**Github site for the research project “Leveransspecifikationer för Geodata-BIM”**

This Github site contains a collection of scripts and data that has been developed in the project delivery specifications for geodata-BIM), which was a research project carried out in the year 2019 within the research programme smart built environment.

The primary focus of the project was to develop and test delivery specifications for Geodata and BIM in the building permit process. The project has also included developing and testing a proposal for a new Swedish standard for building models in 2D and 3D that comply with CityGML's regulations.

The Github repository contains six folders which are CityGML3\_ADE, BuildingPermitcheck.zip, GeodatatoIFC.zip, IfcToCityGML3SWE.zip, SGPtoRevit.zip and SHP\_DWGtoSGP.zip. The content of these folders are described below.

**CityGML3\_ADE**

This folder contains the output of the further development of the Swedish geoprocess Building which was carried out in the project. The output files are test results of the project and it is not an official accepted standard. The CityGML3\_ADE repository includes the following:

* An **ADE** folderthat contains the xsd-file for the created CityGML 3.0 A
* A  **CityGML-3** folder that contains CityGML 3.0 xsd-files that was modified to be used on a local computer
* A **config** folder that contains the configuration files for ShapeChange. StandardNamespace.xml was modified for this test. Search paths to the local CityGML 3.0 xsd-files were added.
* A configuration file that include the configuration parameters for running ShapeChange, **BY\_CityGML-ADE.xml**
* The UML application schema used for creating the xsd-file for the CityGML 3.0 ADE (here zipped to **CityGML3\_ADE\_v4\_EAP.zip** since the original file is too large for GitHUB)

**BuildingPermitcheck.zip**

This folder contains a workspace used to check if a building (LOD1 model according to the CityGML3 ADE) conforms to the regulations in a detailed development plan. The workspace reads the detailed development plan and building model, finds in which area the building will be located and checks the valid regulation in that area. The result is presented visually in FME and saved as a report in Excel. The folder contains the following folders:

* **Input:** the detailed development plan over the area where the building is planned and a LOD1 CityGML3 ADE model of the building.
* **Output:** report of the building permit check as an Excel sheet.
* **xsd:** xsd-files for the CityGML3 ADE (which are also included in the folder CityGML3\_ADE)

**GeodatatoIFC.zip**

The folder contains a FME Workspace named **DWGtoIFC.fmw** (with test data) that translates geodata (DWG-file) into IFC. The user can specify to create either solids, surface or mesh as geometric representations. It is also possible to select IfcAnnotation or IfcBuildingElementProxy as output IFC class. The tests carried out in the research project showed that when converting geodata to IFC (BIM) it is important to use surfaces and solid(volume) objects. For example, line objects and point clouds should be avoided. This is the reasons why lines are not included as an option for geometric representation in this script.

**I**[**fcToCityGML3SWE.zip**](https://github.com/LeveransspecifikationerGeodataBIM/Main/blob/master/IfcToCityGML3SWE.zip)

The IfcToCityGML3SWE folder contains the following files:

* **IFC\_CityGML3\_Sve.fmw:** A FME Workspace that can be used to convert BIM data (IFC format) to CityGML3 Sve-test according to the specification CityGML3 Sve-Test that can be found in the CityGML3\_ADE folder. The IFC file are converted into a coherent 3D solid either in Lod1 or Lod2, which is dependent on the parameter’s settings chosen by the users.
* **IFC\_validation.fmw**: A FME workspace that was created to test if FME can be used for generic validation of IFC files. The workspace used an excel spreadsheet with rules that are defined by the user to validate an IFC files classification such as Coclass and attributes such as isExternal.
* **Inspect\_CityGML3\_Sve.fmw:** A simple FME workspace that is used to read the output CityGML3\_ADE file.

[**SGPtoRevit.zip**](https://github.com/LeveransspecifikationerGeodataBIM/Main/blob/master/SGPtoRevit.zip)

Test was carried out to make sure that the national specifications of geodata could be translated into DWG which is a widely used exchange file formats among many actors in construction and planning processes in Sweden. This folder contains the following file:

* **SGP\_2\_DWG\_1\_MYRAN.fmw:** A FME workspace used to convert the SGP(National Swedish specification for spatial data) data to DWG for the case study of Myran in Falun.
* **SGP\_2\_DWG\_1\_Lotsen.fmw:** A FME workspace used to convert the SGP(National Swedish specification for spatial data) data to DWG for the case study of Lotsen in Karlstad.
* **Test\_inläsning\_av\_IFCExport.fmw:** A FME workspace to read IFC files**.**
* **Hojdpunkt2hojdkurva\_2\_LOTSEN.fmw:** A FME workspace to translate points to height contours.

**SHP\_DWGtoSGP.zip**

This folder contains several FME workspaces that can be used to translate Shape and DWG files to several SGP data themes. SGP is the national specification for geodata in Sweden. It contains the following folders:

* **Lotsen\_byggnad\_till\_lod2\_cityGML:** Contains a FME workspace that translates existing 3D buildings(dwg file) into lod2 cityGML3.
* **Lotsen\_till\_sgp:** Includes several of FME workspaces that were used to translate DWG and shape files to SGP for the project Lotsen in Karlstad. It also includes the input files and the generated output files as XML.
* **Myran\_till\_sgp:** Includes several of FME workspaces that were used to translate DWG and shape files to SGP for the project Myran in Falun. It also includes the input files and the generated output files as XML.