

Exploring CityGML – Part 1

Moving from proprietary GIS applications to Open Source geospatial and now working with an Autodesk Partner as a 'Geographer in a CAD World', I have used a variety of spatial data formats over the past 20 years. However, it wasn't until recently that I started to look at what CityGML could provide to me and the clients that I work with. I started from knowing very little about CityGML and as this is only Part 1 I definitely still have quite a bit to understand about this data format and how to get the most from it.

This blog aims to detail the start of my journey exploring CityGML from where you can source examples of this data format, to how to translate the data into usable formats and then its use within various software packages such as QGIS and Autodesk InfraWorks.

Ok so I know very little, where should I start?..... Google! A guick search for CityGML and I found the CityGML homepage:

http://www.citygml.org/



However, at time of writing this blog (May 2019) the website was under reconstruction.

So, after another google search I then found this website:

https://www.3dcitydb.org/3dcitydb/











cadline

Page **2** of **24**



As the homepage states it is a **3D City Database** with a free geo database to store the 3D City models. I liked the words 'free' and 'database', so decided this was a good place to start my journey! There may have been more sensible places to start.. but this was my journey and I like to explore.

I clicked on the **Demonstrations** link which indicated that they had 3D Models online for **Berlin** and New York.









cadline

Page **3** of **24**

I started with the 3D City Database Online Viewer for Berlin.



The viewer was quite simple to **navigate**, but rather more complex when it came to the **toolbox**.







The viewer also provided different **basemapping** options e.g. Mapbox Aerial Imagery and navigating around the model it was clear how useful the real-life **façades** of the properties could be.



Next steps??? Ok let's get some of this **data** and see how I can use it. On the 3D City Database I found a <u>Downloads</u> page which included links to install a **Universal Installer**.

The City ONL Batalase 3D City DB	Hore Privacy & Terms Contact. New Patters Dance Software Deveload Parties 3DCityDB in Action Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Publications Public
Downloads • Documentation • 3D Citly Database • Importer/Exporter • Importer/Exporter • Importer/Exporter • Web Feature Service • 3DCit/9D-Web Map-Client • citygni/4j	Get the Universal Installer Package The 30 City Database Importer/Exporter loci is shipped as universal installer that will guide you through the steps of the setup process. A full installation of the importer/Exporter including the 3D City Database SQL scripts, the new 3D Web Viewer, documentation, and example CityCML as well as KML/COLLAD. Hes requires approx. 480 MB of hard disk space. Installing only the mandatory application files will use sprace. 33 MB of hand disk space, installation pockages can be chosen during the setup process. Please note that the Java Buttime Environment (version 8 or higher)' needs to be installed on your system in order to run the installer package (and the Importer/Exporter tool afterwards).
Software Licensing Our software is open source and released under the terms of Apacher. Software Project Page Visits our Github Page' for details, further material, the GitHub repository, etc. Get access to the Wilk, and report bugs. Docker for 3DCityDB The 3DCityDB is also available as Docker images. Find out more.	Get it 4.2.0 SubclyOB-Importer-Exporter-4.2.0-Setup.jar (Version 4.2.0 Oracle & PostIGIS 205 MB)

The installer download a .JAR file.

ne (D:) > OPEN SOURCE GIS > CITYGML			
Name	Date modified	Туре	Size
3DCityDB-Importer-Exporter-4.2.0-Setup.jar	14/05/2019 14:25	Executable Jar File	205,332 KB









Page **5** of **24**

To run the installer, I simply **double clicked** the .JAR file and the installer opened.



This added a new **shortcut** to my desktop, which included an **Importer and Exporter tool** and some **sample scripts** for creating and managing a 3D Database.

🔠 Setup - 3D City Database Importer/Exporter v4.2.0	- 🗆 × 🚺 3D City Database 🔷
Installing Please wait while setup installs the 3D City Database Importer/Exporter. Step 7 of 9	CityGML 3D City Database SQL Scripts
Pack installation progress: D:\OPEN SOURCE GIS\CITYGML\Installation\Wb\systems-common-java8-0.7.2.jar	3DCityDB Importer Exporter
Overall installation progress:	3DCityDB Importer Exporter Uninst
	Documentation
	Sample datasets
	E Templates
	3D Viewer
(Made with IzPack - http://izpack.org/)	A

The installer also included a series of sample datasets (KML and CityGML) including the data for the Berlin 3D Model.

^	Name	Date modified	Туре	Size
	tile_0_0	14/05/2019 14:46	File folder	
	🔚 Gasometer.zip	13/02/2019 14:04	WinRAR ZIP archive	19,568 KB

The sample scripts were installed to the destination location and included scripts for both Oracle and PostGIS.

01784 419 922

sales@cadline.co.uk







Page 6 of 24

	^			
^	Name	Date modified	Туре	Size
	CITYDB_PKG	14/05/2019 14:36	File folder	
	MIGRATION	14/05/2019 14:36	File folder	
	SCHEMA	14/05/2019 14:36	File folder	
	UTIL	14/05/2019 14:36	File folder	
	📄 CREATE_DB.sql	13/02/2019 14:04	Microsoft SQL Ser	3 KE
	DROP DB.sal	13/02/2019 14:04	Microsoft SOL Ser	2 KE

This also included a series of **.BAT files** that automatically ran the scripts for you.

> C	TYGML > Installation > 3dcitydb >	postgresql > ShellScripts > V	Vindows	√ Ū	Search Windows
^	Name	Date modified	Туре	Size	
	MIGRATION	14/05/2019 14:36	File folder		
	CONNECTION_DETAILS.bat	15/05/2019 10:46	Windows Batch File	1 KB	
	CREATE_DB.bat	13/02/2019 14:04	Windows Batch File	4 KB	
	CREATE_SCHEMA.bat	13/02/2019 14:04	Windows Batch File	4 KB	
	DROP_DB.bat	13/02/2019 14:04	Windows Batch File	2 KB	
	DROP_SCHEMA.bat	13/02/2019 14:04	Windows Batch File	3 KB	
	GRANT_ACCESS.bat	13/02/2019 14:04	Windows Batch File	4 KB	
	REVOKE_ACCESS.bat	13/02/2019 14:04	Windows Batch File	3 KB	

Step one was to create a new blank PostGIS database instance using PGAdmin.



Step 2 was to use the .BAT files provided by the installer to automatically create the empty Database Tables. For the Create Database.BAT file to successfully run, I needed to edit the CONENCTION_DETAILS.BAT file to successfully access my PostGIS instance. I opened the .BAT file in Notepad and made the relevant edits.

L







Page **7** of **24**

CONNECTION_DETAILS.bat - Notepad
File Edit Format View Help
:: Provide your database details here set PGBIN=C:\Program Files\PostgreSOL\10\bin
set PGHOST=localhost
set CITYDB=citygml3d
set PGUSER=postgres
::

With the connection details correct, I could now run the **Create_DB.BAT** file and a command shell opened and ran each of the individual postgres SQL scripts, creating tables and inserting values where required.



Note – the first part of the Create_DB.BAT asks you the projection to assign to the tables in your database and as I would be importing data from Berlin I chose the DHD / Soldner Berlin Projection System – (3086).

sales@cadline.co.uk





Page 8 of 24

Refreshing and checking my PostGIS database, it was clear that the Create_DB.BAT file had ran the scripts as there were now 66 Tables in the new CityGML PostGIS database.

✓
> 🛅 address
> 🗄 address_to_bridge
> 🔠 address_to_building
> 🖽 ade
> 🗄 aggregation_info
> 🚍 appear_to_surface_data
> 🗄 appearance
> 🔠 breakline_relief
> 🔠 bridge
bridge_constr_element
bridge_furniture
bridge_installation
bridge_open_to_them_srf
bridge_opening
> = bridge room

However, the main spatial tables e.g. Buildings were empty.

SEL	ECT * FROM	citydb.buildi Dain Messages	ng			
4	id [PK] integer	objectclass_id integer	building_parent_id integer	building_root_id integer	class character varying (256)	class_code character v

Step three was to utilise the Import/Export Tool to now import the sample CityGML data into my new PostGIS database. From the Import menu I chose browse and located one of the sample Berlin GML tiles.

3D City Database Importer/Exporter					
File Project View Help					
Import Export KML/COLLADA/gITF Export ADE Manager SPSHG Database	Preferences				Console
	💐 Import				×
	Look in:	📙 tile_0_0		 Ø 📁 🛄• 	
Versioning	0	📙 appearan	ce		
Workspace Use default workspace		Gasomet	er.gml		
Attribute Elter	Recent Items				
amilia					
miname					
	Desktop				
from #					
1 011 #					
Bounding Box	Documents				
Reference system Same as in database					
X _{min}	This PC				
y _{min}	- Insec				
Mode All overlapping features Just features inside		Ele name	Commuter and		0000
Feature Types	Network	me name:	Gasometer.gm		open
G. CityObject		Files of type:	CityGML Files (*.gml, *.xml, *.zip, *.gz, *.	jzip) 🗸	Cancel
bt/− Bridge					







74
2

Connection	cityaml3d	
Connection	Installe	
Description	citygml3d	Apply
Username	postgres	New
Password	••••••	Copy
	Save password	Delete
Type	PostgreSQL/PostGIS V	Delete
Server	localhost Port 5433	
Database	citygml3d	
	Dee default orhema	
Server Database	localhost Port 5433 iotygnl3d	

Before running the import, I needed to ensure that on the Database tab the Database connection details were correct.

Once the connection to my new PostGIS CityGML database was successful I could then use the **Import** Tab to choose **which features** to import and then start the import process.

🕷 3D City Database Importer/Evonter : cityaml3d	- n x
File Project View Help	
Import Export KML/COLLADA/gTTF Export ADE Manager SPSHG Database Preferences D:\CPEN SOURCE GIS\CITYGML l/installation/isamples/Berlin/CityGML (casometer_LoD2/ble_0_0/Gasometer.gml Versioning	Console (10:12:27 INFO) Initializing database import (10:12:27 INFO) Spatial indexes are enabled. (10:11:27 INFO) Normal indexes are enabled. (10:11:27 INFO) Normal indexes are enabled. (10:11:27 INFO) Normal indexes are enabled. (10:11:27 INFO) Info Normal indexes are enabled. (10:11:27 INFO) Info Normal indexes are enabled. (10:11:27 INFO) Liss of import files successfully created. (10:11:27 INFO) Liss of import files Successfully created. (10:11:27 INFO) Info Liss of import files Successfully created. (10:11:27 INFO) Info Liss of import files Successfully Created. (10:11:27 INFO) Info Liss of import files Successfully created. (10:11:27 INFO) Info Liss of import files Successfully Created. (10:11:27 INFO) Info Liss of Import files Successfully Created. (10:11:27 INFO) Info Liss of Import files Successfully Created. (10:11:27 INFO) Info Liss of Import files Successfully Created. (10:11:27 INFO) Info Liss of Import files Successfully Created. (10:11:27 INFO) Info Liss of Import files Successfully Created. (10:11:27 INFO) Import files Successfully Created.
Workspace Use default workspace Attribute Fiter gridid gridid	
	CityGML import × Gasemeter.gml Importing dity objects Details • Top-level features: 0 Remaining files: 0
Peature Types Point P	Carcel
Importing CityGML dataset	stgreSQL/PostGIS database connected

The import process took only **20 seconds** and after refreshing my PostGIS database I could see that I now had records in my spatial tables.

01784 419 922 🤣 sales@cadline.co.uk





Page **10** of **24**

Admin 4 File V Object V Tools	✓ Help ✓									
	🕴 🎟 🝸 🛛 Da	ashboard Properties	SQL Statisti	cs Dependencies De	pendents 🔳 city	db.building/citygml3d/pc	ostgres@PostgreSQL 10			
> 🛅 breakline_relief	* E	B - Q -	2601	🛛 🗸 🖌 🖌 No limit	• • • •	8 = - 2 '	°≘ <i>∎</i>			
> 🛅 bridge		citydb building/city	aml3d/nostares@i	PostareSOL 10						
bridge_constr_element		Edites of the second	annow poorar co@r	oolgroode to						
bridge_furniture	Q	Jery Editor Query H	story							
bridge_installation	1	SELECT * FROM	citydb.buildi	ng						
bridge_open_to_them_sm	2									
> = bridge_opening		Data Output E	plain Messages							
 > is bridge_thematic_surface 		id [PK] integer	objectclass_id integer	building_parent_id integer	building_root_id integer	class character varying (256)	class_codespace character varying (4000)	function character varying (1000)	function_codespace character varying (4000)	usage character varying (100
> 🖽 building	_	1	17	26 [null]	17	[null]	[null]	2121	[null]	[null]
> building_furniture		2	45	26 [null]	45	[null]	[null]	1744	[null]	[null]
building_installation		3	58	26 [null]	58	[null]	(nuli)	1231	(nuli)	(null)
> city_iumiture		4	77	26 [null]	77	[null]	[null]	2121	[null]	[null]
> = cityobject		5	133	26 [null]	133	(null)	(null)	2121	[null]	(null)
cityobject_genericattrib		6	157	26 [null]	157	[null]	[null]	1231	[null]	[null]
tityobject_member		7	165	26 [null]	165	(null)	(null)	2364	[null]	(null)
> El cityobjectgroup		8	249	26 [null]	249	[null]	[null]	1231	[null]	[null]
>		9	285	26 [null]	285	[null]	[null]	1231	[null]	[nuli]
external_reference		10	305	26 [null]	305	Inulil	Inuli	1744	[null]	ínulil
> generalization		11	325	26 [null]	325	Inutil	Inull	1231	Inuli	Inuli
 generic_cityobject marid_coverage 		12	349	26 [null]	349	[null]	[null]	1231	[null]	Inuli
 ana_coverage aroup to cityobiect 		13	385	26 [null]	385	Inuli	Inuli	1721	Inuli	Inuli
i group to chyotyper		4		in fund	505	friend	from 1		frond (from 1

So we now have a new PostGIS database with 3D CityGML datasets for Berlin!.... how can we visualise these? My first thought was definitely **QGIS**.



cadline

In QGIS I created a **Connection** to my new PostGIS CityGML database.

Q Create a	a New PostGIS Connection	×
Connecti	ion Information	
Name	(itygm]3d	
Service		
Host	localhost	
Port	5433	
Database	citygml3d	
SSL mode	disable	\sim
Auther	ntication	

Then in the Data Source Manager I chose to load in the Building Layers.

Connections							
citygml3d							\sim
Connect New	Edit Remove				Load	Save	:
Schema	Table	Comment	Column	Data Type	Spatial Type	SRID	^
citydb	bridge_installation		lod2 implicit re	Geometry	. PointZ	4326	
🔥 citydb	bridge_installation		lod2_other_geom	Geometry	Select	4326	
citydb	bridge_installation		lod3_implicit_re	Geometry	PointZ	4326	
🛕 citydb	bridge_installation		lod3_other_geom	Geometry	Select	4326	
citydb	bridge_installation		lod4_implicit_re	Geometry	PointZ	4326	
🛕 citydb	bridge_installation		lod4_other_geom	Geometry	Select	4326	
citydb	bridge_opening		lod3_implicit_re	Geometry	PointZ	4326	
citydb	bridge_opening		lod4_implicit_re	Geometry	C PointZ	4326	
citydb	building		lod1_terrain_int	Geometry	V MultiLineStringZ	4326	
citydb	building		lod2_multi_curve	Geometry	V MultiLineStringZ		
citydb	building		lod2_terrain_int	Geometry	V MultiLineStringZ		
citydb	building		lod3_multi_curve	Geometry	√ MultiLineStringZ		
citydb	building		lod3_terrain_int	Geometry	√ MultiLineStringZ		
citudh	huilding		lodd multi curve	Genmetry	1/ Multil insString7		







However, as the Data Source Manager indicated the Buildings geometry type was **MutliLineString** and didn't provide a footprint for the buildings. After a little searching in the database I found that the **Surface_Geometry** layer provided the **polygons** for the building outlines.



In order to view the CityGML data in true 3D, draped over surface terrain, I needed to source **terrain data** for Berlin. This **Cadline FAQ** outlines how you can source **world-wide terrain data for free** –

https://www.cadlinecommunity.co.uk/hc/en-us/articles/360001501558-QGIS-World-3D-Mapping









Page 12 of 24

30-Meter SRTM Tile Downloader This interface attempts to ease the pain of downloading 30-meter resolution elevation data from the Shuttle Radar Topography Mission You clicked tile **N52E013** Click on yellow tiles to download their corresponding data Or, view preview image

I was then able to source **3D terrain data** for the area around **Berlin**.

Once the file was downloaded I simply **dropped** the terrain into my QGIS map window.



To open the QGIS 3D viewer, from the View menu I chose New 3D Map window. Once the 3D Map window was open I selected the configuration settings and set the Elevation to use the Berlin Terrain data (N52E013).











To view the CityGML data in 3D, you need to use the Layer Styling Pane, and activate Enable 3D Renderer. Once this is activated, you can choose a Height value and Extrusion.



The Height and Extrusion values can be a static value for all features e.g. 5 metres for Height, or you can use the **Field** values in the source dataset. However, I couldn't find a field in my PostGIS table that contained the height value.

This indicated that there was likely other settings or translation steps I would need to do in order to visualise CityGML correctly within QGIS, but as a first attempt I was happy using a static height value for all features.

This was the first time I had viewed CityGML data in a client application and it was from a **PostGIS database** instance that I controlled.... **Very exciting!**

01784 419 922

surface_geometry	
Enable 3D Renderer	
Height	0.00
Extrusion	Data defined override Description
Altitude binding	Store Data in the Project Attribute Field
id (integer) gmlid (string) gmlid_codespace (string) parent_id (integer) root_id (integer) is_solid (double) is_composite (double) is_triangulated (double) is_triangulated (double) is_reverse (double) solid_geometry (string) implicit_geometry (string)	Field type: int, double, string Expression Variable Edit Paste Assistant

If you don't have QGIS, or you aren't a GIS user, I also found another free to use Viewer so that you too can view and sample CityGML datasets. Follow this link - <u>http://www.citygmlwiki.org/index.php/Freeware</u>

sales@cadline.co.uk

To download the KIT Viewer - https://www.iai.kit.edu/1302.php







cadline

Page **14** of **24**



I then simply used the **Open** button to find my Berlin CityGML file – **Gasometer.gml** – and the CityGML features opened into the KIT Viewer window.



sales@cadline.co.uk

This was a great find as I could then check the features in the source CityGML file in the KIT Viewer.



Page **15** of **24**



Against the features as imported into my PostGIS database and being visualised in **QGIS**.. and they were the same!



With my limited knowledge there was only so far I could go with viewing CityGML within QGIS, so I decided to concentrate next on accessing my CityGML datasets within Autodesk InfraWorks.



cadline

InfraWorks is definitely no stranger to visualising 3D datasets. In fact, you can create 3D Models of most places around the world using the freely available **OpenStreetMap** datasets, or if working in the **UK** you could link your Models to **OS Mastermap** and use the new **Building Height Attributes** for even more accuracy. In addition, with onsite surveying you can also open **Point Cloud** datasets to visualise real-world assets.









Page **16** of **24**



To visualise the CityGML features in InfraWorks I used the Model Builder tool to create a 3D Model of Berlin.











And then **deleted** the existing **OpenStreetMap** buildings from the centre of my Berlin Model.



Using the **Data Source** options in InfraWorks I connected my Model to my **PostGIS database** and loaded in the **Surface_data** table.

I Connect to	b Data Source		
Connection typ	e: PostgreSQL *		
Connection Set	tings	I Choose Data Sources	×
Service: Data store:	localhost:5433 User name: postgres ▼ Password: ******* Bemember password dtygmiberlin ✓ Show all geometry tables	Include All Exclude All ditygmlberlin ditygmlberlin <lidit< th=""><th></th></lidit<>	

After configuring the Surface_data layer as **Buildings**, I refreshed the model however no building features were added into the model.

sales@cadline.co.uk





Page **18** of **24**



Reviewing the Surface_data layer in PostGIS I could see the geometry was **POINT** data and so wouldn't generate buildings within InfraWorks. However, the Surface_Geometry layer which we used in QGIS wasn't available from the InfraWorks PostGIS import options.

Database Schema Table		
🔁 🔄 🧱 Import Layer/File 🔚 Export to F	File	
Providers		Info Table Preview
 solitary_vegetat_object solitary_vegetat_object 	^	surface_data
solitary_vegetat_object solitary_vegetat_object		General info
solitary_vegetat_object		Relation type: Table Owner: postgres
: surface_data		Pages: 50 Rows (estimation): 1558
surface_geometry surface_geometry		Privileges: select, insert, update, delete
surface_geometry tex_image		PostGIS
textureparam thematic surface		Column: gt_reference_point Geometry: POINT
√° tin_relief		Dimension: 2 Spatial ref: DHDN / Soldner Berlin (3068)
∵ tin_relief V_ tin_relief		Extent: (unknown) (find out)
traffic area	~	

cadlíne

So for the moment, I wasn't able to connect InfraWorks to the CityGML data in my PostGIS database. The next option was to use the open **CityGML** tool directly from within the **Data Sources** Pane.

Conceptual View	ProcessedPointCloud	600	53	0	DATA SOURCE
1					Group by: Feature Type * Show: All
				*	
					(및 3D Model
					AutoCAD DWG (3D Objects)
					AutoCAD DWG as 2D Overlay
					Autodesk Civil 3D DWG
				-	The Autodesk IMX
					Autodesk Revit
					CityGML
Cloud import for You can also us	CityGML data is no longer supported. Inste e a trial or licensed version of FME Desktop	ad, install and use the free C to convert your CityGML data	tyGML Importer for I to IMX.	nfraWorks to cor	wert your CityGML data to IMX before import.
					Ct. LandXML
					T Point Cloud







Page **19** of **24**

However, at some point it appears that this link is **no longer supported** and InfraWorks requires that the CityGML format is translated into **.IMX format** in order to open into InfraWorks.

Clicking the CityGML button in Infraworks gave me the link to the free to use importer.



The link opened the download page for the CityGML Importer on the Safe Software webpage -

https://www.safe.com/citygml-importer/

www.cadline.co.uk



Clicking the Free Download link meant that I had to register before I could access the FME download page.



01784 419 922 *sales@cadline.co.uk*



cadlíne

After installing **FME desktop** I used the free evaluation licence code I was emailed to activate the software.



One of the welcome emails also had a link to download the **Workbenches** required for translating CityGML to .IMX format, which I had to copy to the **/FME/Workbenches/** folder.

poard	Organise	New	Open	Select
> This PC ⇒ Document	ts → FME → Workspaces			
· · · · · · · · · · · · · · · · · · ·	Name	Date modi	fied Type	Size
wid.crowther@cadline.c	CityGML_To_IMX.fmw	11/10/2017	7 09:41 FMW File	2,072 KB
	CityGML_To_Map3D.fmv	w 11/10/2013	7 09:41 FMW File	194 KB

From my **Start** menu I opened the **FME Quick Translator** tool and **Ran** the **CityGML to IMX Workbench**, loading the Berlin GML file and editing the location of any LOG files and the output .IMX file.



Note – I had to uninstall FME and re-install with the Python 2.7 option ticked for the translation to be successful.







Guide by David Crowther

Page 21 of 24

The translation process took about 2-3 minutes to run but was successful.



And generated the required **.IMX** ouptut file.

CITYGML > Installation > samples > Berlin	> CityGML > Gasomet	er_LoD2 > tile_0_0	5 V	Search tile_0_0
^ Name	Date modified	Туре	Size	
appearance	02/08/2012 17:16	File folder		
fme.log	15/05/2019 15:47	Text Document	97 KB	
Gasometer.gfs	15/05/2019 10:26	GFS File	10 KB	
💱 Gasometer.gml	02/08/2012 17:16	GML File	4,033 KB	
💦 test.imx	15/05/2019 15:47	IMX File	10,304 KB	

Now within InfraWorks I was able to use the Data Source pane and open an Autodesk IMX file.

DATA SOUR	CES	6 X
Group by: Feature Type * Show: All	*	
🗊 🖳 🙈 🖾 🗶 🗙	🔒 🗃 🛛 😘	
[특,] 3D Model	Date Loaded	
↔ AutoCAD DWG (3D Objects)		
G AutoCAD DWG as 2D Overlay	Wed May 15 2019	
🔃 Autodesk Civil 3D DWG	l Wed May 15 2019	
🕵 Autodesk IMX	Wed May 15 2019	
Autodesk Revit		
Autodesk IMX	Wed May 15 2010	
G DGN 3D Model	Web May 15 2015	
G IFC	Wed May 15 2019	
LandXML		
Point Cloud	Wed May 15 2019	
1 Raster		
I SDF	Wed May 15 2019	
E CHP	Wed May 15 2010	
E SOLINA	1 Vieu May 15 2019	
C Skatel In	Wed May 15 2019	
watermultis Vector Imported	Wed May 15 2019	

Configuring the Berlin .IMX file to be Type - Buildings.









cadlíne

Page **22** of **24**

Name	test - BUILDINGS	Source	Autodesk IMX				
escription	<empty></empty>	Туре	Buildings			*	
Common	IMX Geo Loc	ation So	urce Tooltip	Table	Script		
urface Opt	tions						
Surfaces	s to Import						

Once the configuration was completed, the InfraWorks model **refreshed** and was updated with the CityGML features now added to the model.



On closer inspection the features were raised above the surface, so I used the **Data Source Configuration** to offset in the **Z** direction **-0.1 metres**, which then corrected the issue.

C I Data Source Configuration	×
Name test - BUILDINGS Source Autodesk IMX	
Description <empty> Type Buildings</empty>	- C.
Common IMX Geo Location Source Tooltip Table Script	
Coordinate System DHDN/3.Berlin/Cassini	Q - IIII
Position Offset	
Coordinate System	
Y 0	
X <empty></empty>	
Y <empty> Z [0.1</empty>	
Z <empty></empty>	
	1 1









I now had an updated InfraWorks model with CityGML features added into the centre of the model.



With textures/facades automatically applied, as well as roof slopes added.











This is the first time that I have been able to visualise CityGML features in a 3D model where I have had the facades truly represented. This is great news, as it means that I no longer have to tell people that an InfraWorks model *'isn't Google StreetView!'*,.. well it's definitely getting closer that's for sure ③.

That was the start of my journey into exploring CityGML, and the **end of Part 1** of my blog. I am not sure where Part 2 of my journey will take me, but I have a feeling I want to better utilise my **PostGIS CityGML** instance and better understand how I can utilise CityGML data within **InfraWorks**. So watch out for Part 2 of this blog series.





