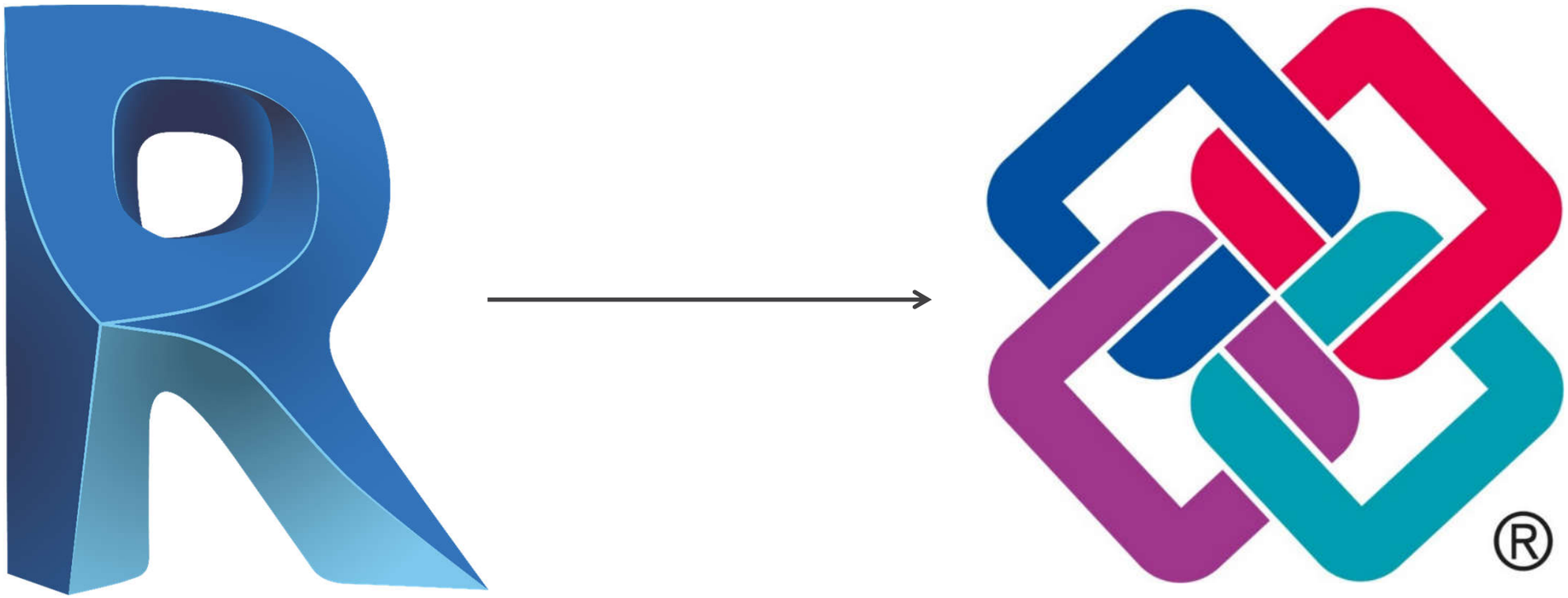
# R E V I T  IFC Collaboration



# What is IFC?

The Industry Foundation Classes (IFC) data model is intended to describe building and construction industry data. It is a platform neutral, open file format specification that is not controlled by a single vendor or group of vendors.

```
<IfcLightFixtureType id="i100005">
     <GlobalId>12345678901234567890000</GlobalId>
     <OwnerHistory>
          <IfcOwnerHistory xsi:nil="true" ref="i100006"/>
     </OwnerHistory>
     <Name>LightFixture_POINTSOURCE_UK</Name>
     <Description>Example light fixture point source</Description>
     <HasPropertySets ex:cType="set">
          <IfcPropertySet pos="0" xsi:nil="true" ref="i100007"/>
     </HasPropertySets>
     <RepresentationMaps ex:cType="list-unique">
          <IfcRepresentationMap pos="0" xsi:nil="true" ref="i100078"/>
     </RepresentationMaps>
     <Tag>Product Template </Tag>
     <ElementType/>
     <PredefinedType>pointsource</PredefinedType>
</IfcLightFixtureType>
```

# Using Incoming IFC

REVIT

SKETCHUP

NAVISWORKS

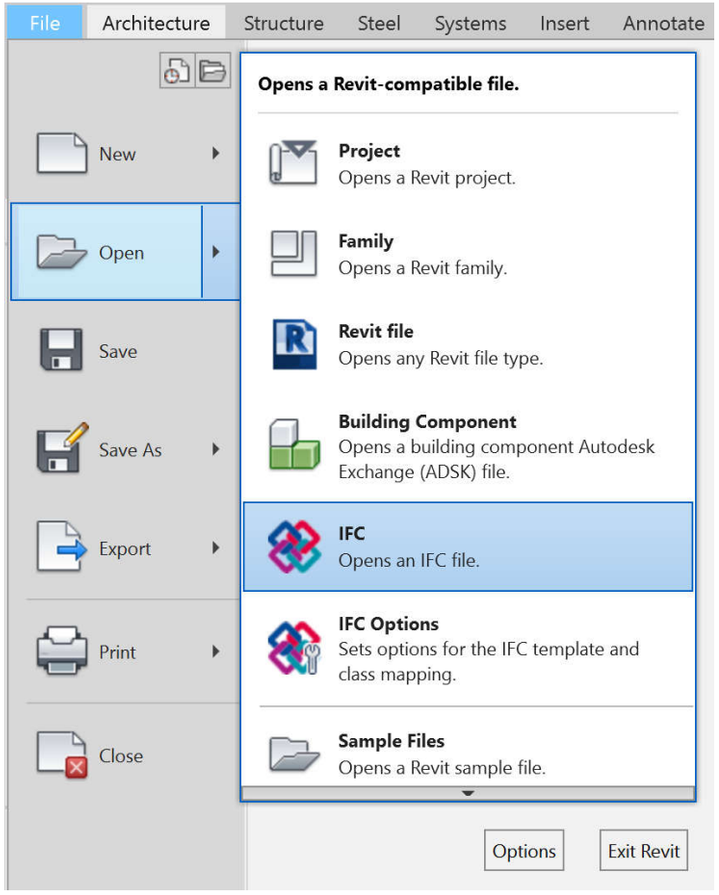
Tekla®

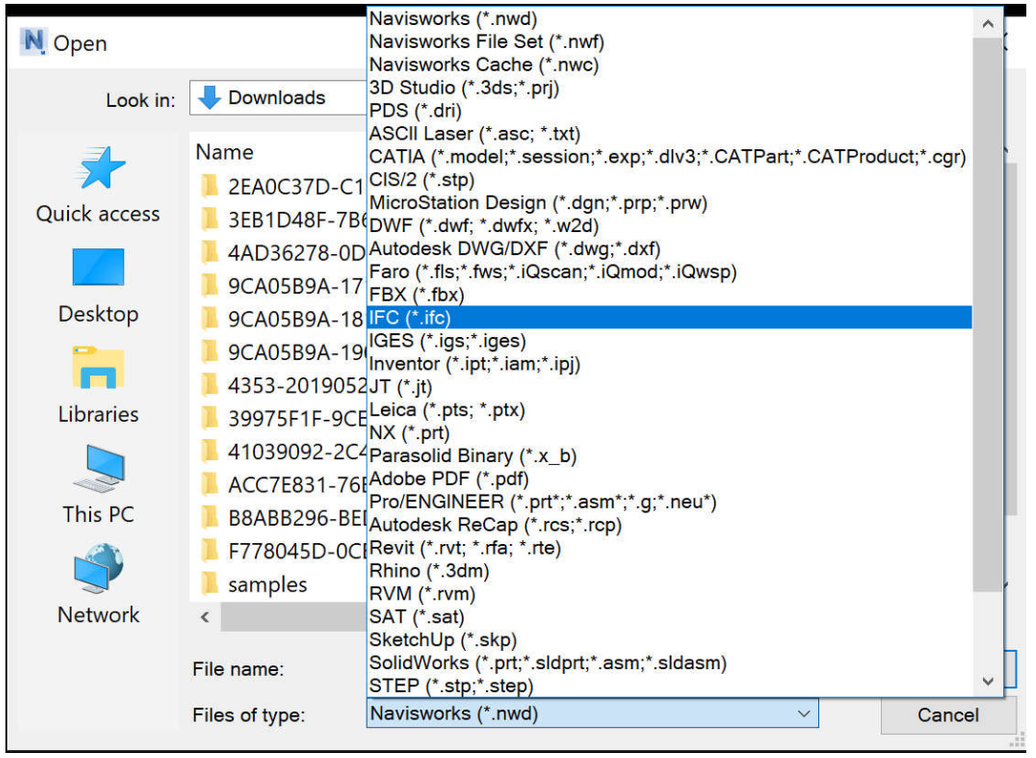
BIMCOLLAB ZOOM

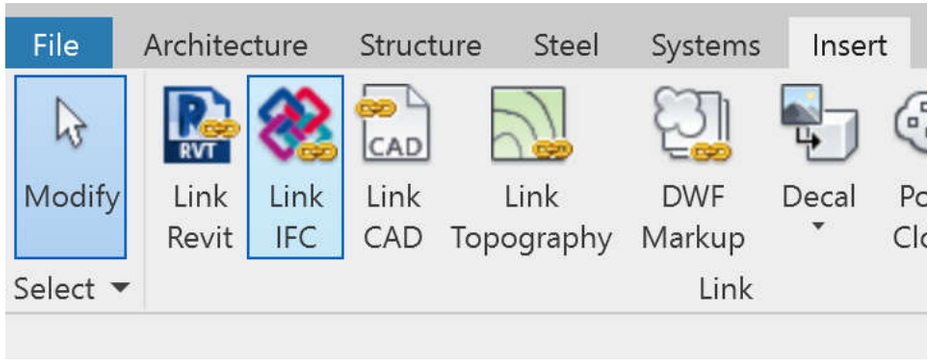
https://www.bimcollab.com/en/zoom/free-ifc-viewer

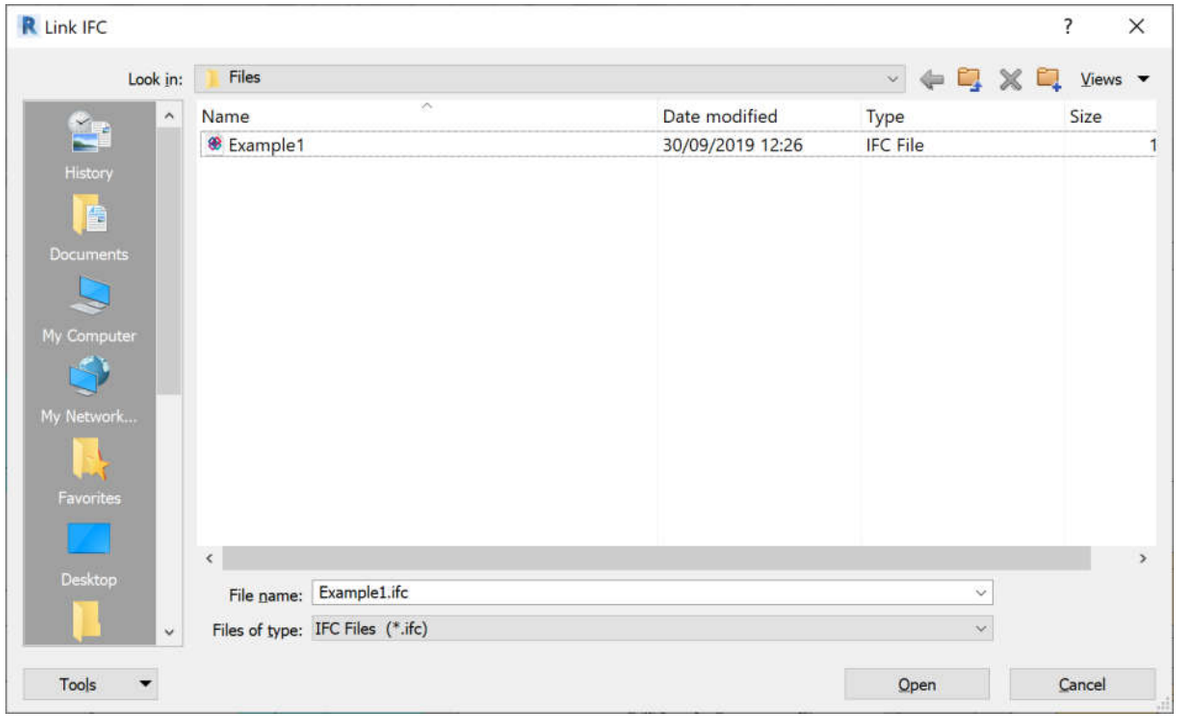
SOLIBRI ANYWHERE

https://solibri.com/download-solibri-anywhere?step=1


File
Architecture
Structure
Steel
Systems
Insert
Annotate
New
Open
Save
Save As
Export
Print
Close
Opens a Revit-compatible file.
Project
Opens a Revit project.
Family
Opens a Revit family.
Revit file
Opens any Revit file type.
Building Component
Opens a building component Autodesk Exchange (ADSK) file.
IFC
Opens an IFC file.
IFC Options
Sets options for the IFC template and class mapping.
Sample Files
Opens a Revit sample file.
Options
Exit Revit

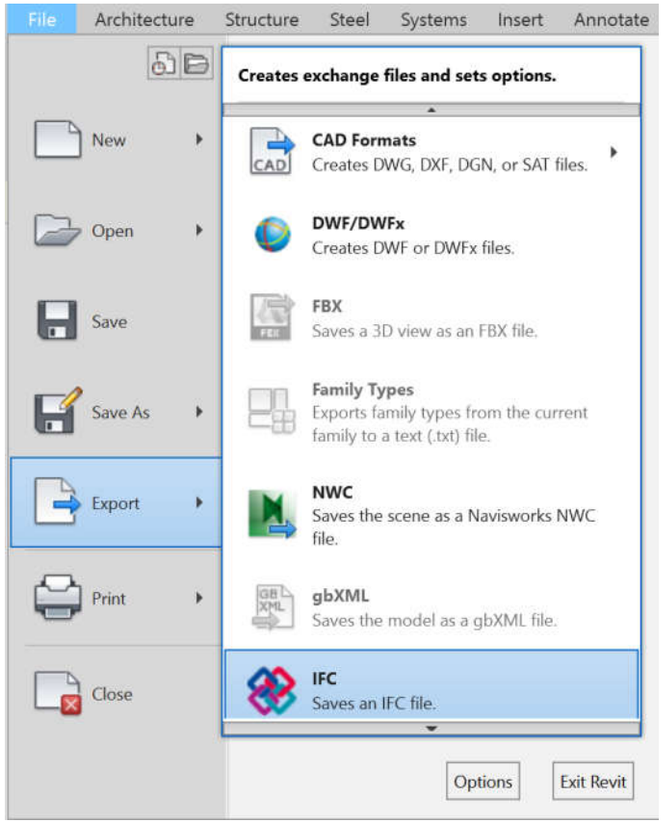

Open
Look in:
Downloads
Quick access
Desktop
Libraries
This PC
Network
Name
2EA0C37D-C1
3EB1D48F-7B
4AD36278-0D
9CA05B9A-17
9CA05B9A-18
9CA05B9A-19
4353-2019052
39975F1F-9CE
41039092-2C4
ACC7E831-76
B8ABB296-BE
F778045D-0C
samples
File name:
Files of type:
Navisworks (*.nwd)
Cancel
Navisworks (*.nwd)
Navisworks File Set (*.nwf)
Navisworks Cache (*.nwc)
3D Studio (*.3ds;*.prj)
PDS (*.dri)
ASCII Laser (*.asc; *.txt)
CATIA (*.model;*.session;*.exp;*.dlv3;*.CATPart;*.CATProduct;*.cgr)
CIS/2 (*.stp)
MicroStation Design (*.dgn;*.prp;*.prw)
DWF (*.dwf; *.dwfx; *.w2d)
Autodesk DWG/DXF (*.dwg;*.dxf)
Faro (*.fls;*.fws;*.iQscan;*.iQmod;*.iQwsp)
FBX (*.fbx)
IFC (*.ifc)
IGES (*.igs;*.iges)
Inventor (*.ipt;*.iam;*.ipj)
JT (*.jt)
Leica (*.pts; *.ptx)
NX (*.prt)
Parasolid Binary (*.x_b)
Adobe PDF (*.pdf)
Pro/ENGINEER (*.prt*;*.asm*;*.g;*.neu*)
Autodesk ReCap (*.rcs;*.rcp)
Revit (*.rvt; *.rfa; *.rte)
Rhino (*.3dm)
RVM (*.rvm)
SAT (*.sat)
SketchUp (*.skp)
SolidWorks (*.prt;*.sldprt;*.asm;*.sldasm)
STEP (*.stp;*.step)

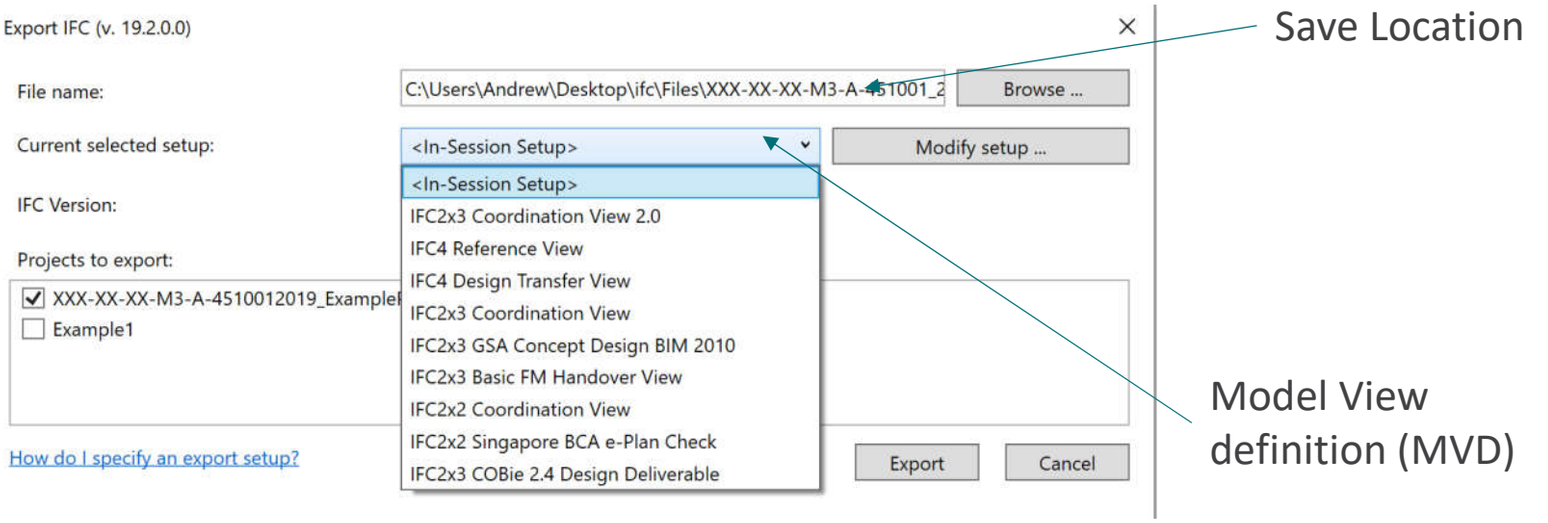

File
Architecture
Structure
Steel
Systems
Insert
Modify
Select
Link Revit
Link IFC
Link CAD
Link Topography
DWF Markup
Decal
Link


Link IFC
Look in:
Files
Views
Name
Date modified
Type
Size
Example1
30/09/2019 12:26
IFC File
History
Documents
My Computer
My Network...
Favorites
Desktop
File name:
Example1.ifc
Files of type:
IFC Files (*.ifc)
Tools
Open
Cancel

## Link an IFC

# Exporting Revit to IFC




## Common Used MVDs

### Buildingsmart Official

| | |
|---|---|
| IFC2x3 Coordination View 2.0 | Spatial and physical components for design coordination between architectural, structural, and building services (MEP) domains |
| IFC2x3 Basic FM Handover View | Handover of model information from planning and design applications to CAFM and CMMS applications, as well as the handover of model information from construction and commissioning software to CAFM and CMMS applications |

### Non-Official

| | |
|---|---|
| IFC2x3 COBie 2.4 Design Deliverable | IFC format equivalent to the COBie (Construction Operations Building Information Exchange) output required by the UK government. |

For More information about MVD go to https://technical.buildingsmart.org/standards/mvd/

## Export formats

Unfortunately it isn’t this easy

Location of Revit IFC export mapping table

# Overview of IFC advanced export

Things to consider and setup

- Latest IFC Export tool
- MVD (Model View Definition) Customisation
- Revit to IFC Class Mapping (For Import and Export)
- Type Overrides (IFCExportAs)
- Property set (Pset) requirements
- Correct Uniclass (or equivalent) Layer export

Latest IFC Export tool

https://github.com/Autodesk/revit-ifc/releases

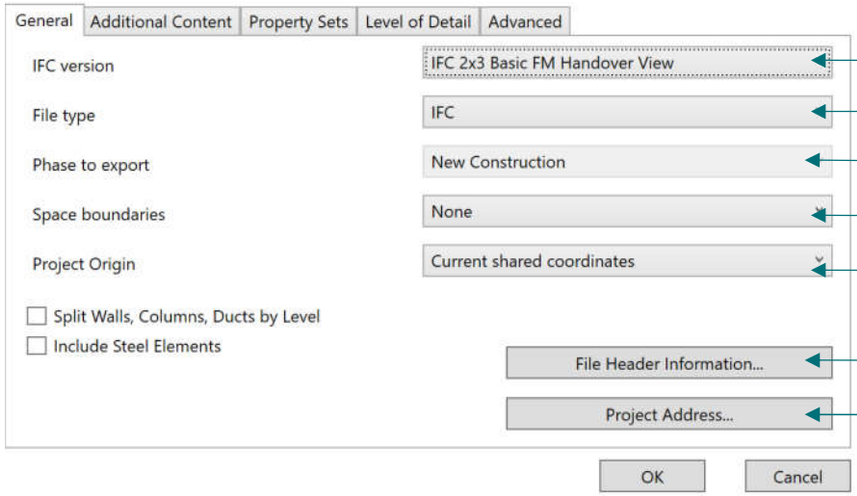
Also available through the Autodesk app store. May not be most up to date version

2019

https://apps.autodesk.com/RVT/en/Detail/Index?id=1763588736399554049&appLang=en&os=Win64

2020

https://apps.autodesk.com/RVT/en/Detail/Index?id=8986482933300179260&appLang=en&os=Win64




MVD

Set to “IFC”

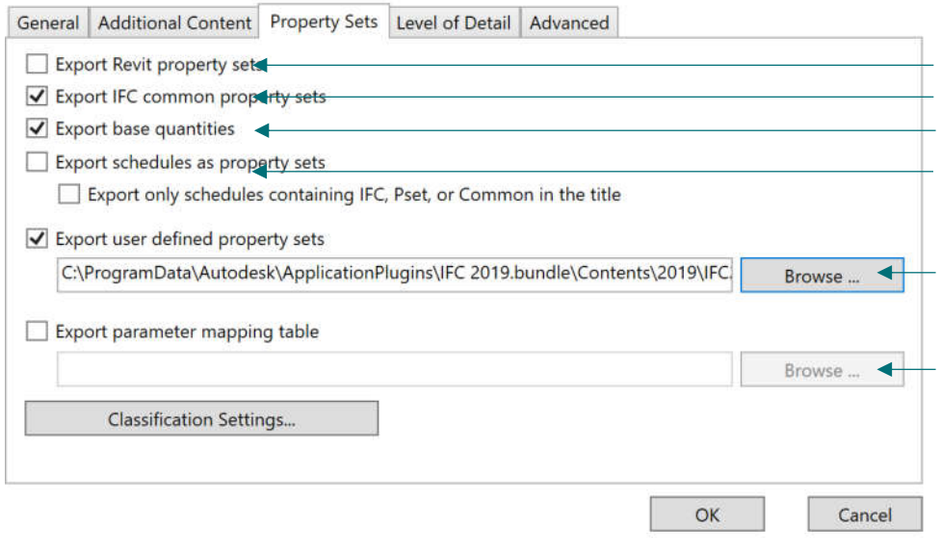
Set to Correct Phase. Usually New Construction

Usually ok to set to 1st Level

Usually Shared Coordinates

Fill In

Fill In




Unselect. (Generally Not appropriate to export all revit parameter information

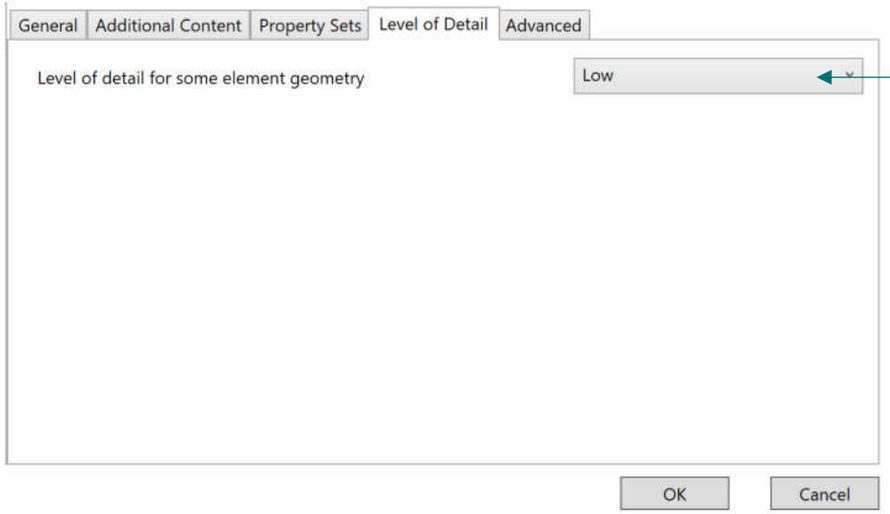
Select, Will export Revit parameters that are common to IFC Psets. EG Fire Rating

Select, Will Export general Quantities such as Areas not defined by rules of measurement

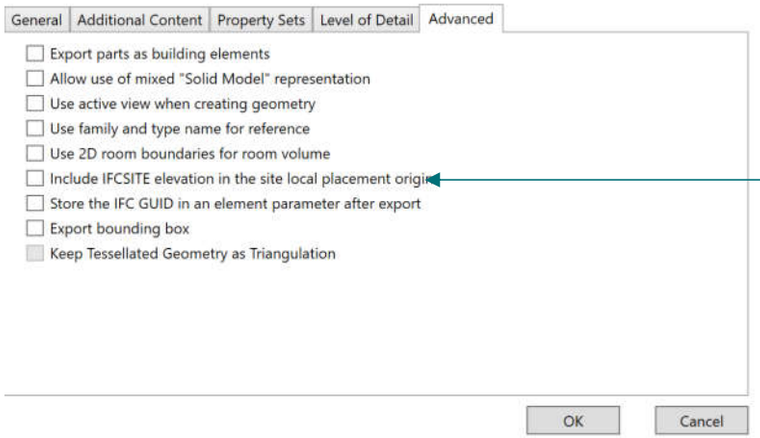
If using schedules to define Psets select, if not deselect

Link to pset tables as described in later slides.

Used to define mapping to IFC specification parameters.



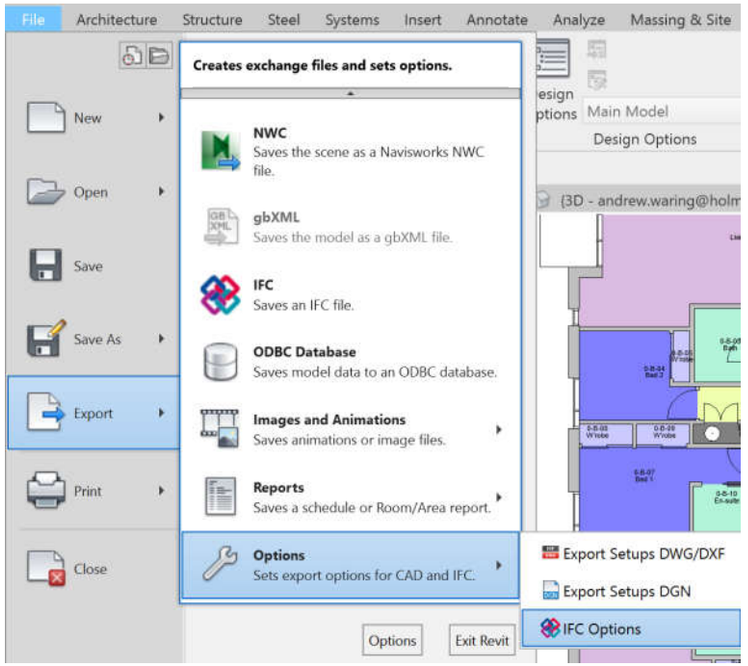

Used to define complexity of tessellation of some elements such as floors, railings, stairs, complex extrusions etc

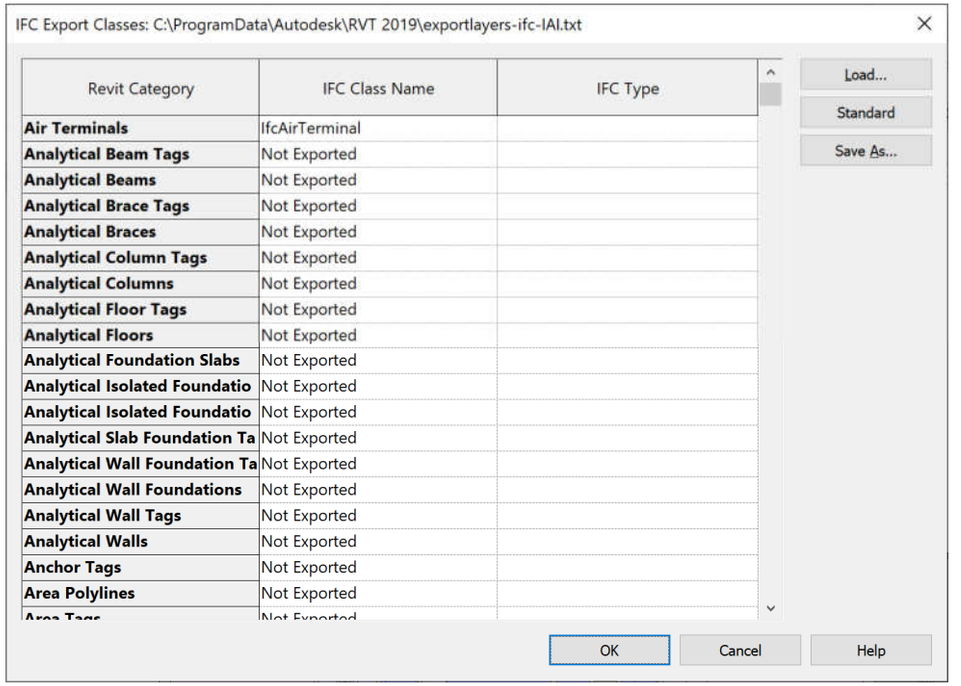



Always tick or else IFC file will not have correct elevation according to shared coordinate

https://www.bim42.com/2018/03/ifc-for-revit-1/
https://www.bim42.com/2018/03/ifc-for-revit-2/
https://knowledge.autodesk.com/support/revit-products/learn-explore/caas/CloudHelp/cloudhelp/2018/

# Class Mapping

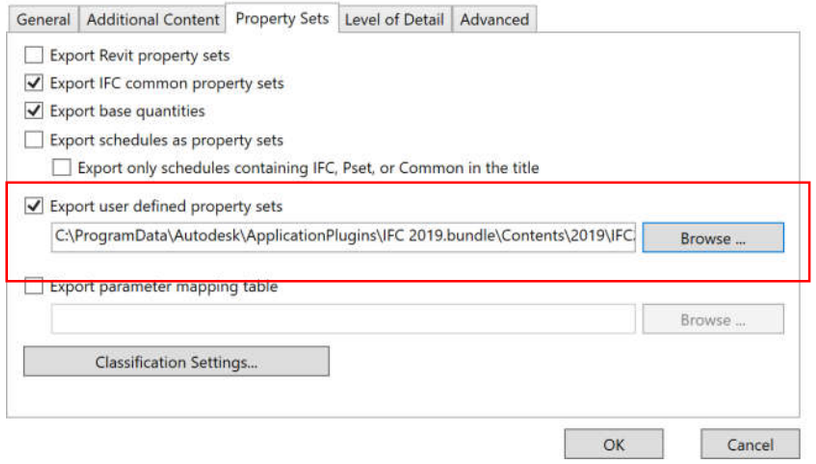



| Revit Category | IFC Class Name | IFC Type |
|---|---|---|
| **Air Terminals** | IfcAirTerminal | |
| **Analytical Beam Tags** | Not Exported | |
| **Analytical Beams** | Not Exported | |
| **Analytical Brace Tags** | Not Exported | |
| **Analytical Braces** | Not Exported | |
| **Analytical Column Tags** | Not Exported | |
| **Analytical Columns** | Not Exported | |
| **Analytical Floor Tags** | Not Exported | |
| **Analytical Floors** | Not Exported | |
| **Analytical Foundation Slabs** | Not Exported | |
| **Analytical Isolated Foundatio** | Not Exported | |
| **Analytical Isolated Foundatio** | Not Exported | |
| **Analytical Slab Foundation Ta** | Not Exported | |
| **Analytical Wall Foundation Ta** | Not Exported | |
| **Analytical Wall Foundations** | Not Exported | |
| **Analytical Wall Tags** | Not Exported | |
| **Analytical Walls** | Not Exported | |
| **Anchor Tags** | Not Exported | |
| **Area Polylines** | Not Exported | |

| **IFC Parameters** | | |
|---|---|---|
| IFCExportAs | IfcDoor | = "IfcDoor" |
| IFCExportType | | = |

Supported Classes https://sourceforge.net/p/ifcexporter/wiki/Supported%20IFC%20Entities/

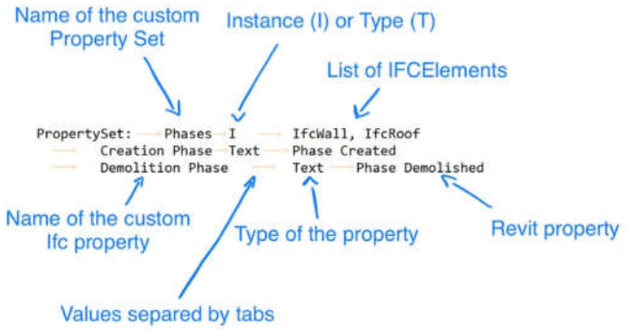



```
# Holmes Miller Pset Definitions
#
# IFC Links
# Ifc4-http://www.buildingsmart-tech.org/ifc/IFC4/Add2/html/
# Ifc2x3-http://www.buildingsmart-tech.org/ifc/IFC2x3/TC1/html/index.htm
#
PropertySet:    COBie_Specification     I       IfcElement
        NominalLength   Real    COBie.Type.NominalLength
        NominalWidth    Real    COBie.Type.NominalWidth
        NominalHeight   Real    COBie.Type.NominalHeight
        Shape   Text    COBie.Type.Shape
        Size    Text    COBie.Type.Size
        Color   Text    COBie.Type.Color
        Finish  Text    COBie.Type.Finish
        Grade   Text    COBie.Type.Grade
        Material        Text    COBie.Type.Material
        Constituents    Text    COBie.Type.Constituents
        Features        Text    COBie.Type.Features
        AccessibilityPerformance        Text    COBie.Type.AccessibilityPerformance
        CodePerformance Text    COBie.Type.CodePerformance
        SustainabilityPerformance       Text    COBie.Type.SustainabilityPerformance
#
PropertySet:    COBie_Component I       IfcElement
        InstallationDate        Text    COBie.Component.InstallationDate
        WarrantyStartDate       Text    COBie.Component.WarrantyStartDate
        TagNumber       Text    COBie.Component.TagNumber
        AssetIdentifier Text    COBie.Component.AssetIdentifier
#
PropertySet:    COBie_Space     I       IfcSpace
        RoomTag Text    COBie.Space.RoomTag
#
PropertySet:    COBie_Asset     I       IfcElement
        AssetType       Text    COBie.Type.AssetType
#
PropertySet:    Pset_ManufacturerOccurence      I       IfcElement
        SerialNumber    Text    COBie.Component.SerialNumber
        BarCode Text    COBie.Component.BarCode
#
```

Door

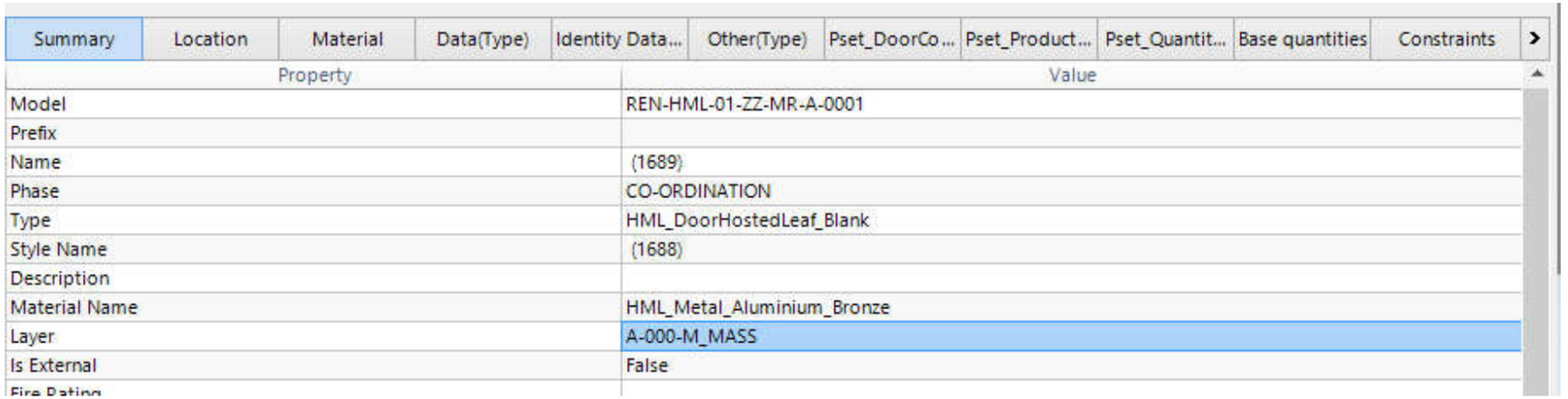
| Summary | Location | Material | Analytical Pr... | Construction... | Data(Type) | Dimensions(T... | Identity Data... | Materials an... | Other(Type) | COBie_Compo... |
|---|---|---|---|---|---|---|---|---|---|---|

| Property | Value |
|---|---|
| AssetIdentifier | N/A |
| InstallationDate | TBC By Contractor If Applicable |
| TagNumber | TBC By Contractor If Applicable |
| WarrantyStartDate | TBC By Contractor If Applicable |




https://www.bim42.com/2018/03/ifc-for-revit-1/

## Property Sets



| Summary | Location | Material | Data(Type) | Identity Data... | Other(Type) | Pset_DoorCo... | Pset_Product... | Pset_Quantit... | Base quantities | Constraints |
|---|---|---|---|---|---|---|---|---|---|---|

| Property | Value |
|---|---|
| Model | REN-HML-01-ZZ-MR-A-0001 |
| Prefix | |
| Name | (1689) |
| Phase | CO-ORDINATION |
| Type | HML_DoorHostedLeaf_Blank |
| Style Name | (1688) |
| Description | |
| Material Name | HML_Metal_Aluminium_Bronze |
| Layer | A-000-M_MASS |
| Is External | False |
| Fire Rating | |

```
#Category       #Sub-Category   #Layer Projection       #Colour ID      #Layer Cut      #Colour ID
Air Terminals           A-Pr6570M-AirTerminals  1
Areas           A-Zz2040M-AreaFill      1
Areas   Color Fill      A-Zz2040M-AreaFill      1
Cable Tray Fittings             A-Pr6570M-CablesConductorsAndFittingsProducts   1
Cable Tray Fittings     Center line     A-Zz3520E-Centrelines   1
Cable Trays             A-Pr6570M-CableTrays    1
Cable Trays     Center line     A-Zz3520E-Centrelines   1
Cable Trays     Drop    A-Pr6570M-CableTrays    1
Cable Trays     Rise    A-Pr6570M-CableTrays    1
```

%ProgramData%\Autodesk\RVT 2018\exportlayers-dwg-BS1192.txt

## Layer Mapping

# Beware

- This exchange format does not have a native editor
- How well the IFC file opens depends on the programs implementation of IFC
- There is no quick and easy way to validate geometry against Revit and no way of accounting for all software
- Data can be validated easier.
- If you aren’t careful you may be handing over more data than you intend which may not be validated