

The CityGML Alderaan dataset

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CityGML Alderaan

The dataset consists of a fantasy city consisting of buildings, trees, and a DTM. The zipped file contains XML-based CityGML 2.0 data grouped into different files.

When it comes to its coordinate reference system, it is:

- Horizontal datum: EPSG 28992 (Amersfoort /RD NEW)
- Vertical datum: EPSG 5109

Nota bene: when visualised, the city model will appear in France, a bit west of the municipality of Joigny.

All data can be:

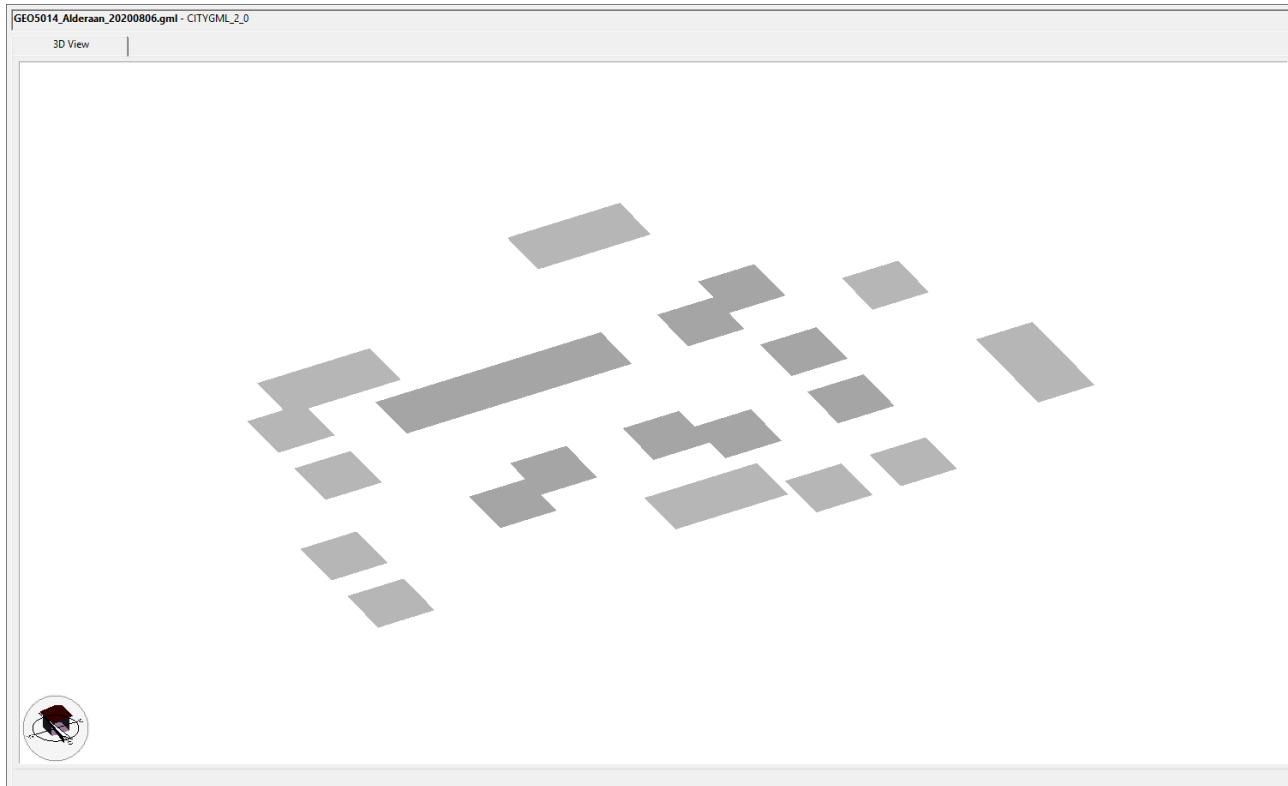
- visualised, for example, in the [KIT ModelViewer](#) or **FME Data Inspector**
- imported into the [3D City Database](#) and then visualised using in QGIS using the [3DCityDB-Tools plugin](#)

CityGML Alderaan

- File name: **Alderaan_buildings.gml**
 - 10 single-part and 1 multi-part buildings in LoD0, LoD1, LoD2 (via thematic surfaces)
 - 11 "ancillary" buildings in LoD0 and LoD1
 - The ancillary buildings are grouped into a CityObjectGroup
 - There are appearances to "style" the different geometries (via X3D materials)
 - There are some generic attributes as example
 - There are some comments to help you understand what is what
- File name: **Alderaan_trees.gml:**
 - 33 SolitaryVegetationObjects (trees) in LoD1, LoD2, LoD3, modelled via implicit geometries
 - 1 CityObjectGroup containing all trees
 - 1 global appearance
- File name: **Alderaan_DTM.gml:**
 - 1 ReliefFeature, consisting of
 - 60 TINRelief objects, in LoD1
 - 1 global appearance

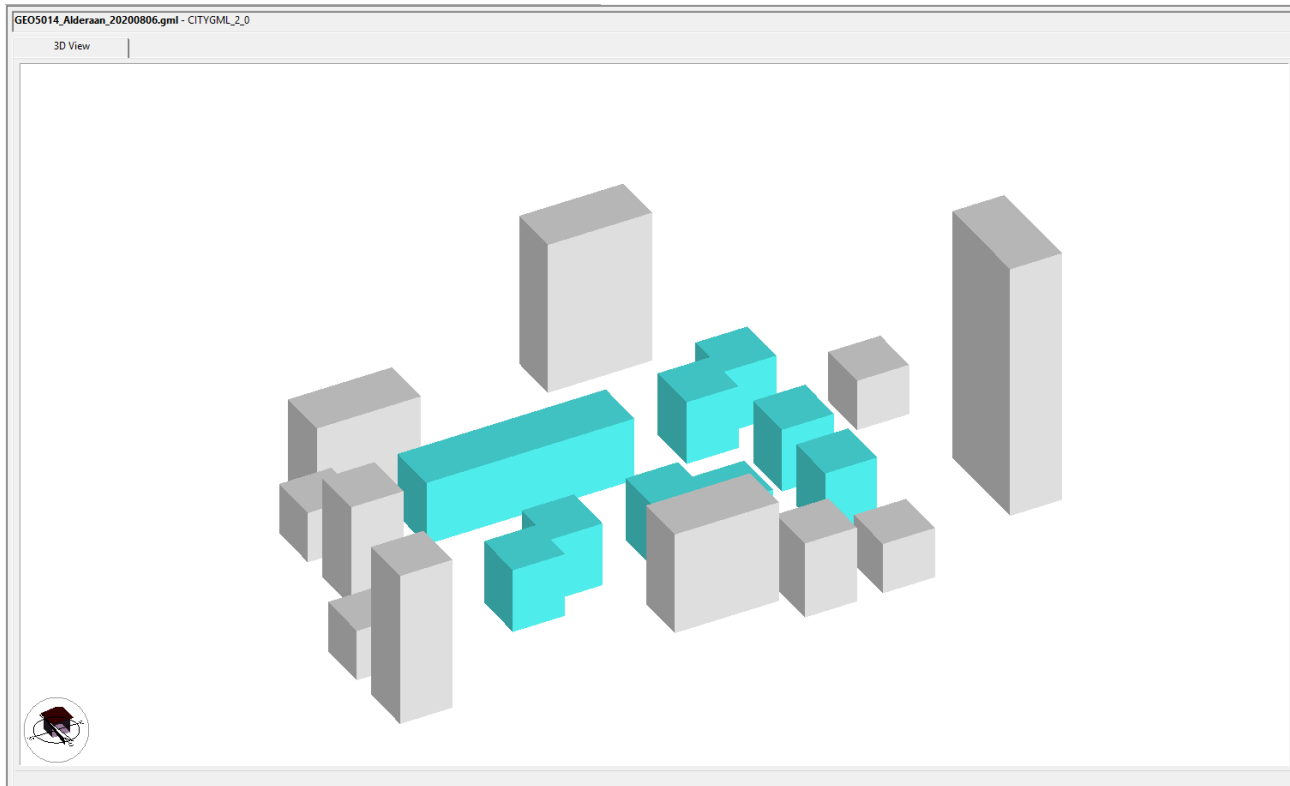
CityGML Alderaan (Buildings)

LoD0 footprints of all 22 buildings



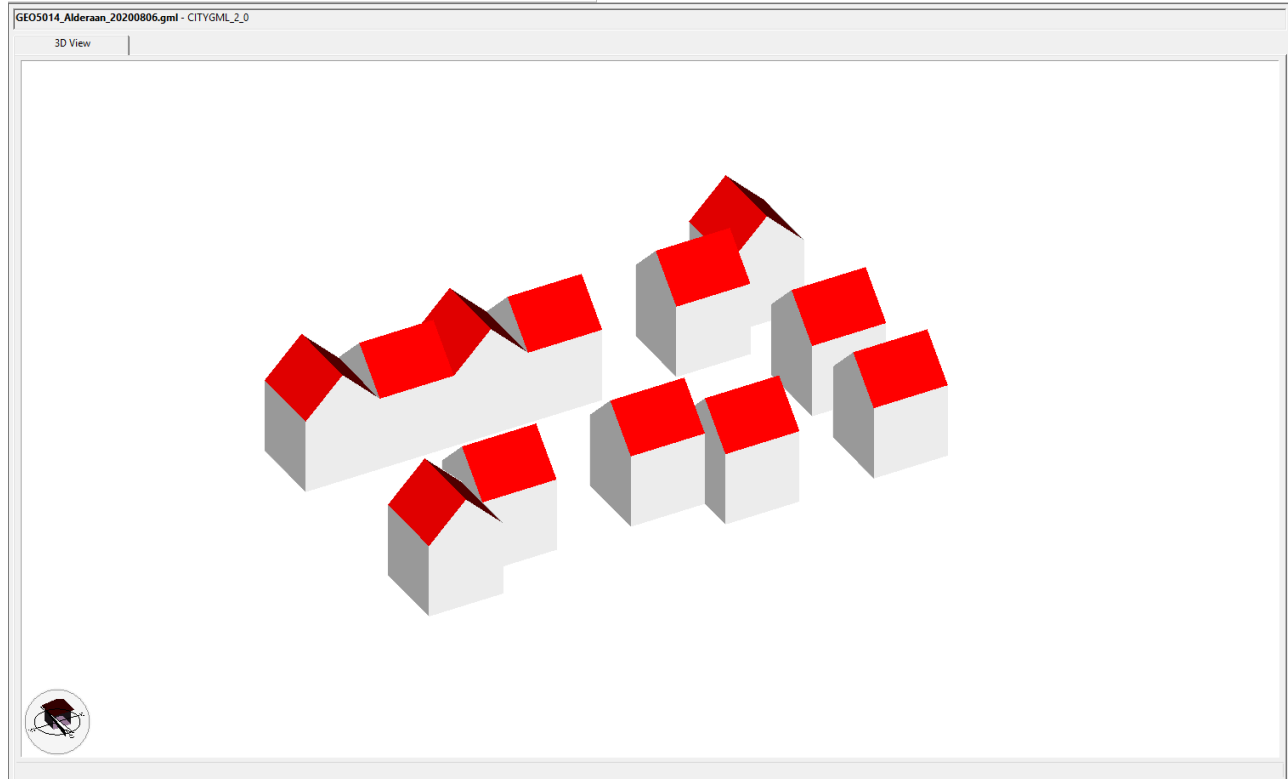
CityGML Alderaan (Buildings)

LoD1 prismatic geometries. In azure the "core" buildings, in grey the "ancillary" buildings



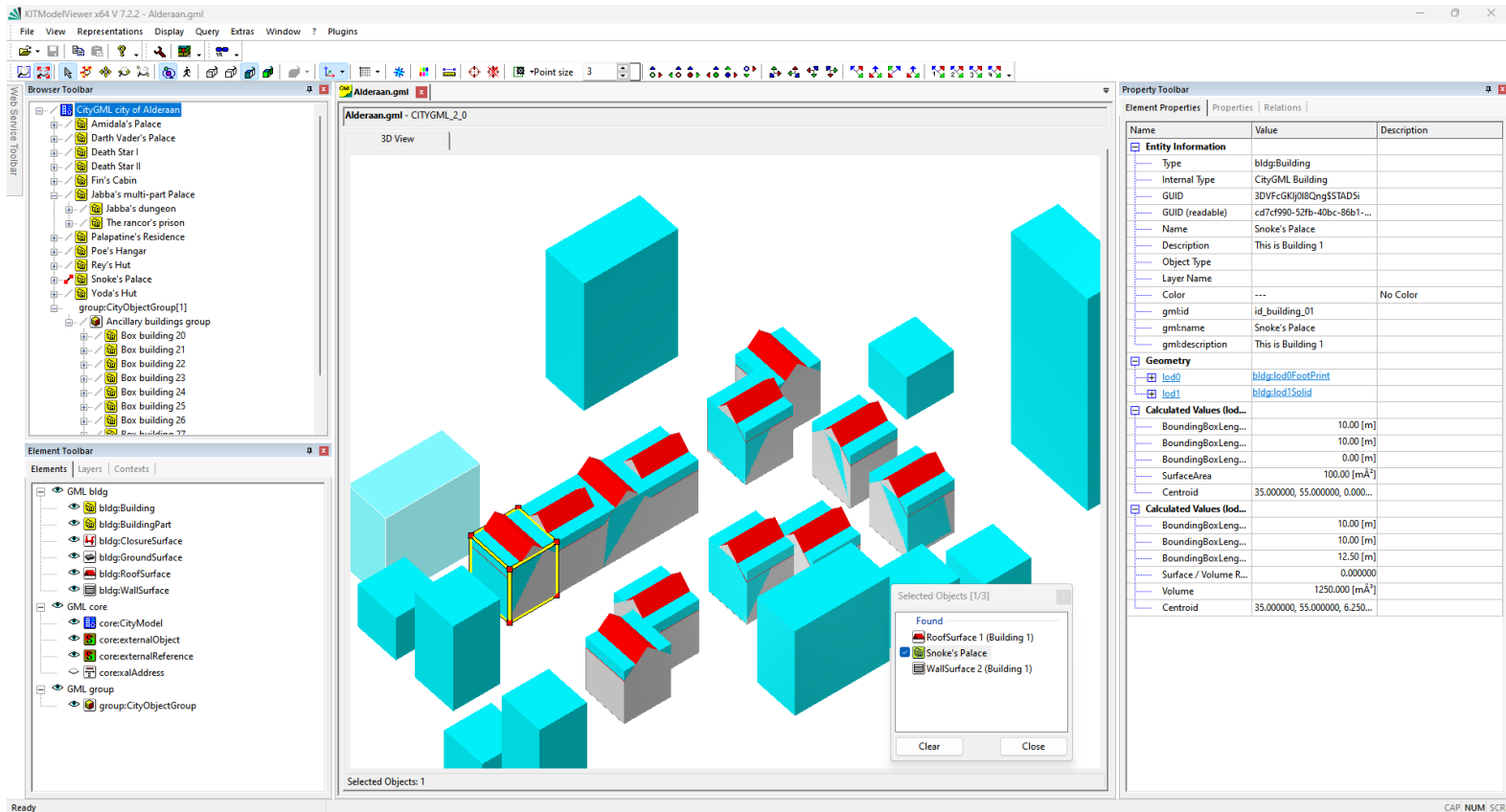
CityGML Alderaan (Buildings)

LoD2 thematic surfaces (only for the "core" buildings)



CityGML Alderaan (Buildings)

Multi-LoD view



The screenshot displays the KITModelViewer application window titled "Alderaan.gml". The main 3D view shows a cityscape of Alderaan with buildings rendered in cyan and red. A yellow bounding box highlights a specific building. A "Selected Objects" dialog is open, showing the following objects:

- Found
- RoofSurface 1 (Building 1)
- Smoke's Palace
- WallSurface 2 (Building 1)

The Property Toolbar on the right shows the following data for the selected object:

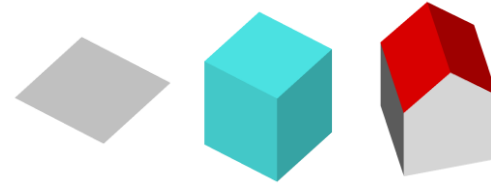
Name	Value	Description
Entity Information		
Type	bldg:Building	
Internal Type	CityGML:Building	
GUID	3DFc-GKj08QngSSTAD5i	
GUID (readable)	cd7c1990-52fb-40bc-86b1-...	
Name	Smoke's Palace	
Description	This is Building 1	
Object Type		
Layer Name		
Color	---	No Color
gmId	id_building_01	
gml:name	Smoke's Palace	
gml:description	This is Building 1	
Geometry		
lod0	bldg:lod0FootPrint	
lod1	bldg:lod1Solid	
Calculated Values (lod...)		
BoundingBoxLeng...	10.00 [m]	
BoundingBoxLeng...	10.00 [m]	
BoundingBoxLeng...	0.00 [m]	
SurfaceArea	100.00 [m ²]	
Centroid	35.000000, 55.000000, 0.000...	
Calculated Values (lod...)		
BoundingBoxLeng...	10.00 [m]	
BoundingBoxLeng...	10.00 [m]	
BoundingBoxLeng...	12.50 [m]	
Surface / Volume R...	0.000000	
Volume	1250.000 [m ³]	
Centroid	35.000000, 55.000000, 6.250...	

CityGML Alderaan (Buildings)

XML file contents (simplified)

- Header and city model attributes
- Building 1 →
- Building 2
- ...
- Building 12
- CityObjectGroup 1
 - Ancillary Building 20
 - Ancillary Building 21
 - ...
 - Ancillary Building 30
- Appearance of buildings in LoD0
- Appearance of buildings in LoD1
- Appearance of buildings in LoD2
- Appearance of ancillary buildings

- **Building 1**
 - Some properties (incl. generic attributes)
 - LoD0 Footprint
 - LoD1 Solid
 - RoofSurface 1
 - Some properties (incl. generic attributes)
 - RoofSurface 2
 - GroundSurface
 - WallSurface 1
 - ...
 - WallSurface 4
 - Address



Property Toolbar	
Properties Relations Element Properties	
Name	Value
Generic Attributes	
test_measure_att	134.45
test_uri_att	https://www.brickset.com
test_integer_att	12
test_real_att	12.34
test_date_att	2020-08-06
test_string_att	This is a test string
GML Attributes	
bldg:class	habitation
bldg:function	residential building
bldg:roofType	gabled roof
bldg:storeysAboveGround	3
gml:description	This is Building 1
gml:id	id_building_01
gml:name	Snoke's Palace
bldg:yearOfConstruction	1955
core:creationDate	2019-11-17
bldg:storeysAboveGround	3
bldg:storeysBelowGround	0
bldg:measuredHeight	15 [m]

```

66 <core:cityObjectMember>
67   <bldg:Building gml:id="id_building_01">
68     <gml:description>This is Building 1</gml:description>
69     <gml:name>Snoke's Palace</gml:name>
70     <core:creationDate>2019-11-17</core:creationDate>
71     <!-- This is an exemplary set of generic attributes attached to a Building BEGIN -->
72     <gen:measureAttribute name="test_measure_att">
73       <gen:value uom="m^2">134.45</gen:value>
74     </gen:measureAttribute>
75     <gen:uriAttribute name="test_uri_att">
76       <gen:value>https://www.brickset.com</gen:value>
77     </gen:uriAttribute>
78     <gen:intAttribute name="test_integer_att">
79       <gen:value>12</gen:value>
80     </gen:intAttribute>
81     <gen:doubleAttribute name="test_real_att">
82       <gen:value>12.34</gen:value>
83     </gen:doubleAttribute>
84     <gen:dateAttribute name="test_date_att">
85       <gen:value>2020-08-06</gen:value>
86     </gen:dateAttribute>
87     <gen:stringAttribute name="test_string_att">
88       <gen:value>This is a test string</gen:value>
89     </gen:stringAttribute>
90     <!-- This is an exemplary set of generic attributes attached to a Building END -->
91     <bldg:class codeSpace="http://www.sig3d.org/codelists/standard/building/2.0/ AbstractBuilding_class.xml">habitation</bldg:class>
92     <bldg:function codeSpace="http://www.sig3d.org/codelists/standard/building/2.0/ AbstractBuilding_function.xml">residential building</bldg:function>
93     <bldg:yearOfConstruction>1955</bldg:yearOfConstruction>
94     <bldg:roofType codeSpace="http://www.sig3d.org/codelists/standard/building/2.0/ AbstractBuilding_roofType.xml">gabled roof</bldg:roofType>
95     <bldg:measuredHeight uom="m">15</bldg:measuredHeight>
96     <bldg:storeysAboveGround>3</bldg:storeysAboveGround>
97     <bldg:storeysBelowGround>0</bldg:storeysBelowGround>
98     <bldg:storeyHeightsAboveGround uom="m">3</bldg:storeyHeightsAboveGround>
99     <bldg:lod0FootPrint>
100       <gml:MultiSurface gml:id="id_building_1_footprint_multisurf_1" srsName="urn:ogc:def:crs:crs:EPSG::28992,crs:EPSG::5109" srsDimension="3">
101         </bldg:lod0FootPrint>
102     <bldg:lod1Solid>
103       <gml:Solid gml:id="id_building_01_lod1_Solid_1" srsName="urn:ogc:def:crs:crs:EPSG::28992,crs:EPSG::5109" srsDimension="3">
104         </bldg:lod1Solid>
105     <!-- Set of LoD2 thematic surfaces BEGIN -->
106     <bldg:boundedBy>
107       <bldg:RoofSurface gml:id="id_building_1_roofsurface_1">
108         </bldg:boundedBy>
109       <bldg:boundedBy>
110         <bldg:RoofSurface gml:id="id_building_1_roofsurface_2">
111         </bldg:boundedBy>
112       <bldg:GroundSurface gml:id="id_building_1_groundsurface_1">
113         </bldg:boundedBy>
114       <bldg:WallSurface gml:id="id_building_1_wallsurface_2">
115         </bldg:boundedBy>
116       <bldg:WallSurface gml:id="id_building_1_wallsurface_1">
117         </bldg:boundedBy>
118     </bldg:boundedBy>
119   </bldg:Building>
120 </core:cityObjectMember>

```

Generic attributes

Building properties

LoD0 Footprint

LoD1 Solid

LoD2 RoofSurface

LoD2 RoofSurface

LoD2 GroundSurface

LoD2 WallSurface

LoD2 WallSurface

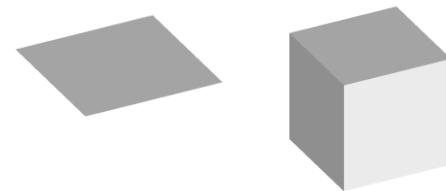
CityGML Alderaan (Buildings)

XML file contents (simplified)

- Header and city model attributes
- Building 1
- Building 2
- ...
- Building 12
- CityObjectGroup 1
 - Ancillary Building 20
 - Ancillary Building 21
 - ...
 - Ancillary Building 30
- Appearance of buildings in LoD0
- Appearance of buildings in LoD1
- Appearance of buildings in LoD2
- Appearance of ancillary buildings



- Ancillary Building 20
 - Some properties
 - LoD0 Footprint
 - LoD1 Solid



Property Toolbar	
Properties Relations Element Properties	
Name	Value
<input checked="" type="checkbox"/> GML Attributes	
gml:description	This is a simple, primastic building meant to p...
gml:id	id_box_building_20
gml:name	Box building 20

```

2772 <!-- ***** -->
2773 <!-- Group of Ancillary buildings -->
2774 <!-- ***** -->
2775 <!-- ***** -->
2776 <!-- CityObject Group 01 -->
2777 <!-- ***** -->
2778 <core:cityObjectMember>
2779   <grp:CityObjectGroup gml:id="id_group_1">
2780     <gml:description>This group contains all ancillary buildings of CityGML city Alderaan</gml:description>
2781     <gml:name>Ancillary buildings group</gml:name>
2782     <!-- This is an exemplary set of generic attributes attached to a CityObjecGroup BEGIN -->
2783     <gen:measureAttribute name="test_measure_att_group">
2784       <gen:value uom="e">1234</gen:value>
2785     </gen:measureAttribute>
2786     <gen:uriAttribute name="test_uri_att_group">
2787       <gen:value>https://en.wikipedia.org/wiki/Black\_Forest\_gateau</gen:value>
2788     </gen:uriAttribute>
2789     <gen:intAttribute name="test_integer_att_group">
2790       <gen:value>12345</gen:value>
2791     </gen:intAttribute>
2792     <gen:doubleAttribute name="test_real_att_group">
2793       <gen:value>0.002</gen:value>
2794     </gen:doubleAttribute>
2795     <gen:dateAttribute name="test_date_att_group">
2796       <gen:value>2020-08-04</gen:value>
2797     </gen:dateAttribute>
2798     <gen:stringAttribute name="test_string_att_group">
2799       <gen:value>This is a test string for group</gen:value>
2800     </gen:stringAttribute>
2801     <!-- This is an exemplary set of generic attributes attached to a CityObjecGroup END -->
2802   <!-- ***** -->
2803   <!-- Ancillary building 20 -->
2804   <!-- ***** -->
2805   <grp:groupMember>
2806     <bldg:Building gml:id="id_box_building_20">
2807       <gml:description>This is a simple, primastic building meant to provide shadowing and occlusions</gml:description>
2808       <gml:name>Box building 20</gml:name>
2809       <bldg:lod0FootPrint>
2810         <gml:MultiSurface gml:id="id lod0 MultiSurf 20" srsName="urn:ogc:def:crs,crs:EPSG::28992,crs:EPSG::5109" srsDimension="3">
2811         </gml:MultiSurface>
2812       </bldg:lod0FootPrint>
2813       <bldg:lod1Solid>
2814         <gml:Solid gml:id="id lod1 Solid 20" srsName="urn:ogc:def:crs,crs:EPSG::28992,crs:EPSG::5109" srsDimension="3">
2815         </gml:Solid>
2816       </bldg:lod1Solid>
2817     </bldg:Building>
2818   </grp:groupMember>

```

Group properties

Generic attributes


Building properties

LoD0 Footprint

LoD1 Solid

CityGML Alderaan (Buildings)

XML file contents (simplified)

- Header and city model attributes
- Building 1
- Building 2
- ...
- Building 12
- CityObjectGroup 1
 - Ancillary Building 20
 - Ancillary Building 21
 - ...
 - Ancillary Building 30
- Appearance of buildings in LoD0  • Appearance for Buildings LoD0
 - Some properties
 - X3D Material (front)
 - X3D Material (back)
- Appearance of buildings in LoD1
- Appearance of buildings in LoD2
- Appearance of ancillary buildings

```

3728 <!-- ***** -->
3729 <!-- Appearance Buildings LoD0 -->
3730 <!-- ***** -->
3731 <app:appearanceMember>
3732 <app:Appearance gml:id="Appearance_Buildings_LoD0">
3733 <gml:description>This appearance defines the colours of the LoD0 building geometries (Footprint surfaces are green)</gml:description>
3734 <gml:name>Alderaan LoD0 Buildings appearance</gml:name>
3735 <app:theme>LoD0_buildings</app:theme>
3736 <app:surfaceDataMember>
3737 <app:X3DMaterial gml:id="id_SurfaceData_Footprint_Gray_FRONT">
3738 <gml:name>SurfaceData LoD0 buildings (Footprint gray) FRONT</gml:name>
3739 <!-- Please note the following attribute to set the FRONT side colour -->
3740 <app:isFront>true</app:isFront>
3741 <!-- These are the RGB values of the solid colour -->
3742 <app:diffuseColor>0.854 0.854 0.854</app:diffuseColor>
3743 <!-- These are Xlinks to the gmlids of the LoD0 multisurfaces. All dependent geometries inherit the same colour!! -->
3744 <app:target>#id_building_1_footprint_multisurf_1</app:target>
3745 <app:target>#id_building_2_footprint_multisurf_1</app:target>
3746 <app:target>#id_building_3_footprint_multisurf_1</app:target>
3747 <app:target>#id_building_4_footprint_multisurf_1</app:target>
3748 <app:target>#id_building_5_footprint_multisurf_1</app:target>
3749 <app:target>#id_building_6_footprint_multisurf_1</app:target>
3750 <app:target>#id_building_7_footprint_multisurf_1</app:target>
3751 <app:target>#id_building_8_footprint_multisurf_1</app:target>
3752 <app:target>#id_building_9_footprint_multisurf_1</app:target>
3753 <app:target>#id_building_10_footprint_multisurf_1</app:target>
3754 <app:target>#id_building_11_footprint_multisurf_1</app:target>
3755 <app:target>#id_building_12_footprint_multisurf_1</app:target>
3756 </app:X3DMaterial>
3757 </app:surfaceDataMember>
3758 <app:surfaceDataMember>
3759 <app:X3DMaterial gml:id="id_SurfaceData_Footprint_Gray_BACK">
3760 <gml:name>SurfaceData LoD0 buildings (Footprint gray) BACK</gml:name>
3761 <!-- Please note the following attribute to set the BACK side colour -->
3762 <app:isFront>false</app:isFront>
3763 <app:diffuseColor>0.854 0.854 0.854</app:diffuseColor>
3764 <app:target>#id_building_1_footprint_multisurf_1</app:target>
3765 <app:target>#id_building_2_footprint_multisurf_1</app:target>
3766 <app:target>#id_building_3_footprint_multisurf_1</app:target>
3767 <app:target>#id_building_4_footprint_multisurf_1</app:target>
3768 <app:target>#id_building_5_footprint_multisurf_1</app:target>
3769 <app:target>#id_building_6_footprint_multisurf_1</app:target>
3770 <app:target>#id_building_7_footprint_multisurf_1</app:target>
3771 <app:target>#id_building_8_footprint_multisurf_1</app:target>
3772 <app:target>#id_building_9_footprint_multisurf_1</app:target>
3773 <app:target>#id_building_10_footprint_multisurf_1</app:target>
3774 <app:target>#id_building_11_footprint_multisurf_1</app:target>
3775 <app:target>#id_building_12_footprint_multisurf_1</app:target>
3776 </app:X3DMaterial>
3777 </app:surfaceDataMember>
3778 </app:Appearance>
3779 </app:appearanceMember>

```

This is a global appearance

Appearance properties

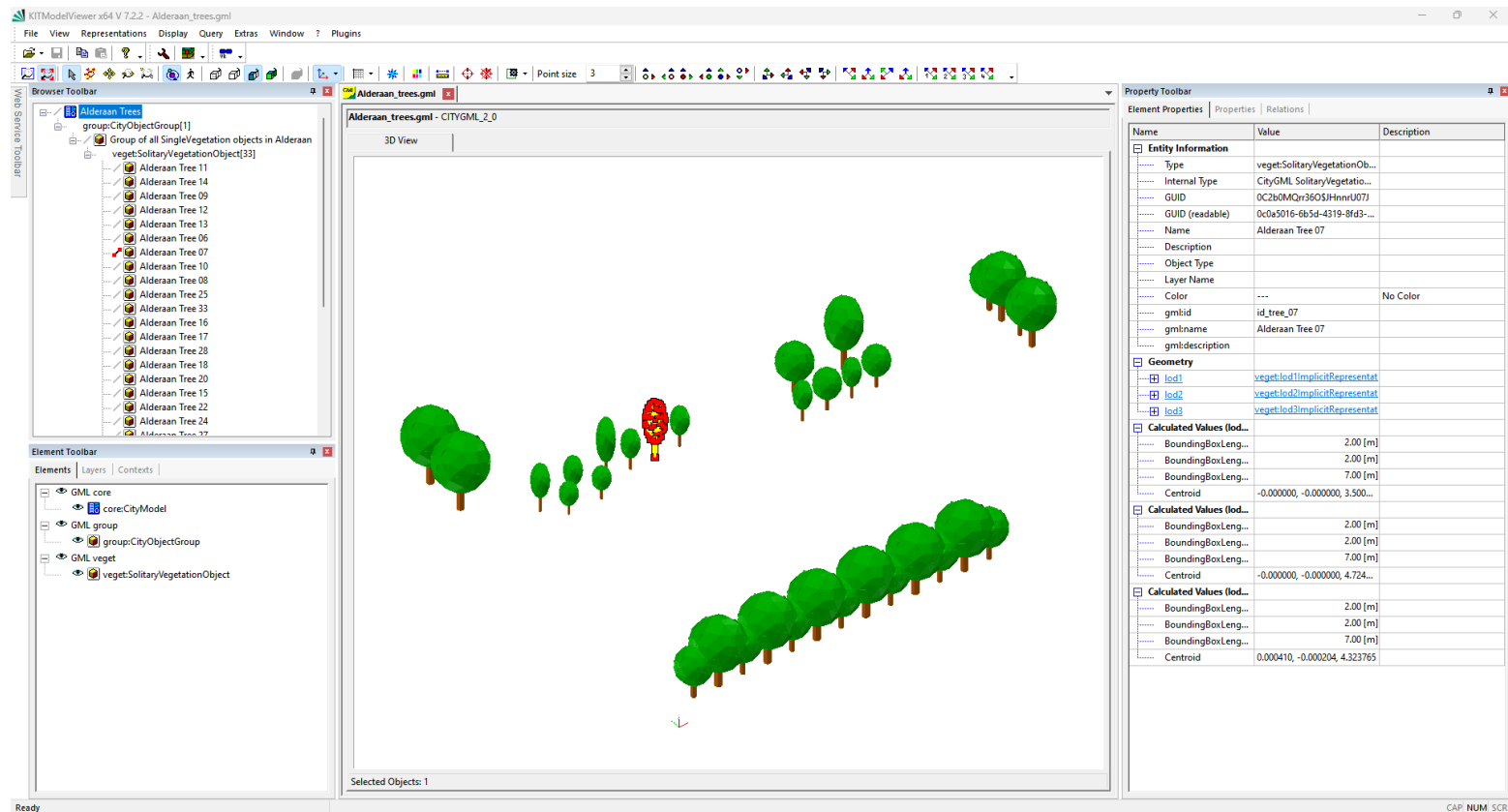
X3D Material properties

These are Xlinks to high-level geometries (in this case: multi-surfaces). When visualising the dataset, appearance is then propagated to the lower-level geometries (in this case: polygons)

X3D Material properties

CityGML Alderaan (Trees)

- Trees visualised in LoD3

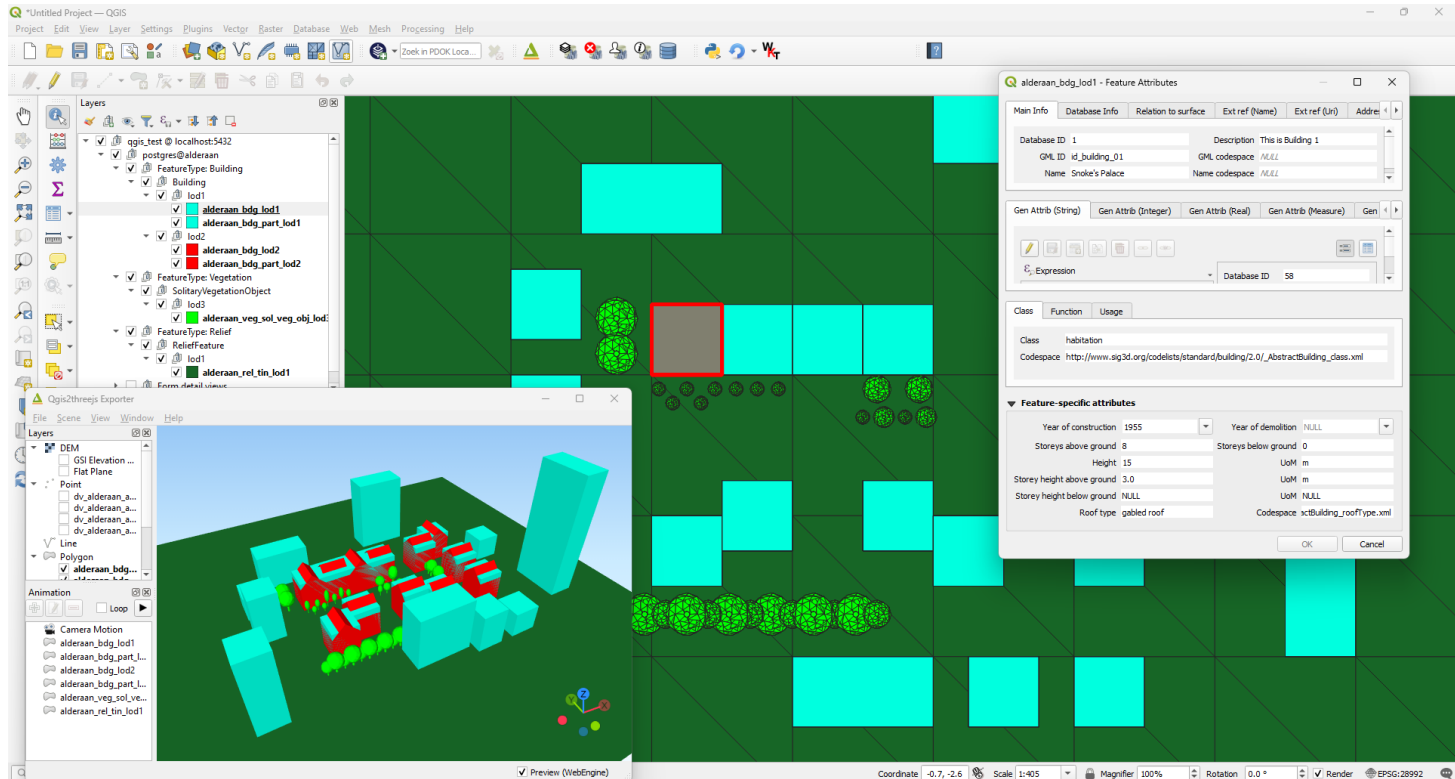


The screenshot displays the KITModelViewer interface for the Alderaan trees dataset. The central 3D view shows a collection of green trees with brown trunks, rendered in a 3D perspective. The interface includes a browser toolbar on the left, an element toolbar at the bottom left, and a property toolbar on the right. The property toolbar shows the following table:

Name	Value	Description
Entity Information		
Type	veget:SolitaryVegetationOb...	
Internal Type	CityGML SolitaryVegetatio...	
GUID	0C2b0MQr360SjHnnuU07j	
GUID (readable)	0c0a5016-6b5d-4319-8fd3-...	
Name	Alderaan Tree 07	
Description		
Object Type		
Layer Name		
Color	---	No Color
gml:id	id_tree_07	
gml:name	Alderaan Tree 07	
gml:description		
Geometry		
lod1	veget:lod1ImplicitRepresentat	
lod2	veget:lod2ImplicitRepresentat	
lod3	veget:lod3ImplicitRepresentat	
Calculated Values (lod...)		
BoundingBox Leng...	2.00 [m]	
BoundingBox Leng...	2.00 [m]	
BoundingBox Leng...	7.00 [m]	
Centroid	-0.000000, -0.000000, 3.500...	
Calculated Values (lod...)		
BoundingBox Leng...	2.00 [m]	
BoundingBox Leng...	2.00 [m]	
BoundingBox Leng...	7.00 [m]	
Centroid	-0.000000, -0.000000, 4.724...	
Calculated Values (lod...)		
BoundingBox Leng...	2.00 [m]	
BoundingBox Leng...	2.00 [m]	
BoundingBox Leng...	7.00 [m]	
Centroid	0.000410, -0.000204, 4.323765	

CityGML Alderaan (all)

- All CityGML files can be imported into the [3D City Database 4.x](#) and visualised in QGIS using the [3DCityDB-Tools plugin](#)



The screenshot shows the QGIS interface with the following components:

- Main Window:** Displays a 2D map of Alderaan with cyan buildings and green vegetation. A red box highlights a specific building.
- Layers Panel:** Shows the loaded layers, including 'alderaan_bdg_lod1', 'alderaan_bdg_part_lod1', 'alderaan_bdg_lod2', 'alderaan_bdg_part_lod2', 'alderaan_veg_sol_veg_obj_lod1', and 'alderaan_rel_tin_lod1'.
- Feature Attributes Dialog:** Open for the selected building, showing metadata and feature-specific attributes.

Database Info	
Database ID	1
Description	This is Building 1
GM:ID id_building_01	GM:codespace
Name	Smoke's Palace
Name codespace	GM:codespace

Feature-specific attributes			
Year of construction	1955	Year of demolition	NULL
Storeys above ground	8	Storeys below ground	0
Height	15	UoM	m
Storey height above ground	3.0	UoM	m
Storey height below ground	NULL	UoM	NULL
Roof type	gabled roof	Codespace	xc:Building_roofType.xml
- 3D Viewport:** Shows a 3D perspective view of the buildings and vegetation.



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