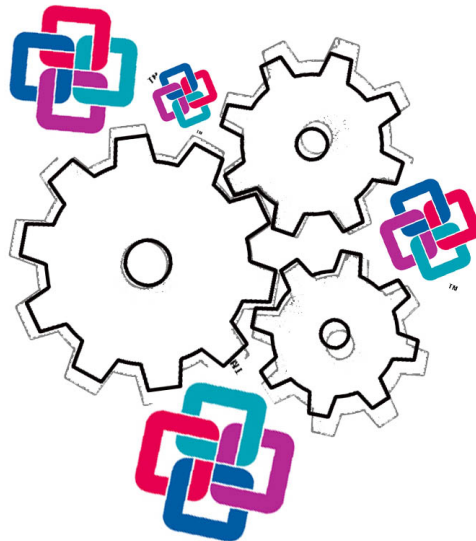




ISPRS EuroSDR GeoBIM benchmark¹
2019

Task 1 – The **support for IFC** within BIM (and other) software

Results of the tests delivered by participants



¹ <https://3d.bk.tudelft.nl/projects/geobim-benchmark/>

Table of Contents

| | |
|---|-----|
| <i>Autodesk Civil 3D</i> | 4 |
| <i>Solibri Office</i> | 13 |
| <i>Bentley Map Enterprise</i> | 26 |
| <i>ACCA usBIM.viewer+</i> | 37 |
| <i>Tekla Structures</i> | 43 |
| <i>ACCA PriMus-IFC</i> | 51 |
| <i>Simplebim</i> | 57 |
| <i>Bentley MicroStation + TerraSolid</i> | 62 |
| <i>FME Desktop</i> | 73 |
| <i>Allplan</i> | 113 |
| <i>AutoCAD Architecture</i> | 125 |
| <i>ACCA Edificius</i> | 137 |
| <i>ESRI, Pro and ArcGIS 10.X, Revit, Safe FME</i> | 156 |
| <i>eveBIM</i> | 159 |
| <i>eveBIM Viewer</i> | 169 |
| <i>BIM Visison 2.20.3</i> | 175 |
| <i>FreeCAD</i> | 182 |
| <i>FreeCAD</i> | 196 |
| <i>BimServer</i> | 197 |
| <i>SketchUp</i> | 202 |
| <i>FZKViewer</i> | 204 |
| <i>FZK Viewer</i> | 215 |
| <i>Autodesk Revit</i> | 220 |
| <i>Autodesk Revit</i> | 227 |
| <i>REVIT</i> | 230 |
| <i>Autodesk Revit 2018</i> | 238 |
| <i>Autodesk Revit 2019.2</i> | 249 |
| <i>Autodesk Revit 2020</i> | 254 |
| <i>Vectorworks Designer 2019</i> | 263 |
| <i>Vectorworks Designer 2019</i> | 272 |
| <i>ArchiCAD</i> | 282 |

| | |
|------------------------------------|------------|
| Archicad | 291 |
| ArchiCAD | 300 |
| Dlubal RFEM | 306 |
| ARCHLine.XP | 316 |
| STR Vision IFC Viewer | 322 |
| RDF IFC Viewer | 326 |
| Infraworks | 330 |
| bimspot | 336 |
| DDS-CAD | 337 |
| Blender | 340 |
| Solibri Anywhere | 349 |
| BricsCAD Ultimate | 356 |
| Lexocad | 362 |

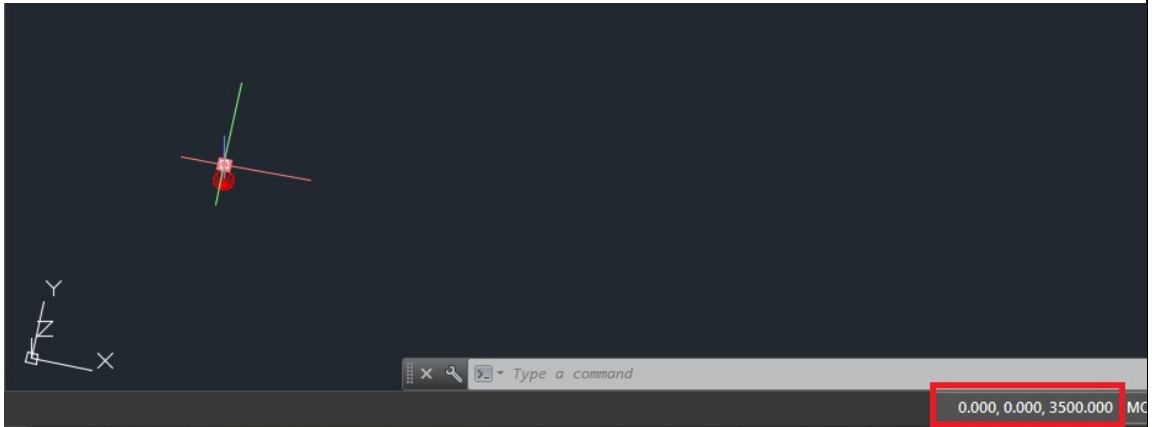
Autodesk Civil 3D – Windows 10 Home

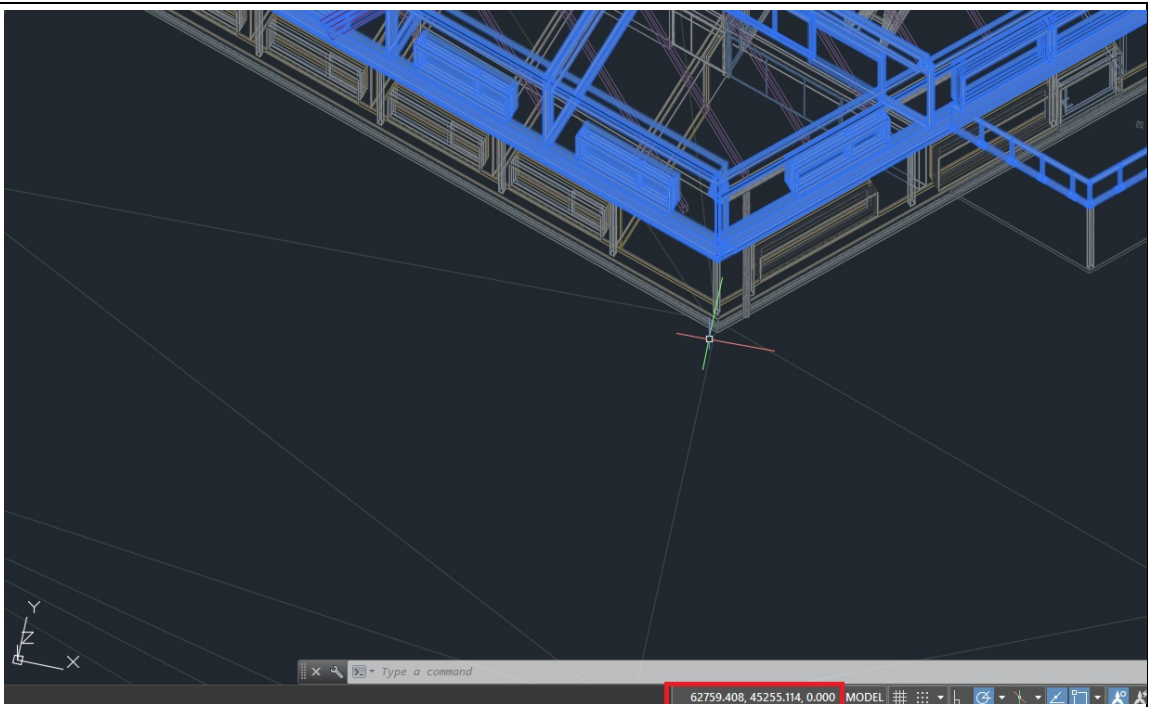
Proprietary software

BIM

Level of tester expertise: 1 - Very beginner user (it is nearly the first time you use the software)

Autodesk Civil 3D

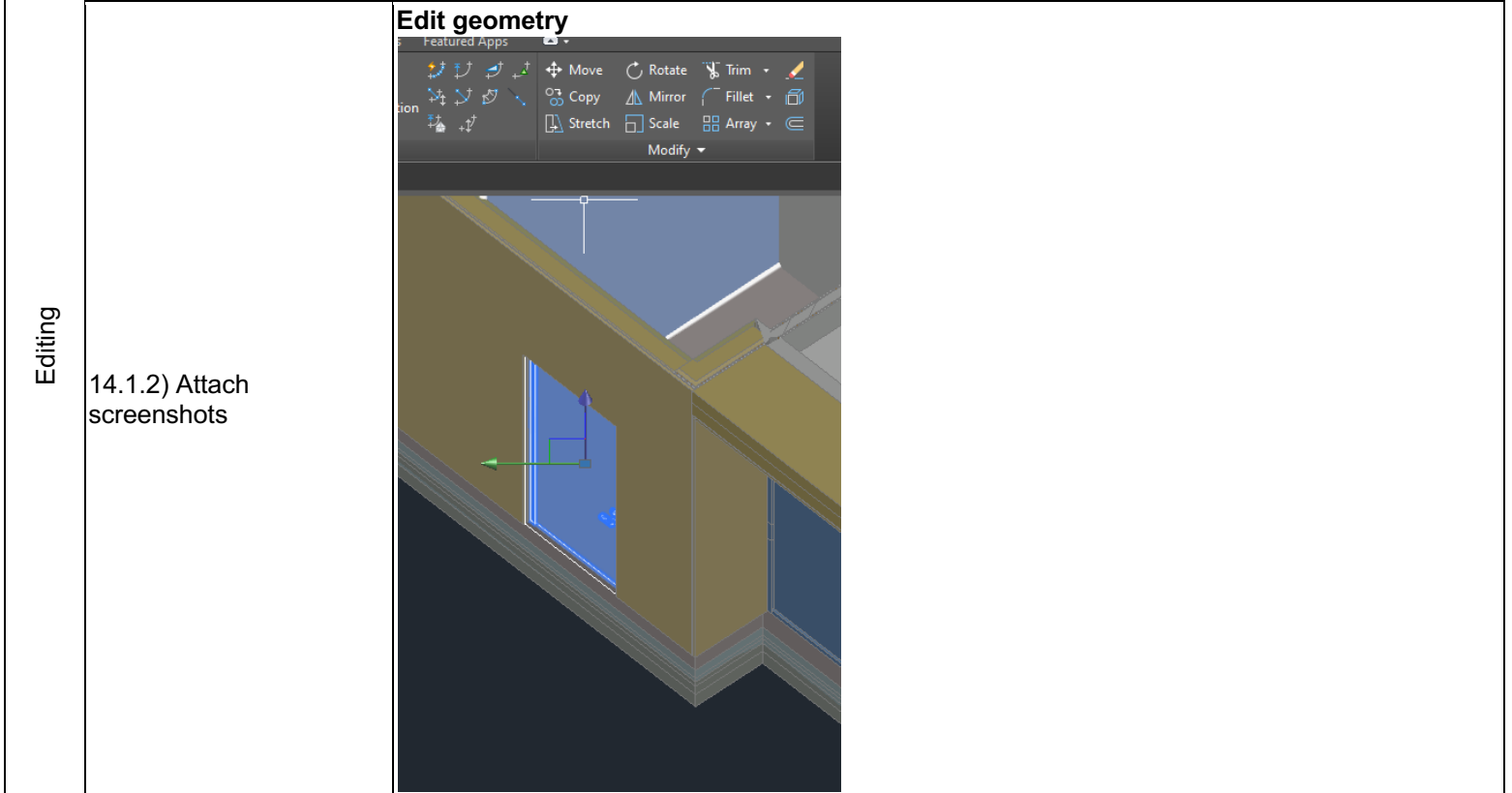
| | | | | | | | |
|--|--|--|------------------------------|---------------------------------|--|----------------------------------|-----------------------|
| Software | Software Name [version] | Civil 3D [2019] | | | Software house | Autodesk | |
| | Proprietary or open source software? | | | Kind of software | | | |
| proprietary | | | BIM | | | | |
| Computer | Model and year | Operating system | CPU | GPU | Memory (RAM) | Hard drive capacity | Hard drive free space |
| | self-built desktop (2013) | Windows 10 Home 64-bit | Intel i5-4570 @ 3.20GHz | AMD Radeon HD 7800 Series | 8 GB | 120 GB | 20 GB |
| Certification | IFC import certification status | Import certification date | Import certification program | IFC export certification status | Export certification date | Export certification program | |
| | not certified | | | not certified | | | |
| Test with Myran.ifc | | | | | | | |
| Performance | How long does it take, approximately, to: Import (and visualise if the software allows it) the model | | | | | 1-5 minutes | |
| | How long does it take, approximately, to: Zoom into the model to see more detail | | | | | it's almost immediate | |
| | How long does it take, approximately, to: Pan the model | | | | | it's almost immediate | |
| | How long does it take, approximately, to: Rotate the model | | | | | it's almost immediate | |
| | How long does it take, approximately, to: Query an object | | | | | less than a minute | |
| | How long does it take, approximately, to: Inspect the objects linked to the queried one through a relationship | | | | | the software does not allow this | |
| Georeferencing | 2.1) Are the world (projected) coordinates taken into account when locating the model in the software's coordinate reference system? | | | | | No | |
| | 2.1.1) Where is the origin of the model coordinate reference system as imported in the software? | | | | | At the blue reference point | |
| | 2.1.2) Attach screenshots |  | | | | | |
| 2.1.3) What is the coordinate reference system and projection and what unit of measure is used for the representation? | | | | | Local right-handed coordinate system with millimetres as unit of measure | | |

| | | | |
|---------------|--|---|--|
| | 2.1.4) Attach screenshots |  | |
| Height | 3.1) Are the "real-world" elevation values (heights) considered when locating the model in the software (z)? | No | |
| | 3.1.1) What is the elevation value of the origin of the model coordinate reference system as imported in the software? | 0 | |
| | 3.1.2) Attach screenshots | See figure from 2.1.2 | |
| | 3.1.3) What is the height reference system? | Local in mm | |
| | 3.1.4) Attach screenshots | See figure from 2.1.2 | |
| | 3.2) short comments to the previous question (optional) | The height of the reference point itself is 3500mm, but everything around it has a height of 0. | |
| Orientation | 4.1) Is the model oriented correctly with respect to the true North? | Yes | |
| | 4.2) short comments to the previous question (optional) | The angle is 48 degrees, similarly to to example on the data page. | |
| Proportions | 5.1) Does the model maintain its correct dimensions and proportions? | Yes | |
| IFC | 6.1) Is the eventual translation consistent with the IFC definitions? | Yes | |
| Hierarchy | 7.1) Are the hierarchical relationships consistent with the IFC hierarchy? | The software does not have the necessary tools to determine this information | |
| Attributes | 8.1) Are the attributes present in the IFC entities retained and consistent? | Yes | |
| Relationships | 9.1) Are the relationships between the objects retained? | The software does not have the necessary tools to determine this information | |
| Geometry | 10.1) Is geometry read correctly? | Yes | |
| Normals | 11.1) Did the normals change? | No | |

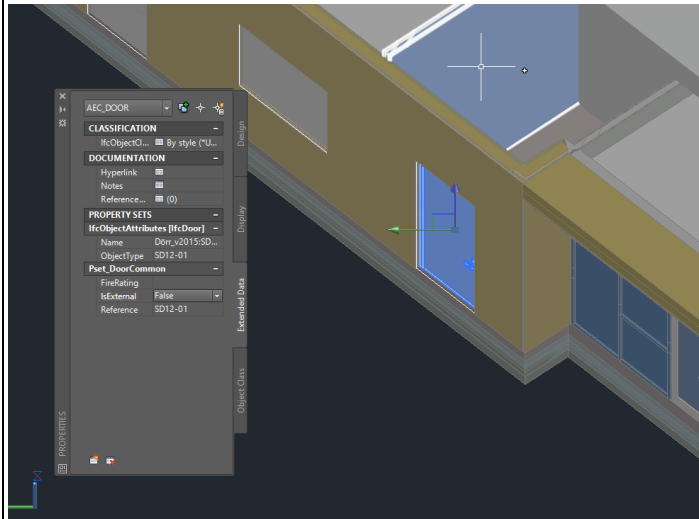


| | | |
|-------|--|-----------------------|
| 2D/3D | 12.1) Is it possible to view the model in 3D? | Yes |
| | 13.1) Is it possible to view the model in 2D? | Yes |
| | 13.2) short comments to the previous question (optional) | Yes, but as wireframe |

| | | |
|---------|--|---|
| Editing | 14.1) Is it possible to edit the model (attributes, geometry, other)? | Yes |
| | 14.1.1) What editing is possible (attributes, geometry, georeferencing, please add details)? | The attributes and the geometry (move, rotate, scale, trim, mirror, stretch). |



Edit attributes

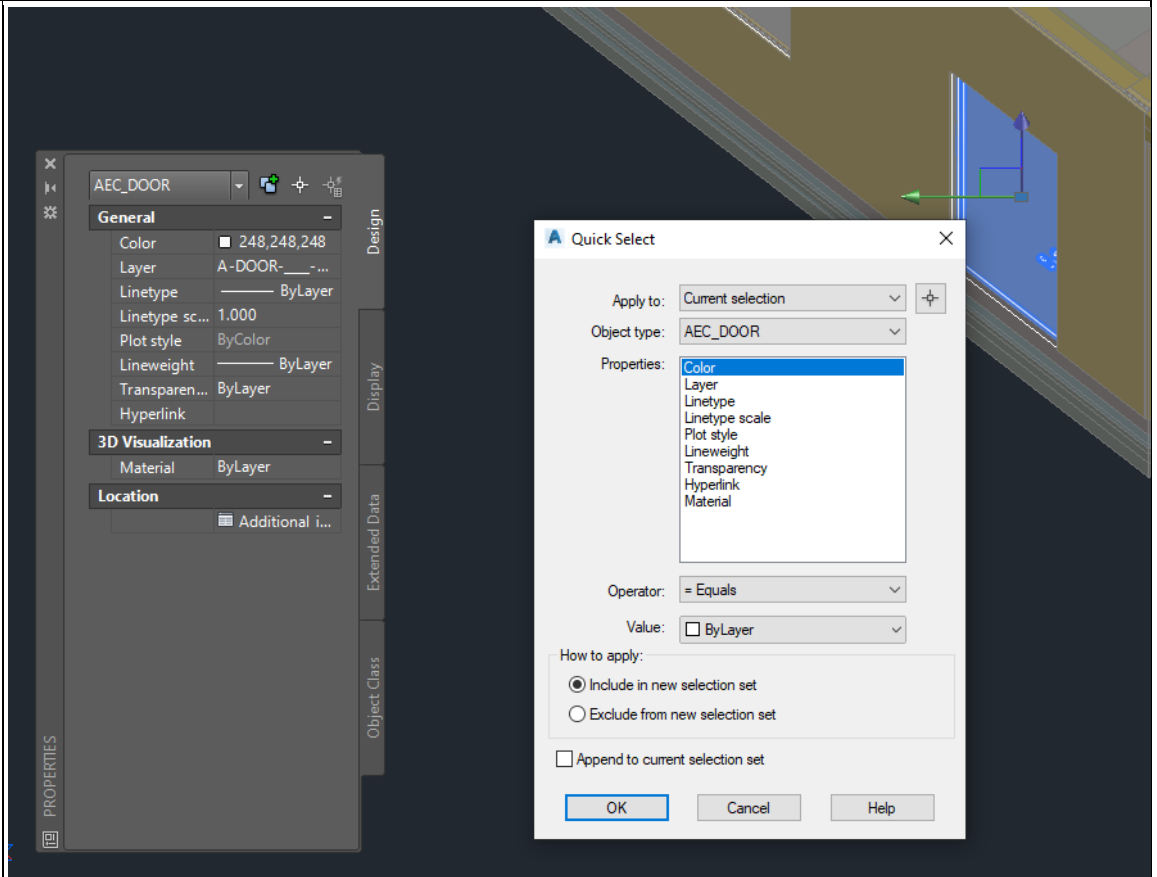


15.1) Is it possible to query the model and the attributes? Yes

15.1.1) What kinds of query are possible? You can do selection on properties that are native to the software (such as material, layer, lineweight), but not specific IFC attributes. Selecting on object type is possible.

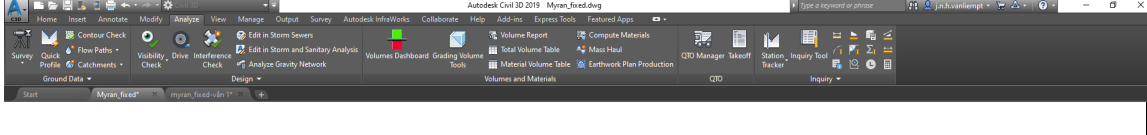
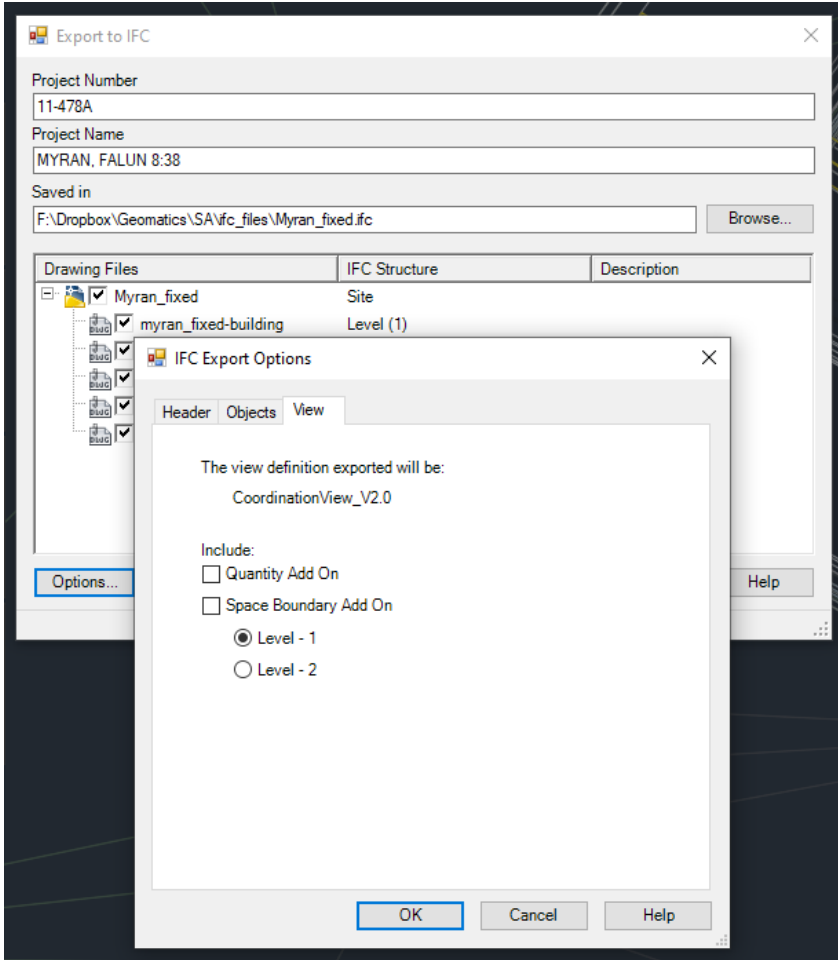
Querying

15.1.2) Attach screenshots



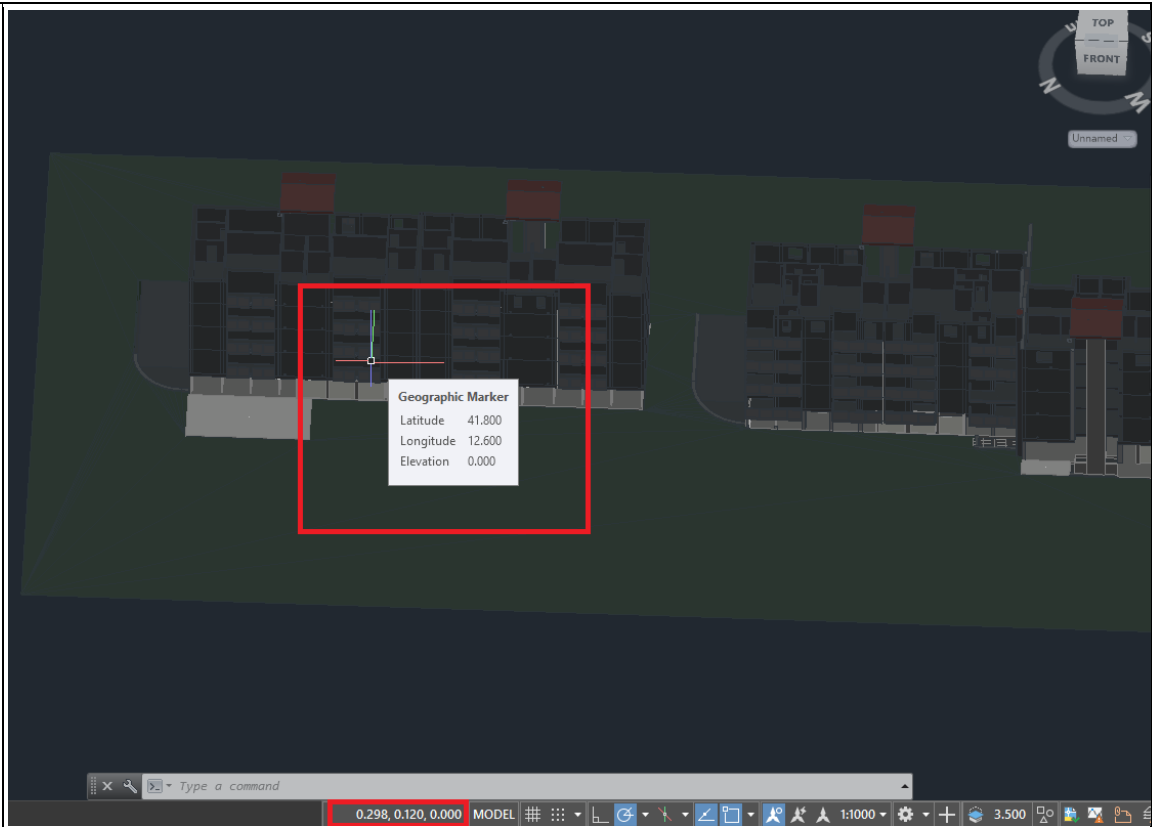
Anal ysis 16.1) Is it possible to analyse the objects and the model?

Yes, analysis about the modelled building performances (energy, noise, shadows...) are possible (type 2)

| | | |
|---|--|---|
| | <p>16.1.1) What analysis are possible? Do you know if the results are reliable?</p> | <p>Visibility check (for example sight distance) and volume report, amongst others. See the screenshot for all options. I didn't really know how to perform these analyses, as they are not so straightforward.</p> |
| | <p>16.1.2) Attach screenshots</p> |  |
| | <p>16.1.3) Time required to perform the analysis about the model itself (type 1)</p> | <p>No analysis of type 1 are possible</p> |
| | <p>16.1.3) Time required to perform the analysis about the model performances (type2)</p> | <p>No analysis of type 2 are possible</p> |
| | <p>16.2) short comments to the previous question (optional)</p> | <p>I couldn't really perform the analyses as they require specific input.</p> |
| <p style="writing-mode: vertical-rl; transform: rotate(180deg);">Export</p> | <p>You arrived at the end of the phase 1: "Import and manage the file in the software".Now choose:</p> | <p>The software has also export abilities to IFC</p> |
| | <p>17.1) Are any pre-processing or setting changes needed in the software to enable a consistent export?</p> | <p>Yes</p> |
| | <p>17.1.1) Can you add a short description of the steps involved in the pre-processing?</p> | <p>You can choose whether to include "Quantity Add On" and "Space Boundary Add On" (Level 1 or level 2) or not.</p> |
| <p>17.1.2) Attach screenshots and files</p> |  | |

| | | |
|---------------------------------|---|--|
| | 18.1) Is it possible to choose the IFC model view definition (MVD) to be used when exporting the data? | No |
| | 18.2) short comments to the previous question (optional) | It will automatically use the CoordinationView_V2.0 view definition. |
| | 19) How long does it take for the data to be exported to IFC? | 1-5 minutes |
| | 19) How long does it take for the data to be exported to IFC? | 1-5 minutes |
| Test with UpTown.ifc | | |
| Performance | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | it crashes without completing the operation |
| | Please report on any errors the software gives when importing the file. | No errors, but trying to do anything will make the software freeze |
| Test with Savigliano.ifc | | |
| Performance | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | 1-5 minutes |
| | How long does it take, approximately, to:Zoom into the model to see more detail | it's almost immediate |
| | How long does it take, approximately, to:Pan the model | it's almost immediate |
| | How long does it take, approximately, to:Rotate the model | it's almost immediate |
| | How long does it take, approximately, to:Query an object | it's almost immediate |
| | How long does it take, approximately, to:Inspect the objects linked to the queried one through a relationship | the software does not allow this |
| Georeferencing | 40.1) Are the world (projected) coordinates taken into account when locating the model in the software's coordinate reference system? | No |
| | 40.1.1) Where is the origin of the model coordinate reference system as imported in the software? | At the blue reference point |

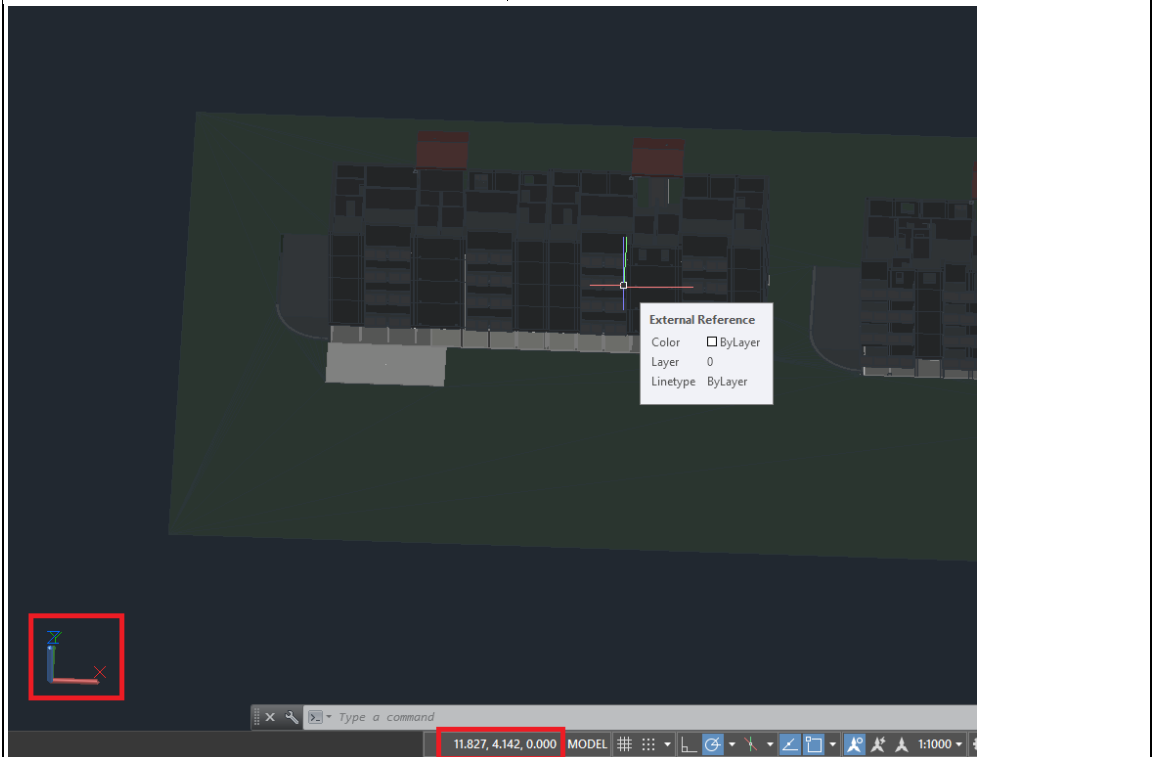
40.1.2) Attach screenshots

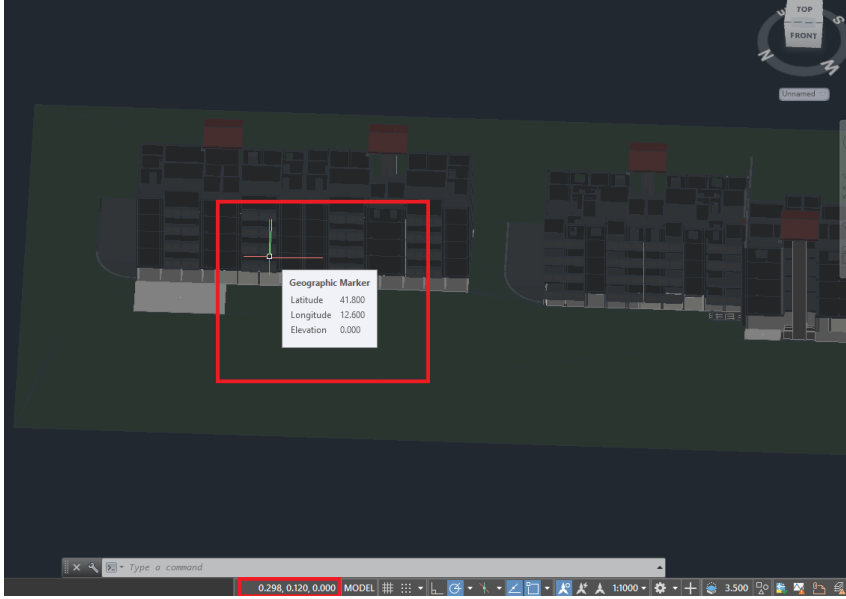



40.1.3) What is the coordinate reference system and projection and what unit of measure is used for the representation?

Local right-handed coordinate system with millimetres as unit of measure

40.1.4) Attach screenshots



| | | | |
|----------------|---|--|--|
| Height | 41.1) Are the "real-world" elevation values (heights) considered when locating the model in the software (z)? | | No |
| | 41.1.1) What is the elevation value of the origin of the model coordinate reference system as imported in the software? | | 0 |
| | 41.1.2) Attach screenshots | |  |
| | 41.1.3) What is the height reference system? | | Local in millimetres |
| | 41.1.4) Attach screenshots | | See figure from 41.1.2 |
| | 41.2) short comments to the previous question (optional) | | You can't see that it is in millimetres, but the whole coordinate system is and it was also shown for Myran_fixed. |
| C r | 42.1) Is the model oriented correctly with respect to the true North? | | Yes |
| P r | 43.1) Does the model maintain its correct dimensions and proportions? | | Yes |
| IF C | 44.1) Is the eventual translation consistent with the IFC definitions? | | Yes |
| Hier arch | 45.1) Are the hierarchical relationships consistent with the IFC hierarchy? | | The software does not have the necessary tools to determine this information |
| Attri bute | 46.1) Are the attributes present in the IFC entities retained and consistent? | | Yes |
| Relations hips | 47.1) Are the relationships between the objects retained? | | The software does not have the necessary tools to determine this information |
| | 47.2) short comments to the previous question (optional) | | The storey relationships are kept at least. |
| G eog | 48.1) Is geometry read correctly? | | Yes |
| N or | 49.1) Did the normals change? | | No |

| | | | |
|--------|---|--|--|
| | 49.1.2) Attach screenshots |  | |
| 2D/3D | 50.1) Is it possible to view the model in 3D? | Yes | |
| | 51.1) Is it possible to view the model in 2D? | Yes | |
| | 51.2) short comments to the previous question (optional) | As 2D wireframe | |
| Export | You arrived at the end of the phase 1: "Import and manage the file in the software".Now choose: | The software has also export abilities to IFC | |
| | 55) How long does it take for the data to be exported to IFC? | 1-5 minutes | |

Solibri Office 9.10.3.5 - Windows 10 Home

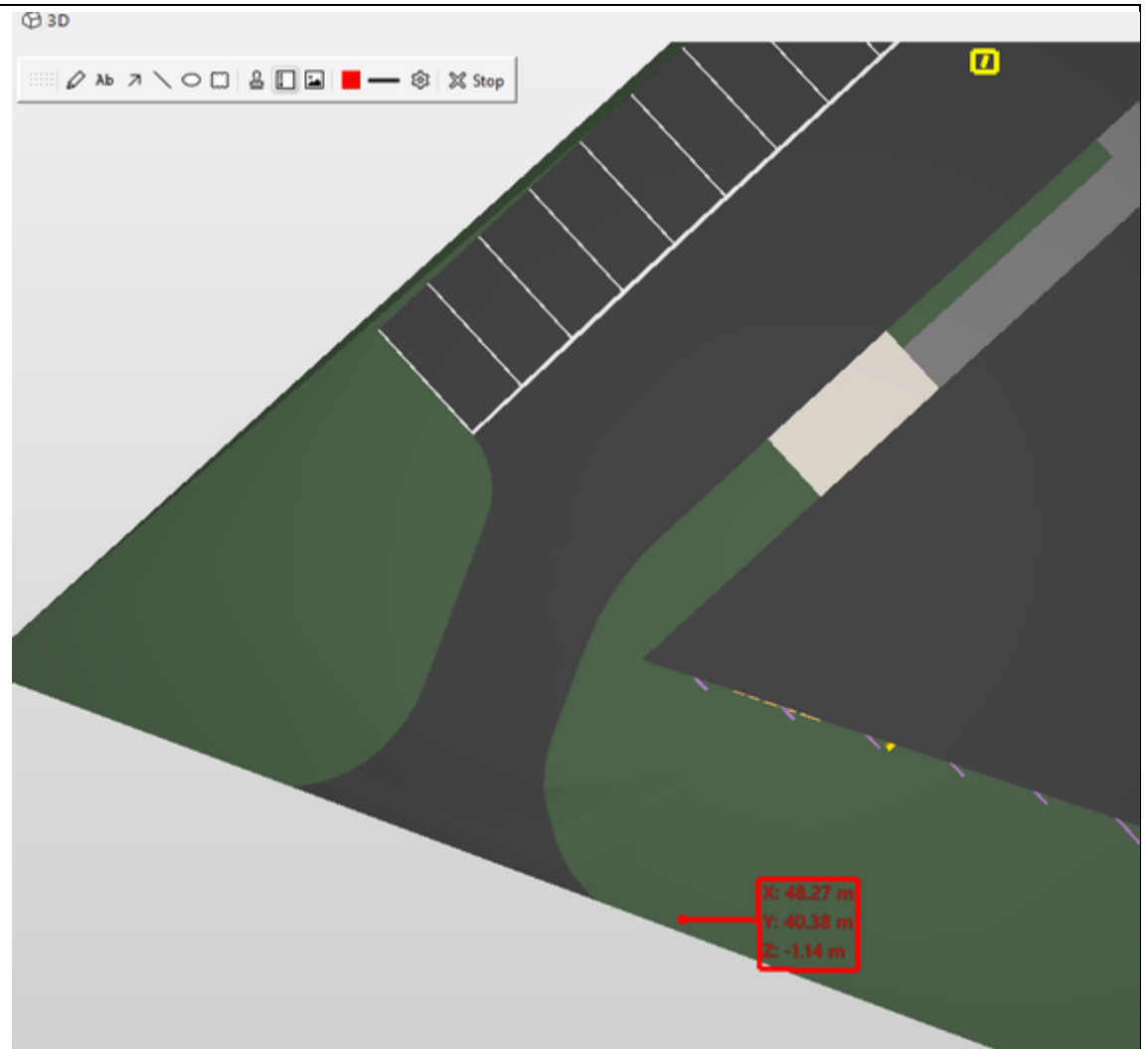
Proprietary software

BIM

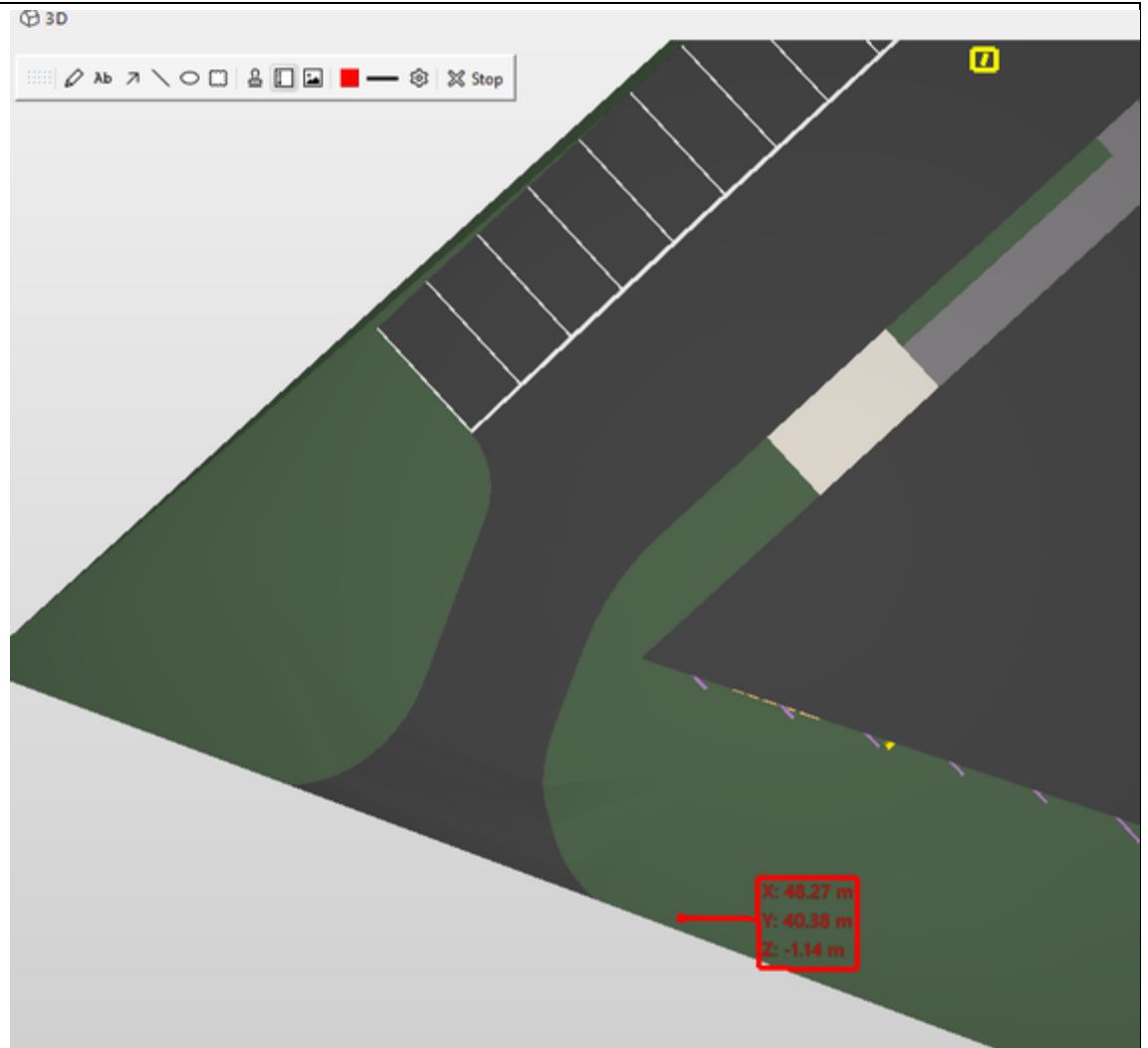
Level of tester expertise: 1 - Very beginner user (it is nearly the first time you use the software)

Solibri Office

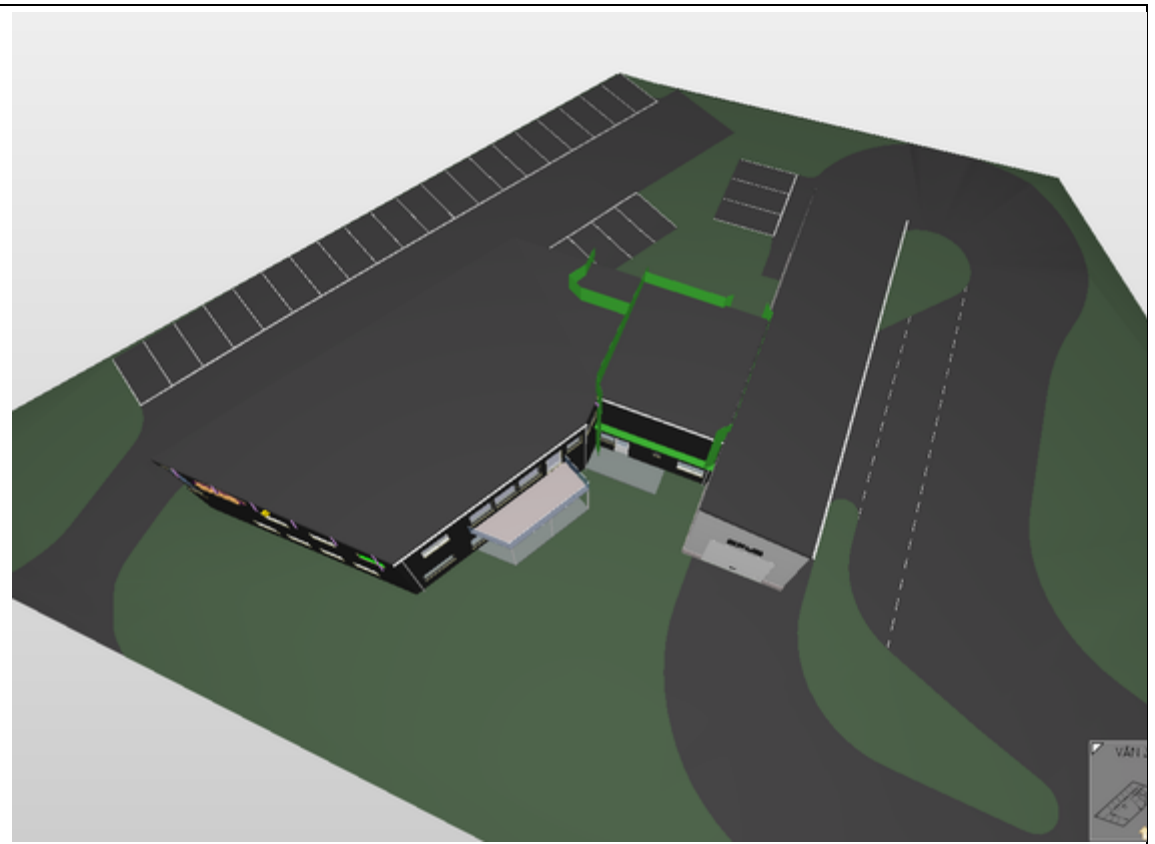
| | | | | | | | |
|----------------------------|--|----------------------------------|------------------------------|---|---------------------------|------------------------------|-----------------------|
| Software | Software Name [version] | Solibri Office [9.10.3.5] | | Software house | | | |
| | Proprietary or open source software? | | | Kind of software | | | |
| proprietary | | | BIM | | | | |
| Computer | Model and year | Operating system | CPU | GPU | Memory (RAM) | Hard drive capacity | Hard drive free space |
| | self-built desktop (2013) | Windows 10 Home 64-bit | Intel i5-4570 @ 3.20GHz | AMD Radeon HD 7800 Series | 8 GB | 120 GB | 20 GB |
| Certification | IFC import certification status | Import certification date | Import certification program | IFC export certification status | Export certification date | Export certification program | |
| | not certified | | | not certified | | | |
| Test with Myran.ifc | | | | | | | |
| Performance | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | | | less than a minute | | | |
| | How long does it take, approximately, to:Pan the model | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Rotate the model | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Query an object | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Inspect the objects linked to the queried one through a relationship | | | the software does not allow this | | | |
| | 2.1) Are the world (projected) coordinates taken into account when locating the model in the software's coordinate reference system? | | | No | | | |
| Georeferencing | 2.1.1) Where is the origin of the model coordinate reference system as imported in the software? | | | Can't determine it properly because the software doesn't allow to pick coordinates outside the model footprint. It is however likely to be at the blue reference point. | | | |

| | | | |
|---------------|---|---|--|
| | <p>2.1.2) Attach screenshots</p> |  | |
| | <p>2.1.3) What is the coordinate reference system and projection and what unit of measure is used for the representation?</p> | <p>Local right-handed coordinate system with metres as unit of measurement</p> | |
| | <p>2.1.4) Attach screenshots</p> | <p>See figure from 2.1.2</p> | |
| <p>Height</p> | <p>3.1) Are the "real-world" elevation values (heights) considered when locating the model in the software (z)?</p> | <p>No</p> | |
| | <p>3.1.1) What is the elevation value of the origin of the model coordinate reference system as imported in the software?</p> | <p>Can't check information on the origin</p> | |
| | <p>3.1.3) What is the height reference system?</p> | <p>Local in metres</p> | |

3.1.4) Attach screenshots



| | | |
|-----------------|--|--|
| Orientation | 4.1) Is the model oriented correctly with respect to the true North? | The software does not have the necessary tools to determine this information |
| | 4.2) short comments to the previous question (optional) | Can't check properly, but it seems like it is oriented correctly |
| Proportion | 5.1) Does the model maintain its correct dimensions and proportions? | Yes |
| IFC definitions | 6.1) Is the eventual translation consistent with the IFC definitions? | Yes |
| Hierarchy | 7.1) Are the hierarchical relationships consistent with the IFC hierarchy? | The software does not have the necessary tools to determine this information |
| Attributes | 8.1) Are the attributes present in the IFC entities retained and consistent? | Yes |
| Relationships | 9.1) Are the relationships between the objects retained? | Yes |
| Geometry | 10.1) Is geometry read correctly? | Yes |
| Normals | 11.1) Did the normals change? | No |

| | | | |
|----------|--|--|--|
| | <p>11.1.2) Attach screenshots</p> |  | |
| 2D/3D | 12.1) Is it possible to view the model in 3D? | Yes | |
| | 13.1) Is it possible to view the model in 2D? | No | |
| Editing | 14.1) Is it possible to edit the model (attributes, geometry, other)? | No | |
| Query | 15.1) Is it possible to query the model and the attributes? | No | |
| Analysis | 16.1) Is it possible to analyse the objects and the model? | Yes, analysis about the model validity and features (geometry, semantics, schema validity...) are possible (type 1) | |
| | 16.1.1) What analysis are possible? Do you know if the results are reliable? | You can check the validity of the model on specific criteria. See the screenshot for an idea about the options. There are different rulesets that can be chosen, and you can also use custom rulesets. | |

16.1.2) Attach screenshots

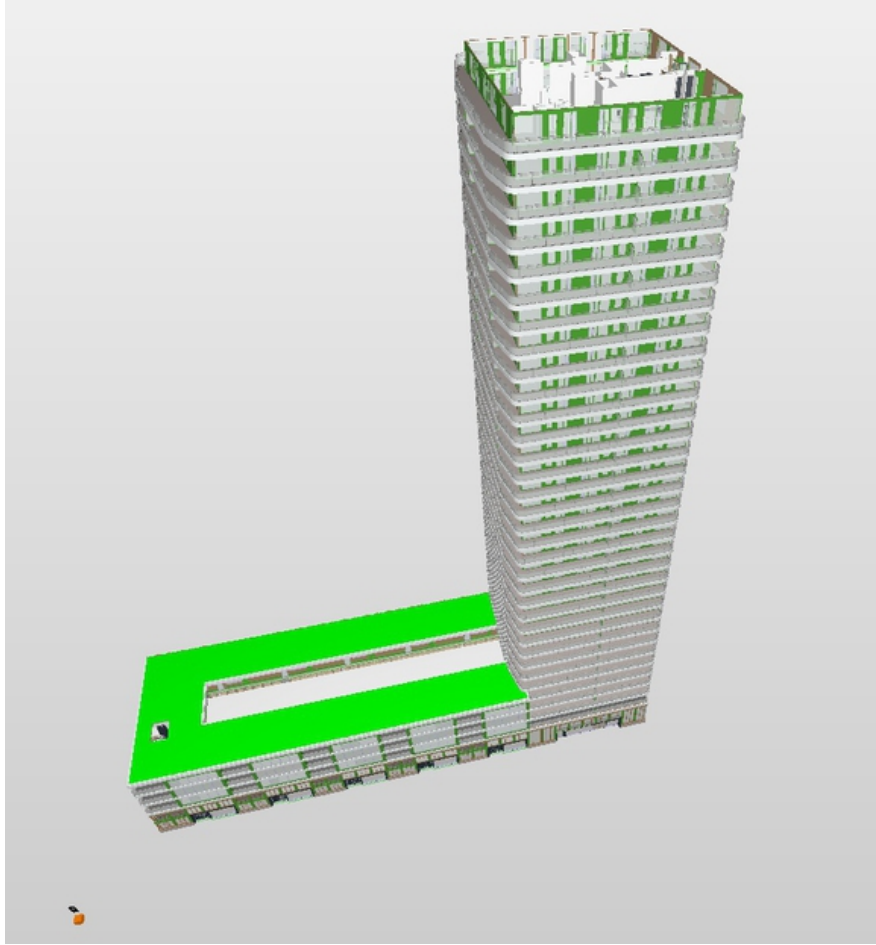
| CHECKING | | Check Model | Report |
|--|--|-------------|--------|
| Ruleset - Checked Model | | | |
| MEP models and Architectural model | | | |
| Building Services and Architectual Components | | | |
| Building Services and Doors and Windows | | | OK |
| Building Services and Beams and Columns (Insulations Not Included) | | | OK |
| Building Services and Other Construction Components (Insulations Not | | | OK |
| Building Services and Furniture and Other Objects | | | OK |
| Insulations and Beams and Columns | | | OK |
| Insulations and Other Construction Components | | | OK |
| Distance between Components | | | |
| Distance Between Columns/Beams and MEP components | | | — |
| Distance Between Doors and MEP components | | | OK |
| Distance Between Windows and MEP components | | | OK |
| Spaces and MEP | | | |
| Ventilation Room Has to Have Drainage | | | — |
| Electrical Rooms Should Not Include Pipes or Ducts | | | OK |
| MEP models and Structural model | | | |
| Intersections between Building Services and Structural Components | | | |
| Building Services and Beams and Columns (Insulations Not Included) | | | — |
| Building Services and Other Construction Components (Insulations Not | | | — |
| Insulations and Beams and Columns | | | — |
| Insulations and Other Construction Components | | | — |
| Distance between Components | | | |
| Distance Between Columns/Beams and MEP components | | | — |
| Distance Between Walls and MEP components | | | — |
| Allowed Intersections In Beams | | | |
| Allowed Beam and Ducts/Pipes Intersections | | | OK |
| Allowed Beam and Cable Carrier Intersections | | | — |
| Structural versus Architectural Models | | | |
| Openings in Structural Model | | | |
| Doors and Windows Shouldn't Intersect with Structural Components | | | OK |
| Curtain Walls Shouldn't Intersect with Structural Components | | | OK |

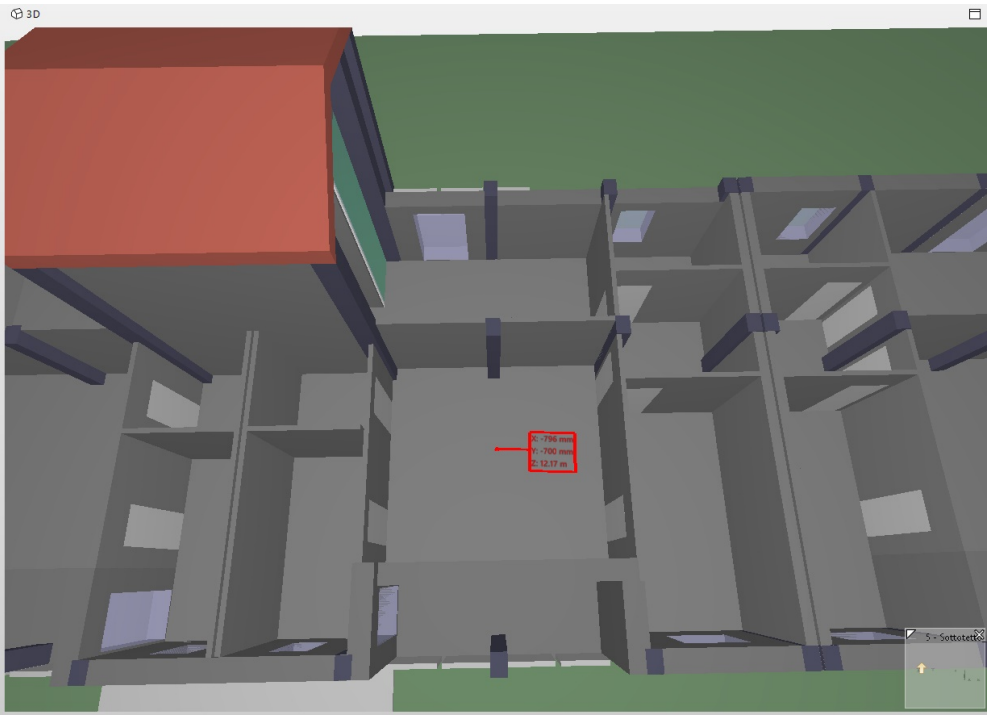
| Ruleset - Checked Model | | | | | | | | |
|-------------------------|--|--|--|--|--|--|--|----|
| § | Location of Openings Should Be Same | | | | | | | OK |
| § | Components in front of Doors and Windows | | | | | | | OK |
| ▼ § | Structural Components Fit in Architectural Ones | | | | | | | |
| § | Walls | | | | | | | — |
| § | Slabs | | | | | | | — |
| § | Columns | | | | | | | — |
| § | Beams | | | | | | | — |
| § | Other Components | | | | | | | — |
| ▼ § | Architectural Components Are Filled | | | | | | | |
| § | Walls to be Filled by Structural Components Should Be Classified | | | | | | | |
| § | Walls | | | | | | | — |
| § | Slabs | | | | | | | — |
| § | Columns | | | | | | | — |
| § | Beams | | | | | | | — |
| ▼ § | BIM Validation - Architectural | | | | | | | |
| ▼ § | Model Structure Check | | | | | | | |
| § | Model Hierarchy | | | | | | | |
| § | Building Floors | | | | | | | |
| § | Doors and Windows | | | | | | | |
| § | Door Opening Direction Definition | | | | | | | |
| § | Unique GUID values | | | | | | | |
| § | Amount of Site Instances | | | | | | | |
| § | Amount of Doors or Windows in Openings | | | | | | | |
| § | If Decomposed Object has Geometry Defined, Its Parts Should Not Have | | | | | | | |
| § | If Parts of Decomposed Object have Geometry Defined, the Decompose | | | | | | | |
| § | Material of Decomposed Objects Should Only Be defined in Part Level | | | | | | | |
| § | Openings in Complex Walls Shouls be Related to Wall, Not Parts | | | | | | | |
| ▼ § | Component Check | | | | | | | |
| ▶ § | Component Dimensions | | | | | | | |
| § | Floor Heights | | | | | | | |
| ▼ § | Clearance | | | | | | | |

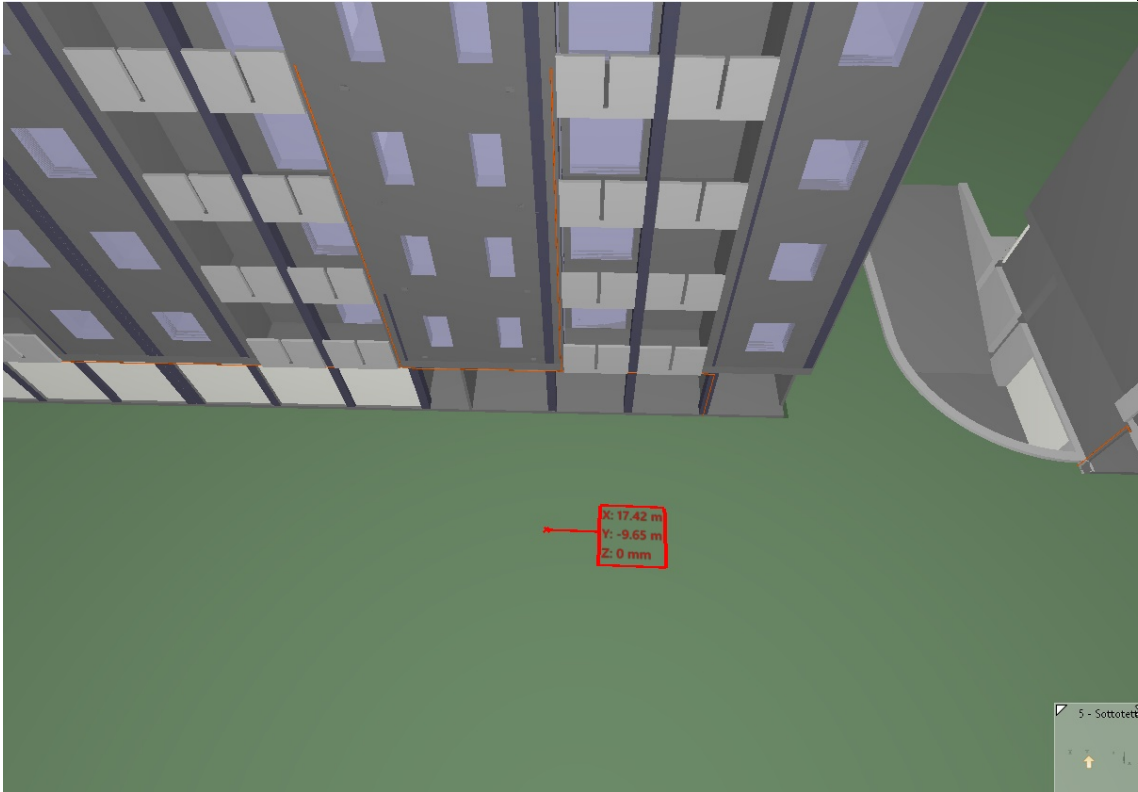
| Ruleset - Checked Model | | | | | | | | |
|-------------------------|--|--|--|--|--|--|--|--|
| ▼ | Clearance | | | | | | | |
| | § Clearance in Front of Windows | | | | | | | |
| | § Clearance in Front of Doors | | | | | | | |
| | § Clearance Above Suspended Ceilings | | | | | | | |
| | § Free Area in Front of Fixed Furnishing | | | | | | | |
| ▼ | Deficiency Detection | | | | | | | |
| | § Required Components | | | | | | | |
| | § Unallocated Areas | | | | | | | |
| ▶ | Components Below and Above | | | | | | | |
| | § Revolving Doors Must Have Swinging Door Next to It | | | | | | | |
| | § Slabs must be Guarded against Falling | | | | | | | |
| ▼ | BIM Validation - Structural | | | | | | | |
| ▼ | Model Structure Check | | | | | | | |
| | § Model Structure | | | | | | | |
| | § Unique GUID values | | | | | | | |
| | § Amount of Site Instances | | | | | | | |
| | § If Decomposed Object has Geometry Defined, Its Parts Should Not Have | | | | | | | |
| | § If Parts of Decomposed Object have Geometry Defined, the Decompose | | | | | | | |
| | § Material of Decomposed Objects Should Only Be defined in Part Level | | | | | | | |
| | § Openings in Complex Walls Shouls be Related to Wall, Not Parts | | | | | | | |
| ▼ | Components and Construction Types | | | | | | | |
| ▶ | Component Dimensions | | | | | | | |
| | § High Walls Have Must Be Thick Enough | | | | | | | |
| | § Construction Types Must Be from Agreed List | | | | | | | |
| ▶ | § Wall Opening Check - Structural | | | | | | | |
| ▶ | § Wall Opening Check - Prefabricated Concrete | | | | | | | |
| ▼ | Deficiency Detection | | | | | | | |
| | § Required Components | | | | | | | |
| ▶ | Components Below and Above | | | | | | | |
| | § Slabs must be Guarded against Falling | | | | | | | |

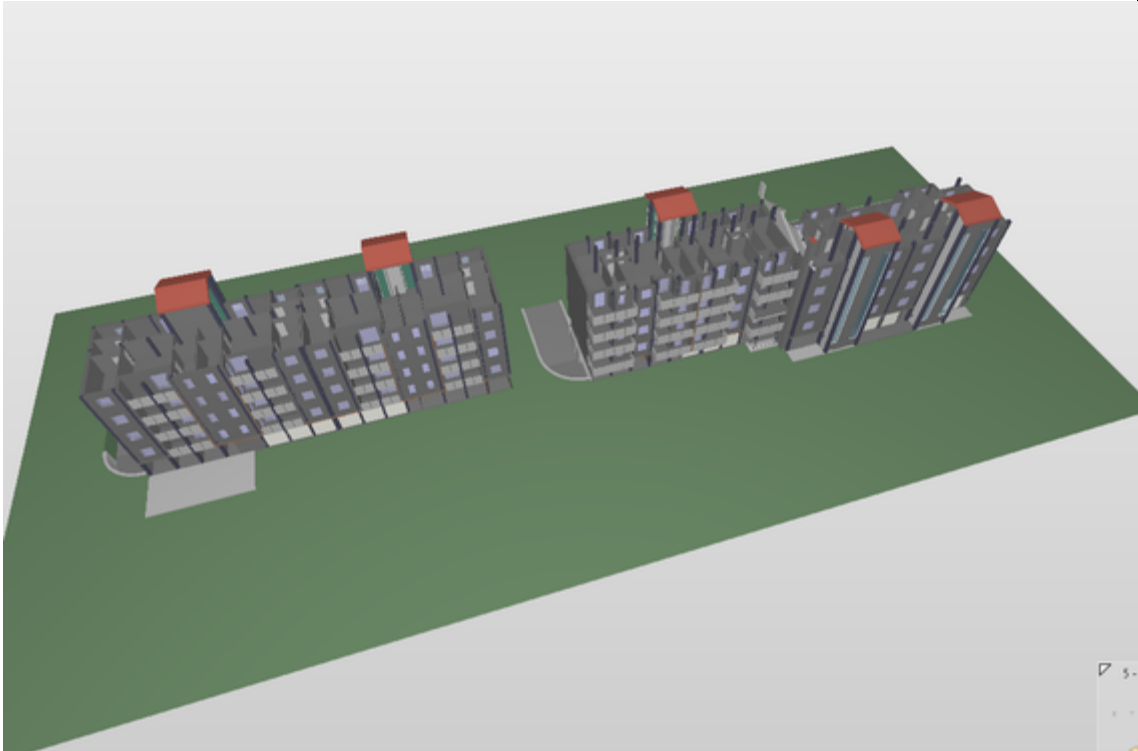
| Ruleset - Checked Model | | | | | | | | | |
|-------------------------|---|--|--|--|--|--|--|--|--|
| ▼ | Intersections Between Architectural Components | | | | | | | | |
| ▼ | Intersections - Same Kind of Components | | | | | | | | |
| | § Wall - Wall Intersections | | | | | | | | |
| | § Slab - Slab Intersections | | | | | | | | |
| | § Roof - Roof Intersections | | | | | | | | |
| | § Beam - Beam Intersections | | | | | | | | |
| | § Column - Column Intersections | | | | | | | | |
| | § Door - Door Intersections | | | | | | | | |
| | § Window - Window Intersections | | | | | | | | |
| | § Stair - Stair Intersections | | | | | | | | |
| | § Suspended Ceiling - Suspended Ceiling Intersections | | | | | | | | |
| | § Railing - Railing Intersections | | | | | | | | |
| | § Ramp - Ramp Intersections | | | | | | | | |
| ▼ | Intersections - Different Kind of Components | | | | | | | | |
| | § Door Intersections | | | | | | | | |
| | § Window Intersections | | | | | | | | |
| | § Column Intersections | | | | | | | | |
| | § Beam Intersections | | | | | | | | |
| | § Stair Intersections | | | | | | | | |
| | § Railing Intersections | | | | | | | | |
| | § Suspended Ceiling Intersections | | | | | | | | |
| | § Wall Intersections | | | | | | | | |
| | § Slab Intersections | | | | | | | | |
| | § Roof Intersections | | | | | | | | |
| ▼ | Intersections of Furniture and Other Objects | | | | | | | | |
| | § Object Intersections | | | | | | | | |
| | § Doors/Windows and Objects | | | | | | | | |
| | § Objects and Other Components | | | | | | | | |

| | | |
|-----------------------------|---|--|
| | | |
| | 16.1.3) Time required to perform the analysis about the model itself (type 1) | less than a minute |
| | 16.1.3) Time required to perform the analysis about the model performances (type2) | No analysis of type 2 are possible |
| | 16.2) short comments to the previous question (optional) | The analysis time is based on checking all the validity criteria |
| Test with UpTown.ifc | | |
| Performance | How long does it take, approximately, to:Zoom into the model to see more detail | it's almost immediate |
| | How long does it take, approximately, to:Pan the model | it's almost immediate |
| | How long does it take, approximately, to:Rotate the model | it's almost immediate |
| | How long does it take, approximately, to:Query an object | it's almost immediate |
| | How long does it take, approximately, to:Inspect the objects linked to the queried one (Element 3) through a relationship | it's almost immediate |
| Proportions | 24.1) Does the model maintain its correct dimensions and proportions? | Yes |

| | | |
|---------------------------------|---|---|
| IFC definition | 25.1) Is the eventual translation consistent with the IFC definitions? | Yes |
| Hierarchy | 26.1) Are the hierarchical relationships consistent with the IFC hierarchy? | The software does not have the necessary tools to determine this information |
| Attributes | 27.1) Are the attributes present in the IFC entities retained and consistent? | Yes |
| Relationships | 28.1) Are the relationships between the objects retained? | Yes |
| Geometry | 29.1) Is geometry read correctly? | Yes |
| Normals | 30.1) Did the normals change? | No |
| | 30.1.2) Attach screenshots |  |
| 2D/3D | 31.1) Is it possible to view the model in 3D? | Yes |
| | 32.1) Is it possible to view the model in 2D? | No |
| | 35.2) short comments to the previous question (optional) | However, the validity check takes longer (about 5 minutes) |
| Export | You arrived at the end of the phase 1: "Import and manage the file in the software".Now choose: | The software cannot export to IFC, therefore skip the phase 2 |
| Test with Savigliano.ifc | | |
| Performance | How long does it take, approximately, to:Zoom into the model to see more detail | it's almost immediate |

| | | |
|----------------|---|---|
| | How long does it take, approximately, to:Rotate the model | it's almost immediate |
| | How long does it take, approximately, to:Query an object | it's almost immediate |
| | How long does it take, approximately, to:Inspect the objects linked to the queried one through a relationship | it's almost immediate |
| Georeferencing | 40.1) Are the world (projected) coordinates taken into account when locating the model in the software's coordinate reference system? | No |
| | 40.1.1) Where is the origin of the model coordinate reference system as imported in the software? | It's at the blue reference point |
| | 40.1.2) Attach screenshots |  |
| | 40.1.3) What is the coordinate reference system and projection and what unit of measure is used for the representation? | Local right-handed coordinate system with metres as unit of measure |

| | | | |
|--------------|---|--|--|
| | 40.1.4) Attach screenshots |  | |
| Height | 41.1) Are the "real-world" elevation values (heights) considered when locating the model in the software (z)? | No | |
| | 41.1.1) What is the elevation value of the origin of the model coordinate reference system as imported in the software? | 0 | |
| | 41.1.2) Attach screenshots | See figure from 40.1.4 | |
| | 41.1.3) What is the height reference system? | Local in metres | |
| | 41.1.4) Attach screenshots | See figure from 40.1.4 | |
| Orientation | 42.1) Is the model oriented correctly with respect to the true North? | Yes | |
| | 42.2) short comments to the previous question (optional) | Yes, based on the coordinates along the bottom part of the model (as shown in the example picture in the data description) | |
| Proporti | 43.1) Does the model maintain its correct dimensions and proportions? | Yes | |
| IFC | 44.1) Is the eventual translation consistent with the IFC definitions? | Yes | |
| Hierarch | 45.1) Are the hierarchical relationships consistent with the IFC hierarchy? | The software does not have the necessary tools to determine this information | |
| Attribute | 46.1) Are the attributes present in the IFC entities retained and consistent? | Yes | |
| Relationship | 47.1) Are the relationships between the objects retained? | Yes | |
| Geometry | 48.1) Is geometry read correctly? | Yes | |
| Normals | 49.1) Did the normals change? | No | |

| | | |
|---------------|--|---|
| | <p>49.1.2) Attach screenshots</p> |  |
| <p>2D/3D</p> | <p>49.2) short comments to the previous question (optional)</p> | <p>Visually the normals seem correct</p> |
| | <p>50.1) Is it possible to view the model in 3D?</p> | <p>Yes</p> |
| | <p>51.1) Is it possible to view the model in 2D?</p> | <p>No</p> |
| <p>Export</p> | <p>You arrived at the end of the phase 1: "Import and manage the file in the software".Now choose:</p> | <p>The software cannot export to IFC, therefore skip the phase 2</p> |

Bentley Map Enterprise V8i SELECTseries 10 - Windows 10 Home

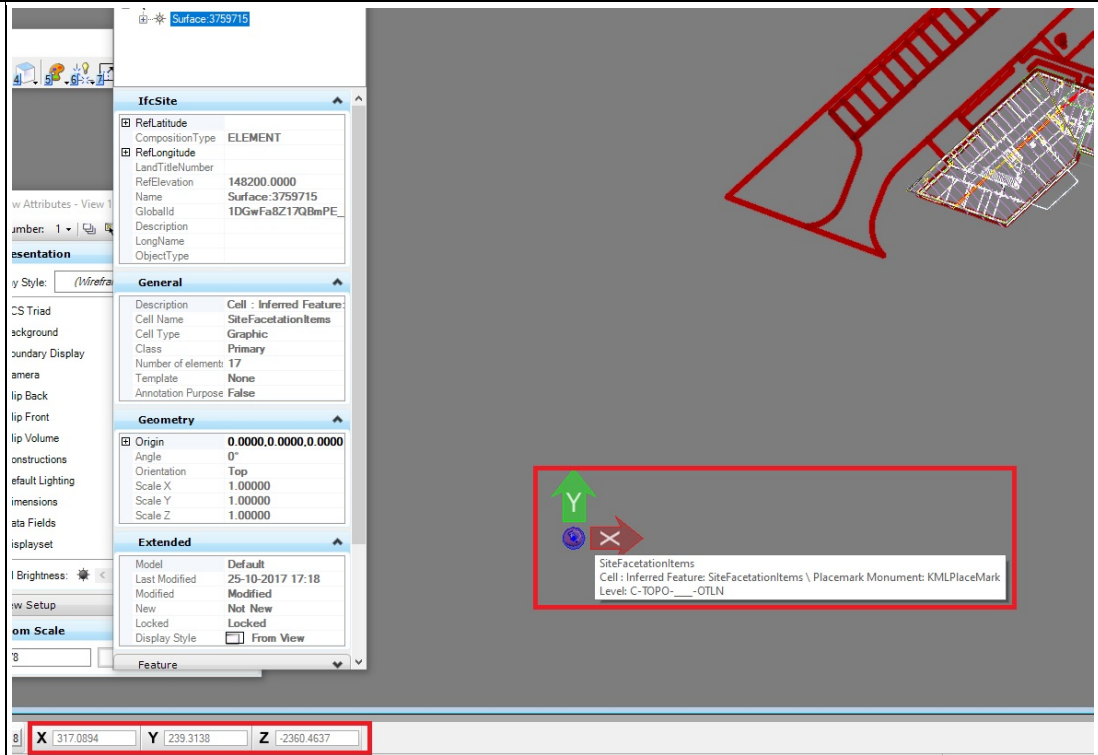
Proprietary software

GIS
Level of tester expertise: 1 - Very beginner user (it is nearly the first time you use the software)

Bentley Map Enterprise

| | | | | | | | |
|----------------------------|--|---|------------------------------|--|---------------------------|----------------------------------|-----------------------|
| Software | Software Name [version] | Bentley Map Enterprise [V8i SELECTseries 10] | | Software house | | | |
| | Proprietary or open source software? | | | Kind of software | | | |
| | proprietary | | | GIS | | | |
| Computer | Model and year | Operating system | CPU | GPU | Memory (RAM) | Hard drive capacity | Hard drive free space |
| | self-built desktop (2013) | Windows 10 Home 64-bit | Intel i5-4570 @ 3.20GHz | AMD Radeon HD 7800 Series | 8 GB | 120 GB | 20 GB |
| Certification | IFC import certification status | Import certification date | Import certification program | IFC export certification status | Export certification date | Export certification program | |
| | not certified | | | not certified | | | |
| Test with Myran.ifc | | | | | | | |
| Performance | How long does it take, approximately, to: Import (and visualise if the software allows it) the model | | | | | less than a minute | |
| | How long does it take, approximately, to: Zoom into the model to see more detail | | | | | it's almost immediate | |
| | How long does it take, approximately, to: Pan the model | | | | | it's almost immediate | |
| | How long does it take, approximately, to: Query an object | | | | | it's almost immediate | |
| | How long does it take, approximately, to: Inspect the objects linked to the queried one through a relationship | | | | | the software does not allow this | |
| Georeferencing | 2.1) Are the world (projected) coordinates taken into account when locating the model in the software's coordinate reference system? | | | | No | | |
| | 2.1.1) Where is the origin of the model coordinate reference system as imported in the software? | | | The origin is at the blue reference point. | | | |

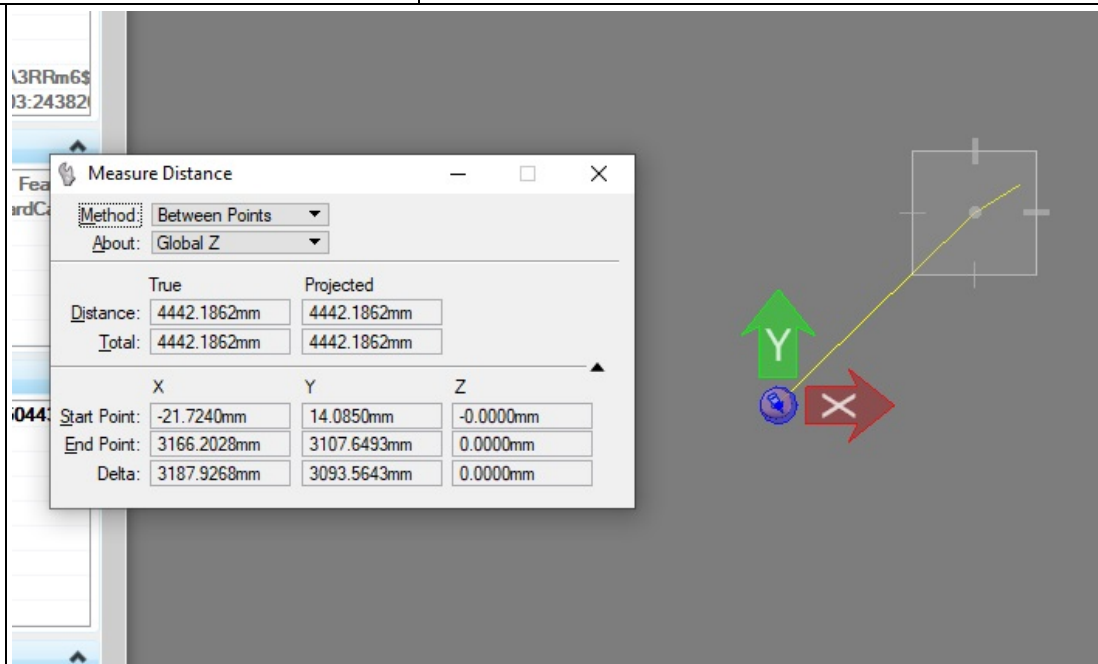
2.1.2) Attach screenshots



2.1.3) What is the coordinate reference system and projection and what unit of measure is used for the representation?

It is a local right-handed coordinate system, with millimetres as unit of measure

2.1.4) Attach screenshots

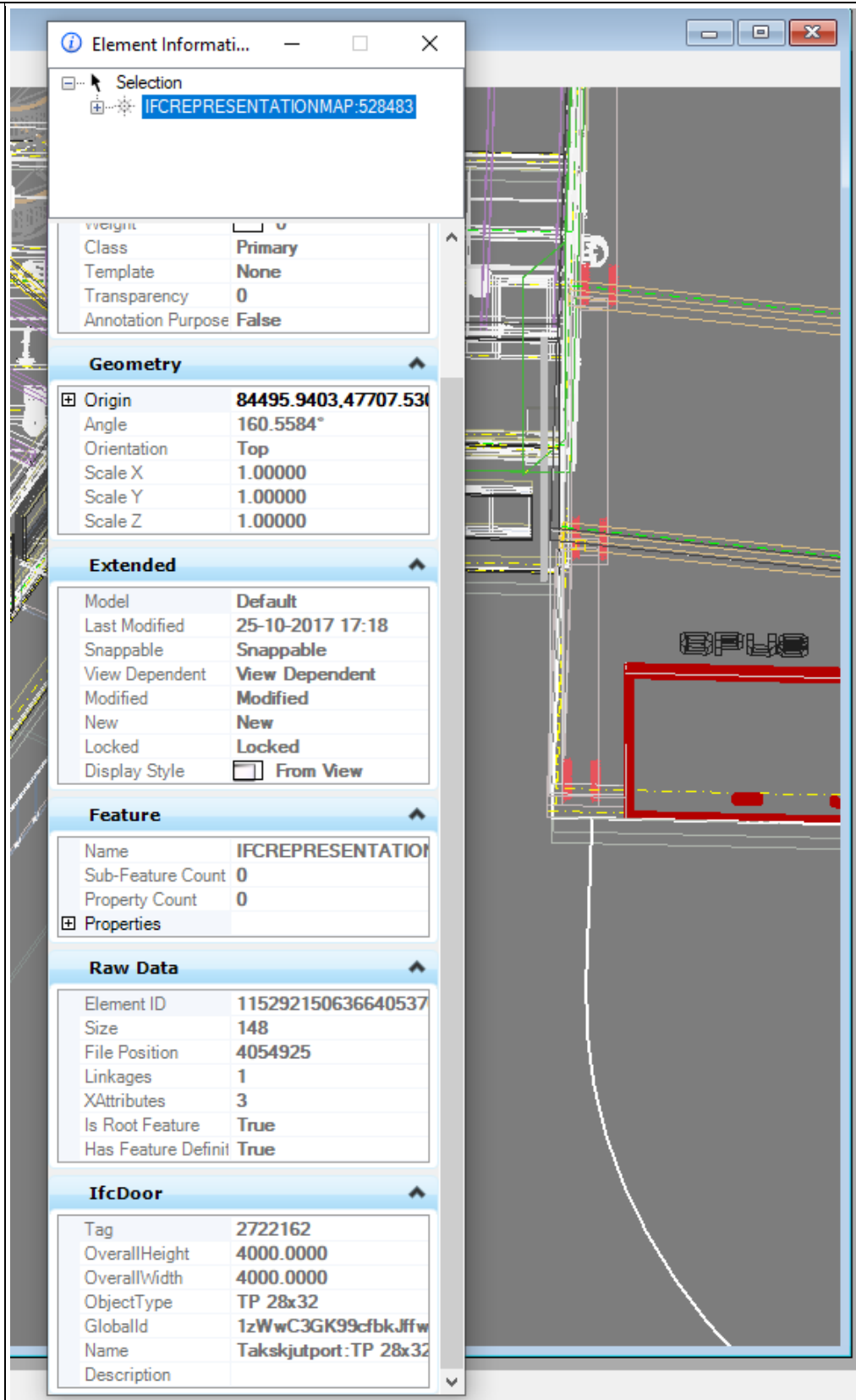


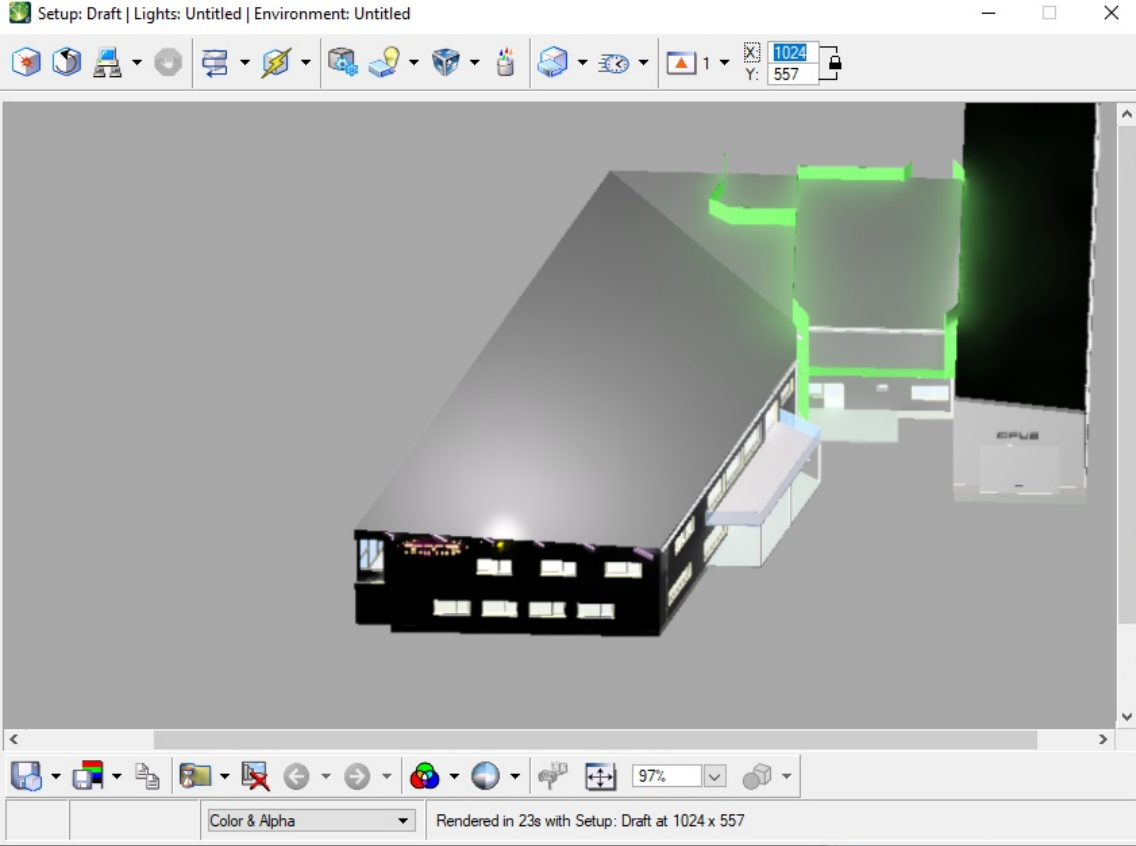
Height 3.1) Are the "real-world" elevation values (heights) considered when locating the model in the software (z)?

No

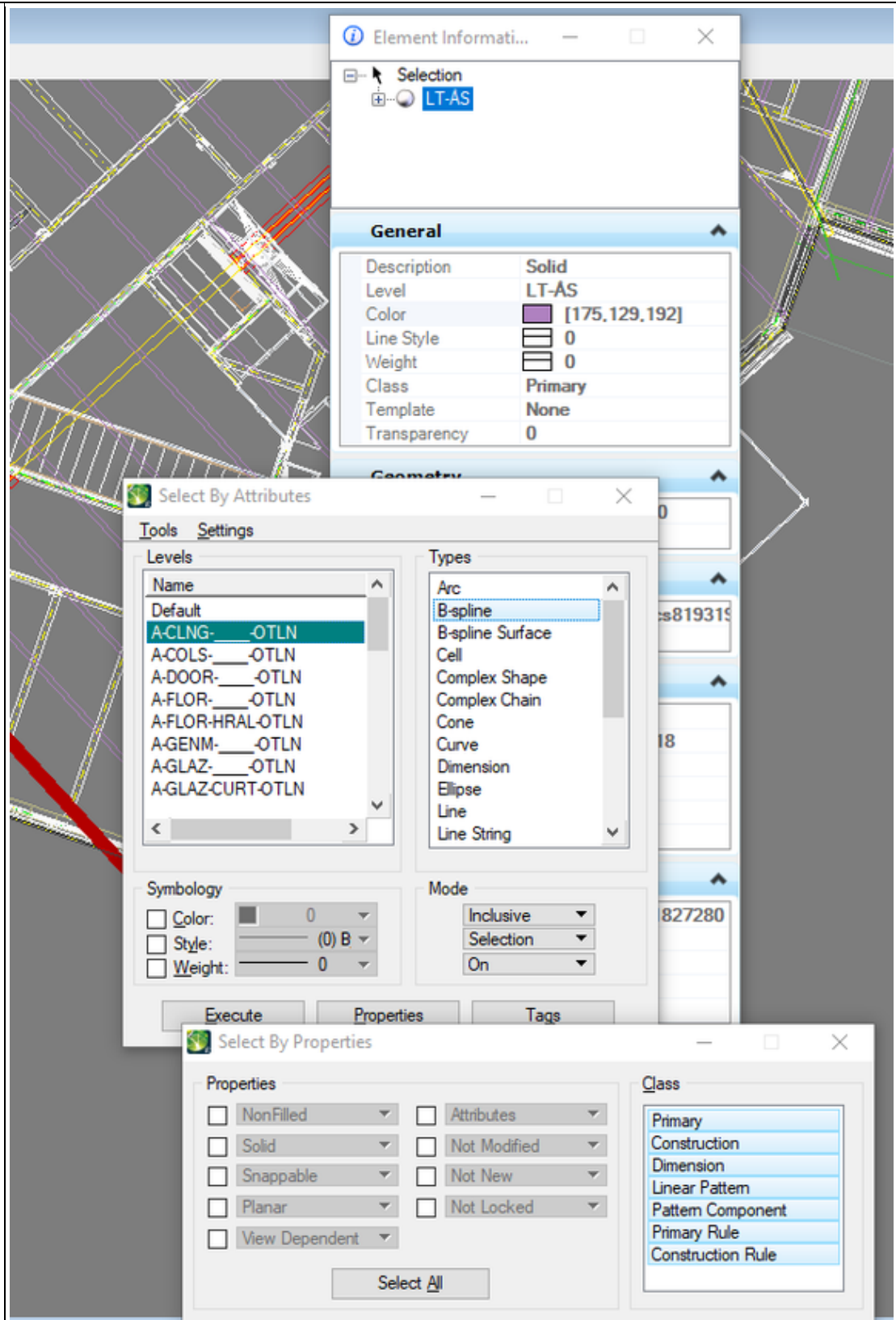
| | | |
|-----------|--|--|
| | 3.1.1) What is the elevation value of the origin of the model coordinate reference system as imported in the software? | 0 |
| | 3.1.2) Attach screenshots | See figure from 2.1.4 |
| | 3.1.3) What is the height reference system? | It's just local, in millimetres |
| | 3.1.4) Attach screenshots | See figure from 2.1.4 |
| Ori ent | 4.1) Is the model oriented correctly with respect to the true North? | Yes |
| Pro port | 5.1) Does the model maintain its correct dimensions and proportions? | Yes |
| Semantics | 6.1) Is the eventual translation consistent with the IFC definitions? | Yes |
| | 7.1) Are the hierarchical relationships consistent with the IFC hierarchy? | The software does not have the necessary tools to determine this information |
| | 8.1) Are the attributes present in the IFC entities retained and consistent? | No |
| | 8.1.1) What changes / inconsistencies / errors / other issues were noted? | The properties shown in the data description are not there. |

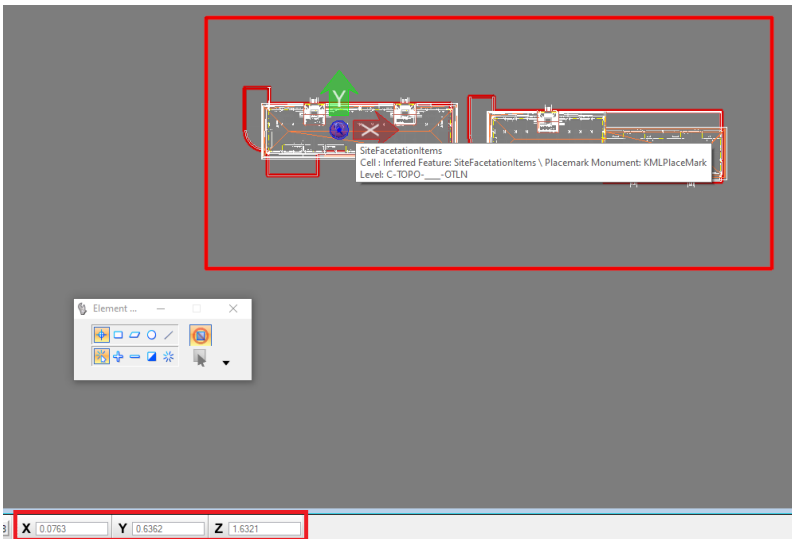
8.1.2) Attach screenshots

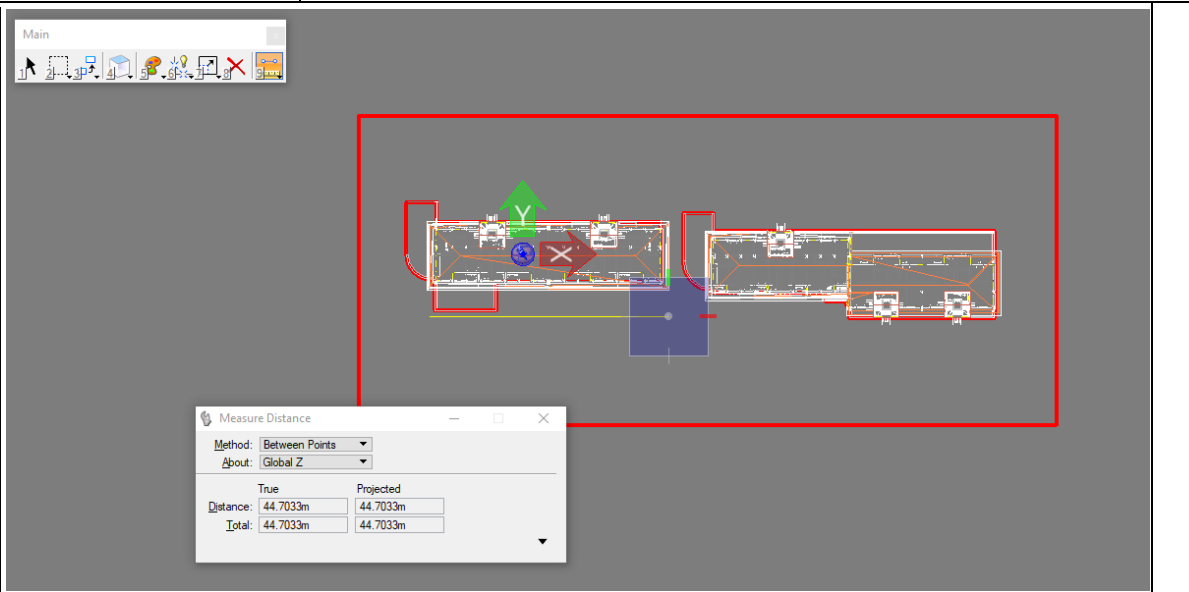


| | | |
|------------------|---|--|
| Relationships | 9.1) Are the relationships between the objects retained? | The software does not have the necessary tools to determine this information |
| Geometry Normals | 10.1) Is geometry read correctly? | Yes |
| | 11.1) Did the normals change? | No |
| | 11.1.2) Attach screenshots |  <p>The screenshot shows the Bentley Map Enterprise V8i SELECTseries 10 software interface. The window title is "Setup: Draft Lights: Untitled Environment: Untitled". The interface includes a top toolbar with various icons for navigation and editing, and a bottom toolbar with a "Color & Alpha" dropdown and a "Rendered in 23s with Setup: Draft at 1024 x 557" status bar. The main view area displays a 3D model of a building with a dark roof and walls. A portion of the building's geometry is highlighted in bright green, indicating a selection or a specific property being tested. The background is a light gray.</p> |
| 2D/3D | 12.1) Is it possible to view the model in 3D? | Yes |
| | 13.1) Is it possible to view the model in 2D? | No |
| Editing | 14.1) Is it possible to edit the model (attributes, geometry, other)? | No |
| Querying | 15.1) Is it possible to query the model and the attributes? | Yes |
| | 15.1.1) What kinds of query are possible? | You can select objects based on some attributes |

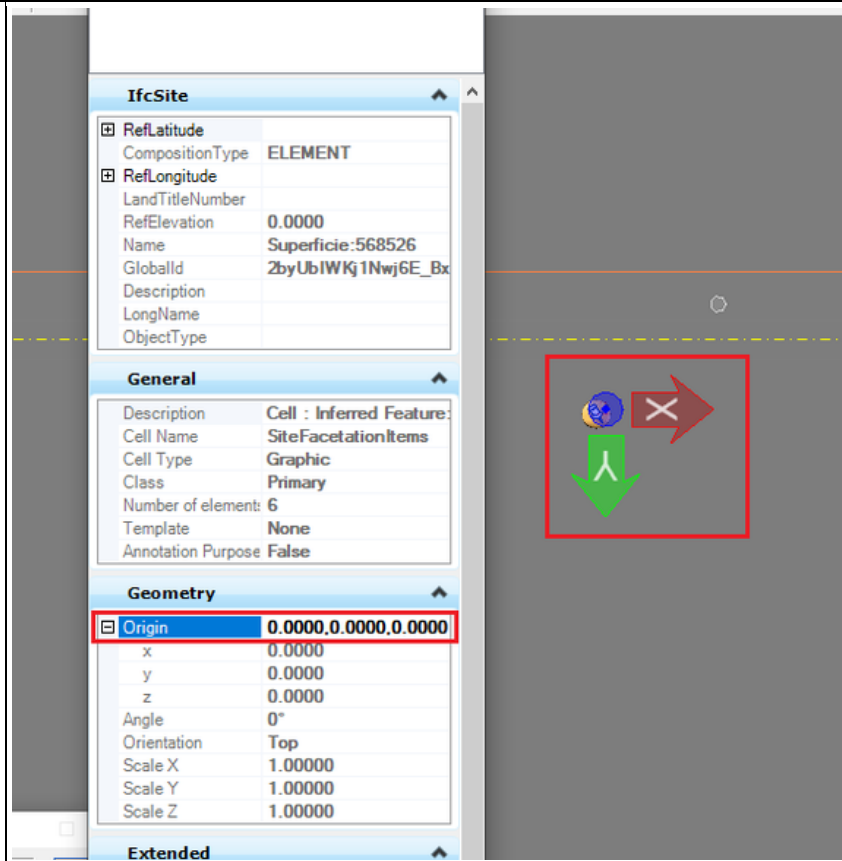
15.1.2) Attach screenshots



| | | |
|---------------------------------|---|--|
| Analysis | 16.1) Is it possible to analyse the objects and the model? | No |
| | 16.1.3) Time required to perform the analysis about the model itself (type 1) | No analysis of type 1 are possible |
| | 16.1.3) Time required to perform the analysis about the model performances (type2) | No analysis of type 2 are possible |
| Export | You arrived at the end of the phase 1: "Import and manage the file in the software".Now choose: | The software cannot export to IFC, therefore skip the phase 2 |
| Test with UpTown.ifc | | |
| Performance | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | it crashes without completing the operation |
| Test with Savigliano.ifc | | |
| Performance | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | 1-5 minutes |
| | How long does it take, approximately, to:Zoom into the model to see more detail | it's almost immediate |
| | How long does it take, approximately, to:Pan the model | it's almost immediate |
| | How long does it take, approximately, to:Rotate the model | it's almost immediate |
| | How long does it take, approximately, to:Query an object | it's almost immediate |
| | How long does it take, approximately, to:Inspect the objects linked to the queried one through a relationship | the software does not allow this |
| Georeferencing | 40.1) Are the world (projected) coordinates taken into account when locating the model in the software's coordinate reference system? | No |
| | 40.1.1) Where is the origin of the model coordinate reference system as imported in the software? | The origin is at the blue reference point. |
| | 40.1.2) Attach screenshots |  |

| | | | |
|---------------|--|---|--|
| | <p>40.1.3) What is the coordinate reference system and projection and what unit of measure is used for the representation?</p> | <p>It is a local right-handed coordinate system, with metres as unit of measure</p> | |
| | <p>40.1.4) Attach screenshots</p> |  | |
| <p>Height</p> | <p>41.1) Are the "real-world" elevation values (heights) considered when locating the model in the software (z)?</p> | <p>No</p> | |
| | <p>41.1.1) What is the elevation value of the origin of the model coordinate reference system as imported in the software?</p> | <p>0</p> | |

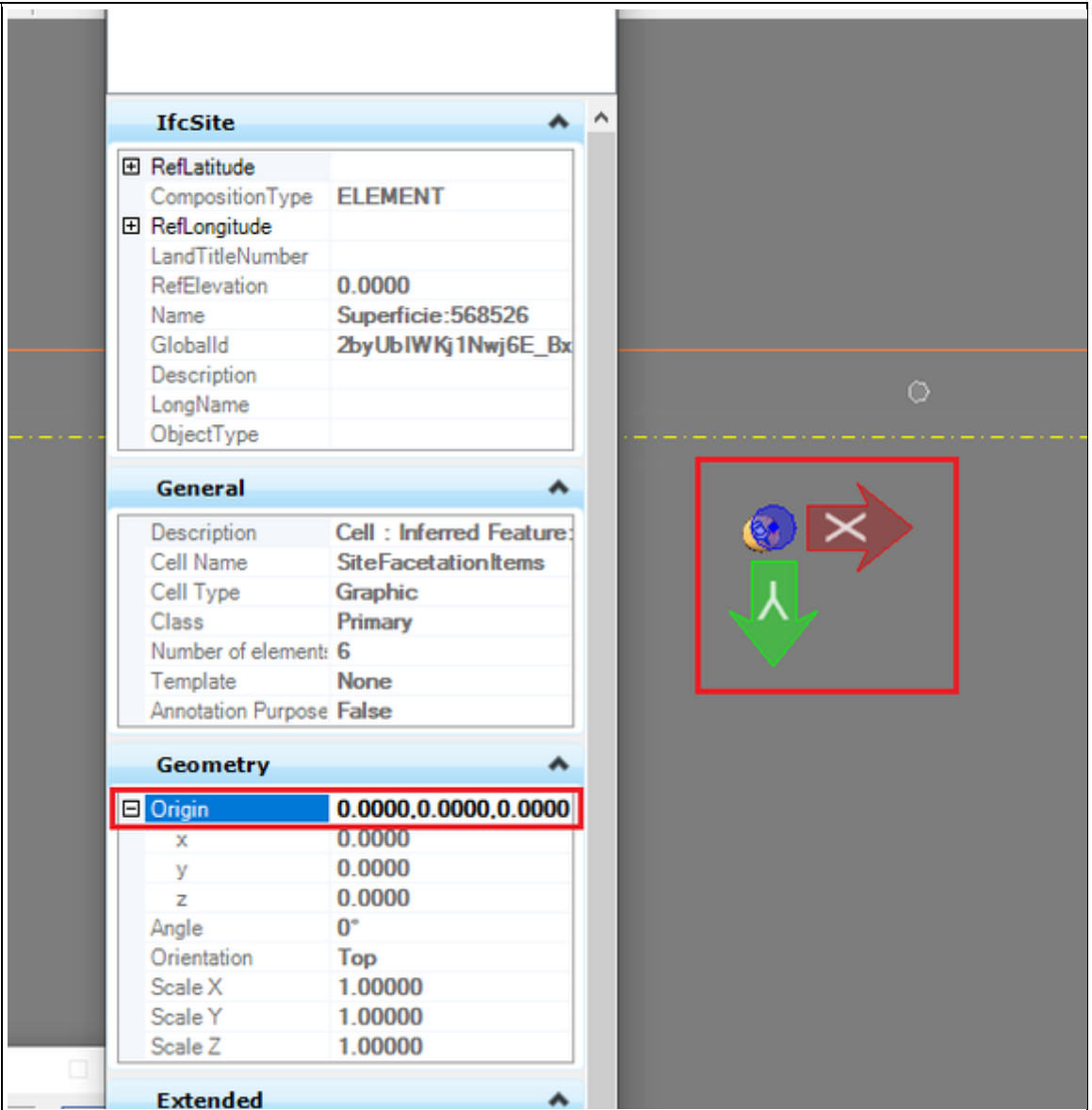
41.1.2) Attach screenshots



41.1.3) What is the height reference system?

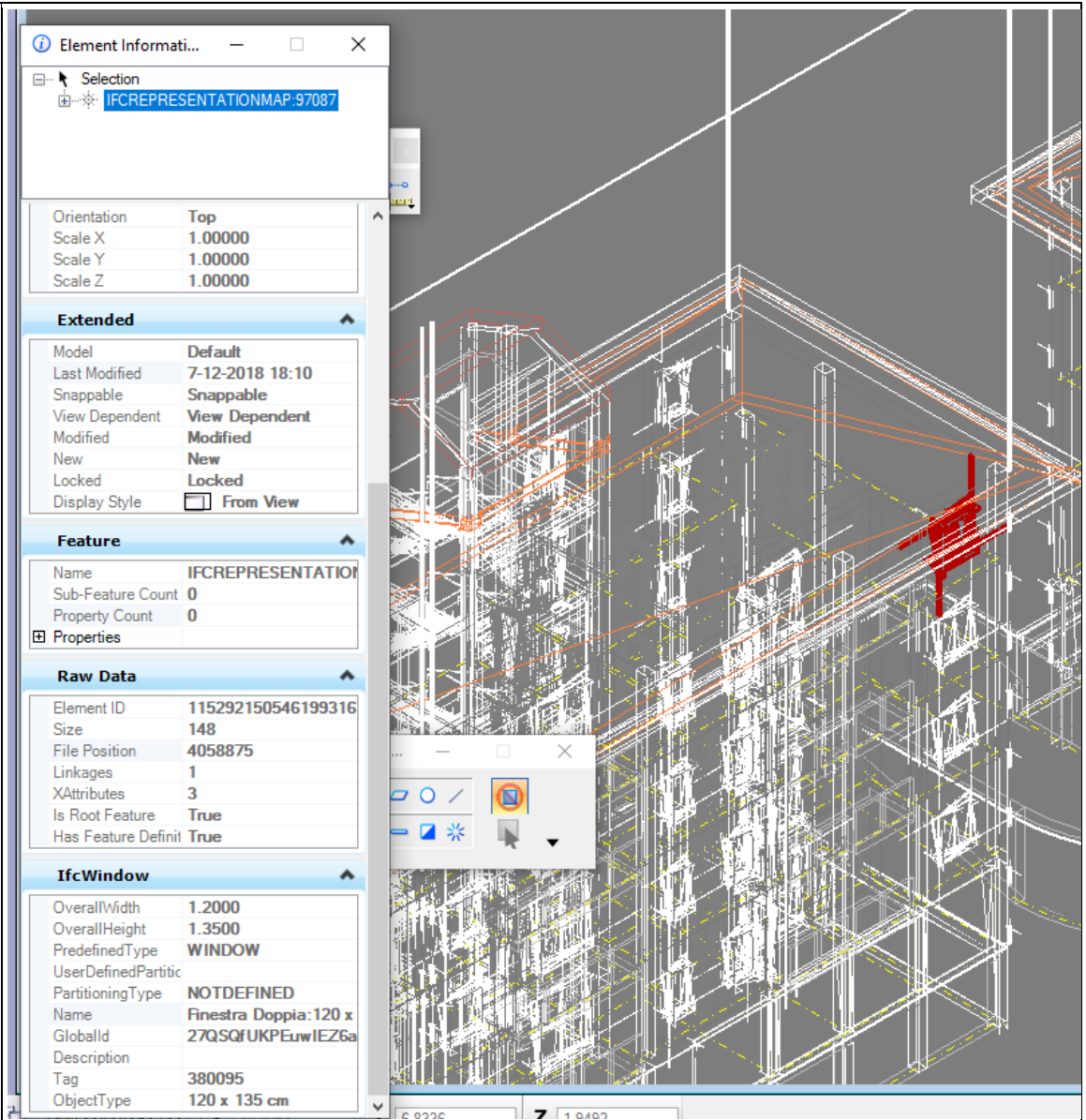
Local in metres

41.1.4) Attach screenshots



| | | |
|---------------------------|---|--|
| Orie ntati g | 42.1) Is the model oriented correctly with respect to the true North? | Yes |
| Prop ortio n | 43.1) Does the model maintain its correct dimensions and proportions? | Yes |
| IFC defin itio n | 44.1) Is the eventual translation consistent with the IFC definitions? | Yes |
| Hier arch | 45.1) Are the hierarchical relationships consistent with the IFC hierarchy? | The software does not have the necessary tools to determine this information |
| Attributes | 46.1) Are the attributes present in the IFC entities retained and consistent? | No |
| | 46.1.1) What changes / inconsistencies / errors / other issues were noted? | The properties shown in the data description are not there. |

46.1.2) Attach screenshots



| | | |
|-----------|---|--|
| Relations | 47.1) Are the relationships between the objects retained? | The software does not have the necessary tools to determine this information |
| Geometry | 48.1) Is geometry read correctly? | Yes |
| Normals | 49.1) Did the normals change? | No |
| | 49.2) short comments to the previous question (optional) | Visually, they didn't change |
| 2D/3D | 50.1) Is it possible to view the model in 3D? | Yes |
| | 51.1) Is it possible to view the model in 2D? | No |
| Export | You arrived at the end of the phase 1: "Import and manage the file in the software".Now choose: | The software cannot export to IFC, therefore skip the phase 2 |

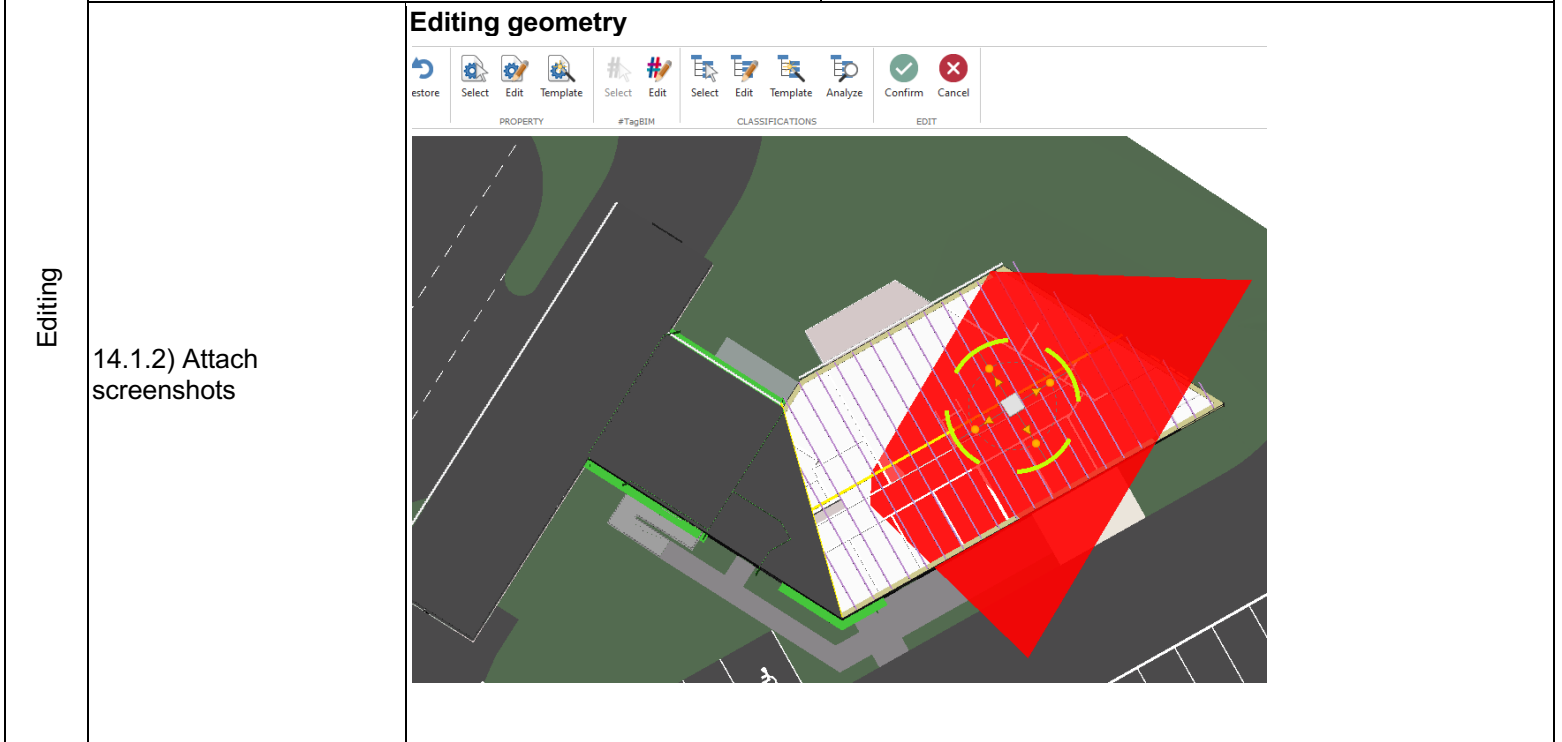
ACCA usBIM.viewer+

| | | | | | | | |
|----------------------------|--|--------------------------------|------------------------------|--|---------------------------|------------------------------|-----------------------|
| Software | Software Name [version] | usBIM.viewer+ [v.8.00d] | | Software house | | ACCA | |
| | Proprietary or open source software? | | | Kind of software | | | |
| proprietary | | | BIM | | | | |
| Computer | Model and year | Operating system | CPU | GPU | Memory (RAM) | Hard drive capacity | Hard drive free space |
| | self-built desktop (2013) | Windows 10 Home 64-bit | Intel i5-4570 @ 3.20GHz | AMD Radeon HD 7800 Series | 8 GB | 120 GB | 20 GB |
| Certification | IFC import certification status | Import certification date | Import certification program | IFC export certification status | Export certification date | Export certification program | |
| | certified in (date) | 2018-01-27 | CV 2.0 | not certified | | | |
| Test with Myran.ifc | | | | | | | |
| Performance | How long does it take, approximately, to: Import (and visualise if the software allows it) the model | | | less than a minute | | | |
| | How long does it take, approximately, to: Zoom into the model to see more detail | | | it's almost immediate | | | |
| | How long does it take, approximately, to: Pan the model | | | it's almost immediate | | | |
| | How long does it take, approximately, to: Rotate the model | | | it's almost immediate | | | |
| | How long does it take, approximately, to: Query an object | | | it's almost immediate | | | |
| | How long does it take, approximately, to: Inspect the objects linked to the queried one through a relationship | | | the software does not allow this | | | |
| Georeferencing | 2.1) Are the world (projected) coordinates taken into account when locating the model in the software's coordinate reference system? | | | The software does not have the necessary tools to check this information | | | |
| Height | 3.1) Are the "real-world" elevation values (heights) considered when locating the model in the software (z)? | | | The software does not have the necessary tools for checking it | | | |
| Orientation | 4.1) Is the model oriented correctly with respect to the true North? | | | Yes | | | |
| IFC definitions | 6.1) Is the eventual translation consistent with the IFC definitions? | | | Yes | | | |
| Hierarchy | 7.1) Are the hierarchical relationships consistent with the IFC hierarchy? | | | The software does not have the necessary tools to determine this information | | | |
| Attributes | 8.1) Are the attributes present in the IFC entities retained and consistent? | | | Yes | | | |
| Relationships | 9.1) Are the relationships between the objects retained? | | | The software does not have the necessary tools to determine this information | | | |
| Geometry | 10.1) Is geometry read correctly? | | | Yes | | | |
| Normals | 11.1) Did the normals change? | | | No | | | |

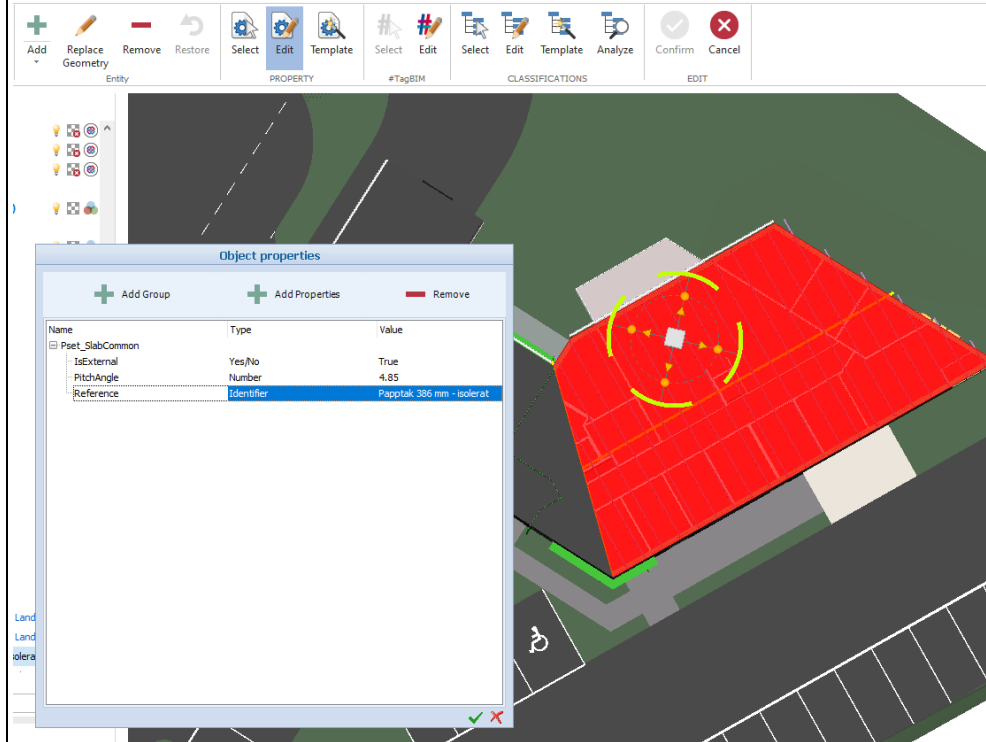


| | | |
|-------|---|-----|
| 2D/3D | 12.1) Is it possible to view the model in 3D? | Yes |
| | 13.1) Is it possible to view the model in 2D? | Yes |

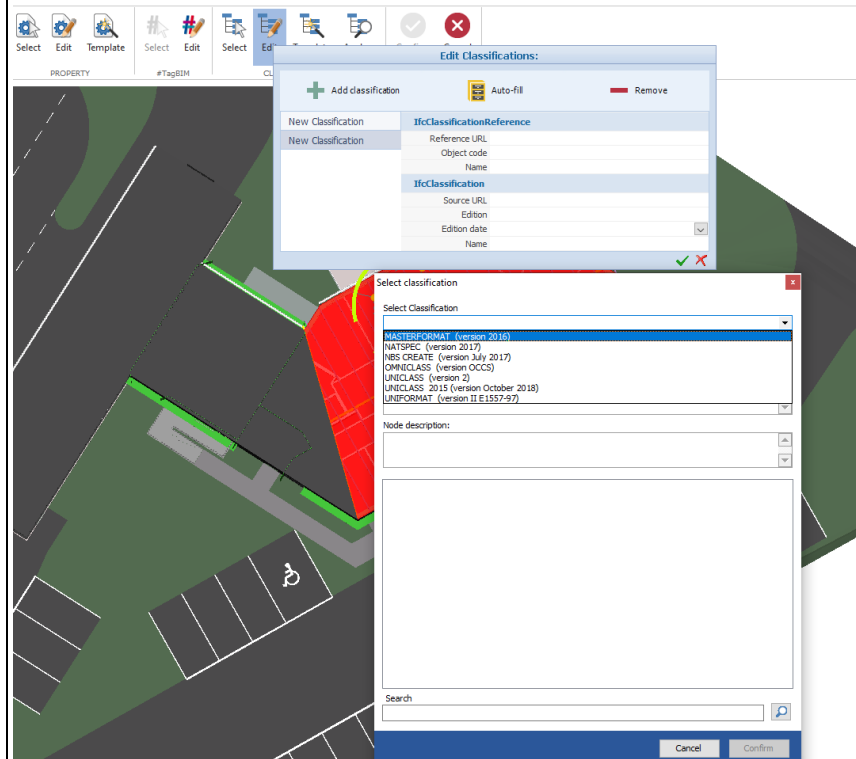
| | | |
|--|--|--|
| | 14.1) Is it possible to edit the model (attributes, geometry, other)? | Yes |
| | 14.1.1) What editing is possible (attributes, geometry, georeferencing, please add details)? | Moving/rotating geometries, editing properties and classifications |

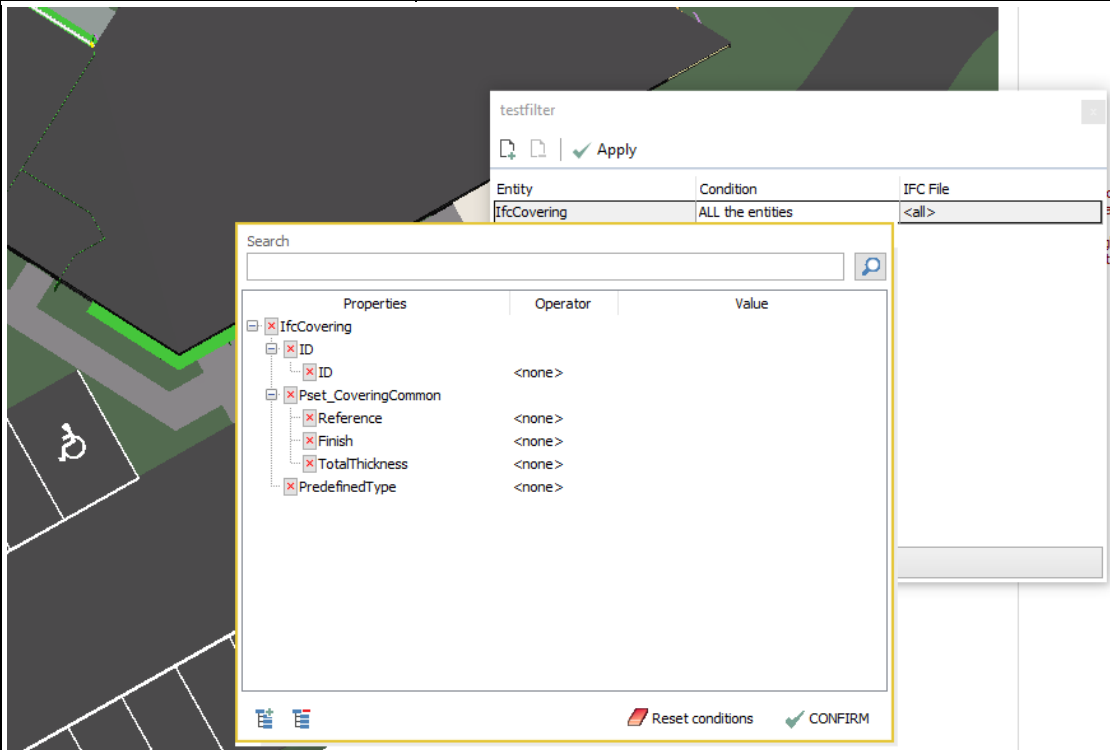



Editing attributes



Editing classifications



| | | |
|-----------------------------|--|--|
| Querying | 15.1) Is it possible to query the model and the attributes? | Yes |
| | 15.1.1) What kinds of query are possible? | You can perform queries on object types and any attribute. This works well and fast. |
| | 15.1.2) Attach screenshots |  <p>The screenshot shows a 3D architectural model of a building with a wheelchair accessibility symbol. A 'testfilter' dialog box is open, displaying a search field and a table of properties for the selected entity 'IfcCovering'. The table lists properties like ID, Pset_CoveringCommon, Reference, Finish, TotalThickness, and PredefinedType, all with '<none>' as values. The dialog also includes 'Apply', 'Reset conditions', and 'CONFIRM' buttons.</p> |
| Analysis | 16.1) Is it possible to analyse the objects and the model? | No |
| | 16.1.3) Time required to perform the analysis about the model itself (type 1) | No analysis of type 1 are possible |
| | 16.1.3) Time required to perform the analysis about the model performances (type2) | No analysis of type 2 are possible |
| Export | You arrived at the end of the phase 1: "Import and manage the file in the software".Now choose: | The software has also export abilities to IFC |
| | 17.1) Are any pre-processing or setting changes needed in the software to enable a consistent export? | No |
| | 18.1) Is it possible to choose the IFC model view definition (MVD) to be used when exporting the data? | No |
| | 19) How long does it take for the data to be exported to IFC? | less than a minute |
| Test with UpTown.ifc | | |
| | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | it's almost immediate |
| | How long does it take, approximately, to:Pan the model | it's almost immediate |
| | How long does it take, approximately, to:Rotate the model | it's almost immediate |
| | How long does it take, approximately, to:Query an object | it's almost immediate |

| | | |
|---------------|---|---|
| | How long does it take, approximately, to:Inspect the objects linked to the queried one (Element 3) through a relationship | the software does not allow this |
| Pro porti | 24.1) Does the model maintain its correct dimensions and proportions? | Yes |
| IFC defi | 25.1) Is the eventual translation consistent with the IFC definitions? | Yes |
| Hier arch | 26.1) Are the hierarchical relationships consistent with the IFC hierarchy? | The software does not have the necessary tools to determine this information |
| Attri bute | 27.1) Are the attributes present in the IFC entities retained and consistent? | Yes |
| Rel atio | 28.1) Are the relationships between the objects retained? | The software does not have the necessary tools to determine this information |
| G e | 29.1) Is geometry read correctly? | Yes |
| Normals | 30.1) Did the normals change? | No |
| | 30.1.2) Attach screenshots |  |
| 2D/3D | 31.1) Is it possible to view the model in 3D? | Yes |
| | 32.1) Is it possible to view the model in 2D? | Yes |

| | | |
|---------------------------------|---|---|
| Export | You arrived at the end of the phase 1: "Import and manage the file in the software".Now choose: | The software has also export abilities to IFC |
| | 36) How long does it take for the data to be exported to IFC? | less than a minute |
| | 36) How long does it take for the data to be exported to IFC? | less than a minute |
| Test with Savigliano.ifc | | |
| Per for | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | it crashes without completing the operation |

Tekla Structures [2019 Service Pack 1] - Windows 10 Home

Proprietary software

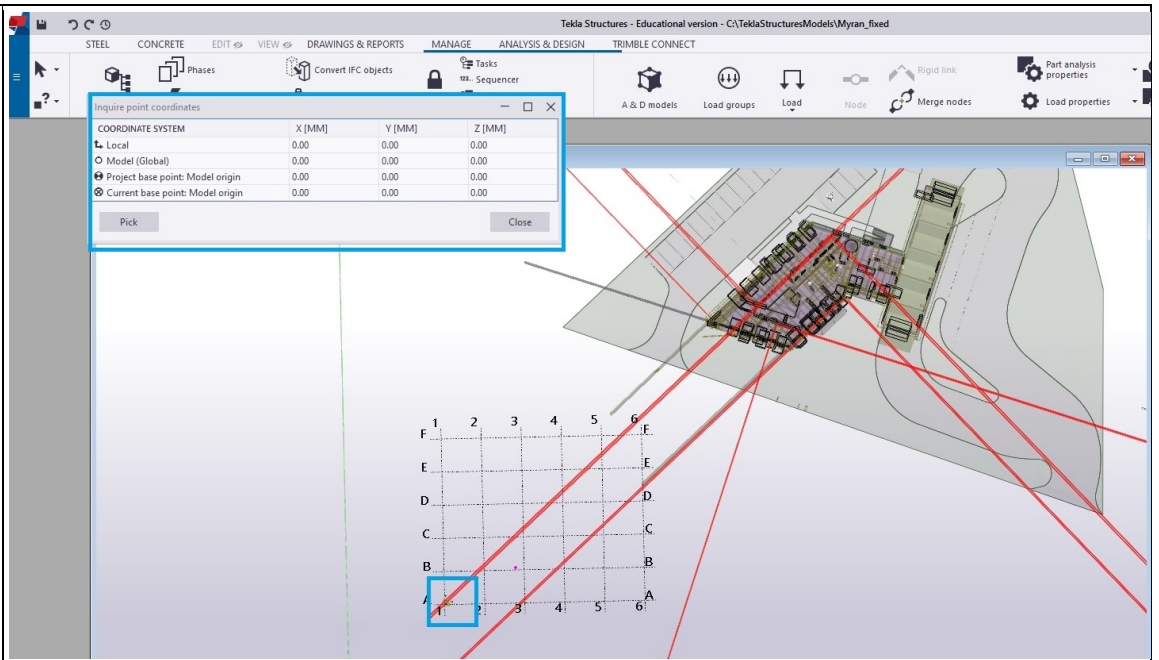
BIM

Level of tester expertise: 1 - Very beginner user (it is nearly the first time you use the software)

Tekla Structures

| | | | | | | | |
|----------------------------|--|---|------------------------------|--|---------------------------|------------------------------|-----------------------|
| Software | Software Name [version] | Tekla Structures [2019 Service Pack 1] | | Software house | | | |
| | Proprietary or open source software? | | | Kind of software | | | |
| proprietary | | | BIM | | | | |
| Computer | Model and year | Operating system | CPU | GPU | Memory (RAM) | Hard drive capacity | Hard drive free space |
| | self-built desktop (2013) | Windows 10 Home 64-bit | Intel i5-4570 @ 3.20GHz | AMD Radeon HD 7800 Series | 8 GB | 120 GB | 20 GB |
| Certification | IFC import certification status | Import certification date | Import certification program | IFC export certification status | Export certification date | Export certification program | |
| | certified in (date) | 2013-10-09 | CV 2.0 | certified in (date) | 2013-06-12 | CV2.0-Struct | |
| Test with Myran.ifc | | | | | | | |
| Performance | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | | | less than a minute | | | |
| | How long does it take, approximately, to:Zoom into the model to see more detail | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Pan the model | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Rotate the model | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Query an object | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Inspect the objects linked to the queried one through a relationship | | | the software does not allow this | | | |
| | Please report on any errors the software gives when importing the file. | | | You have to convert it to Tekla's own structure first. It couldn't convert quite many objects. | | | |
| Georeferencing | 2.1) Are the world (projected) coordinates taken into account when locating the model in the software's coordinate reference system? | | | No | | | |
| | 2.1.1) Where is the origin of the model coordinate reference system as imported in the software? | | | The origin is at the reference point. | | | |

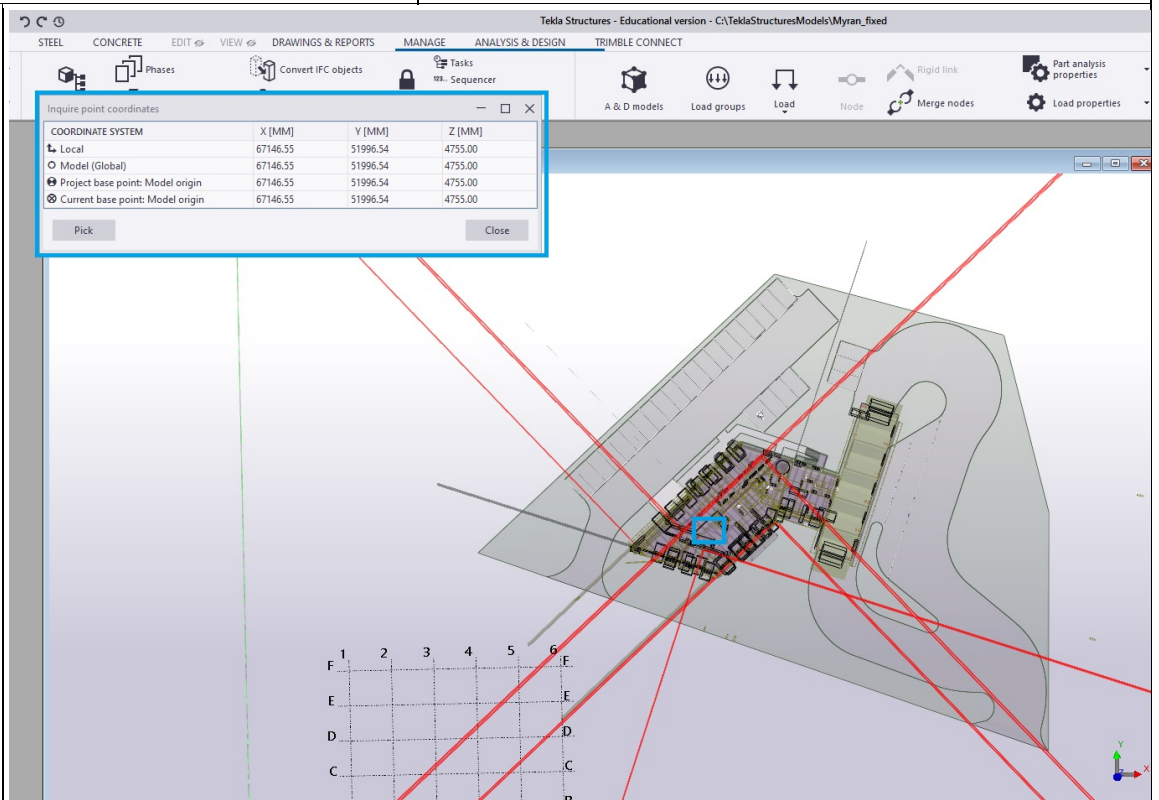
2.1.2) Attach screenshots



2.1.3) What is the coordinate reference system and projection and what unit of measure is used for the representation?

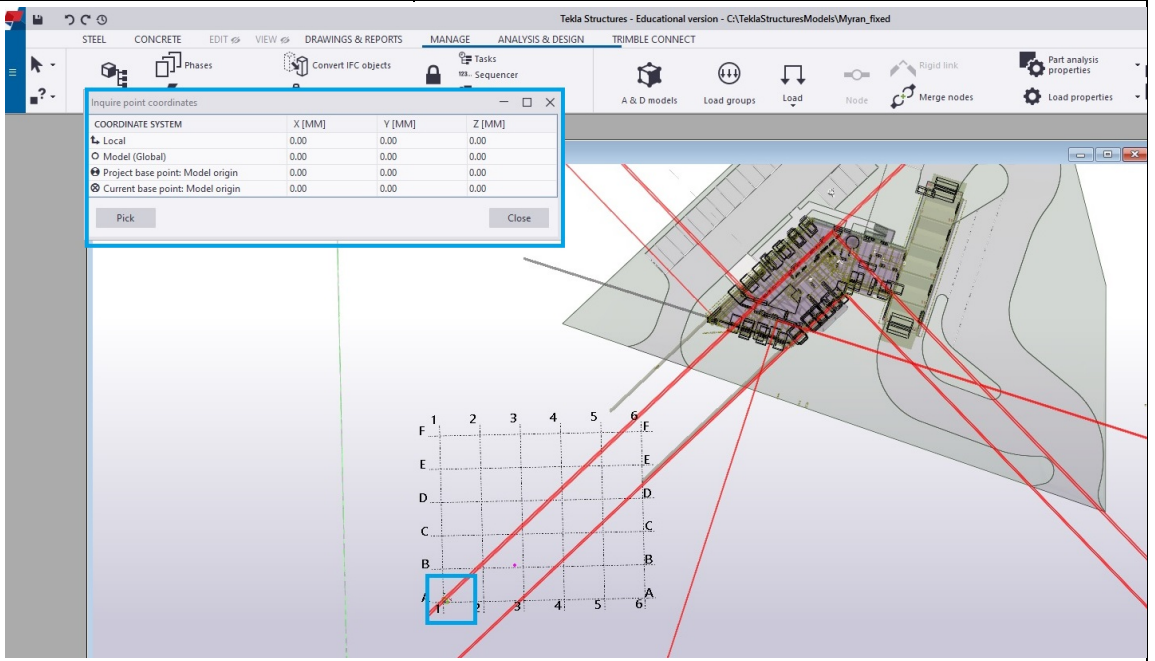
It is a local coordinate system, using millimetres as unit of measure.

2.1.4) Attach screenshots

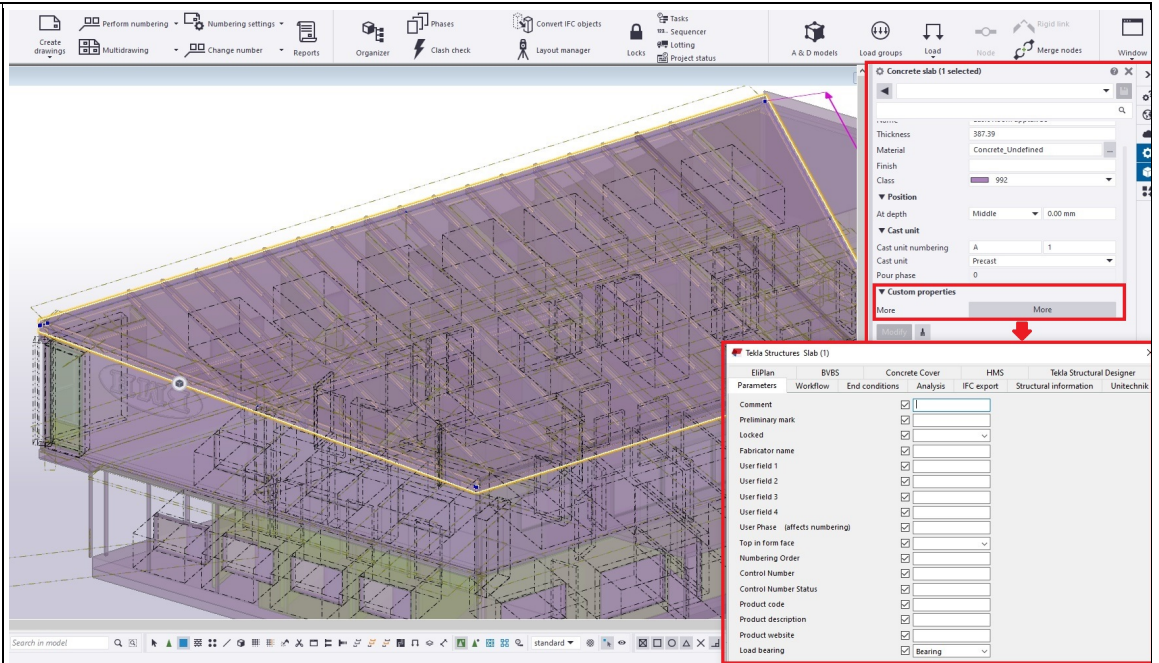


Height 3.1) Are the "real-world" elevation values (heights) considered when locating the model in the software (z)?

No

| | | |
|------------------------|---|---|
| | <p>3.1.1) What is the elevation value of the origin of the model coordinate reference system as imported in the software?</p> | <p>0</p> |
| | <p>3.1.2) Attach screenshots</p> |  |
| | <p>3.1.3) What is the height reference system?</p> | <p>Local in millimetres</p> |
| | <p>3.1.4) Attach screenshots</p> | <p>See picture from 3.1.2</p> |
| <p>Orientation</p> | <p>4.1) Is the model oriented correctly with respect to the true North?</p> | <p>Yes</p> |
| <p>Proportions</p> | <p>5.1) Does the model maintain its correct dimensions and proportions?</p> | <p>Yes</p> |
| <p>IFC definitions</p> | <p>6.1) Is the eventual translation consistent with the IFC definitions?</p> | <p>Yes</p> |
| | <p>6.2) short comments to the previous question (optional)</p> | <p>Only elements 5 and 6 are present (or clickable).</p> |
| <p>Hierarchy</p> | <p>7.1) Are the hierarchical relationships consistent with the IFC hierarchy?</p> | <p>The software does not have the necessary tools to determine this information</p> |
| <p>Attributes</p> | <p>8.1) Are the attributes present in the IFC entities retained and consistent?</p> | <p>No</p> |
| | <p>8.1.1) What changes / inconsistencies / errors / other issues were noted?</p> | <p>The attributes are not there. IFC objects have to be converted to Tekla's native structure, which would explain why the attributes are lost (only elements 5 and 6 can be checked)</p> |

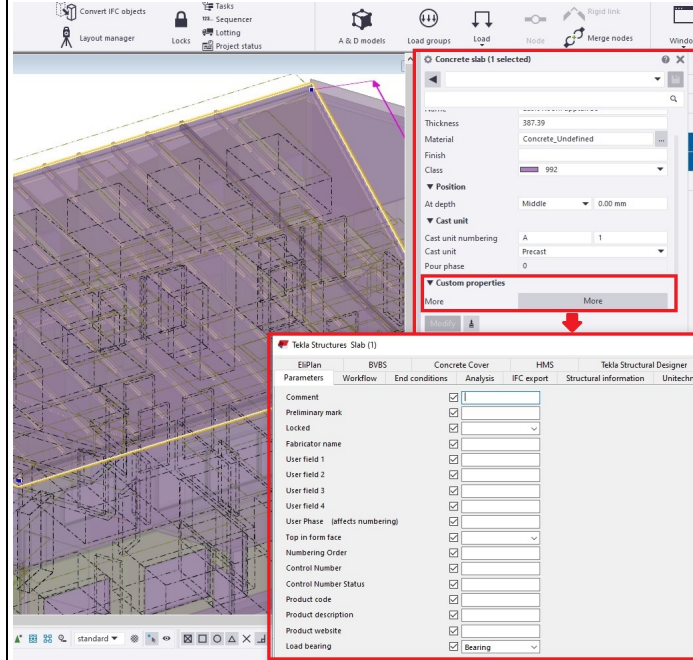
8.1.2) Attach screenshots



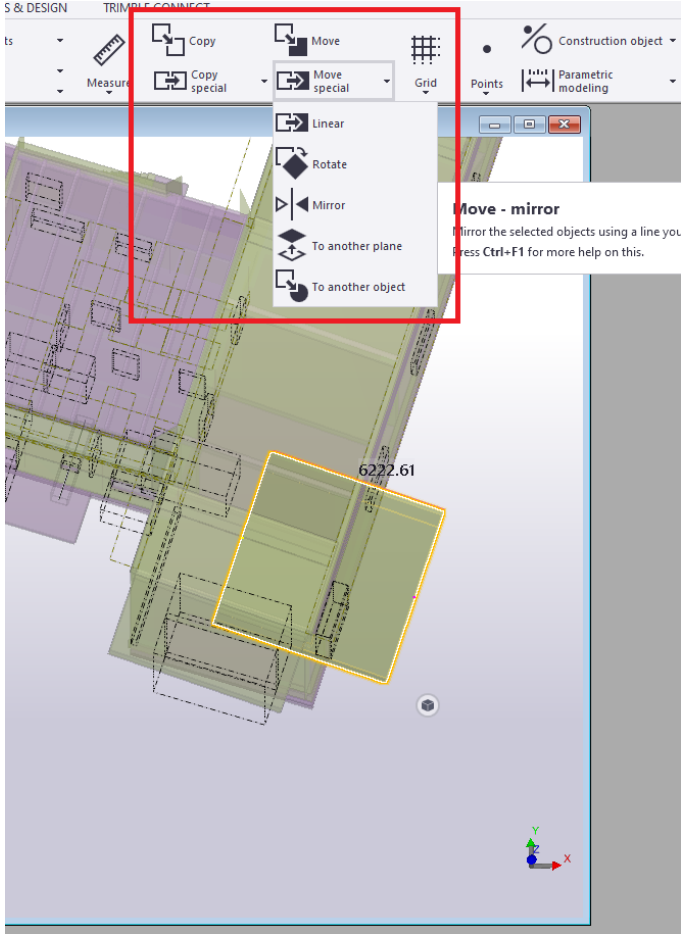
| | | |
|-------------|--|---|
| Relatio | 9.1) Are the relationships between the objects retained? | The software does not have the necessary tools to determine this information |
| Geoc | 10.1) Is geometry read correctly? | Yes |
| Normal s | 11.1) Did the normals change? | The software does not have the necessary tools for checking it |
| | 11.2) short comments to the previous question (optional) | Can't even check them visually. |
| 2D/3 D | 12) Visualisation 3D | Yes |
| | 13) Visualisation 2D | No |
| Editing | 14.1) Is it possible to edit the model (attributes, geometry, other)? | Yes |
| | 14.1.1) What editing is possible (attributes, geometry, georeferencing, please add details)? | It is possible to edit attributes (that are native to Tekla), and you can move/rotate geometries. |

14.1.2) Attach screenshots

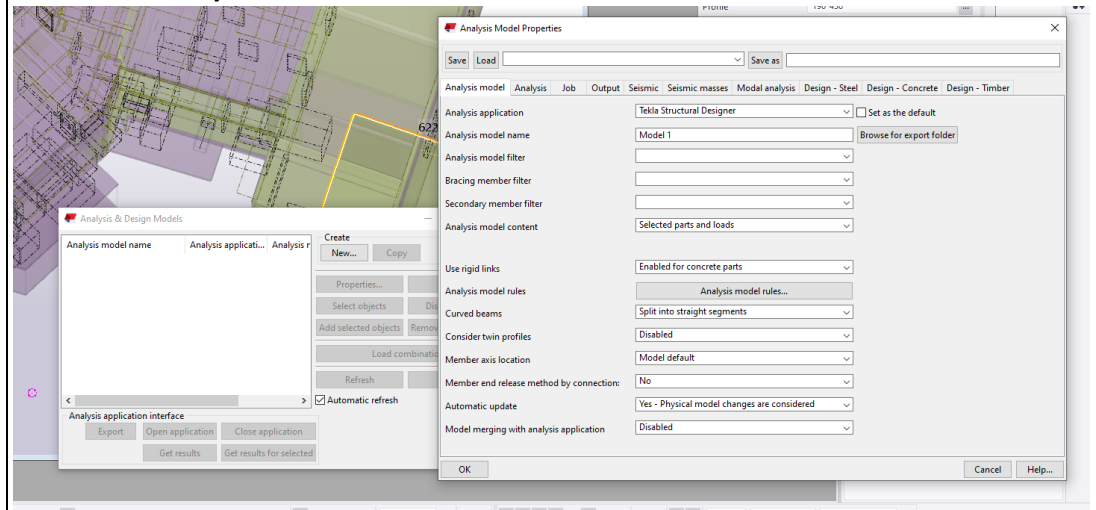
Editing properties



Editing geometry

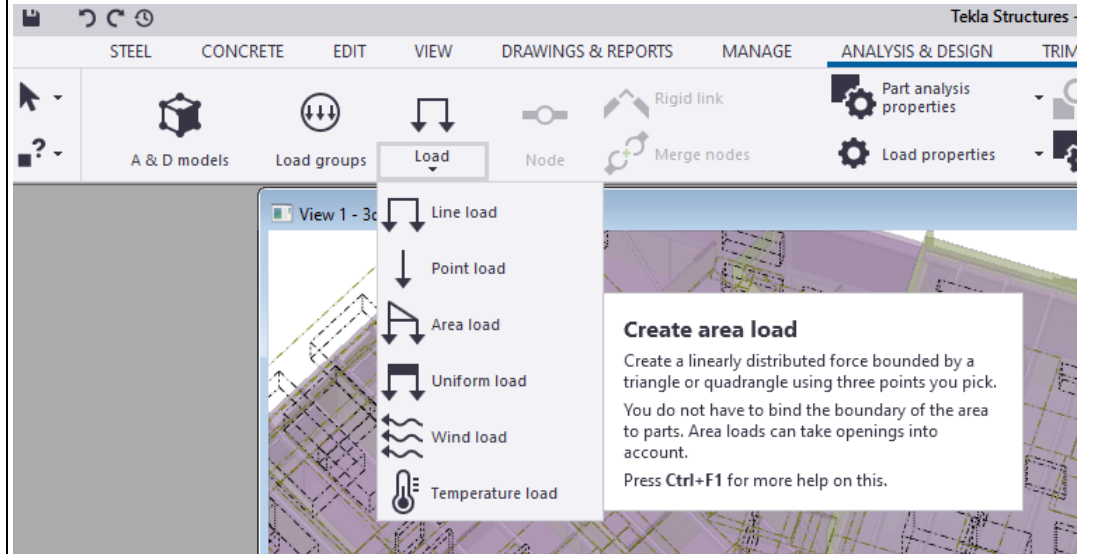
| | | |
|-----------------|---|--|
| |  | |
| <p>Q</p> | <p>15.1) Is it possible to query the model and the attributes?</p> | <p>No</p> |
| <p>Analysis</p> | <p>16.1) Is it possible to analyse the objects and the model?</p> | <p>Yes, analysis about the modelled building performances (energy, noise, shadows...) are possible (type 2)</p> |
| | <p>16.1.1) What analysis are possible? Do you know if the results are reliable?</p> | <p>You can do load analysis, part analysis, and customized analysis. However, I don't know how they would work and can't properly test them.</p> |

Customized analysis models

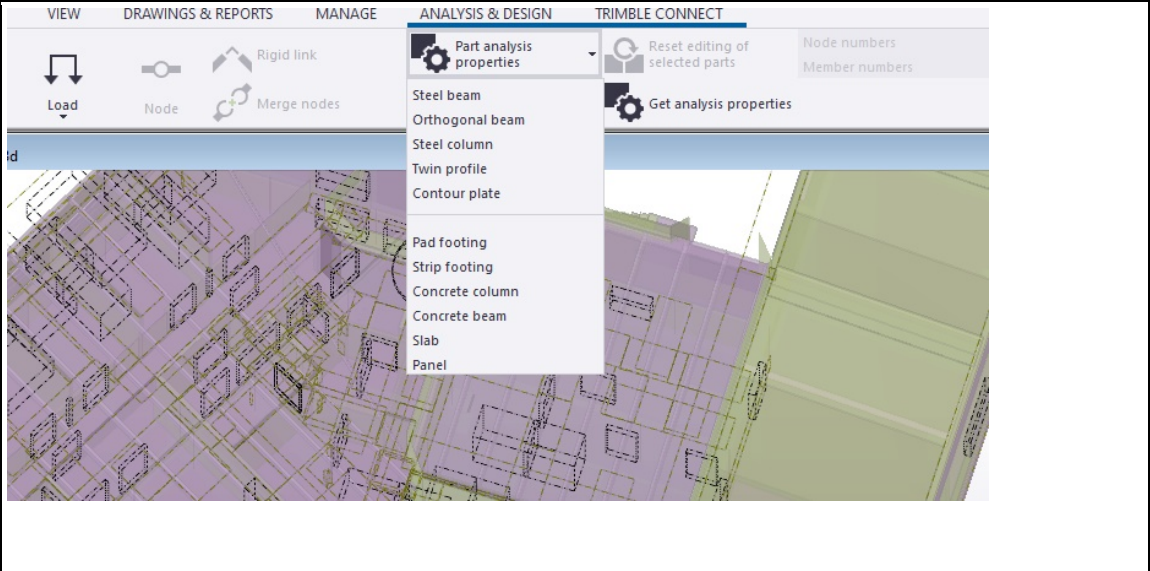


16.1.2) Attach screenshots

Load analysis




Part analysis

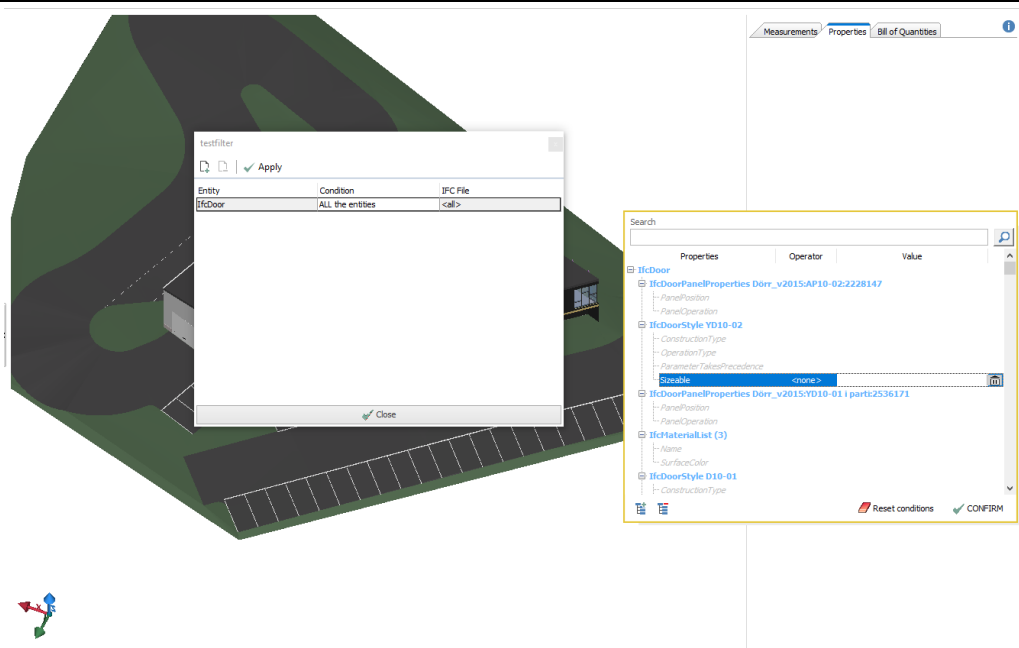
| | | |
|--|---|--|
| | |  |
| | <p>16.1.3) Time required to perform the analysis about the model itself (type 1)</p> | <p>No analysis of type 1 are possible</p> |
| | <p>16.1.3) Time required to perform the analysis about the model performances (type2)</p> | <p>it's almost immediate</p> |
| | <p>16.2) short comments to the previous question (optional)</p> | <p>Even though I can't properly test the analyses, they seem to be performed very quickly.</p> |
| <p>Export</p> | <p>You arrived at the end of the phase 1: "Import and manage the file in the software".Now choose:</p> | <p>The software has also export abilities to IFC</p> |
| | <p>17.1) Are any pre-processing or setting changes needed in the software to enable a consistent export?</p> | <p>No</p> |
| | <p>18.1) Is it possible to choose the IFC model view definition (MVD) to be used when exporting the data?</p> | <p>Yes</p> |
| | <p>18.1.1) Which ones are available?</p> | <p>Coordination view (1.0 and 2.0), steel fabrication view, surface geometry (if this is a view)</p> |
| | <p>18.1.2) Is it possible to add a customised MVD to be used for exporting IFC?</p> | <p>No</p> |
| | <p>19) How long does it take for the data to be exported to IFC?</p> | <p>it's almost immediate</p> |
| <p>Test with UpTown.ifc</p> | | |
| <p>Perf orm anc</p> | <p>How long does it take, approximately, to: Import (and visualise if the software allows it) the model</p> | <p>it crashes without completing the operation</p> |
| <p>Test with Savigliano.ifc</p> | | |
| <p>Perf orm anc</p> | <p>How long does it take, approximately, to: Import (and visualise if the software allows it) the model</p> | <p>it crashes without completing the operation</p> |

ACCA PriMus-IFC

| | | | | | | | |
|----------------------------|--|---------------------------------------|------------------------------|--|---------------------------|------------------------------|-----------------------|
| Software | Software Name [version] | PriMus-IFC [BIM 2(b) (64 bit)] | | Software house | ACCA | | |
| | Proprietary or open source software? | | | Kind of software | | | |
| proprietary | | | BIM | | | | |
| Computer | Model and year | Operating system | CPU | GPU | Memory (RAM) | Hard drive capacity | Hard drive free space |
| | self-built desktop (2013) | Windows 10 Home 64-bit | Intel i5-4570 @ 3.20GHz | AMD Radeon HD 7800 Series | 8 GB | 120 GB | 20 GB |
| Certification | IFC import certification status | Import certification date | Import certification program | IFC export certification status | Export certification date | Export certification program | |
| | certified in (date) | 2018-01-27 | CV 2.0 | not certified | | | |
| Test with Myran.ifc | | | | | | | |
| Performance | How long does it take, approximately, to: Import (and visualise if the software allows it) the model | | | less than a minute | | | |
| | How long does it take, approximately, to: Zoom into the model to see more detail | | | it's almost immediate | | | |
| | How long does it take, approximately, to: Pan the model | | | it's almost immediate | | | |
| | How long does it take, approximately, to: Rotate the model | | | it's almost immediate | | | |
| | How long does it take, approximately, to: Query an object | | | it's almost immediate | | | |
| | How long does it take, approximately, to: Inspect the objects linked to the queried one through a relationship | | | the software does not allow this | | | |
| Georeferencing | 2.1) Are the world (projected) coordinates taken into account when locating the model in the software's coordinate reference system? | | | The software does not have the necessary tools to check this information | | | |
| Height | 3.1) Are the "real-world" elevation values (heights) considered when locating the model in the software (z)? | | | The software does not have the necessary tools for checking it | | | |
| Orientation | 4.1) Is the model oriented correctly with respect to the true North? | | | Yes | | | |
| Proportions | 5.1) Does the model maintain its correct dimensions and proportions? | | | Yes | | | |
| IFC definitions | 6.1) Is the eventual translation consistent with the IFC definitions? | | | Yes | | | |
| Hierarchy | 7.1) Are the hierarchical relationships consistent with the IFC hierarchy? | | | The software does not have the necessary tools to determine this information | | | |
| Attributes | 8.1) Are the attributes present in the IFC entities retained and consistent? | | | Yes | | | |
| Relationships | 9.1) Are the relationships between the objects retained? | | | The software does not have the necessary tools to determine this information | | | |
| Geometry | 10.1) Is geometry read correctly? | | | Yes | | | |

| | | |
|----------|--|--|
| | 11.1) Did the normals change? | No |
| | 11.1.1) What changes / inconsistencies / errors / other issues were noted? | They didn't change (visually) |
| Normals | 11.1.2) Attach screenshots |  |
| 2D/3D | 12.1) Is it possible to view the model in 3D? | Yes |
| | 13.1) Is it possible to view the model in 2D? | Yes |
| Editing | 14.1) Is it possible to edit the model (attributes, geometry, other)? | No |
| Querying | 15.1) Is it possible to query the model and the attributes? | Yes |
| | 15.1.1) What kinds of query are possible? | You can perform queries on object types and any attribute. This works well and fast. |

15.1.2) Attach screenshots



16.1) Is it possible to analyse the objects and the model?

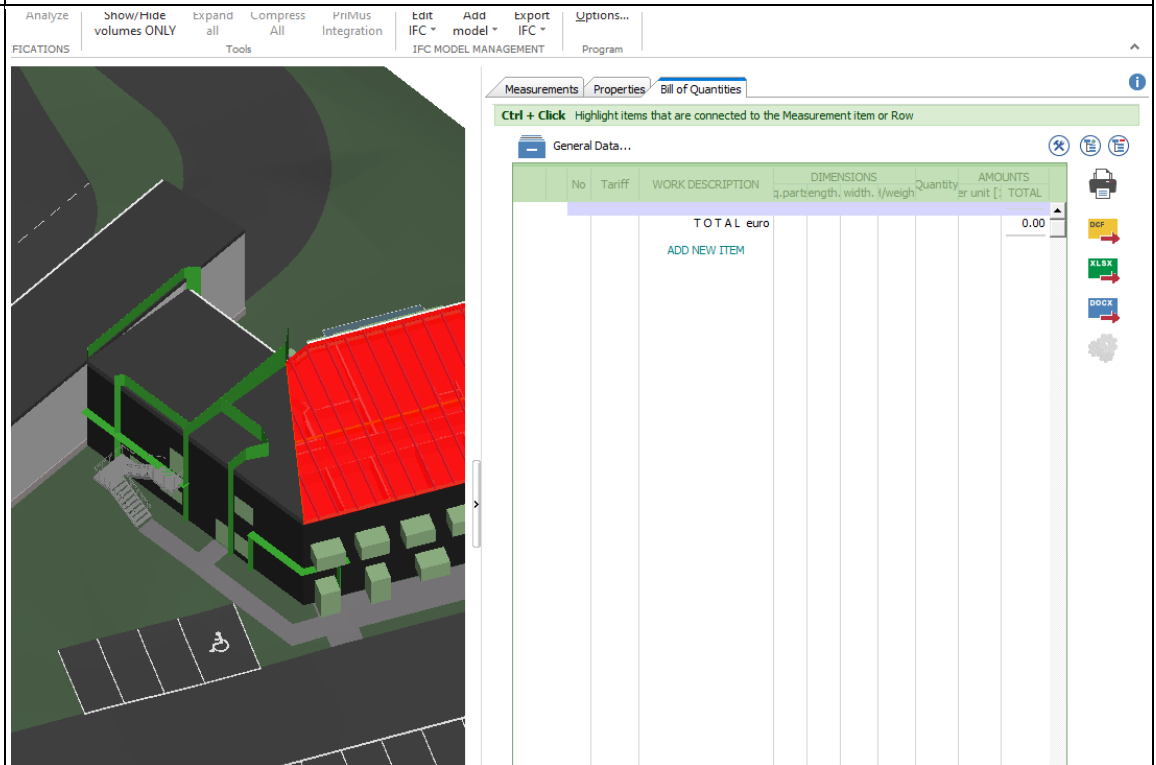
Yes, analysis about the modelled building performances (energy, noise, shadows...) are possible (type 2)

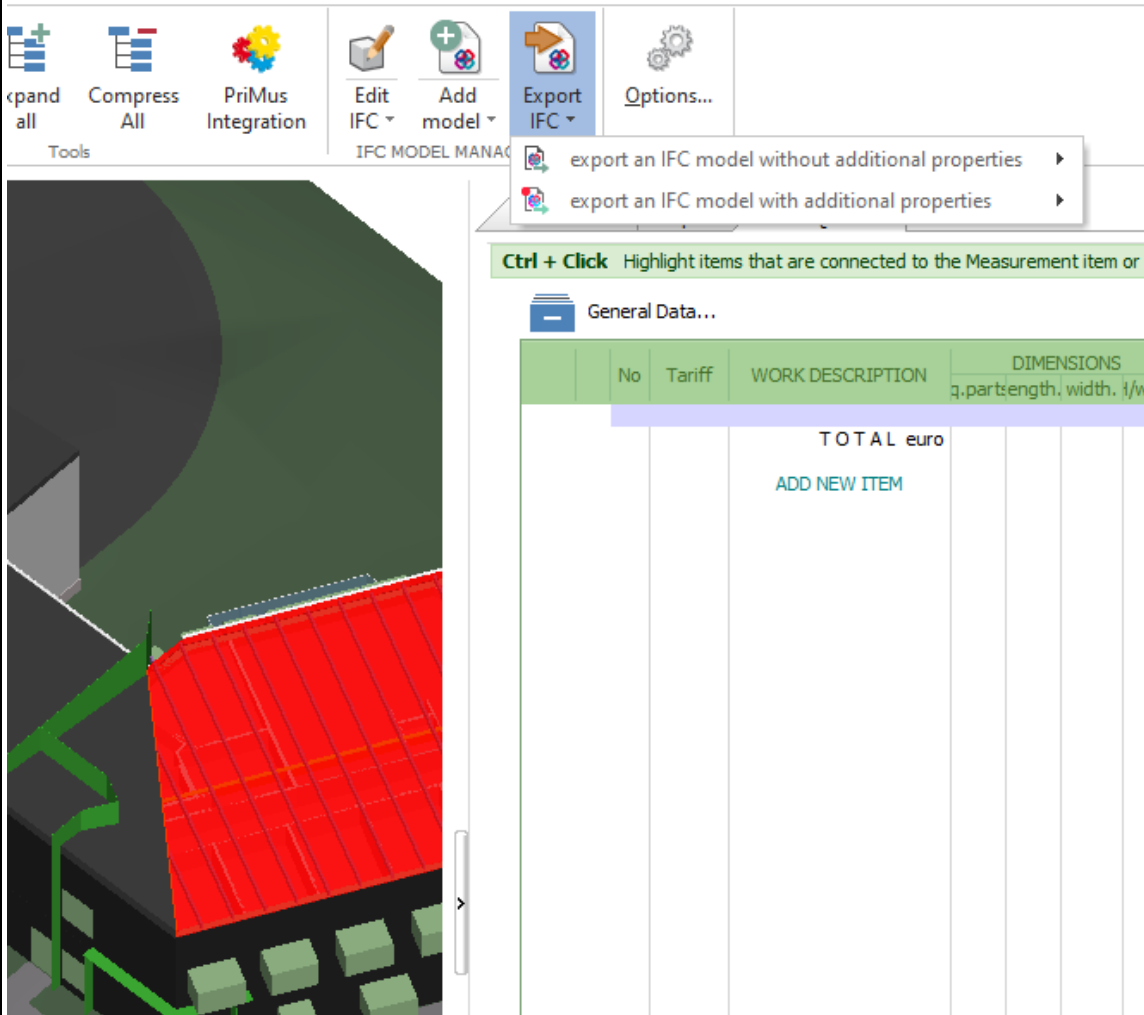
16.1.1) What analysis are possible? Do you know if the results are reliable?

You can do a cost performance analysis (Bill of Quantities). The reliability of the results depends on the input, as you have to associate each object with a rate item to determine the cost of every object. You can do this with an Excel sheet.

Analysis

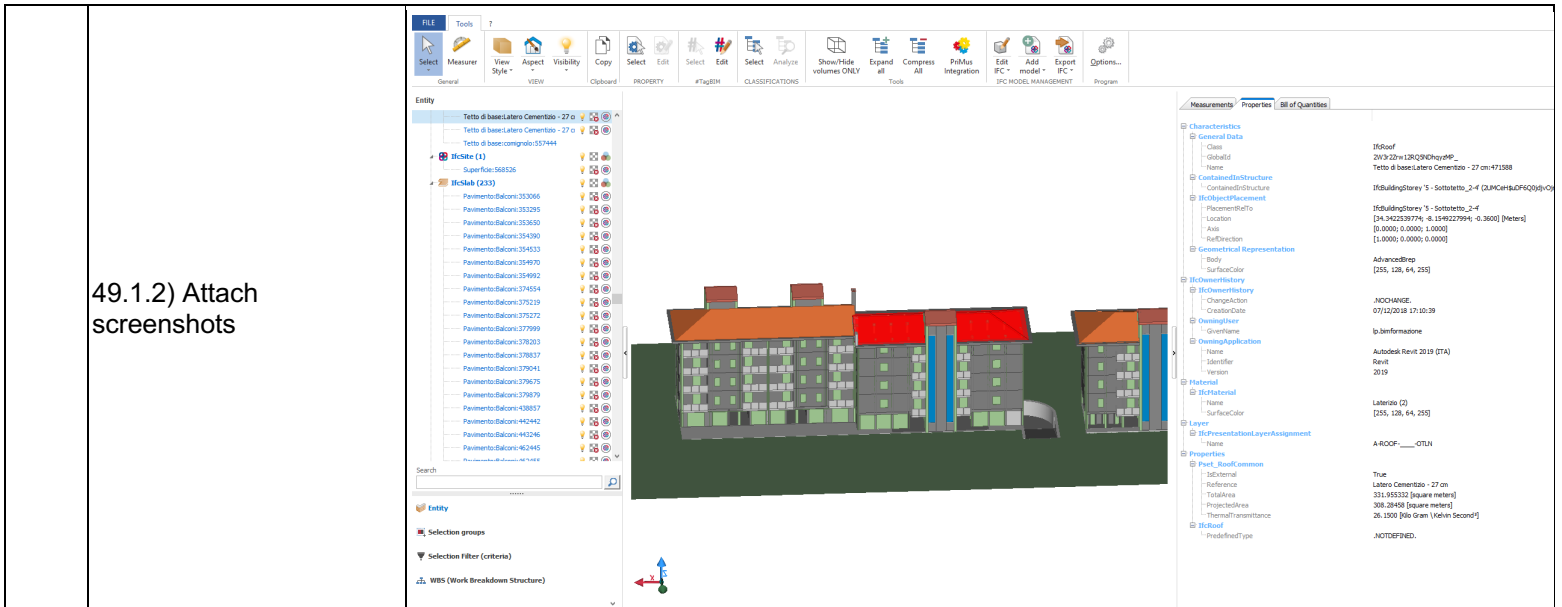
16.1.2) Attach screenshots



| | | |
|-----------------------------|--|---|
| | 16.1.3) Time required to perform the analysis about the model itself (type 1) | No analysis of type 1 are possible |
| | 16.2) short comments to the previous question (optional) | I can't assess this, because I don't have any suitable input data. |
| Export | You arrived at the end of the phase 1: "Import and manage the file in the software".Now choose: | The software has also export abilities to IFC |
| | 17.1) Are any pre-processing or setting changes needed in the software to enable a consistent export? | Yes |
| | 17.1.1) Can you add a short description of the steps involved in the pre-processing? | You have to choose between adding additional properties or not |
| | 17.1.2) Attach screenshots and files |  |
| | 18.1) Is it possible to choose the IFC model view definition (MVD) to be used when exporting the data? | No |
| | 19) How long does it take for the data to be exported to IFC? | less than a minute |
| Test with UpTown.ifc | | |
| Performance | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | it crashes without completing the operation |

| Test with Savigliano.ifc | | |
|--------------------------|---|---|
| Performance | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | less than a minute |
| | How long does it take, approximately, to:Zoom into the model to see more detail | it's almost immediate |
| | How long does it take, approximately, to:Pan the model | it's almost immediate |
| | How long does it take, approximately, to:Rotate the model | it's almost immediate |
| | How long does it take, approximately, to:Query an object | it's almost immediate |
| | How long does it take, approximately, to:Inspect the objects linked to the queried one through a relationship | the software does not allow this |
| | 39) Attach screenshots regarding the eventually reported errors. | |
| Georeferencing | 40.1) Are the world (projected) coordinates taken into account when locating the model in the software's coordinate reference system? | The software does not have the necessary tools to check this information |
| Height | 41.1) Are the "real-world" elevation values (heights) considered when locating the model in the software (z)? | The software does not have the necessary tools for checking it |
| Orientations | 42.1) Is the model oriented correctly with respect to the true North? | Yes |
| Proportions | 43.1) Does the model maintain its correct dimensions and proportions? | Yes |
| IFC definitions | 44.1) Is the eventual translation consistent with the IFC definitions? | Yes |
| Hierarchy | 45.1) Are the hierarchical relationships consistent with the IFC hierarchy? | The software does not have the necessary tools to determine this information |
| Attributes | 46.1) Are the attributes present in the IFC entities retained and consistent? | Yes |
| Relationships | 47.1) Are the relationships between the objects retained? | Yes |
| | 47.2) short comments to the previous question (optional) | It seems like they are retained, but I could only find many "IfcRelConnectsPathElements" relations. |
| Geometry | 48.1) Is geometry read correctly? | Yes |
| Normals | 49.1) Did the normals change? | No |
| | 49.1.1) What changes / inconsistencies / errors / other issues were noted? | I haven't noticed anything off. |

49.1.2) Attach screenshots



| | | |
|--------|--|---|
| 2D/3D | 50.1) Is it possible to view the model in 3D? | Yes |
| | 51.1) Is it possible to view the model in 2D? | Yes |
| Export | You arrived at the end of the phase 1: "Import and manage the file in the software". Now choose: | The software has also export abilities to IFC |
| | 55) How long does it take for the data to be exported to IFC? | less than a minute |

Simplebim 8.0 - Windows 10 Home

Proprietary software

BIM

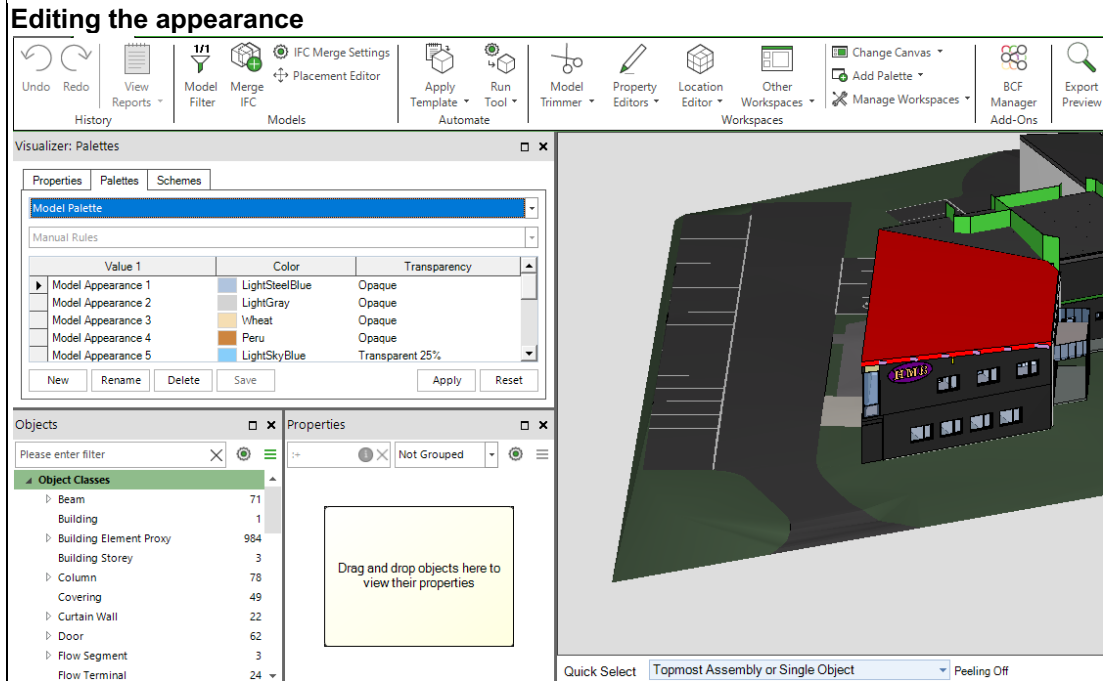
Level of tester expertise: 1 - Very beginner user (it is nearly the first time you use the software)

Simplebim

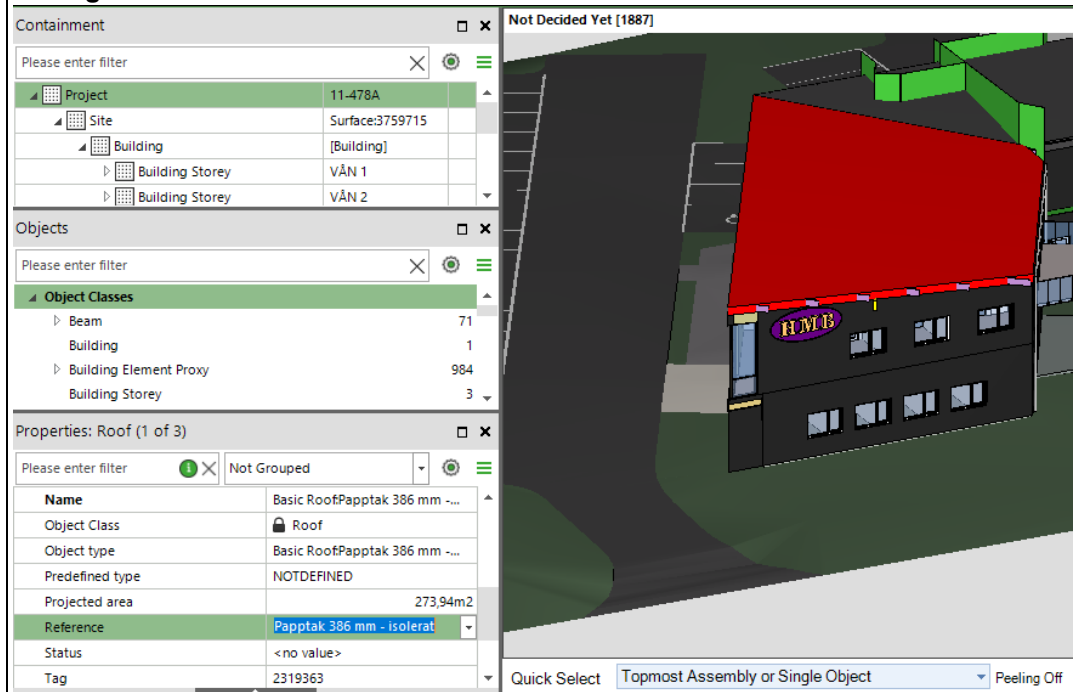
| | | | | | | | |
|----------------------------|--|---------------------------|------------------------------|--|---------------------------|------------------------------|-----------------------|
| Software | Software Name [version] | Simplebim [8.0] | | Software house | | | |
| | Proprietary or open source software? | | | Kind of software | | | |
| proprietary | | | BIM | | | | |
| Computer | Model and year | Operating system | CPU | GPU | Memory (RAM) | Hard drive capacity | Hard drive free space |
| | self-built desktop (2013) | Windows 10 Home 64-bit | Intel i5-4570 @ 3.20GHz | AMD Radeon HD 7800 Series | 8 GB | 120 GB | 20 GB |
| Certification | IFC import certification status | Import certification date | Import certification program | IFC export certification status | Export certification date | Export certification program | |
| | not certified | | | not certified | | | |
| Test with Myran.ifc | | | | | | | |
| Performance | How long does it take, approximately, to: Import (and visualise if the software allows it) the model | | | less than a minute | | | |
| | How long does it take, approximately, to: Zoom into the model to see more detail | | | it's almost immediate | | | |
| | How long does it take, approximately, to: Pan the model | | | it's almost immediate | | | |
| | How long does it take, approximately, to: Rotate the model | | | it's almost immediate | | | |
| | How long does it take, approximately, to: Query an object | | | it's almost immediate | | | |
| | How long does it take, approximately, to: Inspect the objects linked to the queried one through a relationship | | | the software does not allow this | | | |
| Georeferencing | 2.1) Are the world (projected) coordinates taken into account when locating the model in the software's coordinate reference system? | | | The software does not have the necessary tools to check this information | | | |
| Height | 3.1) Are the "real-world" elevation values (heights) considered when locating the model in the software (z)? | | | The software does not have the necessary tools for checking it | | | |
| Orientation | 4.1) Is the model oriented correctly with respect to the true North? | | | The software does not have the necessary tools to determine this information | | | |
| Proportions | 5.1) Does the model maintain its correct dimensions and proportions? | | | Yes | | | |
| IFC definitions | 6.1) Is the eventual translation consistent with the IFC definitions? | | | Yes | | | |
| Hierarchy | 7.1) Are the hierarchical relationships consistent with the IFC hierarchy? | | | The software does not have the necessary tools to determine this information | | | |
| Attributes | 8.1) Are the attributes present in the IFC entities retained and consistent? | | | Yes | | | |
| Relationships | 9.1) Are the relationships between the objects retained? | | | The software does not have the necessary tools to determine this information | | | |
| Geometry | 10.1) Is geometry read correctly? | | | Yes | | | |
| Normals | 11.1) Did the normals change? | | | No | | | |

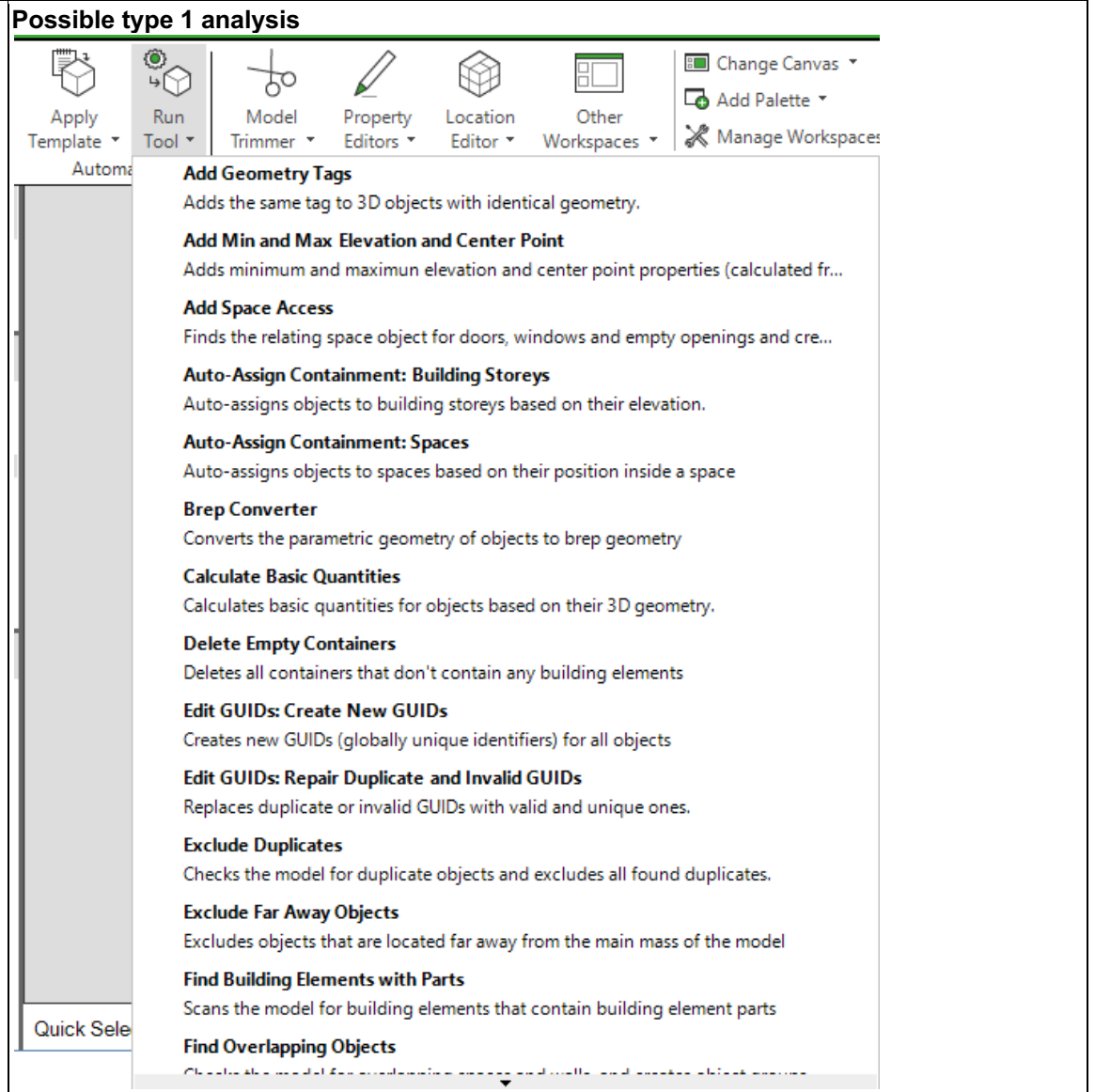
| | | |
|---------|--|---|
| 2D/3D | 12.1) Is it possible to view the model in 3D? | Yes |
| | 13.1) Is it possible to view the model in 2D? | No |
| Editing | 14.1) Is it possible to edit the model (attributes, geometry, other)? | Yes |
| | 14.1.1) What editing is possible (attributes, geometry, georeferencing, please add details)? | You can modify the attributes and appearance. Changing the geometry seems not to be possible. |

14.1.2) Attach screenshots



Editing attributes




| | | |
|---|---|--|
| Use | 15.1) Is it possible to query the model and the attributes? | No |
| Analysis | 16.1) Is it possible to analyse the objects and the model? | No |
| | 16.1.1) What analysis are possible? Do you know if the results are reliable? | No analysis possible, unless some functionalities in the screenshot would count as type 1 analysis. In that case, it seems to work well. |
| | 16.1.2) Attach screenshots |  |
| | 16.1.3) Time required to perform the analysis about the model itself (type 1) | No analyses of type 1 are possible |
| 16.1.3) Time required to perform the analysis about the model performances (type2) | No analysis of type 2 are possible | |
| You arrived at the end of the phase 1: "Import and manage the file in the software".Now choose: | The software has also export abilities to IFC | |
| Exp ort | 17.1) Are any pre-processing or setting changes needed in the software to enable a consistent export? | No |

| | | |
|---------------------------------|---|--|
| | 18.1) Is it possible to choose the IFC model view definition (MVD) to be used when exporting the data? | No |
| | 19) How long does it take for the data to be exported to IFC? | less than a minute |
| Test with UpTown.ifc | | |
| Performance | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | 5-20 minutes |
| | How long does it take, approximately, to:Pan the model | less than a minute |
| | How long does it take, approximately, to:Rotate the model | less than a minute |
| | How long does it take, approximately, to:Query an object | less than a minute |
| | How long does it take, approximately, to:Inspect the objects linked to the queried one (Element 3) through a relationship | the software does not allow this |
| | Please report on any errors the software gives when importing the file. | No errors |
| Proportions | 24.1) Does the model maintain its correct dimensions and proportions? | Yes |
| IFC definitions | 25.1) Is the eventual translation consistent with the IFC definitions? | Yes |
| Hierarchical | 26.1) Are the hierarchical relationships consistent with the IFC hierarchy? | The software does not have the necessary tools to determine this information |
| Attributes | 27.1) Are the attributes present in the IFC entities retained and consistent? | Yes |
| | 27.2) short comments to the previous question (optional) | Yes, they are all retained, except for the attributes that had empty values |
| Relationships | 28.1) Are the relationships between the objects retained? | The software does not have the necessary tools to determine this information |
| Geometry | 29.1) Is geometry read correctly? | Yes |
| Normals | 30.1) Did the normals change? | Yes |
| | 30.2) short comments to the previous question (optional) | Yes, visually |
| 2D/3D | 31.1) Is it possible to view the model in 3D? | Yes |
| | 32.1) Is it possible to view the model in 2D? | No |
| Queries | 34.1.1) What kinds of query are possible? | No querying possible |
| Export | You arrived at the end of the phase 1: "Import and manage the file in the software".Now choose: | The software has also export abilities to IFC |
| | 36) How long does it take for the data to be exported to IFC? | 1-5 minutes |
| Test with Savigliano.ifc | | |
| Performance | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | less than a minute |
| | How long does it take, approximately, to:Zoom into the model to see more detail | it's almost immediate |
| | How long does it take, approximately, to:Pan the model | it's almost immediate |
| | How long does it take, approximately, to:Rotate the model | it's almost immediate |
| | How long does it take, approximately, to:Query an object | it's almost immediate |

Simplebim 8.0 - Windows 10 Home

Proprietary software

BIM
Level of tester expertise: 1 - Very beginner user (it is nearly the first time you use the software)

| | | |
|---------------|---|--|
| | How long does it take, approximately, to:Inspect the objects linked to the queried one through a relationship | the software does not allow this |
| | 38) Please report on any errors the software gives when importing the file. | No errors |
| | 39) Attach screenshots regarding the eventually reported errors. | |
| Georef erenci | 40.1) Are the world (projected) coordinates taken into account when locating the model in the software's coordinate reference system? | The software does not have the necessary tools to check this information |
| Height | 41.1) Are the "real-world" elevation values (heights) considered when locating the model in the software (z)? | The software does not have the necessary tools for checking it |
| Orientati | 42.1) Is the model oriented correctly with respect to the true North? | The software does not have the necessary tools to determine this information |
| Proporti | 43.1) Does the model maintain its correct dimensions and proportions? | Yes |
| IFC defi | 44.1) Is the eventual translation consistent with the IFC definitions? | Yes |
| Hier arch | 45.1) Are the hierarchical relationships consistent with the IFC hierarchy? | The software does not have the necessary tools to determine this information |
| Attri bute | 46.1) Are the attributes present in the IFC entities retained and consistent? | Yes |
| Rel atio | 47.1) Are the relationships between the objects retained? | The software does not have the necessary tools to determine this information |
| Ge | 48.1) Is geometry read correctly? | Yes |
| Normals | 49.1) Did the normals change? | No |
| | 49.1.1) What changes / inconsistencies / errors / other issues were noted? | Visually, it seems like it hasn't changed. |
| | 49.1.2) Attach screenshots |  |
| 2D/3D | 50.1) Is it possible to view the model in 3D? | Yes |
| | 51.1) Is it possible to view the model in 2D? | No |
| Export | You arrived at the end of the phase 1: "Import and manage the file in the software".Now choose: | The software has also export abilities to IFC |
| | 55) How long does it take for the data to be exported to IFC? | less than a minute |

Bentley MicroStation + TerraSolid [MS Connect Edition 10.04.00.46 + TerraScan 19.004] - Windows 10 Home

Proprietary software

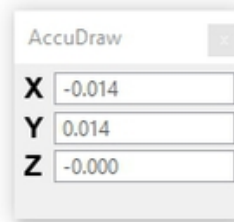
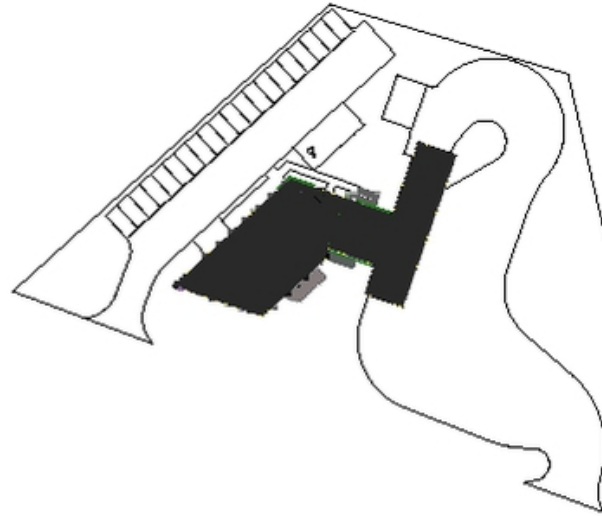
CAD

Level of tester expertise: 3 - Expert user (you know very well the technical details and tricks)

Bentley MicroStation + TerraSolid

| | | | | | | | |
|----------------------------|--|--|------------------------------|---------------------------------|---------------------------|------------------------------|-----------------------|
| Software | Software Name [version] | MicroStation + TerraSolid [MS Connect Edition 10.04.00.46 + TerraScan 19.004] | | | Software house | Bentley Systems | |
| | Proprietary or open source software? | | | Kind of software | | | |
| | proprietary | | | CAD | | | |
| Computer | Model and year | Operating system | CPU | GPU | Memory (RAM) | Hard drive capacity | Hard drive free space |
| | Dell G5 15, 2018 | Windows 10 Home | i7-8750H | NVIDIA GeForce GTX1060 6GB | 32 | 461 | 22 |
| Certification | IFC import certification status | Import certification date | Import certification program | IFC export certification status | Export certification date | Export certification program | |
| | not certified | | | not certified | | | |
| Test with Myran.ifc | | | | | | | |
| Performance | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | | | less than a minute | | | |
| | How long does it take, approximately, to:Zoom into the model to see more detail | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Pan the model | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Rotate the model | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Query an object | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Inspect the objects linked to the queried one through a relationship | | | it's almost immediate | | | |
| | Please report on any errors the software gives when importing the file. | | | lack of errors | | | |
| Georeferencing | 2.1) Are the world (projected) coordinates taken into account when locating the model in the software's coordinate reference system? | | | No | | | |
| | 2.1.1) Where is the origin of the model coordinate reference system as imported in the software? | | | Blue point in almost 0,0,0 | | | |

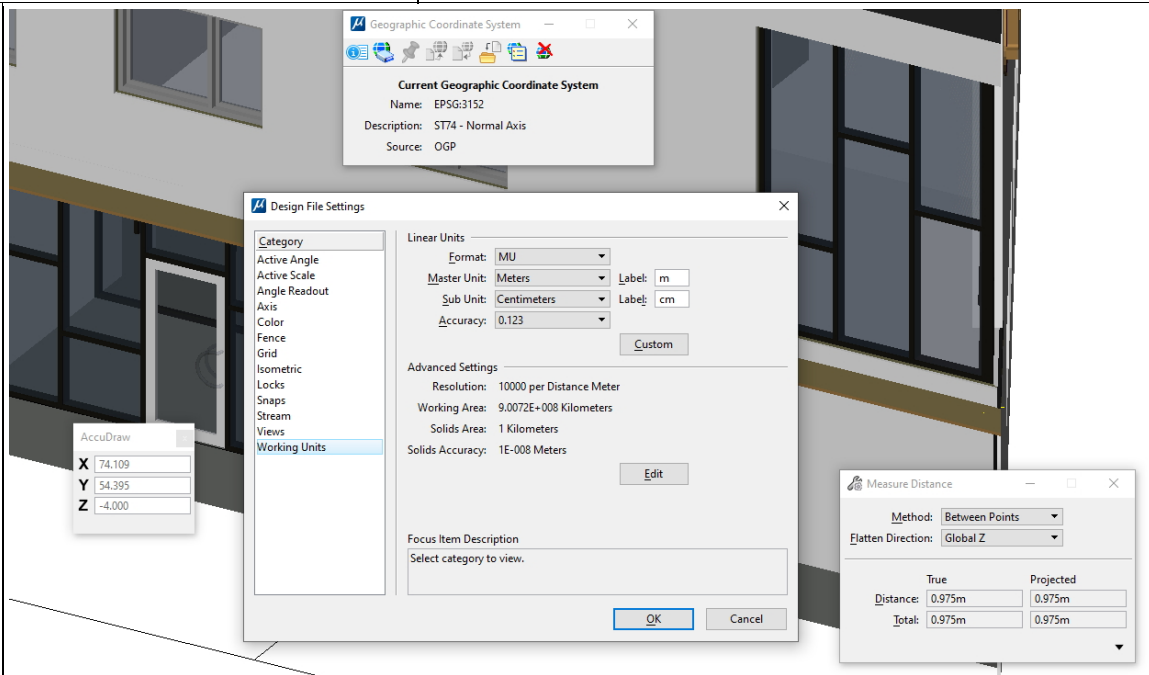
2.1.2) Attach screenshots

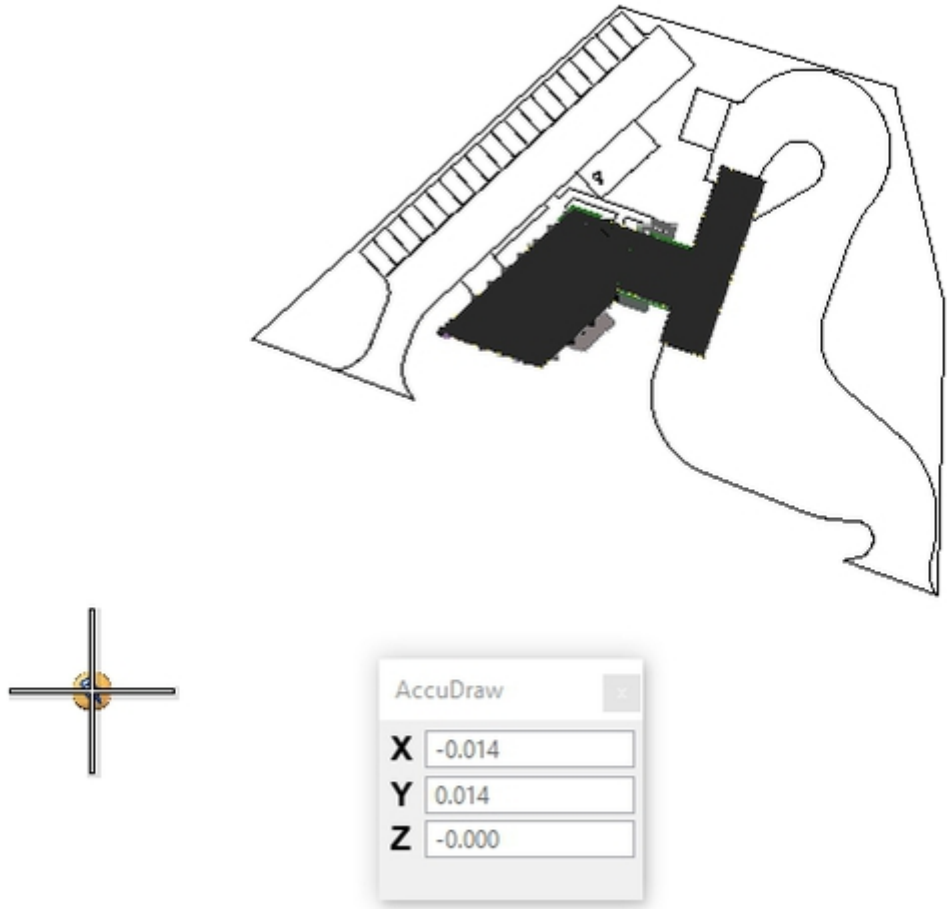


2.1.3) What is the coordinate reference system and projection and what unit of measure is used for the representation?

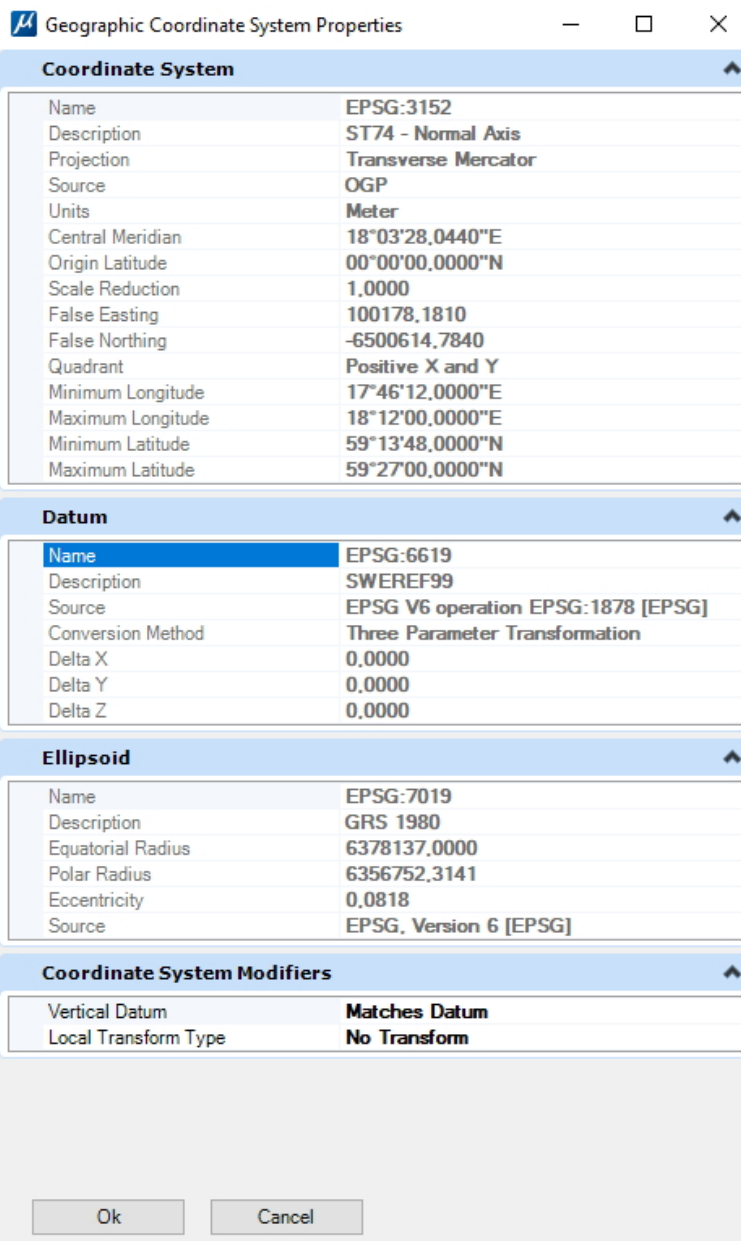
EPSG:3152, meters

2.1.4) Attach screenshots



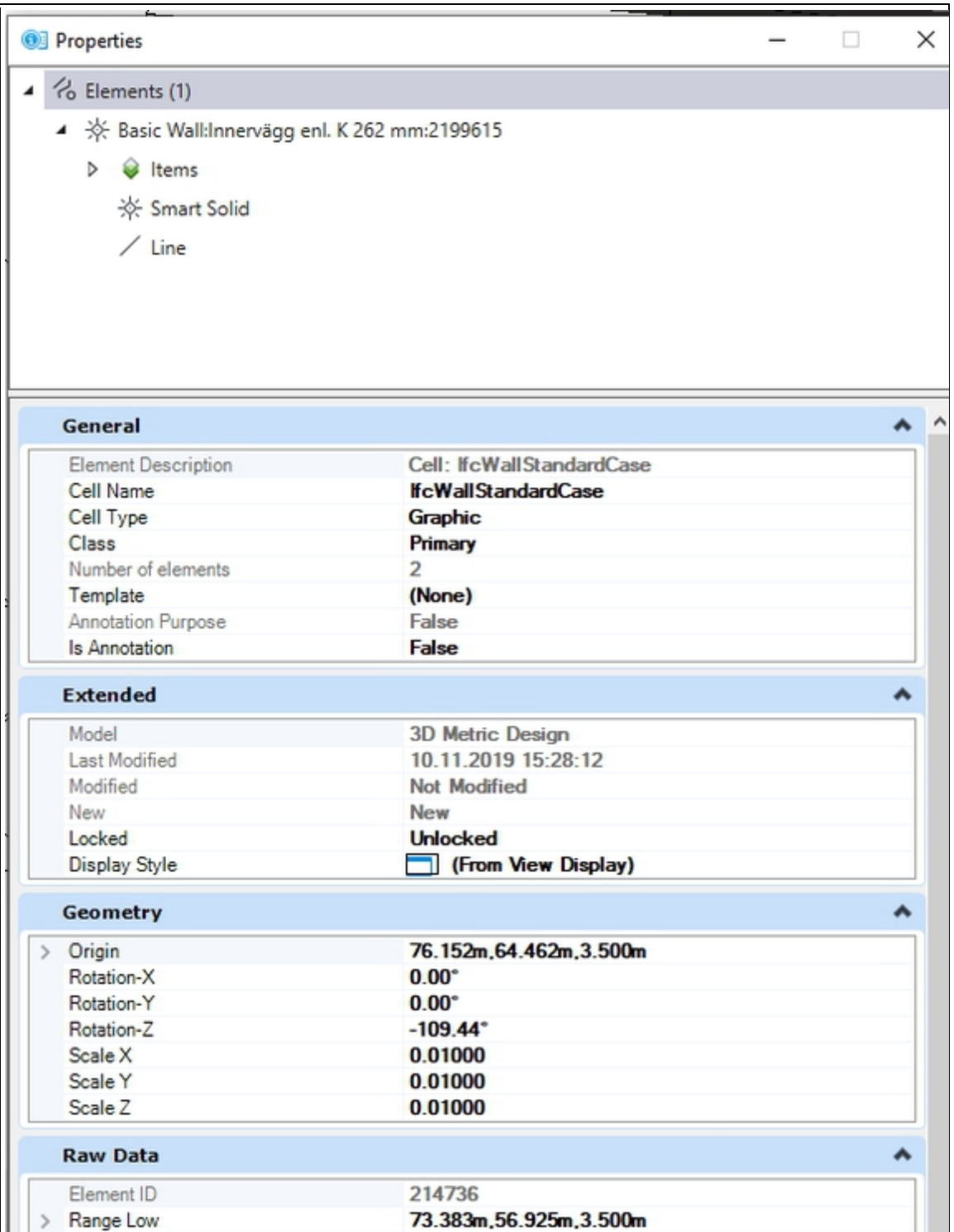
| | | |
|--------|--|---|
| Height | 3.1) Are the "real-world" elevation values (heights) considered when locating the model in the software (z)? | No |
| | 3.1.1) What is the elevation value of the origin of the model coordinate reference system as imported in the software? | blue point in 0.000m |
| | 3.1.2) Attach screenshots |  |
| | 3.1.3) What is the height reference system? | EPSG:6619 |

3.1.4) Attach screenshots

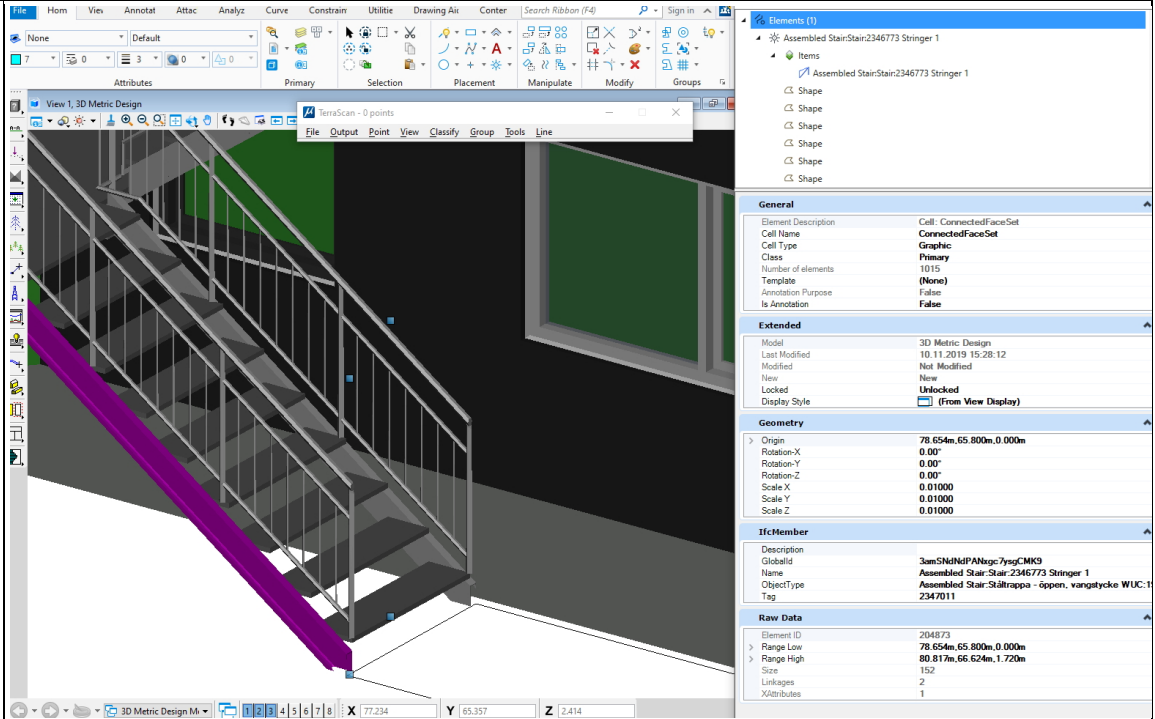


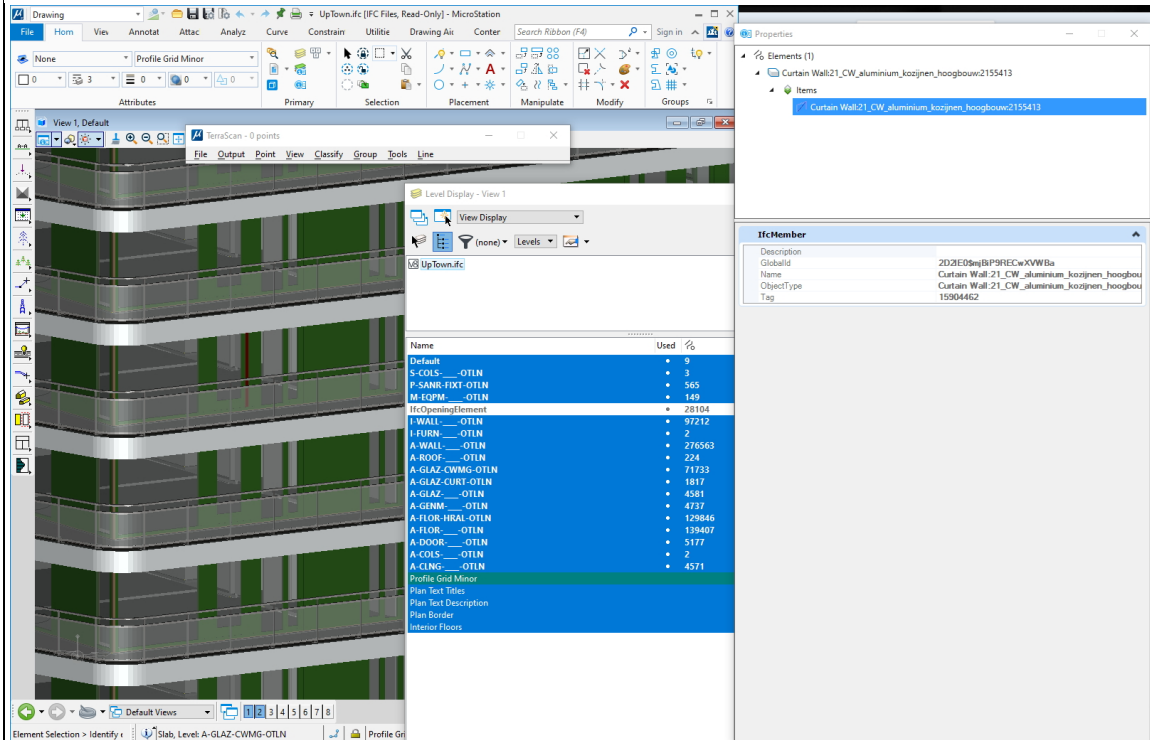
| | | |
|--------------------|---|--|
| Orie ntati | 4.1) Is the model oriented correctly with respect to the true North? | Yes |
| Pro porti | 5.1) Does the model maintain its correct dimensions and proportions? | Yes |
| IFC definitions | 6.1) Is the eventual translation consistent with the IFC definitions? | No |
| | 6.1.1) What changes / inconsistencies / errors / other issues were noted? | only IfcWall and IfcWallStandardCase were translated |


6.1.2) Attach screenshots

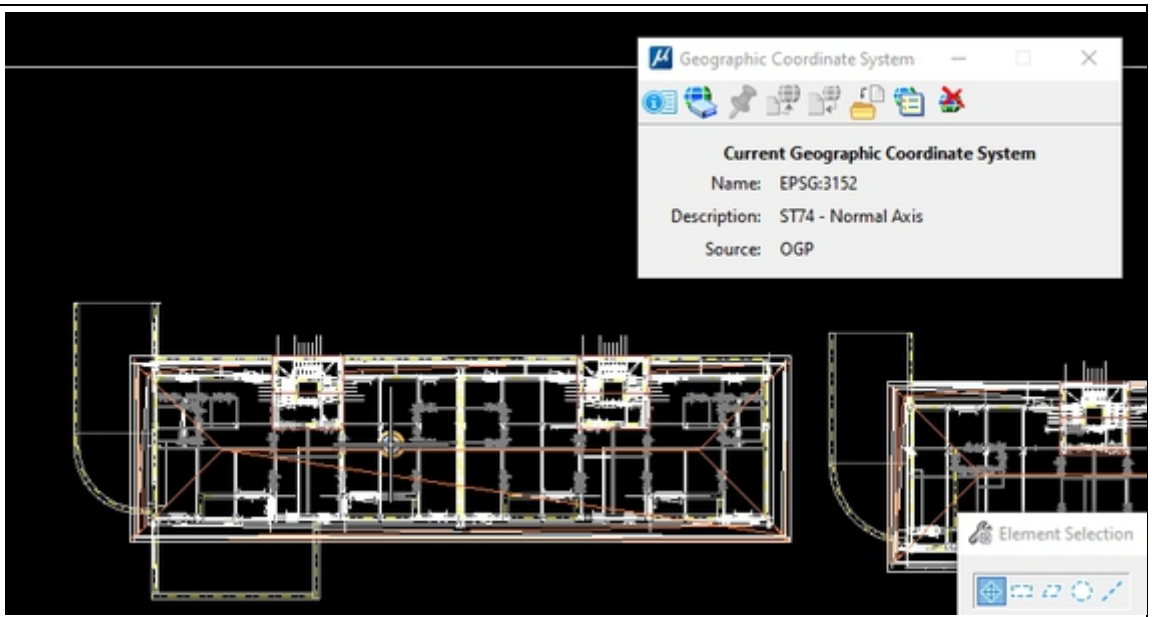


| | | |
|-----------|--|-----------------------------|
| Hierarchy | 7.1) Are the hierarchical relationships consistent with the IFC hierarchy? | No |
| | 7.2) short comments to the previous question (optional) | there is no hierarchy in MS |

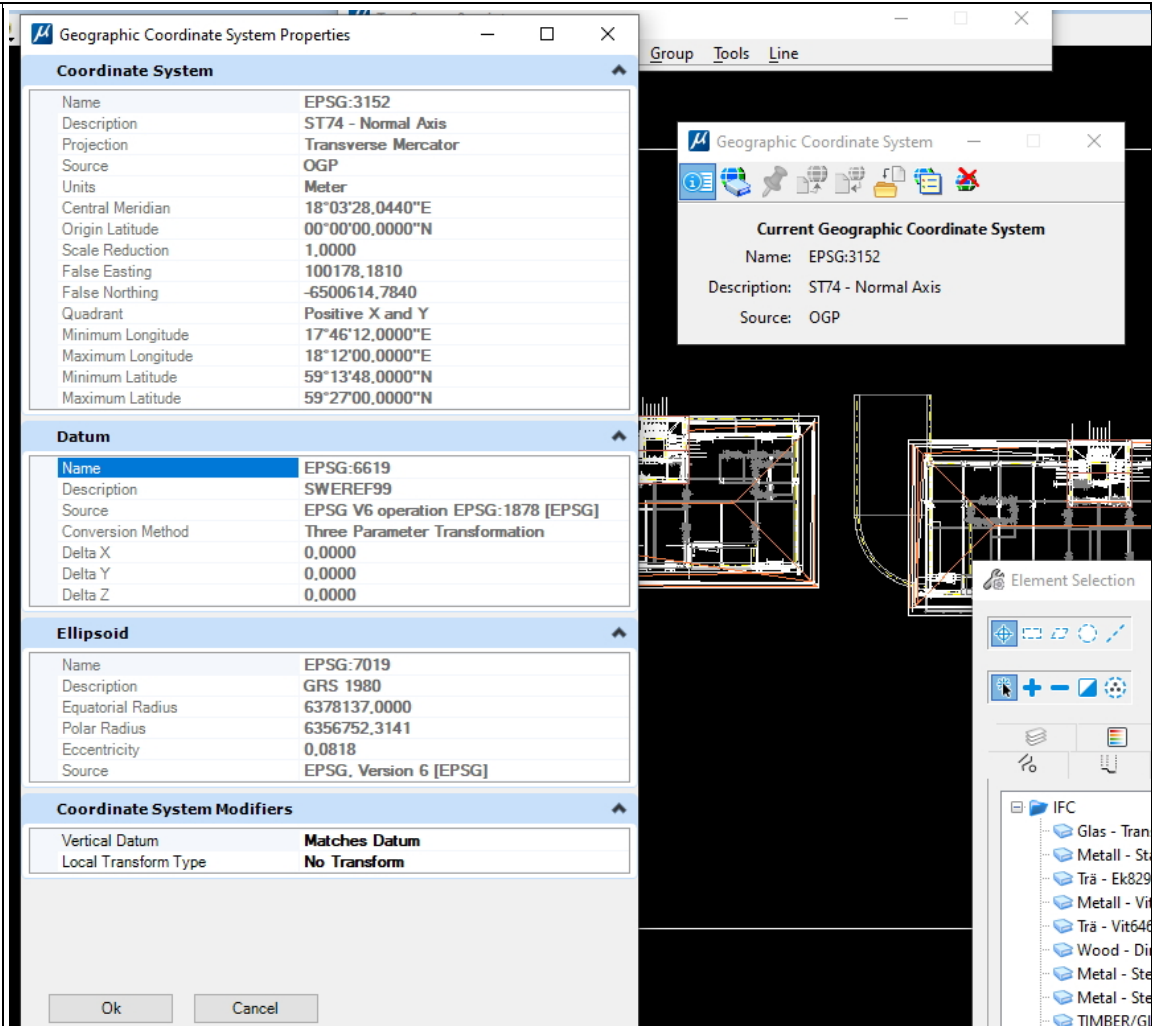
| | | |
|--------------|---|--|
| | 8.1) Are the attributes present in the IFC entities retained and consistent? | No |
| | 8.1.1) What changes / inconsistencies / errors / other issues were noted? | there are no properties like IsExternal and so on, only Reference is assigned |
| Attributes | 8.1.2) Attach screenshots |  |
| | | |
| Relationship | 9.1) Are the relationships between the objects retained? | Yes |
| Geometry | 10.1) Is geometry read correctly? | Yes |
| Normal | 11.1) Did the normals change? | No |
| | 11.1.1) What changes / inconsistencies / errors / other issues were noted? | no changes |
| 2D/3D | 12.1) Is it possible to view the model in 3D? | Yes |
| | 13.1) Is it possible to view the model in 2D? | Yes |
| Editing | 14.1) Is it possible to edit the model (attributes, geometry, other)? | partially |
| | 14.2) short comments to the previous question (optional) | moving, deleting and changing attributes in IfcClass are available, editing geometry not |
| Query | 15.1) Is it possible to query the model and the attributes? | No |
| Analysis | 16.1) Is it possible to analyse the objects and the model? | No |
| | 16.1.1) What analysis are possible? Do you know if the results are reliable? | none |
| | 16.1.3) Time required to perform the analysis about the model itself (type 1) | No analysis of type 1 are possible |
| | 16.1.3) Time required to perform the analysis about the model performances (type2) | No analysis of type 2 are possible |
| Export | You arrived at the end of the phase 1: "Import and manage the file in the software".Now choose: | The software cannot export to IFC, therefore skip the phase 2 |

| Test with UpTown.ifc | | |
|----------------------|---|---|
| | How long does it take, approximately, to:Zoom into the model to see more detail | it's almost immediate |
| | How long does it take, approximately, to:Pan the model | it's almost immediate |
| | How long does it take, approximately, to:Rotate the model | it's almost immediate |
| | How long does it take, approximately, to:Query an object | the software does not allow this |
| | How long does it take, approximately, to:Inspect the objects linked to the queried one (Element 3) through a relationship | the software does not allow this |
| | Please report on any errors the software gives when importing the file. | lack of errors, via File->Import import was unsuccessful after 18 min, via drag and drop import was successful after 1067 sek |
| Proportions | 24.1) Does the model maintain its correct dimensions and proportions? | proportion are OK, dimensions are: 84365.5584 instead of 84171.9, 59210.4897 instead of 59349.0, 23000.0000 instead of 22958.2, 25829.3420 instead of 25018.0 |
| | 24.2) short comments to the previous question (optional) | differences in dimensions are similar as in Myran model |
| IFC definitions | 25.1) Is the eventual translation consistent with the IFC definitions? | Yes |
| Hierarchy | 26.1) Are the hierarchical relationships consistent with the IFC hierarchy? | No |
| | 26.1.2) Attach screenshots |  |
| Attributes | 27.1) Are the attributes present in the IFC entities retained and consistent? | Yes |
| Geometry | 29.1) Is geometry read correctly? | Yes |
| Normals | 30.1) Did the normals change? | No |
| Rendering | 31.1) Is it possible to view the model in 3D? | Yes |

| | | |
|---------------------------------|---|---|
| | 32.1) Is it possible to view the model in 2D? | Yes |
| Exp ort | You arrived at the end of the phase 1: "Import and manage the file in the software".Now choose: | The software cannot export to IFC, therefore skip the phase 2 |
| Test with Savigliano.ifc | | |
| | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | 1-5 minutes |
| | How long does it take, approximately, to:Zoom into the model to see more detail | it's almost immediate |
| | How long does it take, approximately, to:Pan the model | it's almost immediate |
| | How long does it take, approximately, to:Rotate the model | it's almost immediate |
| | How long does it take, approximately, to:Query an object | the software does not allow this |
| | How long does it take, approximately, to:Inspect the objects linked to the queried one through a relationship | the software does not allow this |
| | 40.1) Are the world (projected) coordinates taken into account when locating the model in the software's coordinate reference system? | No |
| | 40.1.1) Where is the origin of the model coordinate reference system as imported in the software? | X=-0.014m, Y=0.014 |
| Performance | 40.1.2) Attach screenshots |  |
| | 40.1.3) What is the coordinate reference system and projection and what unit of measure is used for the representation? | EPSG:3152, meters |

| | | | |
|---------------------------|---|--|--|
| | <p>40.1.4) Attach screenshots</p> |  | |
| <p>Height Orientation</p> | <p>41.1) Are the "real-world" elevation values (heights) considered when locating the model in the software (z)?</p> <p>41.1.1) What is the elevation value of the origin of the model coordinate reference system as imported in the software?</p> | <p>No</p> <p>0.000m, EPSG:6619</p> | |

41.1.2) Attach screenshots



41.1.3) What is the height reference system?

SWEREF99

| | | |
|---------------------|---|--|
| Orie ntati | 42.1) Is the model oriented correctly with respect to the true North? | Yes |
| Pro porti c | 43.1) Does the model maintain its correct dimensions and proportions? | proportions are OK, dimensions are different: 51.831m instead of 49582.0, 45.310m instead of 42204.0 |
| IFC defi niti | 44.1) Is the eventual translation consistent with the IFC definitions? | Yes |
| Hier arch | 45.1) Are the hierarchical relationships consistent with the IFC hierarchy? | No |
| Attri bute | 46.1) Are the attributes present in the IFC entities retained and consistent? | The software does not have the necessary tools to determine this information |
| R el | 47.1) Are the relationships between the objects retained? | No |
| G e | 48.1) Is geometry read correctly? | Yes |
| Normal s | 49.1) Did the normals change? | No |
| | 49.1.1) What changes / inconsistencies / errors / other issues were noted? | no changes |

Bentley MicroStation + TerraSolid [MS Connect Edition 10.04.00.46 + TerraScan 19.004] - Windows 10 Home

Proprietary software

CAD

Level of tester expertise: 3 - Expert user (you know very well the technical details and tricks)

| | | |
|-------------------------|---|---|
| Exp 2D/3 D out | 50.1) Is it possible to view the model in 3D? | Yes |
| | 51.1) Is it possible to view the model in 2D? | Yes |
| Exp out | You arrived at the end of the phase 1: "Import and manage the file in the software".Now choose: | The software cannot export to IFC, therefore skip the phase 2 |

FME Desktop 2019.2 build 19800 - Windows 10 Home

Proprietary software

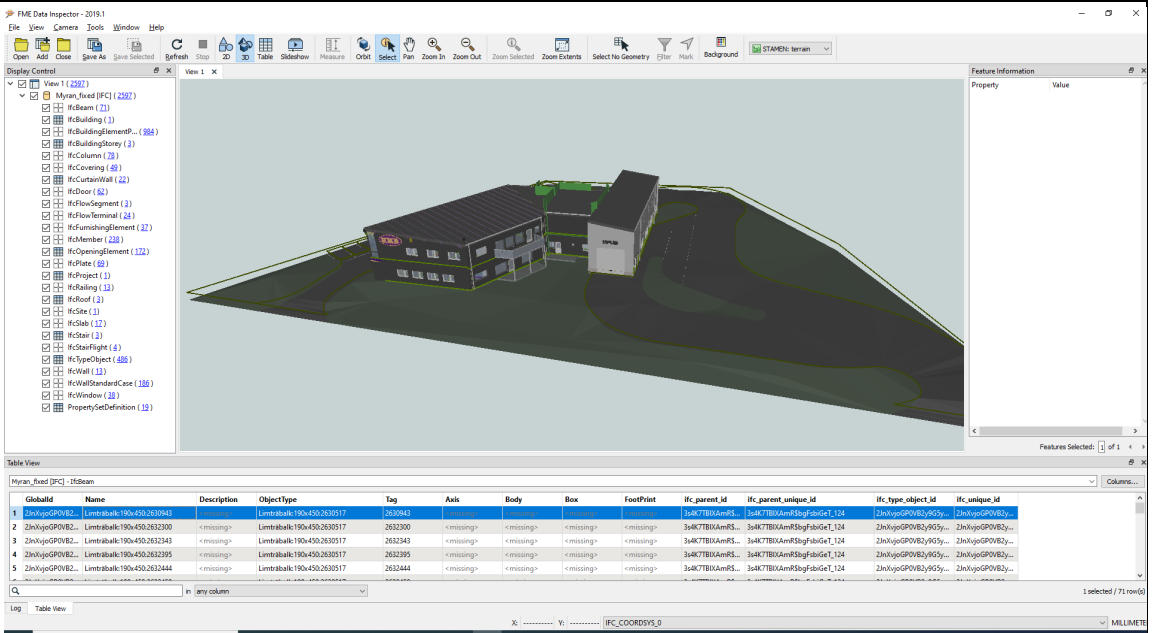
Extract/Transform/Load

Level of tester expertise: 3 - Expert user (you know very well the technical details and tricks)

FME Desktop

| | | | | | | | | |
|----------------------------|--|---|---|---|-------------------------------|------------------------------|-----------------------|--|
| Software | Software Name [version] | FME Desktop [2019.2 build 19800] | | Software house | www.safe.com/downloads | | | |
| | Proprietary or open source software? | | | Kind of software | | | | |
| | proprietary | | | Extract/Transform/Load | | | | |
| Computer | Model and year | Operating system | CPU | GPU | Memory (RAM) | Hard drive capacity | Hard drive free space | |
| | Dell Latitude 3400 x64 i7-8586U 2019 | MS Windows 10.0.18362 | x64 i7-8586U | GeForce MX130 NVidia | 16 | 940 | 405 | |
| Certification | IFC import certification status | Import certification date | Import certification program | IFC export certification status | Export certification date | Export certification program | | |
| | not certified | | | not certified | | | | |
| Test with Myran.ifc | | | | | | | | |
| Performance | How long does it take, approximately, to: Import (and visualise if the software allows it) the model | | | less than a minute | | | | |
| | How long does it take, approximately, to: Zoom into the model to see more detail | | | less than a minute | | | | |
| | How long does it take, approximately, to: Pan the model | | | it's almost immediate | | | | |
| | How long does it take, approximately, to: Rotate the model | | | it's almost immediate | | | | |
| | How long does it take, approximately, to: Query an object | | | it's almost immediate | | | | |
| | How long does it take, approximately, to: Inspect the objects linked to the queried one through a relationship | | Relationships such as parent id are read when the dataset is initially read, so these can be used to locate a parent feature using a filter query. Takes a few mouse clicks to do this and user needs to copy the parent_id, select the IFC_Stair feature type, open the filter query, select GlobalID and then paste the parent id value, so that's why it takes about a minute. | | | | | |
| | Please report on any errors the software gives when importing the file. | | Warnings logged in Data Inspector Log while reading the dataset. Many of these are incidental and do not necessarily indicate an error or problem. The coordinate system was not found in the dataset, and some traits might have been dropped, though these are likely not significant. The warning included text as follows : "Worker 86976 > Coordinate system named IFC_COORDSYS_0 does not exist. Worker 86976 > ... Last line repeated 25 times ... Worker 97736 > Error encountered while copying traits to generated solids. Some solid components may be missing traits, appearances, measures or attributes Error encountered while copying traits to generated solids. Some solid components may be missing traits, appearances, measures or attributes Worker 97736 > ... Last line repeated 4 times ..." | | | | | |
| Georeferencing | 2.1) Are the world (projected) coordinates taken into account when locating the model in the software's coordinate reference system? | | | FME uses the IfcSite RefLatitude (59.33199999972223) and RefLongitude (18.06499999972222) to geolocate the model. | | | | |
| | 2.2) short comments to the previous question (optional) | | FME uses the IfcSite RefLatitude (59.33199999972223) and RefLongitude (18.06499999972222) to geolocate the model. In this dataset these values seem to be not very accurate. FME can use northing and easting values as offsets to correct the georeferencing. The model is stored in millimeters, so we use a Scaler to scale to meters which is the default unit of EPSG 3013 | | | | | |

| | | |
|-----------------|--|---|
| | Other | Other_ FME uses IfcSite RefElevation (148200 mm or 148.2m) when geolocating. |
| Orientation | 4.1) Is the model oriented correctly with respect to the true North? | Yes |
| | 4.2) short comments to the previous question (optional) | Orientation looks the same in FME as in the GeoBIM website sample screenshots |
| Proportions | 5.1) Does the model maintain its correct dimensions and proportions? | Yes |
| | Other | Other_ Dimensions and proportions are correct in 2D. Data Inspector does not allow the measurement of dimensions in 3D. These measurements could be made in an FME Workspace using transformers (Zmax - Zmin etc), but there is no gui tool for doing this interactively in Data Inspector. |
| | 5.2) short comments to the previous question (optional) | Dimensions and proportions are correct in 2D. Data Inspector does not allow the measurement of dimensions in 3D. These measurements could be made in an FME Workspace using transformers (Zmax - Zmin etc), but there is no interface tool for doing this interactively in Data Inspector. Proportions appear correct in 3D. The spatial extents of an object appear in the bbox range shown for the selected object. This could be used to estimate 3D dimension. |
| IFC definitions | 6.1) Is the eventual translation consistent with the IFC definitions? | Yes |
| | 6.2) short comments to the previous question (optional) | All significant properties and ids appear to be read correctly. Compared to the GeoBIM screenshots, there appear to be some properties that are not read, including OwnerHistory, ObjectPlacement, Representation. With the exception of OwnerHistory, most of these properties are really internal file references - specifically file line number references. Some of the relationship information looks quite different between FME and the tool screen shots shown on the Benchmark Myran.ifc data webpage. This is because FME resolves the relationships and inserts the parent ids. |
| Hierarchy | 7.1) Are the hierarchical relationships consistent with the IFC hierarchy? | Yes |
| | 7.2) short comments to the previous question (optional) | Yes the relationships are maintained, both in terms of feature type and ifc_parent_id relationships. Some of the relationship information looks quite different between FME and the tool screen shots shown on the GeoBIM benchmark Myran.ifc dataset webpage. Most of the reference properties shown are really internal file references - specifically file line number references. FME does not display these internal properties but rather resolves these references and reads the associated parent ids, properties, geometries or appearances instead. For example, Element 1 has the following properties in the GeoBIM example screenshot: Has Associations (#923061), IsDefinedBy (#528514), ObjectPlacement (#926190), ContainedInStructure (#919402). Rather than display these line number references, FME resolves them to include the parent id such as ifc_parent_id: 2p1EsZz71B6BQESW\$gr9GJ for Element 1. For example, the attached screen shots show how the parent_id can be used to find the containedInStructure. Following the reference using filter features function in Data Inspector allows the user to find the opening that the door belongs to and then the wall that the opening belongs to. |
| | Other | Other_ Attributes that are found agree: GlobalId, Name, ObjectType, Tag. Missing: OwnerHistory ObjectPlacement Representation |
| | 8.2) short comments to the previous question (optional) | The properties and ids are read correctly except for internal file reference properties described in 7.1 above |
| Relationships | 9.1) Are the relationships between the objects retained? | Yes |

| | | |
|--|--|---|
| | 9.2) short comments to the previous question (optional) | Basic visual inspection for previous question. Screen shots show how parent objects such as containing walls can be found by following the parent id references. |
| Geometry | 10.1) Is geometry read correctly? | Yes |
| | 10.2) short comments to the previous question (optional) | There are several different read modes in FME which can affect how geometries are grouped. The default mode for the FME IFC reader is relational mode. In this mode FME reads primary object properties as attributes. Object geometries and their properties are read as nested, named FME geometries and geometry traits. So for IFCDoor, the attributes store properties such as GlobalID, ifc_unique_id, Name, etc, and the geometry contains a combination of null and Body geometries. The null geometries store traits such as property sets, appearances and materials. Body geometries store multi-surfaces and solids as appropriate. In the case of IFCDoor, the combination of materials, appearances, properties and property sets are stored as an aggregate of null and body geometries with the geometry name = IfcDoor. For more info see: https://docs.safe.com/fme/html/FME_Desktop_Documentation/FME_ReadersWriters/ifc/IFC_reader.htm |
| Normals | 11.1) Did the normals change? | No |
| | 11.1.1) What changes / inconsistencies / errors / other issues were noted? | No obvious differences were found between the way FME displayed the Myran dataset vs the GeoBIM website screenshots or Solibri viewer |
| 11.1.2) Attach screenshots |  <p>The screenshot displays the FME Data Inspector interface. On the left, a tree view shows a hierarchy of IFC objects under 'Myran_fixed [IFC] (2307)', including elements like IfcBeam, IfcBuilding, IfcBuildingElementPart, IfcBuildingStorey, IfcColumn, IfcCovering, IfcCurtainWall, IfcDoor, IfcFlowSegment, IfcFlowTerminal, IfcFurnitureElement, IfcMember, IfcOpeningElement, IfcProject, IfcRailing, IfcRoof, IfcStair, IfcStairFlight, IfcTypeOfElement, IfcWall, IfcWallStandardCase, IfcWindow, and PropertySetDefinition. The main area shows a 3D perspective view of a building model with green outlines. Below the 3D view is a 'Table View' showing a list of objects with columns for GlobalId, Name, Description, Object Type, Tag, Axis, Body, Box, Footprint, Ifc_parent_id, Ifc_parent_unique_id, Ifc_type_object_id, and Ifc_unique_id. The table contains five rows of data for various IfcWall and IfcWindow objects.</p> | |
| <p>Fig. 1 FME Data Inspector show dataset full extents</p> | | |

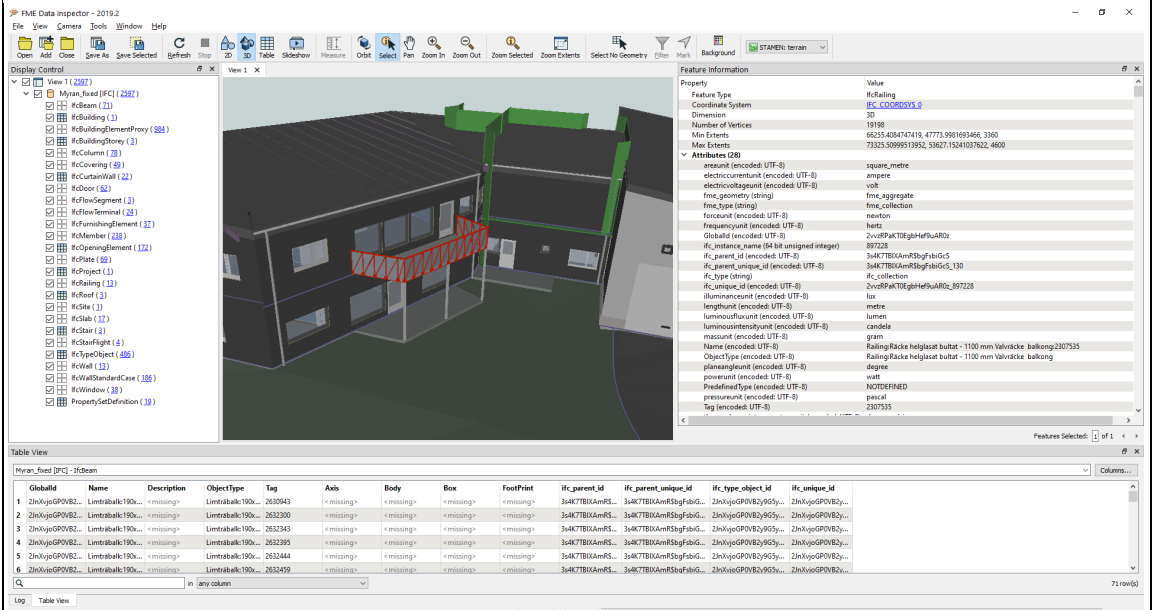


Figure 2. Zoom to view of railing

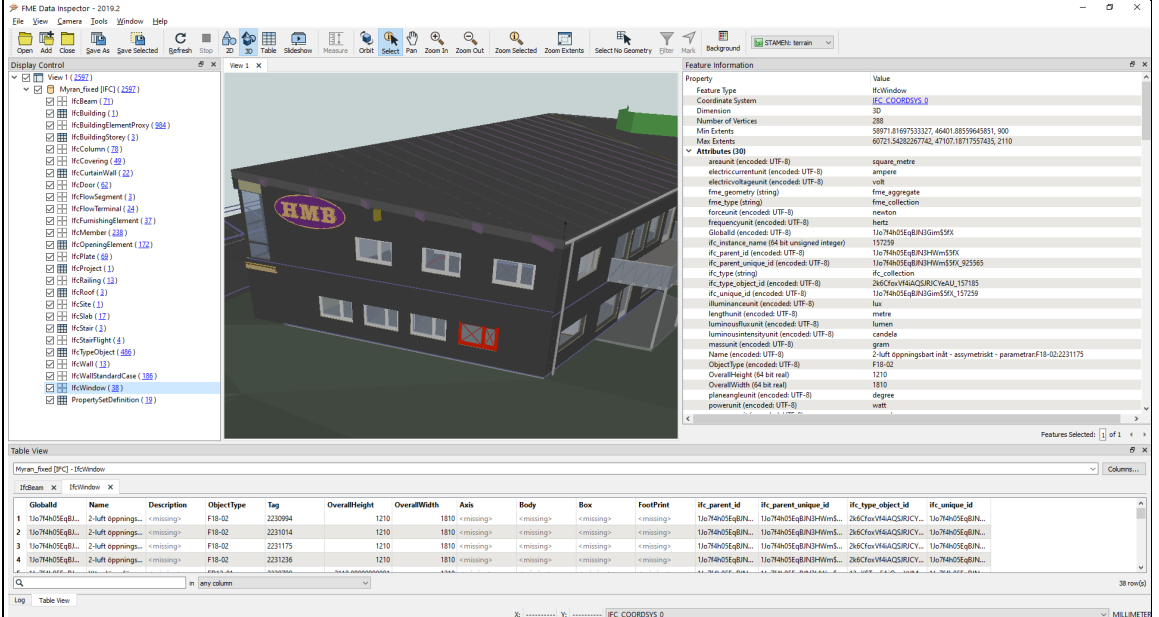


Figure 3. Zoom to view of window

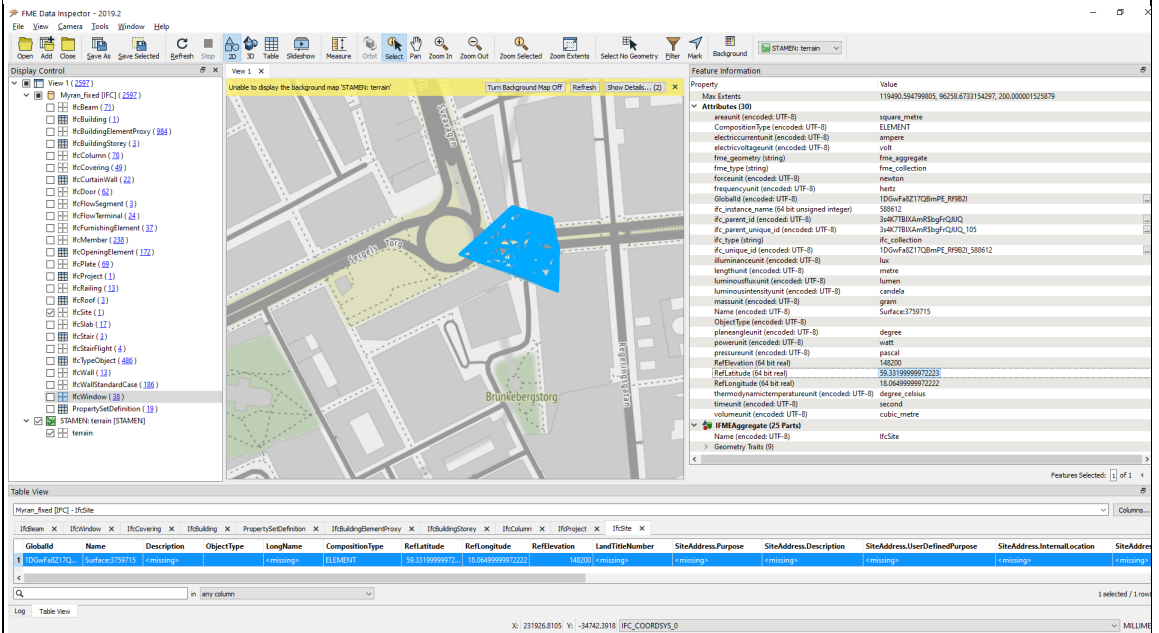


Figure 4. Default georeferencing

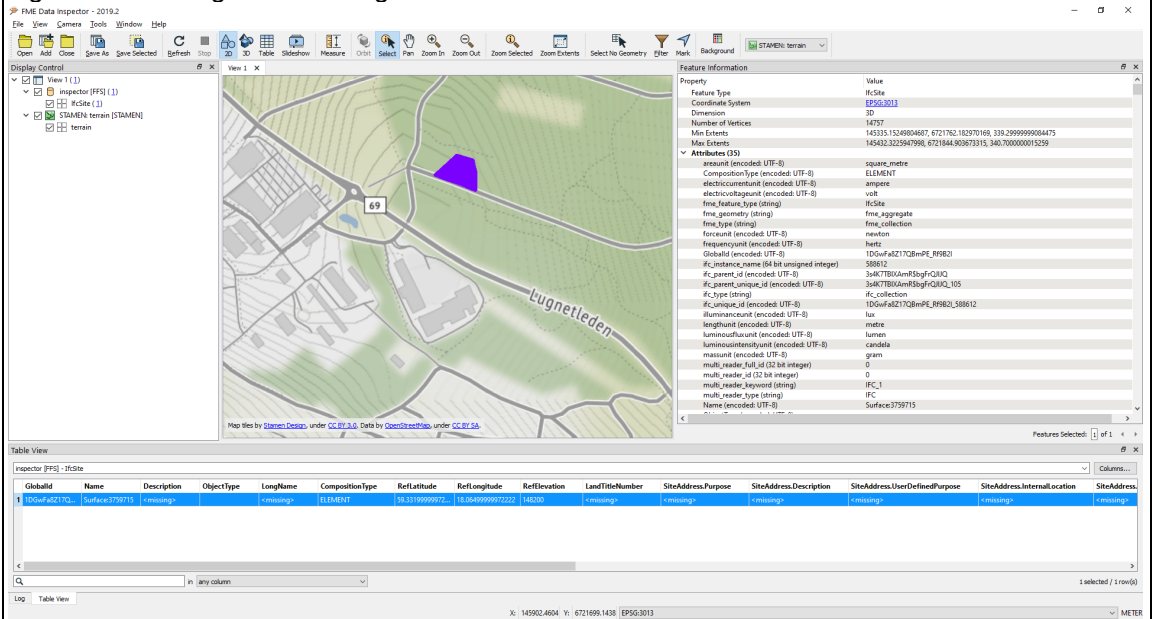


Figure 5. Georeferencing using Scale and Offset values and CoordinateSystemSetter (FME Workspace).

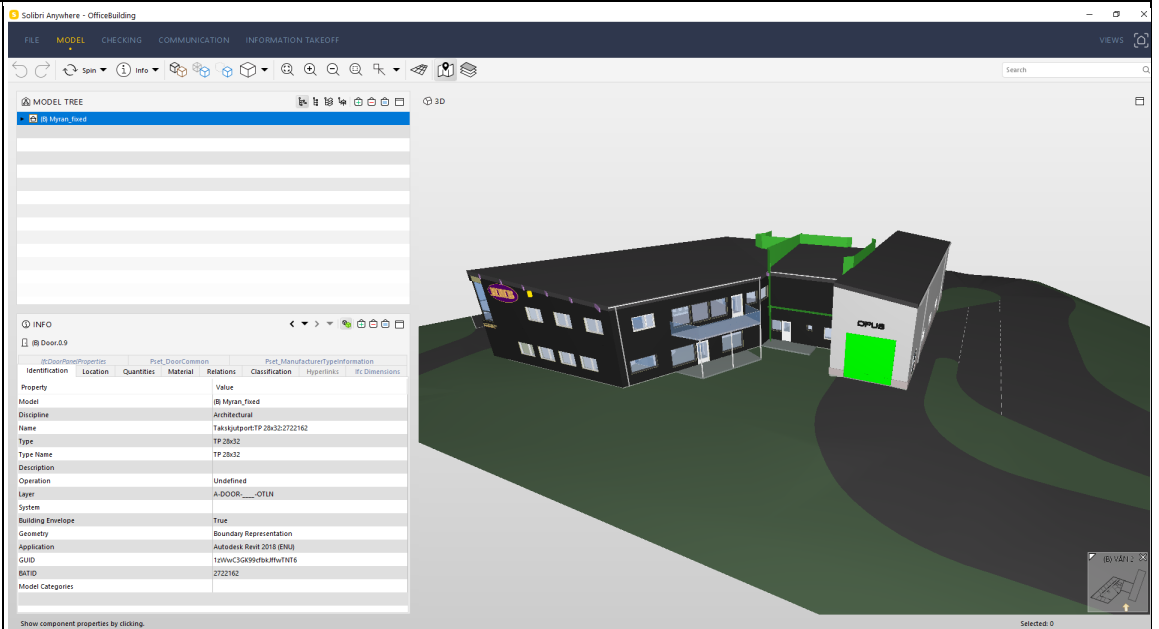


Figure 6. Comparison screenshot using Solibri

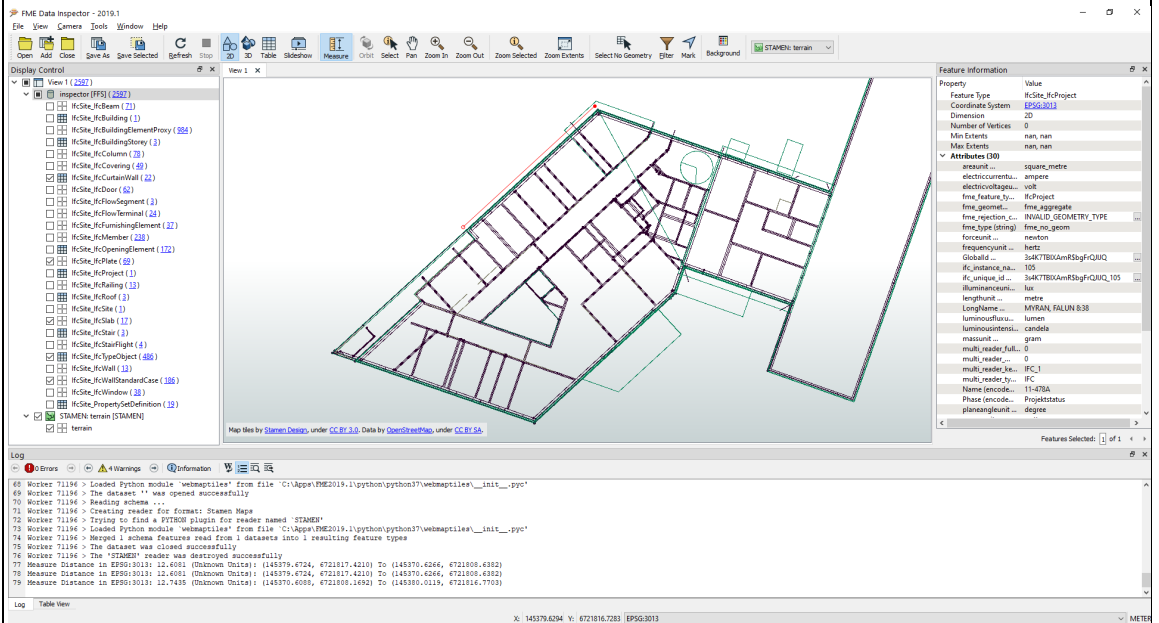


Figure 7. Task1 3.1 Dimension measurements

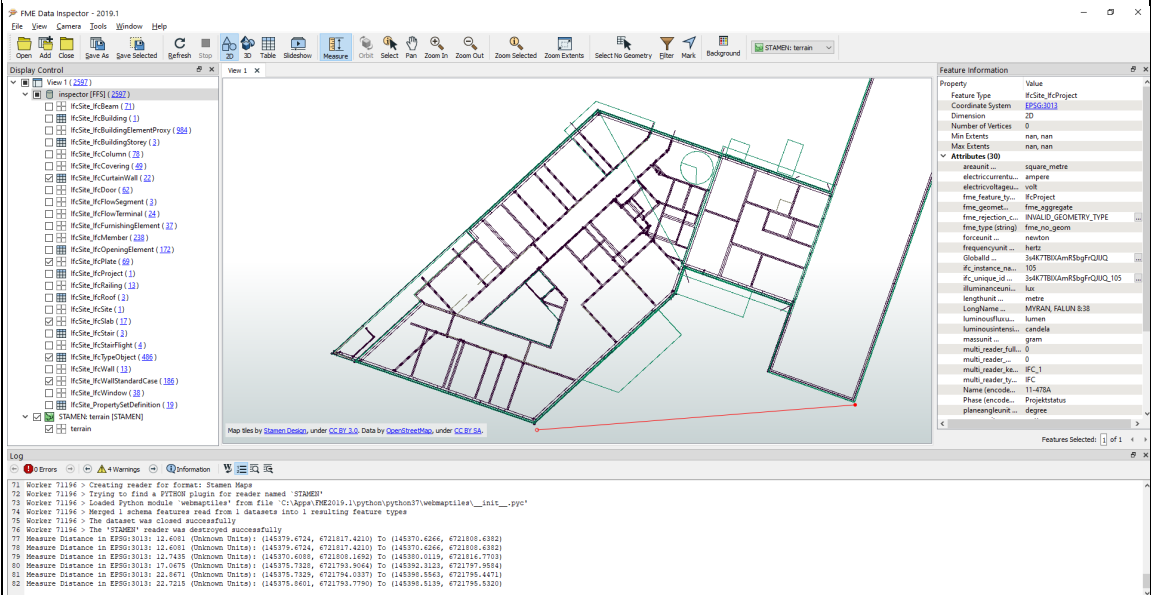


Figure 7. Task1 3.2 Dimension measurements

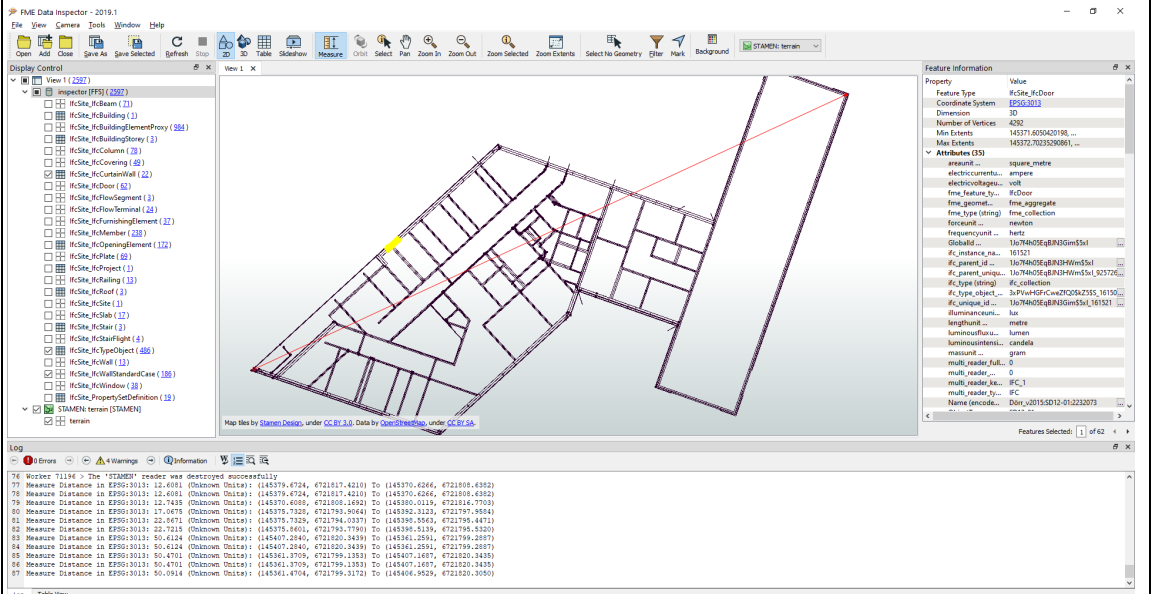


Figure 7. Task1 3.3 Dimension measurements

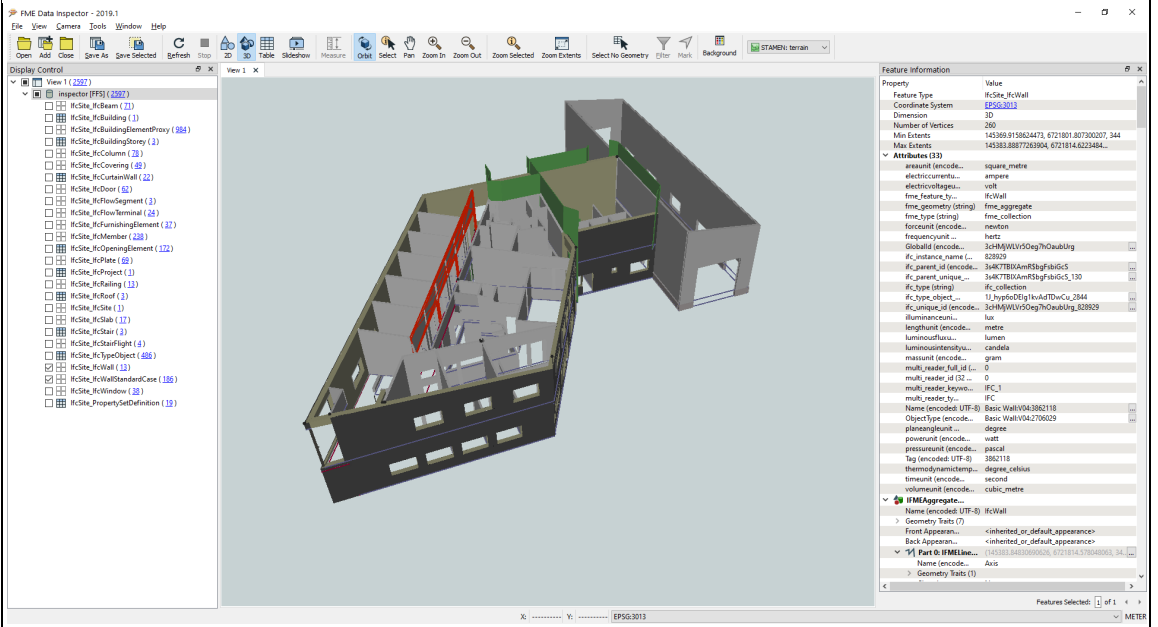


Figure 8. Task1 Part4 6.1 Inspect Wall classification and properties

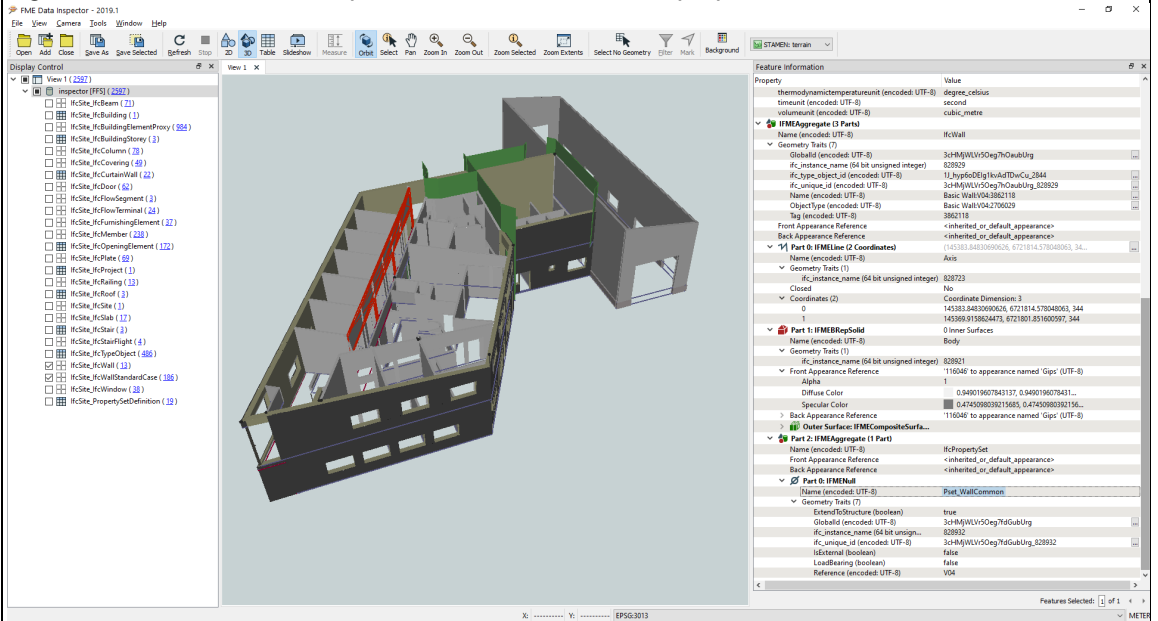


Figure 9. Task1 Part4 6.2 Inspect Wall classification and properties

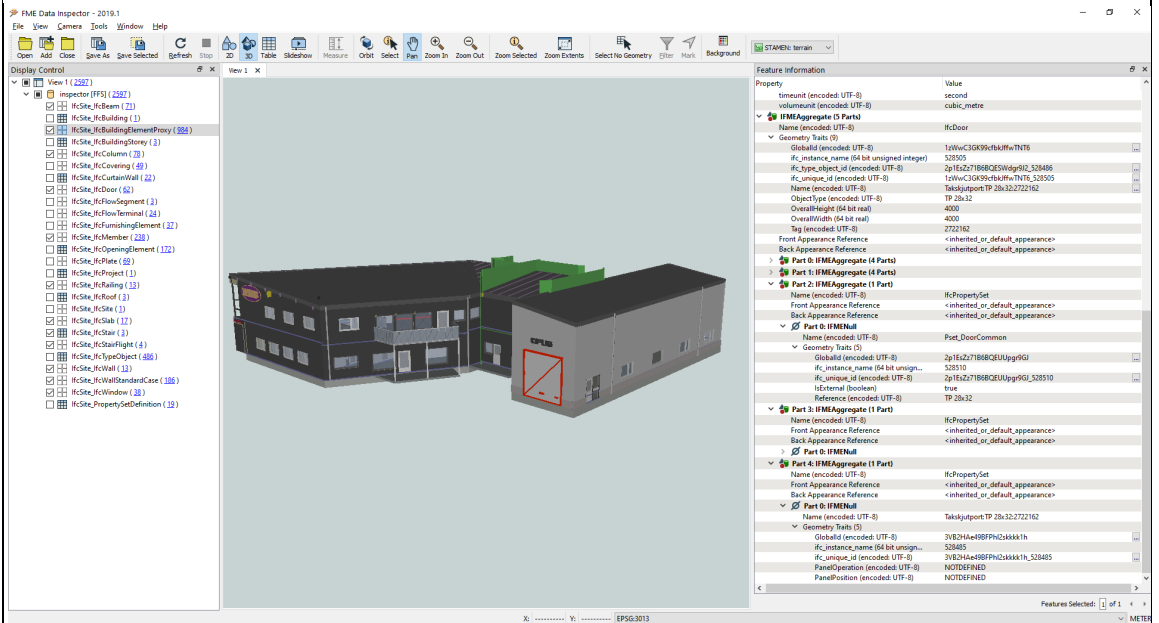


Figure 10. Task1 Part4 7.1 Inspect Wall classification and properties

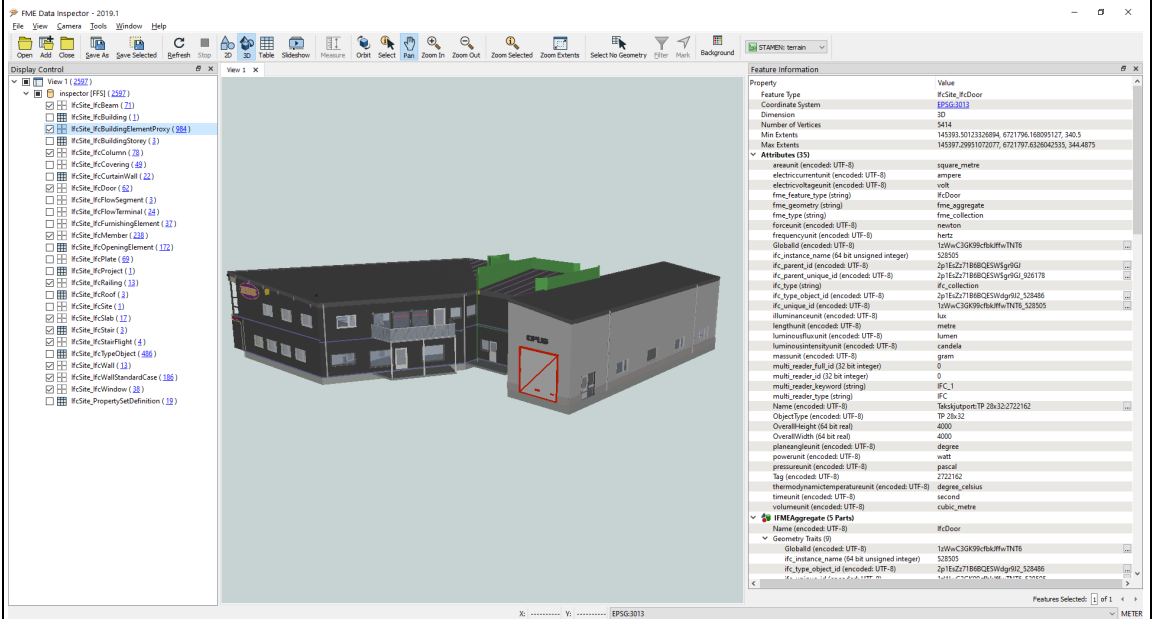


Figure 10. Task1 Part4 7.2 Inspect Wall classification and properties

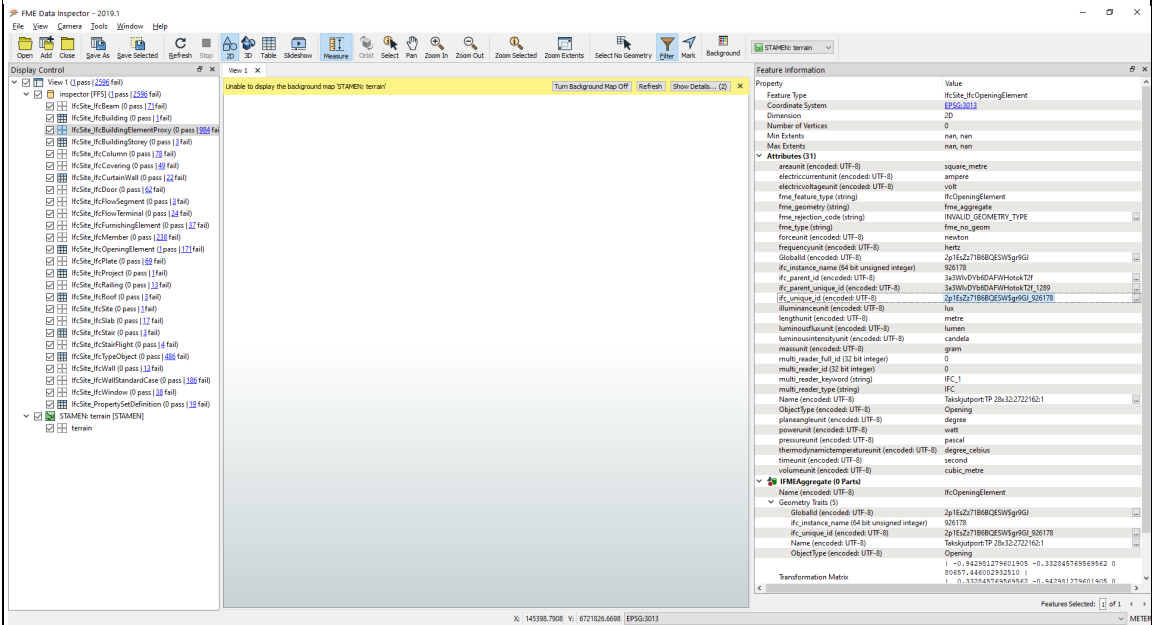


Figure 11. Task1 Part4 7.2 Use ifc_unique_parent_id from IFCDoor to find parent IfcOpeningElement with same ifc_unique_id

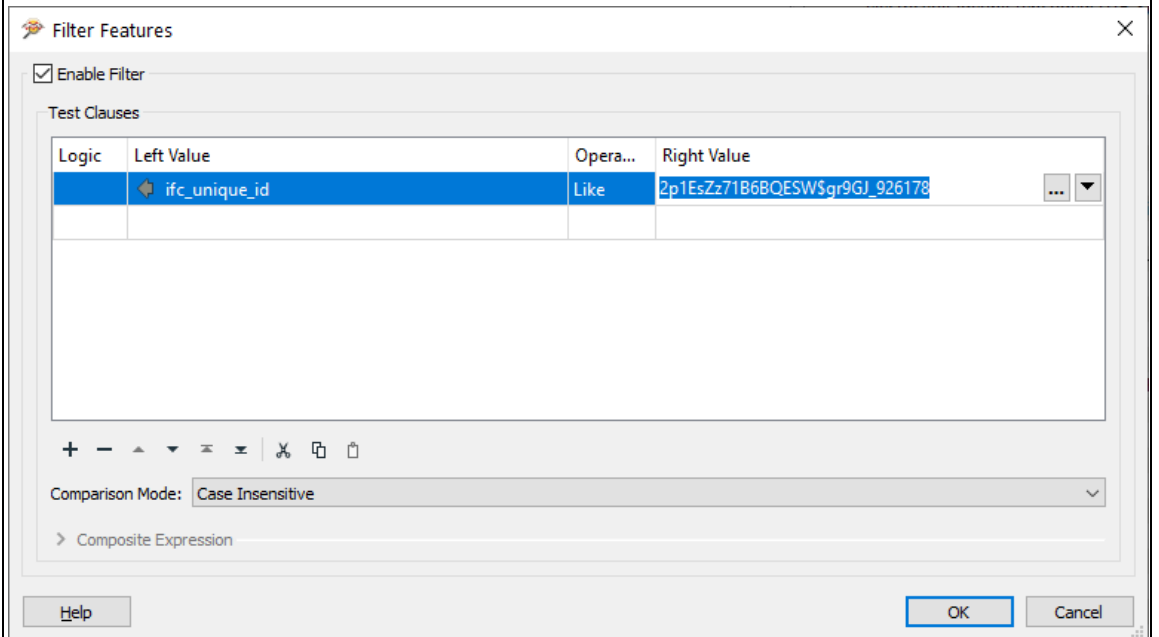


Figure 12. Task1 Part4 7.2 Use ifc_unique_parent_id from IFCDoor to find parent IfcOpeningElement with same ifc_unique_id – filter query.

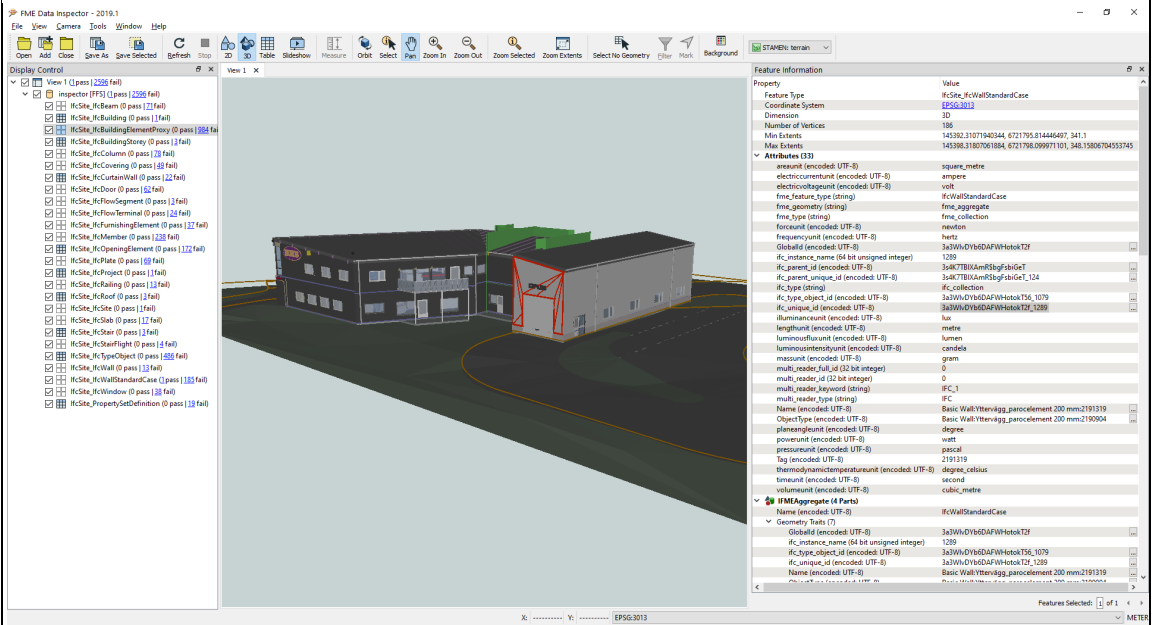


Figure 13. Task1 Part4 7.2 Use ifc_unique_parent_id from IFCDoor to find parent IFCOpeningElement with same ifc_unique_id – parent containing wall.

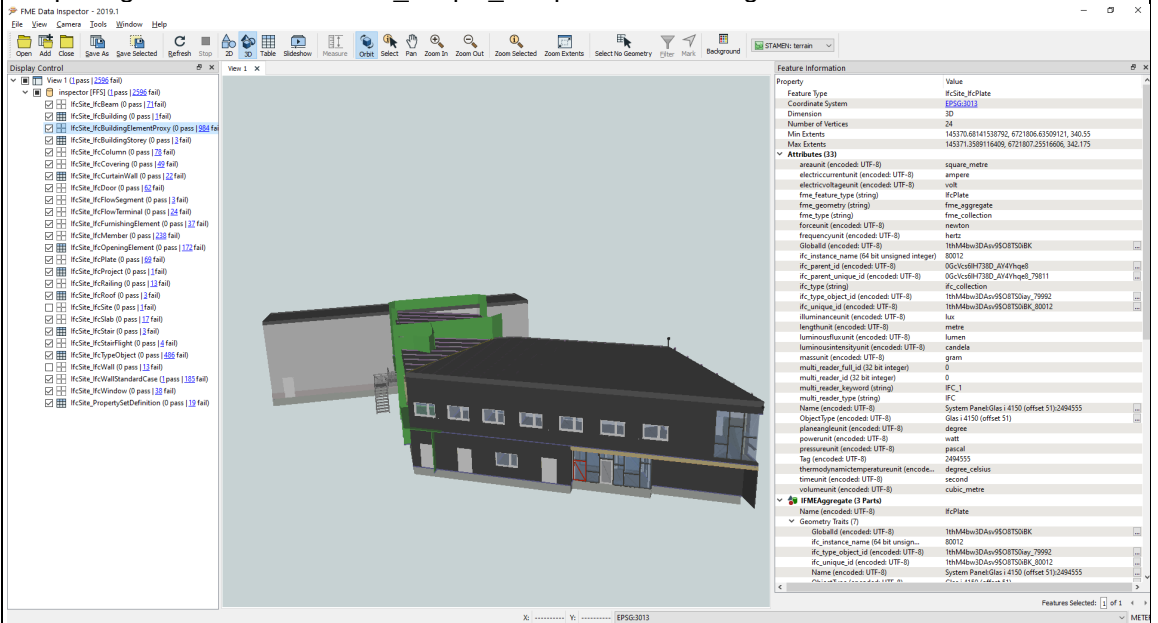


Figure 14. IFCPlate glass window - attributes

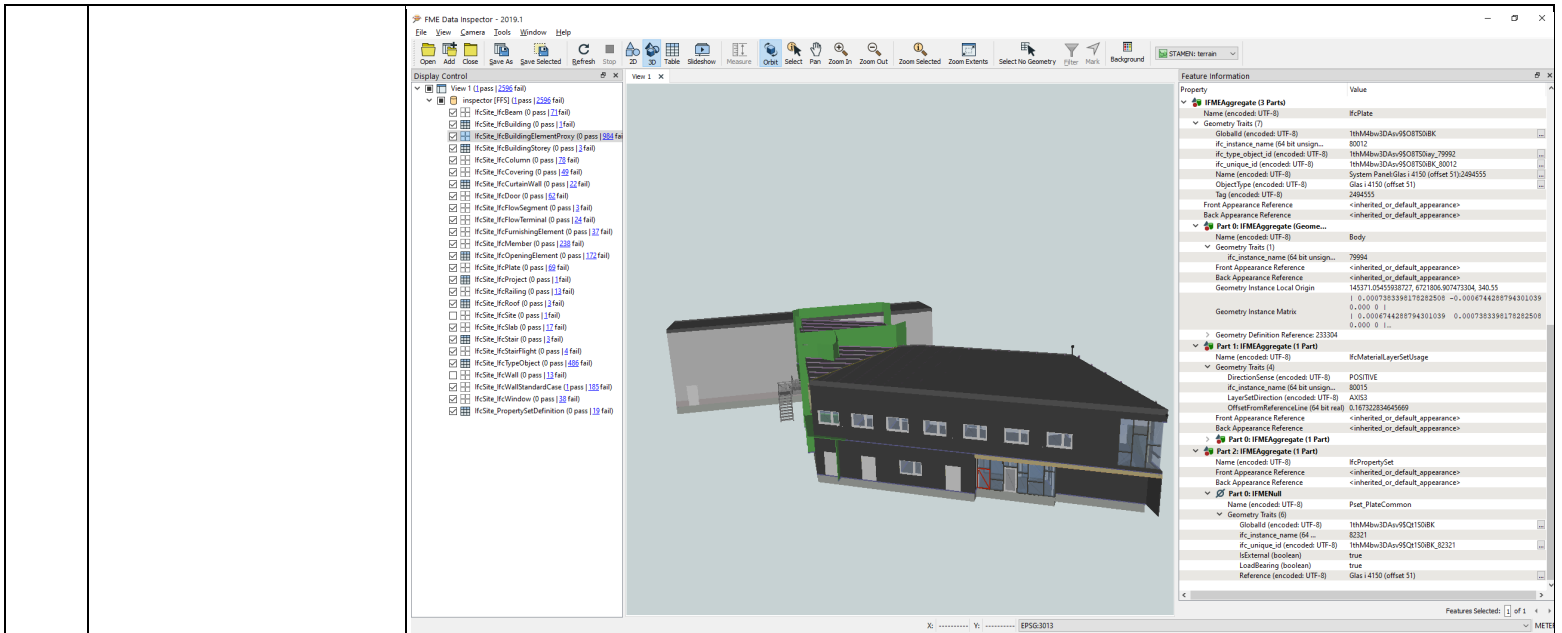


Figure 15. IFCPlate glass window - geometry

| | | |
|---------|---|---|
| | 12.1) Is it possible to view the model in 3D? | Yes |
| 2D/3D | 12.2) short comments to the previous question (optional) | FME has 2 main desktop applications, FME Data Inspector and FME Workbench. FME Data Inspector allows you to view the model in 2D or 3D. FME Workbench is a tool for define translation and transformation workflows. One advantage of not rendering the model in FME Workbench is that it allows FME to process large models object by object without having to render the whole model at once. This allows FME to process larger models than it might be able to render. You can also use an FME workspace to query a large model so that you only display a small part of it at any one time. Finally, 2D and 3D modes have different functionality. 2D mode is georeferenced, allows the measurement of distance, and can display a background map. 3D mode is a richer viewing experience but doesnt support background maps or distance measurement. |
| | 13.1) Is it possible to view the model in 2D? | Yes |
| | 13.2) short comments to the previous question (optional) | 2D mode allows for the model georeferencing to be viewed, along with distances, dimensions and background maps. see 12.2 above |
| | Other | Data Inspector does not allow for any editing. FME Workbench can be used to define a transformation model that can be used to modify model attributes, geometries or appearances. |
| Queryin | 15.1) Is it possible to query the model and the attributes? | Yes |
| | 15.1.1) What kinds of query are possible? | You can filter by any attribute value, such as GlobalID, or by category, such as Object Type = Glas i 4150 (offset 51) |

Task 1 Form 5 Views and Queries

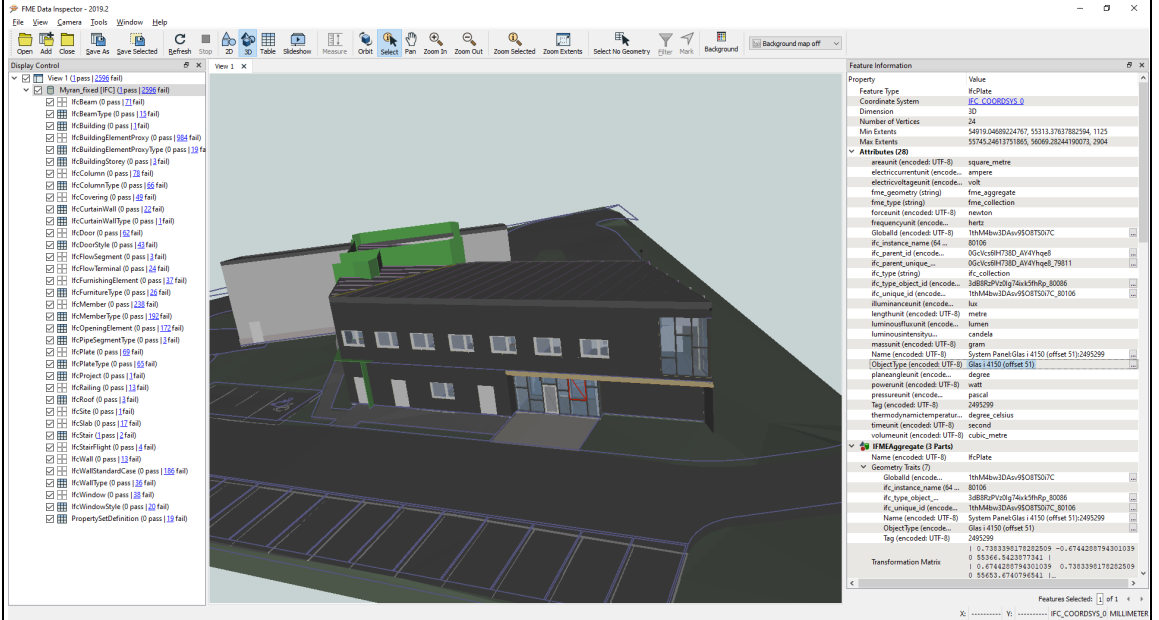


Figure 16. 3D View of model

15.1.2) Attach screenshots

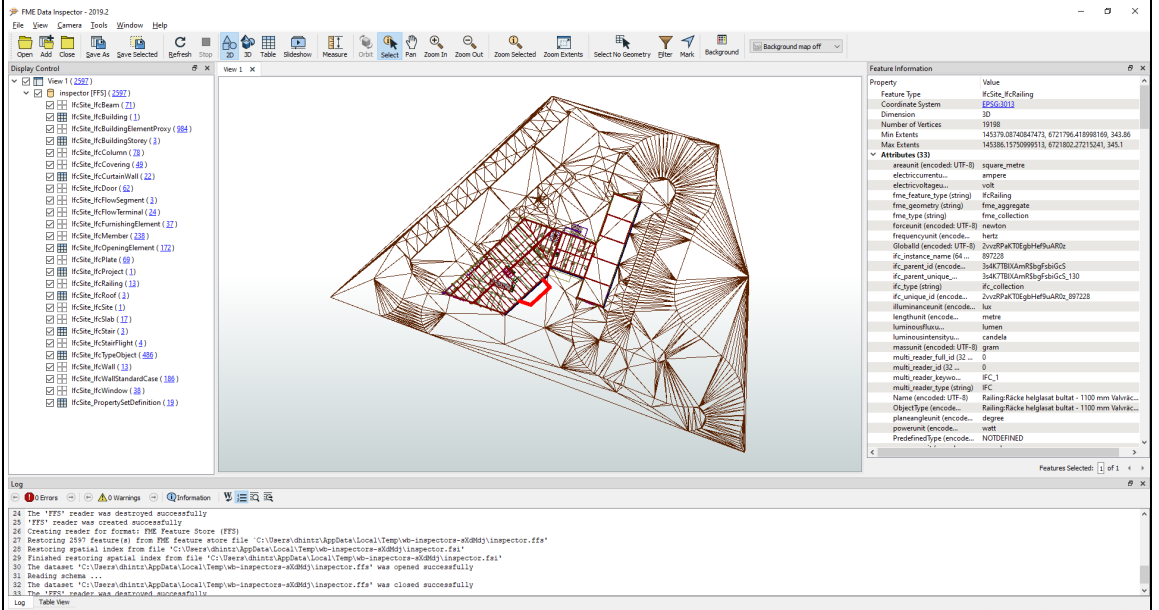


Figure 17. 2D View of model showing georeferencing – EPSG 3013

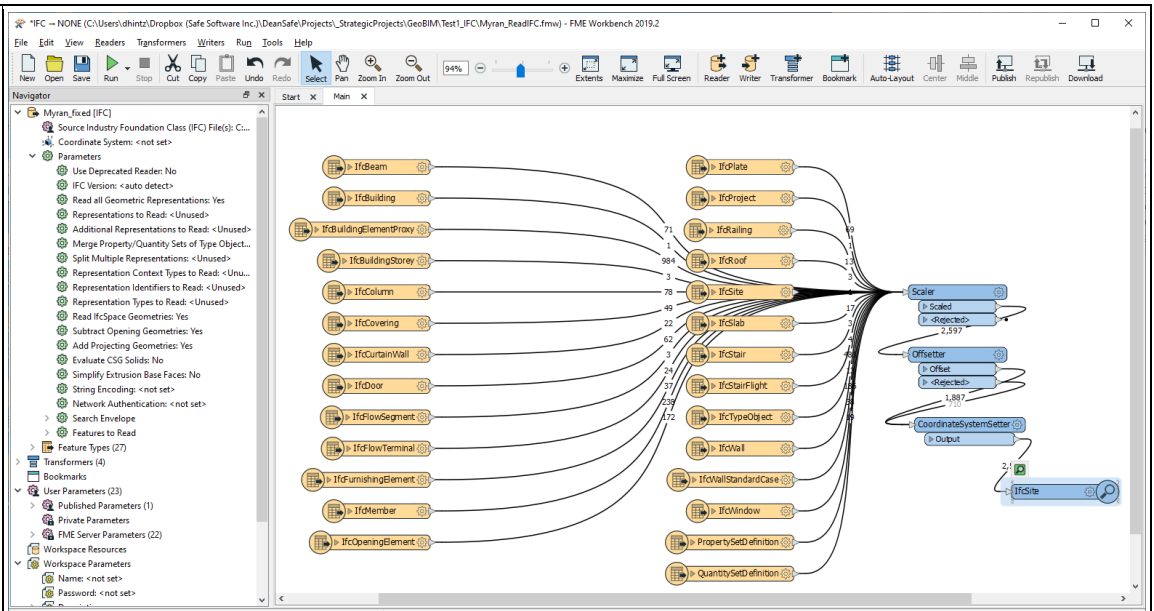


Figure 18. FME Workspace used to geolocate model using scale, offset and coordinate system settings.

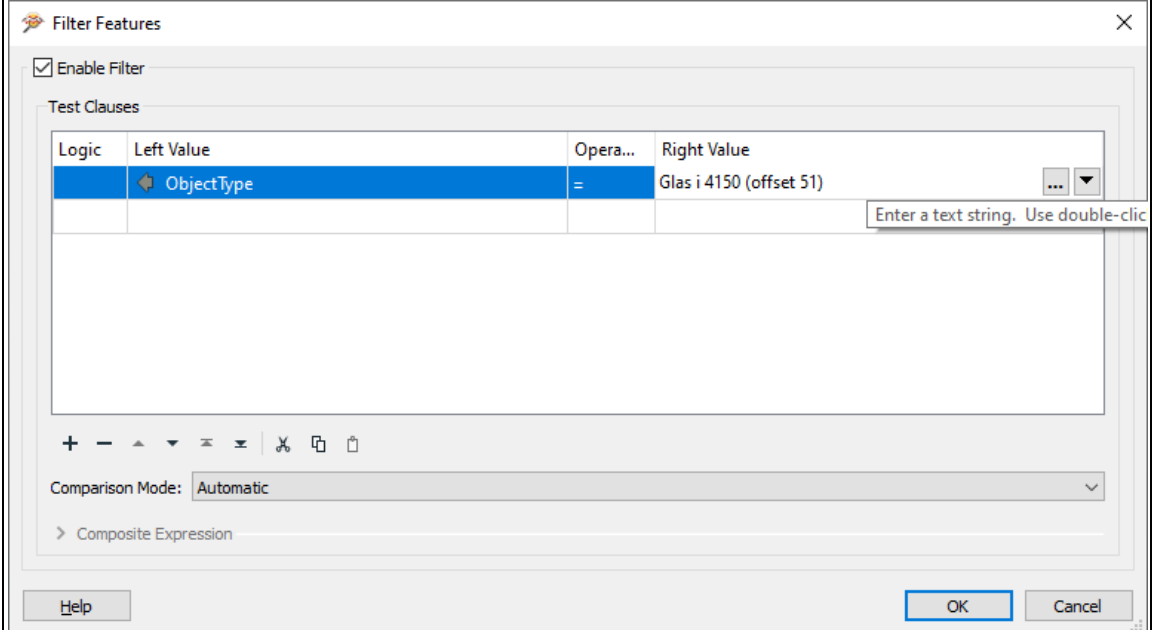


Figure 19. Filter query on ObjectType = 'Glas I 4150 (offset 51)'

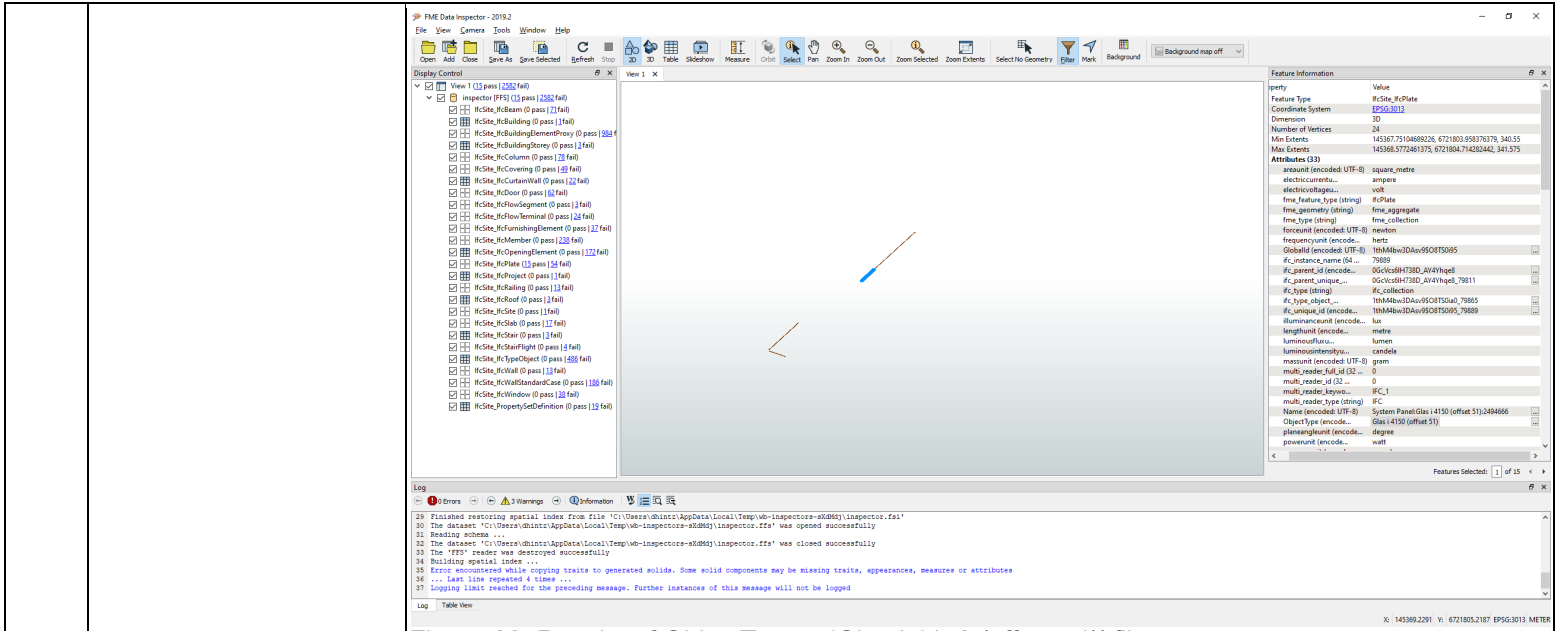


Figure 20. Results of ObjectType = 'Glas I 4150 (offset 51)' filter query.

| | |
|---|---|
| <p>15.2) short comments to the previous question (optional)</p> | <p>FME workbench allows users to create ETL or transformation workflows called FME workspaces. Workspaces can be used to automate changes or updates to individual model components or to the model as a whole. Transformations can also be used to convert the model to an alternate representation suitable for another format such as CityGML or 3DPDF</p> |
| <p>Analysis</p> <p>16.1) Is it possible to analyse the objects and the model?</p> <p>16.1.1) What analysis are possible? Do you know if the results are reliable?</p> | <p>Yes, both analysis about the model and its performances are possible (type 1 and 2)</p> <p>Analysis of both model validity and performance are possible. However, typically domain experts are required to conduct performance analysis such as energy. FME has tools such as GeometryValidator, AttributeValidator, AreaCalculator, VolumeCalculator, Tester and many other transformers which can be used in combination to do model validity analysis. FME also supports slope and aspect analysis so this has been used to conduct analysis of solar photovoltaic potential. However, Safe Software does not provide out of the box solutions for either type of building analysis. Users can design their own workflows for this or share them via the FME Community and FME Hub.</p> |

Task 1 Form 5 Views and Queries

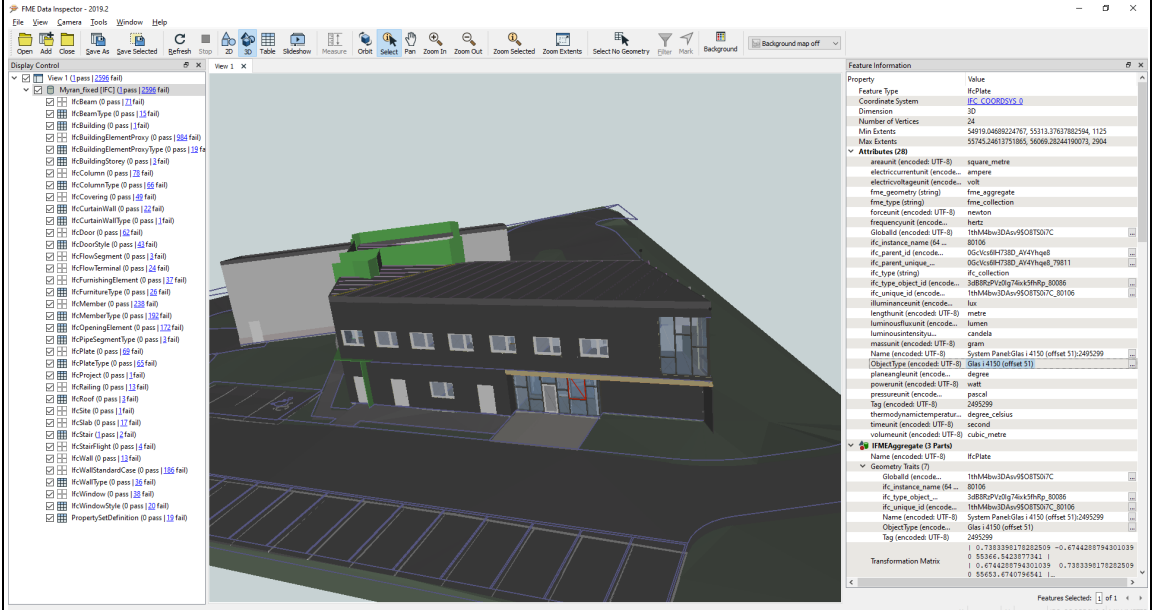


Figure 16. 3D View of model

16.1.2) Attach screenshots

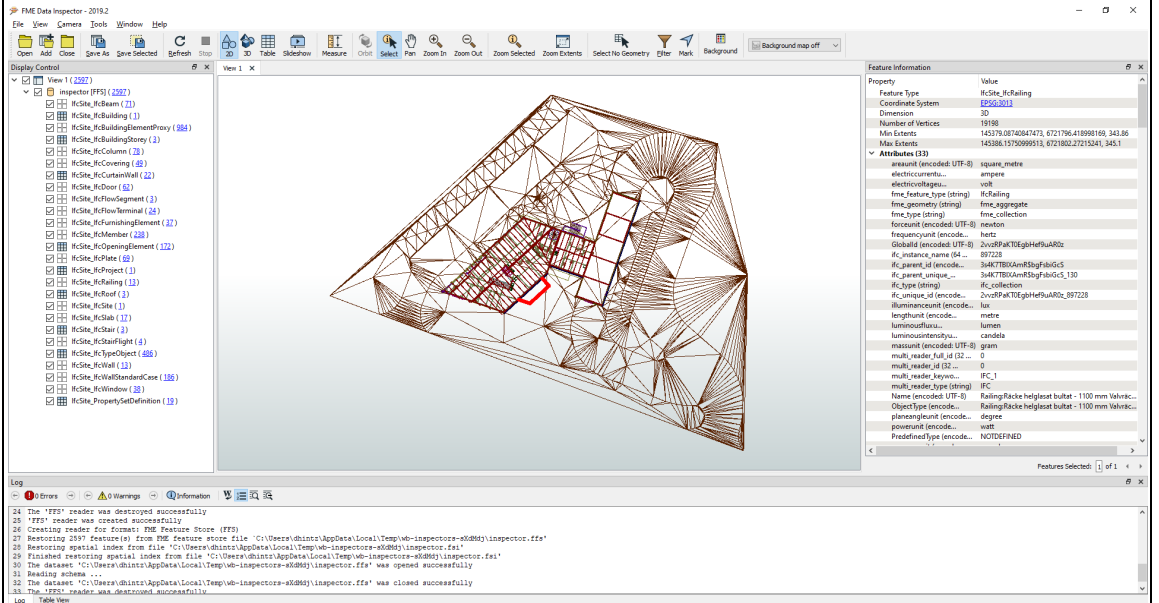


Figure 17. 2D View of model showing georeferencing – EPSG 3013

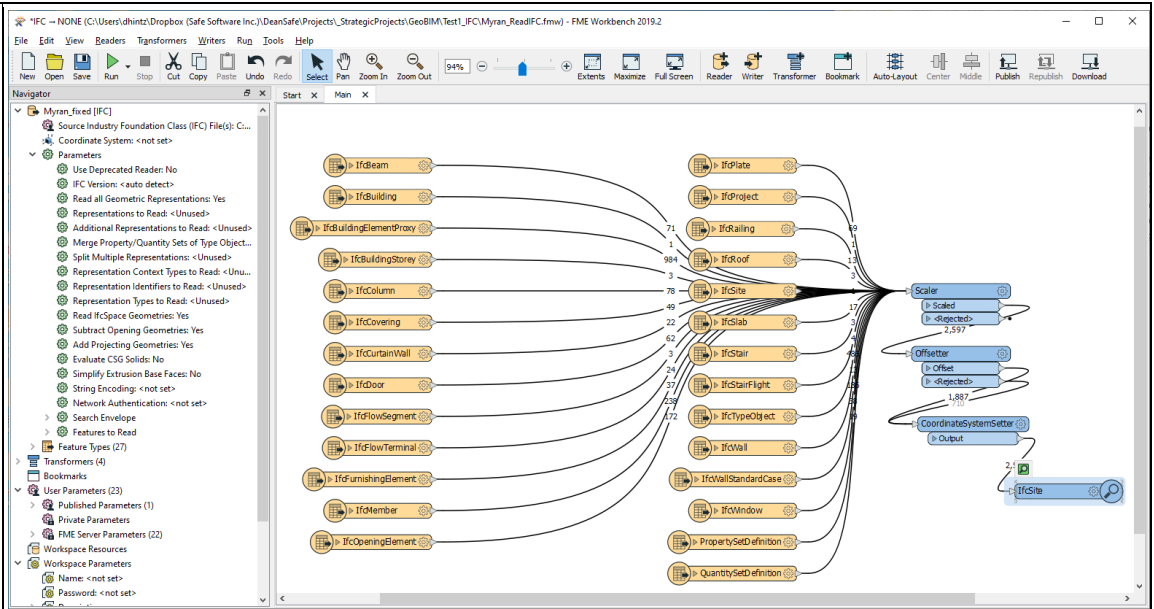


Figure 18. FME Workspace used to geolocate model using scale, offset and coordinate system settings.

| Logic | Left Value | Opera... | Right Value |
|-------|-------------|----------|-------------------------|
| | Object Type | = | Glas i 4150 (offset 51) |

Figure 19. Filter query on ObjectType = 'Glas I 4150 (offset 51)'

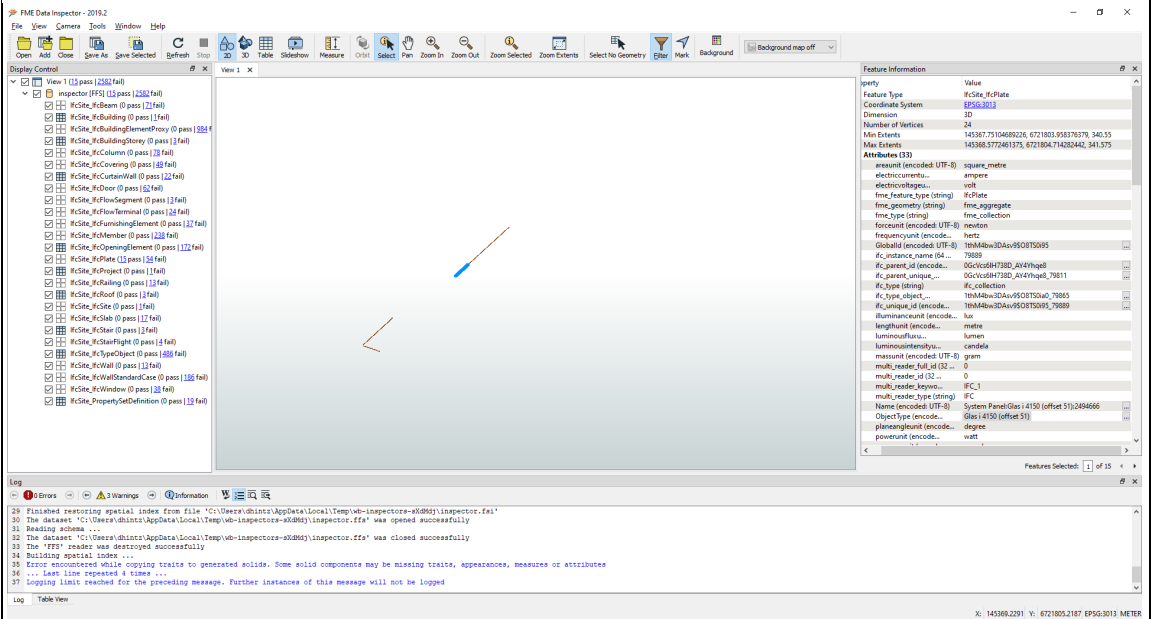


Figure 20. Results of ObjectType = 'Glas I 4150 (offset 51)' filter query.

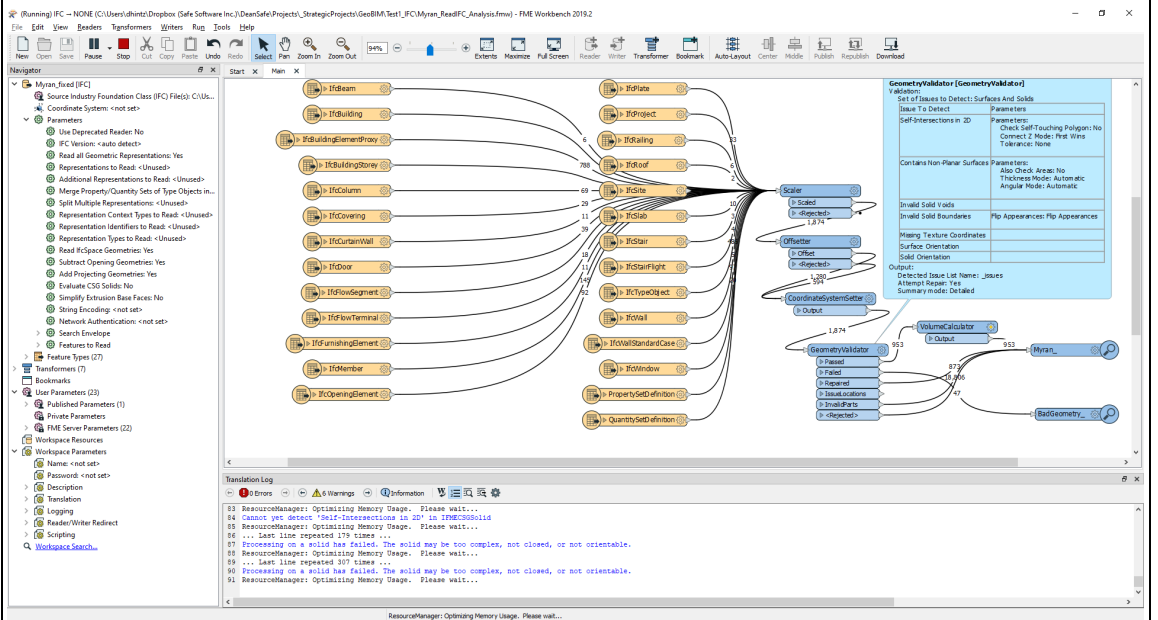


Figure 21. FME Workspace transformation model for performing validity analysis on IFC geometries.

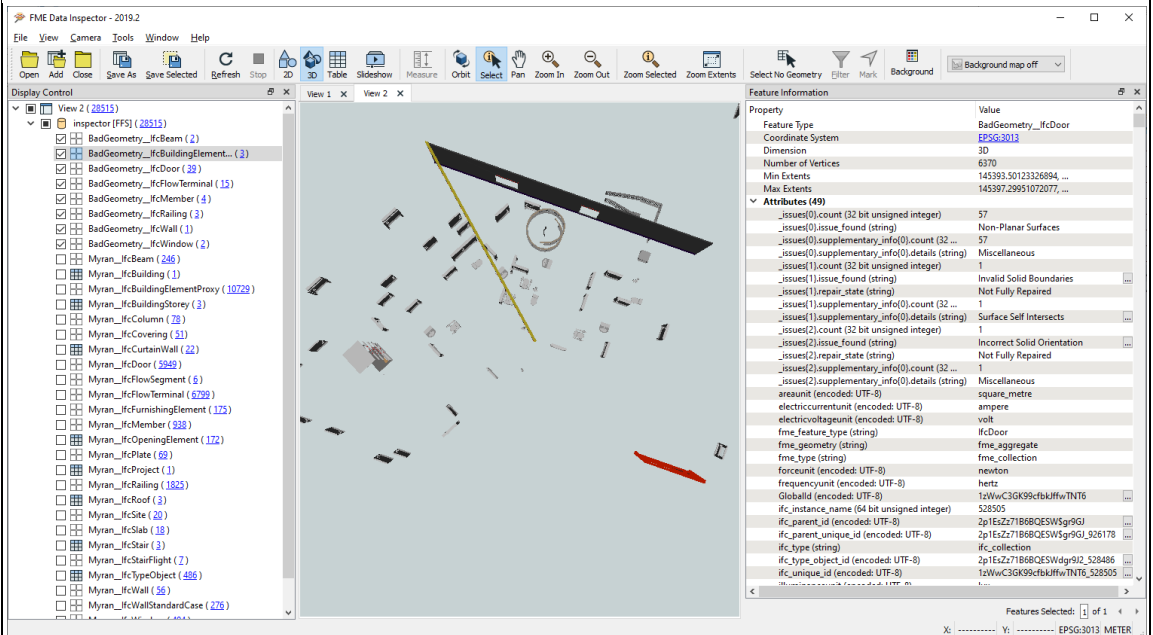
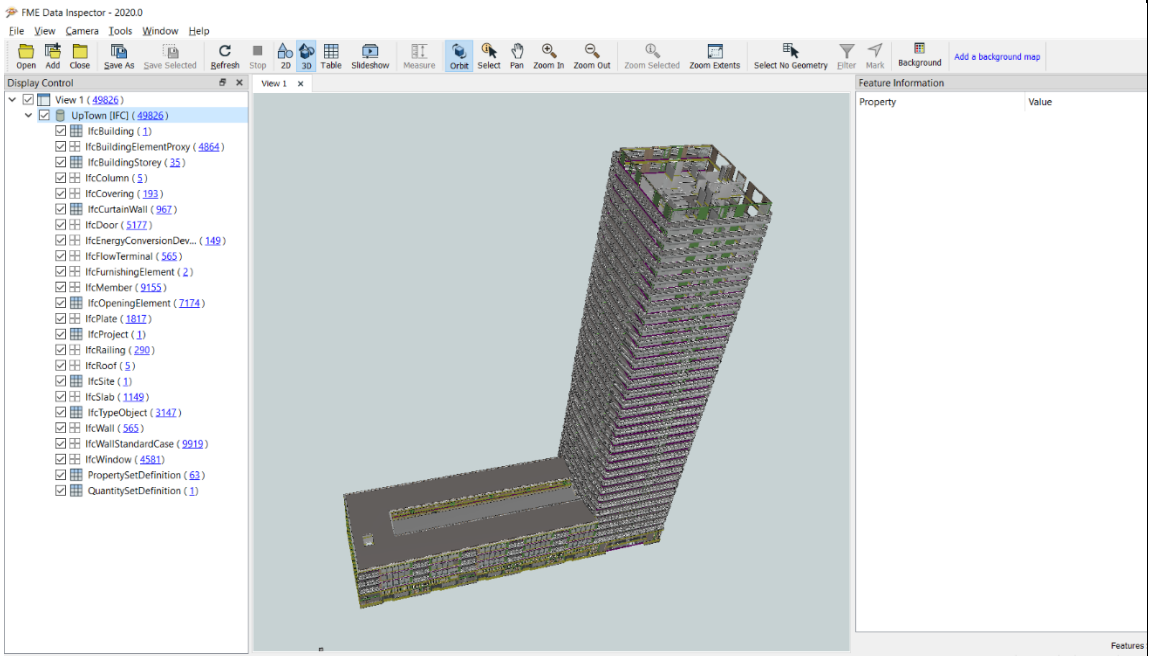


Figure 22. Results from transformation model for performing validity analysis on IFC geometries. Shows IFcDoor with invalid geometry including non-planar surfaces, invalid solid boundaries and self intersections

| | | |
|-----------------------------|--|--|
| | 16.1.3) Time required to perform the analysis about the model itself (type 1) | 1-5 minutes |
| | 16.1.3) Time required to perform the analysis about the model performances (type2) | 1-5 minutes |
| | 16.2) short comments to the previous question (optional) | The time required depends on the size of the model and the type of analysis being performed. |
| Export | You arrived at the end of the phase 1: "Import and manage the file in the software".Now choose: | The software has also export abilities to IFC |
| | 17.1) Are any pre-processing or setting changes needed in the software to enable a consistent export? | No |
| | 17.2) short comments to the previous question (optional) | No setting or pre-processing required. However, since the default IFC version is 4 on the writer, you need to set it to 2x3 if you want to keep it the same as the source for Myran_fixed.ifc |
| | 18.1) Is it possible to choose the IFC model view definition (MVD) to be used when exporting the data? | No |
| | 18.2) short comments to the previous question (optional) | FME does not support MVD out of the box. However, users can define their own model view definitions using FME's data model filtering and transformation tools. For an example of this see: https://knowledge.safe.com/questions/86339/using-xml-to-filter-ifc.html |
| | 19) How long does it take for the data to be exported to IFC? | less than a minute |
| Test with UpTown.ifc | | |
| Perform ance | How long does it take, approximately, to:Zoom into the model to see more detail | less than a minute |
| | How long does it take, approximately, to:Pan the model | it's almost immediate |

| | | |
|-----------------|---|---|
| | How long does it take, approximately, to:Rotate the model | less than a minute |
| | How long does it take, approximately, to:Query an object | it's almost immediate |
| | How long does it take, approximately, to:Inspect the objects linked to the queried one (Element 3) through a relationship | 1-5 minutes |
| | Please report on any errors the software gives when importing the file. | The approach to evaluating the object link is using a filter query as described for the Myran.ifc dataset. Filter queries in FME Data Inspector are only supported in 2D mode. When attempting to switch from 3D to 2D I had a process crash (a child worker process, not the parent application). This required me to reload the data. Given the long load time, I decided to create a cache file to do the remainder of the processing and queries for Uptown.ifc. This involved creating an IFC to FFS FME default workspace. FFS = FME feature store which is our internal storage and processing format. The remainder of the queries were then performed using the FFS cache. |
| Proportions | 24.1) Does the model maintain its correct dimensions and proportions? | Yes |
| | 24.2) short comments to the previous question (optional) | There did not appear to be complete georeferencing information discoverable in the model, so the offsets, scaling, rotation and coordinate system provided on the GeoBIM dataset webpage were applied using an FME workspace before these dimensions and orientation observations were taken. |
| IFC definitions | 25.1) Is the eventual translation consistent with the IFC definitions? | Yes |
| | 25.2) short comments to the previous question (optional) | All significant classifications, hierarchy, properties, property sets, and ids appear to be read correctly: GlobalId, Name, ObjectType, feature_type, Tag, Area, Height, Width, berekende_diepte_glaslat, glas_dikte, NLRs_C_breedte, Mark, Workset, Category, Family, positie_rooster_lengte, Type, materiaal_draaiend_deel etc. Compared to the GeoBIM screenshots, there appear to be some properties that are not displayed, at least not in the same way, including OwnerHistory, ObjectPlacement, Representation. With the exception of OwnerHistory, most of these properties are really internal file references - specifically file line number references. Some of the relationship information looks quite different between FME and the tool screen shots shown on the Benchmark Myran.ifc data webpage. This is because FME resolves the relationships and inserts the parent ids (ifc_parent_id etc). |
| Hierarchy | 26.1) Are the hierarchical relationships consistent with the IFC hierarchy? | Yes |
| | 26.2) short comments to the previous question (optional) | Yes the hierarchical relationships are maintained, in terms of feature type, class / categories, and ifc_parent_id relationships. Some of the relationship reference link information looks quite different between FME and the screen shots shown on the GeoBIM benchmark dataset webpage. Most of the reference properties shown are really internal file references - specifically file line number references. FME does not display these internal properties but rather resolves these references and reads the associated parent ids, properties, geometries or appearances instead. |
| Attributes | 27.1) Are the attributes present in the IFC entities retained and consistent? | Yes |
| | 27.2) short comments to the previous question (optional) | as above |
| Relationships | 28.1) Are the relationships between the objects retained? | Yes |
| | 28.2) short comments to the previous question (optional) | as above |

| | | |
|---|--|---|
| Geometry | 29.1) Is geometry read correctly? | Yes |
| | 29.2) short comments to the previous question (optional) | There are several different read modes in FME which can affect how geometries are grouped. The default mode for the FME IFC reader is relational mode. In this mode FME reads primary object properties as attributes. Object geometries and their properties are read as nested, named FME geometries and geometry traits. Representations are stored in the geometry names. So for IFCDoor, the attributes store properties such as GlobalID, ifc_unique_id, Name, etc, and the parent geometry is named IFCDoor and contains a combination of null and Body geometries. The null geometries store traits such as property sets, appearances and materials. Body geometries store multi-surfaces and solids as appropriate. In the case of IFCDoor, the combination of materials, appearances, properties and property sets are stored as an aggregate of null and body geometries with the geometry name = IFCDoor. For more info see: https://docs.safe.com/fme/html/FME_Desktop_Documentation/FME_ReadersWriters/ifc/IFC_reader.htm |
| Normals | 30.1) Did the normals change? | No |
| | 30.1.1) What changes / inconsistencies / errors / other issues were noted? | No obvious problems with normals were observed. If there were issues with normals, we would expect to see differences in transparency, materials on the wrong side etc. Refer to screen shots for UpTown.ifc |
| | 30.1.2) Attach screenshots |  <p>The screenshot shows the FME Data Inspector interface. On the left, the 'Display Control' tree lists the IFC dataset hierarchy for 'UpTown (IFC) (49826)'. The tree includes various IFC entities such as IFCBuilding (1), IFCBuildingElementProxy (4864), IFCBuildingStorey (35), IFCColumn (5), IFCCovering (193), IFCCurtainWall (967), IFCDoor (5177), IFCEnergyConversionDev... (149), IFCFlowTerminal (565), IFCFurnishingElement (2), IFCMember (9155), IFCOpeningElement (2174), IFCPlate (1817), IFCProject (1), IFCRailing (290), IFCRoof (5), IFCSite (1), IFCSlab (1149), IFCTypeObject (3147), IFCWall (565), IFCWallStandardCase (9919), IFCWindow (4581), PropertySetDefinition (63), and QuantitySetDefinition (1). The main view shows a 3D model of a tall building with a complex facade. The 'Feature Information' window on the right is empty.</p> |
| <p>Fig 1. FME Data Inspector show Uptown.IFC dataset at full extents Note that in the screen shots below, comparison with GeoBIM website screenshots can be somewhat challenging since the properties, relationships and attributes are displayed differently. What FME calls 'Attributes' seem to correspond to a lot of the relationship or hierarchy information shown on the website (ids and classification). Also, for much of what GeoBIM calls 'attributes', with FME this information is stored as traits within the geometry aggregates (materials, property sets, appearances etc). The following screenshots simply page through all the attributes, geometries and traits available for the Elements in question using the Feature Information window in FME Data Inspector. Please contact the author if there are any questions on how to interpret these results. Note that free demo licenses of FME are available for educational and research purposes, so that is</p> | | |

always an option for anyone who wishes to test this for themselves from <https://www.safe.com/free-fme-licenses/>

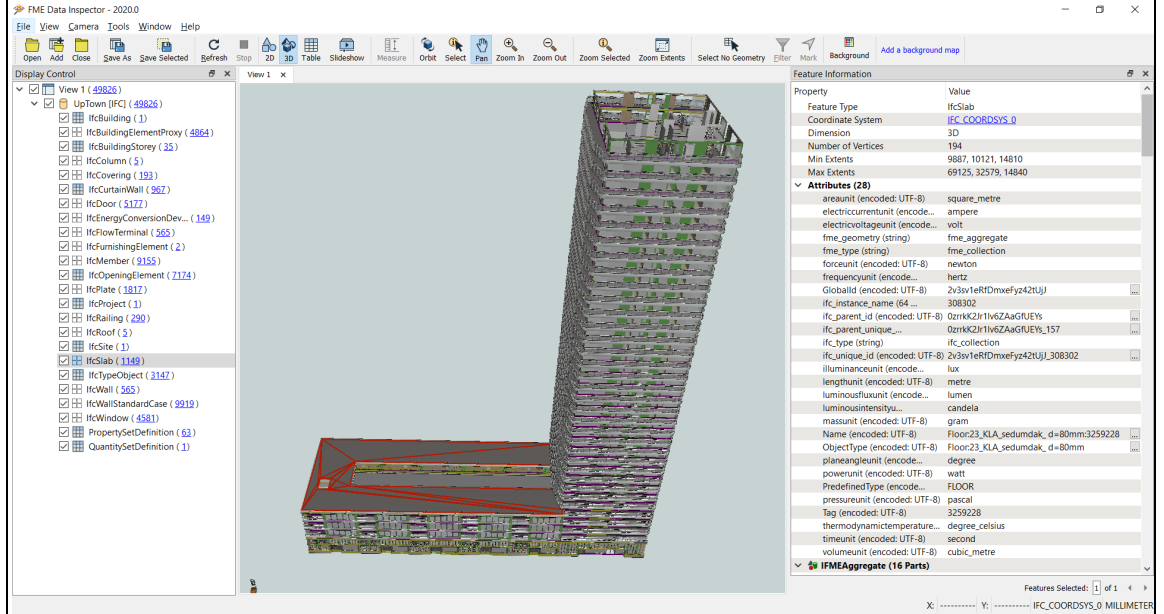


Fig 2. Uptown Element 1 IfcSlab: Feature Information - Attributes (hierarchy: FeatureType, GlobalId, Name, ObjectType)

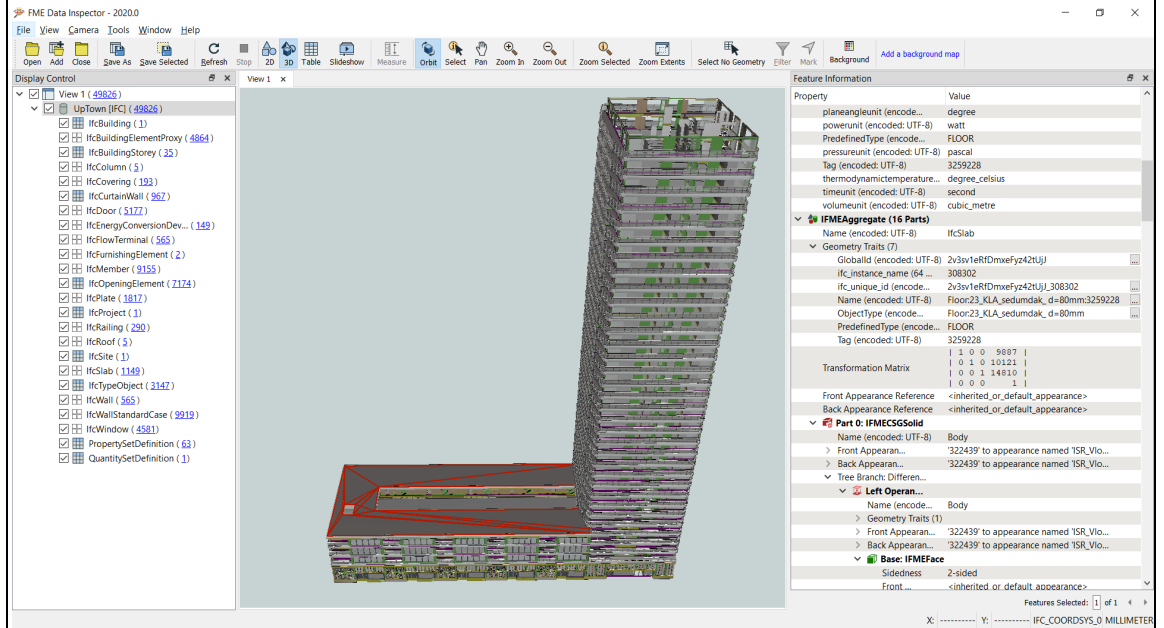


Fig 3. Uptown Element 1 IfcSlab: Feature Information - Geometry screenshot/snap 1 (geometry aggregate part 0 traits / attributes: Name, PredefinedType, Tag, ObjectType, ids)

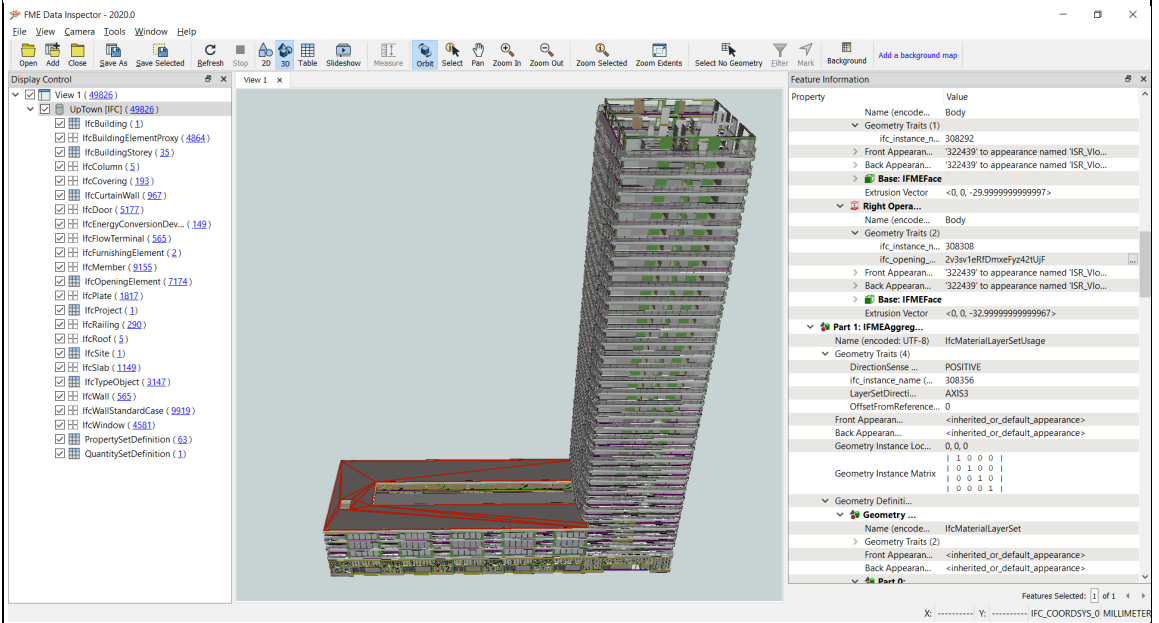


Fig 4. Uptown Element 1 IfcSlab: Geometry snap 2 (geometry trait – attributes2)

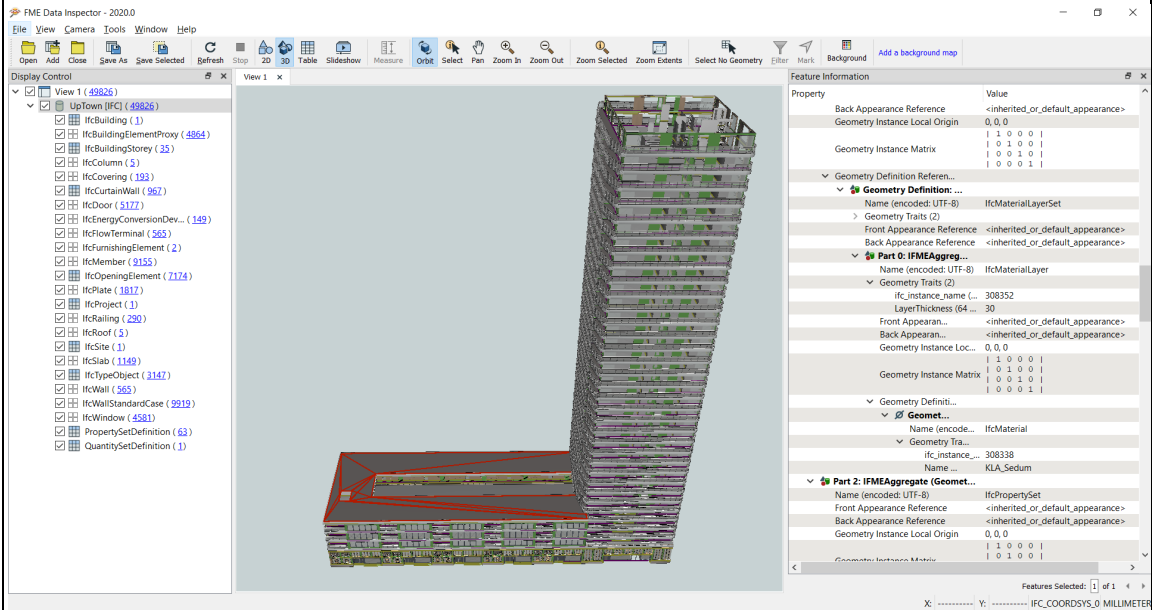


Fig 5. Uptown Element 1 IfcSlab: Geometry snap 3 (geometry trait – attributes3: Materials)

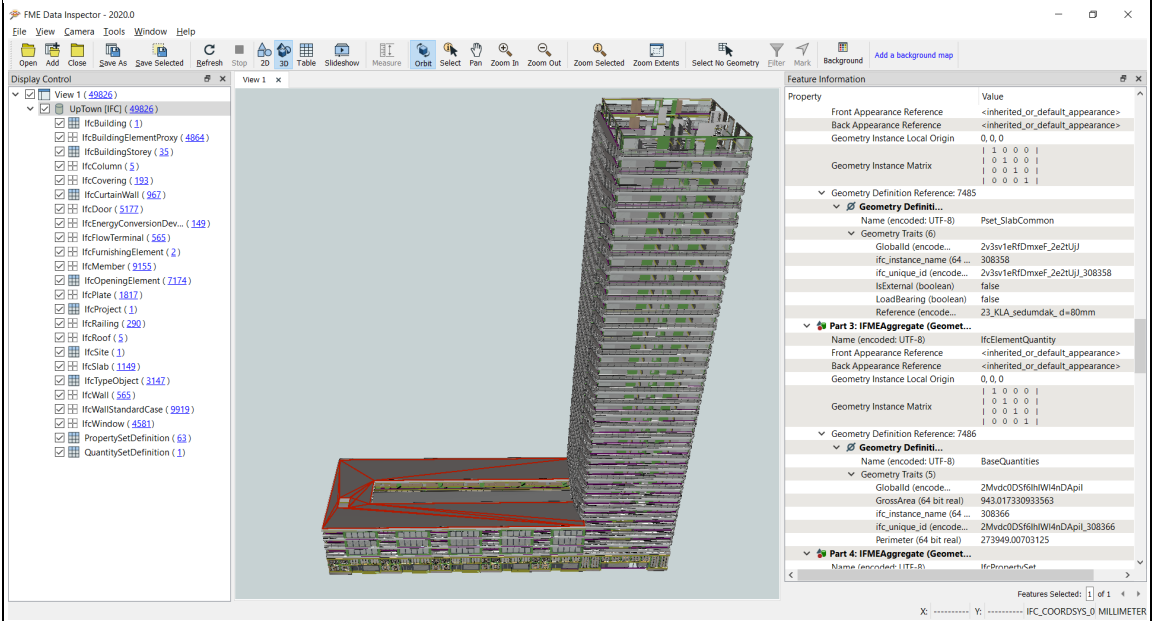


Fig 6. Uptown Element 1 IfcSlab: Geometry snap 4 (geometry trait – attributes4: Name, LoadBearing, Reference, GrossArea, Perimeter)

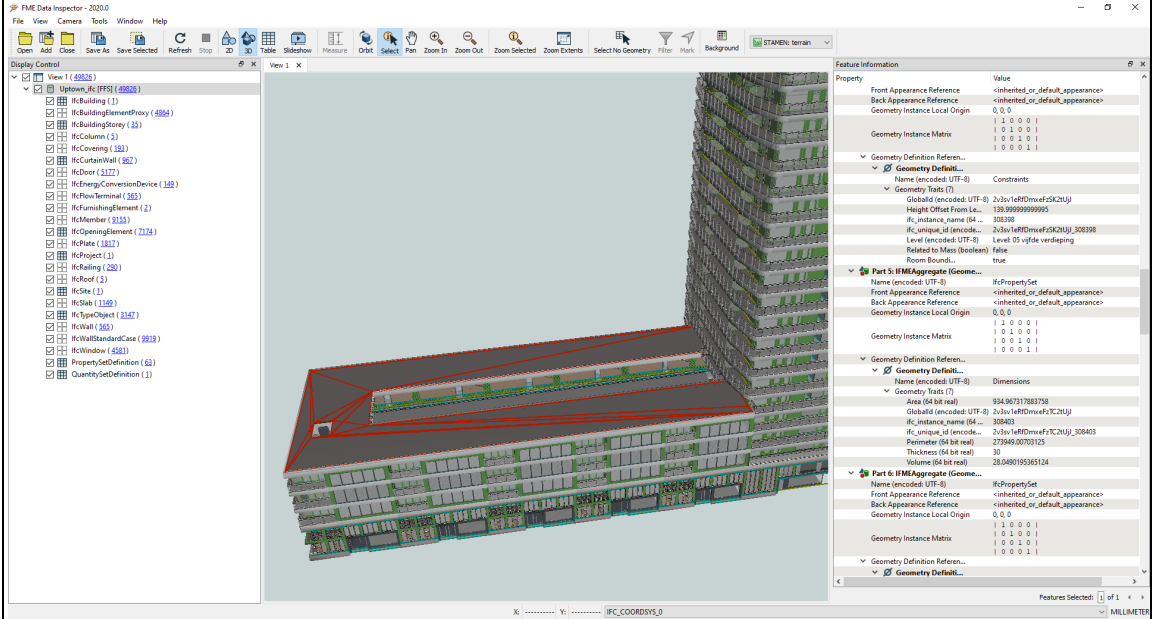


Fig 7. Uptown Element 1 IfcSlab: Geometry snap 5 (geometry aggregate parts 4-6 – traits/attributes: Height Offset, Level, Area, Volume, Perimeter, Thickness)

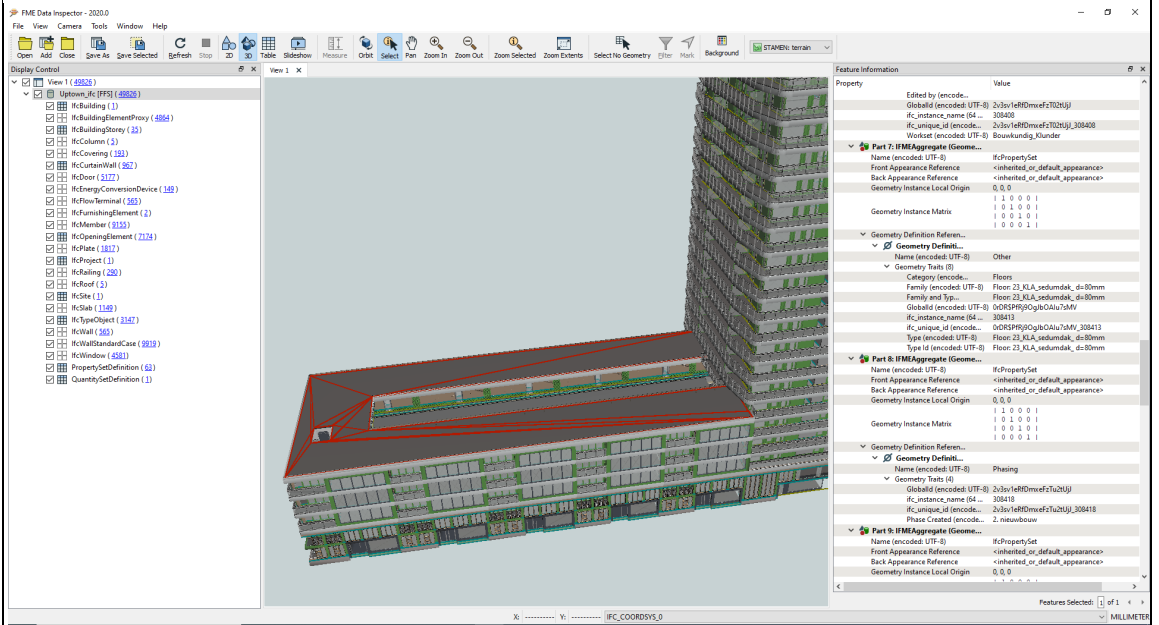


Fig 8. Uptown Element 1 lfcSlab: Geometry snap 6 (geometry aggregate parts 7-9 – traits/attributes: Category, Family, Type, Phase Created)

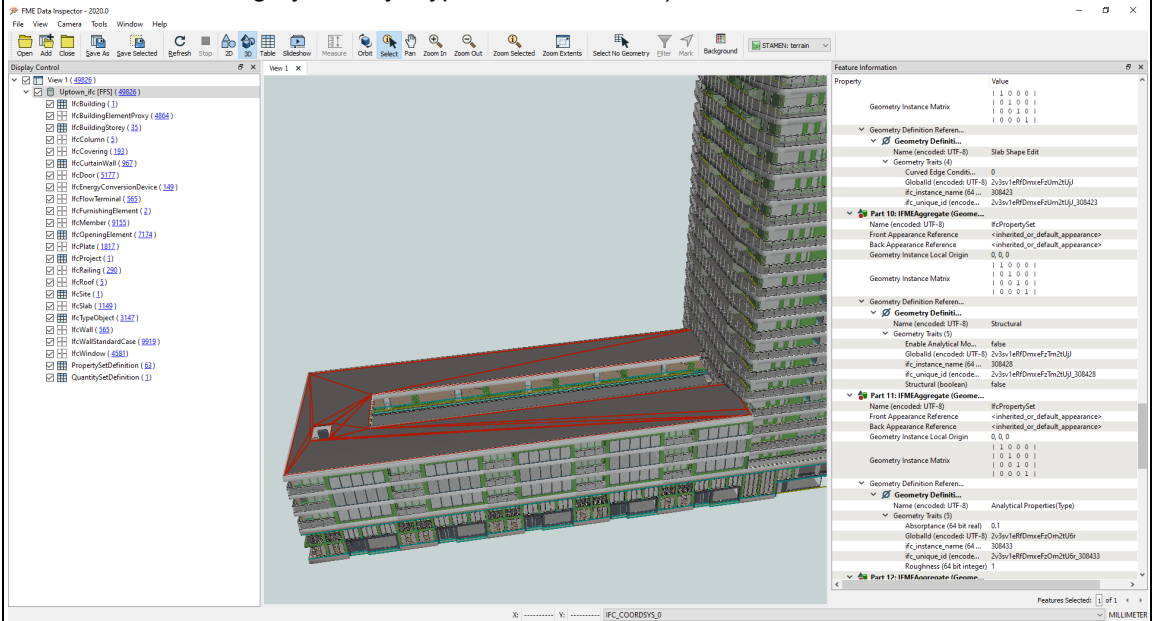


Fig 9. Uptown Element 1 lfcSlab: Geometry snap 7 (geometry aggregate parts 9-11 – traits/attributes: Absorptance, Roughness)

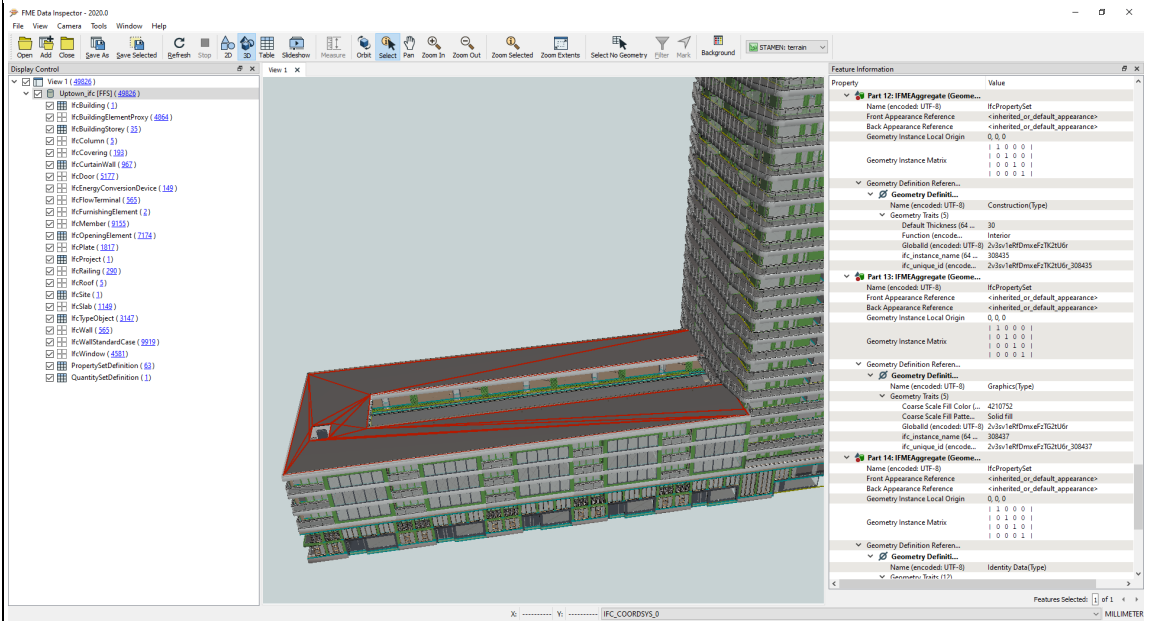


Fig 10. Uptown Element 1 IFCSlab: Geometry snap 8 (geometry aggregate parts 12-14 – traits/attributes: Default Thickness, Function, Appearances)

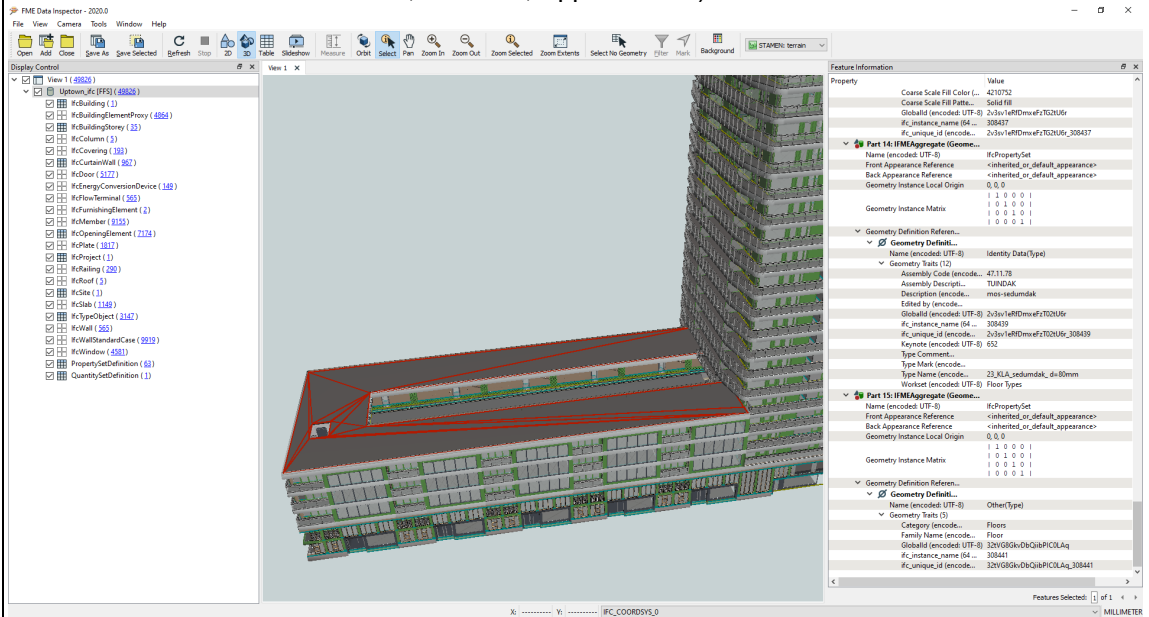


Fig 11. Uptown Element 1 IFCSlab: Geometry snap 9 (geometry aggregate parts 14-15 – traits/attributes: Assembly Code, Assembly Description, Type Name, Workset)

Given the relatively large size of the dataset, for the remainder of the IFC read tests, it was found to be more efficient to do the processing, inspection and queries for Uptown.ifc using an FME feature store cache called FFS - our internal storage and processing format. This involved creating an IFC to FFS default FME workspace. The FME Workspace was used to read from the Uptown.IFC source file and write to an FFS FME cache file. The remainder of the queries were then performed using the FFS cache (UpTown.FFS).

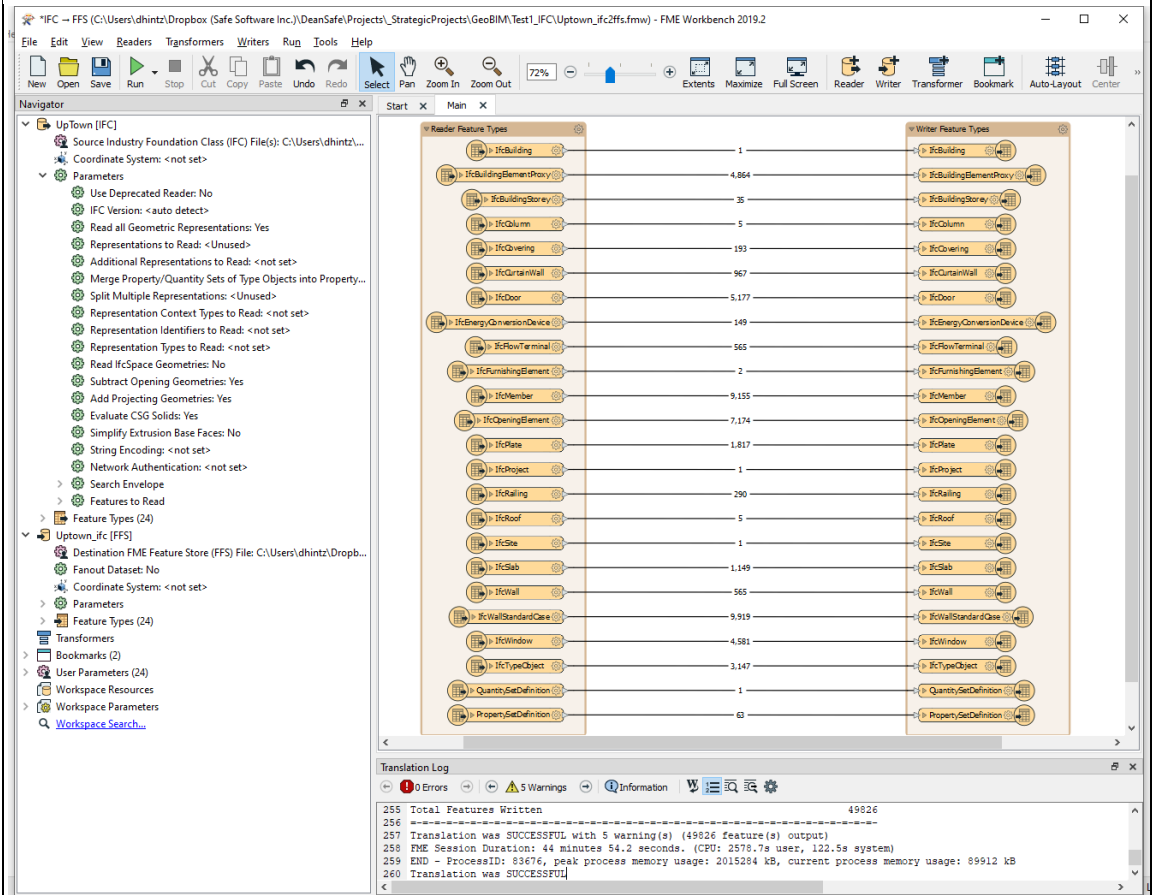


Fig. 12. FME Workspace to read from Uptown.IFC and write to Uptown.FFS

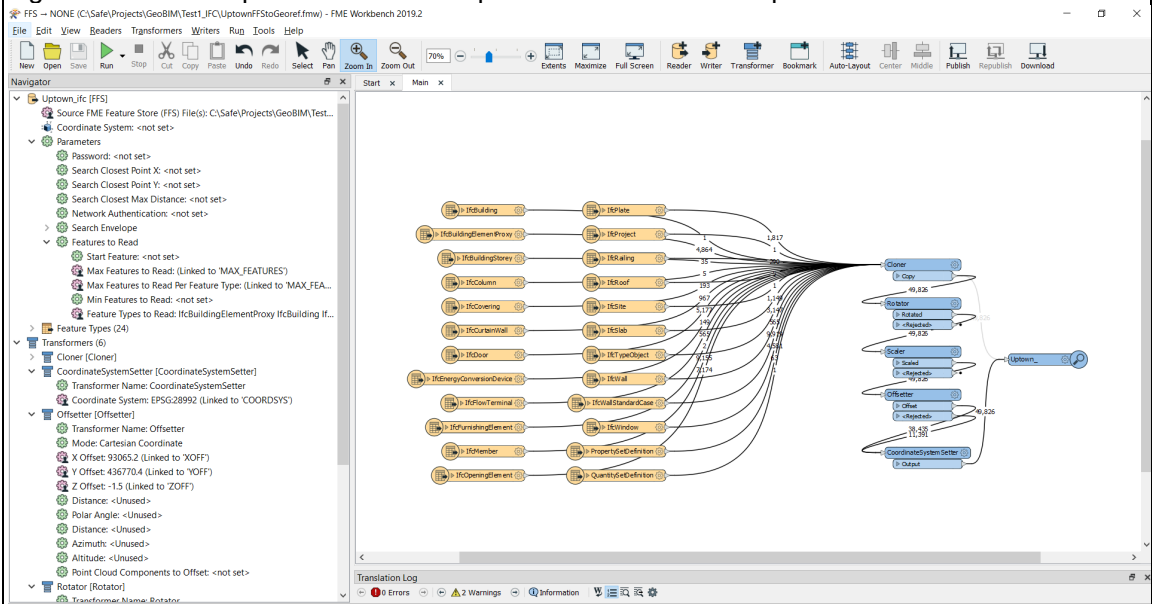


Fig 13. FME Workspace to read from Uptown.FFS, perform georeferencing and display results in FME Data Inspector.

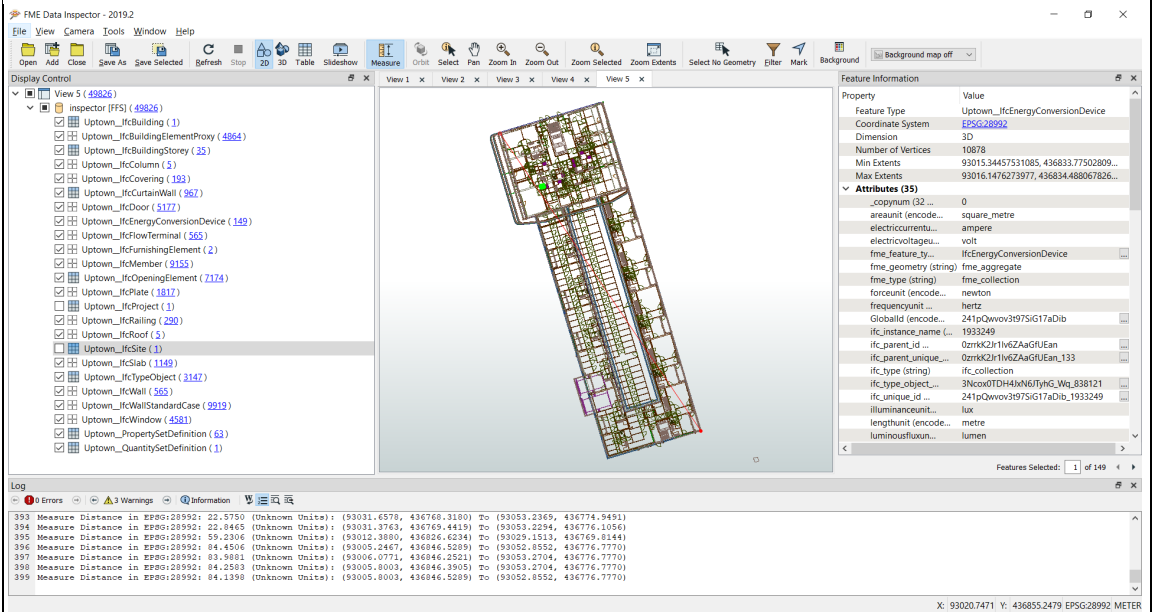


Fig 14. Form 8 Uptown georeferencing & dimensions - diagonal

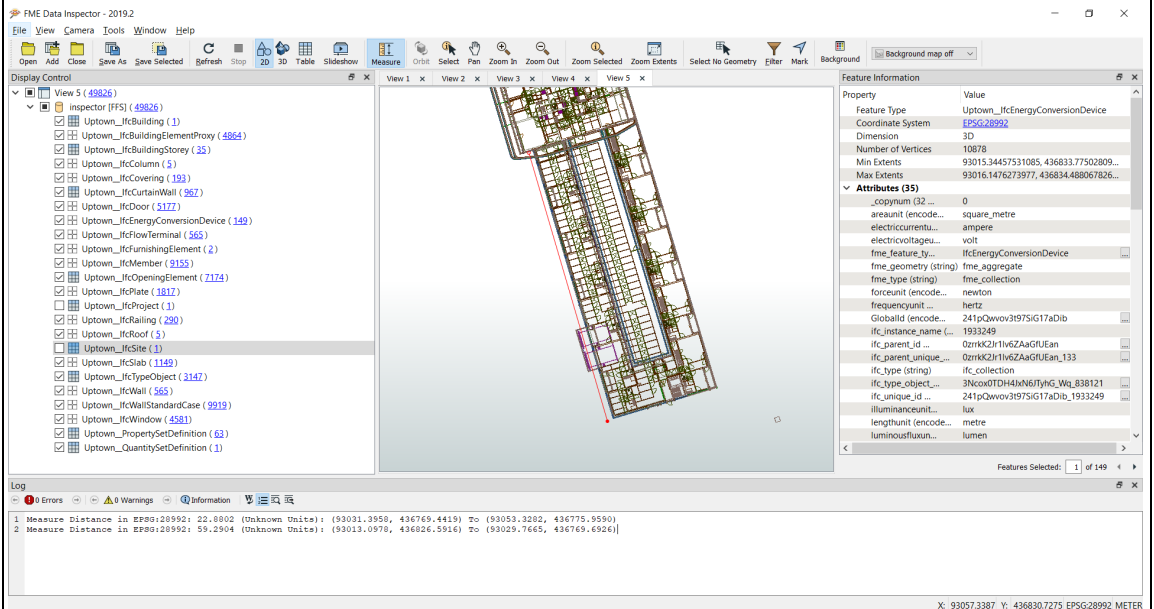


Fig 15. Form 8 Uptown georeferencing & dimensions – length part 1

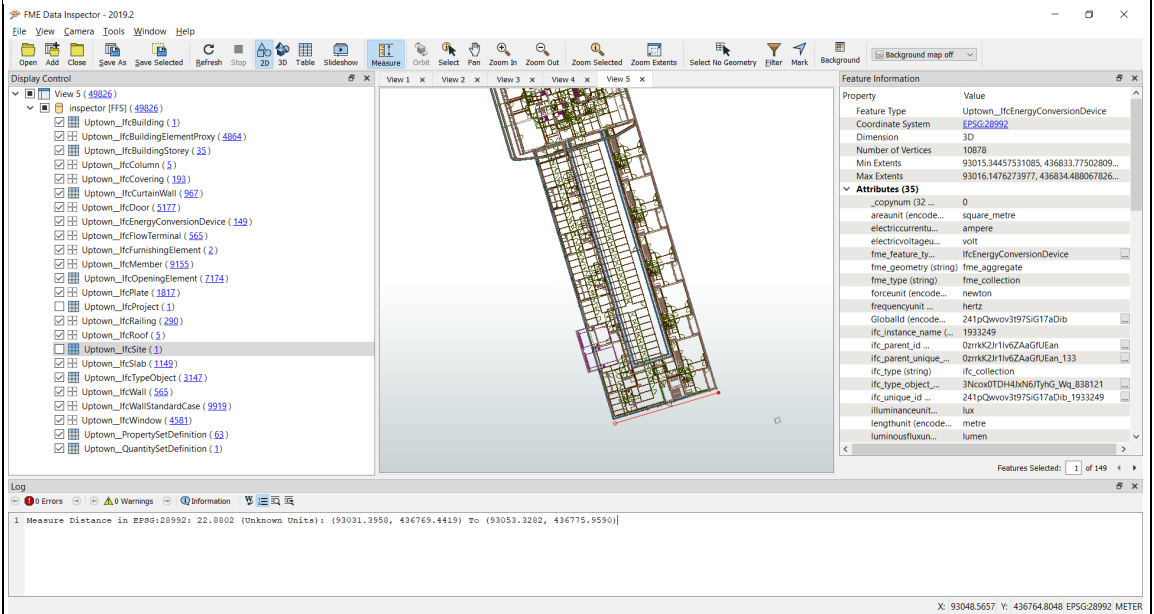


Fig 16. Form 8 Uptown georeferencing & dimensions – width

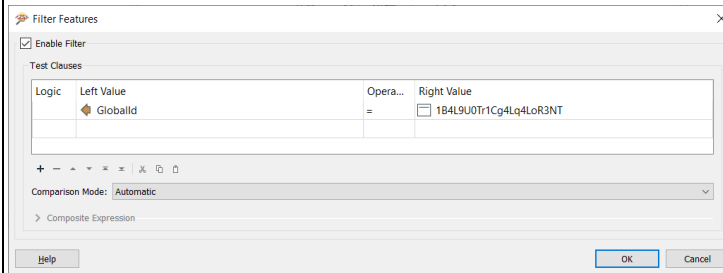


Figure 17. Filter query to locate GlobalId = 1B4L9U0TrCg4Lq4LoR3NT

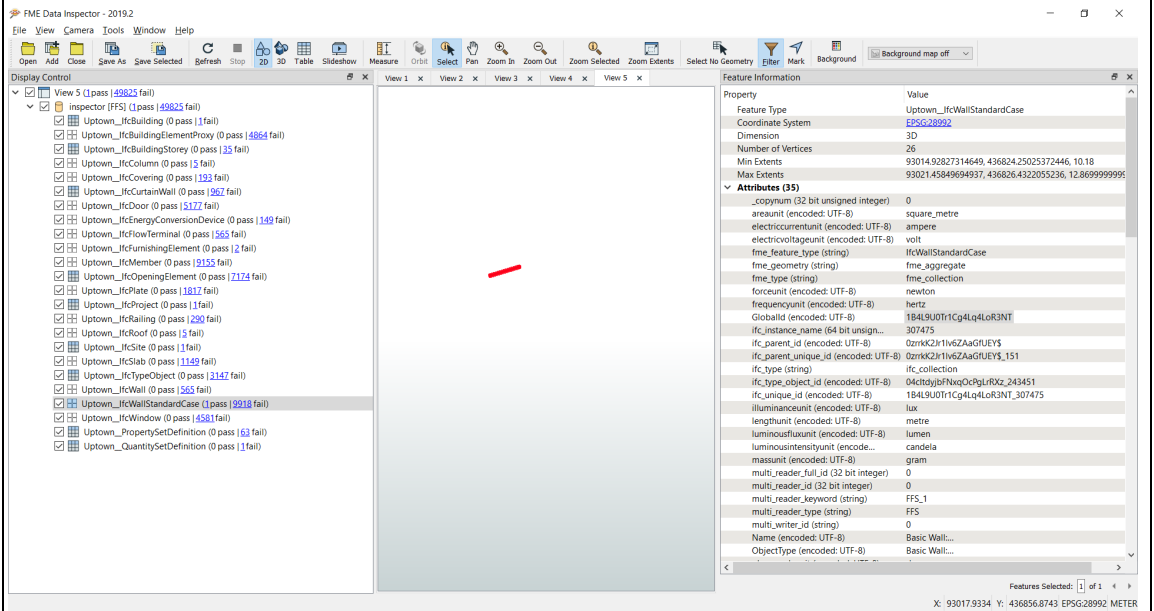


Figure 18. Display of Wall feature with GlobalId = 1B4L9U0TrCg4Lq4LoR3NT – snap 1

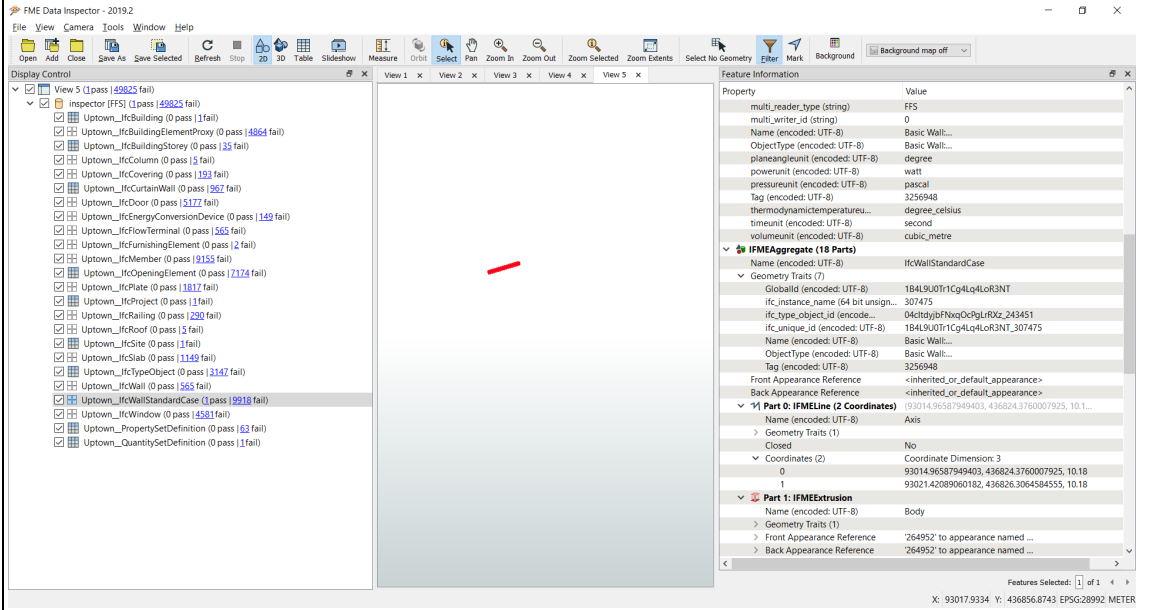


Figure 19. Display of Wall feature with GlobalId = 1BL9U0TrCg4LoR3NT – snap 2

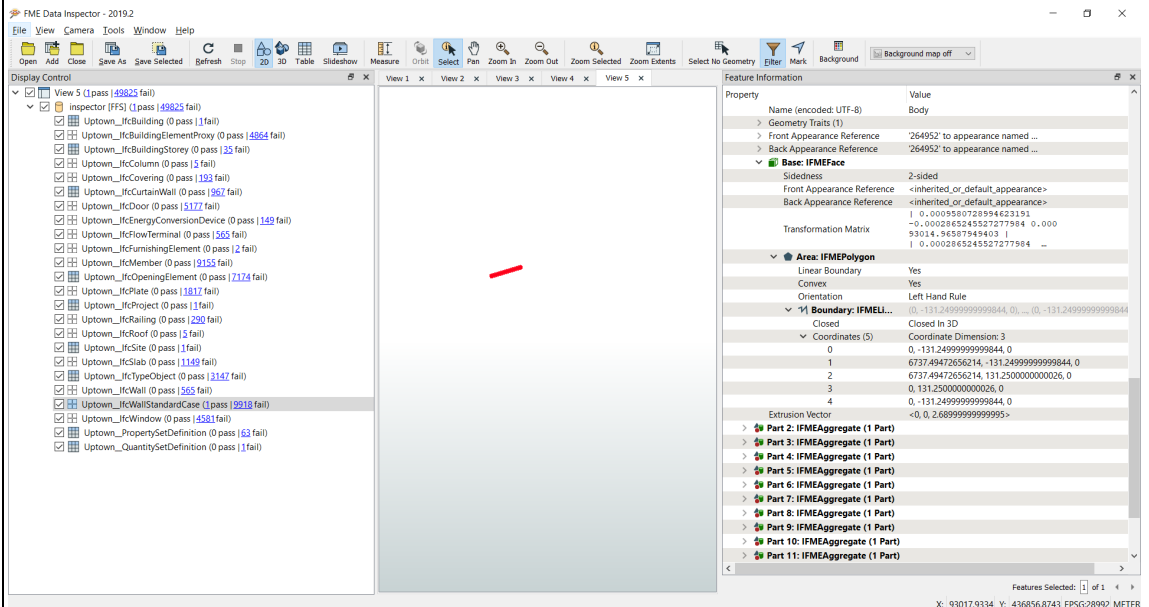


Figure 20. Display of Wall feature with GlobalId = 1BL9U0TrCg4LoR3NT – snap 3

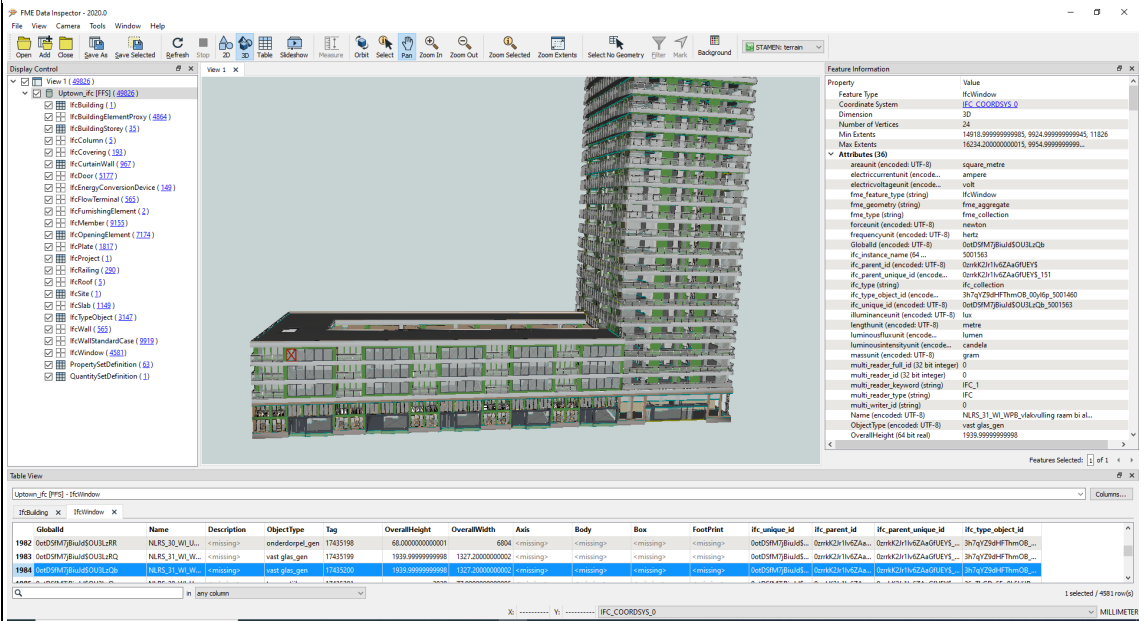


Fig 21. Uptown Element 4 IFCWindow: Feature Information - Attributes (hierarchy: Feature Type, GlobalId, Name, ObjectType)

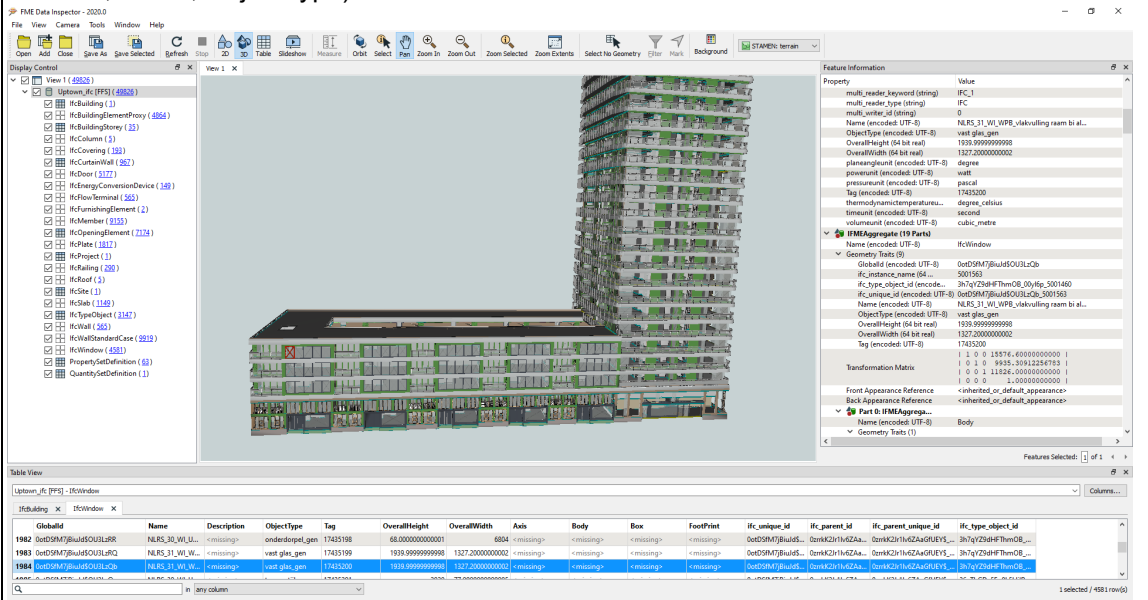


Fig 22. Uptown Element 4 IFCWindow: Geometry screenshot/snap 1 (geometry aggregate part 0 traits / attributes: OverallHeight, OverallWidth, Tag)

| Property | Value |
|-------------------------------|--|
| OverallWidth (64 bit real) | 1327.2000000000002 |
| Tag (encoded: UTF-8) | 17435200 |
| Transformation Matrix | $\begin{bmatrix} 1 & 0 & 0 & 15576.600000000000 & & \\ 0 & 0 & 1 & 9935.30912256783 & & \\ 0 & 0 & 1 & 11826.000000000000 & & \\ 0 & 0 & 0 & 1.000000000000 & & \end{bmatrix}$ |
| Front Appearance Reference | <inherited_or_default_appearance> |
| Back Appearance Reference | <inherited_or_default_appearance> |
| Part 0: IFMEAggrega... | |
| Part 1: IFMEAggrega... | |
| Geometry Traits (1) | |
| ifc_instance_name (64 ...) | 66485 |
| Front Appearance Reference | <inherited_or_default_appearance> |
| Back Appearance Reference | <inherited_or_default_appearance> |
| Geometry Instance Lo... | 0, 0, 0 |
| Geometry Instance Matrix | $\begin{bmatrix} 1 & 0 & 0 & 0 & & \\ 0 & 1 & 0 & 0 & & \\ 0 & 0 & 1 & 0 & & \\ 0 & 0 & 0 & 1 & & \end{bmatrix}$ |
| Geometry Definiti... | |
| Geometry Definiti... | |
| Name (encode...) | IfcMaterial |
| Geometry Traits (2) | |
| ifc_instance_na... | 66485 |
| Name (encode...) | Glass |
| Part 2: IFMEAggrega... | |
| Name (encoded: UTF-8) | IfcPropertySet |
| Front Appearance Reference | <inherited_or_default_appearance> |
| Back Appearance Reference | <inherited_or_default_appearance> |
| Geometry Instance Lo... | 0, 0, 0 |
| Geometry Instance Matrix | $\begin{bmatrix} 1 & 0 & 0 & 0 & & \\ 0 & 1 & 0 & 0 & & \\ 0 & 0 & 1 & 0 & & \\ 0 & 0 & 0 & 1 & & \end{bmatrix}$ |
| Geometry Definiti... | |
| Geometry Definiti... | |
| Name (encode...) | Graphics |
| Geometry Traits (5) | |
| GlobalId (encode... | DotDSFM7jBiuId_uA3LzQb |
| ifc_instance_na... | 5001612 |
| ifc_unique_id ... | DotDSFM7jBiuId_uA3LzQb_5001612 |
| inverse draairicht... | false |
| rooster (boolean) | false |
| Part 3: IFMEAggrega... | |
| Part 4: IFMEAggrega... | |
| Name (encoded: UTF-8) | IfcPropertySet |
| Front Appearance Reference | <inherited_or_default_appearance> |
| Back Appearance Reference | <inherited_or_default_appearance> |

Fig 23. Uptown Element 4 IfcWindow: Geometry snap 2 (geometry aggregate parts 0-4 traits / attributes: Name, Appearances)

| Property | Value |
|-------------------------------|--|
| Name (encode...) | Pset_WindowCommon |
| Geometry Traits (5) | |
| GlobalId (encode... | DotDSFM7jBiuIdzdc3LzQb |
| ifc_instance_na... | 5001566 |
| ifc_unique_id ... | DotDSFM7jBiuIdzdc3LzQb_5001566 |
| isExternal (boolean) | false |
| Reference ... | vast glas_gen |
| Part 5: IFMEAggrega... | |
| Name (encoded: UTF-8) | IfcPropertySet |
| Front Appearance Reference | <inherited_or_default_appearance> |
| Back Appearance Reference | <inherited_or_default_appearance> |
| Geometry Instance Lo... | 0, 0, 0 |
| Geometry Instance Matrix | $\begin{bmatrix} 1 & 0 & 0 & 0 & & \\ 0 & 1 & 0 & 0 & & \\ 0 & 0 & 1 & 0 & & \\ 0 & 0 & 0 & 1 & & \end{bmatrix}$ |
| Geometry Definiti... | |
| Geometry Definiti... | |
| Name (encode...) | Phasing |
| Geometry Traits (4) | |
| GlobalId (encode... | DotDSFM7jBiuId_uY3LzQb |
| ifc_instance_na... | 5001632 |
| ifc_unique_id ... | DotDSFM7jBiuId_uY3LzQb_5001632 |
| Phase Created ... | 2. nieuwbouw |
| Part 6: IFMEAggrega... | |
| Name (encoded: UTF-8) | IfcPropertySet |
| Front Appearance Reference | <inherited_or_default_appearance> |
| Back Appearance Reference | <inherited_or_default_appearance> |
| Geometry Instance Lo... | 0, 0, 0 |
| Geometry Instance Matrix | $\begin{bmatrix} 1 & 0 & 0 & 0 & & \\ 0 & 1 & 0 & 0 & & \\ 0 & 0 & 1 & 0 & & \\ 0 & 0 & 0 & 1 & & \end{bmatrix}$ |
| Geometry Definiti... | |
| Geometry Definiti... | |
| Name (encode...) | Dimensions |
| Geometry Traits (14) | |
| Area (64 bit real) | 7.892844000000008 |
| berekende_diepte... | 22 |
| berekende_diepte... | 32 |
| breedte_vlakvulli... | 1300 |
| glas_dikte (64 ...) | 30 |
| GlobalId (encode... | DotDSFM7jBiuId_uM3LzQb |
| Height (64 bit real) | 1927.9999999999999 |
| hoogte_vlakvulli... | 700 |
| ifc_instance_na... | 5001607 |
| ifc_unique_id ... | DotDSFM7jBiuId_uM3LzQb_5001607 |
| NLRS_C_breed... | 1315.1999999999999 |

Fig 24. Uptown Element 4 IfcWindow: Geometry snap 3 (geometry aggregate parts 5-6 traits / attributes: Area, Height, Berekende_*, glas_dikte, hoogte_*)

| Property | Value |
|--|--|
| profielbreedte (...) | 62 |
| Volume (64 bit real) | 0.07360510399999999 |
| Width (64 bit real) | 1315.1999999999999 |
| Part 7: IFMEAggregate... | |
| Name (encoded: UTF-8) | IfcElementQuantity |
| Front Appearance Reference | <inherited_or_default_appearance> |
| Back Appearance Reference | <inherited_or_default_appearance> |
| Geometry Instance Location | 0, 0, 0 |
| Geometry Instance Matrix | 1 1 0 0 0 1 0 1 0 0 0 1 0 0 1 0 0 1 1 0 0 0 1 1 |
| Geometry Definition... | |
| Geometry Definition... | |
| Name (encoded: UTF-8) | BaseQuantities |
| Geometry Traits (6) | |
| Area (64 bit real) | 7.892844000000008 |
| GlobalId (encoded: OidE01BQ501B5biiGqykMe) | ... |
| Height (64 bit real) | 1927.9999999999999 |
| ifc_instance_name | 5001575 |
| ifc_unique_id | OidE01BQ501B5biiGqykMe_5001575 |
| Width (64 bit real) | 1315.1999999999999 |
| Part 8: IFMEAggregate... | |
| Name (encoded: UTF-8) | IfcPropertySet |
| Front Appearance Reference | <inherited_or_default_appearance> |
| Back Appearance Reference | <inherited_or_default_appearance> |
| Geometry Instance Location | 0, 0, 0 |
| Geometry Instance Matrix | 1 1 0 0 0 1 0 1 0 0 0 1 0 0 1 0 0 1 1 0 0 0 1 1 |
| Geometry Definition... | |
| Geometry Definition... | |
| Name (encoded: UTF-8) | Identity Data |
| Geometry Traits (6) | |
| Edited by | |
| GlobalId (encoded: OidDSM77Biiuid_uQ3LzCb) | ... |
| ifc_instance_name | 5001617 |
| ifc_unique_id | OidDSM77Biiuid_uQ3LzCb_5001617 |
| Mark (encoded: UTF-8) | 198 |
| Workset (encoded: UTF-8) | Bouwkundig_Klunder |
| Part 9: IFMEAggregate... | |
| Name (encoded: UTF-8) | IfcPropertySet |
| Front Appearance Reference | <inherited_or_default_appearance> |
| Back Appearance Reference | <inherited_or_default_appearance> |
| Geometry Instance Location | 0, 0, 0 |
| Geometry Instance Matrix | 1 1 0 0 0 1 0 1 0 0 0 1 0 0 1 0 0 1 1 0 0 0 1 1 |

Fig 25. Uptown Element 4 IfcWindow: Geometry snap 4 (geometry aggregate parts 7-9 traits / attributes: Mark, Workset)

| Property | Value |
|--|--|
| Geometry Definition... | |
| Name (encoded: UTF-8) | Other |
| Geometry Traits (22) | |
| berekende_draai... | false |
| berekende_draai... | false |
| berekende_draai... | false |
| berekende_draai... | false |
| berekende_draai... | false |
| berekende_draai... | false |
| berekende_kiepst... | false |
| berekende_ok_ro... | 40 |
| berekende_ok_ro... | 0 |
| berekende_positi... | 0 |
| Category (encoded: UTF-8) | Windows |
| Family (encoded: UTF-8) | NLRS_31_WL_WPB_vlakvulling raam bi al... |
| Family and Typ... | NLRS_31_WL_WPB_vlakvulling raam bi al... |
| geen_pan... | true |
| GlobalId (encoded: OidTGG7ZHF1xVEbVAshMkO) | ... |
| ifc_instance_name | 5001627 |
| ifc_unique_id | OidTGG7ZHF1xVEbVAshMkO_5001627 |
| NLRS_C_hoogte (...) | 1927.9999999999999 |
| positie_rooster_... | 22 |
| symbol_afsta... | 85 |
| Type (encoded: UTF-8) | NLRS_31_WL_WPB_vlakvulling raam bi al... |
| Type Id (encoded: UTF-8) | NLRS_31_WL_WPB_vlakvulling raam bi al... |
| Part 10: IFMEAggregate... | |
| Name (encoded: UTF-8) | IfcPropertySet |
| Front Appearance Reference | <inherited_or_default_appearance> |
| Back Appearance Reference | <inherited_or_default_appearance> |
| Geometry Instance Location | 0, 0, 0 |
| Geometry Instance Matrix | 1 1 0 0 0 1 0 1 0 0 0 1 0 0 1 0 0 1 1 0 0 0 1 1 |
| Geometry Definition... | |
| Geometry Definition... | |
| Name (encoded: UTF-8) | Materials and Finishes |
| Geometry Traits (7) | |
| glas_materiaal ... | Glass |
| GlobalId (encoded: OidDSM77Biiuid_u63LzCb) | ... |
| ifc_instance_name | 5001622 |
| ifc_unique_id | OidDSM77Biiuid_u63LzCb_5001622 |
| materiaal_draaien... | KLA_aluminium_RAL 7024 |
| materiaal_kozij... | KLA_aluminium_RAL 7024 |
| materiaal_roost... | KLA_aluminium_RAL 7024 |
| Part 11: IFMEAggregate... | |
| Name (encoded: UTF-8) | IfcPropertySet |
| Front Appearance Reference | <inherited_or_default_appearance> |

Fig 26. Uptown Element 4 IfcWindow: Geometry snap 5 (geometry aggregate parts 9-11 traits / attributes: berekende_*, Category, Family, NLRS_C_Hoogte*, positive_rooster*, Type, glas_materiaal)

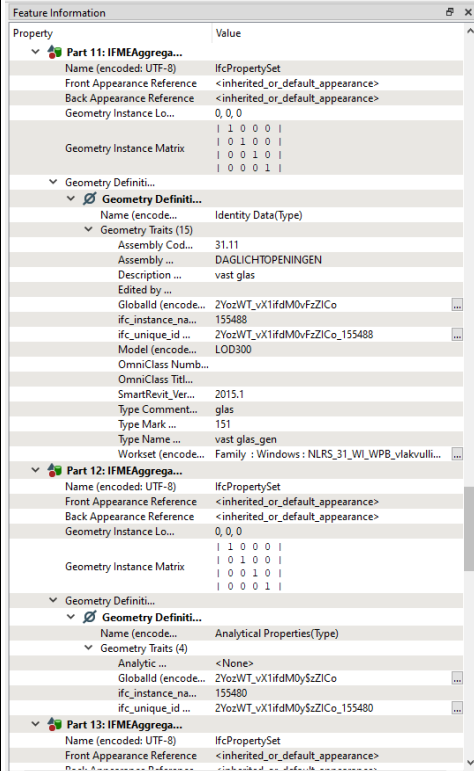


Fig 27. Uptown Element 4 IfcWindow: Geometry snap 6 (geometry aggregate parts 11-13 traits / attributes: Assembly Code, Description, Model, SmartRevit_Version, Type*, Workset, Property Sets)

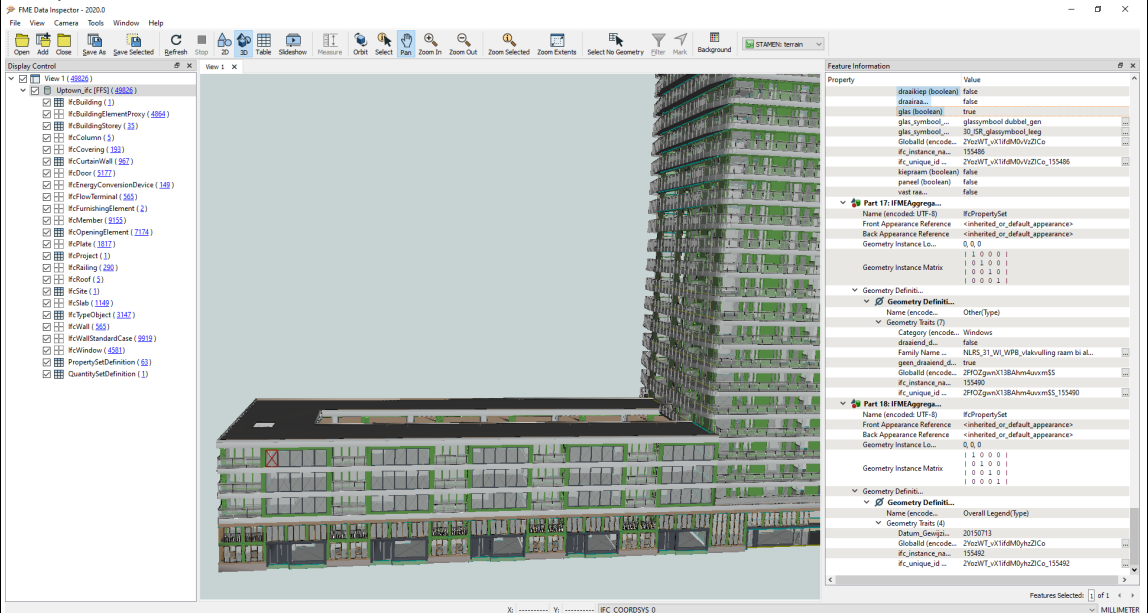


Fig 28. Uptown Element 4 IfcWindow: Geometry snap 7 (geometry aggregate parts 17-18 traits / attributes: glas*, Category, Family Name, Datum, panel)

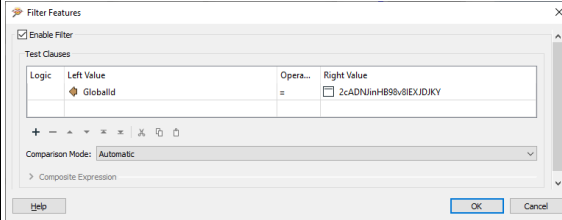


Fig 29. Use filter features to locate lfcRailing GlobalID = 2cADNjInHB98v8IEXJDJKY

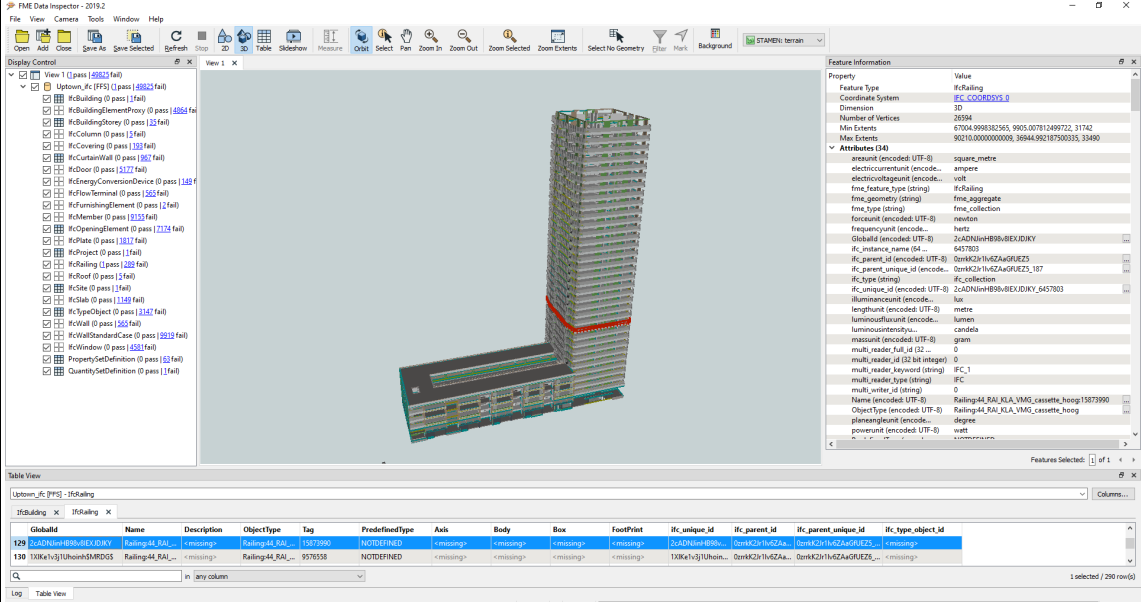


Fig 30. Uptown Element 2 lfcRailing: Feature Information - Attributes (hierarchy: FeatureType, GlobalId, Name, ObjectType)

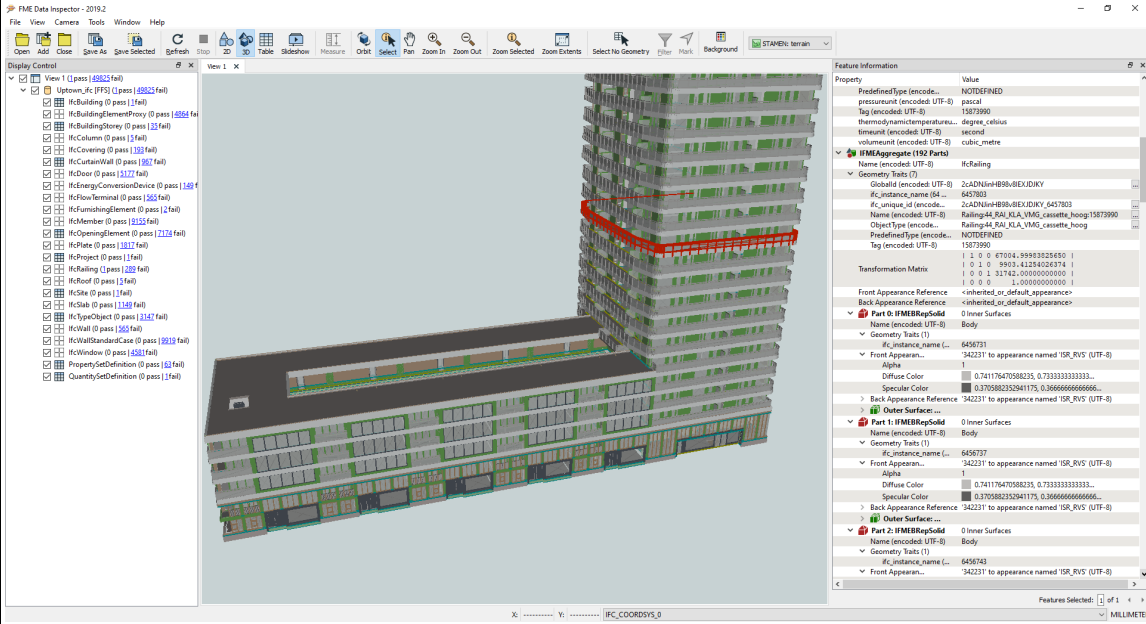


Fig 31. Uptown Element 2 lfcRailing: Geometry screenshot / snap 1 (geometry aggregate parts 0-2 traits / attributes) showing Name, ObjectType, Tag, IDs

| Property | Value |
|------------------------------|---|
| ifc_instance_name (...) | 6456743 |
| Front Appearance Reference | '342231' to appearance named 'SR_RVS' (UTF-8) |
| Alpha | 1 |
| Diffuse Color | 0.741176470588235, 0.733333333333333... |
| Specular Color | 0.3705882352941175, 0.366666666666666... |
| Back Appearance Reference | '342231' to appearance named 'SR_RVS' (UTF-8) |
| Outer Surface: ... | |
| Part 3: IFMEBRepSolid | 0 Inner Surfaces |
| Name (encoded: UTF-8) | Body |
| Geometry Traits (1) | |
| ifc_instance_name (...) | 6456749 |
| Front Appearance Reference | '342231' to appearance named 'SR_RVS' (UTF-8) |
| Alpha | 1 |
| Diffuse Color | 0.741176470588235, 0.733333333333333... |
| Specular Color | 0.3705882352941175, 0.366666666666666... |
| Back Appearance Reference | '342231' to appearance named 'SR_RVS' (UTF-8) |
| Outer Surface: ... | |
| Part 4: IFMEBRepSolid | 0 Inner Surfaces |
| Name (encoded: UTF-8) | Body |
| Geometry Traits (1) | |
| ifc_instance_name (...) | 6456755 |
| Front Appearance Reference | '342231' to appearance named 'SR_RVS' (UTF-8) |
| Alpha | 1 |
| Diffuse Color | 0.741176470588235, 0.733333333333333... |
| Specular Color | 0.3705882352941175, 0.366666666666666... |
| Back Appearance Reference | '342231' to appearance named 'SR_RVS' (UTF-8) |
| Outer Surface: ... | |
| Part 5: IFMEBRepSolid | 0 Inner Surfaces |
| Name (encoded: UTF-8) | Body |
| Geometry Traits (1) | |
| ifc_instance_name (...) | 6456761 |
| Front Appearance Reference | '342231' to appearance named 'SR_RVS' (UTF-8) |
| Alpha | 1 |
| Diffuse Color | 0.741176470588235, 0.733333333333333... |
| Specular Color | 0.3705882352941175, 0.366666666666666... |
| Back Appearance Reference | '342231' to appearance named 'SR_RVS' (UTF-8) |
| Outer Surface: ... | |
| Part 6: IFMEBRepSolid | 0 Inner Surfaces |
| Name (encoded: UTF-8) | Body |
| Geometry Traits (1) | |
| ifc_instance_name (...) | 6456767 |
| Front Appearance Reference | '342231' to appearance named 'SR_RVS' (UTF-8) |
| Alpha | 1 |
| Diffuse Color | 0.741176470588235, 0.733333333333333... |
| Specular Color | 0.3705882352941175, 0.366666666666666... |

Fig 32. Uptown Element 2 IfcRailing: Geometry snap 2 (aggregate parts 3-6 traits / attributes) showing appearances

| Property | Value |
|---------------------------------|--|
| Geometry Definition... | |
| Name (encoded: UTF-8) | Pset_RailingCommon |
| Geometry Traits (6) | |
| GlobalId (encoded: UTF-8) | 2C6VylabT1YgNR9hWATS18 |
| Height (64 bit real) | 900 |
| ifc_instance_name (64 ...) | 6457809 |
| ifc_unique_id (encode... | 2C6VylabT1YgNR9hWATS18_6457809 |
| IsExternal (boolean) | false |
| Reference (encode... | 44_RAI_KLA_VMG_casette_hoog |
| Part 180: IFMEAggrega... | |
| Name (encoded: UTF-8) | IfcElementQuantity |
| Front Appearance Reference | <inherited_or_default_appearance> |
| Back Appearance Reference | <inherited_or_default_appearance> |
| Geometry Instance Local Origin | 0, 0, 0 |
| Geometry Instance Matrix | 1 1 0 0 0 1 0 1 0 0 0 1 0 0 1 0 0 1 0 0 0 1 1 |
| Geometry Definition Referen... | |
| Geometry Definition... | |
| Name (encoded: UTF-8) | BaseQuantities |
| Geometry Traits (4) | |
| GlobalId (encoded: UTF-8) | 09p85vpq99_uu8wWShWtyb |
| ifc_instance_name (64 ...) | 6457816 |
| ifc_unique_id (encode... | 09p85vpq99_uu8wWShWtyb_6457816 |
| Length (64 bit real) | 72867.487854704 |
| Part 181: IFMEAggrega... | |
| Name (encoded: UTF-8) | IfcPropertySet |
| Front Appearance Reference | <inherited_or_default_appearance> |
| Back Appearance Reference | <inherited_or_default_appearance> |
| Geometry Instance Local Origin | 0, 0, 0 |
| Geometry Instance Matrix | 1 1 0 0 0 1 0 1 0 0 0 1 0 0 1 0 0 1 0 0 0 1 1 |
| Geometry Definition Referen... | |
| Geometry Definition... | |
| Name (encoded: UTF-8) | Constraints |
| Geometry Traits (6) | |
| Base Level (encode... | Level: 11 blk: ruwe vloer |
| Base Offset (64 bit real) | 30.00000000000251 |
| GlobalId (encoded: UTF-8) | 2cADNlnHB98v8JlnJDKY |
| ifc_instance_name (64 ...) | 6457824 |
| ifc_unique_id (encode... | 2cADNlnHB98v8JlnJDKY_6457824 |
| Tread/Stringer Offset (...) | 0 |
| Part 182: IFMEAggrega... | |
| Name (encoded: UTF-8) | IfcPropertySet |
| Front Appearance Reference | <inherited_or_default_appearance> |

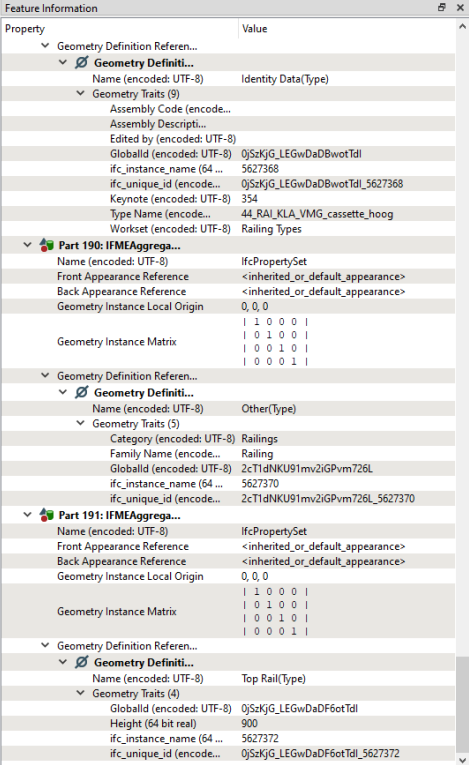
Fig 33. Uptown Element 2 IfcRailing: Geometry snap 3 (aggregate parts 180-182 traits / attributes) showing BaseQuantities, Base Level, Base Offset, Length

| Property | Value | | | | | | | | | | | | | | | | | | | | | | | | |
|---------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Geometry Definition... | | | | | | | | | | | | | | | | | | | | | | | | | |
| Geomet... | | | | | | | | | | | | | | | | | | | | | | | | | |
| Name (encoded: UTF-8) | Dimensions | | | | | | | | | | | | | | | | | | | | | | | | |
| Geometry Traits (4) | | | | | | | | | | | | | | | | | | | | | | | | | |
| GlobalId (encoded: UTF-8) | 2cADNjinHB98v8ikJDIKY | | | | | | | | | | | | | | | | | | | | | | | | |
| ifc_instance_name (64 bit real) | 6457829 | | | | | | | | | | | | | | | | | | | | | | | | |
| ifc_unique_id (encoded: UTF-8) | 2cADNjinHB98v8ikJDIKY_6457829 | | | | | | | | | | | | | | | | | | | | | | | | |
| Length (64 bit real) | 72867.487854704 | | | | | | | | | | | | | | | | | | | | | | | | |
| Part 183: IFMEAggrega... | | | | | | | | | | | | | | | | | | | | | | | | | |
| Name (encoded: UTF-8) | IfcPropertySet | | | | | | | | | | | | | | | | | | | | | | | | |
| Front Appearance Reference | <inherited_or_default_appearance> | | | | | | | | | | | | | | | | | | | | | | | | |
| Back Appearance Reference | <inherited_or_default_appearance> | | | | | | | | | | | | | | | | | | | | | | | | |
| Geometry Instance Local Origin | 0, 0, 0 | | | | | | | | | | | | | | | | | | | | | | | | |
| Geometry Instance Matrix | <table border="1"> <tr><td>1</td><td>1</td><td>0</td><td>0</td><td>0</td><td>1</td></tr> <tr><td>0</td><td>1</td><td>0</td><td>0</td><td>0</td><td>1</td></tr> <tr><td>0</td><td>0</td><td>1</td><td>0</td><td>0</td><td>1</td></tr> <tr><td>1</td><td>0</td><td>0</td><td>0</td><td>1</td><td>1</td></tr> </table> | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 1 |
| 1 | 1 | 0 | 0 | 0 | 1 | | | | | | | | | | | | | | | | | | | | |
| 0 | 1 | 0 | 0 | 0 | 1 | | | | | | | | | | | | | | | | | | | | |
| 0 | 0 | 1 | 0 | 0 | 1 | | | | | | | | | | | | | | | | | | | | |
| 1 | 0 | 0 | 0 | 1 | 1 | | | | | | | | | | | | | | | | | | | | |
| Geometry Definition Referen... | | | | | | | | | | | | | | | | | | | | | | | | | |
| Geomet... | | | | | | | | | | | | | | | | | | | | | | | | | |
| Name (encoded: UTF-8) | Identity Data | | | | | | | | | | | | | | | | | | | | | | | | |
| Geometry Traits (5) | | | | | | | | | | | | | | | | | | | | | | | | | |
| Edited by... | | | | | | | | | | | | | | | | | | | | | | | | | |
| GlobalId (encoded: UTF-8) | 2cADNjinHB98v8ikbDIKY | | | | | | | | | | | | | | | | | | | | | | | | |
| ifc_instance_name (64 bit real) | 6457834 | | | | | | | | | | | | | | | | | | | | | | | | |
| ifc_unique_id (encoded: UTF-8) | 2cADNjinHB98v8ikbDIKY_6457834 | | | | | | | | | | | | | | | | | | | | | | | | |
| Workset... | Bouwkundig_Klunder | | | | | | | | | | | | | | | | | | | | | | | | |
| Part 184: IFMEAggrega... | | | | | | | | | | | | | | | | | | | | | | | | | |
| Name (encoded: UTF-8) | IfcPropertySet | | | | | | | | | | | | | | | | | | | | | | | | |
| Front Appearance Reference | <inherited_or_default_appearance> | | | | | | | | | | | | | | | | | | | | | | | | |
| Back Appearance Reference | <inherited_or_default_appearance> | | | | | | | | | | | | | | | | | | | | | | | | |
| Geometry Instance Local Origin | 0, 0, 0 | | | | | | | | | | | | | | | | | | | | | | | | |
| Geometry Instance Matrix | <table border="1"> <tr><td>1</td><td>1</td><td>0</td><td>0</td><td>0</td><td>1</td></tr> <tr><td>0</td><td>1</td><td>0</td><td>0</td><td>0</td><td>1</td></tr> <tr><td>0</td><td>0</td><td>1</td><td>0</td><td>0</td><td>1</td></tr> <tr><td>1</td><td>0</td><td>0</td><td>0</td><td>1</td><td>1</td></tr> </table> | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 1 |
| 1 | 1 | 0 | 0 | 0 | 1 | | | | | | | | | | | | | | | | | | | | |
| 0 | 1 | 0 | 0 | 0 | 1 | | | | | | | | | | | | | | | | | | | | |
| 0 | 0 | 1 | 0 | 0 | 1 | | | | | | | | | | | | | | | | | | | | |
| 1 | 0 | 0 | 0 | 1 | 1 | | | | | | | | | | | | | | | | | | | | |
| Geometry Definition Referen... | | | | | | | | | | | | | | | | | | | | | | | | | |
| Geomet... | | | | | | | | | | | | | | | | | | | | | | | | | |
| Name (encoded: UTF-8) | Other | | | | | | | | | | | | | | | | | | | | | | | | |
| Geometry Traits (8) | | | | | | | | | | | | | | | | | | | | | | | | | |
| Categor... | Railings | | | | | | | | | | | | | | | | | | | | | | | | |
| Family and Type | Railings: 44_RAI_KLA_VMG_cassette_hoog | | | | | | | | | | | | | | | | | | | | | | | | |
| GlobalId (encoded: UTF-8) | Railings: 44_RAI_KLA_VMG_cassette_hoog | | | | | | | | | | | | | | | | | | | | | | | | |
| ifc_instance_name (64 bit real) | OKUz2jWTSMRPvRi8iKHC | | | | | | | | | | | | | | | | | | | | | | | | |
| ifc_unique_id (encoded: UTF-8) | OKUz2jWTSMRPvRi8iKHC_6457839 | | | | | | | | | | | | | | | | | | | | | | | | |
| Type (encoded: UTF-8) | Railings: 44_RAI_KLA_VMG_cassette_hoog | | | | | | | | | | | | | | | | | | | | | | | | |
| Type Id ... | Railings: 44_RAI_KLA_VMG_cassette_hoog | | | | | | | | | | | | | | | | | | | | | | | | |

Fig 34. Uptown Element 2 IfcRailing: Geometry snap 4 (aggregate parts 183-184 traits / attributes) showing Workset, Family, Type

| Property | Value | | | | | | | | | | | | | | | | | | | | | | | | |
|---------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Name (encoded: UTF-8) | IfcPropertySet | | | | | | | | | | | | | | | | | | | | | | | | |
| Front Appearance Reference | <inherited_or_default_appearance> | | | | | | | | | | | | | | | | | | | | | | | | |
| Back Appearance Reference | <inherited_or_default_appearance> | | | | | | | | | | | | | | | | | | | | | | | | |
| Geometry Instance Local Origin | 0, 0, 0 | | | | | | | | | | | | | | | | | | | | | | | | |
| Geometry Instance Matrix | <table border="1"> <tr><td>1</td><td>1</td><td>0</td><td>0</td><td>0</td><td>1</td></tr> <tr><td>0</td><td>1</td><td>0</td><td>0</td><td>0</td><td>1</td></tr> <tr><td>0</td><td>0</td><td>1</td><td>0</td><td>0</td><td>1</td></tr> <tr><td>1</td><td>0</td><td>0</td><td>0</td><td>1</td><td>1</td></tr> </table> | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 1 |
| 1 | 1 | 0 | 0 | 0 | 1 | | | | | | | | | | | | | | | | | | | | |
| 0 | 1 | 0 | 0 | 0 | 1 | | | | | | | | | | | | | | | | | | | | |
| 0 | 0 | 1 | 0 | 0 | 1 | | | | | | | | | | | | | | | | | | | | |
| 1 | 0 | 0 | 0 | 1 | 1 | | | | | | | | | | | | | | | | | | | | |
| Geometry Definition Referen... | | | | | | | | | | | | | | | | | | | | | | | | | |
| Geometry Definiti... | | | | | | | | | | | | | | | | | | | | | | | | | |
| Name (encoded: UTF-8) | Phasing | | | | | | | | | | | | | | | | | | | | | | | | |
| Geometry Traits (4) | | | | | | | | | | | | | | | | | | | | | | | | | |
| GlobalId (encoded: UTF-8) | 2cADNjinHB98v8ikTIDJKY | | | | | | | | | | | | | | | | | | | | | | | | |
| ifc_instance_name (64 bit real) | 6457844 | | | | | | | | | | | | | | | | | | | | | | | | |
| ifc_unique_id (encoded: UTF-8) | 2cADNjinHB98v8ikTIDJKY_6457844 | | | | | | | | | | | | | | | | | | | | | | | | |
| Phase Created (encoded: UTF-8) | 2. nieuwbouw | | | | | | | | | | | | | | | | | | | | | | | | |
| Part 186: IFMEAggrega... | | | | | | | | | | | | | | | | | | | | | | | | | |
| Name (encoded: UTF-8) | IfcPropertySet | | | | | | | | | | | | | | | | | | | | | | | | |
| Front Appearance Reference | <inherited_or_default_appearance> | | | | | | | | | | | | | | | | | | | | | | | | |
| Back Appearance Reference | <inherited_or_default_appearance> | | | | | | | | | | | | | | | | | | | | | | | | |
| Geometry Instance Local Origin | 0, 0, 0 | | | | | | | | | | | | | | | | | | | | | | | | |
| Geometry Instance Matrix | <table border="1"> <tr><td>1</td><td>1</td><td>0</td><td>0</td><td>0</td><td>1</td></tr> <tr><td>0</td><td>1</td><td>0</td><td>0</td><td>0</td><td>1</td></tr> <tr><td>0</td><td>0</td><td>1</td><td>0</td><td>0</td><td>1</td></tr> <tr><td>1</td><td>0</td><td>0</td><td>0</td><td>1</td><td>1</td></tr> </table> | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 1 |
| 1 | 1 | 0 | 0 | 0 | 1 | | | | | | | | | | | | | | | | | | | | |
| 0 | 1 | 0 | 0 | 0 | 1 | | | | | | | | | | | | | | | | | | | | |
| 0 | 0 | 1 | 0 | 0 | 1 | | | | | | | | | | | | | | | | | | | | |
| 1 | 0 | 0 | 0 | 1 | 1 | | | | | | | | | | | | | | | | | | | | |
| Geometry Definition Referen... | | | | | | | | | | | | | | | | | | | | | | | | | |
| Geometry Definiti... | | | | | | | | | | | | | | | | | | | | | | | | | |
| Name (encoded: UTF-8) | Construction(Type) | | | | | | | | | | | | | | | | | | | | | | | | |
| Geometry Traits (10) | | | | | | | | | | | | | | | | | | | | | | | | | |
| Angled Joins (encoded: UTF-8) | Add Vertical/Horizontal Segments | | | | | | | | | | | | | | | | | | | | | | | | |
| Baluster Offset (64 bit real) | 0 | | | | | | | | | | | | | | | | | | | | | | | | |
| GlobalId (encoded: UTF-8) | 0jSzkjG_LEGwDaDBkottIdl | | | | | | | | | | | | | | | | | | | | | | | | |
| ifc_instance_name (64 bit real) | 5627362 | | | | | | | | | | | | | | | | | | | | | | | | |
| ifc_unique_id (encoded: UTF-8) | 0jSzkjG_LEGwDaDBkottIdl_5627362 | | | | | | | | | | | | | | | | | | | | | | | | |
| Landing Height ... | 0 | | | | | | | | | | | | | | | | | | | | | | | | |
| Rail Connectio... | Weld | | | | | | | | | | | | | | | | | | | | | | | | |
| Railing Height (64 bit real) | 1200 | | | | | | | | | | | | | | | | | | | | | | | | |
| Tangent Joins (encoded: UTF-8) | Extend Rails to Meet | | | | | | | | | | | | | | | | | | | | | | | | |
| Use Landing Height ... | No | | | | | | | | | | | | | | | | | | | | | | | | |
| Part 187: IFMEAggrega... | | | | | | | | | | | | | | | | | | | | | | | | | |
| Name (encoded: UTF-8) | IfcPropertySet | | | | | | | | | | | | | | | | | | | | | | | | |
| Front Appearance Reference | <inherited_or_default_appearance> | | | | | | | | | | | | | | | | | | | | | | | | |
| Back Appearance Reference | <inherited_or_default_appearance> | | | | | | | | | | | | | | | | | | | | | | | | |
| Geometry Instance Local Origin | 0, 0, 0 | | | | | | | | | | | | | | | | | | | | | | | | |

Fig 35. Uptown Element 2 IfcRailing: Geometry snap 5 (aggregate parts 186-187 traits / attributes) showing Name, Phase Created, Construction, Angled Joins, Rail Connection, Railing Height

| | | |
|--|--|--|
| | |  <p>Fig 36. Uptown Element 2 IfcRailing: Geometry snap 6 (aggregate parts 186-187 traits / attributes) showing Assembly Code, Description, Keynote, Type Name, Workset, Category, Family, Height</p> |
|--|--|--|

| | | |
|--|---|---|
| | <p>30.2) short comments to the previous question (optional)</p> | <p>Note that in the screen shots below, comparison with GeoBIM website screenshots can be somewhat challenging since the properties, relationships and attributes are displayed differently. What FME calls 'Attributes' seem to correspond to a lot of the relationship or hierarchy information shown on the website (ids and classification). Also, for much of what GeoBIM calls 'attributes', with FME this information is stored as traits within the geometry aggregates (materials, property sets, appearances etc). The following screenshots simply page through all the attributes, geometries and traits available for the Elements in question using the Feature Information window in FME Data Inspector. Please contact the author if there are any questions on how to interpret these results. Note that free demo licenses of FME are available for educational and research purposes, so that is always an option for anyone who wishes to test this for themselves from https://www.safe.com/free-fme-licenses/</p> |
|--|---|---|

| | | |
|-------|---|---|
| 2D/3D | <p>31.1) Is it possible to view the model in 3D?</p> | <p>Yes</p> |
| | <p>31.2) short comments to the previous question (optional)</p> | <p>As mentioned above, it is possible to view in 3D using FME Data Inspector. In general, the machine used should have 16GB RAM and a dedicated video card. However, given the size of the Uptown.ifc, the model takes some time to load directly in Data Inspector and can encounter delays when zooming or changing display modes. Because of this we found better performance when using an FME workspace created in FME Workbench to convert the IFC to FME FFS file and then use Data Inspector to display that.</p> |
| | <p>32.1) Is it possible to view the model in 2D?</p> | <p>Yes</p> |

32.2) short comments to the previous question (optional)

As mentioned above, it is possible to view in 3D using FME Data Inspector. In general, the machine used should have 16GB RAM and a dedicated video card. However, given the size of the Uptown.ifc, the model takes some time to load directly in Data Inspector and can encounter delays when zooming or changing display modes. Because of this we found better performance when using an FME workspace created in FME Workbench to convert the IFC to FME FFS file and then use Data Inspector to display that.

2D display works ok. Background map only visible in 2D. Also, we needed to flip to 2D mode to run the filter queries.

34.1) Is it possible to query the model and the attributes?

The answers are the same I gave during the test with Myran.ifc

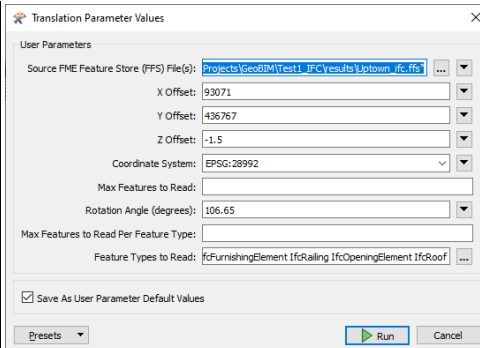
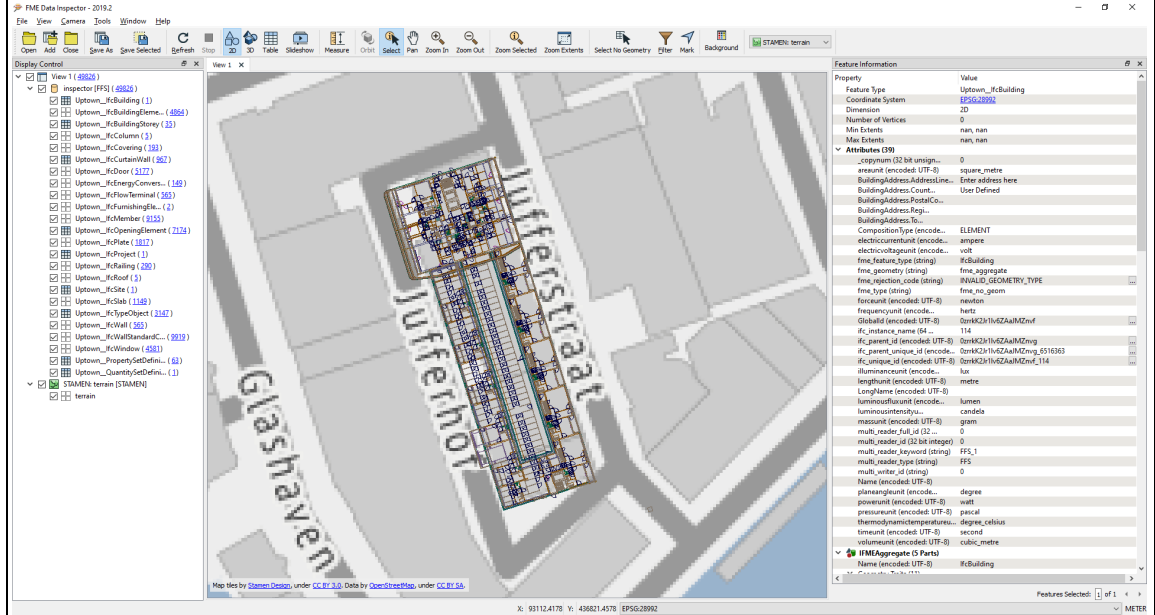


Fig 1. Adjusted X,Y Offsets to improve georeferencing relative to Stamen background map (OSM).



34.1.2) Attach screenshots

Querying

Fig 2. Display of UpTown.ifc in Data Inspector using 2D view mode showing georeferencing relative to Stamen background map (IfcBuilding attributes).

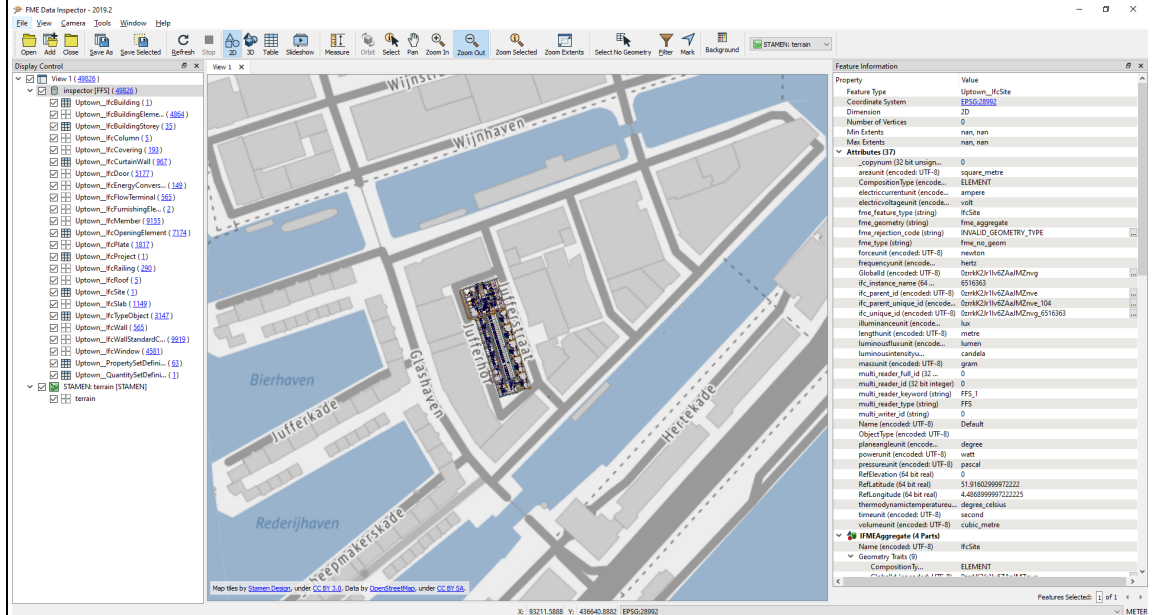


Fig 3. Display of UpTown.ifc in Data Inspector using 2D view mode showing georeferencing relative to Stamen background map – zoomed out (IfcSite attributes).

34.2) short comments to the previous question (optional)

Georeferencing relative to background maps - this was adjusted for viewing purposes. OSM is like based on web mercator and thus not necessarily very accurate in terms of real world coordinates.

You arrived at the end of the phase 1: "Import and manage the file in the software". Now choose:

The software has also export abilities to IFC

36) How long does it take for the data to be exported to IFC?

1-5 minutes

Export

36.1) Comments to the previous question (optional)

UpTown.ifc to UpTown_fme.ifc translation completed in 1 minute and 3 seconds. Translation completed without any errors. There were a number of warnings related to inappropriate geometry type. For example: "WARN |IFC: Unable to write a geometry of type 'IFMEArc' with representation identifier 'Body'
WARN |IFC: Unable to write a geometry of type 'IFMELine' with representation identifier 'Body'" Most likely these feature types should be either multi-surface or solids not lines or arcs. FME could use transformers to detect and correct these problems. It may be that the geometry name = 'Bday' is incorrect for this feature type and this should be changed to something else that does allow for lines such as 'Annotation' or 'Footprint'. Full translation logs, FME workspaces and Uptown_fme.ifc export will be sent in a separate email.

Allplan 2020 - Windows 10 Home

Proprietary software

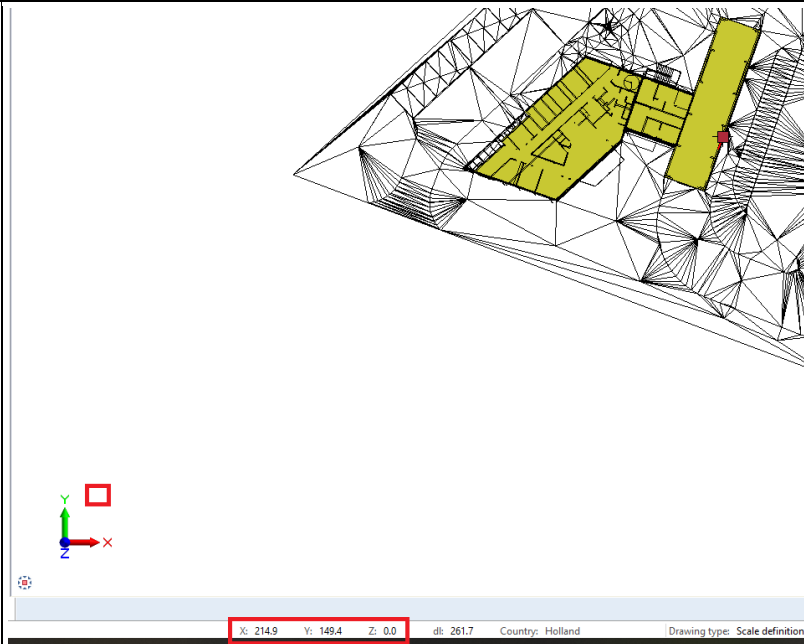
BIM

Level of tester expertise: 1 - Very beginner user (it is nearly the first time you use it)

Allplan

| | | | | | | | |
|---|--|---------------------------|---|-----------------------------------|---------------------------|---|-----------------------|
| Software | Software Name [version] | Allplan [2020] | | Software house | /- | | |
| | Proprietary or open source software? | | | Kind of software | | | |
| proprietary | | | BIM | | | | |
| Computer | Model and year | Operating system | CPU | GPU | Memory (RAM) | Hard drive capacity | Hard drive free space |
| | self-built desktop (2013) | Windows 10 Home 64-bit | Intel i5-4570 @ 3.20GHz | AMD Radeon HD 7800 Series | 8 GB | 120 GB | 20 GB |
| Certification | IFC import certification status | Import certification date | Import certification program | IFC export certification status | Export certification date | Export certification program | |
| | certified in (date) | 2014-05-07 | buildingSMART International IFC Certification 2.0 | certified in (date) | 2013-04-16 | buildingSMART International IFC Certification 2.0 | |
| Test with Myran.ifc | | | | | | | |
| Performance | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | | | 1-5 minutes | | | |
| | How long does it take, approximately, to:Zoom into the model to see more detail | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Pan the model | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Rotate the model | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Query an object | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Inspect the objects linked to the queried one through a relationship | | | less than a minute | | | |
| Please report on any errors the software gives when importing the file. | | | It ignored 14 objects, but does not state which ones these are. | | | | |
| Georeferencing | 2.1) Are the world (projected) coordinates taken into account when locating the model in the software's coordinate reference system? | | | No | | | |
| | 2.1.1) Where is the origin of the model coordinate reference system as imported in the software? | | | (0, 0) (at the reference point) | | | |

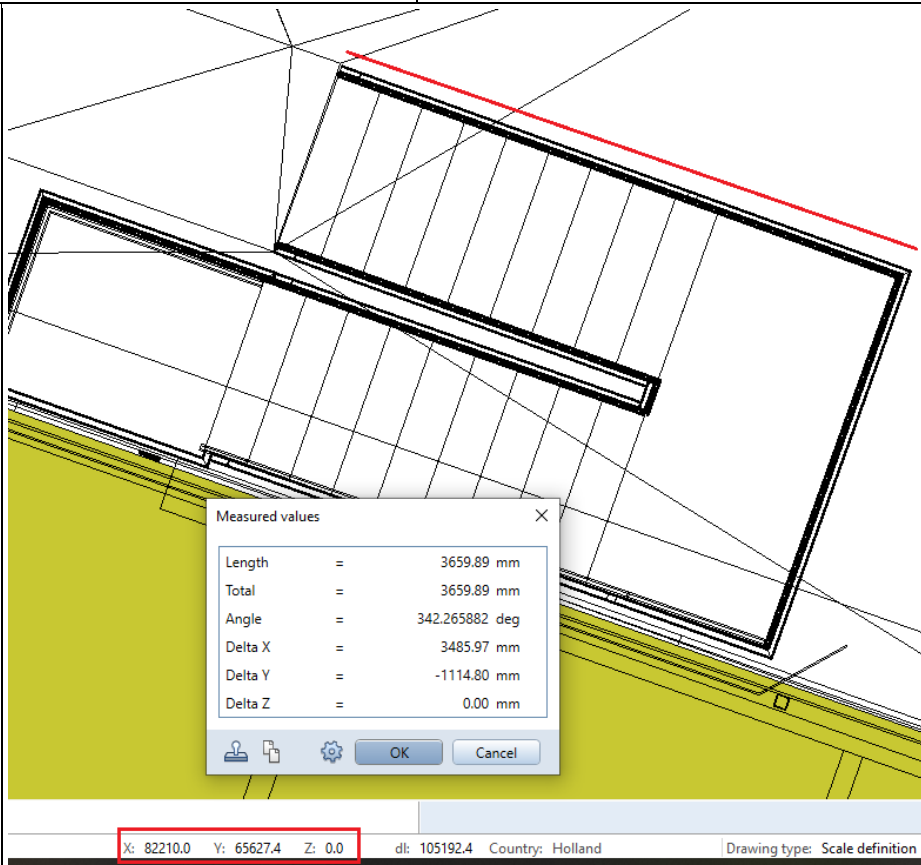
2.1.2) Attach screenshots

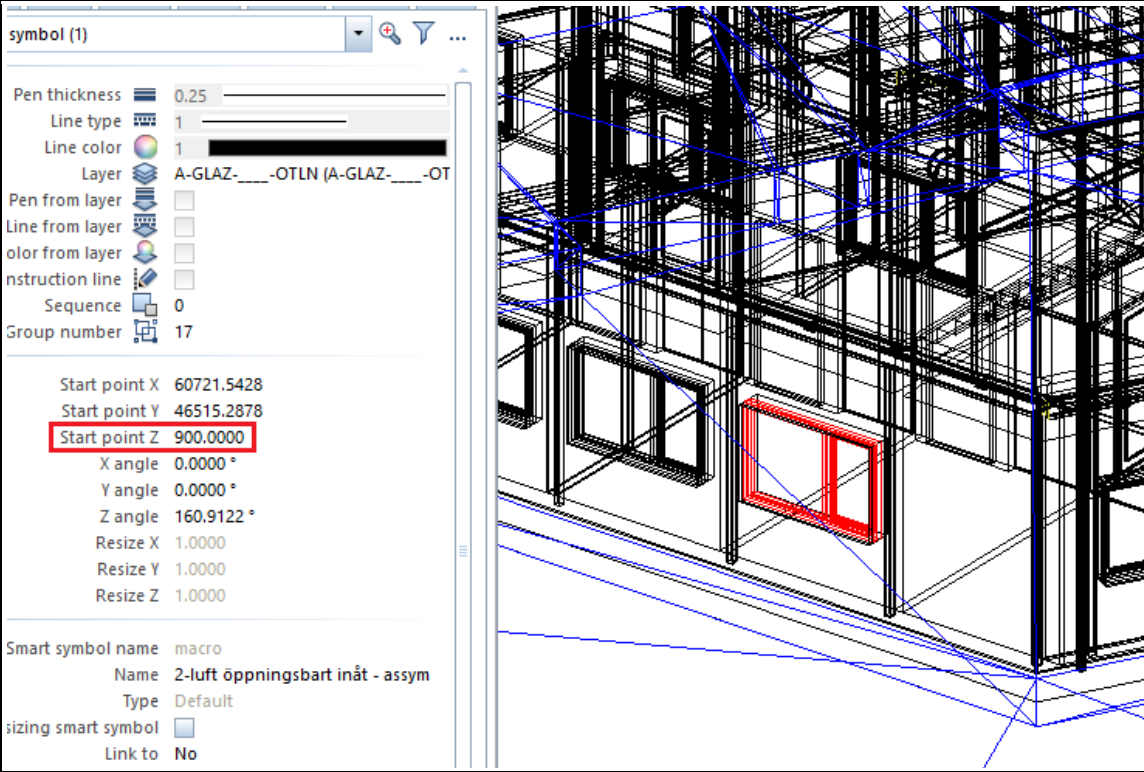


2.1.3) What is the coordinate reference system and projection and what unit of measure is used for the representation?

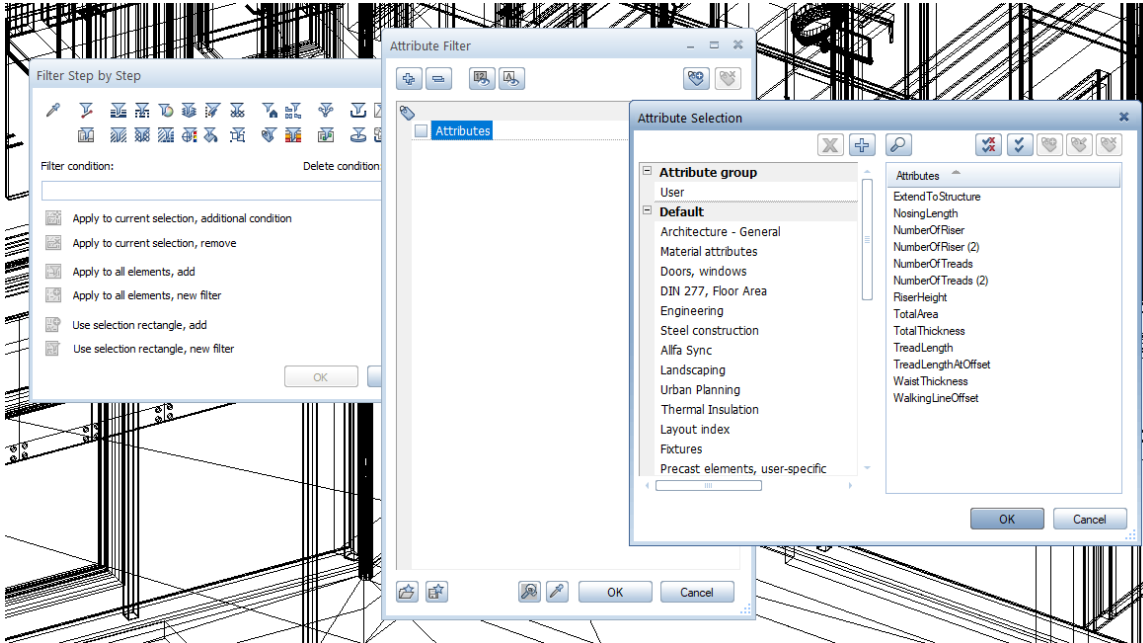
It is a right-handed local coordinate system, and it uses millimetres as unit of measure.

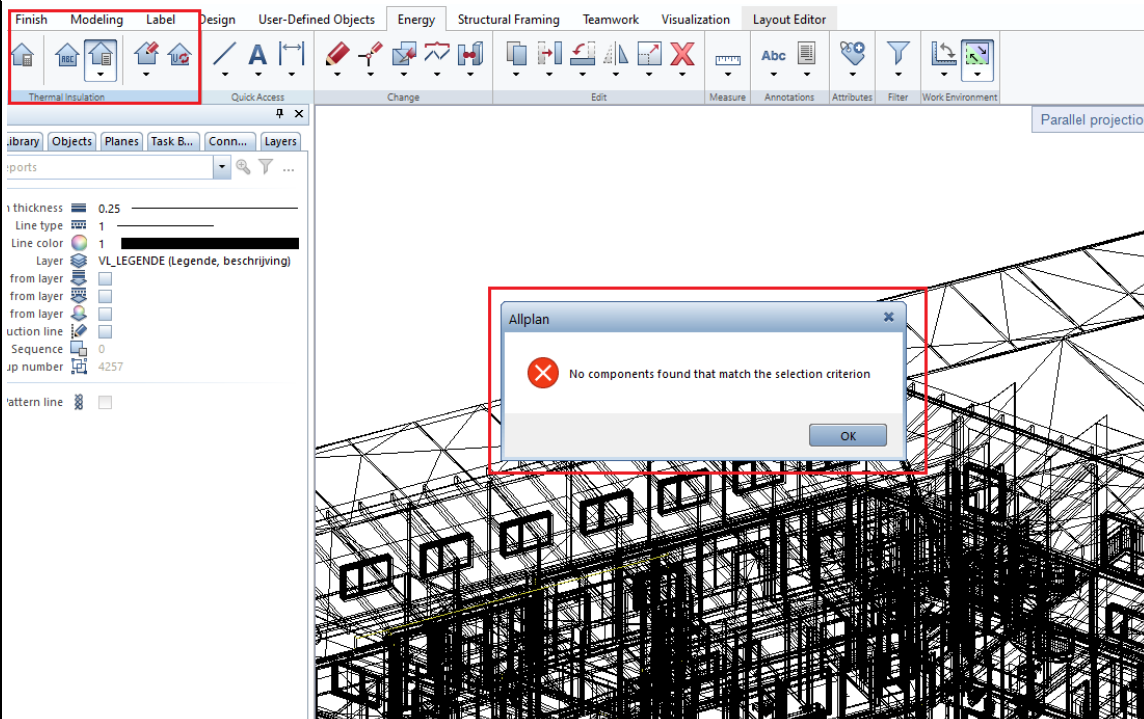
2.1.4) Attach screenshots

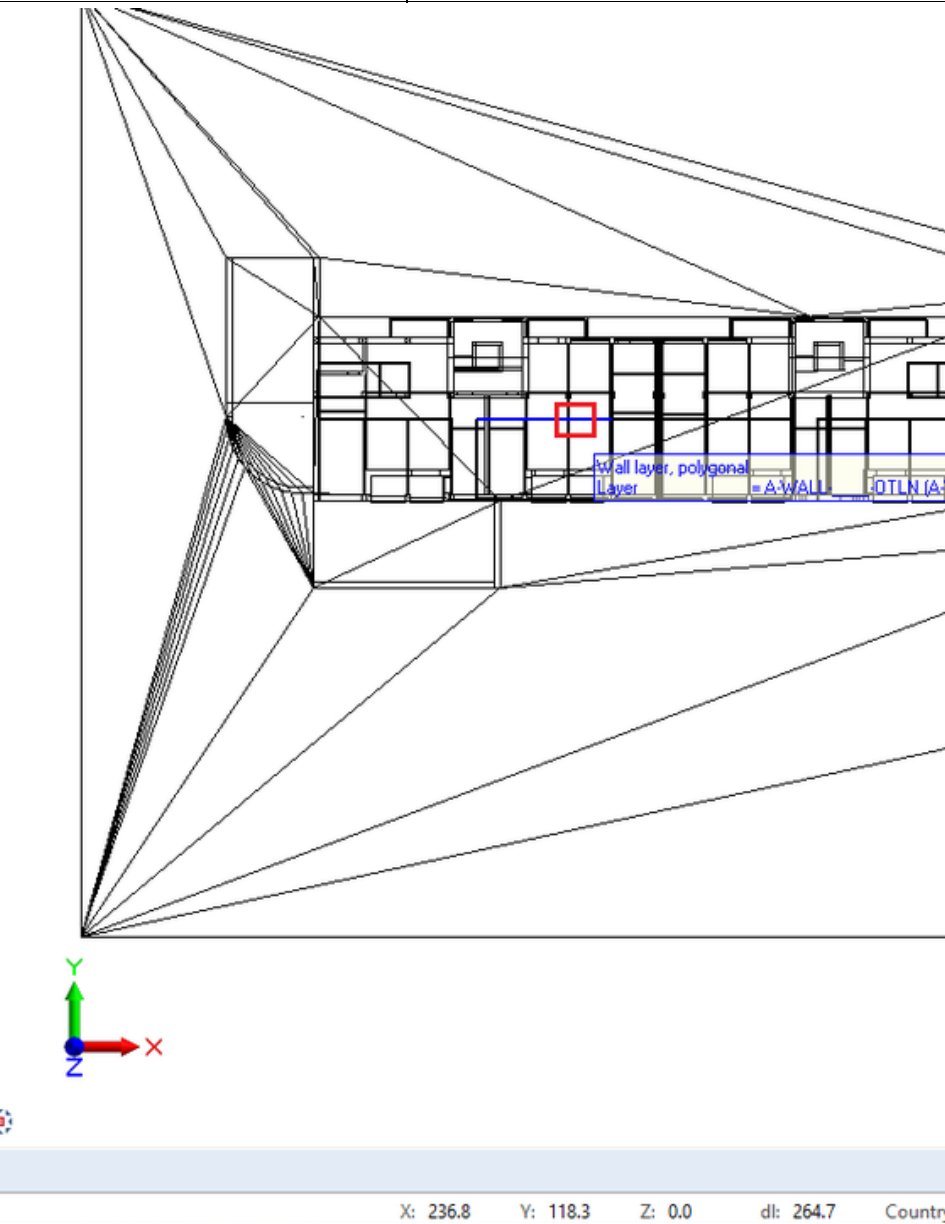


| | | |
|-----------------|--|--|
| Height | 3.1) Are the "real-world" elevation values (heights) considered when locating the model in the software (z)? | No |
| | 3.1.1) What is the elevation value of the origin of the model coordinate reference system as imported in the software? | 0 |
| | 3.1.2) Attach screenshots |  |
| | 3.1.3) What is the height reference system? | Local, starting at 0 |
| | 3.1.4) Attach screenshots | See screenshot from 3.1.2 |
| Orient | 4.1) Is the model oriented correctly with respect to the true North? | Yes |
| Proportions | 5.1) Does the model maintain its correct dimensions and proportions? | Yes |
| IFC definitions | 6.1) Is the eventual translation consistent with the IFC definitions? | Partially |
| | 6.2) short comments to the previous question (optional) | For some elements yes (for example element 2, the IfcRailing), others are "user defined architecture elements" |
| Hierarchy | 7.1) Are the hierarchical relationships consistent with the IFC hierarchy? | The software does not have the necessary tools to determine this information |
| Attributes | 8.1) Are the attributes present in the IFC entities retained and consistent? | Yes |
| Relationships | 9.1) Are the relationships between the objects retained? | The software does not have the necessary tools to determine this information |
| Geometry | 10.1) Is geometry read correctly? | Yes |
| | 10.2) short comments to the previous question (optional) | The geometry types can't be seen, but objects are not grouped nor broken. |

| | | |
|----------------------------|--|---|
| Normals | 11.1) Did the normals change? | The software does not have the necessary tools for checking it |
| | 11.2) short comments to the previous question (optional) | Can only see 3D wireframe, so no face colours to visually check. |
| 2D/3D | 12.1) Is it possible to view the model in 3D? | Yes |
| | 12.2) short comments to the previous question (optional) | However, only a 3D wireframe. |
| | 13.1) Is it possible to view the model in 2D? | Yes |
| Editing | 14.1) Is it possible to edit the model (attributes, geometry, other)? | Yes |
| | 14.1.1) What editing is possible (attributes, geometry, georeferencing, please add details)? | The attributes can be edited, and the geometry can be modified as well (with the mouse - rotating, moving, resizing). |
| 14.1.2) Attach screenshots | <div> </div> | |

| | | |
|----------|--|--|
| | | |
| Querying | 15.1) Is it possible to query the model and the attributes? | Yes |
| | 15.1.1) What kinds of query are possible? | You can filter on (native) attributes/properties. Not on geometry or Ifc attributes however. |
| | 15.1.2) Attach screenshots |  <p>The screenshot displays two overlapping dialog boxes in the Allplan software interface. The background is a 3D wireframe model of a building's structural frame. The 'Attribute Filter' dialog is in the foreground, showing a 'Filter Step by Step' section with various filter icons and a 'Filter condition' field. Below it are several action buttons like 'Apply to current selection, additional condition'. The 'Attribute Selection' dialog is partially visible behind it, showing a tree view of 'Attribute group' categories such as 'User', 'Default', 'Architecture - General', 'Material attributes', etc., and a list of specific attributes on the right side.</p> |
| Analysis | 16.1) Is it possible to analyse the objects and the model? | Yes, analysis about the modelled building performances (energy, noise, shadows...) are possible (type 2) |
| | 16.1.1) What analysis are possible? Do you know if the results are reliable? | It's possible to do an analysis on thermal insulation. It however does not work on the dataset, nor are there clear instructions on how to do it. |

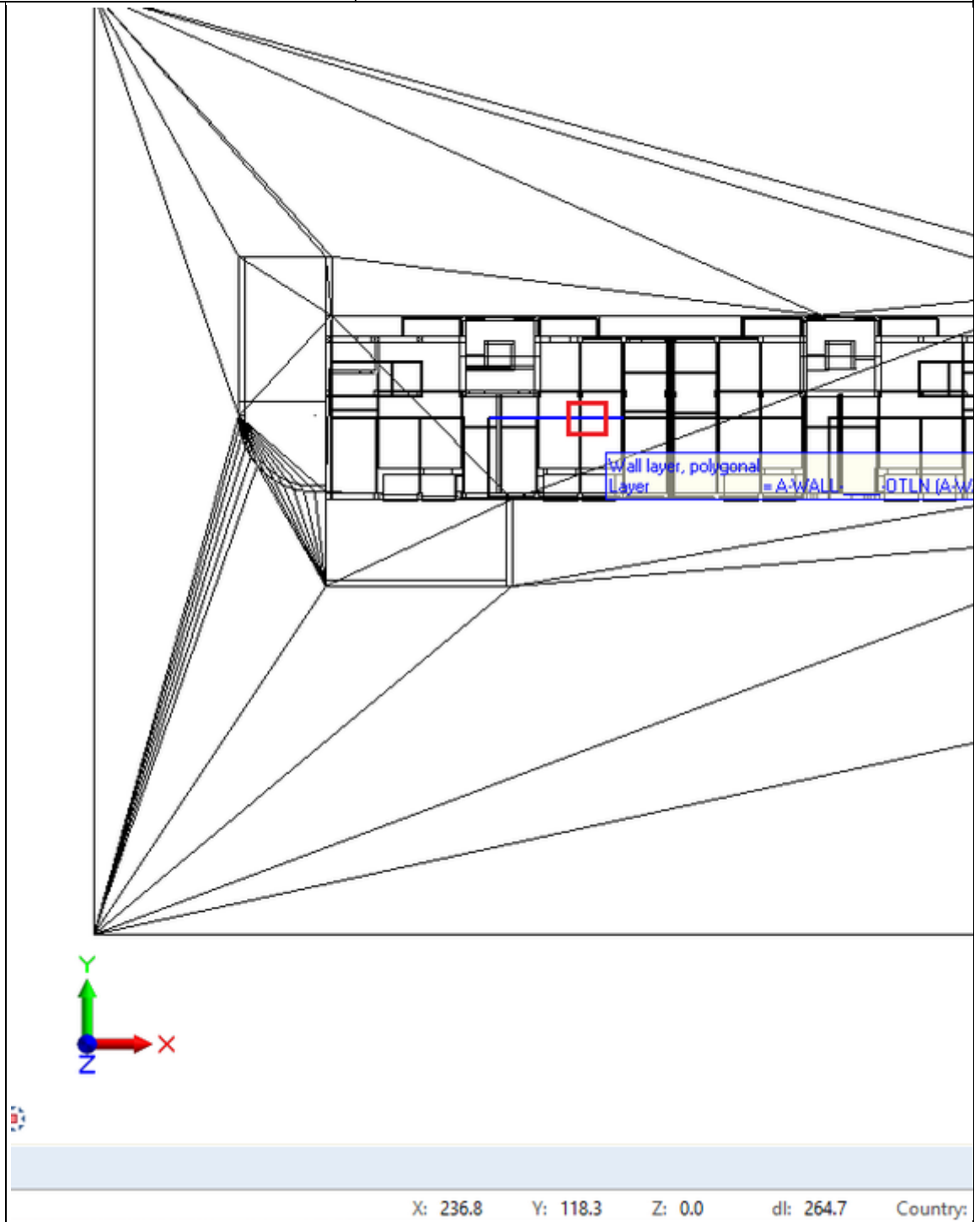
| | | |
|--|---|--|
| | <p>16.1.2) Attach screenshots</p> |  |
| | <p>16.1.3) Time required to perform the analysis about the model itself (type 1)</p> | <p>No analysis of type 1 are possible</p> |
| | <p>16.1.3) Time required to perform the analysis about the model performances (type2)</p> | <p>it crashes without completing the operation</p> |
| <p>Export</p> | <p>You arrived at the end of the phase 1: "Import and manage the file in the software".Now choose:</p> | <p>The software has also export abilities to IFC</p> |
| | <p>17.1) Are any pre-processing or setting changes needed in the software to enable a consistent export?</p> | <p>No</p> |
| | <p>18.1) Is it possible to choose the IFC model view definition (MVD) to be used when exporting the data?</p> | <p>No</p> |
| | <p>19) How long does it take for the data to be exported to IFC?</p> | <p>less than a minute</p> |
| <p>Test with UpTown.ifc</p> | | |
| <p>Performance</p> | <p>How long does it take, approximately, to:Import (and visualise if the software allows it) the model</p> | <p>it crashes without completing the operation</p> |
| <p>Test with Savigliano.ifc</p> | | |
| <p>Performance</p> | <p>How long does it take, approximately, to:Import (and visualise if the software allows it) the model</p> | <p>less than a minute</p> |
| | <p>How long does it take, approximately, to:Zoom into the model to see more detail</p> | <p>it's almost immediate</p> |
| | <p>How long does it take, approximately, to:Pan the model</p> | <p>it's almost immediate</p> |
| | <p>How long does it take, approximately, to:Rotate the model</p> | <p>it's almost immediate</p> |
| | <p>How long does it take, approximately, to:Query an object</p> | <p>it's almost immediate</p> |

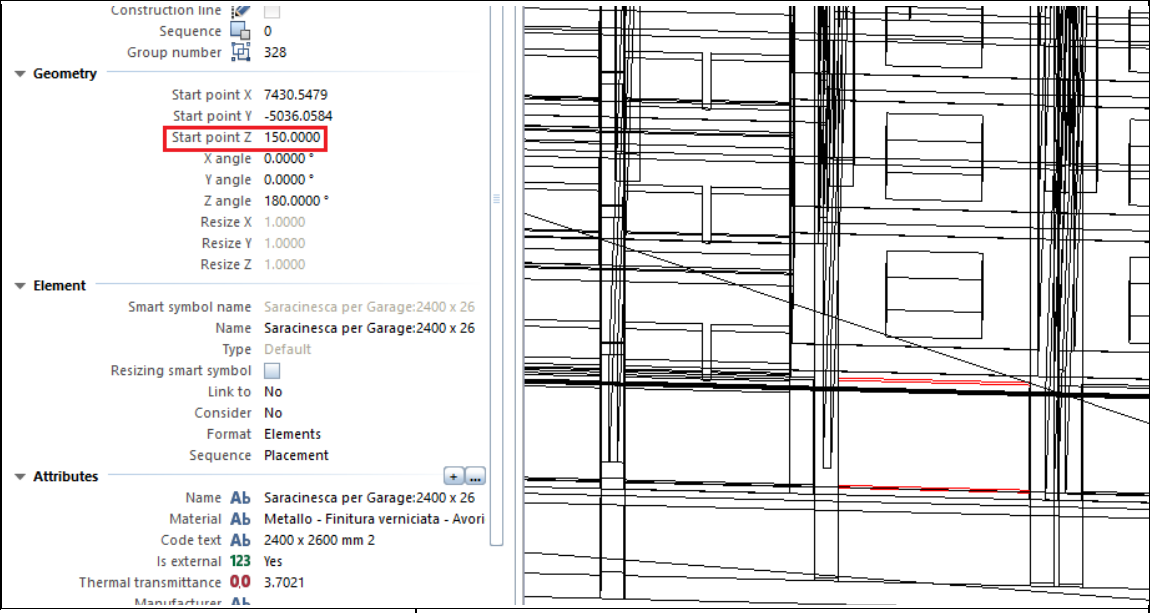
| | | |
|---|--|--|
| | <p>How long does it take, approximately, to:Inspect the objects linked to the queried one through a relationship</p> | <p>the software does not allow this</p> |
| | <p>38) Please report on any errors the software gives when importing the file.</p> | <p>440 elements have been ignored during the import.</p> |
| <p style="writing-mode: vertical-rl; transform: rotate(180deg);">Georeferencing</p> | <p>40.1) Are the world (projected) coordinates taken into account when locating the model in the software's coordinate reference system?</p> | <p>No</p> |
| | <p>40.1.1) Where is the origin of the model coordinate reference system as imported in the software?</p> | <p>(0, 0) (at the reference point)</p> |
| <p>40.1.2) Attach screenshots</p> |  | |

40.1.3) What is the coordinate reference system and projection and what unit of measure is used for the representation?

It is a right-handed local coordinate system, and it uses millimetres as unit of measure.

40.1.4) Attach screenshots



| | | | |
|--|---|--|--|
| Height | 41.1) Are the "real-world" elevation values (heights) considered when locating the model in the software (z)? | | No |
| | 41.1.1) What is the elevation value of the origin of the model coordinate reference system as imported in the software? | | 0 |
| | 41.1.2) Attach screenshots | |  |
| | 41.1.3) What is the height reference system? | | Local, presumably in cm |
| | 41.1.4) Attach screenshots | | See screenshot from 41.1.2 |
| 41.2) short comments to the previous question (optional) | | | Many objects don't show any height attribute |
| Orientation | 42.1) Is the model oriented correctly with respect to the true North? | | Yes |
| | 43.1) Does the model maintain its correct dimensions and proportions? | | Yes |
| Proportions | Other | Other problems | |
| | 44.2) short comments to the previous question (optional) | Most elements couldn't be found, possibly due to the import error. Only element 4 was there, but it didn't properly show its lfc type. | |
| Hierarchy | 45.1) Are the hierarchical relationships consistent with the IFC hierarchy? | | The software does not have the necessary tools to determine this information |
| | 46.1) Are the attributes present in the IFC entities retained and consistent? | | Yes |
| Attributes | 46.2) short comments to the previous question (optional) | | While most elements of the data description can not be found (probably due to the import errors), element 4 has the correct properties, and other elements seem to have retained them as well. |
| | 47.1) Are the relationships between the objects retained? | | The software does not have the necessary tools to determine this information |
| Geometry | 48.1) Is geometry read correctly? | | Yes |
| | 48.2) short comments to the previous question (optional) | | The geometry types can't be seen, but objects are not grouped nor broken. |

| | | |
|---------|---|--|
| Normals | 49.1) Did the normals change? | The software does not have the necessary tools for checking it |
| | 49.2) short comments to the previous question (optional) | Can only see 3D wireframe, so no face colours to visually check. |
| 2D/3D | 50.1) Is it possible to view the model in 3D? | Yes |
| | 51.1) Is it possible to view the model in 2D? | Yes |
| Export | You arrived at the end of the phase 1: "Import and manage the file in the software".Now choose: | The software has also export abilities to IFC |
| | 55) How long does it take for the data to be exported to IFC? | less than a minute |

55.2) Attach screenshots (optional)

Log file

```

-----
Elements ignored                : 0
-----

Invalid object sub types

2200 x 2600 mm [1]
  Saracinesca per Garage:2200 x 26 [OMS25cLFPEXOnUDO$#hvVY]

2250 x 2450 mm [13]
  Saracinesca per Garage:2250 x 24 [1iIrRFGVP0DxrDb16ZYtPk]
  Saracinesca per Garage:2250 x 24 [OMS25cLFPEXOnUDO$#hvLZ]
  Saracinesca per Garage:2250 x 24 [OMS25cLFPEXOnUDO$#hvL9]
  Saracinesca per Garage:2250 x 24 [OMS25cLFPEXOnUDO$#hukz]
  Saracinesca per Garage:2250 x 24 [OMS25cLFPEXOnUDO$#hv5N]
  Saracinesca per Garage:2250 x 24 [OMS25cLFPEXOnUDO$#hv5G]
  Saracinesca per Garage:2250 x 24 [OMS25cLFPEXOnUDO$#hv5H]
  Saracinesca per Garage:2250 x 24 [OMS25cLFPEXOnUDO$#hus$]
  Saracinesca per Garage:2250 x 24 [OMS25cLFPEXOnUDO$#hu$f]
  Saracinesca per Garage:2250 x 24 [OMS25cLFPEXOnUDO$#hvSg]
  Saracinesca per Garage:2250 x 24 [OMS25cLFPEXOnUDO$#huqt]
  Saracinesca per Garage:2250 x 24 [37$ovpWBf1yFWIZkKpwNeZ]
  Saracinesca per Garage:2250 x 24 [OMS25cLFPEXOnUDO$#hurk]

2370 x 2600 mm [7]
  Saracinesca per Garage:2370 x 26 [3MdNo6_qL5wuxMVyJZPL1n]
  Saracinesca per Garage:2370 x 26 [3MdNo6_qL5wuxMVyJZPLSv]
  Saracinesca per Garage:2370 x 26 [2sBCw_3yz1J9yQE9WPW97r]
  Saracinesca per Garage:2370 x 26 [2sBCw_3yz1J9yQE9WPW97U]
  Saracinesca per Garage:2370 x 26 [OMS25cLFPEXOnUDO$#hvS1]
  Saracinesca per Garage:2370 x 26 [2sBCw_3yz1J9yQE9WPW93L]
  Saracinesca per Garage:2370 x 26 [2sBCw_3yz1J9yQE9WPW93K]

2400 x 2600 mm 2 [4]
  Saracinesca per Garage:2400 x 26 [2sBCw_3yz1J9yQE9WPW8zM]
  Saracinesca per Garage:2400 x 26 [2sBCw_3yz1J9yQE9WPW89M]
  Saracinesca per Garage:2400 x 26 [2sBCw_3yz1J9yQE9WPW94i]
  Saracinesca per Garage:2400 x 26 [2sBCw_3yz1J9yQE9WPW92G]

2600 x 2600 mm [2]
  Saracinesca per Garage:2600 x 26 [OMS25cLFPEXOnUDO$#huoU]
  Saracinesca per Garage:2600 x 26 [OMS25cLFPEXOnUDO$#hutf]

2700 x 2600 mm [2]
  Saracinesca per Garage:2700 x 26 [2sBCw_3yz1J9yQE9WPW8PB]
  Saracinesca per Garage:2700 x 26 [OMS25cLFPEXOnUDO$#hutm]

30x30 cm [4]
  Pilaastro in calcestruzzo - Retta [2WQOWLIjP5JuNDWV$zMDL8]
  Pilaastro in calcestruzzo - Retta [2WQOWLIjP5JuNDWV$zMDKy]
  Pilaastro in calcestruzzo - Retta [2WQOWLIjP5JuNDWV$zMDKj]
  Pilaastro in calcestruzzo - Retta [2WQOWLIjP5JuNDWV$zM2Lh]

30x40 cm [11]
  Pilaastro in calcestruzzo - Retta [2WQOWLIjP5JuNDWV$zMDKc]
  Pilaastro in calcestruzzo - Retta [2WQOWLIjP5JuNDWV$zMDKW]
  Pilaastro in calcestruzzo - Retta [2WQOWLIjP5JuNDWV$zMDKY]
  Pilaastro in calcestruzzo - Retta [2WQOWLIjP5JuNDWV$zMDKi]
  Pilaastro in calcestruzzo - Retta [2WQOWLIjP5JuNDWV$zMDKk]
  Pilaastro in calcestruzzo - Retta [2WQOWLIjP5JuNDWV$zMDWt]
  Pilaastro in calcestruzzo - Retta [2WQOWLIjP5JuNDWV$zM2tq]
  Pilaastro in calcestruzzo - Retta [2WQOWLIjP5JuNDWV$zM2ts]
  Pilaastro in calcestruzzo - Retta [2WQOWLIjP5JuNDWV$zM2tm]
  Pilaastro in calcestruzzo - Retta [2WQOWLIjP5JuNDWV$zM2to]
  Pilaastro in calcestruzzo - Retta [2WQOWLIjP5JuNDWV$zM2ty]

30x40 cm 2 [10]
  Pilaastro in calcestruzzo - Retta [2WQOWLIjP5JuNDWV$zM2tG]
  Pilaastro in calcestruzzo - Retta [2WQOWLIjP5JuNDWV$zM2tM]
    
```

Allplan 2020 - Windows 10 Home

Proprietary software

BIM

Level of tester expertise: 1 - Very beginner user (it is nearly the first time you use it)

AutoCAD Architecture 2020 - Windows 10 Home

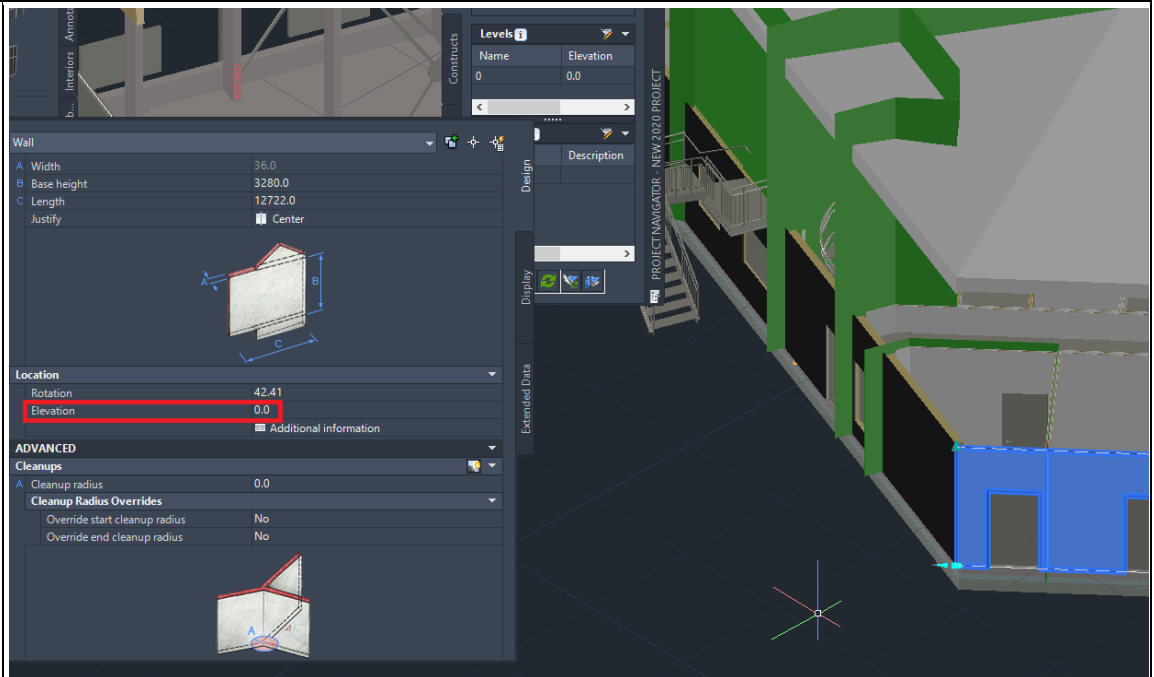
Proprietary software

CAD

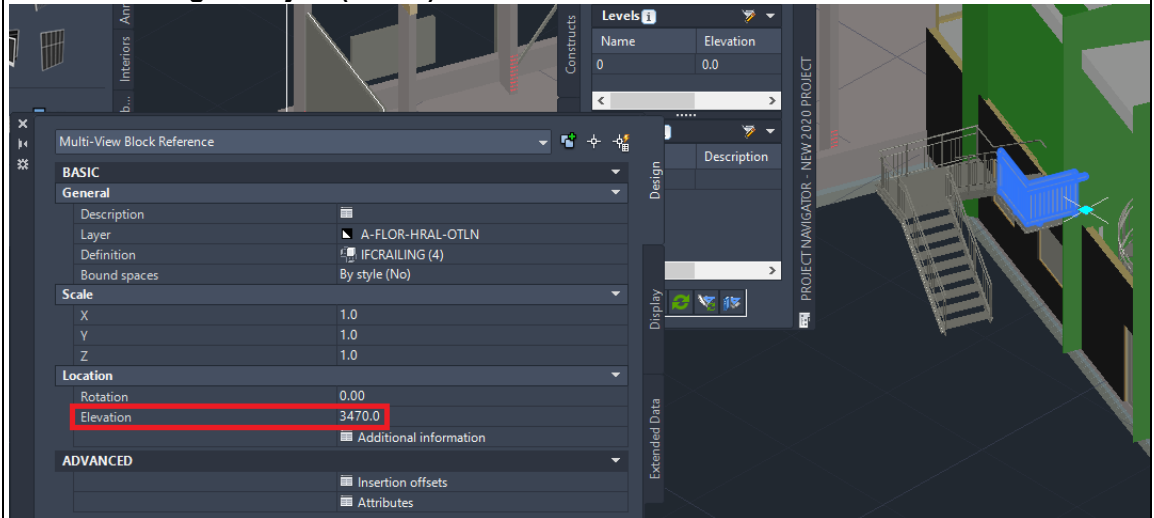
Level of tester expertise: 1 - Very beginner user (it is nearly the first time you use it)

AutoCAD Architecture

| | | | | | | | |
|---|--|----------------------------|----------------------------------|---------------------------------|---------------------------|---|-----------------------|
| Software | Software Name [version] | Architecture [2020] | | Software house | AutoCAD | | |
| | Proprietary or open source software? | | | Kind of software | | | |
| proprietary | | | CAD | | | | |
| Computer | Model and year | Operating system | CPU | GPU | Memory (RAM) | Hard drive capacity | Hard drive free space |
| | self-built desktop (2013) | Windows 10 Home 64-bit | Intel i5-4570 @ 3.20GHz | AMD Radeon HD 7800 Series | 8 GB | 120 GB | 20 GB |
| Certification | IFC import certification status | Import certification date | Import certification program | IFC export certification status | Export certification date | Export certification program | |
| | not certified | | | certified in (date) | 2015-02-24 | buildingSMART International IFC Certification 2.0 | |
| Test with Myran.ifc | | | | | | | |
| Performance | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | | | 1-5 minutes | | | |
| | How long does it take, approximately, to:Zoom into the model to see more detail | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Pan the model | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Rotate the model | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Query an object | | | less than a minute | | | |
| How long does it take, approximately, to:Inspect the objects linked to the queried one through a relationship | | | the software does not allow this | | | | |
| Georeferencing | 2.1) Are the world (projected) coordinates taken into account when locating the model in the software's coordinate reference system? | | | Yes | | | |
| Height | 3.1) Are the "real-world" elevation values (heights) considered when locating the model in the software (z)? | | | No | | | |
| | 3.1.1) What is the elevation value of the origin of the model coordinate reference system as imported in the software? | | | 0 | | | |
| | 3.1.2) Attach screenshots | | Elevation origin | | | | |

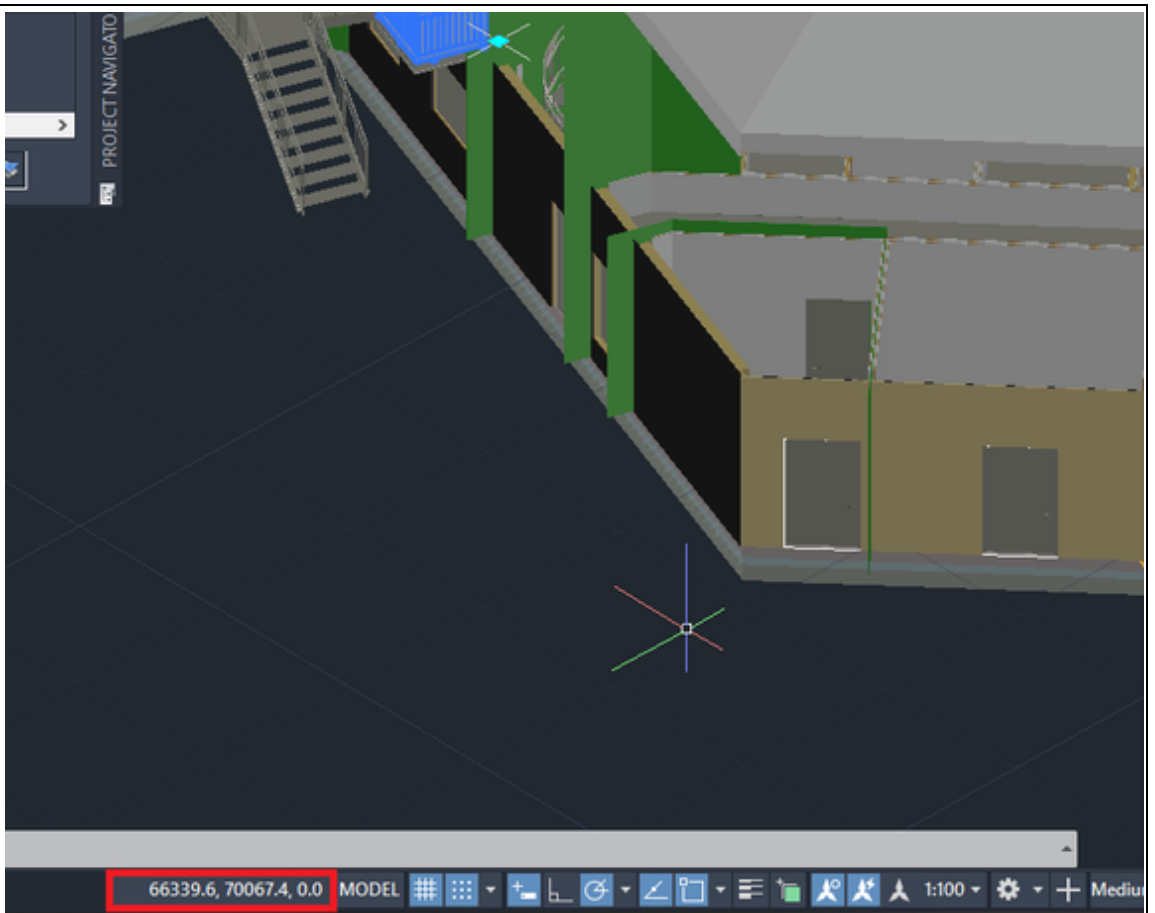


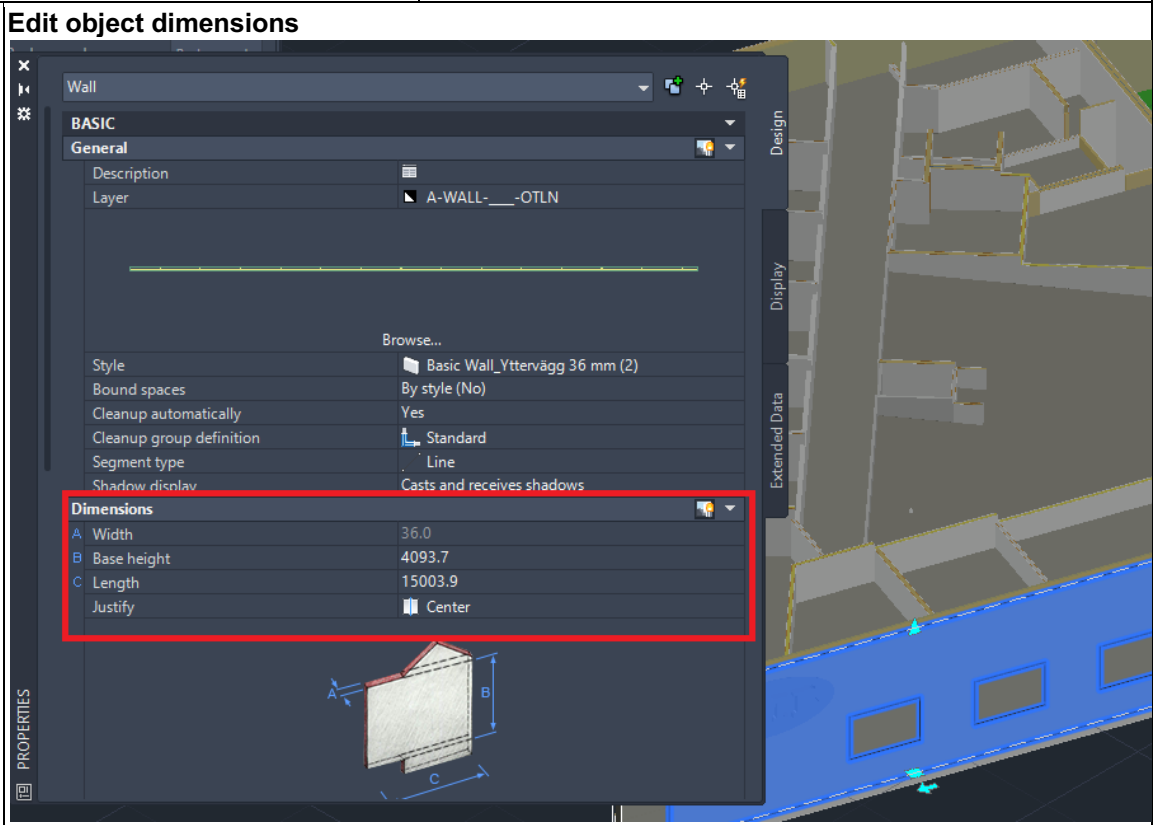
Elevation of higher object (in mm)

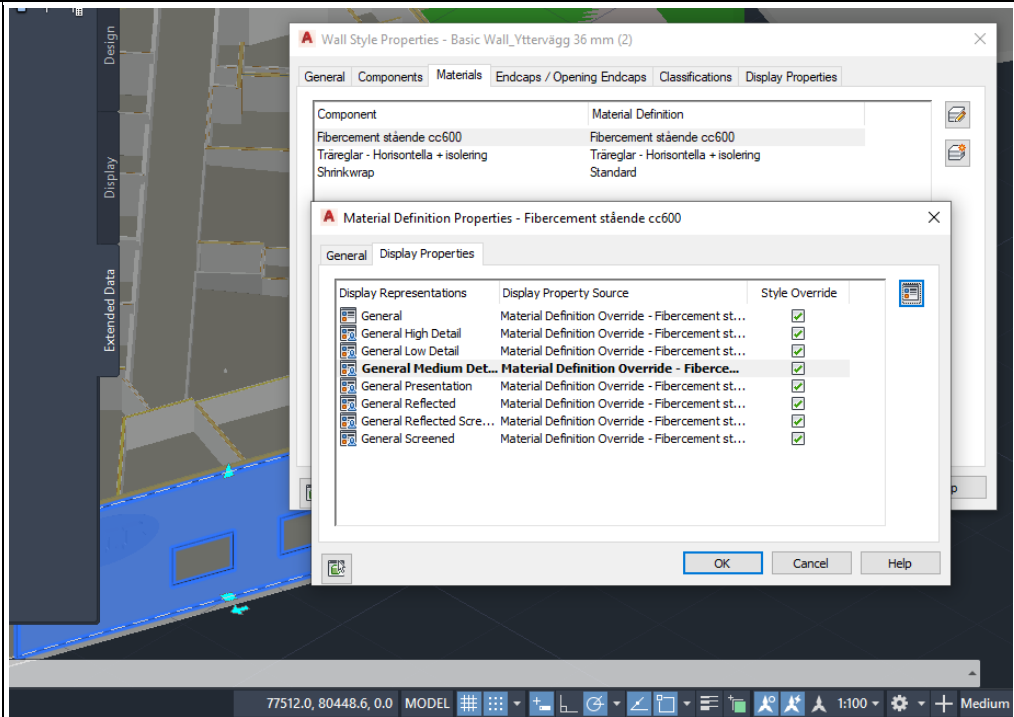


3.1.3) What is the height reference system?

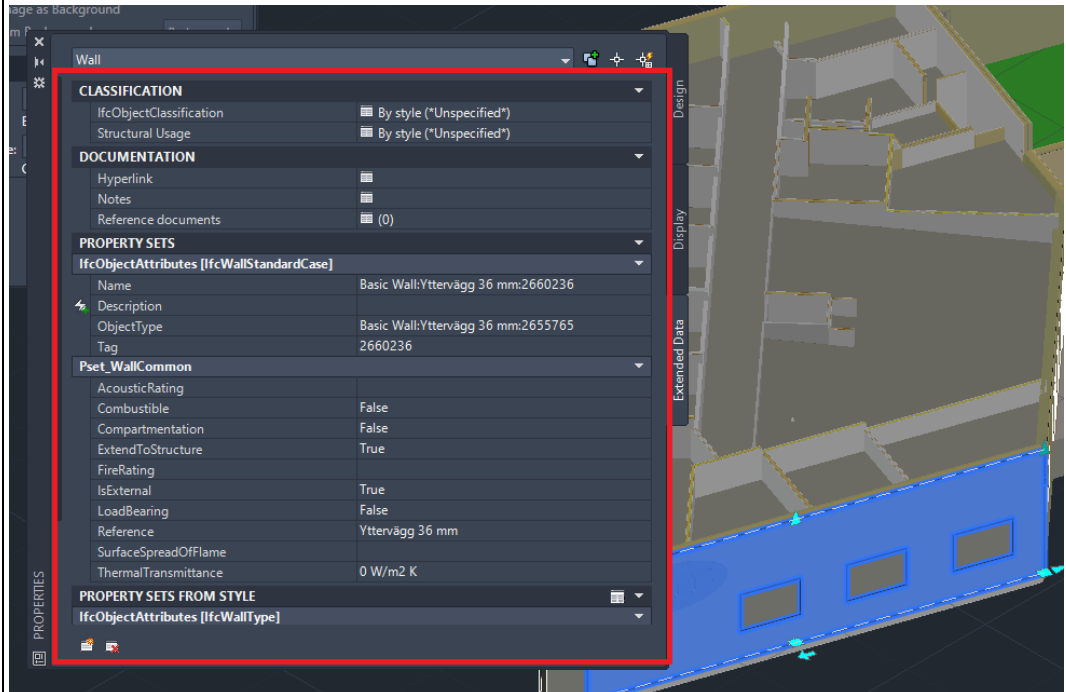
Local

| | | |
|------------------------|---|---|
| | <p>3.1.4) Attach screenshots</p> |  |
| <p>Orientation</p> | <p>4.1) Is the model oriented correctly with respect to the true North?</p> | <p>Yes</p> |
| | <p>4.2) short comments to the previous question (optional)</p> | <p>The angle is 48 degrees, similarly to to example on the data page.</p> |
| <p>Proportions</p> | <p>5.1) Does the model maintain its correct dimensions and proportions?</p> | <p>Yes</p> |
| <p>IFC definitions</p> | <p>6.1) Is the eventual translation consistent with the IFC definitions?</p> | <p>Yes</p> |
| | <p>6.2) short comments to the previous question (optional)</p> | <p>Despite there not being any errors during the import, not all elements shown on the data page are present.</p> |
| <p>Hierarchy</p> | <p>7.1) Are the hierarchical relationships consistent with the IFC hierarchy?</p> | <p>The software does not have the necessary tools to determine this information</p> |
| <p>Attributes</p> | <p>8.1) Are the attributes present in the IFC entities retained and consistent?</p> | <p>Yes</p> |
| | <p>8.2) short comments to the previous question (optional)</p> | <p>The attributes are included in "Extended Data" in the object popup.</p> |
| <p>Relationships</p> | <p>9.1) Are the relationships between the objects retained?</p> | <p>The software does not have the necessary tools to determine this information</p> |
| <p>Geometry</p> | <p>10.1) Is geometry read correctly?</p> | <p>The software does not have the necessary tools to determine this information</p> |

| | | |
|---------|--|--|
| | 10.2) short comments to the previous question (optional) | Objects are not grouped nor broken, but the geometry types can't be viewed. |
| Normal | 11.1) Did the normals change? | The software does not have the necessary tools for checking it |
| 2D/3D | 12.1) Is it possible to view the model in 3D? | Yes |
| | 12.2) short comments to the previous question (optional) | View -> under Appearance, click SW Isometric -> under Visual Styles, click for example Realistic |
| | 13.1) Is it possible to view the model in 2D? | Yes |
| Editing | 14.1) Is it possible to edit the model (attributes, geometry, other)? | Yes |
| | 14.1.1) What editing is possible (attributes, geometry, georeferencing, please add details)? | The attributes, geometry (both change dimensions and move), style (e.g. material). Georeferencing can NOT be changed. |
| | 14.1.2) Attach screenshots |  <p>Edit object dimensions</p> <p>Wall</p> <p>BASIC</p> <p>General</p> <p>Description</p> <p>Layer A-WALL-___-OTLN</p> <p>Style Basic Wall_Yttervägg 36 mm (2)</p> <p>Bound spaces By style (No)</p> <p>Cleanup automatically Yes</p> <p>Cleanup group definition Standard</p> <p>Segment type Line</p> <p>Shadow display Casts and receives shadows</p> <p>Dimensions</p> <p>A Width 36.0</p> <p>B Base height 4093.7</p> <p>C Length 15003.9</p> <p>Justify Center</p> <p>Edit style (material)</p> |

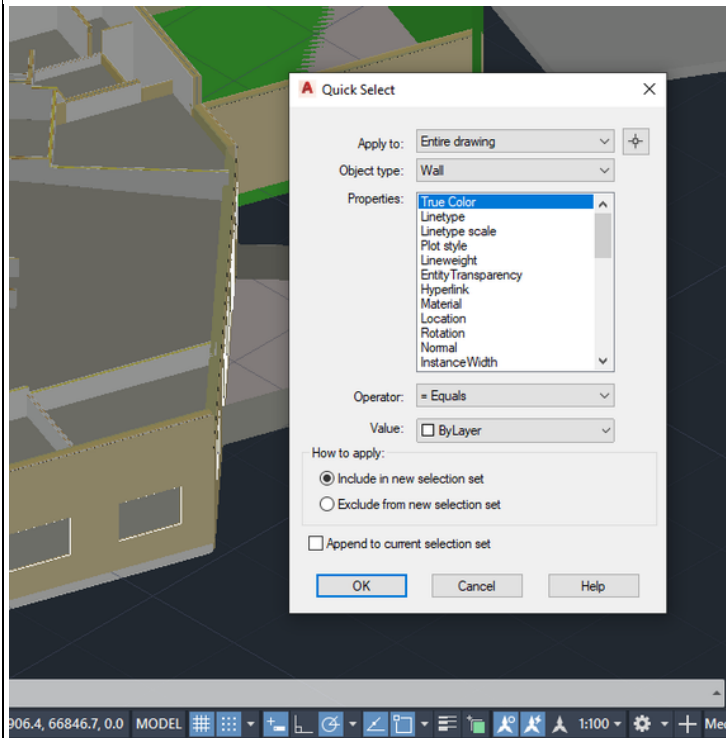


Edit attributes



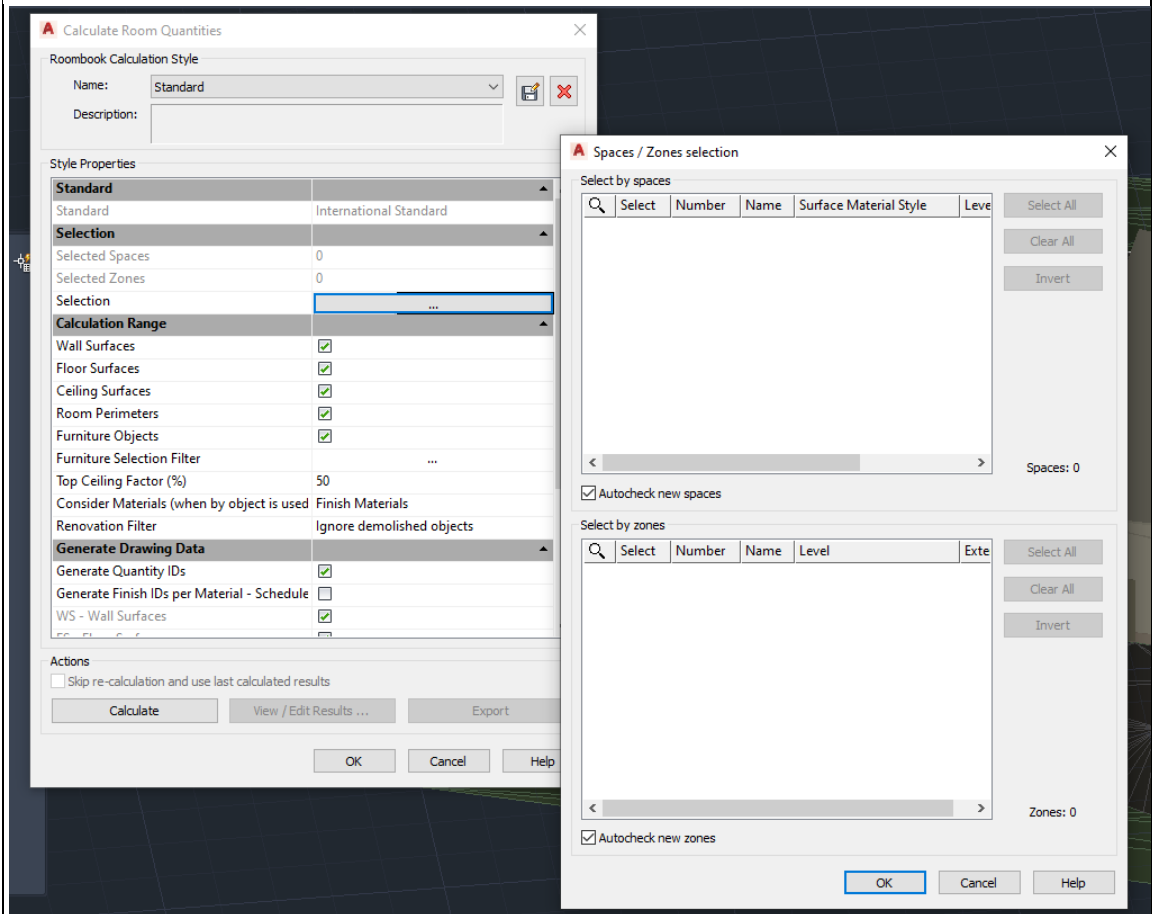
| | | |
|--------------|---|---|
| Queryin g | 15.1) Is it possible to query the model and the attributes? | Yes |
| | 15.1.1) What kinds of query are possible? | You can do selection on properties that are native to the software (such as material, layer, style), but not specific IFC attributes. You can also query objects on geometries and locations. |

15.1.2) Attach screenshots

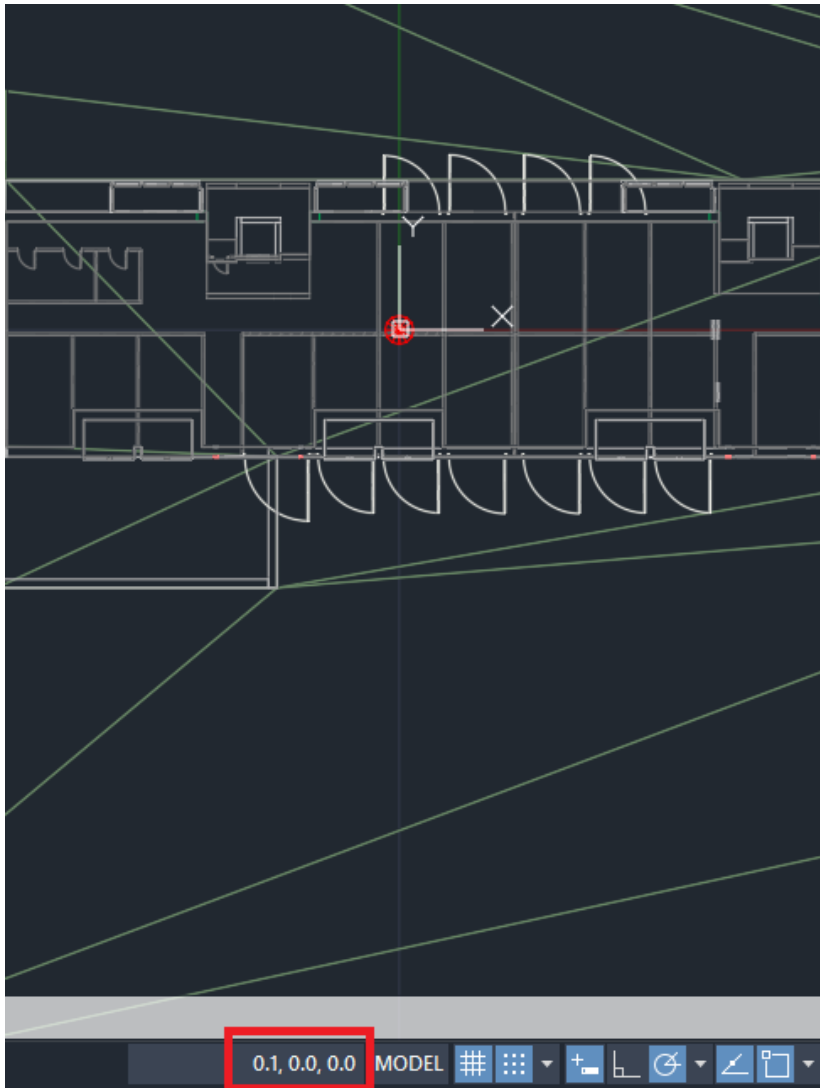


| | | |
|----------|--|--|
| Analysis | 16.1) Is it possible to analyse the objects and the model? | No |
| | 16.1.1) What analysis are possible? Do you know if the results are reliable? | You should be able to do a Room Quantities analysis, however it can't be performed because there are no spaces/zones to be selected. |

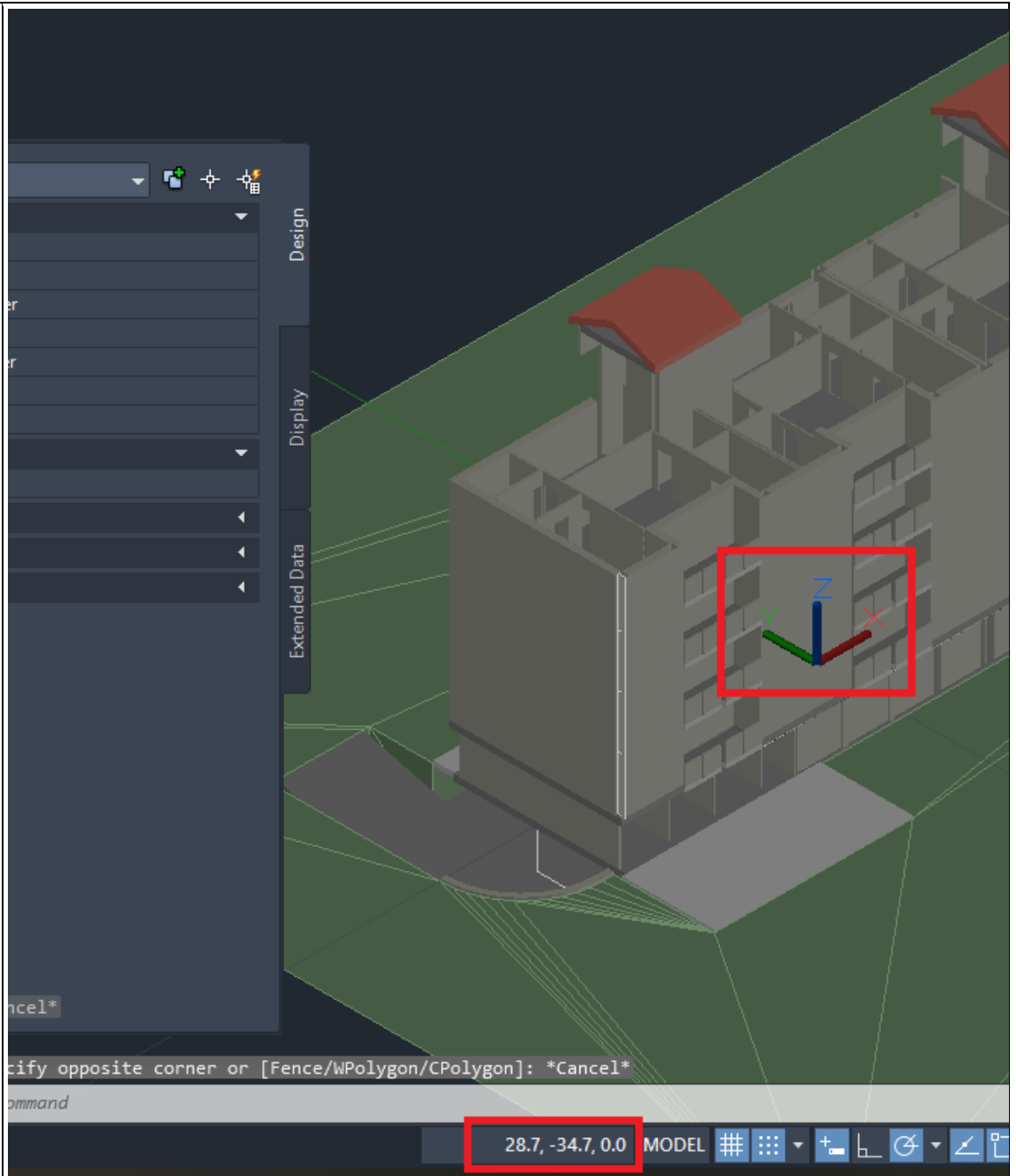
16.1.2) Attach screenshots



| | | |
|---------------------------------|--|--|
| | 16.1.3) Time required to perform the analysis about the model itself (type 1) | No analysis of type 1 are possible |
| | 16.1.3) Time required to perform the analysis about the model performances (type2) | No analysis of type 2 are possible |
| Export | You arrived at the end of the phase 1: "Import and manage the file in the software".Now choose: | The software has also export abilities to IFC |
| | 17.1) Are any pre-processing or setting changes needed in the software to enable a consistent export? | No |
| | 18.1) Is it possible to choose the IFC model view definition (MVD) to be used when exporting the data? | No |
| | 18.2) short comments to the previous question (optional) | It will automatically use the CoordinationView_V2.0 view definition. |
| | 19) How long does it take for the data to be exported to IFC? | less than a minute |
| Test with UpTown.ifc | | |
| Perf orm | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | it crashes without completing the operation |
| Test with Savigliano.ifc | | |
| Perf orm | How long does it take, approximately, to:Zoom into the model to see more detail | 1-5 minutes |

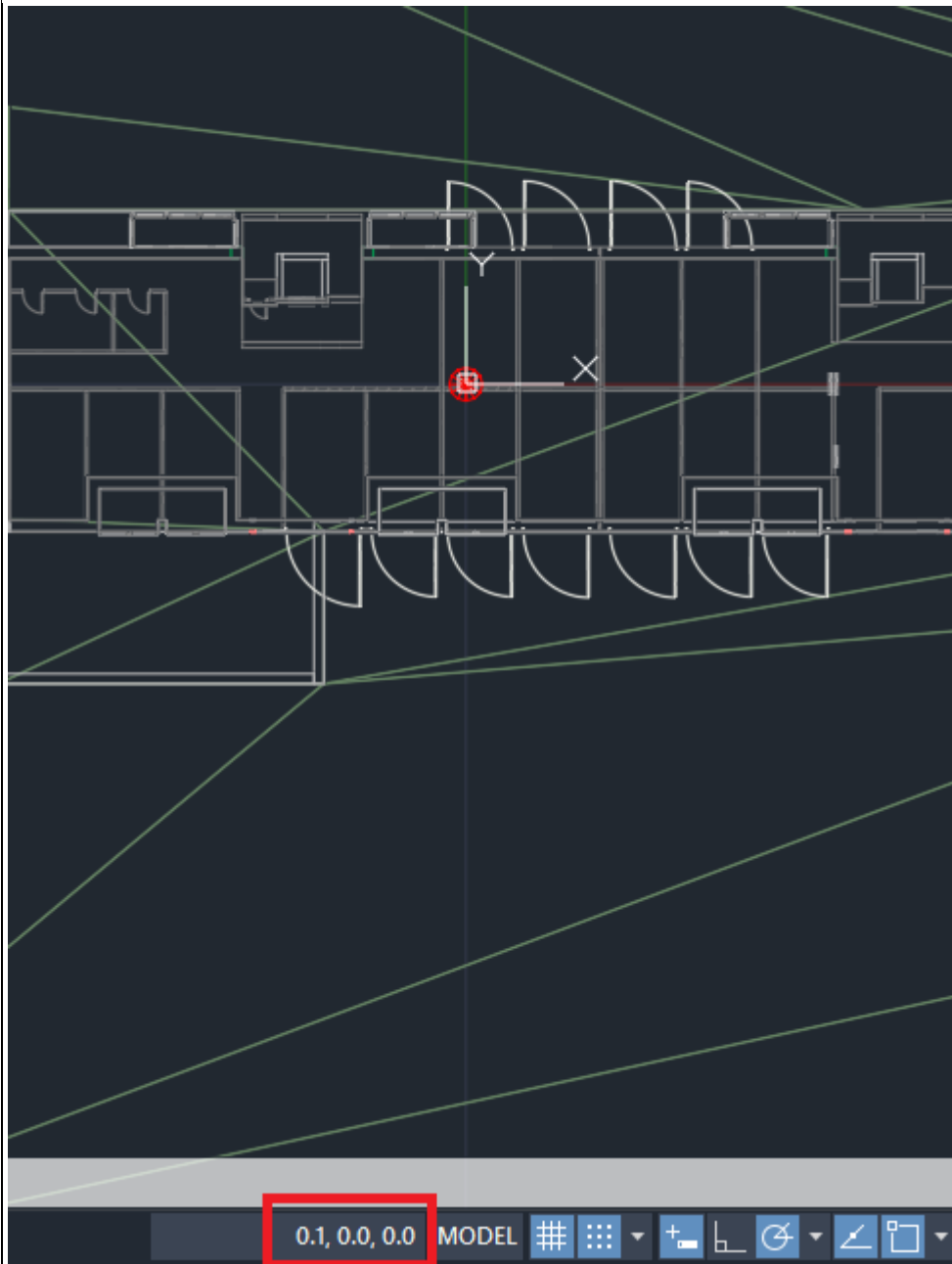
| | | |
|----------------|---|---|
| | How long does it take, approximately, to:Zoom into the model to see more detail | it's almost immediate |
| | How long does it take, approximately, to:Pan the model | it's almost immediate |
| | How long does it take, approximately, to:Rotate the model | it's almost immediate |
| | How long does it take, approximately, to:Query an object | it's almost immediate |
| | How long does it take, approximately, to:Inspect the objects linked to the queried one through a relationship | the software does not allow this |
| Georeferencing | 40.1) Are the world (projected) coordinates taken into account when locating the model in the software's coordinate reference system? | No |
| | 40.1.1) Where is the origin of the model coordinate reference system as imported in the software? | (0, 0, 0) |
| | 40.1.2) Attach screenshots |  |
| | 40.1.3) What is the coordinate reference system and projection and what unit of measure is used for the representation? | It is a local right-handed reference system with metres as unit of measure (however, you could also choose millimetres during import) |

40.1.4) Attach screenshots



| | | |
|--------|---|----|
| Height | 41.1) Are the "real-world" elevation values (heights) considered when locating the model in the software (z)? | No |
| | 41.1.1) What is the elevation value of the origin of the model coordinate reference system as imported in the software? | 0 |

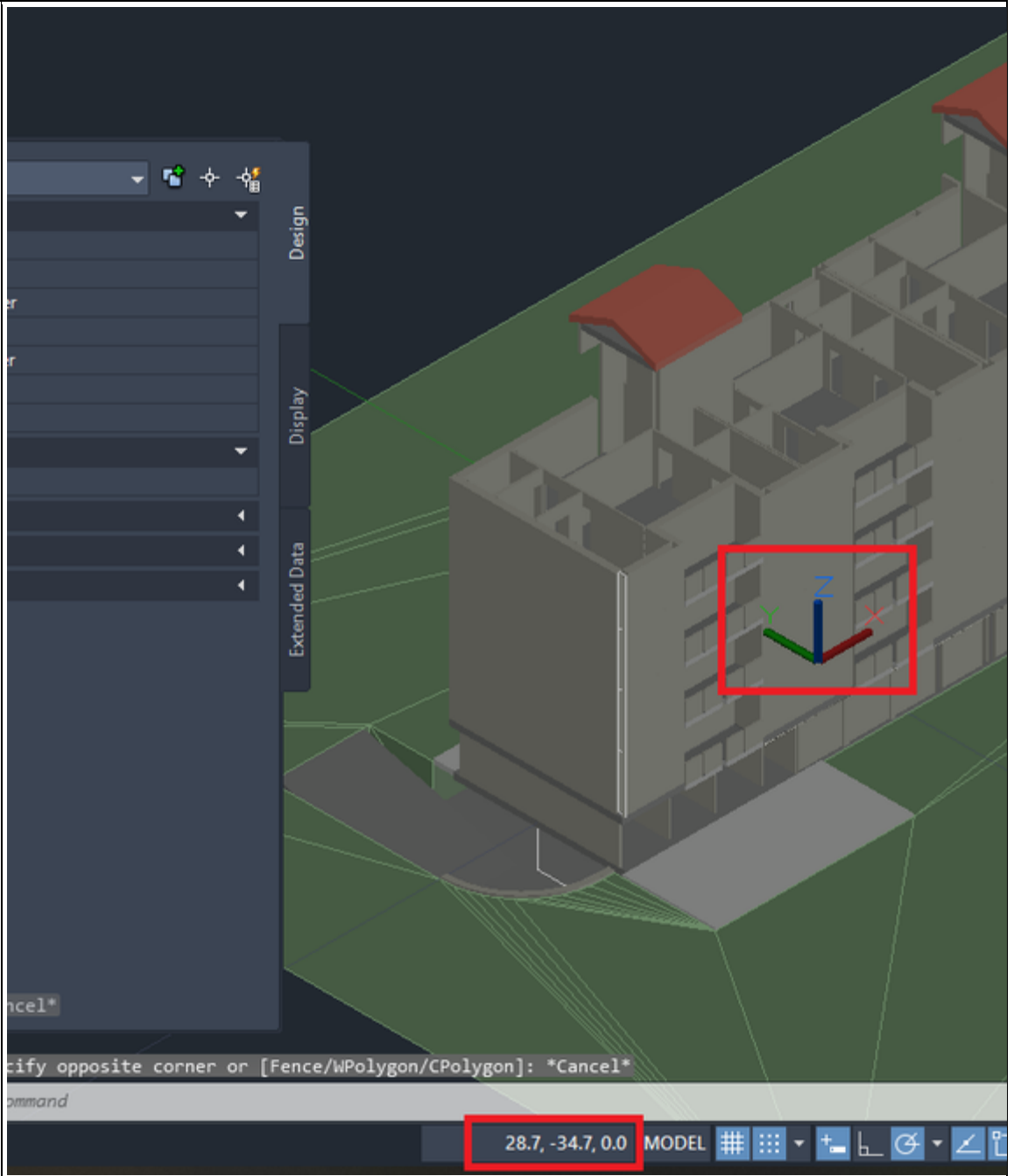
41.1.2) Attach screenshots



41.1.3) What is the height reference system?

Local

41.1.4) Attach screenshots



| | | |
|------|---|--|
| Orie | 42.1) Is the model oriented correctly with respect to the true North? | Yes |
| Pro | 43.1) Does the model maintain its correct dimensions and proportions? | Yes |
| IFC | 44.1) Is the eventual translation consistent with the IFC definitions? | Yes |
| Hier | 45.1) Are the hierarchical relationships consistent with the IFC hierarchy? | The software does not have the necessary tools to determine this information |

| | | |
|--------------|--|--|
| Attributes | 46.1) Are the attributes present in the IFC entities retained and consistent? | Yes |
| | 46.2) short comments to the previous question (optional) | Yes, they are present in "Extended Data" in the popup that shows when you click an object. |
| Relationship | 47.1) Are the relationships between the objects retained? | The software does not have the necessary tools to determine this information |
| Geometry | 48.1) Is geometry read correctly? | The software does not have the necessary tools to determine this information |
| | 48.2) short comments to the previous question (optional) | Objects are not grouped nor broken, but the geometry types can not be seen. |
| Normals | 49.1) Did the normals change? | The software does not have the necessary tools for checking it |
| 2D/3D | 50.1) Is it possible to view the model in 3D? | Yes |
| | 51.1) Is it possible to view the model in 2D? | Yes |
| Export | You arrived at the end of the phase 1: "Import and manage the file in the software". Now choose: | The software has also export abilities to IFC |
| | 55) How long does it take for the data to be exported to IFC? | 1-5 minutes |

ACCA Edificius v.BIM ONE(d) - Windows 10 Home

Proprietary software

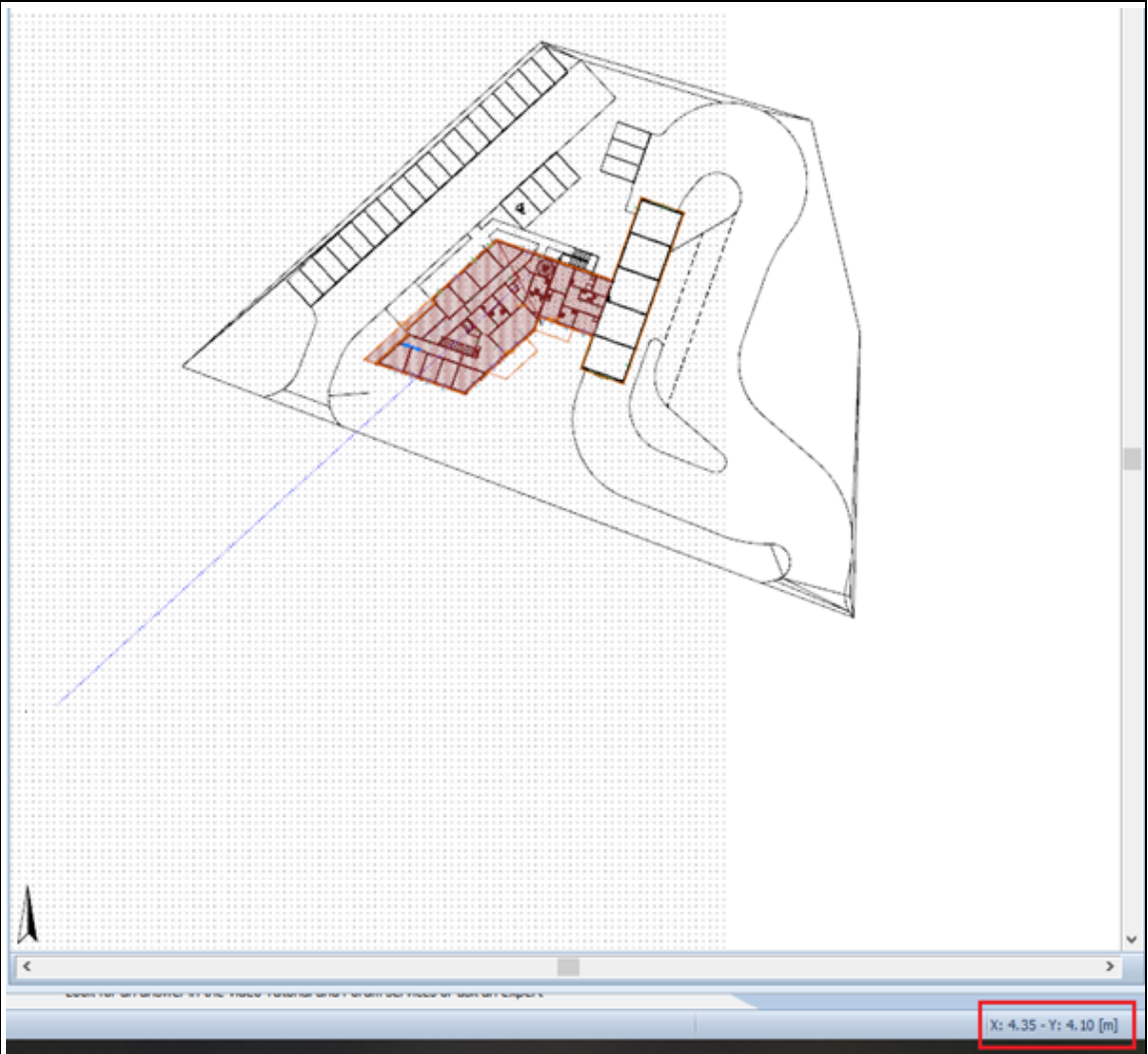
BIM

Level of tester expertise: 1 - Very beginner user (it is nearly the first time you use it)

ACCA Edificius

| | | | | | | | |
|----------------------------|--|---------------------------------|---|----------------------------------|---------------------------|---|-----------------------|
| Software | Software Name [version] | Edificius [v.BIM ONE(d)] | | Software house | | ACCA | |
| | Proprietary or open source software? | | | Kind of software | | | |
| proprietary | | | BIM | | | | |
| Computer | Model and year | Operating system | CPU | GPU | Memory (RAM) | Hard drive capacity | Hard drive free space |
| | self-built desktop (2013) | Windows 10 Home 64-bit | Intel i5-4570 @ 3.20GHz | AMD Radeon HD 7800 Series | 8 GB | 120 | 20 |
| Certification | IFC import certification status | Import certification date | Import certification program | IFC export certification status | Export certification date | Export certification program | |
| | certified in (date) | 2017-05-31 | buildingSMART International IFC Certification 2.0 | certified in (date) | 2016-03-11 | buildingSMART International IFC Certification 2.0 | |
| Test with Myran.ifc | | | | | | | |
| Performance | How long does it take, approximately, to: Import (and visualise if the software allows it) the model | | | less than a minute | | | |
| | How long does it take, approximately, to: Zoom into the model to see more detail | | | it's almost immediate | | | |
| | How long does it take, approximately, to: Pan the model | | | it's almost immediate | | | |
| | How long does it take, approximately, to: Rotate the model | | | it's almost immediate | | | |
| | How long does it take, approximately, to: Query an object | | | the software does not allow this | | | |
| | How long does it take, approximately, to: Inspect the objects linked to the queried one through a relationship | | | the software does not allow this | | | |
| | Please report on any errors the software gives when importing the file. | | It had the following kind of errors: incorrect element referencing, unexpected error while calculation Entity 2409 cross beam, a critical error has occurred in the structural model calculation. | | | | |
| Georeferencing | 2.1) Are the world (projected) coordinates taken into account when locating the model in the software's coordinate reference system? | | | No | | | |
| Georeferencing | 2.1.1) Where is the origin of the model coordinate reference system as imported in the software? | | | (0, 0) | | | |

2.1.2) Attach screenshots



2.1.3) What is the coordinate reference system and projection and what unit of measure is used for the representation?

It is a right-handed local coordinate system, with x and y representing metres.

2.1.4) Attach screenshots

See 2.1.2

Height

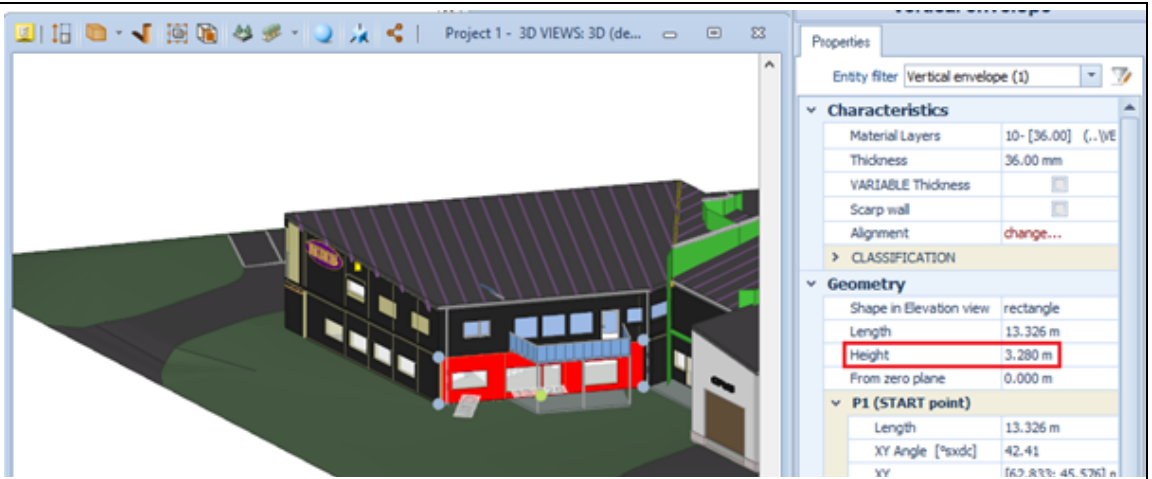
3.1) Are the "real-world" elevation values (heights) considered when locating the model in the software (z)?

No

3.1.1) What is the elevation value of the origin of the model coordinate reference system as imported in the software?

0

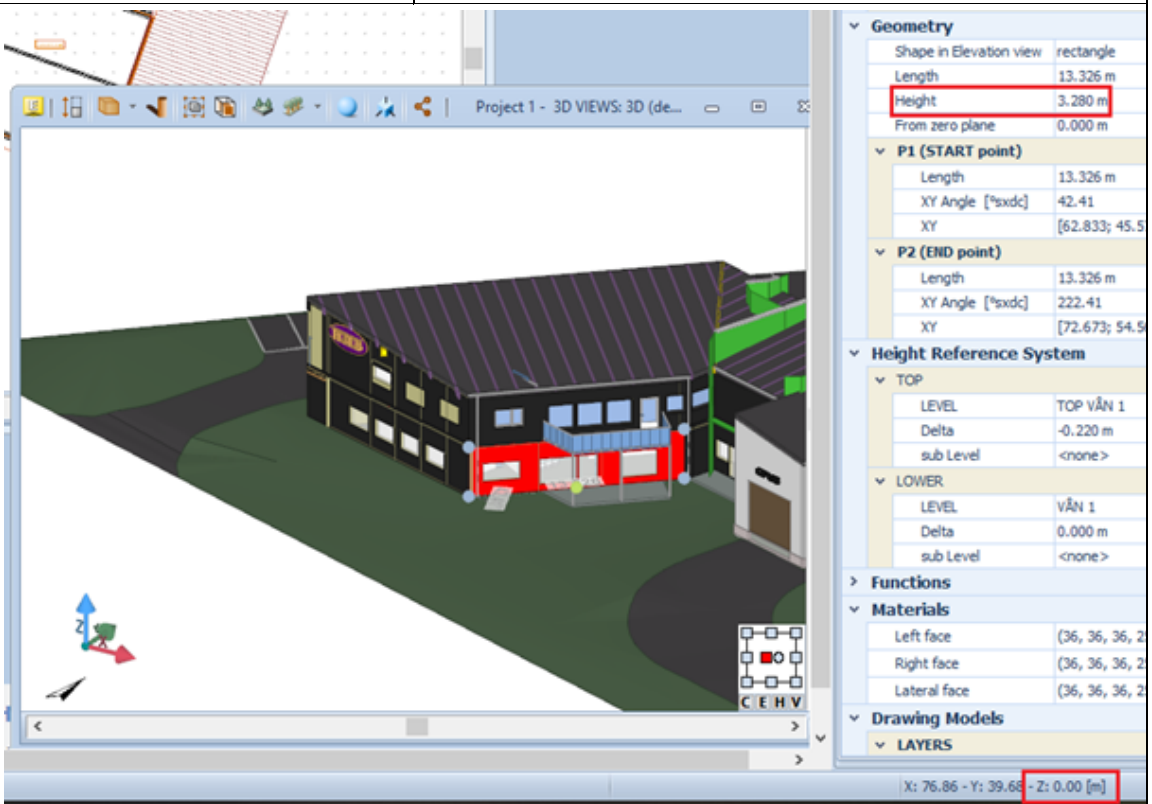
3.1.2) Attach screenshots



3.1.3) What is the height reference system?

Local per level/floor, in meters

3.1.4) Attach screenshots



4.1) Is the model oriented correctly with respect to the true North?

Yes

4.2) short comments to the previous question (optional)

It is oriented with the north pointing upwards. When rotating the model, the north arrow moves as well.

5.1) Does the model maintain its correct dimensions and proportions?

Yes

6.1) Is the eventual translation consistent with the IFC definitions?

No

6.1.1) What changes / inconsistencies / errors / other issues were noted?

For example opening, door, and curtain wall are detected by the software. IFCBeam and IFCCovering are loaded as an IFC Proxy Object. It also has vertical/horizontal envelopes which are actually not IFC classifications.

Horizontal envelope (not defined in IFC)

The screenshot shows a 2D architectural plan with a red-outlined polygon representing a horizontal envelope. A properties panel on the right is titled "Horizontal envelope" and contains the following data:

| Horizontal envelope | |
|--|--|
| Entity filter: Horizontal envelope (1) | |
| Characteristics | |
| Name | Horizontal envelope |
| Material Layers | 8- [220.00] (.. \HORIZONTAL (Default)) |
| Thickness | 220.00 mm |
| Alignment | change... |
| > Curved | <input type="checkbox"/> |
| > CLASSIFICATION | |
| Geometry | |
| > GRADIENT | |
| Pitching method | horizontal |
| Inclination [%] | 0.00 |
| Length | 13.561 m |
| Angle [%sxdc] | 42.41 |
| Node [1] | [72.826; 54.863] m |
| Node [2] | [62.814; 45.717] m |
| > Height Reference System | |
| > LOWER | |
| LEVEL | vÅN 2 |
| Delta | 0.000 m |
| sub Level | <none> |
| Materials | |
| Upper face | (198, 187, 187, 255) (0, 0, 0, 255) (99, 94, 94, |
| Lower face | (198, 187, 187, 255) (0, 0, 0, 255) (99, 94, 94, |

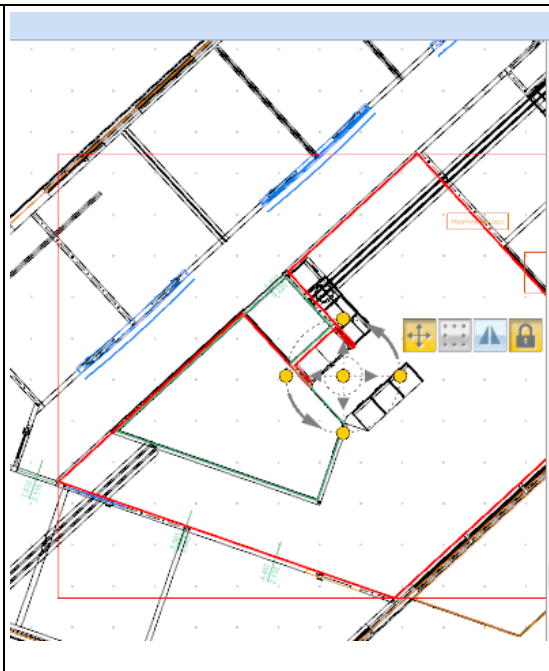
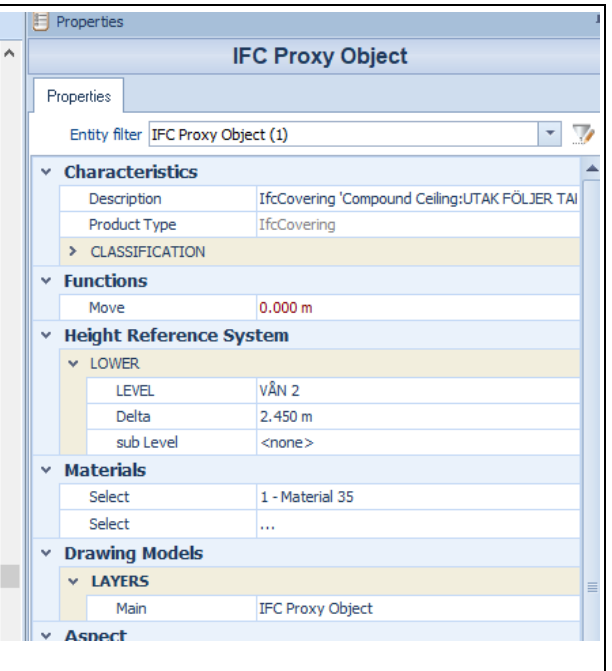
Opening (consistent with IFC)

6.1.2) Attach screenshots

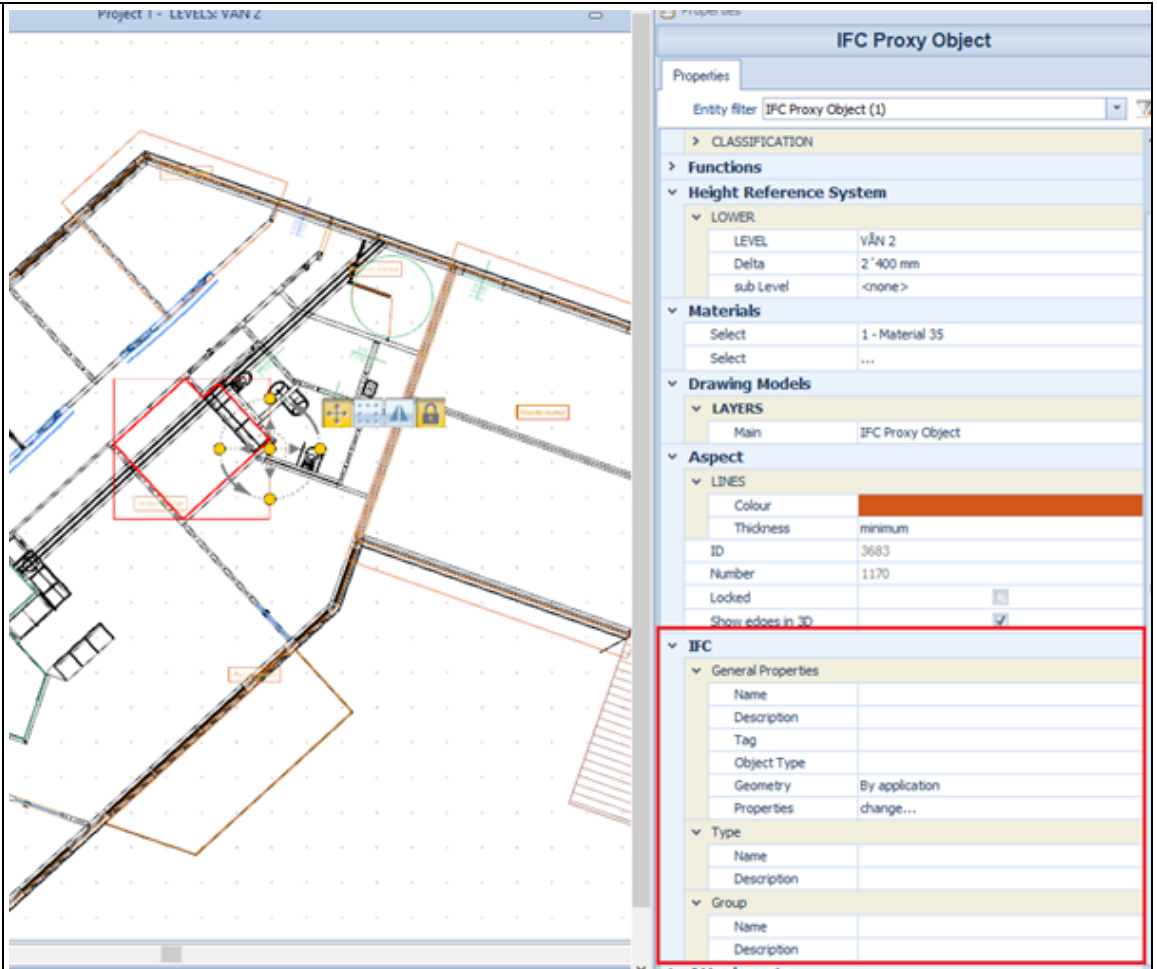
The screenshot shows a 2D architectural plan with a green-outlined polygon representing an opening. A properties panel on the right is titled "Opening" and contains the following data:

| Opening | |
|----------------------------|--------------------------|
| Entity filter: Opening (1) | |
| Characteristics | |
| > CLASSIFICATION | |
| Geometry | |
| Shape | Free |
| Width | 5.519 m |
| Height | 5.429 m |
| > SELECTED SEGMENT | |
| Length | 5.551 m |
| Angle [%sxdc] | 42.41 |
| Node [1] | [-0.714; 1.121] m |
| Node [2] | [3.384; 4.865] m |
| Rotation [%sxdc] | 0.00 |
| Leaf side (int./ext.) | <input type="checkbox"/> |
| > FRAME from profile | |
| Position | None |

IFC Proxy Object (partially consistent with IFC)

| | | | |
|------------|--|---|--|
| | |  |  |
| Hierarchy | 7.1) Are the hierarchical relationships consistent with the IFC hierarchy? | The software does not have the necessary tools to determine this information | |
| | 7.2) short comments to the previous question (optional) | The hierarchical relationships are not shown at all. | |
| Attributes | 8.1) Are the attributes present in the IFC entities retained and consistent? | No | |
| | 8.1.1) What changes / inconsistencies / errors / other issues were noted? | There is a box in the properties which should show the IFC attributes, but it is empty. | |

8.1.2) Attach screenshots



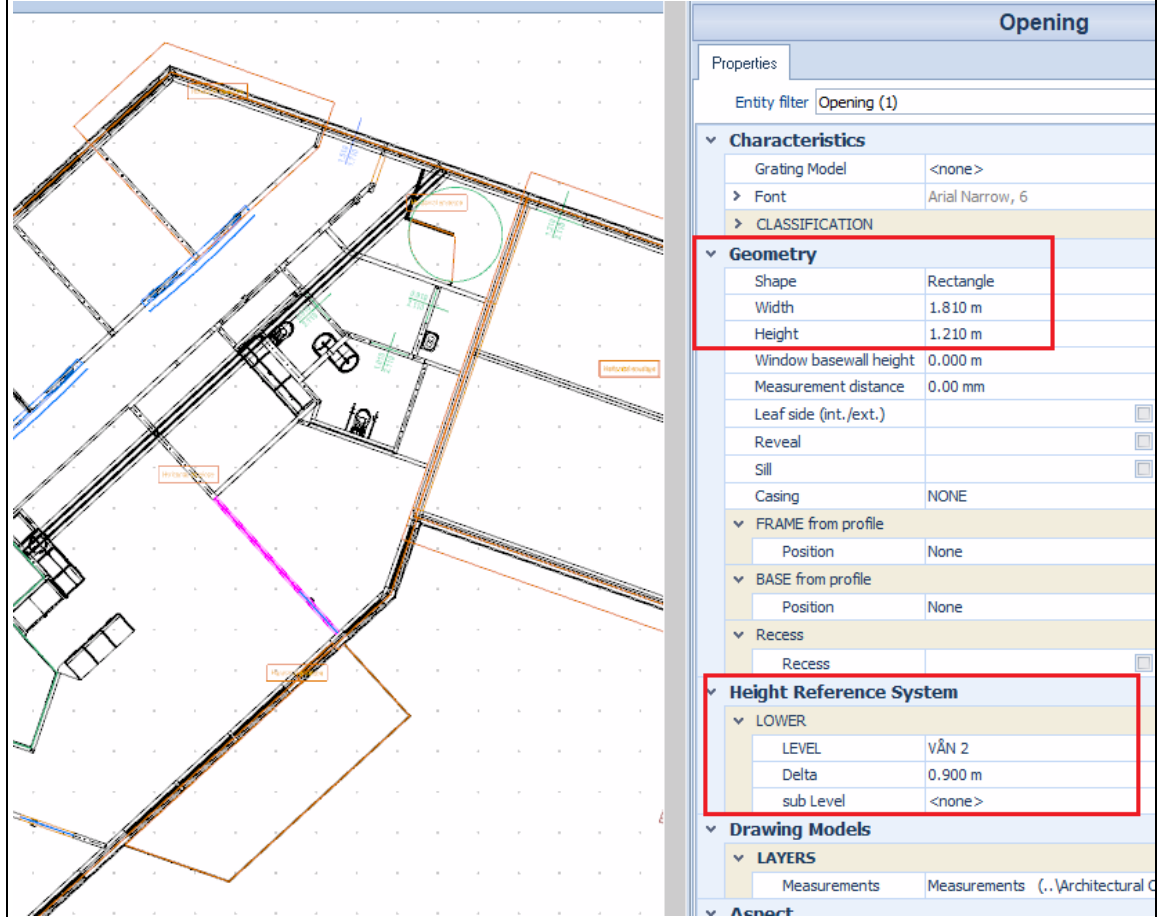
| | | |
|---------------|---|---|
| Relationships | 9.1) Are the relationships between the objects retained? | The software does not have the necessary tools to determine this information |
| | 9.2) short comments to the previous question (optional) | It is not possible to see the relationships between the objects. |
| Geometry | 10.1) Is geometry read correctly? | The software does not have the necessary tools to determine this information |
| | 10.2) short comments to the previous question (optional) | It is not possible to see the types of geometry. However, objects are not grouped nor broken. |
| Normal | 11.1) Did the normals change? | The software does not have the necessary tools for checking it |
| 2D/3D | 12.1) Is it possible to view the model in 3D? | Yes |
| | 12.2) short comments to the previous question (optional) | Yes, it's possible. You can also select to show only specific floors or object types. |
| | 13.1) Is it possible to view the model in 2D? | Yes |
| | 13.2) short comments to the previous question (optional) | Yes, it's possible, you can view the different levels/floors separately. |
| Editing | 14.1) Is it possible to edit the model (attributes, geometry, other)? | Yes |

14.1.1) What editing is possible (attributes, geometry, georeferencing, please add details)?

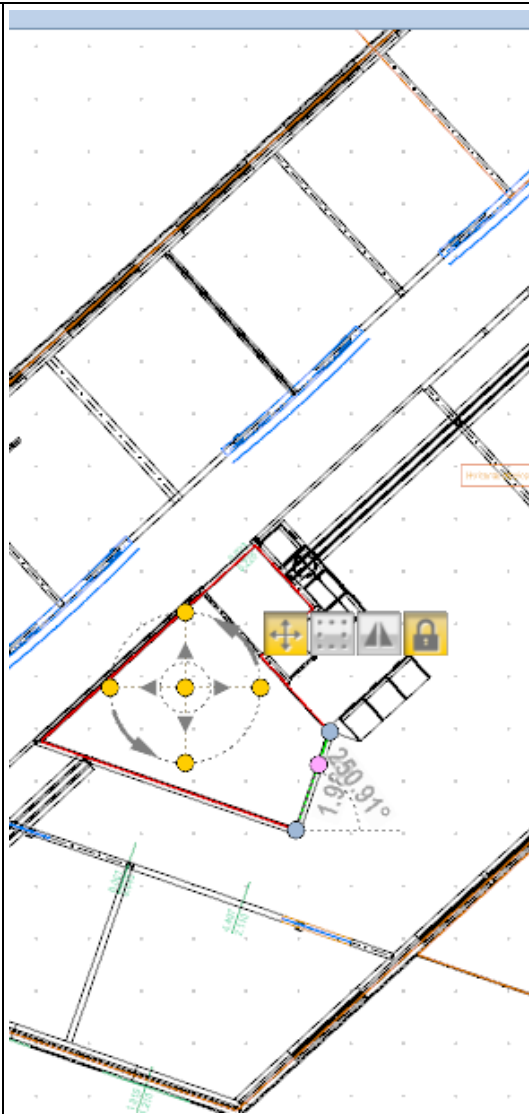
You can edit the geometry - by changing the (local) coordinates of nodes of objects or by changing the height/width. In the first case, you could also move a geometry. This is inconsistent for different objects, even if they are of the same type. The height can also be changed. Attributes can be altered freely as well. The colours can be changed in the 2D view. It is not possible to change the object type however.

14.1.2) Attach screenshots

Editing the geometry (only height/width)



Editing the geometry (by changing the actual coordinates of nodes)



Opening

Properties

Entity filter: Opening (1)

Characteristics

- CLASSIFICATION

Geometry

| | |
|--------|---------|
| Shape | Free |
| Width | 5.519 m |
| Height | 5.429 m |

SELECTED SEGMENT

| | |
|-----------------------|-------------------|
| Length | 1.982 m |
| Angle [°sxdc] | 250.91 |
| Node [1] | [-1.487; 6.550] m |
| Node [2] | [-2.135; 4.678] m |
| Rotation [°sxdc] | 0.00 |
| Leaf side (int./ext.) | |

FRAME from profile

| | |
|----------|------|
| Position | None |
|----------|------|

Drawing Models

- LAYERS**

| | |
|--------------|-------------------------------|
| Measurements | Measurements (. \Architectura |
|--------------|-------------------------------|

> Aspect

> IFC

> Attachments

Editing the colour

The screenshot displays the ACCA Edificius software interface. On the left, a 2D architectural plan is shown with a grid and various structural elements. A red line segment is highlighted, with a dimension of 132.41. On the right, the 'Vertical envelope' properties panel is open, showing various settings for the selected element.

Vertical envelope

Properties

Entity filter: Vertical envelope (1)

XY Angle [°sxd] 312.41
XY [68.489; 57.239] m

Height Reference System

TOP

| | |
|------------|-----------|
| LEVEL | TOP VÂN 2 |
| delta (P1) | 0.000 m |
| delta (P2) | 0.000 m |
| sub Level | <none> |

LOWER

| | |
|------------|---------|
| LEVEL | VÂN 2 |
| delta (P1) | 2.110 m |
| delta (P2) | 2.110 m |
| sub Level | <none> |

Functions

| | |
|---------|---------|
| Move XY | 0.000 m |
| Move Z | 0.000 m |

Materials

| | |
|--------------|--|
| Left face | (242, 242, 242, 255) (0, 0, 0, 255) (121, 121, 121, 255) (255) |
| Right face | (242, 242, 242, 255) (0, 0, 0, 255) (121, 121, 121, 255) (255) |
| Lateral face | (242, 242, 242, 255) (0, 0, 0, 255) (121, 121, 121, 255) (255) |

Drawing Models

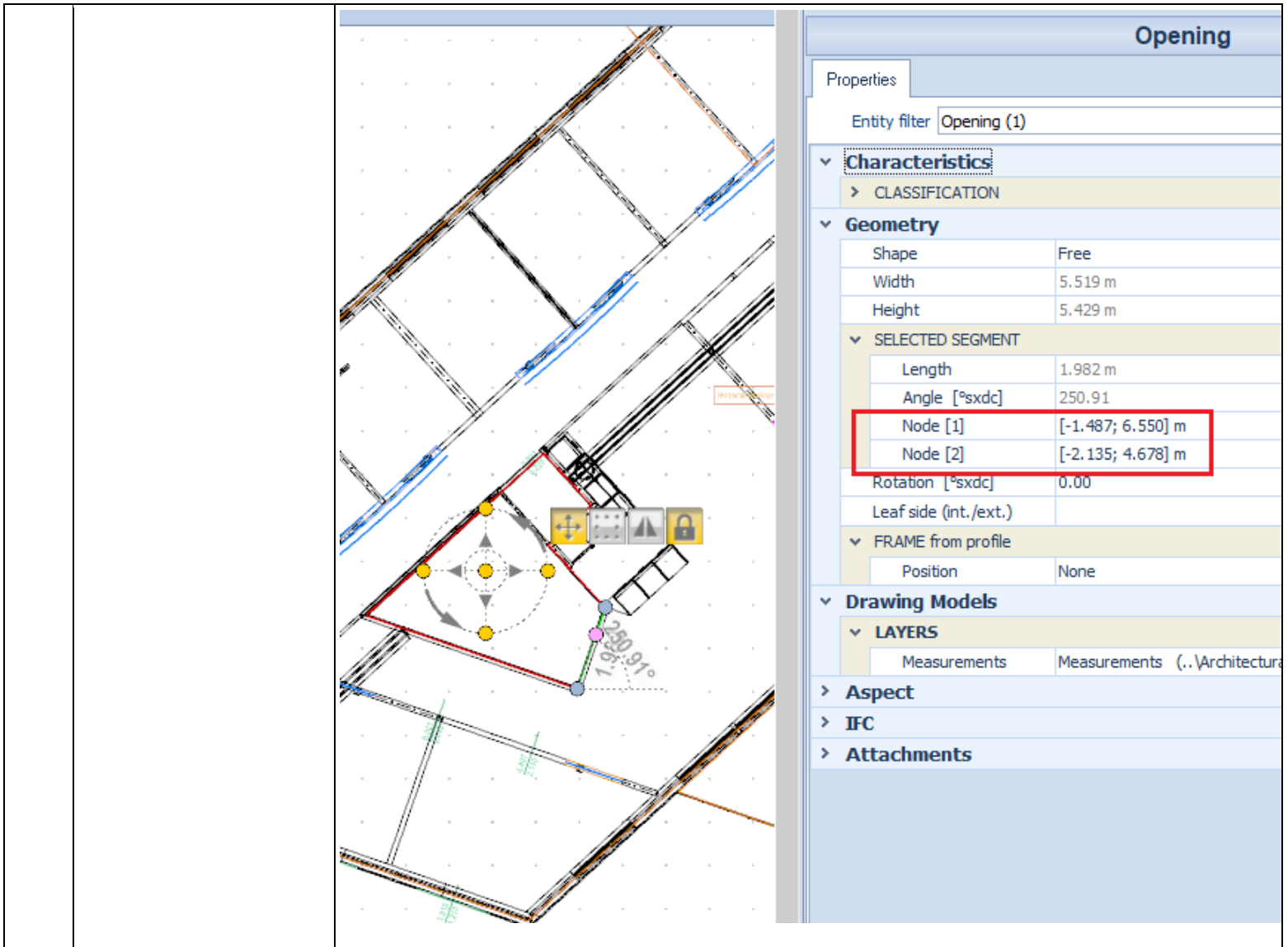
LAYERS

| | |
|------|-------------------|
| Main | Building Envelope |
|------|-------------------|

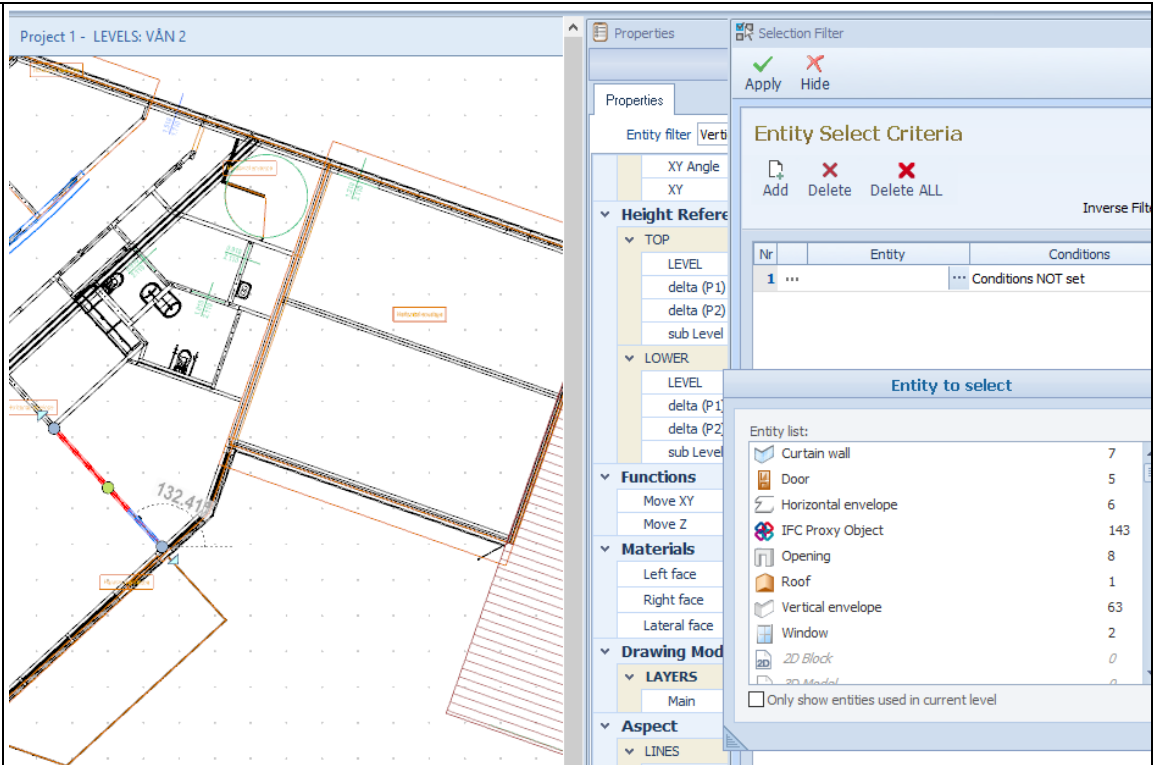
Aspect

LINES

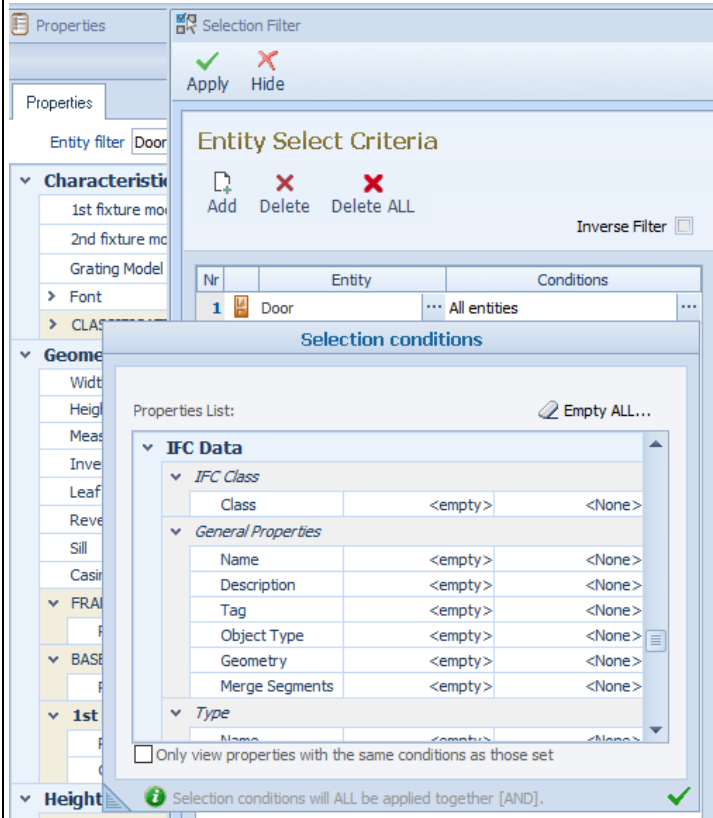
| | |
|--------|-----------|
| Colour | [Magenta] |
| ID | 2303 |



| | | |
|----------|---|---|
| Querying | 15.1) Is it possible to query the model and the attributes? | Yes |
| | 15.1.1) What kinds of query are possible? | Yes, it is possible the query by object type. Additionally, you can then choose to query the specified object(s) based on their (IFC) attributes, geometry, material, and BOQ (bill of quantities). You can also specify that only objects of the current level (floor) should be selected. |
| | 15.1.2) Attach screenshots | Selection of object type |



Selection of additional attributes



Selection on geometry

The screenshot displays the 'Selection Filter' dialog box in ACCA Edificius. The 'Entity filter' is set to 'Door'. The 'Entity Select Criteria' section shows a table with one entry: 'Door' with the condition 'All entities'. The 'Selection conditions' dialog is open, showing a list of properties under the 'Geometry' category. The 'Reveal' sub-category is expanded, showing 'Present', 'Upper side', and 'Data' with empty conditions. A message at the bottom states: 'Selection conditions will ALL be applied together [AND].'

Entity Select Criteria

| Nr | Entity | Conditions |
|----|--------|--------------|
| 1 | Door | All entities |

Selection conditions

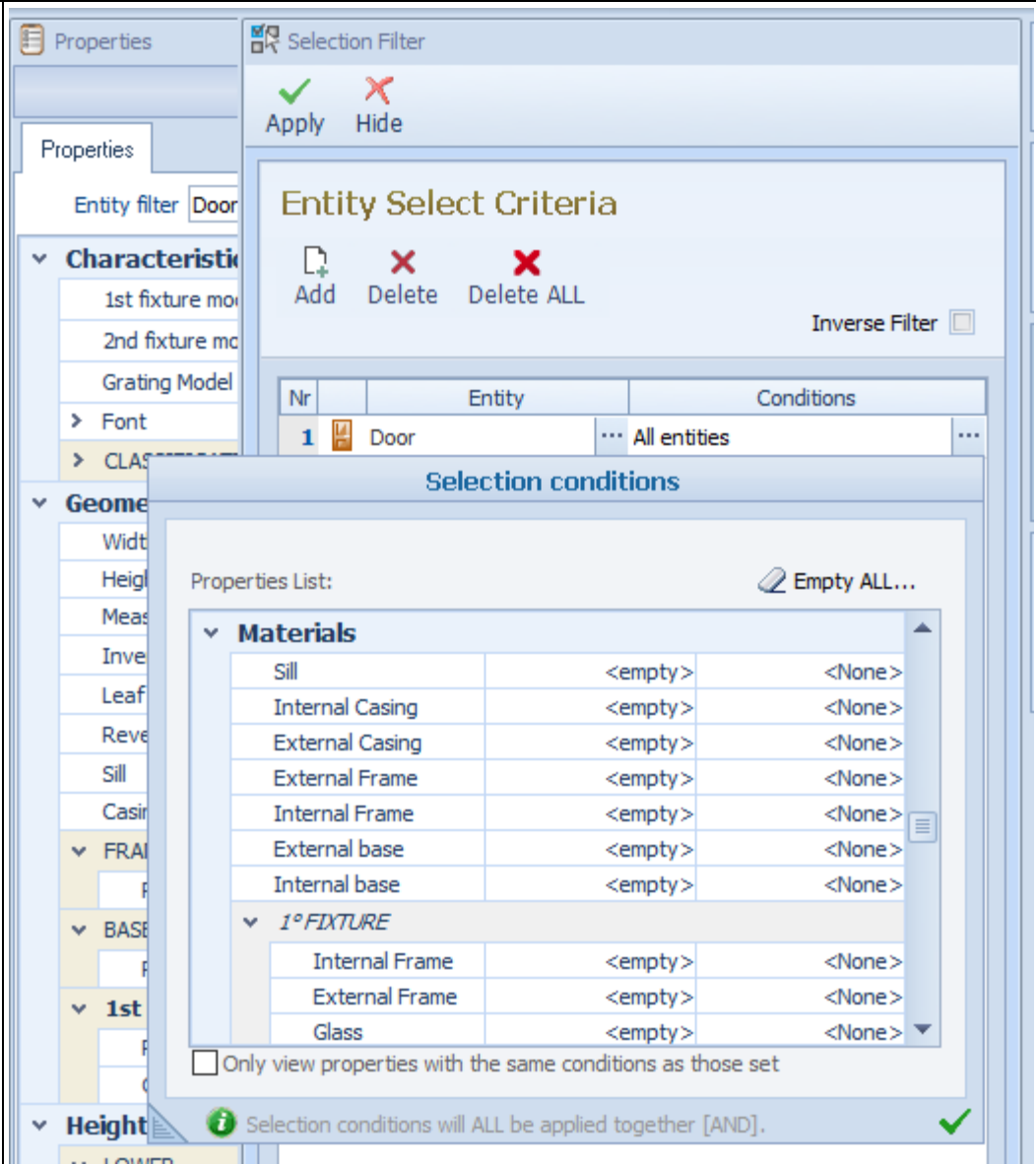
Properties List:

| Property | Condition | Value |
|---------------------|-----------|--------|
| Geometry | | |
| Width | <empty> | <None> |
| Height | <empty> | <None> |
| Height 2 | <empty> | <None> |
| Arc Radius | <empty> | <None> |
| Circle Radius | <empty> | <None> |
| Horizontal semiaxis | <empty> | <None> |
| Vertical semiaxis | <empty> | <None> |
| Reveal | | |
| Present | <empty> | <None> |
| Upper side | <empty> | <None> |
| Data | <empty> | <None> |

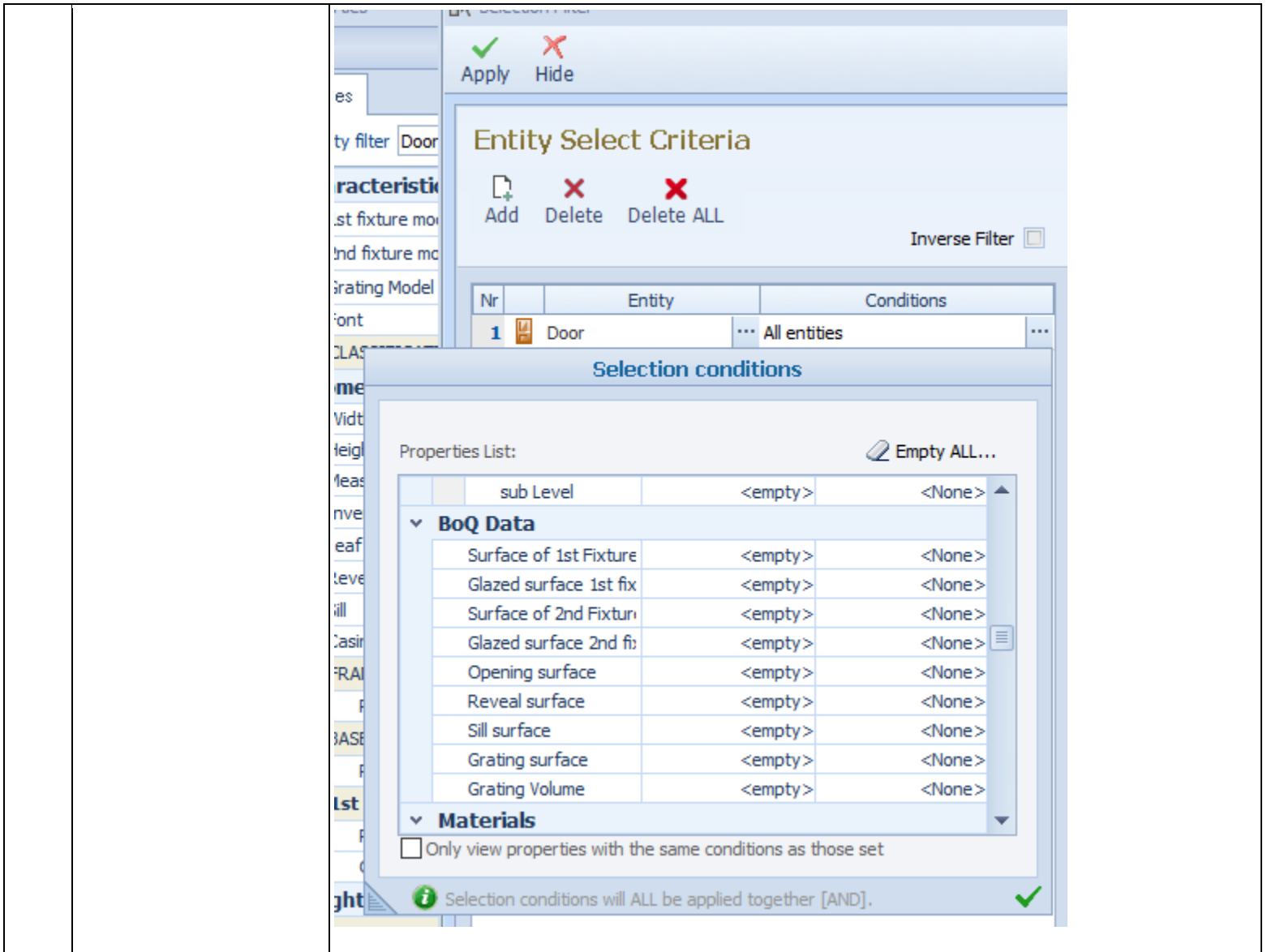
Only view properties with the same conditions as those set

Selection conditions will ALL be applied together [AND].

Selection on material



Selection on BOQ (bill of quantities)



| | | |
|----------|---|---|
| Analysis | 16.1) Is it possible to analyse the objects and the model? | No |
| | 16.1.1) What analysis are possible? Do you know if the results are reliable? | (no analysis possible) |
| | 16.1.3) Time required to perform the analysis about the model itself (type 1) | No analysis of type 1 are possible |
| | 16.1.3) Time required to perform the analysis about the model performances (type2) | No analysis of type 2 are possible |
| Export | You arrived at the end of the phase 1: "Import and manage the file in the software".Now choose: | The software has also export abilities to IFC |
| | 17.1) Are any pre-processing or setting changes needed in the software to enable a consistent export? | No |
| | 17.2) short comments to the previous question (optional) | It can only export IFC2x3. |

ACCA Edificius v.BIM ONE(d) - Windows 10 Home

Proprietary software

BIM

Level of tester expertise: 1 - Very beginner user (it is nearly the first time you use it)

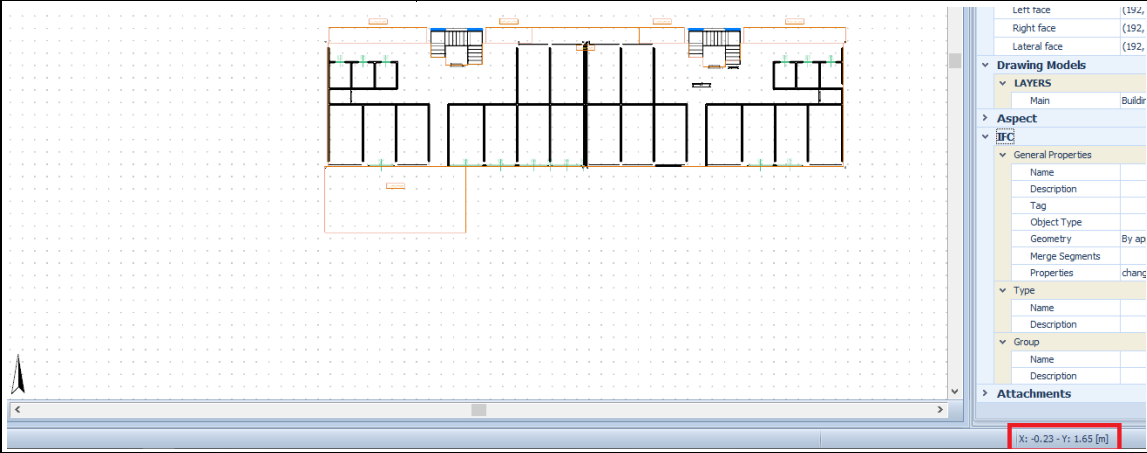
| | |
|--|---|
| 18.1) Is it possible to choose the IFC model view definition (MVD) to be used when exporting the data? | Yes |
| 18.1.1) Which ones are available? | You can choose Coordination View 2.0 or Surface Geometry View. |
| 18.1.2) Is it possible to add a customised MVD to be used for exporting IFC? | Yes |
| 18.1.2.1) What kind of customisation is possible? | For example, you can choose whether or not the axis geometry, footprint geometry, profile geometry, parametrical profiles, or bounding box are exported to the output file. |

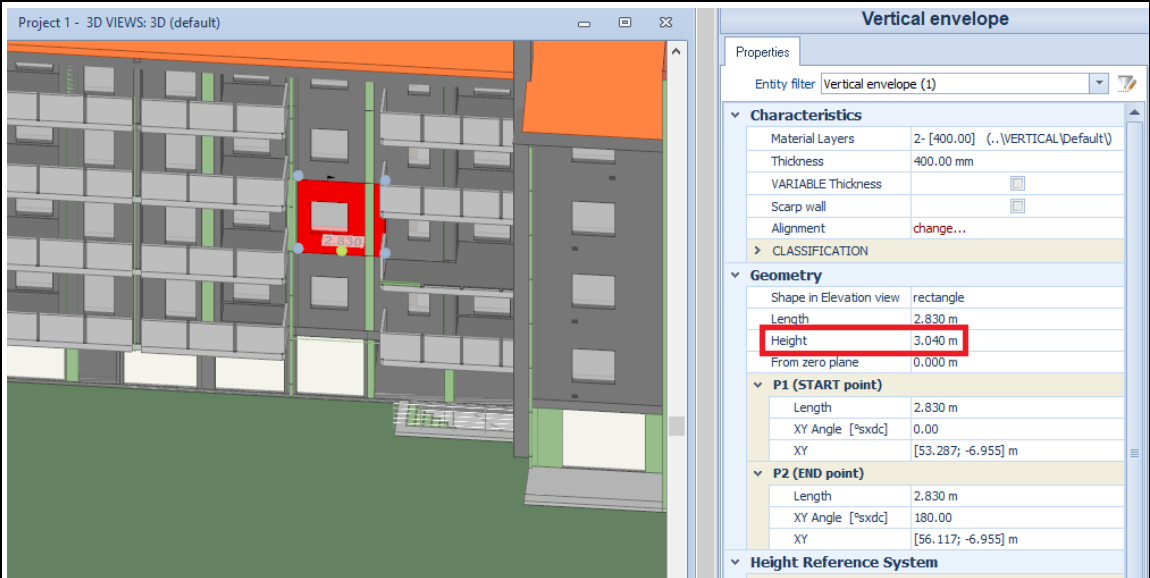
18.1.2.2) Attach screenshots and files



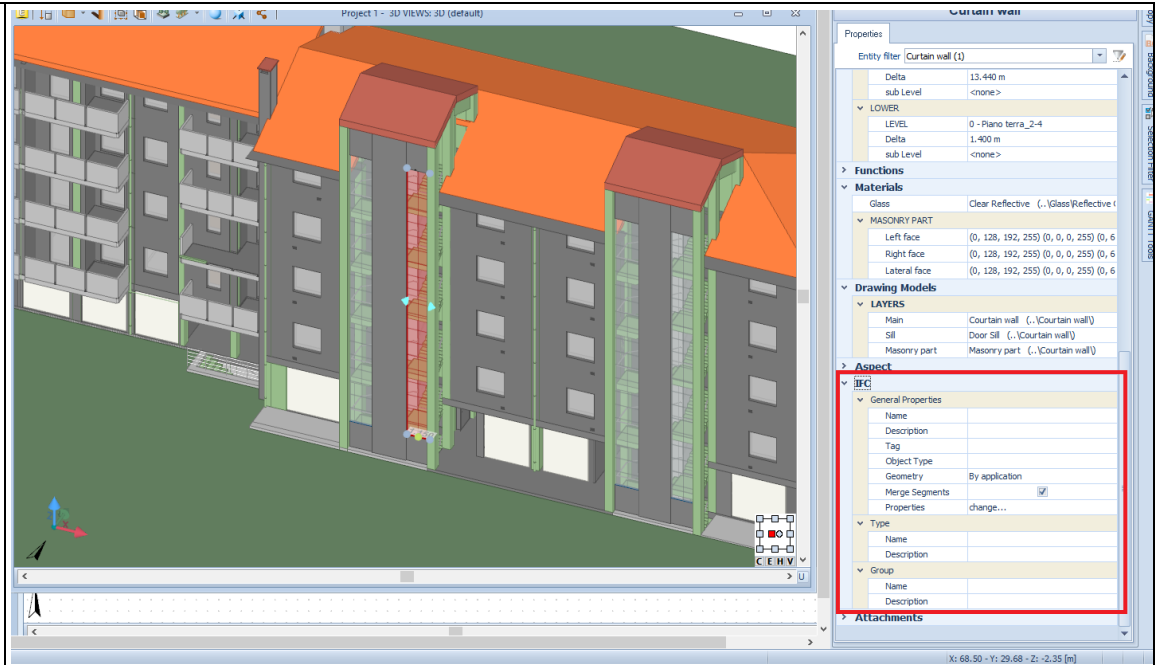
19) How long does it take for the data to be exported to IFC? less than a minute

Test with Savigliano.ifc

| | | |
|----------------|---|---|
| Performance | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | less than a minute |
| | How long does it take, approximately, to:Zoom into the model to see more detail | it's almost immediate |
| | How long does it take, approximately, to:Pan the model | it's almost immediate |
| | How long does it take, approximately, to:Rotate the model | it's almost immediate |
| | How long does it take, approximately, to:Query an object | it's almost immediate |
| | How long does it take, approximately, to:Inspect the objects linked to the queried one through a relationship | the software does not allow this |
| | 38) Please report on any errors the software gives when importing the file. | None |
| Georeferencing | 40.1) Are the world (projected) coordinates taken into account when locating the model in the software's coordinate reference system? | No |
| Georeferencing | 40.1.1) Where is the origin of the model coordinate reference system as imported in the software? | (0,0) |
| | 40.1.2) Attach screenshots |  |
| | 40.1.3) What is the coordinate reference system and projection and what unit of measure is used for the representation? | It is a right-handed local coordinate system, with x and y representing metres. |
| | 40.1.4) Attach screenshots | See 40.1.2 |
| Height | 41.1) Are the "real-world" elevation values (heights) considered when locating the model in the software (z)? | No |
| | 41.1.1) What is the elevation value of the origin of the model coordinate reference system as imported in the software? | 0 |

| | | |
|-------------|---|--|
| | 41.1.2) Attach screenshots |  |
| | 41.1.3) What is the height reference system? | Local per level/floor, in meters. |
| | 41.1.4) Attach screenshots | See 41.1.2 |
| Orientation | 42.1) Is the model oriented correctly with respect to the true North? | Yes |
| | 42.2) short comments to the previous question (optional) | It is oriented with the north pointing upwards. When rotating the model, the north arrow moves as well. |
| Proportions | 43.1) Does the model maintain its correct dimensions and proportions? | Yes |
| | Other | Partially |
| | 44.2) short comments to the previous question (optional) | For example opening, door, and curtain wall are detected by the software. Some are loaded as a general IFC Proxy Object. It also has vertical/horizontal envelopes which are actually not IFC classifications. |
| Hierarchy | 45.1) Are the hierarchical relationships consistent with the IFC hierarchy? | The software does not have the necessary tools to determine this information |
| Attributes | 46.1) Are the attributes present in the IFC entities retained and consistent? | No |
| | 46.1.1) What changes / inconsistencies / errors / other issues were noted? | There is a box in the properties which should show the IFC attributes, but it is empty. |

46.1.2) Attach screenshots



| | | |
|-------------------|---|---|
| Relation ships | 47.1) Are the relationships between the objects retained? | The software does not have the necessary tools to determine this information |
| | 47.2) short comments to the previous question (optional) | The relationships are not shown at least. |
| Geometry | 48.1) Is geometry read correctly? | The software does not have the necessary tools to determine this information |
| | 48.2) short comments to the previous question (optional) | 2 It is not possible to see the types of geometry. However, it seems like objects are not grouped nor broken. |
| 2D/ 3D | 49.1) Did the normals change? | The software does not have the necessary tools for checking it |
| 2D/3D | 50.1) Is it possible to view the model in 3D? | Yes |
| | 51.1) Is it possible to view the model in 2D? | Yes |
| Export | You arrived at the end of the phase 1: "Import and manage the file in the software".Now choose: | The software has also export abilities to IFC |
| | 55) How long does it take for the data to be exported to IFC? | less than a minute |

ESRI, Pro and ArcGIS 10.X, Revit, Safe FME [ArcGIS Pro 2.4, ArcGIS 10.7, FME 2019.1, Revit 2018 - 2020] - Windows 10 Home

Proprietary software

BIM

Level of tester expertise: 3 - Expert user (you know very well the technical details and tricks)

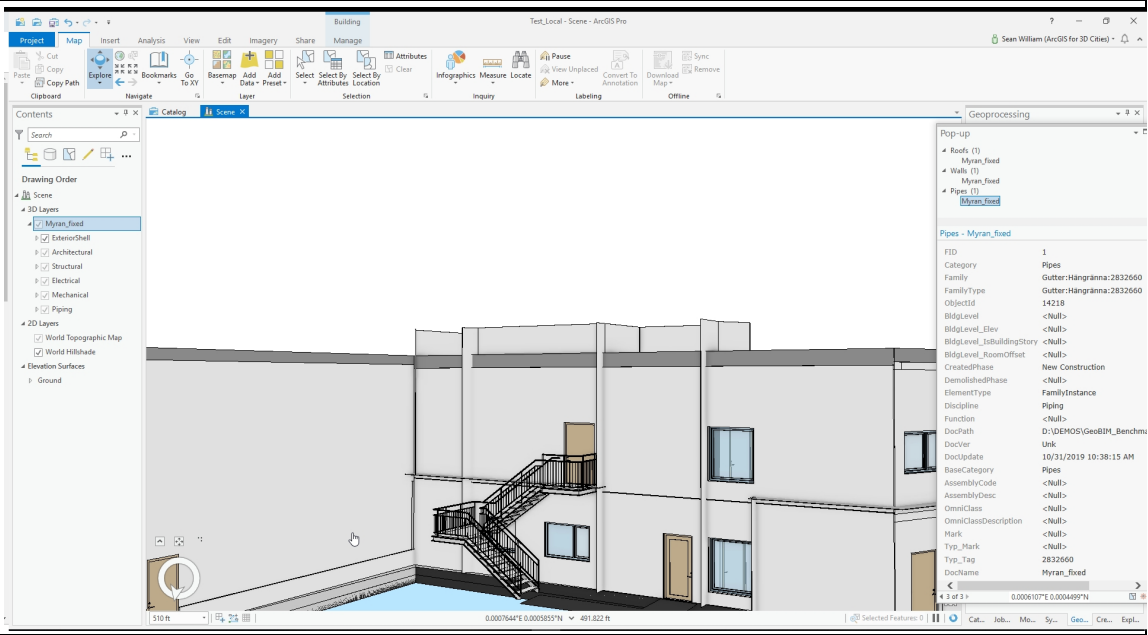
ESRI, Pro and ArcGIS 10.X, Revit, Safe FME

| | | | | | | | |
|----------------------------|--|--|------------------------------|--|---------------------------|------------------------------|-----------------------|
| Software | Software Name [version] | ESRI, Pro and ArcGIS 10.X, Revit, Safe FME [ArcGIS Pro 2.4, ArcGIS 10.7, FME 2019.1, Revit 2018 - 2020] | | | Software house | ESRI developer | |
| | Proprietary or open source software? | | | Kind of software | | | |
| | proprietary | | | BIM | | | |
| Computer | Model and year | Operating system | CPU | GPU | Memory (RAM) | Hard drive capacity | Hard drive free space |
| | Dell Precision M7720 2017 | Windows 10 | Intel i7 | Nvidia P5000 | 64GB RAM | 1TB | 450GB |
| Certification | IFC import certification status | Import certification date | Import certification program | IFC export certification status | Export certification date | Export certification program | |
| | certification in progress | | N/A | not certified | | | |
| Test with Myran.ifc | | | | | | | |
| Performance | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | | | 5-20 minutes | | | |
| | How long does it take, approximately, to:Zoom into the model to see more detail | | | less than a minute | | | |
| | How long does it take, approximately, to:Pan the model | | | less than a minute | | | |
| | How long does it take, approximately, to:Rotate the model | | | less than a minute | | | |
| | How long does it take, approximately, to:Query an object | | | less than a minute | | | |
| | How long does it take, approximately, to:Inspect the objects linked to the queried one through a relationship | | | less than a minute | | | |
| | Please report on any errors the software gives when importing the file. | | | IFC opening elements not imported and needed to be discarded | | | |
| Georeferencing | 2.1) Are the world (projected) coordinates taken into account when locating the model in the software's coordinate reference system? | | | Yes | | | |
| | 2.2) short comments to the previous question (optional) | | | N/A | | | |
| Height | 3.1) Are the "real-world" elevation values (heights) considered when locating the model in the software (z)? | | | Yes | | | |
| | 3.2) short comments to the previous question (optional) | | | When imported XYZ reference coordinates are taken into account with the models location. | | | |
| Orientation | 4.1.1) How is the model oriented, with respect to the reference direction? | | | | | | |
| | 4.2) short comments to the previous question (optional) | | | Initially not but fixed | | | |
| Proportions | 5.1) Does the model maintain its correct dimensions and proportions? | | | Yes | | | |
| | 5.2) short comments to the previous question (optional) | | | All dimensions were maintained | | | |

| | | |
|----------------|--|--|
| IFC definition | 6.1) Is the eventual translation consistent with the IFC definitions? | Yes |
| | 6.2) short comments to the previous question (optional) | N/A |
| Hierarchy | 7.1) Are the hierarchical relationships consistent with the IFC hierarchy? | The software does not have the necessary tools to determine this information |
| | 7.2) short comments to the previous question (optional) | N/A |
| Attributes | 8.1) Are the attributes present in the IFC entities retained and consistent? | Yes |
| | 8.2) short comments to the previous question (optional) | All transferred over |
| Relationships | 9.1) Are the relationships between the objects retained? | The software does not have the necessary tools to determine this information |
| Geometry | 10.1) Is geometry read correctly? | Yes |
| | 10.2) short comments to the previous question (optional) | geometry imported correctly into Revit and structure defined by FME into ArcGIS fGDB |
| | 11.2) short comments to the previous question (optional) | some |
| 2D/3D | 12.1) Is it possible to view the model in 3D? | Yes |
| | 12.2) short comments to the previous question (optional) | ArcGIS Pro visualises in 3D either in local coordinates or Global. Revit permits 3D views, FME Data Inspector allows for 3D Views. |
| | 13.1) Is it possible to view the model in 2D? | Yes |
| | 13.2) short comments to the previous question (optional) | ArcGIS Pro, Revit and FME permit 2D viewing of models |
| Editing | 14.1) Is it possible to edit the model (attributes, geometry, other)? | Yes |
| | 14.1.1) What editing is possible (attributes, geometry, georeferencing, please add details)? | Geometry editing as well as transformation and georeferencing are possible along with changing attributes. |

Editing

14.1.2) Attach screenshots

| | | |
|----------|--|---|
| | 14.2) short comments to the previous question (optional) | N/A |
| Querying | 15.1) Is it possible to query the model and the attributes? | Yes |
| | 15.1.1) What kinds of query are possible? | Select by attribute and direct query |
| | 15.1.2) Attach screenshots |  |
| | 15.2) short comments to the previous question (optional) | N/A |
| Analysis | 16.1) Is it possible to analyse the objects and the model? | No |
| | 16.1.1) What analysis are possible? Do you know if the results are reliable? | N/A |
| | 16.1.3) Time required to perform the analysis about the model itself (type 1) | No analysis of type 1 are possible |
| | 16.1.3) Time required to perform the analysis about the model performances (type2) | No analysis of type 2 are possible |

eveBIM

| | | | | | | | |
|----------------------------|--|----------------------------------|---|--|---------------------------|------------------------------|-----------------------|
| Software | Software Name [version] | eveBIM [2.10.0] | | Software house | CSTB | | |
| | Proprietary or open source software? | | | Kind of software | | | |
| | proprietary | | | BIM | | | |
| Computer | Model and year | Operating system | CPU | GPU | Memory (RAM) | Hard drive capacity | Hard drive free space |
| | DELL Precision 5510 - 2018 | Windows 7 Professionnel - 64 bit | Intel(R) Xeon(R) CPU E3-1505M v5 | Nvidia Quadro M1000M | 16,0 Go | 953 Go | 278 Go |
| Certification | IFC import certification status | Import certification date | Import certification program | IFC export certification status | Export certification date | Export certification program | |
| | not certified | | | not certified | | | |
| Test with Myran.ifc | | | | | | | |
| Performance | How long does it take, approximately, to: Import (and visualise if the software allows it) the model | | | it's almost immediate | | | |
| | How long does it take, approximately, to: Pan the model | | | it's almost immediate | | | |
| | How long does it take, approximately, to: Rotate the model | | | it's almost immediate | | | |
| | How long does it take, approximately, to: Inspect the objects linked to the queried one through a relationship | | | it's almost immediate | | | |
| | Please report on any errors the software gives when importing the file. | | | No error | | | |
| Georeferencing | 2.1) Are the world (projected) coordinates taken into account when locating the model in the software's coordinate reference system? | | | Yes | | | |
| | 2.2) short comments to the previous question (optional) | | In eveBIM you can choose how you geolocalise your files. eveBIM can load multi-files (ifc, cityGML, shape) with different coordinate system. In france BIM manager don't use the latitude and longitude information to geolocalise their files but use the local placement as base point. So in eveBIM we let the possibility to manage the geolocalisation as you want: 1) either using latitude, longitude and elevation given in the ifcSite, 2) either using the localPlacement of the IfcSite as base point (in this case you have to set the default coordinate system, 3) either in advance parameters configure for each loaded file exactly what you want (which coordinate system, use latitude/longitude or not, use true north,...) | | | | |
| Height | 3.1) Are the "real-world" elevation values (heights) considered when locating the model in the software (z)? | | | Yes | | | |
| | 3.2) short comments to the previous question (optional) | | | If we pick a point on the terrain, the elevation of the ground is around ~148 mm | | | |
| Orientation | 4.1) Is the model oriented correctly with respect to the true North? | | | Yes | | | |
| | 4.2) short comments to the previous question (optional) | | | eveBIM use the information of the true north given in the IfcProject. As I said before, in advance configuration, we can choose to ignore this information. In the 3D view, there is a compass that show you the north | | | |

| | | |
|-----------------|--|--|
| Proportions | 5.1) Does the model maintain its correct dimensions and proportions? | Yes |
| | 5.2) short comments to the previous question (optional) | There is no distorsion or scale. eveBIM preserve unit (in mm). we see this when we do measures or calculate surfaces. |
| IFC definitions | 6.1) Is the eventual translation consistent with the IFC definitions? | Yes |
| | 6.2) short comments to the previous question (optional) | I'm not sure to understand the question. In the properties view, we have a mode without traduction, and an other which translation (thus IfcWall is indicated as Wall or 'Mur' in france). eveBIM is multi langage (english and french) |
| Hierarchy | 7.1) Are the hierarchical relationships consistent with the IFC hierarchy? | Yes |
| | 7.2) short comments to the previous question (optional) | In eveBIM, the 'Model view' window, show you the spatial hierarchy (IfcProject > IfcSite > IfcBuidling > IfcBuildingStorey > ...). eveBIM can also present groupe hierarchy (objects classified under the IfcGroup) |
| Attributes | 8.1) Are the attributes present in the IFC entities retained and consistent? | Yes |
| | 8.2) short comments to the previous question (optional) | When we click on an element, the properties are displayed. it's quite similar to the way the properties are presented in the file description on GeoBIM / data / Myran Ifc Model. |
| Relationships | 9.1) Are the relationships between the objects retained? | Yes |
| | 9.2) short comments to the previous question (optional) | The different relationships are displayed in the property view. We can see IfcRelAssociatesMaterial, IfcRelFillsElement, IfcRelContainedInSpatialStructure, IfcRelAggregates depending on the objets we select |
| Geometry | 10.1) Is geometry read correctly? | Yes |
| | 10.2) short comments to the previous question (optional) | The model is displayed in the same way than the images displayed in geoBIM/data. The geometry of the IfcSite is a surface. |
| Normals | 11.1) Did the normals change? | Yes |
| | 11.2) short comments to the previous question (optional) | Yes for the windows. I think in the model, there is a problem of normal for some element (geometry of the site, under the building). In eveBIM, we have an option name 'backface culling (by press 'b' touch) which allows to control the reversed normals |
| 2D/3D | 12.1) Is it possible to view the model in 3D? | Yes |
| | 13.1) Is it possible to view the model in 2D? | No |
| | 14.2) short comments to the previous question (optional) | We can edit some attributes (change name, description, tag, predefined type and pset). We can modify or add property set. |
| Q 5 | 15.1) Is it possible to query the model and the attributes? | Yes |

15.1.1) What kinds of query are possible?

Selection by attributes: From a type of element (IfcWall, IfcBuildingStorey, IfcSpace, ...) select the elements that have a certain value of attribute (examples of rule: select all the IfcWall with the surface > 20 m² or select all the external walls). The operators for rules are =, !=, <, >, <=, >=, contains, not contains.

15.1.2) Attach screenshots

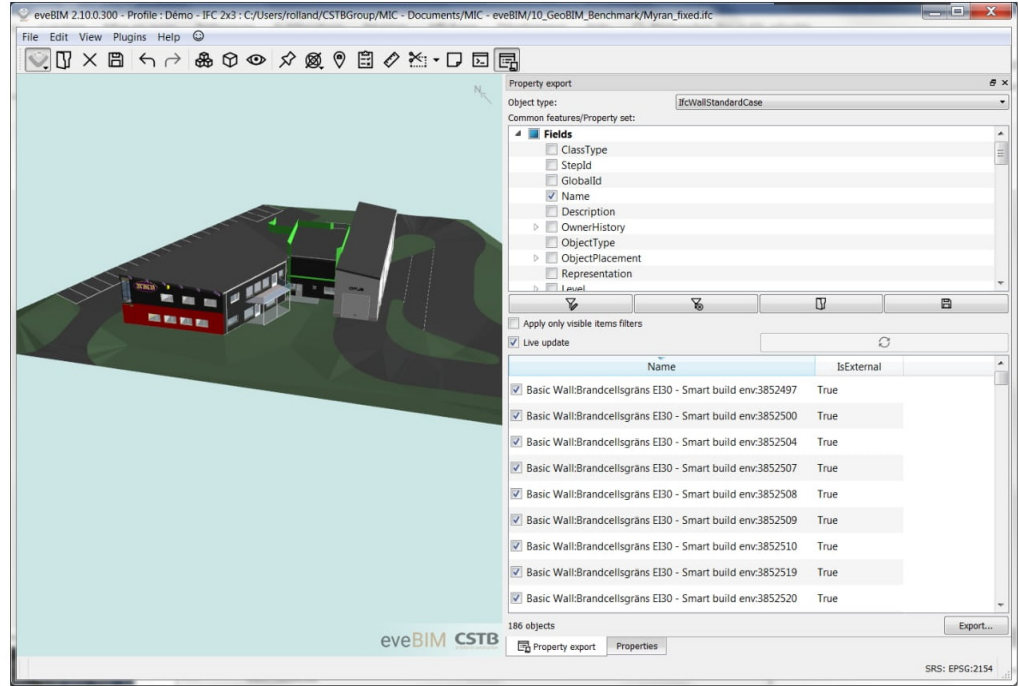


Figure 1 General view : 3D View and Property export pluggin

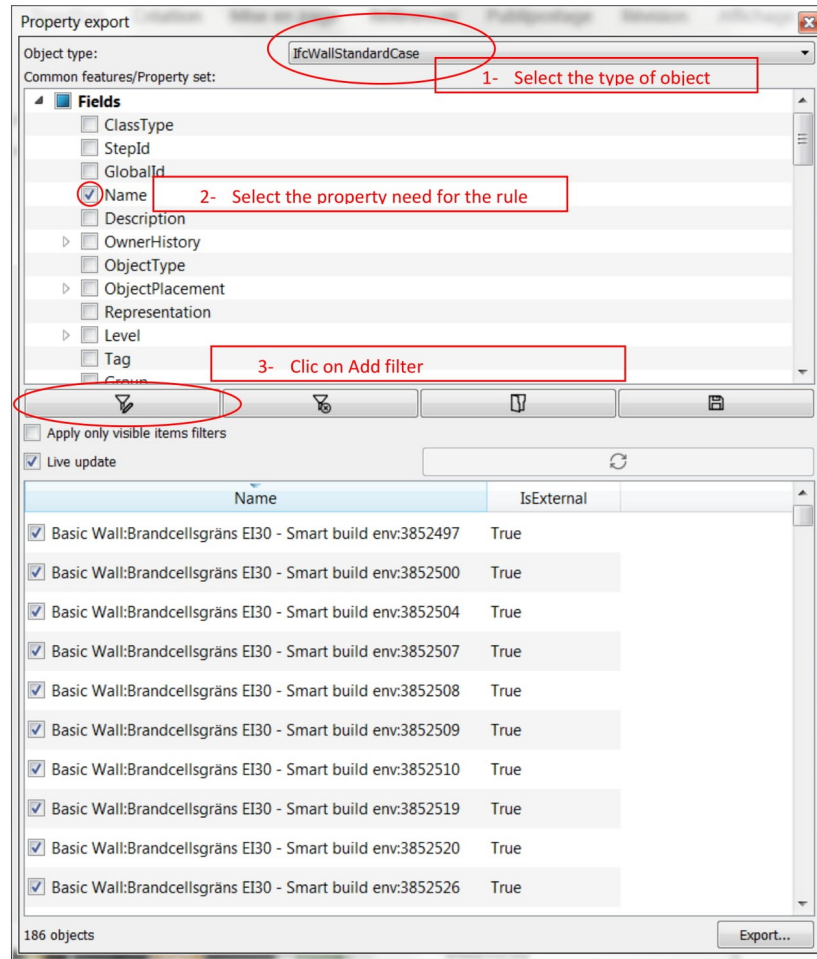


Figure 2 How to create a filter (Part 1)

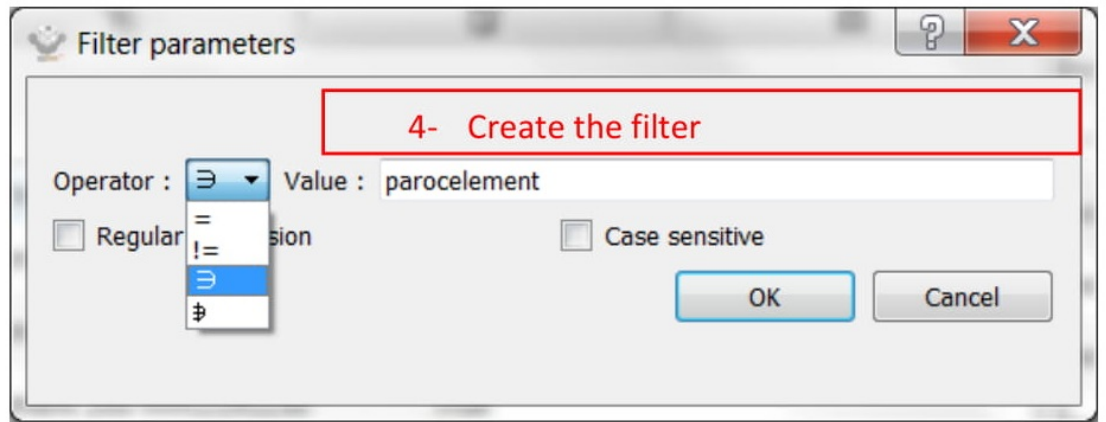


Figure 3 How to create a filter (Part 2)

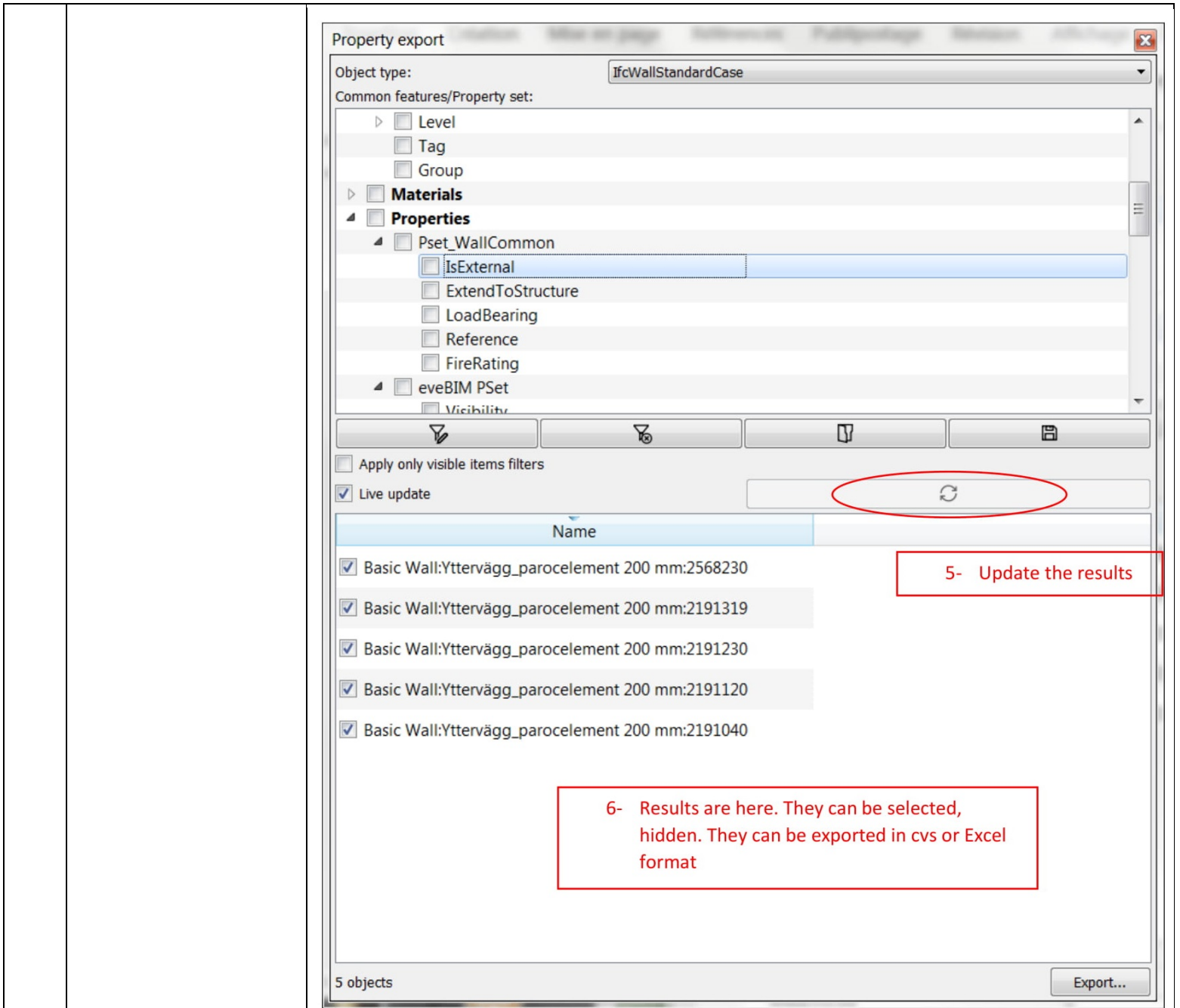


Figure 4 How to create a filter (Part 3)

Other

Only semantics validity

16.1.1) What analysis are possible? Do you know if the results are reliable?

eveBim can check that an IFC model has required attributes and properties (and check that values of the properties are inferior, superior, different, equal to, or that the property exists, ...).
In eveBIM, we can simulate the date and hour of the day. Then we can see the difference of color on the faces.

16.1.2) Attach screenshots

| | B | C | D | E | F | G | H | I |
|----|--|--|----------------------|-----------------|--------------------------|----|---|------------------------|
| 1 | 2.9.6 | | | | | | | |
| 2 | | Surface | Window Height | Walls count | SDB repartition | | | |
| 3 | Pset cible | Properties/BaseQuantities/GrossFloorArea | Fields/OverallHeight | CDP/Walls/Count | CDP/SpaceRepartition/SDB | | | |
| 4 | Opération | >= | <= | < | > | | | |
| 5 | "Fields/LongName" = "SDB" | | 5 | | | | | Selection Part |
| 6 | "Fields/ClassType" = "IfcSpace" AND "Fields/LongName" = "Chambre 1" | | 9 | | | | | Rules Part |
| 7 | "Fields/ClassType" = "IfcSpace" AND "Fields/LongName" = "Chambre 2" AND "Fields/Niveau/Nom" = "N2" | | 9 | | | | | Value of the rule Part |
| 8 | "Fields/ClassType" = "IfcSpace" AND "Fields/LongName" = "Niche" | | | | | | | |
| 9 | "Fields/ClassType" = "IfcWindow" | | 2,5 | | | | | |
| 10 | "Fields/ClassType" = "IfcBuilding" | | | | 4 | | | |
| 11 | "Fields/ClassType" = "IfcBuildingStorey" | | | | | 80 | | |

Figure 1 Excel where rules are defined

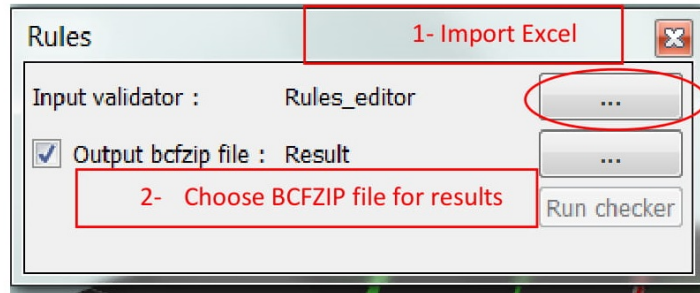


Figure 2 eveBIM: Checker

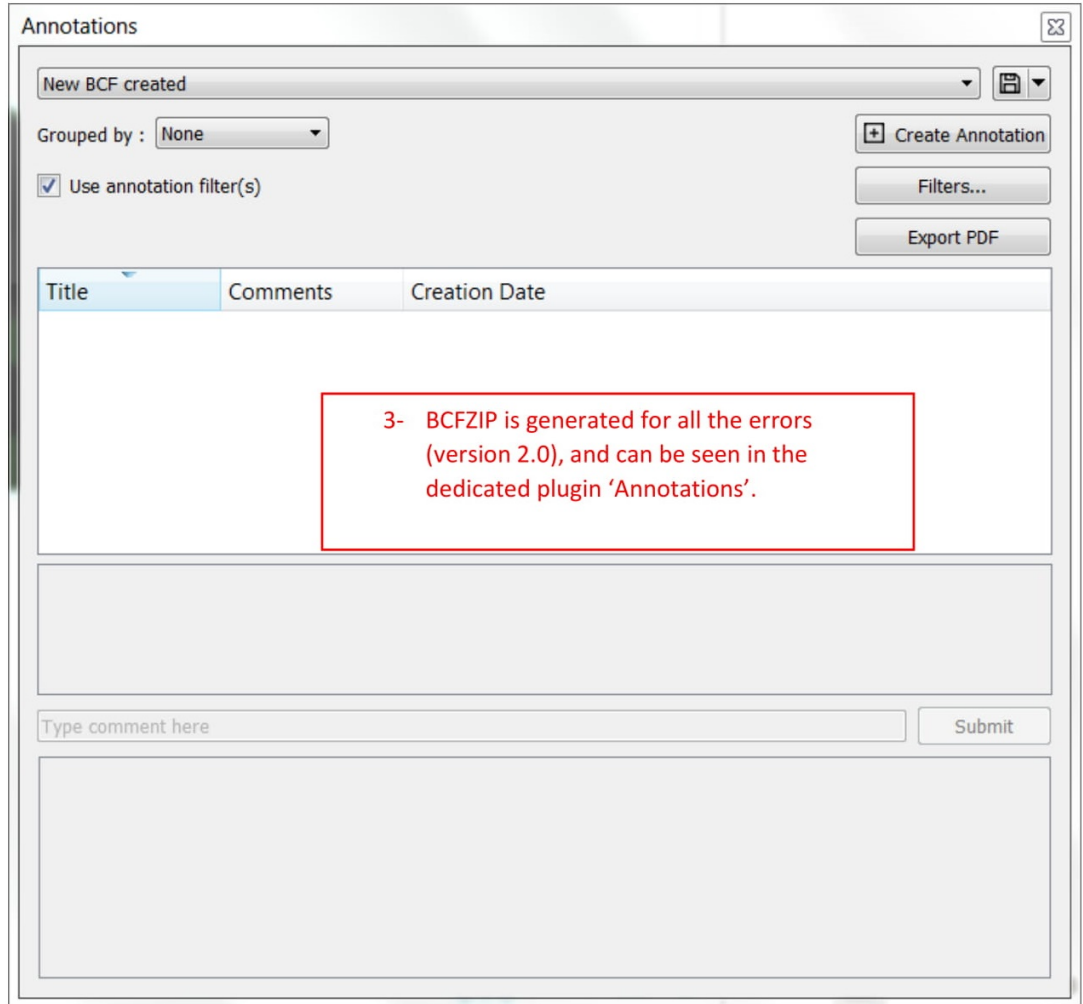


Figure 3 Results In BCF Plugin

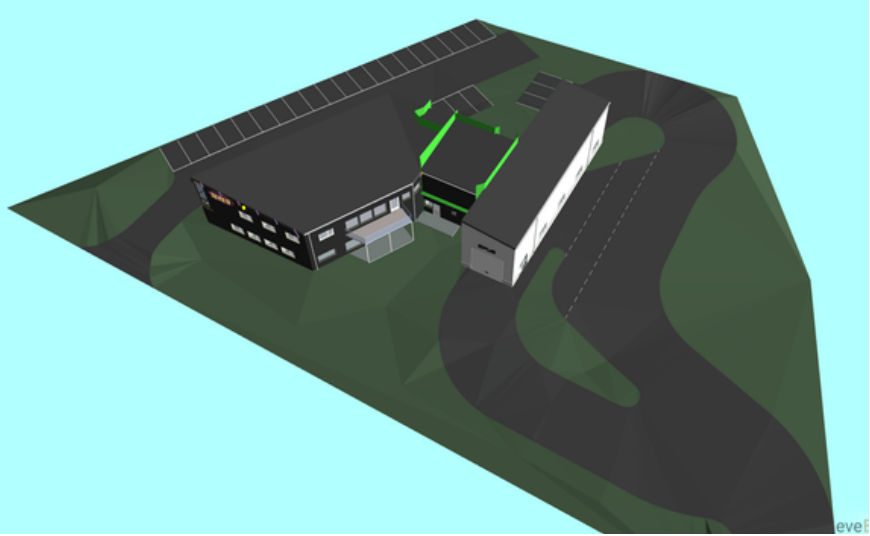
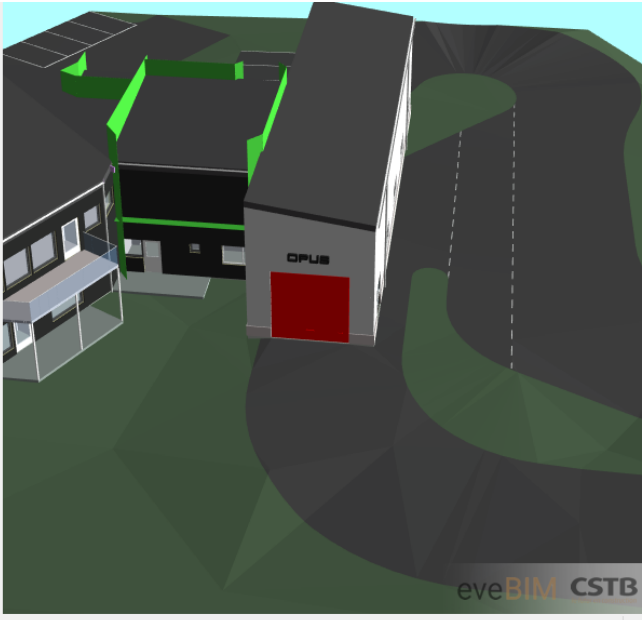
| | | |
|-----------------------------|---|---|
| | 16.1.3) Time required to perform the analysis about the model itself (type 1) | less than a minute |
| | 16.1.3) Time required to perform the analysis about the model performances (type2) | No analysis of type 2 are possible |
| | You arrived at the end of the phase 1: "Import and manage the file in the software".Now choose: | The software cannot export to IFC, therefore skip the phase 2 |
| Test with UpTown.ifc | | |
| Performance | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | 1-5 minutes |
| | How long does it take, approximately, to:Zoom into the model to see more detail | it's almost immediate |
| | How long does it take, approximately, to:Pan the model | it's almost immediate |
| | How long does it take, approximately, to:Rotate the model | it's almost immediate |
| | How long does it take, approximately, to:Query an object | it's almost immediate |

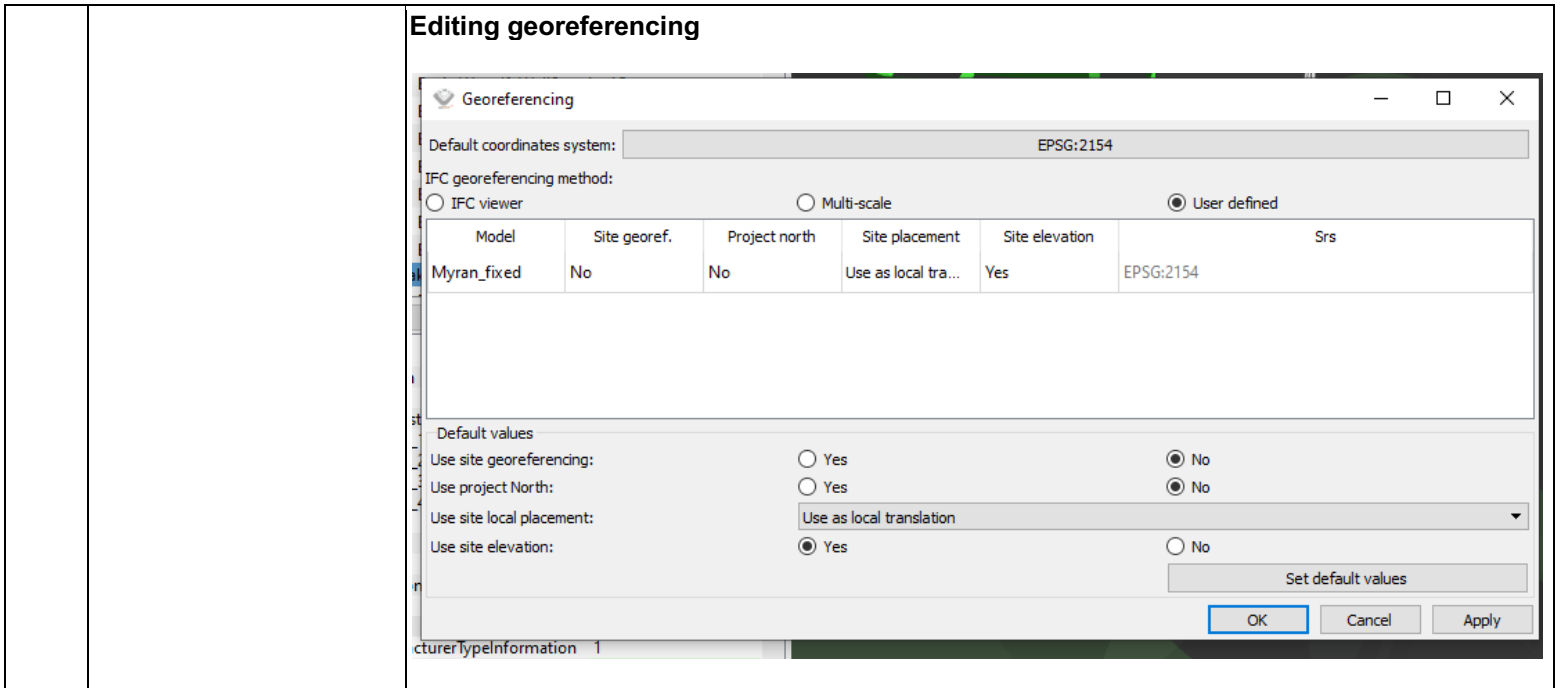
| | | |
|--|---|---|
| | How long does it take, approximately, to:Inspect the objects linked to the queried one (Element 3) through a relationship | it's almost immediate |
| Propor tions | 24.1) Does the model maintain its correct dimensions and proportions? | Yes |
| | 24.2) short comments to the previous question (optional) | Ok no error |
| IFC defi nitions | 25.1) Is the eventual translation consistent with the IFC definitions? | Yes |
| Hierarc hy | 26.1) Are the hierarchical relationships consistent with the IFC hierarchy? | Yes |
| | 26.2) short comments to the previous question (optional) | Exactly the same |
| Attribut es | 27.1) Are the attributes present in the IFC entities retained and consistent? | Yes |
| | 27.2) short comments to the previous question (optional) | All the attributes can be read |
| Relatio nships | 28.1) Are the relationships between the objects retained? | Yes |
| | 28.2) short comments to the previous question (optional) | \- We find IfcRelAssignsToGroup, IfcRelContainedInSpatialStructure, ...tructure |
| G e o | 29.1) Is geometry read correctly? | Yes |
| Nor mals | 30.1) Did the normals change? | Yes |
| | 30.2) short comments to the previous question (optional) | For geometry (surface) we can see the direction of normal |
| 2D/3D | 31.1) Is it possible to view the model in 3D? | Yes |
| | 31.2) short comments to the previous question (optional) | Everything is ok |
| | 32.1) Is it possible to view the model in 2D? | No |
| Exp ort | You arrived at the end of the phase 1: "Import and manage the file in the software".Now choose: | The software cannot export to IFC, therefore skip the phase 2 |
| Test with Savigliano.ifc | | |
| Performance | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | it's almost immediate |
| | How long does it take, approximately, to:Zoom into the model to see more detail | it's almost immediate |
| | How long does it take, approximately, to:Pan the model | it's almost immediate |
| | How long does it take, approximately, to:Rotate the model | it's almost immediate |
| | How long does it take, approximately, to:Query an object | it's almost immediate |
| | How long does it take, approximately, to:Inspect the objects linked to the queried one through a relationship | it's almost immediate |
| | 38) Please report on any errors the software gives when importing the file. | Some geometries can't be generated. Error message is: "Warn - IFCProduct (#565376): error IfcRepresentationItem (#564617) Error - this representation Item IfcAdvancedBRep (#564922) is not implemented... TODO |
| 39) Attach screenshots regarding the eventually reported errors. | | |
| Georef erenci | 40.1) Are the world (projected) coordinates taken into account when locating the model in the software's coordinate reference system? | Yes |
| Hei ght | 41.1) Are the "real-world" elevation values (heights) considered when locating the model in the software (z)? | Yes |

| | | |
|------------------------|---|--|
| Orie ntati on | 42.1) Is the model oriented correctly with respect to the true North? | Yes |
| Pro porti ons | 43.1) Does the model maintain its correct dimensions and proportions? | Yes |
| IFC defi nitions | 44.1) Is the eventual translation consistent with the IFC definitions? | Yes |
| Hierarc hy | 45.1) Are the hierarchical relationships consistent with the IFC hierarchy? | Yes |
| | 45.2) short comments to the previous question (optional) | everything is ok |
| Attribut es | 46.1) Are the attributes present in the IFC entities retained and consistent? | Yes |
| | 46.2) short comments to the previous question (optional) | same answer as other files: ok |
| R el t | 47.1) Are the relationships between the objects retained? | Yes |
| Geometry | 48.1) Is geometry read correctly? | No |
| | 48.1.1) What changes / inconsistencies / errors / other issues were noted? | The IfcAdvancedBrep is not implemented so the geometry is not shown |
| | 48.1.2) Attach screenshots | <pre> ERROR - this Representation Item IfcAdvancedBrep (#565115) is not implemented ... TODO :-) ERROR - OsgBuildVisitor failed to generate IfcAdvancedBrep WARN - IfcProduct (#565376) : error in IfcRepresentationItem (#565115) ERROR - this Representation Item IfcAdvancedBrep (#565368) is not implemented ... TODO :-) ERROR - OsgBuildVisitor failed to generate IfcAdvancedBrep WARN - IfcProduct (#565376) : error in IfcRepresentationItem (#565368) WARN - IfcProduct (#565376) : failed to generate "Body" representation!!! ERROR - this Representation Item IfcAdvancedBrep (#377175) is not implemented ... TODO :-) ERROR - OsgBuildVisitor failed to generate IfcAdvancedBrep WARN - IfcProduct (#377642) : error in IfcRepresentationItem (#377175) ERROR - this Representation Item IfcAdvancedBrep (#377634) is not implemented ... TODO :-) ERROR - OsgBuildVisitor failed to generate IfcAdvancedBrep WARN - IfcProduct (#377642) : error in IfcRepresentationItem (#377634) WARN - IfcProduct (#377642) : failed to generate "Body" representation!!! </pre> |
| Nor mals | 49.1) Did the normals change? | Yes |
| | 49.2) short comments to the previous question (optional) | Same as previous IFC files |
| 2D/3D | 50.1) Is it possible to view the model in 3D? | Yes |
| | 50.2) short comments to the previous question (optional) | with missing elements |
| | 51.1) Is it possible to view the model in 2D? | No |
| Exp ort | You arrived at the end of the phase 1: "Import and manage the file in the software".Now choose: | The software cannot export to IFC, therefore skip the phase 2 |

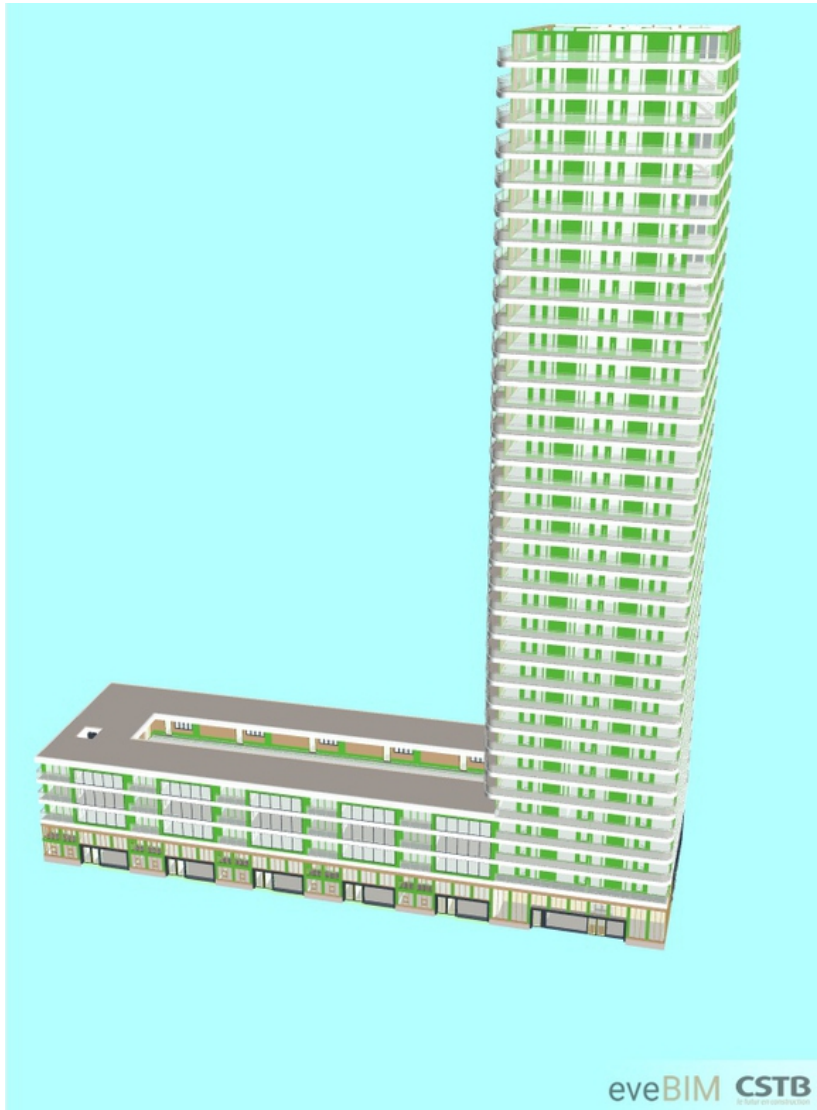
eveBIM Viewer

| | | | | | | | |
|----------------------------|--|---------------------------------------|------------------------------|---|---------------------------|------------------------------|-----------------------|
| Software | Software Name [version] | eveBIM Viewer [Beta 2.4.2.201] | | Software house | CSTB | | |
| | Proprietary or open source software? | | | Kind of software | | | |
| | proprietary | | | BIM | | | |
| Computer | Model and year | Operating system | CPU | GPU | Memory (RAM) | Hard drive capacity | Hard drive free space |
| | self-built desktop (2013) | Windows 10 Home 64-bit | Intel i5-4570 @ 3.20GHz | AMD Radeon HD 7800 Series | 8 GB | 120 GB | 20 GB |
| Certification | IFC import certification status | Import certification date | Import certification program | IFC export certification status | Export certification date | Export certification program | |
| | not certified | | | not certified | | | |
| Test with Myran.ifc | | | | | | | |
| Performance | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | | | less than a minute | | | |
| | How long does it take, approximately, to:Zoom into the model to see more detail | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Pan the model | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Rotate the model | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Query an object | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Inspect the objects linked to the queried one through a relationship | | | it's almost immediate | | | |
| Georeferencing | 2.1) Are the world (projected) coordinates taken into account when locating the model in the software's coordinate reference system? | | | Yes | | | |
| | 2.2) short comments to the previous question (optional) | | | By default, it would load the model with a local coordinate system. You can however change the settings to have it use the model's coordinate system. | | | |
| Orientati | 3.1) Are the "real-world" elevation values (heights) considered when locating the model in the software (z)? | | | Yes | | | |
| Proporti | 4.1) Is the model oriented correctly with respect to the true North? | | | Yes | | | |
| IFC defini | 5.1) Does the model maintain its correct dimensions and proportions? | | | Yes | | | |
| Hierarch | 6.1) Is the eventual translation consistent with the IFC definitions? | | | Yes | | | |
| Attribute | 7.1) Are the hierarchical relationships consistent with the IFC hierarchy? | | | The software does not have the necessary tools to determine this information | | | |
| Relatio | 8.1) Are the attributes present in the IFC entities retained and consistent? | | | Yes | | | |
| Relati | 9.1) Are the relationships between the objects retained? | | | Yes | | | |


| | 9.2) short comments to the previous question (optional) | IfcRelContainedInSpatialStructure is there at least | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------------------------------|--|---|------|-------|--------------|------|-----------|---|-----------------|---|---------------|--------------------|---------------|-------|---------------|---------|---------------|-----------------|------------|---|-------------|---|------------|------|-----------------|---|------------|------|-----------|----------|----------------------------------|---|--------------|--|------|---|--------|----|-----------|--------------|--------|
| U o d | 10.1) Is geometry read correctly? | Yes | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Normals | 11.1) Did the normals change? | No | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 11.1.2) Attach screenshots |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2D/3D | 12.1) Is it possible to view the model in 3D? | Yes | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 13.1) Is it possible to view the model in 2D? | No | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Editing | 14.1) Is it possible to edit the model (attributes, geometry, other)? | Yes | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 14.1.1) What editing is possible (attributes, geometry, georeferencing, please add details)? | You can edit some attributes (name, description, tag, CompositionType, reference, visibility). You can change the coordinate system (to local or user defined). The geometry can't be edited. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 14.1.2) Attach screenshots | <div> <p>Editing attributes</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Basic W... IfcWallStandardCase <input checked="" type="checkbox"/> Basic W... IfcWallStandardCase <input checked="" type="checkbox"/> Basic W... IfcWallStandardCase <input checked="" type="checkbox"/> Basic W... IfcWallStandardCase <input checked="" type="checkbox"/> Basic W... IfcWallStandardCase <input checked="" type="checkbox"/> Basic W... IfcWallStandardCase <input checked="" type="checkbox"/> Basic W... IfcWallStandardCase <input checked="" type="checkbox"/> Basic W... IfcWallStandardCase <input checked="" type="checkbox"/> Basic W... IfcWallStandardCase <input checked="" type="checkbox"/> Basic W... IfcWallStandardCase <input checked="" type="checkbox"/> Taksjektupo... IfcDoor <p>Properties</p> <table border="1"> <thead> <tr> <th>Name</th> <th>Value</th> </tr> </thead> <tbody> <tr> <td>OverallWidth</td> <td>4000</td> </tr> <tr> <td>Materials</td> <td>1</td> </tr> <tr> <td> IfcMaterialList</td> <td>4</td> </tr> <tr> <td> IfcMaterial_1</td> <td>Handtag - ytterdør</td> </tr> <tr> <td> IfcMaterial_2</td> <td>Gummi</td> </tr> <tr> <td> IfcMaterial_3</td> <td>Dørblad</td> </tr> <tr> <td> IfcMaterial_4</td> <td>Dørr - Dørrkarm</td> </tr> <tr> <td>Properties</td> <td>3</td> </tr> <tr> <td> eveBIM PSet</td> <td>1</td> </tr> <tr> <td> Visibility</td> <td>True</td> </tr> <tr> <td> Pset_DoorCommon</td> <td>2</td> </tr> <tr> <td> IsExternal</td> <td>True</td> </tr> <tr> <td> Reference</td> <td>TP 28x32</td> </tr> <tr> <td> Pset_ManufacturerTypeInformation</td> <td>1</td> </tr> <tr> <td> Manufacturer</td> <td></td> </tr> <tr> <td>Type</td> <td>3</td> </tr> <tr> <td> Fields</td> <td>11</td> </tr> <tr> <td> ClassType</td> <td>IfcDoorStyle</td> </tr> <tr> <td> StepId</td> <td>528486</td> </tr> </tbody> </table> </div> <div>  </div> | Name | Value | OverallWidth | 4000 | Materials | 1 | IfcMaterialList | 4 | IfcMaterial_1 | Handtag - ytterdør | IfcMaterial_2 | Gummi | IfcMaterial_3 | Dørblad | IfcMaterial_4 | Dørr - Dørrkarm | Properties | 3 | eveBIM PSet | 1 | Visibility | True | Pset_DoorCommon | 2 | IsExternal | True | Reference | TP 28x32 | Pset_ManufacturerTypeInformation | 1 | Manufacturer | | Type | 3 | Fields | 11 | ClassType | IfcDoorStyle | StepId |
| Name | Value | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| OverallWidth | 4000 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Materials | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| IfcMaterialList | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| IfcMaterial_1 | Handtag - ytterdør | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| IfcMaterial_2 | Gummi | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| IfcMaterial_3 | Dørblad | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| IfcMaterial_4 | Dørr - Dørrkarm | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Properties | 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| eveBIM PSet | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Visibility | True | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pset_DoorCommon | 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| IsExternal | True | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Reference | TP 28x32 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pset_ManufacturerTypeInformation | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Manufacturer | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Type | 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Fields | 11 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ClassType | IfcDoorStyle | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| StepId | 528486 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |



| | | |
|-----------------------------|---|---|
| | 15.1) Is it possible to query the model and the attributes? | No |
| Analysis | 16.1) Is it possible to analyse the objects and the model? | No |
| | 16.1.3) Time required to perform the analysis about the model itself (type 1) | No analysis of type 1 are possible |
| | 16.1.3) Time required to perform the analysis about the model performances (type2) | No analysis of type 2 are possible |
| Export | You arrived at the end of the phase 1: "Import and manage the file in the software".Now choose: | The software has also export abilities to IFC |
| | 17.1) Are any pre-processing or setting changes needed in the software to enable a consistent export? | No |
| | 18.1) Is it possible to choose the IFC model view definition (MVD) to be used when exporting the data? | No |
| | 19) How long does it take for the data to be exported to IFC? | less than a minute |
| Test with UpTown.ifc | | |
| Performance | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | 5-20 minutes |
| | How long does it take, approximately, to:Zoom into the model to see more detail | less than a minute |
| | How long does it take, approximately, to:Pan the model | less than a minute |
| | How long does it take, approximately, to:Rotate the model | less than a minute |
| | How long does it take, approximately, to:Query an object | less than a minute |
| | How long does it take, approximately, to:Inspect the objects linked to the queried one (Element 3) through a relationship | less than a minute |
| Pro port | 24.1) Does the model maintain its correct dimensions and proportions? | Yes |

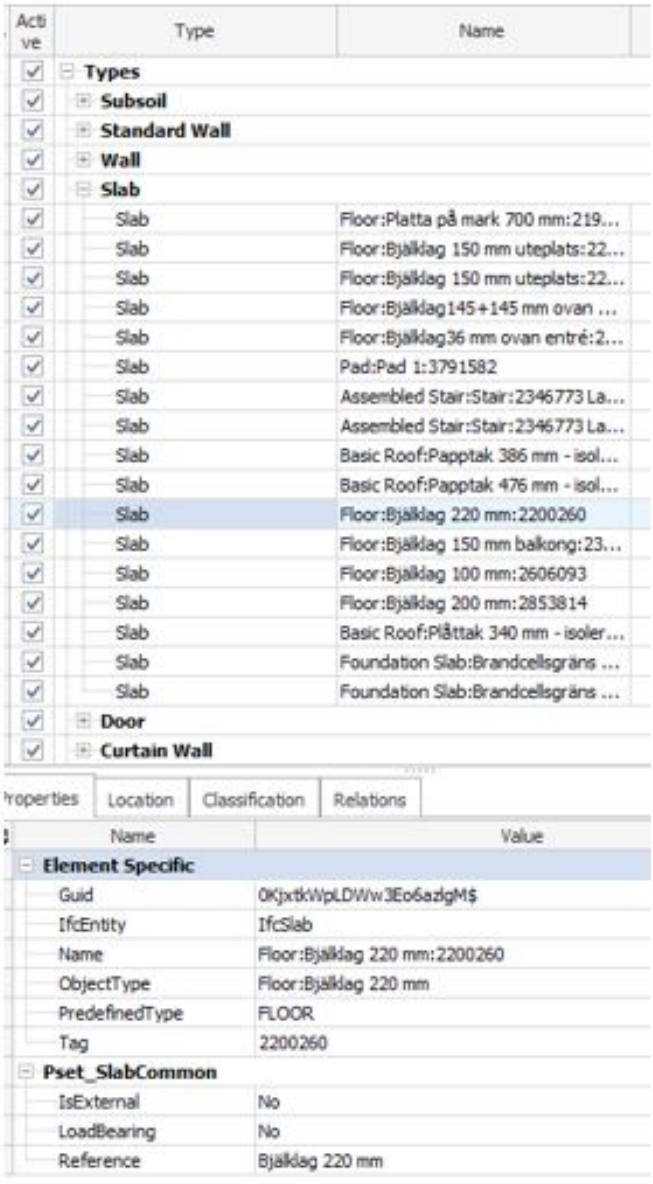
| | | |
|------------|---|---|
| IFC def | 25.1) Is the eventual translation consistent with the IFC definitions? | Yes |
| Hier arch | 26.1) Are the hierarchical relationships consistent with the IFC hierarchy? | The software does not have the necessary tools to determine this information |
| Attri bute | 27.1) Are the attributes present in the IFC entities retained and consistent? | Yes |
| R el t | 28.1) Are the relationships between the objects retained? | Yes |
| G e | 29.1) Is geometry read correctly? | Yes |
| Normals | 30.1) Did the normals change? | No |
| | 30.1.2) Attach screenshots |  |
| 2D/3D | 31.1) Is it possible to view the model in 3D? | Yes |
| | 32.1) Is it possible to view the model in 2D? | No |
| Exp ort | You arrived at the end of the phase 1: "Import and manage the file in the software".Now choose: | The software has also export abilities to IFC |

| | | |
|---------------------------------|---|--|
| | 36) How long does it take for the data to be exported to IFC? | 20 minutes-1 hour |
| Test with Savigliano.ifc | | |
| Performance | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | less than a minute |
| | How long does it take, approximately, to:Zoom into the model to see more detail | it's almost immediate |
| | How long does it take, approximately, to:Pan the model | it's almost immediate |
| | How long does it take, approximately, to:Rotate the model | it's almost immediate |
| | How long does it take, approximately, to:Query an object | it's almost immediate |
| | How long does it take, approximately, to:Inspect the objects linked to the queried one through a relationship | it's almost immediate |
| | 39) Attach screenshots regarding the eventually reported errors. | |
| Georeferencing | 40.1) Are the world (projected) coordinates taken into account when locating the model in the software's coordinate reference system? | Yes |
| Height | 41.1) Are the "real-world" elevation values (heights) considered when locating the model in the software (z)? | Yes |
| Orientation | 42.1) Is the model oriented correctly with respect to the true North? | Yes |
| Proportions | 43.1) Does the model maintain its correct dimensions and proportions? | Yes |
| IFC definitions | 44.1) Is the eventual translation consistent with the IFC definitions? | Yes |
| Hierarchy | 45.1) Are the hierarchical relationships consistent with the IFC hierarchy? | The software does not have the necessary tools to determine this information |
| Attributes | 46.1) Are the attributes present in the IFC entities retained and consistent? | Yes |
| Relationships | 47.1) Are the relationships between the objects retained? | Yes |
| Geometry | 48.1) Is geometry read correctly? | Yes |
| Normals | 49.1) Did the normals change? | No |

| | | | |
|--------|---|--|--|
| | 49.1.2) Attach screenshots |  | |
| 2D/3D | 50.1) Is it possible to view the model in 3D? | Yes | |
| 2D/3D | 51.1) Is it possible to view the model in 2D? | No | |
| Export | You arrived at the end of the phase 1: "Import and manage the file in the software".Now choose: | The software has also export abilities to IFC | |
| Export | 55) How long does it take for the data to be exported to IFC? | less than a minute | |

BIM Visison 2.20.3

| | | | | | | | |
|----------------------------|--|-------------------------------|------------------------------|---------------------------------|---------------------------|------------------------------|-----------------------|
| Software | Software Name [version] | BIM Visison [2.20.3] | | Software house | | Datacomp Sp. z o.o. | |
| | Proprietary or open source software? | | | Kind of software | | | |
| | open source | | | 3D viewer | | | |
| Computer | Model and year | Operating system | CPU | GPU | Memory (RAM) | Hard drive capacity | Hard drive free space |
| | HP ZBook 15 G3, 2018 | Windows 10 Enterprise, 64-bit | Intel® Core™ i7-6820HQ CPU | NVIDIA Quadro M1000M | 32 | 474 | 217 |
| Certification | IFC import certification status | Import certification date | Import certification program | IFC export certification status | Export certification date | Export certification program | |
| | not certified | | | not certified | | | |
| Test with Myran.ifc | | | | | | | |
| Performance | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Zoom into the model to see more detail | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Pan the model | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Rotate the model | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Query an object | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Inspect the objects linked to the queried one through a relationship | | | it's almost immediate | | | |
| Georeferencing | 2.1) Are the world (projected) coordinates taken into account when locating the model in the software's coordinate reference system? | | | Yes | | | |
| Height | 3.1) Are the "real-world" elevation values (heights) considered when locating the model in the software (z)? | | | Yes | | | |
| Orientation | 4.1) Is the model oriented correctly with respect to the true North? | | | Yes | | | |
| Proportions | 5.1) Does the model maintain its correct dimensions and proportions? | | | Yes | | | |
| IFC definitions | 6.1) Is the eventual translation consistent with the IFC definitions? | | | Yes | | | |
| Hierarchy | 7.1) Are the hierarchical relationships consistent with the IFC hierarchy? | | | Yes | | | |
| Attributes | 8.1) Are the attributes present in the IFC entities retained and consistent? | | | Yes | | | |
| Relations | 9.1) Are the relationships between the objects retained? | | | Yes | | | |
| | 9.2) short comments to the previous question (optional) | | | Some relations might be missing | | | |
| Geometry | 10.1) Is geometry read correctly? | | | Yes | | | |

| Z o | 11.1) Did the normals change? | Yes | | | | | | | | | | | | | | | | | | | | | | | |
|-------------------------|---|--|------|-------|-------------------------|--|------|------------------------|-----------|---------|------|---------------------------------|------------|------------------------|----------------|-------|-----|---------|------------------------|--|------------|----|-------------|----|-----------|
| | 12.1) Is it possible to view the model in 3D? | Yes | | | | | | | | | | | | | | | | | | | | | | | |
| 2D/3D | 13.1) Is it possible to view the model in 2D? | Yes | | | | | | | | | | | | | | | | | | | | | | | |
| Editing | 14.1) Is it possible to edit the model (attributes, geometry, other)? | No | | | | | | | | | | | | | | | | | | | | | | | |
| | 14.2) short comments to the previous question (optional) | At least, I cannot find such possibilities | | | | | | | | | | | | | | | | | | | | | | | |
| Querying | 15.1) Is it possible to query the model and the attributes? | Yes | | | | | | | | | | | | | | | | | | | | | | | |
| | 15.1.1) What kinds of query are possible? | There are general pre-defined ways to view the information, listed by structure, by types, by groups (system, zones or other) and by layers. For all these properties, location, classification and relations can be shown at the object level | | | | | | | | | | | | | | | | | | | | | | | |
| | 15.1.2) Attach screenshots | <p><i>List by types:</i></p>  <p>The screenshot displays a hierarchical list of building elements. The 'Types' section is expanded, showing sub-categories like 'Subsoil', 'Standard Wall', 'Wall', 'Slab', 'Door', and 'Curtain Wall'. Under 'Slab', several items are listed, including 'Floor:Platta på mark 700 mm: 219...', 'Floor:Bjälklag 150 mm uteplats: 22...', and 'Floor:Bjälklag 220 mm: 2200260'. The 'Properties' panel for the selected 'Floor: Bjälklag 220 mm: 2200260' element shows the following details:</p> <table border="1"> <thead> <tr> <th>Name</th> <th>Value</th> </tr> </thead> <tbody> <tr> <td>Element Specific</td> <td></td> </tr> <tr> <td>Guid</td> <td>0KjxdkWpLDWw3Eo6azgM\$</td> </tr> <tr> <td>IfcEntity</td> <td>IfcSlab</td> </tr> <tr> <td>Name</td> <td>Floor: Bjälklag 220 mm: 2200260</td> </tr> <tr> <td>ObjectType</td> <td>Floor: Bjälklag 220 mm</td> </tr> <tr> <td>PredefinedType</td> <td>FLOOR</td> </tr> <tr> <td>Tag</td> <td>2200260</td> </tr> <tr> <td>Pset_SlabCommon</td> <td></td> </tr> <tr> <td>IsExternal</td> <td>No</td> </tr> <tr> <td>LoadBearing</td> <td>No</td> </tr> <tr> <td>Reference</td> <td>Bjälklag 220 mm</td> </tr> </tbody> </table> | Name | Value | Element Specific | | Guid | 0KjxdkWpLDWw3Eo6azgM\$ | IfcEntity | IfcSlab | Name | Floor: Bjälklag 220 mm: 2200260 | ObjectType | Floor: Bjälklag 220 mm | PredefinedType | FLOOR | Tag | 2200260 | Pset_SlabCommon | | IsExternal | No | LoadBearing | No | Reference |
| Name | Value | | | | | | | | | | | | | | | | | | | | | | | | |
| Element Specific | | | | | | | | | | | | | | | | | | | | | | | | | |
| Guid | 0KjxdkWpLDWw3Eo6azgM\$ | | | | | | | | | | | | | | | | | | | | | | | | |
| IfcEntity | IfcSlab | | | | | | | | | | | | | | | | | | | | | | | | |
| Name | Floor: Bjälklag 220 mm: 2200260 | | | | | | | | | | | | | | | | | | | | | | | | |
| ObjectType | Floor: Bjälklag 220 mm | | | | | | | | | | | | | | | | | | | | | | | | |
| PredefinedType | FLOOR | | | | | | | | | | | | | | | | | | | | | | | | |
| Tag | 2200260 | | | | | | | | | | | | | | | | | | | | | | | | |
| Pset_SlabCommon | | | | | | | | | | | | | | | | | | | | | | | | | |
| IsExternal | No | | | | | | | | | | | | | | | | | | | | | | | | |
| LoadBearing | No | | | | | | | | | | | | | | | | | | | | | | | | |
| Reference | Bjälklag 220 mm | | | | | | | | | | | | | | | | | | | | | | | | |

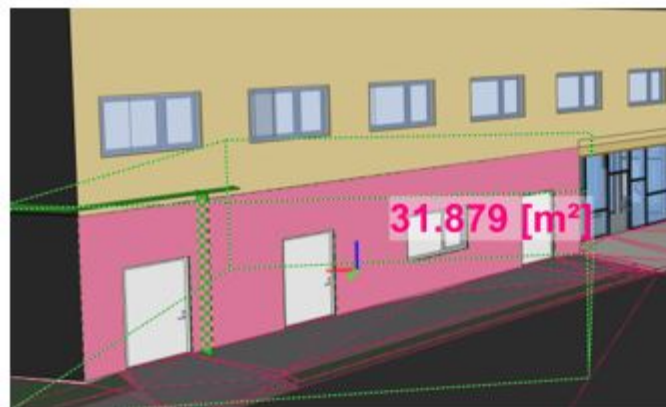
| | | |
|----------|--|---|
| Analysis | 16.1) Is it possible to analyse the objects and the model? | Yes, analysis about the modelled building performances (energy, noise, shadows...) are possible (type 2) |
| | 16.1.1) What analysis are possible? Do you know if the results are reliable? | Volume, area, edge, weight, counting and coordinates can be measured. Do not know if they are reliable |

16.1.2) Attach screenshots

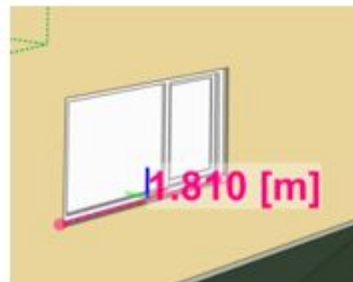
Volume:



Area:



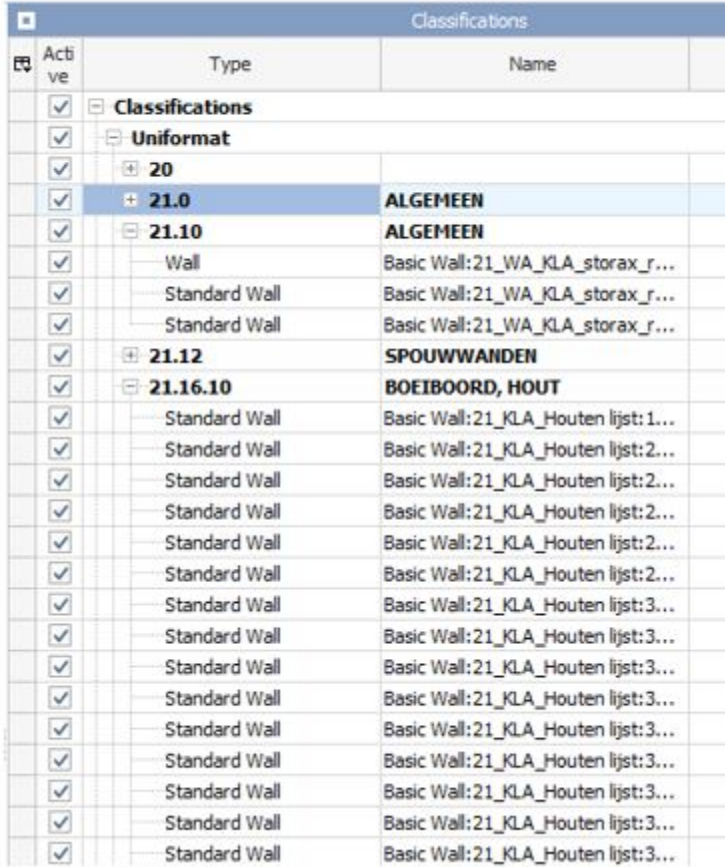
Edge:



Steel weight:



| | | |
|-----------------------------|---|--|
| | 16.1.3) Time required to perform the analysis about the model itself (type 1) | No analysis of type 1 are possible |
| | 16.1.3) Time required to perform the analysis about the model performances (type2) | it's almost immediate |
| | You arrived at the end of the phase 1: "Import and manage the file in the software".Now choose: | The software cannot export, therefore skip the phase 2 |
| Test with UpTown.ifc | | |
| Performance | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | 5-20 minutes |
| | How long does it take, approximately, to:Zoom into the model to see more detail | it's almost immediate |
| | How long does it take, approximately, to:Pan the model | it's almost immediate |
| | How long does it take, approximately, to:Rotate the model | it's almost immediate |
| | How long does it take, approximately, to:Query an object | it's almost immediate |
| | How long does it take, approximately, to:Inspect the objects linked to the queried one (Element 3) through a relationship | it's almost immediate |
| Pro port | 24.1) Does the model maintain its correct dimensions and proportions? | Yes |
| Hier arch | 26.1) Are the hierarchical relationships consistent with the IFC hierarchy? | Yes |
| Attri bute | 27.1) Are the attributes present in the IFC entities retained and consistent? | Yes |
| R el t | 28.1) Are the relationships between the objects retained? | Yes |
| G e c | 29.1) Is geometry read correctly? | Yes |
| N o s | 30.1) Did the normals change? | Yes |
| 2D/3 D | 31.1) Is it possible to view the model in 3D? | Yes |
| | 32.1) Is it possible to view the model in 2D? | Yes |
| Edit ing | 33.1) Is it possible to edit the model (attributes, geometry, other)? | No |
| Querying | 34.1) Is it possible to query the model and the attributes? | The answers are the same I gave during the test with Myran.ifc |
| | 34.1.1) What kinds of query are possible? | There are general pre-defined ways to view the information, listed by structure, by types, by groups (system, zones or other) and by layers. For all these properties, location, classification and relations can be shown on the object level |

| | | |
|---------------------------------|---|--|
| | 34.1.2) Attach screenshots | <p>List by classification:</p>  |
| Exp ort | You arrived at the end of the phase 1: "Import and manage the file in the software".Now choose: | The software cannot export, therefore skip the phase 2 |
| Test with Savigliano.ifc | | |
| Performance | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | it's almost immediate |
| | How long does it take, approximately, to:Zoom into the model to see more detail | it's almost immediate |
| | How long does it take, approximately, to:Pan the model | it's almost immediate |
| | How long does it take, approximately, to:Rotate the model | it's almost immediate |
| | How long does it take, approximately, to:Query an object | it's almost immediate |
| | How long does it take, approximately, to:Inspect the objects linked to the queried one through a relationship | it's almost immediate |
| | 39) Attach screenshots regarding the eventually reported errors. | |
| Geor efer | 40.1) Are the world (projected) coordinates taken into account when locating the model in the software's coordinate reference system? | Yes |
| Hei ght | 41.1) Are the "real-world" elevation values (heights) considered when locating the model in the software (z)? | Yes |

Datacomp Sp. z o.o. BIM Visison 2.20.3 - Windows 10 Home

Open source

3D viewer

Level of tester expertise: 1 - Very beginner user (it is nearly the first time you use it)

| | | |
|---------------------------------|---|--|
| Orie ntati o | 42.1) Is the model oriented correctly with respect to the true North? | Yes |
| Pro porti o | 43.1) Does the model maintain its correct dimensions and proportions? | Yes |
| IFC defi niti o | 44.1) Is the eventual translation consistent with the IFC definitions? | Yes |
| Hier arch y | 45.1) Are the hierarchical relationships consistent with the IFC hierarchy? | Yes |
| Attri bute c | 46.1) Are the attributes present in the IFC entities retained and consistent? | Yes |
| R el t | 47.1) Are the relationships between the objects retained? | Yes |
| G e o | 48.1) Is geometry read correctly? | Yes |
| N o r m a l s | 49.1) Did the normals change? | Yes |
| 2D/3 D | 50.1) Is it possible to view the model in 3D? | Yes |
| | 51.1) Is it possible to view the model in 2D? | Yes |
| Exp ort | You arrived at the end of the phase 1: "Import and manage the file in the software".Now choose: | The software cannot export, therefore skip the phase 2 |

FreeCAD

| | | | | | | | |
|----------------------------|--|---|---|---------------------------------|---------------------------|------------------------------|-----------------------|
| Software | Software Name [version] | FreeCAD [Current 0.19_pre development build 0.19.17352_x64_LP_11.11_PY2 QT4-WinVS2013] | | Software house | does not apply | | |
| | Proprietary or open source software? | | | Kind of software | | | |
| | open source | | | CAD | | | |
| Computer | Model and year | Operating system | CPU | GPU | Memory (RAM) | Hard drive capacity | Hard drive free space |
| | Dell Precision 3630 | Windows 10 Education | Intel Core i5-8500 3.00 GHz | Intel UHD Graphics 630 | 16 | 237 (System drive) | 167 (System drive) |
| Certification | IFC import certification status | Import certification date | Import certification program | IFC export certification status | Export certification date | Export certification program | |
| | not certified | | | not certified | | | |
| Test with Myran.ifc | | | | | | | |
| Performance | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | | | 5-20 minutes | | | |
| | How long does it take, approximately, to:Zoom into the model to see more detail | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Pan the model | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Rotate the model | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Query an object | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Inspect the objects linked to the queried one through a relationship | | | it's almost immediate | | | |
| | Please report on any errors the software gives when importing the file. | | I have set the log to debug level. Thus it is very verbose. There seem to be 3 types of error messages, that may pertain to similar causes, but in different places in the import process: Invalid base object, invalid shape, ... has an invalid shape. | | | | |
| Georeferencing | 2.1) Are the world (projected) coordinates taken into account when locating the model in the software's coordinate reference system? | | | Yes | | | |
| | 2.2) short comments to the previous question (optional) | | Checked min and max X and Y values for the terrain and part of the building compared to website image. Looks reasonable with reference point at 0,0 (not the whole model). For example, terrain.X ranges from 22320 to 119491. | | | | |
| Height | 3.1) Are the "real-world" elevation values (heights) considered when locating the model in the software (z)? | | | Yes | | | |
| | 3.2) short comments to the previous question (optional) | | Checked min and max z values of terrain and roof. Terrain goes from -1200 to 200, roof up to 6860. There is no information about the vertical location of the reference point on the website. But apparently the model is not moved to zero, but the reference point is at z=0. | | | | |
| Other | The model is oriented correctly with respect to the reference system. | | | | | | |

| | | |
|-----------------|--|--|
| | 4.2) short comments to the previous question (optional) | True north (somewhere in NNE in the ref system) is not relevant at all for this. There is a (brand new) function in FreeCAD (and most other CAD systems) to rotate the view such that true north points to display top, but usually architecture plans are not displayed nor printed like this. Also, this would not change the model orientation. |
| Proportions | 5.1) Does the model maintain its correct dimensions and proportions? | Yes |
| | 5.2) short comments to the previous question (optional) | It is hard to compare with the suggestions, because it is not clear where exactly measurements were taken. E.g. the diagonal measure could be different on different heights and the vertical measurement in section B is through a sloped roof, again depending on exact position of measurement.. |
| IFC definitions | 6.1) Is the eventual translation consistent with the IFC definitions? | Yes |
| | 6.2) short comments to the previous question (optional) | Checked all mappings through FreeCAD's Python console. IfcOpeningElement was not imported due to default import settings. |
| Hierarchy | 7.1) Are the hierarchical relationships consistent with the IFC hierarchy? | Yes |
| | 7.2) short comments to the previous question (optional) | I am not sure about the question and the meaning of "hierarchical relationships". From the pictures and the mentioning of subclasses it looks like you are talking about the inheritance tree defined for the IFC? Usually, native BIM applications do not need to implement the IFC type tree including all abstract types. Also, implementation details are usually not visible to the user (unless we have an Open Source application). So a more reasonable question would relate to the spatial hierarchy, that is Project/Site/Building/Storey (but then the "hierarchy" part of the data section would need to be updated). With regard to this, FreeCAD behaves properly. I also checked that all inherited attributes are considered and preserved during import. |
| Attributes | 8.1) Are the attributes present in the IFC entities retained and consistent? | Yes |
| | 8.2) short comments to the previous question (optional) | All properties from properties (under "attributes" in detailed data screenshots) are retained. With regard to attributes defined directly for the entity type (including inherited attributes) - these can be configured. From default configuration, most are retained, but ObjectType is missing from the configuration file for example. |
| Relationships | 9.1) Are the relationships between the objects retained? | Yes |
| | 9.2) short comments to the previous question (optional) | Spatial aggregation and containment is properly retained (although in debug mode, aggregations with more than 10 objects are skipped). Type objects (IfcRelDefinedByType) seem not to be considered. IfcRelConnectsPathElements (connection between walls) is ignored. IfcRelVoidsElement/IfcRelFillsElement could not be checked because due to import settings, openings were not imported as objects in their own right. |
| Geometry | 10.1) Is geometry read correctly? | Yes |
| | 10.2) short comments to the previous question (optional) | It is difficult to deliver a precise evaluation without concrete examples of geometry types that should result in solids and others that should result in surfaces. Whether a solid is a proper solid can be determined from the IFC geometry type in many cases, but not in all. For instance in this model the site geometry is an IfcFaceBasedSurfaceModel with IfcConnectedFaceSet. This can be either a closed or open shell. A different way to distinguish solids from surfaces may be the actual geometry but this may be contrary to the geometry representation type (which would mean that the file does not conform to the standard). It seems that these cases do exist in the IFC file at hand. |
| z o s | 11.1) Did the normals change? | No |

| | | |
|----------|--|---|
| | 11.1.1) What changes / inconsistencies / errors / other issues were noted? | No changes. Is the typeform flow correct? Should I really answer this question if the normals did *not* change? |
| | 11.2) short comments to the previous question (optional) | Visual check by setting all rendering materials to one-sided via Python script. No changes observed. |
| 2D/3D | 12.1) Is it possible to view the model in 3D? | Yes |
| | 12.2) short comments to the previous question (optional) | 3D view is very nice and responsive. Only changes of visibility for all objects at once take a bit longer. |
| | 13.1) Is it possible to view the model in 2D? | Yes |
| | 13.2) short comments to the previous question (optional) | Projection works just fine. There are also several ways create 2D technical drawings, but I did not extensively evaluate these. |
| Editing | 14.1) Is it possible to edit the model (attributes, geometry, other)? | Yes |
| | 14.1.1) What editing is possible (attributes, geometry, georeferencing, please add details)? | Full CAD functionality available, including attributes, both through GUI and scripting interface. With regard to IFC, also validity of enumeratin values is checked. |
| Querying | 15.1) Is it possible to query the model and the attributes? | Yes |
| | 15.1.1) What kinds of query are possible? | <ul style="list-style-type: none"> * simple search by (partial) name (screenshot A) * search via Python console - arbitrary complex conditions (screenshot B) * select with pointing device in model tree or 3D view * transfer pointing device selection to console (screenshot C) |

15.1.2) Attach screenshots

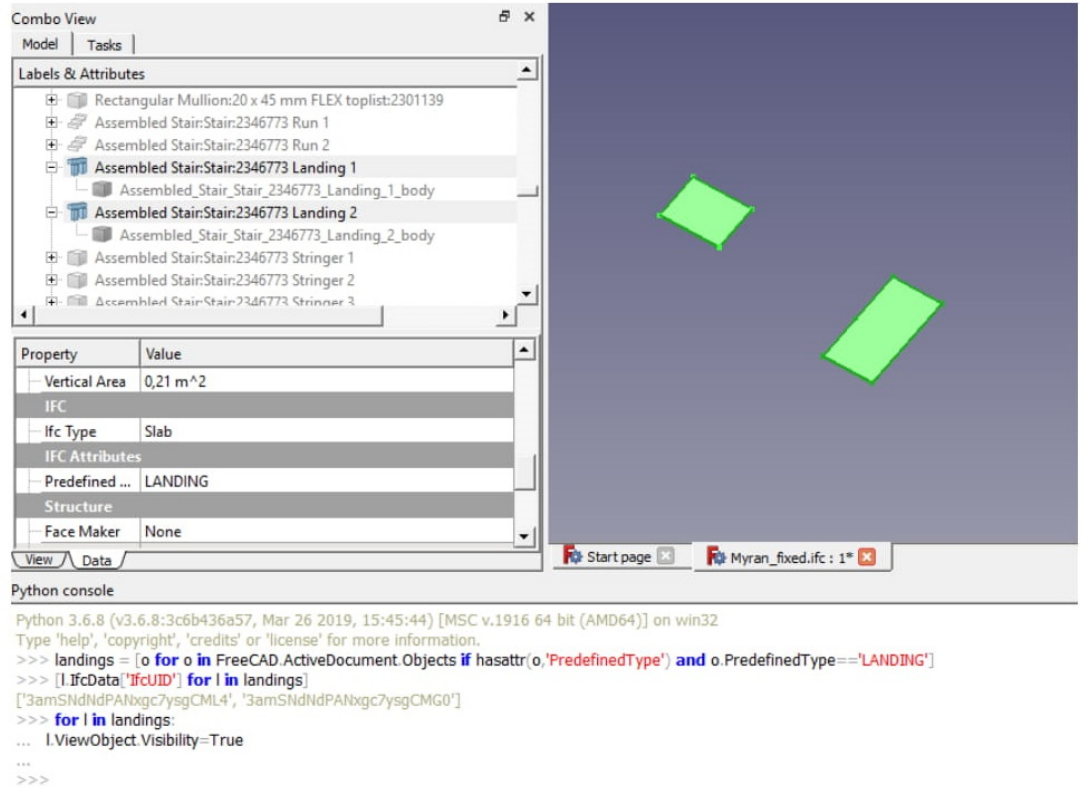


Figure 2: Screenshot B, Search with script

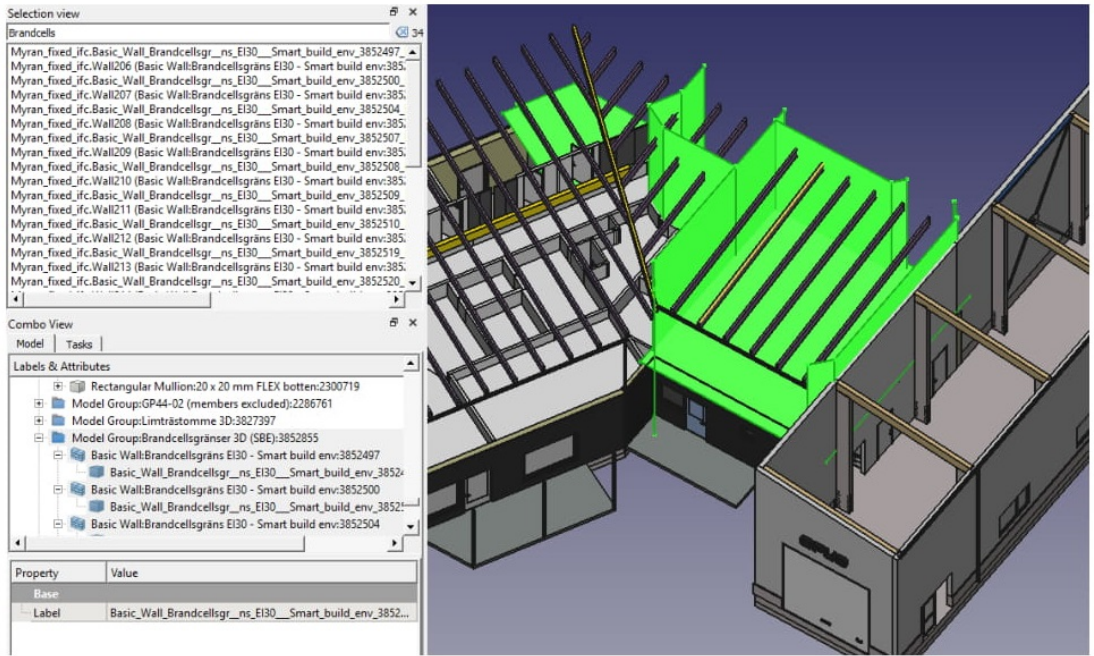


Figure 1: Screenshot A, Simple search

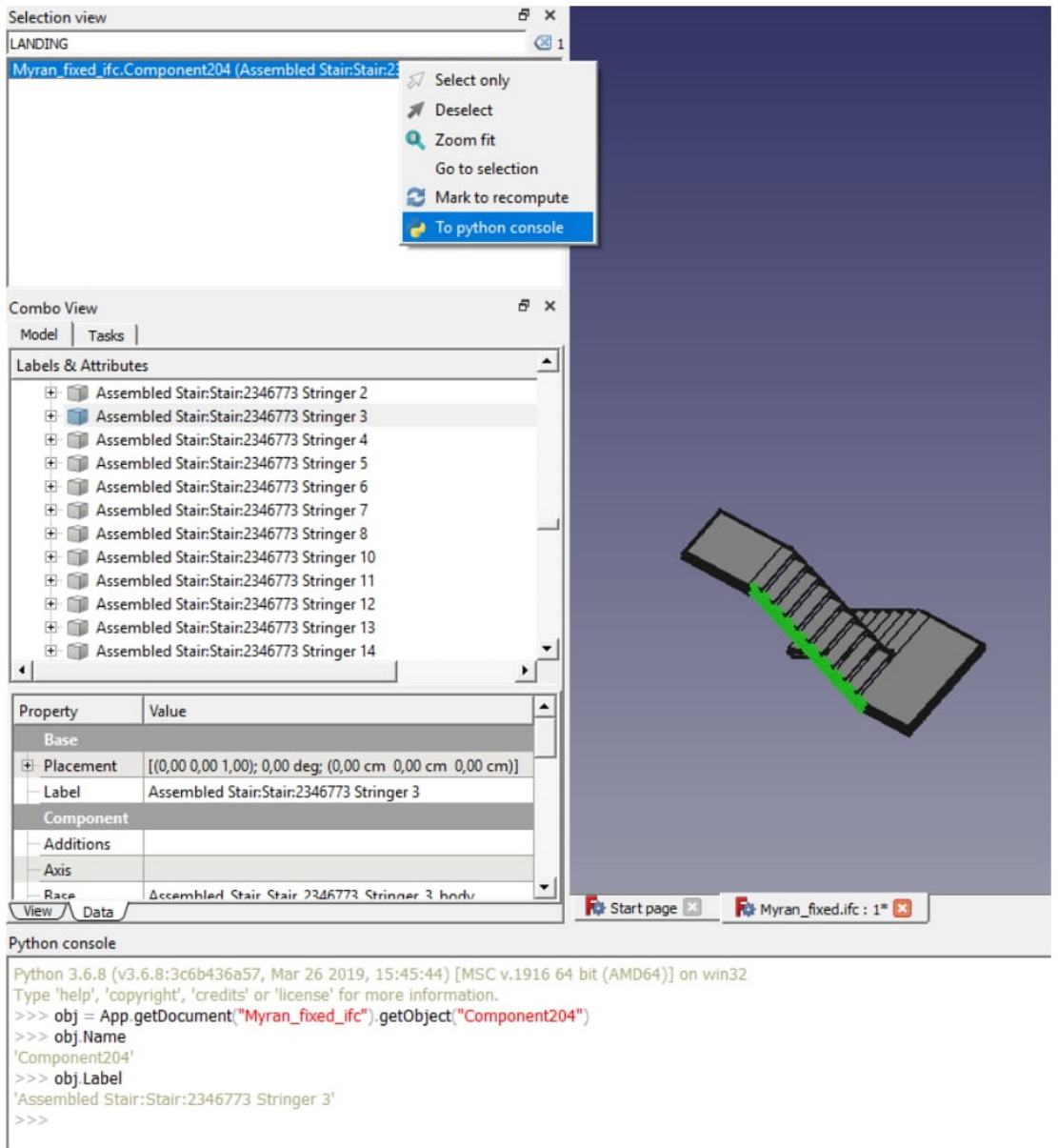


Figure 3: Screenshot C, Point and send to console

15.2) short comments to the previous question (optional)

It would be nice to be able to add more than one file as screenshot.

Anal
view

16.1) Is it possible to analyse the objects and the model?

Yes, both analysis about the model and its performances are possible (type 1 and 2)

| | | |
|--|---|---|
| | <p>16.1.1) What analysis are possible? Do you know if the results are reliable?</p> | <p>Just a few possibilities (not exhaustive):</p> <ul style="list-style-type: none">* Validity of geometry (not closed solids etc.)* IFC preflight (standard conformance)* FEM analysis* Solar diagram* CFD simulation* ... more possible due to extensibility with workbenches and open source code <p>I trust the geometry validation quite well since it is based on a mature and open source CAD kernel (OpenCascade). Maturity means it is used, tested, improved for a long time, open source code means people can verify and check what it really does under the hood. Most analysis tools integrate other external (open source) tools, e.g. pysolar for solar analysis or OpenFoam for CFD and are as reliably as these.</p> |
|--|---|---|

16.1.2) Attach screenshots

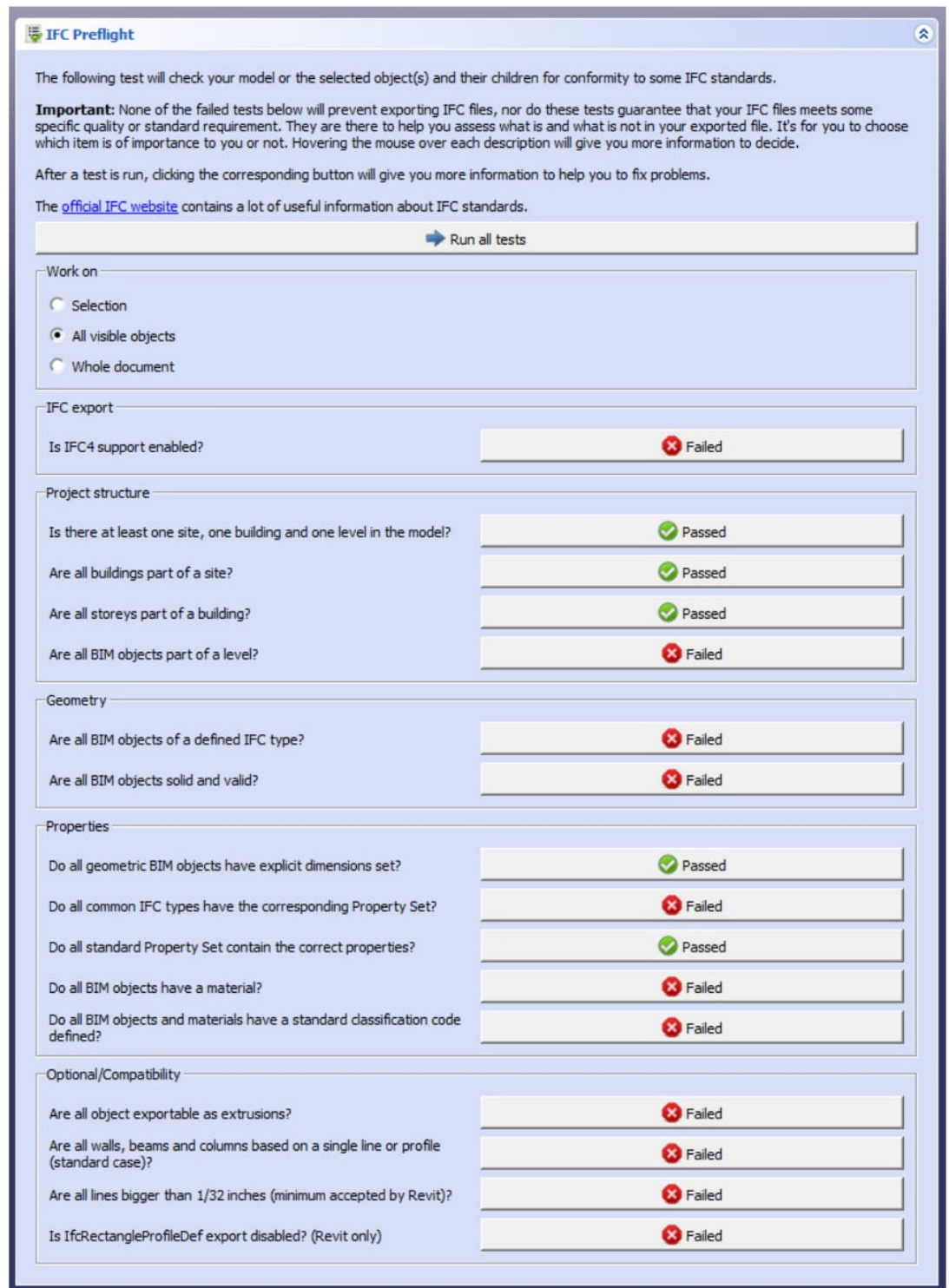


Figure 1: Screenshot, IFC preflight results

Check Geometry

3670 processed out of 3820 selected
2116 invalid shapes.

| Name | Type | Error |
|------------------------------|----------|--------------------------|
| Vertex30 | Vertex | Invalid Point On Curve |
| Vertex29 | Vertex | Invalid Point On Curve |
| Vertex30 | Vertex | Invalid Point On Curve |
| Myran_fixed_ifc.Component131 | Compound | Invalid |
| Edge24 | Edge | Check Failed |
| Vertex17 | Vertex | Invalid Point On Curve |
| Edge25 | Edge | Check Failed |
| Edge36 | Edge | Check Failed |
| Edge37 | Edge | Check Failed |
| Vertex24 | Vertex | Invalid Point On Curve |
| Vertex17 | Vertex | Invalid Point On Curve |
| Vertex24 | Vertex | Invalid Point On Curve |
| Myran_fixed_ifc.Component135 | Compound | Invalid |
| Edge24 | Edge | Check Failed |
| Edge25 | Edge | Check Failed |
| Vertex18 | Vertex | Invalid Point On Curve |
| Edge36 | Edge | Check Failed |
| Vertex23 | Vertex | Invalid Point On Curve |
| Edge37 | Edge | Check Failed |
| Vertex23 | Vertex | Invalid Point On Curve |
| Vertex18 | Vertex | Invalid Point On Curve |
| Myran_fixed_ifc.Component137 | Compound | Invalid |
| Edge39 | Edge | Check Failed |
| Vertex25 | Vertex | Invalid Point On Curve |
| Edge40 | Edge | Check Failed |
| Vertex25 | Vertex | Invalid Point On Curve |
| Myran_fixed_ifc.Component138 | Compound | Invalid |
| Face8 | Face | Not Closed |
| Edge23 | Edge | Invalid Curve On Surface |
| Vertex17 | Vertex | Invalid Point On Curve |
| Vertex18 | Vertex | Invalid Point On Curve |
| Vertex25 | Vertex | Invalid Point On Curve |
| Vertex26 | Vertex | Invalid Point On Curve |
| Vertex17 | Vertex | Invalid Point On Curve |
| Vertex25 | Vertex | Invalid Point On Curve |
| Vertex18 | Vertex | Invalid Point On Curve |
| Vertex26 | Vertex | Invalid Point On Curve |
| Myran_fixed_ifc.Component133 | Compound | Invalid |
| Vertex18 | Vertex | Invalid Point On Curve |
| Vertex23 | Vertex | Invalid Point On Curve |
| Vertex23 | Vertex | Invalid Point On Curve |
| Vertex18 | Vertex | Invalid Point On Curve |
| Myran_fixed_ifc.Component136 | Compound | Invalid |
| Edge39 | Edge | Check Failed |
| Edge40 | Edge | Check Failed |
| Vertex26 | Vertex | Invalid Point On Curve |
| Vertex26 | Vertex | Invalid Point On Curve |
| Myran_fixed_ifc.Component142 | Compound | Invalid |
| Edge24 | Edge | Check Failed |
| Edge25 | Edge | Check Failed |
| Edge36 | Edge | Check Failed |
| Vertex23 | Vertex | Invalid Point On Curve |
| Edge37 | Edge | Check Failed |

Figure 2: Check geometry (BREP) dialog window

Check Geometry

3670 processed out of 3820 selected
2116 invalid shapes.

| Name | Type | Error |
|----------------------------------|----------|-------------|
| Vertex30 | Vertex | Invalid Poi |
| Vertex29 | Vertex | Invalid Poi |
| Vertex30 | Vertex | Invalid Poi |
| [-] Myran_fixed_ifc.Component131 | Compound | Invalid |
| [-] Edge24 | Edge | Check Fail |
| Vertex17 | Vertex | Invalid Poi |
| Edge25 | Edge | Check Fail |
| Edge36 | Edge | Check Fail |
| [-] Edge37 | Edge | Check Fail |
| Vertex24 | Vertex | Invalid Poi |
| Vertex17 | Vertex | Invalid Poi |
| Vertex24 | Vertex | Invalid Poi |
| [-] Myran_fixed_ifc.Component135 | Compound | Invalid |
| Edge24 | Edge | Check Fail |
| [-] Edge25 | Edge | Check Fail |
| Vertex18 | Vertex | Invalid Poi |
| [-] Edge36 | Edge | Check Fail |
| Vertex23 | Vertex | Invalid Poi |
| Edge37 | Edge | Check Fail |
| Vertex23 | Vertex | Invalid Poi |
| Vertex18 | Vertex | Invalid Poi |
| [-] Myran_fixed_ifc.Component137 | Compound | Invalid |
| [-] Edge39 | Edge | Check Fail |
| Vertex25 | Vertex | Invalid Poi |
| Edge40 | Edge | Check Fail |
| Vertex25 | Vertex | Invalid Poi |
| [-] Myran_fixed_ifc.Component138 | Compound | Invalid |
| [-] Face8 | Face | Not Closed |
| Edge23 | Edge | Invalid Cur |
| Vertex17 | Vertex | Invalid Poi |

Check Geometry

3670 processed out of 3820 selected
2116 invalid shapes.

| Name | Type | Error |
|----------------------------------|----------|-------------|
| Vertex30 | Vertex | Invalid Poi |
| Vertex29 | Vertex | Invalid Poi |
| Vertex30 | Vertex | Invalid Poi |
| [-] Myran_fixed_ifc.Component131 | Compound | Invalid |
| [-] Edge24 | Edge | Check Fail |
| Vertex17 | Vertex | Invalid Poi |
| Edge25 | Edge | Check Fail |
| Edge36 | Edge | Check Fail |
| [-] Edge37 | Edge | Check Fail |
| Vertex24 | Vertex | Invalid Poi |
| Vertex17 | Vertex | Invalid Poi |
| Vertex24 | Vertex | Invalid Poi |
| [-] Myran_fixed_ifc.Component135 | Compound | Invalid |
| Edge24 | Edge | Check Fail |
| [-] Edge25 | Edge | Check Fail |
| Vertex18 | Vertex | Invalid Poi |
| [-] Edge36 | Edge | Check Fail |
| Vertex23 | Vertex | Invalid Poi |
| Edge37 | Edge | Check Fail |
| Vertex23 | Vertex | Invalid Poi |
| Vertex18 | Vertex | Invalid Poi |
| [-] Myran_fixed_ifc.Component137 | Compound | Invalid |
| [-] Edge39 | Edge | Check Fail |
| Vertex25 | Vertex | Invalid Poi |
| Edge40 | Edge | Check Fail |
| Vertex25 | Vertex | Invalid Poi |
| [-] Myran_fixed_ifc.Component138 | Compound | Invalid |
| [-] Face8 | Face | Not Closed |
| Edge23 | Edge | Invalid Cur |
| Vertex17 | Vertex | Invalid Poi |

| | | |
|--------|---|---|
| | 16.1.3) Time required to perform the analysis about the model itself (type 1) | 1-5 minutes |
| | 16.1.3) Time required to perform the analysis about the model performances (type2) | No analysis of type 2 are possible |
| | 16.2) short comments to the previous question (optional) | Type 2 analysis: I did not install additional libraries and workbenches due to a matter of time, so could not try these. |
| Export | You arrived at the end of the phase 1: "Import and manage the file in the software".Now choose: | The software has also export abilities to IFC |
| | 17.1) Are any pre-processing or setting changes needed in the software to enable a consistent export? | Yes |
| | 17.1.1) Can you add a short description of the steps involved in the pre-processing? | The default settings yielded an error regarding colors (to be checked in later versions and reported for fixing if necessary). By changing the settings to use the IFCOpenShell serializer, the error did not appear. No checks for further consistency have been conducted, because it is not clear what "consistency" would mean in this context. |

17.1.2) Attach screenshots and files

Export options

- Force export as Brep
- Use DAE triangulation options
- Join coplanar facets when triangulating
- Store IFC universal ID in FreeCAD objects
- Use IfcOpenShell serializer if available
- Export 2D objects as IfcAnnotations
- Export full FreeCAD parametric model
- Reuse similar entities
- Disable IfcRectangleProfileDef
- Auto-detect and export as standard cases when applicable
- Add default site if one is not found in the document
- Add default building if one is not found in the document (no standard)
- Add default building storey if one is not found in the document

Figure 1: Default IFC export options

When using default options (Figure 1), then an error related to colors is raised.

```
Traceback (most recent call last):
  File "<string>", line 211, in <module>
  File "D:\sw\FreeCAD_0.19.17352_x64_LP_11.11_PY2QT4-WinVS2013\Mod\Arch\importIFC.py", line 1678, in export
    representation, placement, shapetype = getRepresentation(ifcfile, context, obj, forcebrep=(brepflag or FORCE_BREP), colors=colors)
  File "D:\sw\FreeCAD_0.19.17352_x64_LP_11.11_PY2QT4-WinVS2013\Mod\Arch\importIFC.py", line 3413, in getRepresentation
    key = rgbt[i]
<type 'exceptions.IndexError':>: list index out of range
```

Inspecting the source it could be found that this piece of code is not carried out when IFCOpenShell serializer is used, so enabled this option and found that the error did not appear. Will be verified in later FreeCAD versions, reported and/or fixed.

| | |
|--|---|
| 18.1) Is it possible to choose the IFC model view definition (MVD) to be used when exporting the data? | No |
| 18.2) short comments to the previous question (optional) | Some of the export options are related to MVD choices, e.g. to use BREP over CSG. |
| 19) How long does it take for the data to be exported to IFC? | less than a minute |

Test with Savigliano.ifc

Home

Open source

CAD

Level of tester expertise: 2 - Current user

| | | |
|-------------|---|---|
| Performance | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | The software was not able to import it, even without crashing |
|-------------|---|---|

FreeCAD 0.18 - Windows 10 Enterprise

Open source

CAD

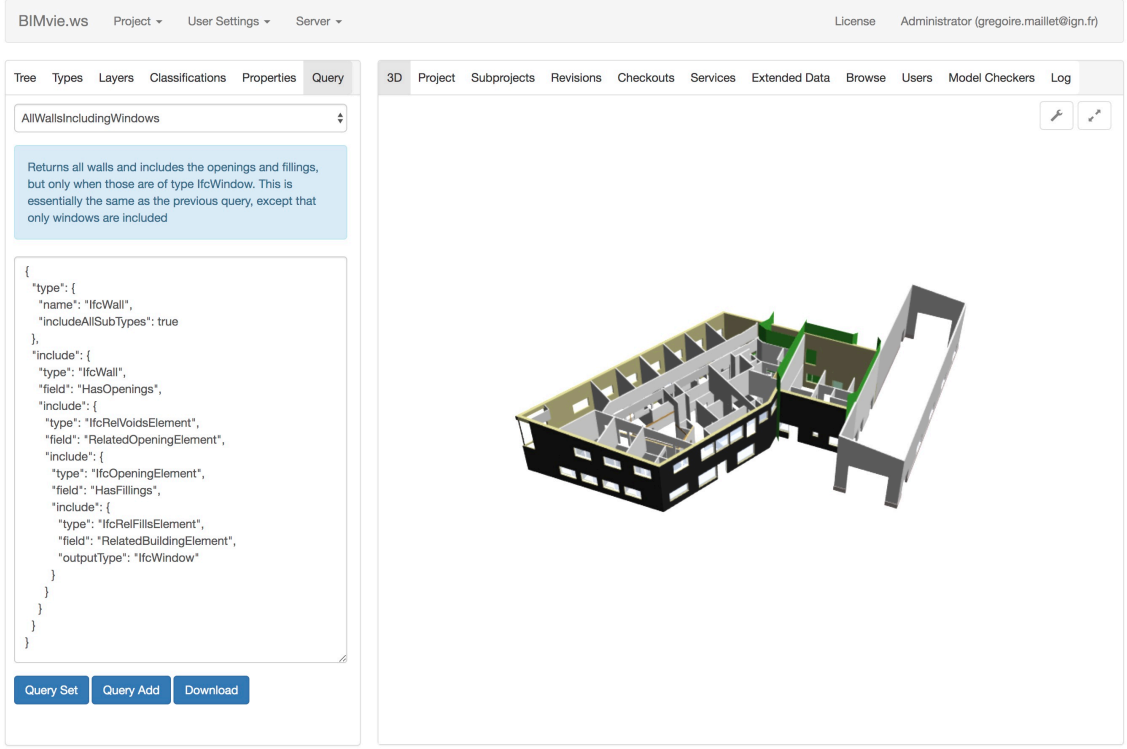
1 - Very beginner user (it is nearly the first time you use it)

FreeCAD

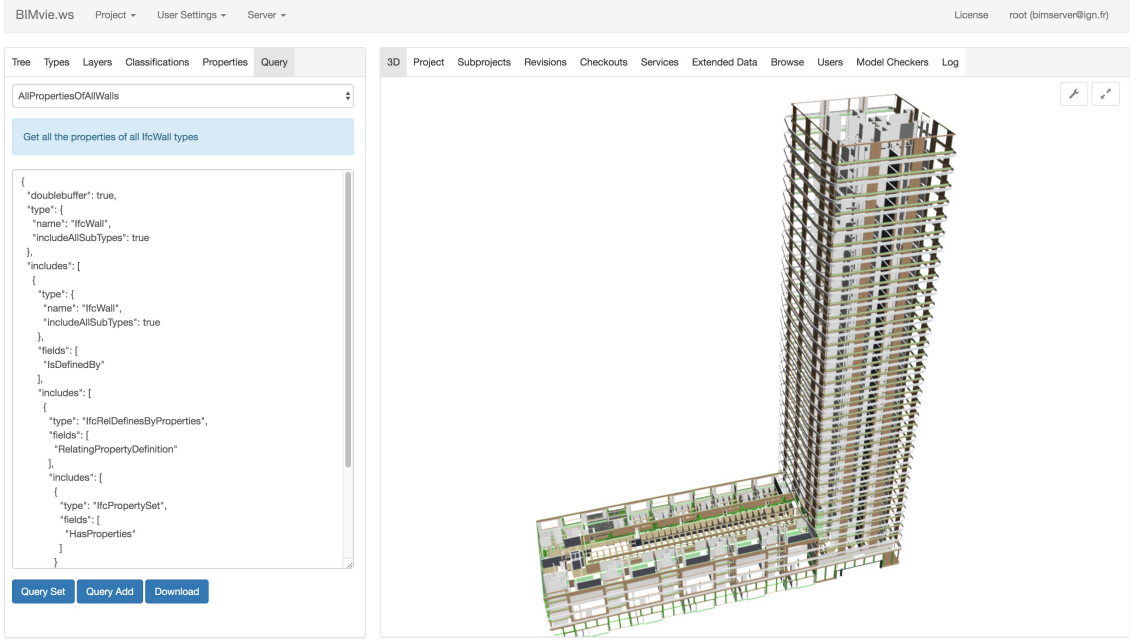
| | | | | | | | |
|---------------------------------|--|---------------------------------|-------------------------------|--|---------------------------|---|-----------------------|
| Software | Software Name [version] | FreeCAD [0.18] | | Software house | | https://www.freecadweb.org/ | |
| | Proprietary or open source software? | | | Kind of software | | | |
| | open source | | | CAD | | | |
| Computer | Model and year | Operating system | CPU | GPU | Memory (RAM) | Hard drive capacity | Hard drive free space |
| | Dell Precision M2800 | Windows 10 Enterprise 2016 LTSC | Intel Core i7-4710MQ 2.50 GHz | Intel HD Graphics 4600 | 8 | 120 | 77 |
| Certification | IFC import certification status | Import certification date | Import certification program | IFC export certification status | Export certification date | Export certification program | |
| | not certified | | | not certified | | | |
| Test with Myran.ifc | | | | | | | |
| Performance | How long does it take, approximately, to: Import (and visualise if the software allows it) the model | | | it crashes without completing the operation | | | |
| Test with UpTown.ifc | | | | | | | |
| Performance | How long does it take, approximately, to: Import (and visualise if the software allows it) the model | | | it crashes without completing the operation | | | |
| Test with Savigliano.ifc | | | | | | | |
| Performance | How long does it take, approximately, to: Import (and visualise if the software allows it) the model | | | it crashes without completing the operation | | | |
| | 38) Please report on any errors the software gives when importing the file. | | | Apparently IFC4 is not supported and fails silently resulting in an empty model. | | | |

BimServer

| | | | | | | | |
|----------------------------|--|----------------------------|------------------------------|--|---|------------------------------|-----------------------|
| Software | Software Name [version] | BimServer [1.5.138] | | Software house | http://bimserver.org | | |
| | Proprietary or open source software? | | | Kind of software | | | |
| | open source | | | BIM | | | |
| Computer | Model and year | Operating system | CPU | GPU | Memory (RAM) | Hard drive capacity | Hard drive free space |
| | MacBook Pro 15-inch 2017 | macOS 10.13.6 | Intel Core i7 2,8GHz | Radeon Pro 555 | 16Go | 500Go | 25Go |
| Certification | IFC import certification status | Import certification date | Import certification program | IFC export certification status | Export certification date | Export certification program | |
| | not certified | | | not certified | | | |
| Test with Myran.ifc | | | | | | | |
| Performance | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | | | 1-5 minutes | | | |
| | How long does it take, approximately, to:Zoom into the model to see more detail | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Pan the model | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Rotate the model | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Query an object | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Inspect the objects linked to the queried one through a relationship | | | it's almost immediate | | | |
| Georeferencing | 2.1) Are the world (projected) coordinates taken into account when locating the model in the software's coordinate reference system? | | | Yes | | | |
| | 2.2) short comments to the previous question (optional) | | | It is not directly visible, but a query on IfcSite object gives the same coordinates as in the IFC file (59°19'55", 18°3'53", 148.2) | | | |
| Height | 3.1) Are the "real-world" elevation values (heights) considered when locating the model in the software (z)? | | | Yes | | | |
| | 3.2) short comments to the previous question (optional) | | | It is not directly visible, but a query on IfcSite object gives the same coordinates as in the IFC file (59°19'55", 18°3'53", 148.2) | | | |
| Orientation | 4.1) Is the model oriented correctly with respect to the true North? | | | Yes | | | |
| | 4.2) short comments to the previous question (optional) | | | It is not directly visible, but a query on IfcRepresentationContext object gives the same TrueNorth direction as in the IFC file (-0.534352349, 0.845261833) | | | |
| Proportions | 5.1) Does the model maintain its correct dimensions and proportions? | | | The software does not have the necessary tools to determine this information | | | |

| | | |
|----------------|--|--|
| | 5.2) short comments to the previous question (optional) | There is nothing native in bimserver to check this, but there is no visible problem in BimView or iTowns. |
| IFC definition | 6.1) Is the eventual translation consistent with the IFC definitions? | Yes |
| | 6.2) short comments to the previous question (optional) | No Translation |
| Hierarchy | 7.1) Are the hierarchical relationships consistent with the IFC hierarchy? | Yes |
| Attribute | 8.1) Are the attributes present in the IFC entities retained and consistent? | Yes |
| Relationship | 9.1) Are the relationships between the objects retained? | Yes |
| Geometry | 10.1) Is geometry read correctly? | Yes |
| | 10.2) short comments to the previous question (optional) | BimServer use IfcOpenShell (http://ifcopenshell.org/) to generate the geometries |
| Normals | 11.1) Did the normals change? | Yes |
| 2D/3D | 12.1) Is it possible to view the model in 3D? | Yes |
| | 12.2) short comments to the previous question (optional) | BimServer included a 3D visu in BimViews and BimSurfer |
| | 13.1) Is it possible to view the model in 2D? | No |
| Editing | 14.1) Is it possible to edit the model (attributes, geometry, other)? | No |
| | 15.1) Is it possible to query the model and the attributes? | Yes |
| Querying | 15.1.1) What kinds of query are possible? | BimServer expose an API with query capabilities It's based on JSON syntax and could test Object Id, Object type or properties It's possible to build and check queries directly in BimViews |
| | 15.1.2) Attach screenshots |  <p>The screenshot shows the BIMView application interface. At the top, there are navigation menus for 'BIMvie.ws', 'Project', 'User Settings', and 'Server'. Below this, there are tabs for 'Tree', 'Types', 'Layers', 'Classifications', 'Properties', and 'Query'. The 'Query' tab is active, showing a query editor with a dropdown menu set to 'AllWallsIncludingWindows'. Below the dropdown, there is a text box containing a query description: 'Returns all walls and includes the openings and fillings, but only when those are of type IfcWindow. This is essentially the same as the previous query, except that only windows are included'. Below the text box is a large text area containing a JSON query structure. At the bottom of the query editor, there are three buttons: 'Query Set', 'Query Add', and 'Download'. To the right of the query editor is a 3D view of a building model, showing a cutaway of a multi-story building with a central courtyard and a ramp structure.</p> |

| | | |
|-----------------------------|---|--|
| Analysis | 16.1) Is it possible to analyse the objects and the model? | No |
| | 16.1.3) Time required to perform the analysis about the model itself (type 1) | No analysis of type 1 are possible |
| | 16.1.3) Time required to perform the analysis about the model performances (type2) | No analysis of type 2 are possible |
| Export | You arrived at the end of the phase 1: "Import and manage the file in the software".Now choose: | The software has also export abilities |
| | 17.1) Are any pre-processing or setting changes needed in the software to enable a consistent export? | No |
| | 18.1) Is it possible to choose the IFC model view definition (MVD) to be used when exporting the data? | No |
| | 19) How long does it take for the data to be exported to IFC? | 1-5 minutes |
| Test with UpTown.ifc | | |
| Performance | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | more than one hour |
| | How long does it take, approximately, to:Zoom into the model to see more detail | it's almost immediate |
| | How long does it take, approximately, to:Pan the model | it's almost immediate |
| | How long does it take, approximately, to:Rotate the model | it's almost immediate |
| | How long does it take, approximately, to:Query an object | it's almost immediate |
| | How long does it take, approximately, to:Inspect the objects linked to the queried one (Element 3) through a relationship | less than a minute |
| | Please report on any errors the software gives when importing the file. | The geometric creation is very long (more than one hour), but finally, it works |
| Proportions | 24.1) Does the model maintain its correct dimensions and proportions? | The software does not have the necessary tools to determine this information |
| | 24.2) short comments to the previous question (optional) | It seems to be good, but there is no tool to measure distances |
| IFC definitions | 25.1) Is the eventual translation consistent with the IFC definitions? | Yes |
| Hierarchical | 26.1) Are the hierarchical relationships consistent with the IFC hierarchy? | Yes |
| Attributes | 27.1) Are the attributes present in the IFC entities retained and consistent? | Yes |
| Relationships | 28.1) Are the relationships between the objects retained? | Yes |
| | 28.2) short comments to the previous question (optional) | In BimViews the relationships are not directly visible in the 'Properties' tab, it's only available from the 'Browse' tab and it's not easy to found a specific object in a very large model like this one |
| Geometry | 29.1) Is geometry read correctly? | Yes |
| | 29.2) short comments to the previous question (optional) | This seems to be correct except that there is no roof at the top of the tower |
| Normals | 30.1) Did the normals change? | Yes |

| | | |
|--------------------------|---|---|
| 2D/3D | 31.1) Is it possible to view the model in 3D? | Yes |
| | 32.1) Is it possible to view the model in 2D? | No |
| Querying | 34.1) Is it possible to query the model and the attributes? | The answers are the same I gave during the test with Myran.ifc |
| | 34.1.2) Attach screenshots |  |
| Export | You arrived at the end of the phase 1: "Import and manage the file in the software".Now choose: | The software has also export abilities |
| | 36) How long does it take for the data to be exported to IFC? | it crashes without completing the operation |
| Test with Savigliano.ifc | | |
| Performance | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | 1-5 minutes |
| | How long does it take, approximately, to:Zoom into the model to see more detail | it's almost immediate |
| | How long does it take, approximately, to:Pan the model | it's almost immediate |
| | How long does it take, approximately, to:Rotate the model | it's almost immediate |
| | How long does it take, approximately, to:Query an object | it's almost immediate |
| | How long does it take, approximately, to:Inspect the objects linked to the queried one through a relationship | less than a minute |
| | 38) Please report on any errors the software gives when importing the file. | Relationships are not directly visible in the Properties tab of BimViews, it's necessary to find the object in the 'Browse' tab |
| Georeferencing | 40.1) Are the world (projected) coordinates taken into account when locating the model in the software's coordinate reference system? | Yes |
| | 40.2) short comments to the previous question (optional) | IfcSite object keep the coordinates (RefLatitude, RefLongitude, RefElevation) |

| | | |
|-----------------|---|--|
| Orientation | 41.1) Are the "real-world" elevation values (heights) considered when locating the model in the software (z)? | The software does not have the necessary tools for checking it |
| Orientation | 42.1) Is the model oriented correctly with respect to the true North? | Yes |
| | 42.2) short comments to the previous question (optional) | it's in TrueNorth property of the IfcGeometricRepresentationContext object (checked in the Browse tab of BimViews) |
| Proportions | 43.1) Does the model maintain its correct dimensions and proportions? | The software does not have the necessary tools to determine this information |
| IFC definitions | 44.1) Is the eventual translation consistent with the IFC definitions? | Yes |
| Hierarchy | 45.1) Are the hierarchical relationships consistent with the IFC hierarchy? | Yes |
| Attributes | 46.1) Are the attributes present in the IFC entities retained and consistent? | Yes |
| Relationships | 47.1) Are the relationships between the objects retained? | Yes |
| Geometry | 48.1) Is geometry read correctly? | Yes |
| Normals | 49.1) Did the normals change? | Yes |
| 2D/3D | 50.1) Is it possible to view the model in 3D? | Yes |
| | 51.1) Is it possible to view the model in 2D? | No |
| Export | You arrived at the end of the phase 1: "Import and manage the file in the software".Now choose: | The software has also export abilities |
| | 55) How long does it take for the data to be exported to IFC? | less than a minute |

Trimble SketchUp 2019 – macOS Mojave

Proprietary

3D viewer

1 - Very beginner user (it is nearly the first time you use it)

SketchUp

| | | | | | | | |
|---------------------------------|---|---------------------------|------------------------------|---|---------------------------|------------------------------|-----------------------|
| Software | Software Name [version] | SketchUp [2019] | | | Software house | Trimble | |
| | Proprietary or open source software? | | | Kind of software | | | |
| | proprietary | | | CAD | | | |
| Computer | Model and year | Operating system | CPU | GPU | Memory (RAM) | Hard drive capacity | Hard drive free space |
| | Mac book air 13 inch 2016 | macOS Mojave | 2,2GZ | x | 8GB | 256 | 22 |
| Certification | IFC import certification status | Import certification date | Import certification program | IFC export certification status | Export certification date | Export certification program | |
| | not certified | | | not certified | | | |
| Test with Myran.ifc | | | | | | | |
| Performance | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | | | 1-5 minutes | | | |
| | How long does it take, approximately, to:Zoom into the model to see more detail | | | it crashes without completing the operation | | | |
| | How long does it take, approximately, to:Pan the model | | | the software does not allow this | | | |
| | How long does it take, approximately, to:Rotate the model | | | the software does not allow this | | | |
| | How long does it take, approximately, to:Query an object | | | the software does not allow this | | | |
| | How long does it take, approximately, to:Inspect the objects linked to the queried one through a relationship | | | the software does not allow this | | | |
| | Please report on any errors the software gives when importing the file. | | | The model is not shown | | | |
| Test with UpTown.ifc | | | | | | | |
| Performance | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | | | it crashes without completing the operation | | | |
| Test with Savigliano.ifc | | | | | | | |
| Performance | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | | | the software does not allow this | | | |
| | How long does it take, approximately, to:Zoom into the model to see more detail | | | the software does not allow this | | | |
| | How long does it take, approximately, to:Pan the model | | | it crashes without completing the operation | | | |
| | How long does it take, approximately, to:Rotate the model | | | it crashes without completing the operation | | | |
| | How long does it take, approximately, to:Query an object | | | it crashes without completing the operation | | | |
| | How long does it take, approximately, to:Inspect the objects linked to the queried one through a relationship | | | it crashes without completing the operation | | | |

Trimble SketchUp 2019 – macOS Mojave

Proprietary

3D viewer

1 - Very beginner user (it is nearly the first time you use it)

| | | |
|--|---|---------------|
| | 38) Please report on any errors the software gives when importing the file. | Import failed |
| | 39) Attach screenshots regarding the eventually reported errors. | |

FZKViewer 5.1 – Windows 10 Enterprise

Proprietary

3D viewer

1 - Very beginner user (it is nearly the first time you use it)

FZKViewer

| | | | | | | | | |
|----------------------------|--|-------------------------------|------------------------------|---|---------------------------|------------------------------|-----------------------|--|
| Software | Software Name [version] | FZKViewer [5.1] | | | Software house | | | Karlsruhe Institute for Technology, C:\Downloads\FZKViewer- 5.1_Build-978.zip |
| | Proprietary or open source software? | | | | Kind of software | | | |
| | open source | | | | 3D viewer | | | |
| Computer | Model and year | Operating system | CPU | GPU | Memory (RAM) | Hard drive capacity | Hard drive free space | |
| | HP ZBook 15 G3, 2018 | Windows 10 Enterprise, 64-bit | Intel® Core™ i7-6820HQ CPU | NVIDIA Quadro M1000M | 32 | 474 | 217 | |
| Certification | IFC import certification status | Import certification date | Import certification program | IFC export certification status | Export certification date | Export certification program | | |
| | not certified | | | not certified | | | | |
| Test with Myran.ifc | | | | | | | | |
| Performance | How long does it take, approximately, to: Import (and visualise if the software allows it) the model | | | less than a minute | | | | |
| | How long does it take, approximately, to: Zoom into the model to see more detail | | | it's almost immediate | | | | |
| | How long does it take, approximately, to: Pan the model | | | it's almost immediate | | | | |
| | How long does it take, approximately, to: Rotate the model | | | it's almost immediate | | | | |
| | How long does it take, approximately, to: Query an object | | | it's almost immediate | | | | |
| | How long does it take, approximately, to: Inspect the objects linked to the queried one through a relationship | | | it's almost immediate | | | | |
| | Please report on any errors the software gives when importing the file. | | | Error 776: Boolean Operation - clipping plane generation for CdgisModel geometry failed; Geometry face - Invalid outer loop; Geometry polyline - Polyline contains colinear points, points removed; Geometry polylines - Double point removed | | | | |
| Georeferencing | 2.1) Are the world (projected) coordinates taken into account when locating the model in the software's coordinate reference system? | | | Yes | | | | |
| Height | 3.1) Are the "real-world" elevation values (heights) considered when locating the model in the software (z)? | | | Yes | | | | |
| Orientation | 4.1) Is the model oriented correctly with respect to the true North? | | | Yes | | | | |
| Proportions | 5.1) Does the model maintain its correct dimensions and proportions? | | | Yes | | | | |
| | 5.2) short comments to the previous question (optional) | | | A measured distance is still correct, 22840.8 mm in the description and 22851.5 mm when I measure. | | | | |
| IFC definitions | 6.1) Is the eventual translation consistent with the IFC definitions? | | | Yes | | | | |

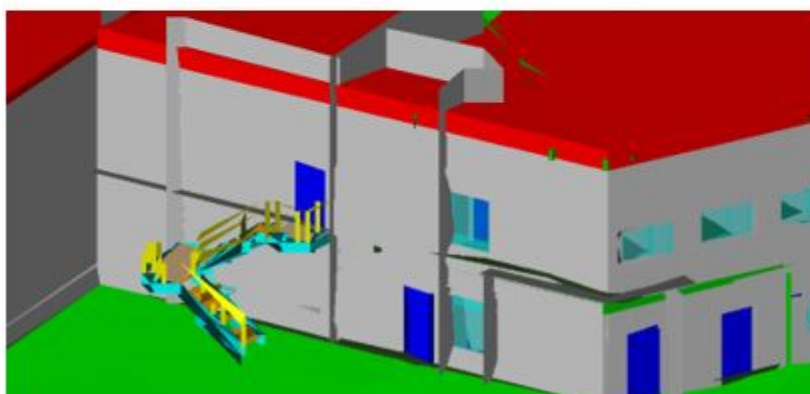
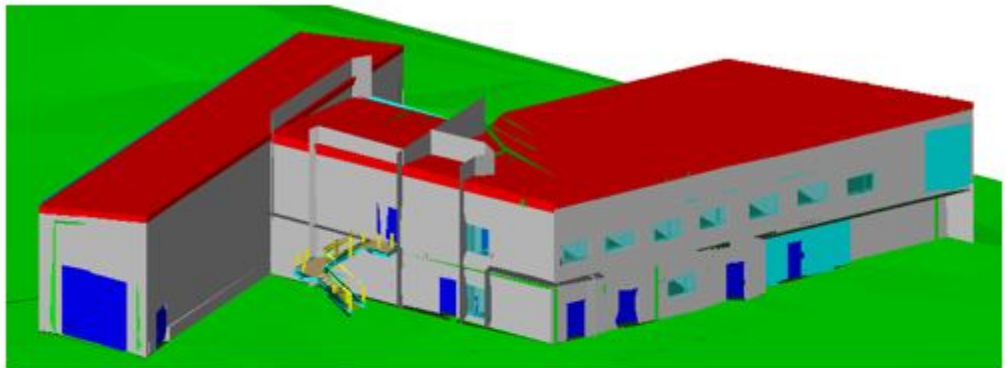
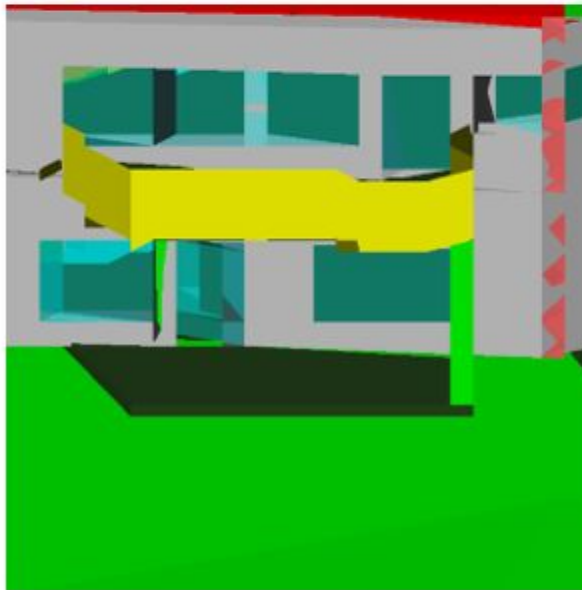
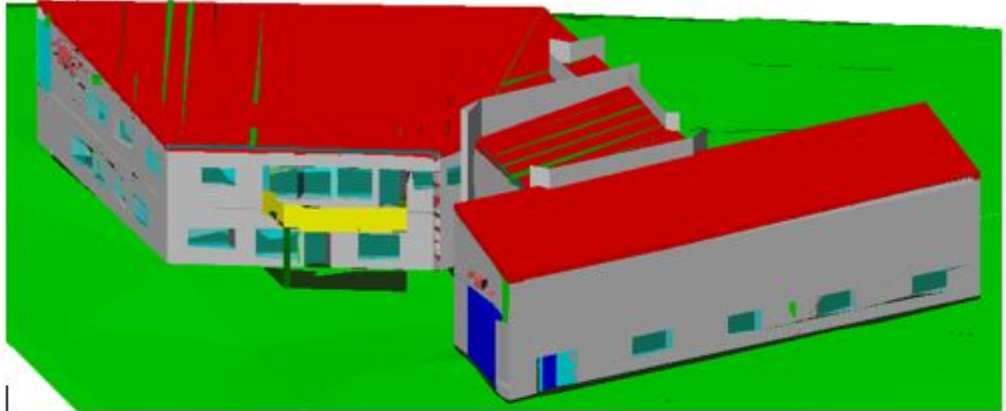
| | | |
|---------------|--|---|
| | 6.2) short comments to the previous question (optional) | The geometrical representation looks a bit distorted when viewing the model, but seem to be correctly translated (examples in the Word document provided) |
| Hierarchy | 7.1) Are the hierarchical relationships consistent with the IFC hierarchy? | Yes |
| | 7.2) short comments to the previous question (optional) | Examples are given in the Word document |
| Attributes | 8.1) Are the attributes present in the IFC entities retained and consistent? | Yes |
| | 8.2) short comments to the previous question (optional) | Examples are given in the Word document |
| Relationships | 9.1) Are the relationships between the objects retained? | Yes |
| | 9.2) short comments to the previous question (optional) | Example is provided in the Word document |
| Geometry | 10.1) Is geometry read correctly? | No |
| | 10.1.1) What changes / inconsistencies / errors / other issues were noted? | The dimensions of the building seem to be ok, but visually more or less all objects look distorted |

FZKViewer 5.1 – Windows 10 Enterprise

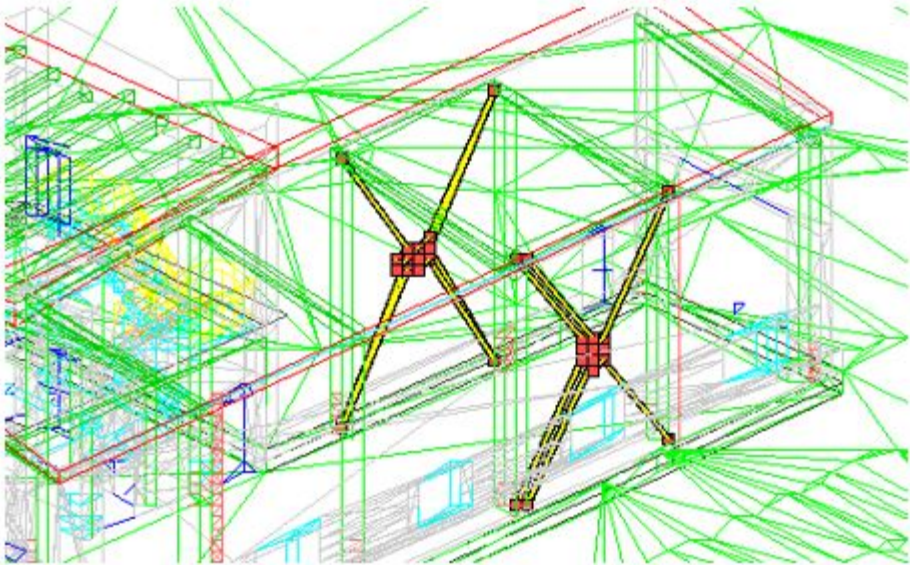
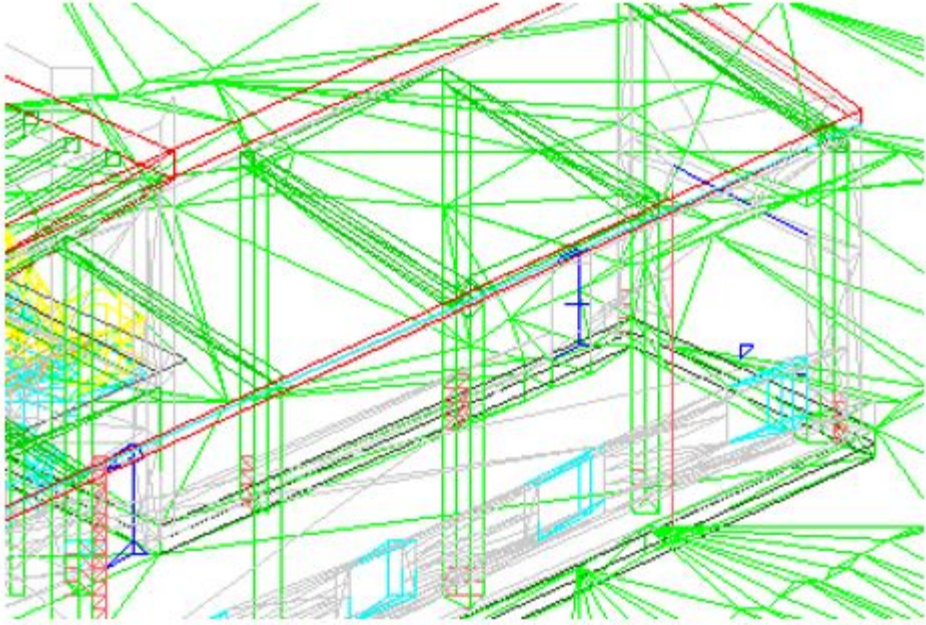
Proprietary

3D viewer

1 - Very beginner user (it is nearly the first time you use it)



10.1.2) Attach screenshots

| | | |
|---------|--|---|
| Z o | 11.1) Did the normals change? | Yes |
| N D S | 12.1) Is it possible to view the model in 3D? | Yes |
| | 14.1) Is it possible to edit the model (attributes, geometry, other)? | Yes |
| | 14.1.1) What editing is possible (attributes, geometry, georeferencing, please add details)? | It is possible to add and remove and recover elements |
| Editing | 14.1.2) Attach screenshots | <p><i>The element "Vinkryss" selected:</i></p>  <p><i>The element "Vinkryss" removed:</i></p>  |
| | | 14.2) short comments to the previous question (optional) |

FZKViewer 5.1 – Windows 10 Enterprise

Proprietary

3D viewer

1 - Very beginner user (it is nearly the first time you use it)

| | | |
|----------|---|--|
| Querying | 15.1) Is it possible to query the model and the attributes? | Yes |
| | 15.1.1) What kinds of query are possible? | Many different predefined queries are available, e.g. IFC PropertySets, Door Information, Entity Type information, Geometry Type information |

15.1.2) Attach screenshots

Query IFC PropertySets

| Name |
|--|
| [-] IfcSlab[Floor] [10] |
| [-] Pset_SlabCommon [10] |
| [+] IfcCovering [49] |
| [+] IfcBuildingStorey [3] |
| [+] IfcWallStandardCase [186] |
| [+] IfcFlowSegment [3] |
| [+] IfcBeam [71] |
| [+] IfcDoor [62] |
| [-] Pset_DoorCommon [62] |
| [-] FireRating [3] |
| [-] IsExternal [62] |
| [-] Reference [62] |
| [-] Pset_ManufacturerTypeInformation [5] |
| [-] Manufacturer [5] |
| [+] IfcBuilding [1] |
| [+] IfcSlab[Roof] [3] |
| [+] IfcWall [13] |
| [+] IfcFlowTerminal [24] |
| [+] IfcWindow [38] |
| [+] IfcPlate [69] |

Door Information:

Query Door Information

| IFC OID | OverallHeight | OverallWidth | Name | Description | Construction Typ | Operation Type | Inter Takes Precs | Seizable | Living Name | Living Description | Living Depth | |
|---------|---------------|--------------|----------|-------------|------------------|----------------|-------------------|----------|-------------|--------------------|--------------|---|
| #12704 | 2047.5 | 985 | OP186-01 | ? | NOTDEFINED | NOTDEFINED | 0 | 0 | 0 | Dev_2015-01-10 | ? | 0 |
| #10388 | 2110 | 1010 | D10-01 | ? | NOTDEFINED | NOTDEFINED | 0 | 0 | 0 | Dev_2015-01-10 | ? | 0 |
| #13684 | 2110 | 1010 | D10-01 | ? | NOTDEFINED | NOTDEFINED | 0 | 0 | 0 | Dev_2015-01-10 | ? | 0 |
| #11279 | 2110 | 1010 | D10-01 | ? | NOTDEFINED | NOTDEFINED | 0 | 0 | 0 | Dev_2015-01-10 | ? | 0 |
| #11732 | 2110 | 1010 | D10-01 | ? | NOTDEFINED | NOTDEFINED | 0 | 0 | 0 | Dev_2015-01-10 | ? | 0 |
| #20896 | 2110 | 1010 | D10-01 | ? | NOTDEFINED | NOTDEFINED | 0 | 0 | 0 | Dev_2015-01-10 | ? | 0 |

Entity Type information:

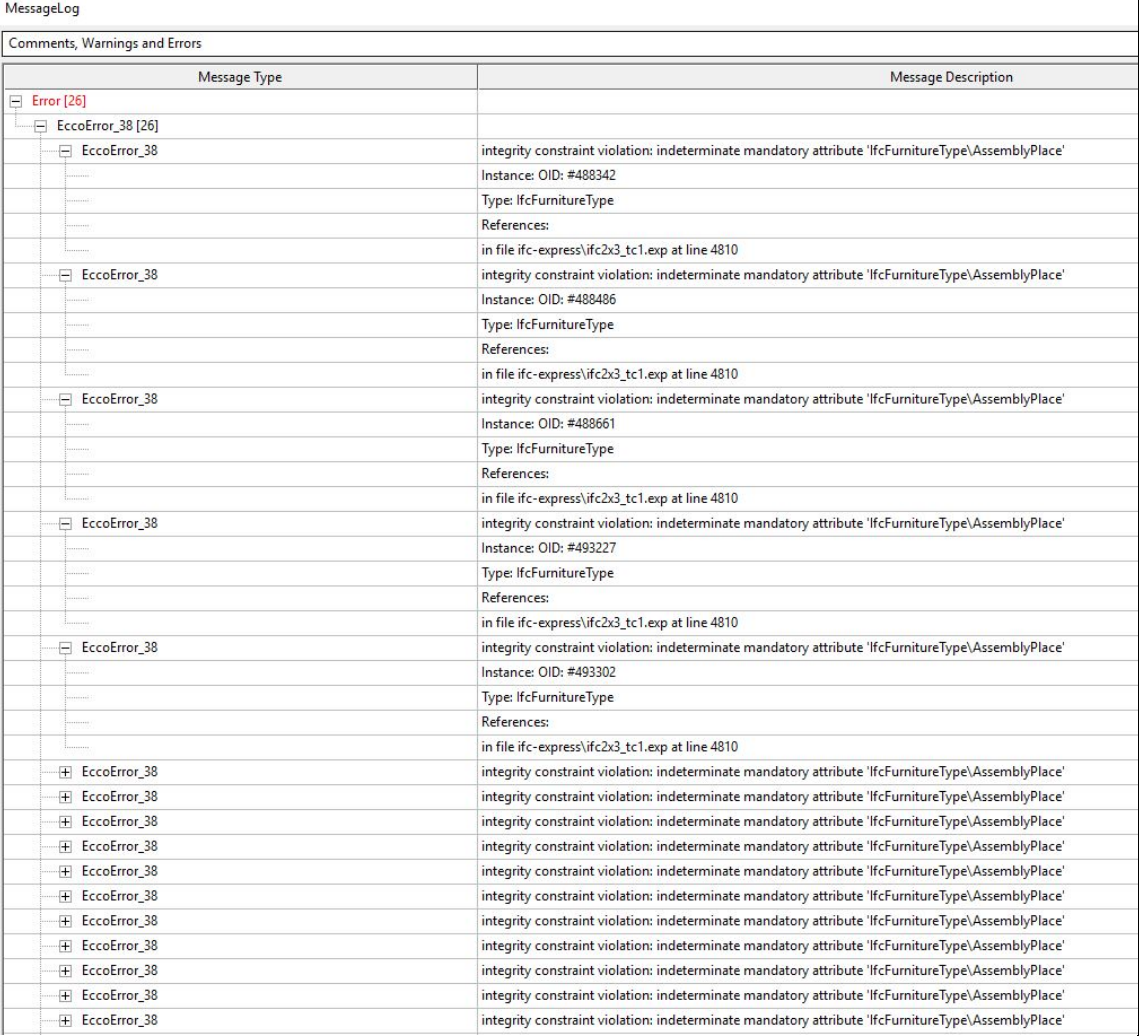
Query Entity Type Info

| Type | IFC OID | Name | Description | PredefinedType | HasPropertySets | RepresentationMaps | Has material definition |
|----------------------|---------|-------------------------------|-------------|----------------|-----------------|--------------------|-------------------------|
| IfcPlateType [7] | #74620 | Glas - Flieslogger (offset) 5 | ? | CURTAIN_PANEL | No | Yes | Yes |
| IfcPlateType [7] | #74621 | Glas - Flieslogger (offset) 5 | ? | CURTAIN_PANEL | No | Yes | Yes |
| IfcPlateType [7] | #74664 | Glas - Flieslogger (offset) 5 | ? | CURTAIN_PANEL | No | Yes | Yes |
| IfcMemberType [1] | #71010 | 20 x 40 mm FLEX teplitz | ? | MEMBER | No | Yes | No |
| IfcMemberType [1] | #62863 | 20 x 40 mm FLEX teplitz | ? | MEMBER | No | Yes | No |
| IfcCurtainWallType 1 | #93899 | Custom Stahl-Glaspartie - UK | ? | NOTDEFINED | No | No | No |
| IfcDoorStyle [4] | #93448 | OP44-01 | ? | NOTDEFINED | No | Yes | Yes |

Geometry Type information:

Query Geometry Type Information

| Name | Value |
|---------------------------------------|-------|
| Brep | 1278 |
| Extrusion - ArbitraryClosedProfile | 320 |
| Extrusion - ArbitraryProfileWithVoids | 239 |
| Extrusion - CircleProfile | 40 |
| Extrusion - I-ShapeProfile | 12 |
| Extrusion - RectangleProfile | 755 |
| Line | 2 |
| MappedGeometry | 562 |
| Polyline | 235 |
| SetOfGeometry | 185 |
| SurfaceModel | 998 |

| | | |
|----------|--|---|
| | 16.1) Is it possible to analyse the objects and the model? | Yes, analysis about the model validity and features (geometry, semantics, schema validity...) are possible (type 1) |
| | 16.1.1) What analysis are possible? Do you know if the results are reliable? | Type 1 - IfcSchemaValidation. Do not know if it is reliable. |
| Analysis | 16.1.2) Attach screenshots |  <p>The screenshot shows a 'MessageLog' window with a table of messages. The messages are grouped under 'Error [26]' and 'EccoError_38'. Each entry in the table has a 'Message Type' and a 'Message Description'. The descriptions consistently state: 'integrity constraint violation: indeterminate mandatory attribute 'IfcFurnitureType'AssemblyPlace'' followed by an instance ID and a reference to a file 'ifc-express\ifc2x3_tc1.exp' at line 4810.</p> |
| | 16.1.3) Time required to perform the analysis about the model itself (type 1) | it's almost immediate |
| | 16.1.3) Time required to perform the analysis about the model performances (type2) | No analysis of type 2 are possible |
| Export | You arrived at the end of the phase 1: "Import and manage the file in the software".Now choose: | The software has also export abilities |
| | 17.1) Are any pre-processing or setting changes needed in the software to enable a consistent export? | No |
| | 18.1) Is it possible to choose the IFC model view definition (MVD) to be used when exporting the data? | No |
| | 19) How long does it take for the data to be exported to IFC? | it's almost immediate |

| Test with UpTown.ifc | | |
|----------------------|---|---|
| Performance | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | 5-20 minutes |
| | How long does it take, approximately, to:Zoom into the model to see more detail | it's almost immediate |
| | How long does it take, approximately, to:Pan the model | it's almost immediate |
| | How long does it take, approximately, to:Rotate the model | it's almost immediate |
| | How long does it take, approximately, to:Query an object | it's almost immediate |
| | How long does it take, approximately, to:Inspect the objects linked to the queried one (Element 3) through a relationship | it's almost immediate |
| | Please report on any errors the software gives when importing the file. | Did not note them down, will try again later and add it to the Word document. |
| Proporti | 24.1) Does the model maintain its correct dimensions and proportions? | Yes |
| IFC definitions | 25.1) Is the eventual translation consistent with the IFC definitions? | Yes |
| Hierarchical | 26.1) Are the hierarchical relationships consistent with the IFC hierarchy? | Yes |
| Attributes | 27.1) Are the attributes present in the IFC entities retained and consistent? | Yes |
| Relationships | 28.1) Are the relationships between the objects retained? | Yes |
| Geometry | 29.1) Is geometry read correctly? | Yes |
| Normals | 30.1) Did the normals change? | Yes |
| 2D/3D | 31.1) Is it possible to view the model in 3D? | Yes |
| | 32.1) Is it possible to view the model in 2D? | No |
| Querying | 34.1.1) What kinds of query are possible? | Model Information (e.g. File Header, Property sets), Entity Information (e.g. Space Information, Text information), Element Type Information, Quantities, File Statistics (e.g. File statistics and SRS statistics) |

34.1.2) Attach screenshots

| Query SRS Info | |
|---|---|
| Name | Value |
| Used Spatial Reference System: | Local CRS - Local Cartesian Coordinate System |
| <input type="checkbox"/> Bounding Box in Local CRS: | |
| <input type="checkbox"/> Position min: | |
| X | 0 |
| Y | 0 |
| Z | 0 |
| <input type="checkbox"/> Position max: | |
| X | 96.4630211572531 |
| Y | 60.7528174853782 |
| Z | 0 |
| <input type="checkbox"/> Bounding Box in Longitude / Latitude: | |
| <input type="checkbox"/> Position min: | |
| Longitude (decimal degree) | 4.48689999865437 |
| Longitude (degree, minute, second) | E 4° 29' 12.8400" |
| Latitude (decimal degree) | 51.9160299999024 |
| Latitude (degree, minute, second) | N 51° 54' 57.7080" |
| <input type="checkbox"/> Position max: | |
| Longitude (decimal degree) | 4.48832009185352 |
| Longitude (degree, minute, second) | E 4° 29' 17.9523" |
| Latitude (decimal degree) | 51.9165583269303 |
| Latitude (degree, minute, second) | N 51° 54' 59.6100" |
| <input type="checkbox"/> Bounding Box in UTM Coordinates (Zone 31): | |
| <input type="checkbox"/> Position min: | |
| Easting | 602264.639309486 |
| Northing | 5752743.45339065 |
| <input type="checkbox"/> Position max: | |
| Easting | 602361.102330434 |
| Northing | 5752804.20620813 |
| <input type="checkbox"/> Model Bounding Box: | |
| <input type="checkbox"/> Position min: | |
| X | -1000 |
| Y | -1000 |
| Z | -2680 |
| <input type="checkbox"/> Position max: | |
| X | 95463 |
| Y | 59752.8 |
| Z | 105652 |

| | | |
|---------------------------------|---|--|
| Export | You arrived at the end of the phase 1: "Import and manage the file in the software".Now choose: | The software has also export abilities |
| | 36) How long does it take for the data to be exported to IFC? | 1-5 minutes |
| Test with Savigliano.ifc | | |
| Performance | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | it's almost immediate |
| | How long does it take, approximately, to:Zoom into the model to see more detail | it's almost immediate |
| | How long does it take, approximately, to:Pan the model | it's almost immediate |

FZKViewer 5.1 – Windows 10 Enterprise

Proprietary

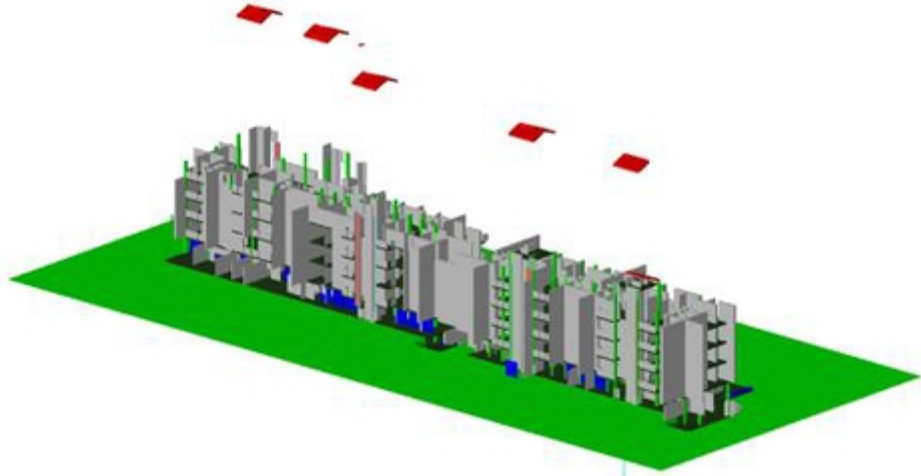
3D viewer

1 - Very beginner user (it is nearly the first time you use it)

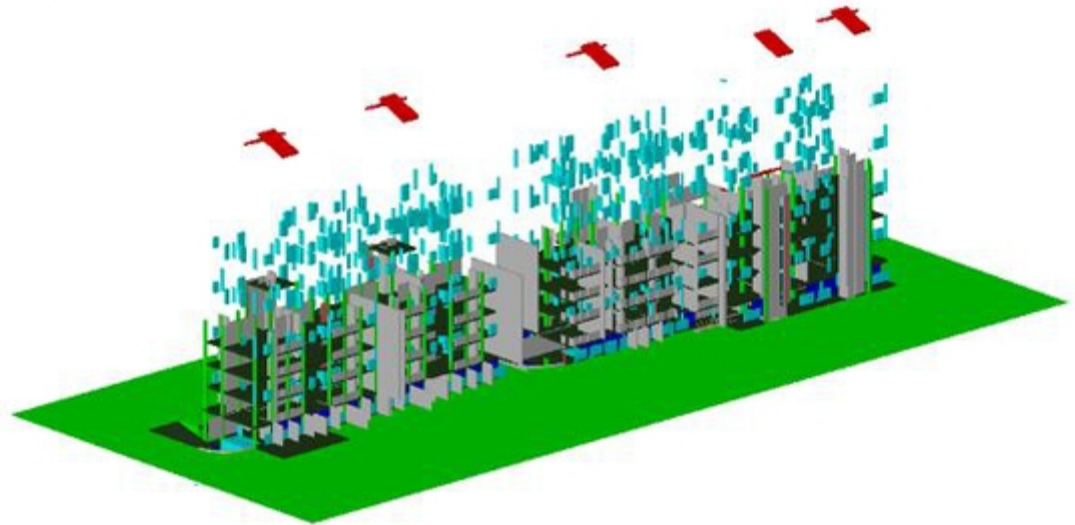
| | | |
|---------------------------------|---|---|
| | How long does it take, approximately, to:Rotate the model | it's almost immediate |
| | How long does it take, approximately, to:Query an object | it's almost immediate |
| | How long does it take, approximately, to:Inspect the objects linked to the queried one through a relationship | it's almost immediate |
| | 38) Please report on any errors the software gives when importing the file. | Boolean operation - clipping plane generation for CsgiModelGeometry failed; EccoError - runtime error: incompatible operand types transition <> enum_literal; Geometry CSG - Geometry is part of IfcColumn; Invalid outer loop; Polylines contains colinear points, points removed; Geometry polyline - double point removed; OpenGL - invalid action; Door/Window - incomplete profile definition; Port not located within element bounding box; Representation identifier of IfcPlate not unique, change to Body_1; Triangulation |
| | 39) Attach screenshots regarding the eventually reported errors. | |
| erenci erenci ng | 40.1) Are the world (projected) coordinates taken into account when locating the model in the software's coordinate reference system? | Yes |
| Hei ght | 41.1) Are the "real-world" elevation values (heights) considered when locating the model in the software (z)? | Yes |
| Orie ntati ng | 42.1) Is the model oriented correctly with respect to the true North? | Yes |
| Pro porti ons | 43.1) Does the model maintain its correct dimensions and proportions? | Yes |
| IFC defi nitions | 44.1) Is the eventual translation consistent with the IFC definitions? | Yes |
| Hier arch | 45.1) Are the hierarchical relationships consistent with the IFC hierarchy? | Yes |
| Attri bute | 46.1) Are the attributes present in the IFC entities retained and consistent? | Yes |
| R el t | 47.1) Are the relationships between the objects retained? | Yes |
| G e o | 48.1) Is geometry read correctly? | Yes |
| N o r m a l s | 49.1) Did the normals change? | Yes |
| 2D/3 D | 50.1) Is it possible to view the model in 3D? | Yes |
| | 51.1) Is it possible to view the model in 2D? | No |
| Export | You arrived at the end of the phase 1: "Import and manage the file in the software".Now choose: | The software has also export abilities |
| | 55) How long does it take for the data to be exported to IFC? | it's almost immediate |

55.2) Attach screenshots
(optional)

IFC2x3:



IFC4:

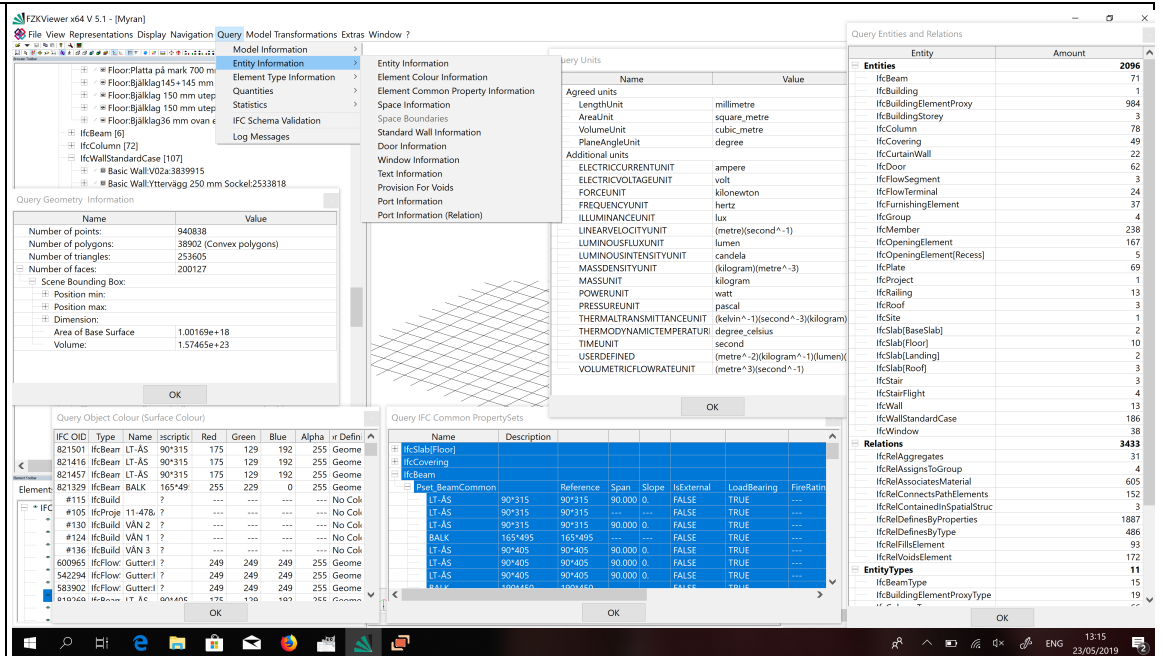


FZK Viewer

| | | | | | | | |
|----------------------------|--|--|--|---|---------------------------|--|-----------------------|
| Software | Software Name [version] | FZK Viewer [5.1 Build 978] | | Software house | | Karlsruhe Institute of Technology (KIT) - Institute for Automation and Applied Informatics (IAI) (https://www.iai.kit.edu/english/1302.php) | |
| | Proprietary or open source software? | | | Kind of software | | | |
| | open source | | | 3D viewer | | | |
| Computer | Model and year | Operating system | CPU | GPU | Memory (RAM) | Hard drive capacity | Hard drive free space |
| | DELL XPS 15 9570 - 2019 | Windows 10 Pro (version 1809) 64-bit operating system, x64-based processor | Intel(R) Core(TM) i7-8750H CPU @ 2.20 GHz 2.21 GHz | \- | 32,0 GB (31,7 GB usable) | 937 GB | 848 GB |
| Certification | IFC import certification status | Import certification date | Import certification program | IFC export certification status | Export certification date | Export certification program | |
| | not certified | | | not certified | | | |
| Test with Myran.ifc | | | | | | | |
| Performance | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | | | the software does not allow this | | | |
| | How long does it take, approximately, to:Zoom into the model to see more detail | | | the software does not allow this | | | |
| | How long does it take, approximately, to:Pan the model | | | the software does not allow this | | | |
| | How long does it take, approximately, to:Rotate the model | | | the software does not allow this | | | |
| | How long does it take, approximately, to:Query an object | | | the software does not allow this | | | |
| | How long does it take, approximately, to:Inspect the objects linked to the queried one through a relationship | | | the software does not allow this | | | |
| Georeferencing | 2.1) Are the world (projected) coordinates taken into account when locating the model in the software's coordinate reference system? | | | Yes | | | |
| Height | 3.1) Are the "real-world" elevation values (heights) considered when locating the model in the software (z)? | | | Yes | | | |
| Orientation | 4.1) Is the model oriented correctly with respect to the true North? | | | Yes | | | |
| | Other | | | the geometry is not visualised, therefore it is not possible to make the measurements | | | |
| IFC definitions | 6.1) Is the eventual translation consistent with the IFC definitions? | | | Yes | | | |

| | | |
|------------|--|---|
| | Other | Sometimes hierarchical relationships and aggregation relationships are visualised in the same way |
| Attributes | 8.1) Are the attributes present in the IFC entities retained and consistent? | Yes |
| | Other | Sometimes they are different from the ones in the descriptions |
| | Other | Many errors are given during the import phase, and no geometry can be visualised |
| | Other | The software could map the normals through colours, but it is impossible to check, since the geometry is not visualised |
| 2D/3D | 12.1) Is it possible to view the model in 3D? | Yes |
| | 12.2) short comments to the previous question (optional) | the 3D view is possible, and many pre-set views can be chosen (axonometries, sides/top/bottom, isometric views, user defined views...). However, since the geometry is not here visualised, it is not possible to check them. |
| | 13.1) Is it possible to view the model in 2D? | No |
| Editing | 14.1) Is it possible to edit the model (attributes, geometry, other)? | No |
| Querying | 15.1) Is it possible to query the model and the attributes? | Yes |
| | 15.1.1) What kinds of query are possible? | <ul style="list-style-type: none"> - Direct query of an element (from the 3D view, from the properties and relations tables, from the hierarchical view); - Browse of model information (header, used MVD, measure units, owner history, used property sets, used materials); - Browse of Entity information tables of: entities, entities colours, entities common properties, space information (no info for this file), space boundaries (no info for this file), specific entities like standard wall, for, window, text, provision for voids, port information; - Browse of element type information; - Quantities (calculation of quantities and space quantities (volumes, surfaces...))(however, no information is present here for this file); - Statistics: file statistics (with included entities, relations and entity types), geometry statistics, (with n. of points, polygons, triangles, faces and bounding box), SRS, space boundaries. |

15.1.2) Attach screenshots



16.1) Is it possible to analyse the objects and the model?

Yes

16.1.1) What analysis are possible? Do you know if the results are reliable?

It is possible to analyse the model to validate the IFC Schema (I do not know if the results are reliable);

It is possible to represent the model based on:

- type of elements
- entities
- face normals
- customisable property values
- owner history
- internal/external
- U-value
- spaces by temperature
- spaces by internal/external
- spaces by usage type
- spaces by space type
- spaces by occupant number
- spaces boundaries by internal/external
- spaces boundaries by virtual/physical
- spaces boundary by type
- walls by width
- walls by layers

16.1.3) Time required to perform the analysis about the model itself (type 1)

less than a minute

Export

You arrived at the end of the phase 1: "Import and manage the file in the software". Now choose:

The software has also export abilities

17.1) Are any pre-processing or setting changes needed in the software to enable a consistent export?

No

17.2) short comments to the previous question (optional)

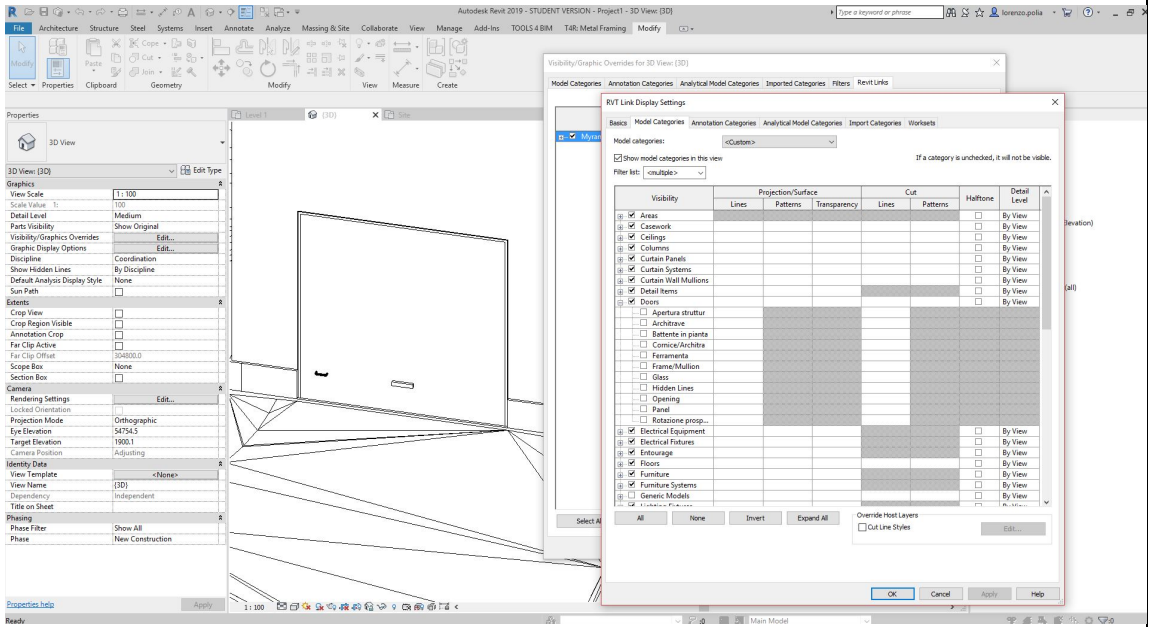
no pre-processing is needed, nor customisation is possible. You can just select 'export to IFC'

| | | |
|--|---|---|
| | 18.1) Is it possible to choose the IFC model view definition (MVD) to be used when exporting the data? | No |
| | 19) How long does it take for the data to be exported to IFC? | it's almost immediate |
| Test with UpTown.ifc | | |
| Perf orm | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | it crashes without completing the operation |
| Test with Savigliano.ifc | | |
| Performance | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | it's almost immediate |
| | How long does it take, approximately, to:Zoom into the model to see more detail | it's almost immediate |
| | How long does it take, approximately, to:Pan the model | it's almost immediate |
| | How long does it take, approximately, to:Rotate the model | it's almost immediate |
| | How long does it take, approximately, to:Query an object | it's almost immediate |
| | How long does it take, approximately, to:Inspect the objects linked to the queried one through a relationship | it's almost immediate |
| | 38) Please report on any errors the software gives when importing the file. | no errors |
| 39) Attach screenshots regarding the eventually reported errors. | | |
| Georeferencing | 40.1) Are the world (projected) coordinates taken into account when locating the model in the software's coordinate reference system? | No |
| | 40.1.1) Where is the origin of the model coordinate reference system as imported in the software? | RefLatitude is read as N 41 degrees 47'59.9972"; RefLongitude is E 12 degrees 36' 0.1373" RefElevation is 0 |
| | 40.1.3) What is the coordinate reference system and projection and what unit of measure is used for the representation? | Local reference system; m is the length unit and degree the plane angle unit |
| Height | 41.1) Are the "real-world" elevation values (heights) considered when locating the model in the software (z)? | No |
| | 41.1.1) What is the elevation value of the origin of the model coordinate reference system as imported in the software? | 0 |
| Orientation | 42.1) Is the model oriented correctly with respect to the true North? | Yes |
| | 42.2) short comments to the previous question (optional) | It is visualised as in the data description, but the value of the True North direction is -234.50 instead of 125.5 |
| | Other | It takes a lot of time to measure the distances and the software stops responding; from how the model is visualised, it appears to have the correct proportions. One of the measures (the length of the left building in the images is similar (45.31 m instead of 42.20 m) but an approximation is made since a snapping system is not possible (also considered the response time of the application) |
| IFC defi | 44.1) Is the eventual translation consistent with the IFC definitions? | Yes |
| Hier arch | 45.1) Are the hierarchical relationships consistent with the IFC hierarchy? | Yes |

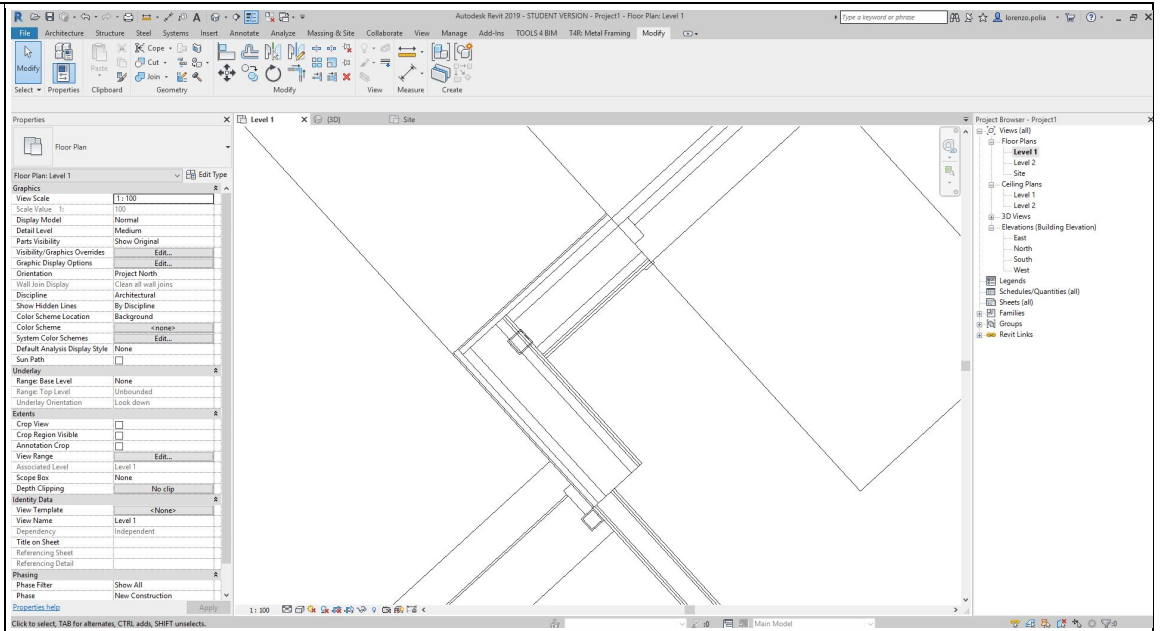
| | | |
|---------------|---|--|
| | 45.2) short comments to the previous question (optional) | The hierarchical relations and the containment relations are represented in the same way in the hierarchical layers tree |
| Attributes | 46.1) Are the attributes present in the IFC entities retained and consistent? | Yes |
| | 46.2) short comments to the previous question (optional) | When querying some of the elements, the application stops responding for a while and takes time to finish the task. |
| Relationships | 47.1) Are the relationships between the objects retained? | Yes |
| | Other | Generally yes, but some elements (some roof pitches) are not visualised |
| Normals | 49.1) Did the normals change? | Yes |
| | 49.2) short comments to the previous question (optional) | They appear mostly consistent, some images are attached at the end |
| 2D/3D | 50.1) Is it possible to view the model in 3D? | Yes |
| | 51.1) Is it possible to view the model in 2D? | No |
| Editing | 52.1) Is it possible to edit the model (attributes, geometry, other)? | No |
| Querying | 53.1) Is it possible to query the model and the attributes? | Yes |
| | 53.1.1) What kinds of query are possible? | see answers for Myran model |
| Analyses | 54.1) Is it possible to analyse the objects and the model? | Yes |
| | 54.1.1) What analysis are possible? Do you know if the results are reliable? | see Myran description; the results are almost immediate |
| Export | You arrived at the end of the phase 1: "Import and manage the file in the software".Now choose: | The software has also export abilities |
| | 55) How long does it take for the data to be exported to IFC? | it's almost immediate |
| | 55.1) Comment to the previous question (optional) | another possible export format is the IFC-ZIP |

Autodesk Revit

| | | | | | | | |
|----------------------------|--|------------------------------|--|---------------------------------|---------------------------|------------------------------|-----------------------|
| Software | Software Name [version] | Autodesk Revit [2019] | | Software house | Autodesk | | |
| | Proprietary or open source software? | | | Kind of software | | | |
| proprietary | | | BIM | | | | |
| Computer | Model and year | Operating system | CPU | GPU | Memory (RAM) | Hard drive capacity | Hard drive free space |
| | HP Envy Notebook - 2015 | Microsoft Windows 10 Home | Intel Core i7-6700HQ | NVIDIA GeForce GTX 950M | 16.0 GB | 120 GB | 10.8 GB |
| Certification | IFC import certification status | Import certification date | Import certification program | IFC export certification status | Export certification date | Export certification program | |
| | certified in (date) | 2015-07-24 | CV2.0 | certified in (date) | 2013-04-16 | CV2.0-Arch | |
| Test with Myran.ifc | | | | | | | |
| Performance | How long does it take, approximately, to: Import (and visualise if the software allows it) the model | | | 1-5 minutes | | | |
| | How long does it take, approximately, to: Zoom into the model to see more detail | | | it's almost immediate | | | |
| | How long does it take, approximately, to: Pan the model | | | it's almost immediate | | | |
| | How long does it take, approximately, to: Rotate the model | | | it's almost immediate | | | |
| | How long does it take, approximately, to: Query an object | | | it's almost immediate | | | |
| | How long does it take, approximately, to: Inspect the objects linked to the queried one through a relationship | | | it's almost immediate | | | |
| | Please report on any errors the software gives when importing the file. | | Some walls intersect with the floors and do not join correctly, subtracting the volumes. Furthermore, the subtraction solids inside the families of doors and windows, which are used to pierce the walls, are mistakenly displayed. | | | | |
| Georeferencing | 2.1) Are the world (projected) coordinates taken into account when locating the model in the software's coordinate reference system? | | | Yes | | | |
| Height | 3.1) Are the "real-world" elevation values (heights) considered when locating the model in the software (z)? | | | Yes | | | |
| Orientations | 4.1) Is the model oriented correctly with respect to the true North? | | | Yes | | | |
| Proportions | 5.1) Does the model maintain its correct dimensions and proportions? | | | Yes | | | |
| IFC definitions | 6.1) Is the eventual translation consistent with the IFC definitions? | | | Yes | | | |
| Hierarchy | 7.1) Are the hierarchical relationships consistent with the IFC hierarchy? | | | No | | | |

| | | |
|--------------|---|---|
| Hierarchy | <p>7.1.1) What changes / inconsistencies / errors / other issues were noted?</p> | <p>The subcategories of families are not recognized by the ifc file. If I try, for example, to turn off the display on a view of a subcategory, I can't do it. However, I can turn off the display of all categories of families.</p> |
| | <p>7.1.2) Attach screenshots</p> |  |
| | <p>7.2) short comments to the previous question (optional)</p> | <p>The display of the subcategories of the doors families are turned off, but all the elements of the door are still visible.</p> |
| Attribute | <p>8.1) Are the attributes present in the IFC entities retained and consistent?</p> | <p>Yes</p> |
| Relationship | <p>9.1) Are the relationships between the objects retained?</p> | <p>Yes</p> |
| Geometry | <p>10.1) Is geometry read correctly?</p> | <p>No</p> |
| | <p>10.1.1) What changes / inconsistencies / errors / other issues were noted?</p> | <p>Some walls intersect with the floors and the beams but do not join correctly, subtracting the volumes. Often the stratigraphy of the walls is not correct in the corners and intersections.</p> |

10.1.2) Attach screenshots



10.2) short comments to the previous question (optional)

The stratigraphy of the walls is not correct in the corners and intersections.

11.1) Did the normals change?

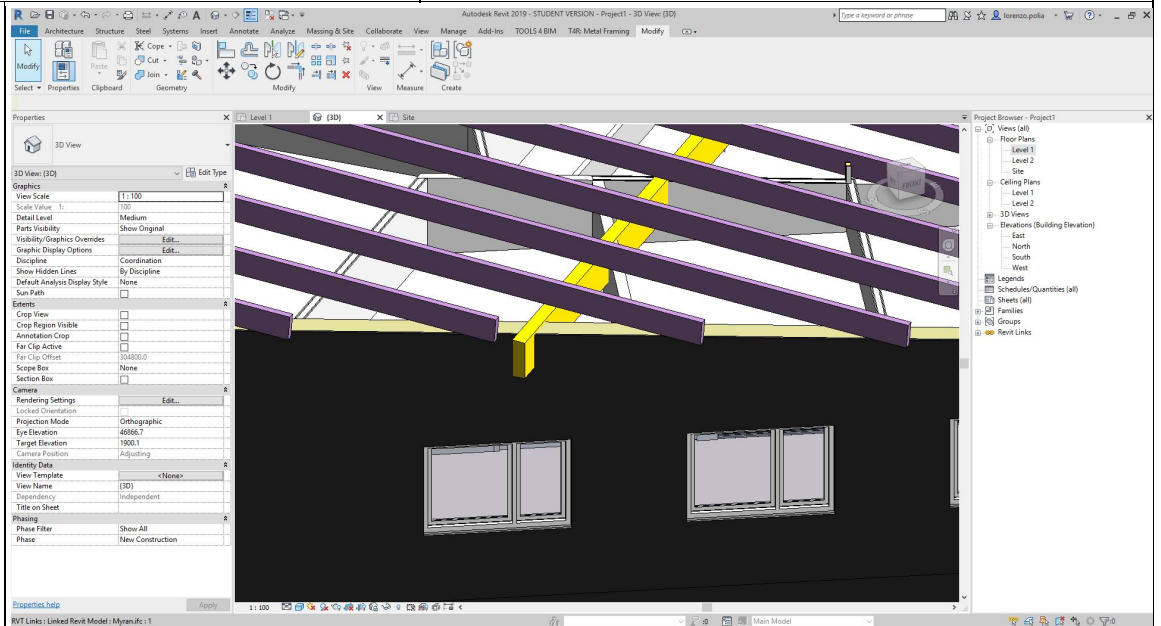
No

11.1.1) What changes / inconsistencies / errors / other issues were noted?

Under the roof the beams changes color.

Normals

11.1.2) Attach screenshots



12.1) Is it possible to view the model in 3D?

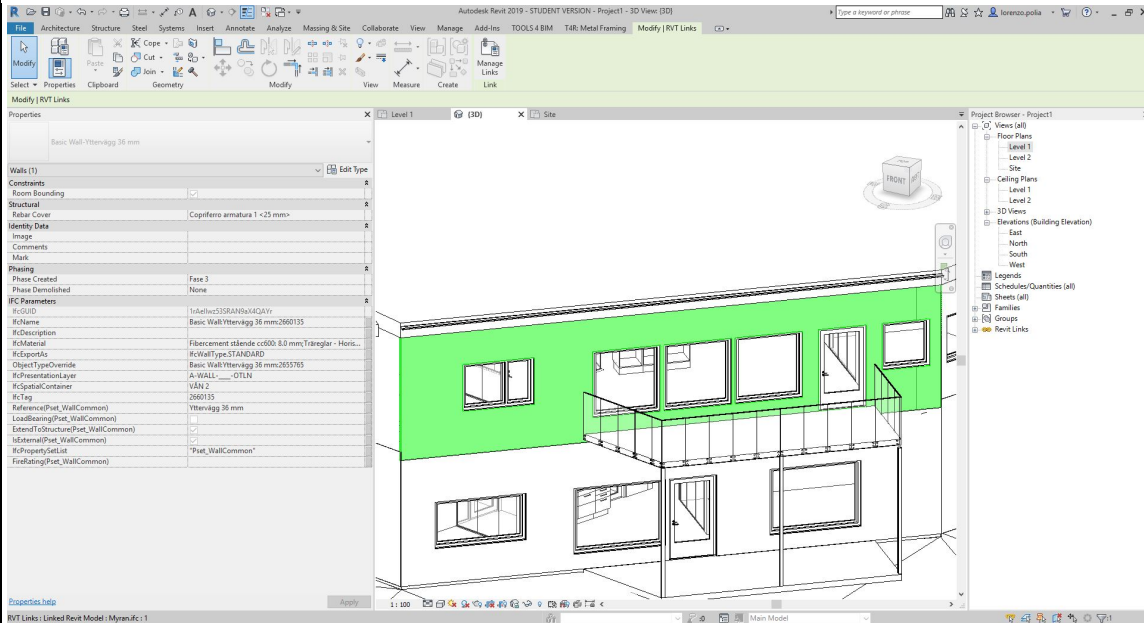
Yes

13.1) Is it possible to view the model in 2D?

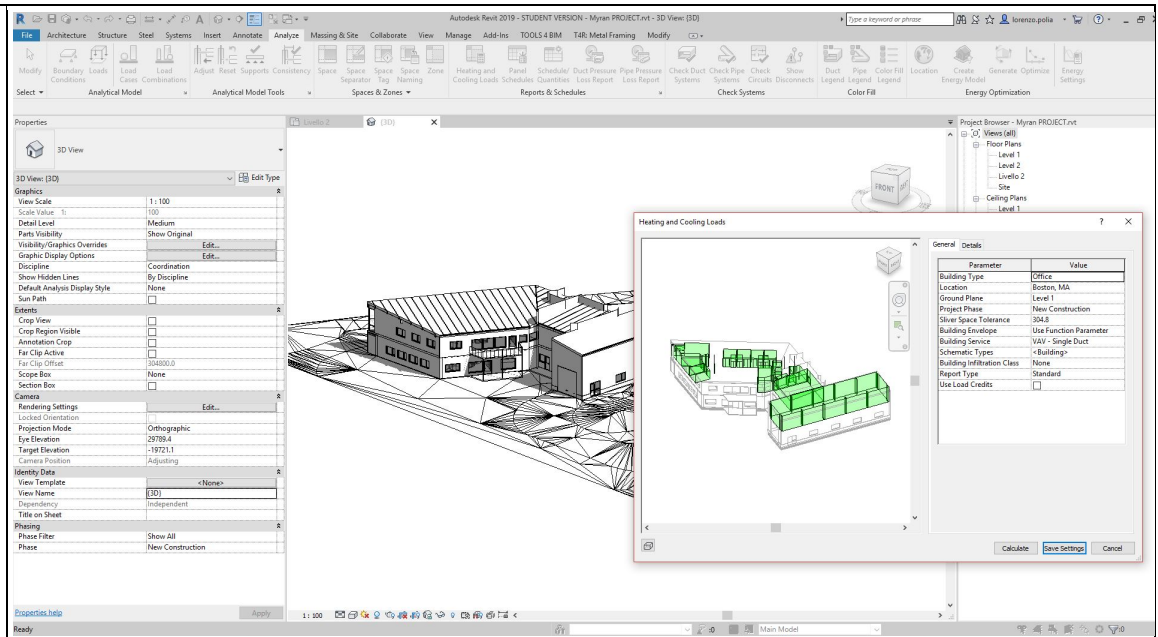
Yes

Editing 14.1) Is it possible to edit the model (attributes, geometry, other)?

No

| | | |
|----------|--|--|
| | 14.2) short comments to the previous question (optional) | It is possible to query some data of the model, but it is not possible to modify geometries or parameters. |
| Querying | 15.1) Is it possible to query the model and the attributes? | Yes |
| | 15.1.1) What kinds of query are possible? | Selecting the elements it is possible to display the properties and some parameters. |
| | 15.1.2) Attach screenshots |  |
| | 15.2) short comments to the previous question (optional) | The properties show the parameters of the selected element (for example the creation phase, the name of the wall, the materials of the stratigraphy, etc.). |
| Analysis | 16.1) Is it possible to analyse the objects and the model? | Yes, analysis about the modelled building performances (energy, noise, shadows...) are possible (type 2) |
| | 16.1.1) What analysis are possible? Do you know if the results are reliable? | It is possible to perform the energy analysis. However Revit is not a specialized software for this function, so the results are not reliable. It is also possible to perform the solar study. In this case the result is more reliable. |

16.1.2) Attach screenshots



| | | |
|--|--|--|
| 16.1.3) Time required to perform the analysis about the model itself (type 1) | No analysis of type 1 are possible | |
| 16.1.3) Time required to perform the analysis about the model performances (type2) | 5-20 minutes | |
| 16.2) short comments to the previous question (optional) | In order to perform the energy analysis it is first necessary to carry out a series of operations on the model: activate the room bounding, compute the spaces, attribute thermophysical properties and then launch the calculation. | |
| Export | You arrived at the end of the phase 1: "Import and manage the file in the software".Now choose: | The software has also export abilities |
| | 17.1) Are any pre-processing or setting changes needed in the software to enable a consistent export? | No |
| | 18.1) Is it possible to choose the IFC model view definition (MVD) to be used when exporting the data? | No |
| | 18.2) short comments to the previous question (optional) | During export it's possible choose to change the detail level for some element geometries, but only creating a new export preset. Using the basic presets provided by the software this parameter cannot be changed. |
| | 19) How long does it take for the data to be exported to IFC? | it's almost immediate |

Test with UpTown.ifc

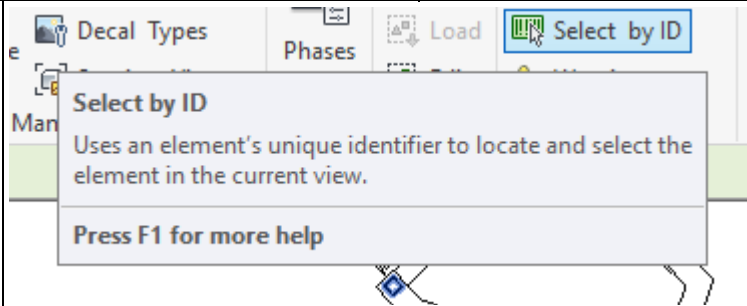
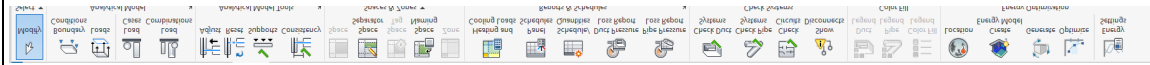
| | | |
|-------------|---|--------------------|
| Performance | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | more than one hour |
| | How long does it take, approximately, to:Zoom into the model to see more detail | more than one hour |
| | How long does it take, approximately, to:Pan the model | less than a minute |
| | How long does it take, approximately, to:Rotate the model | less than a minute |
| | How long does it take, approximately, to:Query an object | less than a minute |

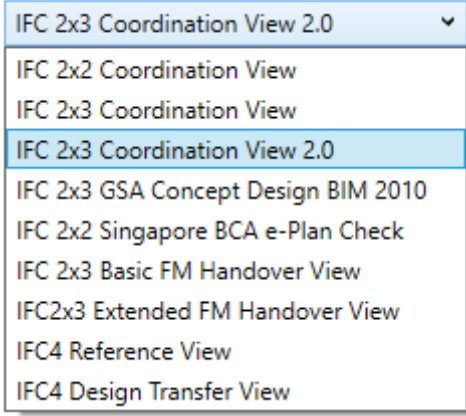
| | | |
|-----------------------------------|---|--|
| | How long does it take, approximately, to:Inspect the objects linked to the queried one (Element 3) through a relationship | less than a minute |
| Pro porti ons | 24.1) Does the model maintain its correct dimensions and proportions? | Yes |
| semantics | 25.1) Is the eventual translation consistent with the IFC definitions? | Yes |
| | 26.1) Are the hierarchical relationships consistent with the IFC hierarchy? | No |
| | 26.1.1) What changes / inconsistencies / errors / other issues were noted? | The subcategory of families is not recognized by the ifc file. |
| | 27.1) Are the attributes present in the IFC entities retained and consistent? | Yes |
| | 28.1) Are the relationships between the objects retained? | Yes |
| G e o m e t r y | 29.1) Is geometry read correctly? | Yes |
| N o r m a l s | 30.1) Did the normals change? | Yes |
| 2D/3 D | 31.1) Is it possible to view the model in 3D? | Yes |
| | 32.1) Is it possible to view the model in 2D? | Yes |
| Editing | 33.1.1) What editing is possible (attributes, geometry, georeferencing, please add details)? | It is possible to query some data of the model, but it is not possible to modify geometries or parameters. The only possible operation is to move the model, using the appropriate command or project points, changing the georeferencing. |
| Export | You arrived at the end of the phase 1: "Import and manage the file in the software".Now choose: | The software has also export abilities |
| | 36) How long does it take for the data to be exported to IFC? | 20 minutes-1 hour |
| Test with Savigliano.ifc | | |
| Performance | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | it's almost immediate |
| | How long does it take, approximately, to:Zoom into the model to see more detail | it's almost immediate |
| | How long does it take, approximately, to:Pan the model | it's almost immediate |
| | How long does it take, approximately, to:Rotate the model | it's almost immediate |
| | How long does it take, approximately, to:Query an object | it's almost immediate |
| | How long does it take, approximately, to:Inspect the objects linked to the queried one through a relationship | it's almost immediate |
| | 39) Attach screenshots regarding the eventually reported errors. | |
| Georef erenci ng | 40.1) Are the world (projected) coordinates taken into account when locating the model in the software's coordinate reference system? | Yes |
| Hei ght | 41.1) Are the "real-world" elevation values (heights) considered when locating the model in the software (z)? | Yes |
| Orie ntati ng | 42.1) Is the model oriented correctly with respect to the true North? | Yes |

| | | |
|---------------------------------|---|--|
| Pro porti ons | 43.1) Does the model maintain its correct dimensions and proportions? | Yes |
| IFC defi nitions | 44.1) Is the eventual translation consistent with the IFC definitions? | Yes |
| Hierarchy | 45.1) Are the hierarchical relationships consistent with the IFC hierarchy? | No |
| | 45.1.1) What changes / inconsistencies / errors / other issues were noted? | The subcategory of families is not recognized by the ifc file. |
| Attri bute | 46.1) Are the attributes present in the IFC entities retained and consistent? | Yes |
| R el t | 47.1) Are the relationships between the objects retained? | Yes |
| Geometry | 48.1) Is geometry read correctly? | No |
| | 48.1.1) What changes / inconsistencies / errors / other issues were noted? | Some walls intersect with the floors and the beams and do not join correctly, subtracting the volumes. Furthermore, the subtraction solids inside the families of doors and windows, which are used to pierce the walls, are mistakenly displayed. |
| N o r m a l s | 49.1) Did the normals change? | Yes |
| 2D/3 D | 50.1) Is it possible to view the model in 3D? | Yes |
| | 51.1) Is it possible to view the model in 2D? | Yes |
| Exp ort | You arrived at the end of the phase 1: "Import and manage the file in the software".Now choose: | The software has also export abilities |
| E x c e l l s | 55) How long does it take for the data to be exported to IFC? | it's almost immediate |

Autodesk Revit

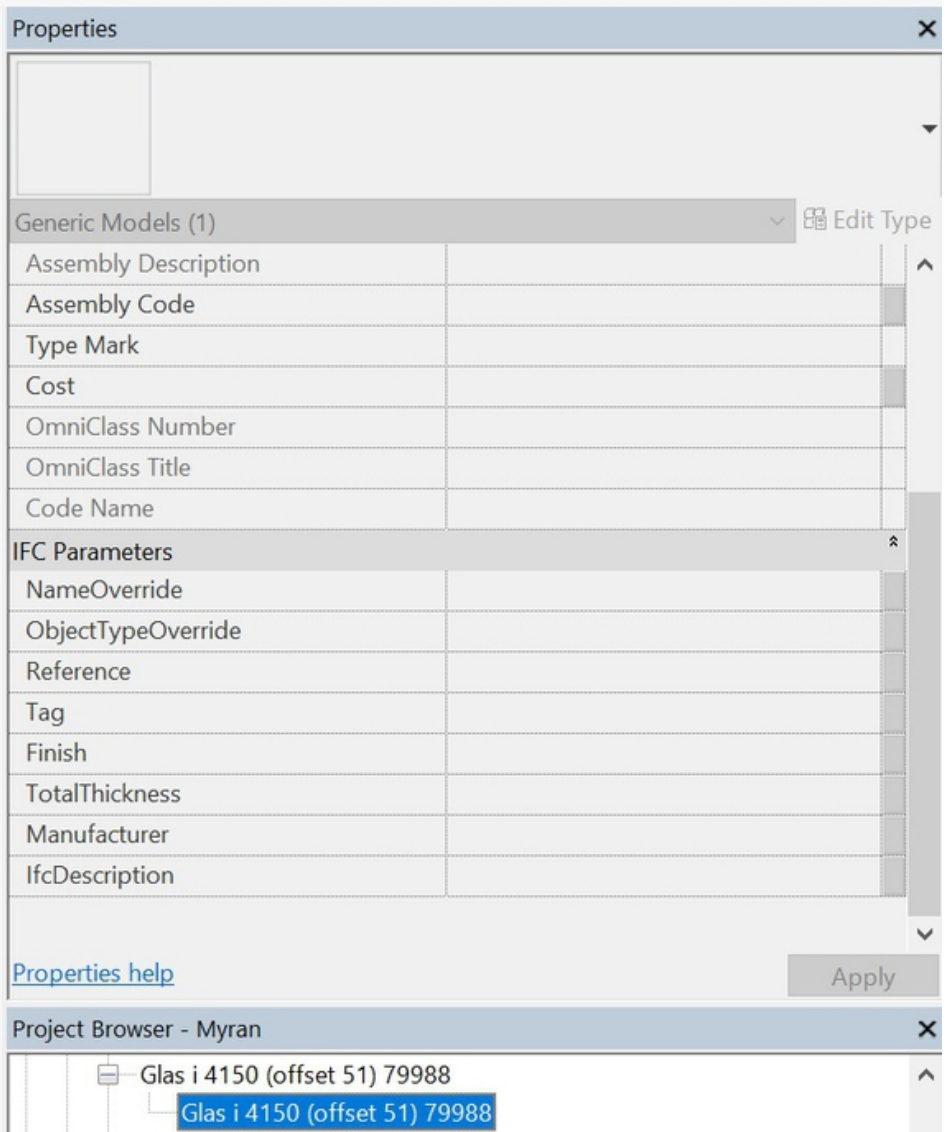
| | | | | | | | |
|----------------------------|--|---------------------------|------------------------------|---------------------------------------|---------------------------|------------------------------|-----------------------|
| Software | Software Name [version] | Revit [2018] | | Software house | | Autodesk | |
| | Proprietary or open source software? | | | Kind of software | | | |
| | proprietary | | | BIM | | | |
| Computer | Model and year | Operating system | CPU | GPU | Memory (RAM) | Hard drive capacity | Hard drive free space |
| | Aspire R5-471T | Windows 10 | Intel (R) Core (TM) i5-6200 | Intel HD Graphics 520 | 8 | 500 (SSD) | 65 |
| Certification | IFC import certification status | Import certification date | Import certification program | IFC export certification status | Export certification date | Export certification program | |
| | certified in (date) | 2015-02-07 | CV2.0 | certified in (date) | 2013-04-16 | CV2.0-Arch | |
| Test with Myran.ifc | | | | | | | |
| Performance | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | | | 1-5 minutes | | | |
| | How long does it take, approximately, to:Zoom into the model to see more detail | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Pan the model | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Rotate the model | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Query an object | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Inspect the objects linked to the queried one through a relationship | | | it's almost immediate | | | |
| Georeferencing | 2.1) Are the world (projected) coordinates taken into account when locating the model in the software's coordinate reference system? | | | Yes | | | |
| Height | 3.1) Are the "real-world" elevation values (heights) considered when locating the model in the software (z)? | | | Yes | | | |
| | 3.2) short comments to the previous question (optional) | | | The precision of the height is in mm. | | | |
| Orientation | 4.1) Is the model oriented correctly with respect to the true North? | | | Yes | | | |
| | 4.2) short comments to the previous question (optional) | | | Alignment can be changed | | | |
| Proportions | 5.1) Does the model maintain its correct dimensions and proportions? | | | Yes | | | |
| | 5.2) short comments to the previous question (optional) | | | Units are also in mm | | | |

| | | | | | | | | | | |
|---|--|---|---------|---------------------|-------------|---------------------|---------------------|---------------------|-------------------------|---------------------|
| IFC definitions | 6.1) Is the eventual translation consistent with the IFC definitions? | No | | | | | | | | |
| | 6.1.1) What changes / inconsistencies / errors / other issues were noted? | Some classes that are different in IFC are the same in Revit | | | | | | | | |
| | 6.1.2) Attach screenshots | <table border="1"> <tr> <td>lfcTank</td> <td>Specialty Equipment</td> </tr> <tr> <td>lfcTankType</td> <td>Specialty Equipment</td> </tr> <tr> <td>lfcTransportElement</td> <td>Specialty Equipment</td> </tr> <tr> <td>lfcTransportElementType</td> <td>Specialty Equipment</td> </tr> </table> | lfcTank | Specialty Equipment | lfcTankType | Specialty Equipment | lfcTransportElement | Specialty Equipment | lfcTransportElementType | Specialty Equipment |
| | lfcTank | Specialty Equipment | | | | | | | | |
| lfcTankType | Specialty Equipment | | | | | | | | | |
| lfcTransportElement | Specialty Equipment | | | | | | | | | |
| lfcTransportElementType | Specialty Equipment | | | | | | | | | |
| 6.2) short comments to the previous question (optional) | These are the standard settings. It is possible to set own Revit Categories (therefore set them to the correct IFC Class name) | | | | | | | | | |
| Hierarchy | 7.1) Are the hierarchical relationships consistent with the IFC hierarchy? | No | | | | | | | | |
| | 7.1.1) What changes / inconsistencies / errors / other issues were noted? | The elements are ordered in the Revit Families that are different from the IFC-hierarchy | | | | | | | | |
| Attributes | 8.1) Are the attributes present in the IFC entities retained and consistent? | Yes | | | | | | | | |
| | 8.2) short comments to the previous question (optional) | Pitch Angle is given in degrees not in radian | | | | | | | | |
| 2D/3D | 12.1) Is it possible to view the model in 3D? | Yes | | | | | | | | |
| | 13.1) Is it possible to view the model in 2D? | Yes | | | | | | | | |
| Editing | 14.1) Is it possible to edit the model (attributes, geometry, other)? | Yes | | | | | | | | |
| | 14.1.1) What editing is possible (attributes, geometry, georeferencing, please add details)? | attributes, georeferencing, for sure geometries (but geometries at all couldn't assessed because not found) | | | | | | | | |
| Querying | 15.1) Is it possible to query the model and the attributes? | Yes | | | | | | | | |
| | 15.1.1) What kinds of query are possible? | select by the Object type, select by id | | | | | | | | |
| | 15.1.2) Attach screenshots |  | | | | | | | | |
| Analysis | 16.1) Is it possible to analyse the objects and the model? | Yes | | | | | | | | |
| | 16.1.1) What analysis are possible? Do you know if the results are reliable? | possible analysis in screenshot. Results are currently not reliable due to the model (no masses available) | | | | | | | | |
| | 16.1.2) Attach screenshots |  | | | | | | | | |
| | 16.1.3) Time required to perform the analysis about the model itself (type 1) | less then a minute | | | | | | | | |

| | | |
|---|--|--|
| | 16.2) short comments to the previous question (optional) | not every possible analysis could be assessed (because not possible) |
| Export | You arrived at the end of the phase 1: "Import and manage the file in the software".Now choose: | The software has also export abilities |
| | 17.1) Are any pre-processing or setting changes needed in the software to enable a consistent export? | No |
| | 18.1) Is it possible to choose the IFC model view definition (MVD) to be used when exporting the data? | Yes |
| | 18.1.1) Which ones are available? | possible definitions can be found in the screenshot |
| | 18.1.2) Is it possible to add a customised MVD to be used for exporting IFC? | Yes |
| | 18.1.2.1) What kind of customisation is possible? | It is possible to create a new export scheme where many different parameters can be changed. |
| | 18.1.2.2) Attach screenshots and files |  |
| 19) How long does it take for the data to be exported to IFC? | 1-5 minutes | |
| Test with UpTown.ifc | | |
| Performance | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | it crashes without completing the operation |
| Test with Savigliano.ifc | | |
| Performance | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | it crashes without completing the operation |

REVIT

| | | | | | | | |
|----------------------------|--|---------------------------|--|---|---------------------------|------------------------------|-----------------------|
| Software | Software Name [version] | REVIT [2018] | | Software house | AUTODESK | | |
| | Proprietary or open source software? | | | Kind of software | | | |
| proprietary | | | BIM | | | | |
| Computer | Model and year | Operating system | CPU | GPU | Memory (RAM) | Hard drive capacity | Hard drive free space |
| | HP ZBook Studio G5/ 2018 | Microsoft Windows 10 Home | Intel(R) Core(TM) i7-8750H CPU @ 2.20GHz, 2208 Mhz, 6 Core(s), 12 Logical Processor(s) | NVIDIA Quadro P1000, 4096 MB(memory), 1493 MHz(clock) | 16 GB | 455GB | 286GB |
| Certification | IFC import certification status | Import certification date | Import certification program | IFC export certification status | Export certification date | Export certification program | |
| | certified in (date) | 2015-07-24 | CoordinationView 2.0 | certified in (date) | 2013-04-16 | CoordinationView 2.0 | |
| Test with Myran.ifc | | | | | | | |
| Performance | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | | | 1-5 minutes | | | |
| | How long does it take, approximately, to:Zoom into the model to see more detail | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Pan the model | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Rotate the model | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Query an object | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Inspect the objects linked to the queried one through a relationship | | | the software does not allow this | | | |
| Georeferencing | 2.1) Are the world (projected) coordinates taken into account when locating the model in the software's coordinate reference system? | | | Yes | | | |
| Height | 3.1) Are the "real-world" elevation values (heights) considered when locating the model in the software (z)? | | | Yes | | | |
| Orientation | 4.1) Is the model oriented correctly with respect to the true North? | | | Yes | | | |
| Proportions | 5.1) Does the model maintain its correct dimensions and proportions? | | | Yes | | | |
| IFC definitions | 6.1) Is the eventual translation consistent with the IFC definitions? | | | Yes | | | |
| Hierarchy | 7.1) Are the hierarchical relationships consistent with the IFC hierarchy? | | | No | | | |

| | | |
|----------------------|---|---|
| | <p>8.1.1) What changes / inconsistencies / errors / other issues were noted?</p> | <p>Some of the attribute found are consistent with the IFC entities' attributes but most of them are missing.</p> |
| | <p>8.1.2) Attach screenshots</p> |  |
| <p>Relationships</p> | <p>9.1) Are the relationships between the objects retained?</p> | <p>No</p> |
| | <p>9.1.1) What changes / inconsistencies / errors / other issues were noted?</p> | <p>Many relationships were unjoined during import.</p> |
| <p>Geometry</p> | <p>10.1) Is geometry read correctly?</p> | <p>No</p> |
| | <p>10.1.1) What changes / inconsistencies / errors / other issues were noted?</p> | <p>No geometry information were found.</p> |
| <p>2D/3D</p> | <p>12.1) Is it possible to view the model in 3D?</p> | <p>Yes</p> |
| | <p>13.1) Is it possible to view the model in 2D?</p> | <p>Yes</p> |
| <p>Editing</p> | <p>14.1) Is it possible to edit the model (attributes, geometry, other)?</p> | <p>Yes</p> |

Autodesk Revit 2018 – Windows 10 Home

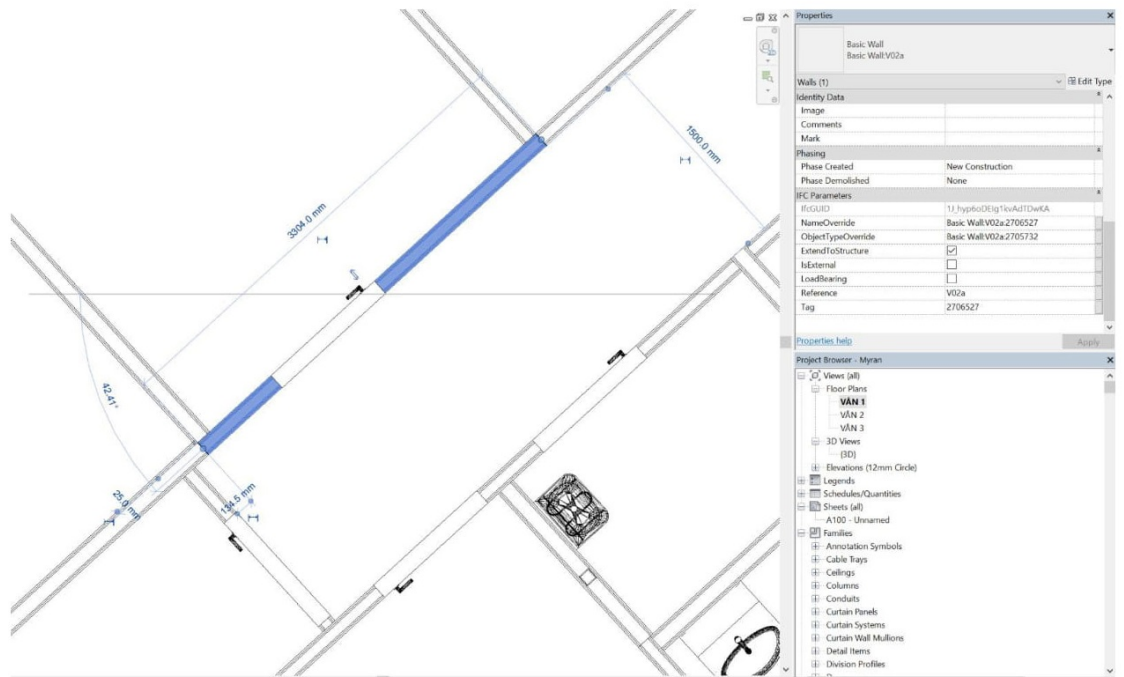
Proprietary

BIM

1 - Very beginner user (it is nearly the first time you use it)

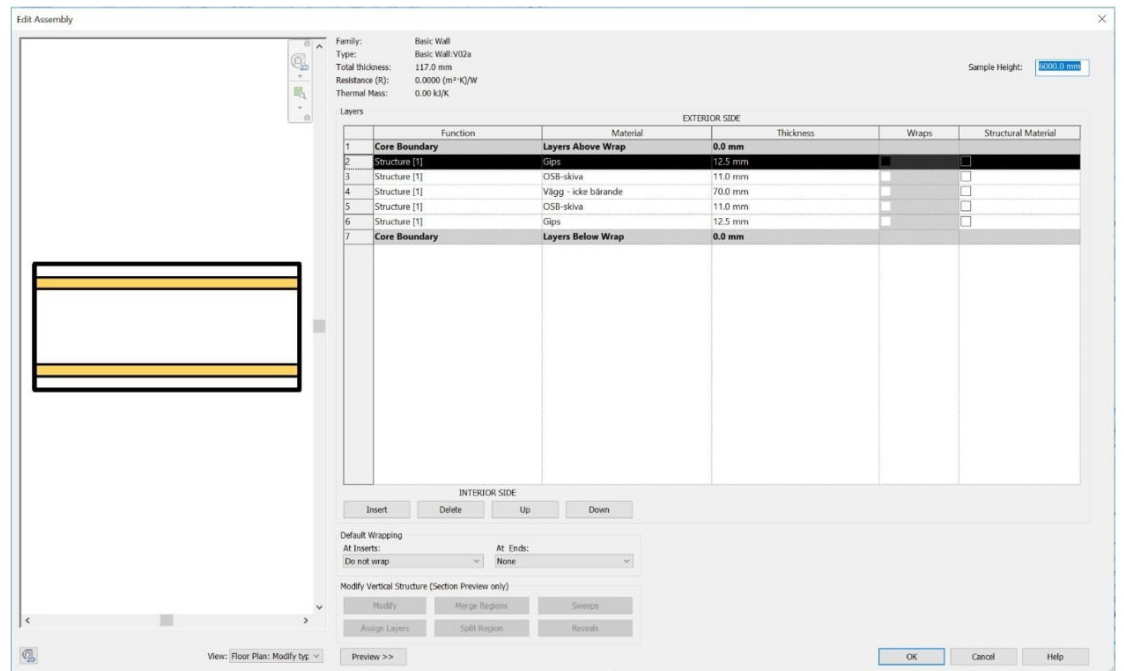
| | | |
|--|--|---|
| | 14.1.1) What editing is possible (attributes, geometry, georeferencing, please add details)? | There are lots of ways to manipulate attributes, geometries, modify semantics etc |
|--|--|---|

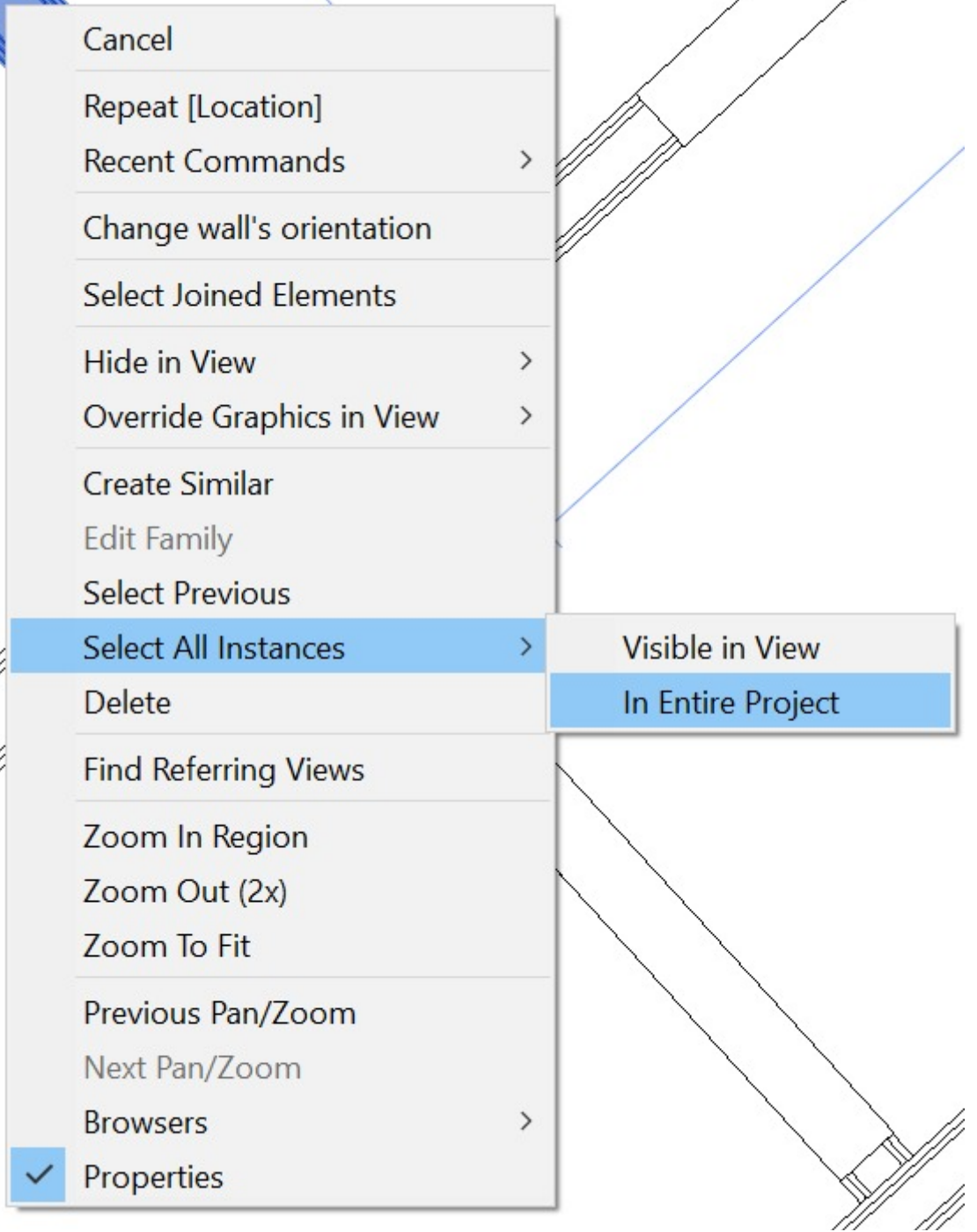

Modification in the geometry

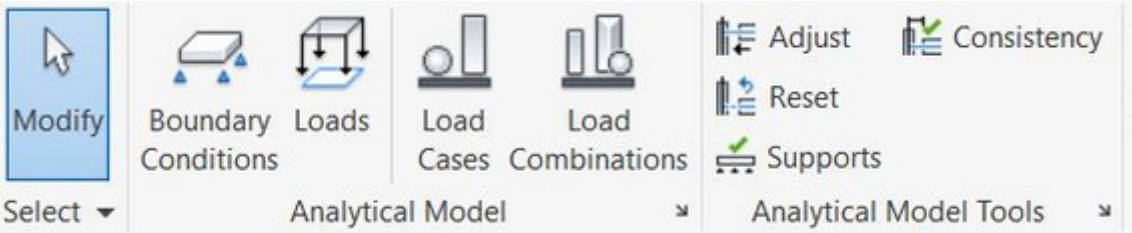
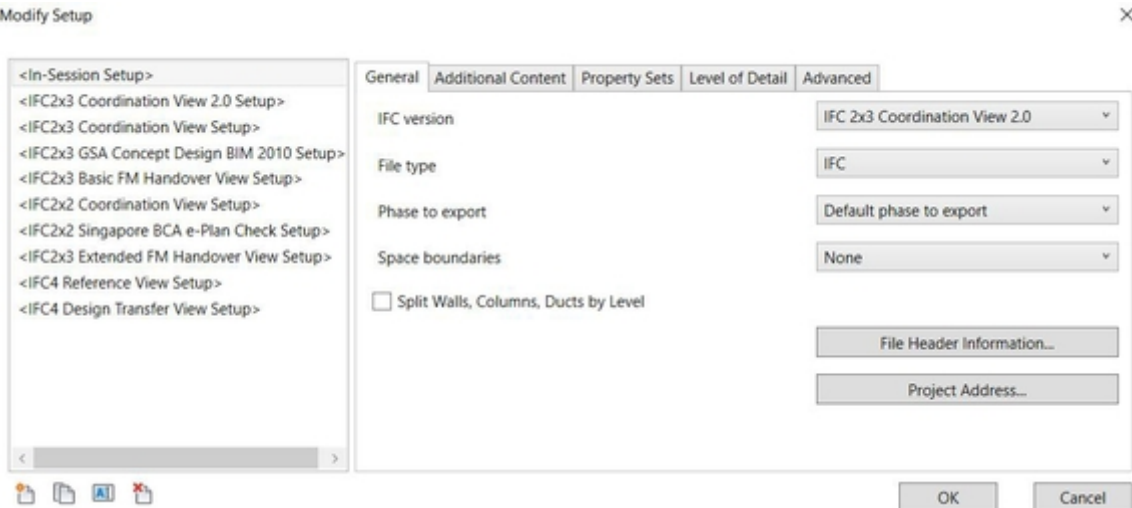


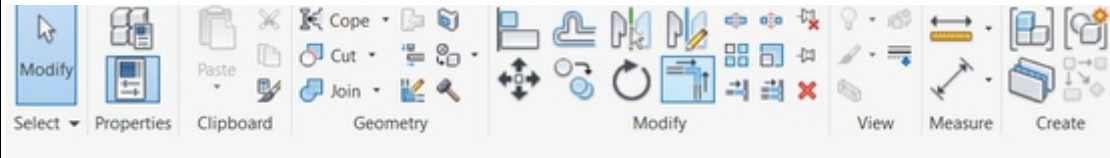
14.1.2) Attach screenshots

Edit attributes of the wall layers example



| | | |
|--|---|--|
| | 15.1) Is it possible to query the model and the attributes? | Yes |
| | 15.1.1) What kinds of query are possible? | Selecting elements, attributes of elements, instances of the same family of objects. |
| Querying | 15.1.2) Attach screenshots |  |
|  | 16.1) Is it possible to analyse the objects and the model? | Yes |

| | | |
|------------------------------------|---|--|
| | <p>16.1.1) What analysis are possible? Do you know if the results are reliable?</p> | <p>Reliability of results depends on the framework that is examined (geometry, semantics). Considering that attributes were unjoined and we could not access and evaluate geometry information of the model, there is no certainty on the accuracy of the results.</p> |
| | <p>16.1.2) Attach screenshots</p> |  |
| | <p>16.1.3) Time required to perform the analysis about the model itself (type 1)</p> | <p>less than a minute</p> |
| <p>Export</p> | <p>You arrived at the end of the phase 1: "Import and manage the file in the software". Now choose:</p> | <p>The software has also export abilities</p> |
| | <p>17.1) Are any pre-processing or setting changes needed in the software to enable a consistent export?</p> | <p>No</p> |
| | <p>18.1) Is it possible to choose the IFC model view definition (MVD) to be used when exporting the data?</p> | <p>Yes</p> |
| | <p>18.1.1) Which ones are available?</p> | <p>IFC 2x2 & 2x3 Coordination View, and Coordination View 2.0</p> |
| | <p>18.1.2) Is it possible to add a customised MVD to be used for exporting IFC?</p> | <p>Yes</p> |
| | <p>18.1.2.1) What kind of customisation is possible?</p> | <p>Specify categories of IFC to be exported, also splitting elements(walls, columns..)</p> |
| | <p>18.1.2.2) Attach screenshots and files</p> |  |
| | <p>19) How long does it take for the data to be exported to IFC?</p> | <p>1-5 minutes</p> |
| <p>Test with UpTown.ifc</p> | | |
| <p>Performance</p> | <p>How long does it take, approximately, to: Import (and visualise if the software allows it) the model</p> | <p>it crashes without completing the operation</p> |

| | | |
|---------------------------------|---|---|
| | How long does it take, approximately, to:Zoom into the model to see more detail | it crashes without completing the operation |
| | How long does it take, approximately, to:Pan the model | it crashes without completing the operation |
| | How long does it take, approximately, to:Rotate the model | it crashes without completing the operation |
| | How long does it take, approximately, to:Query an object | it crashes without completing the operation |
| | How long does it take, approximately, to:Inspect the objects linked to the queried one (Element 3) through a relationship | it crashes without completing the operation |
| Normals | 30.1) Did the normals change? | Yes |
| 2D/3D | 31.1) Is it possible to view the model in 3D? | Yes |
| | 32.1) Is it possible to view the model in 2D? | Yes |
| Editing | 33.1) Is it possible to edit the model (attributes, geometry, other)? | Yes |
| | 33.1.2) Attach screenshots |  |
| Querying | 34.1) Is it possible to query the model and the attributes? | Yes |
| | 34.1.1) What kinds of query are possible? | Select elements, attributes, families of elements. |
| Analysis | 35.1) Is it possible to analyse the objects and the model? | Yes |
| | 35.1.3) Time required to perform the analysis about the model (type 1) | 5-20 minutes |
| Export | You arrived at the end of the phase 1: "Import and manage the file in the software".Now choose: | The software has also export abilities |
| | 36) How long does it take for the data to be exported to IFC? | 1-5 minutes |
| Test with Savigliano.ifc | | |
| | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | it crashes without completing the operation |

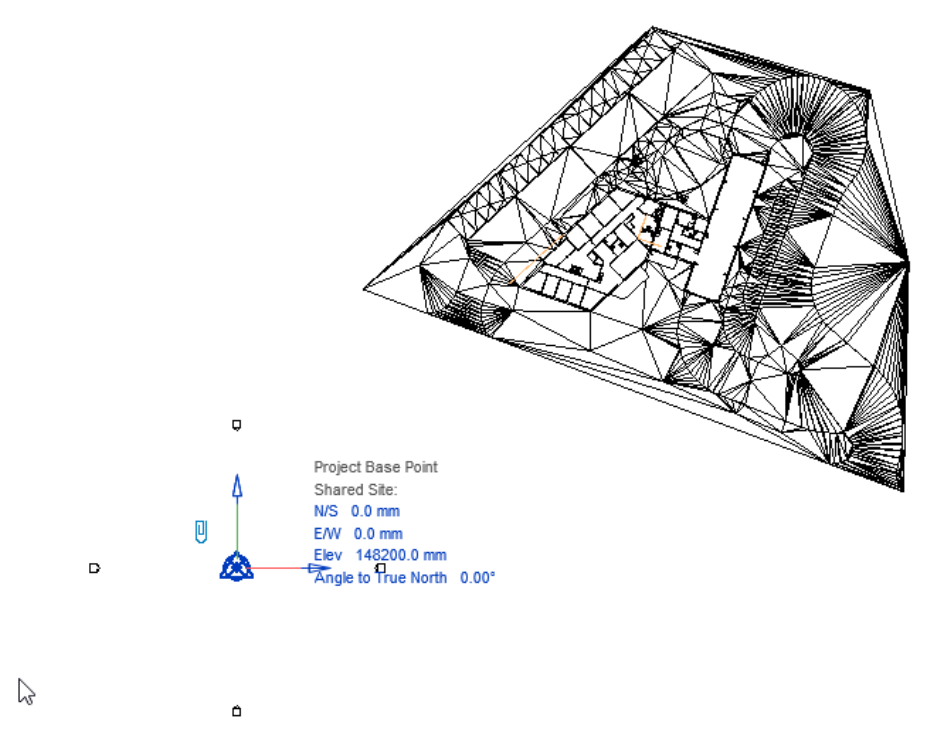
Autodesk Revit 2018

| | | | | | | | |
|----------------------------|---|---|--|----------------------------------|---------------------------|------------------------------|-----------------------|
| Software | Software Name [version] | Autodesk Revit 2018 [18.0.0.420] | | Software house | | Autodesk | |
| | Proprietary or open source software? | | | Kind of software | | | |
| proprietary | | | BIM | | | | |
| Computer | Model and year | Operating system | CPU | GPU | Memory (RAM) | Hard drive capacity | Hard drive free space |
| | Lenovo T480 2018 | Windows 10 Enterprise | Intel i5-8250U | Nvidia GeForce MX150 | 8 | 480 | 240 |
| Certification | IFC import certification status | Import certification date | Import certification program | IFC export certification status | Export certification date | Export certification program | |
| | certified in (date) | 2015-07-24 | buildingSMART | certified in (date) | 2013-04-16 | buildingSMART | |
| Test with Myran.ifc | | | | | | | |
| Performance | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | | | 1-5 minutes | | | |
| | How long does it take, approximately, to:Zoom into the model to see more detail | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Pan the model | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Rotate the model | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Query an object | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Inspect the objects linked to the queried one through a relationship | | | the software does not allow this | | | |
| | Please report on any errors the software gives when importing the file. | | Error message Elements Can't keep elements joined. Walls : Basic Wall : Basic Wall:Yttervägg 36 mm : id 246962 Walls : Basic Wall : Basic Wall:Yttervägg 240 mm : id 247515 Can't keep elements joined. Walls : Basic Wall : Basic Wall:V04 : id 246649 Walls : Basic Wall : Basic Wall:V04 : id 246757 Walls : Basic Wall : Basic Wall:V03 : id 247099 Can't keep elements joined. Walls : Basic Wall : Basic Wall:Yttervägg 36 mm : id 246820 Walls : Basic Wall : Basic Wall:Yttervägg 36 mm : id 246862 Walls : Basic Wall : Basic Wall:Yttervägg 36 mm : id 246877 Walls : Basic Wall : Basic Wall:Yttervägg 240 mm : id 247581 Can't keep elements joined. Walls : Basic Wall : Basic Wall:Yttervägg 36 mm : id 246820 Walls : Basic Wall : Basic Wall:Yttervägg 36 mm : id 246862 Walls : Basic Wall : Basic Wall:Yttervägg 36 mm : id 246877 Walls : Basic Wall : Basic Wall:Yttervägg 240 mm : id 247581 Can't make cut-out. Void Blend : id 246656 lfcOpeningElements : Opening 580221 : Opening 580221 : id 246687 Can't make cut-out. Void Extrusion : id 246786 lfcOpeningElements : Opening 518892 : Opening 518892 : id 246795 Can't make cut-out. Void Extrusion : id 247320 lfcOpeningElements : Opening 204231 : Opening 204231 : id 247329 Can't cut instance of Opening 518565 out of Wall. Walls : Basic Wall : Basic Wall:Yttervägg 36 mm : id 246820 lfcOpeningElements : Opening 518565 : Opening 518565 : id 246840 Can't regenerate Family Opening 204231. Edit Family to modify it. Type : lfcOpeningElements : Opening 204231 : Opening 204231 : id 247327 Can't regenerate Family Opening 518892. Edit Family to modify it. Type : lfcOpeningElements : Opening 518892 : Opening 518892 : id 246793 Can't regenerate Family Opening 580221. Edit Family to modify it. Type : lfcOpeningElements : Opening 580221 : Opening 580221 : id 246685 Rectangular | | | | |

opening doesn't cut its host. Rectangular Straight Wall Opening : Rectangular Straight Wall Opening : id 248291 Rectangular opening doesn't cut its host. Rectangular Straight Wall Opening : Rectangular Straight Wall Opening : id 248308 Rectangular opening doesn't cut its host. Rectangular Straight Wall Opening : Rectangular Straight Wall Opening : id 248344 Rectangular opening doesn't cut its host. Rectangular Straight Wall Opening : Rectangular Straight Wall Opening : id 248392 Rectangular opening doesn't cut its host. Rectangular Straight Wall Opening : Rectangular Straight Wall Opening : id 248558 Rectangular opening doesn't cut its host. Rectangular Straight Wall Opening : Rectangular Straight Wall Opening : id 248586 Instance of in-place family is not cutting host. Walls : Basic Wall : Basic Wall:Yttervägg 36 mm : id 246820 IfcOpeningElements : Opening 518565 : Opening 518565 : id 246840 Instance of in-place family is not cutting host. Walls : Basic Wall : Basic Wall:Yttervägg 36 mm : id 246862 IfcOpeningElements : Opening 518437 : Opening 518437 : id 246876 Instance of in-place family is not cutting host. Walls : Basic Wall : Basic Wall:Yttervägg 36 mm : id 246877 IfcOpeningElements : Opening 517844 : Opening 517844 : id 246940 Instance of in-place family is not cutting host. Walls : Basic Wall : Basic Wall:V06a : id 247614 IfcOpeningElements : Opening 579680 : Opening 579680 : id 247628 Instance of in-place family is not cutting host. Walls : Basic Wall : Basic Wall:V06a : id 247629 IfcOpeningElements : Opening 564238 : Opening 564238 : id 247643 Instance of in-place family is not cutting host. Walls : Basic Wall : Basic Wall:V02a : id 247644 IfcOpeningElements : Opening 564114 : Opening 564114 : id 247658 Instance of in-place family is not cutting host. Walls : Basic Wall : Basic Wall:Yttervägg 36 mm : id 247682 IfcOpeningElements : Opening 517009 : Opening 517009 : id 248557 Instance of in-place family is not cutting host. Walls : Basic Wall : Basic Wall:Yttervägg 36 mm : id 247714 IfcOpeningElements : Opening 516266 : Opening 516266 : id 247749 Instance of in-place family is not cutting host. Walls : Basic Wall : Basic Wall:V05c : id 247869 IfcOpeningElements : Opening 4481 : Opening 4481 : id 247885 Instance of in-place family is not cutting host. Walls : Basic Wall : Basic Wall:Yttervägg 120 mm : id 247887 IfcOpeningElements : Opening 3999 : Opening 3999 : id 247901 Instance of in-place family is not cutting host. Walls : Basic Wall : Basic Wall:V02a : id 247902 IfcOpeningElements : Opening 3237 : Opening 3237 : id 247916 Instance of in-place family is not cutting host. Walls : Basic Wall : Basic Wall:V05b : id 247919 IfcOpeningElements : Opening 2727 : Opening 2727 : id 247964 Instance of in-place family is not cutting host. Walls : Basic Wall : Basic Wall:V11b : id 247966 IfcOpeningElements : Opening 2589 : Opening 2589 : id 247980 Instance of in-place family is not cutting host. Walls : Basic Wall : Basic Wall:V02a : id 247981 IfcOpeningElements : Opening 2271 : Opening 2271 : id 247995 Instance of in-place family is not cutting host. Walls : Basic Wall : Basic Wall:V06a : id 247996 IfcOpeningElements : Opening 2209 : Opening 2209 : id 248010 Instance of in-place family is not cutting host. Walls : Basic Wall : Basic Wall:V02a : id 248011 IfcOpeningElements : Opening 1949 : Opening 1949 : id 248025 Instance of in-place family is not cutting host. Walls : Basic Wall : Basic Wall:V02a : id 248026 IfcOpeningElements : Opening 1844 : Opening 1844 : id 248040 Instance of in-place family is not cutting host. Walls : Basic Wall : Basic Wall:V02a : id 248041 IfcOpeningElements : Opening 1652 : Opening 1652 : id 248055 Instance of in-place family is not cutting host. Walls : Basic Wall : Basic Wall:V08 : id 248057 IfcOpeningElements : Opening 1349 : Opening 1349 : id 248073 Instance of in-place family is not cutting host. Walls : Basic Wall : Basic Wall:Yttervägg 240 mm : id 248213 IfcOpeningElements : Opening 540 : Opening 540 : id 248227 Can't keep elements joined. Walls : Basic Wall : Basic Wall:Innervägg 70 mm Icke Bärande : id 247058 Void Blend : id 247065 IfcOpeningElements : Opening 511763 : Opening 511763 : id 247076 Can't keep elements joined. Walls : Basic Wall : Basic Wall:V04 : id 246649 Void Blend : id 246656 Void Extrusion : id 246678 IfcOpeningElements : Opening 580221 : Opening 580221 : id 246687 The following problems were encountered in the IFC file: IFC: IfcPolyLine #589477 is too short, discarding. The following problems were encountered in the IFC file: IFC: IfcProfileDef #519093 has a very short segment that can't be fixed. Highlighted floors overlap. Floors : Floor : Floor:Platta på mark 700 mm : id 249412 Floors : Floor : Floor:Bjälklag 150 mm uteplats : id 249613 Highlighted floors overlap. Floors : Floor : Floor:Platta på mark 700 mm : id 249412

Floors : Floor : Floor:Bjälklag 150 mm uteplats : id 249624 Highlighted floors overlap. Floors : Floor : Floor:Platta på mark 700 mm : id 249412 Floors : Floor : Pad:Pad 1 : id 251286 Highlighted floors overlap. Floors : Floor : Floor:Bjälklag 220 mm : id 249443 Floors : Floor : Floor:Bjälklag 150 mm balkong : id 250719 Highlighted floors overlap. Floors : Floor : Floor:Bjälklag 220 mm : id 249443 Floors : Floor : Floor:Bjälklag 100 mm : id 250828 Highlighted walls overlap. One of them may be ignored when Revit finds room boundaries. Use Cut Geometry to embed one wall within the other. Walls : Basic Wall : Basic Wall:V04 : id 246649 Walls : Basic Wall : Basic Wall:V04 : id 246757 Highlighted walls overlap. One of them may be ignored when Revit finds room boundaries. Use Cut Geometry to embed one wall within the other. Walls : Basic Wall : Basic Wall:V04 : id 246757 Walls : Basic Wall : Basic Wall:Portälvägg : id 249867 Highlighted walls overlap. One of them may be ignored when Revit finds room boundaries. Use Cut Geometry to embed one wall within the other. Walls : Basic Wall : Basic Wall:Yttervägg 36 mm : id 246862 Walls : Basic Wall : Basic Wall:Yttervägg 36 mm : id 246877 Highlighted walls overlap. One of them may be ignored when Revit finds room boundaries. Use Cut Geometry to embed one wall within the other. Walls : Basic Wall : Basic Wall:Yttervägg 36 mm : id 246877 Walls : Basic Wall : Basic Wall:Yttervägg 36 mm : id 248535 Highlighted walls overlap. One of them may be ignored when Revit finds room boundaries. Use Cut Geometry to embed one wall within the other. Walls : Basic Wall : Basic Wall:V02a : id 247351 Walls : Basic Wall : Basic Wall:Brandcellsgräns EI30 - Smart build env : id 251318 Highlighted walls overlap. One of them may be ignored when Revit finds room boundaries. Use Cut Geometry to embed one wall within the other. Walls : Basic Wall : Basic Wall:V02a : id 247644 Walls : Basic Wall : Basic Wall:Brandcellsgräns EI30 - Smart build env : id 251316 Highlighted walls overlap. One of them may be ignored when Revit finds room boundaries. Use Cut Geometry to embed one wall within the other. Walls : Basic Wall : Basic Wall:Innervägg enl. K 262 mm : id 247752 Walls : Basic Wall : Basic Wall:V13 : id 251255 Highlighted walls overlap. One of them may be ignored when Revit finds room boundaries. Use Cut Geometry to embed one wall within the other. Walls : Basic Wall : Basic Wall:Innervägg enl. K 262 mm : id 247752 Walls : Basic Wall : Basic Wall:Brandcellsgräns EI30 - Smart build env : id 251323 Highlighted walls overlap. One of them may be ignored when Revit finds room boundaries. Use Cut Geometry to embed one wall within the other. Walls : Basic Wall : Basic Wall:Yttervägg_parocement 200 mm : id 247789 Walls : Basic Wall : Basic Wall:Brandcellsgräns EI30 - Smart build env : id 251327 Highlighted walls overlap. One of them may be ignored when Revit finds room boundaries. Use Cut Geometry to embed one wall within the other. Walls : Basic Wall : Basic Wall:Vägg enl. K 197 : id 247840 Walls : Basic Wall : Basic Wall:Brandcellsgräns EI30 - Smart build env : id 251327 Highlighted walls overlap. One of them may be ignored when Revit finds room boundaries. Use Cut Geometry to embed one wall within the other. Walls : Basic Wall : Basic Wall:V02a : id 247981 Walls : Basic Wall : Basic Wall:Brandcellsgräns EI30 - Smart build env : id 251318 Highlighted walls overlap. One of them may be ignored when Revit finds room boundaries. Use Cut Geometry to embed one wall within the other. Walls : Basic Wall : Basic Wall:V06a : id 247996 Walls : Basic Wall : Basic Wall:Brandcellsgräns EI30 - Smart build env : id 251319 Highlighted walls overlap. One of them may be ignored when Revit finds room boundaries. Use Cut Geometry to embed one wall within the other. Walls : Basic Wall : Basic Wall:V02a : id 248011 Walls : Basic Wall : Basic Wall:Brandcellsgräns EI30 - Smart build env : id 251320 Highlighted walls overlap. One of them may be ignored when Revit finds room boundaries. Use Cut Geometry to embed one wall within the other. Walls : Basic Wall : Basic Wall:V02a : id 248026 Walls : Basic Wall : Basic Wall:Brandcellsgräns EI30 - Smart build env : id 251321 Highlighted walls overlap. One of them may be ignored when Revit finds room boundaries. Use Cut Geometry to embed one wall within the other. Walls : Basic Wall : Basic Wall:V02a : id 248041 Walls : Basic Wall : Basic Wall:Brandcellsgräns EI30 - Smart build env : id 251317 Highlighted walls overlap. One of them may be ignored when Revit finds room boundaries. Use Cut Geometry to embed one wall within the other. Walls : Basic Wall : Basic Wall:Yttervägg 240 mm : id 248116 Walls : Basic Wall : Basic Wall:Brandcellsgräns EI30 - Smart build env : id 251324 Highlighted walls overlap. One of

| | | |
|-------------|--|--|
| | | <p>them may be ignored when Revit finds room boundaries. Use Cut Geometry to embed one wall within the other. Walls : Basic Wall : Basic Wall:Yttervägg 240 mm : id 248167 Walls : Basic Wall : Basic Wall:Brandcellsgräns EI30 - Smart build env : id 251323 Highlighted walls overlap. One of them may be ignored when Revit finds room boundaries. Use Cut Geometry to embed one wall within the other. Walls : Basic Wall : Basic Wall:V02a : id 249194 Walls : Basic Wall : Basic Wall:Brandcellsgräns EI30 - Smart build env : id 251315 Highlighted walls overlap. One of them may be ignored when Revit finds room boundaries. Use Cut Geometry to embed one wall within the other. Walls : Basic Wall : Basic Wall:Yttervägg 240 mm : id 249428 Walls : Basic Wall : Basic Wall:Brandcellsgräns EI30 - Smart build env : id 251324 Highlighted walls overlap. One of them may be ignored when Revit finds room boundaries. Use Cut Geometry to embed one wall within the other. Walls : Basic Wall : Basic Wall:Innervägg enl. K 262 mm : id 249429 Walls : Basic Wall : Basic Wall:Brandcellsgräns EI30 - Smart build env : id 251323 Highlighted walls overlap. One of them may be ignored when Revit finds room boundaries. Use Cut Geometry to embed one wall within the other. Walls : Basic Wall : Basic Wall:V02a : id 249633 Walls : Basic Wall : Basic Wall:Brandcellsgräns EI30 - Smart build env : id 251321 Highlighted walls overlap. One of them may be ignored when Revit finds room boundaries. Use Cut Geometry to embed one wall within the other. Walls : Basic Wall : Basic Wall:V05a : id 250935 Walls : Basic Wall : Basic Wall:Brandcellsgräns EI30 - Smart build env : id 251318 Insert conflicts with joined Wall. IfcOpeningElements : Opening 517401 : Opening 517401 : id 246982 Walls : Basic Wall : Basic Wall:Yttervägg 240 mm : id 247581 Insert conflicts with joined Wall. Walls : Basic Wall : Basic Wall:V04 : id 247120 Windows : F15-02 : F15-02 - Mark 42 : id 250811 Insert conflicts with joined Wall. IfcOpeningElements : Opening 515903 : Opening 515903 : id 247787 Walls : Basic Wall : Basic Wall:Brandcellsgräns EI30 - Smart build env : id 251318 Insert conflicts with joined Wall. Walls : Basic Wall : Basic Wall:V02a : id 248026 Windows : F15-01 : F15-01 - Mark 18 : id 249566 Insert conflicts with joined Wall. Walls : Basic Wall : Basic Wall:V08 : id 248057 IfcOpeningElements : Opening 827 : Opening 827 : id 248166</p> |
| | Other | only elevation is correctly specified; Northern and Eastern values are 0.0 and 0.0 |
| Height | 3.1) Are the "real-world" elevation values (heights) considered when locating the model in the software (z)? | Yes |
| | 3.2) short comments to the previous question (optional) | elevation correct |
| Orientation | 4.1) Is the model oriented correctly with respect to the true North? | No |
| | 4.1.1) How is the model oriented, with respect to the reference direction? | Angle to True North 0.0° |

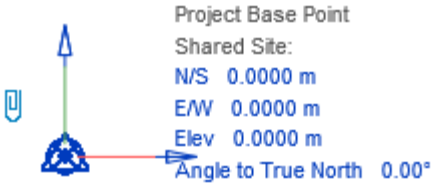
| | | |
|-----------------|--|---|
| | 4.1.2) Attach screenshots |  |
| Proportions | 5.1) Does the model maintain its correct dimensions and proportions? | Yes |
| Proportions | 5.2) short comments to the previous question (optional) | Height of Section B can not be measured unambiguously due to the sloped roof |
| IFC definitions | 6.1) Is the eventual translation consistent with the IFC definitions? | Yes |
| Hierarchy | 7.1) Are the hierarchical relationships consistent with the IFC hierarchy? | The software does not have the necessary tools to determine this information |
| Attributes | 8.1) Are the attributes present in the IFC entities retained and consistent? | No |
| Attributes | 8.1.1) What changes / inconsistencies / errors / other issues were noted? | no plate specified, only the complete glass front |
| Geometry | 10.1) Is geometry read correctly? | In general yes, but reported errors lead to broken objects etc. |
| Normals | 11.1) Did the normals change? | The software does not have the necessary tools for checking it |
| 2D/3D | 13.1) Is it possible to view the model in 3D? | Yes |
| 2D/3D | 12.1) Is it possible to view the model in 2D? | Yes |
| Editing | 14.1) Is it possible to edit the model (attributes, geometry, other)? | Yes |
| Editing | 14.1.1) What editing is possible (attributes, geometry, georeferencing, please add details)? | Revit internal attributes + IFC Attributes except the IfcGUID |
| Querying | 15.1) Is it possible to query the model and the attributes? | Yes |
| Querying | 15.1.1) What kinds of query are possible? | filtering objects by category |

| | | |
|---------------------------------|---|--|
| Anal ysis | 16.1) Is it possible to analyse the objects and the model? | Maybe possible; too unexperienced with software to perform such tasks |
| | You arrived at the end of the phase 1: "Import and manage the file in the software".Now choose: | The software has also export abilities to IFC |
| Export | 17.1) Are any pre-processing or setting changes needed in the software to enable a consistent export? | No |
| | 18.1) Is it possible to choose the IFC model view definition (MVD) to be used when exporting the data? | Yes |
| | 18.1.1) Which ones are available? | IFC2x3 Coordination View 2.0 IFC2x3 Coordination View IFC2x3 GSA Concept Design BIM 2010 IFC2x3 Basic FM Handover View IFC2x2 Coordination View IFC2x2 Singapore BCA e-Plan Check IFC2x3 Extended FM Handover View IFC4 Reference View IFC4 Design Transfer View |
| | Other | I don't know; not experienced enough |
| | 19) How long does it take for the data to be exported to IFC? | it crashes without completing the operation |
| Test with UpTown.ifc | | |
| Perfor mance | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | The software was not able to import it, even without crushing |
| Test with Savigliano.ifc | | |
| Performance | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | 1-5 minutes |
| | How long does it take, approximately, to:Zoom into the model to see more detail | it's almost immediate |
| | How long does it take, approximately, to:Pan the model | it's almost immediate |
| | How long does it take, approximately, to:Rotate the model | it's almost immediate |
| | How long does it take, approximately, to:Query an object | it's almost immediate |
| | How long does it take, approximately, to:Inspect the objects linked to the queried one through a relationship | it's almost immediate |
| | 38) Please report on any errors the software gives when importing the file. | Error message Elements Can't keep elements joined. Walls : Basic Wall : Muro di base:Strutturale - 35 cm:425707 : id 226945 Walls : Basic Wall : Muro di base:Generico - 10 cm:298586 : id 233246 Can't keep elements joined. Walls : Basic Wall : Muro di base:Generico - 40 cm:133292 : id 230075 Walls : Basic Wall : Muro di base:Generico - 40 cm:133292 : id 233969 Walls : Basic Wall : Muro di base:Muro balconi - 10 cm:520552 : id 235803 Can't keep elements joined. Walls : Basic Wall : Muro di base:Generico - 40 cm:133292 : id 231458 Walls : Basic Wall : Muro di base:Generico - 40 cm:133292 : id 235844 Walls : Basic Wall : Muro di base:Muro balconi - 10 cm:520552 : id 236092 Can't keep elements joined. Walls : Basic Wall : Muro di base:Generico - 40 cm:133292 : id 231931 Walls : Basic Wall : Muro di base:Generico - 40 cm:133292 : id 236131 Walls : Basic Wall : Muro di base:Muro balconi - 10 cm:520552 : id 236418 Can't keep elements joined. Walls : Basic Wall : Muro di base:Generico - 40 cm:133292 : id 232485 Walls : Basic Wall : Muro di base:Generico - 40 cm:133292 : id 236558 Walls : Basic Wall : Muro di base:Muro balconi - 10 cm:520552 : id 236817 Can't keep elements joined. Walls : Basic Wall : Muro di base:Generico - 40 cm:133292 : id 233933 Walls : Basic Wall : |

Muro di base:Generico - 40 cm:133292 : id 233934 Walls : Basic Wall : Muro di base:Muro balconi - 10 cm:520552 : id 238168 Can't keep elements joined. Walls : Basic Wall : Muro di base:Generico - 40 cm:133292 : id 235804 Walls : Basic Wall : Muro di base:Generico - 40 cm:133292 : id 235805 Walls : Basic Wall : Muro di base:Muro balconi - 10 cm:520552 : id 238185 Can't keep elements joined. Walls : Basic Wall : Muro di base:Generico - 40 cm:133292 : id 236093 Walls : Basic Wall : Muro di base:Generico - 40 cm:133292 : id 236094 Walls : Basic Wall : Muro di base:Muro balconi - 10 cm:520552 : id 238202 Can't keep elements joined. Walls : Basic Wall : Muro di base:Generico - 40 cm:133292 : id 236419 Walls : Basic Wall : Muro di base:Generico - 40 cm:133292 : id 236430 Walls : Basic Wall : Muro di base:Muro balconi - 10 cm:520552 : id 238219 Instance(s) of 100 x 220 cm not cutting anything. Walls : Basic Wall : Muro di base:Generico - 40 cm:133292 : id 232247 Windows : 100 x 220 cm : 100 x 220 cm - Mark 195 : id 236763 Instance(s) of 100 x 220 cm 90384 not cutting anything. Walls : Basic Wall : Muro di base:Generico - 40 cm:133292 : id 232247 Windows : 100 x 220 cm 90384 : 100 x 220 cm 90384 - Mark 194 : id 236762 Instance(s) of 120 x 135 cm not cutting anything. Walls : Basic Wall : Muro di base:Generico - 40 cm:133292 : id 232058 Windows : 120 x 135 cm : 120 x 135 cm - Mark 186 : id 236739 Instance(s) of 120 x 135 cm not cutting anything. Walls : Basic Wall : Muro di base:Generico - 40 cm:133292 : id 232188 Windows : 120 x 135 cm : 120 x 135 cm - Mark 193 : id 236761 Instance(s) of 120 x 135 cm 98850 not cutting anything. Walls : Basic Wall : Muro di base:Generico - 40 cm:133292 : id 232293 Windows : 120 x 135 cm 98850 : 120 x 135 cm 98850 - Mark 196 : id 236764 Instance(s) of 120 x 135 cm 98850 not cutting anything. Walls : Basic Wall : Muro di base:Generico - 40 cm:133292 : id 232339 Windows : 120 x 135 cm 98850 : 120 x 135 cm 98850 - Mark 188 : id 236742 Instance(s) of 120 x 215 cm not cutting anything. Walls : Basic Wall : Muro di base:Generico - 40 cm:133292 : id 232058 Windows : 120 x 215 cm : 120 x 215 cm - Mark 185 : id 236738 Instance(s) of 120 x 215 cm 80979 not cutting anything. Walls : Basic Wall : Muro di base:Generico - 40 cm:133292 : id 230937 Windows : 120 x 215 cm 80979 : 120 x 215 cm 80979 - Mark 91 : id 235009 Instance(s) of 120 x 215 cm 80979 not cutting anything. Walls : Basic Wall : Muro di base:Generico - 40 cm:133292 : id 232339 Windows : 120 x 215 cm 80979 : 120 x 215 cm 80979 - Mark 187 : id 236741 Instance(s) of 140 x 140 cm not cutting anything. Walls : Basic Wall : Muro di base:Generico - 40 cm:133292 : id 232516 Windows : 140 x 140 cm : 140 x 140 cm - Mark 203 : id 236795 Instance(s) of 140 x 140 cm not cutting anything. Walls : Basic Wall : Muro di base:Generico - 40 cm:133292 : id 232549 Windows : 140 x 140 cm : 140 x 140 cm - Mark 200 : id 236792 Instance(s) of 140 x 140 cm 242263 not cutting anything. Walls : Basic Wall : Muro di base:Generico - 40 cm:133292 : id 232516 Windows : 140 x 140 cm 242263 : 140 x 140 cm 242263 - Mark 201 : id 236793 Instance(s) of 70 x 140 cm not cutting anything. Walls : Basic Wall : Muro di base:Generico - 40 cm:133292 : id 230827 Windows : 70 x 140 cm : 70 x 140 cm - Mark 104 : id 235034 Instance(s) of 70 x 140 cm not cutting anything. Walls : Basic Wall : Muro di base:Generico - 40 cm:133292 : id 232293 Windows : 70 x 140 cm : 70 x 140 cm - Mark 197 : id 236765 Instance(s) of 70 x 140 cm 93420 not cutting anything. Walls : Basic Wall : Muro di base:Generico - 40 cm:133292 : id 230827 Windows : 70 x 140 cm 93420 : 70 x 140 cm 93420 - Mark 103 : id 235033 Instance(s) of 70 x 140 cm 93420 not cutting anything. Walls : Basic Wall : Muro di base:Generico - 40 cm:133292 : id 232188 Windows : 70 x 140 cm 93420 : 70 x 140 cm 93420 - Mark 192 : id 236760 Instance(s) of 80 x 135 cm not cutting anything. Walls : Basic Wall : Muro di base:Generico - 40 cm:133292 : id 232454 Windows : 80 x 135 cm : 80 x 135 cm - Mark 206 : id 236798 Instance(s) of 80 x 135 cm 95126 not cutting anything. Walls : Basic Wall : Muro di base:Generico - 40 cm:133292 : id 230937 Windows : 80 x 135 cm 95126 : 80 x 135 cm 95126 - Mark 105 : id 235035 Instance(s) of 80 x 135 cm 95126 not cutting anything. Walls : Basic Wall : Muro di base:Generico - 40 cm:133292 : id 232454 Windows : 80 x 135 cm 95126 : 80 x 135 cm 95126 - Mark 207 : id 236799 Rectangular opening doesn't cut its host. Rectangular Straight Wall Opening : Rectangular Straight Wall Opening : id 229378 Rectangular opening doesn't cut its host. Rectangular Straight Wall Opening : Rectangular Straight Wall Opening : id 229382 Rectangular opening doesn't cut its host. Rectangular Straight Wall Opening :

Rectangular Straight Wall Opening : id 229727 Rectangular opening doesn't cut its host.
 Rectangular Straight Wall Opening : Rectangular Straight Wall Opening : id 229729
 Rectangular opening doesn't cut its host. Rectangular Straight Wall Opening : Rectangular
 Straight Wall Opening : id 230056 Rectangular opening doesn't cut its host. Rectangular
 Straight Wall Opening : Rectangular Straight Wall Opening : id 230057 Rectangular opening
 doesn't cut its host. Rectangular Straight Wall Opening : Rectangular Straight Wall Opening : id
 230059 Rectangular opening doesn't cut its host. Rectangular Straight Wall Opening :
 Rectangular Straight Wall Opening : id 230060 Rectangular opening doesn't cut its host.
 Rectangular Straight Wall Opening : Rectangular Straight Wall Opening : id 230720
 Rectangular opening doesn't cut its host. Rectangular Straight Wall Opening : Rectangular
 Straight Wall Opening : id 230721 Rectangular opening doesn't cut its host. Rectangular
 Straight Wall Opening : Rectangular Straight Wall Opening : id 230723 Rectangular opening
 doesn't cut its host. Rectangular Straight Wall Opening : Rectangular Straight Wall Opening : id
 230724 Rectangular opening doesn't cut its host. Rectangular Straight Wall Opening :
 Rectangular Straight Wall Opening : id 231912 Rectangular opening doesn't cut its host.
 Rectangular Straight Wall Opening : Rectangular Straight Wall Opening : id 231913
 Rectangular opening doesn't cut its host. Rectangular Straight Wall Opening : Rectangular
 Straight Wall Opening : id 231915 Rectangular opening doesn't cut its host. Rectangular
 Straight Wall Opening : Rectangular Straight Wall Opening : id 231916 Instance of in-place
 family is not cutting host. Walls : Basic Wall : Muro di base:Generico - 40 cm:133292 : id
 227322 IfcOpeningElements : Opening 260236 : Opening 260236 : id 227360 Instance of in-
 place family is not cutting host. Walls : Basic Wall : Muro di base:Generico - 40 cm:133292 : id
 227437 IfcOpeningElements : Opening 258067 : Opening 258067 : id 227475 Instance of in-
 place family is not cutting host. Walls : Basic Wall : Muro di base:Generico - 20 cm:2340 : id
 227816 IfcOpeningElements : Opening 111868 : Opening 111868 : id 227830 Instance of in-
 place family is not cutting host. Walls : Basic Wall : Muro di base:Generico - 20 cm:2340 : id
 228118 IfcOpeningElements : Opening 107237 : Opening 107237 : id 228132 Instance of in-
 place family is not cutting host. Walls : Basic Wall : Muro di base:Generico - 20 cm:2340 : id
 228556 IfcOpeningElements : Opening 54012 : Opening 54012 : id 228570 Instance of in-place
 family is not cutting host. Walls : Basic Wall : Muro di base:Strutturale - 35 cm:425707 : id
 229206 IfcOpeningElements : Opening 234884 : Opening 234884 : id 231079 Instance of in-
 place family is not cutting host. Walls : Basic Wall : Muro di base:Generico - 40 cm:133292 : id
 230147 IfcOpeningElements : Opening 67349 : Opening 67349 : id 230185 Instance of in-place
 family is not cutting host. Walls : Basic Wall : Muro di base:Generico - 40 cm:133292 : id
 230827 IfcOpeningElements : Opening 116159 : Opening 116159 : id 230859 Instance of in-
 place family is not cutting host. Walls : Basic Wall : Muro di base:Generico - 40 cm:133292 : id
 230937 IfcOpeningElements : Opening 116790 : Opening 116790 : id 230981 Instance of in-
 place family is not cutting host. Walls : Basic Wall : Muro di base:Generico - 40 cm:133292 : id
 230937 IfcOpeningElements : Opening 116812 : Opening 116812 : id 230995 Instance of in-
 place family is not cutting host. Walls : Basic Wall : Muro di base:Generico - 40 cm:133292 : id
 232058 IfcOpeningElements : Opening 257394 : Opening 257394 : id 232074 Instance of in-
 place family is not cutting host. Walls : Basic Wall : Muro di base:Generico - 40 cm:133292 : id
 232058 IfcOpeningElements : Opening 257416 : Opening 257416 : id 232088 Instance of in-
 place family is not cutting host. Walls : Basic Wall : Muro di base:Generico - 40 cm:133292 : id
 232058 IfcOpeningElements : Opening 257438 : Opening 257438 : id 232102 Instance of in-
 place family is not cutting host. Walls : Basic Wall : Muro di base:Generico - 40 cm:133292 : id
 232058 IfcOpeningElements : Opening 257460 : Opening 257460 : id 232116 Instance of in-
 place family is not cutting host. Walls : Basic Wall : Muro di base:Generico - 40 cm:133292 : id
 232188 IfcOpeningElements : Opening 257826 : Opening 257826 : id 232204 Instance of in-
 place family is not cutting host. Walls : Basic Wall : Muro di base:Generico - 40 cm:133292 : id
 232188 IfcOpeningElements : Opening 257848 : Opening 257848 : id 232218 Instance of in-
 place family is not cutting host. Walls : Basic Wall : Muro di base:Generico - 40 cm:133292 : id
 232247 IfcOpeningElements : Opening 258201 : Opening 258201 : id 232263 Instance of in-

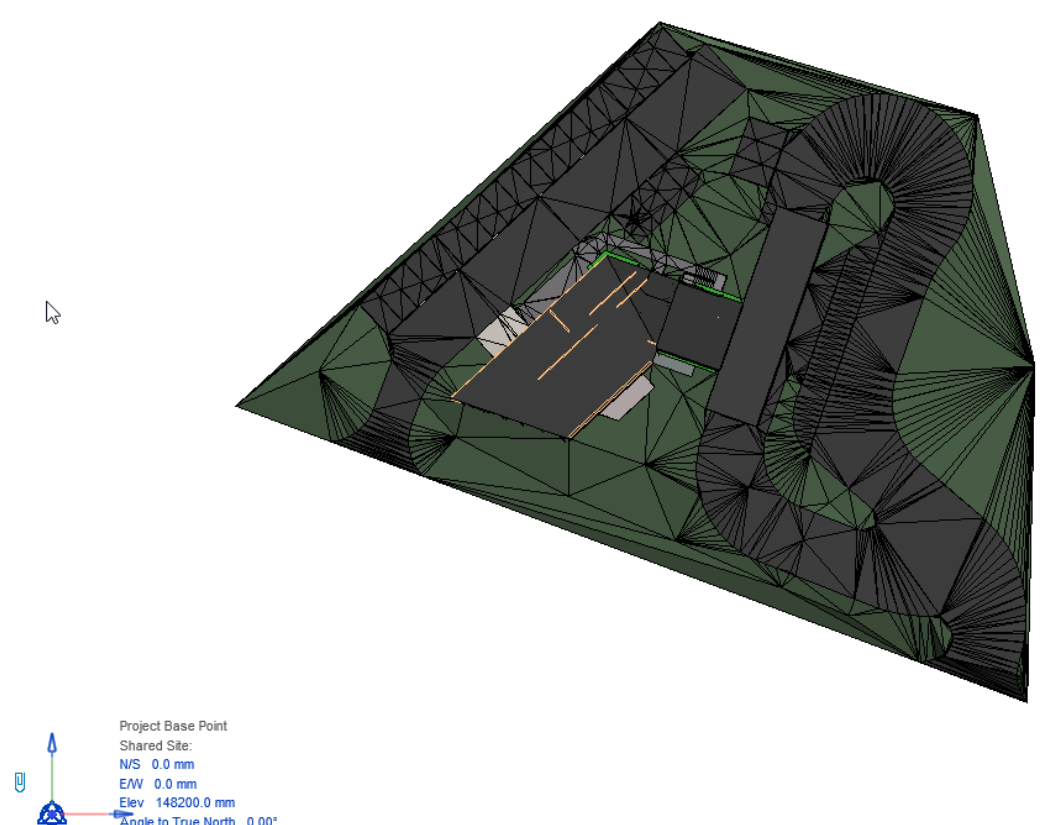
place family is not cutting host. Walls : Basic Wall : Muro di base:Generico - 40 cm:133292 : id 232293 IfcOpeningElements : Opening 258484 : Opening 258484 : id 232309 Instance of in-place family is not cutting host. Walls : Basic Wall : Muro di base:Generico - 40 cm:133292 : id 232339 IfcOpeningElements : Opening 258730 : Opening 258730 : id 232355 Instance of in-place family is not cutting host. Walls : Basic Wall : Muro di base:Generico - 40 cm:133292 : id 232339 IfcOpeningElements : Opening 258752 : Opening 258752 : id 232369 Instance of in-place family is not cutting host. Walls : Basic Wall : Muro di base:Generico - 40 cm:133292 : id 232339 IfcOpeningElements : Opening 258774 : Opening 258774 : id 232383 Instance of in-place family is not cutting host. Walls : Basic Wall : Muro di base:Generico - 40 cm:133292 : id 232339 IfcOpeningElements : Opening 258796 : Opening 258796 : id 232397 Instance of in-place family is not cutting host. Walls : Basic Wall : Muro di base:Generico - 40 cm:133292 : id 232454 IfcOpeningElements : Opening 260366 : Opening 260366 : id 232470 Instance of in-place family is not cutting host. Walls : Basic Wall : Muro di base:Generico - 40 cm:133292 : id 232516 IfcOpeningElements : Opening 260811 : Opening 260811 : id 232534 Instance of in-place family is not cutting host. Walls : Basic Wall : Muro di base:Generico - 40 cm:133292 : id 232549 IfcOpeningElements : Opening 260961 : Opening 260961 : id 232579 Can't keep elements joined. Walls : Basic Wall : Muro di base:Strutturale - 35 cm:425707 : id 232580 Void Extrusion : id 232663 IfcOpeningElements : Opening 271716 : Opening 271716 : id 232670 The following problems were encountered in the IFC file: There were 1 errors and 0 warnings encountered while reading the IFC file. Please look at D:\GeoBIMBenchmark\Savigliano\Savigliano.ifc.log for more information. Highlighted floors overlap. Floors : Floor : Pavimento:Pavimento - 36 cm : id 233753 Floors : Floor : Pavimento:Calcestruzzo da 300 mm : id 236886 Highlighted floors overlap. Floors : Floor : Pavimento:Pavimento - 36 cm : id 234222 Floors : Floor : Pavimento:Balconi : id 234264 Highlighted floors overlap. Floors : Floor : Pavimento:Pavimento - 36 cm : id 234222 Floors : Floor : Pavimento:Marmetta balconi - 3 cm : id 238579 Highlighted floors overlap. Floors : Floor : Pavimento:Pavimento - 36 cm : id 235652 Floors : Floor : Piattaforma:Magrone : id 240014 Highlighted floors overlap. Floors : Floor : Pavimento:Pavimento - 36 cm : id 236834 Floors : Floor : Piattaforma:Magrone : id 240029 Highlighted walls overlap. One of them may be ignored when Revit finds room boundaries. Use Cut Geometry to embed one wall within the other. Walls : Basic Wall : Muro di base:Strutturale - 35 cm:425707 : id 226945 Walls : Basic Wall : Muro di base:Generico - 10 cm:298586 : id 233252 Highlighted walls overlap. One of them may be ignored when Revit finds room boundaries. Use Cut Geometry to embed one wall within the other. Walls : Basic Wall : Muro di base:Strutturale - 20 cm:301367 : id 228258 Walls : Basic Wall : Muro di base:Strutturale - 20 cm:301367 : id 233602 Highlighted walls overlap. One of them may be ignored when Revit finds room boundaries. Use Cut Geometry to embed one wall within the other. Walls : Basic Wall : Muro di base:Strutturale - 20 cm:301367 : id 228281 Walls : Basic Wall : Muro di base:Strutturale - 20 cm:301367 : id 233545 Highlighted walls overlap. One of them may be ignored when Revit finds room boundaries. Use Cut Geometry to embed one wall within the other. Walls : Basic Wall : Muro di base:Generico - 20 cm:2340 : id 228304 Walls : Basic Wall : Muro di base:Generico - 20 cm:2340 : id 233532 Highlighted walls overlap. One of them may be ignored when Revit finds room boundaries. Use Cut Geometry to embed one wall within the other. Walls : Basic Wall : Muro di base:Strutturale - 20 cm:301367 : id 230229 Walls : Basic Wall : Muro di base:Strutturale - 20 cm:301367 : id 233601 Highlighted walls overlap. One of them may be ignored when Revit finds room boundaries. Use Cut Geometry to embed one wall within the other. Walls : Basic Wall : Muro di base:Strutturale - 20 cm:301367 : id 233544 Walls : Basic Wall : Muro di base:Strutturale - 20 cm:301367 : id 234424 Highlighted walls overlap. One of them may be ignored when Revit finds room boundaries. Use Cut Geometry to embed one wall within the other. Walls : Basic Wall : Muro di base:Strutturale - 20 cm:301367 : id 233546 Walls : Basic Wall : Muro di base:Strutturale - 20 cm:301367 : id 234436 Insert conflicts with joined Wall. IfcOpeningElements : Opening : Opening : id 226979 Walls : Basic Wall : Muro di base:Generico - 10 cm:298586 : id 233246 Insert conflicts with joined Wall. IfcOpeningElements : Opening 246895 : Opening 246895 : id 228043 Walls : Basic


| | | |
|---|--|---|
| | <p>Wall : Muro di base:Generico - 10 cm:298586 : id 235847 Insert conflicts with joined Wall. IfcOpeningElements : Opening 246895 : Opening 246895 : id 228043 Walls : Basic Wall : Muro di base:Generico - 10 cm:298586 : id 235848 Insert conflicts with joined Wall. IfcOpeningElements : Opening 66743 : Opening 66743 : id 228473 Walls : Basic Wall : Muro di base:Generico - 10 cm:298586 : id 233970 Insert conflicts with joined Wall. IfcOpeningElements : Opening 272600 : Opening 272600 : id 229205 Walls : Basic Wall : Muro di base:Strutturale - 35 cm:425707 : id 236829 Insert conflicts with joined Wall. Walls : Basic Wall : Muro di base:Generico - 10 cm:298586 : id 233944 Doors : 80 x 210 cm 65949 : 80 x 210 cm 65949 - Mark 64 : id 233951 Insert conflicts with joined Wall. Walls : Basic Wall : Muro di base:Generico - 10 cm:298586 : id 235738 Doors : 80 x 210 cm 238431 : 80 x 210 cm 238431 - Mark 196 : id 235744 Insert conflicts with joined Wall. Walls : Basic Wall : Muro di base:Generico - 10 cm:298586 : id 235817 Doors : 80 x 210 cm 65949 : 80 x 210 cm 65949 - Mark 208 : id 235824 Insert conflicts with joined Wall. Walls : Basic Wall : Muro di base:Generico - 10 cm:298586 : id 236036 Doors : 80 x 210 cm 238431 : 80 x 210 cm 238431 - Mark 226 : id 236042 Insert conflicts with joined Wall. Walls : Basic Wall : Muro di base:Generico - 10 cm:298586 : id 236105 Doors : 80 x 210 cm 65949 : 80 x 210 cm 65949 - Mark 238 : id 236112 Insert conflicts with joined Wall. Walls : Basic Wall : Muro di base:Generico - 10 cm:298586 : id 236362 Doors : 80 x 210 cm 238431 : 80 x 210 cm 238431 - Mark 255 : id 236368 Insert conflicts with joined Wall. Walls : Basic Wall : Muro di base:Generico - 10 cm:298586 : id 236491 Doors : 80 x 210 cm 65949 : 80 x 210 cm 65949 - Mark 267 : id 236498 Insert conflicts with joined Wall. Walls : Basic Wall : Muro di base:Generico - 10 cm:298586 : id 236750 Doors : 80 x 210 cm 238431 : 80 x 210 cm 238431 - Mark 285 : id 236756</p> | |
| | 39) Attach screenshots regarding the eventually reported errors. | |
| Georeferencing | 40.1) Are the world (projected) coordinates taken into account when locating the model in the software's coordinate reference system? | No |
| | 40.1.1) Where is the origin of the model coordinate reference system as imported in the software? | N: 0; E:0; Elev:0; Angle to True North:0; |
| | 40.1.2) Attach screenshots |  <p>Project Base Point Shared Site: N/S 0.0000 m E/W 0.0000 m Elev 0.0000 m Angle to True North 0.00°</p> |
| 40.1.3) What is the coordinate reference system and projection and what unit of measure is used for the representation? | no CRS specified; unit: meters | |
| Height | 41.1) Are the "real-world" elevation values (heights) considered when locating the model in the software (z)? | No |
| | 41.1.1) What is the elevation value of the origin of the model coordinate reference system as imported in the software? | 0 m |
| | 41.1.3) What is the height reference system? | no reference system specified |
| Orientati | 42.1) Is the model oriented correctly with respect to the true North? | No |

| | | |
|-----------------|---|--|
| | 42.1.1) How is the model oriented, with respect to the reference direction? | no orientation; angle to true north 0.0° |
| | Other | correct dimensions but sections at different heights. (e.g at 12.17 m instead of 12 m) |
| IFC definitions | 44.1) Is the eventual translation consistent with the IFC definitions? | No |
| | 44.1.1) What changes / inconsistencies / errors / other issues were noted? | element not imported |
| Attribute | 45.1) Are the hierarchical relationships consistent with the IFC hierarchy? | Yes |
| Attributes | 46.1) Are the attributes present in the IFC entities retained and consistent? | No |
| | 46.1.1) What changes / inconsistencies / errors / other issues were noted? | window not imported |
| Relationship | 47.1) Are the relationships between the objects retained? | The software does not have the necessary tools to determine this information |
| Geometry | 48.1) Is geometry read correctly? | No |
| | 48.1.1) What changes / inconsistencies / errors / other issues were noted? | elements missing and some are broken |
| Normals | 49.1) Did the normals change? | The software does not have the necessary tools for checking it |
| 2D | 50.1) Is it possible to view the model in 3D? | Yes |
| Export | You arrived at the end of the phase 1: "Import and manage the file in the software".Now choose: | The software has also export abilities to IFC |
| | 55) How long does it take for the data to be exported to IFC? | it crashes without completing the operation |

Autodesk Revit 2019.2

| | | | | | | | |
|----------------------------|--|---|------------------------------|--|---------------------------|------------------------------|-----------------------|
| Software | Software Name [version] | Autodesk Revit 2019.2 [19.2.1.1] | | Software house | Autodesk | | |
| | Proprietary or open source software? | | | Kind of software | | | |
| | proprietary | | | BIM | | | |
| Computer | Model and year | Operating system | CPU | GPU | Memory (RAM) | Hard drive capacity | Hard drive free space |
| | LENOVO T480s, 2018 | Windows 10 Enterprise | Intel Core i5-8250U | Intel UHD Graphics 620 | 8 | 475 | 207 |
| Certification | IFC import certification status | Import certification date | Import certification program | IFC export certification status | Export certification date | Export certification program | |
| | certified in (date) | 2015-07-24 | buildingSMART | certified in (date) | 2013-04-16 | buildingSMART | |
| Test with Myran.ifc | | | | | | | |
| Performance | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | | | 1-5 minutes | | | |
| | How long does it take, approximately, to:Zoom into the model to see more detail | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Pan the model | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Rotate the model | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Query an object | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Inspect the objects linked to the queried one through a relationship | | | the software does not allow this | | | |
| | Please report on any errors the software gives when importing the file. | | | 76 errors, diverse errors regarding "Can't make cut out", "Can't keep elements joined.", ... | | | |
| Georeferencing | 2.1) Are the world (projected) coordinates taken into account when locating the model in the software's coordinate reference system? | | | No | | | |
| Georeferencing | 2.1.1) Where is the origin of the model coordinate reference system as imported in the software? | | | 0 / 0 | | | |

| | | |
|------------------------|---|---|
| | <p>2.1.2) Attach screenshots</p> |  |
| | <p>2.1.3) What is the coordinate reference system and projection and what unit of measure is used for the representation?</p> | <p>no crs specified, unit: mm</p> |
| <p>Height</p> | <p>3.1) Are the "real-world" elevation values (heights) considered when locating the model in the software (z)?</p> | <p>Yes</p> |
| <p>Orientation</p> | <p>4.1) Is the model oriented correctly with respect to the true North?</p> | <p>No</p> |
| | <p>4.1.1) How is the model oriented, with respect to the reference direction?</p> | <p>0.00°</p> |
| <p>Proportions</p> | <p>5.1) Does the model maintain its correct dimensions and proportions?</p> | <p>Yes</p> |
| | <p>5.2) short comments to the previous question (optional)</p> | <p>Section B is not clearly measurable because the roof is sloped.</p> |
| <p>IFC definitions</p> | <p>6.1) Is the eventual translation consistent with the IFC definitions?</p> | <p>Yes</p> |
| <p>Hierarchy</p> | <p>7.1) Are the hierarchical relationships consistent with the IFC hierarchy?</p> | <p>The software does not have the necessary tools to determine this information</p> |
| <p>Attributes</p> | <p>8.1) Are the attributes present in the IFC entities retained and consistent?</p> | <p>No</p> |
| | <p>8.1.1) What changes / inconsistencies / errors / other issues were noted?</p> | <p>No Plate specified, only the complete glass wall</p> |

| | | |
|-----------|--|---|
| | 8.1.2) Attach screenshots |  |
| Relations | 9.1) Are the relationships between the objects retained? | Yes |
| | 9.2) short comments to the previous question (optional) | I think ye, but it is hard to figure out |
| Geometry | 10.1) Is geometry read correctly? | Yes |
| | 10.2) short comments to the previous question (optional) | Not always |
| Normals | 11.1) Did the normals change? | The software does not have the necessary tools for checking it |
| 2D/3D | 12.1) Is it possible to view the model in 3D? | Yes |
| | 13.1) Is it possible to view the model in 2D? | Yes |
| Editing | 14.1) Is it possible to edit the model (attributes, geometry, other)? | Yes |
| | 14.1.1) What editing is possible (attributes, geometry, georeferencing, please add details)? | Revit attributes, also IFC parameters if applicable (also IfcGUID), Geometry is full editable |
| Querying | 15.1) Is it possible to query the model and the attributes? | Yes |
| | 15.1.1) What kinds of query are possible? | Category filter for elements, no direct query (select....) |
| Analysis | 16.1) Is it possible to analyse the objects and the model? | Yes, analysis about the model validity and features (geometry, semantics, schema validity...) are possible (type 1) |
| | 16.1.1) What analysis are possible? Do you know if the results are reliable? | Geometry / topology check at import, no semantic check |
| | 16.1.3) Time required to perform the analysis about the model itself (type 1) | No analysis of type 1 are possible |

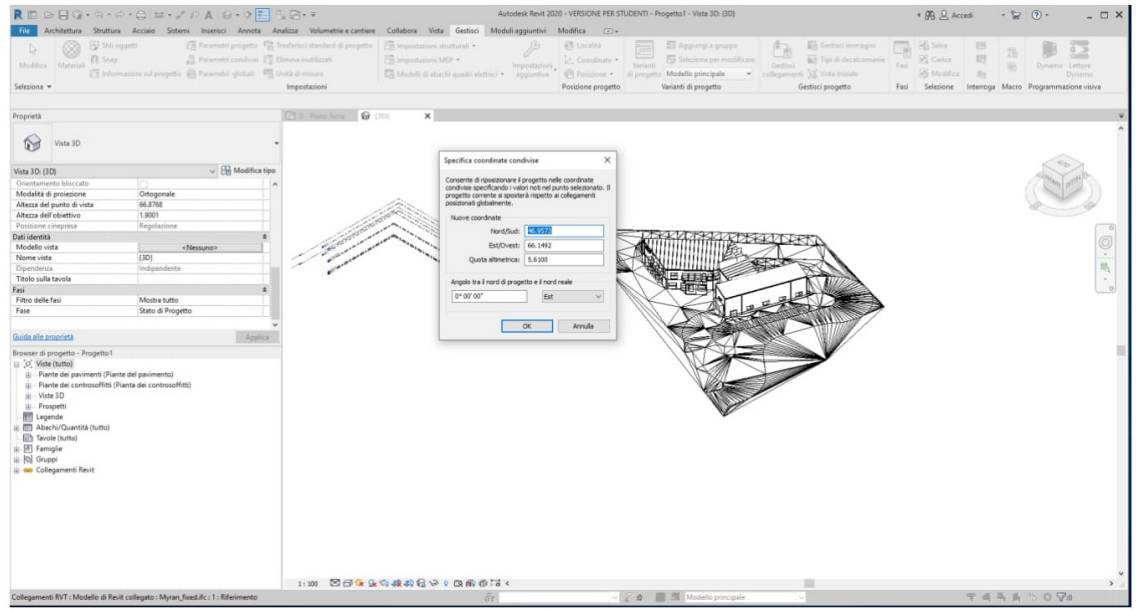
| | | |
|---------------------------------|---|--|
| | 16.1.3) Time required to perform the analysis about the model performances (type2) | No analysis of type 2 are possible |
| | 16.2) short comments to the previous question (optional) | Type 1: only implicit at import / Type 2: no experience |
| Export | You arrived at the end of the phase 1: "Import and manage the file in the software".Now choose: | The software has also export abilities to IFC |
| | 17.1) Are any pre-processing or setting changes needed in the software to enable a consistent export? | No |
| | 18.1) Is it possible to choose the IFC model view definition (MVD) to be used when exporting the data? | Yes |
| | 18.1.1) Which ones are available? | IFC2x3 Coordination View 2.0 IFC4 Reference View IFC4 Design Transfer View IFC2x3 Coordination View IFC2x3 GSA Concept Design BIM 2010 IFC2x3 Basic FM Handover View IFC2x2 Coordination View IFC2x2 Singapore BCA e-Plan View IFC2x3 COBie 2.4 Design Deliverable |
| | 18.1.2) Is it possible to add a customised MVD to be used for exporting IFC? | No |
| | 18.2) short comments to the previous question (optional) | Only IFC configuration json (regarding IFC Export for Revit) |
| | 19) How long does it take for the data to be exported to IFC? | it's almost immediate |
| Test with UpTown.ifc | | |
| | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | The software was not able to import it, even without crushing |
| Test with Savigliano.ifc | | |
| Performance | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | 1-5 minutes |
| | How long does it take, approximately, to:Zoom into the model to see more detail | it's almost immediate |
| | How long does it take, approximately, to:Pan the model | it's almost immediate |
| | How long does it take, approximately, to:Rotate the model | it's almost immediate |
| | How long does it take, approximately, to:Query an object | it's almost immediate |
| | How long does it take, approximately, to:Inspect the objects linked to the queried one through a relationship | the software does not allow this |
| | 38) Please report on any errors the software gives when importing the file. | 46 errors, 65 warnings |
| Georeferencing | 40.1) Are the world (projected) coordinates taken into account when locating the model in the software's coordinate reference system? | No |
| | 40.1.1) Where is the origin of the model coordinate reference system as imported in the software? | 0 / 0 |
| | 40.1.3) What is the coordinate reference system and projection and what unit of measure is used for the representation? | no crs, unit: m |

| | | |
|-----------------|---|---|
| Height | 41.1) Are the "real-world" elevation values (heights) considered when locating the model in the software (z)? | No |
| | 41.1.1) What is the elevation value of the origin of the model coordinate reference system as imported in the software? | 0 |
| | 41.1.3) What is the height reference system? | no system |
| Orientation | 42.1) Is the model oriented correctly with respect to the true North? | No |
| | 42.1.1) How is the model oriented, with respect to the reference direction? | 0.00° |
| Proportions | 43.1) Does the model maintain its correct dimensions and proportions? | Yes |
| | 43.2) short comments to the previous question (optional) | but some measure differ in a few cm (maybe because its hard to find the same points to measure out of the sketch) |
| IFC definitions | 44.1) Is the eventual translation consistent with the IFC definitions? | No |
| | 44.1.1) What changes / inconsistencies / errors / other issues were noted? | Building element was not imported |
| Hierarchy | 45.1) Are the hierarchical relationships consistent with the IFC hierarchy? | The software does not have the necessary tools to determine this information |
| Relationships | 47.1) Are the relationships between the objects retained? | The software does not have the necessary tools to determine this information |
| Geometry | 48.1) Is geometry read correctly? | No |
| | 48.1.1) What changes / inconsistencies / errors / other issues were noted? | Many elements are missing. Some elements are broken regarding their storey |
| Normals | 49.1) Did the normals change? | The software does not have the necessary tools for checking it |
| 2D/3D | 50.1) Is it possible to view the model in 3D? | Yes |
| | 51.1) Is it possible to view the model in 2D? | Yes |
| Export | You arrived at the end of the phase 1: "Import and manage the file in the software".Now choose: | The software has also export abilities to IFC |
| | 55) How long does it take for the data to be exported to IFC? | it's almost immediate |

Autodesk Revit 2020

| | | | | | | | |
|----------------------------|--|---|---|---|---------------------------|------------------------------|-----------------------|
| Software | Software Name [version] | Autodesk Revit 2020 [Educational 2020] | | Software house | Autodesk | | |
| | Proprietary or open source software? | | | Kind of software | | | |
| | Proprietary | | | BIM | | | |
| Computer | Model and year | Operating system | CPU | GPU | Memory (RAM) | Hard drive capacity | Hard drive free space |
| | Assembled (Motherboard TUF Z390-PRO GAMING) | Windows 10 Pro version 1809 | Intel (R) Core (TH) i7-9700K CPU @3.60GHz 3.60GHz | Nvidia Geforce GTX 1660Ti | 64 GB | 465 GB + 3630 GB | 353 GB + 77.9 GB |
| Certification | IFC import certification status | Import certification date | Import certification program | IFC export certification status | Export certification date | Export certification program | |
| | not certified | | | not certified | | | |
| Test with Myran.ifc | | | | | | | |
| Performance | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | | | less than a minute | | | |
| | How long does it take, approximately, to:Zoom into the model to see more detail | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Pan the model | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Rotate the model | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Query an object | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Inspect the objects linked to the queried one through a relationship | | | less than a minute | | | |
| | Please report on any errors the software gives when importing the file. | | | no error | | | |
| Georeferencing | 2.1) Are the world (projected) coordinates taken into account when locating the model in the software's coordinate reference system? | | | No | | | |
| | 2.1.1) Where is the origin of the model coordinate reference system as imported in the software? | | | The IFC lost the coordinate reference system, so I can't get the origin. I can decide the new origin as I want. | | | |

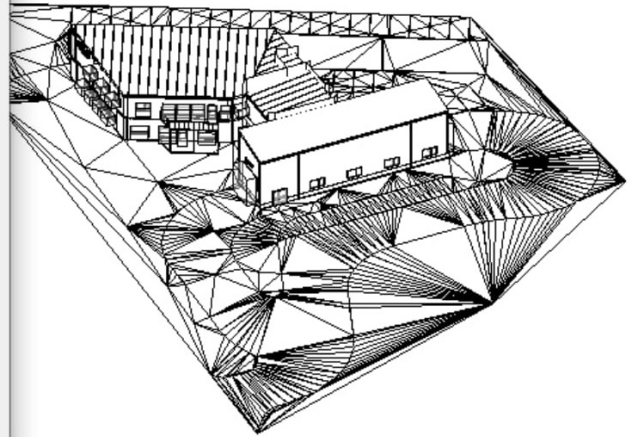
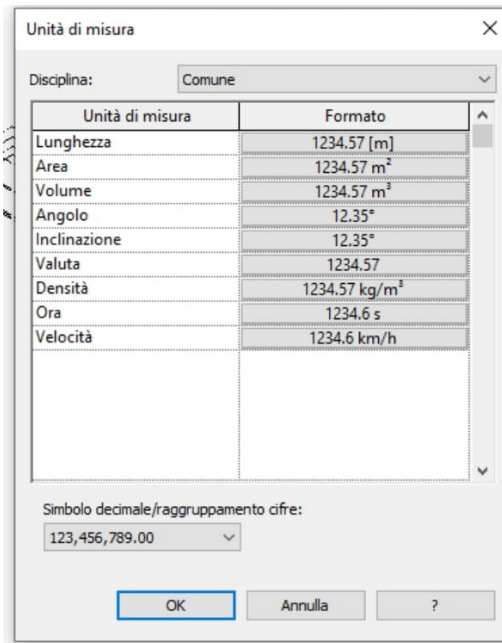
2.1.2) Attach screenshots



2.1.3) What is the coordinate reference system and what unit of measure is used for the representation?

CRS: geographic, UoM: meters

2.1.4) Attach screenshots



2.2) short comments to the previous question (optional)

no comments

Height

3.1) Are the "real-world" elevation values (heights) considered when locating the model in the software (z)?

Yes

3.2) short comments to the previous question (optional)

no comments.

Orientatio
n

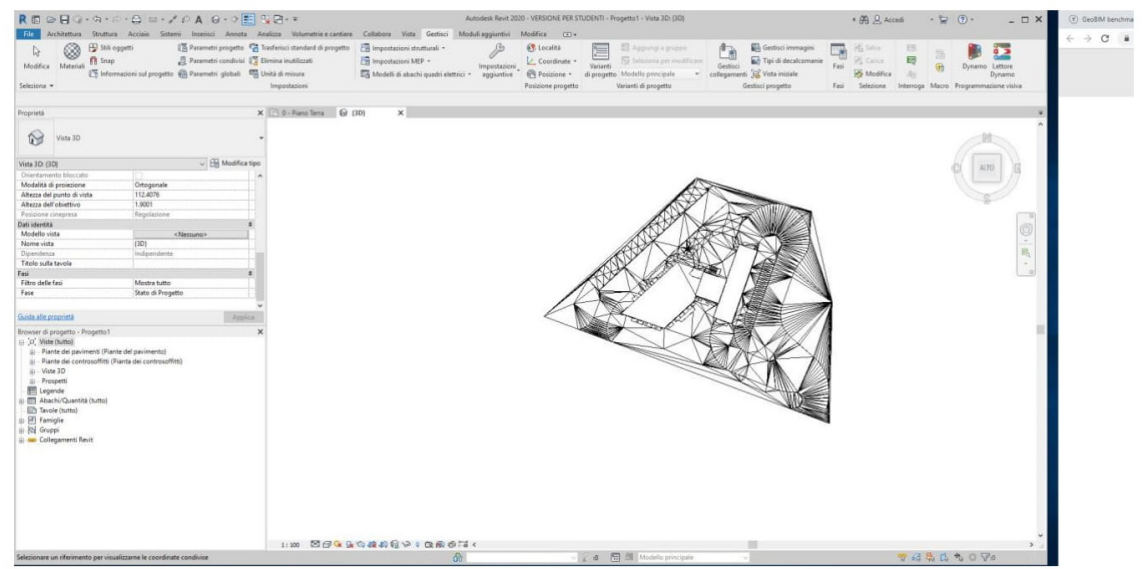
4.1) Is the model oriented correctly with respect to the true North?

No

4.1.1) How is the model oriented, with respect to the reference direction?

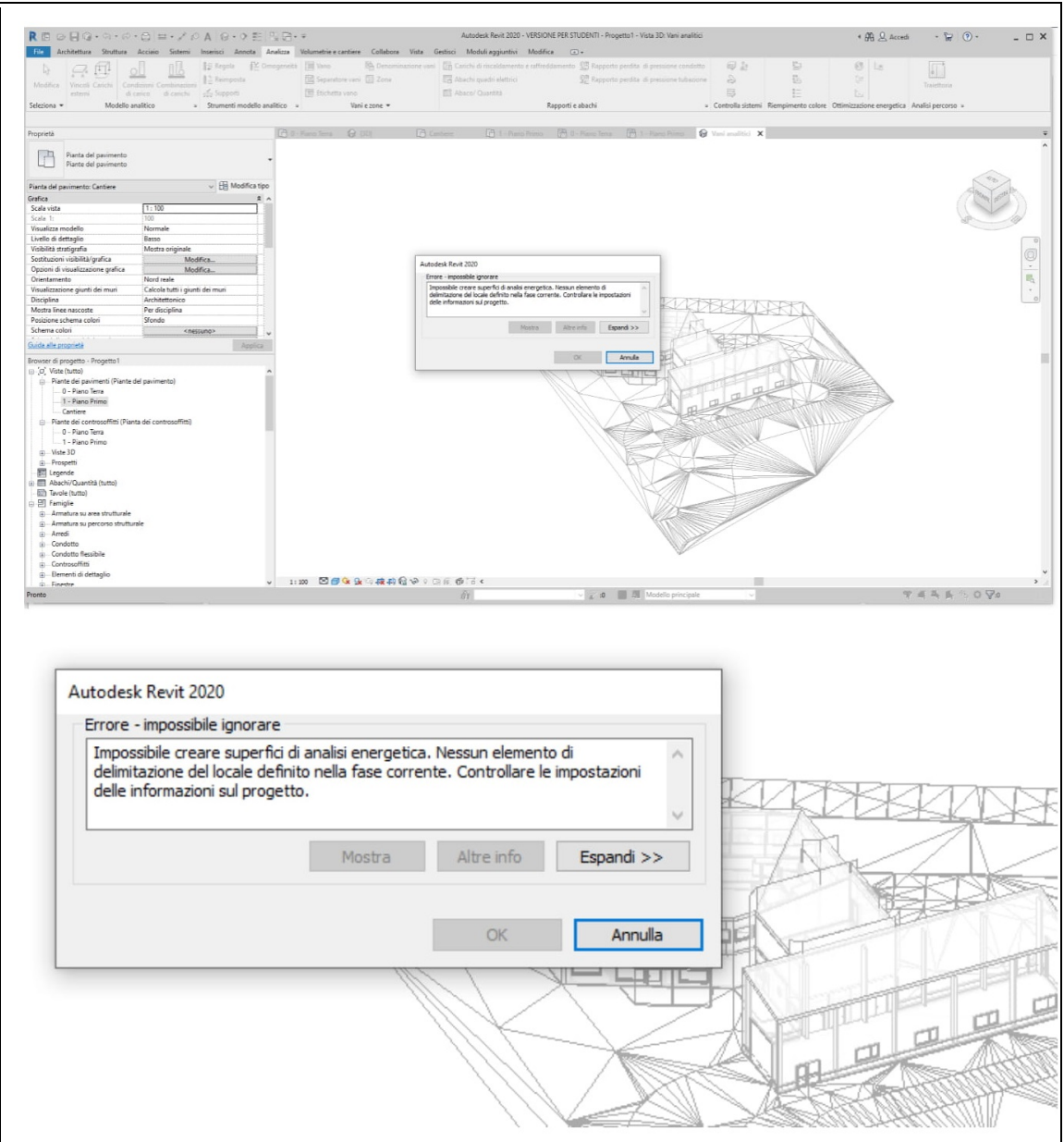
The model is oriented.

4.1.2) Attach screenshots



| | | |
|-------------|--|---|
| | 4.2) short comments to the previous question (optional) | no comments |
| Proportions | 5.1) Does the model maintain its correct dimensions and proportions? | Yes |
| | 5.2) short comments to the previous question (optional) | no comments |
| Geometries | 10.1) Is geometry read correctly? | Yes |
| | 10.2) short comments to the previous question (optional) | no comments. |
| Normals | 11.1) Did the normals change? | Yes |
| | 11.2) short comments to the previous question (optional) | no comments. |
| 2D/3D | 12.1) Is it possible to view the model in 3D? | Yes |
| | 12.2) short comments to the previous question (optional) | no comments. |
| | 13.1) Is it possible to view the model in 2D? | Yes |
| | 13.2) short comments to the previous question (optional) | no comments. |
| Editing | 14.1) Is it possible to edit the model (attributes, geometry, other)? | No |
| | 14.2) short comments to the previous question (optional) | The software doesn't allow me to edit the features. |
| Querying | 15.1) Is it possible to query the model and the attributes? | No |
| | 15.2) short comments to the previous question (optional) | no comments. |
| Analyses | 16.1) Is it possible to analyse the objects and the model? | No |
| | 16.1.1) What analysis are possible? Do you know if the results are reliable? | Revit Educational 2020 allows energetic, structural analyses but they don't work with Myran IFC file. |

16.1.2) Attach screenshots



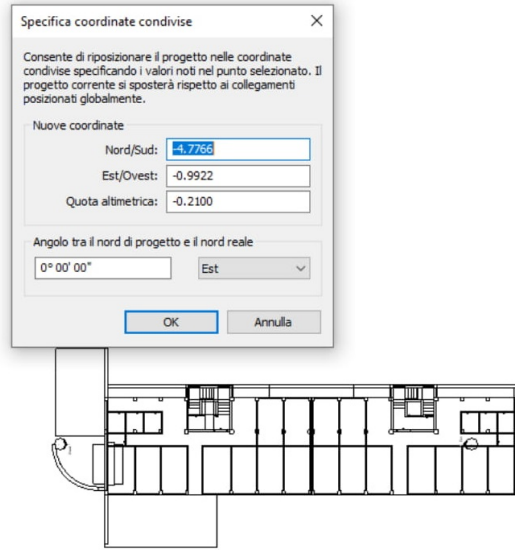
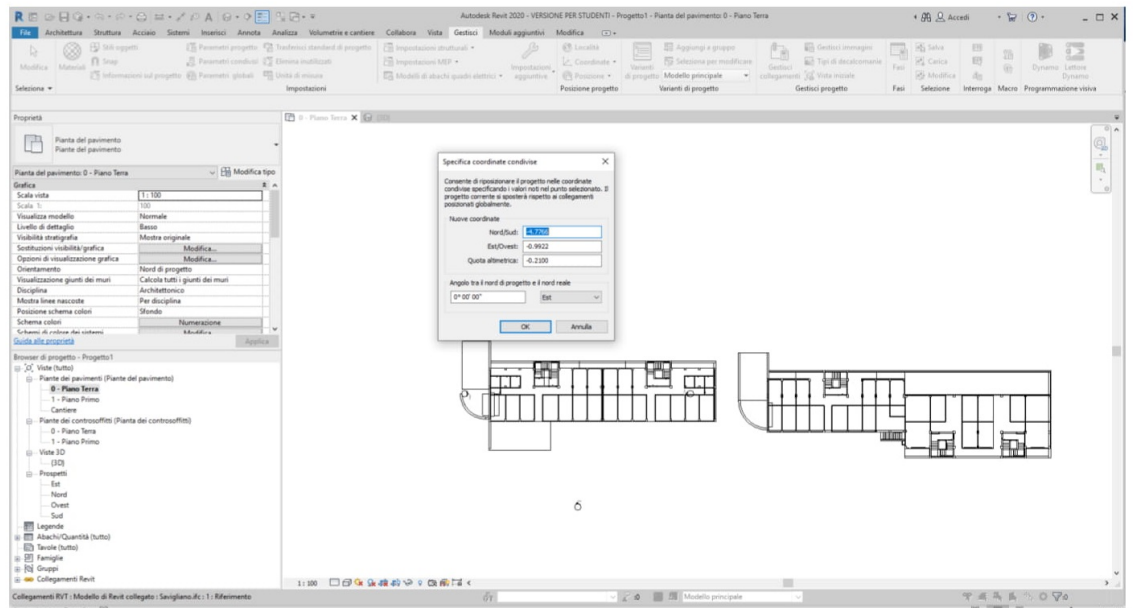
| | | |
|--------|--|---|
| | 16.1.3) Time required to perform the analysis about the model itself (type 1) | No analysis of type 1 are possible |
| | 16.1.3) Time required to perform the analysis about the model performances (type2) | No analysis of type 2 are possible |
| | 16.2) short comments to the previous question (optional) | no comments |
| Export | You arrived at the end of the phase 1: "Import and manage the file in the software".Now choose: | The software has also export abilities to IFC |
| | 17.1) Are any pre-processing or setting changes needed in the software to enable a consistent export? | No |
| | 17.2) short comments to the previous question (optional) | no comments. |
| | 18.1) Is it possible to choose the IFC model view definition (MVD) to be used when exporting the data? | No |
| | 18.2) short comments to the previous question (optional) | It doesn't appear in the scroll list. |

| | | |
|---------------------------------|---|--|
| | 19) How long does it take for the data to be exported to IFC? | it's almost immediate |
| Test with UpTown.ifc | | |
| Performance | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | 20 minutes-1 hour |
| | How long does it take, approximately, to:Zoom into the model to see more detail | it's almost immediate |
| | How long does it take, approximately, to:Pan the model | it's almost immediate |
| | How long does it take, approximately, to:Rotate the model | it's almost immediate |
| | How long does it take, approximately, to:Query an object | it's almost immediate |
| | How long does it take, approximately, to:Inspect the objects linked to the queried one (Element 3) through a relationship | it's almost immediate |
| | Please report on any errors the software gives when importing the file. | no errors. |
| Proportions | 24.1) Does the model maintain its correct dimensions and proportions? | Yes |
| | 24.2) short comments to the previous question (optional) | no comments |
| | Other | Not all the features of the IFC file could be selectable. |
| | Other | They are not all be readen. |
| Geo metr | 29.1) Is geometry read correctly? | Yes |
| | 29.2) short comments to the previous question (optional) | no comments. |
| Z o | 30.1) Did the normals change? | Yes |
| 2D/3D | 31.1) Is it possible to view the model in 3D? | Yes |
| | 31.2) short comments to the previous question (optional) | no comments. |
| | 32.1) Is it possible to view the model in 2D? | Yes |
| | 32.2) short comments to the previous question (optional) | no comments. |
| Editing | 33.1) Is it possible to edit the model (attributes, geometry, other)? | No |
| | 33.2) short comments to the previous question (optional) | The software doesn't allow me to edit the features. |
| Quer ying | 34.1) Is it possible to query the model and the attributes? | No |
| | 34.2) short comments to the previous question (optional) | no comments. |
| Analysi s | 35.1) Is it possible to analyse the objects and the model? | No |
| | 35.2) short comments to the previous question (optional) | Revit Educational 2020 allows energetic, structural analyses but they don't work with UpTown IFC file. |
| Export | You arrived at the end of the phase 1: "Import and manage the file in the software".Now choose: | The software has also export abilities to IFC |
| | 36) How long does it take for the data to be exported to IFC? | it's almost immediate |
| Test with Savigliano.ifc | | |
| Performance | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | less than a minute |
| | How long does it take, approximately, to:Zoom into the model to see more detail | it's almost immediate |
| | How long does it take, approximately, to:Pan the model | it's almost immediate |
| | How long does it take, approximately, to:Rotate the model | it's almost immediate |
| | How long does it take, approximately, to:Query an object | it's almost immediate |

| | | |
|--|---|---|
| | How long does it take, approximately, to:Inspect the objects linked to the queried one through a relationship | it's almost immediate |
| | 38) Please report on any errors the software gives when importing the file. | no errors |
| | 39) Attach screenshots regarding the eventually reported errors. | |
| | 40.1) Are the world (projected) coordinates taken into account when locating the model in the software's coordinate reference system? | No |
| | 40.1.1) Where is the origin of the model coordinate reference system as imported in the software? | The IFC lost the coordinate reference system, so I can't get the origin. I can decide the new origin as I want. |

Georeferencing

40.1.2) Attach screenshots



40.1.3) What is the coordinate reference system and projection and what unit of measure is used for the representation?

CRS: geographic, UoM: meters.

Specifica coordinate condivise

Consente di riposizionare il progetto nelle coordinate condivise specificando i valori noti nel punto selezionato. Il progetto corrente si sposterà rispetto ai collegamenti posizionati globalmente.

Nuove coordinate

Nord/Sud:

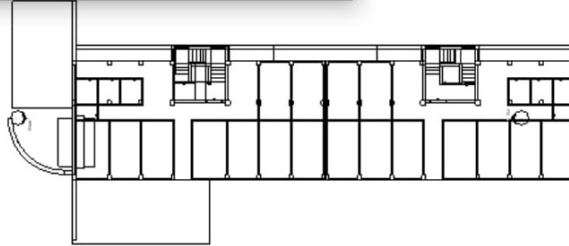
Est/Ovest:

Quota altimetrica:

Angolo tra il nord di progetto e il nord reale

Est

OK Annulla



40.1.4) Attach screenshots

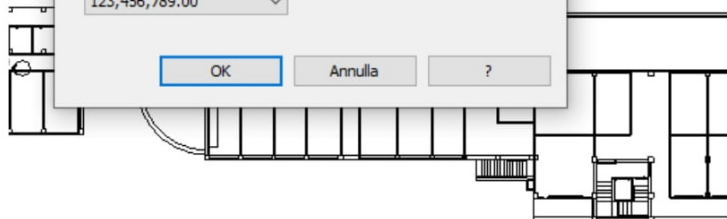
Unità di misura

Disciplina: Comune

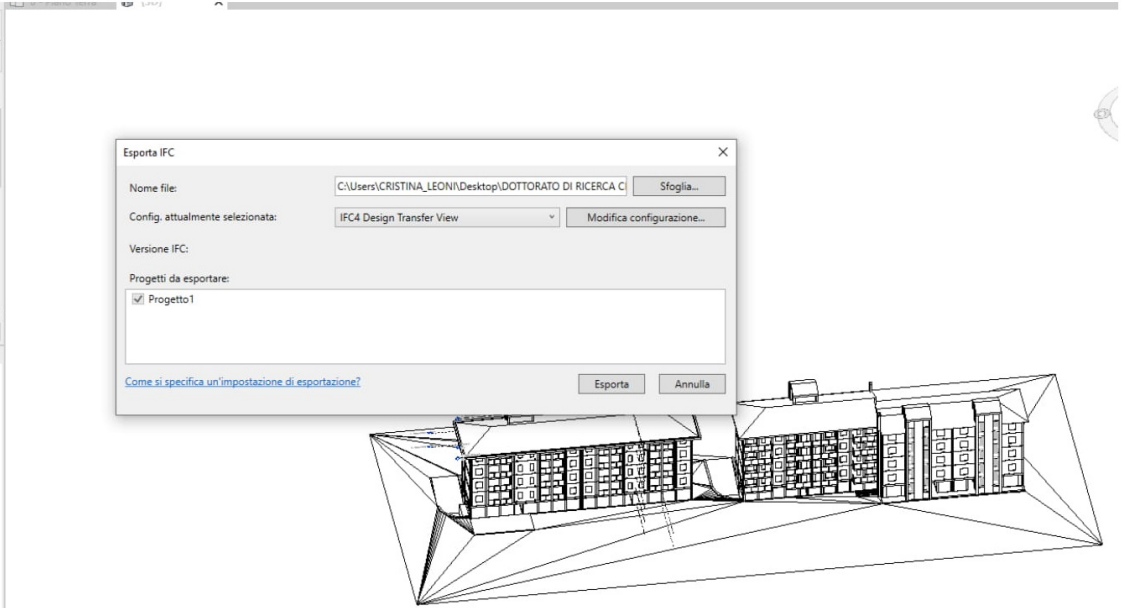
| Unità di misura | Formato |
|-----------------|---------------------------|
| Lunghezza | 1234.57 [m] |
| Area | 1234.57 m ² |
| Volume | 1234.57 m ³ |
| Angolo | 12.35° |
| Inclinazione | 12.35° |
| Valuta | 1234.57 |
| Densità | 1234.57 kg/m ³ |
| Ora | 1234.6 s |
| Velocità | 1234.6 km/h |

Simbolo decimale/raggruppamento cifre:

OK Annulla ?

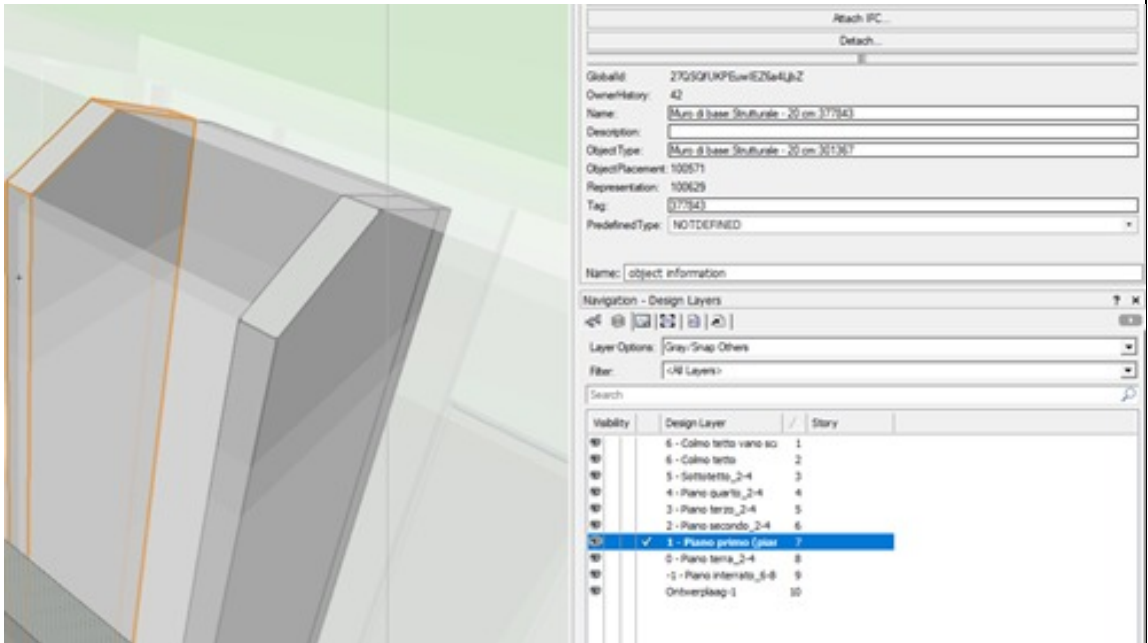


| | | |
|-------------|---|--|
| | 40.2) short comments to the previous question (optional) | no comments. |
| Height | 41.1) Are the "real-world" elevation values (heights) considered when locating the model in the software (z)? | Yes |
| | 41.2) short comments to the previous question (optional) | no comments. |
| | 42.1) Is the model oriented correctly with respect to the true North? | No |
| | 42.1.1) How is the model oriented, with respect to the reference direction? | The model is not oriented as the Uptown and Myran IFC model. |
| Orientation | 42.1.2) Attach screenshots | |
| | 42.2) short comments to the previous question (optional) | no comments. |
| Proportions | 43.1) Does the model maintain its correct dimensions and proportions? | Yes |
| | 43.2) short comments to the previous question (optional) | no comments. |
| | Other | Not all the features of the IFC file could be selectable. |
| | 44.2) short comments to the previous question (optional) | Not all the features of the IFC file could be selectable. |
| | Other | Not all the features of the IFC file could be selectable. |
| | 45.2) short comments to the previous question (optional) | Not all the features of the IFC file could be selectable. |

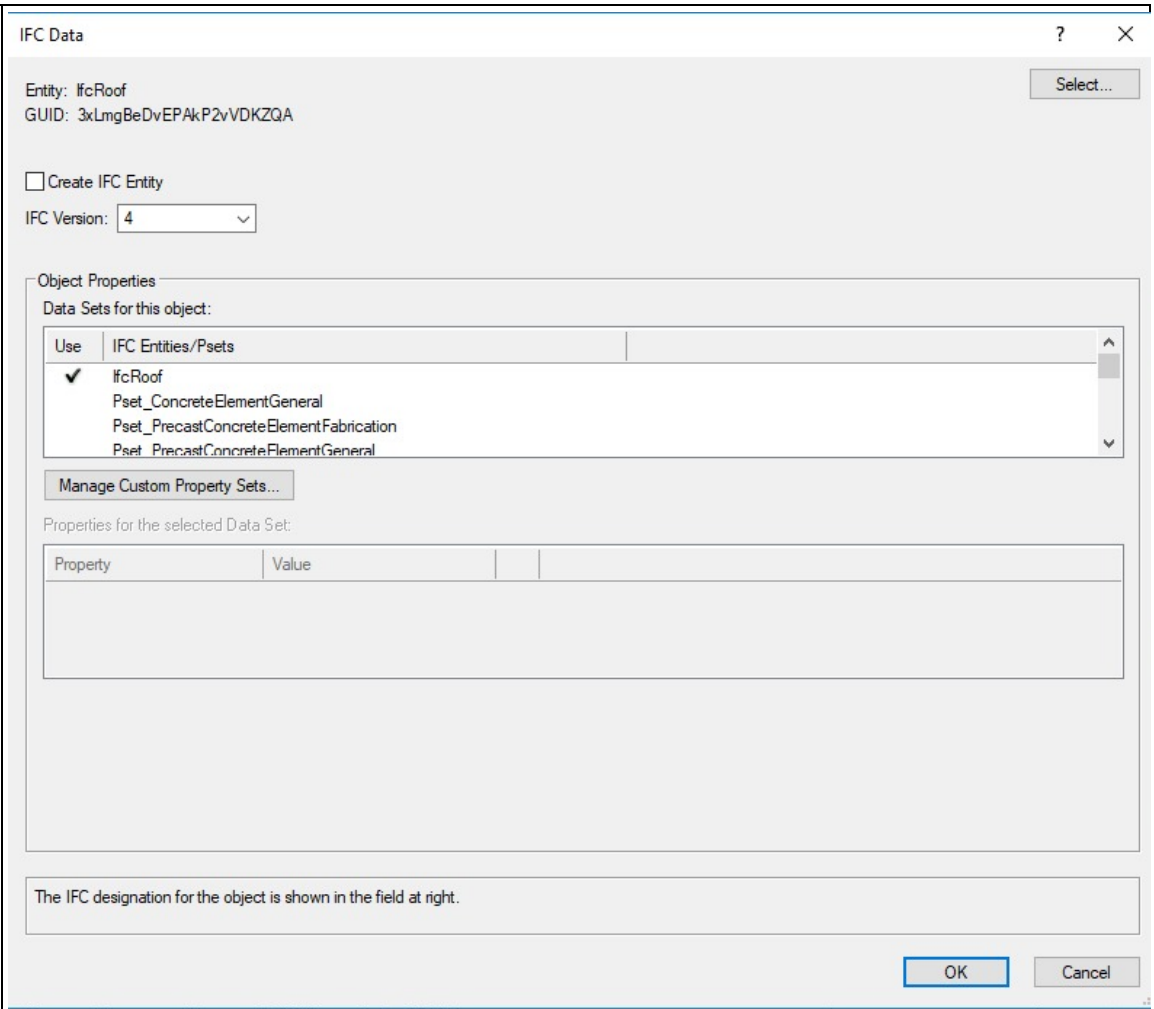
| | | |
|----------|---|---|
| | Other | They are not all be readen. |
| | 46.2) short comments to the previous question (optional) | no other comments. |
| | Other | Not for all objects. |
| | 47.2) short comments to the previous question (optional) | no other comments. |
| Geo metr | 48.1) Is geometry read correctly? | Yes |
| | 48.2) short comments to the previous question (optional) | no comments. |
| Nor mals | 49.1) Did the normals change? | Yes |
| | 49.2) short comments to the previous question (optional) | no comments. |
| 2D/3D | 50.1) Is it possible to view the model in 3D? | Yes |
| | 50.2) short comments to the previous question (optional) | no comments. |
| | 51.1) Is it possible to view the model in 2D? | Yes |
| | 51.2) short comments to the previous question (optional) | no comments. |
| Export | You arrived at the end of the phase 1: "Import and manage the file in the software".Now choose: | The software has also export abilities to IFC |
| | 55) How long does it take for the data to be exported to IFC? | it's almost immediate |
| | 55.1) Comment to the previous question (optional) | no comments. |
| | 55.2) Attach screenshots (optional) |  |

Vectorworks Designer 2019

| | | | | | | | |
|----------------------------|--|---|------------------------------|--|---------------------------|------------------------------|-----------------------|
| Software | Software Name [version] | Vectorworks Designer 2019 [2019 SP2] | | Software house | Software house | | |
| | Proprietary or open source software? | | | Kind of software | | | |
| proprietary | | | BIM | | | | |
| Computer | Model and year | Operating system | CPU | GPU | Memory (RAM) | Hard drive capacity | Hard drive free space |
| | TURBOX 2017 | Windows | Intel i7 | NVIDIA GTX 960 M | 16 GB DDR3 | 500 GB | 216 GB |
| Certification | IFC import certification status | Import certification date | Import certification program | IFC export certification status | Export certification date | Export certification program | |
| | certified in (date) | 2013-11-11 | buildingSMART international | certified in (date) | 2013-11-11 | buildingSMART international | |
| Test with Myran.ifc | | | | | | | |
| Performance | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Zoom into the model to see more detail | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Pan the model | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Rotate the model | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Query an object | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Inspect the objects linked to the queried one through a relationship | | | the software does not allow this | | | |
| Georeferencing | 2.1) Are the world (projected) coordinates taken into account when locating the model in the software's coordinate reference system? | | | Yes | | | |
| | 2.2) short comments to the previous question (optional) | | | Georeferencing tool preserves the origin and orientation of the georeferenced data to match document coordinates | | | |
| | Other | | | Height value is equal to zero, however information about the real-world reference system is not given. Relative elevations are provided for the stories of the building. | | | |
| Orientation | 4.1) Is the model oriented correctly with respect to the true North? | | | Yes | | | |
| | 4.2) short comments to the previous question (optional) | | | if the ifc geometric representation context has been defined, then the model orientation can be changed. | | | |
| Proportions | 5.1) Does the model maintain its correct dimensions and proportions? | | | Yes | | | |
| IFC definitions | 6.1) Is the eventual translation consistent with the IFC definitions? | | | Yes | | | |
| Hierarchy | 7.1) Are the hierarchical relationships consistent with the IFC hierarchy? | | | Yes | | | |

| | | |
|--------------|---|--|
| Attribute | 8.1) Are the attributes present in the IFC entities retained and consistent? | Yes |
| Relationship | 9.1) Are the relationships between the objects retained? | Yes |
| Geometry | 10.1) Is geometry read correctly? | Yes |
| Normal | 11.1) Did the normals change? | The software does not have the necessary tools for checking it |
| 2D/3D | 12.1) Is it possible to view the model in 3D? | Yes |
| D | 13.1) Is it possible to view the model in 2D? | Yes |
| Editing | 14.1) Is it possible to edit the model (attributes, geometry, other)? | Yes |
| | 14.1.1) What editing is possible (attributes, geometry, georeferencing, please add details)? | Attributes, geometry, scale, units and geo referencing |
| | <p>14.1.2) Attach screenshots</p>  | |
| Querying | 15.1) Is it possible to query the model and the attributes? | Yes |
| | 15.1.1) What kinds of query are possible? | Attributes, geometry and entities can be queried. |

15.1.2) Attach screenshots



15.2) short comments to the previous question (optional)

Query tools are present, however query is possible if the project is connected to a database. Object selection and information retrieval is possible.

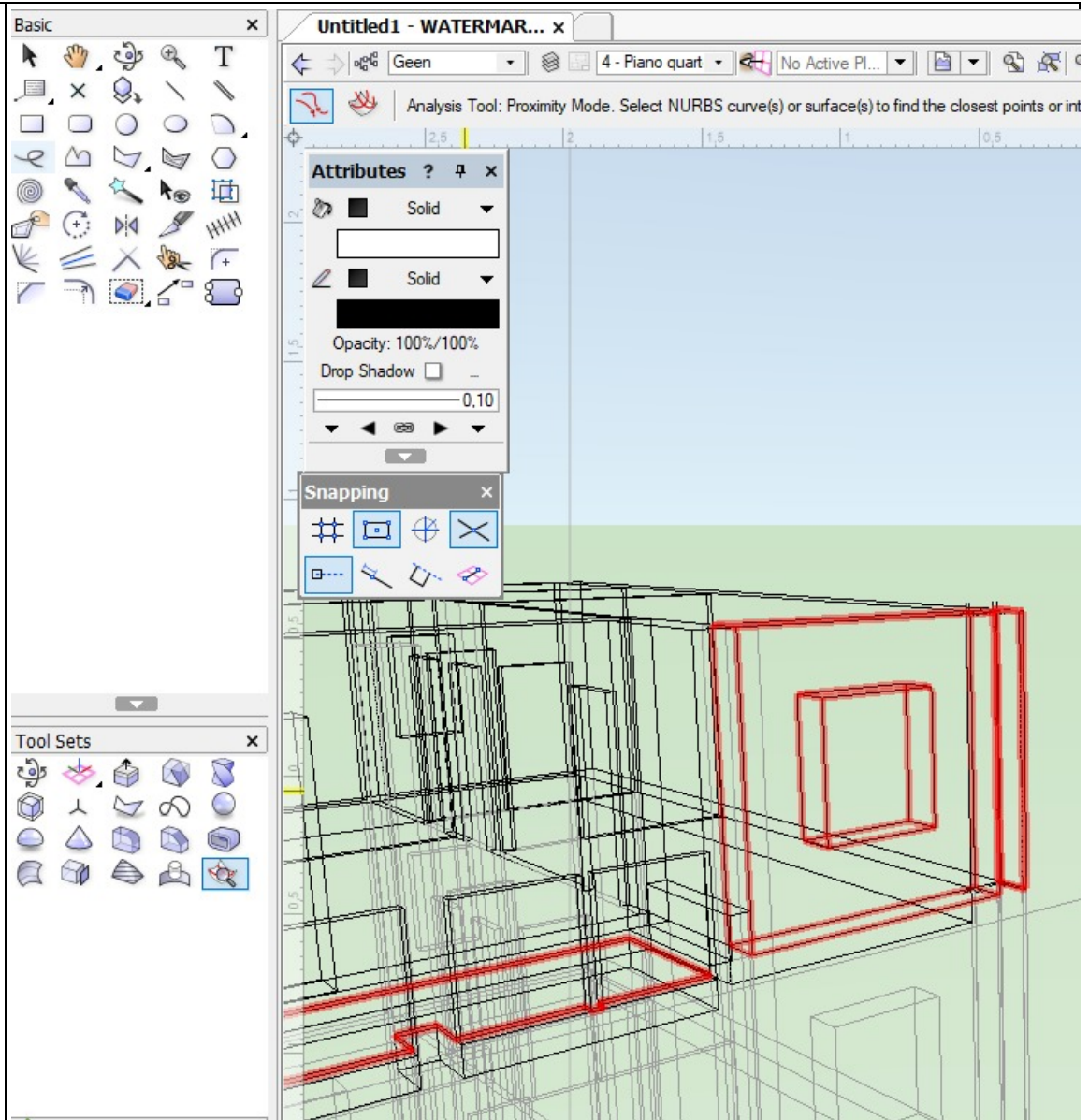
Other

Analysis is possible only for NURBS.(Non Uniform Rational Basis Splines).

16.1.1) What analysis are possible? Do you know if the results are reliable?

Distance and intersection analysis are possible. The model couldn't be converted to NURBS, thus the analysis wasn't performed.

16.1.2) Attach screenshots



16.1.3) Time required to perform the analysis about the model itself (type 1)

it's almost immediate

16.2) short comments to the previous question (optional)

Answer 16.1.3 is not accurate, as analysis couldn't be performed.

Export

You arrived at the end of the phase 1: "Import and manage the file in the software". Now choose:

The software has also export abilities

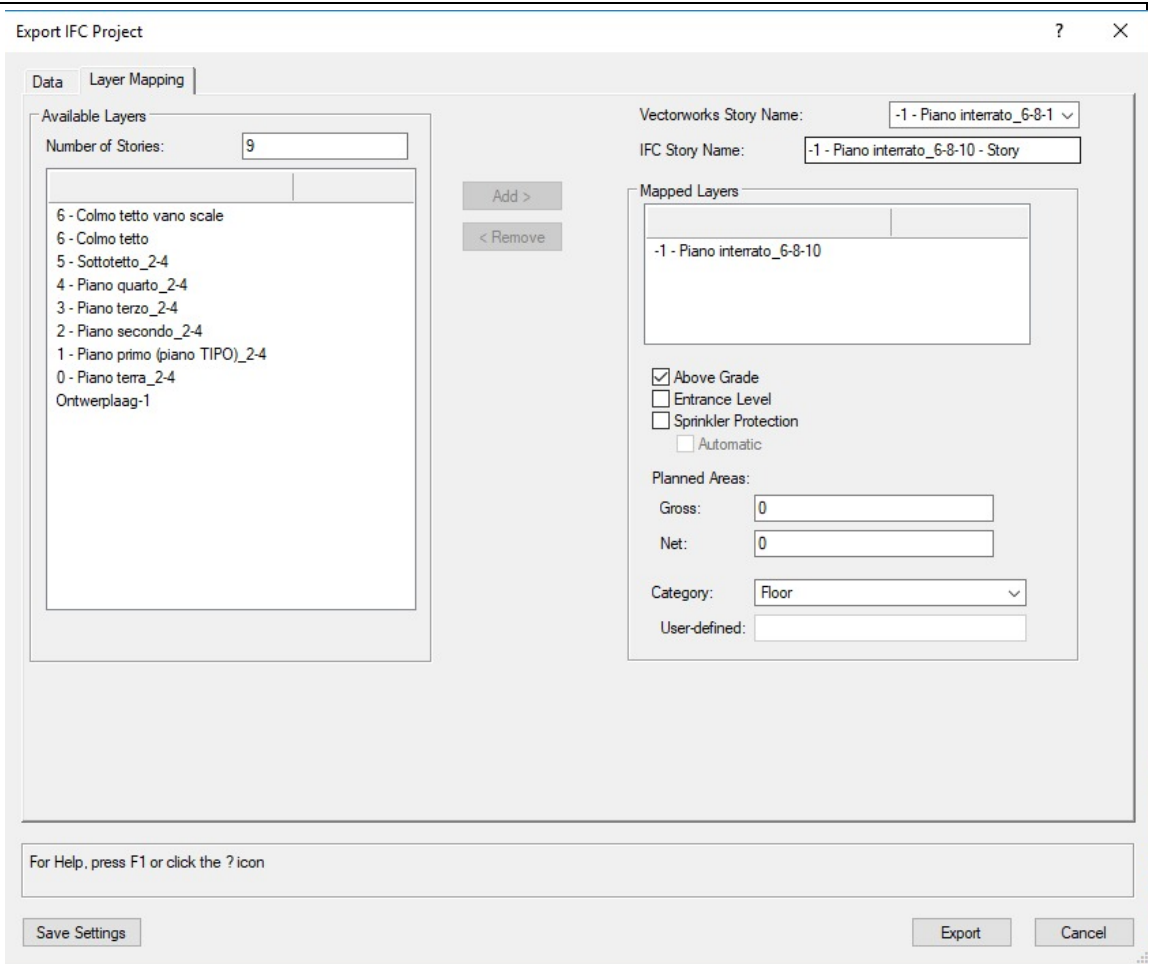
17.1) Are any pre-processing or setting changes needed in the software to enable a consistent export?

Yes

17.1.1) Can you add a short description of the steps involved in the pre-processing?

A layer mapping pre-process was needed to export the file. Each layer had to be selected separately and assigned to the correct "vector story name".

17.1.2) Attach screenshots and files



| | |
|---|---|
| Other | Yes, but only for IFC version 2x2 and 2x3. |
| 18.2) short comments to the previous question (optional) | The studied model is in IFC version 4, thus the MVD couldn't be selected. |
| 19) How long does it take for the data to be exported to IFC? | less then a minute |

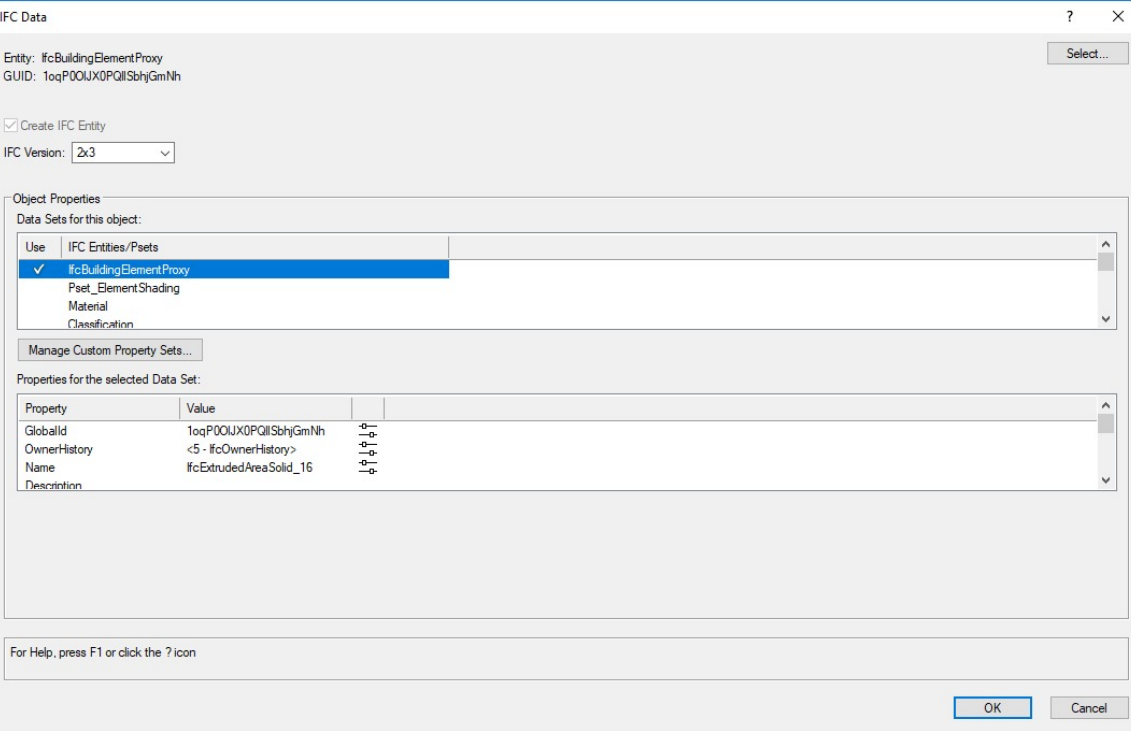
Test with UpTown.ifc

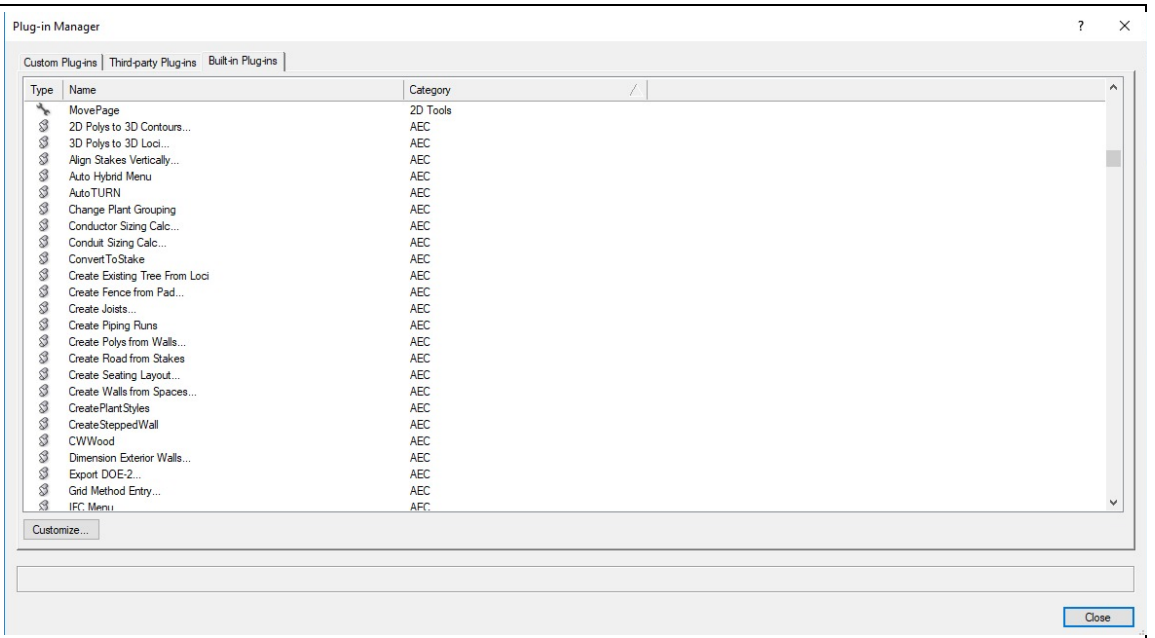
| | | |
|-------------|---|---|
| Performance | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | it crashes without completing the operation |
| | How long does it take, approximately, to:Zoom into the model to see more detail | it crashes without completing the operation |
| | How long does it take, approximately, to:Pan the model | it crashes without completing the operation |
| | How long does it take, approximately, to:Rotate the model | it crashes without completing the operation |
| | How long does it take, approximately, to:Query an object | it crashes without completing the operation |
| | How long does it take, approximately, to:Inspect the objects linked to the queried one (Element 3) through a relationship | it crashes without completing the operation |
| Proporti | 24.1) Does the model maintain its correct dimensions and proportions? | Yes |

| | | |
|------------|--|--|
| IFC def | 25.1) Is the eventual translation consistent with the IFC definitions? | Yes |
| Hier arch | 26.1) Are the hierarchical relationships consistent with the IFC hierarchy? | Yes |
| Attri bute | 27.1) Are the attributes present in the IFC entities retained and consistent? | Yes |
| R el t | 28.1) Are the relationships between the objects retained? | Yes |
| G e o | 29.1) Is geometry read correctly? | Yes |
| 2D/3 D | 31.1) Is it possible to view the model in 3D? | Yes |
| | 32.1) Is it possible to view the model in 2D? | Yes |
| Editing | 33.1) Is it possible to edit the model (attributes, geometry, other)? | Yes |
| | 33.1.1) What editing is possible (attributes, geometry, georeferencing, please add details)? | Attributes, geometry, georeferencing can be edited. Attributes can be changed in the object info - data bar: for example, IFC entity name and type can be changed. A number of tools exist to modify object's geometry: add surfaces, scale etc. Projection plane, orientation of the model, CRS informations can be also changed. |

33.1.2) Attach screenshots

The screenshot shows the 'Object Info - Data' window with the 'Data' tab selected. The 'IFC Entity' section is expanded, showing a tree view of record formats for an 'IfcWall' object. The tree includes 'IfcWall' (checked), 'Pset_ReinforcementBarPitchOfWall', 'Pset_WallCommon' (checked), 'Pset_ElementShading', 'Material' (checked), 'Classification', 'Classification2', 'Classification3', and 'COBie_Asset'. Below the tree are buttons for 'Attach Record', 'Attach IFC...', and 'Detach...'. The bottom section of the window displays various object properties: GlobalId (3GW6zPgB91lwWmQbxQ4wn2), OwnerHistory (41), Name (Damwand84:Damwand:7891187), Description (empty), ObjectType (Damwand84:Damwand:7891185), ObjectPlacement (2168195), Representation (2170153), and Tag (7891187). A 'Name:' field is also present at the bottom.

| | | |
|----------|--|---|
| Querying | 34.1) Is it possible to query the model and the attributes? | Yes |
| | 34.1.1) What kinds of query are possible? | Queries can be performed if the project is connected to a database. Generic selection and attribute retrieval can be done, class filtering is also possible. |
| | 34.1.2) Attach screenshots |  |
| Analysis | 35.1) Is it possible to analyse the objects and the model? | Yes |
| | 35.1.1) What analysis are possible? Do you know if the results are reliable? | Shadow analysis can be performed, selection by location etc. A number of plugins is available for AEC categories. The reliability of the results couldn't be checked. |

| | | |
|--|--|--|
| | <p>35.1.2) Attach screenshots</p> |  |
| | <p>35.1.3) Time required to perform the analysis about the model (type 1)</p> | <p>1-5 minutes</p> |
| <p>Export</p> | <p>You arrived at the end of the phase 1: "Import and manage the file in the software".Now choose:</p> | <p>The software has also export abilities</p> |
| | <p>36) How long does it take for the data to be exported to IFC?</p> | <p>more than one hour</p> |
| <p>Test with Savigliano.ifc</p> | | |
| | <p>How long does it take, approximately, to:Import (and visualise if the software allows it) the model</p> | <p>it crashes without completing the operation</p> |

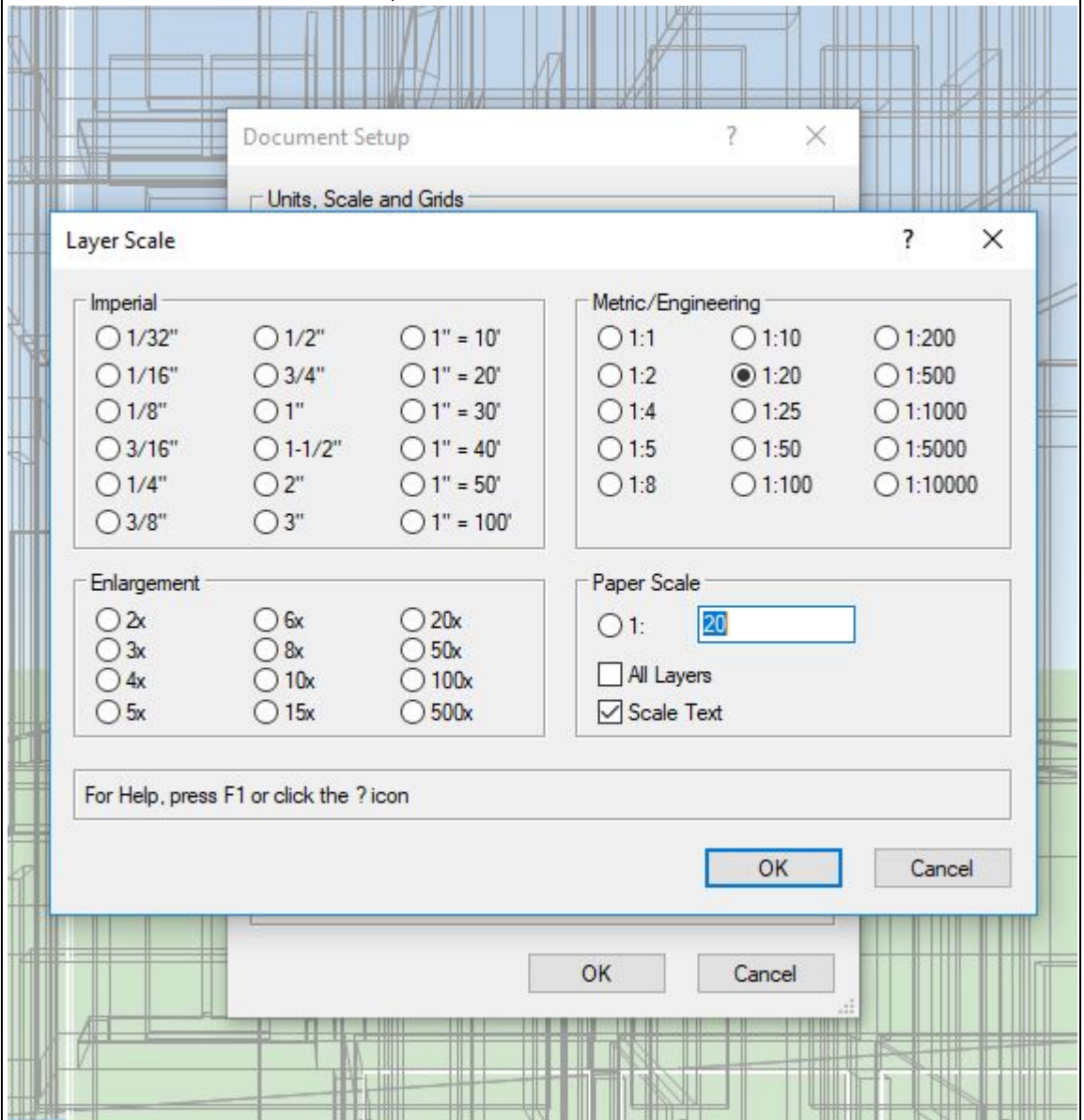
Vectorworks Designer 2019

| | | | | | | | |
|----------------------------|--|---|------------------------------|--|---------------------------|------------------------------|-----------------------|
| Software | Software Name [version] | Vectorworks Designer 2019 [2019 SP2 (Build 463397) (64-Bit)] | | | Software house | Software house | |
| | Proprietary or open source software? | | | Kind of software | | | |
| proprietary | | | BIM | | | | |
| Computer | Model and year | Operating system | CPU | GPU | Memory (RAM) | Hard drive capacity | Hard drive free space |
| | HP ZBook Studio G5 | Microsoft Windows 10 Home | Intel(R) Core™ i7-8750 | GPU NVIDIA Quadro P1000 | 16.00 GB | 455.00 GB | 280.00 GB |
| Certification | IFC import certification status | Import certification date | Import certification program | IFC export certification status | Export certification date | Export certification program | |
| | certified in (date) | 2013-11-11 | buildingSMART International | certified in (date) | 2013-11-11 | buildingSMART International | |
| Test with Myran.ifc | | | | | | | |
| Performance | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | | | less then a minute | | | |
| | How long does it take, approximately, to:Zoom into the model to see more detail | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Pan the model | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Rotate the model | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Query an object | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Inspect the objects linked to the queried one through a relationship | | | the software does not allow this | | | |
| Georeferencing | 2.1) Are the world (projected) coordinates taken into account when locating the model in the software's coordinate reference system? | | | Yes | | | |
| | 2.2) short comments to the previous question (optional) | | | The software adjusts origin and orientation of georeferenced data to match document coordinates by default. We don't know the actual origin coordinates, therefore we cannot check if they are correct | | | |
| Height | 3.1) Are the "real-world" elevation values (heights) considered when locating the model in the software (z)? | | | Yes | | | |
| | 3.2) short comments to the previous question (optional) | | | Every layer has its own elevation value | | | |
| Orientation | 4.1) Is the model oriented correctly with respect to the true North? | | | Yes | | | |
| | 4.2) short comments to the previous question (optional) | | | The entity that describes the model orientation is the IfcGeometricRepresentationContext. It might be missing in our file, therefore no orientation entity was created | | | |
| Proportions | 5.1) Does the model maintain its correct dimensions and proportions? | | | No | | | |

5.1.1) How do the dimensions change / how is the model distorted?

A scale of 1:20 is applied by default

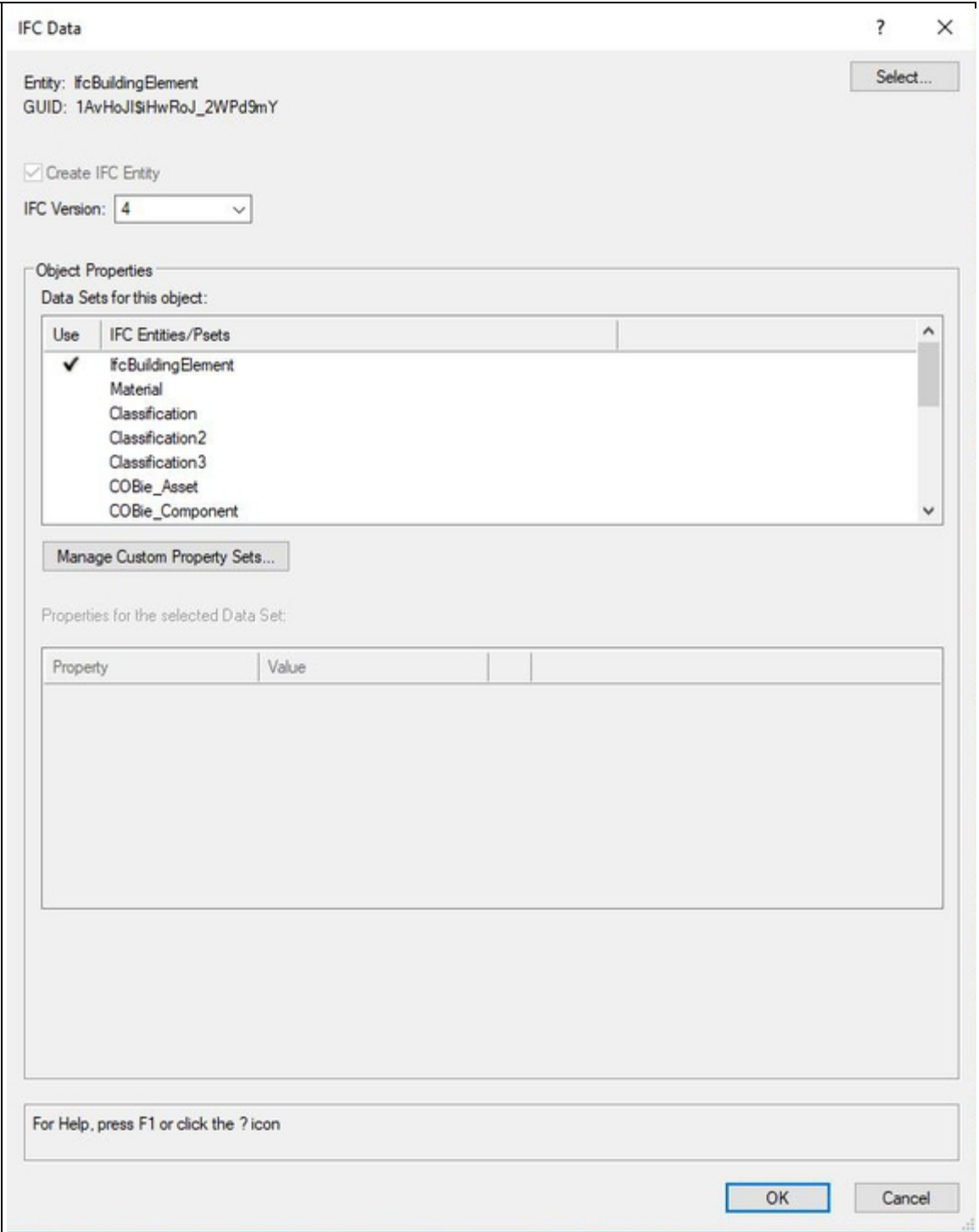
5.1.2) Attach screenshots



| | | |
|-----------------|--|--|
| IFC definitions | 6.1) Is the eventual translation consistent with the IFC definitions? | Yes |
| Hierarchical | 7.1) Are the hierarchical relationships consistent with the IFC hierarchy? | Yes |
| Attributes | 8.1) Are the attributes present in the IFC entities retained and consistent? | Yes |
| Relationships | 9.1) Are the relationships between the objects retained? | The software does not have the necessary tools to determine this information |
| Geometry | 10.1) Is geometry read correctly? | Yes |

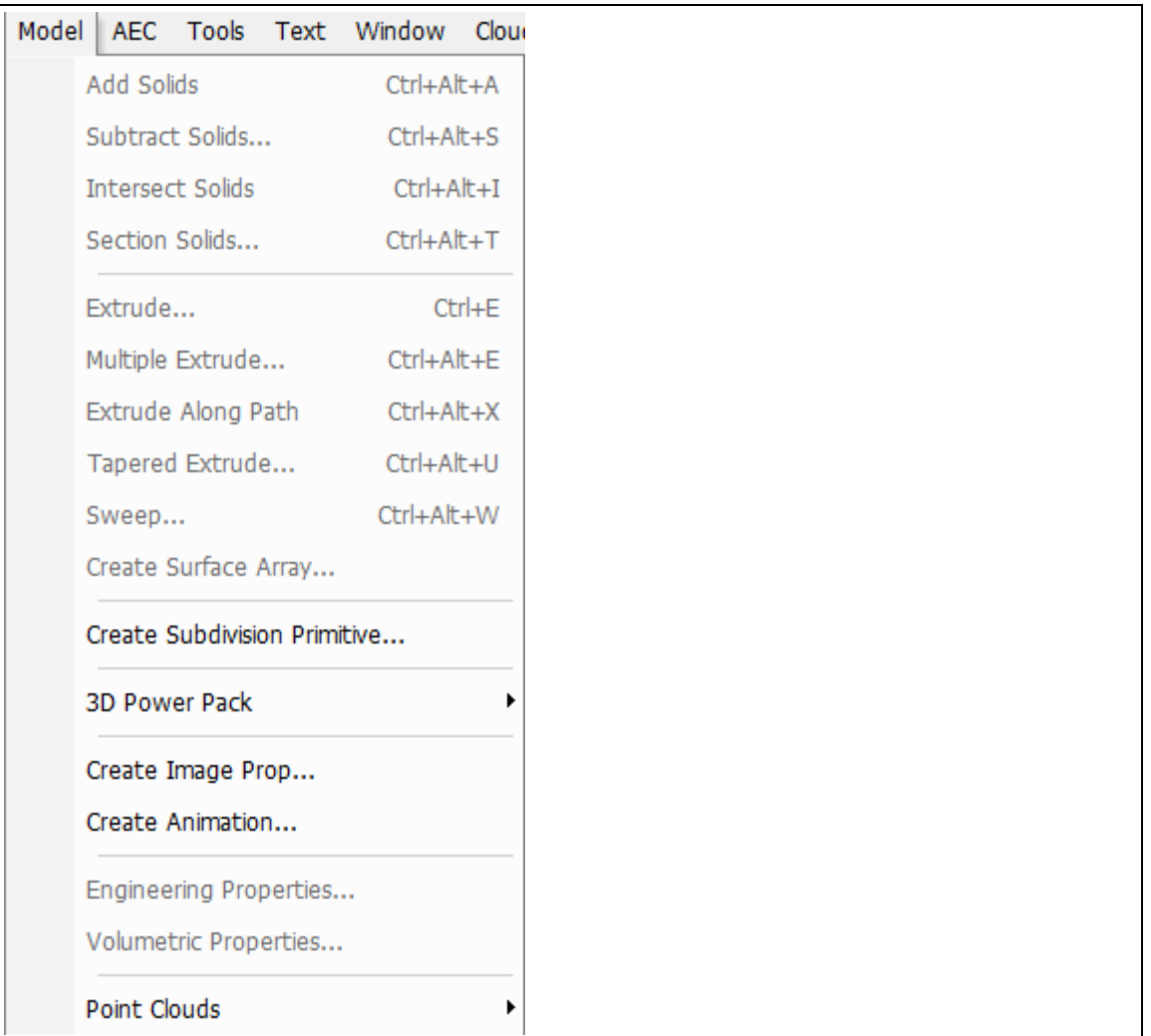
| Normal | 11.1) Did the normals change? | The software does not have the necessary tools for checking it | | | | |
|----------------------------|--|--|---------|-----------------|----------|--|
| | 12.1) Is it possible to view the model in 3D? | Yes | | | | |
| | 13.1) Is it possible to view the model in 2D? | Yes | | | | |
| 2D/3D | 14.1) Is it possible to edit the model (attributes, geometry, other)? | Yes | | | | |
| | 14.1.1) What editing is possible (attributes, geometry, georeferencing, please add details)? | Attributes, geometry, reference system, scale, measuring units can be modified. Possibly, other attributes can also be modified (http://app-help.vectorworks.net/2019/eng/VW2019_Guide/IFC/Viewing_and_Editing_IFC_Data.htm) | | | | |
| Editing | 14.1.2) Attach screenshots | <p>Viewing and Editing IFC Data with the IFC Data Command</p> <table border="1"> <thead> <tr> <th>Command</th> <th>Workspace: Path</th> </tr> </thead> <tbody> <tr> <td>IFC Data</td> <td> <ul style="list-style-type: none"> Architect: AEC Landmark: Landmark > Architectural Spotlight: Spotlight > Architectural </td> </tr> </tbody> </table> <ol style="list-style-type: none"> 1. Select the Vectorworks object or IFC entity. Multiple items can be selected; edits apply to all eligible objects in the selection. 2. Select the command. 3. If you have selected a group that contains objects with multiple IfcObjectTypes, the Choose IFC Type dialog box opens. Select the IFC Type to apply to the group. Optionally, remove the IFC data from the contained objects. 4. When the items to be edited have been specified if necessary, the IFC Data dialog box opens. View or edit the IFC data as described in Assigning IFC Data to Objects. <p>If an IFC entity is selected, the IFC Data dialog box displays the data attached to the entity as described in Assigning IFC Data to Objects; the data can be edited. If a Vectorworks plug-in object is selected, the IFC Data dialog box displays the corresponding IFC Object type. At export, the object will be converted to that type of entity.</p> | Command | Workspace: Path | IFC Data | <ul style="list-style-type: none"> Architect: AEC Landmark: Landmark > Architectural Spotlight: Spotlight > Architectural |
| | Command | Workspace: Path | | | | |
| IFC Data | <ul style="list-style-type: none"> Architect: AEC Landmark: Landmark > Architectural Spotlight: Spotlight > Architectural | | | | | |
| 14.1.2) Attach screenshots | | | | | | |
| Querying | 15.1) Is it possible to query the model and the attributes? | Yes | | | | |
| | 15.1.1) What kinds of query are possible? | You can query entities, geometries and attributes | | | | |

15.1.2) Attach screenshots

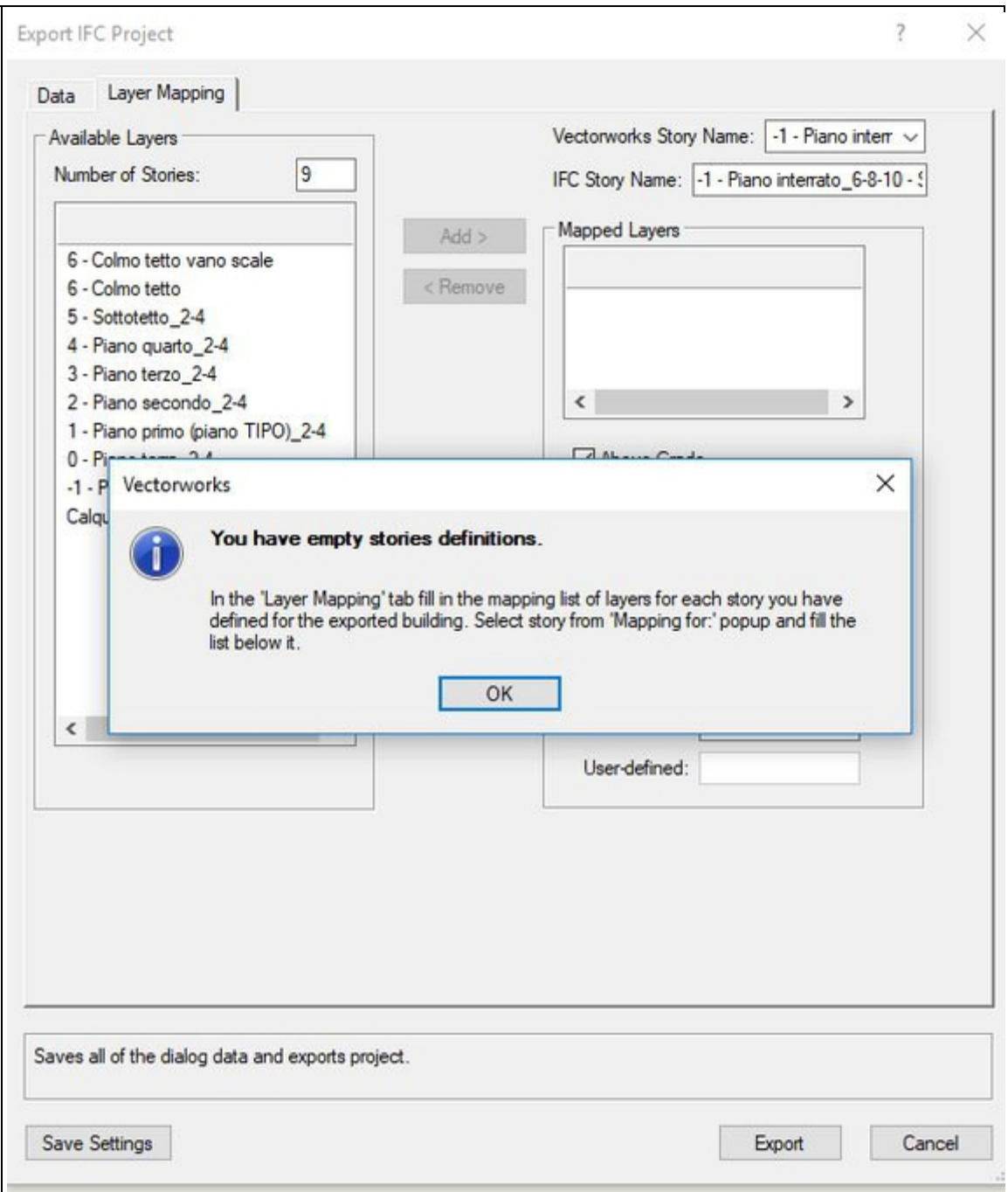


16.1.1) What analysis are possible? Do you know if the results are reliable?

Options to do models intersections, subtractions etc. are available. We are not sure if they are considered as analysis tools.

| | | |
|---------------|--|---|
| | <p>16.1.2) Attach screenshots</p> |  |
| | <p>16.2) short comments to the previous question (optional)</p> | <p>We didn't manage to use the analysis tools.</p> |
| <p>Export</p> | <p>You arrived at the end of the phase 1: "Import and manage the file in the software".Now choose:</p> | <p>The software has also export abilities</p> |
| | <p>17.1) Are any pre-processing or setting changes needed in the software to enable a consistent export?</p> | <p>Yes</p> |
| | <p>17.1.1) Can you add a short description of the steps involved in the pre-processing?</p> | <p>Selection of each floor and its assigning to corresponding layers.</p> |

17.1.2) Attach screenshots and files



| | |
|---|--|
| Other | Only available for former IFC version (older than 4) |
| 19) How long does it take for the data to be exported to IFC? | less than a minute |

Test with UpTown.ifc

| | | |
|-------------|---|---|
| Performance | How long does it take, approximately, to import (and visualise if the software allows it) the model | it crashes without completing the operation |
|-------------|---|---|

| | | |
|---------------|---|---|
| | How long does it take, approximately, to:Zoom into the model to see more detail | it crashes without completing the operation |
| | How long does it take, approximately, to:Pan the model | it crashes without completing the operation |
| | How long does it take, approximately, to:Rotate the model | it crashes without completing the operation |
| | How long does it take, approximately, to:Query an object | it crashes without completing the operation |
| | How long does it take, approximately, to:Inspect the objects linked to the queried one (Element 3) through a relationship | it crashes without completing the operation |
| Pro porfi | 24.1) Does the model maintain its correct dimensions and proportions? | Yes |
| IFC defi | 25.1) Is the eventual translation consistent with the IFC definitions? | Yes |
| Hier arch | 26.1) Are the hierarchical relationships consistent with the IFC hierarchy? | Yes |
| Attri bute | 27.1) Are the attributes present in the IFC entities retained and consistent? | Yes |
| R el t | 28.1) Are the relationships between the objects retained? | Yes |
| Geometry | 29.1) Is geometry read correctly? | Yes |
| | Other | Surface normals can only be displayed for NURBS surfaces. Different visualisation methods didn't provide different colours for different faces directions |
| 2D/3 D | 31.1) Is it possible to view the model in 3D? | Yes |
| | 32.1) Is it possible to view the model in 2D? | Yes |
| Editing | 33.1) Is it possible to edit the model (attributes, geometry, other)? | Yes |
| | 33.1.1) What editing is possible (attributes, geometry, georeferencing, please add details)? | Attributes, geometry, scale, georeference information, units |

33.1.2) Attach screenshots

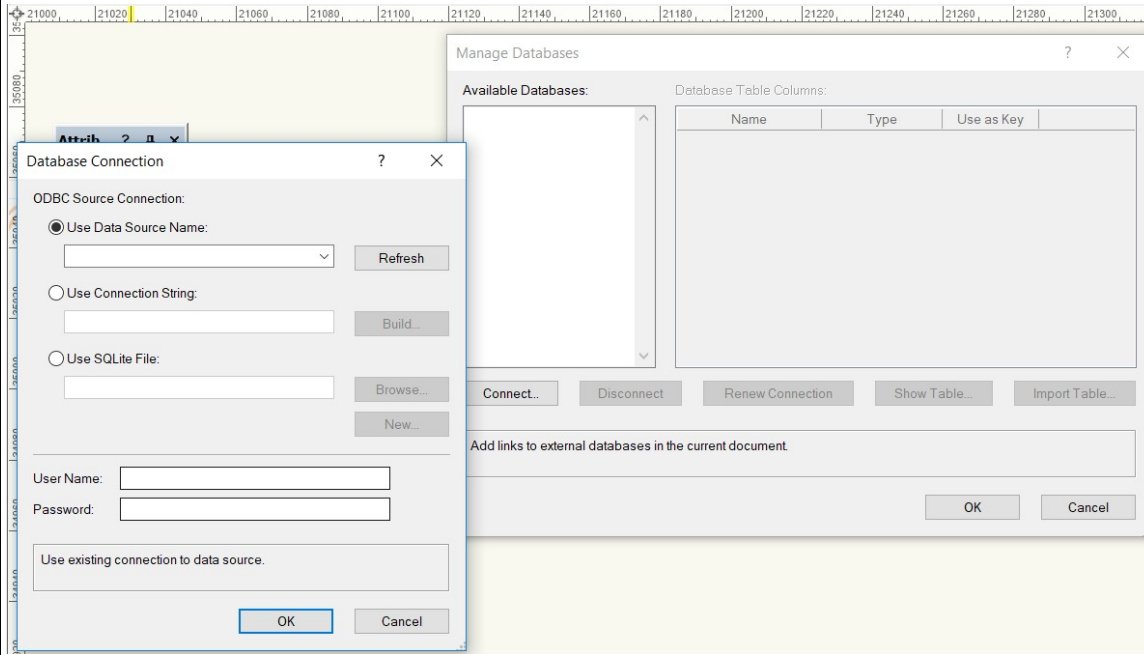
The screenshot shows the 'Object Info - Data' window with the 'Data' tab selected. The 'IFC Entity' section is expanded, showing a tree view under 'IfcWall'. The following items are checked:

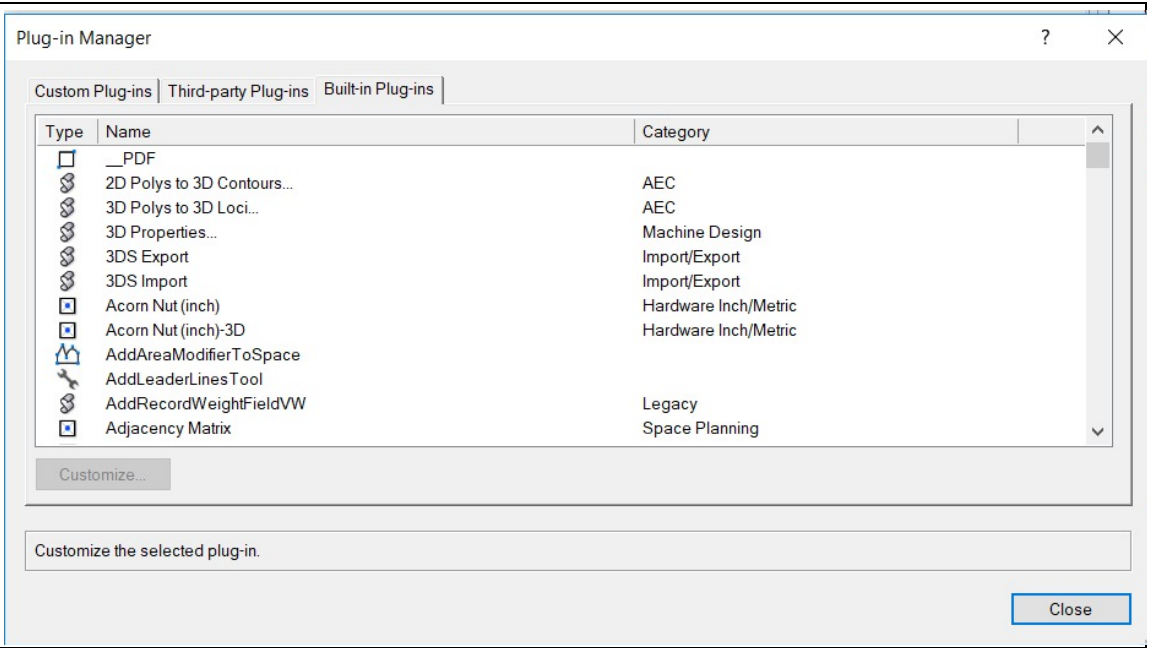
- IfcWall
- Pset_ReinforcementBarPitchOfWall
- Pset_WallCommon
- Pset_ElementShading
- Material

Below the tree view are three buttons: 'Attach Record', 'Attach IFC...', and 'Detach...'. The bottom section of the window contains the following fields:

- GlobalId: 3GW6zPgB91lwWmQbxQ4wn2
- OwnerHistory: 41
- Name: Damwand84:Damwand:7891187
- Description: (empty)
- ObjectType: Damwand84:Damwand:7891185
- ObjectPlacement: 2168195
- Representation: 2170153
- Tag: 7891187

At the bottom, there is a 'Name:' label followed by an empty text input field.

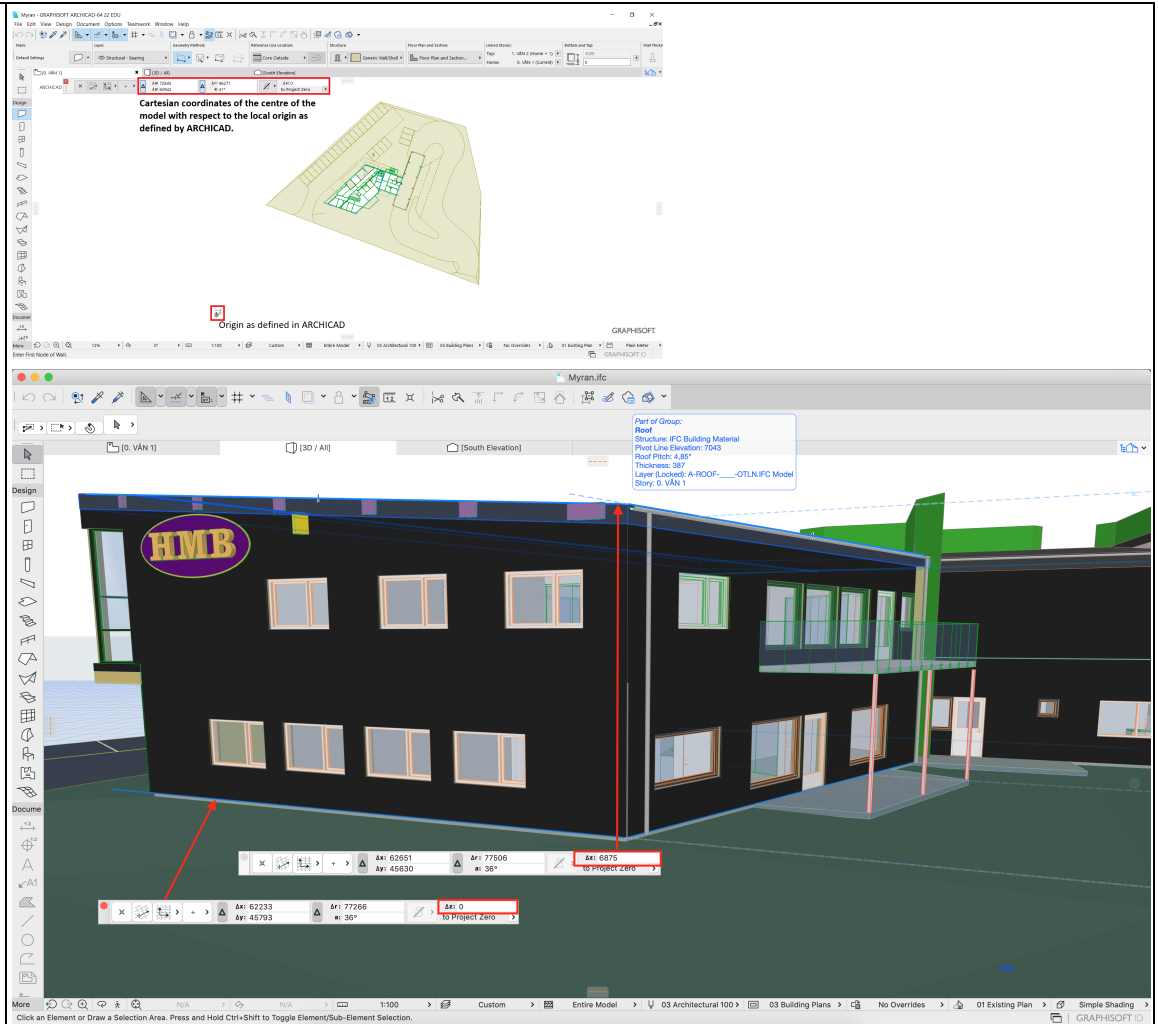
| | | |
|----------|--|--|
| | 34.1) Is it possible to query the model and the attributes? | Yes |
| | 34.1.1) What kinds of query are possible? | Class filtering, object selection, attribute filtering and every other generic query. It is also possible to connect the software with a database and perform more complicated queries |
| Querying | 34.1.2) Attach screenshots |  |
| Analysis | 35.1) Is it possible to analyse the objects and the model? | Yes |
| | 35.1.1) What analysis are possible? Do you know if the results are reliable? | Depending on the purpose of the analysis there are several plug-ins available, such as an energy efficiency plug-in. |

| | | |
|--|--|--|
| | <p>35.1.2) Attach screenshots</p> |  |
| | <p>35.1.3) Time required to perform the analysis about the model (type 1)</p> | <p>1-5 minutes</p> |
| <p>Export</p> | <p>You arrived at the end of the phase 1: "Import and manage the file in the software".Now choose:</p> | <p>The software has also export abilities</p> |
| | <p>36) How long does it take for the data to be exported to IFC?</p> | <p>more than one hour</p> |
| <p>Test with Savigliano.ifc</p> | | |
| <p>Perfo rman</p> | <p>How long does it take, approximately, to:Import (and visualise if the software allows it) the model</p> | <p>it crashes without completing the operation</p> |

ArchiCAD

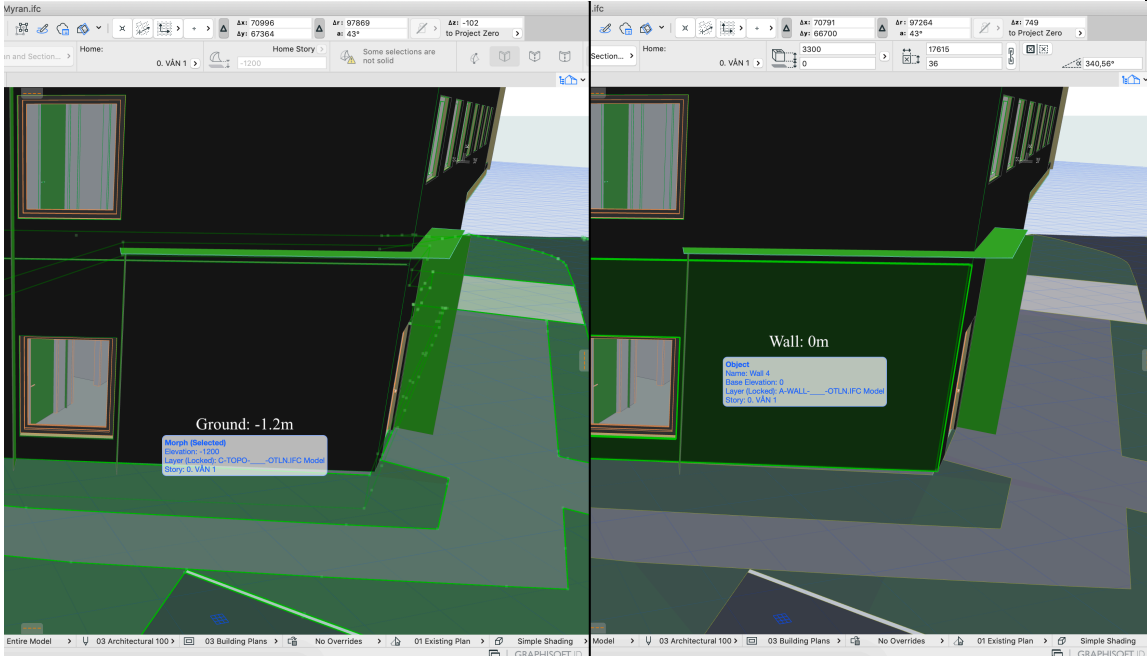
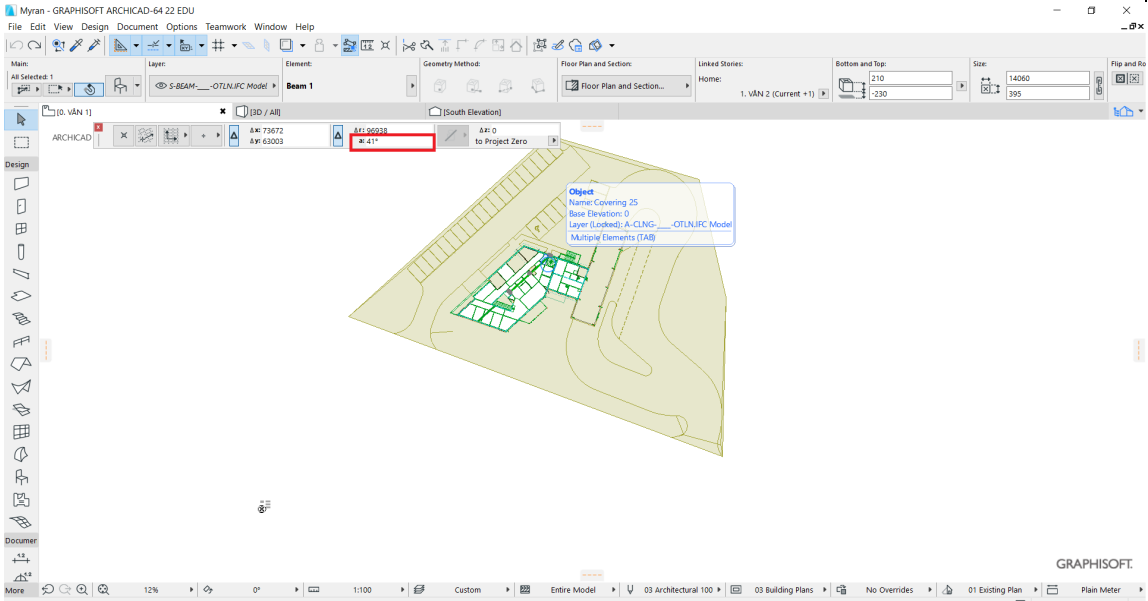
| | | | | | | | |
|----------------------------|--|--|--|--|---------------------------|--|-----------------------|
| Software | Software Name [version] | ArchiCAD [ArchiCAD 22] | | Software house | Graphisoft | | |
| | Proprietary or open source software? | | | Kind of software | | | |
| | proprietary | | | BIM | | | |
| Computer | Model and year | Operating system | CPU | GPU | Memory (RAM) | Hard drive capacity | Hard drive free space |
| | HP Pavilion Gaming Laptop 15-cx0400nd | Windows 10 Home (64-bit) - v10.0.17134 Build 17134 | Intel i7-8750H @ 2.20GHz | NVIDIA GeForce GTX1050 | 16 | 1000 | 887 |
| Certification | IFC import certification status | Import certification date | Import certification program | IFC export certification status | Export certification date | Export certification program | |
| | certified in (date) | 2013-09-20 | IFC Coordination View 2.0 Import (buildingSMART) | certified in (date) | 2013-04-16 | IFC Coordination View 2.0 Import (buildingSMART) | |
| Test with Myran.ifc | | | | | | | |
| Performance | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | | | less then a minute | | | |
| | How long does it take, approximately, to:Zoom into the model to see more detail | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Pan the model | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Rotate the model | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Query an object | | | the software does not allow this | | | |
| | How long does it take, approximately, to:Inspect the objects linked to the queried one through a relationship | | | the software does not allow this | | | |
| Georeferencing | 2.1) Are the world (projected) coordinates taken into account when locating the model in the software's coordinate reference system? | | | The software does not have the necessary tools to check this information | | | |
| | 2.2) short comments to the previous question (optional) | | | It just imports it without any further options. There is a coordinate tool, but this is linked to a local Cartesian reference system. We can see the project location in LON/LAT, but in the model view itself there seems to be no reference to this. | | | |
| Height | 3.1) Are the "real-world" elevation values (heights) considered when locating the model in the software (z)? | | | No | | | |
| | 3.1.1) What is the elevation value of the origin of the model coordinate reference system as imported in the software? | | | 0 metre. The bottom elements of the model are moved to 0m. | | | |

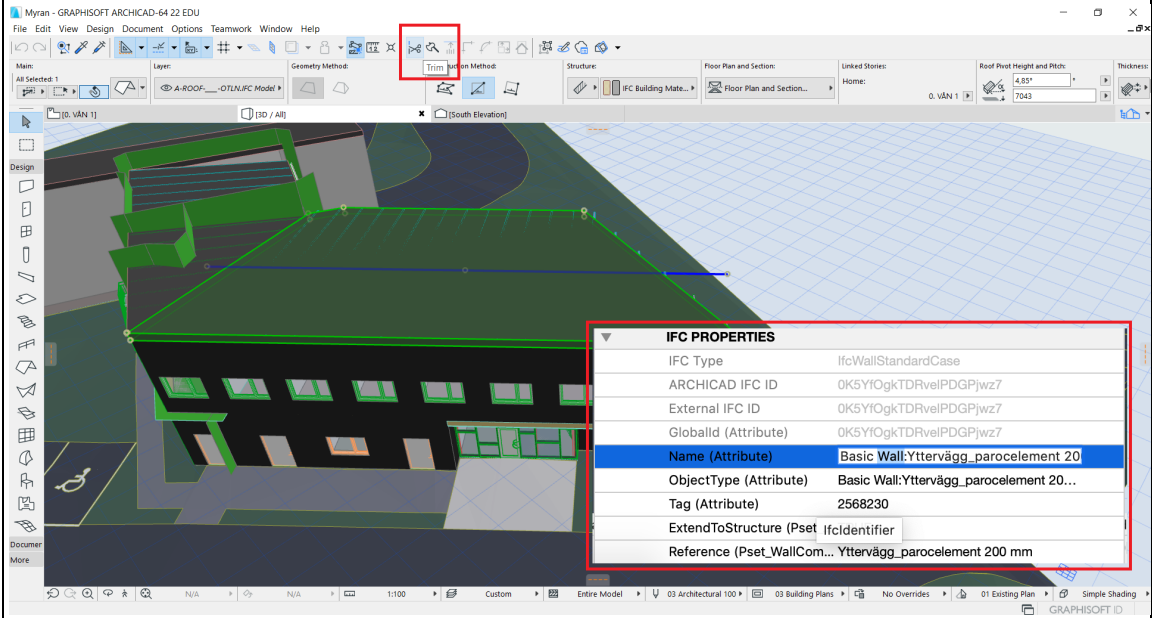
3.1.2) Attach screenshots

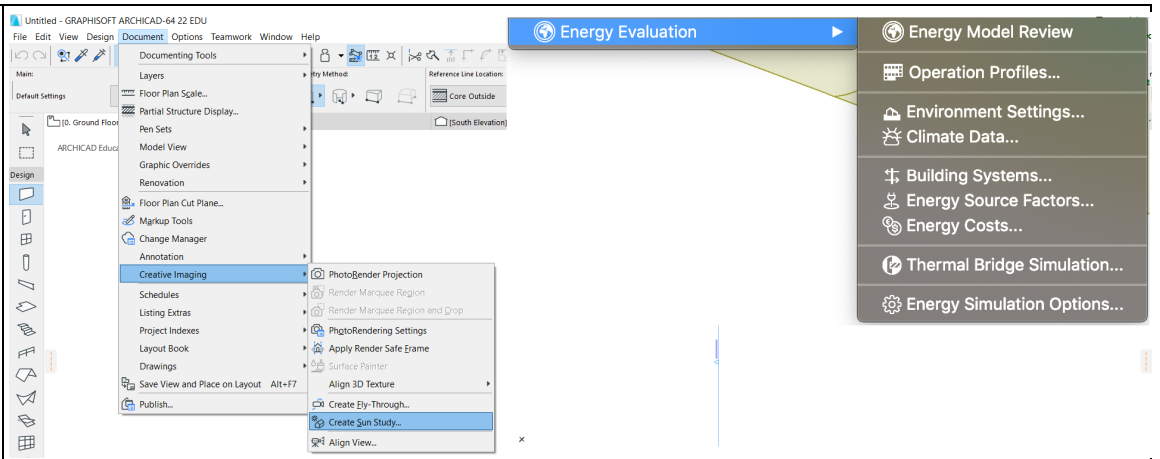


3.1.3) What is the height reference system?

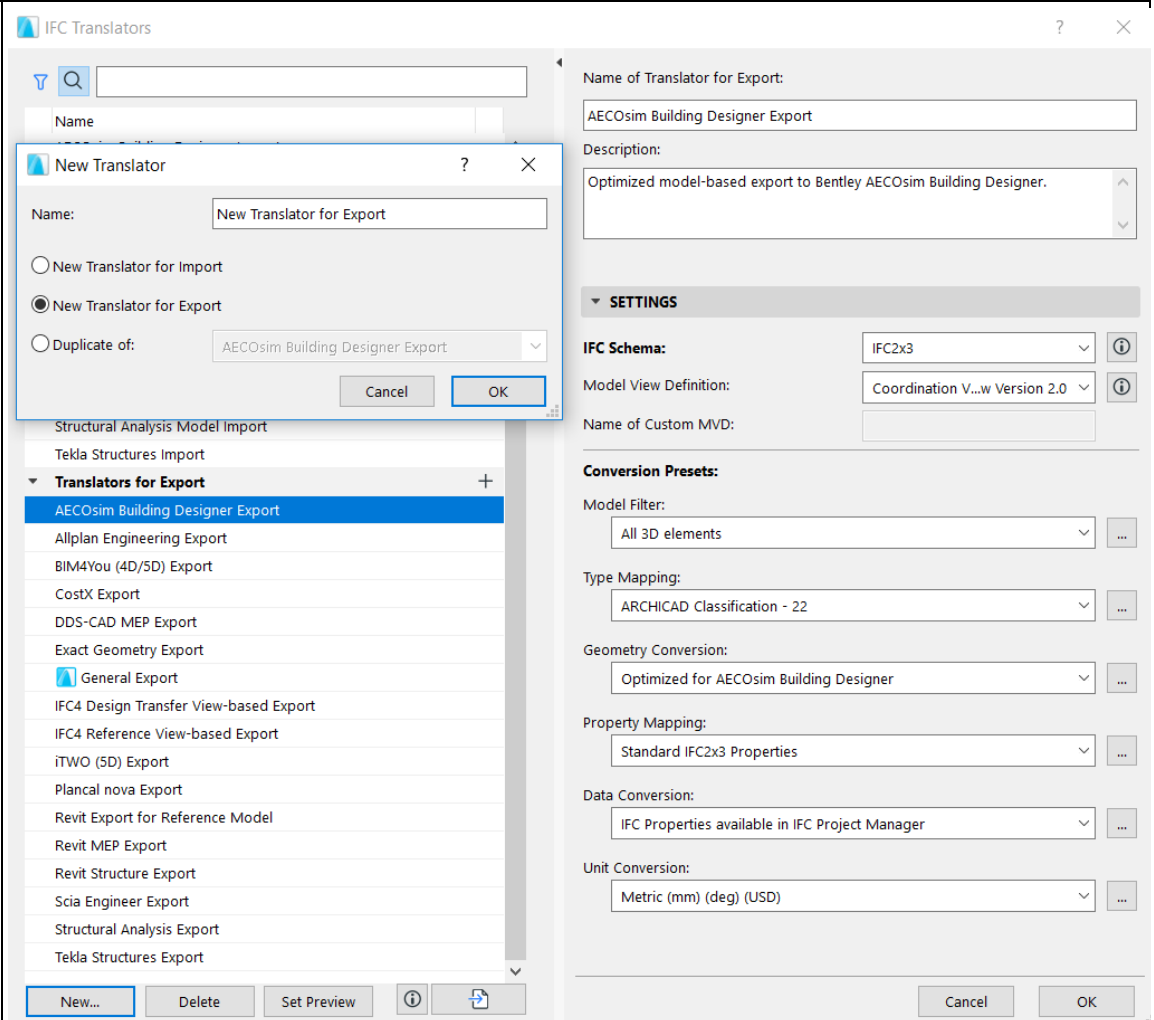
There isn't one. Altitude of sea level is given in project location information (148,2m).

| | | |
|--|---|--|
| | <p>3.1.4) Attach screenshots</p> |  |
| | <p>3.2) short comments to the previous question (optional)</p> | <p>None of the provided information seems to match reality.</p> |
| | <p>4.1) Is the model oriented correctly with respect to the true North?</p> | <p>No</p> |
| | <p>4.1.1) How is the model oriented, with respect to the reference direction?</p> | <p>41deg</p> |
| <p style="writing-mode: vertical-rl; transform: rotate(180deg);">Orientation</p> | <p>4.1.2) Attach screenshots</p> |  |
| <p>Pro porti</p> | <p>5.1) Does the model maintain its correct dimensions and proportions?</p> | <p>Yes</p> |
| <p>IFC defi</p> | <p>6.1) Is the eventual translation consistent with the IFC definitions?</p> | <p>Yes</p> |

| | | |
|---------------|--|--|
| Hierarchy | 7.1) Are the hierarchical relationships consistent with the IFC hierarchy? | Yes |
| | 7.2) short comments to the previous question (optional) | We manually checked a few elements by using the available IFC project manager in ARCHICAD. |
| Attributes | 8.1) Are the attributes present in the IFC entities retained and consistent? | Yes |
| | 8.2) short comments to the previous question (optional) | Difficult to check in the software. |
| Relationships | 9.1) Are the relationships between the objects retained? | Yes |
| | 9.2) short comments to the previous question (optional) | When looking at an element, a door or window says that it is part of a wall. |
| Normals | 11.1) Did the normals change? | Yes |
| | 11.2) short comments to the previous question (optional) | The same face in different directions has different colours. |
| 2D/3D | 12.1) Is it possible to view the model in 3D? | Yes |
| | 12.2) short comments to the previous question (optional) | Easily accessible through a tab at the top. |
| | 13.1) Is it possible to view the model in 2D? | Yes |
| | 13.2) short comments to the previous question (optional) | Same as for 3D. |
| Editing | 14.1) Is it possible to edit the model (attributes, geometry, other)? | Yes |
| | 14.1.1) What editing is possible (attributes, geometry, georeferencing, please add details)? | Attributes, georeferencing, morphing tool to perform operations on geometries. |
| Editing | 14.1.2) Attach screenshots |  |
| | Other | Find and Select tool |
| Analysis | 16.1) Is it possible to analyse the objects and the model? | Yes |
| | 16.1.1) What analysis are possible? Do you know if the results are reliable? | It is possible to create a sun study, an energy evaluation (climate data, environment costs) is also possible. |

| | | |
|---|--|---|
| | <p>16.1.2) Attach screenshots</p> |  |
| | <p>16.1.3) Time required to perform the analysis about the model itself (type 1)</p> | <p>less then a minute</p> |
| | <p>16.2) short comments to the previous question (optional)</p> | <p>You can immediately show the results or save them as a video. Experiment conducted at default settings for the sunstudy.</p> |
| <p>Export</p> | <p>You arrived at the end of the phase 1: "Import and manage the file in the software".Now choose:</p> | <p>The software has also export abilities</p> |
| <p>17.1) Are any pre-processing or setting changes needed in the software to enable a consistent export?</p> | <p>No</p> | |
| <p>18.1) Is it possible to choose the IFC model view definition (MVD) to be used when exporting the data?</p> | <p>Yes</p> | |
| <p>18.1.1) Which ones are available?</p> | <p>Coordination View, IFC 2x3 Coordination View (Surface Geometry), IFC 2x3 Basic FM Handover View, Concept Design BIM 2010, and more available under the translator option in the export.</p> | |
| <p>18.1.2) Is it possible to add a customised MVD to be used for exporting IFC?</p> | <p>Yes</p> | |
| <p>18.1.2.1) What kind of customisation is possible?</p> | <p>Several aspects of the different MVD translators can be customized. Completely new ones can be made as well.</p> | |

18.1.2.2) Attach screenshots and files



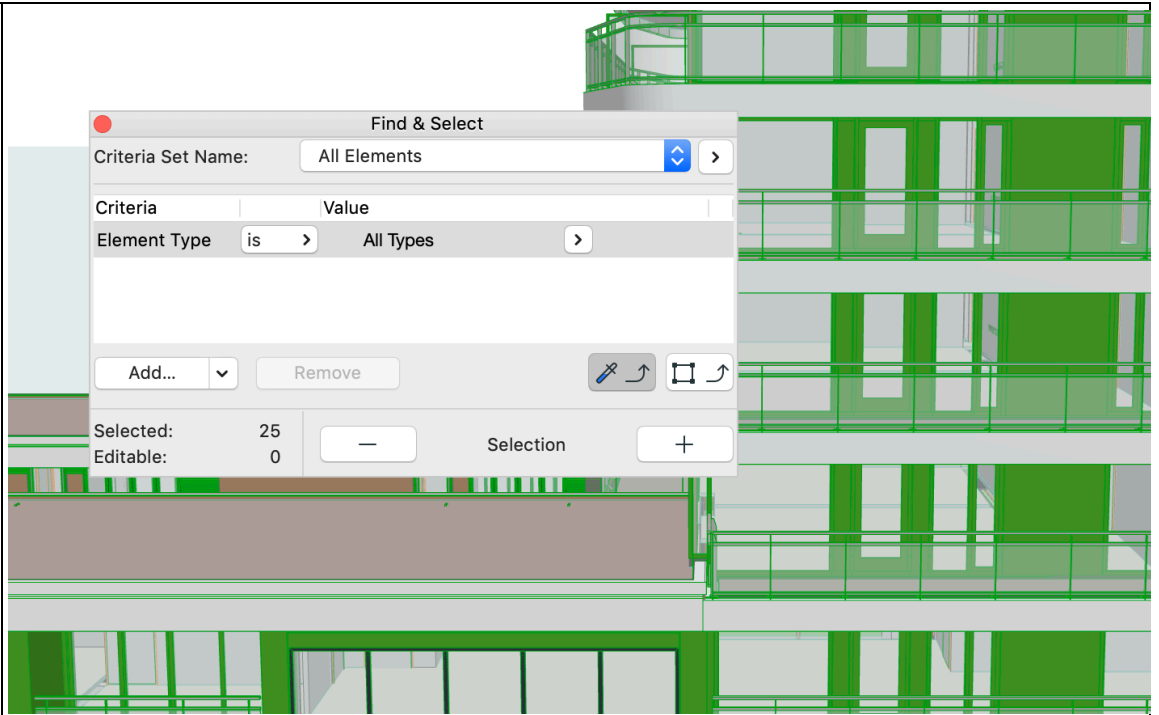
19) How long does it take for the data to be exported to IFC? less then a minute

Test with UpTown.ifc

| | | |
|--------------|---|----------------------------------|
| Performance | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | 1-5 minutes |
| | How long does it take, approximately, to:Zoom into the model to see more detail | less then a minute |
| | How long does it take, approximately, to:Pan the model | less then a minute |
| | How long does it take, approximately, to:Rotate the model | it's almost immediate |
| | How long does it take, approximately, to:Query an object | the software does not allow this |
| | How long does it take, approximately, to:Inspect the objects linked to the queried one (Element 3) through a relationship | the software does not allow this |
| Proporitions | 24.1) Does the model maintain its correct dimensions and proportions? | Yes |
| | 24.2) short comments to the previous question (optional) | Everything appears to be normal. |

| | | |
|-----------------|--|--|
| IFC definitions | 25.1) Is the eventual translation consistent with the IFC definitions? | Yes |
| | 25.2) short comments to the previous question (optional) | We tested this manually by selecting an element (for example: Wall:21_WA_KLA_storax_rooster_41mm_2270:3225692 in ARCHICAD) and by looking up this same element in the original .ifc. |
| Hierarchy | 26.1) Are the hierarchical relationships consistent with the IFC hierarchy? | Yes |
| | 26.2) short comments to the previous question (optional) | We manually checked a few elements by using the available IFC project manager in ARCHICAD. |
| Attributes | 27.1) Are the attributes present in the IFC entities retained and consistent? | Yes |
| | 27.2) short comments to the previous question (optional) | Difficult to check in the software. |
| Relationships | 28.1) Are the relationships between the objects retained? | Yes |
| Geometry | 29.1) Is geometry read correctly? | Yes |
| | 29.2) short comments to the previous question (optional) | It is possible to check whether a morph is solid or not. This can be done under the design > modify morph > check solidity option. This process is not intuitive. |
| Normals | 30.1) Did the normals change? | Yes |
| | 30.2) short comments to the previous question (optional) | We can see changes in colour of the same surface from different directions. Gradual shadow transition looks realistic. |
| 2D/3D | 31.1) Is it possible to view the model in 3D? | Yes |
| | 31.2) short comments to the previous question (optional) | Via the tabs at the top you can switch between views. |
| | 32.1) Is it possible to view the model in 2D? | Yes |
| | 32.2) short comments to the previous question (optional) | Same as previous question about 3D. |
| Editing | 33.1) Is it possible to edit the model (attributes, geometry, other)? | Yes |
| | 33.1.1) What editing is possible (attributes, geometry, georeferencing, please add details)? | Changing attributes is possible, as is editing of both the local reference system of the model as the global referencing of the project. Morph objects can be solidified. Trimming and splitting operations on the geometry are also possible. |

33.1.2) Attach screenshots



34.1) Is it possible to query the model and the attributes?

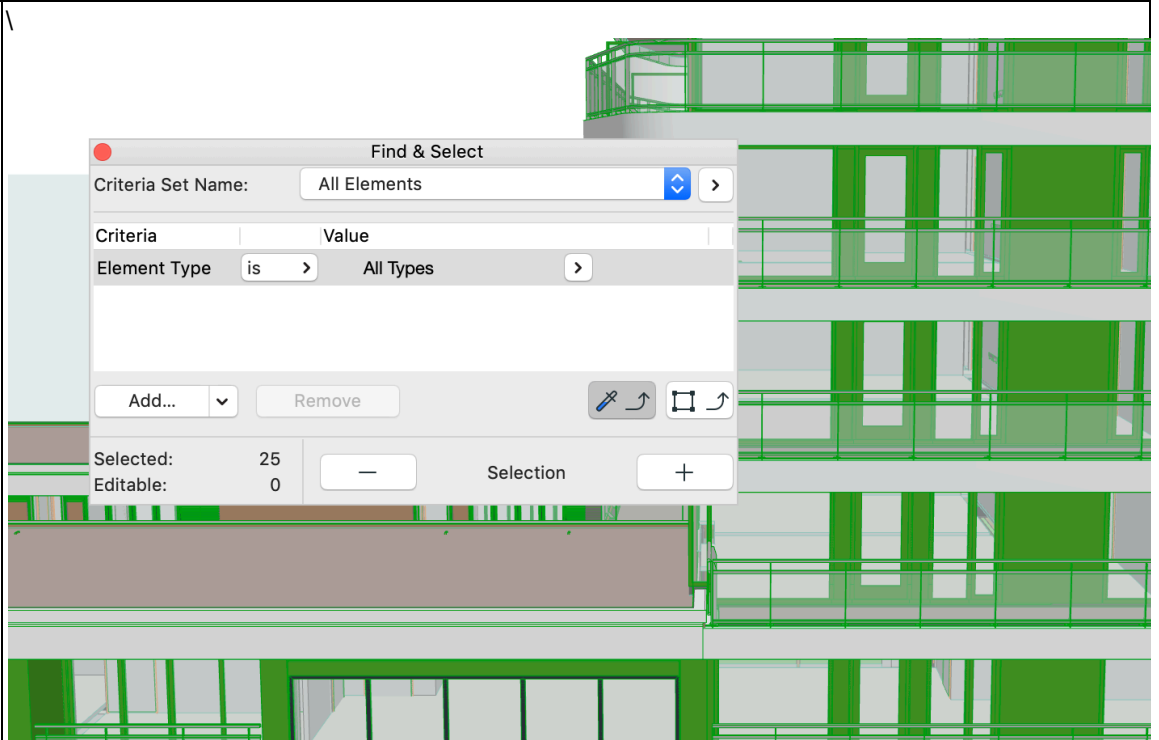
Yes

34.1.1) What kinds of query are possible?

Find and select tool (has issues).

Querying

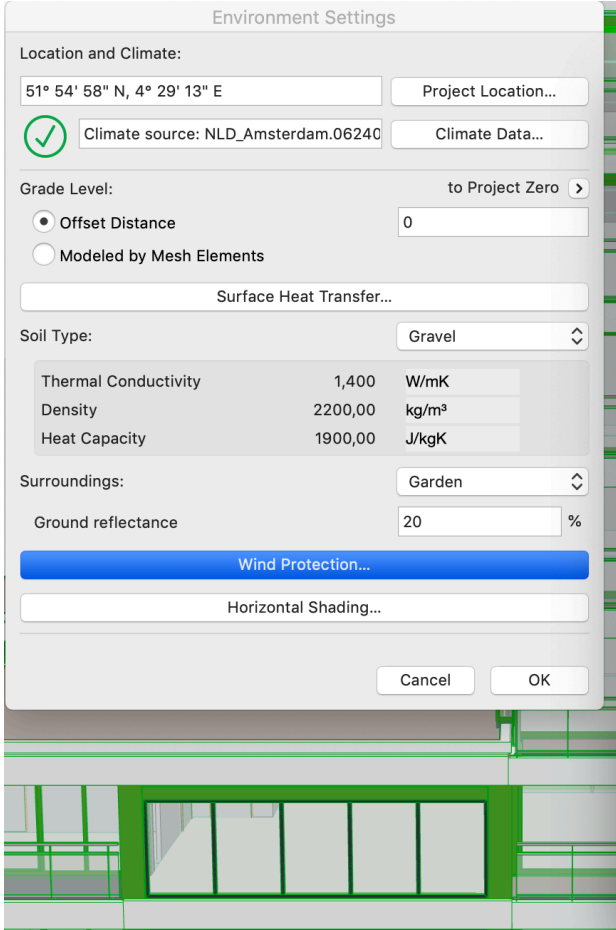
34.1.2) Attach screenshots



Analysis

35.1) Is it possible to analyse the objects and the model?

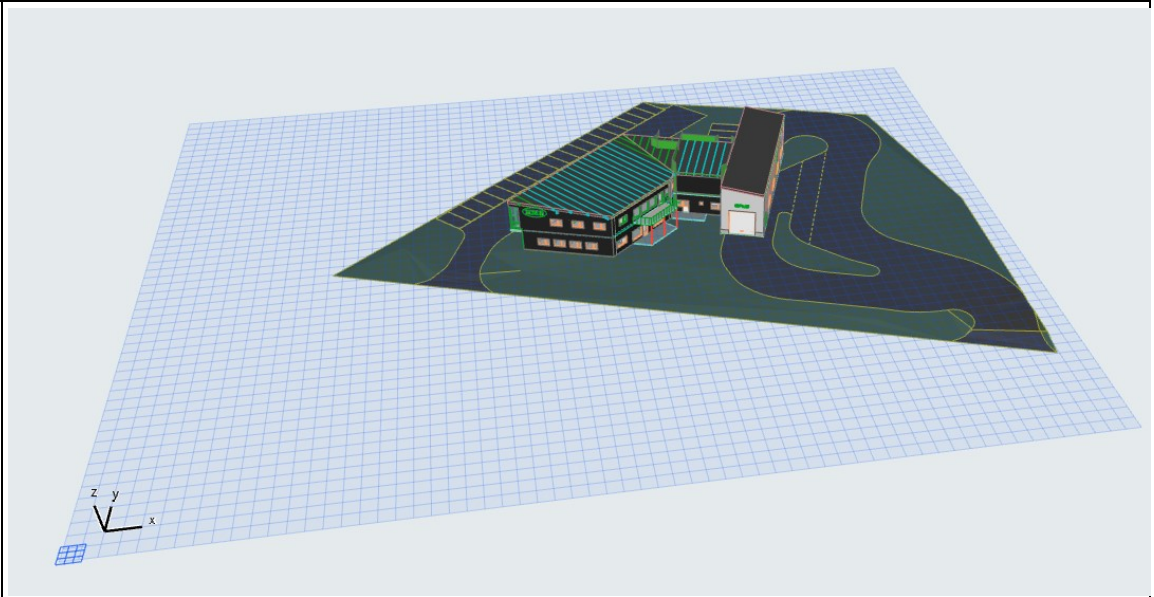
Yes

| | | |
|--|--|--|
| <p>35.1.1) What analysis are possible? Do you know if the results are reliable?</p> | <p>It is possible to create a sun study, an energy evaluation (climate data, environment costs) is also possible. Analysis accuracy depends on your input model. For example, energy model requires thermalblocks to properly study energy usage. If the placement of these blocks is done in a less precise way, it will affect the analysis results in a negative way. The exact accuracy and reliability are unknown.</p> | |
| <p>35.1.2) Attach screenshots</p> |  | |
| <p>35.1.3) Time required to perform the analysis about the model (type 1)</p> | | <p>1-5 minutes</p> |
| <p>35.2) short comments to the previous question (optional)</p> | | <p>There are many analysis options, too many to all list here. An example of a wind analysis is shown in the provided screenshot. We ran the timing on the sun study again for comparison reasons with the other datasets.</p> |
| <p>Export You arrived at the end of the phase 1: "Import and manage the file in the software".Now choose:</p> | | <p>The software has also export abilities</p> |
| <p>36) How long does it take for the data to be exported to IFC?</p> | | <p>more than one hour</p> |
| <p>36.1) Comments to the previous question (optional)</p> | | <p>Really big file</p> |
| <p>Test with Savigliano.ifc</p> | | |
| <p>Performance How long does it take, approximately, to:Import (and visualise if the software allows it) the model</p> | | <p>it crashes without completing the operation</p> |

ArchiCAD

| | | | | | | | |
|----------------------------|--|---------------------------|------------------------------|---|---------------------------|------------------------------|-----------------------|
| Software | Software Name [version] | ArchiCAD [22.0.0] | | Software house | Graphisoft | | |
| | Proprietary or open source software? | | | Kind of software | | | |
| proprietary | | | | | | | |
| Computer | Model and year | Operating system | CPU | GPU | Memory (RAM) | Hard drive capacity | Hard drive free space |
| | HP zbook studio G5 2018 | Windows 10 | Intel I7-8750H | NVIDIA Quadro-p1000 | 16 | 512 | 90 |
| Certification | IFC import certification status | Import certification date | Import certification program | IFC export certification status | Export certification date | Export certification program | |
| | certified in (date) | 2013-09-20 | CV2.0 | certified in (date) | 2013-04-16 | CV2.0-Arch | |
| Test with Myran.ifc | | | | | | | |
| Performance | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | | | less then a minute | | | |
| | How long does it take, approximately, to:Zoom into the model to see more detail | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Pan the model | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Rotate the model | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Query an object | | | the software does not allow this | | | |
| | How long does it take, approximately, to:Inspect the objects linked to the queried one through a relationship | | | the software does not allow this | | | |
| Georeferencing | 2.1) Are the world (projected) coordinates taken into account when locating the model in the software's coordinate reference system? | | | No | | | |
| | 2.1.1) Where is the origin of the model coordinate reference system as imported in the software? | | | It is arbitrarily set by the software itself and remains fixed for the whole life of the project (unless you relocate it) | | | |

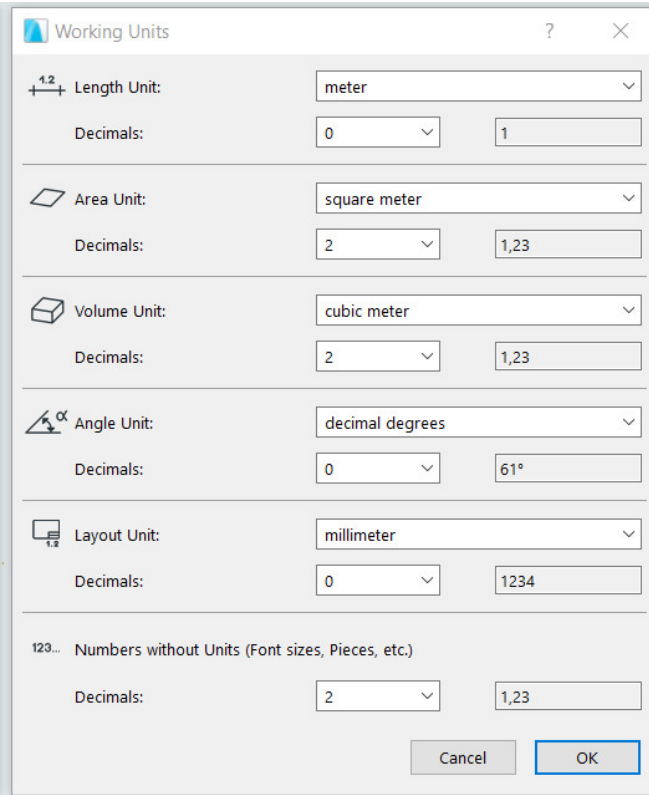
2.1.2) Attach screenshots



2.1.3) What is the coordinate reference system and projection and what unit of measure is used for the representation?

Cartesian coordinate reference system. The measurement unit can be customised, it is now in meters.

2.1.4) Attach screenshots

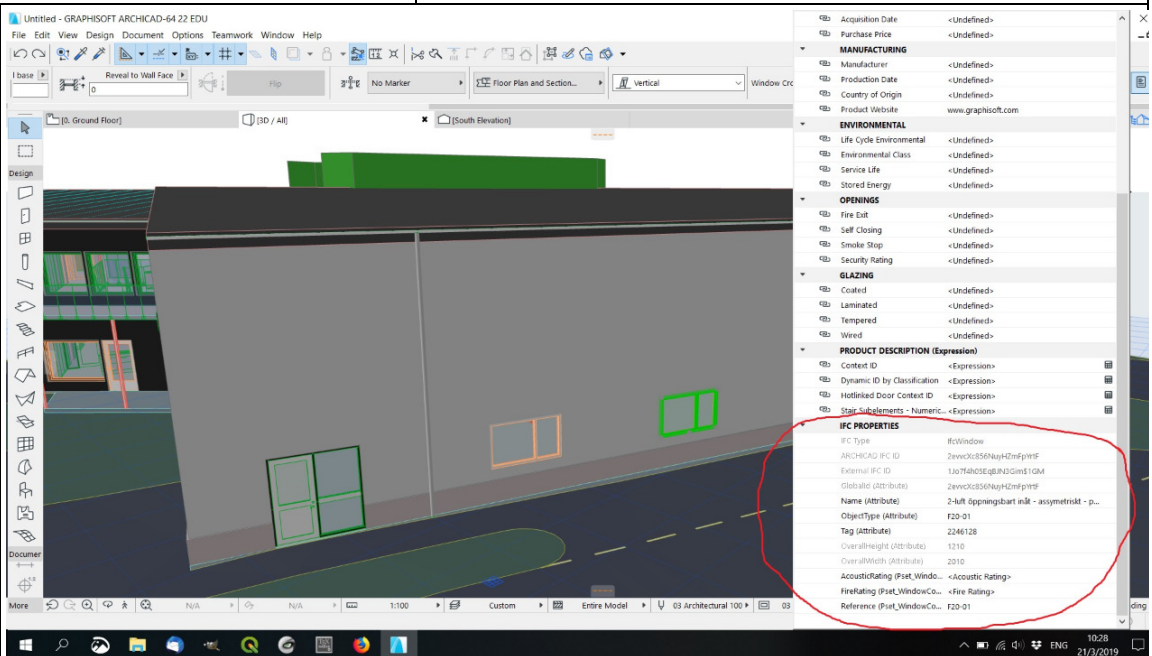


3.1) Are the "real-world" elevation values (heights) considered when locating the model in the software (z)?

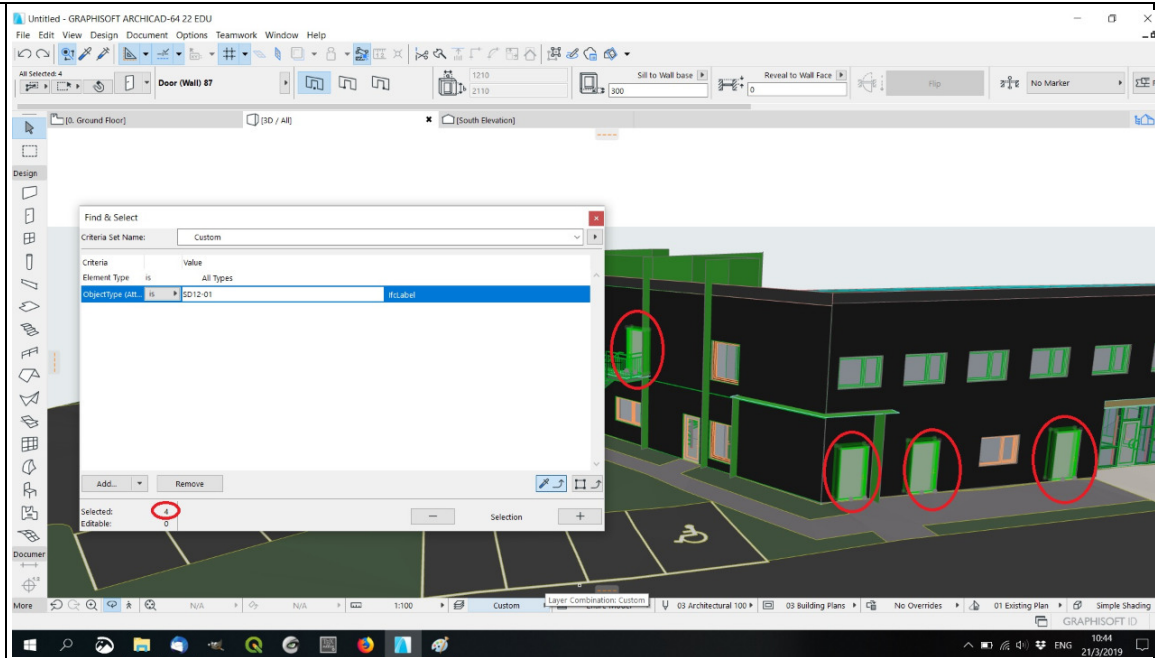
Yes

4.1) Is the model oriented correctly with respect to the true North?

The software does not have the necessary tools to determine this information

| | | |
|------------------------|--|---|
| Pro porti ons | 5.1) Does the model maintain its correct dimensions and proportions? | Yes |
| IFC defi nitions | 6.1) Is the eventual translation consistent with the IFC definitions? | Yes |
| Hierarchy | 7.1) Are the hierarchical relationships consistent with the IFC hierarchy? | Yes |
| | 7.2) short comments to the previous question (optional) | It is difficult to find out, however IFC classes are present from which the information can be extracted |
| Attri bute | 8.1) Are the attributes present in the IFC entities retained and consistent? | Yes |
| Relationships | 9.1) Are the relationships between the objects retained? | The software does not have the necessary tools to determine this information |
| | 9.2) short comments to the previous question (optional) | This is very difficult to check as it is very difficult to define relationships objects have documented before loading them into the software |
| Geo metr | 10.1) Is geometry read correctly? | Yes |
| | Other | Unclear question. Same colour for different faces directions |
| 2D/3 D | 12.1) Is it possible to view the model in 3D? | Yes |
| | 13.1) Is it possible to view the model in 2D? | Yes |
| Editing | 14.1) Is it possible to edit the model (attributes, geometry, other)? | Yes |
| | 14.1.1) What editing is possible (attributes, geometry, georeferencing, please add details)? | You can alter attribute values, but not geometries |
| Editing | 14.1.2) Attach screenshots |  |
| | 15.1) Is it possible to query the model and the attributes? | Yes |
| Querying | 15.1.1) What kinds of query are possible? | Attribute and spatial queries (clicking on elements) |

15.1.2) Attach screenshots



16.1) Is it possible to analyse the objects and the model?

Yes

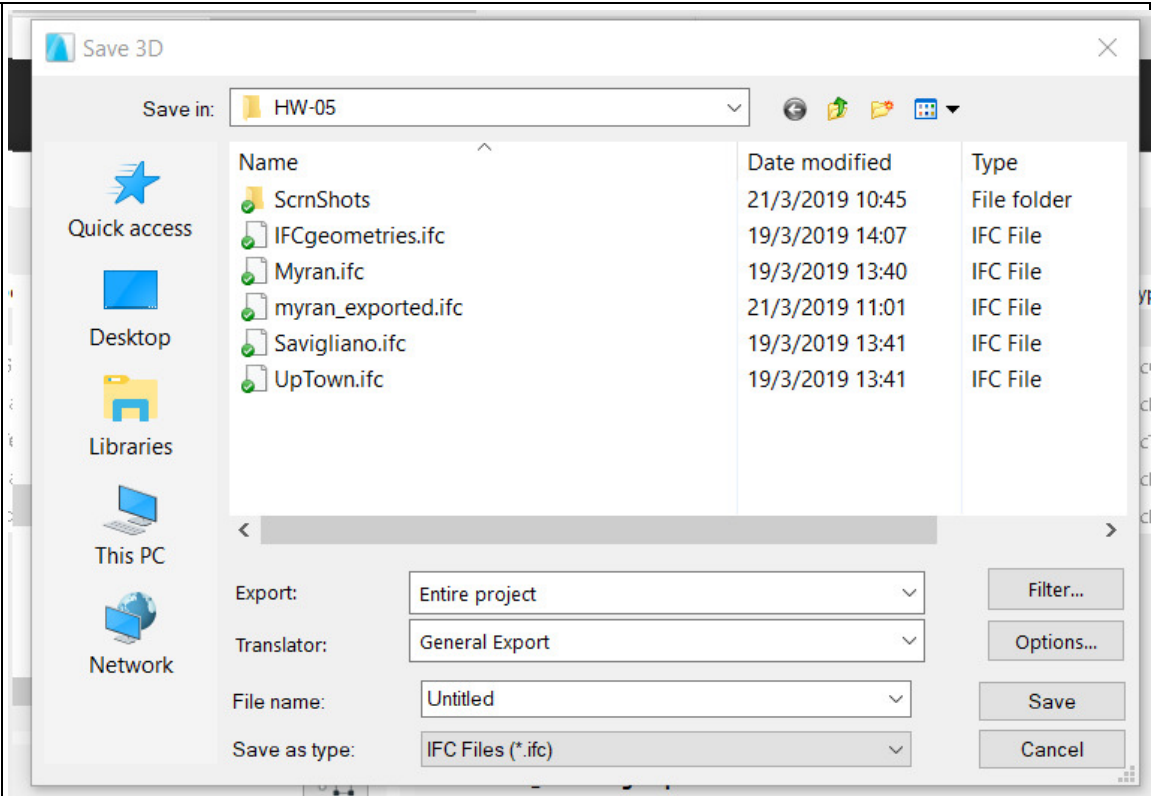
Analysis

16.1.1) What analysis are possible? Do you know if the results are reliable?

We found information about sunstudies and energy analysis possibilities for the software online. However, we were not able to perform these analysis ourselves.

| | | |
|---------------|--|---|
| | <p>16.1.2) Attach screenshots</p> | <p>https://www.graphisoft.com/archicad/open.../structural_workflows/ Vertaal deze pagina Increasingly, new developments in ARCHICAD emphasize effective collaboration ... analytical model for efficient structural analysis, design, and documentation.</p> <p>ARCHICAD Energy Evaluation - Run Energy Simulation and Review ... https://www.youtube.com/watch?v=qfgDshnwET8 Vertaal deze pagina 22 jun. 2012 - Geüpload door ARCHICAD ArchiCAD 16 New Features - Energy Evaluation Run Energy ... input data are obtained by meanings of ...  2:50</p> <p>04.ArchiCAD 16 Site Analysis - YouTube https://www.youtube.com/watch?v=QPaelLSrceE Vertaal deze pagina 25 jul. 2013 - Geüpload door OTENBuildingCourses ArchiCAD 16 Site Analysis. ... 04.ArchiCAD 16 Site Analysis. OTENBuildingCourses. Loading ...  8:36</p> <p>ARCHICAD Energy Evaluation - Working with Zones - YouTube https://www.youtube.com/watch?v=ntg0ffJc4r8 Vertaal deze pagina 2 mei 2012 - Geüpload door ARCHICAD ArchiCAD 16 New Features - Energy Evaluation Working with Zones GRAPHISOFT continues to innovate in ...  1:53</p> <p>Create Sun Study in ArchiCAD - YouTube https://www.youtube.com/watch?v=W5Cw1oxyaNI Vertaal deze pagina 29 jun. 2017 - Geüpload door four5six Short video explaining how to create a sun study in ArchiCAD.  8:36</p> |
| | <p>16.2) short comments to the previous question (optional)</p> | <p>As described before, we did not succeed in doing the analysis.</p> |
| <p>Export</p> | <p>You arrived at the end of the phase 1: "Import and manage the file in the software".Now choose:</p> | <p>The software has also export abilities</p> |
| | <p>17.1) Are any pre-processing or setting changes needed in the software to enable a consistent export?</p> | <p>Yes</p> |
| | <p>17.1.1) Can you add a short description of the steps involved in the pre-processing?</p> | <p>The extent of the project to be exported needs to be specified together with the translator.</p> |

17.1.2) Attach screenshots and files



18.1) Is it possible to choose the IFC model view definition (MVD) to be used when exporting the data?

No

18.2) short comments to the previous question (optional)

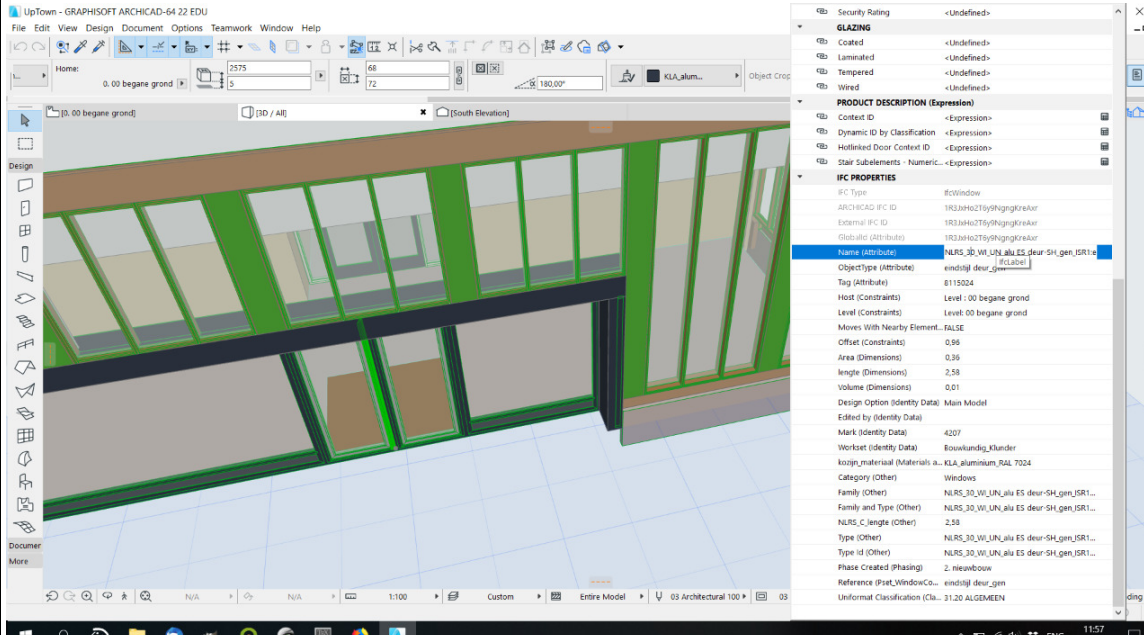
It is not possible to change the MVD

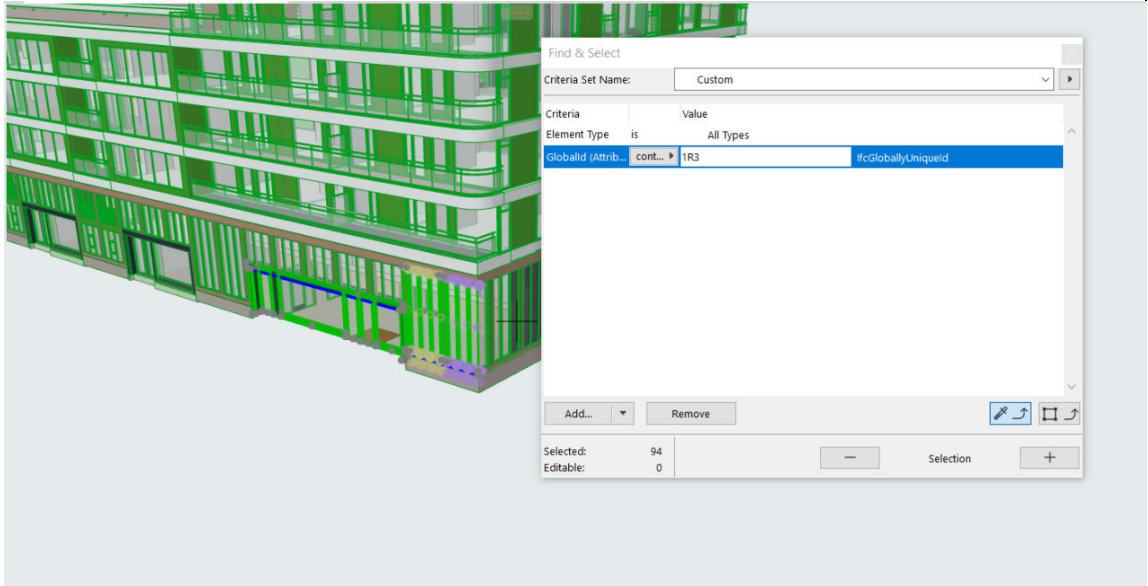
19) How long does it take for the data to be exported to IFC?

less then a minute

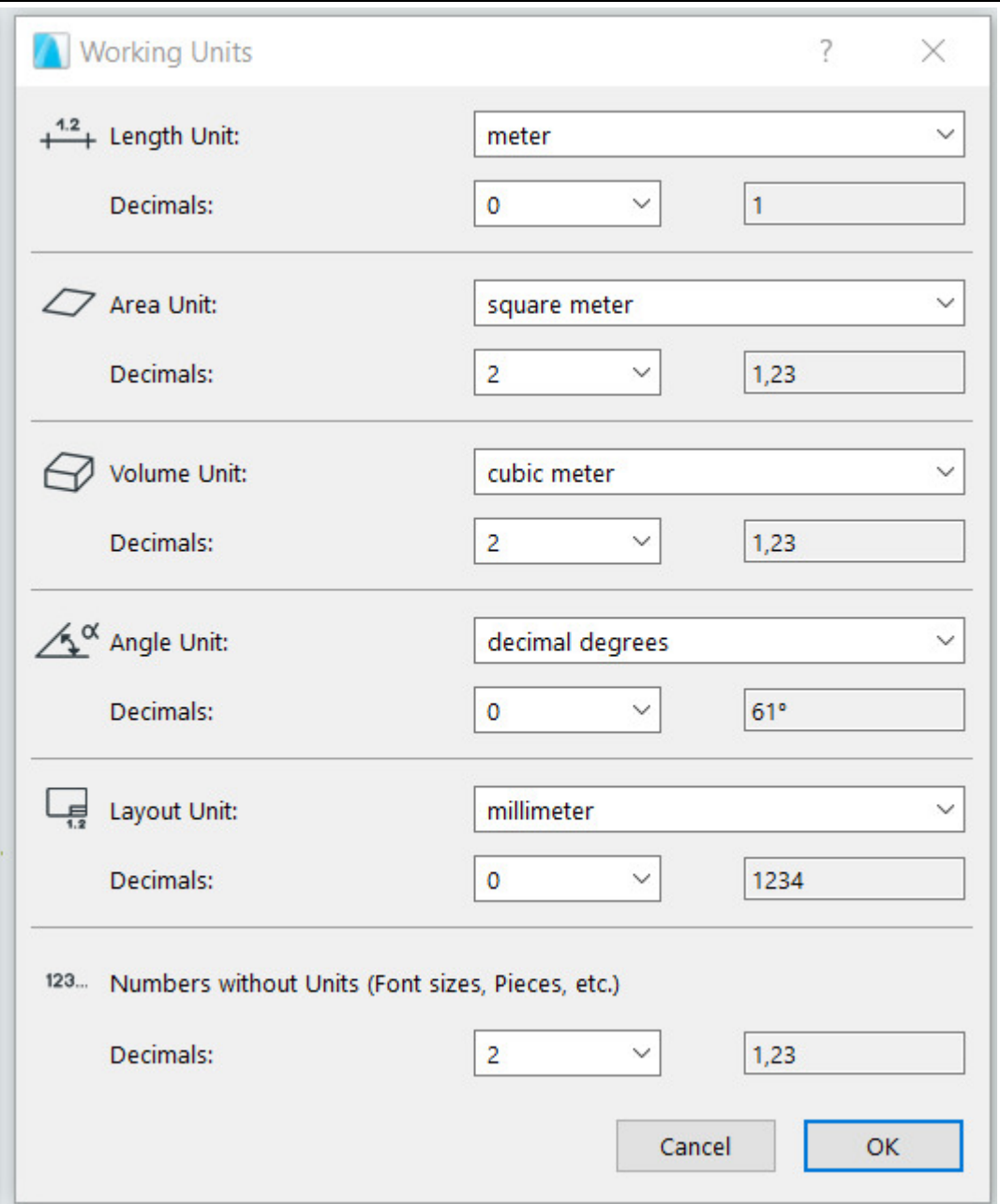
Test with UpTown.ifc

| | | |
|-----------------|---|----------------------------------|
| Performance | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | 1-5 minutes |
| | How long does it take, approximately, to:Zoom into the model to see more detail | it's almost immediate |
| | How long does it take, approximately, to:Pan the model | it's almost immediate |
| | How long does it take, approximately, to:Rotate the model | it's almost immediate |
| | How long does it take, approximately, to:Query an object | it's almost immediate |
| | How long does it take, approximately, to:Inspect the objects linked to the queried one (Element 3) through a relationship | the software does not allow this |
| Proporti | 24.1) Does the model maintain its correct dimensions and proportions? | Yes |
| IFC definitions | 25.1) Is the eventual translation consistent with the IFC definitions? | Yes |

| | | |
|---------------|--|--|
| Hierarchical | 26.1) Are the hierarchical relationships consistent with the IFC hierarchy? | Yes |
| Attribute | 27.1) Are the attributes present in the IFC entities retained and consistent? | Yes |
| Relationships | 28.1) Are the relationships between the objects retained? | The software does not have the necessary tools to determine this information |
| Geometry | 29.1) Is geometry read correctly? | Yes |
| | Other | unclear question: same colour for different faces directions |
| 2D/3D | 31.1) Is it possible to view the model in 3D? | Yes |
| | 32.1) Is it possible to view the model in 2D? | Yes |
| Editing | 33.1) Is it possible to edit the model (attributes, geometry, other)? | Yes |
| | 33.1.1) What editing is possible (attributes, geometry, georeferencing, please add details)? | You can alter attribute values, but not geometries |
| Editing | 33.1.2) Attach screenshots |  <p>The screenshot shows the ArchiCAD 22 interface. The main view displays a 3D architectural model of a building facade with a window. The window is highlighted in green. The Properties panel on the right shows the 'IFC PROPERTIES' for the selected window, including fields like 'Name', 'Object Type', 'Tag', 'Host', 'Level', 'Offset', 'Area', 'Length', and 'Volume'. The 'Name' field is highlighted in blue.</p> |
| Querying | 34.1) Is it possible to query the model and the attributes? | Yes |
| | 34.1.1) What kinds of query are possible? | Attribute and spatial queries (clicking on elements) |

| | | |
|-----------------|---|--|
| | <p>34.1.2) Attach screenshots</p> |  |
| <p>Analysis</p> | <p>35.1) Is it possible to analyse the objects and the model?</p> | <p>Yes</p> |
| | <p>35.1.1) What analysis are possible? Do you know if the results are reliable?</p> | <p>We found information about sunstudies and energy analysis possibilities for the software online. However, we were not able to perform these analysis ourselves.</p> |

35.1.2) Attach screenshots



35.2) short comments to the previous question (optional)

We could not fill in the previous question as we failed to execute an analysis

Export You arrived at the end of the phase 1: "Import and manage the file in the software".Now choose:

The software has also export abilities

36) How long does it take for the data to be exported to IFC?

more than one hour

Test with Savigliano.ifc

How long does it take, approximately, to:Import (and visualise if the software allows it) the model

it crashes without completing the operation

Graphisoft ArchiCAD 21 – Windows 10


Proprietary

BIM

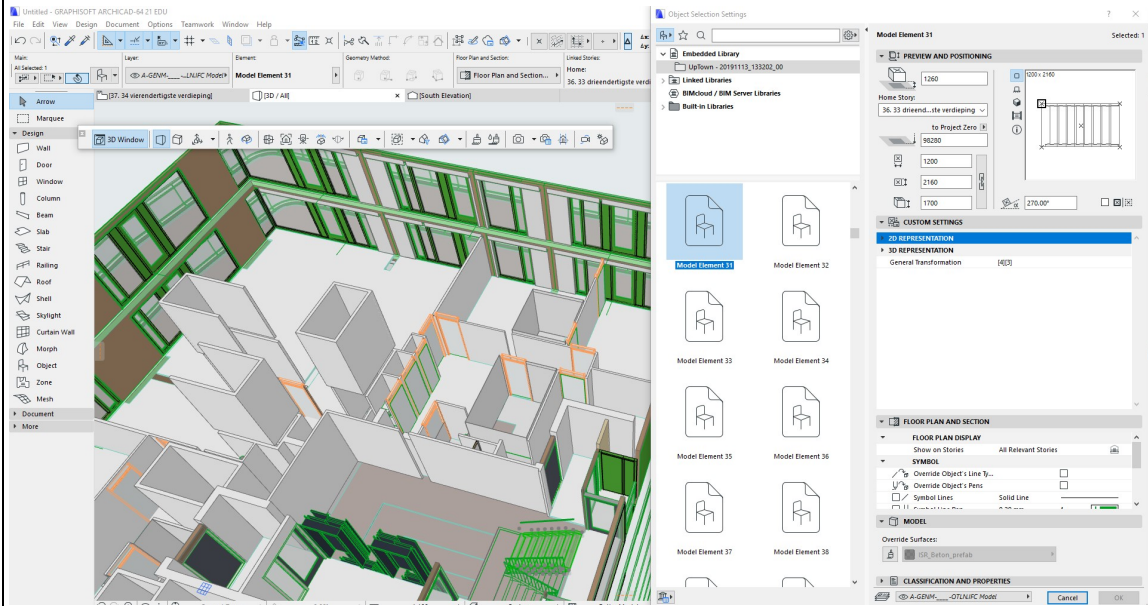
1 - Very beginner user (it is nearly the first time you use it)

ArchiCAD

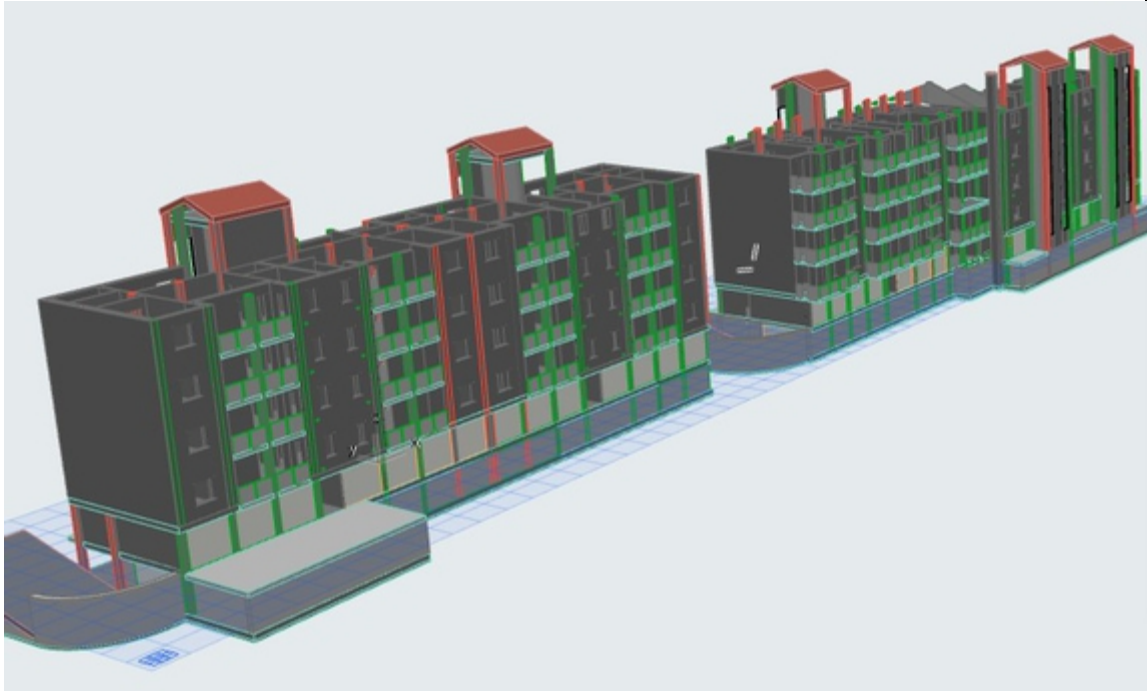
| | | | | | | | |
|----------------------------|--|-------------------------------|---|---------------------------------|---------------------------|---|-----------------------|
| Software | Software Name [version] | ArchiCAD [ArchiCAD 21] | | Software house | | Graphisoft | |
| | Proprietary or open source software? | | | Kind of software | | | |
| proprietary | | | BIM | | | | |
| Computer | Model and year | Operating system | CPU | GPU | Memory (RAM) | Hard drive capacity | Hard drive free space |
| | Asus VivoBook Pro N552VW-FY217T 2016 | Windows 10 64X | Intel Core i7-6700HQ | GeForce GTX 960M | 8 | 256 | 56 |
| Certification | IFC import certification status | Import certification date | Import certification program | IFC export certification status | Export certification date | Export certification program | |
| | certified in (date) | 2013-03-12 | IFC Coordination View 2.0 (Certification 2.0) and the buildingSMART alliance 2013 COBie Challenge | certified in (date) | 2013-03-12 | IFC Coordination View 2.0 (Certification 2.0) and the buildingSMART alliance 2013 COBie Challenge | |
| Test with Myran.ifc | | | | | | | |
| Performance | How long does it take, approximately, to: Import (and visualise if the software allows it) the model | | | 1-5 minutes | | | |
| | How long does it take, approximately, to: Zoom into the model to see more detail | | | it's almost immediate | | | |
| | How long does it take, approximately, to: Pan the model | | | it's almost immediate | | | |
| | How long does it take, approximately, to: Rotate the model | | | it's almost immediate | | | |
| | How long does it take, approximately, to: Query an object | | | it's almost immediate | | | |
| | How long does it take, approximately, to: Inspect the objects linked to the queried one through a relationship | | | it's almost immediate | | | |
| Georeferencing | 2.1) Are the world (projected) coordinates taken into account when locating the model in the software's coordinate reference system? | | | Yes | | | |
| Height | 3.1) Are the "real-world" elevation values (heights) considered when locating the model in the software (z)? | | | Yes | | | |
| Orientation | 4.1) Is the model oriented correctly with respect to the true North? | | | Yes | | | |
| Proportions | 5.1) Does the model maintain its correct dimensions and proportions? | | | Yes | | | |
| IFC definitions | 6.1) Is the eventual translation consistent with the IFC definitions? | | | Yes | | | |

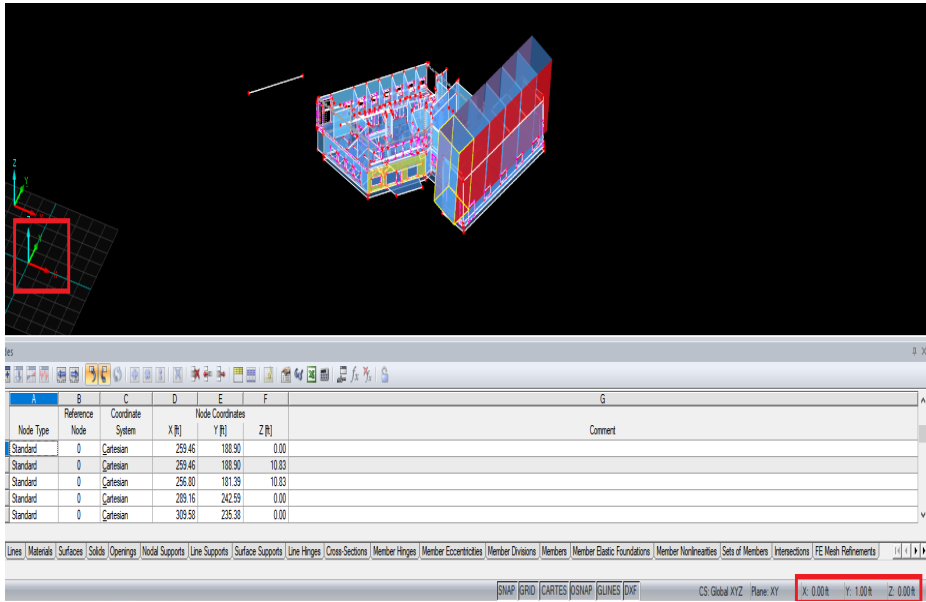
| | | |
|------------|--|---|
| Hier arch | 7.1) Are the hierarchical relationships consistent with the IFC hierarchy? | Yes |
| Attri bute | 8.1) Are the attributes present in the IFC entities retained and consistent? | Yes |
| R el t | 9.1) Are the relationships between the objects retained? | Yes |
| Geometry | 10.1) Is geometry read correctly? | Yes |
| | 10.2) short comments to the previous question (optional) | The software doesn't explicitly show this information. However, with visual inspection and adding and removing elements, I didn't find any reason to expect that the geometry was not read correctly. |
| 2D/3 D | 12.1) Is it possible to view the model in 3D? | Yes |
| | 13.1) Is it possible to view the model in 2D? | Yes |
| Editi ng | 14.1) Is it possible to edit the model (attributes, geometry, other)? | No |
| Querying | 15.1) Is it possible to query the model and the attributes? | Yes |
| | 15.1.1) What kinds of query are possible? | \- selecting all walls (and then hiding them or show them collectively). this can also be done to all other elements (slabs, stairs, windows and so on). - querying for an element based on its IFC id. then the attributes of the elements can be viewed. |
| | 15.1.2) Attach screenshots |  |

| | | |
|-----------------------------|--|--|
| | 15.2) short comments to the previous question (optional) | Note; Archicad is software used mostly by designers. Hence querying is not the main priority (unlike navigating for example). therefore there is no specific querying tool in ArchiCAD. instead, there are multiple ways to query and these ways are integrated within the different tools, and I don't believe I checked all of them. |
| Analysis | 16.1) Is it possible to analyse the objects and the model? | No |
| | 16.1.1) What analysis are possible? Do you know if the results are reliable? | I couldn't perform any of the analysis that I am aware of. |
| | 16.1.2) Attach screenshots | |
| | 16.2) short comments to the previous question (optional) | It would be helpful if you give some examples of the expected analysis. then I can try to perform these analyses |
| | You arrived at the end of the phase 1: "Import and manage the file in the software".Now choose: | The software has also export abilities |
| Export | 17.1) Are any pre-processing or setting changes needed in the software to enable a consistent export? | No |
| | 18.1) Is it possible to choose the IFC model view definition (MVD) to be used when exporting the data? | Yes |
| | 18.1.2) Is it possible to add a customised MVD to be used for exporting IFC? | Yes |
| | 18.1.2.1) What kind of customisation is possible? | additional filtering for the element classes |
| | 19) How long does it take for the data to be exported to IFC? | less then a minute |
| Test with UpTown.ifc | | |
| Performance | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | 5-20 minutes |
| | How long does it take, approximately, to:Zoom into the model to see more detail | it's almost immediate |

| | | |
|--------------------|---|---|
| | How long does it take, approximately, to:Pan the model | it's almost immediate |
| | How long does it take, approximately, to:Rotate the model | it's almost immediate |
| | How long does it take, approximately, to:Inspect the objects linked to the queried one (Element 3) through a relationship | the software does not allow this |
| | Please report on any errors the software gives when importing the file. | Elements have been created and/or have changed their position on currently unseen stories |
| Pro porti on | 24.1) Does the model maintain its correct dimensions and proportions? | Yes |
| IFC definitions | 25.1) Is the eventual translation consistent with the IFC definitions? | No |
| | 25.1.1) What changes / inconsistencies / errors / other issues were noted? | The software was able to read and visualize all classes correctly. However, it was not able to correctly define each class; for example, a stair is presented correctly but does not have the definition and attributes of a stair. |
| | 25.1.2) Attach screenshots |  |
| Hier arch | 26.1) Are the hierarchical relationships consistent with the IFC hierarchy? | The software does not have the necessary tools to determine this information |
| Attributes | 27.1) Are the attributes present in the IFC entities retained and consistent? | No |
| | 27.1.1) What changes / inconsistencies / errors / other issues were noted? | some objects are not recognized correctly in terms of attributes and semantics |
| | 27.1.2) Attach screenshots | See 25.1.2 |
| Rel atio n | 28.1) Are the relationships between the objects retained? | The software does not have the necessary tools to determine this information |
| G e o | 29.1) Is geometry read correctly? | Yes |
| N o | 30.1) Did the normals change? | No |
| 2D/3 D | 31.1) Is it possible to view the model in 3D? | Yes |
| | 32.1) Is it possible to view the model in 2D? | Yes |
| A n a | 35.1) Is it possible to analyse the objects and the model? | No |

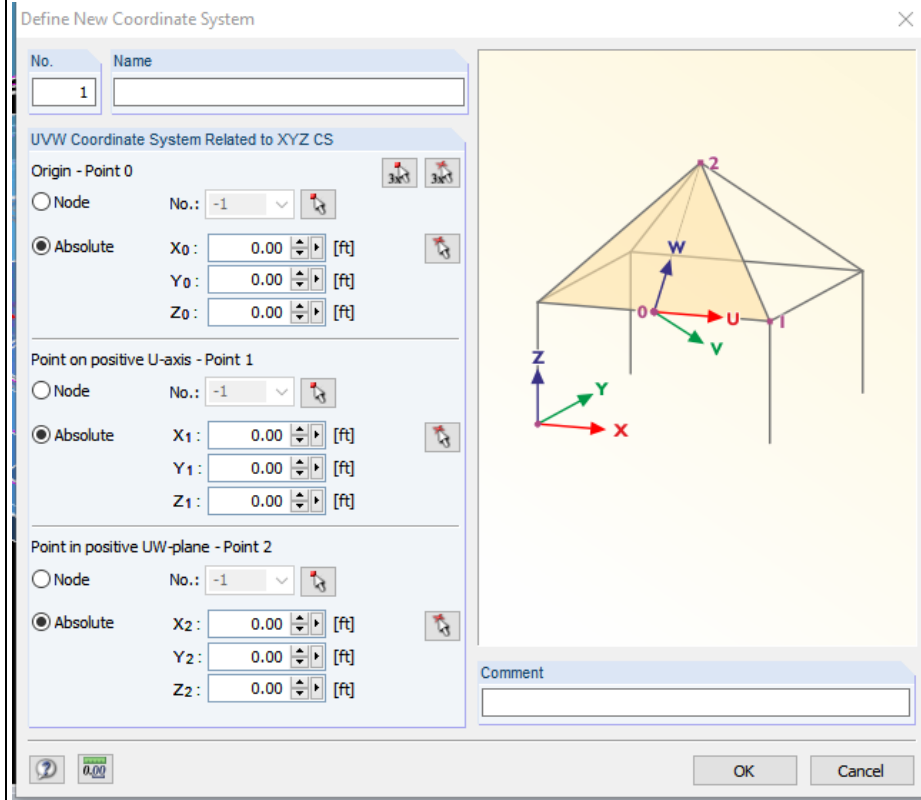
| | | |
|---------------------------------|---|--|
| Export | You arrived at the end of the phase 1: "Import and manage the file in the software".Now choose: | The software has also export abilities to IFC |
| | 36) How long does it take for the data to be exported to IFC? | 20 minutes-1 hour |
| | 36.1) Comments to the previous question (optional) | Some elements could not be exported due to missing geometry |
| Test with Savigliano.ifc | | |
| Performance | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | less than a minute |
| | How long does it take, approximately, to:Zoom into the model to see more detail | it's almost immediate |
| | How long does it take, approximately, to:Pan the model | it's almost immediate |
| | How long does it take, approximately, to:Rotate the model | it's almost immediate |
| | How long does it take, approximately, to:Query an object | the software does not allow this |
| | How long does it take, approximately, to:Inspect the objects linked to the queried one through a relationship | the software does not allow this |
| | 38) Please report on any errors the software gives when importing the file. | inconsistency found during IFC file read operation / Some elements could not be imported during to missing or incorrect geometry |
| Georeferencing | 40.1) Are the world (projected) coordinates taken into account when locating the model in the software's coordinate reference system? | Yes |
| Height | 41.1) Are the "real-world" elevation values (heights) considered when locating the model in the software (z)? | Yes |
| Orientation | 42.1) Is the model oriented correctly with respect to the true North? | Yes |
| Proportions | 43.1) Does the model maintain its correct dimensions and proportions? | Yes |
| IFC definitions | 44.1) Is the eventual translation consistent with the IFC definitions? | No |
| | 44.1.1) What changes / inconsistencies / errors / other issues were noted? | Some classes/layers are missing, most notably are the roofs and windows |

| | | |
|--------|--|--|
| | 44.1.2) Attach screenshots |  |
| Other | | if an entity is not missing then its attributes are retained |
| Ratio | 47.1) Are the relationships between the objects retained? | The software does not have the necessary tools to determine this information |
| Export | You arrived at the end of the phase 1: "Import and manage the file in the software". Now choose: | The software has also export abilities to IFC |
| | 55) How long does it take for the data to be exported to IFC? | less than a minute |

| Georeferencing | 2.1) Are the world (projected) coordinates taken into account when locating the model in the software's coordinate reference system? | No | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-----------------|--|--|------------------|----------------|-------------------|------------------|--|--|---------|--|--|--|--------|--------|--------|--|----------|---|-----------|--------|--------|------|--|----------|---|-----------|--------|--------|-------|--|----------|---|-----------|--------|--------|-------|--|----------|---|-----------|--------|--------|------|--|----------|---|-----------|--------|--------|------|
| | 2.1.1) Where is the origin of the model coordinate reference system as imported in the software? | At the blue reference point | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 2.1.2) Attach screenshots |  <table border="1"> <thead> <tr> <th>Node Type</th> <th>Reference Node</th> <th>Coordinate System</th> <th colspan="3">Node Coordinates</th> <th>Comment</th> </tr> <tr> <th></th> <th></th> <th></th> <th>X [ft]</th> <th>Y [ft]</th> <th>Z [ft]</th> <th></th> </tr> </thead> <tbody> <tr> <td>Standard</td> <td>0</td> <td>Cartesian</td> <td>253.45</td> <td>188.90</td> <td>0.00</td> <td></td> </tr> <tr> <td>Standard</td> <td>0</td> <td>Cartesian</td> <td>253.45</td> <td>188.90</td> <td>10.83</td> <td></td> </tr> <tr> <td>Standard</td> <td>0</td> <td>Cartesian</td> <td>256.00</td> <td>181.39</td> <td>10.83</td> <td></td> </tr> <tr> <td>Standard</td> <td>0</td> <td>Cartesian</td> <td>289.16</td> <td>242.59</td> <td>0.00</td> <td></td> </tr> <tr> <td>Standard</td> <td>0</td> <td>Cartesian</td> <td>308.50</td> <td>235.38</td> <td>0.00</td> <td></td> </tr> </tbody> </table> | Node Type | Reference Node | Coordinate System | Node Coordinates | | | Comment | | | | X [ft] | Y [ft] | Z [ft] | | Standard | 0 | Cartesian | 253.45 | 188.90 | 0.00 | | Standard | 0 | Cartesian | 253.45 | 188.90 | 10.83 | | Standard | 0 | Cartesian | 256.00 | 181.39 | 10.83 | | Standard | 0 | Cartesian | 289.16 | 242.59 | 0.00 | | Standard | 0 | Cartesian | 308.50 | 235.38 | 0.00 |
| Node Type | Reference Node | Coordinate System | Node Coordinates | | | Comment | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | X [ft] | Y [ft] | Z [ft] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Standard | 0 | Cartesian | 253.45 | 188.90 | 0.00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Standard | 0 | Cartesian | 253.45 | 188.90 | 10.83 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Standard | 0 | Cartesian | 256.00 | 181.39 | 10.83 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Standard | 0 | Cartesian | 289.16 | 242.59 | 0.00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Standard | 0 | Cartesian | 308.50 | 235.38 | 0.00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 2.1.3) What is the coordinate reference system and projection and what unit of measure is used for the representation? | Local right-handed coordinate system with feet as unit of measurement | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 2.1.4) Attach screenshots | See screenshot from 2.1.2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Height | 3.1) Are the "real-world" elevation values (heights) considered when locating the model in the software (z)? | No | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 3.1.1) What is the elevation value of the origin of the model coordinate reference system as imported in the software? | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 3.1.2) Attach screenshots | See figure from 2.1.2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 3.1.3) What is the height reference system? | Local in feet | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 3.1.4) Attach screenshots | See figure from 2.1.2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Orientation | 4.1) Is the model oriented correctly with respect to the true North? | Yes | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Proportions | 5.1) Does the model maintain its correct dimensions and proportions? | Yes | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| IFC definitions | 6.1) Is the eventual translation consistent with the IFC definitions? | The software does not have the necessary tools to determine this information | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Hierarchy | 7.1) Are the hierarchical relationships consistent with the IFC hierarchy? | The software does not have the necessary tools to determine this information | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Attributes | 8.1) Are the attributes present in the IFC entities retained and consistent? | The software does not have the necessary tools to determine this information | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Relationships | 9.1) Are the relationships between the objects retained? | The software does not have the necessary tools to determine this information | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

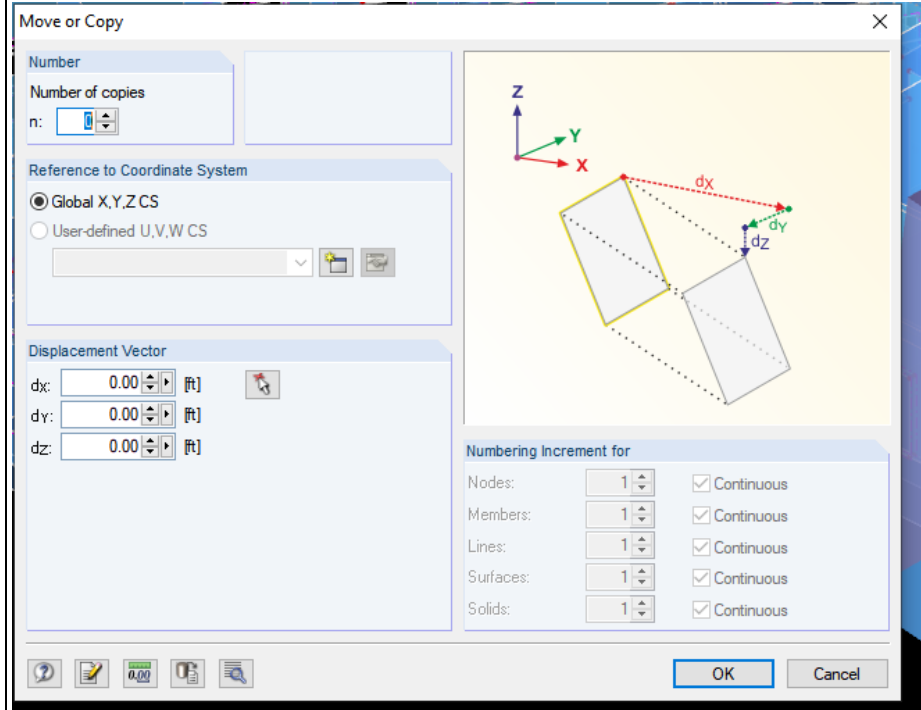
| | | |
|-----------|--|--|
| Geometric | 10.1) Is geometry read correctly? | Yes |
| Normals | 11.1) Did the normals change? | No |
| 2D/3D | 12.1) Is it possible to view the model in 3D? | Yes |
| | 13.1) Is it possible to view the model in 2D? | No |
| Editing | 14.1) Is it possible to edit the model (attributes, geometry, other)? | Yes |
| | 14.1.1) What editing is possible (attributes, geometry, georeferencing, please add details)? | You can create a user defined coordinate system. Move, mirror, rotate geometry, edit nodes or create new nodes, lines, solids etc.. The attributes can't be seen and thus also not edited. |

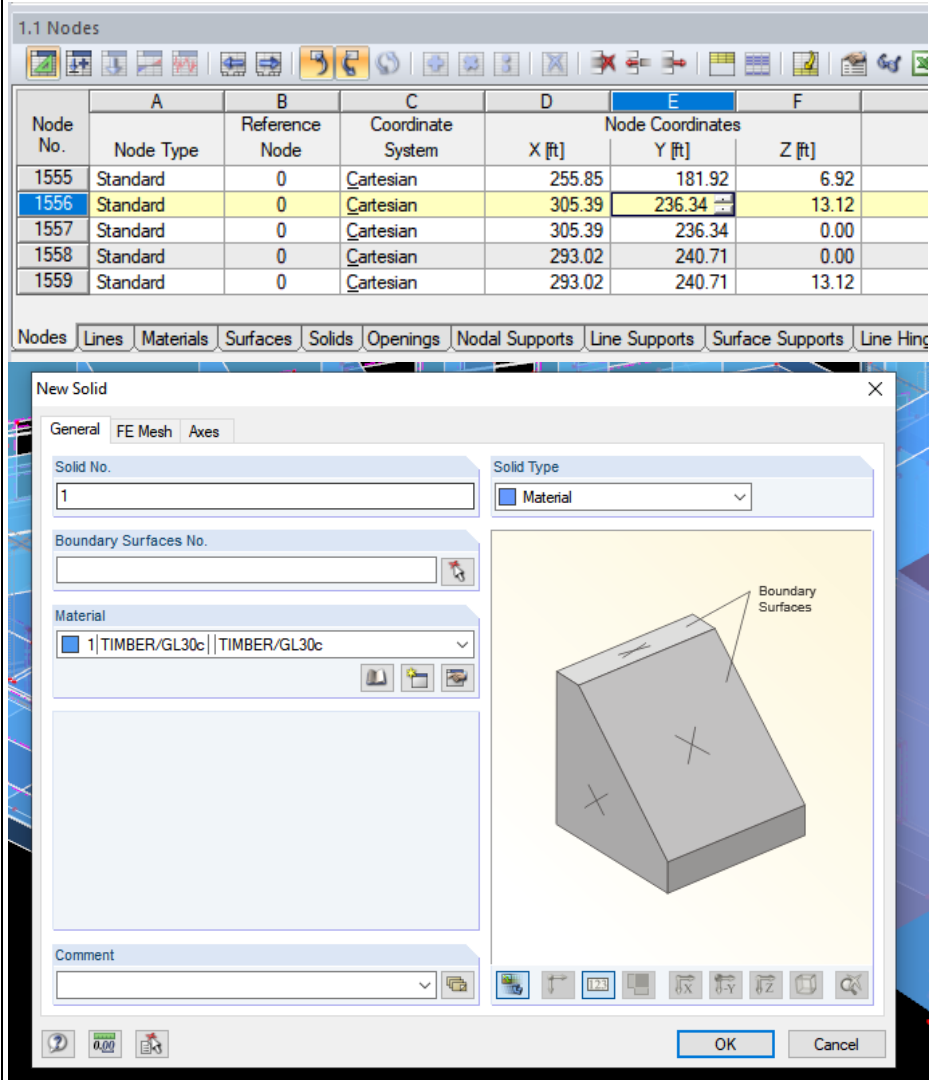
Edit CRS



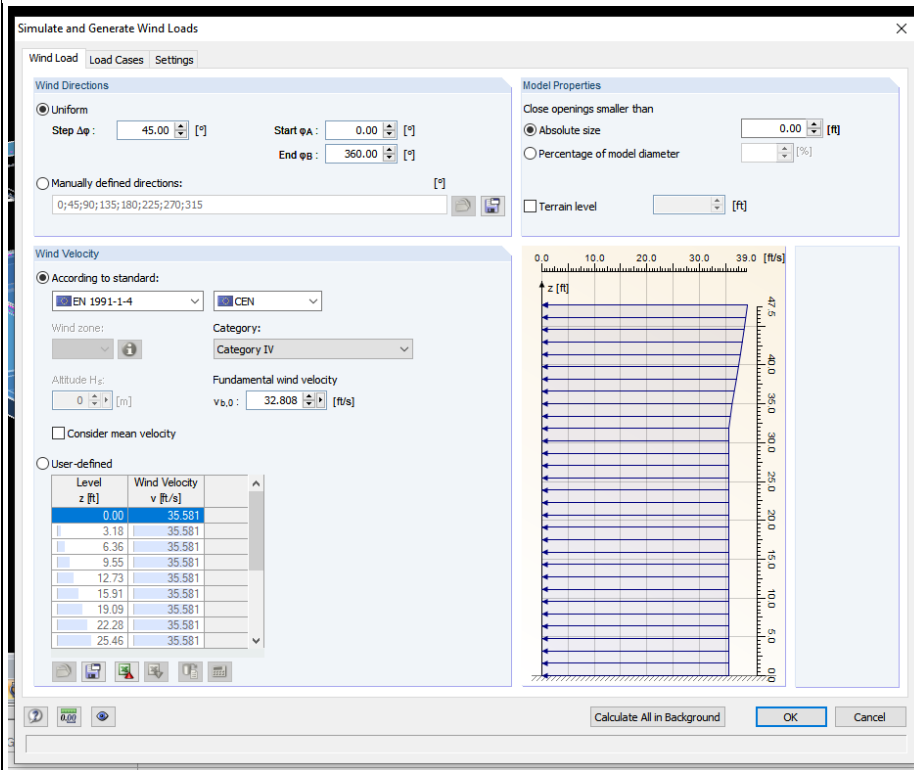
14.1.2) Attach screenshots

Editing geometry

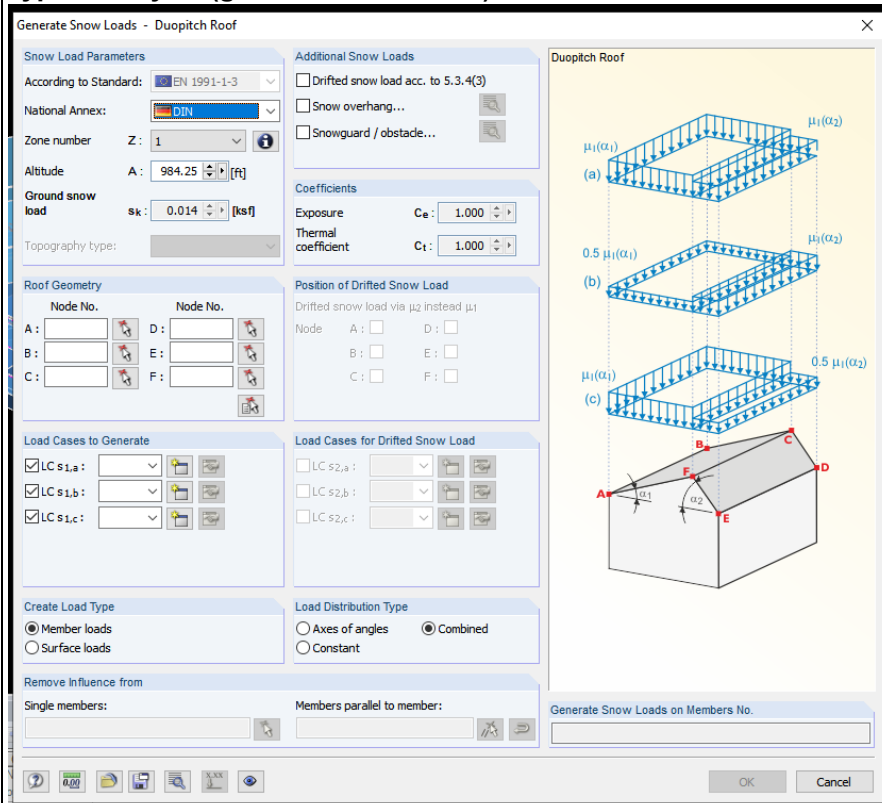




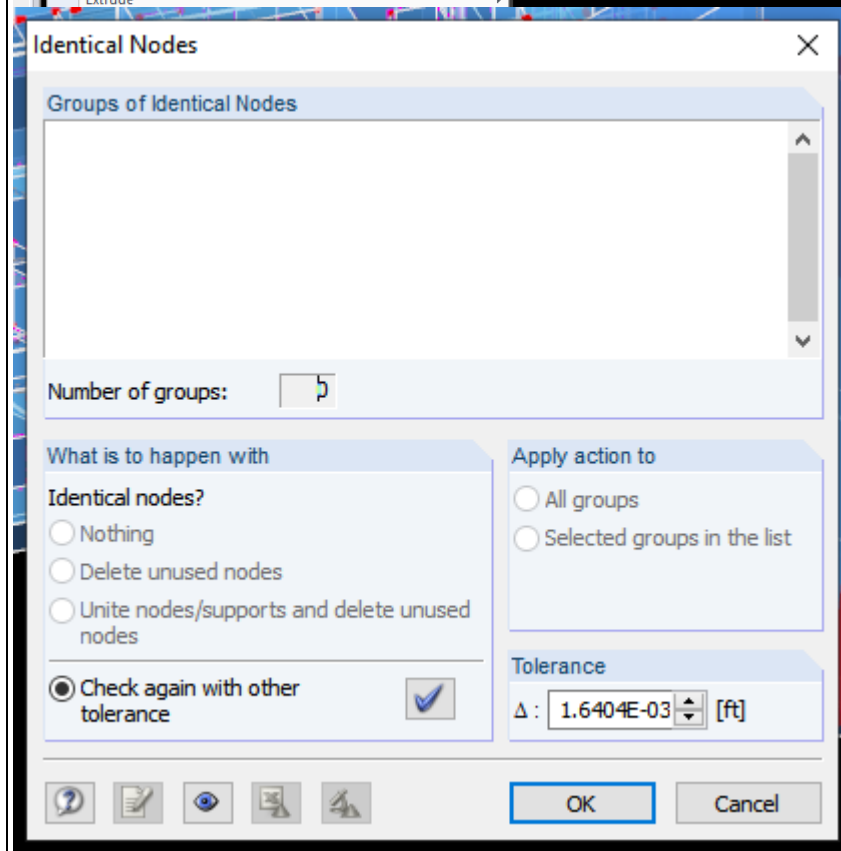
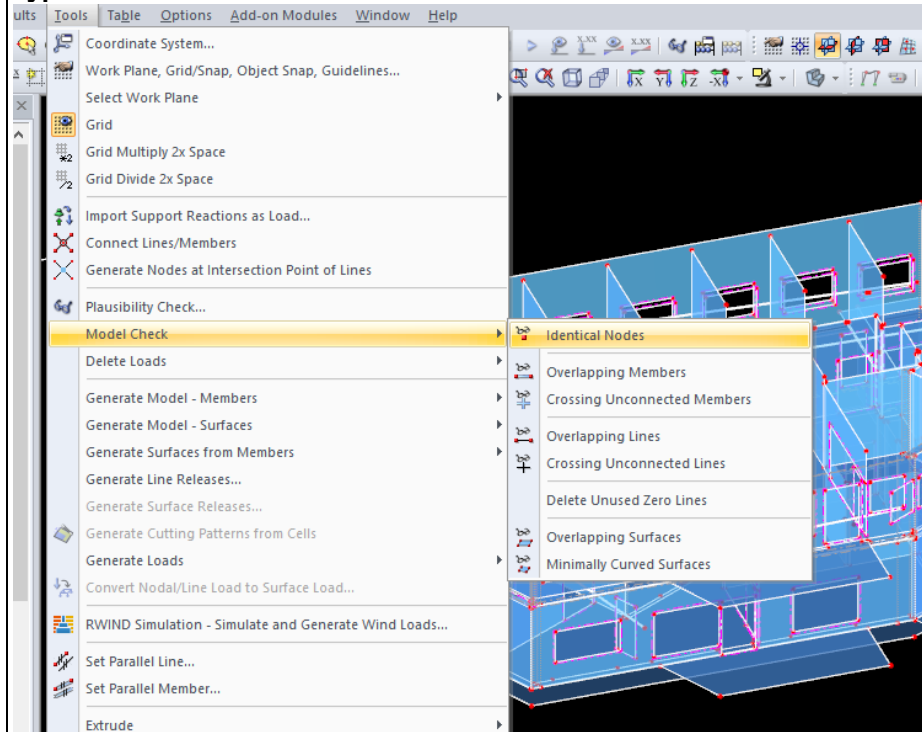
| | | |
|----------|--|---|
| ue | 15.1) Is it possible to query the model and the attributes? | No |
| Analysis | 16.1) Is it possible to analyse the objects and the model? | Yes, both analysis about the model and its performances are possible (type 1 and 2) |
| | 16.1.1) What analysis are possible? Do you know if the results are reliable? | Wind load analysis, snow load analysis, model geometry checks. I don't know if it's reliable. |
| | 16.1.2) Attach screenshots | Type 1 analysis (simulate and generate wind loads) |

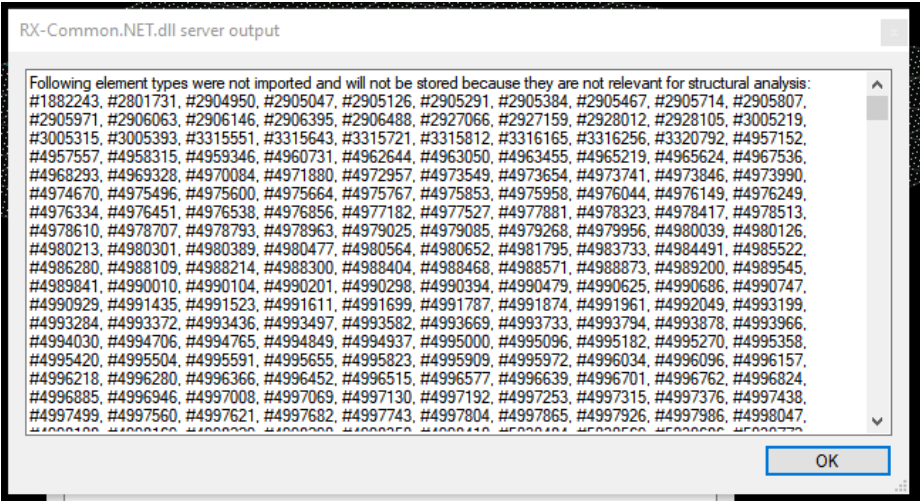


Type 1 analysis (generate snow loads)



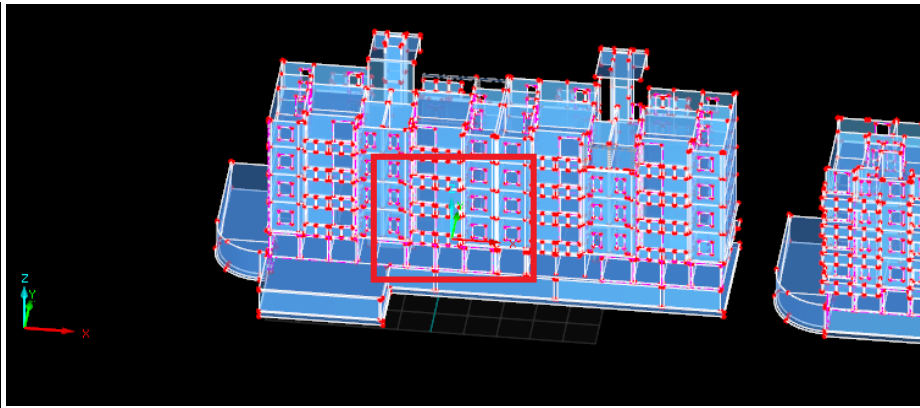
Type 2

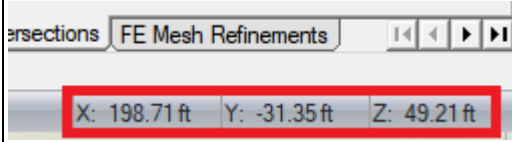


| | | |
|-----------------------------|--|--|
| | 16.1.3) Time required to perform the analysis about the model itself (type 1) | It's almost immediate |
| | 16.1.3) Time required to perform the analysis about the model performances (type2) | It's almost immediate |
| | 16.2) short comments to the previous question (optional) | Not sure if anything happened with type 2 analysis, as I didn't see anything changing |
| Export | You arrived at the end of the phase 1: "Import and manage the file in the software".Now choose: | The software has also export abilities to IFC |
| | 17.1) Are any pre-processing or setting changes needed in the software to enable a consistent export? | No |
| | 18.1) Is it possible to choose the IFC model view definition (MVD) to be used when exporting the data? | No |
| | 19) How long does it take for the data to be exported to IFC? | less than a minute |
| Test with UpTown.ifc | | |
| Performance | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | 5-20 minutes |
| | How long does it take, approximately, to:Zoom into the model to see more detail | it's almost immediate |
| | How long does it take, approximately, to:Pan the model | it's almost immediate |
| | How long does it take, approximately, to:Rotate the model | it's almost immediate |
| | How long does it take, approximately, to:Query an object | it's almost immediate |
| | Please report on any errors the software gives when importing the file. | <p>Same as with Myran – some objects were not imported.</p>  |
| Proporti | 24.1) Does the model maintain its correct dimensions and proportions? | Yes |
| IFC def. | 25.1) Is the eventual translation consistent with the IFC definitions? | The software does not have the necessary tools to determine this information |
| Hier arch | 26.1) Are the hierarchical relationships consistent with the IFC hierarchy? | The software does not have the necessary tools to determine this information |

| | | |
|-----------|---|--|
| Attribute | 27.1) Are the attributes present in the IFC entities retained and consistent? | The software does not have the necessary tools to determine this information |
| Relation | 28.1) Are the relationships between the objects retained? | The software does not have the necessary tools to determine this information |
| Geometry | 29.1) Is geometry read correctly? | Yes |
| Normals | 30.1) Did the normals change? | No |
| 2D/3D | 31.1) Is it possible to view the model in 3D? | Yes |
| | 32.1) Is it possible to view the model in 2D? | No |
| Export | You arrived at the end of the phase 1: "Import and manage the file in the software".Now choose: | The software has also export abilities to IFC |
| | 36) How long does it take for the data to be exported to IFC? | less than a minute |

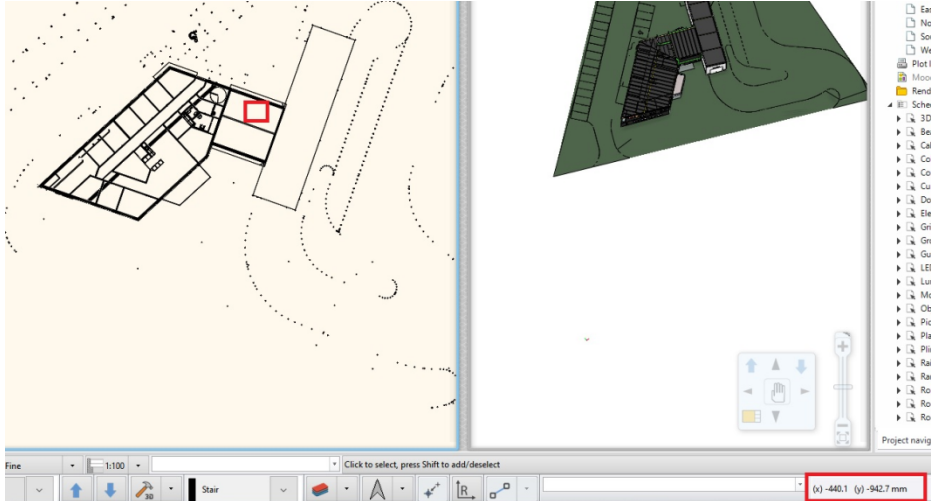
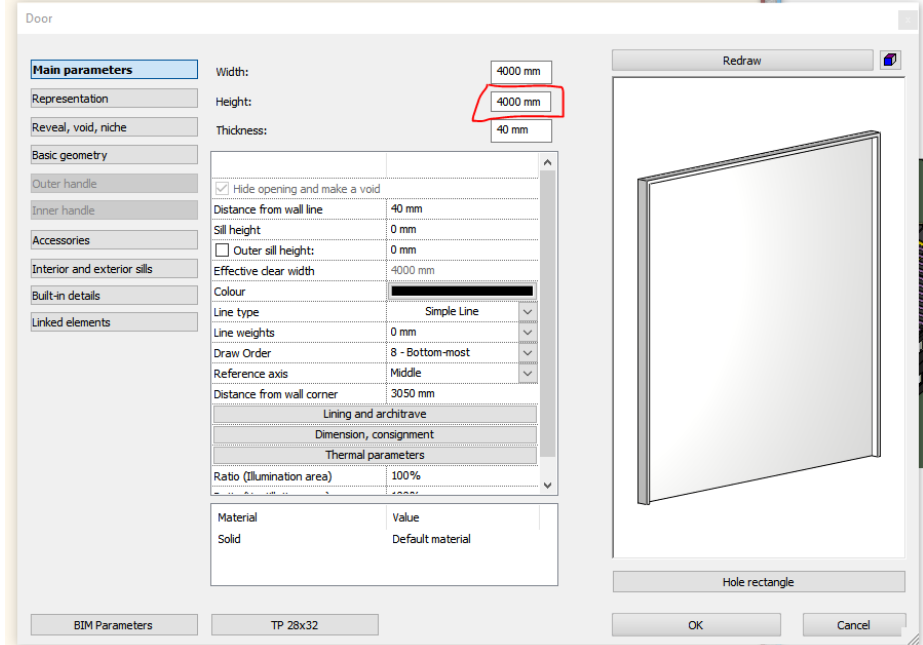
Test with Savigliano.ifc

| | | |
|---|---|--|
| Performance | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | less than a minute |
| | How long does it take, approximately, to:Zoom into the model to see more detail | it's almost immediate |
| | How long does it take, approximately, to:Pan the model | it's almost immediate |
| | How long does it take, approximately, to:Rotate the model | it's almost immediate |
| | How long does it take, approximately, to:Query an object | it's almost immediate |
| | How long does it take, approximately, to:Inspect the objects linked to the queried one through a relationship | the software does not allow this |
| | 38) Please report on any errors the software gives when importing the file. | Same as for Myran and UpTown |
| Georeferencing | 40.1) Are the world (projected) coordinates taken into account when locating the model in the software's coordinate reference system? | No |
| | 40.1.1) Where is the origin of the model coordinate reference system as imported in the software? | At the blue reference point |
| | 40.1.2) Attach screenshots |  |
| 40.1.3) What is the coordinate reference system and projection and what unit of measure is used for the representation? | Local right-handed with feet as unit of measurement | |

| | | |
|-----------------|---|---|
| | 40.1.4) Attach screenshots |  <p>Also see screenshot of 40.1.2</p> |
| Height | 41.1) Are the "real-world" elevation values (heights) considered when locating the model in the software (z)? | No |
| Orientation | 42.1) Is the model oriented correctly with respect to the true North? | Yes |
| Proportions | 43.1) Does the model maintain its correct dimensions and proportions? | Yes |
| IFC definitions | 44.1) Is the eventual translation consistent with the IFC definitions? | The software does not have the necessary tools to determine this information |
| Hierarchy | 45.1) Are the hierarchical relationships consistent with the IFC hierarchy? | The software does not have the necessary tools to determine this information |
| Attributes | 46.1) Are the attributes present in the IFC entities retained and consistent? | The software does not have the necessary tools to determine this information |
| Relationships | 47.1) Are the relationships between the objects retained? | The software does not have the necessary tools to determine this information |
| Geometry | 48.1) Is geometry read correctly? | Yes |
| Normals | 49.1) Did the normals change? | Yes |
| 2D/3D | 50.1) Is it possible to view the model in 3D? | Yes |
| | 51.1) Is it possible to view the model in 2D? | No |
| Export | You arrived at the end of the phase 1: "Import and manage the file in the software". Now choose: | The software has also export abilities to IFC |
| | 36) How long does it take for the data to be exported to IFC? | less than a minute |

ARCHLine.XP

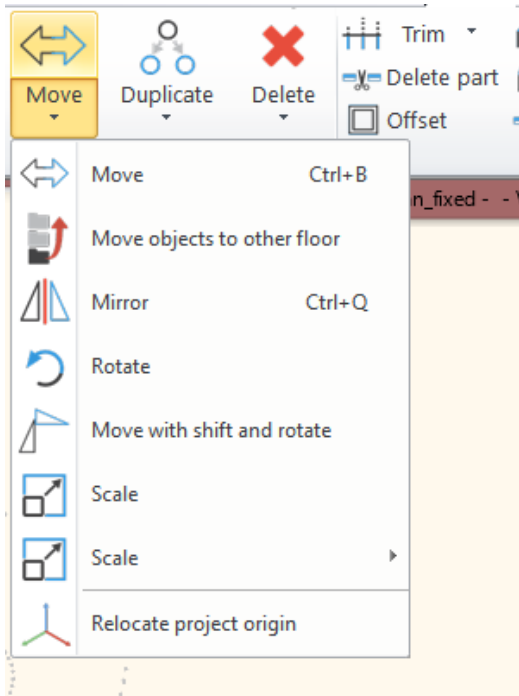
| | | | | | | | |
|---|--|---------------------------|------------------------------|----------------------------------|---------------------------|------------------------------|-----------------------|
| Software | Software Name [version] | ARCHLine.XP [2019] | | Software house | CadLine Ltd | | |
| | Proprietary or open source software? | | | Kind of software | | | |
| | proprietary | | | BIM | | | |
| Computer | Model and year | Operating system | CPU | GPU | Memory (RAM) | Hard drive capacity | Hard drive free space |
| | Lenovo Thinkpad P1 Gen 2 (2019) | Windows 10 Home 64-bit | Intel i7-9750H @ 2.60GHz | Nvidia Quadro T1000 | 16 GB | 512 GB | 60 GB |
| Certification | IFC import certification status | Import certification date | Import certification program | IFC export certification status | Export certification date | Export certification program | |
| | certified in (date) | 23-06-2015 | CV 2.0 | certified in (date) | 23-06-2015 | CV2.0-Arch | |
| Test with Myran.ifc | | | | | | | |
| Performance | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | | | less than a minute | | | |
| | How long does it take, approximately, to:Zoom into the model to see more detail | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Pan the model | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Rotate the model | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Query an object | | | less than a minute | | | |
| | How long does it take, approximately, to:Inspect the objects linked to the queried one through a relationship | | | the software does not allow this | | | |
| Please report on any errors the software gives when importing the file. | | | | | | | |
| Georeferencing | 2.1) Are the world (projected) coordinates taken into account when locating the model in the software's coordinate reference system? | | | No | | | |
| | 2.1.1) Where is the origin of the model coordinate reference system as imported in the software? | | | See the screenshot | | | |

| | |
|---|---|
| <p>2.1.2) Attach screenshots</p> |  |
| <p>2.1.3) What is the coordinate reference system and projection and what unit of measure is used for the representation?</p> | <p>Local right-handed coordinate system with millimetres as unit of measurement</p> |
| <p>2.1.4) Attach screenshots</p> | <p>See screenshot from 2.1.2</p> |
| <p>3.1) Are the "real-world" elevation values (heights) considered when locating the model in the software (z)?</p> | <p>No</p> |
| <p>3.1.1) What is the elevation value of the origin of the model coordinate reference system as imported in the software?</p> | <p>Can't check it because height is not shown with mouse cursor, only when you click an object. But since the height of the origin is supposed to be 148m, you can see in the screenshot (showing properties of the garage door) that objects are placed way lower than that.</p> |
| <p style="writing-mode: vertical-rl; transform: rotate(180deg);">Height</p> <p>3.1.2) Attach screenshots</p> |  |
| <p>3.1.3) What is the height reference system?</p> | <p>Local in mm</p> |
| <p>3.1.4) Attach screenshots</p> | <p>See figure from 2.1.2</p> |

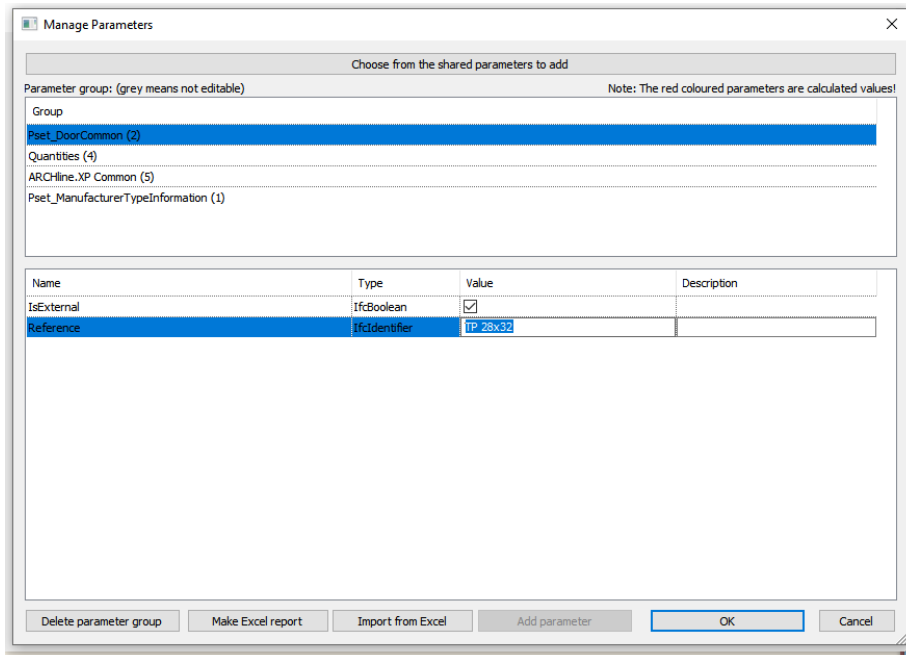
| | | |
|------------------------------|--|--|
| Orie ntati on | 4.1) Is the model oriented correctly with respect to the true North? | Yes |
| Pro porti ons | 5.1) Does the model maintain its correct dimensions and proportions? | Yes |
| IFC defi nitions | 6.1) Is the eventual translation consistent with the IFC definitions? | Yes |
| Hier arch | 7.1) Are the hierarchical relationships consistent with the IFC hierarchy? | Yes |
| Attri bute s | 8.1) Are the attributes present in the IFC entities retained and consistent? | Yes |
| Rel atio ns | 9.1) Are the relationships between the objects retained? | The software does not have the necessary tools to determine this information |
| G e o | 10.1) Is geometry read correctly? | Yes |
| N o r m a l s | 11.1) Did the normals change? | No |
| 2D/3 D | 12.1) Is it possible to view the model in 3D? | Yes |
| | 13.1) Is it possible to view the model in 2D? | Yes |
| Editing | 14.1) Is it possible to edit the model (attributes, geometry, other)? | Yes |
| | 14.1.1) What editing is possible (attributes, geometry, georeferencing, please add details)? | Attributes and geometry can be edited |

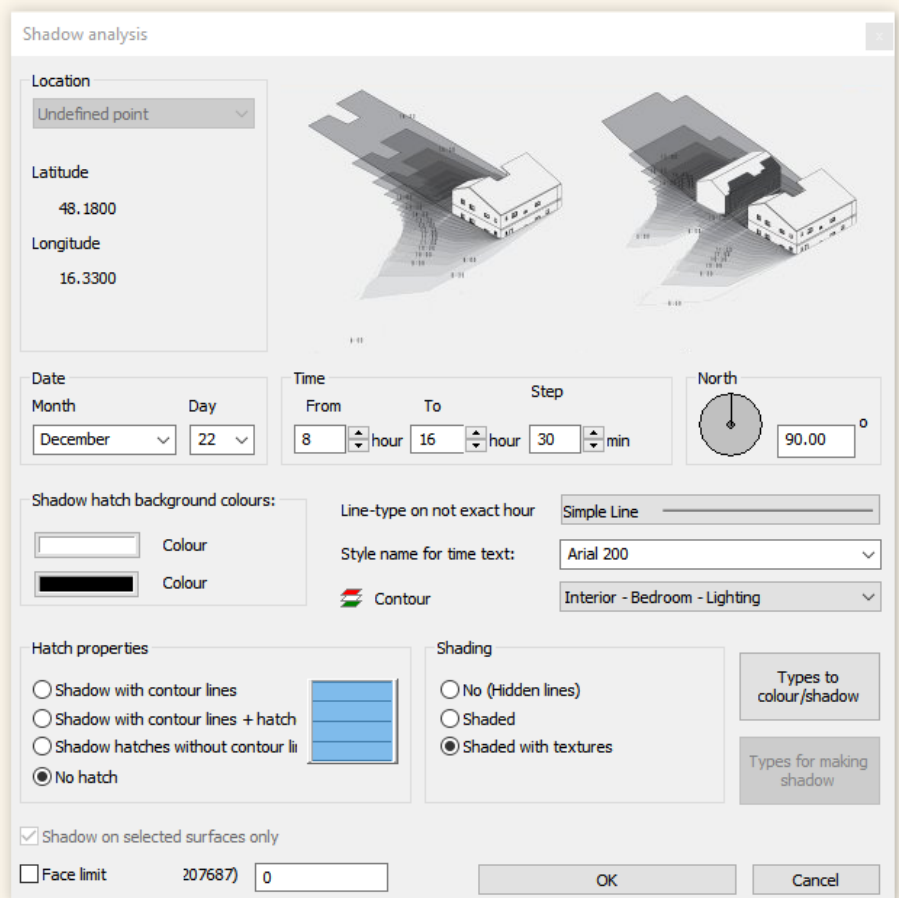
14.1.2) Attach screenshots

Edit geometry



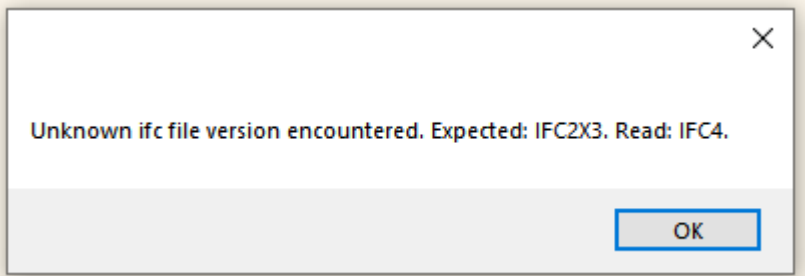
Edit attributes



| | | |
|-----------------------------|--|--|
| User | 15.1) Is it possible to query the model and the attributes? | No |
| Analysis | 16.1) Is it possible to analyse the objects and the model? | Yes, analysis about the modelled building performances (energy, noise, shadows...) are possible (type 2) |
| | 16.1.1) What analysis are possible? Do you know if the results are reliable? | Shadow analysis is possible. |
| | 16.1.2) Attach screenshots |  |
| | 16.1.3) Time required to perform the analysis about the model itself (type 2) | less than a minute |
| Export | You arrived at the end of the phase 1: "Import and manage the file in the software". Now choose: | The software has also export abilities to IFC |
| | 17.1) Are any pre-processing or setting changes needed in the software to enable a consistent export? | No |
| | 18.1) Is it possible to choose the IFC model view definition (MVD) to be used when exporting the data? | No |
| | 19) How long does it take for the data to be exported to IFC? | less than a minute |
| Test with UpTown.ifc | | |
| Performance | How long does it take, approximately, to: Import (and visualise if the software allows it) the model | more than one hour |

| | | |
|---------------|---|--|
| | How long does it take, approximately, to:Zoom into the model to see more detail | it's almost immediate |
| | How long does it take, approximately, to:Pan the model | it's almost immediate |
| | How long does it take, approximately, to:Rotate the model | less than a minute |
| | How long does it take, approximately, to:Query an object | less than a minute |
| Pro porti | 24.1) Does the model maintain its correct dimensions and proportions? | Yes |
| IFC defi | 25.1) Is the eventual translation consistent with the IFC definitions? | Yes |
| Hier arch | 26.1) Are the hierarchical relationships consistent with the IFC hierarchy? | Yes |
| Attri bute | 27.1) Are the attributes present in the IFC entities retained and consistent? | Yes |
| Rel atio | 28.1) Are the relationships between the objects retained? | The software does not have the necessary tools to determine this information |
| G e | 29.1) Is geometry read correctly? | Yes |
| N o | 30.1) Did the normals change? | No |
| 2D/3 D | 31.1) Is it possible to view the model in 3D? | Yes |
| | 32.1) Is it possible to view the model in 2D? | Yes |
| Export | You arrived at the end of the phase 1: "Import and manage the file in the software".Now choose: | The software has also export abilities to IFC |
| | 36) How long does it take for the data to be exported to IFC? | more than one hour |

Test with Savigliano.ifc

| | | |
|-------------|---|--|
| | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | it crashes without completing the operation |
| Performance | Please report on any errors the software gives when importing the file. |  |

STR Vision IFC Viewer v.1.0.1.2 – Windows 10 Home

Proprietary

BIM

1 - Very beginner user (it is nearly the first time you use it)

STR Vision IFC Viewer

| | | | | | | | |
|----------------------------|--|---|------------------------------|--|---------------------------|------------------------------|-----------------------|
| Software | Software Name [version] | STR Vision IFC Viewer [v. 1.0.1.2] | | Software house | | TeamSystem | |
| | Proprietary or open source software? | | | Kind of software | | | |
| | proprietary | | | 3D Viewer | | | |
| Computer | Model and year | Operating system | CPU | GPU | Memory (RAM) | Hard drive capacity | Hard drive free space |
| | Lenovo Thinkpad P1 Gen 2 (2019) | Windows 10 Home 64-bit | Intel i7-9750H @ 2.60GHz | Nvidia Quadro T1000 | 16 GB | 512 GB | 60 GB |
| Certification | IFC import certification status | Import certification date | Import certification program | IFC export certification status | Export certification date | Export certification program | |
| | not certified | | | | | | |
| Test with Myran.ifc | | | | | | | |
| Performance | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | | | less than a minute | | | |
| | How long does it take, approximately, to:Zoom into the model to see more detail | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Pan the model | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Rotate the model | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Query an object | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Inspect the objects linked to the queried one through a relationship | | | it's almost immediate | | | |
| Georeferencing | 2.1) Are the world (projected) coordinates taken into account when locating the model in the software's coordinate reference system? | | | The software does not have the necessary tools to determine this information | | | |
| Height | 3.1) Are the "real-world" elevation values (heights) considered when locating the model in the software (z)? | | | The software does not have the necessary tools to determine this information | | | |
| Orientation | 4.1) Is the model oriented correctly with respect to the true North? | | | Yes | | | |
| Proportions | 5.1) Does the model maintain its correct dimensions and proportions? | | | The software does not have the necessary tools to determine this information | | | |
| IFC definitions | 6.1) Is the eventual translation consistent with the IFC definitions? | | | Yes | | | |
| Hierarchy | 7.1) Are the hierarchical relationships consistent with the IFC hierarchy? | | | Yes | | | |
| Attributes | 8.1) Are the attributes present in the IFC entities retained and consistent? | | | Yes | | | |
| Relationships | 9.1) Are the relationships between the objects retained? | | | Yes | | | |
| Geometry | 10.1) Is geometry read correctly? | | | Yes | | | |
| Normals | 11.1) Did the normals change? | | | No | | | |
| 2D/3D | 12.1) Is it possible to view the model in 3D? | | | Yes | | | |

STR Vision IFC Viewer v.1.0.1.2 – Windows 10 Home

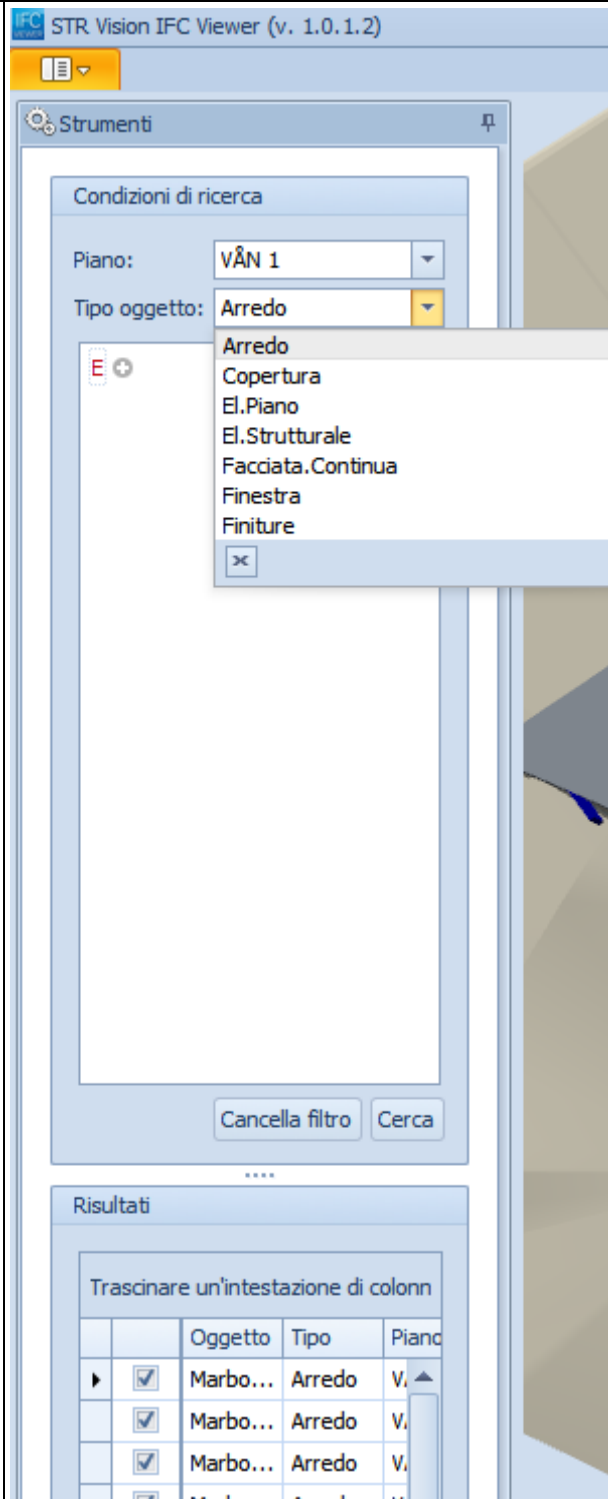
Proprietary

BIM

1 - Very beginner user (it is nearly the first time you use it)

| | | |
|----------|---|-------------------------------|
| | 13.1) Is it possible to view the model in 2D? | No |
| Editing | 14.1) Is it possible to edit the model (attributes, geometry, other)? | No |
| Querying | 15.1) Is it possible to query the model and the attributes? | Yes |
| | 15.1.1) What kinds of query are possible? | You can search by object type |

15.1.2) Attach screenshots



| | | |
|------------|---|---|
| A | 16.1) Is it possible to analyse the objects and the model? | No |
| Exp ort | You arrived at the end of the phase 1: "Import and manage the file in the software".Now choose: | The software cannot export to IFC, therefore skip the phase 2 |

STR Vision IFC Viewer v.1.0.1.2 – Windows 10 Home

Proprietary

BIM

1 - Very beginner user (it is nearly the first time you use it)

| Test with UpTown.ifc | | |
|--------------------------|---|---|
| Perf orm | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | it crashes without completing the operation |
| Test with Savigliano.ifc | | |
| Perf orm | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | it crashes without completing the operation |

RDF IFC Viewer 1.01 – Windows 10 Home

Open source

3D viewer

1 - Very beginner user (it is nearly the first time you use it)

RDF IFC Viewer

| | | | | | | | |
|----------------------------|--|------------------------------|------------------------------|--|---------------------------|------------------------------|-----------------------|
| Software | Software Name [version] | RDF IFC Viewer [1.01] | | Software house | | RDF | |
| | Proprietary or open source software? | | | Kind of software | | | |
| | open source | | | 3D viewer | | | |
| Computer | Model and year | Operating system | CPU | GPU | Memory (RAM) | Hard drive capacity | Hard drive free space |
| | Lenovo Thinkpad P1 Gen 2 (2019) | Windows 10 Home 64-bit | Intel i7-9750H @ 2.60GHz | Nvidia Quadro T1000 | 16 GB | 512 GB | 220 GB |
| Certification | IFC import certification status | Import certification date | Import certification program | IFC export certification status | Export certification date | Export certification program | |
| | not certified | | | not certified | | | |
| Test with Myran.ifc | | | | | | | |
| Performance | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Zoom into the model to see more detail | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Pan the model | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Rotate the model | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Query an object | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Inspect the objects linked to the queried one through a relationship | | | it's almost immediate | | | |
| Georeferencing | 2.1) Are the world (projected) coordinates taken into account when locating the model in the software's coordinate reference system? | | | The software does not have the necessary tools to check this information | | | |
| | 2.2) short comments to the previous question (optional) | | | Coordinates can't be seen in the software | | | |
| Height | 3.1) Are the "real-world" elevation values (heights) considered when locating the model in the software (z)? | | | The software does not have the necessary tools for checking it | | | |
| | 3.2) short comments to the previous question (optional) | | | Coordinates can't be seen in the software | | | |
| Orientation | 4.1) Is the model oriented correctly with respect to the true North? | | | The software does not have the necessary tools to determine this information | | | |
| Proportions | 5.1) Does the model maintain its correct dimensions and proportions? | | | The software does not have the necessary tools to determine this information | | | |
| | 5.2) short comments to the previous question (optional) | | | Visually it seems correct, but the software has no measurement tools | | | |
| IFC definitions | 6.1) Is the eventual translation consistent with the IFC definitions? | | | Yes | | | |
| Hierarchy | 7.1) Are the hierarchical relationships consistent with the IFC hierarchy? | | | Yes | | | |

RDF IFC Viewer 1.01 – Windows 10 Home

Open source

3D viewer

1 - Very beginner user (it is nearly the first time you use it)

| | | |
|-----------------------------|---|--|
| Attributes | 8.1) Are the attributes present in the IFC entities retained and consistent? | Yes |
| Relationships | 9.1) Are the relationships between the objects retained? | Yes |
| Geometry | 10.1) Is geometry read correctly? | Yes |
| Normals | 11.1) Did the normals change? | No |
| 2D/3D | 12.1) Is it possible to view the model in 3D? | Yes |
| | 13.1) Is it possible to view the model in 2D? | No |
| Editing | 14.1) Is it possible to edit the model (attributes, geometry, other)? | No |
| Query | 15.1) Is it possible to query the model and the attributes? | No |
| Analysis | 16.1) Is it possible to analyse the objects and the model? | No |
| Export | You arrived at the end of the phase 1: "Import and manage the file in the software".Now choose: | The software has also export abilities to IFC |
| | 17.1) Are any pre-processing or setting changes needed in the software to enable a consistent export? | No |
| | 18.1) Is it possible to choose the IFC model view definition (MVD) to be used when exporting the data? | No |
| | 19) How long does it take for the data to be exported to IFC? | it's almost immediate |
| Test with UpTown.ifc | | |
| Performance | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | 1-5 minutes |
| | How long does it take, approximately, to:Zoom into the model to see more detail | it's almost immediate |
| | How long does it take, approximately, to:Pan the model | it's almost immediate |
| | How long does it take, approximately, to:Rotate the model | it's almost immediate |
| | How long does it take, approximately, to:Query an object | it's almost immediate |
| | How long does it take, approximately, to:Inspect the objects linked to the queried one (Element 3) through a relationship | it's almost immediate |
| Proportions | 24.1) Does the model maintain its correct dimensions and proportions? | The software does not have the necessary tools to determine this information |
| IFC definitions | 25.1) Is the eventual translation consistent with the IFC definitions? | Yes |
| Hierarchy | 26.1) Are the hierarchical relationships consistent with the IFC hierarchy? | Yes |
| Attributes | 27.1) Are the attributes present in the IFC entities retained and consistent? | Yes |
| Relationships | 28.1) Are the relationships between the objects retained? | Yes |
| Geometry | 29.1) Is geometry read correctly? | Yes |
| Normals | 30.1) Did the normals change? | No |
| 2D/3D | 31.1) Is it possible to view the model in 3D? | Yes |

| | | |
|---------------------------------|---|---|
| | 32.1) Is it possible to view the model in 2D? | No |
| Export | You arrived at the end of the phase 1: "Import and manage the file in the software".Now choose: | The software has also export abilities to IFC |
| | 36) How long does it take for the data to be exported to IFC? | it's almost immediate |
| | 36.1) Comments to the previous question (optional) | I think the export is not real export (because there are no editing functionalities), but just saving the original file |
| Test with Savigliano.ifc | | |
| Performance | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | less than a minute |
| | How long does it take, approximately, to:Zoom into the model to see more detail | it's almost immediate |
| | How long does it take, approximately, to:Pan the model | it's almost immediate |
| | How long does it take, approximately, to:Rotate the model | it's almost immediate |
| | How long does it take, approximately, to:Query an object | it's almost immediate |
| | How long does it take, approximately, to:Inspect the objects linked to the queried one through a relationship | it's almost immediate |
| Georeferencing | 40.1) Are the world (projected) coordinates taken into account when locating the model in the software's coordinate reference system? | The software does not have the necessary tools to check this information |
| Height | 41.1) Are the "real-world" elevation values (heights) considered when locating the model in the software (z)? | The software does not have the necessary tools for checking it |
| Orientation | 42.1) Is the model oriented correctly with respect to the true North? | The software does not have the necessary tools to determine this information |
| Proportions | 43.1) Does the model maintain its correct dimensions and proportions? | The software does not have the necessary tools to determine this information |
| IFC definitions | 44.1) Is the eventual translation consistent with the IFC definitions? | Yes |
| Hierarchy | 45.1) Are the hierarchical relationships consistent with the IFC hierarchy? | Yes |
| Attributes | 46.1) Are the attributes present in the IFC entities retained and consistent? | Yes |
| Relationships | 47.1) Are the relationships between the objects retained? | Yes |
| Geometry | 48.1) Is geometry read correctly? | Yes |
| Normals | 49.1) Did the normals change? | No |
| 2D/3D | 50.1) Is it possible to view the model in 3D? | Yes |
| | 51.1) Is it possible to view the model in 2D? | No |

RDF IFC Viewer 1.01 – Windows 10 Home

Open source

3D viewer

1 - Very beginner user (it is nearly the first time you use it)

| | | |
|--------|---|---|
| Export | You arrived at the end of the phase 1: "Import and manage the file in the software".Now choose: | The software has also export abilities to IFC |
| | 55) How long does it take for the data to be exported to IFC? | it's almost immediate |
| | 55.1) Comment to the previous question (optional) | I think it's not really exporting but rather saving the original file |

Autodesk Infracore 2020 – Windows 10 Home

Proprietary

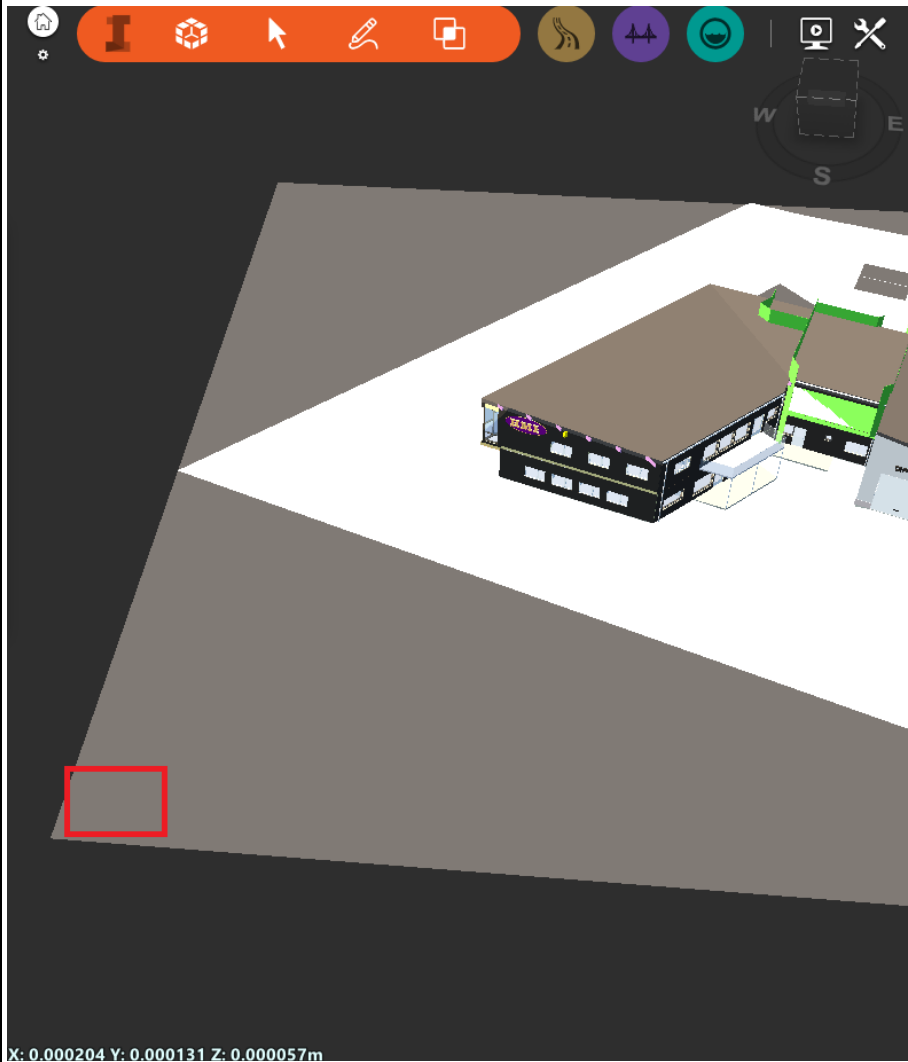
Infrastructure design

1 - Very beginner user (it is nearly the first time you use it)

Infracore

| | | | | | | | |
|----------------------------|--|----------------------------------|------------------------------|----------------------------------|---------------------------|------------------------------|-----------------------|
| Software | Software Name [version] | Autodesk Infracore [2020] | | Software house | Autodesk | | |
| | Proprietary or open source software? | | | Kind of software | | | |
| | proprietary | | | Infrastructure design | | | |
| Computer | Model and year | Operating system | CPU | GPU | Memory (RAM) | Hard drive capacity | Hard drive free space |
| | Lenovo Thinkpad P1 Gen 2 (2019) | Windows 10 Home 64-bit | Intel i7-9750H @ 2.60GHz | Nvidia Quadro T1000 | 16 GB | 512 GB | 220 GB |
| Certification | IFC import certification status | Import certification date | Import certification program | IFC export certification status | Export certification date | Export certification program | |
| | not certified | | | not certified | | | |
| Test with Myran.ifc | | | | | | | |
| Performance | How long does it take, approximately, to: Import (and visualise if the software allows it) the model | | | less than a minute | | | |
| | How long does it take, approximately, to: Zoom into the model to see more detail | | | it's almost immediate | | | |
| | How long does it take, approximately, to: Pan the model | | | it's almost immediate | | | |
| | How long does it take, approximately, to: Rotate the model | | | it's almost immediate | | | |
| | How long does it take, approximately, to: Query an object | | | the software does not allow this | | | |
| | How long does it take, approximately, to: Inspect the objects linked to the queried one through a relationship | | | the software does not allow this | | | |
| Georeferencing | 2.1) Are the world (projected) coordinates taken into account when locating the model in the software's coordinate reference system? | | | No | | | |
| | 2.1.1) Where is the origin of the model coordinate reference system as imported in the software? | | | At the blue reference point | | | |

2.1.2) Attach screenshots



2.1.3) What is the coordinate reference system and projection and what unit of measure is used for the representation?

Local in metres

2.1.4) Attach screenshots

See 2.1.2

Height

3.1) Are the "real-world" elevation values (heights) considered when locating the model in the software (z)?

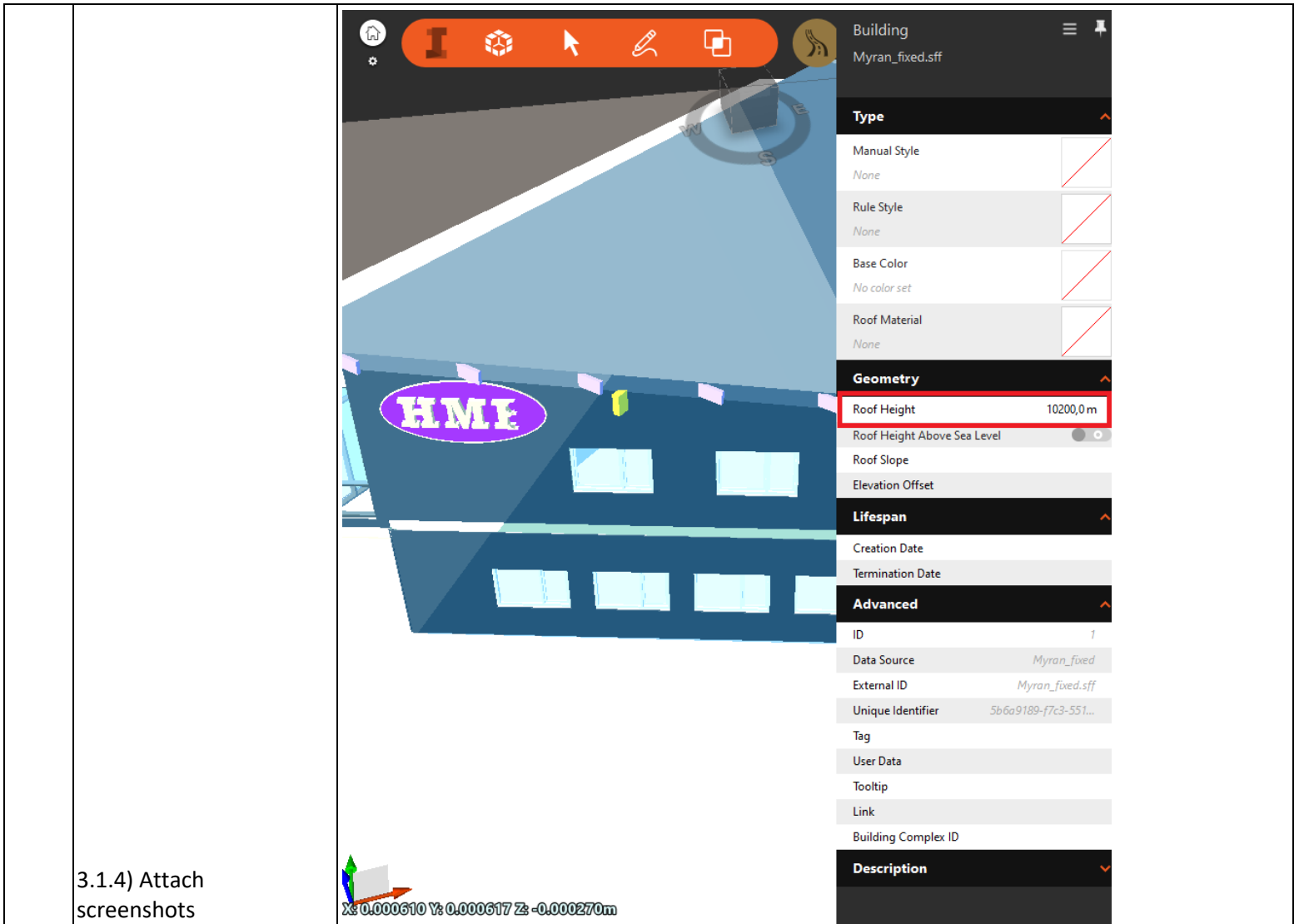
No

3.1.1) What is the elevation value of the origin of the model coordinate reference system as imported in the software?

0

3.1.3) What is the height reference system?


Local in metres




3.1.4) Attach screenshots

| | | |
|--------------------|--|--|
| Orie ntati o | 4.1) Is the model oriented correctly with respect to the true North? | Yes |
| Pro porti o | 5.1) Does the model maintain its correct dimensions and proportions? | Yes |
| IFC defini t | 6.1) Is the eventual translation consistent with the IFC definitions? | The software does not have the necessary tools for checking it |
| | 6.2) short comments to the previous question (optional) | Can't check single objects |
| Hierarch y | 7.1) Are the hierarchical relationships consistent with the IFC hierarchy? | The software does not have the necessary tools to determine this information |
| | 7.2) short comments to the previous question (optional) | Can't check single objects |
| Attrib utes | 8.1) Are the attributes present in the IFC entities retained and consistent? | The software does not have the necessary tools to determine this information |

| | | |
|-----------------------------|---|--|
| Relationships | 9.1) Are the relationships between the objects retained? | The software does not have the necessary tools to determine this information |
| | 9.2) short comments to the previous question (optional) | Can't check single objects |
| Geometry | 10.1) Is geometry read correctly? | Yes |
| Normals | 11.1) Did the normals change? | No |
| 2D/3D | 12.1) Is it possible to view the model in 3D? | Yes |
| | 13.1) Is it possible to view the model in 2D? | No |
| Editing | 14.1) Is it possible to edit the model (attributes, geometry, other)? | No |
| Query | 15.1) Is it possible to query the model and the attributes? | No |
| Analysis | 16.1) Is it possible to analyse the objects and the model? | No |
| Export | You arrived at the end of the phase 1: "Import and manage the file in the software".Now choose: | The software cannot export to IFC, therefore skip the phase 2 |
| Test with UpTown.ifc | | |
| Performance | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | 1-5 minutes |
| | How long does it take, approximately, to:Zoom into the model to see more detail | it's almost immediate |
| | How long does it take, approximately, to:Pan the model | it's almost immediate |
| | How long does it take, approximately, to:Rotate the model | it's almost immediate |
| | How long does it take, approximately, to:Query an object | the software does not allow this |
| | How long does it take, approximately, to:Inspect the objects linked to the queried one (Element 3) through a relationship | the software does not allow this |
| Proportion | 24.1) Does the model maintain its correct dimensions and proportions? | Yes |
| IFC definitions | 25.1) Is the eventual translation consistent with the IFC definitions? | The software does not have the necessary tools for checking it |
| Hierarchy | 26.1) Are the hierarchical relationships consistent with the IFC hierarchy? | The software does not have the necessary tools for checking it |
| Attributes | 27.1) Are the attributes present in the IFC entities retained and consistent? | The software does not have the necessary tools for checking it |
| Relationships | 28.1) Are the relationships between the objects retained? | The software does not have the necessary tools for checking it |
| Geometry | 29.1) Is geometry read correctly? | Yes |
| Normals | 30.1) Did the normals change? | No |
| 2D/3D | 31.1) Is it possible to view the model in 3D? | Yes |

| | | |
|---------------------------------|---|---|
| | 32.1) Is it possible to view the model in 2D? | No |
| Export | You arrived at the end of the phase 1: "Import and manage the file in the software".Now choose: | The software has also export abilities to IFC |
| | 36) How long does it take for the data to be exported to IFC? | The software cannot export to IFC, therefore skip the phase 2 |
| Test with Savigliano.ifc | | |
| Performance | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | it's almost immediate |
| | How long does it take, approximately, to:Zoom into the model to see more detail | it's almost immediate |
| | How long does it take, approximately, to:Pan the model | it's almost immediate |
| | How long does it take, approximately, to:Rotate the model | it's almost immediate |
| | How long does it take, approximately, to:Query an object | the software does not allow this |
| | How long does it take, approximately, to:Inspect the objects linked to the queried one through a relationship | the software does not allow this |
| Georeferencing | 40.1) Are the world (projected) coordinates taken into account when locating the model in the software's coordinate reference system? | No |
| | 40.1.1) Where is the origin of the model coordinate reference system as imported in the software? | At the blue reference point |
| | 40.1.2) Attach screenshots |  |
| | 40.1.3) What is the coordinate reference system and projection and what unit of measure is used for the representation? | Local, seems to be in decimetres (when comparing measurement tool to change of coordinates when you move the mouse) |
| | 40.1.4) Attach screenshots | See 40.1.2 |
| Height | 41.1) Are the "real-world" elevation values (heights) considered when locating the model in the software (z)? | No |

| | | |
|-----------------------|---|--|
| | 41.1.1) What is the elevation value of the origin of the model coordinate reference system as imported in the software? | 0 |
| | 41.1.2) Attach screenshots |  |
| | 41.1.3) What is the height reference system? | Local in metres |
| | 41.1.4) Attach screenshots | See 41.1.2 |
| Orie ntati | 42.1) Is the model oriented correctly with respect to the true North? | Yes |
| Pro porti | 43.1) Does the model maintain its correct dimensions and proportions? | Yes |
| IFC defini | 44.1) Is the eventual translation consistent with the IFC definitions? | The software does not have the necessary tools for checking it |
| Hiera rchy | 45.1) Are the hierarchical relationships consistent with the IFC hierarchy? | The software does not have the necessary tools for checking it |
| Attribu tes | 46.1) Are the attributes present in the IFC entities retained and consistent? | The software does not have the necessary tools for checking it |
| Relat ionsh ips | 47.1) Are the relationships between the objects retained? | The software does not have the necessary tools for checking it |
| Geo metr y | 48.1) Is geometry read correctly? | Yes |
| Nor mals | 49.1) Did the normals change? | No |
| 2D/3 D | 50.1) Is it possible to view the model in 3D? | Yes |
| | 51.1) Is it possible to view the model in 2D? | No |
| Expo rt | You arrived at the end of the phase 1: "Import and manage the file in the software".Now choose: | The software cannot export to IFC, therefore skip the phase 2 |

bimspot beta – Windows 10 Home

Proprietary

BIM

1 - Very beginner user (it is nearly the first time you use it)

bimspot

| | | | | | | | |
|---------------------------------|--|---------------------------|------------------------------|---|---------------------------|------------------------------|-----------------------|
| Software | Software Name [version] | bimspot [beta] | | Software house | | | |
| | Proprietary or open source software? | | | Kind of software | | | |
| | proprietary | | | BIM | | | |
| Computer | Model and year | Operating system | CPU | GPU | Memory (RAM) | Hard drive capacity | Hard drive free space |
| | Lenovo Thinkpad P1 Gen 2 (2019) | Windows 10 Home 64-bit | Intel i7-9750H @ 2.60GHz | Nvidia Quadro T1000 | 16 GB | 512 GB | 220 GB |
| Certification | IFC import certification status | Import certification date | Import certification program | IFC export certification status | Export certification date | Export certification program | |
| | not certified | | | not certified | | | |
| Test with Myran.ifc | | | | | | | |
| Performance | How long does it take, approximately, to: Import (and visualise if the software allows it) the model | | | it crashes without completing the operation | | | |
| Test with UpTown.ifc | | | | | | | |
| Performance | How long does it take, approximately, to: Import (and visualise if the software allows it) the model | | | it crashes without completing the operation | | | |
| Test with Savigliano.ifc | | | | | | | |
| Performance | How long does it take, approximately, to: Import (and visualise if the software allows it) the model | | | it crashes without completing the operation | | | |

DDS-CAD

| | | | | | | | |
|----------------------------|--|---------------------------------------|------------------------------|--|---------------------------|------------------------------|-----------------------|
| Software | Software Name [version] | DDS-CAD [x64 build 23/9-2019] | | Software house | Nemetschek | | |
| | Proprietary or open source software? | | | Kind of software | | | |
| | proprietary | | | BIM | | | |
| Computer | Model and year | Operating system | CPU | GPU | Memory (RAM) | Hard drive capacity | Hard drive free space |
| | Lenovo Thinkpad P1 Gen 2 (2019) | Windows 10 Home 64-bit | Intel i7-9750H @ 2.60GHz | Nvidia Quadro T1000 | 16 GB | 512 GB | 135 GB |
| Certification | IFC import certification status | Import certification date | Import certification program | IFC export certification status | Export certification date | Export certification program | |
| | certification in progress | | MEP Reference Exchange | certification in progress | | MEP Reference Exchange | |
| Test with Myran.ifc | | | | | | | |
| Performance | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Zoom into the model to see more detail | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Pan the model | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Rotate the model | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Query an object | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Inspect the objects linked to the queried one through a relationship | | | it's almost immediate | | | |
| Georeferencing | 2.1) Are the world (projected) coordinates taken into account when locating the model in the software's coordinate reference system? | | | The software does not have the necessary tools to check this information | | | |
| | 2.2) short comments to the previous question (optional) | | | The software does not have the possibility to inspect coordinates | | | |
| Height | 3.1) Are the "real-world" elevation values (heights) considered when locating the model in the software (z)? | | | The software does not have the necessary tools for checking it | | | |
| | 3.2) short comments to the previous question (optional) | | | The software does not have the possibility to inspect coordinates | | | |
| Orientation | 4.1) Is the model oriented correctly with respect to the true North? | | | The software does not have the necessary tools to determine this information | | | |

| | | |
|-----------------|--|---|
| | 4.2) short comments to the previous question (optional) | The software does not have the possibility to inspect coordinates |
| Proportions | 5.1) Does the model maintain its correct dimensions and proportions? | Yes |
| IFC definitions | 6.1) Is the eventual translation consistent with the IFC definitions? | Yes |
| Hierarchy | 7.1) Are the hierarchical relationships consistent with the IFC hierarchy? | Yes |
| | 7.2) short comments to the previous question (optional) | The objects are contained within the correct storey |
| Attributes | 8.1) Are the attributes present in the IFC entities retained and consistent? | The software does not have the necessary tools to determine this information |
| | 8.2) short comments to the previous question (optional) | Even though it should be possible to check the attributes, I can't see them because of a bug in the software. The "properties pop-up" won't show. |
| Relationships | 9.1) Are the relationships between the objects retained? | Yes |
| Geometry | 10.1) Is geometry read correctly? | Yes |
| Normals | 11.1) Did the normals change? | No |
| 2D/3D | 12.1) Is it possible to view the model in 3D? | Yes |
| | 13.1) Is it possible to view the model in 2D? | No |
| Editing | 14.1) Is it possible to edit the model (attributes, geometry, other)? | No |
| Query | 15.1) Is it possible to query the model and the attributes? | No |
| Analysis | 16.1) Is it possible to analyse the objects and the model? | No |

| | | |
|---------------------------------|---|--|
| Export | You arrived at the end of the phase 1: "Import and manage the file in the software".Now choose: | The software cannot export to IFC, therefore skip the phase 2 |
| Test with UpTown.ifc | | |
| Performance | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | less than a minute |
| | How long does it take, approximately, to:Zoom into the model to see more detail | it's almost immediate |
| | How long does it take, approximately, to:Pan the model | it's almost immediate |
| | How long does it take, approximately, to:Rotate the model | it's almost immediate |
| | How long does it take, approximately, to:Query an object | it's almost immediate |
| | How long does it take, approximately, to:Inspect the objects linked to the queried one (Element 3) through a relationship | it's almost immediate |
| Proportions | 24.1) Does the model maintain its correct dimensions and proportions? | Yes |
| IFC definitions | 25.1) Is the eventual translation consistent with the IFC definitions? | Yes |
| Hierarchy | 26.1) Are the hierarchical relationships consistent with the IFC hierarchy? | Yes |
| | 26.2) short comments to the previous question (optional) | The objects are classified under the correct storeys |
| Attributes | 27.1) Are the attributes present in the IFC entities retained and consistent? | Bugged |
| | 27.2) short comments to the previous question (optional) | The software has a bug which causes me to be unable to inspect object properties |
| Relationships | 28.1) Are the relationships between the objects retained? | Yes |
| Geometry | 29.1) Is geometry read correctly? | Yes |
| Normals | 30.1) Did the normals change? | No |
| 2D/3D | 31.1) Is it possible to view the model in 3D? | Yes |
| | 32.1) Is it possible to view the model in 2D? | No |
| Export | You arrived at the end of the phase 1: "Import and manage the file in the software".Now choose: | The software cannot export to IFC, therefore skip the phase 2 |
| Test with Savigliano.ifc | | |
| Performance | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | it crashes without completing the operation |

Blender 2.81a – Windows 10 Home

Open source

3D creation suite

1 - Very beginner user (it is nearly the first time you use it)

Blender

| | | | | | | | |
|----------------------------|--|---------------------------|------------------------------|---|---------------------------|------------------------------|-----------------------|
| Software | Software Name [version] | Blender [2.81a] | | Software house | Bricsys | | |
| | Proprietary or open source software? | | | Kind of software | | | |
| | open source | | | 3D creation suite | | | |
| Computer | Model and year | Operating system | CPU | GPU | Memory (RAM) | Hard drive capacity | Hard drive free space |
| | Lenovo Thinkpad P1 Gen 2 (2019) | Windows 10 Home 64-bit | Intel i7-9750H @ 2.60GHz | Nvidia Quadro T1000 | 16 GB | 512 GB | 135 GB |
| Certification | IFC import certification status | Import certification date | Import certification program | IFC export certification status | Export certification date | Export certification program | |
| | not certified | | | not certified | | | |
| Test with Myran.ifc | | | | | | | |
| Performance | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | | | 1-5 minutes | | | |
| | How long does it take, approximately, to:Zoom into the model to see more detail | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Pan the model | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Rotate the model | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Query an object | | | it's almost immediate | | | |
| | How long does it take, approximately, to:Inspect the objects linked to the queried one through a relationship | | | it's almost immediate | | | |
| Georeferencing | 2.1) Are the world (projected) coordinates taken into account when locating the model in the software's coordinate reference system? | | | No | | | |
| | 2.1.1) Where is the origin of the model coordinate reference system as imported in the software? | | | The origin of the model as a whole is at (0, 0, 0). The coordinates of the reference point are approximately (4, 1, 6). | | | |

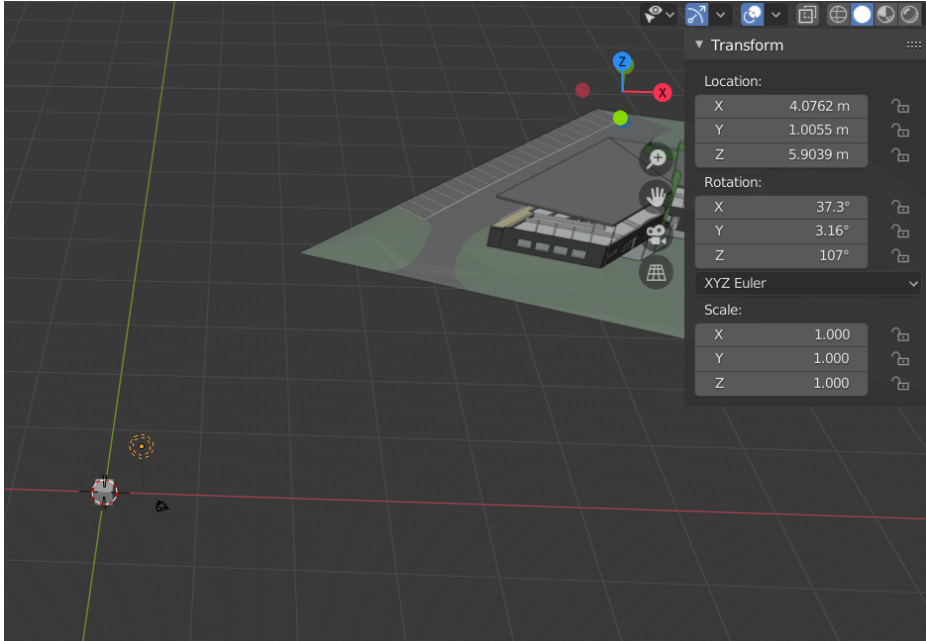
| | | |
|---|--|--|
| <p>2.1.2) Attach screenshots</p> | | |
| <p>2.1.3) What is the coordinate reference system and projection and what unit of measure is used for the representation?</p> | <p>Local right-handed, in metres</p> | |
| <p>3.1) Are the "real-world" elevation values (heights) considered when locating the model in the software (z)?</p> | <p>No</p> | |
| <p>3.1.1) What is the elevation value of the origin of the model coordinate reference system as imported in the software?</p> | <p>For the whole model it's 0, for the reference point it's 5,9m</p> | |
| <p>3.1.2) Attach screenshots</p> | <p>See 2.1.2</p> | |
| <p>3.1.3) What is the height reference system?</p> | <p>Local in metres</p> | |

Blender 2.81a – Windows 10 Home

Open source

3D creation suite

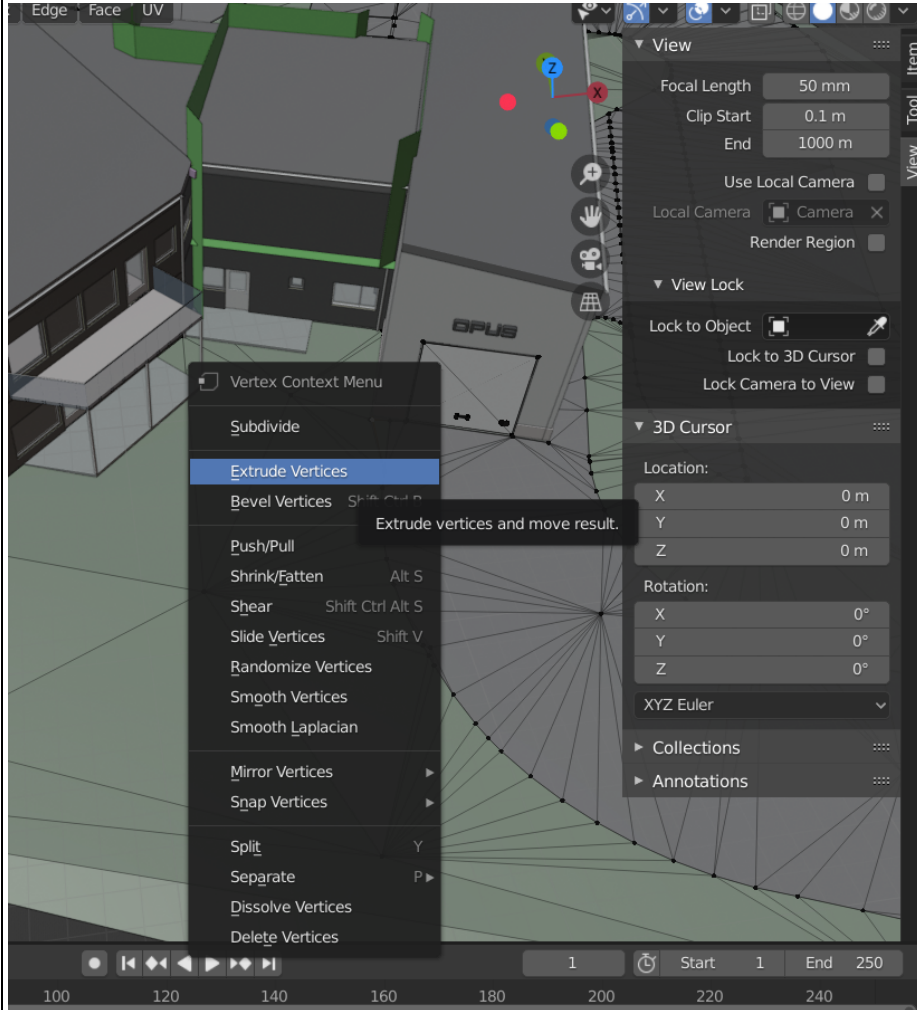
1 - Very beginner user (it is nearly the first time you use it)

| | | |
|-----------------|--|--|
| | 3.1.4) Attach screenshots |  |
| Orientation | 4.1) Is the model oriented correctly with respect to the true North? | Yes |
| Proportions | 5.1) Does the model maintain its correct dimensions and proportions? | Yes |
| IFC definitions | 6.1) Is the eventual translation consistent with the IFC definitions? | The software does not have the necessary tools for checking it |
| | 6.2) short comments to the previous question (optional) | Object types are not explicitly shown. You can only see the given names of objects, but not the actual IFC definition. |
| Hierarchy | 7.1) Are the hierarchical relationships consistent with the IFC hierarchy? | Yes |
| | 7.2) short comments to the previous question (optional) | You can see in a tree how all objects are related to each other, including hierarchy. |
| Attributes | 8.1) Are the attributes present in the IFC entities retained and consistent? | The software does not have the necessary tools to determine this information |
| | 8.2) short comments to the previous question (optional) | Custom properties are empty |
| Relationships | 9.1) Are the relationships between the objects retained? | Yes |
| | 9.2) short comments to the previous question (optional) | You can see in a tree how all objects are related to each other, including hierarchy. |
| Geometry | 10.1) Is geometry read correctly? | Yes |
| Normals | 11.1) Did the normals change? | No |
| 2D/3D | 12.1) Is it possible to view the model in 3D? | Yes |
| | 13.1) Is it possible to view the model in 2D? | No |
| Editing | 14.1) Is it possible to edit the model (attributes, geometry, other)? | Yes |

14.1.1) What editing is possible (attributes, geometry, georeferencing, please add details)?

You can edit attributes and geometry (move, rotate, scale, edit vertices).

Editing vertices



14.1.2) Attach screenshots

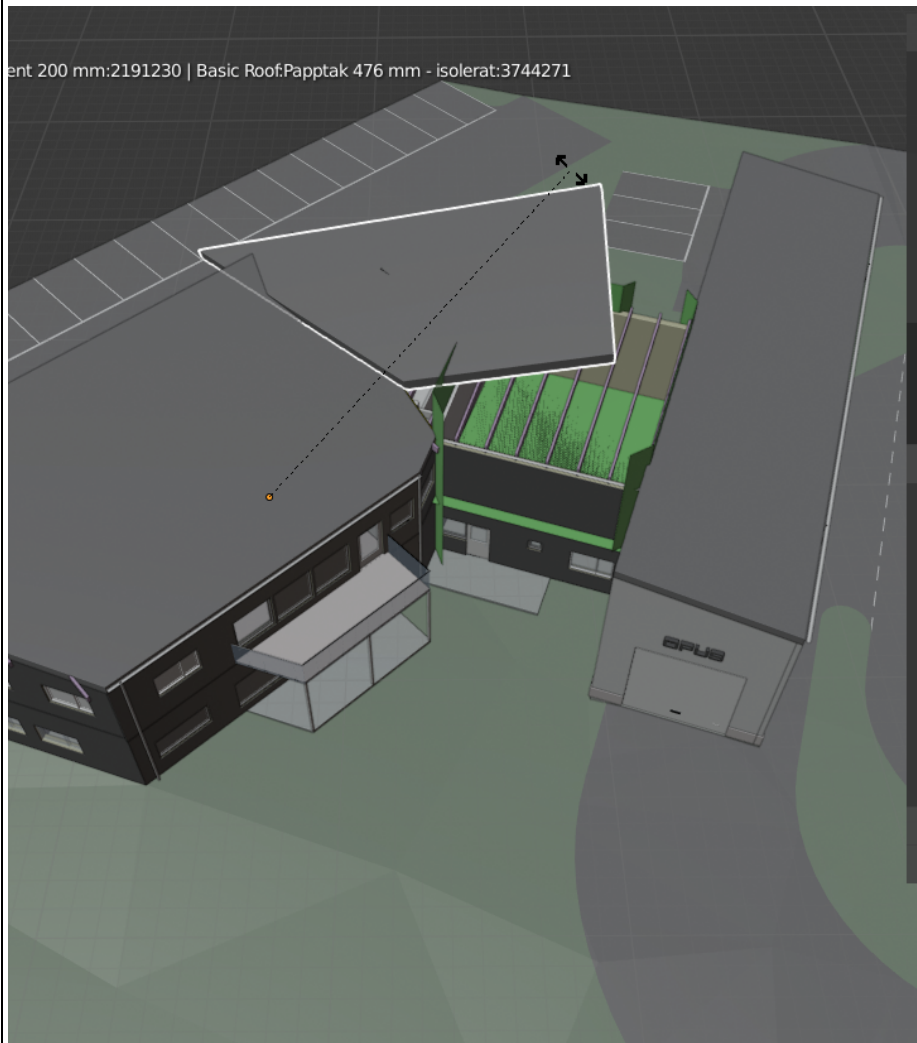
Rotating object

Blender 2.81a – Windows 10 Home

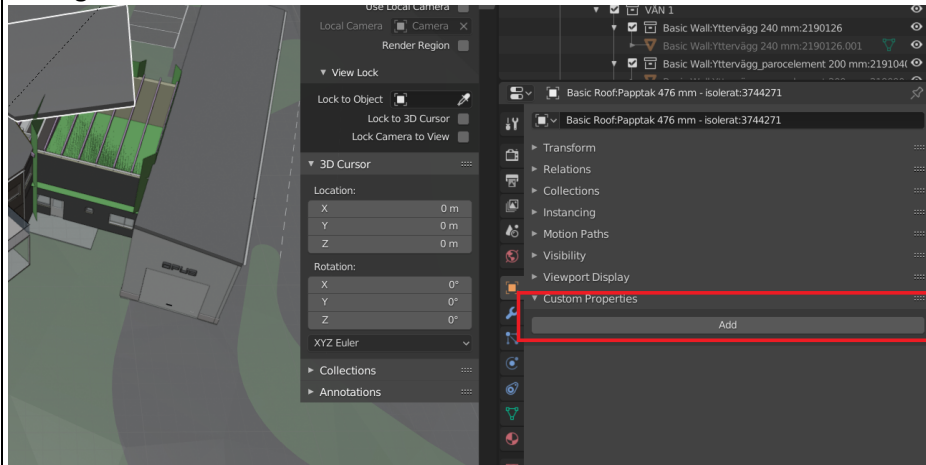
Open source

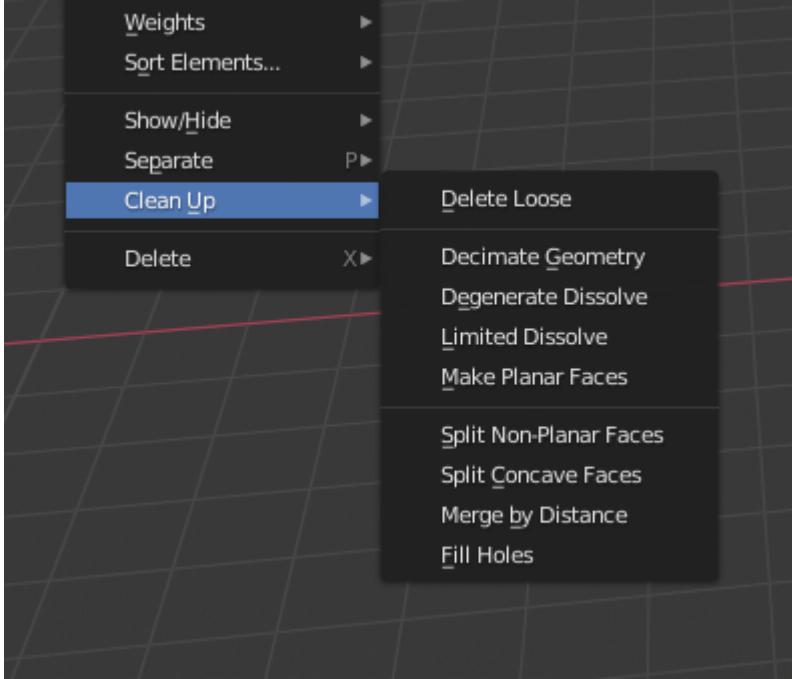
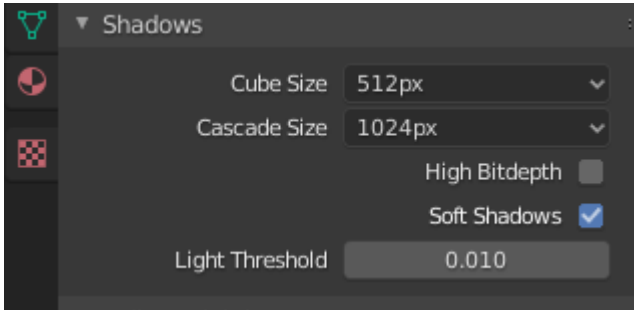
3D creation suite

1 - Very beginner user (it is nearly the first time you use it)



Editing attributes



| | | |
|----------|--|--|
| | | |
| Querying | 15.1) Is it possible to query the model and the attributes? | Yes |
| | 15.1.1) What kinds of query are possible? | Any query (spatial and on attributes), but you have to write it in Python (https://blender.stackexchange.com/questions/122878/selecting-objects-with-the-same-property-values-without-python) |
| Analysis | 16.1) Is it possible to analyse the objects and the model? | Yes, analysis about the model validity and features (geometry, semantics, schema validity...) are possible (type 1) |
| | 16.1.1) What analysis are possible? Do you know if the results are reliable? | You can clean the geometries. It is also possible to create (visual) shadows, but I don't think that counts as actual shadow analysis. |
| | 16.1.2) Attach screenshots | <p>Clean geometries</p>  <p>Create shadows</p>  |

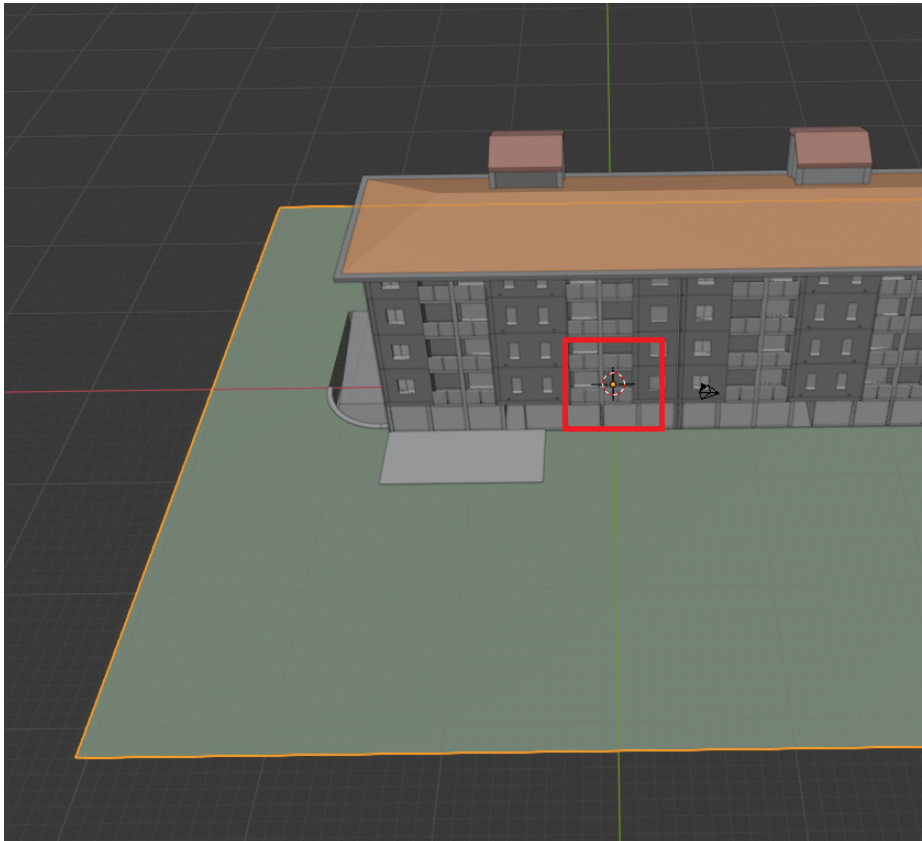
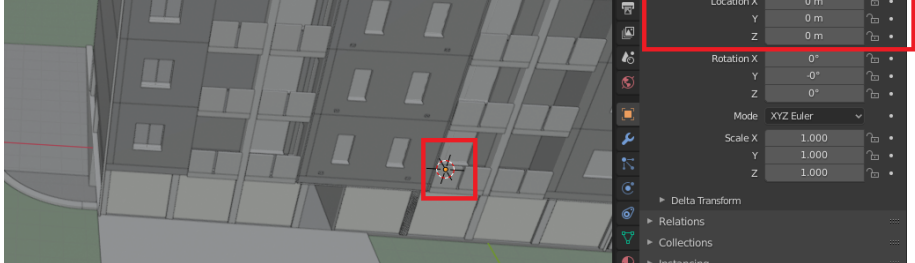
Blender 2.81a – Windows 10 Home

Open source

3D creation suite

1 - Very beginner user (it is nearly the first time you use it)

| | | |
|---------------------------------|---|--|
| | | |
| | 16.1.3) Time required to perform the analysis about the model itself (type 1) | it's almost immediate |
| | 16.1.3) Time required to perform the analysis about the model performances (type2) | No analysis of type 2 are possible |
| Export | You arrived at the end of the phase 1: "Import and manage the file in the software".Now choose: | The software cannot export to IFC, therefore skip the phase 2 |
| Test with UpTown.ifc | | |
| Performance | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | it crashes without completing the operation |
| Test with Savigliano.ifc | | |
| Performance | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | 5-20 minutes |
| | How long does it take, approximately, to:Zoom into the model to see more detail | it's almost immediate |
| | How long does it take, approximately, to:Pan the model | it's almost immediate |
| | How long does it take, approximately, to:Rotate the model | it's almost immediate |
| | How long does it take, approximately, to:Query an object | it's almost immediate |
| | How long does it take, approximately, to:Inspect the objects linked to the queried one through a relationship | it's almost immediate |
| | 38) Please report on any errors the software gives when importing the file. | 5-20 minutes |
| Georeferencing | 40.1) Are the world (projected) coordinates taken into account when locating the model in the software's coordinate reference system? | No |
| | 40.1.1) Where is the origin of the model coordinate reference system as imported in the software? | The origin of the model as a whole is at (0, 0, 0), which starts at the reference point. |

| | | |
|---|--|--|
| |  | |
| 40.1.2) Attach screenshots | | |
| 40.1.3) What is the coordinate reference system and projection and what unit of measure is used for the representation? | | Local in metres |
| 40.2) short comments to the previous question (optional) | | (same as for Myran so no screenshot) |
| 41.1) Are the "real-world" elevation values (heights) considered when locating the model in the software (z)? | | No |
| 41.1.1) What is the elevation value of the origin of the model coordinate reference system as imported in the software? | | 0 (at reference point/origin of model) |
| <p style="writing-mode: vertical-rl; transform: rotate(180deg);">Height</p> <p>41.1.2) Attach screenshots</p> |  | |
| 41.1.3) What is the height reference system? | | Local in metres |
| 41.1.4) Attach screenshots | | See 41.1.2 |
| 42.1) Is the model oriented correctly with respect to the true North? | | Yes |

Blender 2.81a – Windows 10 Home

Open source

3D creation suite

1 - Very beginner user (it is nearly the first time you use it)

| | | |
|-----------------|---|--|
| Dimension | 43.1) Does the model maintain its correct dimensions and proportions? | Yes |
| IFC definitions | 44.1) Is the eventual translation consistent with the IFC definitions? | The software does not have the necessary tools for checking it |
| | 44.2) short comments to the previous question (optional) | Object classification is not shown |
| Hierarchy | 45.1) Are the hierarchical relationships consistent with the IFC hierarchy? | Yes |
| Attributes | 46.1) Are the attributes present in the IFC entities retained and consistent? | No |
| | 46.1.1) What changes / inconsistencies / errors / other issues were noted? | Same as Myran: custom properties are just empty |
| | 46.2) short comments to the previous question (optional) | No |
| Relationship | 47.1) Are the relationships between the objects retained? | Yes |
| Geometry | 48.1) Is geometry read correctly? | Yes |
| Normals | 49.1) Did the normals change? | No |
| 2D/3D | 50.1) Is it possible to view the model in 3D? | Yes |
| | 51.1) Is it possible to view the model in 2D? | No |
| Export | You arrived at the end of the phase 1: "Import and manage the file in the software".Now choose: | The software cannot export to IFC, therefore skip the phase 2 |

Solibri Anywhere 9.10.4.13 – Windows 10 Home

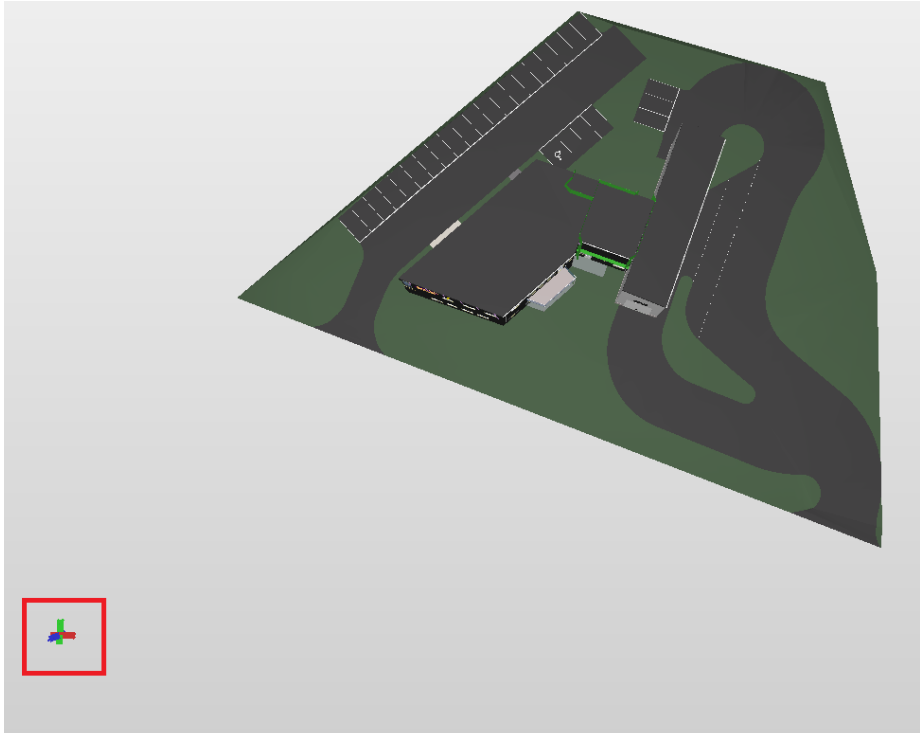
Proprietary

3D viewer

1 - Very beginner user (it is nearly the first time you use it)

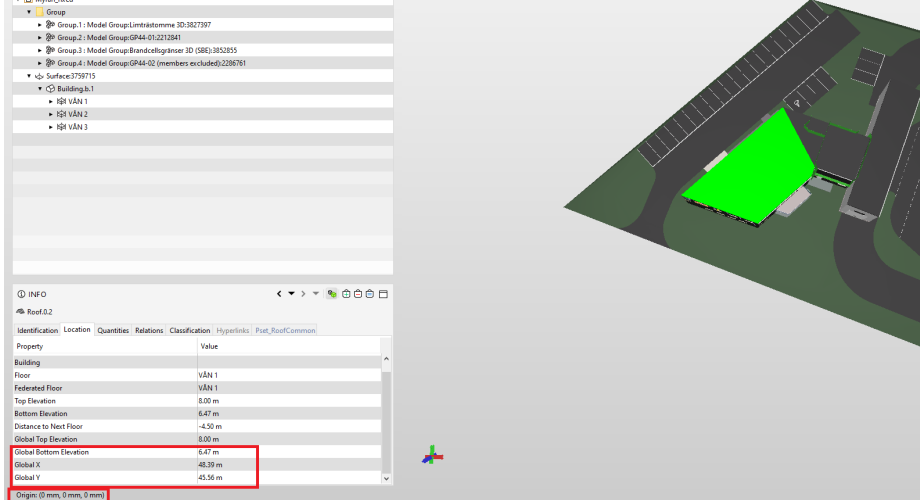
Solibri Anywhere

| | | | | | | | |
|----------------------------|--|-------------------------------------|------------------------------|---------------------------------|------------------------------------|------------------------------|-----------------------|
| Software | Software Name [version] | Solibri Anywhere [9.10.4.13] | | Software house | | | |
| | Proprietary or open source software? | | | Kind of software | | | |
| proprietary | | | 3D viewer | | | | |
| Computer | Model and year | Operating system | CPU | GPU | Memory (RAM) | Hard drive capacity | Hard drive free space |
| | Lenovo Thinkpad P1 Gen 2 (2019) | Windows 10 Home 64-bit | Intel i7-9750H @ 2.60GHz | Nvidia Quadro T1000 | 16 GB | 512 GB | 130 GB |
| Certification | IFC import certification status | Import certification date | Import certification program | IFC export certification status | Export certification date | Export certification program | |
| | certified in (date) | 2013-10-30 | CV 2.0 | not certified | | | |
| Test with Myran.ifc | | | | | | | |
| Performance | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | | | | less than a minute | | |
| | How long does it take, approximately, to:Zoom into the model to see more detail | | | | it's almost immediate | | |
| | How long does it take, approximately, to:Pan the model | | | | it's almost immediate | | |
| | How long does it take, approximately, to:Rotate the model | | | | it's almost immediate | | |
| | How long does it take, approximately, to:Query an object | | | | it's almost immediate | | |
| | How long does it take, approximately, to:Inspect the objects linked to the queried one through a relationship | | | | it's almost immediate | | |
| Georeferencing | 2.1) Are the world (projected) coordinates taken into account when locating the model in the software's coordinate reference system? | | | | No | | |
| | 2.1.1) Where is the origin of the model coordinate reference system as imported in the software? | | | | Seems to be at the reference point | | |

| | |
|----------------------------------|---|
| <p>2.1.2) Attach screenshots</p> |  |
|----------------------------------|---|

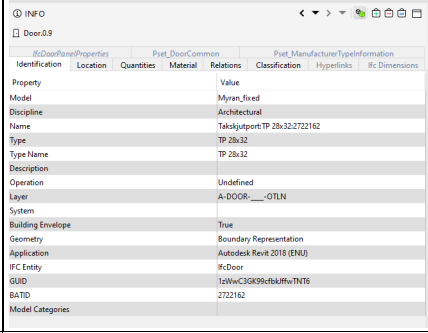

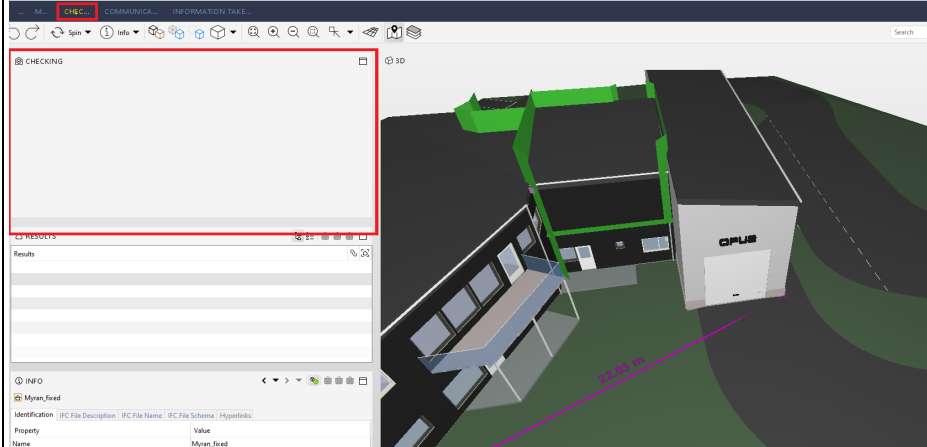
2.1.3) What is the coordinate reference system and projection and what unit of measure is used for the representation?

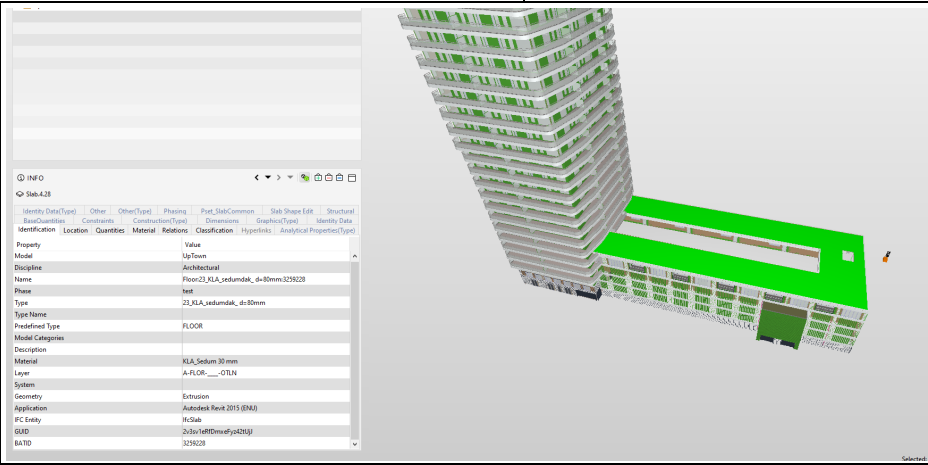
Local right-handed in metres or milimetres, unclear because software doesn't allow proper check

| | |
|----------------------------------|--|
| <p>2.1.4) Attach screenshots</p> |  |
|----------------------------------|--|

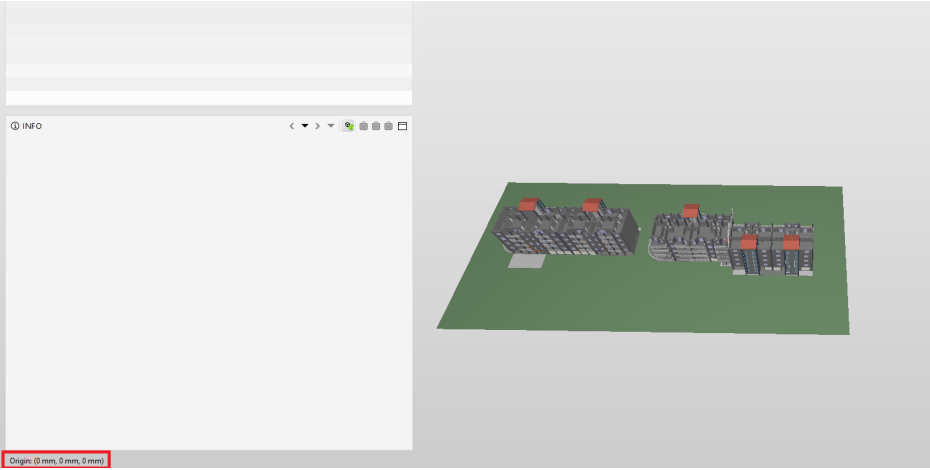
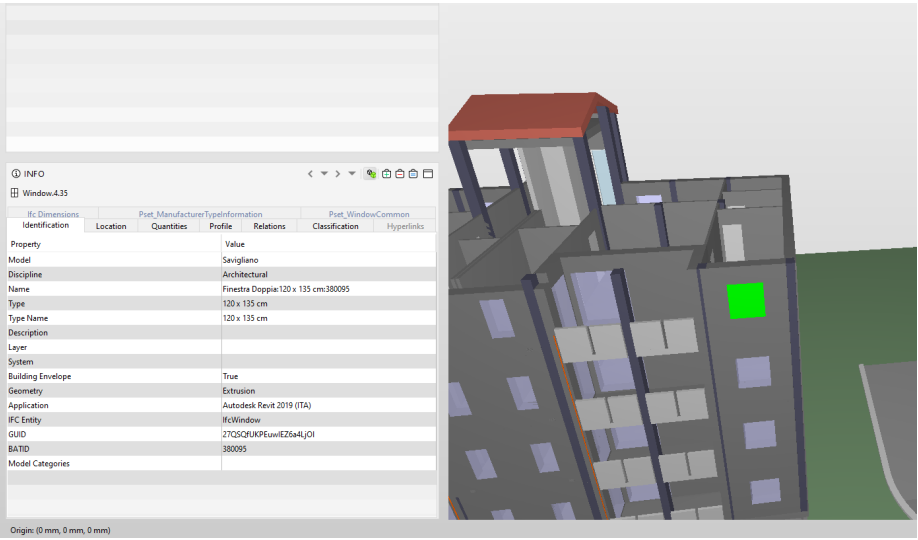
2.2) short comments to the previous question (optional)

| | | |
|--------|--|--------------------------------|
| Height | 3.1) Are the "real-world" elevation values (heights) considered when locating the model in the software (z)? | No |
| | 3.1.1) What is the elevation value of the origin of the model coordinate reference system as imported in the software? | 0 |
| | 3.1.2) Attach screenshots | See 2.1.4 |
| | 3.1.3) What is the height reference system? | Local in metres or millimetres |

| | | |
|--|--|--|
| Attributes | 4.1) Is the model oriented correctly with respect to the true North? | Yes |
| | 5.1) Does the model maintain its correct dimensions and proportions? | Yes |
| | 6.1) Is the eventual translation consistent with the IFC definitions? | Yes |
| | 7.1) Are the hierarchical relationships consistent with the IFC hierarchy? | Yes |
| Attributes | 8.1) Are the attributes present in the IFC entities retained and consistent? | No |
| | 8.1.1) What changes / inconsistencies / errors / other issues were noted? | Only reference is retained, other attributes are not |
| | 8.1.2) Attach screenshots |   |
| 9.1) Are the relationships between the objects retained? | Yes | |
| Geometry | 10.1) Is geometry read correctly? | Yes |
| Normals | 11.1) Did the normals change? | No |
| 2D/3D | 12.1) Is it possible to view the model in 3D? | Yes |
| | 13.1) Is it possible to view the model in 2D? | No |
| Editing | 14.1) Is it possible to edit the model (attributes, geometry, other)? | No |
| Query | 15.1) Is it possible to query the model and the attributes? | No |
| Analysis | 16.1) Is it possible to analyse the objects and the model? | Yes, analysis about the model validity and features (geometry, semantics, schema validity...) are possible (type 1) |
| | 16.1.1) What analysis are possible? Do you know if the results are reliable? | It should be able to do a model validity check. However, I can't perform it, even when following guidelines. In the "checking" box, the model does not show up. |
| | 16.1.2) Attach screenshots |  |

| | | |
|-----------------------------|---|--|
| | 16.1.3) Time required to perform the analysis about the model itself (type 1) | No analysis of type 1 are possible |
| | 16.1.3) Time required to perform the analysis about the model performances (type2) | No analysis of type 2 are possible |
| Export | You arrived at the end of the phase 1: "Import and manage the file in the software".Now choose: | The software cannot export to IFC, therefore skip the phase 2 |
| Test with UpTown.ifc | | |
| Performance | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | 1-5 minutes |
| | How long does it take, approximately, to:Zoom into the model to see more detail | it's almost immediate |
| | How long does it take, approximately, to:Pan the model | it's almost immediate |
| | How long does it take, approximately, to:Rotate the model | it's almost immediate |
| | How long does it take, approximately, to:Query an object | it's almost immediate |
| | How long does it take, approximately, to:Inspect the objects linked to the queried one (Element 3) through a relationship | it's almost immediate |
| Proportions | 24.1) Does the model maintain its correct dimensions and proportions? | Yes |
| IFC | 25.1) Is the eventual translation consistent with the IFC definitions? | Yes |
| Hierarchy | 26.1) Are the hierarchical relationships consistent with the IFC hierarchy? | Yes |
| Attributes | 27.1) Are the attributes present in the IFC entities retained and consistent? | No |
| | 27.1.1) What changes / inconsistencies / errors / other issues were noted? | Only the reference attribute is kept |
| | 27.1.2) Attach screenshots |  |
| Relationships | 28.1) Are the relationships between the objects retained? | Yes |
| Geometry | 29.1) Is geometry read correctly? | Yes |
| Normals | 30.1) Did the normals change? | No |

| | | |
|---------------------------------|---|--|
| 2D/3D | 31.1) Is it possible to view the model in 3D? | Yes |
| | 32.1) Is it possible to view the model in 2D? | No |
| Editing | 33.1) Is it possible to edit the model (attributes, geometry, other)? | The answers are the same I gave during the test with Myran.ifc |
| Querying | 34.1) Is it possible to query the model and the attributes? | The answers are the same I gave during the test with Myran.ifc |
| Analysis | 35.1) Is it possible to analyse the objects and the model? | The answers are the same I gave during the test with Myran.ifc |
| Export | You arrived at the end of the phase 1: "Import and manage the file in the software".Now choose: | The software cannot export to IFC, therefore skip the phase 2 |
| Test with Savigliano.ifc | | |
| Performance | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | less than a minute |
| | How long does it take, approximately, to:Zoom into the model to see more detail | it's almost immediate |
| | How long does it take, approximately, to:Pan the model | it's almost immediate |
| | How long does it take, approximately, to:Rotate the model | it's almost immediate |
| | How long does it take, approximately, to:Query an object | it's almost immediate |
| | How long does it take, approximately, to:Inspect the objects linked to the queried one through a relationship | it's almost immediate |
| Georeferencing | 40.1) Are the world (projected) coordinates taken into account when locating the model in the software's coordinate reference system? | No |
| | 40.1.1) Where is the origin of the model coordinate reference system as imported in the software? | At the reference point |
| | 40.1.3) What is the coordinate reference system and projection and what unit of measure is used for the representation? | Can't show it on a screenshot because it's inside the building |
| Height | 41.1) Are the "real-world" elevation values (heights) considered when locating the model in the software (z)? | No |
| | 41.1.1) What is the elevation value of the origin of the model coordinate reference system as imported in the software? | 0 |
| | 41.1.2) Attach screenshots | |
| | 41.1.3) What is the height reference system? | Local in metres or milimetres (similarly to Myran) |

| | | |
|---------------|---|--|
| | 41.1.4) Attach screenshots |  |
| Orientation | 42.1) Is the model oriented correctly with respect to the true North? | Yes |
| Proportions | 43.1) Does the model maintain its correct dimensions and proportions? | Yes |
| IFC | 44.1) Is the eventual translation consistent with the IFC definitions? | Yes |
| Hierarchy | 45.1) Are the hierarchical relationships consistent with the IFC hierarchy? | Yes |
| Attributes | 46.1) Are the attributes present in the IFC entities retained and consistent? | No |
| | 46.1.1) What changes / inconsistencies / errors / other issues were noted? | No, only "reference" is there |
| Attributes | 46.1.2) Attach screenshots |  |
| Relationships | 47.1) Are the relationships between the objects retained? | Yes |
| Geometry | 48.1) Is geometry read correctly? | Yes |
| Normals | 49.1) Did the normals change? | No |
| 2D/3D | 50.1) Is it possible to view the model in 3D? | Yes |
| | 51.1) Is it possible to view the model in 2D? | No |

Solibri Anywhere 9.10.4.13 – Windows 10 Home

Proprietary

3D viewer

1 - Very beginner user (it is nearly the first time you use it)

| | | |
|--------|---|---|
| Export | You arrived at the end of the phase 1: "Import and manage the file in the software".Now choose: | The software cannot export to IFC, therefore skip the phase 2 |
|--------|---|---|

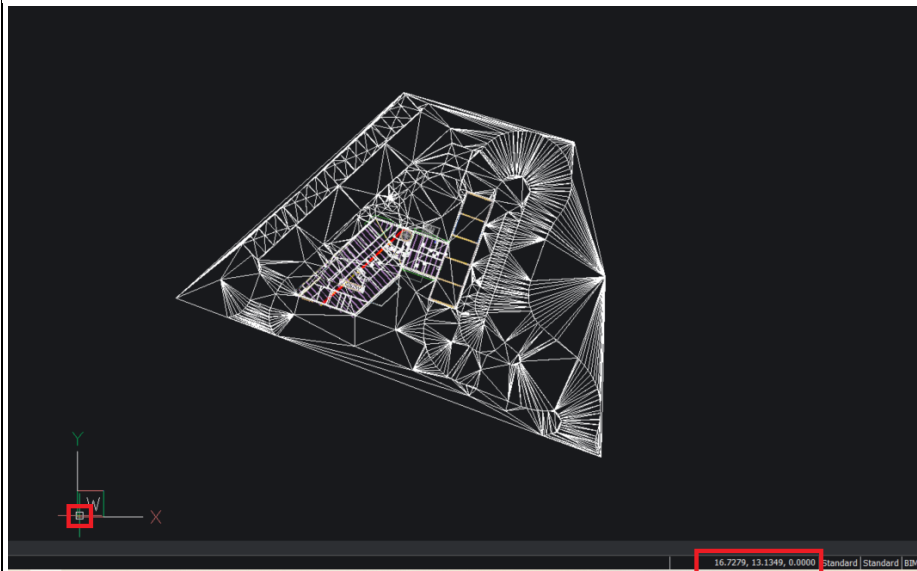
BricsCAD Ultimate

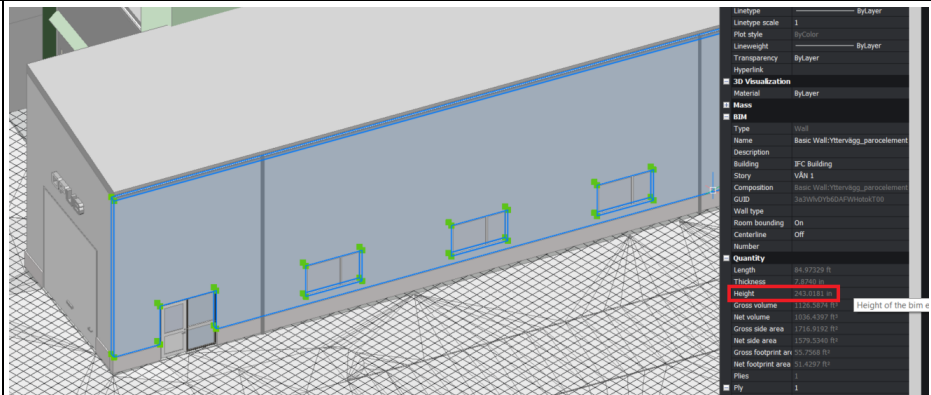
| | | | | | | | |
|---------------|--------------------------------------|--------------------------------|------------------------------|---------------------------------|---------------------------|------------------------------|-----------------------|
| Software | Software Name [version] | BricsCAD Ultimate [V20] | | Software house | | | Bricsys |
| | Proprietary or open source software? | | | Kind of software | | | |
| | proprietary | | | CAD | | | |
| Computer | Model and year | Operating system | CPU | GPU | Memory (RAM) | Hard drive capacity | Hard drive free space |
| | Lenovo Thinkpad P1 Gen 2 (2019) | Windows 10 Home 64-bit | Intel i7-9750H @ 2.60GHz | Nvidia Quadro T1000 | 16 GB | 512 GB | 107 GB |
| Certification | IFC import certification status | Import certification date | Import certification program | IFC export certification status | Export certification date | Export certification program | |
| | certified in (date) | 2017-10-11 | CV 2.0 | certified in (date) | 2016-10-14 | CV2.0-Arch | |

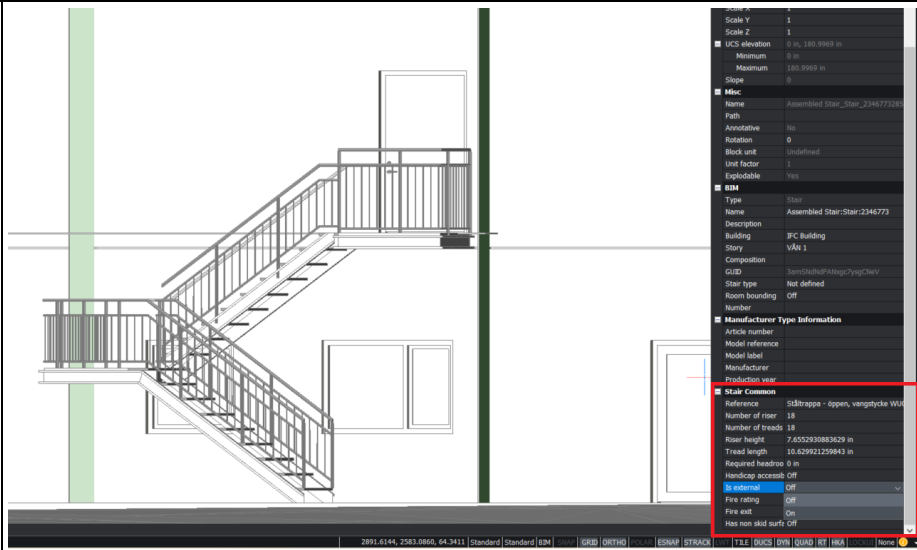
Test with Myran.ifc

| | | |
|-------------|---|----------------------------------|
| Performance | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | less than a minute |
| | How long does it take, approximately, to:Zoom into the model to see more detail | it's almost immediate |
| | How long does it take, approximately, to:Pan the model | it's almost immediate |
| | How long does it take, approximately, to:Rotate the model | it's almost immediate |
| | How long does it take, approximately, to:Query an object | it's almost immediate |
| | How long does it take, approximately, to:Inspect the objects linked to the queried one through a relationship | the software does not allow this |

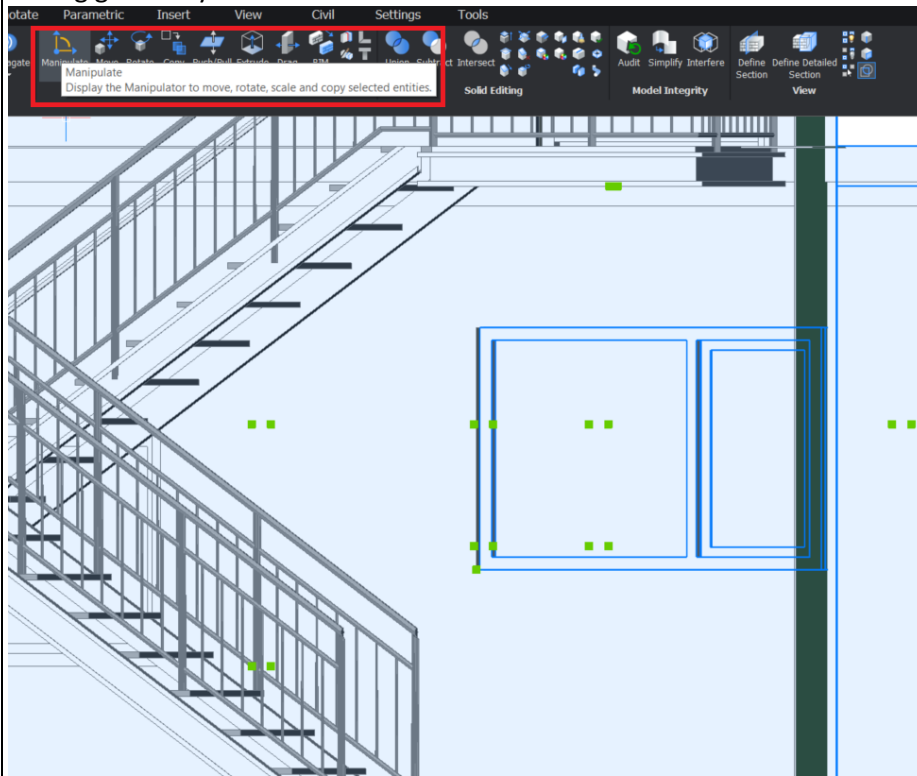
| | | |
|----------------|--|----------------------------------|
| Georeferencing | 2.1) Are the world (projected) coordinates taken into account when locating the model in the software's coordinate reference system? | No |
| | 2.1.1) Where is the origin of the model coordinate reference system as imported in the software? | At the reference point (0, 0, 0) |
| | 2.1.2) Attach screenshots | |



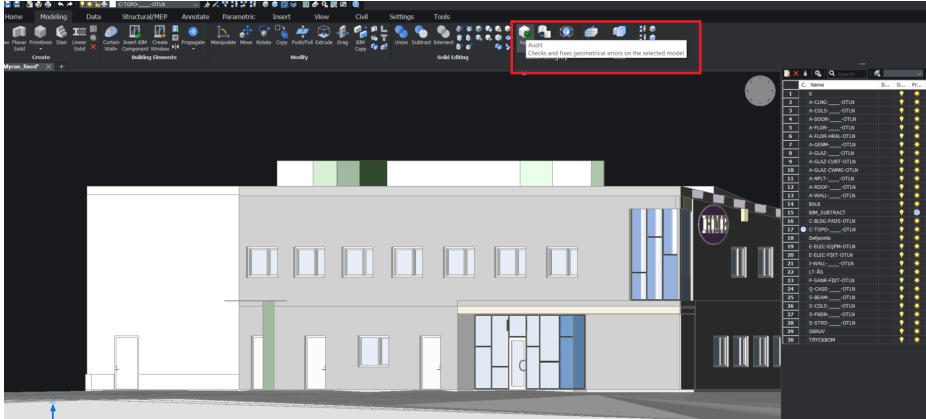
| | | |
|------------|--|---|
| | 2.1.3) What is the coordinate reference system and projection and what unit of measure is used for the representation? | Local right-handed in inches |
| | 2.1.4) Attach screenshots | See 2.1.2 |
| Height | 3.1) Are the "real-world" elevation values (heights) considered when locating the model in the software (z)? | No |
| | 3.1.1) What is the elevation value of the origin of the model coordinate reference system as imported in the software? | 0 |
| | 3.1.2) Attach screenshots | See 2.1.2 |
| | 3.1.3) What is the height reference system? | Local in inches |
| | 3.1.4) Attach screenshots |  |
| Orientati | 4.1) Is the model oriented correctly with respect to the true North? | Yes |
| Proporti | 5.1) Does the model maintain its correct dimensions and proportions? | Yes |
| IFC defini | 6.1) Is the eventual translation consistent with the IFC definitions? | Yes |
| Hierarch | 7.1) Are the hierarchical relationships consistent with the IFC hierarchy? | Yes |
| | 7.2) short comments to the previous question (optional) | They're contained in the correct storeys at least |
| Attrib | 8.1) Are the attributes present in the IFC entities retained and consistent? | Yes |
| Relati | 9.1) Are the relationships between the objects retained? | Yes |
| Ge | 10.1) Is geometry read correctly? | Yes |
| Norm | 11.1) Did the normals change? | No |
| 2D/3D | 12.1) Is it possible to view the model in 3D? | Yes |
| | 13.1) Is it possible to view the model in 2D? | No |
| Editing | 14.1) Is it possible to edit the model (attributes, geometry, other)? | Yes |
| | 14.1.1) What editing is possible (attributes, geometry, georeferencing, please add details)? | You can edit attributes and geometry (scale, move, rotate) |
| | 14.1.2) Attach screenshots | Editing attributes |



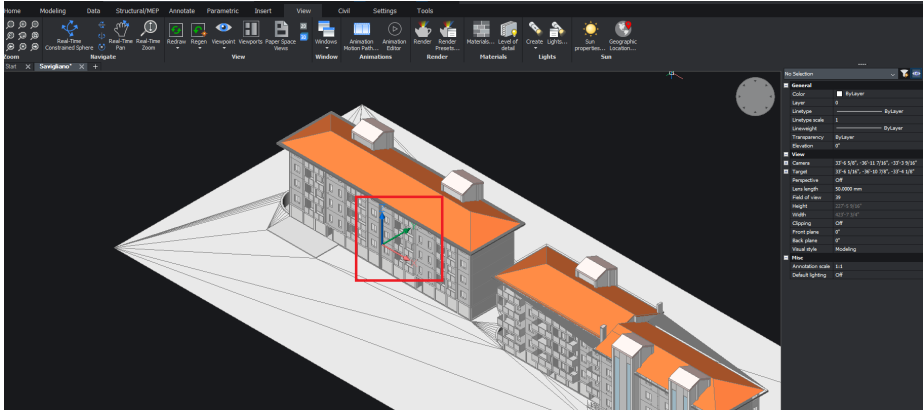
Editing geometry



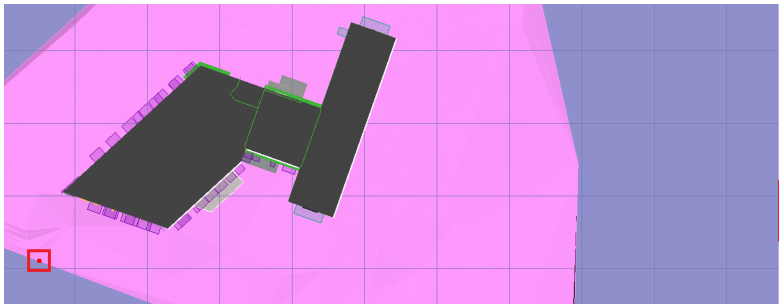
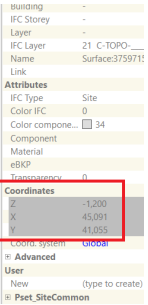
| | | |
|----------|---|---|
| Q | 15.1) Is it possible to query the model and the attributes? | No |
| Analysis | 16.1) Is it possible to analyse the objects and the model? | Yes, analysis about the model validity and features (geometry, semantics, schema validity...) are possible (type 1) |

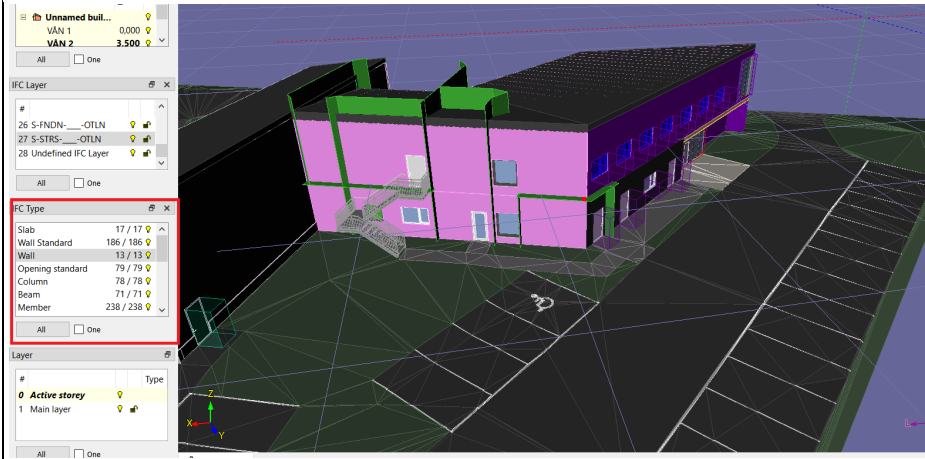
| | | |
|------------------------------------|--|--|
| | <p>16.1.1) What analysis are possible? Do you know if the results are reliable?</p> <p>16.1.2) Attach screenshots</p> | <p>You can check the integrity of the model</p>  |
| | <p>16.1.3) Time required to perform the analysis about the model itself (type 1)</p> | <p>it crashes without completing the operation</p> |
| | <p>16.1.3) Time required to performing the analysis about the model performances (type2)</p> | <p>No analysis of type 2 are possible</p> |
| <p>Export</p> | <p>You arrived at the end of the phase 1: "Import and manage the file in the software".Now choose:</p> | <p>The software has also export abilities to IFC</p> |
| | <p>17.2) short comments to the previous question (optional)</p> | <p>Apparently need a license for export</p> |
| | <p>18.1) Is it possible to choose the IFC model view definition (MVD) to be used when exporting the data?</p> | <p>No</p> |
| | <p>19) How long does it take for the data to be exported to IFC?</p> | <p>less than a minute</p> |
| <p>Test with UpTown.ifc</p> | | |
| <p>Performance</p> | <p>How long does it take, approximately, to:Import (and visualise if the software allows it) the model</p> | <p>20 minutes-1 hour</p> |
| | <p>How long does it take, approximately, to:Zoom into the model to see more detail</p> | <p>it's almost immediate</p> |
| | <p>How long does it take, approximately, to:Pan the model</p> | <p>it's almost immediate</p> |
| | <p>How long does it take, approximately, to:Rotate the model</p> | <p>it's almost immediate</p> |
| | <p>How long does it take, approximately, to:Query an object</p> | <p>it's almost immediate</p> |
| | <p>How long does it take, approximately, to:Inspect the objects linked to the queried one (Element 3) through a relationship</p> | <p>the software does not allow this</p> |
| <p>Pro porti</p> | <p>24.1) Does the model maintain its correct dimensions and proportions?</p> | <p>Yes</p> |
| <p>IFC defini</p> | <p>25.1) Is the eventual translation consistent with the IFC definitions?</p> | <p>Yes</p> |

| | | |
|---------------------------------|---|--|
| Hierarchy | 26.1) Are the hierarchical relationships consistent with the IFC hierarchy? | Yes |
| Attributes | 27.1) Are the attributes present in the IFC entities retained and consistent? | Yes |
| Relationships | 28.1) Are the relationships between the objects retained? | Yes |
| Geometry Normals | 29.1) Is geometry read correctly? | Yes |
| | 30.1) Did the normals change? | No |
| 2D/3D | 31.1) Is it possible to view the model in 3D? | Yes |
| | 32.1) Is it possible to view the model in 2D? | Yes |
| Editing | 33.1) Is it possible to edit the model (attributes, geometry, other)? | The answers are the same I gave during the test with Myran.ifc |
| Querying | 34.1) Is it possible to query the model and the attributes? | The answers are the same I gave during the test with Myran.ifc |
| Analysis | 35.1) Is it possible to analyse the objects and the model? | The answers are the same I gave during the test with Myran.ifc |
| Export | You arrived at the end of the phase 1: "Import and manage the file in the software".Now choose: | The software has also export abilities to IFC |
| | 36) How long does it take for the data to be exported to IFC? | it crashes without completing the operation |
| Test with Savigliano.ifc | | |
| Performance | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | 1-5 minutes |
| | How long does it take, approximately, to:Zoom into the model to see more detail | it's almost immediate |
| | How long does it take, approximately, to:Pan the model | it's almost immediate |
| | How long does it take, approximately, to:Rotate the model | it's almost immediate |
| | How long does it take, approximately, to:Query an object | it's almost immediate |
| | How long does it take, approximately, to:Inspect the objects linked to the queried one through a relationship | the software does not allow this |
| Georeferencing | 40.1) Are the world (projected) coordinates taken into account when locating the model in the software's coordinate reference system? | No |
| | 40.1.1) Where is the origin of the model coordinate reference system as imported in the software? | At the reference point |

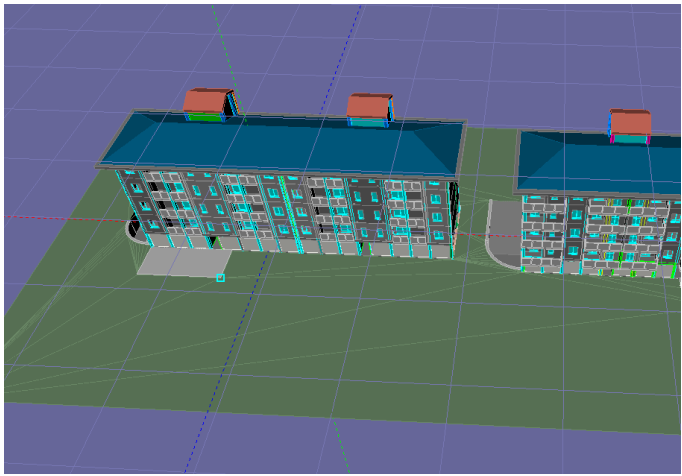
| | | |
|------------------|---|--|
| | 40.1.2) Attach screenshots |  |
| | 40.1.3) What is the coordinate reference system and projection and what unit of measure is used for the representation? | Local right-handed in inches |
| | 40.2) short comments to the previous question (optional) | Also see Myran screenshots |
| Height | 41.1) Are the "real-world" elevation values (heights) considered when locating the model in the software (z)? | No |
| | 41.1.1) What is the elevation value of the origin of the model coordinate reference system as imported in the software? | 0 |
| | 41.1.3) What is the height reference system? | Also see Myran screenshots |
| Orientation | 42.1) Is the model oriented correctly with respect to the true North? | Yes |
| Proportions | 43.1) Does the model maintain its correct dimensions and proportions? | Yes |
| IFC definitions | 44.1) Is the eventual translation consistent with the IFC definitions? | Yes |
| Relationships | 47.1) Are the relationships between the objects retained? | Yes |
| Geometry Normals | 48.1) Is geometry read correctly? | Yes |
| | 49.1) Did the normals change? | No |
| 2D/3D | 50.1) Is it possible to view the model in 3D? | Yes |
| | 51.1) Is it possible to view the model in 2D? | No |
| Export | You arrived at the end of the phase 1: "Import and manage the file in the software". Now choose: | The software has also export abilities to IFC |
| | 55) How long does it take for the data to be exported to IFC? | less than a minute |

Lexocad

| | | | | | | | | |
|----------------------------|--|--|---|----------------------------------|---|------------------------------|-----------------------|--|
| Software | Software Name [version] | Lexocad [v26] | | Software house | | Cadwork | | |
| | Proprietary or open source software? | | | Kind of software | | | | |
| | proprietary | | | CAD | | | | |
| Computer | Model and year | Operating system | CPU | GPU | Memory (RAM) | Hard drive capacity | Hard drive free space | |
| | Lenovo Thinkpad P1 Gen 2 (2019) | Windows 10 Home 64-bit | Intel i7-9750H @ 2.60GHz | Nvidia Quadro T1000 | 16 GB | 512 GB | 76 GB | |
| Certification | IFC import certification status | Import certification date | Import certification program | IFC export certification status | Export certification date | Export certification program | | |
| | certified in (date) | 2016-10-04 | CV 2.0 | certification in progress | | CV2.0-Arch | | |
| Test with Myran.ifc | | | | | | | | |
| Performance | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | | | 1-5 minutes | | | | |
| | How long does it take, approximately, to:Zoom into the model to see more detail | | | it's almost immediate | | | | |
| | How long does it take, approximately, to:Pan the model | | | it's almost immediate | | | | |
| | How long does it take, approximately, to:Rotate the model | | | it's almost immediate | | | | |
| | How long does it take, approximately, to:Query an object | | | it's almost immediate | | | | |
| | How long does it take, approximately, to:Inspect the objects linked to the queried one through a relationship | | | the software does not allow this | | | | |
| Georeferencing | 2.1) Are the world (projected) coordinates taken into account when locating the model in the software's coordinate reference system? | | No | | | | | |
| | 2.1.1) Where is the origin of the model coordinate reference system as imported in the software? | | It's not possible to see the origin, because I can only see coordinates of objects. However, it seems to be at the reference point. | | | | | |
| | 2.1.2) Attach screenshots |  | | |  | | | |
| | 2.1.3) What is the coordinate reference system and projection and what unit of measure is used for the representation? | | Local, in metres | | | | | |

| | | |
|-----------|--|--|
| | 2.1.4) Attach screenshots | See 2.1.2 |
| | 2.2) short comments to the previous question (optional) | In the settings of the software it is indicated that unit of measurement is metres |
| Height | 3.1) Are the "real-world" elevation values (heights) considered when locating the model in the software (z)? | No |
| | 3.1.1) What is the elevation value of the origin of the model coordinate reference system as imported in the software? | Can't check it, but it's probably 0 |
| | 3.1.3) What is the height reference system? | Local |
| Ori | 4.1) Is the model oriented correctly with respect to the true North? | Yes |
| Pro | 5.1) Does the model maintain its correct dimensions and proportions? | Yes |
| Semantics | 6.1) Is the eventual translation consistent with the IFC definitions? | Yes |
| | 7.1) Are the hierarchical relationships consistent with the IFC hierarchy? | Yes |
| | 8.1) Are the attributes present in the IFC entities retained and consistent? | Yes |
| | 9.1) Are the relationships between the objects retained? | Yes |
| Geomet | 10.1) Is geometry read correctly? | Yes |
| | 11.1) Did the normals change? | No |
| 2D/3D | 12.1) Is it possible to view the model in 3D? | Yes |
| | 13.1) Is it possible to view the model in 2D? | No |
| Editi | 14.1) Is it possible to edit the model (attributes, geometry, other)? | No |
| Querying | 15.1) Is it possible to query the model and the attributes? | Yes |
| | 15.1.1) What kinds of query are possible? | Only on object type |
| | 15.1.2) Attach screenshots |  |
| An | 16.1) Is it possible to analyse the objects and the model? | No |
| Exp | You arrived at the end of the phase 1: "Import and manage the file in the software". Now choose: | The software cannot export to IFC, therefore skip the phase 2 |

| | | |
|---------------------------------|---|--|
| | 17.2) short comments to the previous question (optional) | Apparently need a license for export |
| Test with UpTown.ifc | | |
| Performance | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | 5-20 minutes |
| | How long does it take, approximately, to:Zoom into the model to see more detail | less than a minute |
| | How long does it take, approximately, to:Pan the model | less than a minute |
| | How long does it take, approximately, to:Rotate the model | 1-5 minutes |
| | How long does it take, approximately, to:Query an object | less than a minute |
| | How long does it take, approximately, to:Inspect the objects linked to the queried one (Element 3) through a relationship | less than a minute |
| Pro porti ons | 24.1) Does the model maintain its correct dimensions and proportions? | Yes |
| Semantics | 25.1) Is the eventual translation consistent with the IFC definitions? | Yes |
| | 26.1) Are the hierarchical relationships consistent with the IFC hierarchy? | Yes |
| | 27.1) Are the attributes present in the IFC entities retained and consistent? | Yes |
| | 28.1) Are the relationships between the objects retained? | Yes |
| Geom etry | 29.1) Is geometry read correctly? | Yes |
| | 30.1) Did the normals change? | No |
| 2D/3 D | 31.1) Is it possible to view the model in 3D? | Yes |
| | 32.1) Is it possible to view the model in 2D? | Yes |
| Edit ing | 33.1) Is it possible to edit the model (attributes, geometry, other)? | The answers are the same I gave during the test with Myran.ifc |
| Quer ying | 34.1) Is it possible to query the model and the attributes? | The answers are the same I gave during the test with Myran.ifc |
| Anal ysis | 35.1) Is it possible to analyse the objects and the model? | The answers are the same I gave during the test with Myran.ifc |
| Export | You arrived at the end of the phase 1: "Import and manage the file in the software".Now choose: | The software cannot export to IFC, therefore skip the phase 2 |
| | 36) How long does it take for the data to be exported to IFC? | 20 minutes-1 hour |
| Test with Savigliano.ifc | | |
| Performance | How long does it take, approximately, to:Import (and visualise if the software allows it) the model | 1-5 minutes |
| | How long does it take, approximately, to:Zoom into the model to see more detail | it's almost immediate |
| | How long does it take, approximately, to:Pan the model | it's almost immediate |

| | | |
|----------------|---|---|
| | How long does it take, approximately, to:Rotate the model | it's almost immediate |
| | How long does it take, approximately, to:Query an object | it's almost immediate |
| | How long does it take, approximately, to:Inspect the objects linked to the queried one through a relationship | the software does not allow this |
| Georeferencing | 40.1) Are the world (projected) coordinates taken into account when locating the model in the software's coordinate reference system? | No |
| | 40.1.1) Where is the origin of the model coordinate reference system as imported in the software? | At the reference point |
| | 40.1.2) Attach screenshots |  |
| | 40.1.3) What is the coordinate reference system and projection and what unit of measure is used for the representation? | Local in metres |
| | 40.2) short comments to the previous question (optional) | Screenshot would be similar to the one for Myran |
| Height | 41.1) Are the "real-world" elevation values (heights) considered when locating the model in the software (z)? | No |
| | 41.1.1) What is the elevation value of the origin of the model coordinate reference system as imported in the software? | 0 |
| | 41.1.3) What is the height reference system? | Screenshot would be similar to the one for Myran |
| Orientation | 42.1) Is the model oriented correctly with respect to the true North? | Yes |
| Percentage | 43.1) Does the model maintain its correct dimensions and proportions? | Yes |
| IFC | 44.1) Is the eventual translation consistent with the IFC definitions? | Yes |
| Relationships | 47.1) Are the relationships between the objects retained? | Yes |
| Geometry | 48.1) Is geometry read correctly? | Yes |
| | 49.1) Did the normals change? | No |
| 2D/3D | 50.1) Is it possible to view the model in 3D? | Yes |
| | 51.1) Is it possible to view the model in 2D? | No |
| Export | You arrived at the end of the phase 1: "Import and manage the file in the software".Now choose: | The software has also export abilities to IFC |
| | 55) How long does it take for the data to be exported to IFC? | less than a minute |

Lexocad v26 – Windows 10 Home

Proprietary

CAD

1 - Very beginner user (it is nearly the first time you use it)