BIM implementation for the Rail Baltica Global Project

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RAIL BALTICA – PART OF THE NORTH SEA-BALTIC CORE NETWORK CORRIDOR

VIDEO
WHY BIM?

- DIRECTIVE 2014/24/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL
  - Europe 2020 strategy for smart, sustainable and inclusive growth
  - Public procurement rules

- Increase the efficiency of public spending

- Facilitating in particular the participation of small and medium-sized enterprises (SMEs) in public procurement

- To enable procurers to make better use of public procurement in support of common societal goals

- Contracting authorities can determine the most economically advantageous tender and the lowest cost using a life-cycle costing approach

- Research and innovation, including eco-innovation and social innovation
To inform, start a dialog and engage the industry’s professionals in the discussion and development of the BIM implementation for the Rail Baltica Global Project.
Agenda

- BIM implementation plans
- BIM Strategy Framework – the concept
- BIM Manual
- Employer’s Information Requirements
- BIM Execution Plan
- Communication channels
General BIM approach

- We are gathering and implementing the best BIM practices
  - from UK, Finland, Denmark, Lithuania, Estonia, Sweden, Norway, Spain, Germany...
  - OpenBIM approach - the Rail Baltica BIM Strategy does not impose the use of any specific authoring tool, and therefore the BIM and CAD Standards are not tool / software related.
  - Monitoring and following closely the newest developments and technologies (IFCRail, IFCRoad, IFCBridge, AR and VR...)
BIM implementation plans

- **Q4 2017**: BIM Strategy Framework
- **Q1 2018**: Detailed BIM Strategy public procurement
- **Q2 2018**: Development of Detailed BIM Strategy with 12 month support
- **Q3 2018**: BIM Technology public procurement
- **Q4 2018**: BIM Technology implementation with support

Rail Baltica
BIM Strategy Framework

- General document which sets the main criteria for BIM implementation for Rail Baltica Global Project
BIM Strategy Framework

Implement technology that supports these objectives

Encourage and support the design and construction supply chain to use BIM tools and technology

Capture operational and asset management information

Extend the use of BIM beyond 3D models to include wider information attributes

Encourage the supply chain to use the best technology

To build the railway twice

Reducing duplication (of work)

Enable cross project information sharing and coordination

Life cycle centric approach
Roles and responsibilities

Supplier BIM MNG Process
Supplier Production Process

Aggregate Models and BIM QA/QC review

DELIVERABLES
- QEX / QTO
- PDF (drawings)
- IPC (open models)
- RVT/DGN/... (native model)
- XXX (BIM data drops)
- XXX 4D (plannings)

Internal / External BIM Design/Construction review
- Document quantities

BIM Aggregate model

feedback
BIM Strategy Framework

- Project Information Model (PIM)
  - model based

- Asset Information Model (AIM)
  - database
BIM Manual **(in development)**

### Supporting Documents

- CAD Standards – **Public draft published**
- Codification Standards
- Codification Tables
- BIM Objects Parameter Matrix
- Level of Definition (LOD)
- BIM Objects LoG Matrix

### Mobilization Templates

- BEP Post-Contract template - **Public draft published**
- TIDP template
- MIDP template

### Delivery Templates

- BIM Delivery Report template
- QAQC CAD/BIM Checklist Report template
- Clash Check Report template
- QEX template
- QTO template
- Data Drop template
BIM Manual – *Supply chain and Client’s CDE*

**WIP**
- Work in Progress
- Rev.Ver: P01.01-03.05-...
- Status: S0

**Shared**
- Rev.Ver: P01-02-...
- Status: S1-S4

**RB Shared**
- Rev.Ver: C01-02-...
- Status: A1-A2-A3-B-AB

Supply Chain CDE

Coordinated by RB Rail
Classification – UNICLASS 2015

Accessible
Easily available and many international design and construction companies are familiar with it

Lifecycle approach
Enables 4D, 5D, 6D workflows

Global reach
Many software solutions have integrated this classification system or there are available plugins/addons to use

Usability
Each and every BIM object/element (instance) is coded and classified accordingly

ISO 12006-2
Building construction – Organization of information about construction works – Part 2: Framework for classification

“It contains consistent tables classifying items of all scale from a facility such as a railway down through to products such as a CCTV camera in a railway station”.

(Sarah Delany, Technical Author and Head of Classification at NBS)
BIM EIR - Model types, content and file formats
BIM EIR - Model types and content
# Level of Definition/Development (LOD)

**LOD = LoG + Lol**  
**LoG = Level of Geometric detail**  
**Lol = Level of Information**

<table>
<thead>
<tr>
<th>RAIL BALTICA BIM DEVELOPMENT PLAN</th>
<th>RAIL BALTICA PROJECT PHASES</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BIM Stage definition</strong></td>
<td>Value engineering</td>
</tr>
<tr>
<td>(reference: PAS 1192-2)</td>
<td>Stage 3 - Definition / Stage 4 - Design</td>
</tr>
<tr>
<td><strong>BIM object LoG</strong></td>
<td></td>
</tr>
<tr>
<td>(reference: BIM Manual + BIM Forum)</td>
<td></td>
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<tr>
<td><strong>BIM object Lol</strong></td>
<td></td>
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<tr>
<td>(reference: BIM Manual)</td>
<td></td>
</tr>
<tr>
<td><strong>BIM MODELS (Geometry + Data)</strong></td>
<td></td>
</tr>
<tr>
<td>Level of Geometric Detail (LoG)</td>
<td>LoG 200</td>
</tr>
<tr>
<td>Level of Information (Lol)</td>
<td>Lol 200</td>
</tr>
<tr>
<td><strong>3D MODELS (Geometry)</strong></td>
<td>Environment models / Existing Utilities models / Buildable &amp; Non-buildable out-of-scope elements models</td>
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<tr>
<td>Level of Geometric Detail (LoG)</td>
<td>LoG 200</td>
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<tr>
<td>Level of Information (Lol)</td>
<td>Lol 0</td>
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<tr>
<td>All</td>
<td></td>
</tr>
<tr>
<td><strong>Geo-reference</strong></td>
<td>Yes</td>
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<tr>
<td><strong>Construction scheduling / planning (4D)</strong></td>
<td>No</td>
</tr>
<tr>
<td><strong>Quantity Extraction (5D)</strong></td>
<td>Partially, up to LoG detail</td>
</tr>
<tr>
<td><strong>Asset Management (6D)</strong></td>
<td>No</td>
</tr>
<tr>
<td><strong>Analytical Calculations linked to BIM</strong></td>
<td>Not a requirement</td>
</tr>
</tbody>
</table>
BIM EIR - File formats

Geotechnical survey
Geodetic survey
Architecture
Structure
Civil Engineering
Construction
BIM Execution Plan (BIM)

Detailed BIM Strategy
Post-contract BIM Execution Plan (BEP) Template

Prepared by the suppliers to explain how the information modelling aspects of a project will be carried out

It is prepared as a direct response to the EIR, TS, BIM Manual and contract documentation
BIM Execution Plan (BIM)
Rail Baltica’s BIM website – BIM Knowledge Center

Currently available

- RB Rail’s BIM documentation
  All the published documents are and will be there

- Useful information
  General information about BIM

Future plans/ideas

- Training materials, videos
- Forum for the community
Published documents (and updates coming)
RB Rail AS is a multi-national joint venture of the Republics of Estonia, Latvia and Lithuania, which has been established to implement Rail Baltica.