

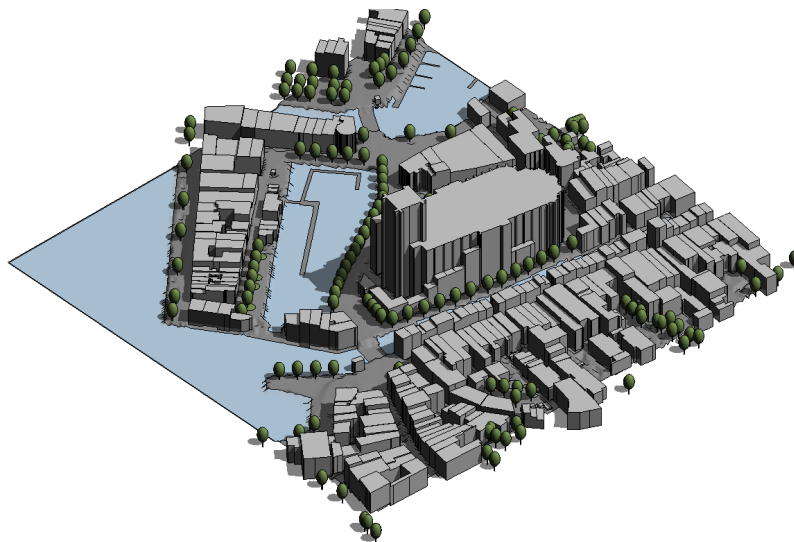
**DOMERA**  
Thuis op het water

# GIS in Dynamo

How to load 3D GIS data into Dynamo?

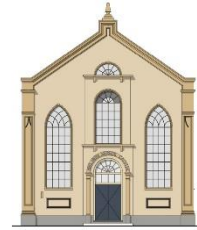
How to automate location analysis in Dynamo/Revit?

Maarten Vroegindeweij



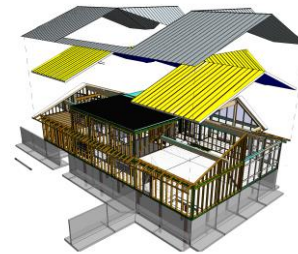
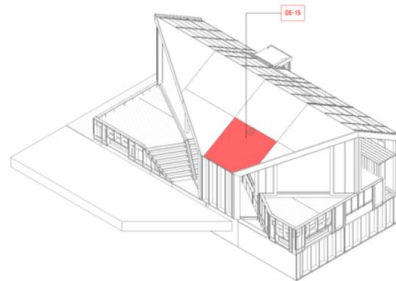
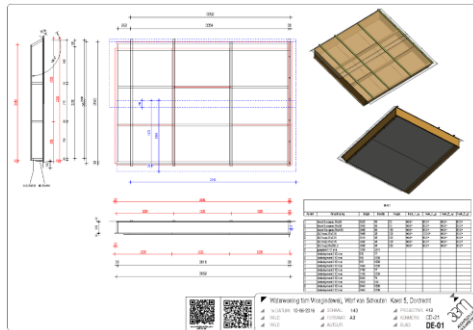
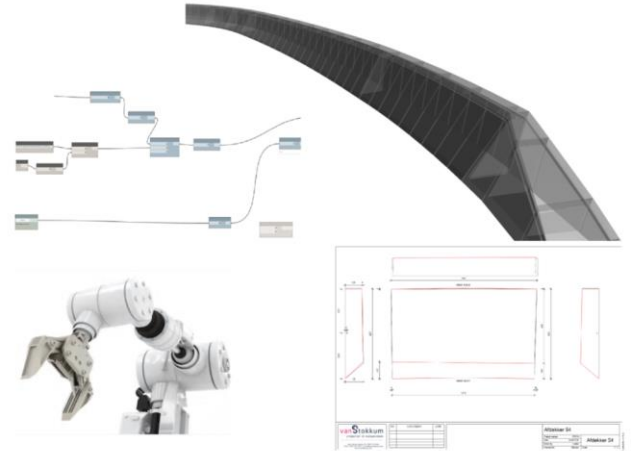
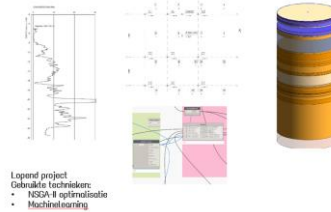
# About 3BM

- Consulting engineers since 2009
- [www.3bm.co.nl](http://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



# 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

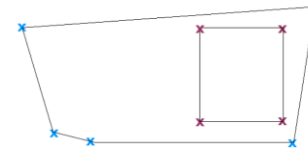


## 4. Conclusion & more information

PDOK

## 3. Vectordata

Vectordata / 3D BAG,  
AHN3, BGT



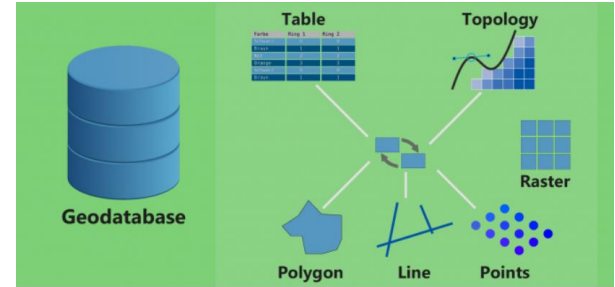
# 1. Intro GIS



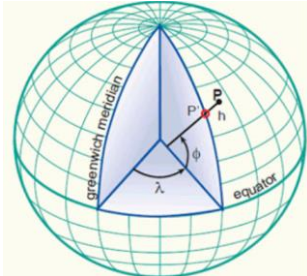
Maps

```
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```

Webserver



Geo Databases

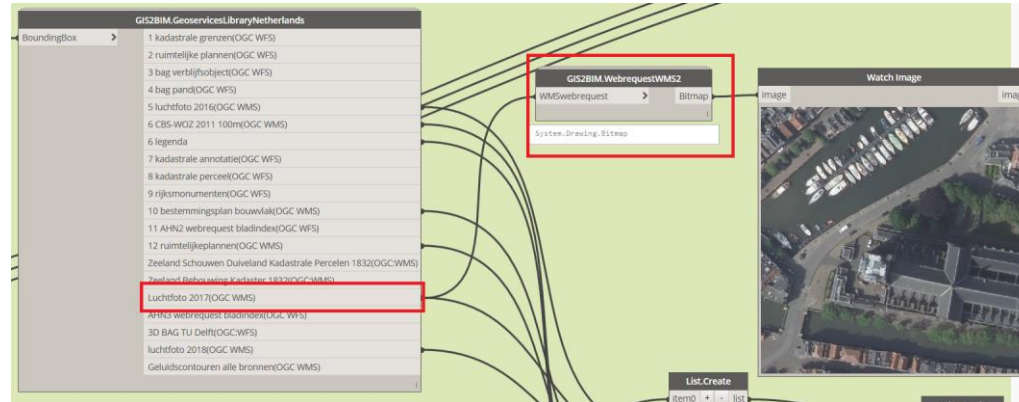
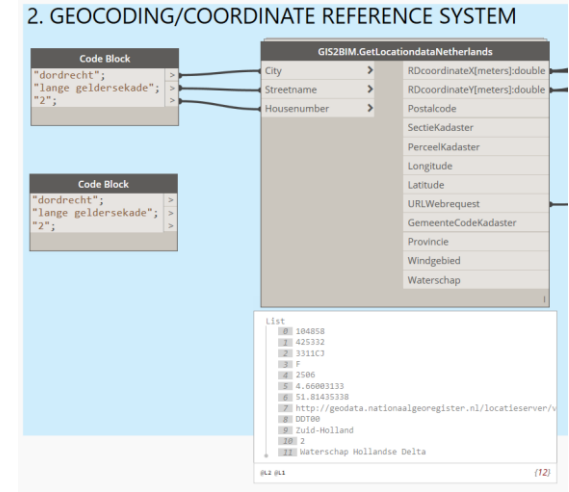


Coordinate Reference Systems

EPSG network WGS84  
Foss4G interpolation WFS  
GDAL irregular Grass  
Shapefile Spatial  
Inspire Qgis  
ArcGIS PDOK  
Esri Infravorks  
PostGIS Ogr2ogr CRS

## 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**

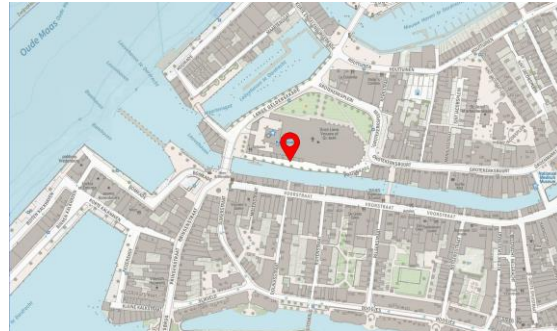
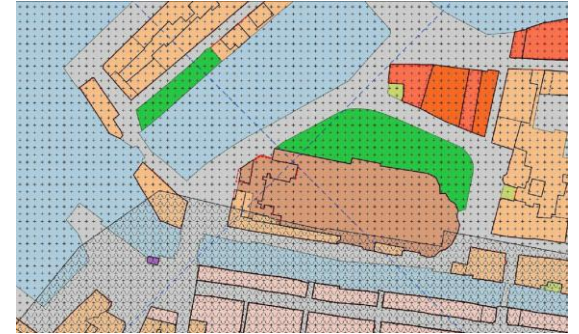




## 2. Location Analysis

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

-OPEN IN DYNAMO/REVIT-

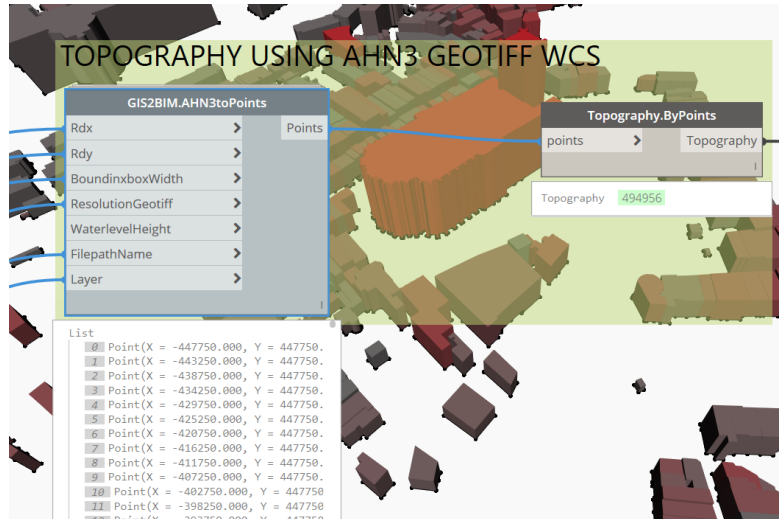
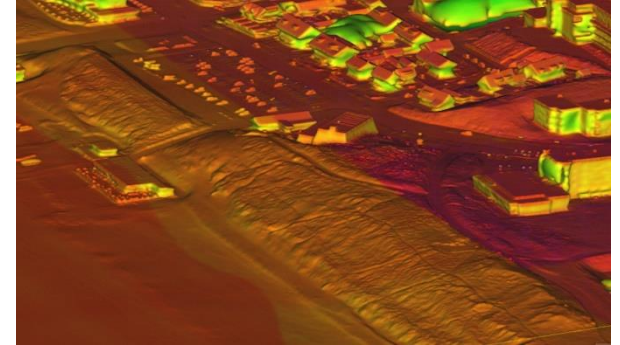


## 2. Other applications ;-)



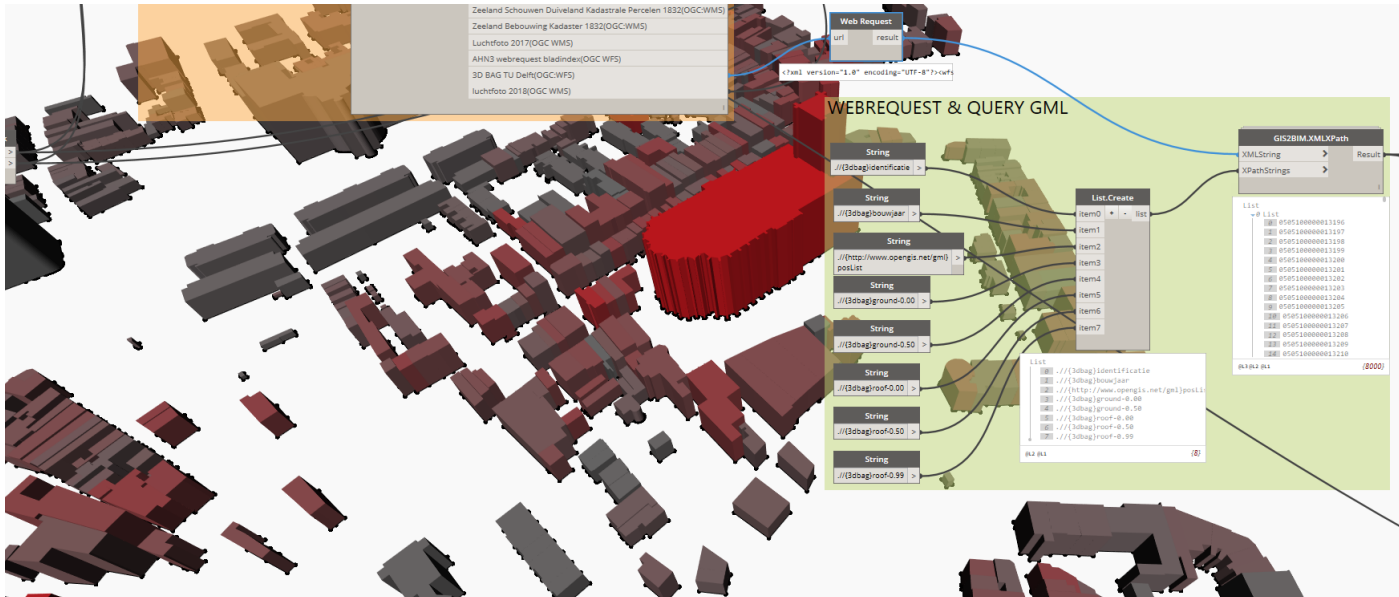
# 3. Vectordata: AHN3 WCS GEOTIFF

- AHN3 pointcloud data
- Geotiff



# 3. Vectordata: 3D BAG

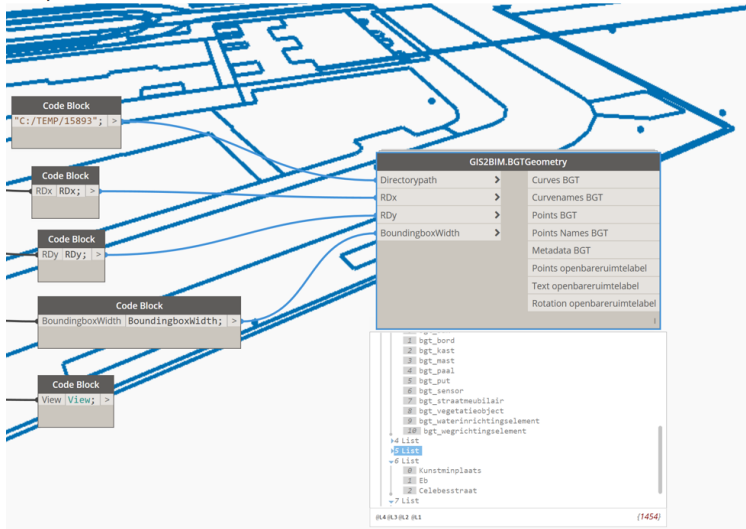
- 3D BAG: server TU Delft: <http://3dbag.bk.tudelft.nl/>





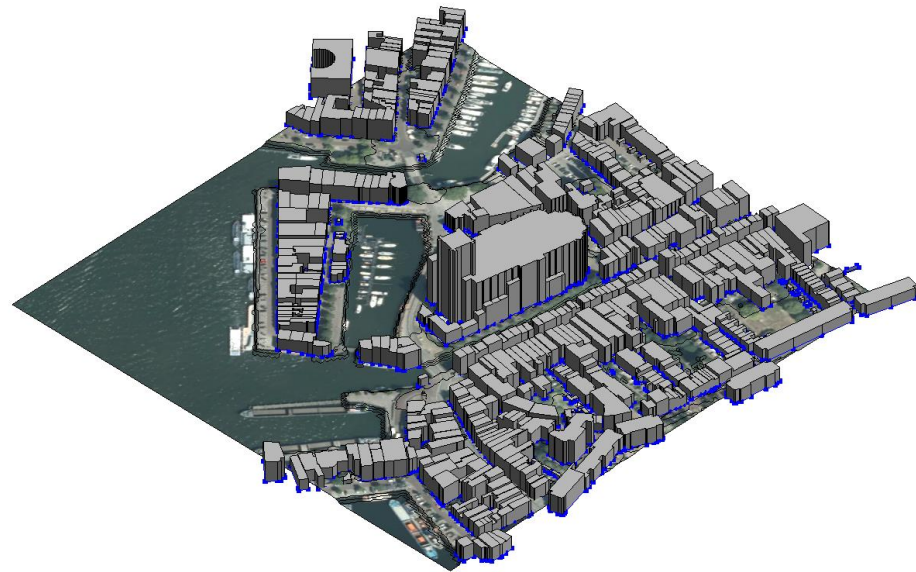
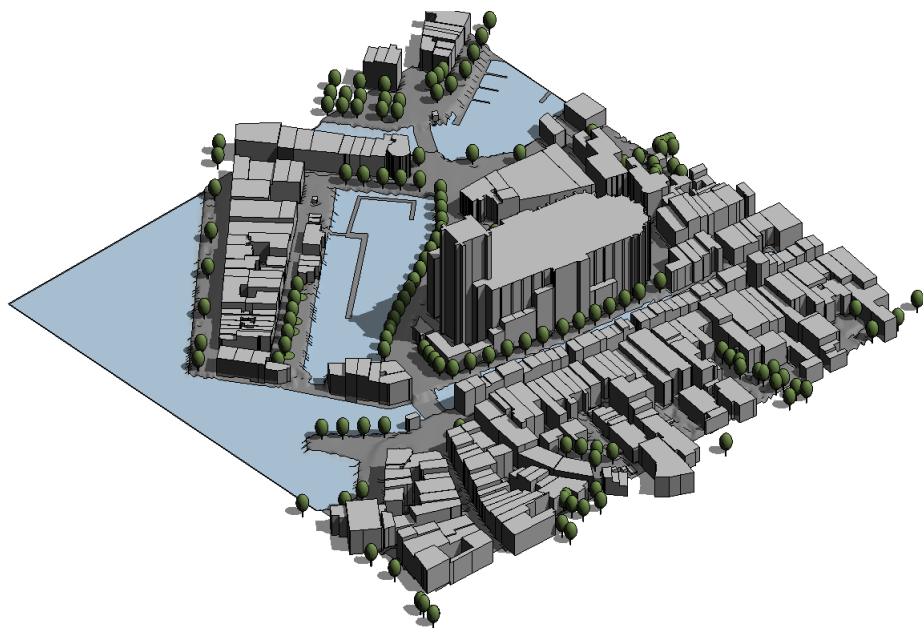
# 3. Vectordata: BGT

- 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

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

### Opensource software

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



# 4. GIS=Data, Other sources

## Data

PDOK

<https://www.pdok.nl/datasets>

Nationaal Georegister

[www.nationaalgeoregister.nl](http://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](#)

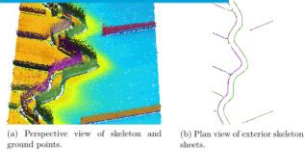
Wiki GIS2BIM:

[GIS2BIM](#)

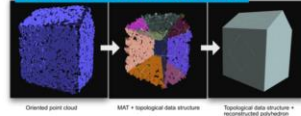
# Future #1

- 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

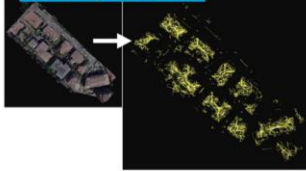
## Watercourse detection



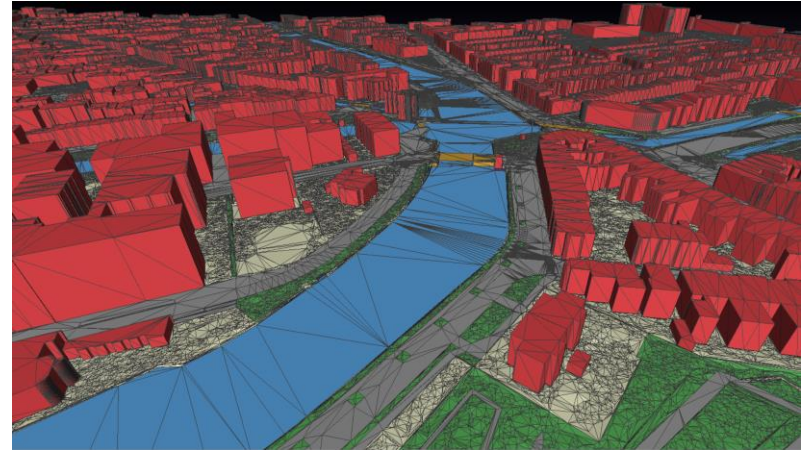
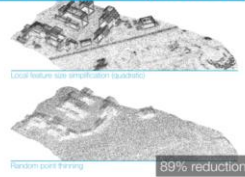
## Surface reconstruction



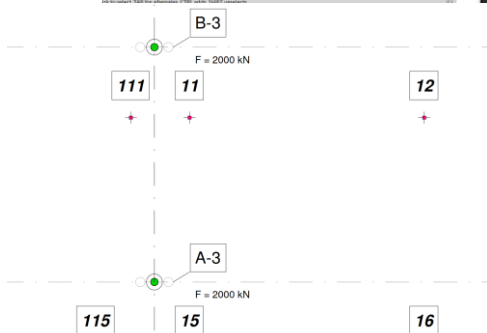
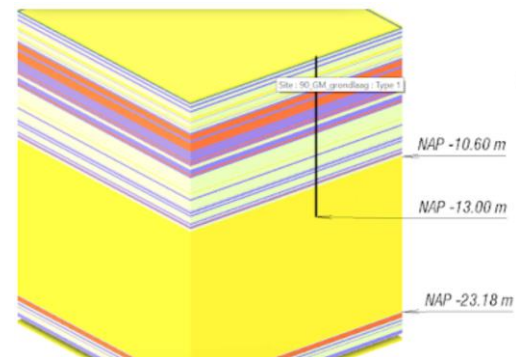
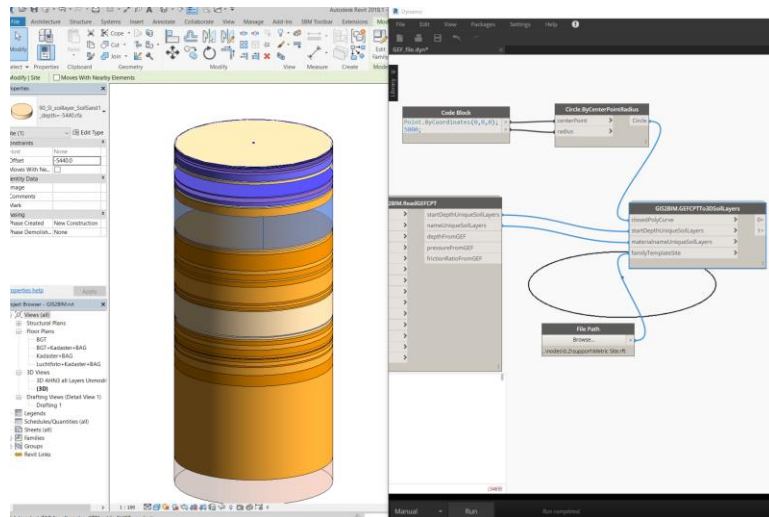
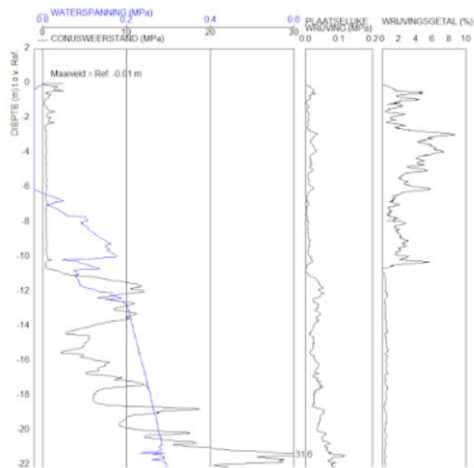
## Building detection



## Point cloud simplification

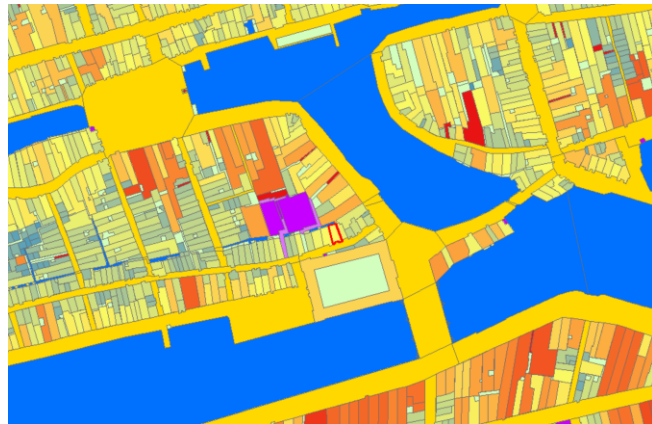


## Ideas #2 CPT in 3D & Pile Optimization

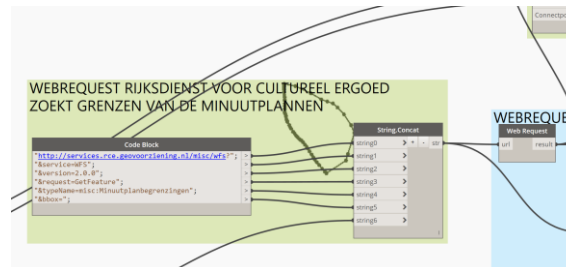
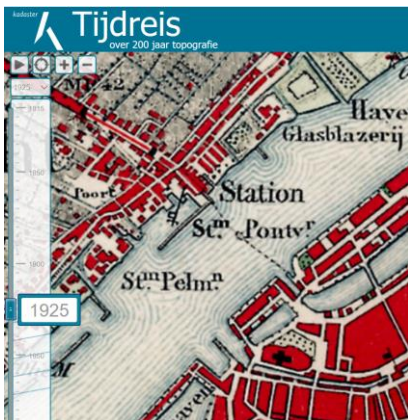
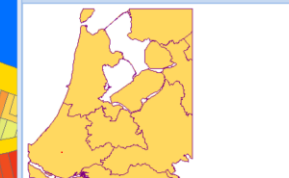


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5	101	-32	1068	1087	1602			
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185	137	-32,5	1015	1364	1547			
186	137	-33	1015	1364	1547			
187	137	-33,5	1015	1364	1547			
188	138							

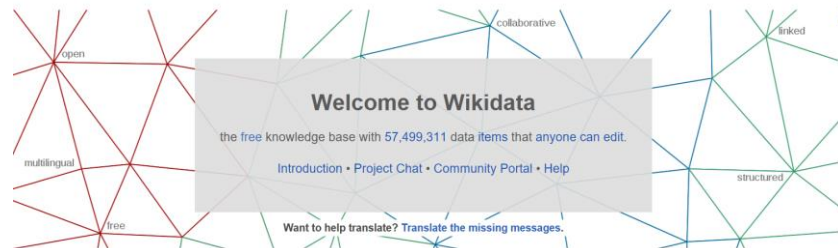
## Ideas #3 HISGIS & Topotijdreis



Rijksmonument 0602 (gemeente Rotterdam gebouwen)	
Perceelnummer	Rotterdam 0602
Naam	Jurg. wed. H. Wijmans
Voornaam	erven Anna Sara
Beroep	
Woonplaats	Rotterdam
Artikelen	
Soort eigendom	huus
Inhoudsgrootte	68.0
Klasse gebouwd	21
Betrijfbare inkomingsgebouwd	46500.0
sectie	0
gemeente	Rotterdam
Klasse part.2	0
<a href="#">Legenda</a> <a href="#">Navigatie</a> <a href="#">Information</a>	



# Ideas #4 Klic / Wikidata SPARQL



# Questions?

Find me at:

- <https://revitstructure.blogspot.com>
- [www.3bmlabs.nl](http://www.3bmlabs.nl)
- [www.3bm.co.nl](http://www.3bm.co.nl)
- [www.domera.nl](http://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>