

Autodesk Revit to COBIE Export Utility

What is COBIE?

COBIE or Construction Operations Building Information Exchange, is a data exchange approach sponsored by the U.S. Corps of Engineers. Its aim is to provide a standardized format to capture information developed during the design, construction and commissioning phases of a building project and facilitate the handover of this information in a consistent way to facilities managers for their use in managing and maintaining the building.

For more information, refer to COBIE on the Whole Building Design Guide website:

www.wbdg.org/resources/cobie.php.

Part of the successful data development process for COBIE rests on the AEC professional inputting data within a building information model (BIM) and delivering it electronically to software applications used by facility managers. At present, spreadsheet applications such as Microsoft Excel offer one way to collect and deliver COBIE data. The Revit to COBIE prototype described in this document provides a means to develop COBIE format data within Revit, associated with a model's components during project development, and export it via Revit schedules. Revit can easily accommodate COBIE or any other attribute data through its shared parameter and schedule view capabilities. The user can either develop a Revit model using the supplied COBIE template or modify an existing Revit model to accommodate COBIE attribute values. The workflows for doing so are explained below.

Instructions in Using Revit-2-COBIE

Prepare the Revit files

Unzip the COBIE2_0.zip file, which contains the following files:

Filename	Description
USAF Blank BIM Project.rvt	A blank Revit project that was created using <i>USAF BIM Template.rte</i> . It provides preconfigured Revit schedule views that are to be copied into an existing project, to add COBIE-formatted schedules.
USAF BIM Template.rte <i>(Revit schedule views that correspond to COBIE sheets)</i>	A Revit Template file (.rte) that provides: <i>Revit COBIE-format schedules:</i> <ol style="list-style-type: none">1. 01-Contact2. 02-Facility3. 03-Floor4. 04-Space5. 05-System-Duct Systems6. 05-System-Non Revit Systems7. 05-System-Piping Systems8. 05-System-Electrical Circuits9. 06-Register10. 07-Component

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(Schedules of keys that you can use in other schedules)	<p>Revit schedule keys:</p> <ol style="list-style-type: none"> 1. COBIEAssetType 2. COBIERegisterType 3. OMNIClass13 4. OMNIClass23 5. OMNIClass21DuctSys 6. OMNIClass21ElecCircuit 7. OMNIClass21NonRevitSystems 8. OMNIClass21PipingSys 9. OMNIClass34
(Object to be added to the model to hold COBIE data not tracked/stored otherwise in a Revit model)	<p>Families/objects that will provide project parameters for COBIE data:</p> <ol style="list-style-type: none"> 1. Contact 2. Facility 3. Register 4. System
COBIE Spreadsheet Template.xls	COBIE template workbook (Excel 2003 format file) based on the file <i>2008-01-16-COBIE-spreadsheet.xls</i> that contains blank COBIE worksheets (downloaded from Whole Building Design Guide website: www.wbdg.org/tools/cobiex.php)
COBIEProcessor20V1l.xls	MS Excel file containing a macro that will compile the COBIE text files exported from Revit schedules into one COBIE-formatted Excel file.
Contact.rfa Facility.rfa Register.rfa System.rfa	Revit Family files (each containing one component)
UpdateRevitExternalIDName.dll	Revit ID update utility. Updates components to have unique ID data field that is required by COBIE.

Install the Revit ID Update Utility

This Revit add-in utility program functions to update component instances in your Revit model to contain a unique ID data field (*RevitExternalIDName*) that is required by COBIE. (Note that the utility requires either that the Revit project was creating using the *USAF BIM Template.rte* template, or have the COBIE schedules copied into an existing model from *USAF Blank BIM Project.rvt*).

To install this utility, copy it to a folder on your hard drive, and edit the *Revit.ini* file (which references this utility) on your workstation, as instructed below:

1. Create a folder for the ID Update Utility (Where it will not be deleted - for example:
C:\Program Files\Autodesk\UpdateRevitExternalIDName)
2. Copy the file you have unzipped - ***UpdateRevitExternalIDName.dll*** into that directory
3. Rename the *<install folder name>* with UpdateRevitExternalIDName (or a name of your choosing – just remember to reference that name when editing the Revit.ini file, as detailed below)

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- Find the file **Revit.ini** residing in the directory:

C:\Program Files\Autodesk Revit Architecture 2010\Program

- Create a backup copy of the **Revit.ini** file (as a precaution, since the next steps require editing that file)
- Open the **Revit.ini** file with a text editor
- In the file, find the text: `[ExternalCommands]`

- If this text does not exist - create it, and along with other text shown below :

```
[ExternalCommands]
ECCount=1
ECName1=COBIE ID Update
ECClassName1=UpdateRevitExternalIDName.UpdateRevitExternalIDName
ECAssembly1=<install folder>\UpdateRevitExternalIDName.dll
ECDescription1=COBIE ID updater
```

... proceed to Step #8

- If the text does exist it should similar to that shown below. The actual number of entries in the section `ECCount` may vary, depending on the number of external Revit commands you have configured on your workstation. Edit the number, incrementing it by one.

```
[ExternalCommands]
ECCount=2
ECName1=Some Name
ECClassName1=SomeProg.Command
ECAssembly1=c:\addins\SomeProg.dll
ECDescription1=Some Description
ECName2=SomeOtherName
ECClassName2=SomeOtherProg.Command
ECAssembly2=c:\addins\SomeOtherProg.dll
ECDescription2=Some Other Description
```

Insert the 4 lines shown below at the end of the `[ExternalCommands]` section:

```
ECNameX=COBIE ID Update
ECClassNameX=UpdateRevitExternalIDName.UpdateRevitExternalIDName
ECAssemblyX=<install folder>\UpdateRevitExternalIDName.dll
ECDescriptionX=COBIE ID updater
```

Edit the "X" in the fields shown above to match the "`ECCount=`" number that you've just edited.

Edit the **<install folder>** text to match the folder where you've placed the file in Step #1.

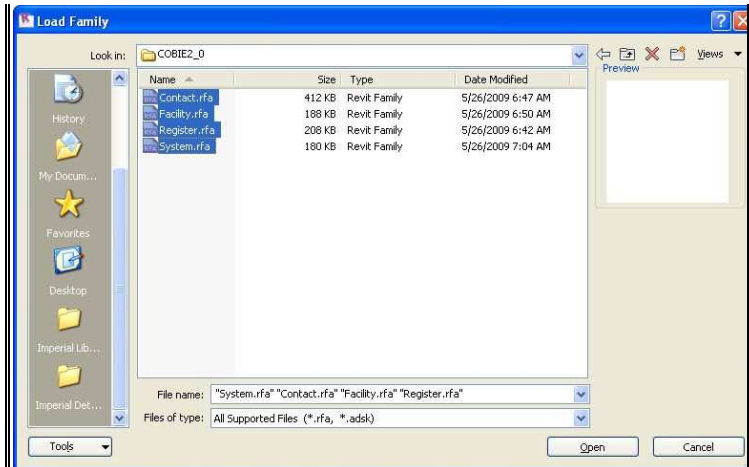
- Save and close Revit.ini file you are editing. If Revit is open, you'll need to close and restart it.

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Create the COBIE Framework in Revit

For a New Revit Project:	For an Existing Revit Project:
<ol style="list-style-type: none"> 1. Create a new Revit Project using USAF BIM Template.rte template (provided) 2. (create and develop model) 	<ol style="list-style-type: none"> 1. Open Revit project 2. Also open Revit file provided in the COBIE package (USAF Blank BIM Project.rvt). Copy schedules from this model ... <div data-bbox="762 573 1189 1079" data-label="Image"> </div> <div data-bbox="1214 824 1431 1008" data-label="Text"> <p><i>Copy all the schedules from the blank COBIE Revit file provided (at left) to the clipboard (Ctrl+C)</i></p> </div> <p>... and paste from the clipboard into your Revit project model</p> <div data-bbox="718 1142 976 1368" data-label="Image"> </div> <div data-bbox="995 1158 1181 1191" data-label="Text"> <p><i>Modify -> Paste</i></p> </div> 3. Load the four COBIE Revit Families (Each family has one component) <ol style="list-style-type: none"> a. Contact b. Facility c. Register d. System <div data-bbox="1222 1435 1437 1635" data-label="Image"> </div> <div data-bbox="1117 1662 1441 1724" data-label="Text"> <p><i>Insert -> (Load from Library) Load Family</i></p> </div>

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(above) Load 4 families (.rfa) from Revit COBIE download

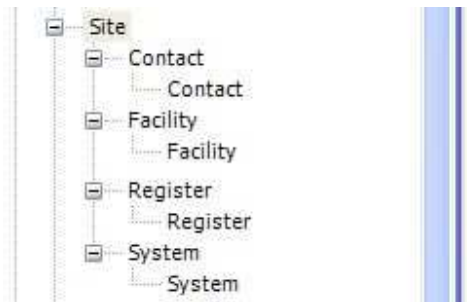
-- Continue....for all models --

4. Add the component from each of these four Revit Families to **Site** view :

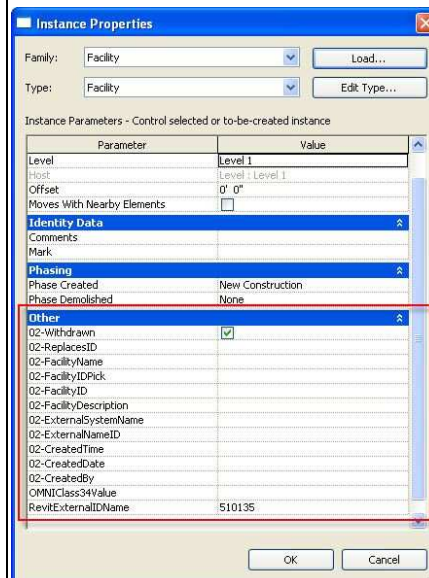
- Contact
- Facility
- Register
- System

If there is no Site view, create one.

It does not matter where you add them.



(above right) Project browser showing Revit COBIE families, and components, (above left) COBIE components added to the workspace.

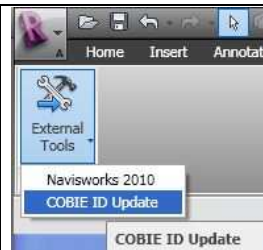


(left) Instance Properties showing Shared Parameters (COBIE fields) for Facility object

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5. Run the Revit utility - **COBIE ID Update**

*Updates each component to have a unique identifier field (shared parameter). COBIE requires each component to have a unique ID. (**ExternalName** column in each Revit COBIE schedule)*



(left) [Revit menu] Select:



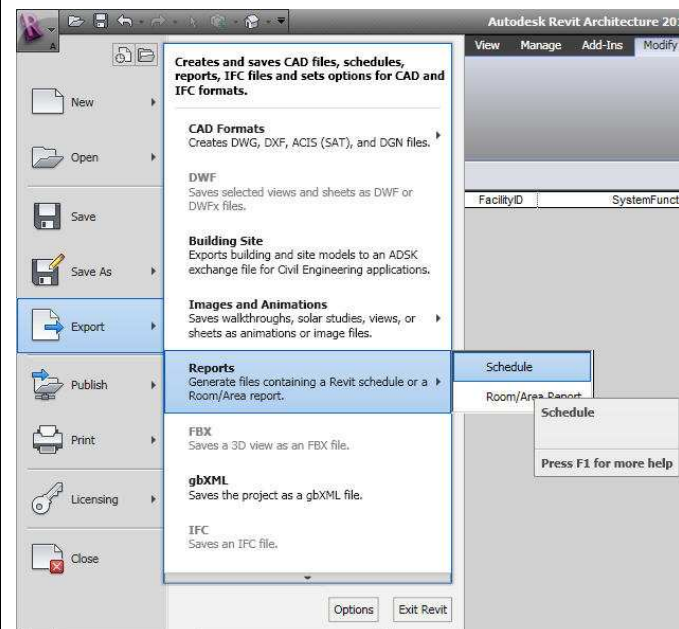
(left) Pop-up progress message verifying elements processed, after running Revit ID update utility

6. Export the COBIE schedules, one by one to a folder of your choosing:

- 01-Contact
- 02-Facility
- 03-Floor
- 04-Space
- 05-System-Duct Systems
- 05-System-Non Revit Systems
- 05-System-Piping Systems
- 05-System-Electrical Circuits
- 06-Register
- 07-Component

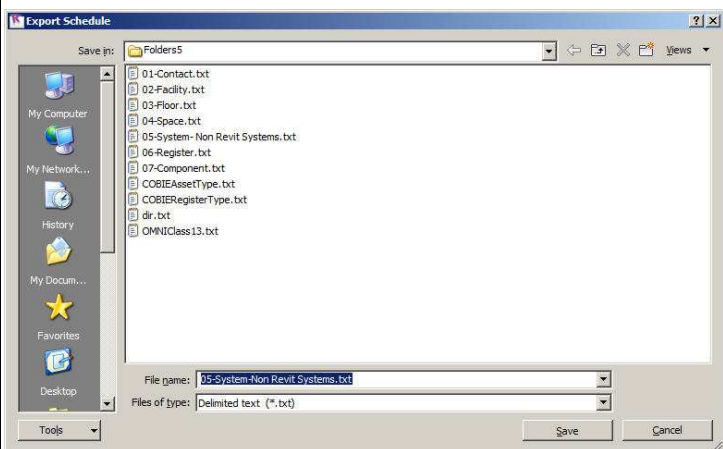
(Note: The schedule view that you are exporting must be active in your viewport to be able use the Export-Report-Schedule function).

(right) [Revit menu] Export -> Reports -> Schedule



Save as a text file (.txt), for eventual import to a COBIE Excel, in a file folder of your choosing.

(right) Save As 'Export Schedule' menu



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Adjust the export schedule settings as shown to the right.

Repeat the export for all COBIE schedules in your model.

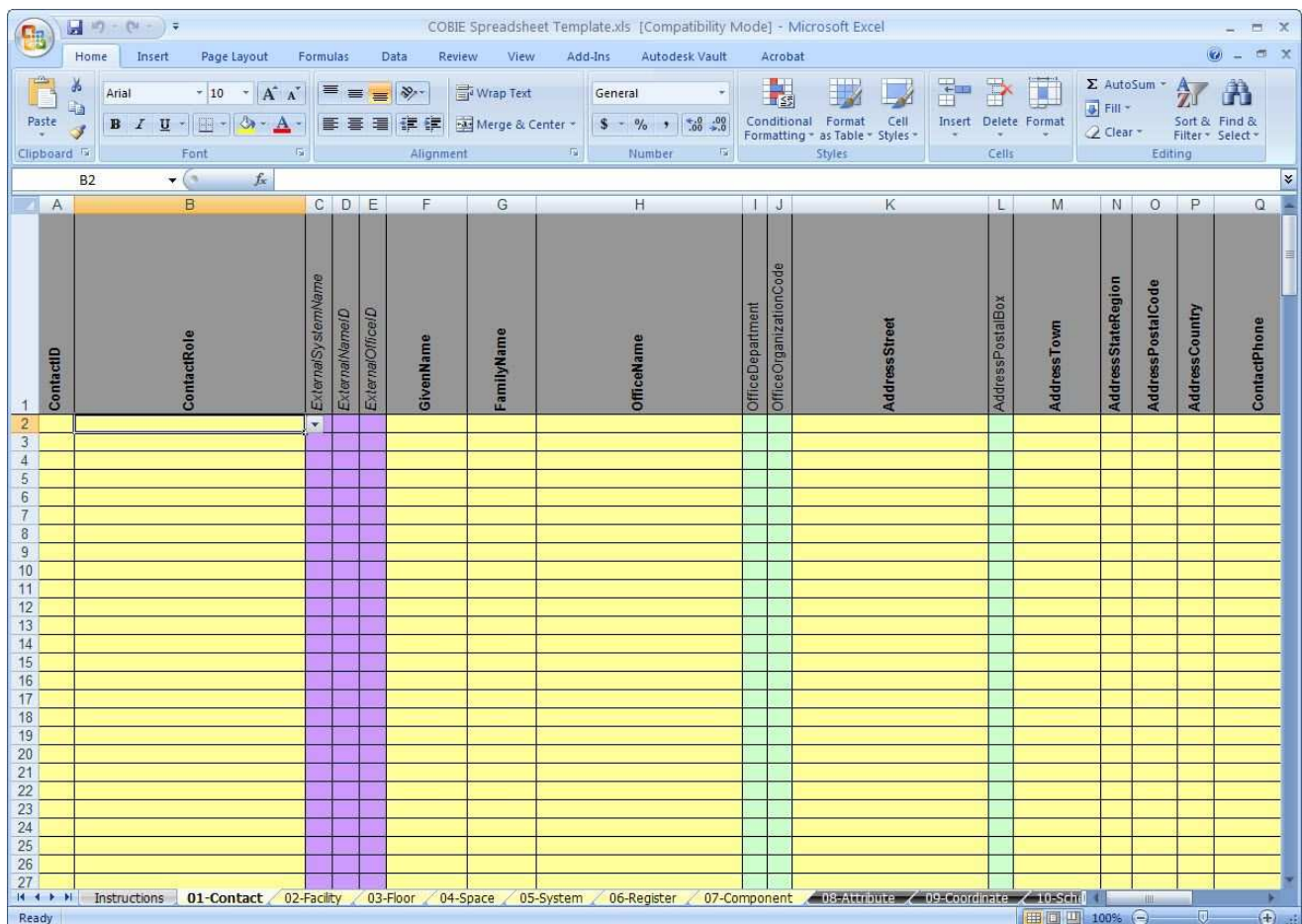
(right) Revit Export Schedule options menu



The 'Export Schedule' dialog box is shown. It has two main sections: 'Schedule appearance' and 'Output options'. In the 'Schedule appearance' section, 'Export column headers' is checked, 'One row' is selected with a radio button, 'Multiple rows, as formatted' is also selected with a radio button, and 'Export group headers, footers, and blank lines' is checked. In the 'Output options' section, 'Field delimiter' is set to '(tab)' and 'Text qualifier' is set to '"'. There are 'OK' and 'Cancel' buttons at the bottom right.

Working with COBIE in Excel

The COBIE format includes 29 separate worksheets. Only seven of these (01-Contact through 07-Component) will have data developed and delivered from a Revit model. Among the files in the *Autodesk Revit to COBIE Export Utility* distribution is a COBIE formatted worksheet > *COBIE Spreadsheet Template.xls*, which has been included for your reference use.

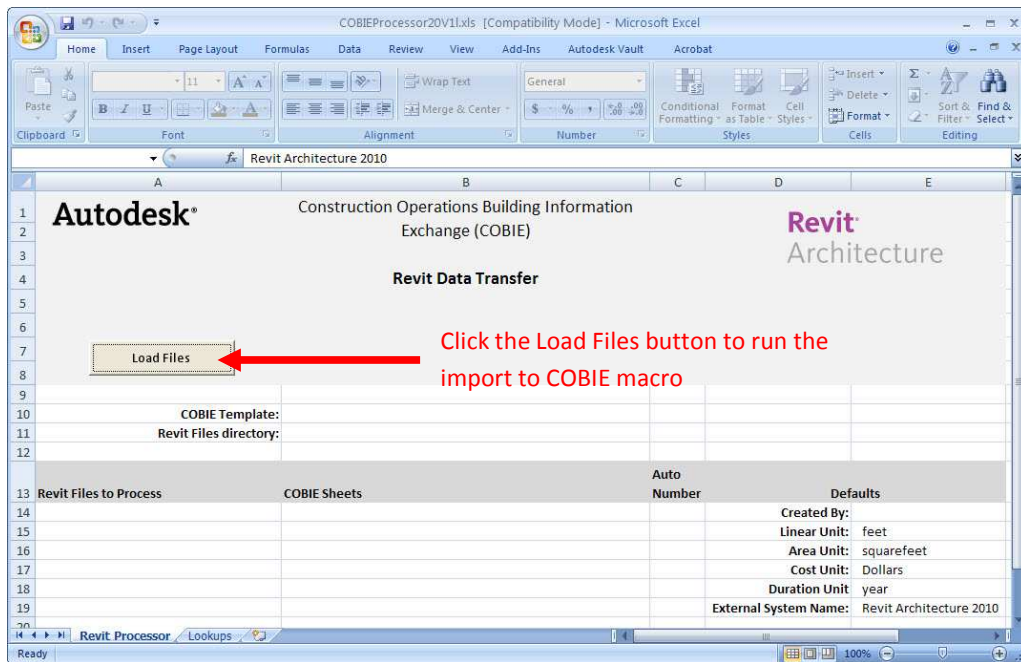


The screenshot shows the 'COBIE Spreadsheet Template.xls' file open in Microsoft Excel. The spreadsheet has 27 columns (A to Q) and 27 rows (1 to 27). The columns are labeled as follows: A: ContactID, B: ContactRole, C: ExternalSystemName, D: ExternalNameID, E: ExternalOfficeID, F: GivenName, G: FamilyName, H: OfficeName, I: OfficeDepartment, J: OfficeOrganizationCode, K: AddressStreet, L: AddressPostaIBox, M: AddressTown, N: AddressStateRegion, O: AddressPostalCode, P: AddressCountry, Q: ContactPhone. The rows are numbered 1 through 27. The spreadsheet is formatted with yellow cells for data entry, and the headers are in a grey background. The Excel ribbon is visible at the top, showing the 'Home' tab with various options like Paste, Font, Alignment, Number, Conditional Formatting, Styles, Cells, and Editing.

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As a final step in delivering data from Revit to a COBIE framework, our toolkit will bring in the exported text files and format them into a single Excel file following the COBIE structure, as shown in the *COBIE Spreadsheet Template.xls* example file. To facilitate this transfer, an Excel utility – *COBIEProcessor20V1.xls* has been included in the Revit to COBIE Utility package. Follow the steps outlined below to upload the Revit-exported text files into MS Excel:

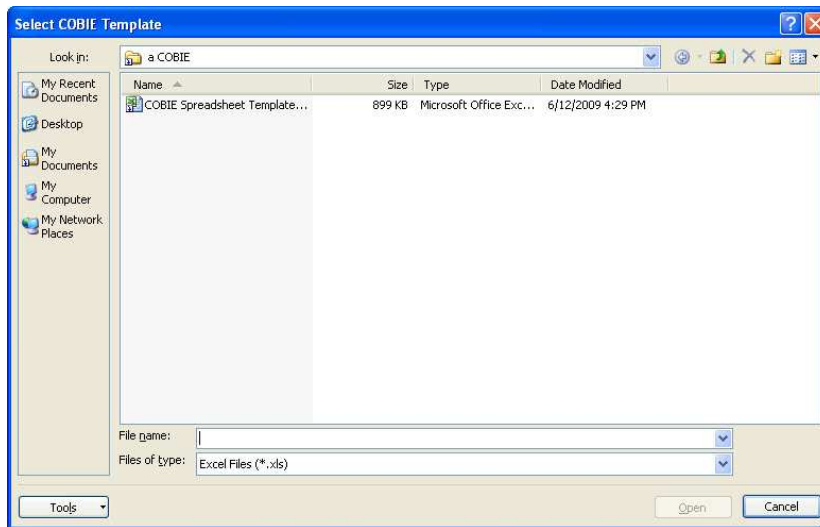
1. In Excel, open the ***COBIEProcessor20V1.xls*** file (and enable macros, if prompted)



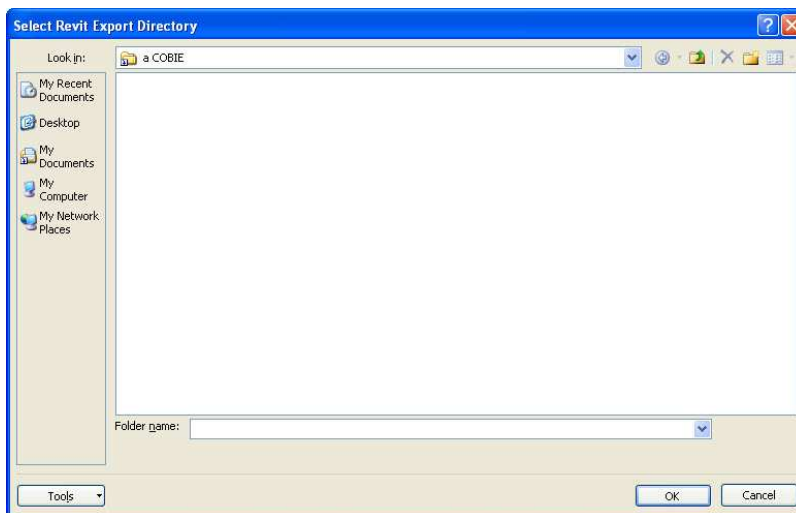
(above) *COBIE Processor* file – Excel macro used to import schedules that were exported Revit into one COBIE formatted worksheet

2. Click on the 'Load Files' button on the left side of the worksheet.
3. A menu (shown below) "Select COBIE Template" pops up – in it, navigate to the folder where you have placed the *COBIE Spreadsheet Template.xls* file, click the file and click 'Open'. (This file was unzipped with the Autodesk Revit to COBIE Export Utility package)

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4. A menu – ‘Select Revit Export Directory’ pops up. Navigate to the folder where have saved the text files exported from Revit and click that folder name and click on OK.



(above) Select Revit Export Directory menu

5. If desired, you can Load Names from your exported schedules to use for the COBIE ‘Created By’ field (a required COBIE field). Select the schedule exported from Revit that contains the name data by clicking on pull down arrow (right side of cell B21) and highlighting an entry on the pull down list (shown below).



In cell E14, you’ll see another pull down list, from which you can select a name for the “Created By: entry (if there were multiple entries in the export file you selected). Select the name you’d like to use.

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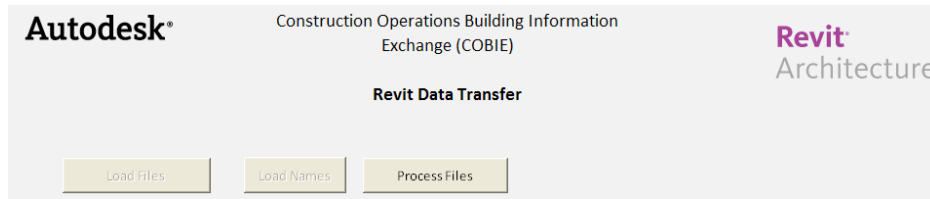
Auto	
Number	Defaults
Yes	Created By: <Select Name>
	<Select Name>
Yes	Area Unit: squarefeet
Yes	Cost Unit: Dollars
Yes	Duration Unit: year
Yes	External System Name: Revit Architecture 2010
Yes	
Yes	

Pull down list will display as many name entries as there are in the exported COBIE schedule specified

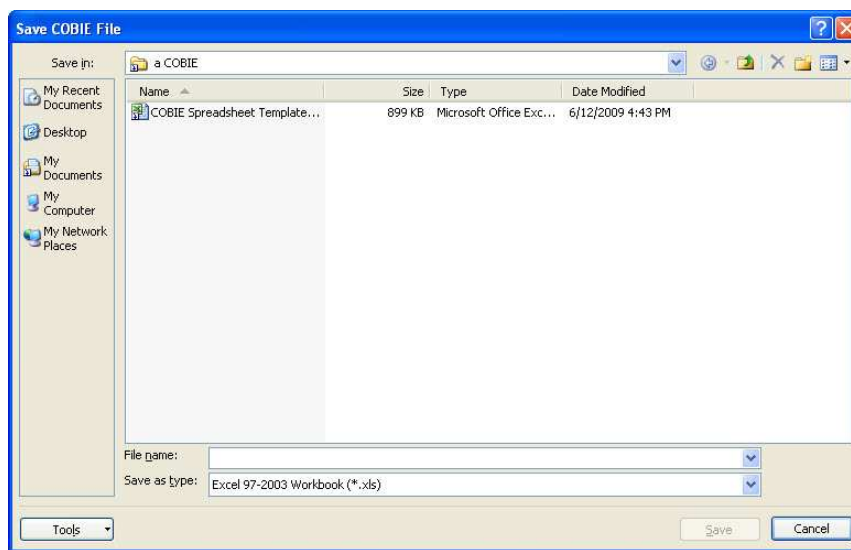
6. If desired, adjust any other of the default fields: Linear Unit, Area Unit, Cost Unit, Duration Unit or External System Name.

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- Click on the 'Process Files' button to finish compiling the COBIE spreadsheet:



- On the next pop-up menu – 'Save COBIE File', type in a file name for the combined COBIE Excel file you're creating, and click on OK – saving a COBIE formatted Excel workbook from your exported Revit data.



(above) Menu - save COBIE Excel file

COBIE data will be developed in a BIM model during the course of a building project, often by many project participants. Exporting schedules can be done at any time to check the validity and completeness of the data that is being developed. The Excel spreadsheet utility offers a quick and easy way to gather the wide range of COBIE data in a Revit model and compile it into a readily accessible, widely deployed format that is familiar to both AEC project participants, clients and facility managers.