3D Spatial Information Infrastructure for the port of Rotterdam

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The Port of Rotterdam

- One of the largest harbours
- Annual throughput 434 million tons
- Area of 10 sq. m
- Distance of 45 km
- Dense populated surrounding area
- Pipes and cables 155 km
- Quays 64 km
- Maasvlakte 2 – extension to the see

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*TUD, TU/e, Port of Rotterdam, Municipality Rotterdam*
Information management
The challenge

- Management of large spectrum of objects (GIS/BIM)
- Current 2D systems are confronted with available 3D data
- Many actors: public and private stakeholder, companies and other institutions
Road map: from 2D to 3D, one object definition
The bottleneck:

3D information model for HbR
Main goal:
3D information model for HbR

Clients, Partners

Read
Add, edit

Departments in HbR

Read, add, delete, edit

3D Generic model

Objects, attributes, relations, appearance
Advise on 3D SDI: interfaces

- National SDI vs Corporate SDI
- 2D SDI vs 3D SDI
Currently worked on:

- Interfaces, model

Diagram:
- HbR
- GWR
- 3D visualisation
- Clip and section
- Partners
- Clients
- Departments
Test side (Civil3D, Architecture, StudioMax, Navisworks)
3D visualisation (WebGL)

- Use case Utilities

Josafat Guerrero
3D visualisation (WebGL)

- Use case Utilities

Josafat Guerrero
3D visualisation (WebGL)

- Query attributes
- Hide layers
- Adjust transparency
Operations on 3D model

- Use case Quays
- Clip objects
  - Close objects
  - Preserve identity and attributes

Wouter Goedhart
3D clip
3D cross section
3D Model: principles

- Define an object only once (smart objects, not only geometry)
- **Re-use** of existing standards (GIS and BIM) for objects that are already specified
- Define new objects if not available (e.g. QUAYS)
- Consider national and international **tendencies** (Geonovum, OGC, buildingSMART, Web3D)
New approach for the 3D model

GIS: Select classes (objects) from existing standards

BIM: Create new descriptions if not exist
GIS: use of existing models

• IMGeo-CityGML – progress within the 3D pilot
• Application Domain Extensions (pipes, geo-technology, etc.)
• IM models of National Standardisation Organisation
Definition of IfcQuay
IfcQuay

• Industry Foundation Classes (IFC) standard (BIM)
• Only Civil Engineering domain model up to now: Bridge (IfcBridge)
• This project adds a domain model for quays and quay walls
• world-wide only project
• Lots of interest from 3rd parties already
Challenges

- Most of the GIS models are 2D
- Attributes may be insufficient for HbR
- Mappings between the models
- Integration GIS and BIM
  - Keep both
  - Map BIM to GIS
  - Map BIM to GIS but keep the original BIM
Thank you for your attention!

http://maasvlakte2-3dsdi.ddss.nl