

6) Attach other screenshots or files that you consider useful

1. Visualizations in BIMVision (before conversion)

Savigliano – Dataset IFC

- ▶ LOD 300 without furniture details
- ▶ Figure 1 shows the building from dataset, Figure 2 hierarchy of IFC elements and building details are showed in Figure 3.

Active	Type	IFC Structure
<input checked="" type="checkbox"/>	Project	0001
<input checked="" type="checkbox"/>	Site	Superficie:508326
<input checked="" type="checkbox"/>	Building	
<input checked="" type="checkbox"/>	Building Storey	-1 - Piano interrato_5-6-10
<input checked="" type="checkbox"/>	Columns	
<input checked="" type="checkbox"/>	Walls	
<input checked="" type="checkbox"/>	Slabs	
<input checked="" type="checkbox"/>	Doors	
<input checked="" type="checkbox"/>	Stairs	
<input checked="" type="checkbox"/>	Building Element Pro...	
<input checked="" type="checkbox"/>	Building Storey	0 - Piano terra_2-4
<input checked="" type="checkbox"/>	Building Storey	1 - Piano primo piano (PQ)_2-4
<input checked="" type="checkbox"/>	Building Storey	2 - Piano secondo_2-4
<input checked="" type="checkbox"/>	Building Storey	3 - Piano terzo_2-4
<input checked="" type="checkbox"/>	Building Storey	4 - Piano quarto_2-4
<input checked="" type="checkbox"/>	Building Storey	5 - Sottotetto_2-4
<input checked="" type="checkbox"/>	Building Storey	6 - Colmo tetto
<input checked="" type="checkbox"/>	Building Storey	6 - Colmo tetto vano scale

Figure 1.2.2

Figure 1.2.1 (a)

Figure 1.2.3 (a)

Visualizations: BIMVision

2. Conversion through FME Quick Translator

Visualization in FME Data Inspector and FZK Viewer

Savigliano – Experiment IFC to CityGML

- ▶ Missing Roof, Window and Slab features in transformed format
- ▶ No hierarchal level information in resulting format

Figure 2.2.1

Figure 2.2.2 (a)

Figure 2.2.3 (a)

Figure 2.2.3 (b)

Visualizations: FME Data Inspector and FZKViewer (Red color)
Conversion tool: FME Quick Translator

a. Translation Errors (logs from FME Quick Translator)

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The IFC reader does not support the following type: 'IfcAdvancedBrep'. All instances of this type will be skipped
The IFC reader does not support the following type: 'IfcSurfaceCurveSweptAreaSolid'. All instances of this type will be skipped
IFC: 2940 objects read
FME Configuration: Source coordinate system for reader IFC[IFC] set to 'IFC_COORDSYS_0' as read from input data
Coordinate System 'IFC_COORDSYS_0' parameters: CS_NAME='IFC_COORDSYS_0' DT_NAME='WGS84' ORG_LAT='41.799999236944444' ORG_LNG='12.600000313888888' PROJ='AZMED' QUAD='1' UNIT='METER' X_OFF='0.0' Y_OFF='0.0'
FME Configuration: Destination coordinate system set to input coordinate system 'IFC_COORDSYS_0'
No matching transformation specification found for feature:
+++++++
Feature Type: 'IfcTypeObject'
Attribute(encoded: UTF-8) : 'GlobalId' has value '12Bqerxb0fu5Cd9b4pKb1'
Attribute(encoded: UTF-8) : 'Name' has value '80 x 210 cm'
Attribute(encoded: UTF-8) : 'OperationType' has value 'SINGLE_SWING_LEFT'
Attribute(boolean) : 'ParameterTakesPrecedence' has value 'No'
Attribute(encoded: UTF-8) : 'PredefinedType' has value 'DOOR'
Attribute(encoded: UTF-8) : 'Tag' has value '148121'
Attribute(string) : 'fme_geometry' has value 'fme_aggregate'
Attribute(string) : 'fme_type' has value 'fme_collection'
Attribute(64 bit unsigned integer): 'ifc_instance_name' has value '7238'
Attribute(string) : 'ifc_type' has value 'ifc_collection'
Attribute(string) : 'ifc_type_name' has value 'IfcDoorType'
Attribute(encoded: UTF-8) : 'ifc_unique_id' has value '12Bqerxb0fu5Cd9b4pKb1_7238'
Coordinate System: 'IFC_COORDSYS_0'
Geometry Type: IFMEAggregate
Name(UTF-8): 'IfcDoorType'
Front Appearance Reference: 'inherited_or_default_appearance'
Back Appearance Reference: 'inherited_or_default_appearance'
Number of Geometries: 2
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Log
640 Errors 224 Warnings Information Warnings Errors

22 The 'xml-enclosed-surface' geometry builder can only accept "surface" geometries, but the geometry given was:
23 ++++++
24 Feature Type: ''
25 Attribute(string): 'fme_geometry' has value 'fme_aggregate'
26 Attribute(string): 'fme_type' has value 'fme_solid'
27 Coordinate System: ''
28 Geometry Type: IFMEBRepSolid
29 Name(UTF-16LE): 'solidMember'
30 Number of Geometry Traits: 2
31 GeometryTrait(encoded: UTF-16LE): 'citygml_lod_name' has value 'solidMember'
32 GeometryTrait(encoded: UTF-16LE): 'gml_geometry' has value 'Solid'
33 Front Appearance Reference: 'inherited_or_default_appearance'

Reading source feature # 2500
Emptying factory pipeline
CityGML Writer: Unable to convert the coordinate system 'IFC_COORDSYS_0' to an EPSG code. No coordinate system will be set on this feature's geometry.
Error encountered while copying traits to generated solids. Some solid components may be missing traits, appearances, measures or attributes
... Last line repeated 4 times ...
Logging limit reached for the preceding message. Further instances of this message will not be logged
<CityGMLWriter> - registered 1274 messages of type: CityGML Writer: Unable to convert the coordinate system 'IFC_COORDSYS_0' to an EPSG code. No coordinate system will be set on this feature's geometry.
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Features Read Summary
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b. Discussion

Transformation process removes many features like Window, Roof and Slabs after translation, Figure 1.2.1 compared with Figure 2.2.2 and 2.2.3. However, the number of IFC to CityGML transformed objects Table 1 (reference: respective dataset submission word and log files) states that these features were successfully translated and only IfcTypeObject (e.g. IfcDoorStyle, IfcWindowStyle) were not transformed.

Figure 2.2.2 and 2.2.3 interprets that same dataset can be visualized differently across the software that support CityGML data visualization. FME Quick Translator is more oriented towards geometrical transformation and less semantic details, no hierarchy is kept for the elements and all object are transformed as *GenericCityObject*, as Figure 2.2.1 shows. Also translation errors states that FME Quick Translator doesn't support all geometries like IfcAdvancedBrep and IfcSurfaceCurveSweptAreaSolid.

Table 1

Total Features Read	3151
IFC to CityGML Stats	
Input Features Transformed	3106
Transformed Features Output	3106
Features Written Summary	3106
Features NOT Transformed	45
Feature Type Not Transformed	IfcTypeObject