Case Helsinki Airport expansion: Implementing InfraBIM-workflow

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Outline of the presentation

- Der rote Faden - InfraBIM workflow development in Finland
- Helsinki Airport expansion project in a nutshell
- InfraBIM-workflow in design
- InfraBIM-workflow in infra construction
- BIM in Communication and collaboration
Der rote Faden – InfraBIM workflow in Finland

- The built environment consist of "different" entities
- To utilize the generated information in all different purposes and phases:
  - How to produce and manage data?
  - Clear processes, standards, requirements and guidelines

- InfraBIM-development in Finland
  - Finnish way of implementing digitalization in operations and execution of construction projects

- "Holy trinity"
  Classification System
  - 'The language' InfraBIM Terminology
  Requirements
  - What and how to model in different phases
  Data exchange is based on
  - Open formats: Inframodel3 (LandXML), IFC, GML
Need and demand for the expansion

- To strengthen Helsinki Airport's position as the significant air traffic hub between Europe and Asia.
- To increase the annual capacity from today's 18 Mio passengers to 30 Mio passengers in the future.

Total investment in expansion construction 900 Mio. €
Renewal of apron infra: Area is 90 football fields
GOAL: 100% infraBIM workflow in design and construction processes

The Helsinki Airport expansion project in a nutshell

- TO strengthen Helsinki Airport's position as the significant air traffic hub between Europe and Asia.
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- GOAL: 100% infraBIM workflow in design and construction processes

The project is executed in co-operation with

- Owner: FINAVIA CORP.
- Infra and geo design: SITOWISE
- Infra construction: DESTIA
- Architectural design: PESARK
- Building Structural design: SWECO
- Building services engineering: GRANLUND
- Building geo design: SIPTI
- Building construction: LEMMINKÄINEN
InfraBIM-workflow in design – Design compatibility check

- Building and Infra (BIM) in the same software – basic combination model

- 3 different examples:
  - Supported excavation and sheet piling
  - Pile foundation and drainage system
  - Water supply line and blasting

- Compatibility check with TeklaBimSight, Solibri, ...

- Demands
  - Open and intelligent data exchange formats (IFC, IM3)
  - Unified processes and operations

- Benefits
  - Proactive co-operation
  - Less errors and conflicts
  - The most technical and economic design solution
InfraBIM-workflow in design – Designer’s quality assurance

- **Key:** Same data – different software – similar view
- Designer’s tools in desktop
  1. Design software
  2. Worksite software
  3. Infra construction machinery simulator
- **Lifecycle:** From designer to machine operator and machines
- "Correct data flow" demands
  - Use of open data formats throughout the process
- **Benefits**
  - Vendor-independent
  - As-planned model is compatible with construction machinery
  - "Do it correctly once"
  - Saving time and money
Designer
- Real Time View
- BIM Coordinator
- 3D-Win Model tool
- Design Model → As-Planned Model
- Combination Model
- Design Changes
- As-Built Model

Surveyor
- Real Time View
- BIM Coordinator
- Surveying
- Machine Control Model
- Surveying Model
- As-Built Data

Work Machinery
- Machine Control Model
- As-Built Surveying
- Machine Work Time
- Efficiency

Project Owner
- Real Time View
- Design Approval
- Quality Control
- Preparedness Tracking
- Transparency process

Site Foreman
- Real Time View
- Work Planning
- Quantity Management
- Preparedness Tracking
- Quality Control
InfraBIM-based construction and machine control system models in execution

- Quality control at work site
  - As-Planned models
  - As-Built data by surveyors
  - As-Built data by machine control
  - Machine control accuracy check
  - **Documentation**

- Data management --> Infrakit
  - BIM Coordinator
  - **All data used by machine control**
    - *Data sharing* <->
    - 70 folders (including subfolders)
    - 850 files
    - 200Mb
    - 80 background/warning maps
    - 90Mb

- As-Built model
  - Digital quality assurance
  - Finished product of construction
  - Base for Maintenance model
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BIM in Communication and collaboration

- **SAME DATA** as used in Design and Construction phases
- **REFINED DATA** in to a Virtual model - tool to
  - Communicate and Collaborate

**Used in:**
- Project management and communication. One visual dashboard to all data.
  - Support in decision-making.
  - 4D/5D: Time and money
- User involved-process:
  - Airport and maintenance staff, pilots

- **Better end product and more satisfied customer**
Thank you for the interest and we hope to see you here in Munich – let’s change some ideas! **Questions?** Visit us at bSF “Finnish pavilion” @booth129
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