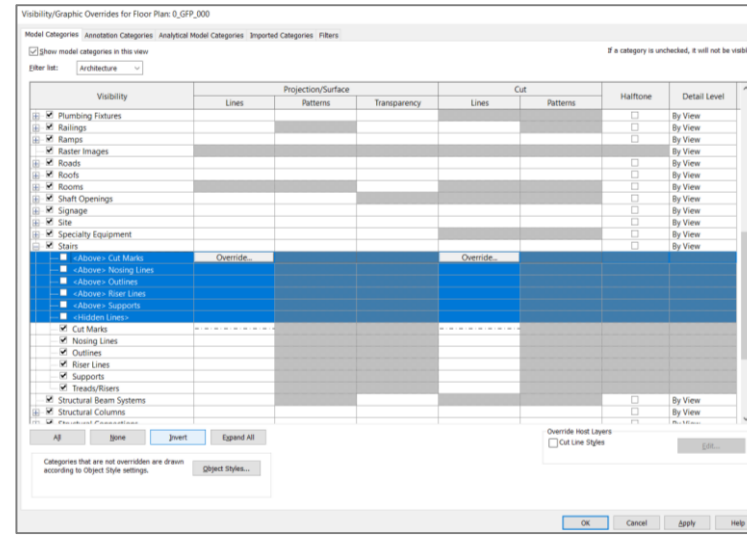
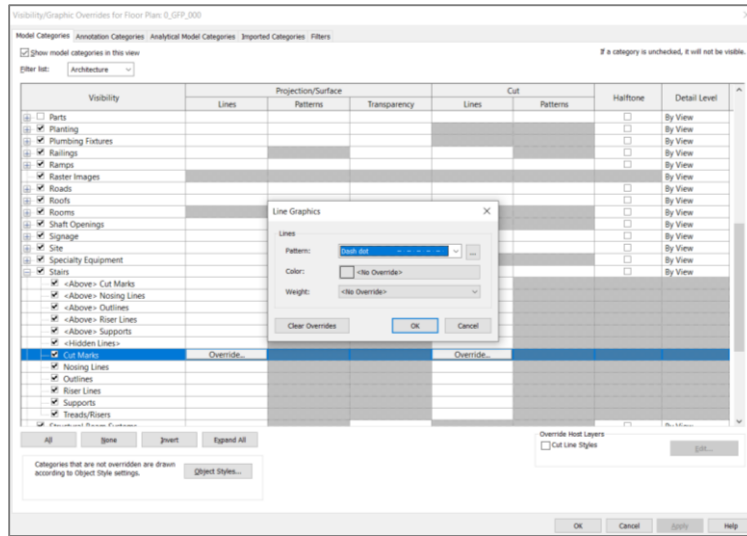
Maximum Riser Height = 18.00

Minimum Tread Depth = 28.00

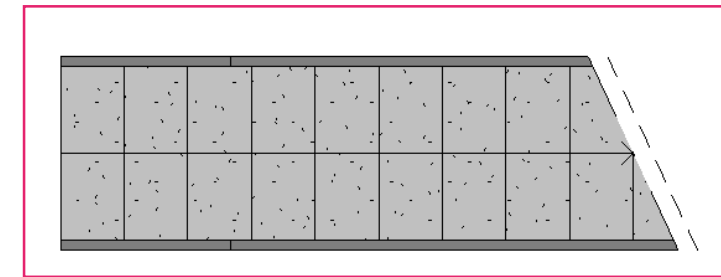
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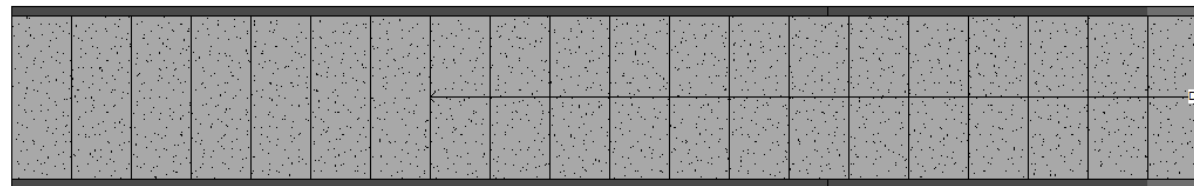
GRAPHICAL REPRESENTATION OF STAIRS



GROUND FLOOR PLAN: DEFAULT REPRESENTATION



GROUND FLOOR PLAN:
CUSTOMIZED REPRESENTATION



FIRST FLOOR PLAN: DEFAULT REPRESENTATION



CAST-IN-PLACE STAIR AND ASSEMBLED STAIR

Type Properties

Family: System Family: Cast-In-Place Stair

Type: Insitu_Concrete_150mm_Waist

Type Parameters

Parameter	Value
Calculation Rules	
Maximum Riser Height	17.00
Minimum Tread Depth	28.00
Minimum Run Width	100.00
Calculation Rules	Edit...
Construction	
Run Type	1mm_Tread-175mm_Depth
Landing Type	200mm_Thickness
Function	Interior
Supports	
Right Support	None
Right Support Type	<None>
Right Lateral Offset	0.00
Left Support	None
Left Support Type	<None>
Left Lateral Offset	0.00
Middle Support	<input type="checkbox"/>

What do these properties do?

<< Preview OK Cancel Apply

Type Properties

Family: System Family: Assembled Stair

Type: Commercial-Ext_Steel_Fire_Escape

Type Parameters

Parameter	Value
Calculation Rules	
Maximum Riser Height	18.00
Minimum Tread Depth	28.00
Minimum Run Width	100.00
Calculation Rules	Edit...
Construction	
Run Type	Concrete_Steps_w-38mm_Tread-38mm_Nosing
Landing Type	Non-Monolithic_Landing
Function	Interior
Supports	
Right Support	Carriage (Open)
Right Support Type	Carriage-50mm_Width
Right Lateral Offset	0.00
Left Support	Carriage (Open)
Left Support Type	Carriage-50mm_Width
Left Lateral Offset	0.00
Middle Support	<input type="checkbox"/>

What do these properties do?

<< Preview OK Cancel Apply

ASSEMBLED STAIRS: SUPPORTS

Type Properties

Family: System Family: Assembled Stair Load...

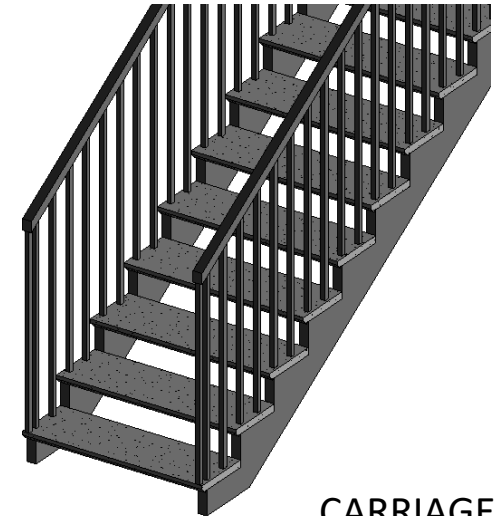
Type: Commercial-Ext_Steel_Fire_Escape Duplicate... Rename...

Type Parameters

Parameter	Value
Minimum Tread Depth	28.00
Minimum Run Width	100.00
Calculation Rules	Edit...
Construction	
Run Type	Concrete_Steps_w-38mm_Tread-38mm_Nosing
Landing Type	Non-Monolithic_Landing
Function	Interior
Supports	
Right Support	Carriage (Open)
Right Support Type	Carriage-50mm_Width
Right Lateral Offset	0.00
Left Support	Carriage (Open)
Left Support Type	Carriage-50mm_Width
Left Lateral Offset	0.00
Middle Support	<input type="checkbox"/>
Middle Support Type	<None>
Middle Support Number	0

[What do these properties do?](#)

<< Preview OK Cancel Apply



CARRIAGE



STRINGER



UNIVERSITÀ DI PARMA

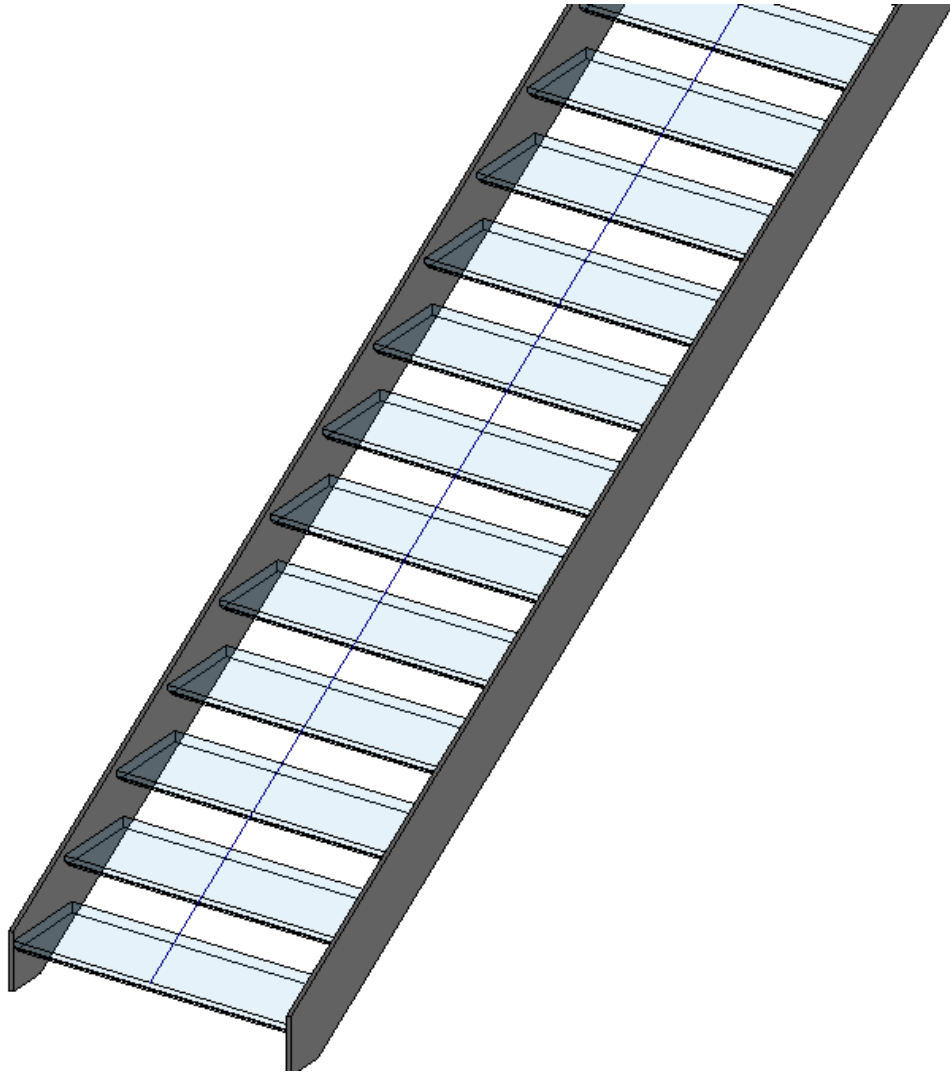
DIPARTIMENTO DI INGEGNERIA E ARCHITETTURA

CORSO DI LAUREA IN ARCHITETTURA E CITTA' SOSTENIBILI

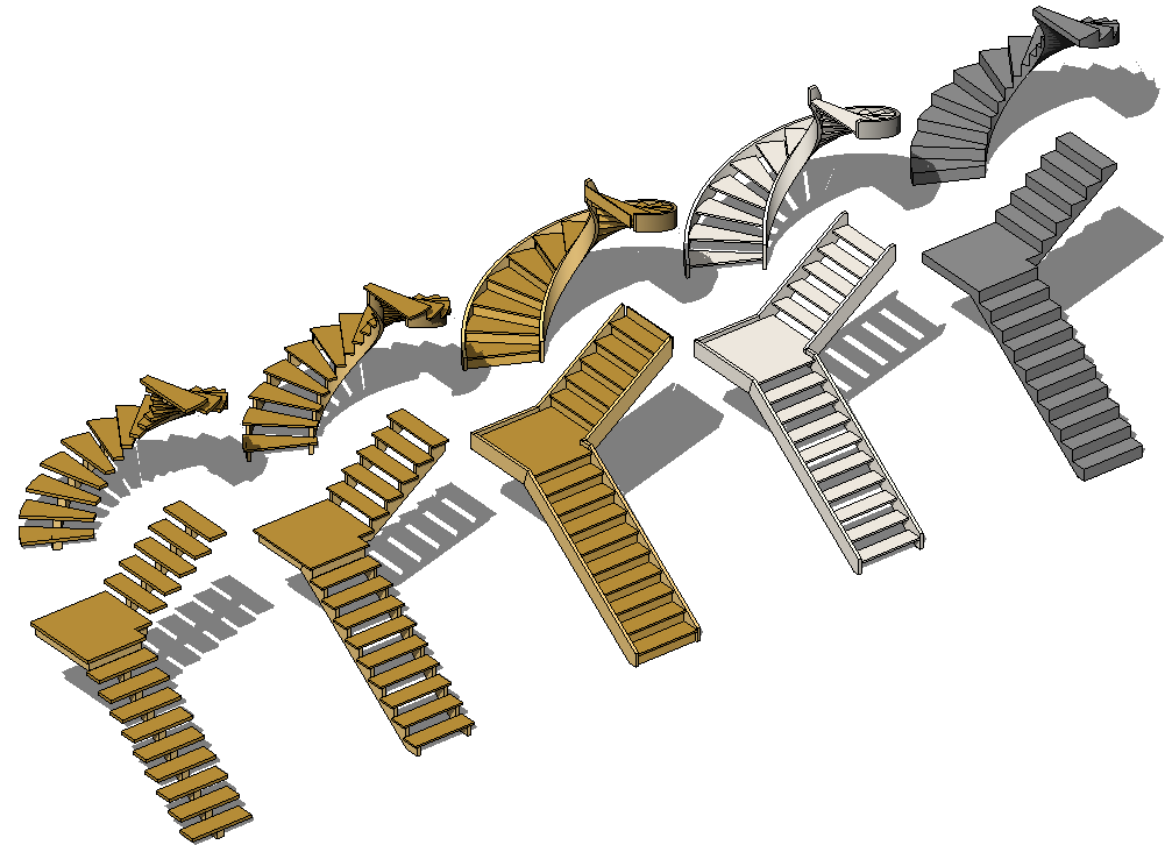
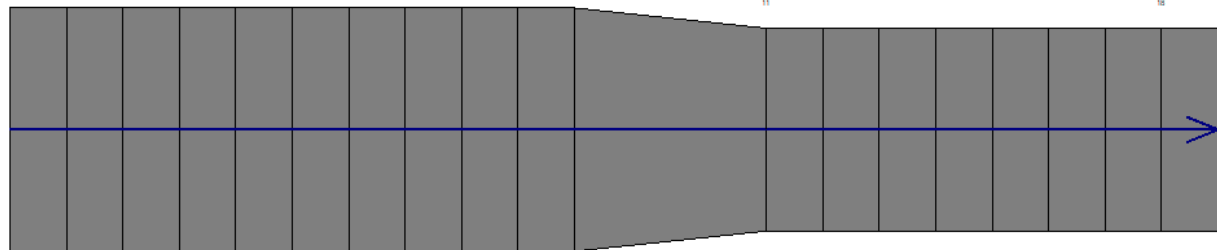
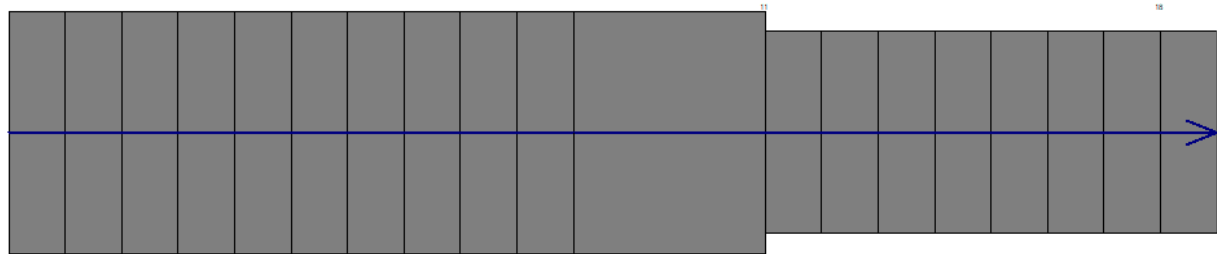
BUILDING INFORMATION MODELING:
DIGITAL MODELING OF ARCHITECTURE, DIGITAL VISUALIZATION OF PROJECT

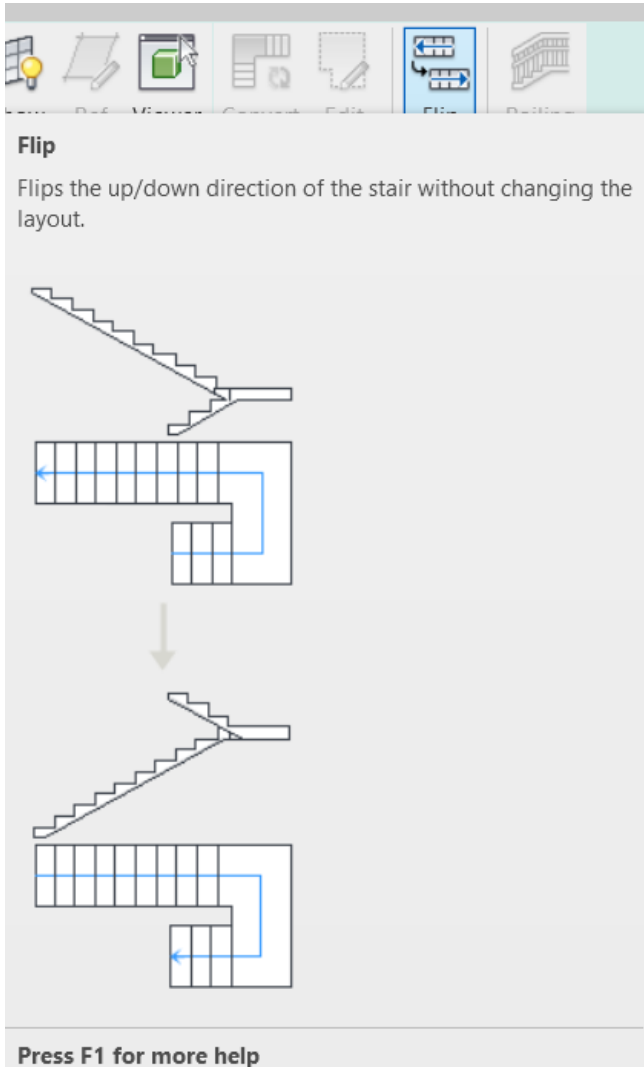
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ASSEMBLED STAIRS: CUSTOMIZED EXAMPLE (MATERIALS)



EDIT STAIRS – CONVERT TO SKETCH BASED – EDIT SKETCH





THICK/SOLID RAMP

Type Properties

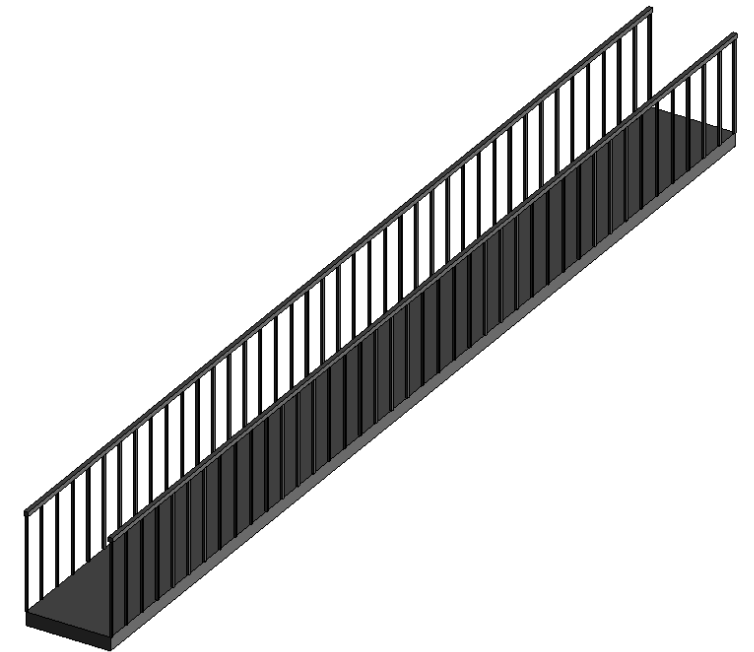
Family: System Family: Ramp Load...
Type: Standard Duplicate...
Rename...

Type Parameters

Parameter	Value
Construction	
Shape	Thick
Thickness	Thick
Function	Solid
Graphics	
Text Size	2.5000 mm
Text Font	Arial
Materials and Finishes	
Ramp Material	<By Category>
Dimensions	
Maximum Incline Length	1200.00
Ramp Max Slope (1/x)	12.000000
Identity Data	
Type Image	
Keynote	
Model	
Manufacturer	

[What do these properties do?](#)

<< Preview OK Cancel Apply



RAMP MAX SLOPE

Type Properties

Family: System Family: Ramp Load...
Type: Standard Duplicate...
Rename...

Type Parameters

Parameter	Value
Construction	
Shape	Thick
Thickness	15.00
Function	Interior
Graphics	
Text Size	2.5000 mm
Text Font	Arial
Materials and Finishes	
Ramp Material	<By Category>
Dimensions	
Maximum Incline Length	1200.00
Ramp Max Slope (1/x)	12.000000
Identity Data	
Type Image	
Keynote	
Model	
Manufacturer	

[What do these properties do?](#)

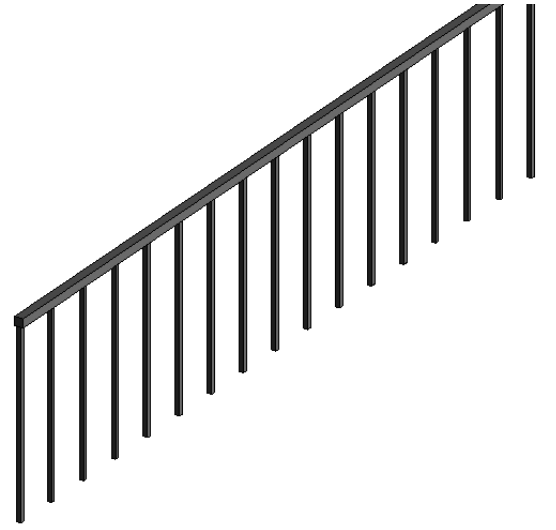
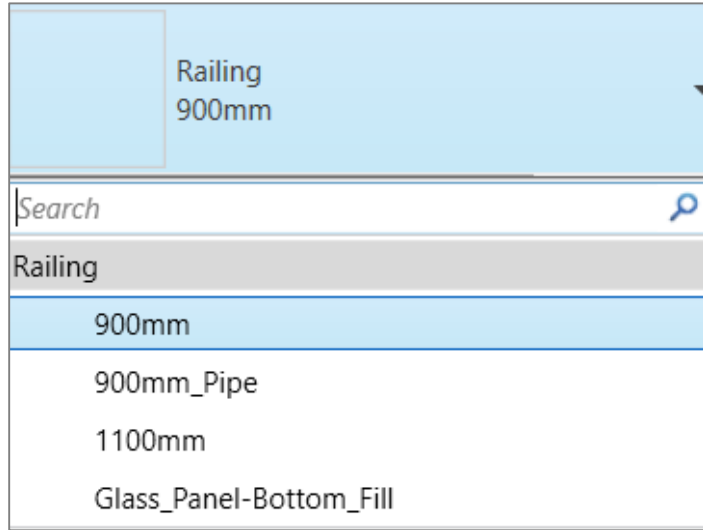
<< Preview OK Cancel Apply

RAMP MAX SLOPE = 12
 $1/12=0.083 \rightarrow 8,3\%$ slope

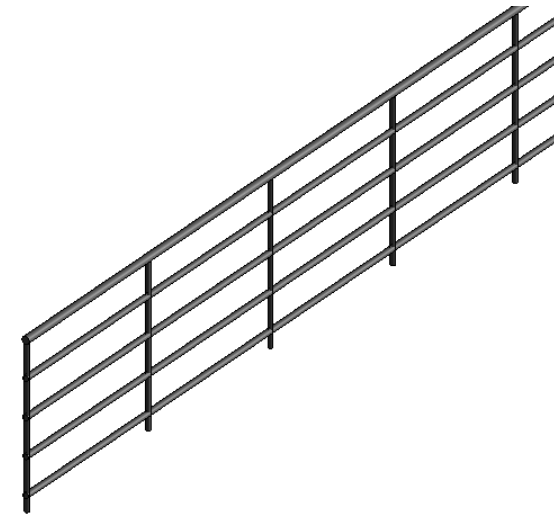
RAMP MAX SLOPE = 12,5
 $1/12,5=0.08 \rightarrow 8\%$ slope

RAMP MAX SLOPE = 5
 $1/5=0.20 \rightarrow 20\%$ slope





900 MM




900 MM_PIPE



GLASS_PANEL-BOTTOM_FILL

Type Properties



Family: System Family: Railing

Type: 1100mm

Buttons: Load..., Duplicate..., Rename...

Type Parameters


Parameter	Value
Construction	
Railing Height	110.00
Rail Structure (Non-Continuous)	Edit...
Baluster Placement	Edit...
Baluster Offset	0.00
Use Landing Height Adjustment	<input type="checkbox"/>
Landing Height Adjustment	0.00
Angled Joins	Add Vertical/Horizontal Segments
Tangent Joins	Extend Rails to Meet
Rail Connections	Trim
Top Rail	
Use Top Rail	<input checked="" type="checkbox"/>
Height	110.00
Type	50x50mm_Rectangular
Handrail 1	
Lateral Offset	
Height	
Position	None
Type	<None>
Handrail 2	
Lateral Offset	
Height	
Position	None
Type	<None>
Identity Data	
Type Image	

[What do these properties do?](#)

View: 3D View: 3D View 1

Buttons: Preview >>, OK, Cancel, Apply

Type Properties



Family: System Family: Railing

Type: 1100mm

Buttons: Load..., Duplicate..., Rename...

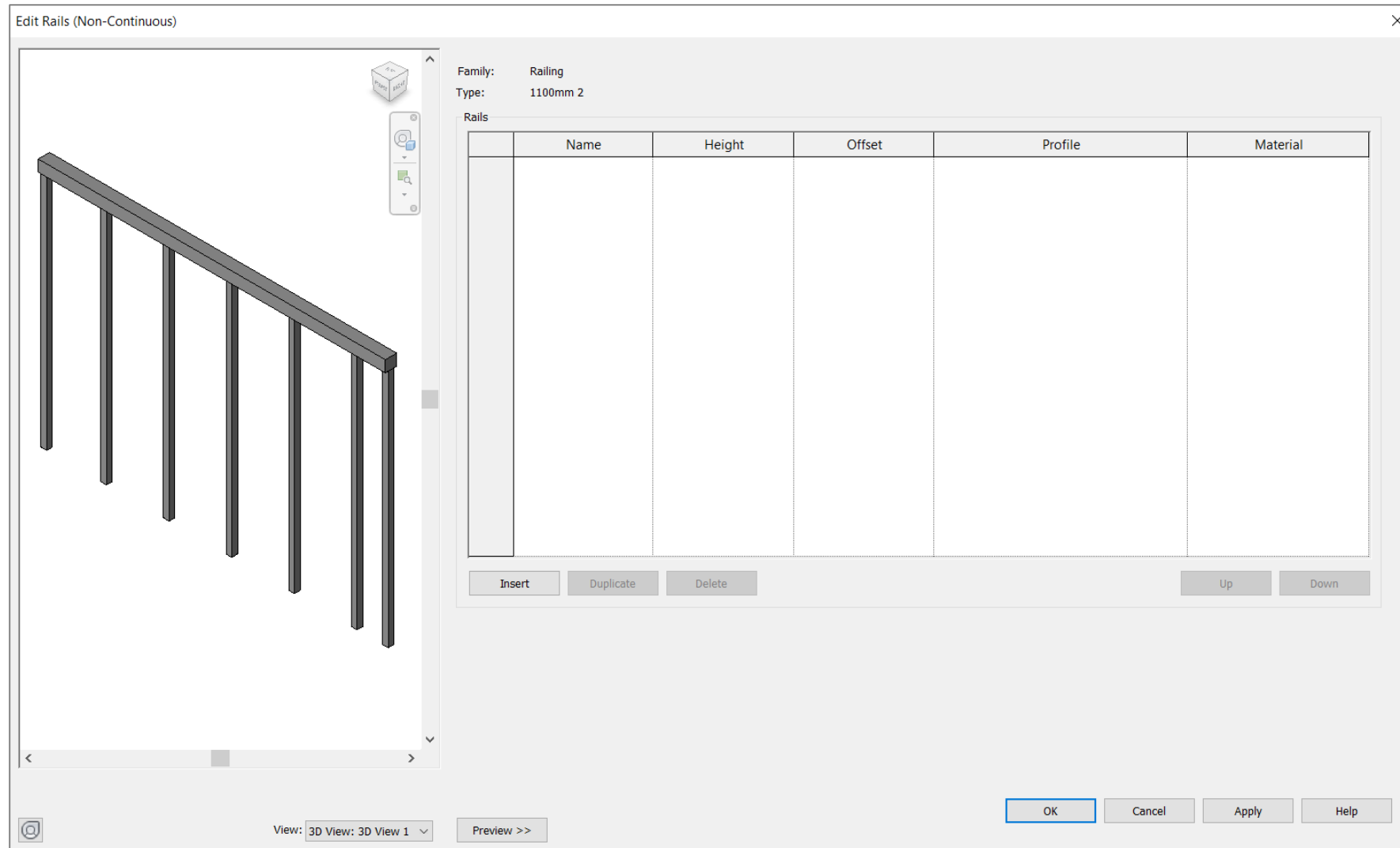
Type Parameters

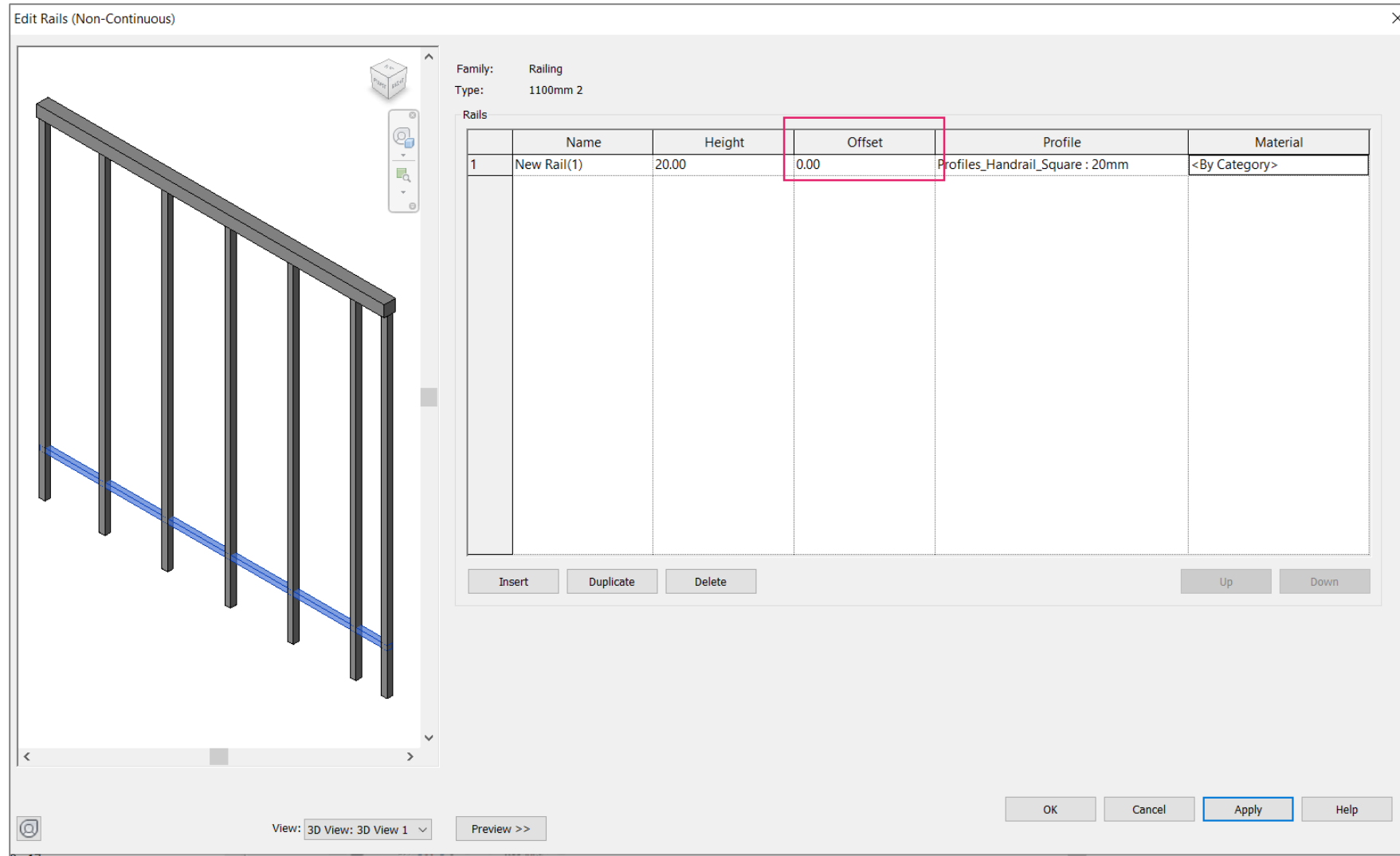
Parameter	Value
Construction	
Railing Height	110.00
Rail Structure (Non-Continuous)	Edit...
Baluster Placement	Edit...
Baluster Offset	0.00
Use Landing Height Adjustment	<input type="checkbox"/>
Landing Height Adjustment	0.00
Angled Joins	Add Vertical/Horizontal Segments
Tangent Joins	Extend Rails to Meet
Rail Connections	Trim
Top Rail	
Use Top Rail	<input checked="" type="checkbox"/>
Height	110.00
Type	50x50mm_Rectangular
Handrail 1	
Lateral Offset	
Height	
Position	None
Type	<None>
Handrail 2	
Lateral Offset	
Height	
Position	None
Type	<None>
Identity Data	
Type Image	

[What do these properties do?](#)

View: 3D View: 3D View 1

Buttons: Preview >>, OK, Cancel, Apply





Edit Baluster Placement
✕

Family: Railing Type: 1100mm 2

Main pattern

	Name	Baluster Family	Base	Base offset	Top	Top offset	Dist. from previous	Offset
1	Pattern start	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2	Regular baluste	Baluster_Square : 25mm	Host	0.00	Top Rail Eleme	0.00	27.50	0.00
3	Pattern end	N/A	N/A	N/A	N/A	N/A	0.00	N/A

Break Pattern at: Each Segment End
Angle: 0.00°
Pattern Length: 27.50

Justify: Beginning
Excess Length Fill: None
Spacing: 0.00

Use Baluster Per Tread On Stairs Balusters Per Tread: 2 Baluster Family: Baluster_Square : 25m

Posts


	Name	Baluster Family	Base	Base offset	Top	Top offset	Space	Offset
1	Start Post	Baluster_Square : 25mm	Host	0.00	Top Rail Eleme	0.00	1.25	0.00
2	Corner Post	Baluster_Square : 25mm	Host	0.00	Top Rail Eleme	0.00	0.00	0.00
3	End Post	Baluster_Square : 25mm	Host	0.00	Top Rail Eleme	0.00	-1.25	0.00

Corner Posts At: Each Segment End
Angle: 0.00°

View: 3D View: 3D View 1
Preview >>

OK
Cancel
Apply
Help

Type Properties



Family: System Family: Railing Load...

Type: 1100mm Duplicate...

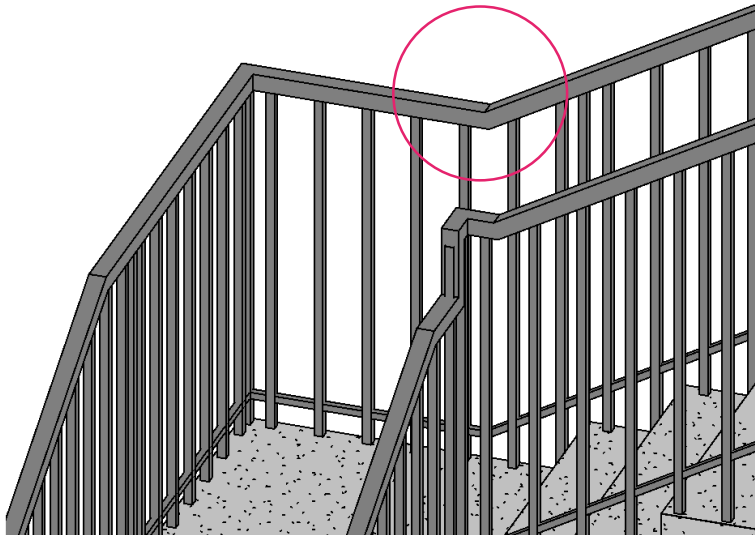
Rename...

Type Parameters

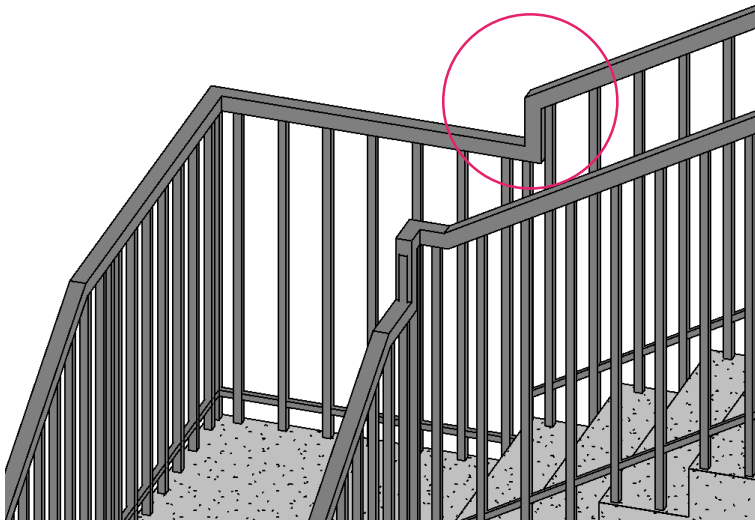
Parameter	Value
Construction	
Railing Height	110.00
Rail Structure (Non-Continuous)	Edit...
Baluster Placement	Edit...
Baluster Offset	0.00
Use Landing Height Adjustment	<input type="checkbox"/>
Landing Height Adjustment	0.00
Angled Joins	Add Vertical/Horizontal Segments
Tangent Joins	Extend Rails to Meet
Rail Connections	Trim
Top Rail	
Use Top Rail	<input checked="" type="checkbox"/>
Height	110.00
Type	50x50mm_Rectangular
Handrail 1	
Lateral Offset	
Height	
Position	None
Type	<None>
Handrail 2	
Lateral Offset	
Height	
Position	None
Type	<None>
Identity Data	
Type Image	

[What do these properties do?](#)

View: 3D View: 3D View 1 Preview >> OK Cancel Apply

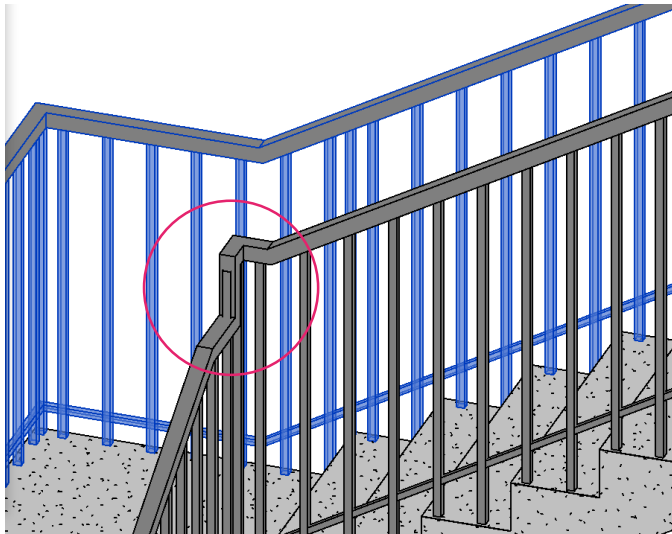


TANGENT JOINS:
EXTEND RAILS TO MEET

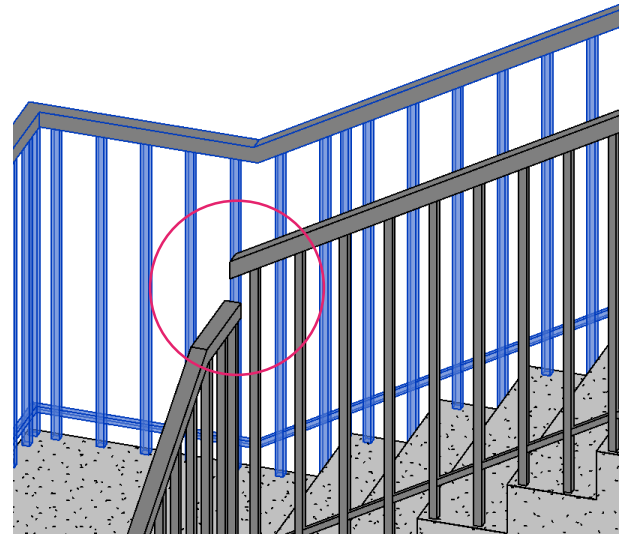


TANGENT JOINS:
NO CONNECTOR/
ADD VERTICAL OR HORIZONTAL ELEMENTS

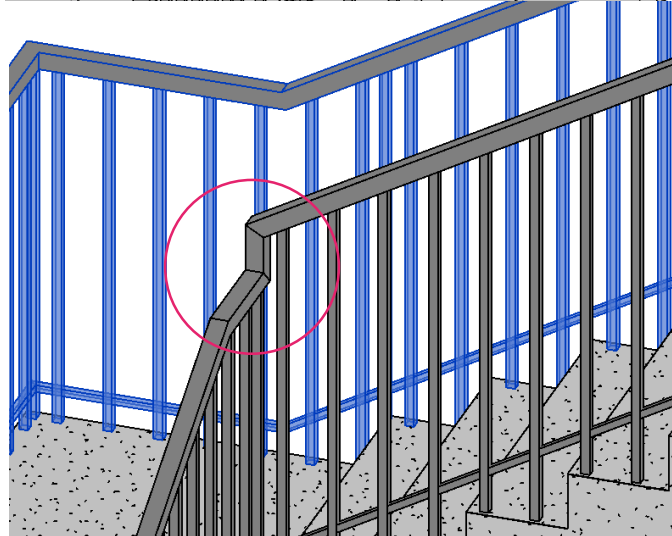
RAILING – TOP RAIL TRANSITIONS



TOP RAIL TRANSITIONS:
GOOSENECK

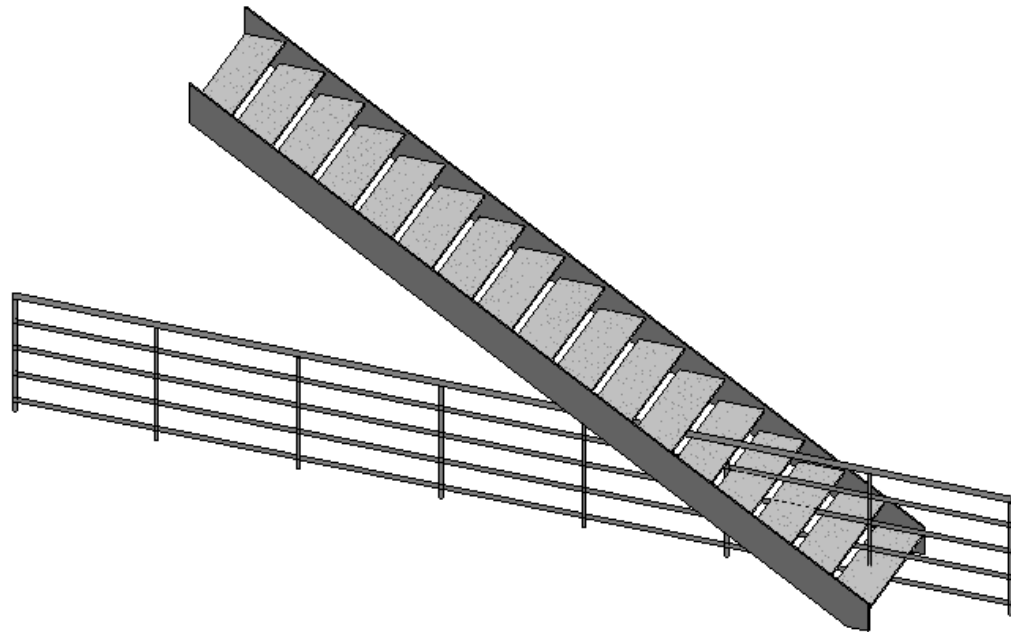


TOP RAIL TRANSITIONS:
NONE

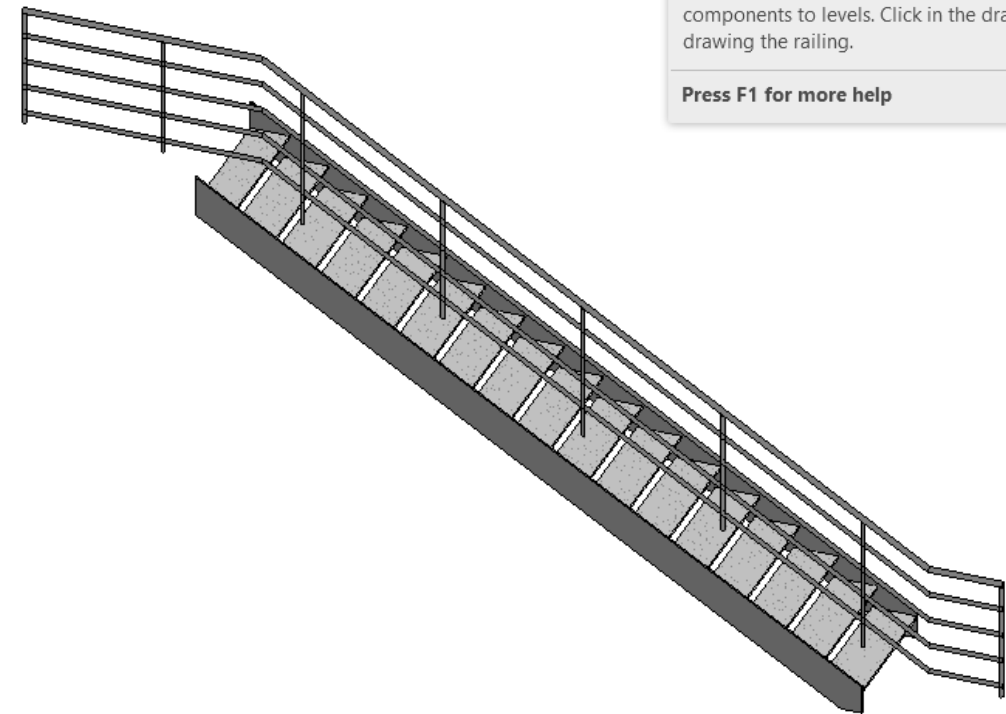


TOP RAIL TRANSITIONS:
SIMPLE

RAILING – PICK NEW HOST COMMAND



EXAMPLE OF RAILING CREATED USING **SKETCH PATH** COMMAND



EXAMPLE OF RAILING PLACED USING **PICK NEW HOST** COMMAND

