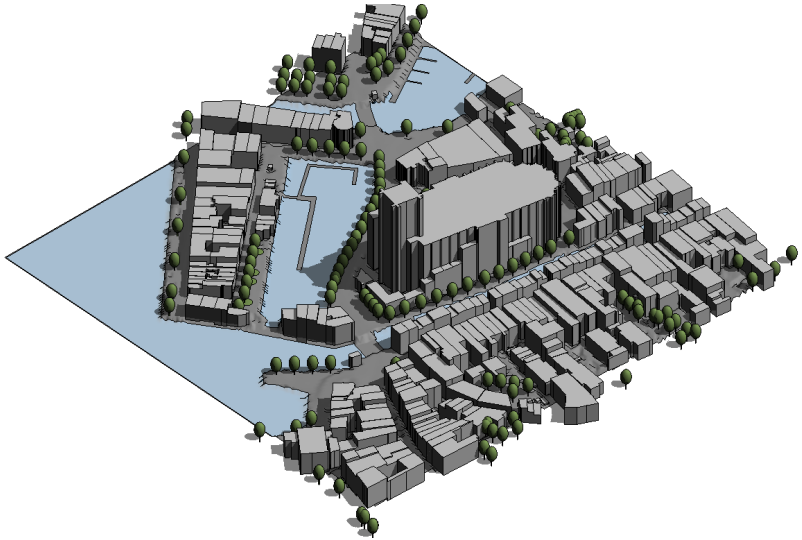
GIS in Dynamo

How to load 3D GIS data into Dynamo?
How to automate location analysis in Dynamo/Revit?

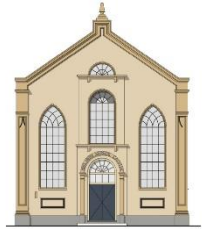
Maarten Vroegindeweij



About 3BM

- Consulting engineers since 2009
- www.3bm.co.nl
- Structural-, Wood Framing, Façade and Prefab Engineering, Monuments

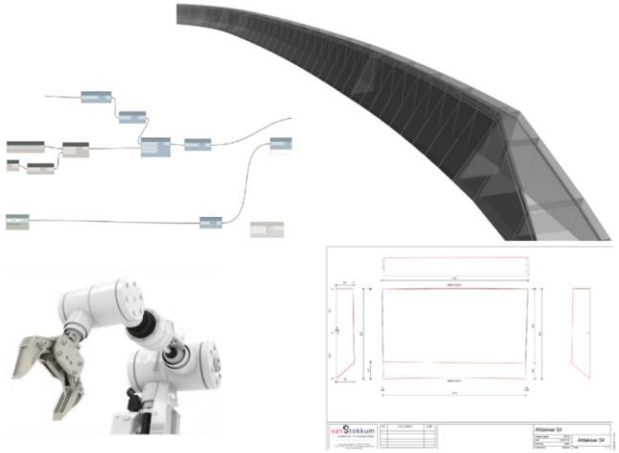


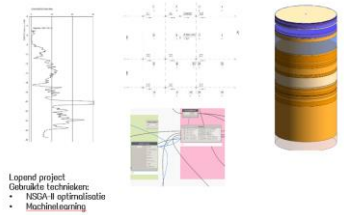


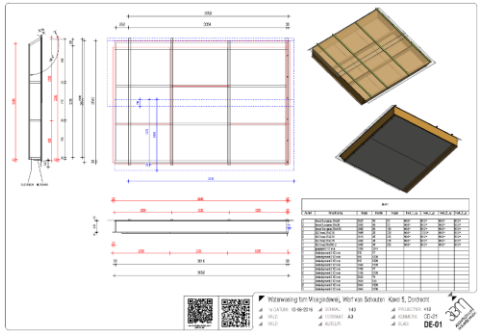


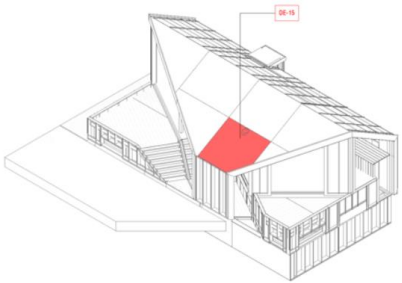

About 3BM Labs

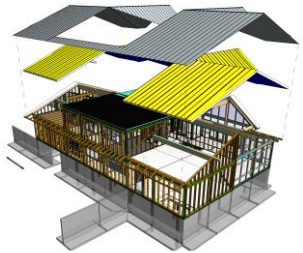
- Digital Fabrication/Drawing Automation
- Software Development
- Computational BIM
- Optimisation
- Dynamo Consultancy











GIS 2 BIM

To learn

- GIS/Rasterdata/Vectordata
- Where to find **relevant** data for The Netherlands?
- How to **load** this data into Dynamo?
- How to **combine** vector and rasterdata

Contents of this presentation

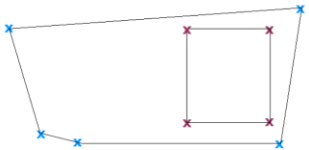
1. Intro GIS

2. Rasterdata

Location Analysis using Dynamo

3. Vectordata

Vectordata / 3D BAG, AHN3, BGT



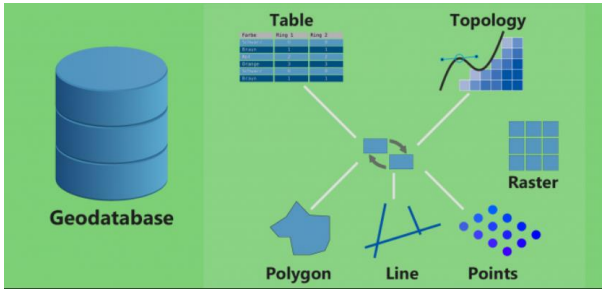
4. Conclusion & more information

PDOK

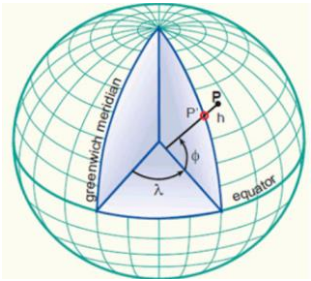
1. Intro GIS

Maps

Webservers



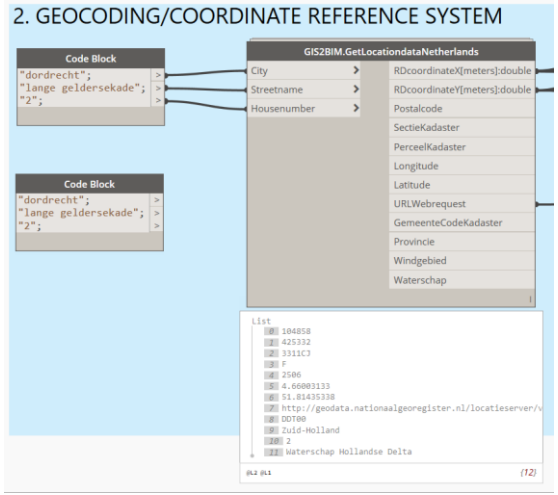
Geo Databases

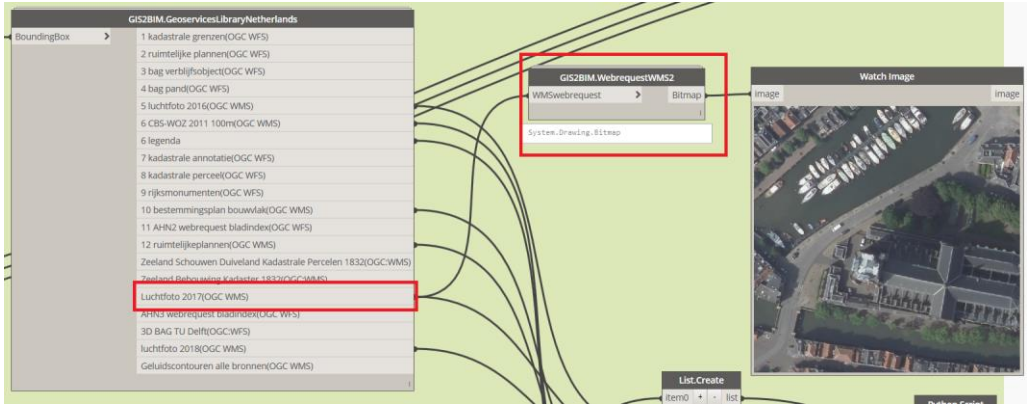


Coordinate Reference Systems

2. Rasterdata

- Geocoding/CRS
- Boundingbox
- Web Map Service(WMS)
- Web Map Tile Service(WMTS)





2. Web Map Service(WMS)

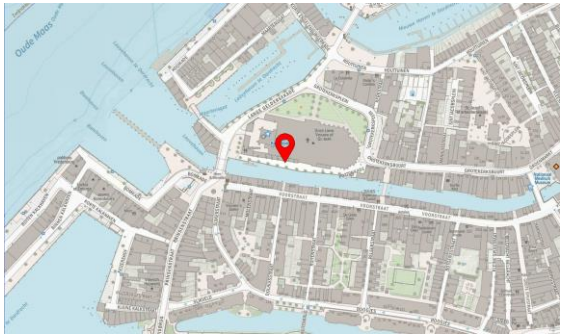
Request&Response

http://geodata.nationaalgeoregister.nl/
luchtfoto/rgb/wms?
&request=**GetMap**
&VERSION=**1.3.0**
&STYLES=**default**
&layers=**2018_ortho25**
&bbox=**104783,425257,104933,425407**
&width=**3000**
&height=**3000**
&format=**image/png**
&crs=**EPSG:28992**

2. Location Analysis

- Use a lot of WMS, WFS, WMTS services together to create a location analysis report inside Revit

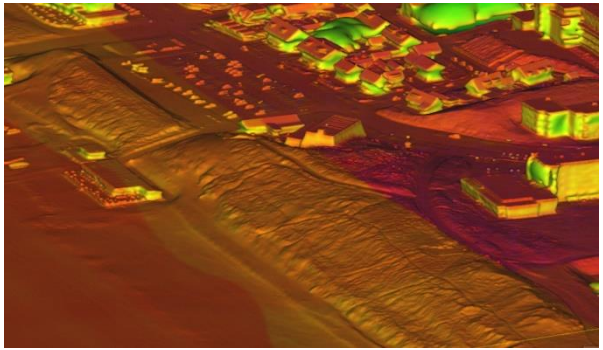
-OPEN IN DYNAMO/REVIT-

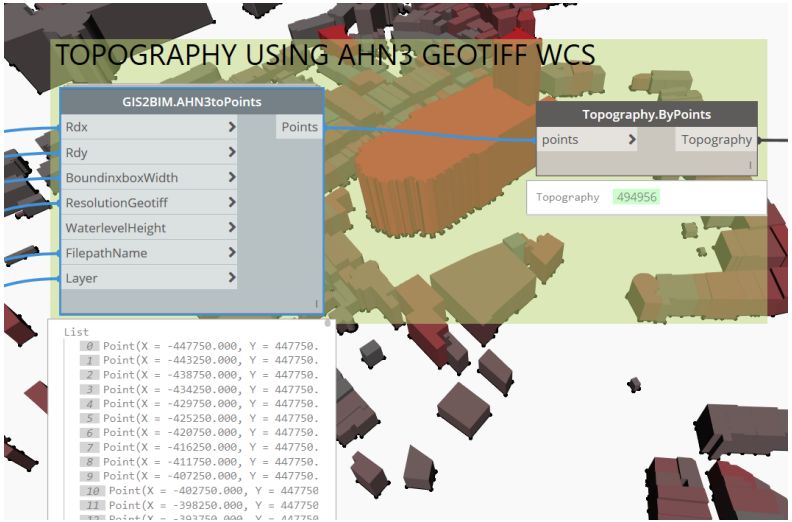


2. Other applications ;-)

3. Vectordata: AHN3 WCS GEOTIFF

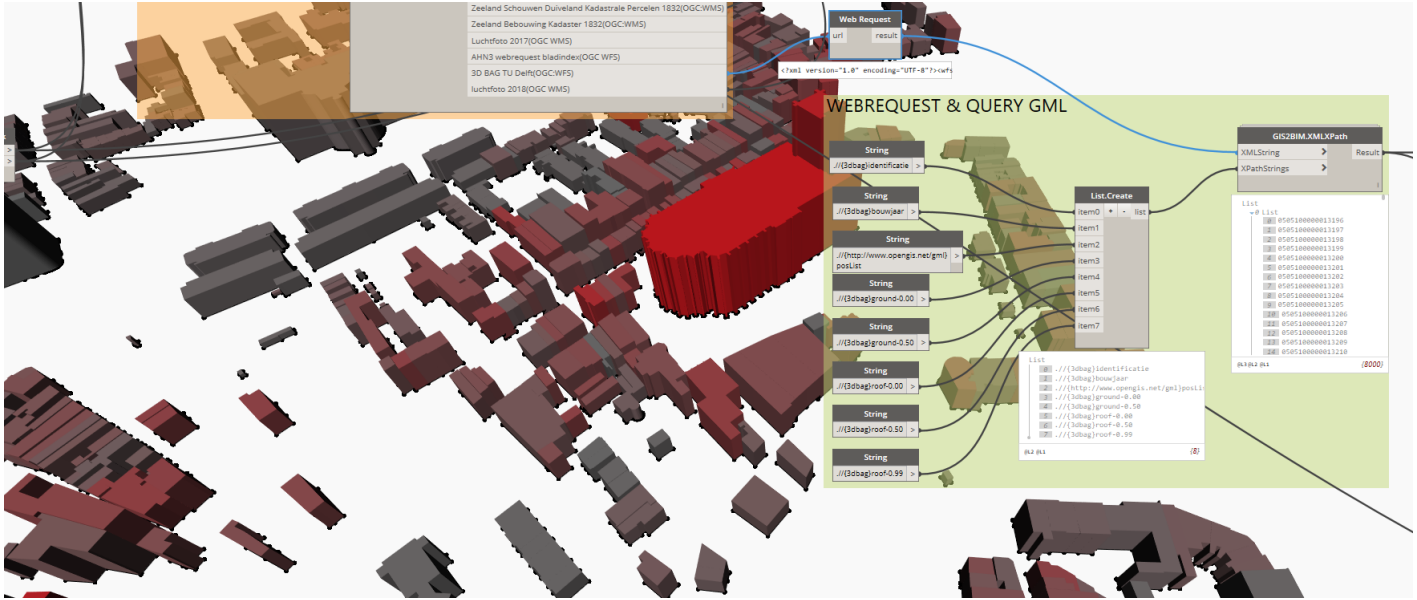
- AHN3 pointcloud data
- Geotiff





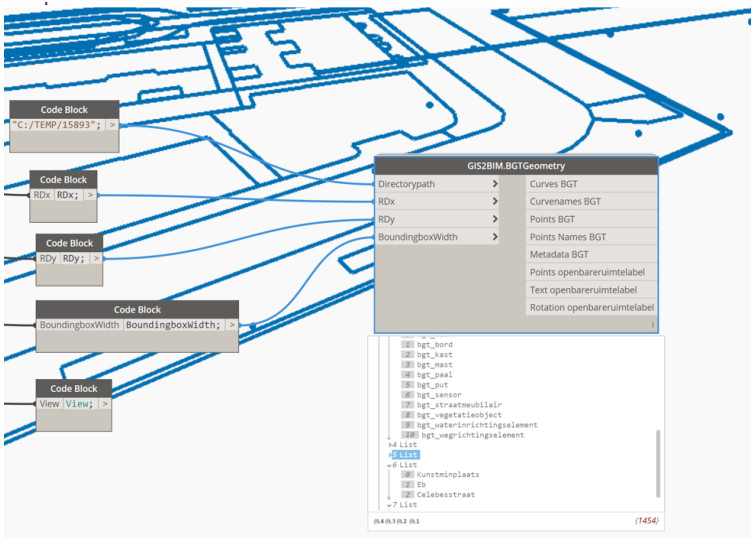
3. Vectordata: 3D BAG

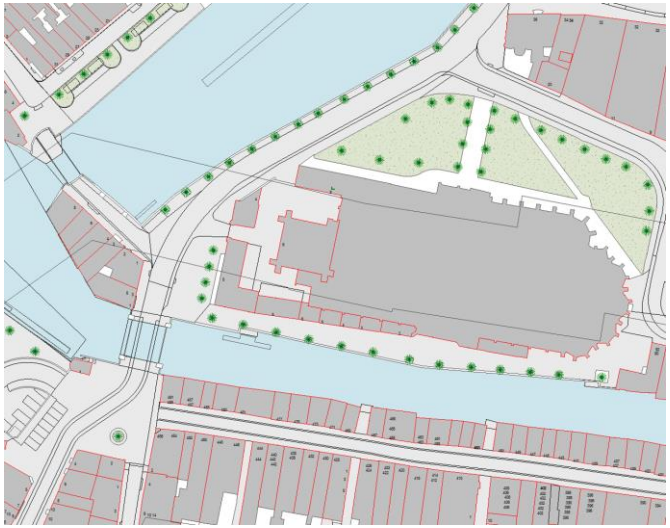
- 3D BAG: server TU Delft: http://3dbag.bk.tudelft.nl/



3. Vectordata: BGT

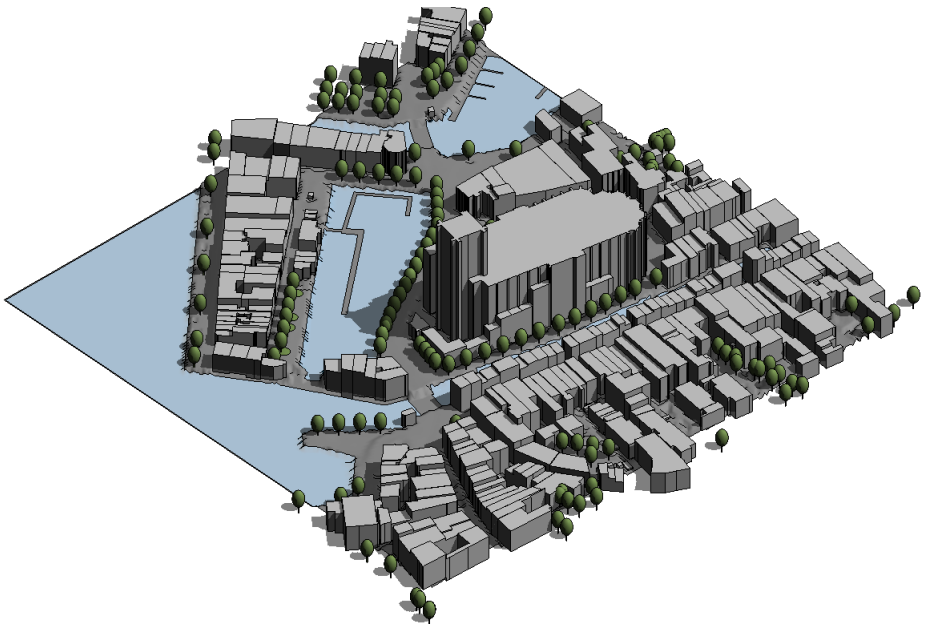
- WFS(not available anymore)
- Download (slow)

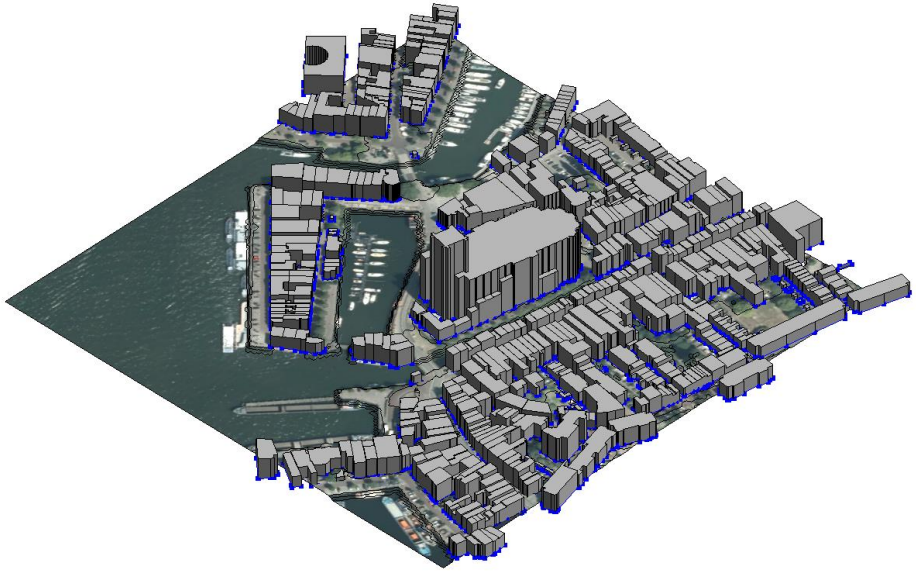




3. Combine AHN3 & 3D BAG & WMS & BGT

- Live Dynamo





4. To remember

1. Geocoding
2. Raster/Vector
3. WMS: Web Map Service(Raster)
4. WMTS/TMS: Web Map Tile Service(Raster)
5. WFS: Web Feature Service(Vector)
6. ARCGIS REST API Raster/Vectordata via ArcGIS API

4. To write down: Dynamo Packages

Dynamo Packages

ELK:	for converting Open Streetmap Data
MeshToolkit:	for loading meshes
Spring Nodes:	convert ToolkitMesh to Mesh
DynamoGIS:	importing Shape Files
DynaMaps:	load OSM data(new!)
GIS2BIM:	for WMS/WFS/WMTS/TMS requests and geoservices.
Revit addin:	Mesh Import from OBJ files

Opensource software

LASzip:	Quickly crop, transform pointclouds
Cloudcompare/Meshlab	Surface Reconstruction Algoritmns

4. GIS=Data, Other sources

Data

PDOK	https://www.pdok.nl/datasets
Nationaal Georegister	www.nationaalgeoregister.nl
INSPIRE Data Europe	http://inspire-geoportal.ec.europa.eu/
Open Street Maps:	http://www.openstreetmap.org

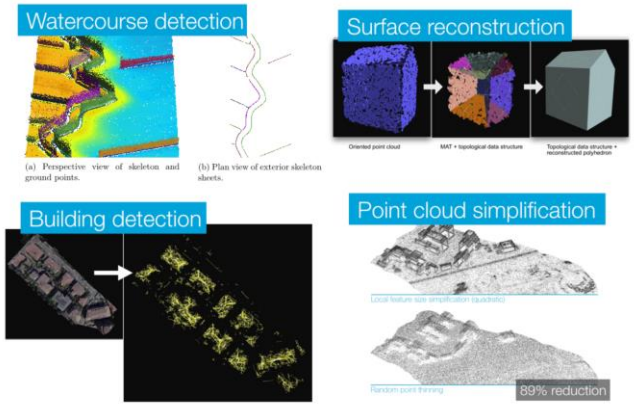
Forum https://geoforum.nl

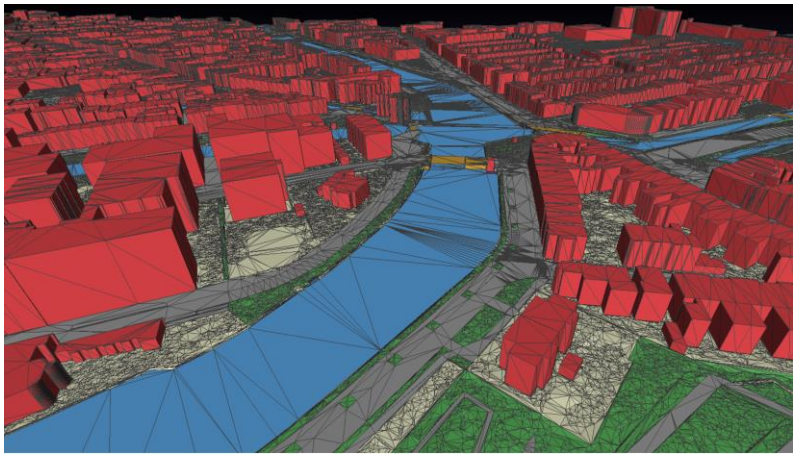
More Information

Gentle introduction to GIS:	QGIS-site
BILT Europe Presentation:	Github
Wiki GIS2BIM:	GIS2BIM

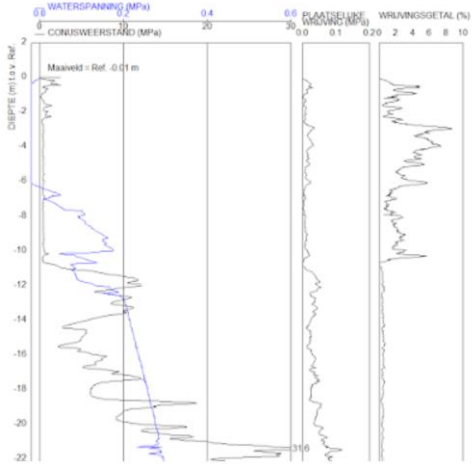
Future #1

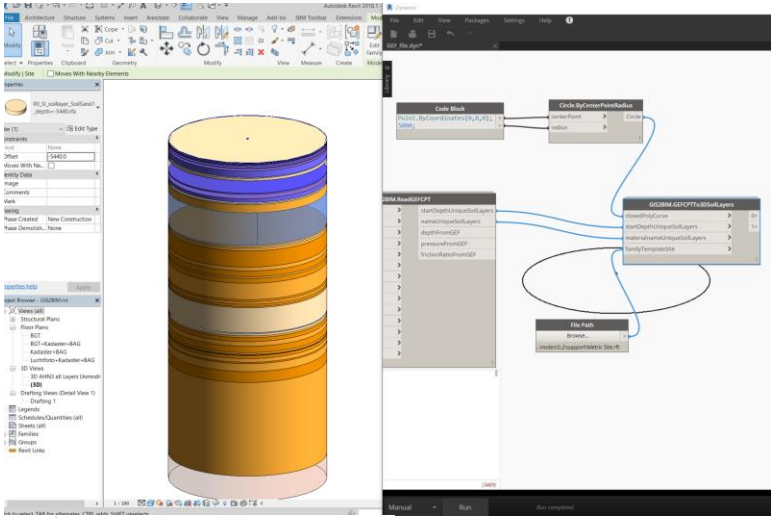
- **Combine 2D GIS datasets and pointclouds(3dfier), make available in 3D Vector Tiles in CityGML and CityJSON**
- **Better integration of ARCGIS webservices in Revit/Infraworks**

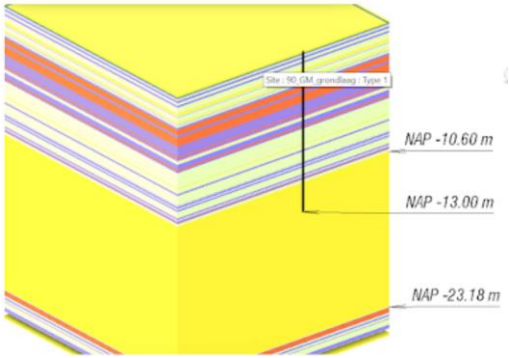


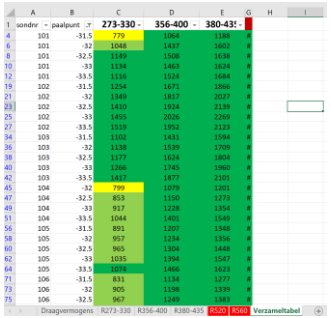


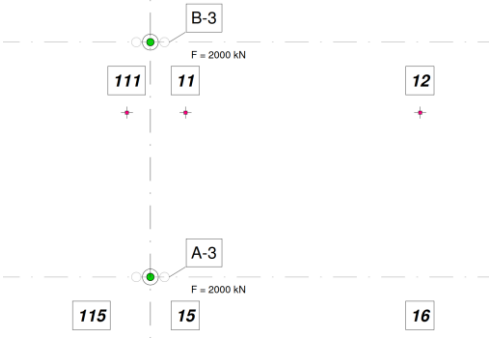
Ideas #2 CPT in 3D & Pile Optimization



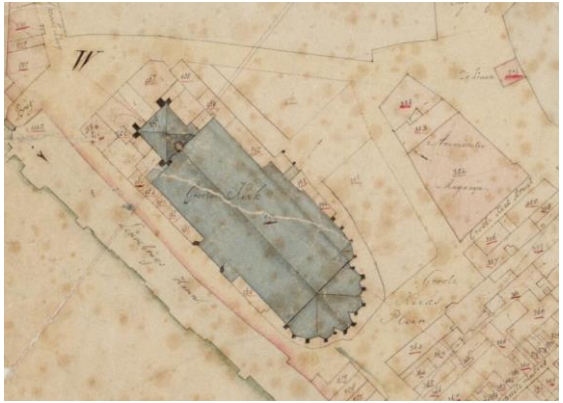


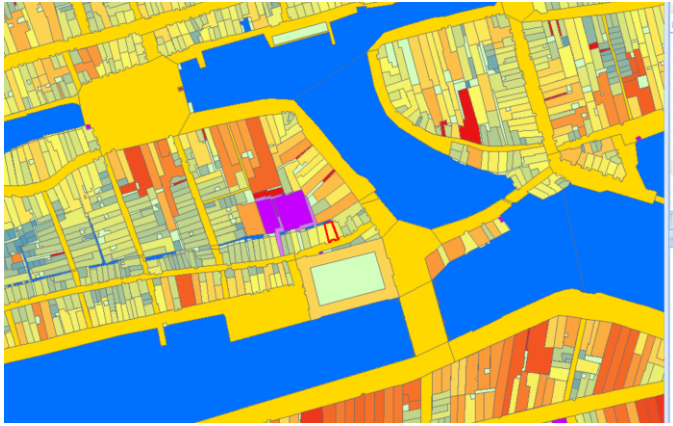


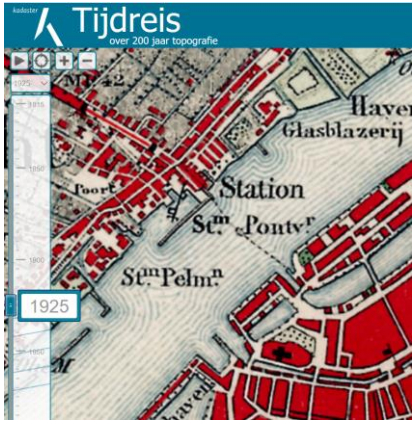


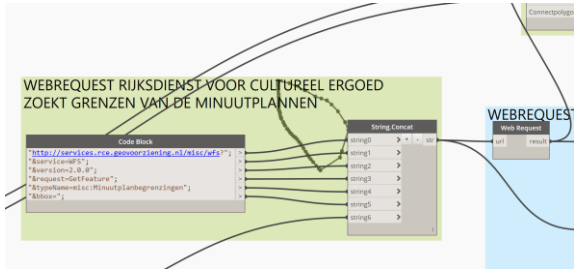


Ideas #3 HISGIS & Topotijdreis

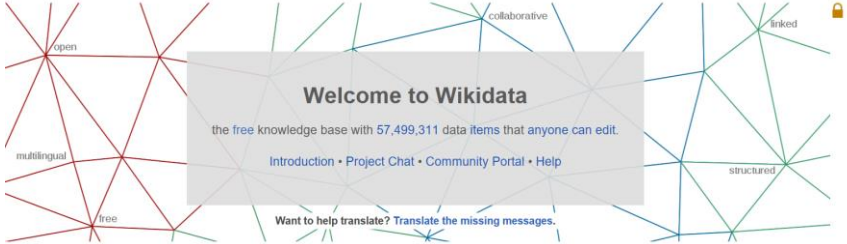








Ideas #4 Klic / Wikidata SPARQL



Questions?

Find me at:

- https://revitstructure.blogspot.com
- www.3bmlabs.nl
- www.3bm.co.nl
- www.domera.nl

Download presentation and datafiles from:

https://github.com/DutchSailor/blog/tree/master/Bouwtechniek%20%26%20Revit/2019-06%20AHN%20Geotiff%20BAG%203D%20%26%20Locatieanalyse