










cubi**Cost**<sup>®</sup>  
Make Everything Count

# TAS-TIO Training



**CONTENTS**

-  **What is TIO**
-  **Import Revit Workflow**
-  **Calculate Qty and Checking**
-  **Architectural Quantification**
-  **Revit Changes**
-  **Basic Principle**
-  **Project Simulation**

# What is TIO?

---

**T**: Takeoff

**I**: Intelligent

**O**: One-step

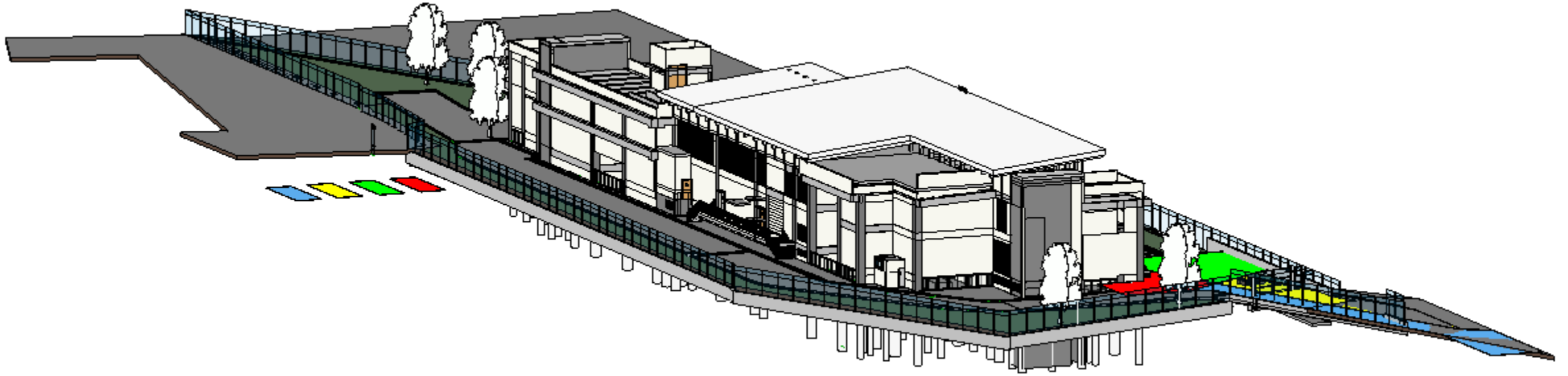
**TIO, One-step Intelligent Take-off**

# What is TIO?

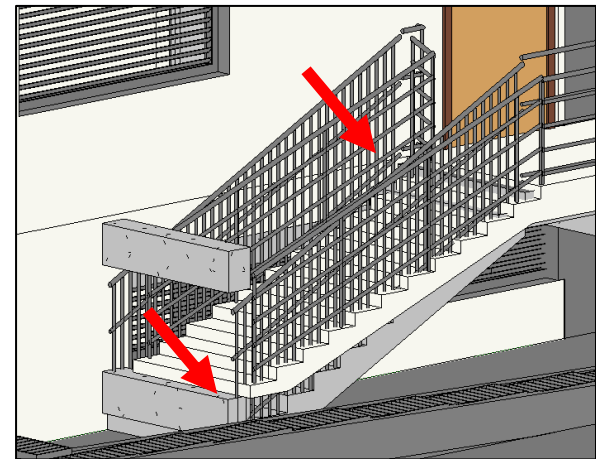
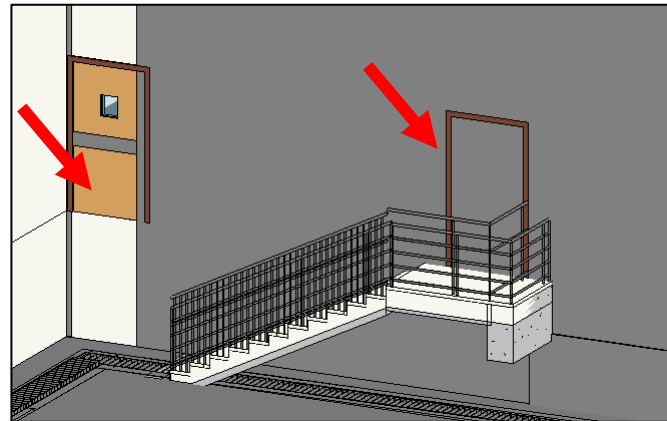
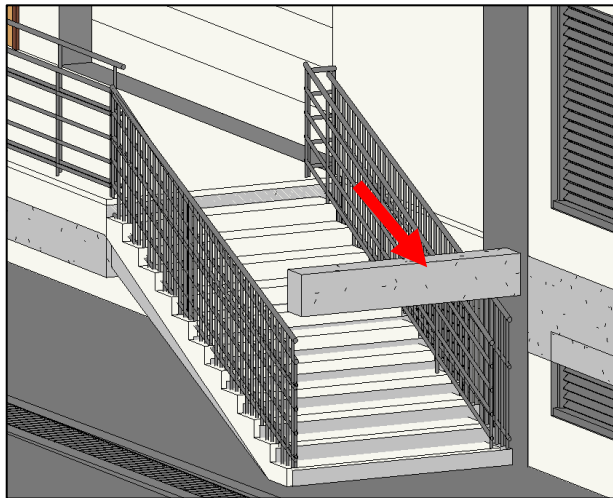
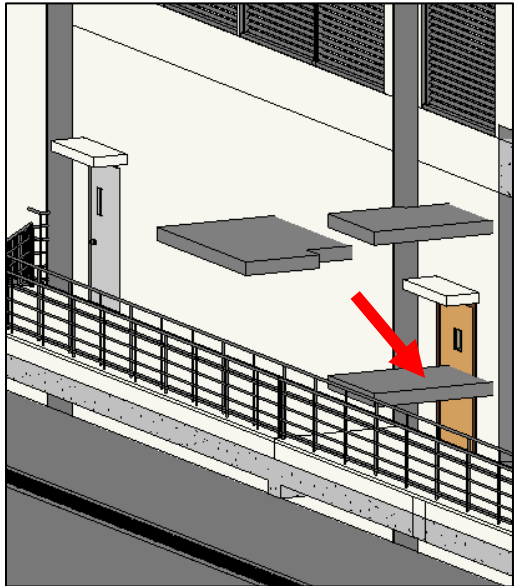
---

- Advanced Edition of TAS
- Subscribe product by year, no longer one-time purchase for permanent use
- Compared to the TAS Pro version, it adds import RVT functions
- It can exchange data with TRB/TAS/TBQ
  - ✓ If you have imported RVT projects in TIO edition, you **cannot** open the projects with Pro edition.
  - ✓ If you have not imported RVT projects in TIO edition, you can open the projects with Pro edition.
  - ✓ You can use TIO edition to open all projects created in Pro edition. You can exchange projects created in TIO edition with TRB.

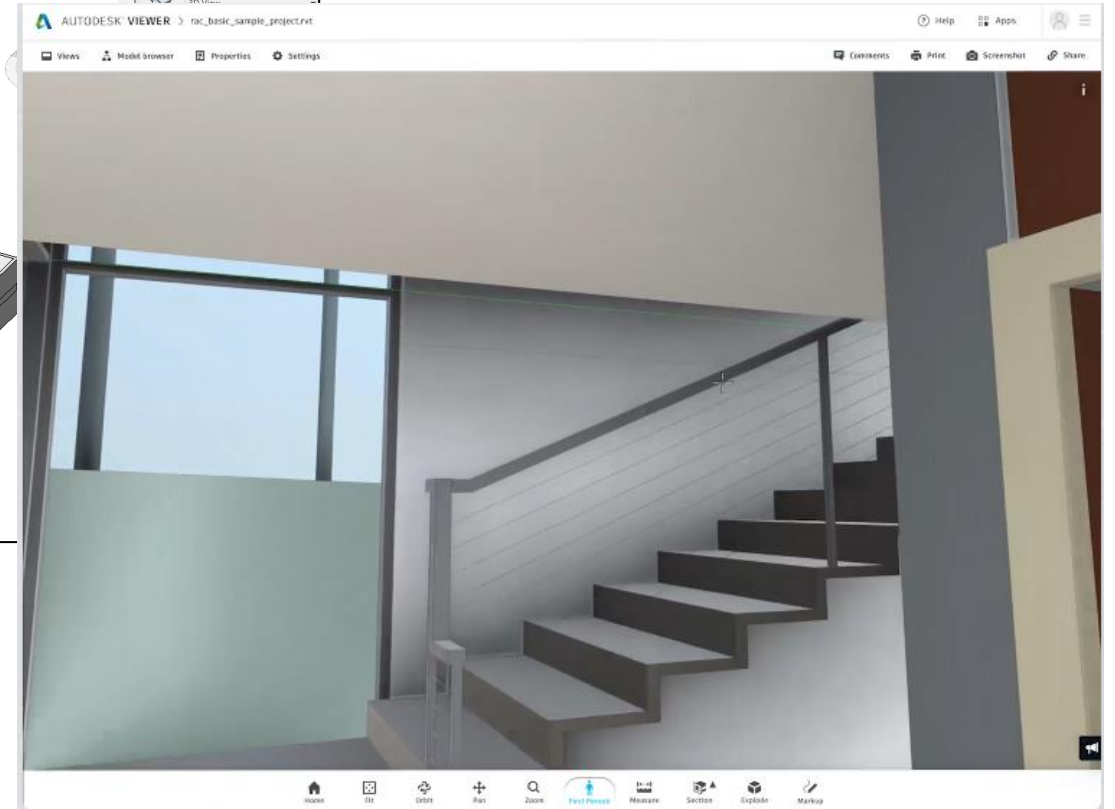
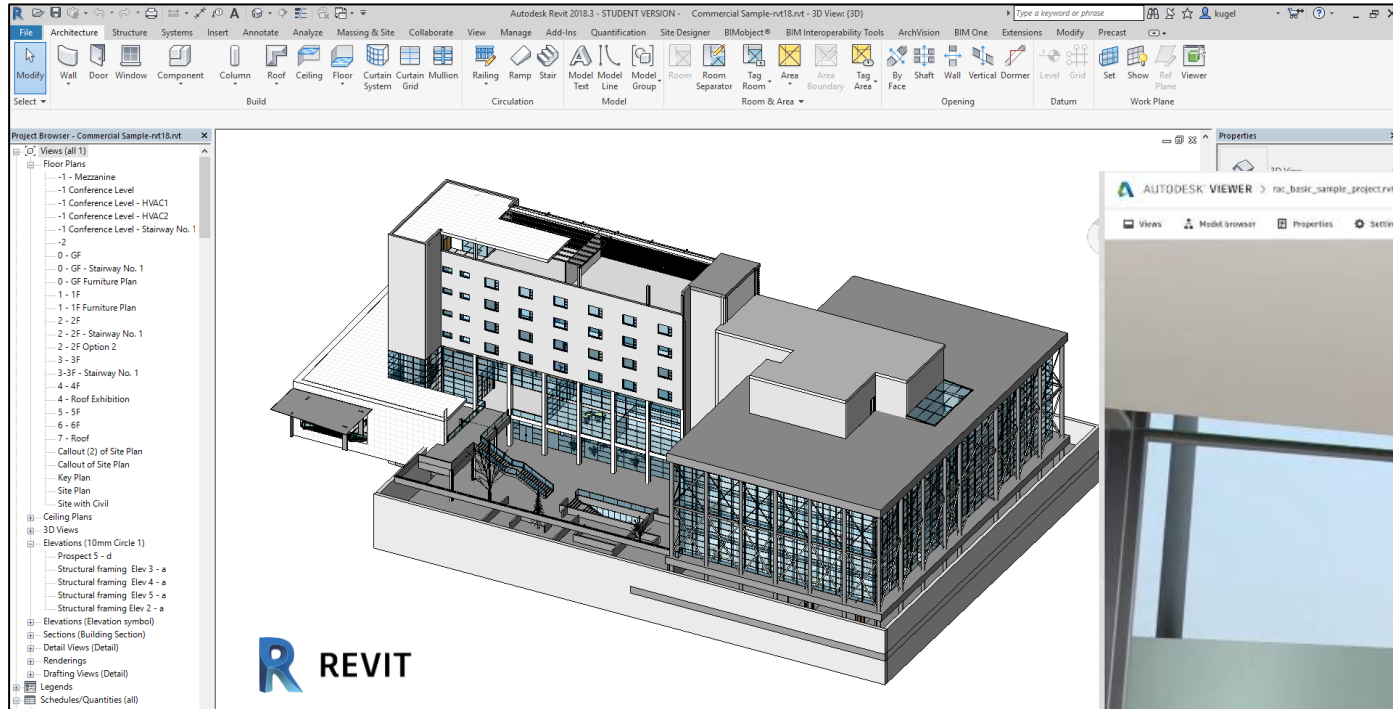
# Is BIM Models fit for QTO?



Study the model before QTO, to allow better preparation before QTO.



# How to View BIM models?



 Autodesk Viewer

Model viewing applications to open, view and check model elements.

# How to View BIM models?



Viewing the Models – Checking & Understand 'Model Content'.

1) Check Overall Model Nature

- How many floors?
- What is the building type, shape & size?
- What are the element category & types?

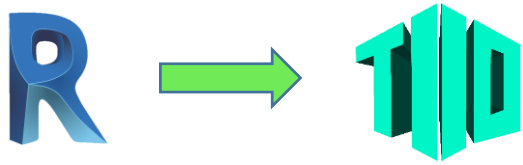
2) Check Details

- Check element geometry
- Check interconnecting elements
- Cross check with element ID

3) Plan which quantities are required to be extracted.

- which quantities required **no, m run, m2 or m3?**
- which elements should be measured and which element are not required to be measured?

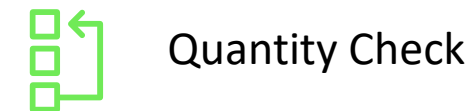
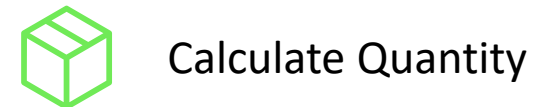
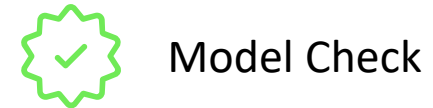
Elements might not contain the quantities/dimension required for QTO



## 1 Import



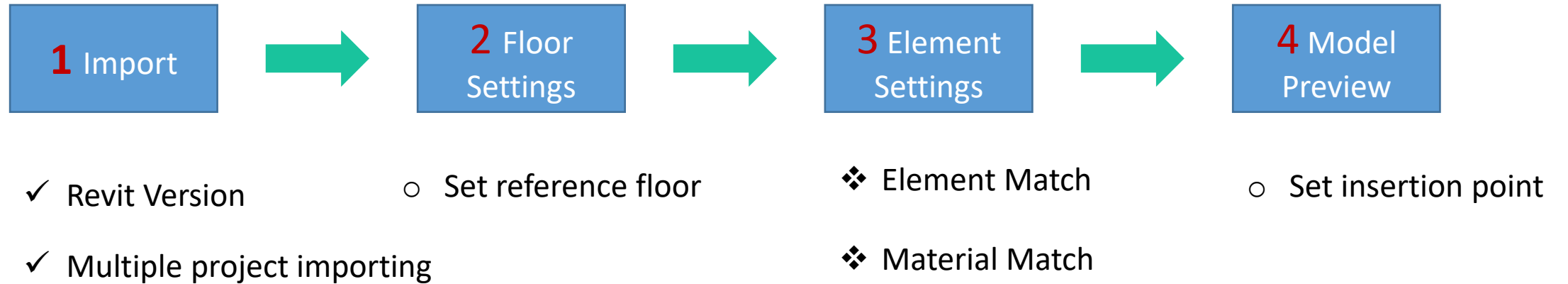
## 2 Calculate





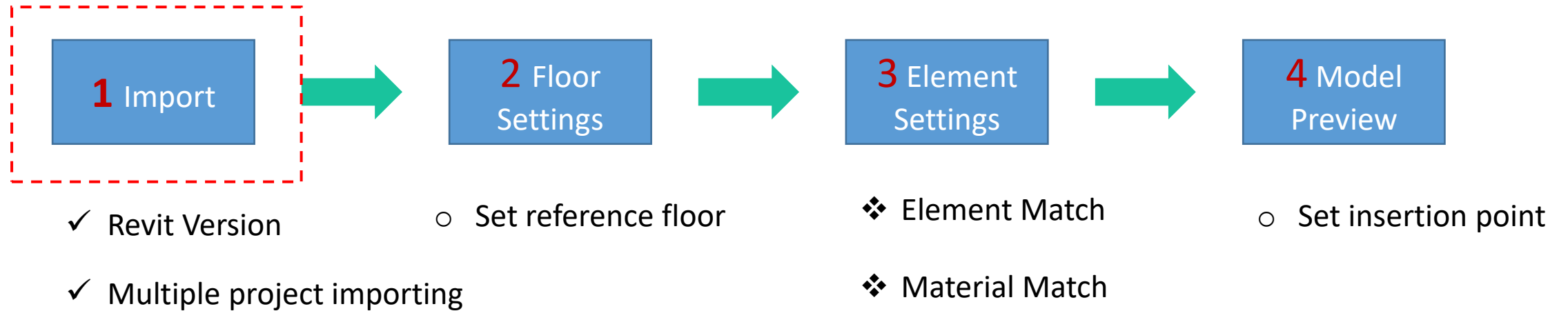
# Import RVT Workflow

---



# Import RVT Workflow

---

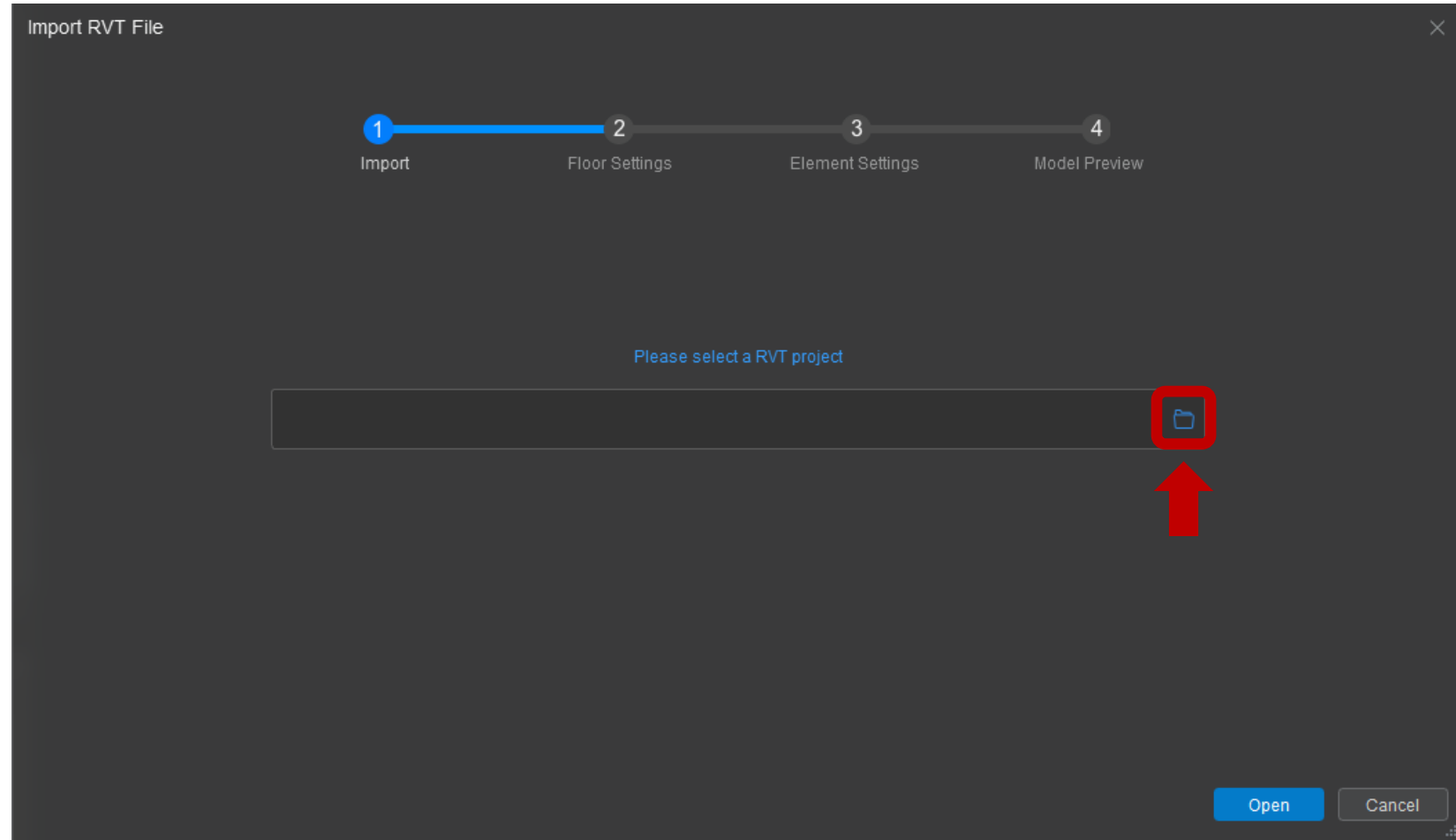


# Import RVT Workflow – Select File

## 1 Import

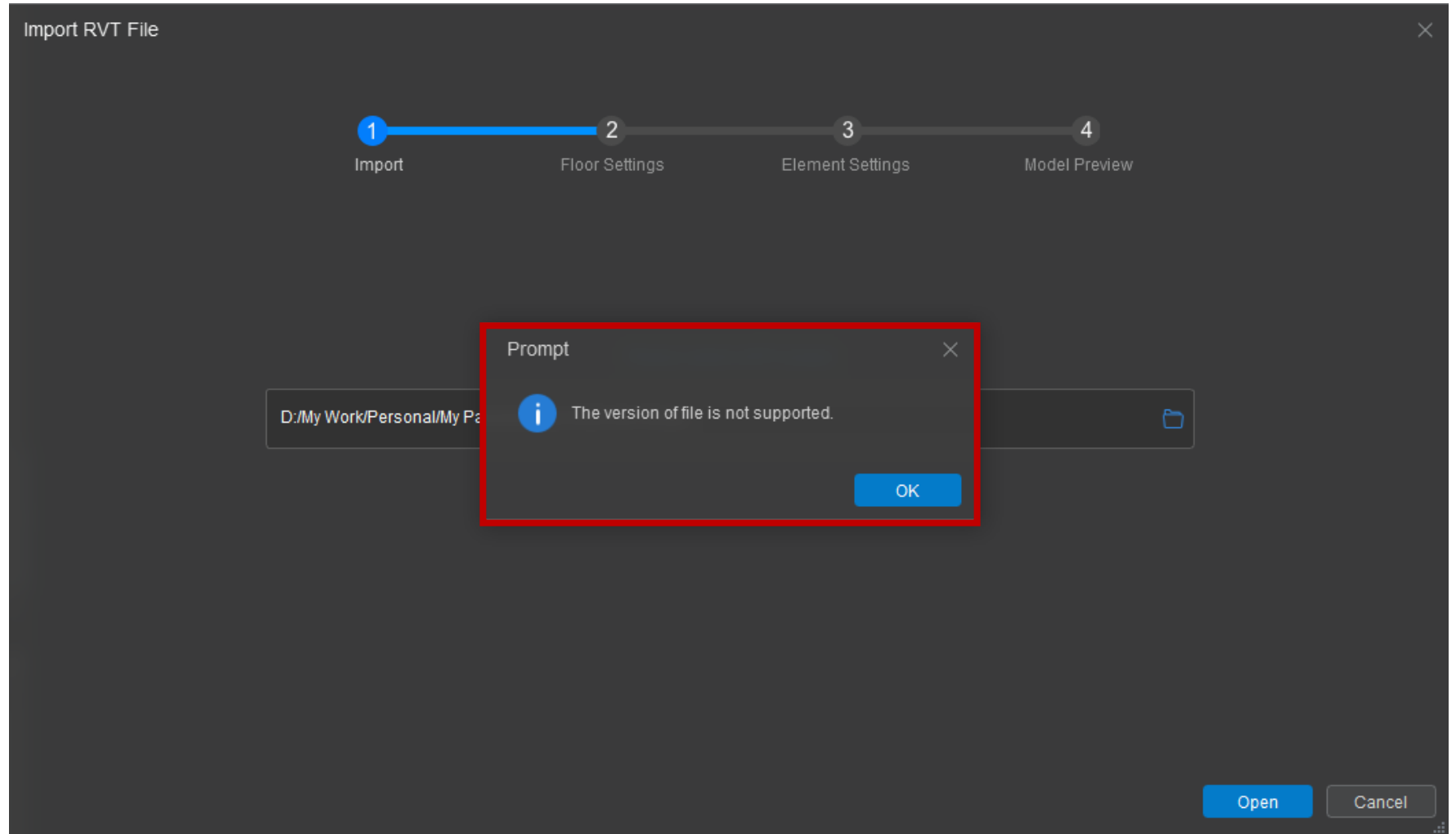
Click **Open**

Select Project File to Import



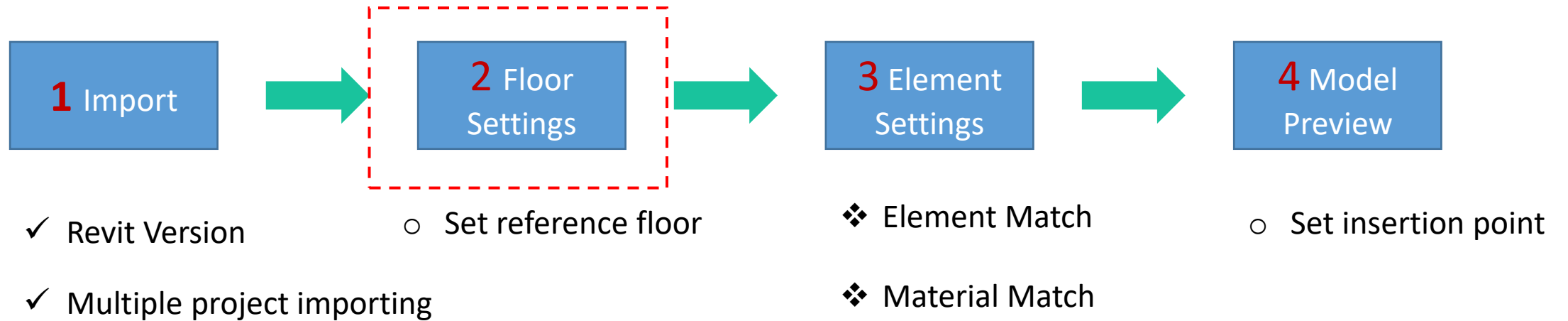
# Import RVT Workflow – Select File

- When selecting files to import, if the error message appears, it is often because the file format fails to meet the requirements.



# Import RVT Workflow

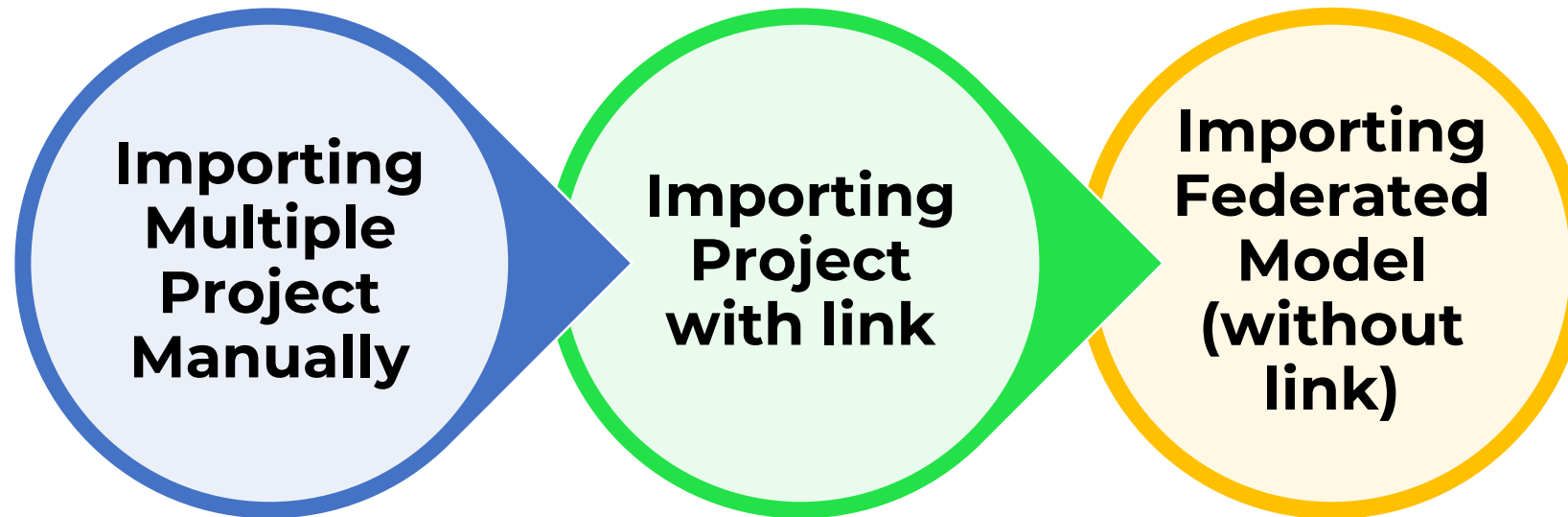
---



# Import RVT Workflow – Select File

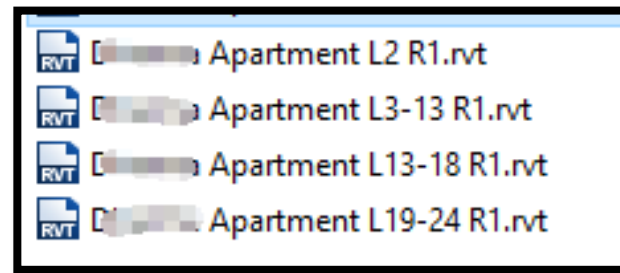
---

## Scenarios in Importing Revit Project



# Import RVT Workflow – Select File

- If a project is consisting of multiple RVT files, you can import each of them consecutively, and generate a complete model at the end.



- Import it first
- After importing the model of L2 level, choose to import this
- After importing the model of L3 level, choose to import this
- After importing the model of L13 level, choose to import this



**RVT**



**TIO**

# Import RVT Workflow – Floor Settings

- If there is a floor whose **bottom elevation is 0**, the reference floor will be **selected automatically**.
- Otherwise, you need to select a specific floor manually as the Reference Floor.

Import RVT File

1 Import 2 Floor Settings 3 Element Settings 4 Model Preview

RVT Reference Floor Settings

	Floor	Height	Bottom Elevation	Reference Floor
11	9th Storey	2.975	135.400	<input type="checkbox"/>
12	8th Storey	2.975	132.425	<input type="checkbox"/>
13	7th Storey	2.975	129.450	<input type="checkbox"/>
14	6th Storey	2.975	126.475	<input type="checkbox"/>
15	5th Storey	2.975	123.500	<input type="checkbox"/>
16	4th Storey	2.975	120.525	<input type="checkbox"/>
17	3rd Storey	2.975	117.550	<input type="checkbox"/>
18	2nd Storey	2.975	114.575	<input type="checkbox"/>
19	1st Storey	3.125	111.450	<input checked="" type="checkbox"/>
20	Basement	4.4	107.050	<input type="checkbox"/>

Reversely Create Zone

Advanced Settings Previous Next Cancel



# Import RVT Workflow – Select File

- For subsequent project to be import, If the elevations (bottom elevation and floor height) of the two files are completely the same, continue to import them. If one of them is inconsistent, the box on the right will appear. To continue to import, select **Reversely Create Zone.**

The screenshot shows the 'Import RVT File' dialog box with a progress bar at the top indicating four steps: 1. Import (checked), 2. Floor Settings (current step), 3. Element Settings, and 4. Model Preview. Below the progress bar is a table titled 'RVT Reference Floor Settings' with columns for Floor, Height, Bottom Elevation, and Reference Floor. A 'Prompt' dialog box is overlaid on the table, displaying an information icon and the text: 'Failed to match floors automatically. Please check floors before import, or select Reversely Create Zone.' The 'OK' button in the prompt is highlighted with a red box. At the bottom of the main dialog, there is a radio button for 'Reversely Create Zone', an 'Advanced Settings' button, and 'Previous', 'Next', and 'Cancel' buttons.

	Floor	Height	Bottom Elevation	Reference Floor
3	Level 11			<input type="checkbox"/>
4	Level 10			<input type="checkbox"/>
5	Level 9			<input type="checkbox"/>
6	Level 8			<input type="checkbox"/>
7	Level 7			<input type="checkbox"/>
8	Level 6			<input type="checkbox"/>
9	Level 5	4.2	22.600	<input type="checkbox"/>
10	Level 4	4.2	18.400	<input type="checkbox"/>
11	Level 3	4.2	14.200	<input type="checkbox"/>
12	Level 2	4.2	10.000	<input checked="" type="checkbox"/>

# Import RVT Workflow – Select File

- **Situation 1**: First project and subsequent project contain of same floor height and bottom elevation

RVT Reference Floor Settings			
	Floor	Height	Bottom Elevation
1	Level 2		10.000
2	Level Mez2	3.325	6.675
3	Level Canopy	1.675	5.000
4	Level Mez	1.675	3.325
5	Level L1	3.325	-0.000

**Project 1**



RVT Reference Floor Settings			
	Floor	Height	Bottom Elevation
1	Level 2		10.000
2	Level Mez2	3.325	6.675
3	Level Canopy	1.675	5.000
4	Level Mez	1.675	3.325
5	Level L1	3.325	-0.000

**Project n**

**CAN proceed with next step without “REVERSELY CHECK ZONE”**

# Import RVT Workflow – Select File

- **Situation 2** : First project and subsequent project contain of different floor height and bottom elevation

RVT Reference Floor Settings			
	Floor	Height	Bottom Elevation
1	Level 2		10.000
2	Level Mez2	3.325	6.675
3	Level Canopy	1.675	5.000
4	Level Mez	1.675	3.325
5	Level L1	3.325	-0.000

**Project 1**

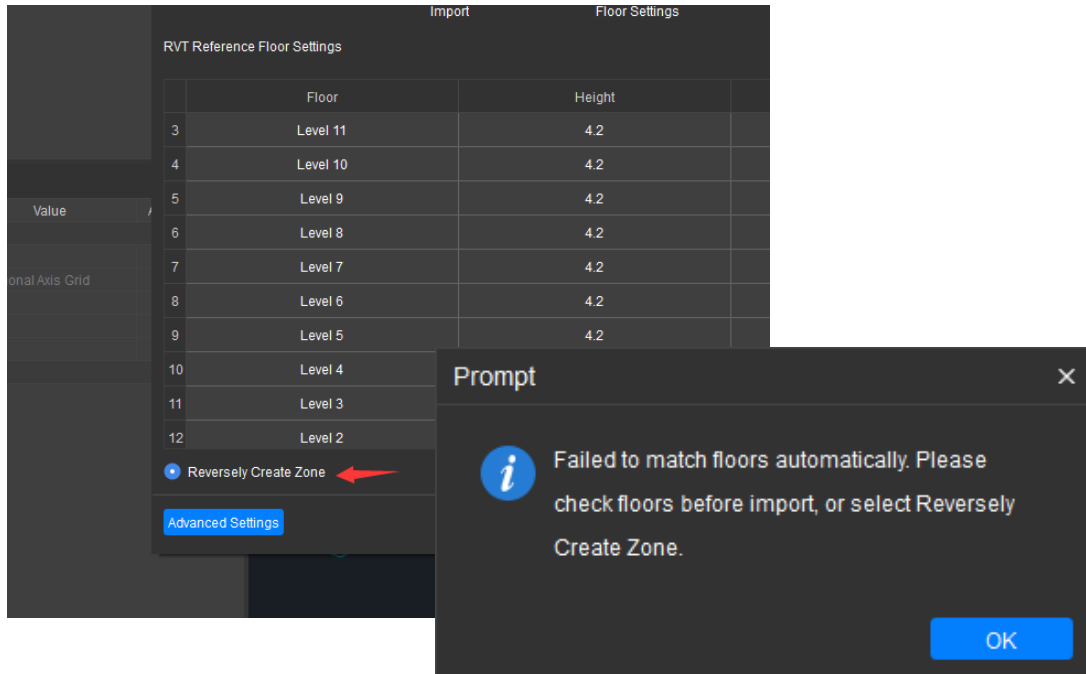


RVT Reference Floor Settings			
	Floor	Height	Bottom Elevation
3	Level 11	4.2	47.800
4	Level 10	4.2	43.600
5	Level 9	4.2	39.400
6	Level 8	4.2	35.200
7	Level 7	4.2	31.000
8	Level 6	4.2	26.800
9	Level 5	4.2	22.600
10	Level 4	4.2	18.400
11	Level 3	4.2	14.200
12	Level 2	4.2	10.000

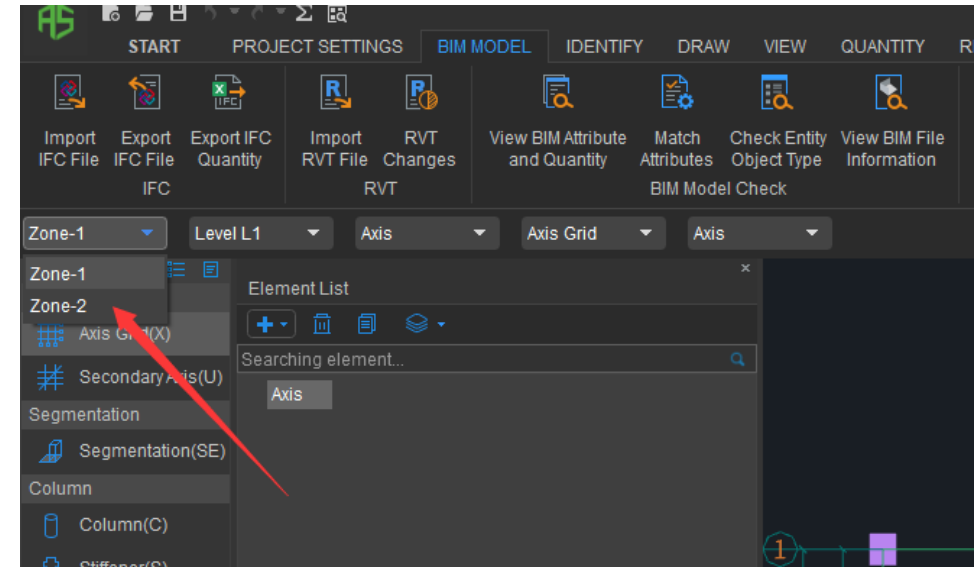
**Project n**

**Cannot proceed with next step without “REVERSELY CHECK ZONE”**

# Import RVT Workflow – Select File



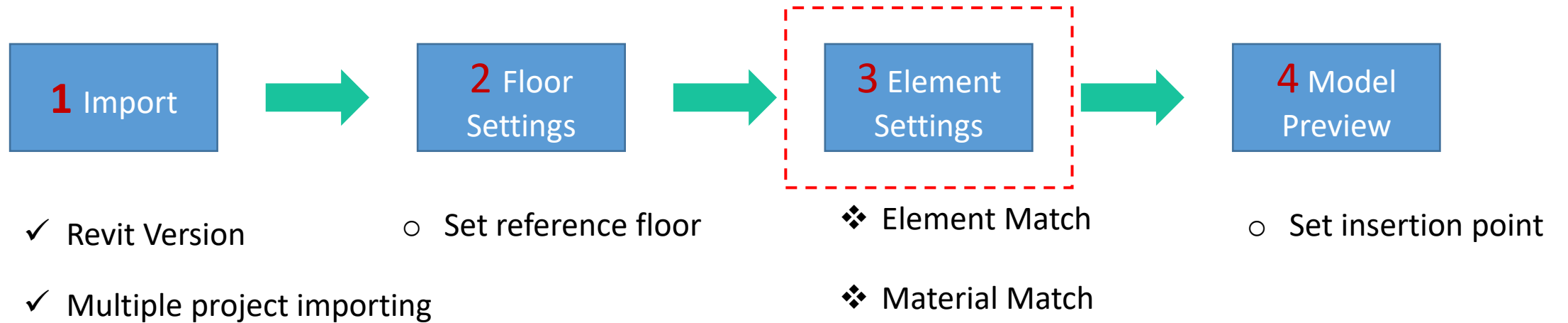
**It will prompt message to click  
reversely create zone**



**It will import as 2 different zone**

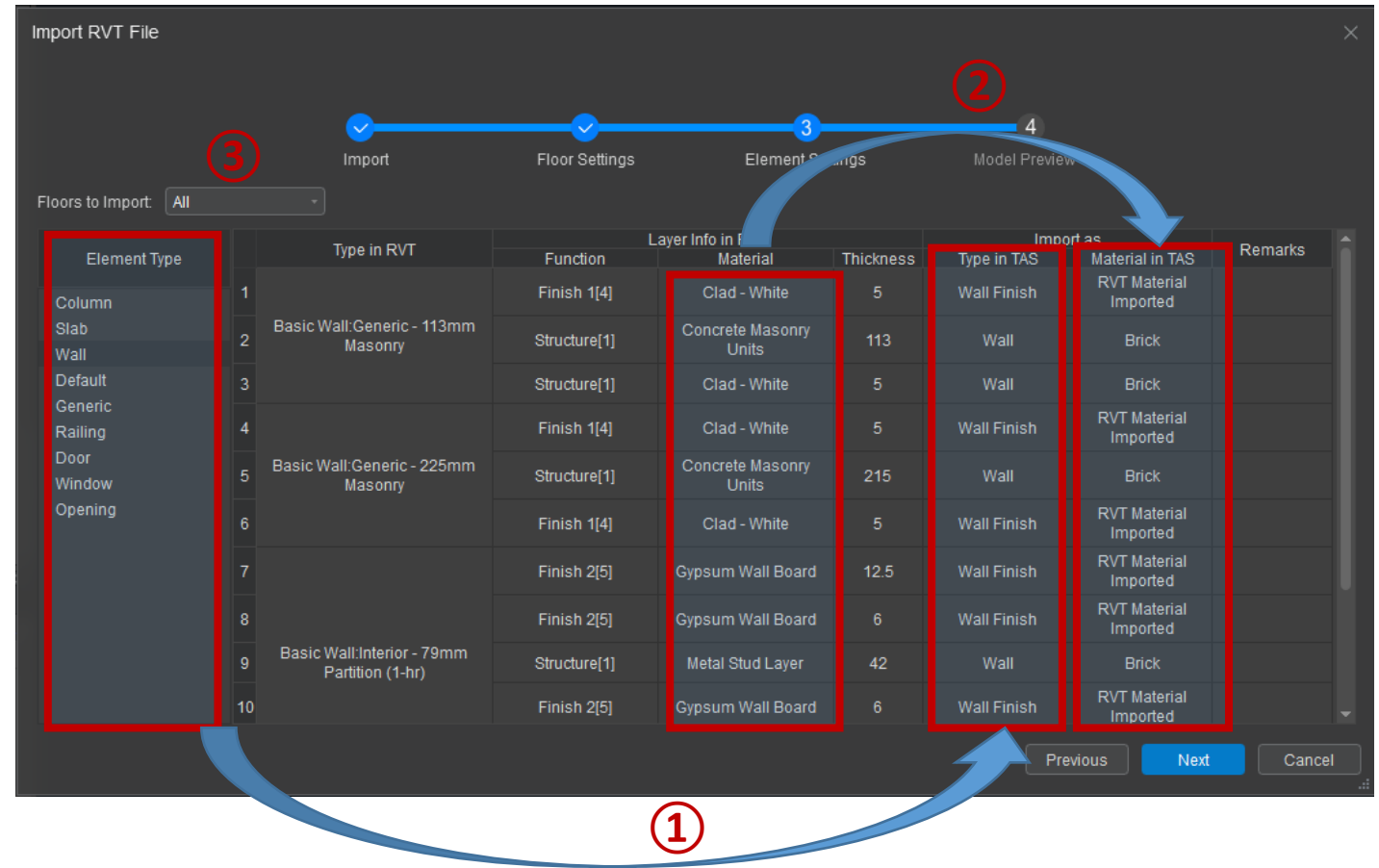
# Import RVT Workflow

---



# Import RVT Workflow – Element Settings

- According to the built-in match principle, the values in **Element Type** in RVT will be auto matched with that in **Type in TAS**. The details of the match principle will be introduced later. You can also modify the matched elements manually.
- According to the built-in match principle, the values in **Material in RVT** will be auto matched with that in **Material in TAS**. The details of the match principle will be introduced later. You can also modify the matched material manually.
- In the list of **Floors to Import**, you can choose which floors to import. By default, all floors will be imported.



# Import RVT Workflow – Element Settings

- Each layer set in Revit will be shown in this element settings together with the thickness. This to avoid any confusion to the users
- This layer can be shown in Layer Material in “Set classification and Quantity” in view quantity by category

Import RVT File

Import Floor Settings Element Settings Model Preview

Floors to Import: All

Element Type	Type in RVT	Layer Info in RVT			Import as		Remarks
		Function	Material	Thickness	Type in TAS	Material in TAS	
Column		Finish 1[4]	Clad - White	5	Wall Finish	RVT Material Imported	
Slab		Structure[1]	Concrete Masonry Units	113	Wall	Brick	
Wall	Basic Wall:Generic - 113mm Masonry	Structure[1]	Clad - White	5	Wall	Brick	
Default		Finish 1[4]	Clad - White	5	Wall Finish	RVT Material Imported	
Generic		Structure[1]	Concrete Masonry Units	215	Wall	Brick	
Railing	Basic Wall:Generic - 225mm Masonry	Finish 1[4]	Clad - White	5	Wall Finish	RVT Material Imported	
Door		Structure[1]	Concrete Masonry Units	215	Wall	Brick	
Window		Finish 1[4]	Clad - White	5	Wall Finish	RVT Material Imported	
Opening		Finish 2[5]	Gypsum Wall Board	12.5	Wall Finish	RVT Material Imported	
		Finish 2[5]	Gypsum Wall Board	6	Wall Finish	RVT Material Imported	
	Basic Wall:Interior - 79mm Partition (1-hr)	Structure[1]	Metal Stud Layer	42	Wall	Brick	
		Finish 2[5]	Gypsum Wall Board	6	Wall Finish	RVT Material Imported	

Previous Next Cancel

# Import RVT Workflow – Element Settings

- By default, the element types of Default and Generic are not imported, because generally they don't belong to the architectural or structural field. If you want to import them, in the **Type in TAS** column, select Custom Point, Custom Area, or Custom Line. Or, you can select **Import None as Custom Point** in the right-click menu.

Import RVT File

Import Floor Settings Element Settings Model Preview

Floors to Import: All

Element Type	Type in RVT	Material in RVT	Import as		Remarks
			Type in TAS	Material in TAS	
Column	1 Post Pole:Post Pole	<by category>	None	No Material Imported	
Slab	2 sofa 2 seaters:sofa 2 seaters	<by category>	Custom Point	No Material Imported	
Wall	3 sofa:sofa	<by category>	Custom Area	No Material Imported	
Default	4 M_Trim-Window-Exterior-Flat:with Sill	Clad - White	Custom Line	No Material Imported	
Generic	5 Landscaping-Gates- La Toulousaine-TLS030035:Landscaping-Gates- La Toulousaine-TLS030035	Polantis Metal	None	No Material Imported	
Railing	6 M_Muntin Pattern_2x2:M_Muntin Pattern_2x2	Wood - Stained	None	No Material Imported	
Door	7 M_Trim-Window-Interior-Flat:Picture Frame	Wood - Stained	None	No Material Imported	
Window					
Opening					

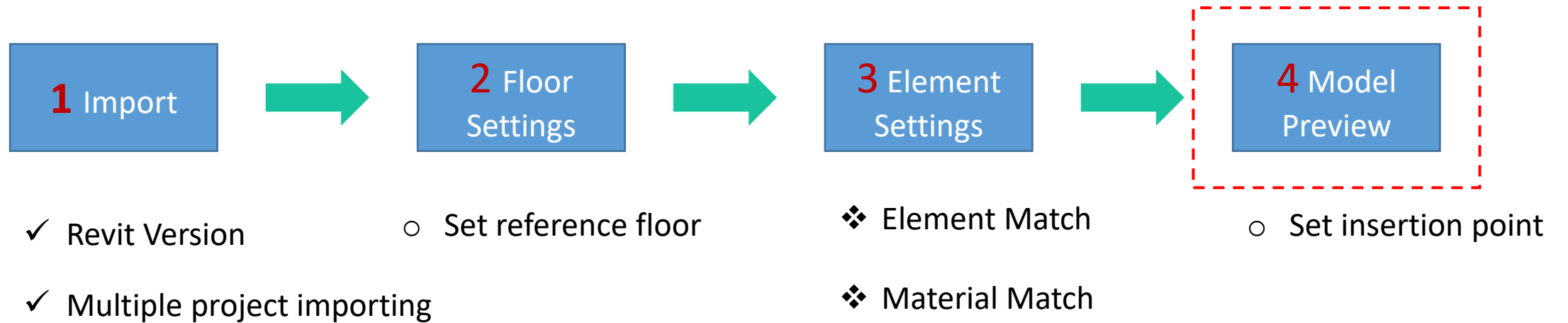
Import None as Custom Point

Previous Next Cancel



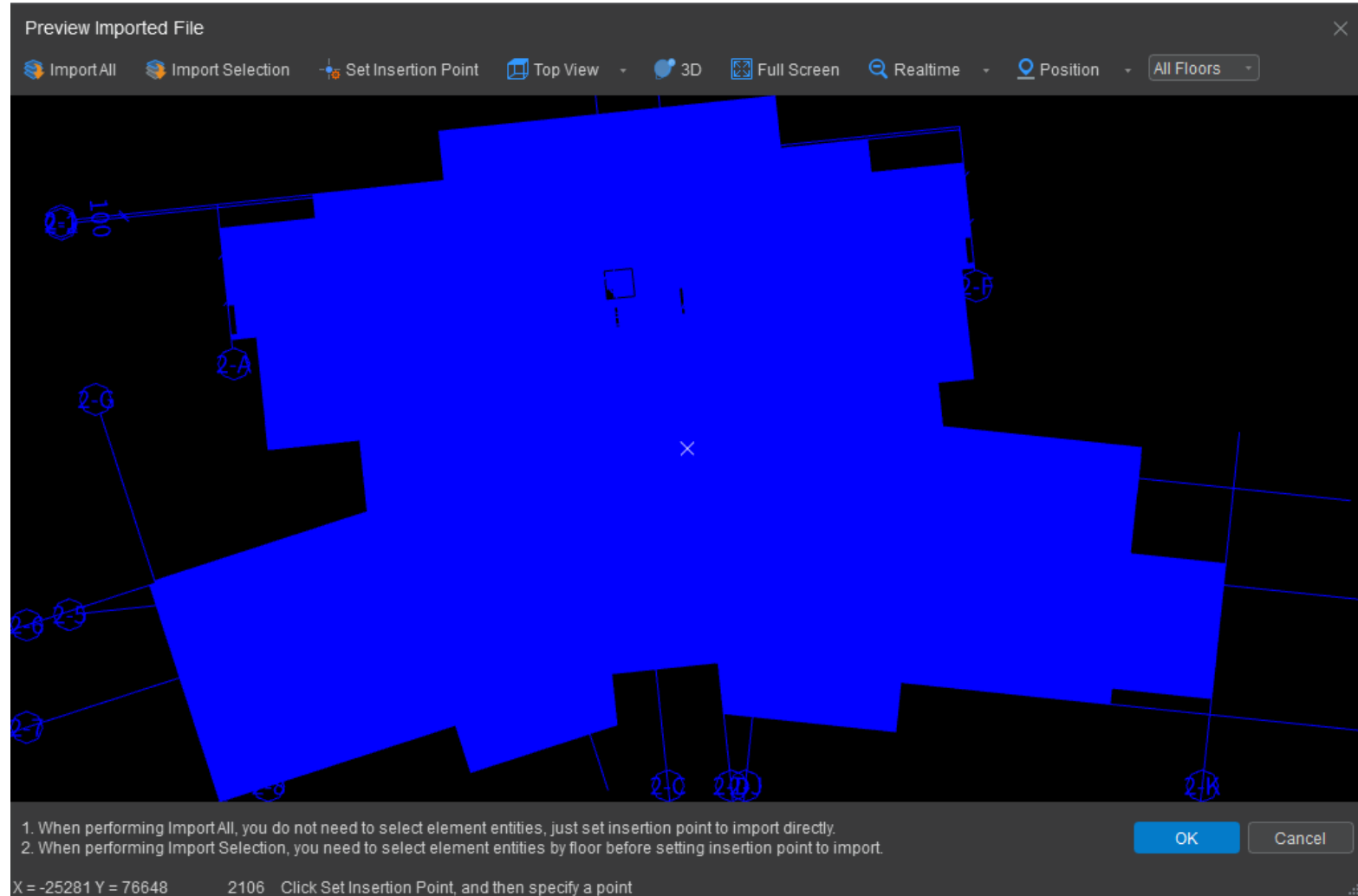
# Import RVT Workflow

---

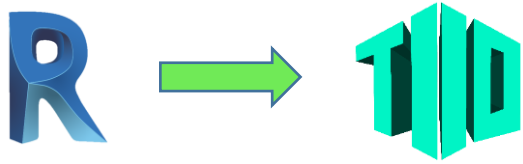


# Import RVT Workflow – Element Settings

- TAS provides an insertion point by default. It is not suggested to make modifications here.







## 1 Import



Select File to Import



Element Settings



## 2 Calculate



Model Check



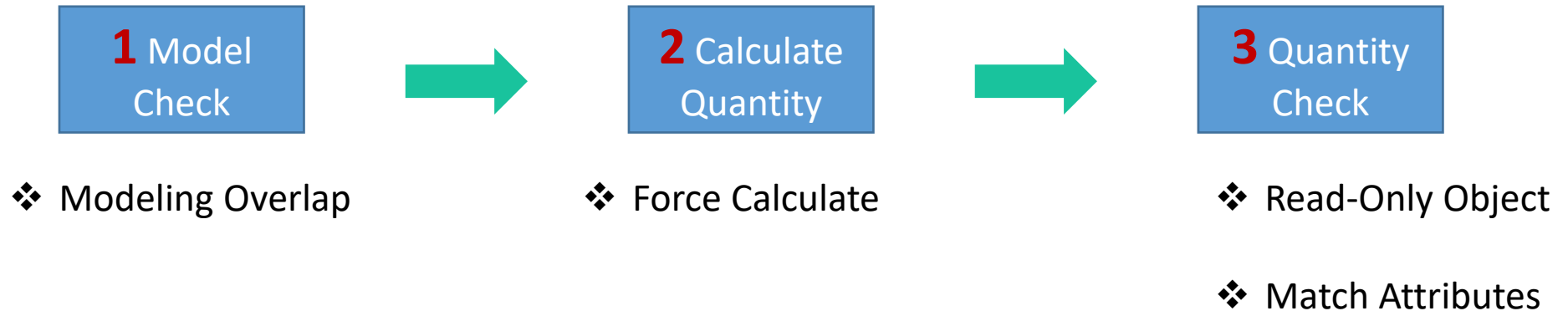
Calculate Quantity



Quantity Check

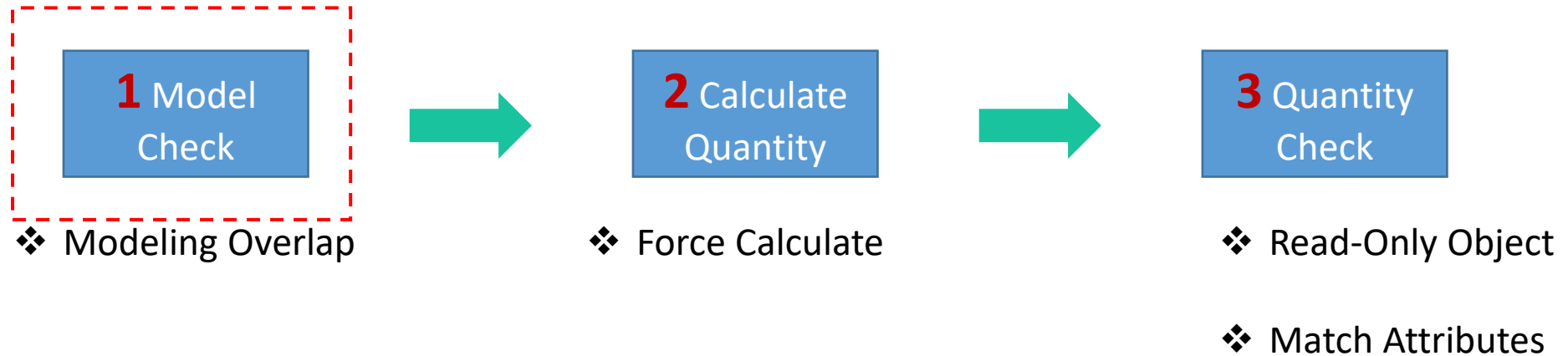
# Calculate Quantity

---



# Calculate Quantity

---



# Calculate Quantity - Model Check

---

## Check Overlapping Entities

- Find out which entities are overlapping in RVT
- How to process these overlapping entities in TIO

# Calculate Quantity - Model Check

- Find out which entities are overlapping in BIM files

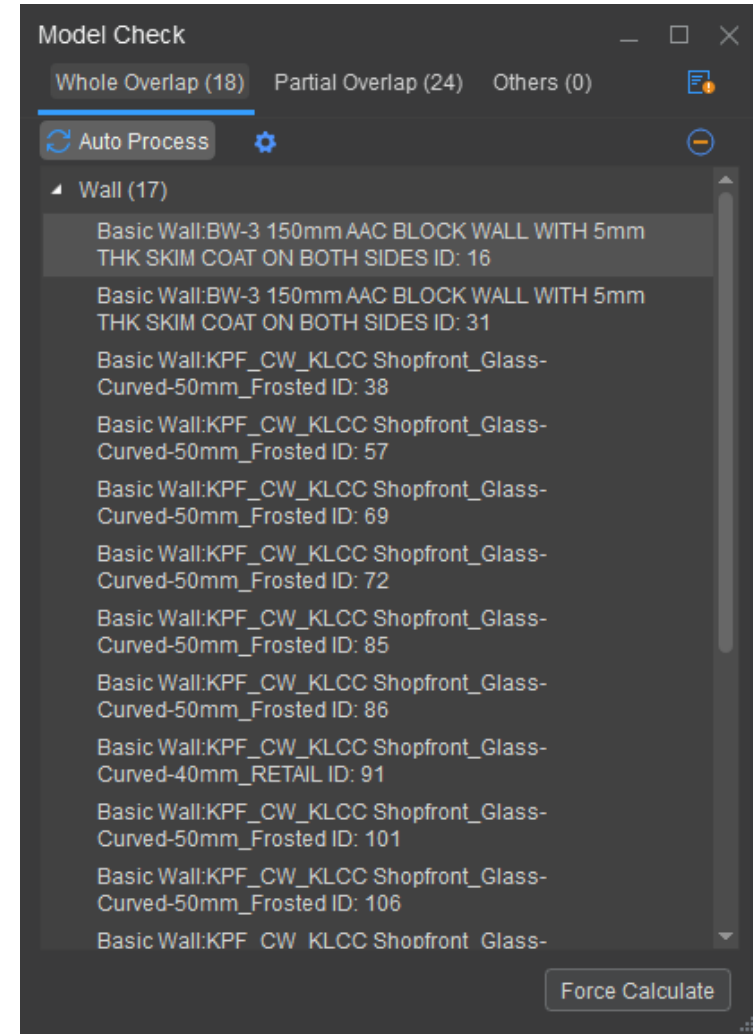
There are three tabs in total, namely:

Whole overlap, Partial overlap and Others.

Whole Overlap: the elements are completely included, or the size of the elements are completely equal.

Partial Overlap: includes all overlaps except full overlap and full inclusion.

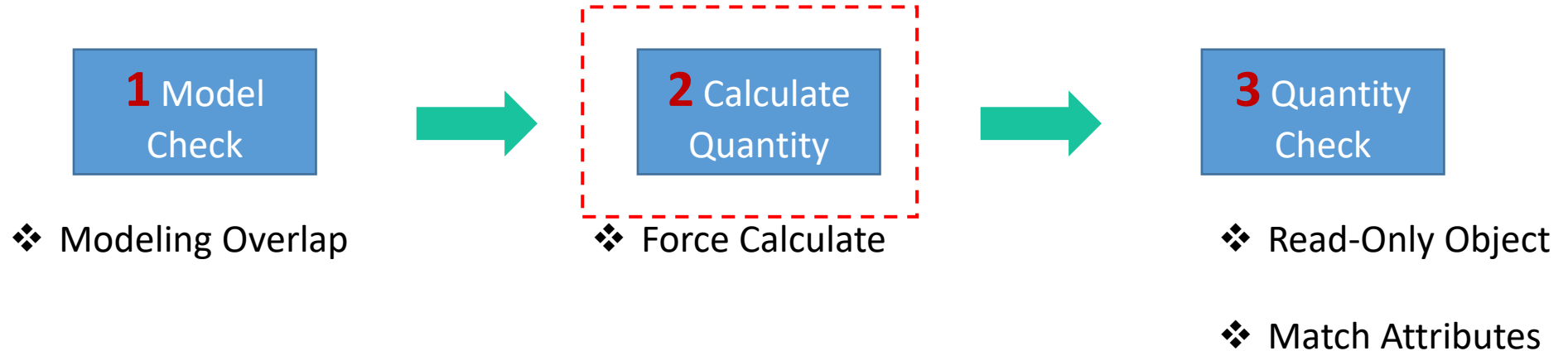
Others: includes other unreasonable information except for overlap, e.g., the bottom elevation of the entity is greater than the top elevation; the thickness of the entity is 0, etc.





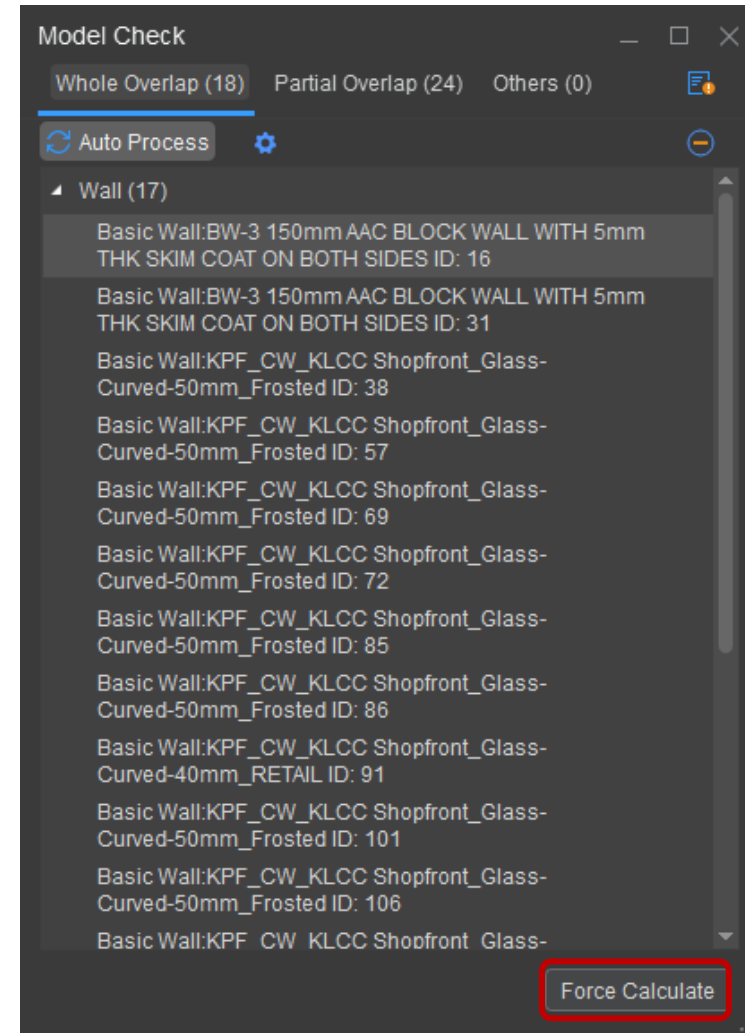
# Calculate Quantity

---



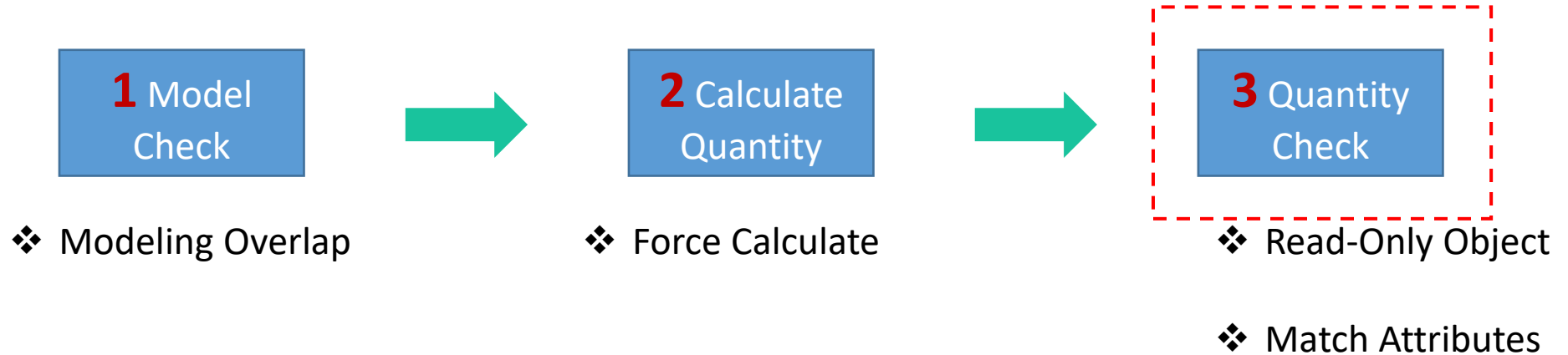
# Calculate Quantity

- When there are overlapping items, if you do not want deal with them one by one, you can use **Force Calculate**. With Force Calculate, no overlaps will be processed. That is to say, when entity A is overlapping with entity B, the overlapping part will be calculated in both entity A and entity B.
- According to our case study, there is only a tiny difference between the results of processing all overlapping entities and using Force Calculate directly.



# Quantity Check

---



# Quantity Check

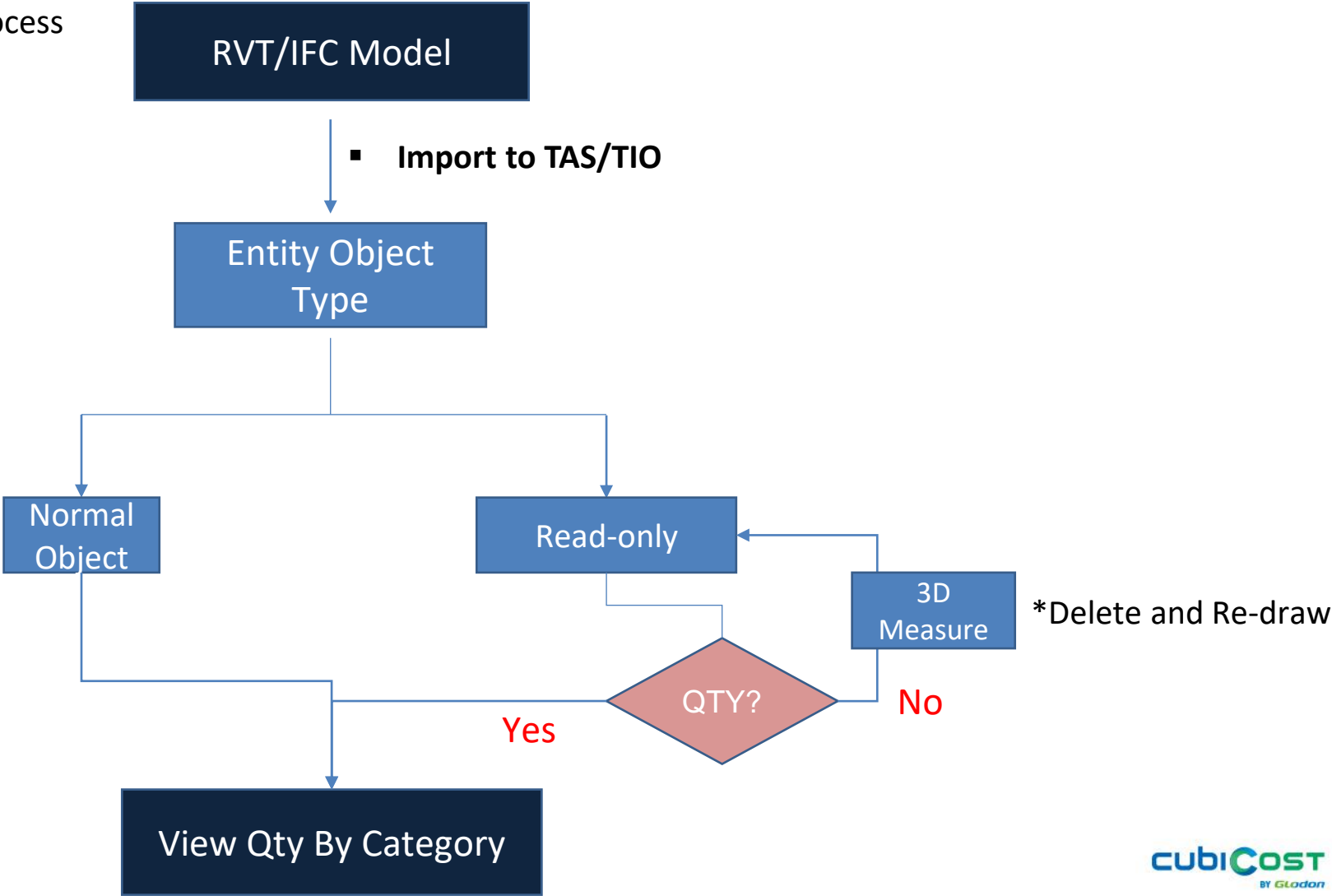
---

- After importing RVT, there are usually TWO object types: **NORMAL OBJECT** and **READ ONLY OBJECT**
- The differences among them regarding Edit, Check and Calculate are listed in the table on the right.

Entity Object Type	Entity Edit
Normal Object	√
Read-only Object	√(Copy, Move, Delete...) ✗ (Extend, into TRB, Apply Finishes)


# Quantity Check

- Recommended QTY Check Process



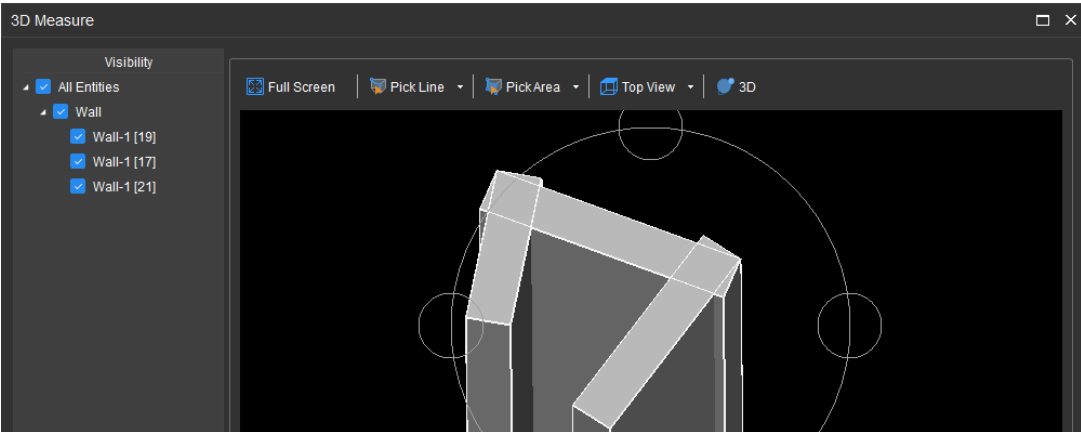
# Quantity Check

- For read-only objects without quantities, can be dealt as follows:
  - Delete and draw** by using TAS/TIO Object.
  - Use **3D Measure** to get the quantity



The screenshot shows a 3D model of a wall structure with a blue highlighted section. Below the model is a table titled "View Element Entity Quantity Expression" with the following data:

Quantity Name	Quantity Expression	Quantity	Unit	Count Tag	Remarks
Volume	$(1.118 \langle \text{Length} \rangle * 3.000 \langle \text{Height of wall} \rangle * 0.200 \langle \text{Thickness of wall} \rangle) - 0.122 \langle \text{Deduct wall} \rangle$	0.549	m3	<input checked="" type="checkbox"/>	
Area of formwork	$(1.161 \langle \text{Length of left side} \rangle + 1.075 \langle \text{Length of right side} \rangle) * 3.000 \langle \text{Height of formwork to wall} \rangle - 1.227 \langle \text{Deduct wall} \rangle$	5.482	m2	<input checked="" type="checkbox"/>	
Area	$(1.118 \langle \text{Length} \rangle * 3.000 \langle \text{Height of wall} \rangle) - 0.611 \langle \text{Deduct wall} \rangle$	2.743	m2	<input checked="" type="checkbox"/>	
Weight of rebar	$0.549 \langle \text{Volume} \rangle * 30.000 \langle \text{Steel ratio} \rangle$	16.459	kg	<input checked="" type="checkbox"/>	

The screenshot shows the "3D Measure" tool interface. On the left, there is a "Visibility" panel with the following items checked:

- All Entities
- Wall
  - Wall-1 [19]
  - Wall-1 [17]
  - Wall-1 [21]

The main area shows a 3D model of the wall structure with measurement tools and a "Top View" button.

# Quantity Check

- To use the BIM attributes as classification conditions, you can use **Match Attributes**.

The image shows two overlapping software dialog boxes. The 'Match Attributes' dialog is in the background, and the 'View Quantity by Category' dialog is in the foreground. A blue arrow points from the 'GUID' dropdown in the 'Match Attributes' dialog to the 'Summary Info' column in the 'View Quantity by Category' table. A red box highlights the 'GUID' dropdown in the 'Match Attributes' dialog, and another red box highlights the 'Summary Info' column in the 'View Quantity by Category' table.

**Match Attributes**

Element Type: Wall, Curtain Wall, Door, Wall Opening, In-situ Slab, Ramp, Slab Opening, Steel/Composite, Room, Wall Finish, Suspended Ceilir, Railing, Custom Point

Match Settings:

- Name: NULL
- Summary Info: GUID
- Remarks: NULL
- Construction Zone: NULL
- Flow Zone: NULL

**View Quantity by Category**

Classification Condition

	Summary Info	Floor	Material	Concrete Grade	Entity Type	Thickness	Name	Quantity
1	10159164	LEVEL_P3	Brick	-	Vertical	160	Basic Wall:BW-3 150mm AAC BLOCK WALL WITH 5mm THK SKIM COAT ON BOTH SIDES	0.035
2	10159272	LEVEL_P3	Brick	-	Vertical	160	Basic Wall:BW-3 150mm AAC BLOCK WALL WITH 5mm THK SKIM COAT ON BOTH SIDES	0.154
3	10159377	LEVEL_P3	Brick	-	Vertical	160	Basic Wall:BW-3 150mm AAC BLOCK WALL WITH 5mm THK SKIM COAT ON BOTH SIDES	3.049
4	10223796	LEVEL_04	Brick	-	Vertical	150	Basic Wall:KLCC- DW-150-NR	9.928
5	10413265	LEVEL_P3	Brick	-	Vertical	160	Basic Wall:BW-3 150mm AAC BLOCK WALL WITH 5mm THK	3.543

Default Template

Show Quantities of Room and Assembly  Show Subtotal  
 Only show quantities of one typical floor

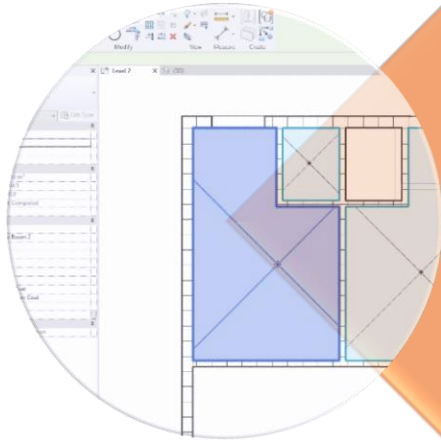
Reversely-Check Model





# Architectural Quantification

---



**Import with  
Room**

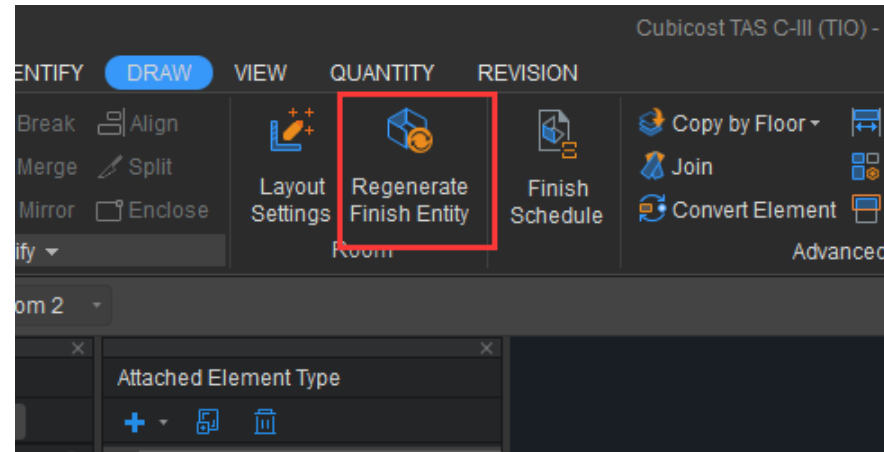


**Import with  
Layering**

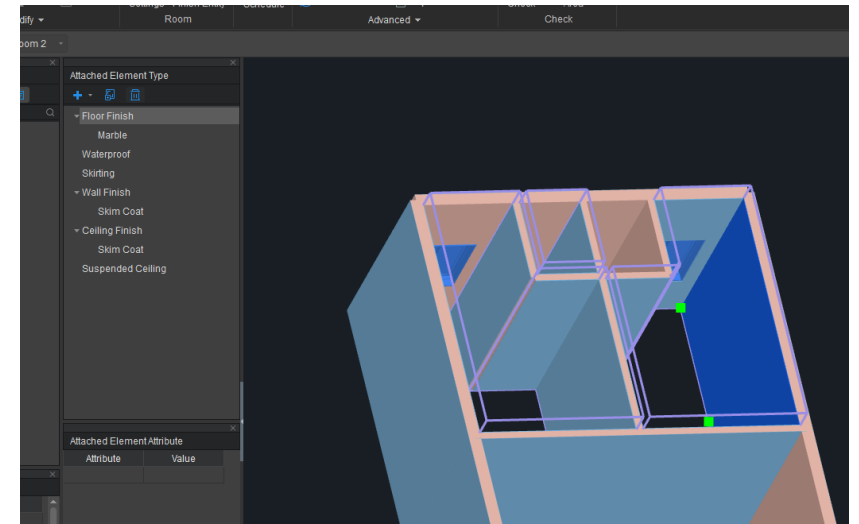
# Import Revit with Room

Volume	Not Computed
Computation Height	0.0
Identity Data	
Number	4
Name	Bed Room 2
Image	
Comments	
Occupancy	
Department	
Base Finish	
Ceiling Finish	Skim Coat
Wall Finish	Skim Coat
Floor Finish	Marble
Occupant	
Phasing	
Phase	New Construction

Using Revit attribute to apply finishes



Re-generate Finish Entity



The finishes will appear accordingly

- Suitable if the model consisted of ONE type finish for each elements e.g. one wall has one finish. If consisted of more than one finishes, suggested to use by “Layering”

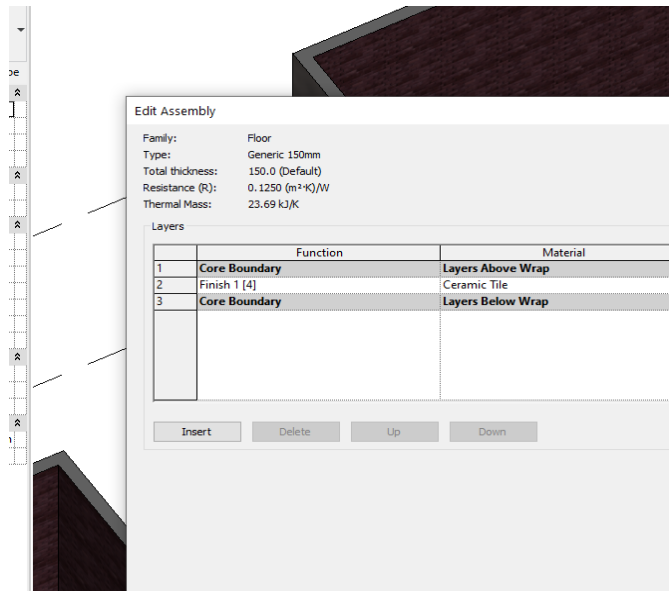
# Import Revit with Layering

## RVT

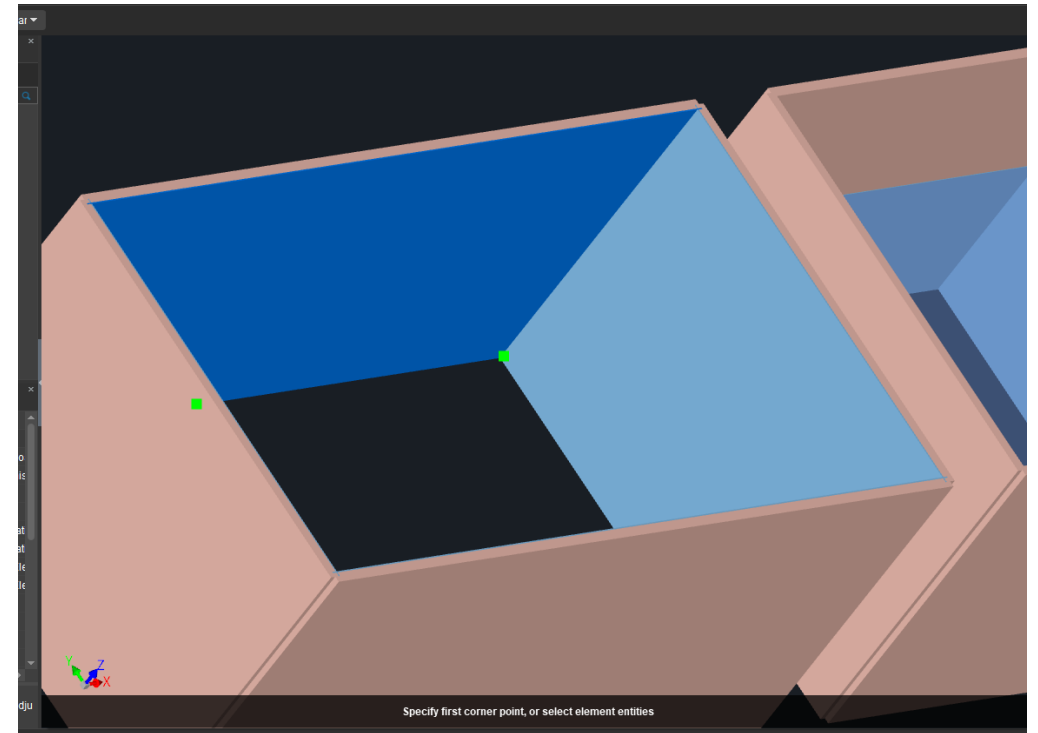
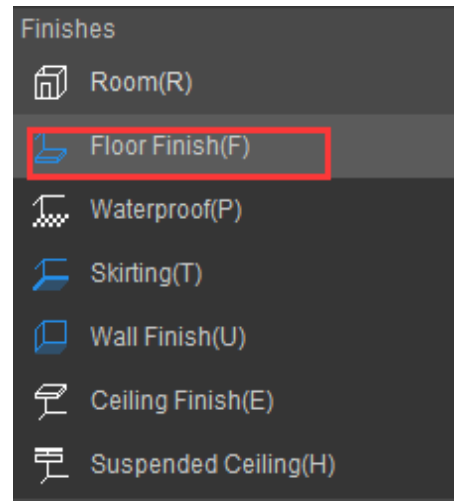
Family: **Basic Wall**  
 Type: Generic - 8"  
 Total thickness: 203.2  
 Resistance (R): 0.0000 (h·ft<sup>2</sup>·°F)/BTU  
 Thermal Mass: 0.0000 BTU/°F

Layers

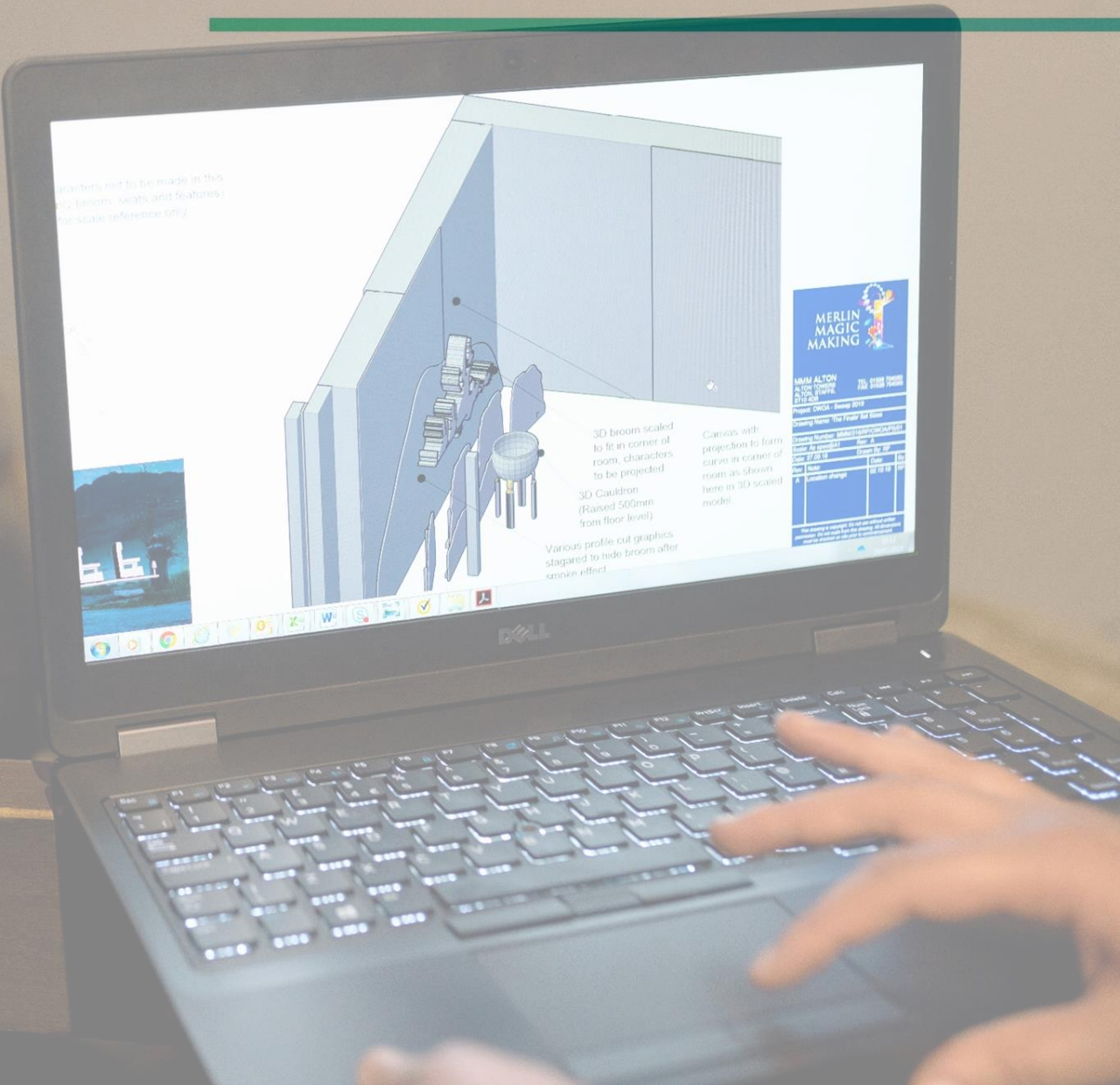
	Function	Material
1	Core Boundary	Layers Above Wrap
2	Finish 1 [4]	<By Category>
3	Core Boundary	Layers Below Wrap



## Cubicost



- Suitable if the element consisted of multiple layer of finishes e.g. C&S and Tiles

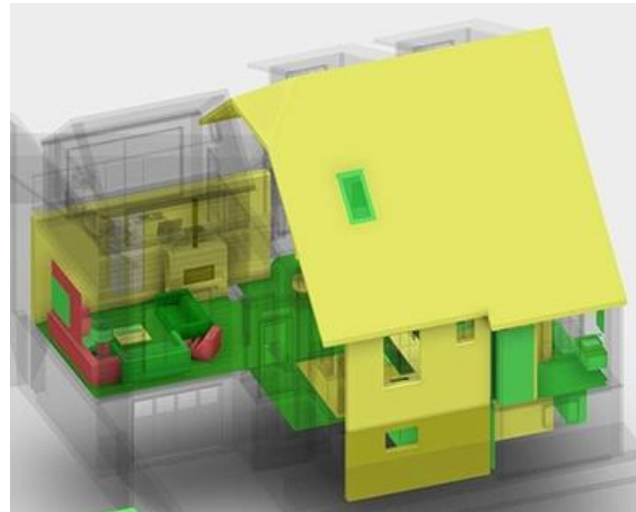


# RVT Changes

# RVT Changes



1 Import  
Changed  
Model



15  
Added

24  
Modified

8  
Deleted

Item	Description	Base QTY	VO QTY	Remarks
1	C35 CONCRETE	9666.83	33.15	Modified
2	C40 CONCRETE	4578.9	155.57	Added
3	BRICK WALL	1359.8	-21.86	Deleted
4	Staircase	532.12	532.12	

**Variation Quantity**

# RVT Changes

---

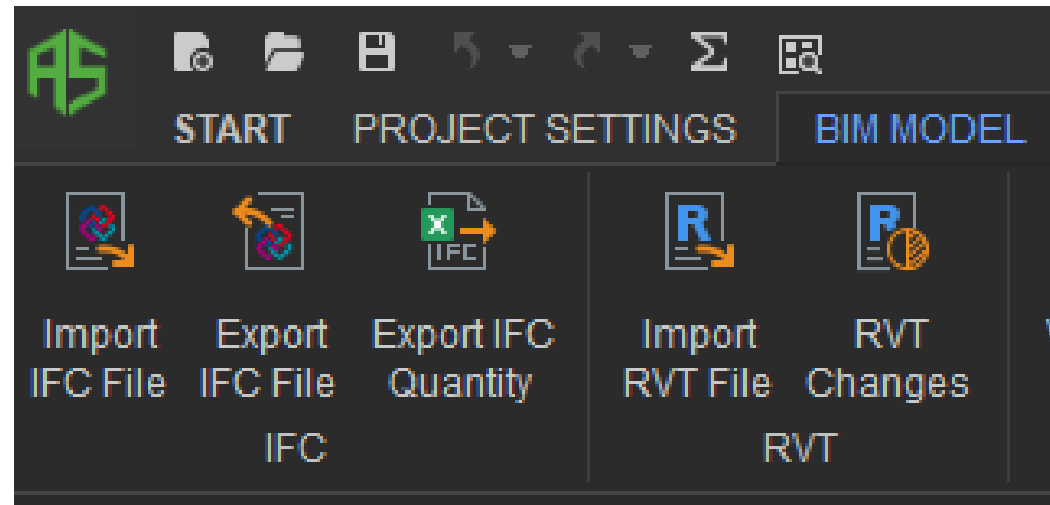
With **RVT Changes**, you can find out the differences of two RVT models.

Which entities are added?

Which entities are deleted?

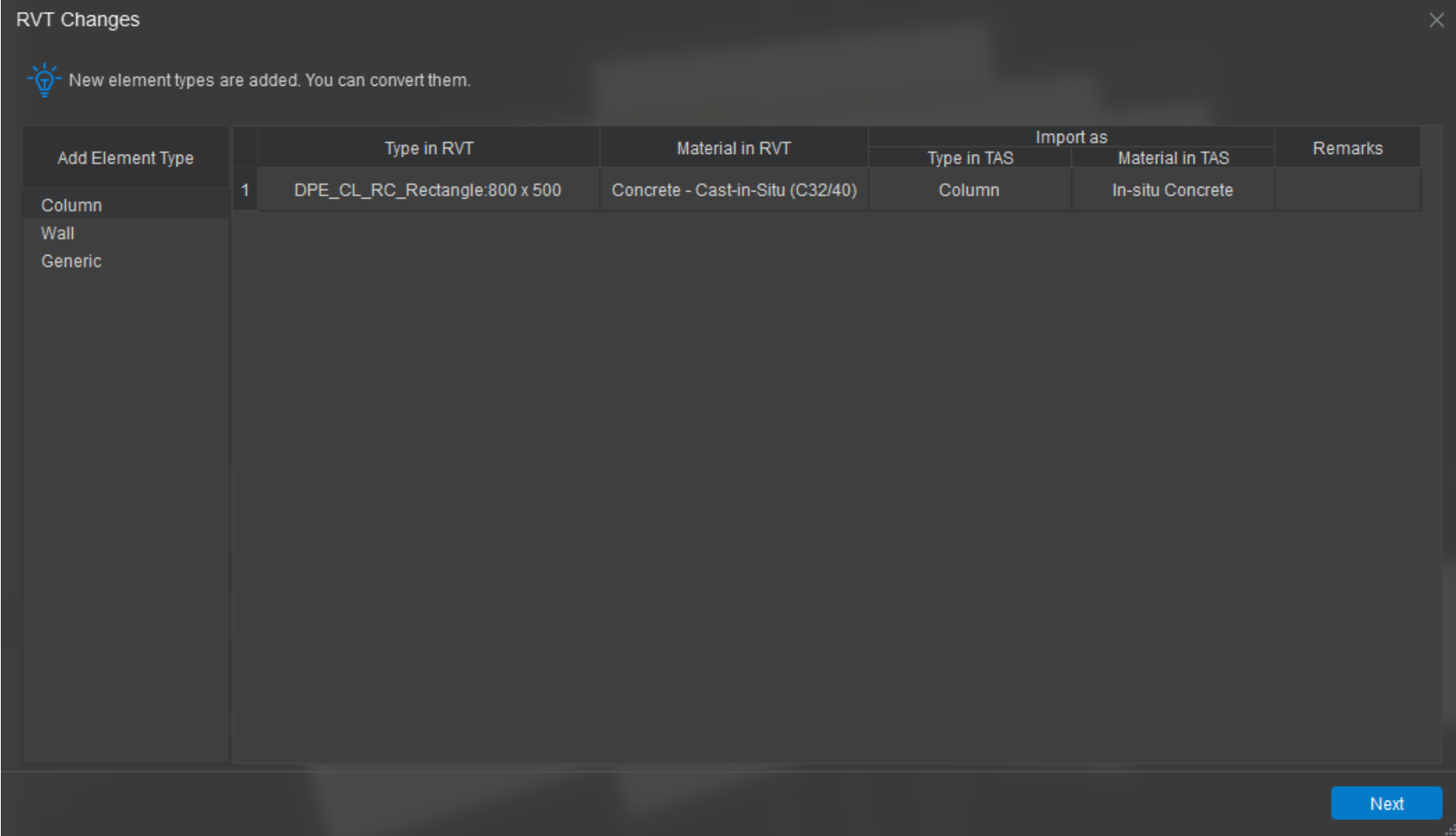
Which entities are modified?

And the result will be shown **on models**.




# RVT Changes

- If there is a newly added element, a window will pop up, and you can do the element type mapping.



RVT Changes

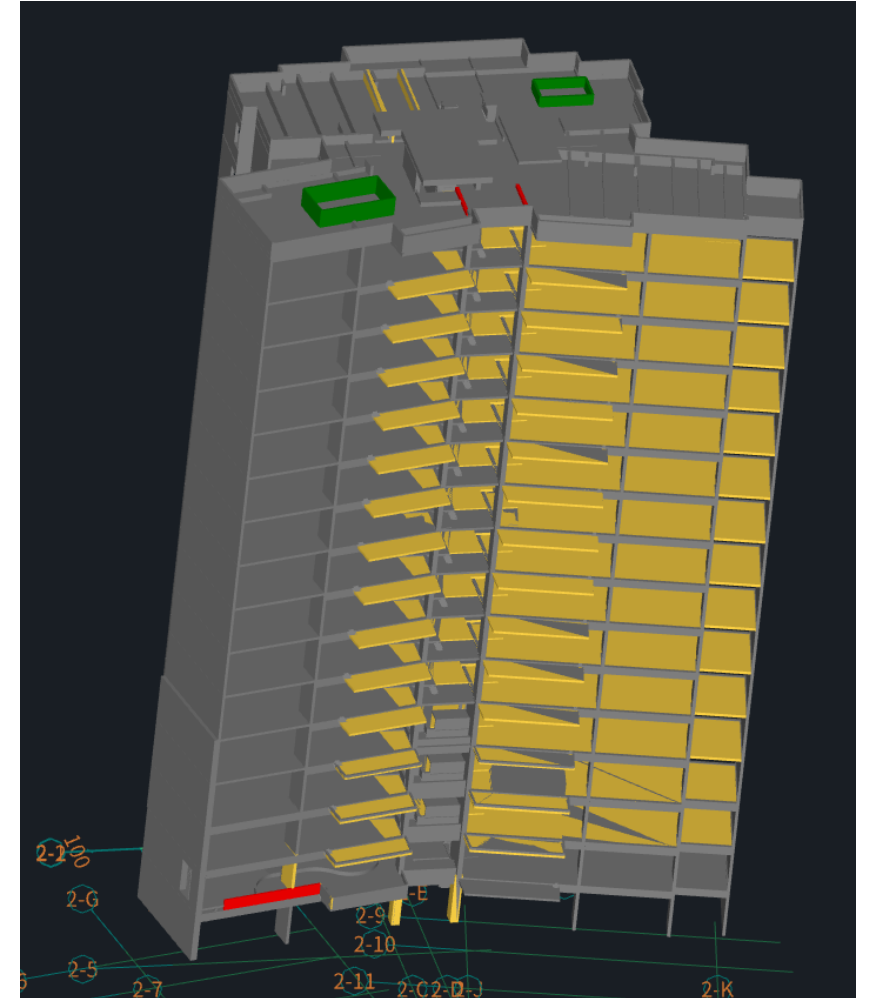
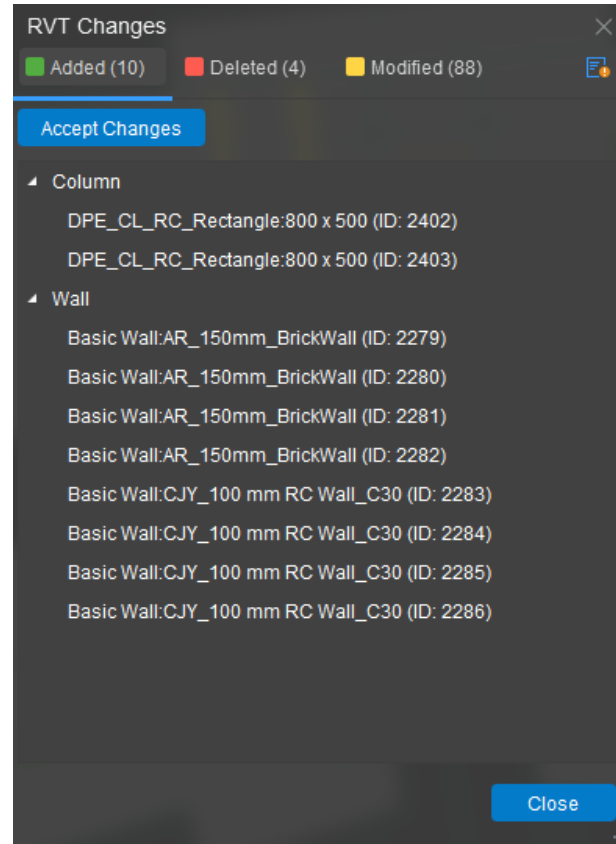
 New element types are added. You can convert them.

Add Element Type	Type in RVT	Material in RVT	Import as		Remarks
			Type in TAS	Material in TAS	
Column	1	DPE_CL_RC_Rectangle:800 x 500	Column	In-situ Concrete	
Wall					
Generic					

Next

# RVT Changes

- For added, deleted and modified entities, you can auto import them by clicking Accept Changes.







# Relevant Principles

---

- Case 1: If there are some changes happened in the original RVT File, you can use **RVT Changes** to display the difference.
- Case 2: If you just change the element type or element material in the process of importing RVT file, the difference will not be displayed when you use **RVT Changes**.
- Case 3: If you change the RVT element in TAS after it is imported, you can then use **RVT Changes** to display the difference.
- Case 4: If you don't change the RVT elements in TAS and just change the TAS elements, the difference will not be displayed when you use **RVT Changes**.



# Basic Principle

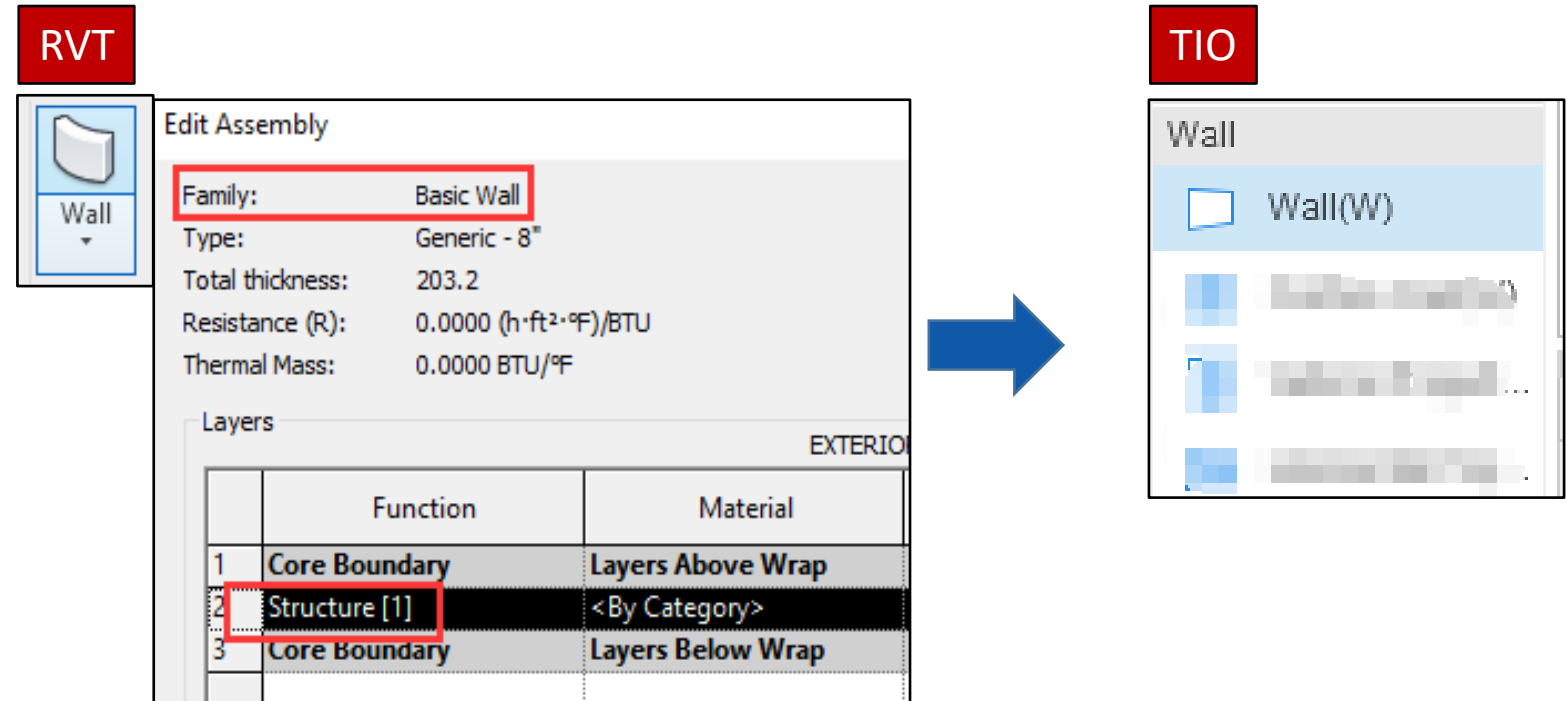
## 3.1 Element Settings - Wall

---

**Wall**

# Wall

- ❖ For a RVT wall, if its Family is Basic Wall, and its Layer Function is Structure, it will be matched with Wall in TIO.



# Wall

- ❖ For a RVT wall, if its Family is Basic Wall, and its Layer Function is others except Structure, it will be matched with Wall Finish in TIO.

**RVT**

Family:	Basic Wall
Type:	Generic - 8"
Total thickness:	203.2
Resistance (R):	0.0000 (h·ft <sup>2</sup> ·°F)/BTU
Thermal Mass:	0.0000 BTU/°F

Layers

	Function	Material
1	Core Boundary	Layers Above Wrap
2	Finish 1 [4]	<By Category> ...
3	Core Boundary	Layers Below Wrap



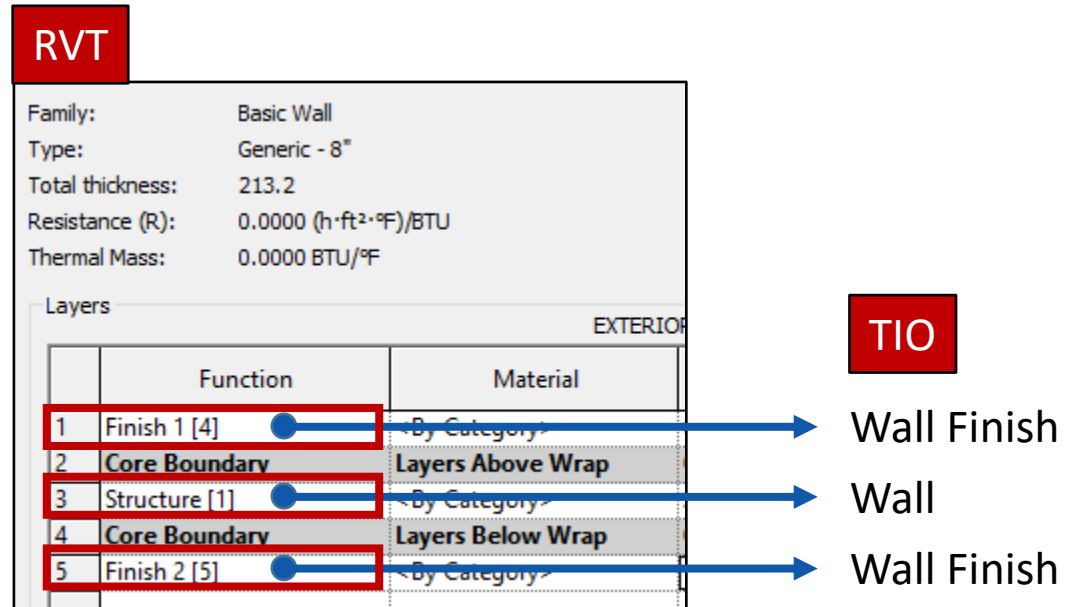
**TIO**

Finishes

	...
	...
	...
	...
	...
	Wall Finish(U)
	...

# Wall

- ❖ For a RVT wall, if its Family is Basic Wall, and its Layer Function contains both Structure and others, after being imported into TIO, it will be matched with different element types based on different layers.



# Wall

- ❖ For a RVT wall, if its Family is Stacked Wall, after being imported into TIO, it will be matched with corresponding wall or wall finish based on its sub elements.





# Material

Function	Material	Condition (Given...)	Name elements with material of RVT	Remarks
Core Boundary	Layers Above Wrap			
Structure [1]	precast concrete			
Core Boundary	Layers Below Wrap			
1	Wall	Brick Wall	Brick	<p>1. Manage to name elements by choosing these 8 materials in Revit. In this way, they could be matched with materials in TIO automatically after import.</p> <p>2. If you choose other materials rather than these 8 materials, in TIO, they will be matched with the default material used when creating elements. You need to check and modify them in Element Settings.</p>
		Block wall	Block	
		Precast wall	Precast	
		Stone wall	Stone	
		Light Panel wall	Light Panel	
		Color Steel Plate wall	Color Steel Plate	
		Wooden Partition wall	Wooden Partition	
		Glass wall	Glass	
		For walls of materials rather than these mentioned above	name them with actual materials	

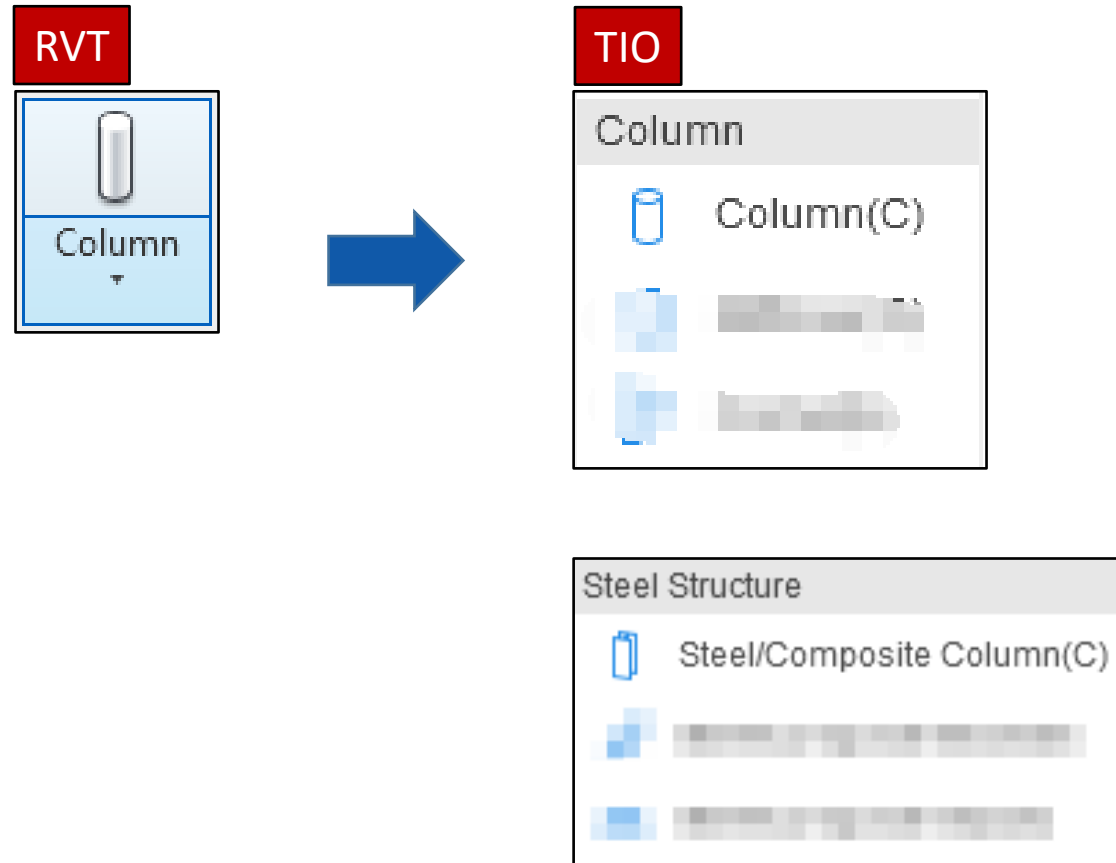
## 3.1 Element Settings - Column

---

**Column**

# Column

- ❖ For RVT columns, they will be matched with Column or Steel Column in TIO after import.



# Material

Function	Material
Core Boundary	Layers Above Wrap
Structure [1]	precast concrete
Core Boundary	Layers Below Wrap

		Condition (Given...)	Name elements with material of RVT	Remarks
2	Column	Precast Column	Precast	<p>1. Manage to name elements by choosing these 4 materials in Revit. In this way, they could be matched with materials in TIO automatically after import.</p> <p>2. If you choose other materials rather than these 4 materials, in TIO, they will be matched with the default material used when creating elements, that is, In-situ Column. You need to check and modify them in Element Settings.</p>
		Brick Column	Brick	
		Stone Column	Stone	
		Steel Column	Steel	

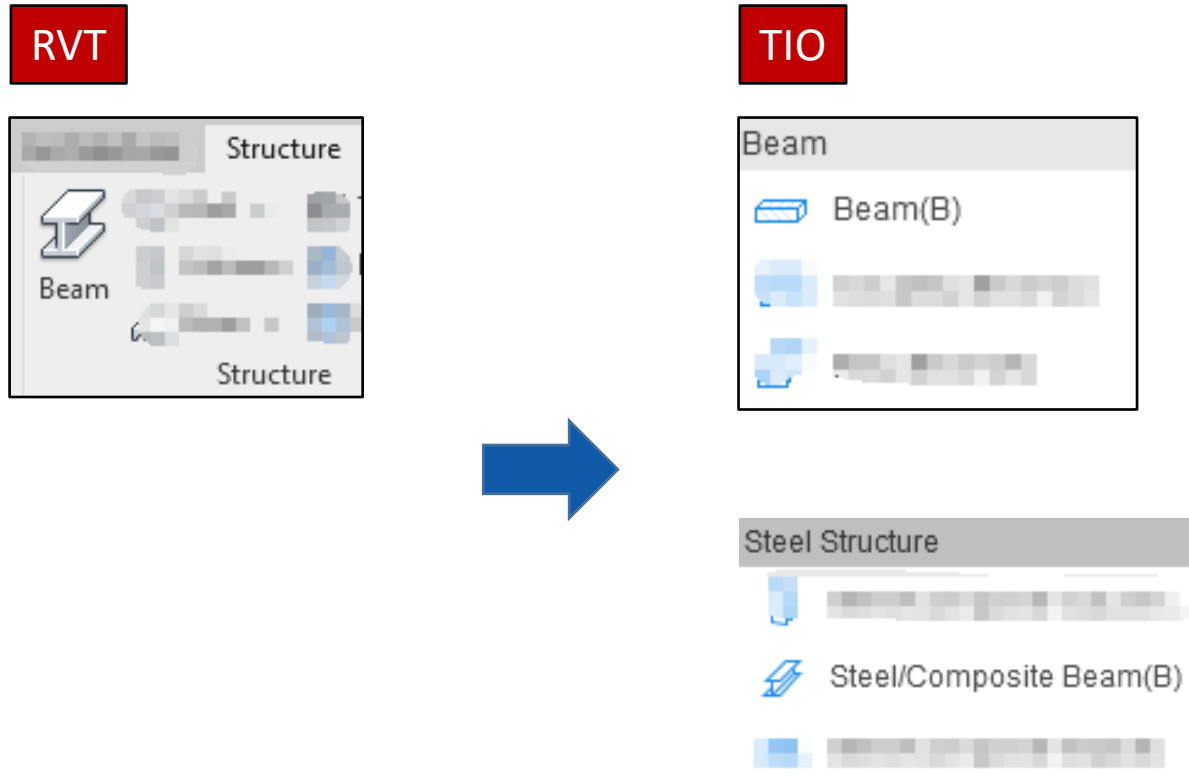
## 3.1 Element Settings - Beam

---

**Beam**

# Beam

- ❖ For RVT beams, they will be matched with Beam or Steel Beam in TIO after import.



# Material

Function	Material	Condition (Given...)	Name elements with material of RVT	Remarks
Core Boundary	Layers Above Wrap			
Structure [1]	precast concrete			
Core Boundary	Layers Below Wrap			
3	Beam	Precast Beam	Precast	<p>1. Manage to name elements by choosing these 2 materials in Revit. In this way, they could be matched with materials in TIO automatically after import.</p> <p>2. If you choose other materials rather than these 2 materials, in TIO, they will be matched with the default material used when creating elements, that is, In-situ Beam. You need to check and modify them in Element Settings.</p>
		Steel Beam	Steel	

## 3.1 Element Settings - Slab

---

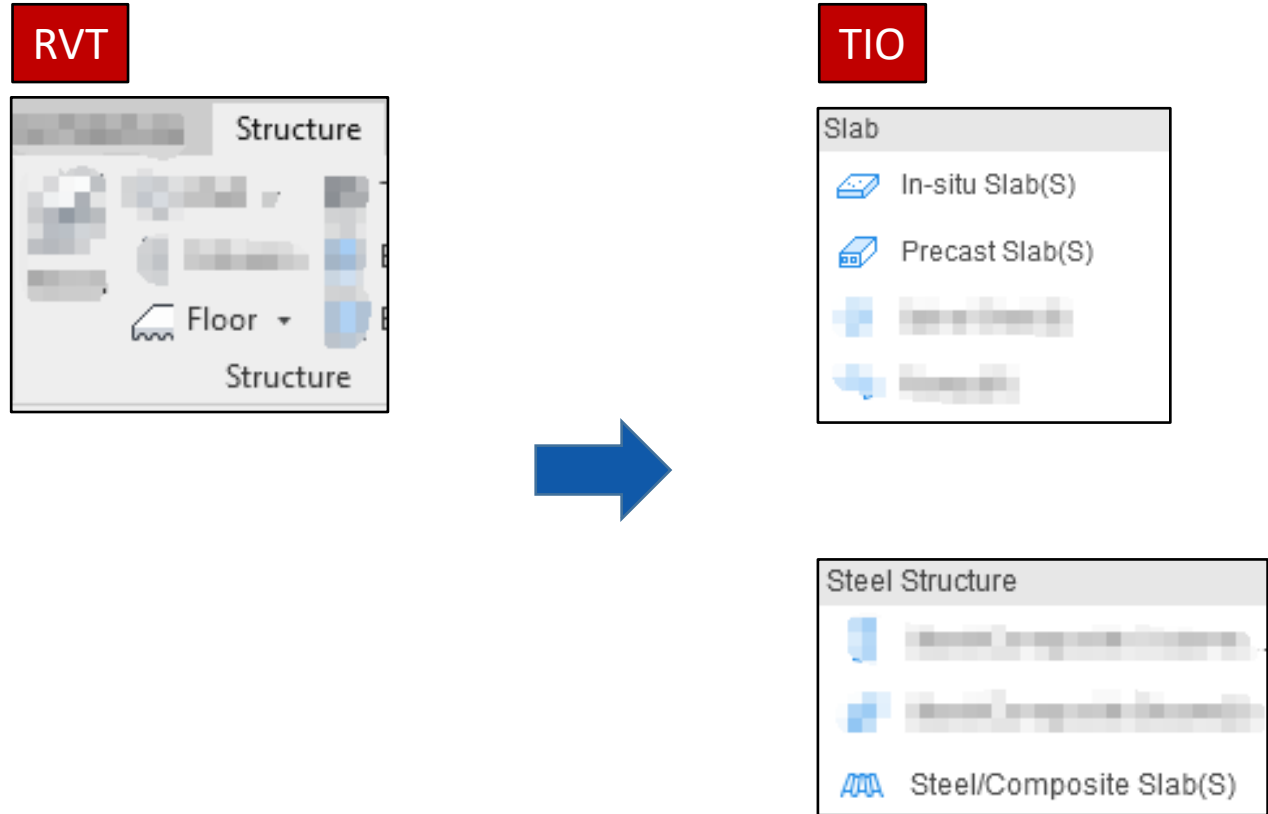
**Slab**



# Slab

---

- ❖ For RVT slabs, they will be matched with Slab or Steel Slab in TIO after import.

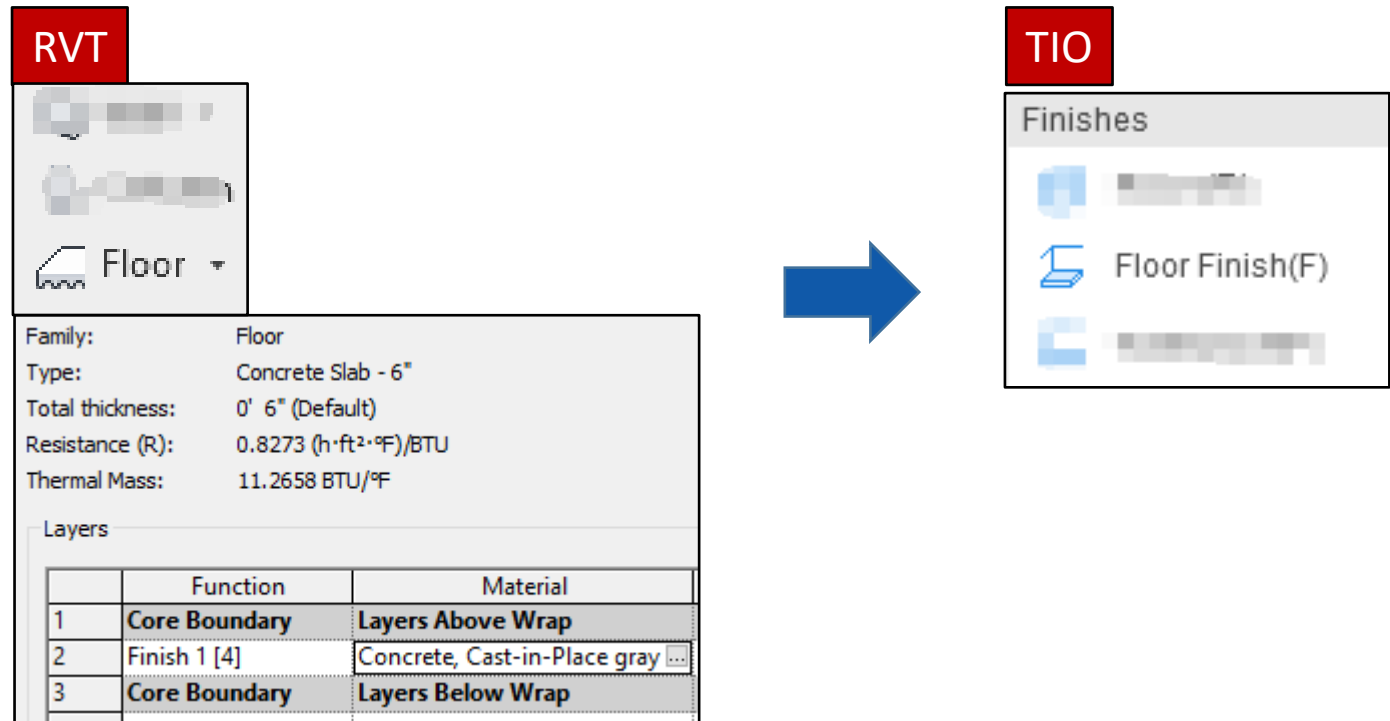


# Material

Function	Material	Condition (Given...)	Name elements with material of RVT	Remarks
Core Boundary	Layers Above Wrap			
Structure [1]	precast concrete			
Core Boundary	Layers Below Wrap			
4	Slab	Precast Slab	Precast	<p>1. Manage to name elements by choosing these 2 materials in Revit. In this way, they could be matched with Precast Slab in TIO automatically after import, though they will be shown as In-situ Slab in Element Settings.</p> <p>2. If you choose other materials, in TIO, they will be matched with In-situ Slab. You need to check and modify them in Element Settings.</p>
		Steel Slab	Steel	

# Slab

- ❖ For a RVT slab, if its Layer Function is others rather than Structure, it will be matched with Floor Finish in TIO.



# Slab

- ❖ For a RVT slab, if its Layer Function contains both Structure and others, the layers above Structure will be imported as Floor Finish, and the layers below Structure will be imported as Ceiling Finish.

**RVT**

Family: Floor  
Type: Concrete Slab - 6"  
Total thickness: 1' 0" (Default)  
Resistance (R): 0.8273 (h·ft<sup>2</sup>·°F)/BTU  
Thermal Mass: 11.2658 BTU/°F

Layers

	Function	Material
1	Finish 1 [4]	By Category
2	Core Boundary	Layers Above Wrap
3	Structure [1]	Concrete, Cast in Place gray
4	Core Boundary	Layers Below Wrap
5	Finish 2 [5]	By Category

**TIO**

Floor Finish  
Slab  
Ceiling Finish

## 3.1 Element Settings - Stair

---

**Stair**

# Stair

---

- ❖ For a RVT stair, it will be imported as Straight Flight in TIO after import.



# Material

Function	Material	Condition (Given...)	Name elements with material of RVT	Remarks
Core Boundary	Layers Above Wrap			
Structure [1]	precast concrete			
Core Boundary	Layers Below Wrap			
5	Stair	Precast Stair	Precast	<p>1. Manage to name elements by choosing these 4 materials in Revit. In this way, they could be matched with materials in TIO automatically after import.</p> <p>2. If you choose other materials rather than these 4 materials, in TIO, they will be matched with the default material used when creating elements, that is, In-situ Concrete Straight. You need to check and modify them in Element Settings.</p>
		Metal Stair	Metal	
		Wood Stair	Wood	
		Glass Stair	Glass	

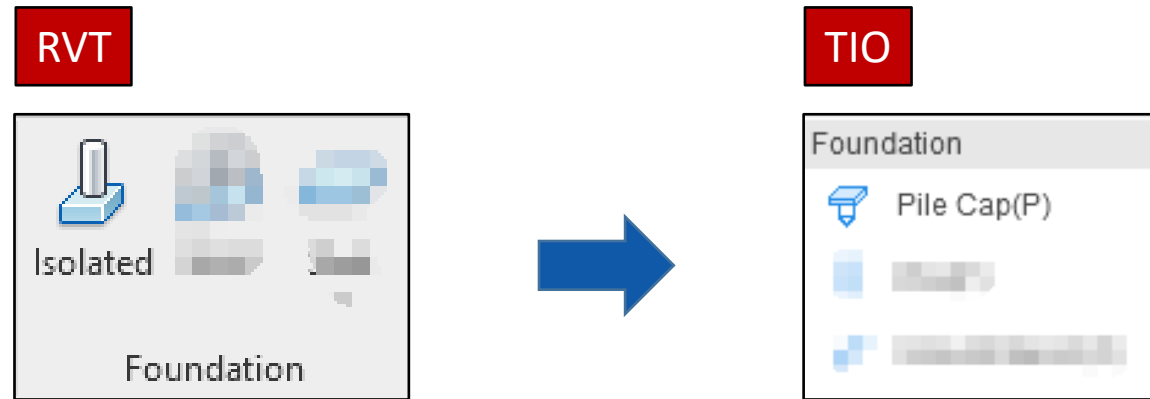
---

# Pile Cap



# 3.1 Element Settings - Pile Cap

- ❖ For a RVT isolated foundation, it will be imported as Pile Cap in TIO.

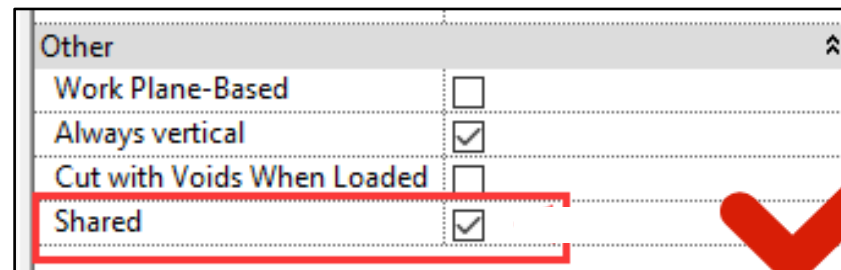
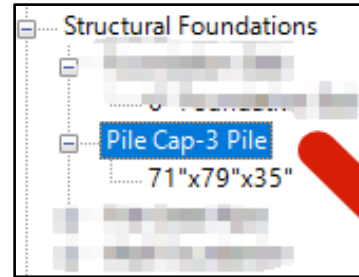


# Material

Function	Material	Condition (Given...)	Name elements with material of RVT	Remarks
Core Boundary	Layers Above Wrap			
Structure [1]	precast concrete			
Core Boundary	Layers Below Wrap			
6	Pile Cap	Precast Pile Cap	Precast	<p>1. Manage to name elements by choosing these 3 materials in Revit. In this way, they could be matched with materials in TIO automatically after import.</p> <p>2. If you choose other materials rather than these 3 materials, in TIO, they will be matched with the default material used when creating elements. You need to check and modify them in Element Settings.</p>
		Brick Pile Cap	Brick	
		Stone Pile Cap	Stone	

# Pile Cap

- ❖ In RVT, if you think the element should be classified as Pile Cap, please use **Isolated** in the **Foundation** group on the **Structure** tab, and its value for Type Name should contain *Pile Cap*.
- ❖ It is recommended to model pile cap separately from pile. However, if it is needed to be modeled as a family, it can be modeled as a shared nested family. Check the Shared properties in the nested family.



## 3.1 Element Settings - Pile

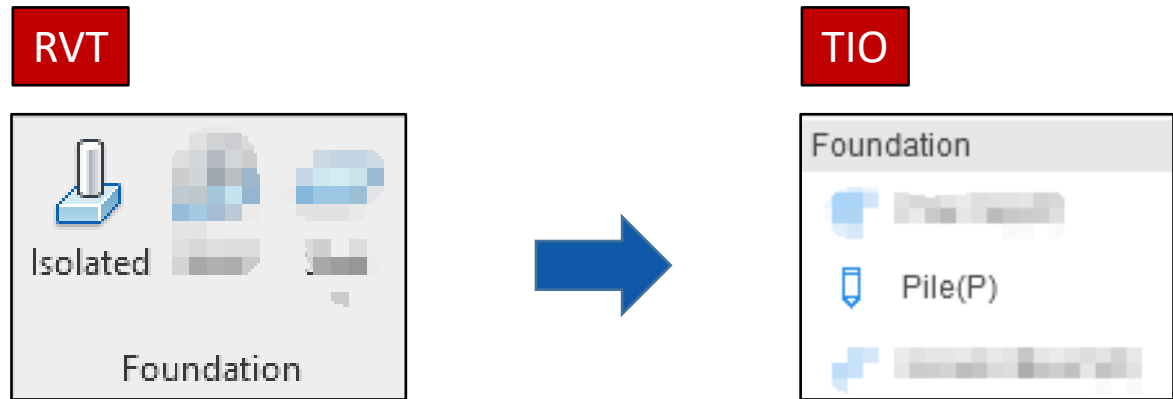
---

**Pile**

# Pile

---

- ❖ For a RVT isolated foundation, it will be imported as Pile in TIO.

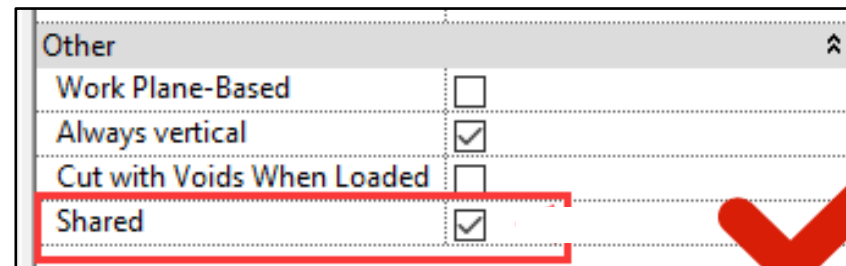
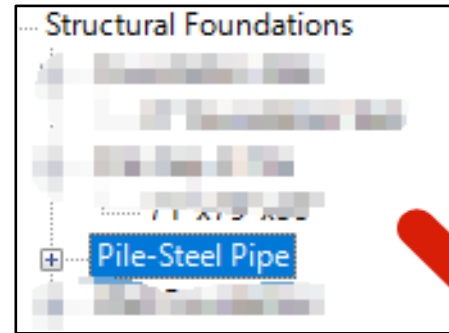


# Material

Function	Material	Condition (Given...)	Name elements with material of RVT	Remarks
Core Boundary	Layers Above Wrap			
Structure [1]	precast concrete			
Core Boundary	Layers Below Wrap			
7	Pile	Precast Pile	Precast	<p>1. Manage to name elements by choosing this materials in Revit. In this way, they could be matched with materials in TIO automatically after import.</p> <p>2. If you choose other materials rather than this material, in TIO, they will be matched with the default material used when creating elements, that is, In-situ Concrete Pile. You need to check and modify them in Element Settings.</p>

# Pile

- ❖ In RVT, if you think the element should be classified as Pile, please use **Isolated** in the **Foundation** group on the **Structure** tab, and its value for Type Name should contain *Pile*.
- ❖ It is recommended to model pile separately from pile cap. However, if it is needed to be modeled as a family, it can be modeled as a shared nested family. Check the Shared properties in the nested family.



## 3.1 Element Settings - Strip Foundation

---

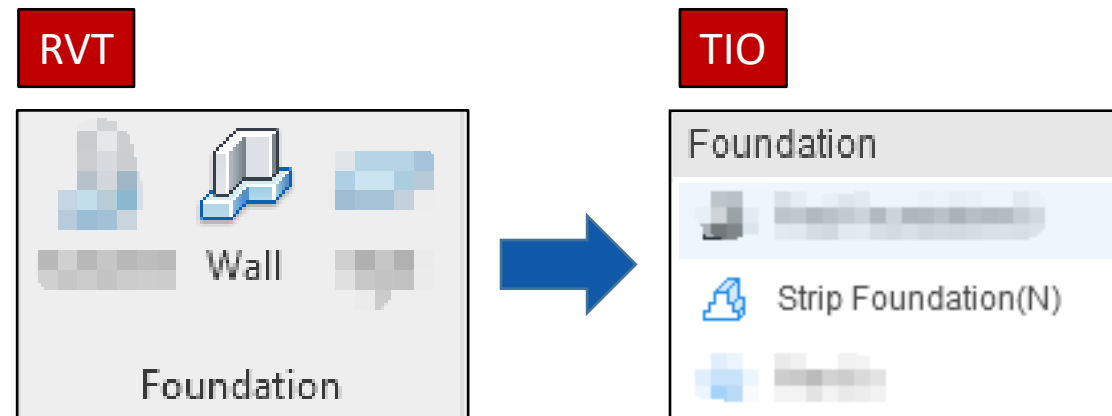
# Strip Foundation



# Strip Foundation

---

- ❖ In RVT, if you think the element should be classified as Strip Foundation, please use **Wall** in the **Foundation** group on the **Structure** tab,



# Material

Item	Element	Condition (Given...)	Name elements with material of RVT	Remarks
11	Strip Foundation	Precast Strip Foundation	Precast	<p>1. Manage to name elements by choosing these 3 materials in Revit. In this way, they could be matched with materials in TIO automatically after import.</p> <p>2. If you choose other materials rather than these 3 materials, in TIO, they will be matched with the default material used when creating elements, that it, In-situ Concrete Strip Foundation. You need to check and modify them in Element Settings.</p>
		Brick Strip Foundation	Brick	
		Rubble Strip Foundation	Rubble	

## 3.1 Element Settings - Raft Foundation

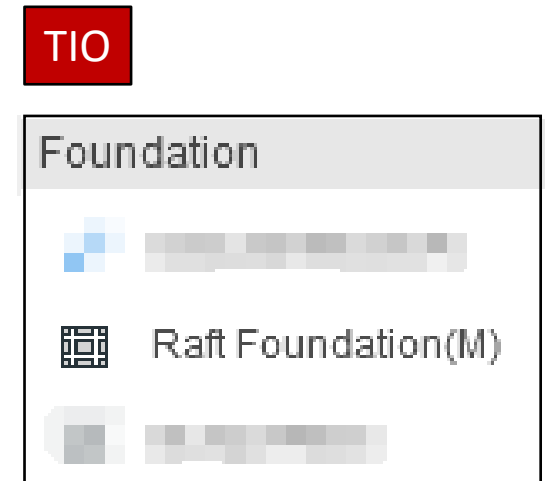
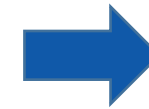
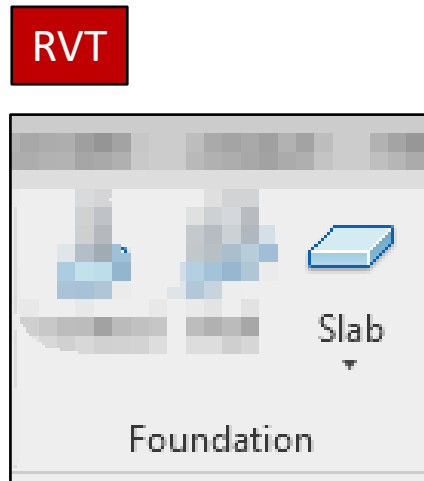
---

# Raft Foundation

# Raft Foundation

---

- ❖ In RVT, if you think the element should be classified as Raft Foundation, please use **Slab** in the **Foundation** group on the **Structure** tab.



# Material

---

Item	Element	Condition (Given...)	Name elements with material of RVT	Remarks
9	Raft Foundation	---	---	No matter what material it is used in Revit, it will be imported as In-situ concrete raft foundation in TIO.

## 3.1 Element Settings - Pad Foundation

---

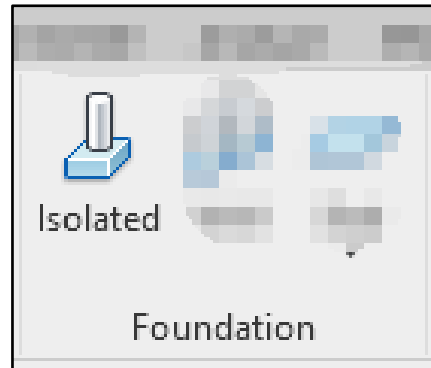
# Pad Foundation

# Pad Foundation

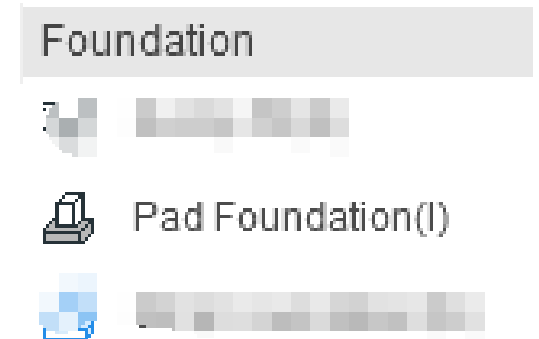
---

- ❖ In RVT, if you think the element should be classified as Pad Foundation, please use **Isolated** in the **Foundation** group on the **Structure** tab, and its value for Type Name should contain *Pad Foundation*.

RVT



TIO

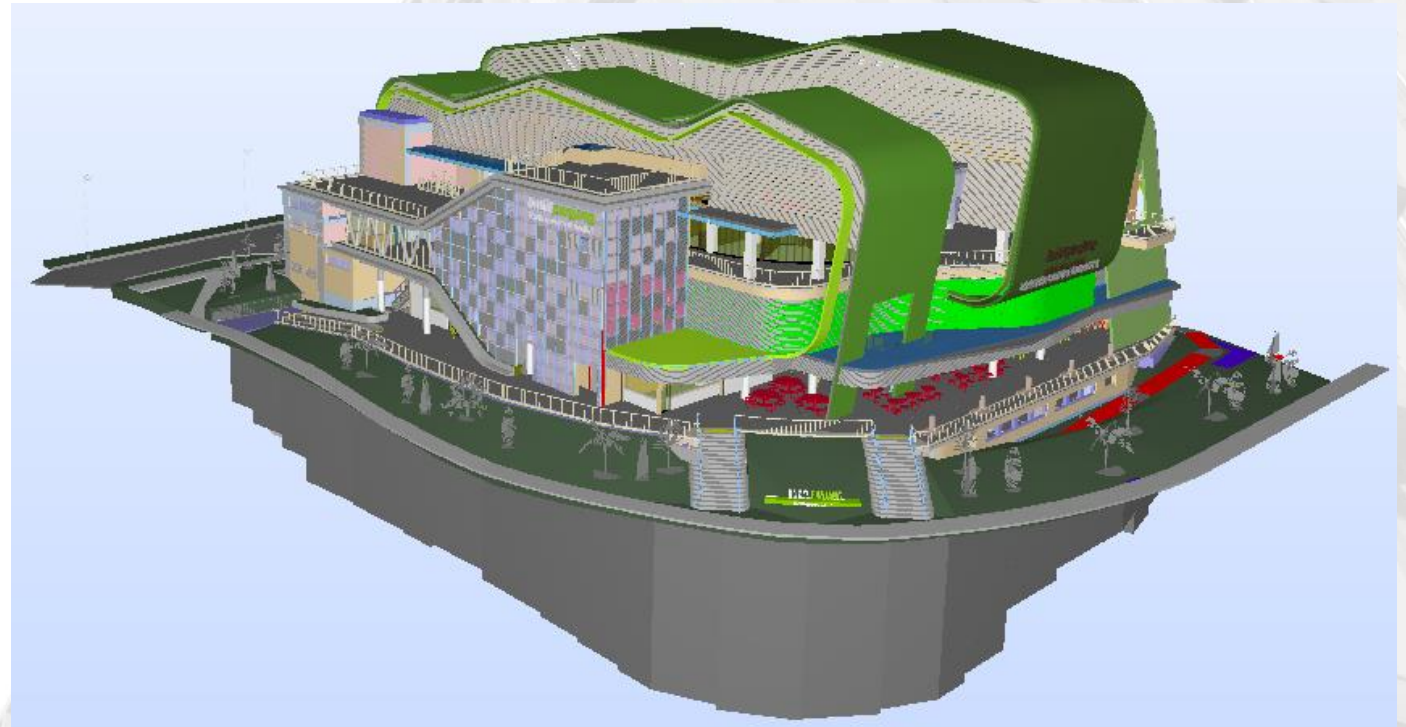
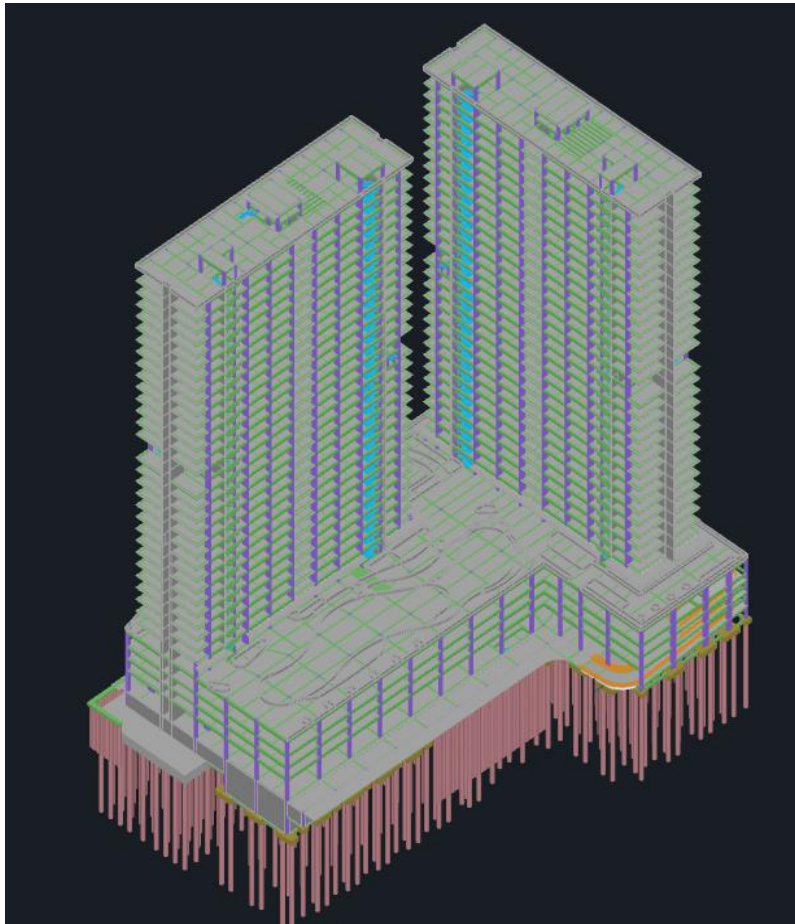


# Material

Item	Element	Condition (Given...)	Name elements with material of RVT	Remarks
10	Pad Foundation	Precast Pad Foundation	Precast	<p>1. Manage to name elements by choosing these 3 materials in Revit. In this way, they could be matched with materials in TIO automatically after import.</p> <p>2. If you choose other materials rather than these 3 materials, in TIO, they will be matched with the default material used when creating elements, that is, In-situ Concrete Pad Foundation. You need to check and modify them in Element Settings.</p>
		Brick Pad Foundation	Brick	
		Rubble Pad Foundation	Rubble	



# Sample project





cubiCOST<sup>®</sup>

Make Everything Count

**Thank You**