GRAPHISOFT ArchiCAD and COBie2

How to Prepare your ArchiCAD 17 Project for COBie2 Documentation

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GRAPHISOFT ArchiCAD and COBie2

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Introduction

COBie is the abbreviation of Construction Operations Building Information Exchange, a specification used in the handover of Facility Management information. It is a spreadsheet data format for the delivery of a subset of building model information, rather than geometric model information.

Although GRAPHISOFT ArchiCAD cannot export COBie spreadsheets directly, ArchiCAD's BIM-quality models and IFC data exchange capabilities produces data output that is easily converted into COBie documentation, with the help of free or commercial conversion programs.

What is the relationship between IFC and COBie?

The COBie spreadsheet is a mapping of the Basic FM Handover View Definition, which is a subset (so-called "Model View Definition"; MVD) of the current IFC 2x3 scheme. Basic FM Handover View Definition was developed by buildingSMART to exchange facility management information among building models. ArchiCAD 17's IFC 2x3 interface and database support the IFC data and model export requirements of the Basic FM Handover View Definition, so most of the values of the COBie spreadsheet cells are extracted from IFC models exported by ArchiCAD 17 according to the Basic FM Handover MVD settings.

Hint To read more information about the relation between IFC 2x3 Basic FM Handover MVD and COBie, visit the buildingSMART website by clicking <u>here</u>.

This paper provides practical information on which data to add to an ArchiCAD project and how to export it as an IFC model, to obtain a format suitable for producing a COBie2 spreadsheet. (The current version of COBie is 2.4.) The final chapter consists of a sample workflow using a free IFC \rightarrow COBie conversion tool recommended by buildingSMART.

- **Hint** For detailed documentation about ArchiCAD's IFC capabilities, visit the GRAPHISOFT website by clicking <u>here</u>.
- **Note** This documentation was written based on the currently available COBie IFC mapping rule called "Responsibility Matrix version 17" (published 30th April 2013).

ArchiCAD Model Preparation for COBie2

The Basic FM Handover View Definition used by COBie2 queries the following IFC data types from an architectural model and/or its elements:

- Owner History data
- IFC Attributes
- IFC Properties (standard IFC 2x3 and custom COBie2-required properties)
- IFC Classification Reference data
- IFC Type Product entities
- IFC Zone assignments
- IFC System assignments
- Base quantities
- Space containment relation
- Space boundary relation

All of these data types are available or can be created in ArchiCAD 17 using one or more of these functions:

- Element Settings dialog boxes
- the IFC Manager tool
- IFC Translator settings used for IFC model export

This chapter summarizes the data (required from a design application) to be provided in ArchiCAD 17 for use by the COBie2 spreadsheet worksheet.

	COBie2 spreadsheet.xml		- (23
	A	В	с		
1	Title	COBie2			
2	Version	2			
3	Release	4			
4	Status	IFC2x3			
5	Region	en-US			
6	Purpose		This spreadsheet supports the exchange of building, system and product information through the life of the p	project.	
7	Outline		Individual worksheets are organized by project phase as shown below		
8					
9	All Phases	Sheet	Contents		
10		Contact	People and Companies		
11			· · · · · · · · · · · · · · · · · · ·		
12	Early Design Worksheets	Sheet	Contents		
13		Facility	Project, Site, and Facility		
14		Floor	Vertical levels and exterior areas		
15	-	Space	Spaces		
16		Zone	Sets of spaces sharing a specific attribute		
17	-	Туре	Types of equipment, products, and materials		
18					
19	Detailed Design Worksheets	Sheet	Contents		
20	-	Component	Individually named or schedule items		
21	4	System	Sets of components providing a service		
22	-	Assembly	Constituents for Types, Components and others		_
23	-	Connection	Logical connections between components		- 1
24	-	Impact	Economic, Environmental and Social Impacts at various stages in the life cycle		- 1
25					- 1
26	Construction Worksheets	Sheet	Contents		- 1
27			Note: submittals and approvals added on Documents		
28			Note: manufacturer and model added on Type		
29	-		Note: serial and tag added on Component		
30					- 1
31	Operations and Maintenance Worksheets	Sheet	Contents		-
32	-	Spare	Onsite and replacement parts		- 1
33		Resource	Required materials, tools, and training		-
34		Job	PM, Safety, and other job plans		_
35			Note: warranty information added on Type		-
36 14	Instruction / Contact / Facility / Floor / Space / Zone / Type / Component / System / Assembly / Connection / Spare / Resource / Job / I[] 🕂 🗓 👬				

Figure 1 The worksheets of the COBie2 spreadsheet

Key to tables displayed in the following sections of this document:

COBie2 data COBie2 data taken directly from data that was input in ArchiCAD. In other words, the ArchiCAD and IFC data types corresponding to these COBie data must be set or created in the ArchiCAD model.

COBie2 data COBie2 data that are automatically extracted from the ArchiCAD model, project settings and their IFC export. In other words, these COBie data are set automatically in ArchiCAD; no extra data definition is required from the ArchiCAD user.

Contact

The COBie2 **Contact** worksheet summarizes the person and organization data of the project/model designer.

Contact COBie2 spreadsheet data	ArchiCAD (IFC) data mapped to COBie data	ArchiCAD command
Email	Owning User of Owner History > Person /Organization tab > Addresses >	File > File Special > IFC 2x3 > IFC Options
	Address type: Telecom > ElectronicMailAddress	
CreatedBy	Owning User of Owner History > Person /Organization tab > Addresses >	(File > File Special > IFC 2x3 > IFC Options)
	Address type: Telecom > ElectronicMailAddress	
CreatedOn	the creation date of the IFC file	
Category	Owning User of Owner History > Person /Organization tab > Roles	File > File Special > IFC 2x3 > IFC Options
Company	Owning User of Owner History > Organization tab > Name	File > File Special > IFC 2x3 > IFC Options
Phone	Owning User of Owner History > Person /Organization tab > Addresses >	File > File Special > IFC 2x3 > IFC Options
	Address type: Telecom > TelephoneNumbers	
ExtSystem	text: 'ArchiCAD-64'	
ExtObject	text: 'IfcPersonAndOrganization'	
ExtIdentifier	Owning User of Owner History > Person /Organization tab > Addresses >	(File > File Special > IFC 2x3 > IFC Options)
	Address type: Telecom > ElectronicMailAddress	
Department	Owning User of Owner History > Person /Organization tab > Addresses >	File > File Special > IFC 2x3 > IFC Options
	Address type: Postal > InternalLocation	
OrganizationCode	Owning User of Owner History > Organization tab > ID	File > File Special > IFC 2x3 > IFC Options
GivenName	Owning User of Owner History > Person tab > GivenName	File > File Special > IFC 2x3 > IFC Options
FamilyName	Owning User of Owner History > Person tab > FamilyName	File > File Special > IFC 2x3 > IFC Options
Street	Owning User of Owner History > Person /Organization tab > Addresses >	File > File Special > IFC 2x3 > IFC Options
	Address type: Postal > AddressLines	
PostalBox	Owning User of Owner History > Person /Organization tab > Addresses >	File > File Special > IFC 2x3 > IFC Options
	Address type: Postal > PostalBox	
Town	Owning User of Owner History > Person /Organization tab > Addresses >	File > File Special > IFC 2x3 > IFC Options
	Address type: Postal > Town	
StateRegion	Owning User of Owner History > Person /Organization tab > Addresses >	File > File Special > IFC 2x3 > IFC Options
	Address type: Postal > Region	
PostalCode	Owning User of Owner History > Person /Organization tab > Addresses >	File > File Special > IFC 2x3 > IFC Options
	Address type: Postal > PostalCode	
Country	Owning User of Owner History > Person / Organization tab > Addresses >	File > File Special > IFC 2x3 > IFC Options
	Address type: Postal > Country	

Figure 2 Mapping between ArchiCAD model data and the COBie2 Contact worksheet data

ArchiCAD project data must be assigned to correspond with the COBie2 items marked in green (the rest of the data are automatically extracted from the IFC model saved from ArchiCAD).

The "Person" and "Organization" data can be entered in ArchiCAD's *IFC Options* (*File > File Special > IFC 2x3*) dialog box at *Owning User of Owner History*. Both "Postal" and "Telecom" address types must be defined, but only once, as "Person" or as "Organization" "Address" data.

	ptions		? ×		Addresses		? ×
	Own	ning User of Owner History			Address Schemes		
					OFFICE Postal	*	Add
📃 Use	e configuration of extende	ed library part items			OFFICE Telecom		
6	Configuration file path:						Delete
	M Person and Organi:	zation	? ×				
	Scheme Proper	rties				Ŧ	
	Owning type:	Person and Organization			Address		
IFC	_				Address type:	Telecom	
	Use Architect Detai	ils from Project Info					
	Name	Value	Туре		Name Valu	e	Type
	Person and Org	gani			Purpose OFFI	UE .	IfcAddress TypeEnum
IFC !	Roles		IfcActorRole				IfoLabel
	Person					io Rhaasi	Ifelebel
			Ifcldentifier		EastinileNumber	e-rnone,	Ifd abal
	FamilyName	COBie-FamilyName	IfcLabel				Ifd shal
Save	GivenName	COBie-GivenName	lfcLabel		FlectronicMailAddr COB	ie-Email:	Ifd abel
	MiddleNames		IfcLabel		WWWHomePagel		Ifd abel
	PrefixTitles		IfcLabel				
	SuffixTitles		IfcLabel		M Addresses		
	Roles	ARCHITECT;	IfcActorRole		Address Schem	es	
	Addresses	OFFICE Postal; OFFICE Telecom;	IfcAddress	╇┫║╴	OFFICE Postal		
Expr	Organization				OFFICE Telecom		Add
		COBie-OrganizationCode	IfcIdentifier				Delete
	Name	COBie-Company	IfcLabel				
	Description	OR	IfcLabel				-
	Roles		IfcActorRole		Address		
	Roles Addresses		IfoActorRole IfoAddress		Address	_	
	Roles Addresses		IfcActorRole IfcAddress		Address Address type:	Po	stal 🗸
-	Roles Addresses	Cancel	IfoActorRole IfoAddress Apply		Address Address type:	Value	stal v
	Roles Addresses	Cancel	IfoActorRole IfoAddress Apply	-	Address Address type: Name V Purpose	Value	stal
	Roles Addresses	Cancel	IfoActorRole IfoAddress Apply	-	Address Address type: Name Purpose UserDefinedPurpos	Value OFFICE e	stal Type IfrcAddressTypeEnum IfcLabel
	Roles Addresses	Cancel	IfoActorRole IfoAddress Apply	-	Address Address type: Name Purpose UserDefinedPurpos Description	Value OFFICE re Postal	stal Type IfcAddressTypeEnum IfcLabel IfcText
	Roles Addresses	Cancel	IfoActorRole IfoAddress Apply	-	Address Address type: Name Purpose UserDefinedPurpos Description InternalLocation	Value OFFICE e Postal COBie-Department	stal Type IfcAddressTypeEnum IfcLabel IfcText IfcLabel
	Roles Addresses	Cancel	IfoActorRole IfoAddress Apply	-	Address type: Address type: Name Purpose UserDefinedPurpos Description InternalLocation AddressLines	Value OFFICE e Postal COBie-Department COBie-Street;	stal Type IfcAddressTypeEnum IfcLabel IfcLabel IfcLabel IfcLabel
	Roles Addresses	Cancel	IfoActorRole IfoAddress Apply	-	Address Address type: Name Purpose UserDefinedPurpos Description InternalLocation AddressLines PostalBox	Value OFFICE e Postal COBie-Department COBie-Street; COBie-PostalBox	stal Type IfcAddressTypeEnum IfcLabel IfcText IfcLabel IfcLabel IfcLabel IfcLabel
	Roles Addresses	Cancel	IfoActorRole IfoAddress Apply		Address Address type: Name Purpose UserDefinedPurpos Description InternalLocation AddressLines PostalBox Town	Value OFFICE re Postal COBie-Department COBie-Street: COBie-PostalBox COBie-Town	stal Type IfcAddressTypeEnum IfcLabel IfcText IfcLabel IfcLabel IfcLabel IfcLabel IfcLabel
	Roles Addresses	Cancel	IfoActorRole IfoAddress Apply		Address Address type: Name Purpose UserDefinedPurpos Description AddressLines PostalBox Town Region	Value OFFICE ee Postal COBie-Department COBie-Street; COBie-PostalBox COBie-Town COBie-Town	stal Type IfoAddressTypeEnum IfoLabel IfoLabel IfoLabel IfoLabel IfoLabel IfoLabel IfoLabel IfoLabel
	Roles Addresses	Cancel	IfoActorRole IfoAddress Apply		Address Address type: Name Purpose UserDefinedPurpos Description InternalLocation AddressLines PostalBox Town Region PostalCode	Value OFFICE e Postal COBie-Department COBie-Street; COBie-Street; COBie-StalBox COBie-Town COBie-StateRegion COBie-StateRegion	stal Type IfoAddressTypeEnum IfdLabel IfoText IfdLabel IfdLabel IfdLabel IfdLabel IfdLabel IfdLabel IfdLabel
	Roles Addresses	Cancel	IfoActorRole IfoAddress Apply		Address Address type: Name Purpose UserDefinedPurpos Description InternalLocation AddressLines PostalBox Town Region PostalCode Country	Value OFFICE Postal COBie-Department COBie-Street; COBie-PostalBox COBie-Town COBie-StateRegion COBie-PostalCode COBie-Country	stal ▼ Type IfcAddressTypeEnum IfcLabel IfcLabel IfcLabel IfcLabel IfcLabel IfcLabel IfcLabel IfcLabel IfcLabel IfcLabel IfcLabel IfcLabel
	Roles Addresses	Cancel	IfoActorRole IfoAddress Apply		Address Address type: Name Purpose UserDefinedPurpos Description InternalLocation AddressLines PostalBox Town Region PostalCode Country	Value OFFICE e Postal COBie-Department COBie-Street; COBie-PostalBox COBie-Town COBie-StateRegion COBie-PostalCode COBie-Country	stal Type IfcAddressTypeEnum IfcLabel IfcLabel IfcLabel IfcLabel IfcLabel IfcLabel IfcLabel IfcLabel IfcLabel

Figure 3 Contact data in ArchiCAD (Person and Organization)

Facility

The COBie2 Facility worksheet summarizes the Facility (IfcBuilding), Project (IfcProject) and Site (IfcSite) data.

Facility COBie2 spreadsheet data	ArchiCAD (IFC) data mapped to COBie data	ArchiCAD command
Name	the Name attribute of the IfcBuilding	File > File Special > IFC 2x3 > IFC Manager
CreatedBy	Owning User of Owner History > Person /Organization tab > Addresses >	(File > File Special > IFC 2x3 > IFC Options)
	Address type: Telecom > ElectronicMailAddress	
CreatedOn	the creation date of the IFC file	
Category	Classification Reference data (ItemReference : Name) of the IfcBuilding	File > File Special > IFC 2x3 > IFC Manager
ProjectName	the <i>Project Name</i> ,or	File > Info > Project Info ,or
	the Name attribute of the IfcProject	File > File Special > IFC 2x3 > IFC Manager
SiteName	the Name attribute of the IfcSite	File > File Special > IFC 2x3 > IFC Manager
LinearUnits	Export Options tab > IFC model units > Options > Length Unit	File > File Special > IFC 2x3 > IFC Translation Setup
AreaUnits	Export Options tab > IFC model units > Options > Area Unit	File > File Special > IFC 2x3 > IFC Translation Setup
VolumeUnits	Export Options tab > IFC model units > Options > Volume Unit	File > File Special > IFC 2x3 > IFC Translation Setup
CurrencyUnit	Export Options tab > IFC model units > Options > Currency Unit	File > File Special > IFC 2x3 > IFC Translation Setup
AreaMeasurement	text: 'ArchiCAD BIM Base Quantities'	
ExternalSystem	text: 'ArchiCAD-64'	
ExternalProjectObject	text: 'IfcProject '	
ExternalProjectIdentifier	the Globalid attribute of the IfcProject	(File > File Special > IFC 2x3 > IFC Manager)
ExternalSiteObject	text: 'IfcSite'	
ExternalSiteIdentifier	the Globalid attribute of the IfcSite	(File > File Special > IFC 2x3 > IFC Manager)
ExternalFacilityObject	text: 'IfcBuilding'	
ExternalFacilityIdentifier	the Globalid attribute of the IfcBuilding	(File > File Special > IFC 2x3 > IFC Manager)
Description	the Description (or LongName or Name) attribute of the IfcBuilding	File > File Special > IFC 2x3 > IFC Manager
ProjectDescription	the Description (or LongName or Name) attribute of the IfcProject	File > File Special > IFC 2x3 > IFC Manager
SiteDescription	the Description (or LongName or Name) attribute of the IfcSite	File > File Special > IFC 2x3 > IFC Manager
Phase	the Phase attribute of the IfcProject	File > File Special > IFC 2x3 > IFC Manager

Figure 4 Mapping between ArchiCAD model and the COBie2 Facility worksheet data

The Facility data (including the Facility "Name") can be defined as the attributes of the IfcProject, IfcSite and IfcBuilding IFC entities in the *IFC Manager* dialog (*File > File Special > IFC 2x3*).

The "ProjectName" data of the Facility worksheet can be set in ArchiCAD at *Project Info* (*File > Info*) or as the "Name" attribute of the IfcProject in the *IFC Manager*.



Figure 5 Attributes of IfcProject, IfcSite and IfcBuilding entities required by COBie2 (IFC Manager)

To set the Facility "Category", define Classification Reference data in the *IFC Manager*. COBie requires IfcBuilding classification by the OmniClass table 11 called "Construction Entities by Function" in US or by the Uniclass system in UK. Both systems are available as built-in classification rules in ArchiCAD under the *Apply Predefined Rule* option in the *IFC Manager*.



Figure 6 COBie Facility Category set as Classification Reference data of IfcBuilding (IFC Manager)

The COBie-required unit systems of the Facility can be set at the export options (*IFC Translation Setup*). There is a predefined settings package (so-called "IFC Translator" in ArchiCAD) which contains the export options (including the required length, area, volume, currency and time units) recommended for the COBie-required IFC export. It is called "Basic FM Handover View" IFC Translator (see chapter <u>COBie2-enabled IFC Model Export</u>).

Floor

The COBie2 Floor worksheet summarizes data of the building stories (IfcBuildingStorey).

Floor COBie2 spreadsheet data	ArchiCAD (IFC) data mapped to COBie data	ArchiCAD command
Name	the Name attribute of an ArchiCAD Story (IfcBuildingStorey)	Design > Story Settings
CreatedBy	Owning User of Owner History > Person /Organization tab > Addresses >	(File > File Special > IFC 2x3 > IFC Options)
	Address type: Telecom > ElectronicMailAddress	
CreatedOn	the creation date of the IFC file	
Category	Classification Reference data (ItemReference : Name) of an IfcBuildingStorey	File > File Special > IFC 2x3 > IFC Manager
ExtSystem	text: 'ArchiCAD-64'	
ExtObject	text: 'IfcBuildingStorey'	
ExtIdentifier	the Globalid attribute of an IfcBuildingStorey	(File > File Special > IFC 2x3 > IFC Manager)
Description	the Description (or LongName or Name) attribute of an IfcBuildingStorey	File > File Special > IFC 2x3 > IFC Manager
Elevation	the <i>Elevation</i> attribute of an ArchiCAD Story	(Design > Story Settings)
Height	the <i>Height</i> attribute of an ArchiCAD Story	(Design > Story Settings)



The "Floors" are interpreted as Stories in the ArchiCAD project. The story names (COBie "Name"), the elevation (COBie "Elevation") and the height (COBie "Height") can be defined in the *Story Settings* dialog (*Design > Story Settings*).



Figure 8 Story definition and its effect on the IFC model in ArchiCAD

To set the Facility "Category", define Classification Reference data in the *IFC Manager*. COBie requires IfcBuildingStorey classification by the OmniClass table 11 called "Construction Entities by Function" in US or by the Uniclass system in UK. Both systems are available as built-in classification rules in ArchiCAD under the *Apply Predefined Rule* option in the *IFC Manager*.

Floor Category can be defined manually too. Apply the *Create Property/Classification* command to an IfcBuildingStorey item in the *IFC Manager*. The required classification "Name" and/or "ItemReference" data can be set in the Classification Reference dialog which opens by clicking the 🔤 button next to the name field of the new Classification Reference item.

The "Description" attribute of an ArchiCAD Story (IfcBuildingStorey) can also be set via the IFC Manager.



Figure 9 ArchiCAD Story data required as COBie Floor data



Figure 10 Manual method of Category definition in ArchiCAD

Space

The COBie2 Space worksheet summarizes data of the Spaces (IfcSpace) of the project.

Space COBie2 spreadsheet data	ArchiCAD (IFC) data mapped to COBie data	ArchiCAD command
Name	the No attribute of an ArchiCAD Zone (IfcSpace)	Zone > Settings Dialog
CreatedBy	Owning User of Owner History > Person /Organization tab > Addresses >	(File > File Special > IFC 2x3 > IFC Options)
	Address type: Telecom > ElectronicMailAddress	
CreatedOn	the creation date of the IFC file	
Category	Classification Reference data (ItemReference : Name) of an IfcSpace	File > File Special > IFC 2x3 > IFC Manager
FloorName	the Name attribute of an ArchiCAD Zone's Home Story	(Design > Story Settings)
Description	the Name attribute of an ArchiCAD Zone	Zone > Settings Dialog
ExtSystem	text: 'ArchiCAD-64'	
ExtObject	text: 'IfcSpace'	
ExtIdentifier	the Globalid attribute of an IfcSpace	(File > File Special > IFC 2x3 > IFC Manager)
RoomTag	IFC Property Set: 'COBie_Space' > IFC Property: 'RoomTag'	Zone > Settings Dialog ,or
		File > File Special > IFC 2x3 > IFC Manager
UsableHeight	the Zone Height attribute	(Zone > Settings Dialog)
GrossArea	base quantity: GrossFloorArea	
NetArea	base quantity: NetFloorArea	

Figure 11 Mapping between ArchiCAD model and the COBie2 Space worksheet data

The "Spaces" are interpreted as Zones (IfcSpaces) in the ArchiCAD project. Thus, the COBie2-required data can be set in ArchiCAD Zone Settings. IFC data can be set using the *Manage IFC Properties* option (*Tags and Categories* tab).

"Name" and "Description" COBie2 items are derived from the "No." and the "Zone Name" attributes of the ArchiCAD Zone. To set the Space "Category", define Classification Reference data. COBie requires IfcSpace classification by the OmniClass table 13 called "Space by Function" in US or by the Uniclass system in UK. Both systems are available as built-in classification rules in ArchiCAD under the *Apply Predefined Rule* option.

Note Each Space has to have a unique COBie "Name" (ArchiCAD Zone "No."). The Zone "No." can be assigned or edited in the Zone Settings dialog box (*Name and Positioning* panel).

The COBie "RoomTag" data can be defined as custom IFC property in an ArchiCAD model. Although any custom IFC property can be defined with the *Create Property/Classification* tool, the COBie-required properties are available when using an IFC scheme template called "COBie2.xml" (available in the ArchiCAD's *Default/ IFC Schemes* folder; see <u>COBie2 Scheme Template</u>).

Zone Selection Settings	? <mark>×</mark>	Manage IFC Properties		? <mark>×</mark>
Favorites	Selected: 1 Editable: 1	Selected: 1 Editable: 1		₽- ₩-
Name and Positioning		Name	Value	Туре
				*
Category: 01 Heated/Cooled		GlobalId	3WRQBlg\$19sxIV	IfcGloballyUniqueId
category of heatedycooled		V Name	COBie-Name	IfcLabel
Name: COBie-Description	No: COBie-Name	✓ LongName	COBie-Description	IfcLabel
		CompositionType	ELEMENT	IfcElementCompositi
Zone Top:		InteriorOrExteriorSpace	INTERNAL	IfcInternalOrExterna
Not Linked	•	✓ AC_Pset_RenovationAndPhas	ing	
	Zone Polygon:	Renovation Status	Existing	IfcLabel
		COBie_Space		
s		RoomTag	COBie-RoomTag	IfcLabel
🕩 🧟 Model		✓ X Classification References		
Area Calculation		× OCCS - Space by Function	13-23 23 21 Servi	IfcClassificationRefe
▶ Listing and Labeling				
 Tags and Categories 			- T	
ID 1002				
Renovation Status Existing				
Show On Renovation Filter All Relevant Filte	ers			
IFC Properties (IfcSpace)				
CompositionType (Attribute) ELEMENT	IfcElementCom			
InteriorOrExteriorSpace (Attribute) INTERNAL	IfcInternalOrEx			
RoomTag (COBie_Space) COBie-RoomTag	J IfcLabel			
OCCS - Space by Function (Classifi 13-23 23 21 Ser	vice Space IfcClassification			*
Manage IF	C Properties	Create Property/Classification	Apply Predefined Rule	•
1020 Project Program	Cancel OK		Canc	и ок

Figure 12 Space data in ArchiCAD

Zone

The COBie2 **Zone** worksheet summarizes the sets of spaces sharing a specific attribute in the project. In other words, it summarizes the data of the groups (IfcZones) of <u>COBie Spaces</u> (IfcSpaces).

Zone COBie2 spreadsheet data	ArchiCAD (IFC) data mapped to COBie data	ArchiCAD command
Name	the <i>Name</i> attribute of an IFC Zone	File > File Special > IFC 2x3 > IFC Manager
CreatedBy	Owning User of Owner History > Person /Organization tab > Addresses >	(File > File Special > IFC 2x3 > IFC Options)
	Address type: Telecom > ElectronicMailAddress	
CreatedOn	the creation date of the IFC file	
Category	Classification Reference data (ItemReference : Name) of an IFC Zone	File > File Special > IFC 2x3 > IFC Manager
SpaceNames	the No attribute of the ArchiCAD Zones (IfcSpaces) assigned to an IFC Zone	(Zone > Settings Dialog)
ExtSystem	text: 'ArchiCAD-64'	
ExtObject	text: 'IfcZone'	
ExtIdentifier	the <i>Globalld</i> attribute of an IFC Zone	(File > File Special > IFC 2x3 > IFC Manager)
Description	the <i>Description</i> attribute of an IFC Zone	File > File Special > IFC 2x3 > IFC Manager



The "Zones" are interpreted as IFC Zone Assignment (IfcZone) entities in the ArchiCAD project. An IfcZone entity is a group of ArchiCAD Zone (IfcSpace) entities. Assignments (including IFC Zone) can be defined and managed only in the *IFC Manager*, so their COBie2-requested data can be defined with the *IFC Manager* too.

A COBie "Zone" (IfcZone) can be defined with the *New* command by applying it on the "IFC Zones" member of the "Assignments" tree. The "Name" attribute of the new IFC Zone defines the COBie "Name" data. Drag and drop the proper IfcSpace (ArchiCAD Zones) members from the IFC model hierarchy tree of the *IFC Manager* to the "New Relation" folder of the new IFC Zone entity.



Figure 14 COBie2 Zone (IFC Zone) definition in the IFC Manager

To set the Zone "Category", define Classification Reference data. COBie requires IfcZone classification by the OmniClass table 13 called "Space by Function" in US or by the Uniclass system in UK. Both systems are available as built-in classification rules in ArchiCAD under the *Apply Predefined Rule* option.

If other Zone "Category" definitions are required by the COBie documentation, apply the *Create Property/Classification* command to an IfcZone item in the *IFC Manager*. As an example, the definition of a "ZoneType" Classification Reference data with one of the following values for the "Name" attribute can be seen in the following figure:

- Circulation Zone
- Lighting Zone
- Fire Alarm Zone
- Historical Preservation Zone
- Occupancy Zone
- Ventilation Zone



Figure 15 Custom (non-standard) Zone Category definition in the IFC Manager

Туре

Type COBie2 spreadsheet data	ArchiCAD (IFC) data mapped to COBie data	ArchiCAD command
Name	the Name attribute of an IFC Type Product	File > File Special > IFC 2x3 > IFC Manager
CreatedBy	Owning User of Owner History > Person /Organization tab > Addresses >	(File > File Special > IFC 2x3 > IFC Options)
	Address type: Telecom > ElectronicMailAddress	
CreatedOn	the creation date of the IFC file	
Category	Classification Reference data (ItemReference : Name) of an IFC Type Product	File > File Special > IFC 2x3 > IFC Manager
Description	the Description attribute of an IFC Type Product	File > File Special > IFC 2x3 > IFC Manager
AssetType	IFC Property Set: 'COBie_Asset' > IFC Property: 'AssetType'	File > File Special > IFC 2x3 > IFC Manager
Manufacturer	IFC Property Set: 'Pset_ManufacturerTypeInformation' > IFC Property: 'Manufacturer'	File > File Special > IFC 2x3 > IFC Manager
ModelNumber	IFC Property Set: 'Pset_ManufacturerTypeInformation' > IFC Property: 'ModelLabel'	File > File Special > IFC 2x3 > IFC Manager
WarrantyGuarantorParts	IFC Property Set: 'COBie_Warranty' > IFC Property: 'WarrantyGuarantorParts'	File > File Special > IFC 2x3 > IFC Manager
WarrantyDurationParts	IFC Property Set: 'COBie_Warranty' > IFC Property: 'WarrantyDurationParts'	File > File Special > IFC 2x3 > IFC Manager
WarrantyGuarantorLabor	IFC Property Set: 'COBie_Warranty' > IFC Property: 'WarrantyGuarantorLabor'	File > File Special > IFC 2x3 > IFC Manager
WarrantyDurationLabor	IFC Property Set: 'COBie_Warranty' > IFC Property: 'WarrantyDurationLabor'	File > File Special > IFC 2x3 > IFC Manager
WarrantyDurationUnit	Export Options tab > IFC model units > Options > Time Unit	File > File Special > IFC 2x3 > IFC Translation Setup
ExtSystem	text: 'ArchiCAD-64'	
ExtObject	text: the type of an IFC Type Product (for example: 'IfcFurnishingElementType')	(File > File Special > IFC 2x3 > IFC Manager)
ExtIdentifier	the Globalid attribute of an IFC Type Product	(File > File Special > IFC 2x3 > IFC Manager)
ReplacementCost	IFC Property Set: 'COBie_EconomicImpactValues' > IFC Property: 'ReplacementCost'	File > File Special > IFC 2x3 > IFC Manager
ExpectedLife	IFC Property Set: 'COBie_ServiceLife' > IFC Property: 'ServiceLifeDuration'	File > File Special > IFC 2x3 > IFC Manager
DurationUnit	Export Options tab > IFC model units > Options > Time Unit	File > File Special > IFC 2x3 > IFC Translation Setup
WarrantyDescription	IFC Property Set: 'COBie_Warranty' > IFC Property: 'WarrantyDescription'	File > File Special > IFC 2x3 > IFC Manager
NominalLength	IFC Property Set: 'COBie_Specification' > IFC Property: 'NominalLength'	File > File Special > IFC 2x3 > IFC Manager
NominalWidth	IFC Property Set: 'COBie_Specification' > IFC Property: 'NominalWidth'	File > File Special > IFC 2x3 > IFC Manager
NominalHeight	IFC Property Set: 'COBie_Specification' > IFC Property: 'NominalHeight'	File > File Special > IFC 2x3 > IFC Manager
ModelReference	IFC Property Set: 'Pset_ManufacturerTypeInformation' > IFC Property: 'ModelReference'	File > File Special > IFC 2x3 > IFC Manager
Shape	IFC Property Set: 'COBie_Specification' > IFC Property: 'Shape'	File > File Special > IFC 2x3 > IFC Manager
Size	IFC Property Set: 'COBie_Specification' > IFC Property: 'Size'	File > File Special > IFC 2x3 > IFC Manager
Color	IFC Property Set: 'COBie_Specification' > IFC Property: 'Color'	File > File Special > IFC 2x3 > IFC Manager
Finish	IFC Property Set: 'COBie_Specification' > IFC Property: 'Finish'	File > File Special > IFC 2x3 > IFC Manager
Grade	IFC Property Set: 'COBie_Specification' > IFC Property: 'Grade'	File > File Special > IFC 2x3 > IFC Manager
Material	IFC Property Set: 'COBie_Specification' > IFC Property: 'Material'	File > File Special > IFC 2x3 > IFC Manager
Constituents	IFC Property Set: 'COBie_Specification' > IFC Property: 'Constituents'	File > File Special > IFC 2x3 > IFC Manager
Features	IFC Property Set: 'COBie_Specification ' > IFC Property: 'Features'	File > File Special > IFC 2x3 > IFC Manager
AccessibilityPerformance	IFC Property Set: 'COBie_Specification' > IFC Property: 'AccessibilityPerformance'	File > File Special > IFC 2x3 > IFC Manager
CodePerformance	IFC Property Set: 'COBie_Specification' > IFC Property: 'CodePerformance'	File > File Special > IFC 2x3 > IFC Manager
SustainabilityPerformance	IFC Property Set: 'COBie_Specification' > IFC Property: 'SustainabilityPerformance'	File > File Special > IFC 2x3 > IFC Manager

COBie2 **Type** worksheet summarizes the types of equipment and products.

Figure 16 Mapping between ArchiCAD model and the COBie2 Type worksheet data

The "Types" are interpreted as IFC Type Product entities in the ArchiCAD project. IFC Type Products and their COBie2-requested data can be defined in the *IFC Manager* only. ArchiCAD automatically generates IFC Type Product entities for all ArchiCAD element types. The following table shows some naming examples of the automatically generated IFC Type Products. Of course, the default values of the names can be modified manually with the *IFC Manager*.

ArchiCAD element (IFC Entity)	IFC Type Product	Derivation of "Name" Attribute of IFC Type Product
Column (IfcColumn)	IfcColumnType	Profile name and size
Beam (IfcBeam)	IfcBeamType	Profile name and size
Wall (IfcWall)	IfcWallType	Name of Cut Fill / Composite and thickness
Slab (IfcSlab)	IfcSlabType	Name of Cut Fill / Composite and thickness
Door (IfcDoor)	IfcDoorStyle	Name of the Library Part without .gsm extension
Window (IfcWindow)	IfcWindowStyle	Name of the Library Part without .gsm extension
Curtain Wall (IfcCurtainWall)	IfcCurtainWallType	"Curtain Wall Type" text
Curtain Wall > Panel element (IfcPlate)	IfcPlateType	Type and size of the CW panel element
Curtain Wall > Frame element (IfcMember)	IfcMemberType	Type and profile size of the CW frame element
GDL-based Objects	IfcFurnitureType, IfcRailingType, IfcRampFlightType, etc.	Name of the Library Part without .gsm extension

Figure 17 The default naming rule examples of IFC Type Product entities

For some object types, ArchiCAD considers other rules to define their IFC Type Product. For example, two windows defined from the same Library Part will be grouped in two separate IFC Type Products, if their size or their operation type (for example: "single swing right" or "single swing left") differs.

To manage the required IFC attributes, properties and classification reference (COBie Category) items of an IFC Type Product (for example the properties of an IfcWindowStyle assigned to identical IfcWindow objects), first set the type object to editable with the *Edit/New Type* tool, and then define, set or modify the COBie-required properties.

Note Each Type has to have a unique COBie "Name" ("Name" attribute of IFC Type Product). When a <u>Component</u> is defined, this "Name" attribute is automatically generated based on the rules described above. If needed (e.g. if the automatically generated "Name" attribute is not unique), it can be modified in *IFC Manager*, after you have made this field editable.

If an IFC Type Product is editable, the following functions are available for it:

- renaming (modification of the "Name" attribute);
- setting, defining (new) or modifying IFC properties and classifications;
- deleting it by moving its all members (for example Windows) to another IFC Type Product (but of the same type: for example IfcWindowStyle);
- a member can be removed from the current IFC Type Product by moving it into a totally new or a currently available (but same type) IFC Type Product.

To make all COBie2-required IFC Properties available for the Type elements in the *IFC Manager*, use the "COBie2.xml" scheme in the ArchiCAD project (see <u>COBie2 Scheme Template</u>).

To set the Type "Category", define Classification Reference data in the *IFC Manager*. COBie requires IfcTypeProduct classification by the OmniClass table 21 called "Elements" in US or by the Uniclass system in UK. Both systems are available as built-in classification rules in ArchiCAD under the *Apply Predefined Rule* option.



Figure 18 COBie-required IFC properties defined for an IFC Type Product entity

The COBie-required duration units can be set at the export options (*IFC Translation Setup*). There is a predefined settings package (so-called "IFC Translator" in ArchiCAD) which contains the export options (including the required time units) recommended for the COBie-required IFC export. It is called "Basic FM Handover View" IFC Translator (see chapter <u>COBie2-enabled IFC Model Export</u>).

Component

The COBie2 **Component** worksheet summarizes the individually named items of the project.

Component	ArchiCAD (IEC) data manned to CORio data	ArchiCAD command
COBie2 spreadsheet data	Archicad (irc) uata mappeu to codie uata	AI CIICAD COIIIIIailu
Name	the <i>ID</i> attribute of an ArchiCAD element	Settings Dialog of an ArchiCAD element
CreatedBy	Owning User of Owner History > Person /Organization tab > Addresses >	(File > File Special > IFC 2x3 > IFC Options)
	Address type: Telecom > ElectronicMailAddress	
CreatedOn	the creation date of the IFC file	
TypeName	the Name attribute of the IFC Type Product assigned to an ArchiCAD element	(File > File Special > IFC 2x3 > IFC Manager)
Space	the No attribute of the ArchiCAD Zone (IfcSpace) assigned to an ArchiCAD element	
Description	the Description attribute of an IFC Type Product	Settings Dialog of an ArchiCAD element ,or
		File > File Special > IFC 2x3 > IFC Manager
ExtSystem	text: 'ArchiCAD-64'	
ExtObject	text: the entity type of an ArchiCAD element (for example: 'IfcFurnishingElement ')	(File > File Special > IFC 2x3 > IFC Manager)
ExtIdentifier	the Globalid attribute of an IFC Type Product	(File > File Special > IFC 2x3 > IFC Manager)
SerialNumber	IFC Property Set: 'Pset_ManufacturerOccurrence' > IFC Property: 'SerialNumber'	Settings Dialog of an ArchiCAD element ,or
		File > File Special > IFC 2x3 > IFC Manager
InstallationDate	IFC Property Set: 'COBie_Component' > IFC Property: 'InstallationDate'	Settings Dialog of an ArchiCAD element ,or
		File > File Special > IFC 2x3 > IFC Manager
WarrantyStartDate	IFC Property Set: 'COBie_Component' > IFC Property: 'WarrantyStartDate'	Settings Dialog of an ArchiCAD element ,or
		File > File Special > IFC 2x3 > IFC Manager
TagNumber	IFC Property Set: 'COBie_Component' > IFC Property: 'TagNumber'	Settings Dialog of an ArchiCAD element ,or
		File > File Special > IFC 2x3 > IFC Manager
BarCode	IFC Property Set: 'Pset_ManufacturerOccurrence' > IFC Property: 'BarCode'	Settings Dialog of an ArchiCAD element ,or
		File > File Special > IFC 2x3 > IFC Manager
AssetIdentifier	IFC Property Set: 'COBie_Component' > IFC Property: 'AssetIdentifier'	Settings Dialog of an ArchiCAD element ,or
		File > File Special > IFC 2x3 > IFC Manager

Figure 19 Mapping between ArchiCAD model and the COBie2 Component worksheet data

The "Name" data are derived from the ArchiCAD "ID" of the element, so you can set them in the element Settings dialogs.

Note Each Component has to have a unique COBie "Name" (ArchiCAD "ID"). If you did not assign unique (different) ID's to your ArchiCAD elements, you can do so at any time, for example using the *Element ID Manager* function (*Document > Schedules and Lists*).

The "Space" data describes the ArchiCAD Zone (IfcSpace) assigned to a component. This data is automatically calculated, if the IFC export uses the *Space containment* and the *IFC Space boundaries* functions (see chapter <u>COBie2-enabled IFC Model Export</u>).

To make all COBie2-required IFC properties available for the Component elements in the element Settings dialog (*Tags and Categories > Manage IFC Properties*), use the "COBie2.xml" scheme in the ArchiCAD project (see <u>COBie2 Scheme Template</u>).

To set the Component "Category", define Classification Reference data in the *IFC Manager*. COBie requires classification of Components (ArchiCAD elements) by the OmniClass table 21 called "Elements" in US or by the Uniclass system in UK. Both systems are available as built-in classification rules in ArchiCAD under the *Apply Predefined Rule* option.

M Object Selection Settings	? ×	📶 Mar	nage IFC Properties		? <mark>×</mark>
Favorites	Selected: 1 Editable: 1	Select	ed: 1 Editable: 1		8- ┏-
A fit Previou and Pacificating			Name	Value	Туре
Preview and Positioning		~	Attributes (IfcTransportElem	ent)	*
Figure Custom Settings			GlobalId	2yHjM6yok\$HBRT	IfcGloballyUniqueId
Eloor Plan and Section			🛛 Name	COBie-Name	IfcLabel
			Description	COBie-Description	IfcText
Listing and Labeling		. 6	Z Tag	BC46D586-F32B	IfcIdentifier
▼ ⊕_ Tags and Categories		6	🛛 CapacityByWeight	0.000000	IfcMassMeasure
			CapacityByNumber	0	IfcCountMeasure
ID COBie-Name	~		AC_Pset_RenovationAndPhas	sing	
Structural Function Non-Load-Bearing Element			Renovation Status	Existing	IfcLabel
Position Interior		~	COBie_Component		
Element Classification ArchiCAD Type		6	AssetIdentifier	COBie-AssetIdent	IfcLabel
✓ Renovation		6	InstallationDate	6/4/2013	IfcCalendarDate
Renovation Status Existing		6	Z TagNumber	COBie-TagNumber	IfcLabel
Show On Renovation Filter All Relevant Filters		6	✓ WarrantyStartDate	6/4/2013	IfcCalendarDate
✓ IFC Properties (IfcTrans		~	Pset_ManufacturerOccurrenc	e	
Description (Attribute) COBie-Description	IfcText	6	BarCode	COBie-BarCode	IfcIdentifier
Tag (Attribute) BC46D586-F32B-BF44-B6DD-12	967C/ IfcIde	6	SerialNumber	COBie-SerialNumber	IfcIdentifier
AssetIdentifier (COBie_Co COBie-AssetIdentifier	IfcLabel	~	Classification References		
InstallationDate (COBie_Co 6/4/2013	IfcCale		CCCS - Elements	21-04 10 10 10 El	IfcClassificationRefe
TagNumber (COBie_Compo COBie-TagNumber	IfcLabel				
WarrantyStartDate (COBie 6/4/2013	IfcCale			•	
BarCode (Pset_Manufactur COBie-BarCode	IfcIde				
SerialNumber (Pset_Manuf COBie-SerialNumber	IfcIde				-
OCCS - Elements (Classifica 21-04 10 10 10 Elevators	ifcClas				•
Manage IFC Properties	-		Create Property/Classification	Apply Predefined Pule	
			or cate Property/classifications		
D1010 Elevators and Lifts Car	Icel OK			Cance	ОК

Figure 20 COBie-required IFC property definition in an element Settings dialog

System

The COBie2 **System** worksheet summarizes the sets of <u>Components</u> providing a service. In other words, it summarizes the data of the systems (IfcSystem) of the project elements.

System COBie2 spreadsheet data	ArchiCAD (IFC) data mapped to COBie data	ArchiCAD command
Name	the Name attribute of an IFC System	File > File Special > IFC 2x3 > IFC Manager
CreatedBy	Owning User of Owner History > Person /Organization tab > Addresses > Address type: Telecom > ElectronicMailAddress	(File > File Special > IFC 2x3 > IFC Options)
CreatedOn	the creation date of the IFC file	
Category	Classification Reference data (ItemReference : Name) of an IFC System	File > File Special > IFC 2x3 > IFC Manager
ComponentNames	the ID attribute of the ArchiCAD elements assigned to an IFC System	(Settings Dialog of an ArchiCAD element)
ExtSystem	text: 'ArchiCAD-64'	
ExtObject	text: 'IfcSystem'	
ExtIdentifier	the <i>Globalid</i> attribute of an IFC System	(File > File Special > IFC 2x3 > IFC Manager)
Description	the Description attribute of an IFC System	File > File Special > IFC 2x3 > IFC Manager

Figure 21 Mapping between ArchiCAD model and the COBie2 System worksheet data

The "Systems" are interpreted as IFC System Assignment entities (IfcSystem) in the ArchiCAD project. Assignments (including IFC System) can be defined and managed only in the *IFC Manager*, so their COBie2-requested data can be defined with the *IFC Manager* too.

A COBie "System" (IfcSystem) can be defined with the *New* command by applying it on the "IFC Systems" member of the "Assignments" tree. The "Name" attribute of the new IFC System defines the COBie "Name" data. Drag and drop the proper ArchiCAD element (COBie Component) members from the IFC model hierarchy tree of the *IFC Manager* to the "New Relation" folder of the new IFC System entity.

To set the System "Category", define Classification Reference data. COBie requires IfcSystem classification by the OmniClass table 21 called "Elements" in US or by the Uniclass system in UK. Both systems are available as built-in classification rules in ArchiCAD under the *Apply Predefined Rule* option.



Figure 22 IFC System definition in the IFC Manager

MEP Systems defined with the <u>GRAPHISOFT MEP Modeler</u> Add-On can be also handled as IfcSystem inside an ArchiCAD project. Just create a new IfcSystem (as mentioned above) and choose the predefined MEP System name from the list available (see the following figure).

If an IFC model (for example exported by an MEP application) merged to the current ArchiCAD project contains IfcSystems, you can also manage them and their properties in the *IFC Manager*.



Figure 23 Conversion of a MEP Modeler System to an IFC System

Document / Attribute / Coordinate / PickLists

Data are extracted automatically from the IFC model exported by ArchiCAD.

Assembly / Connection / Spare / Resource / Job / Impact / Issue

These data types are not requested from a design application by the COBie2 rules, and they are not available in ArchiCAD projects either. The table contents should be manually filled out in the spreadsheet, if they are required.

COBie2 Scheme Template

To make all COBie2-required custom IFC properties available for the COBie <u>Space</u>, <u>Type</u> and <u>Component</u> entities in the Setting Dialogs and in the *IFC Manager*, load the "COBie2.xml" scheme template file into the ArchiCAD project: use the *Merge* command for the .xml file in the *IFC Scheme Setup* dialog (*File > File Special > IFC 2x3*).



Figure 24 COBie-required properties loaded as a scheme template

COBie2-enabled IFC Model Export

COBie-required IFC model/file can be exported easily by using the export set (so-called "IFC Translator") optimized for the Basic FM Handover View. Just use the *Save as* command (*File* menu) together with the translator called "Basic FM Handover View" from either a Floor Plan or a 3D window.



Figure 25 IFC model export based on Basic FM Handover View (COBie)

The steps of IFC model export:

- 1. Element filtering possibilities for the export:
 - Selected elements only (available only if elements have been selected): elements selected in the current view (the view that was open when you issued the export command) will be exported.
 - Entire project:

entire model (regardless of any selection, and regardless of the elements' show/hide status) will be exported.

- Visible elements (on all stories):

the visible elements in the current view will be exported, regardless of any selection. "Visible" means all elements that are set to be displayed (due to layer settings, model view options, partial structure display, etc.).

- **Note** If you issue the export command from Floor Plan view ("Visible elements (on all stories)"), this choice includes all elements currently displayed on every story of the project.
- All elements on current story (available only if Floor Plan is open):
 all elements (regardless of any selection, and regardless of the elements' show/hide status) on
 the current story of the Floor Plan will be exported.
- Visible elements on current story (available only if Floor Plan is open):
 all elements (regardless of any selection) that are visible on the current story of the Floor Plan will be exported.
- **Note** If you choose "Visible elements," make sure that ArchiCAD Zones are set to be displayed in the current view. For example, if you are saving from the 3D window, make sure that Zones are "on" in the *Filter and Cut Elements in 3D* dialog box (*View* > *Elements in 3D View*).

2. Choose the "Basic FM Handover View" Translator, in which export settings are fine-tuned for the FM Handover requirements.

Note The meaning of the "Derived model data to export" options (*IFC Translation Setup* > *Export Options*):

- Space containment:

It exports the relationship between ArchiCAD Zones (IfcSpaces) and their contained Object (Furnishing, Mechanical (HVAC), etc.) and Morph elements. "Contained" means that the middle point of an Object or Morph is within an ArchiCAD Zone in the 3D space. This option is required for exporting COBie "Space" data of the <u>Component</u> worksheet.

- Base quantities (length, area and volume):
 It exports elements' base quantities required by COBie2.
- IFC Space boundaries with tolerance between Zones [mm]:

It exports the logical connection between ArchiCAD Zones (IfcSpace) and the building elements that enclose them. The "tolerance between Zones" means the maximum distance between neighboring ArchiCAD Zones (for example, the thickest wall/slab) in mm. This option is required for exporting COBie "Space" data of the <u>Component</u> worksheet.

M IFC Translation Setup			? ×	
Available Translators				
Name	Project Partner		Duplicate	
Basic FM Handover View	COBie	<u> </u>		
Concept Design BIM 2010	GSA		Rename	
Coordination View (Surface Geometry)	General	_		
Coordination View Version 2.0	General	=	Remove	
Data Exchange with Analysis Applications	Structural			
Data Exchange with Autodesk Revit MEP	MEP		Browse	
Data Exchange with Autodesk Revit Structure	Structural			🤊 🔤 🗙
Data Exchange with Bentley Building	Structural	Default fo	Derived Model Data to Export	
Data Exchange with DDS-CAD MEP	MEP	-		
	•		Space containment	
Location: C:\Users\arechtorisz\Graphisoft\IFC	ranslators 17.0.0 INT\Basic FM Handover \	/iew.xml	Bounding box	
Description			Base quantities (length, area and volume)	
Import/Export Filter Options			All Library Part parameters as custom IEC n	roperties
Import Options				
 Export Options 			IFC Space boundaries with tolerance between the second	en Zones [mm]: 400.00
Elements to export:	Visible elements (on all stories)		ArchiCAD Zone Categories as IFC Space da	assification data
Derived model data to export:	Of	otions		
				Cancer
IFC View Definition:	Extended Model View			
Extended Model View name:	FMHandover		IFC Model Units	? <mark>- × -</mark>
Surface Geometry (BREP geometries only)			Length Unit:	Millimeter 👻
IFC Site geometry:	As boundary representation (BREP)		Angle Unit:	Degree 💌
Complex elements:	Options		Area Unit:	Square Meter 🔹
TEC model units:		ations	Volume Unit:	Cubic Meter 👻
	U,	Juons	Currency Unit:	USD 🗸
Global Unique Identifiers (GUID):	Keep existing (recommended))	Time Unit:	Year 🗸
IFC file encoding:	ANSI - for compatibility mode			
Revert Changes	Cancel	Save Settings		Cancel OK

Figure 26 Major export options of the "Basic FM Handover View" (COBie) IFC translator

- 3. Define file name.
- 4. Choose the file format of the IFC export. Choose .IFC or .IFCXML depending on the file support of the COBie2 spreadsheet converter programs (see the <u>How to Create a COBie2 Spreadsheet</u> chapter).
- 5. Click Save.

How to Create a COBie2 Spreadsheet

An external application is needed to convert an ArchiCAD IFC file to an XLS/XML-type COBie2 spreadsheet format.

The IFC, IFCXML and COBie2 spreadsheet formats for the IFC 2x3 Basic FM Handover MVD do capture the same information content and can be transformed forth and back across the different formats. A number of dedicated tools can be used to execute the transformations, such as the free COBie Toolkit application, developed by Engineer Research and Development Center (ERDC).

ERDC COBie Toolkit, developed for the COBie FM Handover project, includes the transformer tool and the configurations to map IFC data to COBie2. The application also checks for any missing items in your IFC model. The conversion can be done in two easy steps (1. IFC file selection and 2. COBie output file type selection).

cone COBie	Foolkit Beta 1.2				٢
Options					
COBie File	Utilities				
Import	/Export/Report	:			
C:\Users	C:\Users\arechtorisz\Documents\IFC models\IFC model.ifc 1. Import				
				2. Export/Report	
File Loade	d as COBie				
	come Save			— ×	
COBie	Save in:	IFC models		• 🔊 📂 🛄 •	
Selec	Recent Items				
Select	Desktop My Documents	File name: Conve Files of type: COBie	rted COBie table SpreadsheetXML (2003)(xml)	↓ Save ↓ Cancel	

Figure 27 The steps of IFC to COBie conversion

Hint COBie Toolkit is a free tool and can be downloaded from <u>here</u> or from the following website:

https://github.com/opensourceBIM/COBie-plugins