CI226444 – Get Organized Civil Infrastructure Projects

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The Story

THE PROJECT
• THE CHALLENGES
• THE GOAL

DOCUMENT MANAGEMENT

LESSONS LEARNED

Q&A
The Project

OpenIJ - The largest sea lock in the world after completion
The main entrance to the Port of Amsterdam
About the speaker

Cees Kruit
About BAM

Key figures

- Revenue 2017: € 6.6 billion
- Adjusted result before tax: € 63.3 million
- Orderbook at year-end 2017: € 11.6 billion
- Employees (average; in FTE): 19,720
- Operating companies: 10
- Countries: 40 worldwide; 5 European home markets
- Shares: 275 million

BIM Level 2 Pass 1192 Certified
Deze afbeelding is slechts een impressie van de toekomstige sluis. In de Planstudie zal bekeken worden wat de definitieve lokatie wordt.
Today’s Class

• Learn about managing engineering and construction data
• Learn how to pick the right solution for your projects needs
• Learn what brings the cloud to civil infrastructure projects
• Learn how to maintain the BIM execution plan
Facts and Numbers Sea Lock OpenIJ

- **545 METER LONG**
- **70 METER WIDE**
- **18 METER DEEP**
- **3 DOORS**

- Maximum ship length of 500 meter (1788 ft)
- Between Lock Walls (229 ft)
- Limited by the depth of the North Sea Canal (59 ft)
- Two operational doors and one spare door. Weight of 2.800 tons each, and high as a 10-floor building
Panama canal lock

Was the Largest Lock in the World

Sea Lock Openij

The Largest Sea Lock in the World

427x55x18,3
(1400x180x60 ft)

545x70x18
(1788x229x59 ft)
Reference
Lock Doors

>6,000 parts and assemblies
Facts and Numbers Sea Lock OpenIJ

290,000 M$^3$ CONCRETE
7,500 TONS TUBULAR PILES
2,000 ANCHORS
25,000 TONS REINFORCEMENT

29,000 Trucks with Concrete
New York City to Washington DC
(8475520ft$^3$)

(1.6535e+7lbs)

25,000 Cars
(5.5116e+7lbs)
Facts and Numbers Sea Lock OpenIJ

Inner Lockhead

Outer Lockhead
Facts and Numbers Sea Lock OpenIJ

290,000 M³ CONCRETE
7,500 TONS TUBULAR PILES
2,000 ANCHORS
25,000 TONS REINFORCEMENT

29,000 Concrete Trucks
New York City to Washington DC

4,500,000 m³ Soil!
(1.589160e+8 ft³)

25,000 Cars
4,500,000 m³ of excavated soil

6,000 swimming pools or 2 times the Johan Cruijff ArenA
The Problem

- Different participants, Bring your own device
- 30 different CAD users, different setups
- Different Template, Different Workflows
- ICT on different locations, Network
The Problem

- Large variety of file formats
- No control on file versions and Revisions
- Reference files
- Duplicates
BIM Execution Plan

• Describe all items
• Update regular on experiences
• Work all in same way, if possible!
Used software to control

Integration
- Revit
- Inventor
- Civil 3D
- AutoCAD

Check-in/out
- Navisworks
- Dynamo
- 3ds Max
- ePLAN

- Solidworks
- Allplan
- VOSS
The Goal

• Get well organized CAD platform with all different problems
  ○ Import 10,000 CAD files into the DMS of choice.
• Every CAD user to be happy working the new way
• Bring in an Engineering Document Management System. One that support the common used engineering software on the project.

• Available from inside and outside the OPENIJ office locations
Data @ the center
The Proposed solution

- Autodesk Vault Professional
  - Ampersand Software AutoProperties Pro
  - Ampersand Software Publisher
- Autodesk Vault File Server
Onboarding the project

Let’s get started
Phases

**PHASE 1**

- **PROJECT APPROACH**
  - Setup to define the scope
  - Define IT infrastructure

- **PROOF OF CONCEPT**
  - Setup IT Infrastructure
  - Scanning for data integrity and missing references.
  - Pilot upload
  - Training Key users

- **FINAL IMPLEMENTATION**
  - Scanning data references
  - Import Civil Project
  - AutoLoad Inventor an AutoCAD data
  - Filling meta data

**PHASE 2**

**PHASE 3**

**PHASE 4**

- **USER TRAINING AND SUPPORT**
  - Trained users based on discipline and application usage.
  - Period of maintenance and support.
Scope the project
The Change

- Revit users
- Inventor Users
- AutoCAD users
- Civil 3D users
Vault infrastructure design

- OPENIJ Haarlem
- Data Center OPENIJ
- OPENIJ Construction site IJMUJDE
- FIELD / HOME USERS

Tunnel connections: OPENIJ Haarlem → Data Center OPENIJ → OPENIJ Construction site IJMUJDE → FIELD / HOME USERS

- USER A
- USER B
- USER C
- USER D

- Vault ADMS
- Vault AVFS
- Job Processor
- NETSCALER
Scanning file relations

- Files old drive mapping
- Files in personal folders
- Files in temp folders
Key users

- Onboarding key users
- Reflect configuration
- Change configuration on feedback
- Catalyst the acceptance of new solution
Uploading data
Check it again
Drawing Process

Work in Progress
- CONCEPT
- 0.1
- PDF

CONCEPT
- FINAL
- 1
- PDF

FINAL
- WIP
- A.1
External Reference Release Process
PHASE 4
Let technology work for you
Difficulties
Usage

- 73 ENGINEERS
- 40,000 DOCUMENTS
- 247,000 VERSIONS
- 1 TERRABYTE

- 100 RVT's
- 2,000 DWG's
- 2,900 IAM's
- 2,200 PDF's
- 16,000 IPT's
- 16,800 unsorted

Largest version 8304
Average version 6.18

- 14 GB Revit models (actual)
- 10 GB Inventor models (actual)
- 10 GB Civil 3D models (actual)
Lessons learned

• Start Vault at start Project
• Start BIM Scan at start Project
• Record all appointments in BIM Execution Plan
• All Workflows, processes, etc. in BIM Execution Plan
• Revit Central Files in BIM 360
• Put your Data Management system of choice in your BIM execution plan.
• Attention to users (Civil3D)
• Clearly explain why you use a Data Management system
• Inform all external engineering consultants how to use BIM
Q&A

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How did we do?

• Your class feedback is critical. Fill out a class survey now.
• Use the AU mobile app or fill out a class survey online.
• Give feedback after each session.
• AU speakers will get feedback in real-time.
• Your feedback results in better classes and a better AU experience.

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