BU18897:
COBie and Classification Systems in Revit

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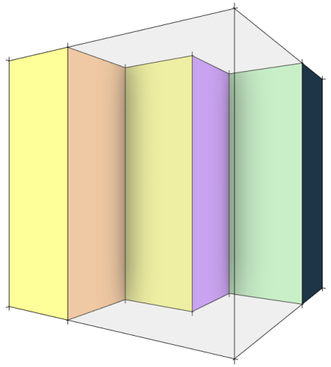
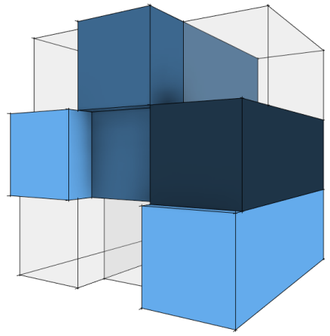
Class summary

- Are you required to submit a **COBie** deliverable from your Revit model?
- Do you need to be able to apply **classification data** to Revit elements from systems such as UniFormat, MasterFormat, OmniClass, Uniclass, or even a custom database?
- This session will provide a deep dive into the 2 tools to help you do this: **COBie Extension** and **Classification Manager**.
- Learn how to get them, how they work, and how you can configure them to meet your needs.
- Walk away with the expertise necessary to manage and track COBie and classification system data in your Revit models.

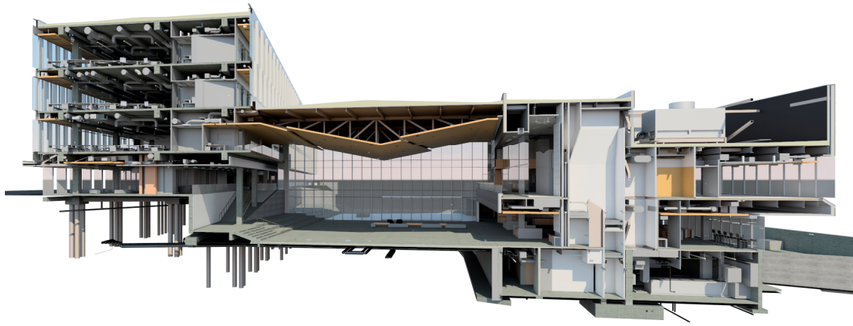




Key learning objectives

At the end of this class, you will be able to:

- Learn **which COBie data can be generated** by the Revit model, and how to collect that data quickly and efficiently
- Understand how to capitalize on the **connectivity between COBie and major classification systems** within your model
- Find out how easy it is to **create your own classification system** and apply the data directly to Revit elements
- Learn how to **export COBie-compliant worksheets** directly from your Revit model



JK

About your speakers

Jason Kunkel

- 21 years experience in industry
- 3 years as architectural designer
- 19 years CAD, BIM, IT support
- Trainer, blogger, developer

T.J. Meehan

AIA, LEED AP

- 21 years experience in industry
- 6 years as an architect
- 16 years as a BIM consultant working with arch's, eng's, contractors, subs, and owners

PLEASE SEE THE HANDOUT FOR MORE DETAILED BIO'S

TJ

Introduction to COBie

Introduction to COBie

What is it?

- COBie is a way to solve this problem:

- A standardized format for taking **data from BIM models to O&M** applications
- Becoming **the norm for data exchange** at construction completion
- COBie **format is strict** and not specific to any one BIM application
- Many O&M solutions **directly import COBie data** to quickly get the building engineers up-and-running

Introduction to COBie

COBie Worksheet Organization

Design

FACILITY	TYPE
FLOOR	COMPONENT
SPACE	SYSTEM
ZONE	ASSEMBLY

Common

CONTACT	ISSUE
PICKLISTS	IMPACT
ATTRIBUTE	DOCUMENT
COORDINATE	CONNECTION

Build

JOB	SPARE	RESOURCE

Introduction to COBie

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JOB	SPARE	RESOURCE

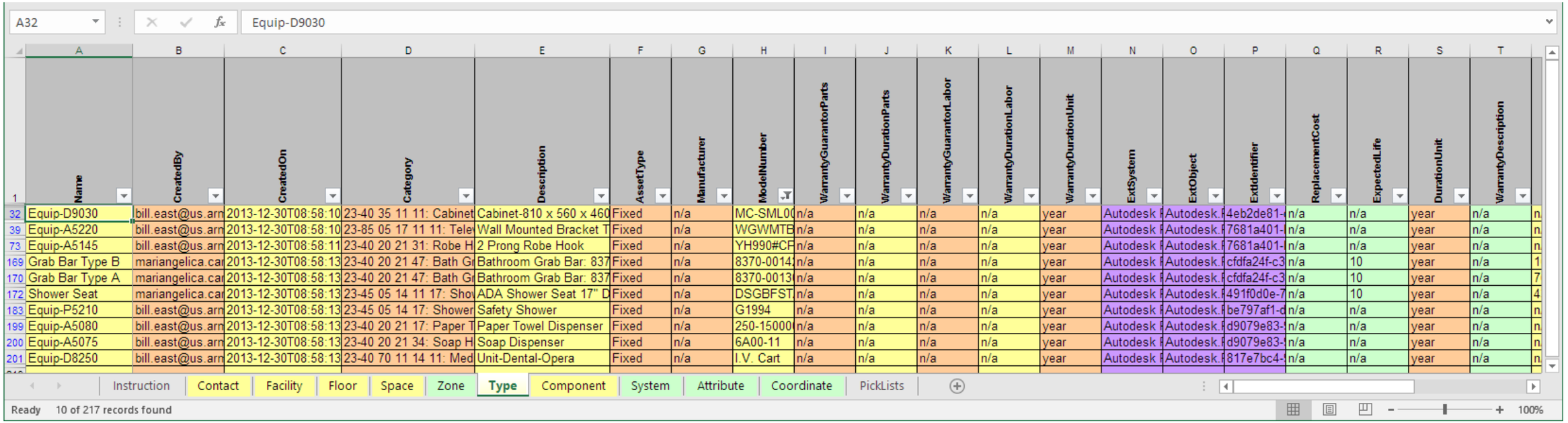
Introduction to COBie

COBie Spreadsheet

- Excel Tabs = COBie worksheets
- Not all data and worksheets are required

- Color coding:

Required	Reference (required)	Optional	External (from software)	Not Used



Introduction to COBie

How does Revit play a role?

- Both Revit and the COBie deliverables are databases
  - It's all about fields of data (parameters in Revit) with values

- Each row of data must have a Unique Identifier
  - This can be a challenge in Revit, since a Door and a Window in the same model can both be '101'

Introduction to COBie

General Considerations

- Warranty information requires contact
  - Anywhere in a COBie export where you list a company, manufacturer, etc., you need a corresponding contact with an email

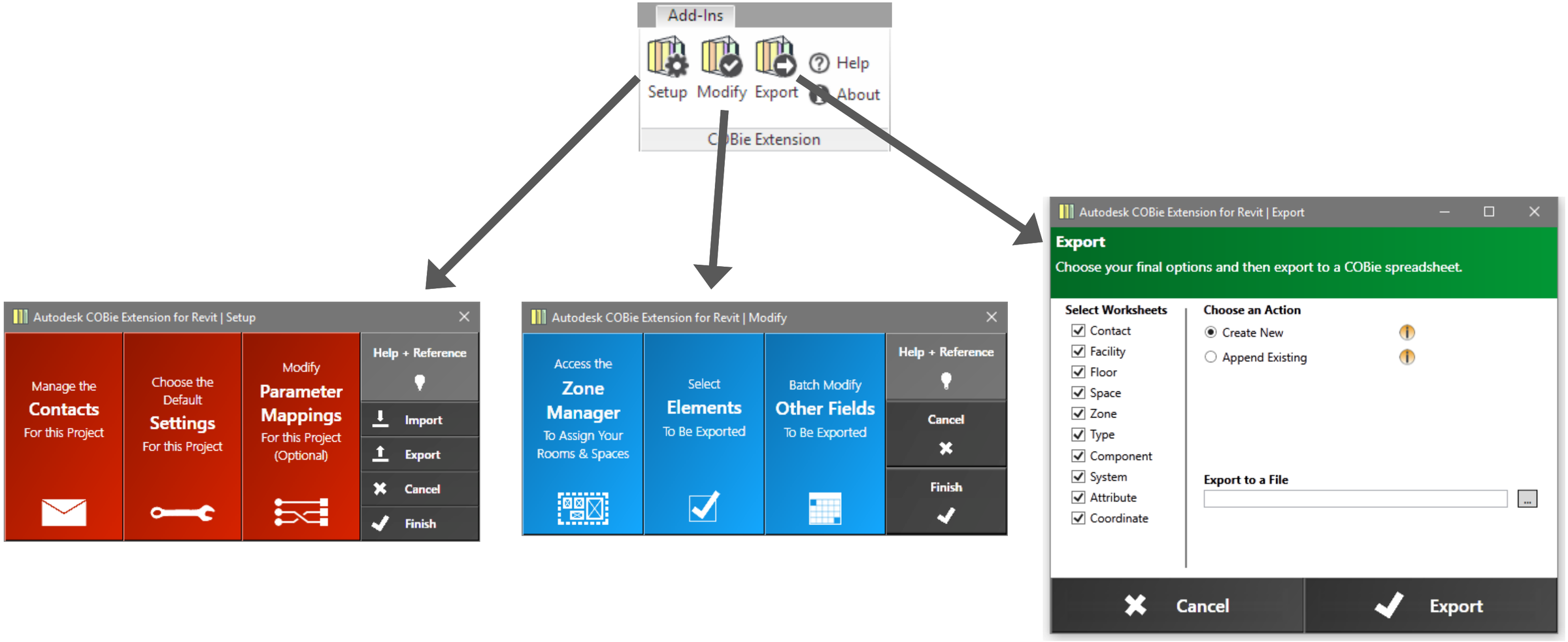
- Attributes vs added columns
  - You cannot simply add columns to the far right for more data
  - You must add to the ‘Attributes’ worksheet
- Million Row Limit (how it relates to COBie file format)?
  - The majority of COBie deliverables are via an Excel spreadsheet
  - Excel has a million row limit (1,048,576 to be exact)
  - 120 parameters x 10,000 pieces of equipment > 1M

JK

Autodesk COBie Extension for Revit

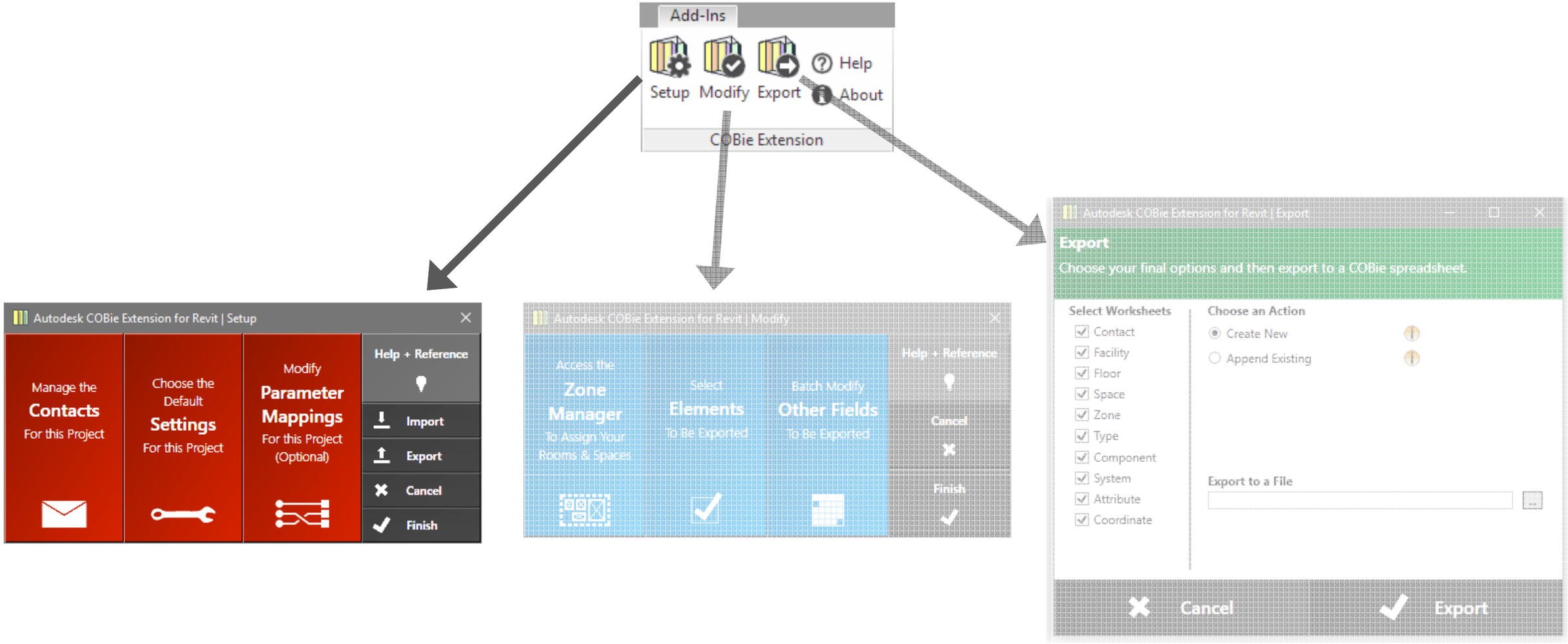
Autodesk COBie Extension for Revit

Basic Use > Ribbon and Landing Pages



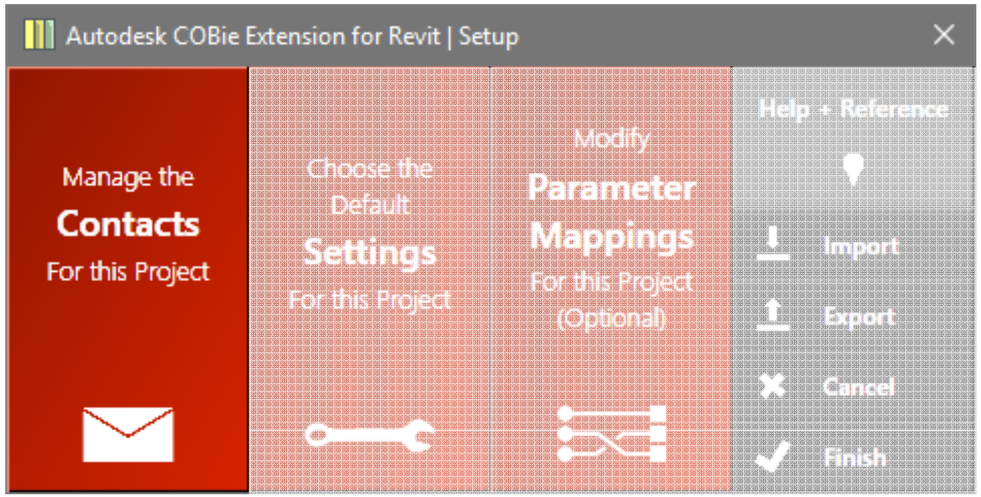
Autodesk COBie Extension for Revit

Basic Use > Setup



Autodesk COBie Extension for Revit

Basic Use > Setup > Contacts



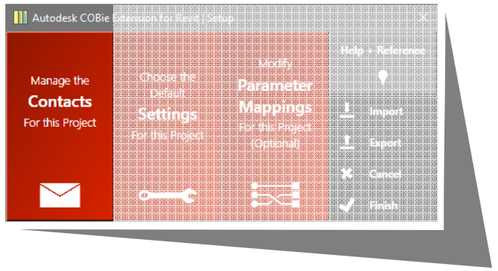
Create all the contacts for this COBie project

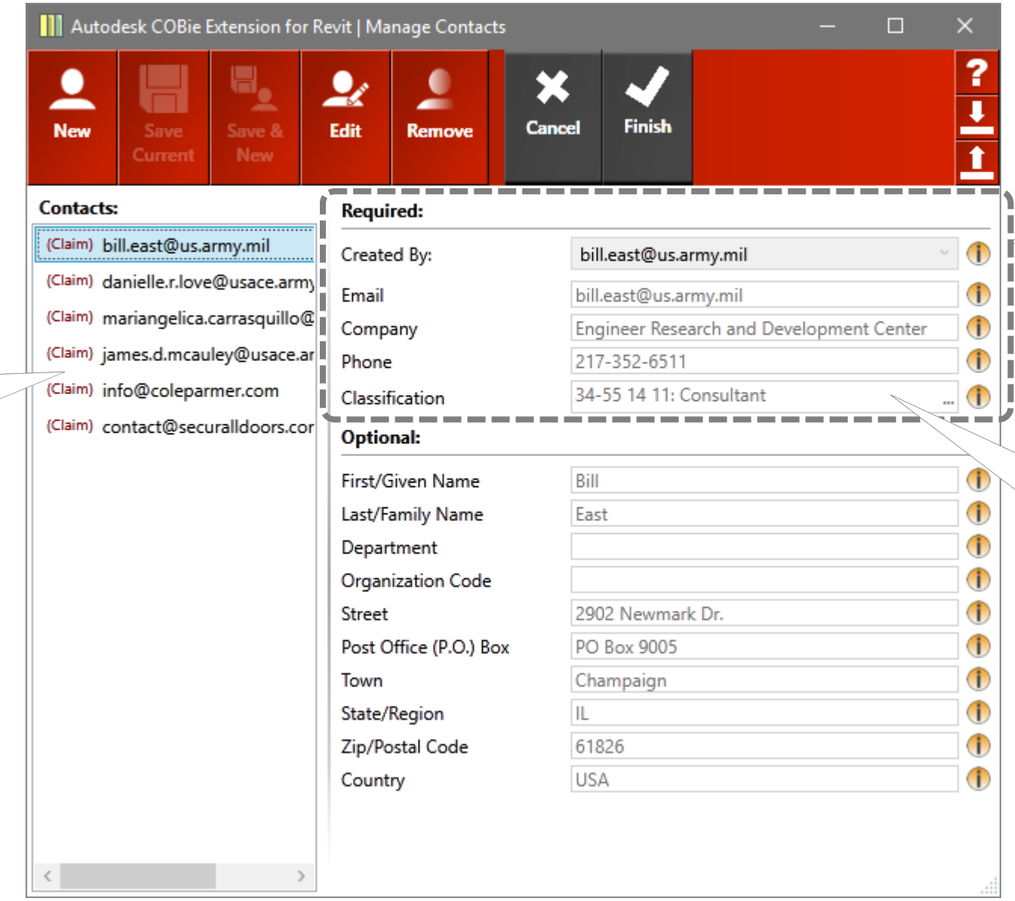
KEY POINTS:

- Every row of data in the entire COBie spreadsheet must have an assigned contact
- Each contact must have an email address = unique identifier
- Contact information saved in Extensible Storage and travels with the model

Autodesk COBie Extension for Revit

Basic Use > Setup > Contacts





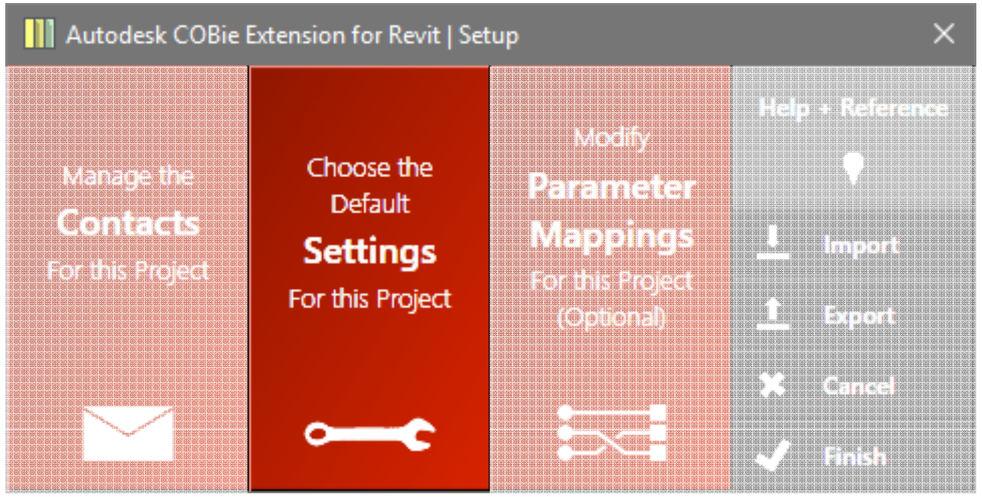
Contacts are tied to Revit logins (Claim vs Un-claim)

Only these fields are required

'Classification' field ties directly to Classification Manager, if installed

Autodesk COBie Extension for Revit

Basic Use > Setup > Settings



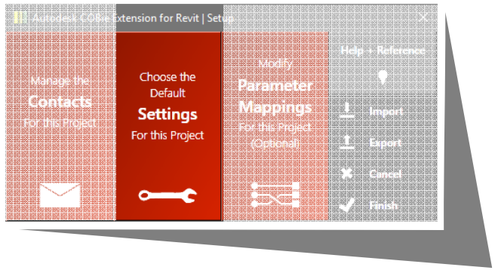
Define all the default settings for this COBie project

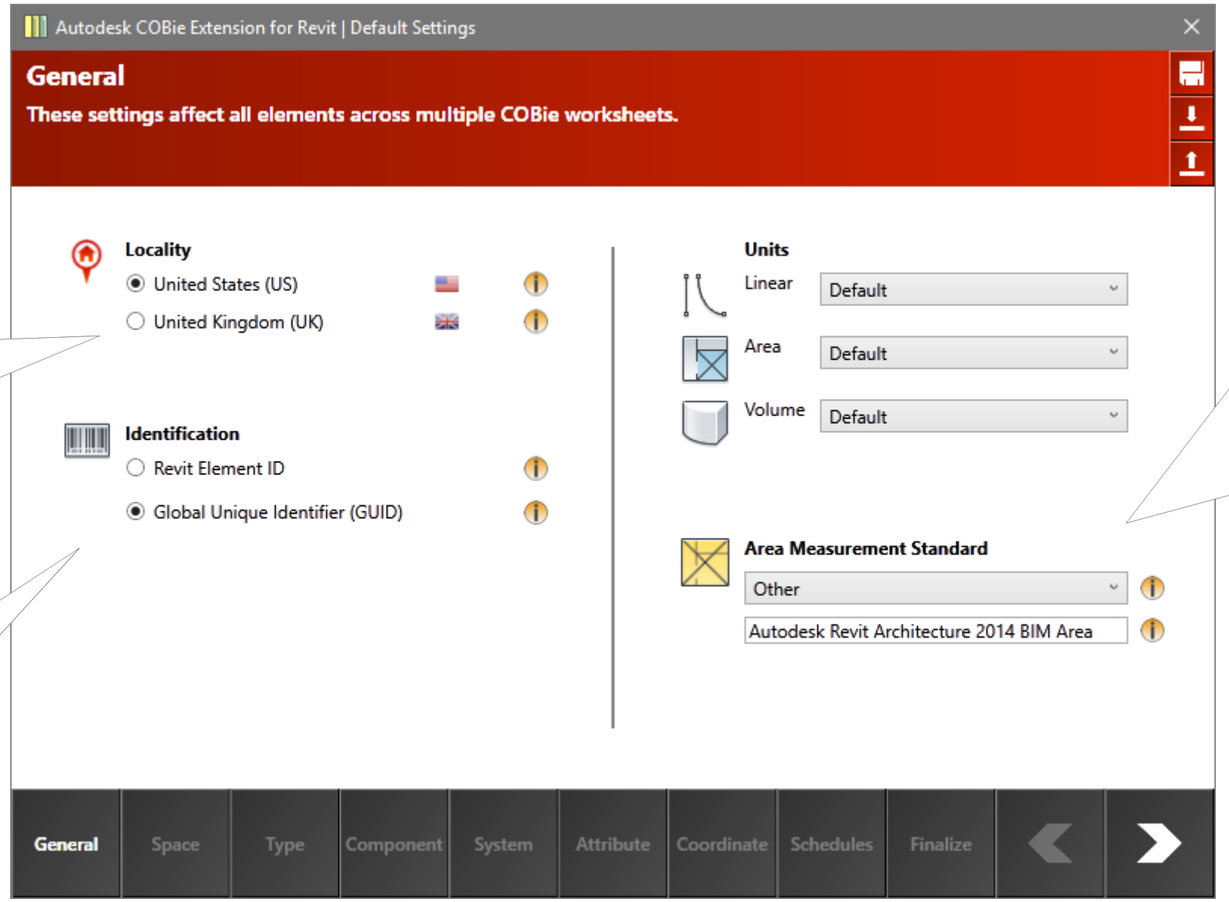
KEY POINTS:

- Wizard interface
- Organized to follow COBie worksheets
- Hover over information icons for pop-up help
- Settings information saved in Extensible Storage and travels with the model

Autodesk COBie Extension for Revit

Basic Use > Setup > Settings > General





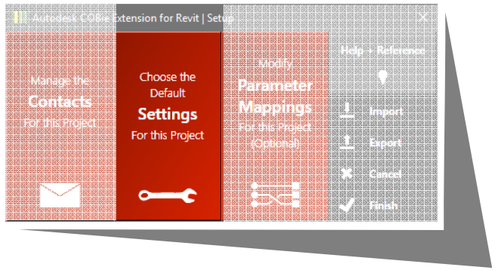
This will affect which Excel template is used

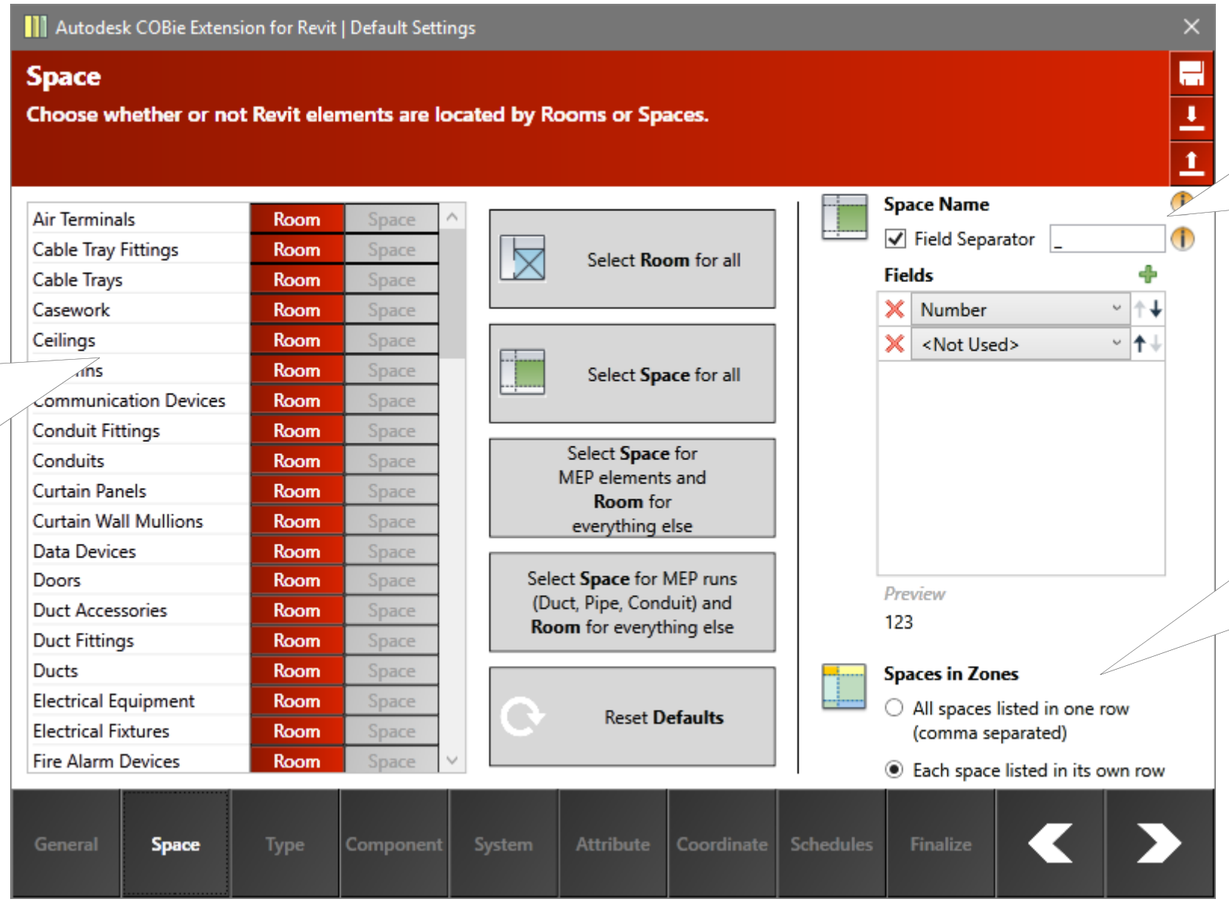
! Element ID's can change with a simple Sync to Central

This setting doesn't read directly from the model nor does it make any changes – it's just to document the method you've used to calculate square footages

Autodesk COBie Extension for Revit

Basic Use > Setup > Settings > Space





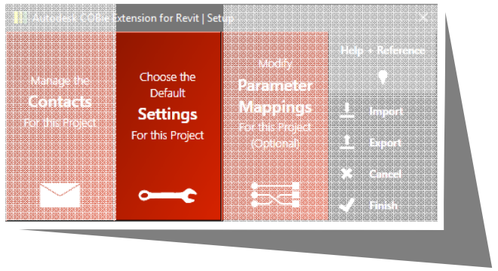
Standard COBie Extension naming tool

Decide how different family categories should pull their location information – Rooms or Spaces

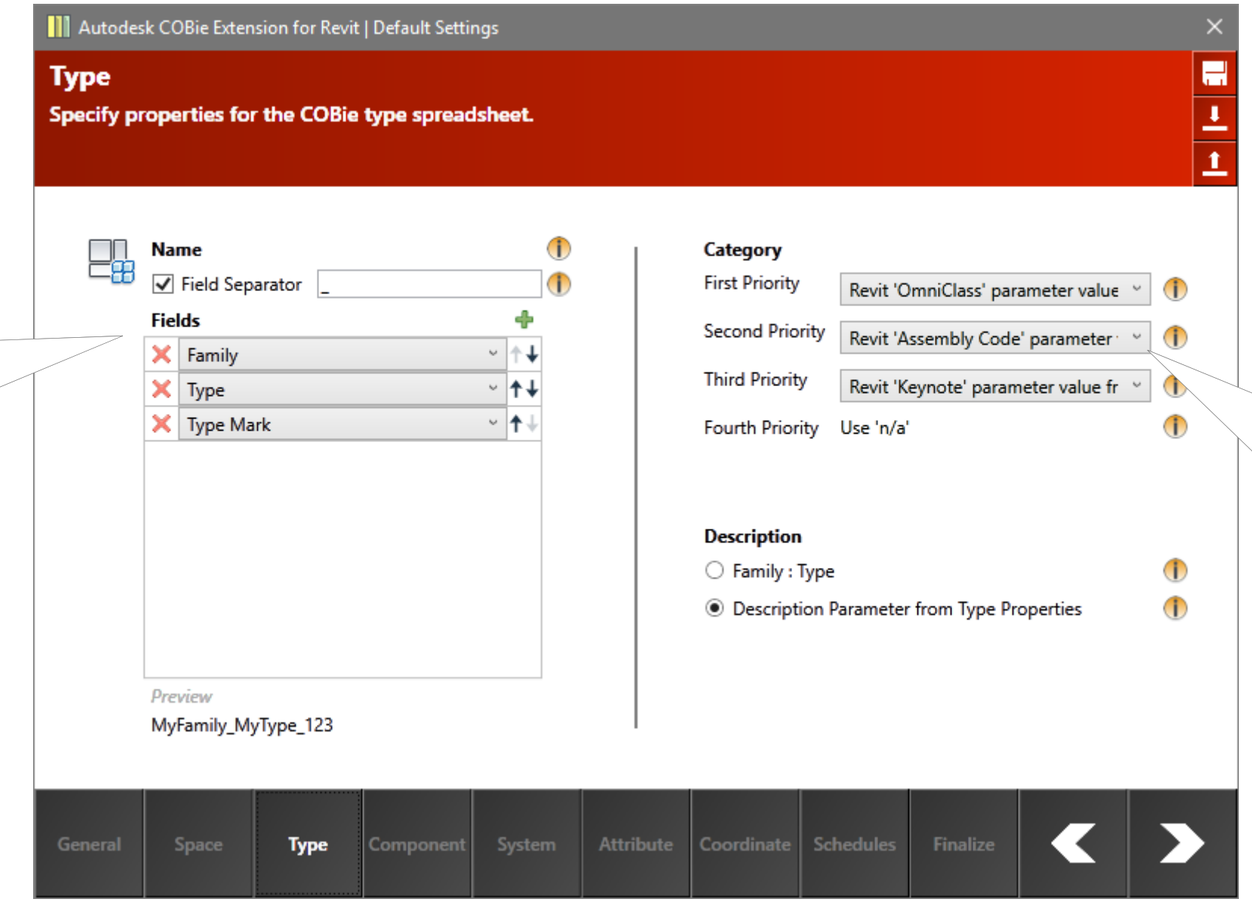
Choose based on your COBie deliverable requirements

Autodesk COBie Extension for Revit

Basic Use > Setup > Settings > Type



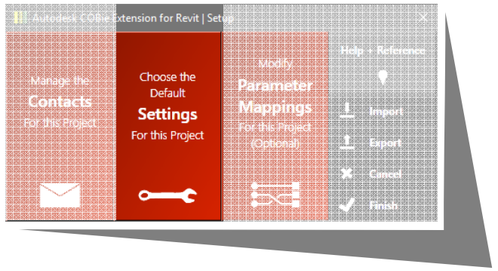
Standard COBie Extension naming tool



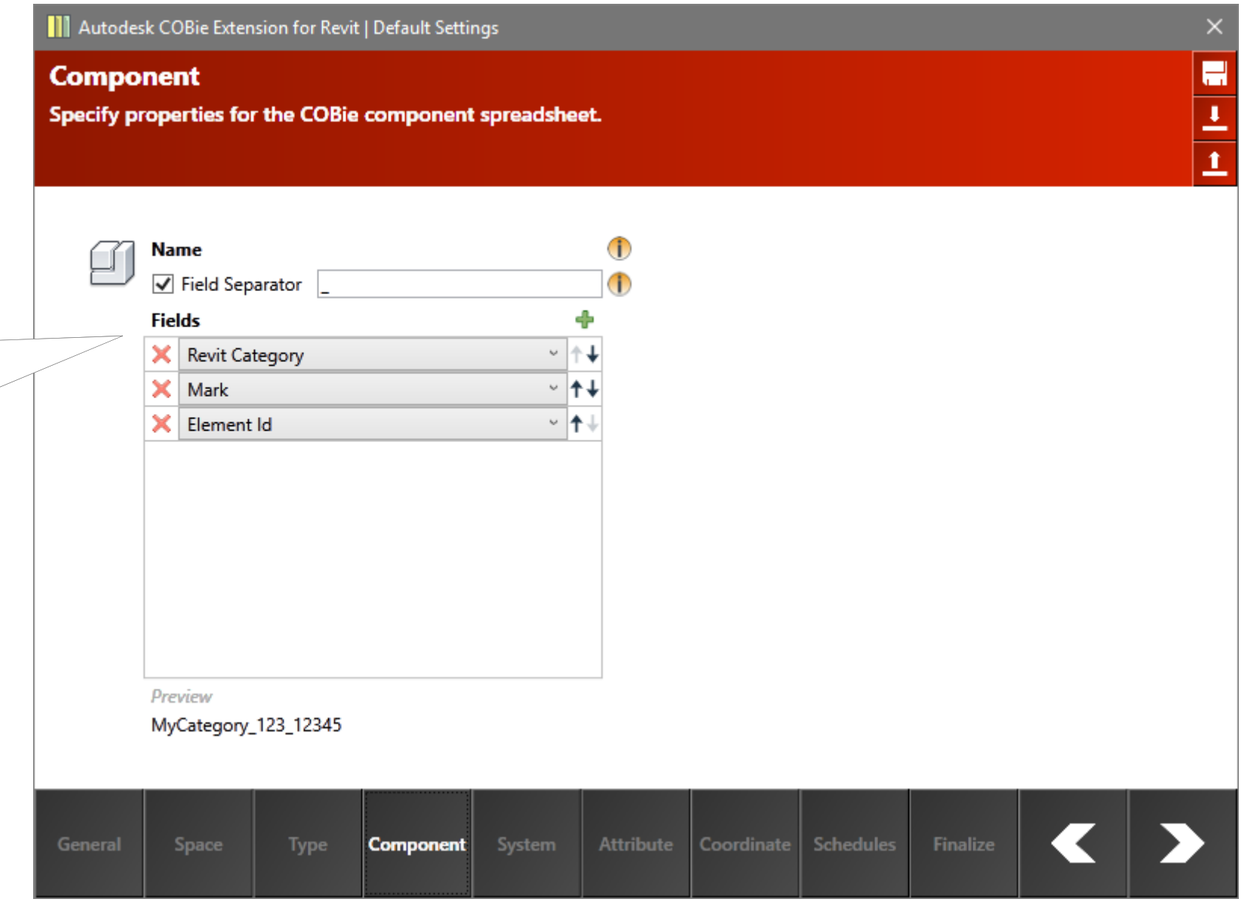
Sets the priority order; can be used to link with Classification Manager

Autodesk COBie Extension for Revit

Basic Use > Setup > Settings > Component

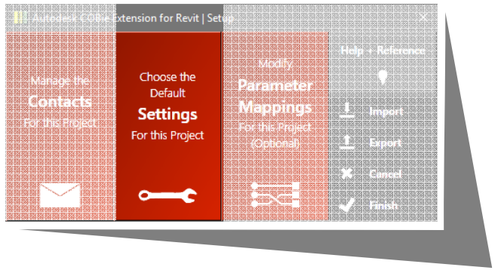


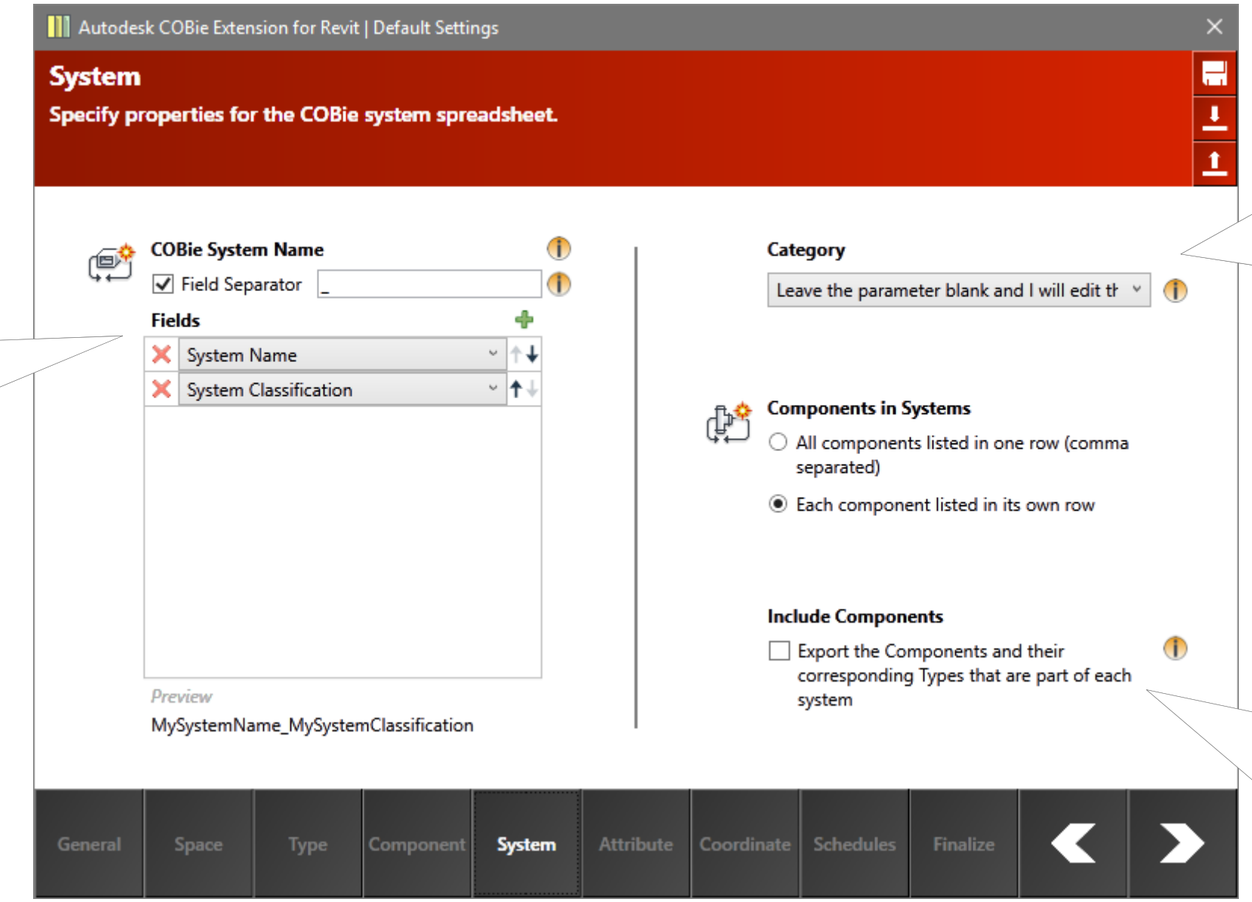
Standard COBie Extension naming tool



Autodesk COBie Extension for Revit

Basic Use > Setup > Settings > System





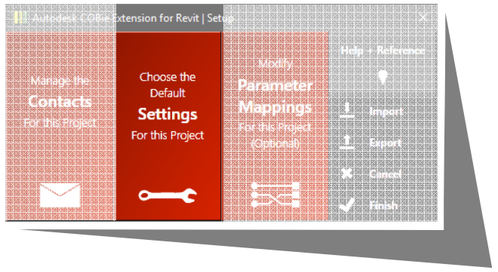
Standard COBie Extension naming tool

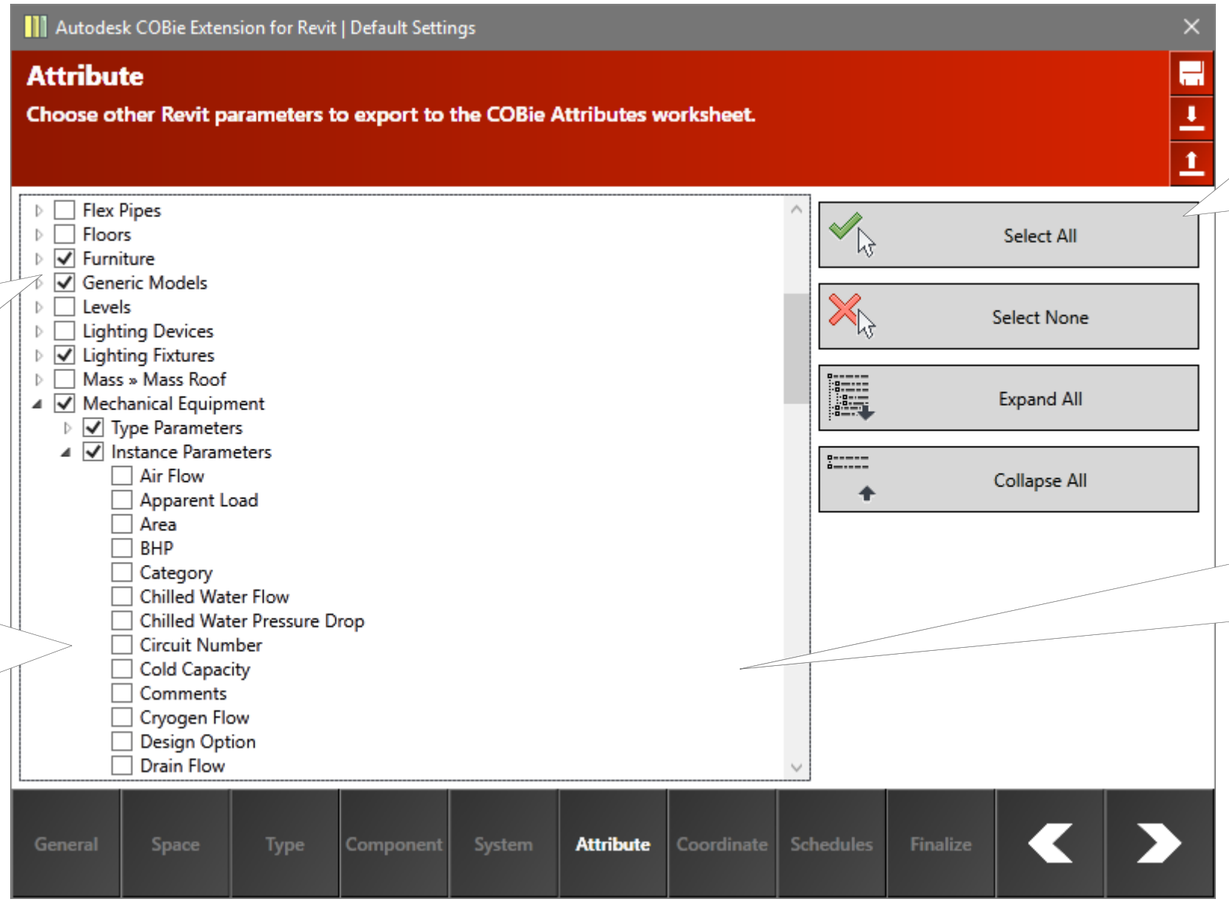
‘Category’ field ties directly to Classification Manager, if installed

This is a great QC check, but be careful as you can quickly export non-compliant elements

Autodesk COBie Extension for Revit

Basic Use > Setup > Settings > Attribute





Broken down by family category, then type vs instance

This is a great way to see what parameters are mapped to what categories in any model

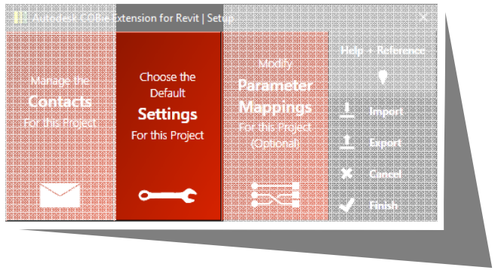
Use these tools to help you quickly select

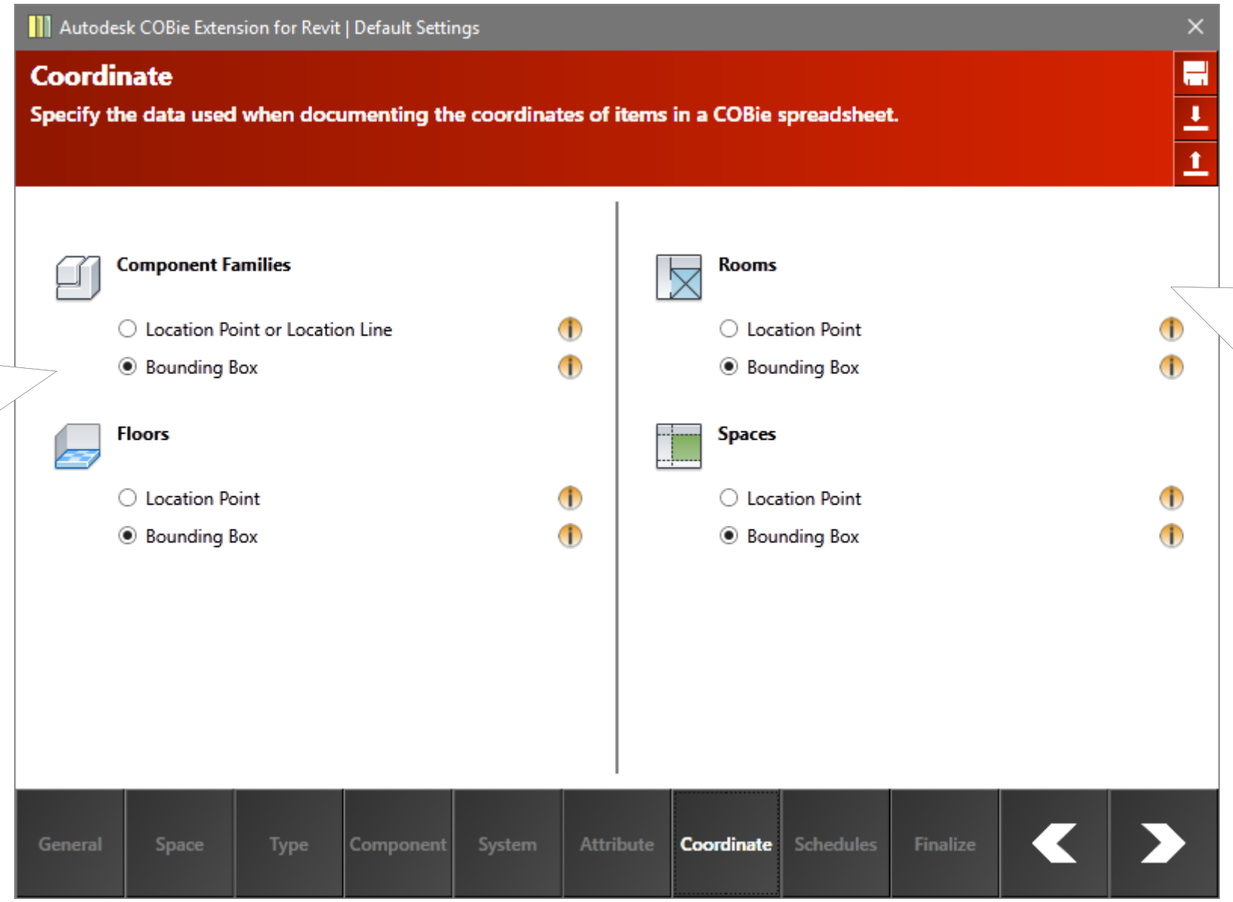
Be careful to only select the ones you need

!

Autodesk COBie Extension for Revit

Basic Use > Setup > Settings > Coordinate



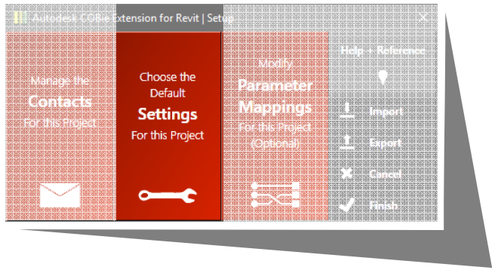


Coordinates are not required and may actually be removed from future versions of COBie

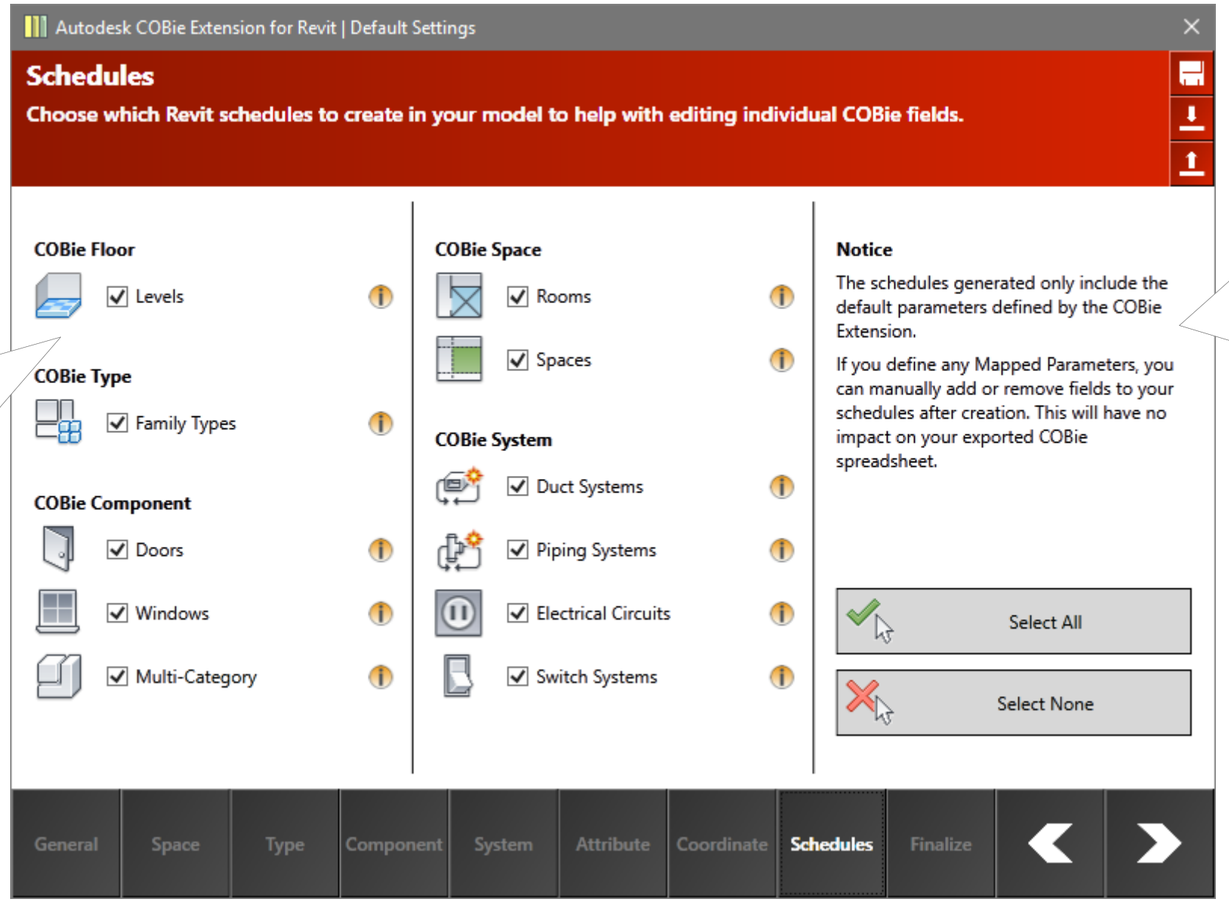
They report the X,Y,Z positions of either insertion points of elements or their overall extents

Autodesk COBie Extension for Revit

Basic Use > Setup > Settings > Schedules



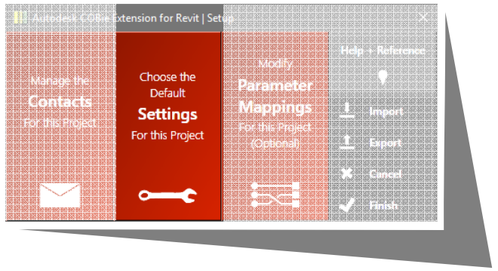
Schedules are not necessary to export from the COBie Extension – they just help with editing values

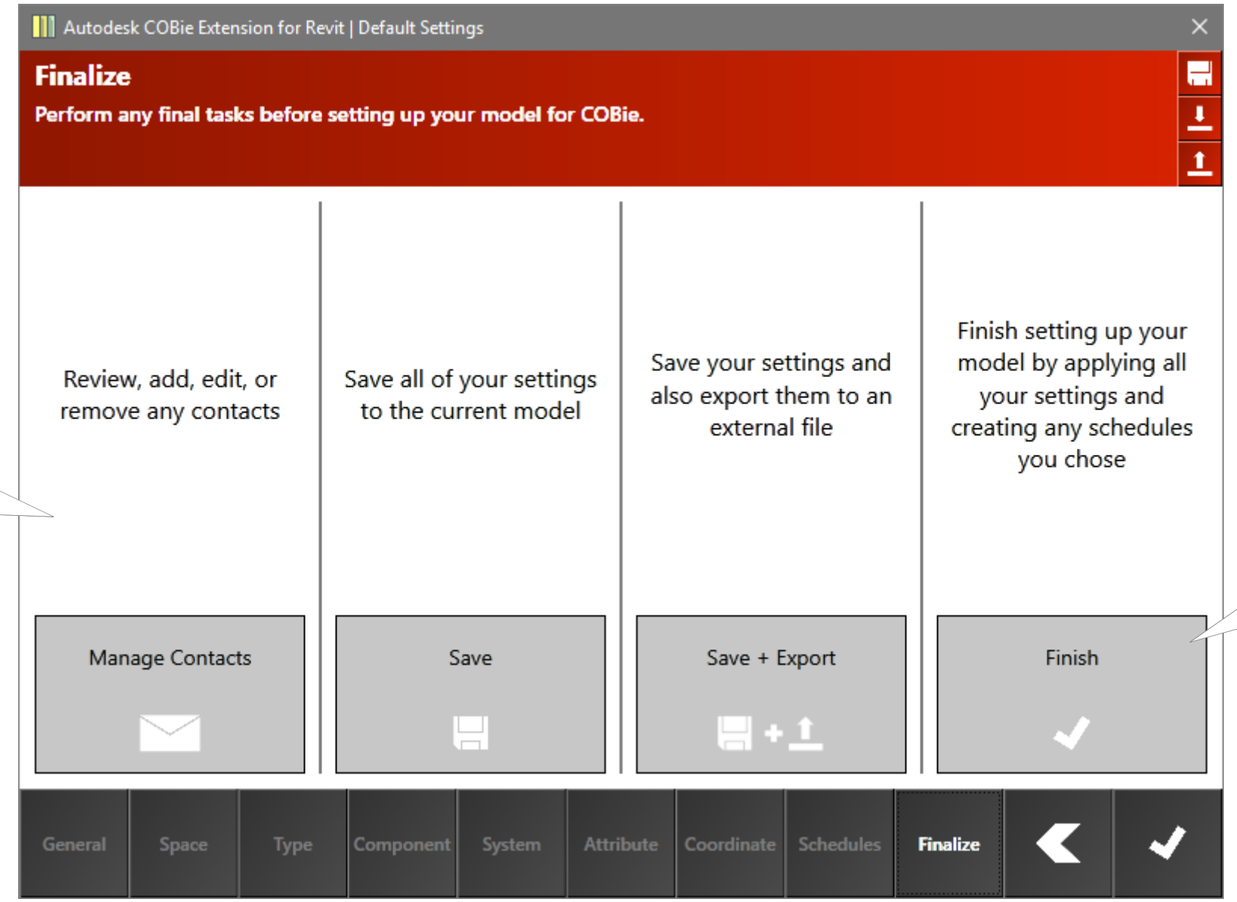


These do not work with any parameters you may have mapped

Autodesk COBie Extension for Revit

Basic Use > Setup > Settings > Finalize



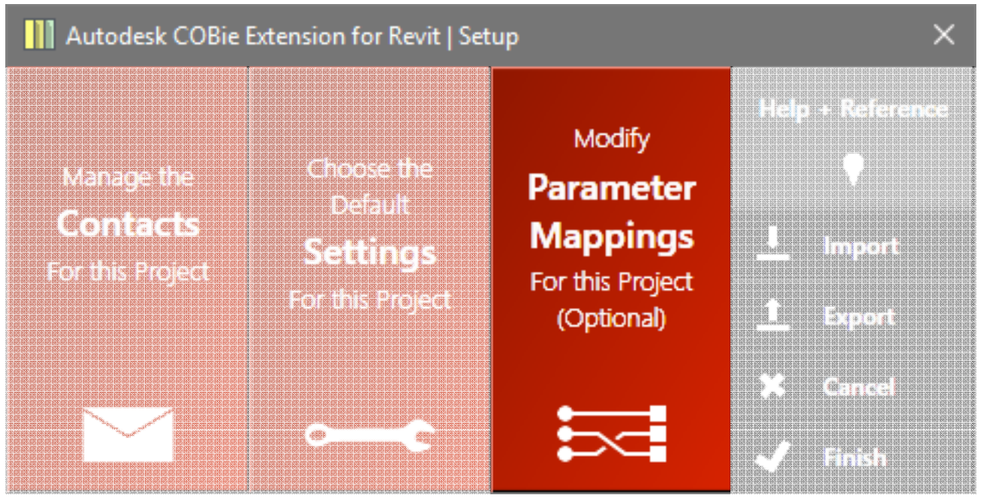


Jump back to Contacts

Saves all your settings to the model

Autodesk COBie Extension for Revit

Basic Use > Setup > Parameter Mappings



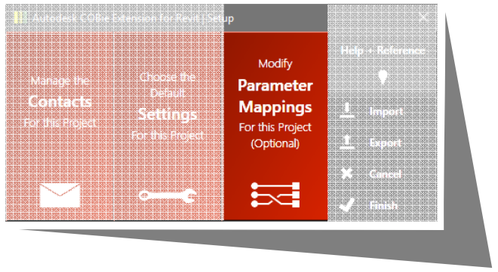
Define your own parameters for exporting this COBie project

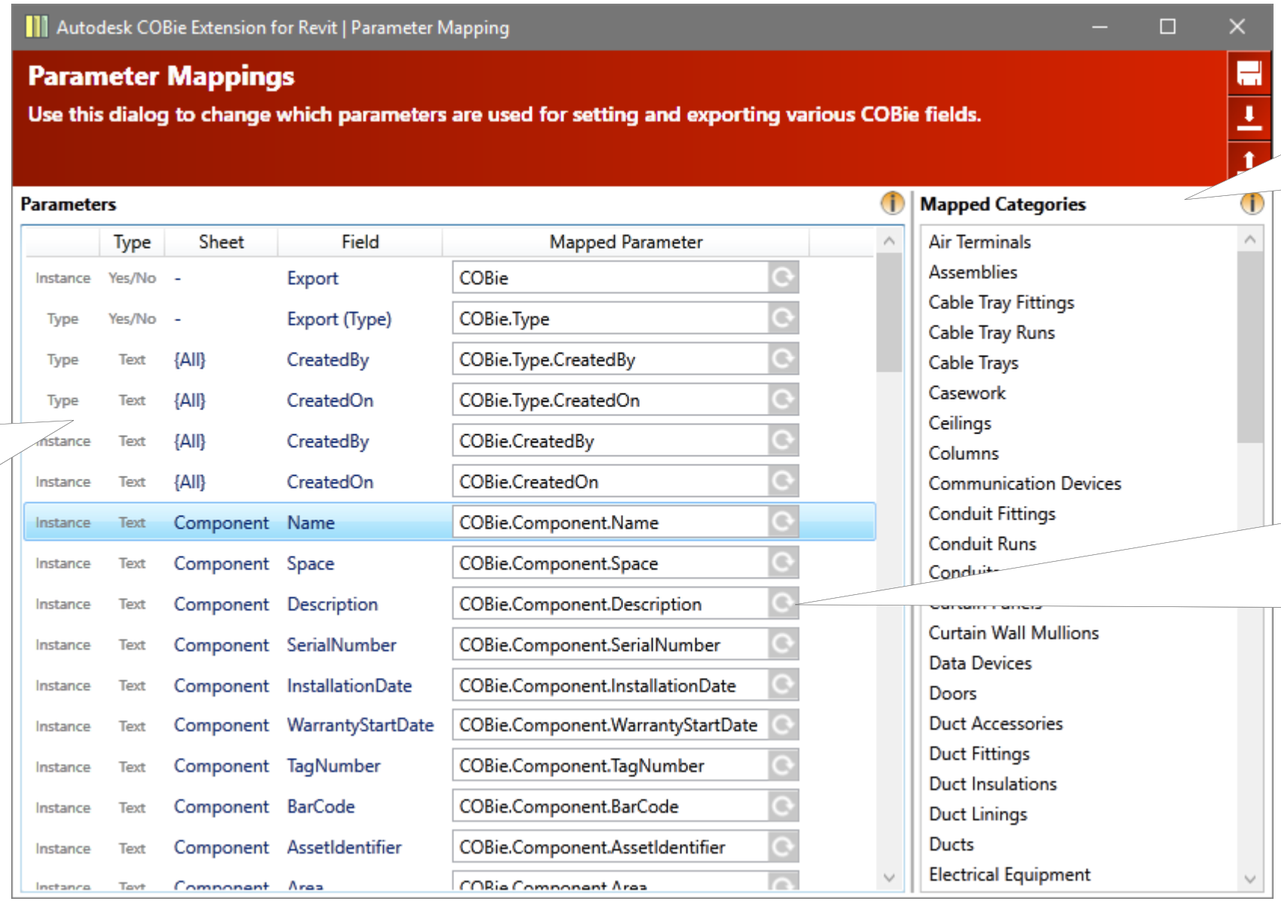
KEY POINTS:

- Project or Shared parameters
- Parameter mapping information saved in Extensible Storage and travels with the model
- COMING SOON!
  - Define your own fields for unique ID's
  - Concatenate multiple parameters

Autodesk COBie Extension for Revit

Basic Use > Setup > Parameter Mappings





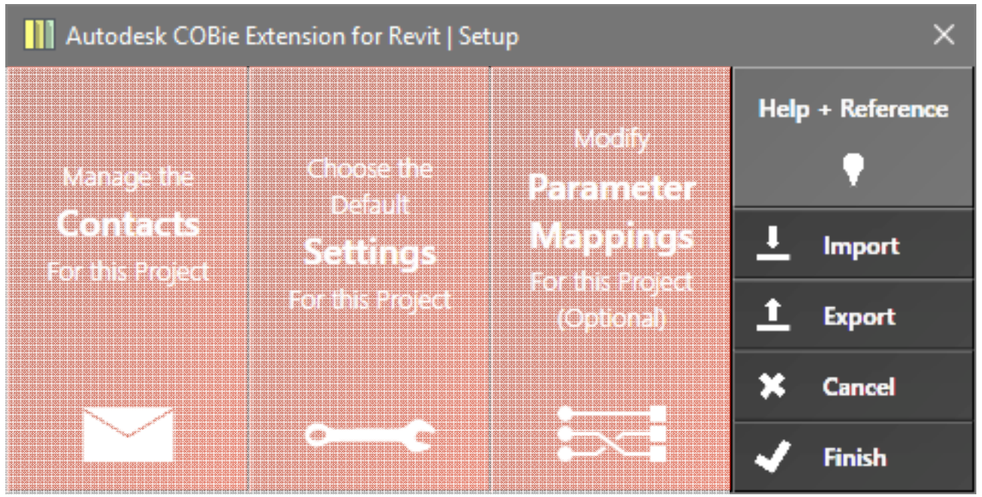
Parameter information such as instance vs type, format, and COBie worksheet

Shows you which categories to map to

Revert back to default parameter, all of which are formatted as: COBie.XX.XX

Autodesk COBie Extension for Revit

Basic Use > Setup > Import/Export



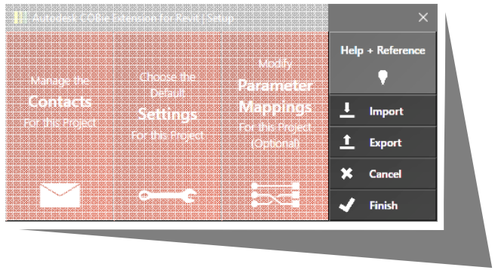
Save all your settings to an external XML file to import into other COBie projects

KEY POINTS:

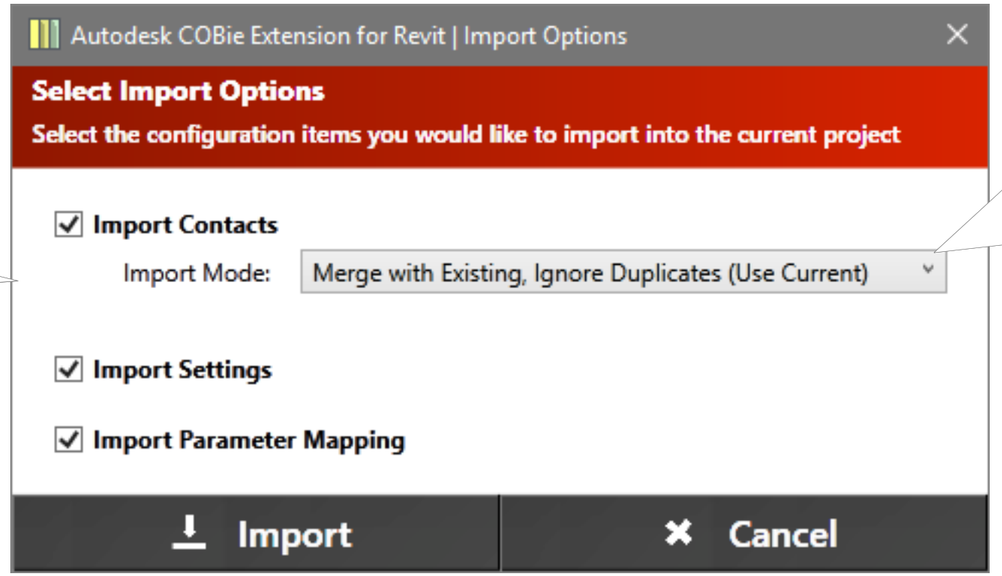
- Can save Contacts, Settings, and Parameter Mappings, or any combination of the 3
- Saves to an XML file that can be edited manually (if you're careful)
- Same icons exist in upper-right of every dialog in Setup

Autodesk COBie Extension for Revit

Basic Use > Setup > Import/Export



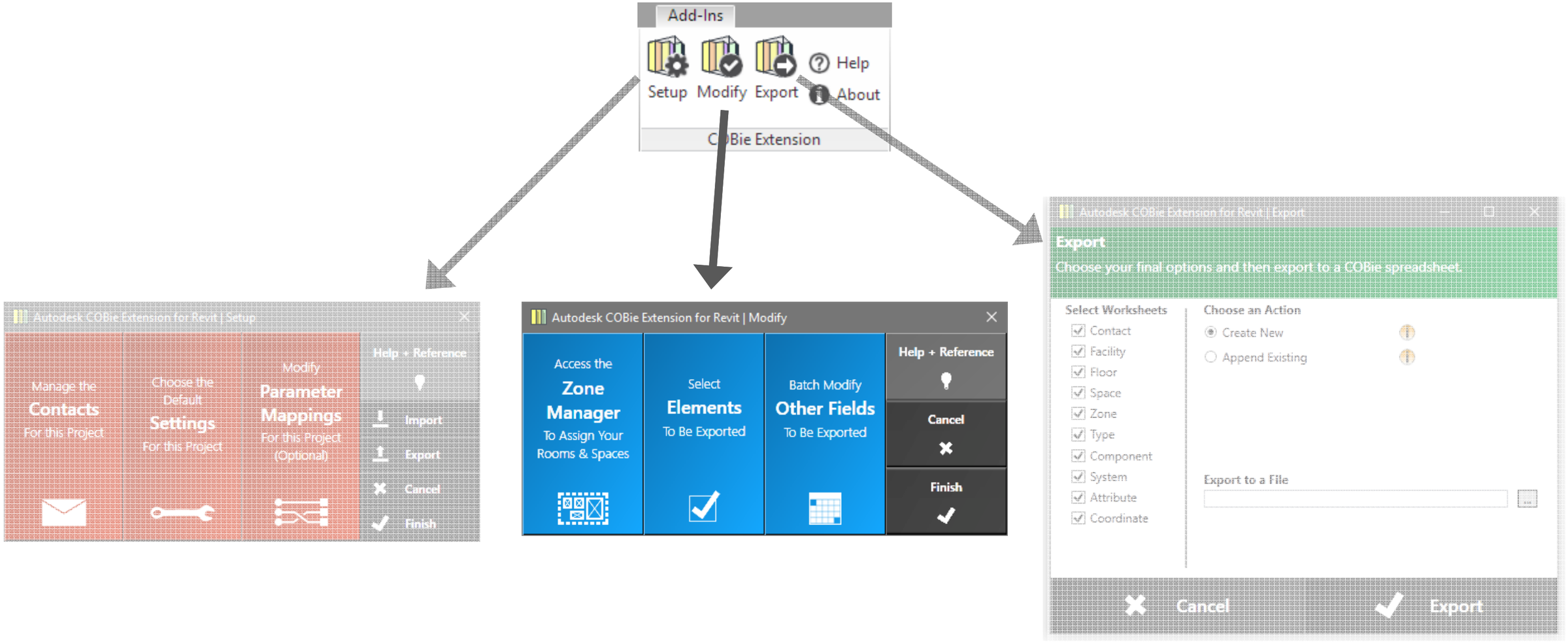
Choose which settings to import



Intelligence built in to help when there are already saved settings:
- Replace
- Merge, delete duplicates
- Merge, keep duplicates

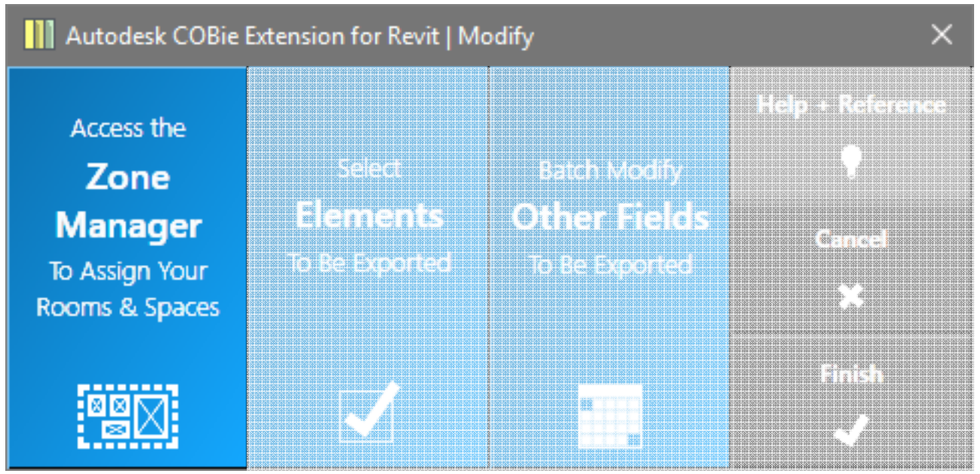
Autodesk COBie Extension for Revit

Basic Use > Modify



Autodesk COBie Extension for Revit

Basic Use > Modify > Zone Manager



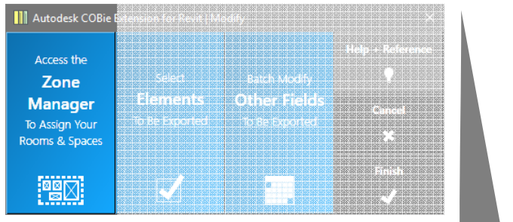
Define your COBie Zones and assign Rooms/Spaces to them

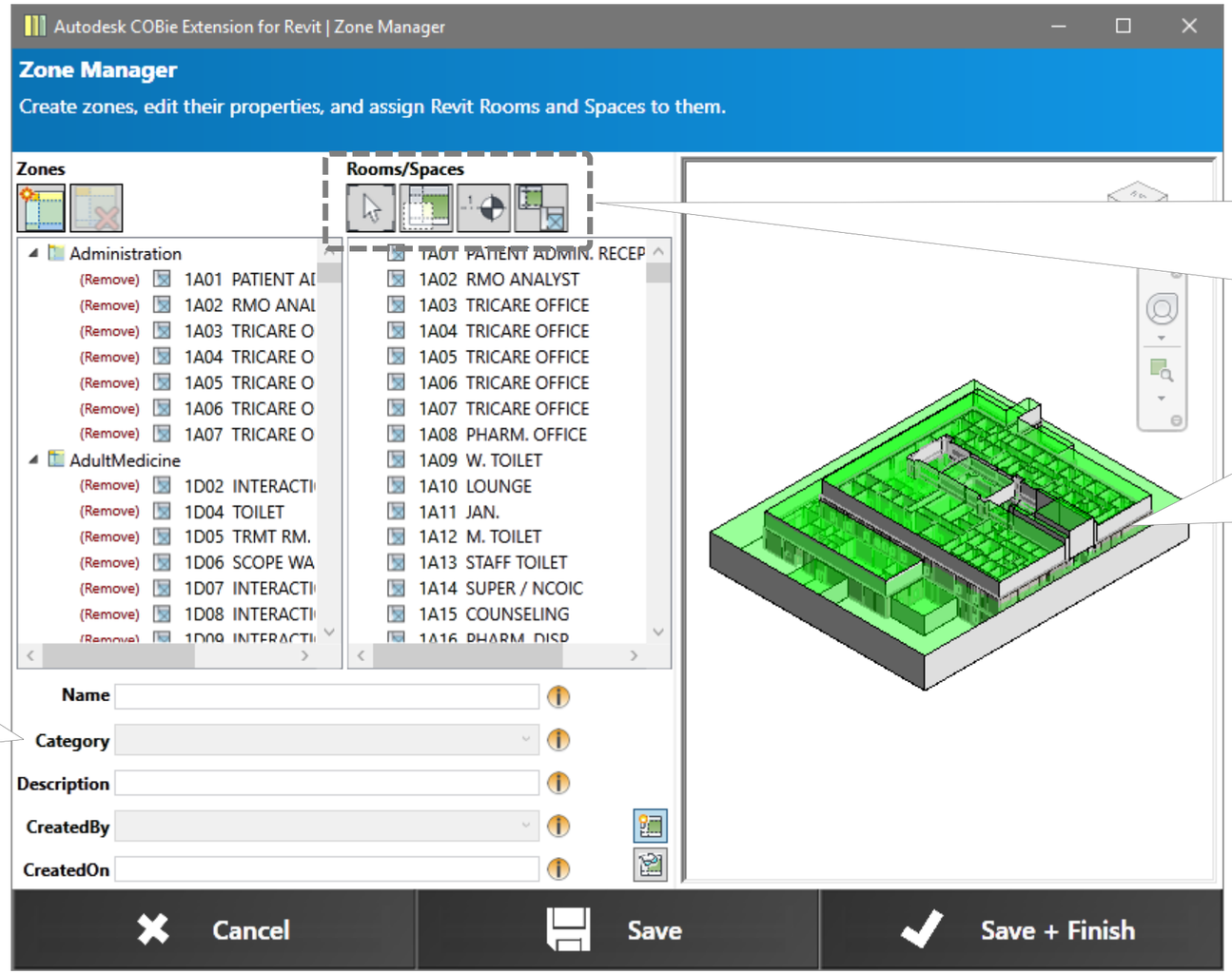
KEY POINTS:

- Allows you to assign a Room or Space to more than one Zone
- Great tool on its own to visualize in 3D Rooms and Zones
- Zone information saved in Extensible Storage and travels with the model
- COMING SOON!
  - Multiple drag-and-drop

Autodesk COBie Extension for Revit

Basic Use > Modify > Zone Manager





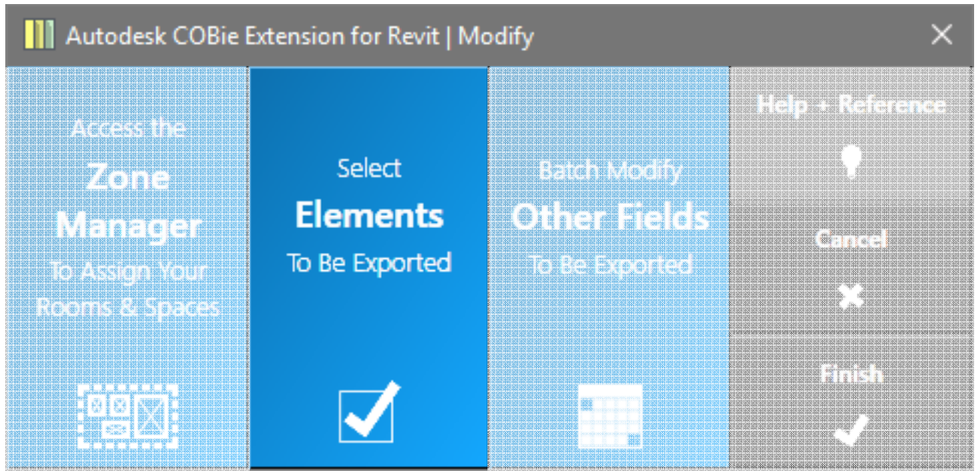
Great filter tools allow you to show Rooms/Spaces not used, by level, or just one or the other

You will be prompted whether or not you want to load the preview

‘Category’ list only shows those allowed with COBie

Autodesk COBie Extension for Revit

Basic Use > Modify > Elements



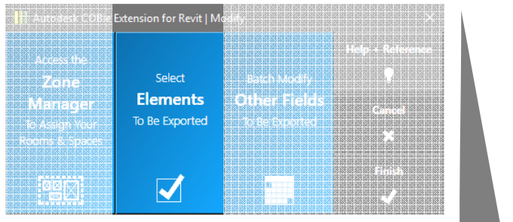
Select the elements you want to export to a COBie spreadsheet

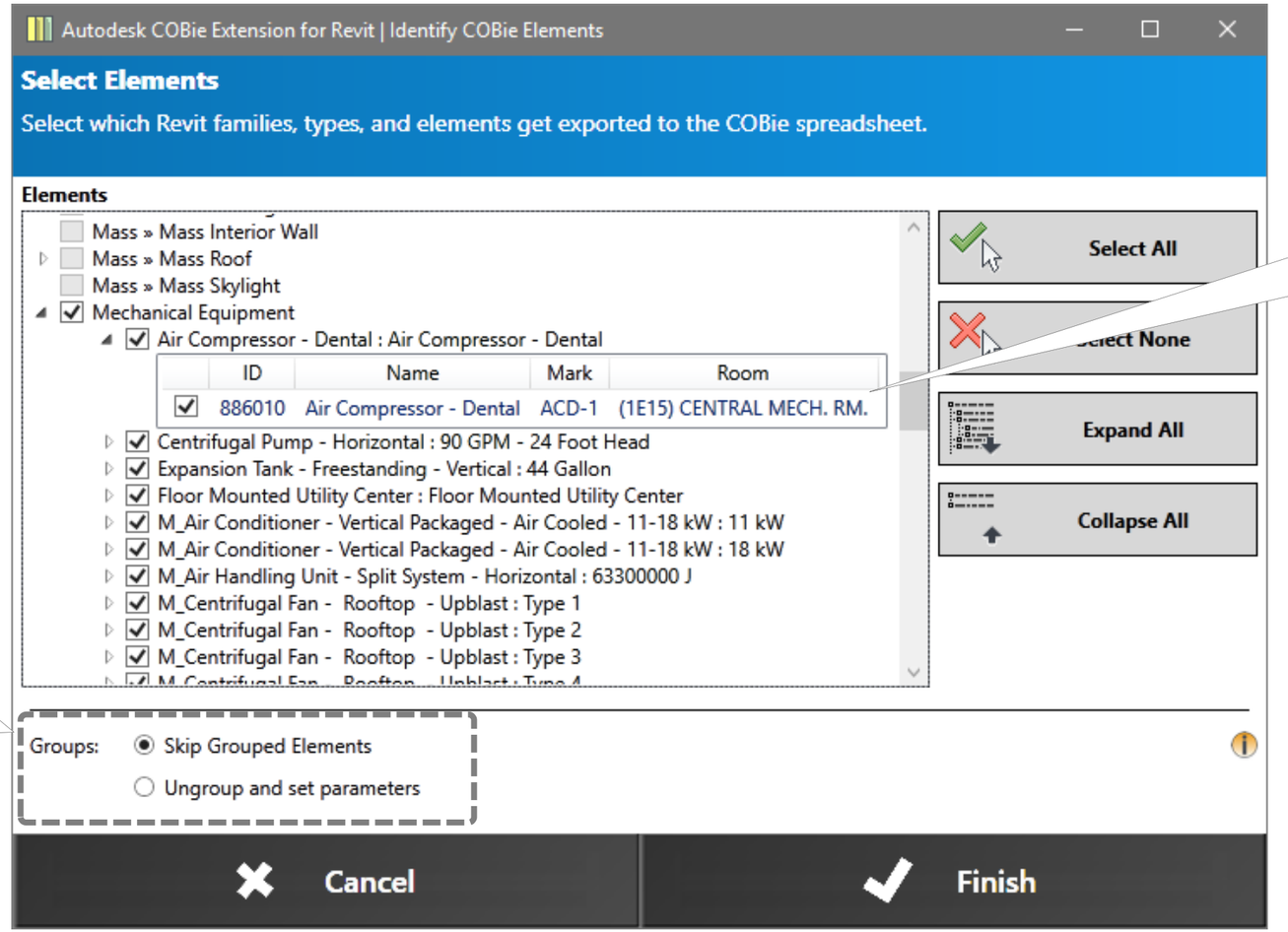
KEY POINTS:

- Simply an easier way to check or uncheck the “COBie” and “COBie.Type” yes/no parameters
- Shows family category, family, type, and instances
- This step is often missed by users and results in nothing exported

Autodesk COBie Extension for Revit

Basic Use > Modify > Elements



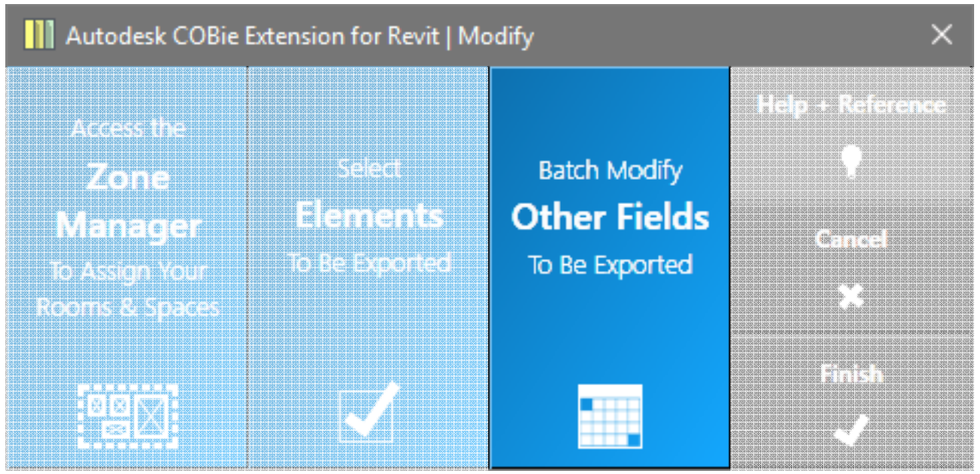


Notice the Room information

The API does not like Groups

Autodesk COBie Extension for Revit

Basic Use > Modify > Other Fields



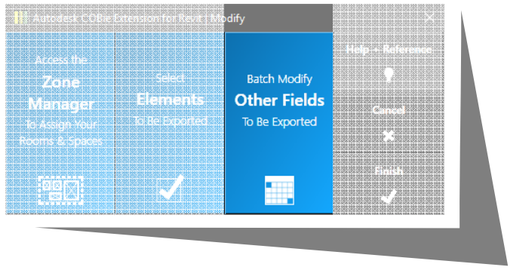
Batch edit some of the parameters of all your COBie elements at once

KEY POINTS:

- COBie Extension only exports from COBie parameters
  - Unless you designate other in parameter mapping
  - So you have to run this step or will not get any data in your COBie spreadsheet
- Batch copies data from standard parameters to COBie parameters
- Some COBie parameters are populated by concatenating values from several other Revit parameters

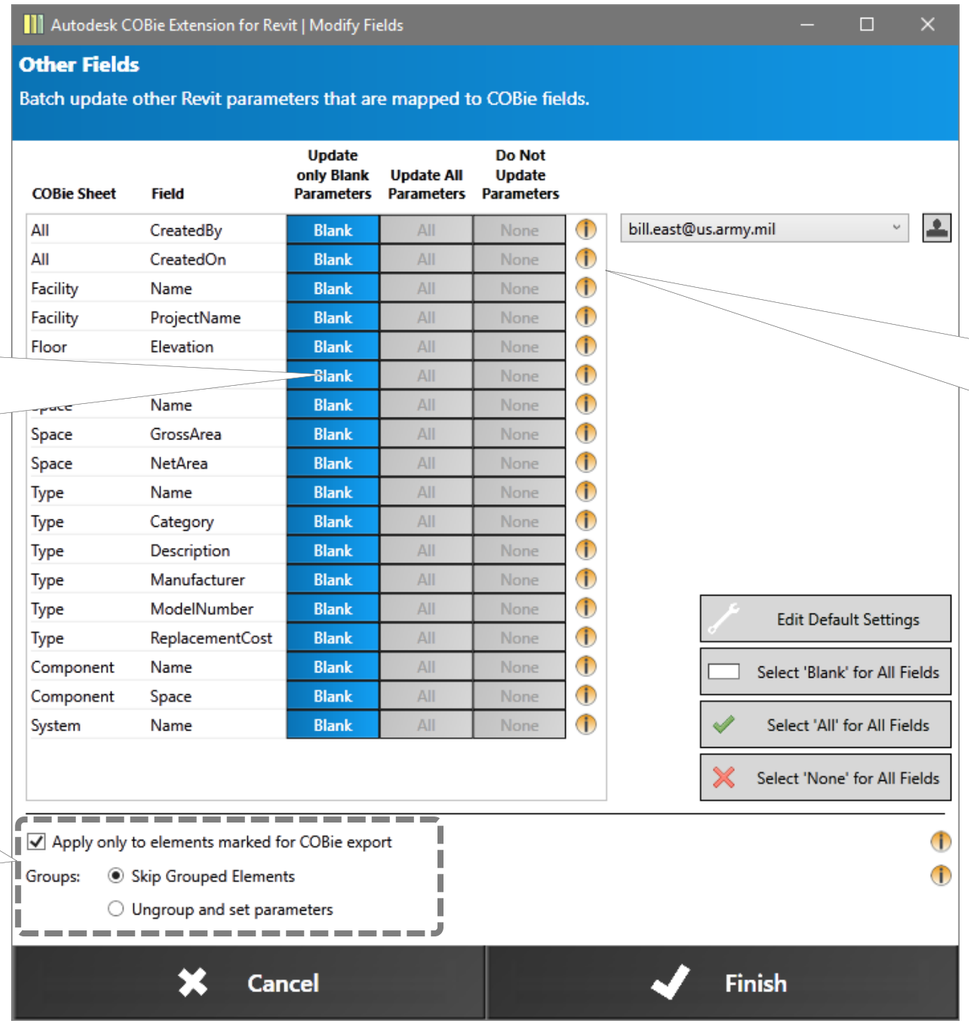
Autodesk COBie Extension for Revit

Basic Use > Modify > Other Fields



Choose whether to only fill in blank fields, overwrite data already in fields, or skip

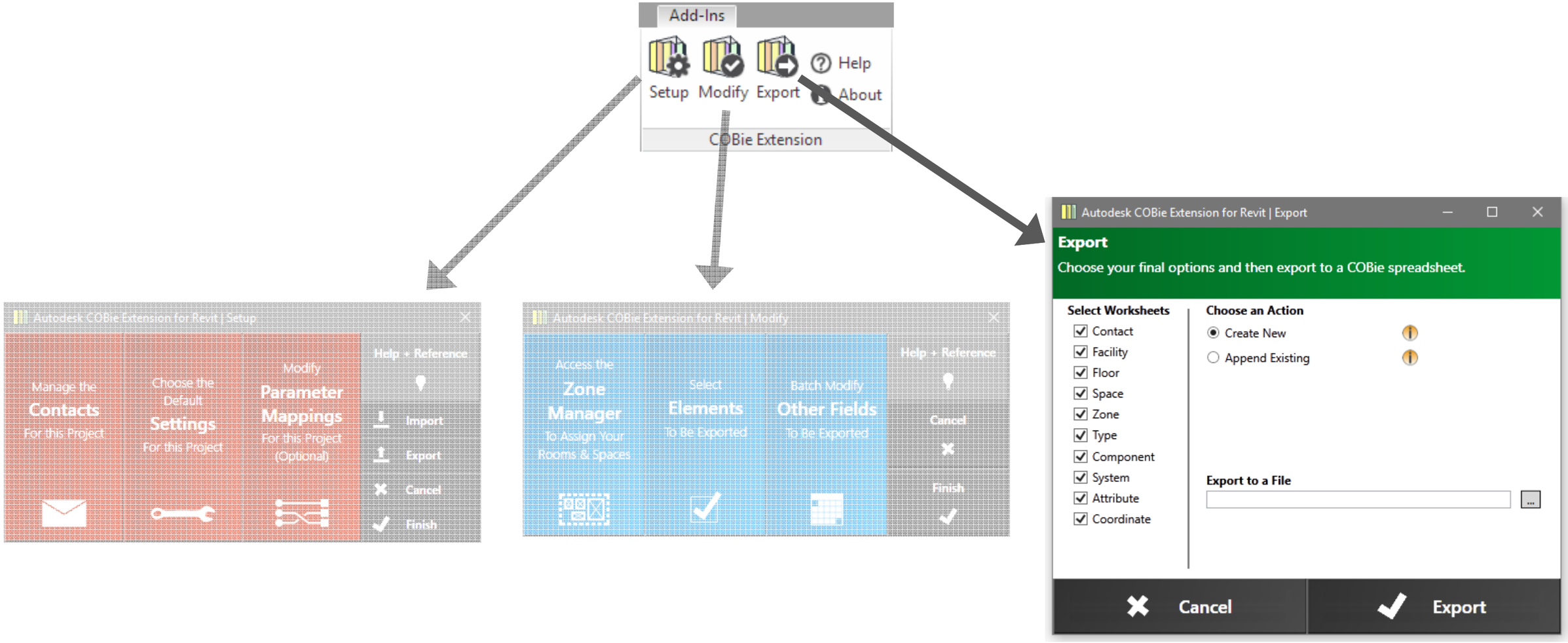
The API still does not like Groups



Here's how to get the date/time stamp and email assigned

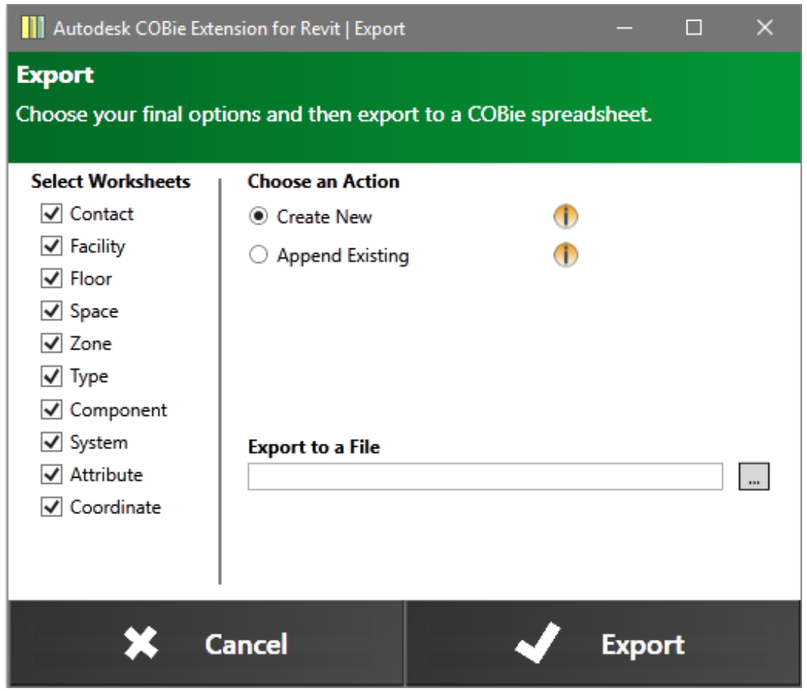
Autodesk COBie Extension for Revit

Basic Use > Export



Autodesk COBie Extension for Revit

Basic Use > Export



Export your COBie project to an Excel file

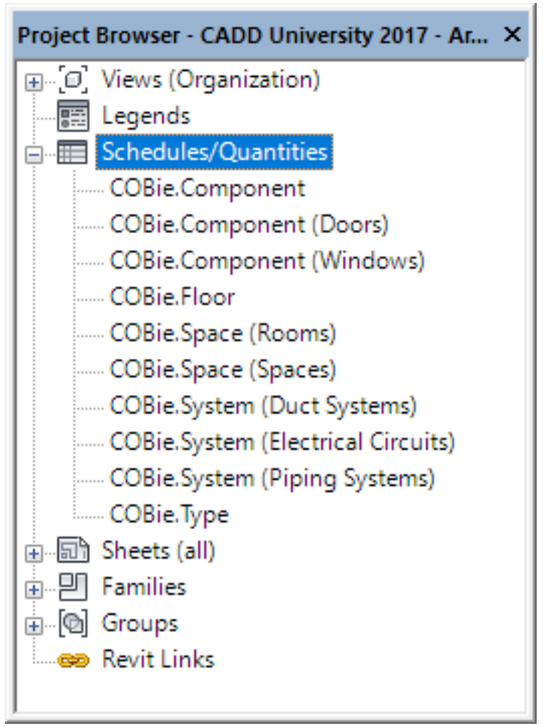
KEY POINTS:

- You can select whichever sheets you want to export
- Often, it is easier to export Type and Component sheets separately
- "Create New" uses the Excel template in the install folder…you can replace with your own
- "Append" does not check for duplicates
- COMING SOON!
  - Export COBie data from linked files

Autodesk COBie Extension for Revit

Deeper Dive

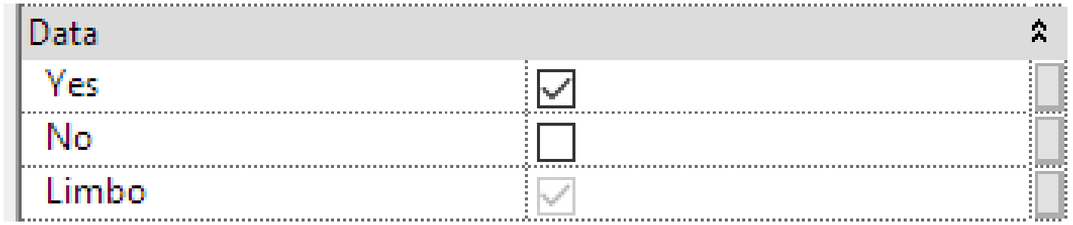
- Schedules vs Parameter Data
  - The COBie Extension does not export the schedules you can create during Setup
  - Those schedules are just to help you edit data and can be modified or deleted
  - They do not work with mapped parameters, but can be manually modified to do so



Autodesk COBie Extension for Revit

Deeper Dive

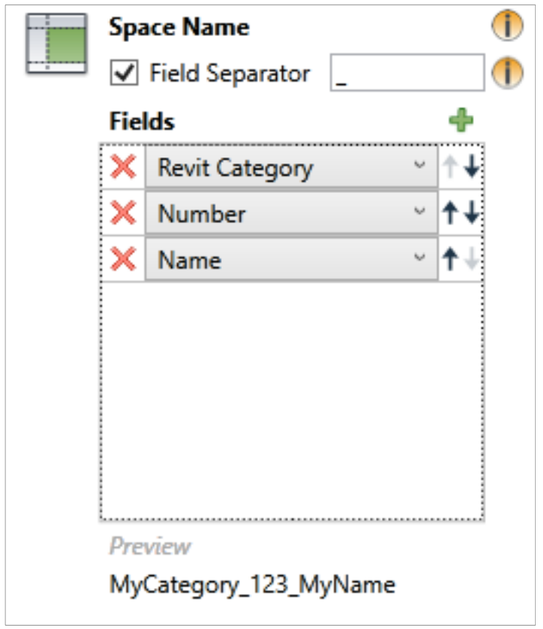
- Selecting Elements for Export
  - Only elements with the “COBie” or “COBie.Type” yes/no parameter checked on will export
  - You can batch do this with Modify > Elements
  - Beware of the fake “yes” parameter, which is a gray check and not a black one



Autodesk COBie Extension for Revit

Deeper Dive

- Spaces in COBie vs Spaces/Rooms in Revit
  - COBie only uses 1 element to track location, but Revit uses 2
  - Because of this, you have to designate the correct one in Settings
  - When defining naming convention for COBie Spaces, consider adding family category to keep them unique



TJ

Introduction to Classification Systems

Introduction to Classification Systems

The Big Three

Systems	Materials	Products
▪ Ideal for estimates and initial design ▪ What the architects and engineers want to know	▪ Ideal for organizing the work to be executed ▪ What the contractor wants to know	▪ Ideal for understanding specific items ▪ What the building engineer wants to know
OmniClass Table 21 / UniFormat	OmniClass Table 22 / MasterFormat	OmniClass Table 23
Uniclass 2015 Table Ss (Systems)	Uniclass 2015 Table En (Entities)	Uniclass 2015 Table Pr (Products)

Introduction to Classification Systems

Complimentary Systems

Facilities	Spaces	People
▪ Classify the overall facility / building	▪ Classify each type of room or space	▪ Classify the people involved with the project
OmniClass Table 11 Uniclass 2015 Table Co (Complexes)	OmniClass Table 13 Uniclass 2015 Table SL (Spaces)	OmniClass Table 34 Uniclass 2015 Table PM

Introduction to Classification Systems

Other Classification Systems

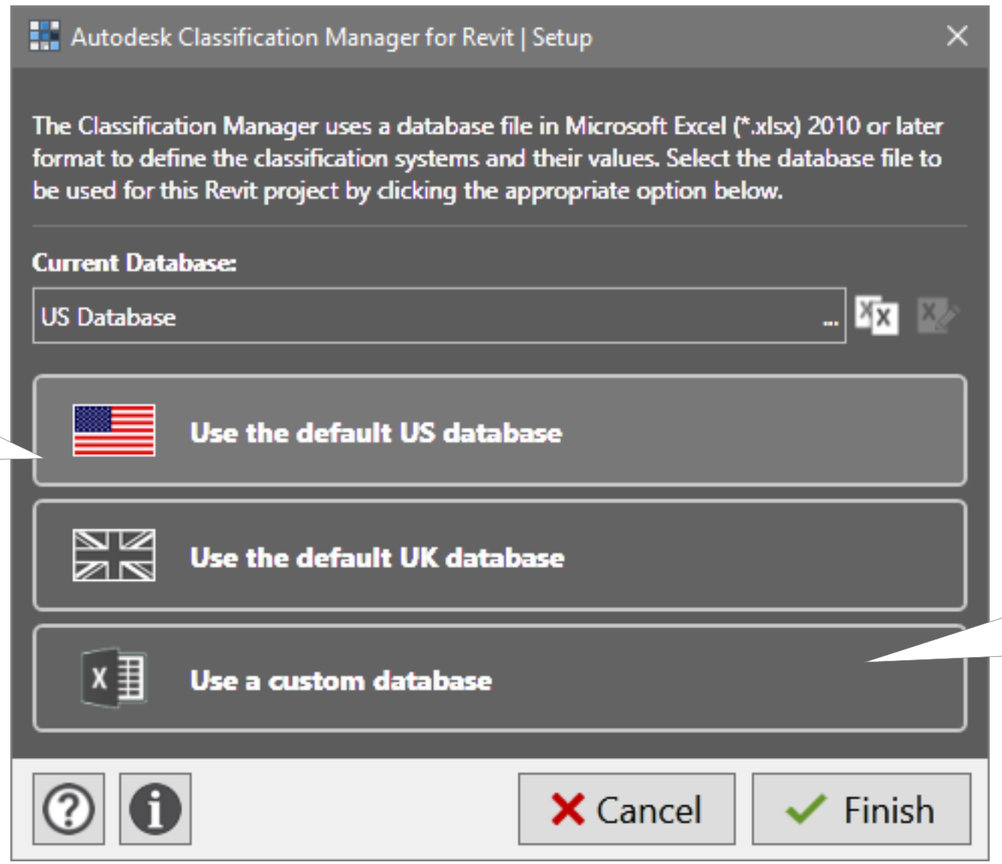
- Older versions of Uniclass
  - Version 2 (Uniclass2) and Version 1.4
- BOMA
  - Building Owners and Managers Association
  - Space classifications
- NATSPEC
  - Australia

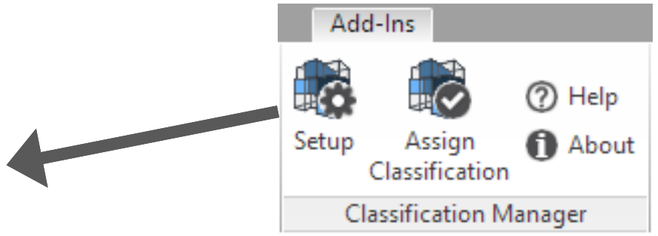
JK

Autodesk Classification Manager for Revit

Autodesk Classification Manager for Revit

Basic Use > Setup





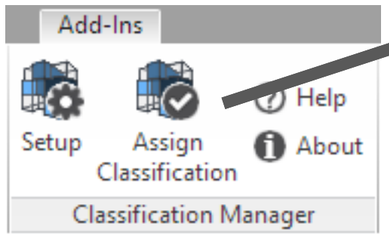
The US and UK Excel databases are in the install folder and can be edited

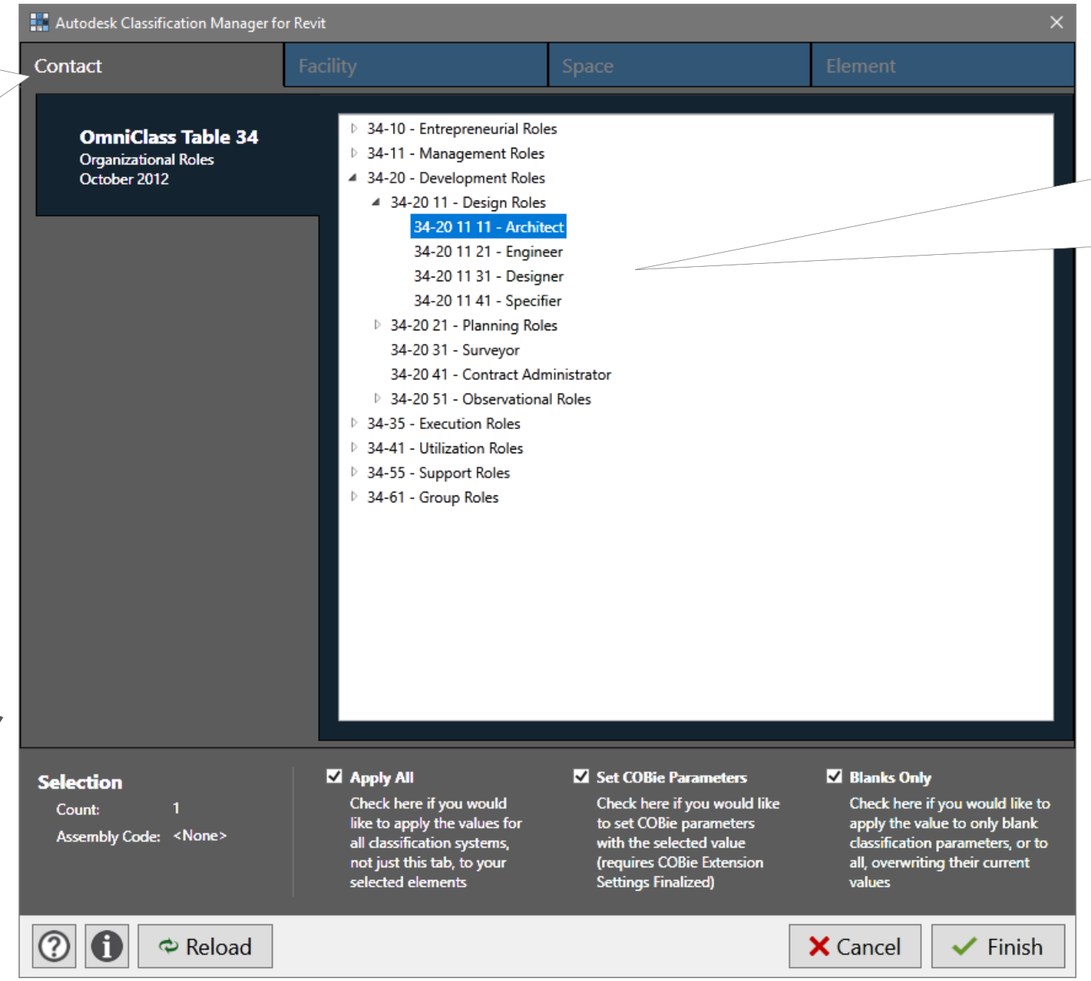
Browse to any properly formatted Excel database (more on that later)

Autodesk Classification Manager for Revit

Basic Use > Assign Classification > Contact

The ‘Contact’ tab will only show when editing contacts through the COBie Extension



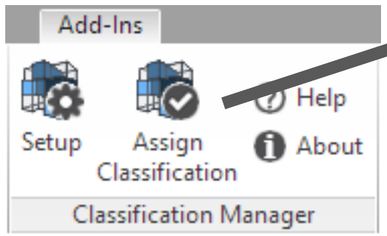


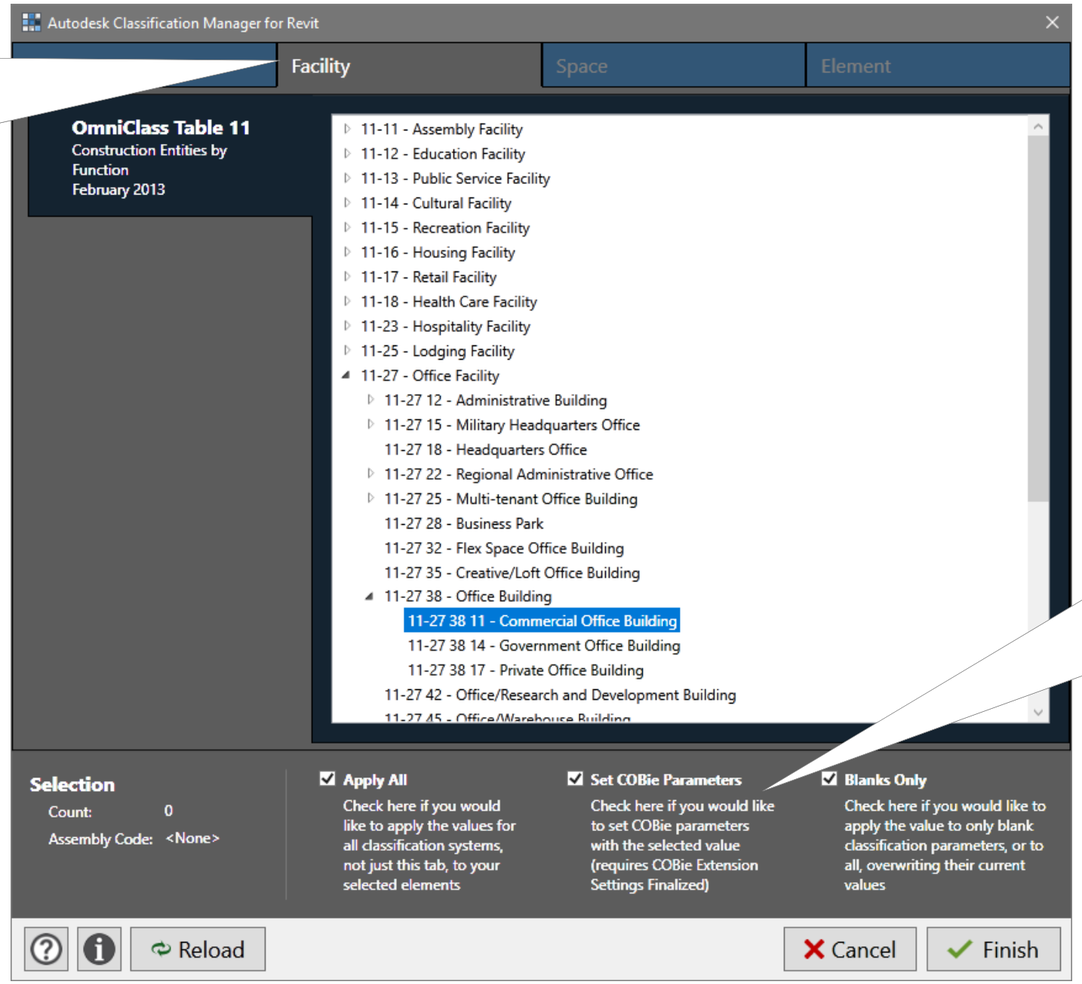
Same data selection interface as Revit Assembly Code and OmniClass

Autodesk Classification Manager for Revit

Basic Use > Assign Classification > Facility

The ‘Facility’ tab will always show, whether or not anything is selected





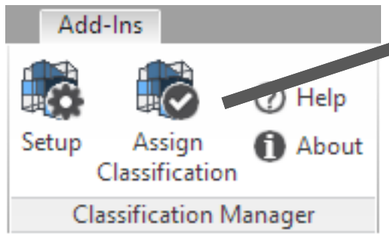
Checking the “Set COBie Parameters” box will automatically populate the appropriate COBie Extension paramters

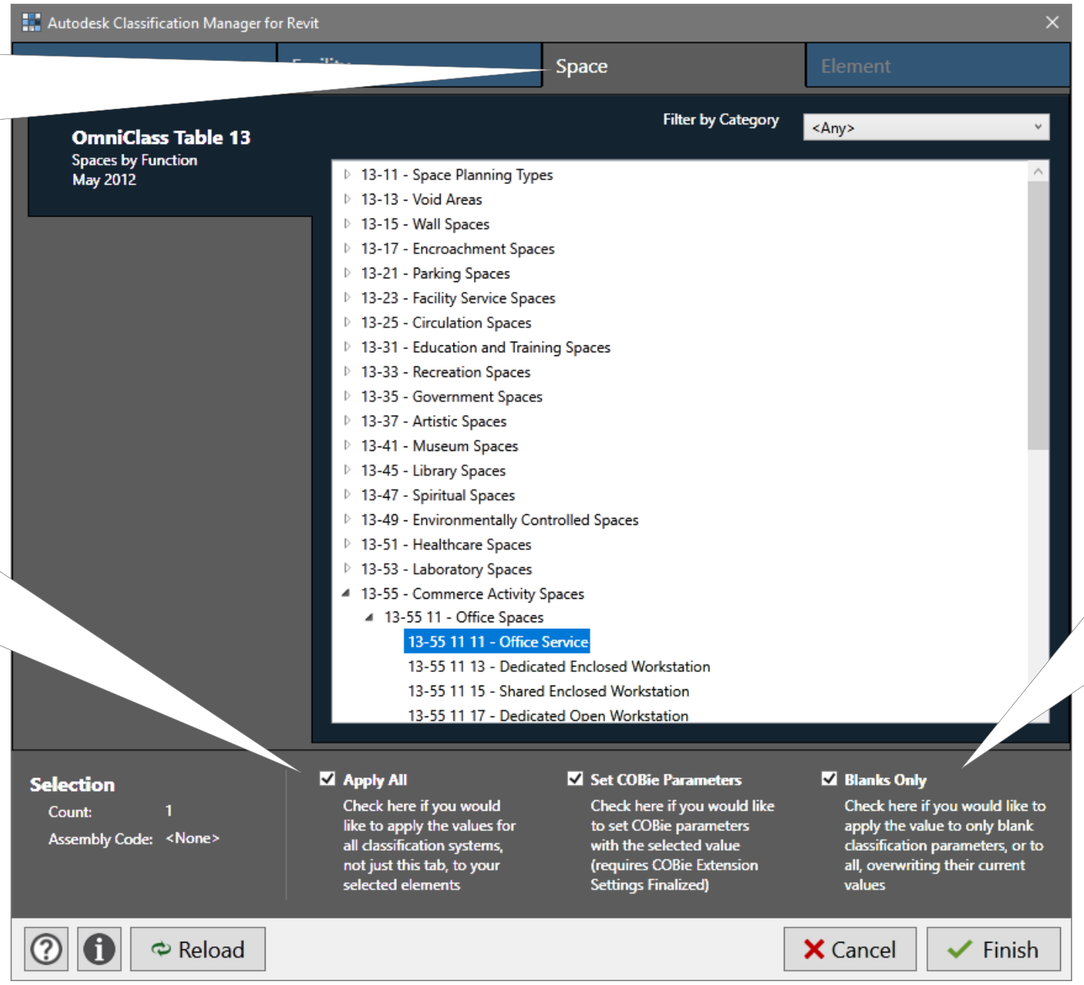
Autodesk Classification Manager for Revit

Basic Use > Assign Classification > Space

The ‘Space’ tab will only show when Rooms and/or Spaces are selected

Check the “Apply All” box to apply equivalent values for all classification tables listed





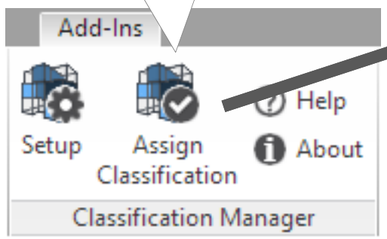
Checking the “Blanks Only” box will not change any already populated values in the selected elements

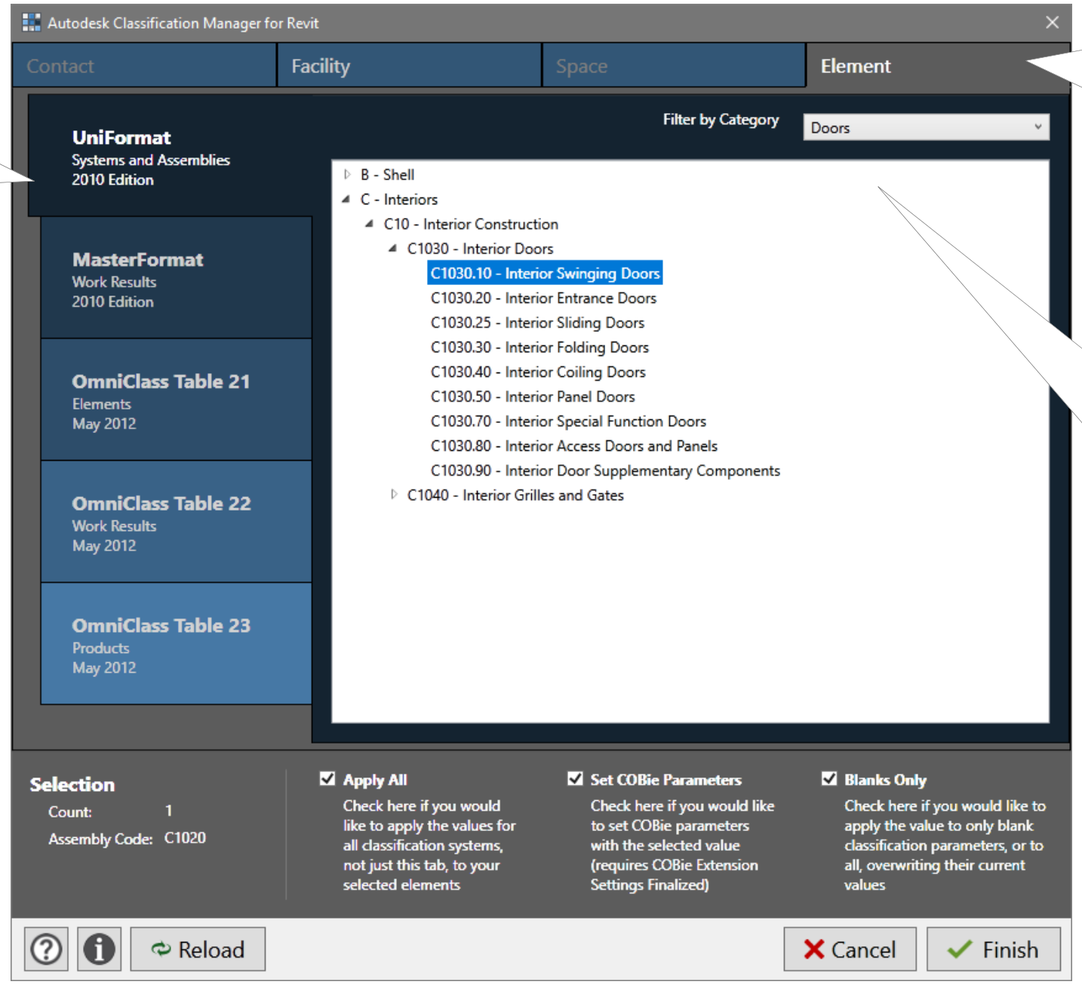
Autodesk Classification Manager for Revit

Basic Use > Assign Classification > Element

You can have up to 5 classification tables for Element

You can assign a Keyboard Shortcut to the “AssignClassification” command





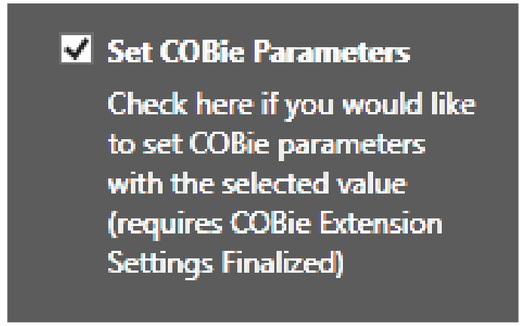
The ‘Element’ tab show whenever you select Revit elements

Use the “Filter by Category” option to only show database values related to a specific family category

Autodesk Classification Manager for Revit

Deeper Dive

- Integrating with COBie Extension
  (pick 1 method below, in order of preference)
  - Method 1: check the CE box in CM
  - Method 2: choose in CE settings
  - Method 3: use parameter mapping in CE
  - Method 4: modify the parameter names in the CM database



Autodesk Classification Manager for Revit

Deeper Dive

- Custom Classification Manager Database Files
  - You **CAN** edit = header information, data in rows
  - You **CANNOT** edit = header information titles, column headers
  - Number and Description = main data columns…add values to these rows
  - Level = family category code (see instructions tab)

	A	B	C	D	E	F	G	H
1	Title	**OmniClass Table 21**						
2	Description	**Elements**						
3	Version	**May 2012**						
4	Function	**Element**						
5	Number Parameter	**Classification.OmniClass.21.Number**						
6	Description Parameter	**Classification.OmniClass.21.Description**						
7	**NUMBER**	**DESCRIPTION**	**LEVEL**	**REVIT CATEGOI**	**UniFormat**	**MasterFormat**	**OmniClass Table 22**	**OmniClass Table 23**
245	21-04 10 80	Operable Access Systems	4		D1080	14 81 00	22-14 81	N/A
246	21-04 10 80 10	Suspended Scaffolding	5		D1080.10	14 81 00	22-14 81	N/A
247	21-04 10 80 20	Rope Climbers	5		D1080.20	14 82 00	22-14 82	N/A
248	21-04 10 80 30	Elevating Platforms	5		D1080.30	14 83 00	22-14 83	N/A
249	21-04 10 80 40	Powered Scaffolding	5		D1080.40	**Multiple Values**	**Multiple Values**	N/A
250	21-04 10 80 50	Building Envelope Access	5		D1080.50	11 24 23	22-11 24 23	N/A

Autodesk Classification Manager for Revit

Deeper Dive

- Update Revit's UniFormat and OmniClass Database Files
  - Text files that can be replaced
  - Copy data in CM Excel file and paste into Notepad?
- Assembly Code
  - Shown in Type definitions
  - Point to any text file in Manage > Other

```
C:\ProgramData\Autodesk\RVT 2017\Libraries\US Imperial\UniformatClassifications.txt
```

- OmniClass
  - Shown in family definitions

```
C:\ProgramData\Autodesk\RVT 2017\UserDataCache\OmniClassTaxonomy.txt
```

Autodesk Classification Manager for Revit

Deeper Dive

- Using Classification Manager for Picklists
  - Revit is not able to create a drop-down list of pre-defined values for parameters
  - Key Schedules only work with one family category and only for custom parameters, not standard ones

- Example: Fire Rating
  - Create a pre-defined list that can fill in the ‘Fire Rating’ parameter for both Doors and Walls
  - Avoid the “1 HR.”, “1 hour”, “One hr.” dilemma

TJ

Wrap up / Next steps

Wrap up / Next steps

www.biminteroperabilitytools.com

- Installation Files
- Samples
- Help Pages
- Quick Start Guides
- Videos
- and other resources…

Wrap up / Next steps

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