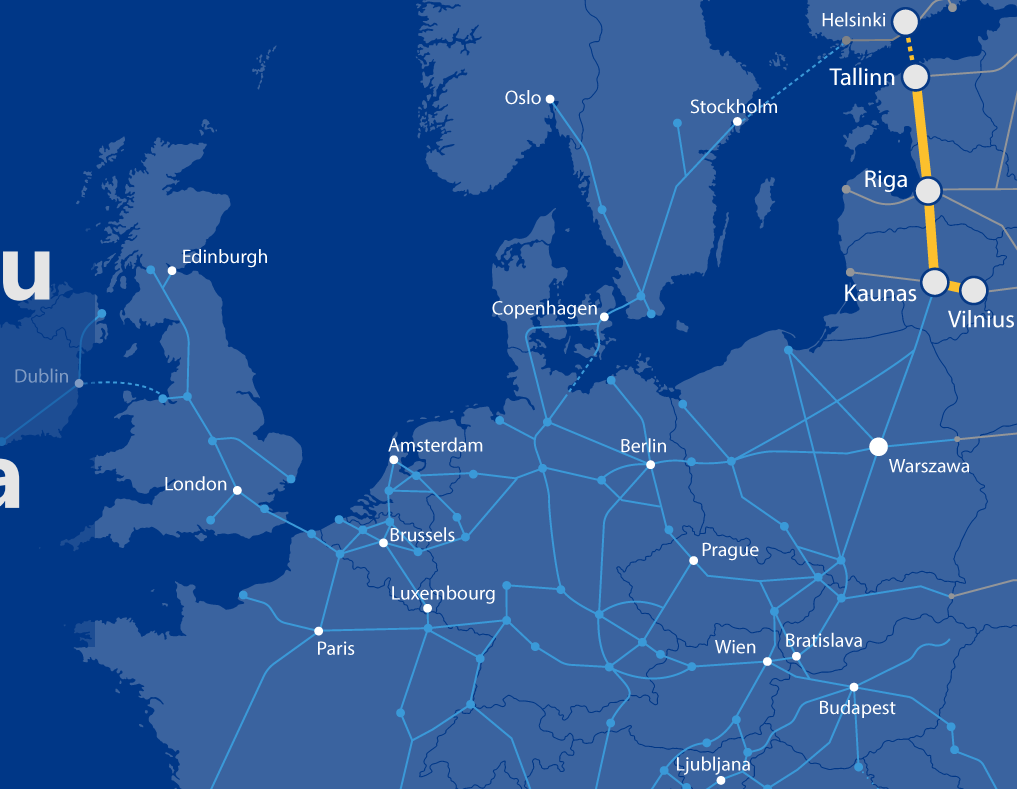


Digitālu procesu ieviešana Rail Baltica projekta ietvaros





Tootsi
Station

Kilksama
Regional Stop

Rapla <<

Par mani



Raitis Bušmanis

Virtuālās projektēšanas un būvniecības
departamenta vadītājs

- RB Rail AS kopš 2018.gada janvāra
- Pirms tam Trimble Solutions Oy
- «Kopā ar BIM» no 2012.gada

EE-DS3-DPS1

PĀRNU – ESTONIAN/LATVIAN BORDER

Rail Baltica

Turpinās pasažieru termināļu būvprojektēšana un sagatavošanās būvniecībai Ulemistē un Pērnavā



Sākta būvniecība Rīgas Centrālās stacijas posmā un parakstīts līgums par būvniecības sākšanu RIX



Kaunas

Vilnius

Tallinn

Pärnu

Rīga

RIX

Mūga



Sākta kravas termināļu projektēšana Mūgā un Salaspilī



Kauņa

Projekta statuss 2021



Būvniecība uzsākta visās Baltijas valstīs



Projektam piešķirti papildu EUR 214,3 miljoni no CEF un valstu valdībām, kas kopumā nodrošina EUR 1,2 miljardus globālā projekta īstenošanai



Sākti reģionālo staciju būvprojektu sagatavošanas darbi



Izstrādāta enerģijas apakšsistēmu stratēģija



Izstrādāta Rail Baltica vadības un signalizācijas apakšsistēmu iepirkuma un izvietojanas stratēģija



Nostiprināta globālā projekta plānošanas un riska atskaites ziņojumu sistēma

Būvprojekts attīstās 643 km garā pamattreses posmā

Turpinās speciālā plāna izstrāde un ietekmes uz vidi novērtējums



Līdzfinansē Eiropas Savienības Eiropas infrastruktūras savienošanas instruments

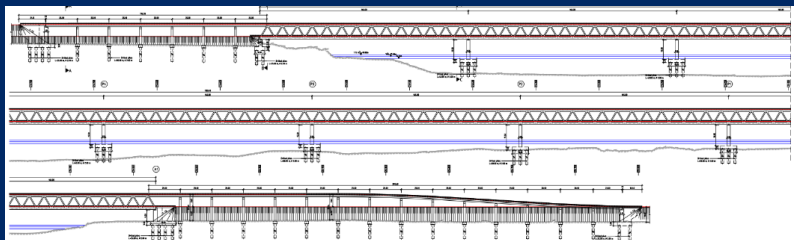
Vairāk par projektu uzzini šeit:
<http://info.railbaltica.org/lv/>



LVC un RB
sadarbība
Apvienotais
tilts pār
Rēvi

Galvenie kombinētā tilta tehniskie parametri

- 2+2 joslu autoceļš,
- 2 ātrvilciena līnijas
- Tērauda kopņu sijas ar 12,00m augstumu
- 7 laidumi (7x165,00m)
- Tilta augstums virs ūdens līmeņa 12,5m

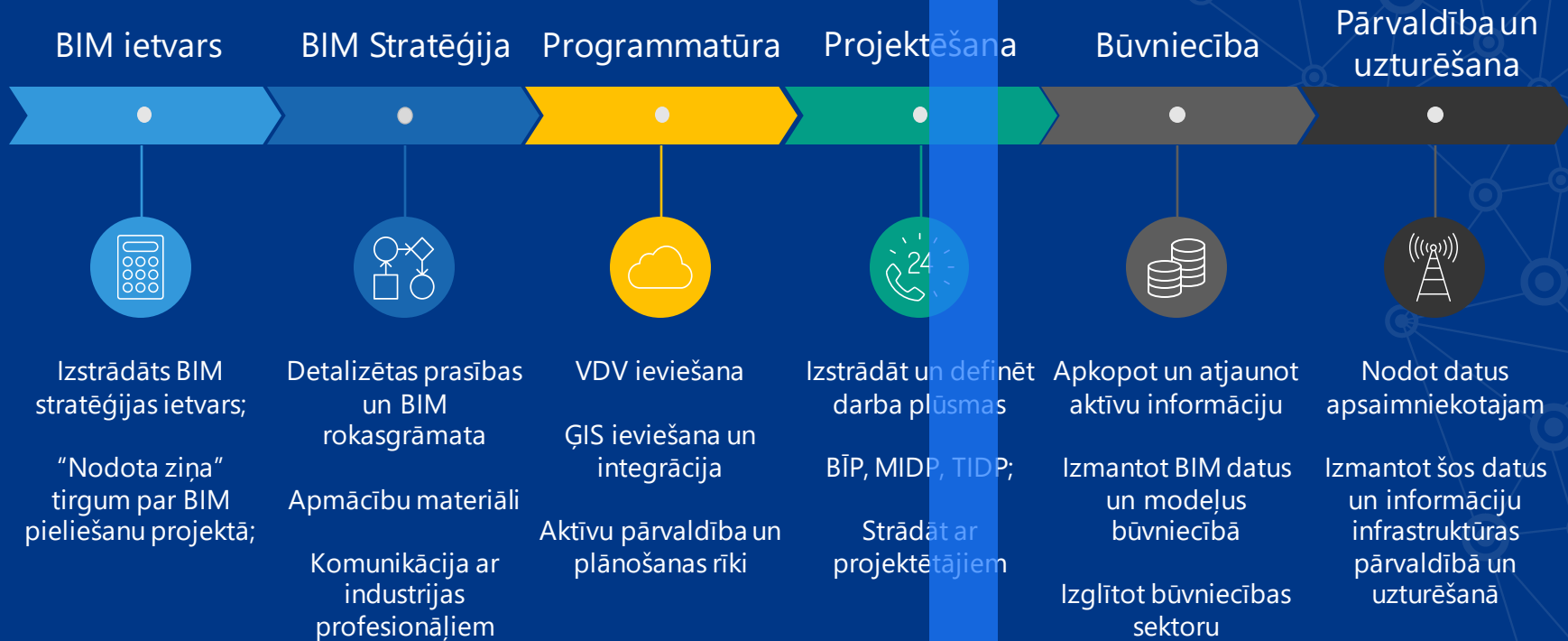




Digitalizācija

Rail Baltica BIM ceļa karte

Rail Baltica projekts





This is the official website of the Rail Baltica Global Project
EN

ABOUT RAIL BALTICA
BENEFITS
NEWS & EVENTS
PROJECT IMPLEMENTERS
PROCUREMENT
INFO CENTRE

RB Rail's BIM documentation

RB Rail AS is currently working towards implementing the BIM Strategy for the Rail Baltica Global Project. The information on the page will be updated regularly to keep you up to date as the project progresses.

DOCUMENTS



Detailed BIM Strategy

A general document that describes the BIM approach for Rail Baltica Global Project. This document sets out a detailed strategy framework for implementing Building Information Management (BIM) on the Rail Baltica Projects. It outlines the strategic BIM goals, defines processes, standards and protocols for the capture, coordination, management and delivery of digital information throughout the lifecycle of design, construction and operation of the assets being delivered.

This document is a part of Design Guidelines.

[Download the file here](#)



BIM Manual (v.18-04-2019)

This document and its supporting ecosystem of documents, forms and templates describe and provide the BIM Strategic processes and workflows to be followed by both Rail Baltica and the Supply Chain during the Lifecycle of the projects, being this ecosystem a live documentation that will evolve during the lifecycle of the Rail Baltica BIM program to capture technological and methodology advancements.

The BIM Manual documentation should be used for all the project phases. Primarily it focuses on the design process and we are continuing to improve it.

This document will be a part of Design Guidelines.

[Download the file here](#)



Building Information Management (BIM) Employer's Information Requirements v2.1

This document sets the requirements according to which the supply chain shall work with BIM systems in order to deliver information to Client – RB Rail or National Implementing Bodies.

This document is a part of Design Guidelines.

[Download the file here](#)



CAD Standards

These standards apply to all drawings (sketches, preliminary, detailed design, construction, shop drawings and asbuilt drawings) and CAD Data (2D or 3D) produced. The intent of these CAD standards is to provide guidelines to ensure that all drawings are prepared to a standard and uniform appearance and reflect high quality workmanship, and that data created by CAD systems is correctly structured and classified to facilitate re-use and understanding by others. This document is not related to any particular Authoring Tool and it will be each Supplier who develops a specific practical standardization for the Authoring Tool to be used in their project, taking as a base this documentation.

This document will be a part of Design Guidelines.

[Download the file here](#)



BEP Template

This BIM Execution Plan (BEP) template has been elaborated to be used as the basis for the post-contract BEP. It has to be prepared as a direct response to the BIM EIR and Technical Specifications. The Supplier shall fulfill all the required information in order to show their intention to comply with all the standards and procedures described in the BIM Manual. The Supplier is free to add extra information.

This document is a part of Design Guidelines.

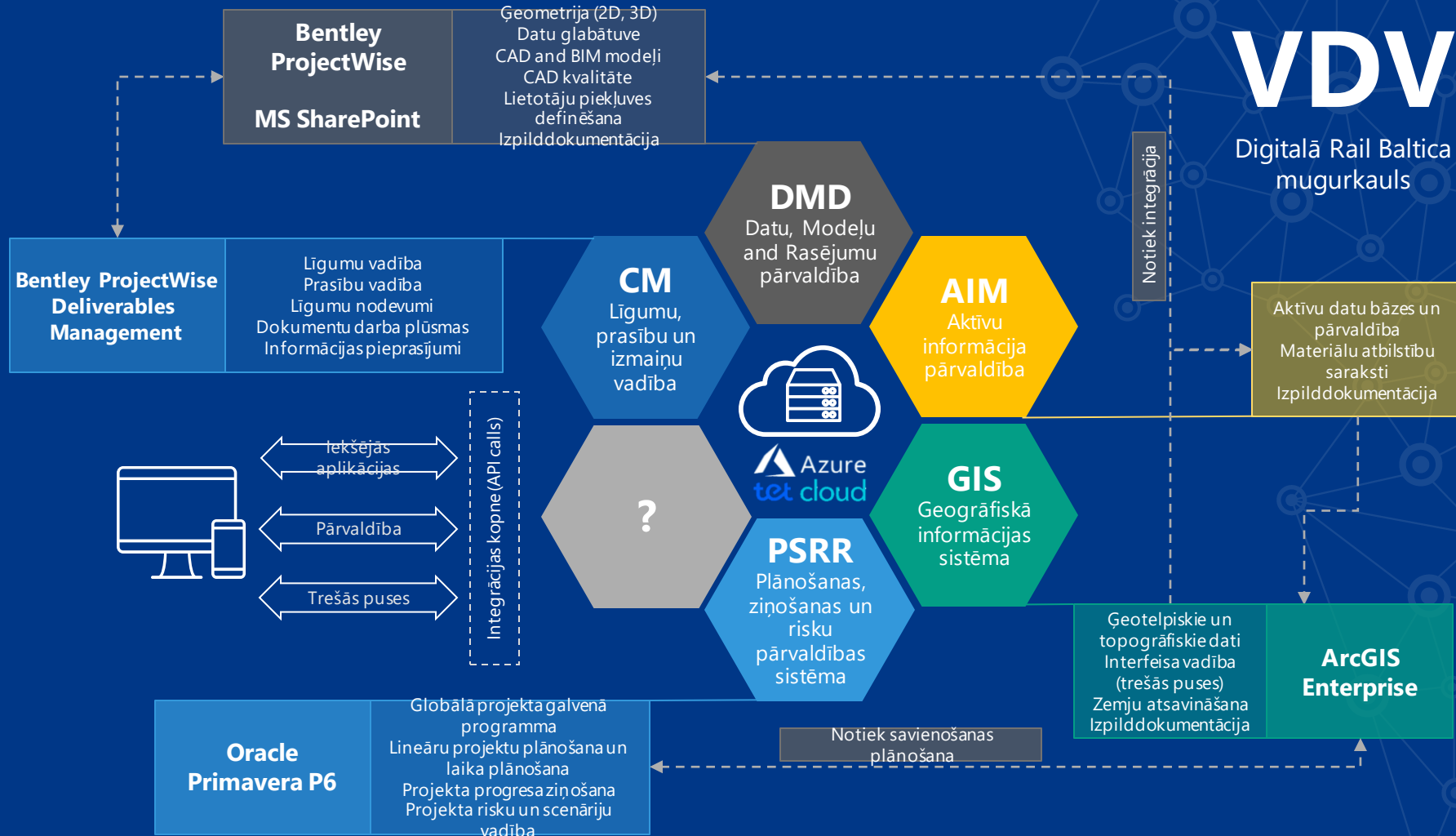
[Download the file here](#)

<http://www.railbaltica.org/rb-rail-as-bim-documentation/>

Rail Baltica BIM dokumentācija

VDV

Digitalā Rail Baltica
mugurkauls

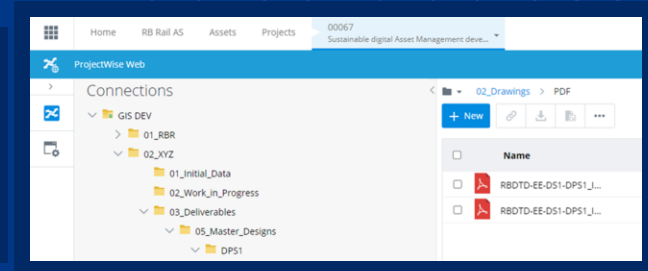
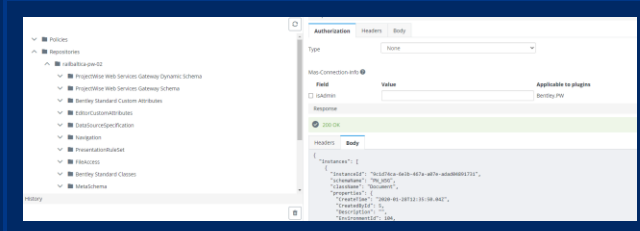
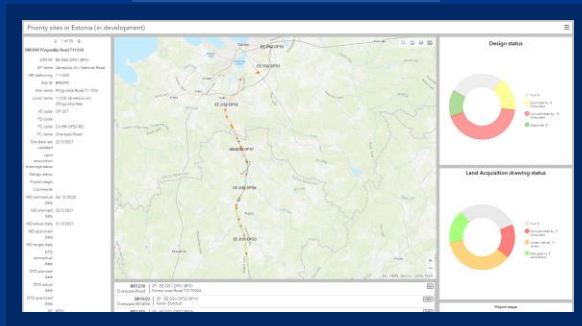


VDV integrācijas plāns

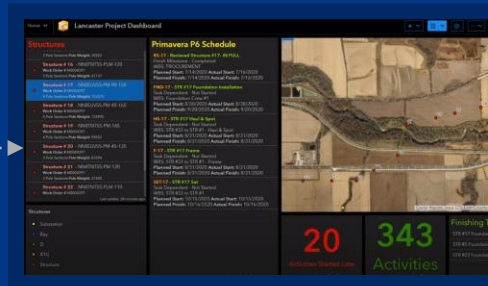
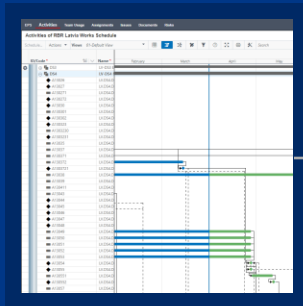
ArcGIS
Online

API

Pieklūt
informācijai PW
vidē



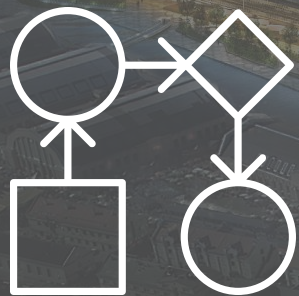
ArcGIS and P6 integrācija



The Solution

- Oracle Primavera P6 EPPM (Enterprise)
- ArcGIS Pro Geoprocessing tool
- Uses P6 web services to retrieve data
- Direct integration with P6 from ArcGIS Pro (no manual export of schedules)
- Supports a large portion of the P6 data model (hundreds of different fields)
- Automated join to a specified feature layer
- Integration with 2D & 3D data
- Geoprocessing tool can be schedule to run at a specified frequency

<https://www.youtube.com/watch?v=3AgxBVEnbCw&t=1035s> - Integrate Project Schedules with ArcGIS; David Reeves



Rezultāti (līdz
šim)

Rīga Central
Station

Projektēšanas posmi

01



Inženierizpētes

Ģeotehniskās inženierizpētes, topogrāfiskie uzmērījumi, Hidroloģiskās izpētes, lāzerskenēšana, utt.

02



Vērtību inženērija (MBP)

(Value Engineering)

Konceptuāla projekta risinājumu izstrāde, lai izvēlētos ekonomiski izdevīgāko vertikālo un horizontālo profilu, būvju tipus, utt.
IIA, CAPEX, OPEX.

~LOD 200

03



Būvprojekta pamatrisinājums I (Master Design)

Gelvenie būvprojekta pamatrisinājumi ar mērķi uzsākt būvniecības iepirkumu procedūras, precīzāki CAPEX aprēķini, utt.

~LOD 300

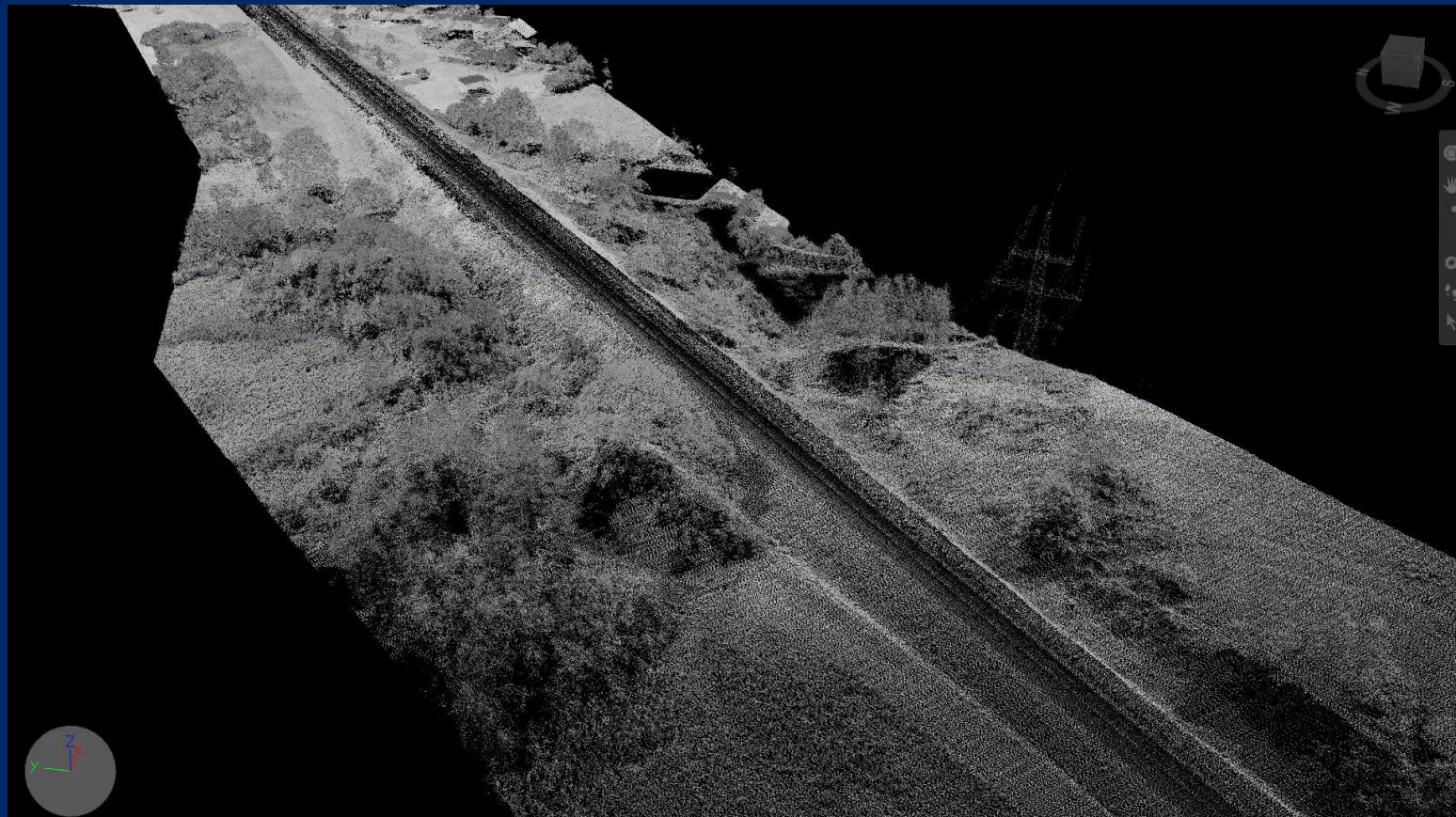
04



Būvprojekts (Detailed Technical Design)

Detalizēti būvprojekta risinājumi

~LOD 400





Design Consultants Contractual Milestone Tracker Dashboard

Filters

Use the following to filter the dashboard elements to a specific Country, Design Section or Design Priority Section.

Filter by Country

Name

Filter by Design Section

Name

Filter by Design Priority Section

Name

Master Design

EE-DS1-DPS1 "Härjula-Rapla county border-Mälinvere"

EE-DS1-DPS2 "Mälinvere-AU"

EE-DS1-DPS3 "Mälinvere-Kaipa"

EE-DS1-DPS4 "Kaipa-Saia"

EE-DS1-DPS5 "Saia-Tusti"

EE-DS2-DPS1 "Üniste-Kangru"

EE-DS2-DPS2 "Kangru-Härjula county border"

EE-DS2-DPS3 "Mälinvere-Soodvahe"

EE-DS2-DPS4 "Tusti-Pärnu"

EE-DS2-DPS5 "Pärnu-Mälinvere"

EE-DS2-DPS6 "Mälinvere-EE/LV border"

LT-DS1-DPS1 "Švecija-Kaunas"

LT-DS1-DPS2 "Žemaitis-Svecija"

LT-DS1-DPS3 "Saia-Zemaitis"

LT-DS1-DPS4 "Ramgala-Saia"

LT-DS2-DPS1 "Berdžina-Ramgala"

LT-DS2-DPS2 "Joniskala-Berdžina"

LT-DS2-DPS3 "Vidzija-Joniskala"

LT-DS2-DPS4 "Vidzija-Vadai"

LV-DS1-DPS1 "Horskaite-Imanta"

LV-DS1-DPS2 "Rīga airport - Māts"

LV-DS2-DPS1 "Hārgal maintenance facilities - Hārgalciņa"

LV-DS2-DPS2 "Hārgalciņa - Saigala"

LV-DS2-DPS3 "Daugava river bridge"

4 1 of 36

EE-DS1-DPS1 "Härjula-Rapla county border-Mälinvere"

EE-DS1-DPS2 "Mälinvere-AU"

EE-DS1-DPS3 "Mälinvere-Kaipa"

EE-DS1-DPS4 "Kaipa-Saia"

EE-DS1-DPS5 "Saia-Tusti"

EE-DS2-DPS1 "Üniste-Kangru"

EE-DS2-DPS2 "Kangru-Härjula county border"

EE-DS2-DPS3 "Mälinvere-Soodvahe"

EE-DS2-DPS4 "Tusti-Pärnu"

EE-DS2-DPS5 "Pärnu-Mälinvere"

EE-DS2-DPS6 "Mälinvere-EE/LV border"

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EE-DS2-DPS1 "Üniste-Kangru"

EE-DS2-DPS2 "Kangru-Härjula county border"

EE-DS2-DPS3 "Mälinvere-Soodvahe"

EE-DS2-DPS4 "Tusti-Pärnu"

EE-DS2-DPS5 "Pärnu-Mälinvere"

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LT-DS2-DPS3 "Vidzija-Joniskala"

LT-DS2-DPS4 "Vidzija-Vadai"

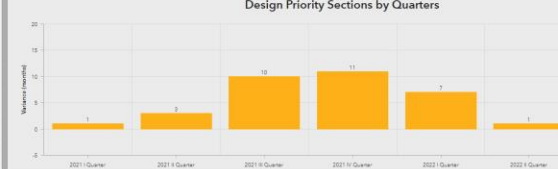
LV-DS1-DPS1 "Horskaite-Imanta"

LV-DS1-DPS2 "Rīga airport - Māts"

LV-DS2-DPS1 "Hārgal maintenance facilities - Hārgalciņa"

LV-DS2-DPS2 "Hārgalciņa - Saigala"

LV-DS2-DPS3 "Daugava river bridge"



Design Consultants Contractual Milestone Tracker

Quarter (MD)

2021 I Quarter

2021 II Quarter

2021 III Quarter

2021 IV Quarter

2022 I Quarter

2022 II Quarter

2022 III Quarter

2022 IV Quarter

2023 I Quarter

2023 II Quarter

2023 III Quarter

2023 IV Quarter

2024 I Quarter

2024 II Quarter

2024 III Quarter

2024 IV Quarter

2025 I Quarter

2025 II Quarter

2025 III Quarter

2025 IV Quarter

2026 I Quarter

2026 II Quarter

2026 III Quarter

2026 IV Quarter

2027 I Quarter

2027 II Quarter

2027 III Quarter

2027 IV Quarter

2028 I Quarter

2028 II Quarter

2028 III Quarter

2028 IV Quarter

2029 I Quarter

2029 II Quarter

2029 III Quarter

2029 IV Quarter

2030 I Quarter

2030 II Quarter

2030 III Quarter

2030 IV Quarter

2031 I Quarter

2031 II Quarter

2031 III Quarter

2031 IV Quarter

2032 I Quarter

2032 II Quarter

2032 III Quarter

2032 IV Quarter

2033 I Quarter

2033 II Quarter

2033 III Quarter

2033 IV Quarter

2034 I Quarter

2034 II Quarter

2034 III Quarter

2034 IV Quarter

2035 I Quarter

2035 II Quarter

2035 III Quarter

2035 IV Quarter

2036 I Quarter

2036 II Quarter

2036 III Quarter

2036 IV Quarter

2037 I Quarter

2037 II Quarter

2037 III Quarter

2037 IV Quarter

2038 I Quarter

2038 II Quarter

2038 III Quarter

2038 IV Quarter

Priority sites in Estonia (in development)

1 of 25

EE-DS1-DPS1

SP name: Järvevala-Lai National Road

MD planning: 11-100

Site ID: BR0290

Site name: Põlva-Rapla Road T11330

Local name: T11330 Järvevala-Lai

VE code: DP-207

FD code: DP-207

FC code: DP-207

PC name: Overpass Road

Site data set: 2023/2021

Land: 2023/2021

Acquisition: 2023/2021

Design status: 2023/2021

Project stage: 2023/2021

Comments: 2023/2021

MD approval: 2023/2021

date: 2023/2021

MD approval: 2023/2021

date: 2023/2021

MD approval: 2023/2021

date: 2023/2021

MD approval: 2023/2021

date: 2023/2021

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date: 2023/2021

MD approval: 2023/2021

date: 2023/2021

MD approval: 2023/2021

date: 2023/2021

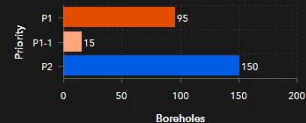
GIS – Nodevumu «izsekošana»

LV DS1 GI Status monitoring

GI Completed date:

Investigation points by Priority

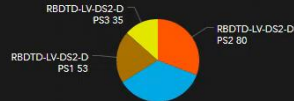
(Site Investigation Plan)



Last update: 2 minutes ago

Investigation points by DPS

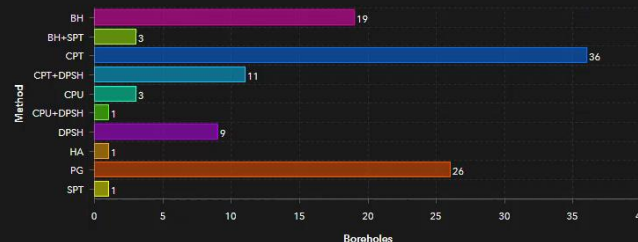
(Site Investigation Plan)



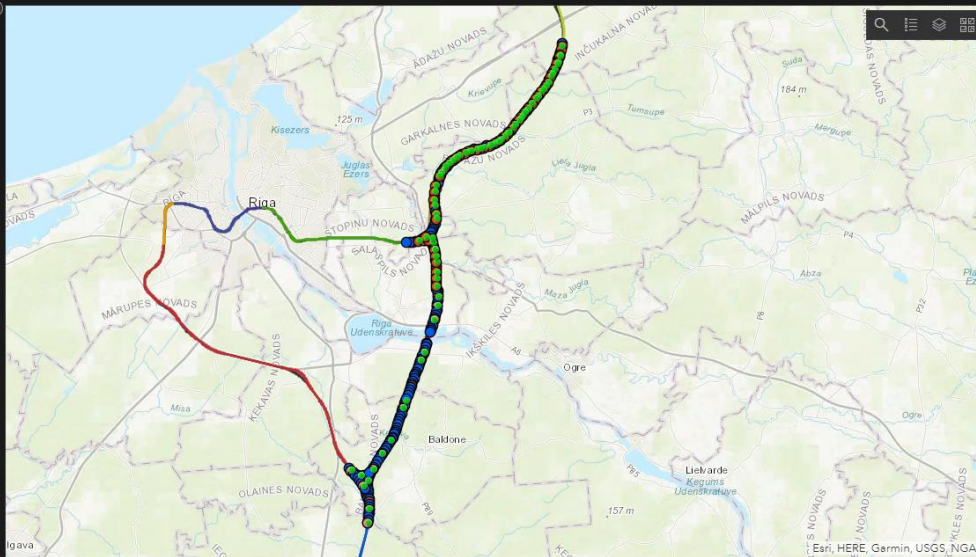
Last update: 2 minutes ago

Geotechnical Investigation points by Method

(LV DS2)



Last update: 2 minutes ago



Geotechnical Investigation Completed

(LV DS2)



Last update: 2 minutes ago

Geotechnical Investigation Completed P1

(LV DS2)



Last update: 2 minutes ago

Geotechnical Investigation Completed P2

(LV DS2)



Last update: 2 minutes ago

Geotechnical Investigation Completed

(LV DS2 DPS1)



Last update: 2 minutes ago

Geotechnical Investigation Completed

(LV DS2 DPS2)



Last update: 2 minutes ago

Geotechnical Investigation Completed

(LV DS2 DPS3)



Last update: 2 minutes ago

Geotechnical Investigation Completed

(LV DS2 DPS4)



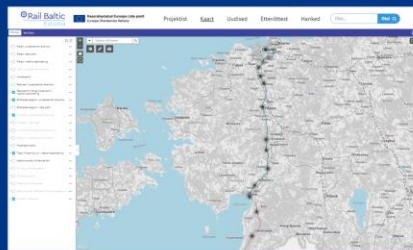
Last update: 2 minutes ago

Global Project Partners Engagement

RB Rail AS & Rail Baltic Estonia OÜ

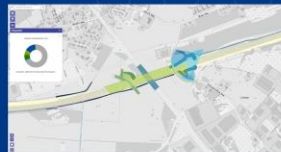
Sharing common environment and data creates new cooperation opportunities between project coordinators and implementing bodies

Public Map

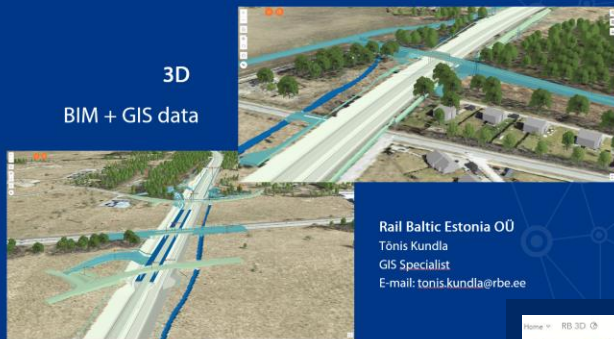


<https://rbestonia.ee/>

Land Acquisition

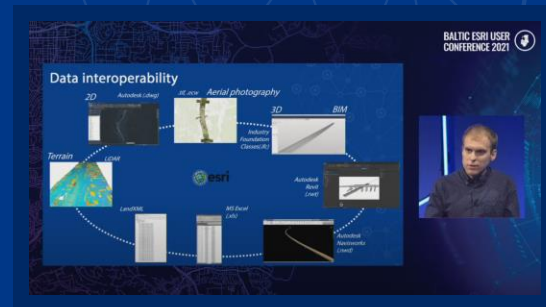


3D
BIM + GIS data



Rail Baltic Estonia OÜ
Tõnis Kundla
GIS Specialist
E-mail: tonis.kundla@rbe.ee

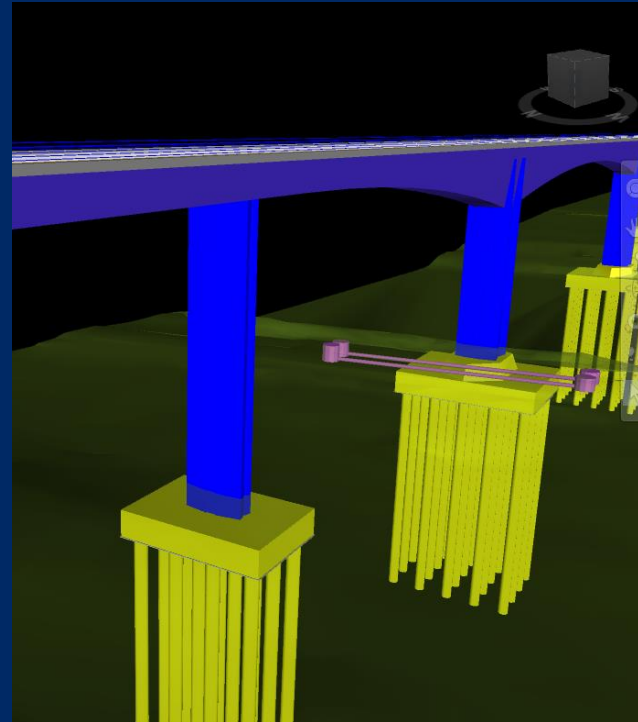
Baltic Esri User Conference
<https://youtu.be/ahAEmb0sRVU?t=6407>



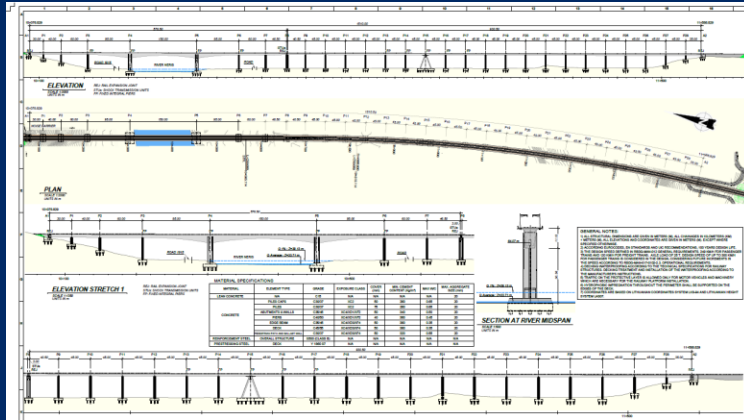
Get 2D (polygons) from 3D – group by OCC



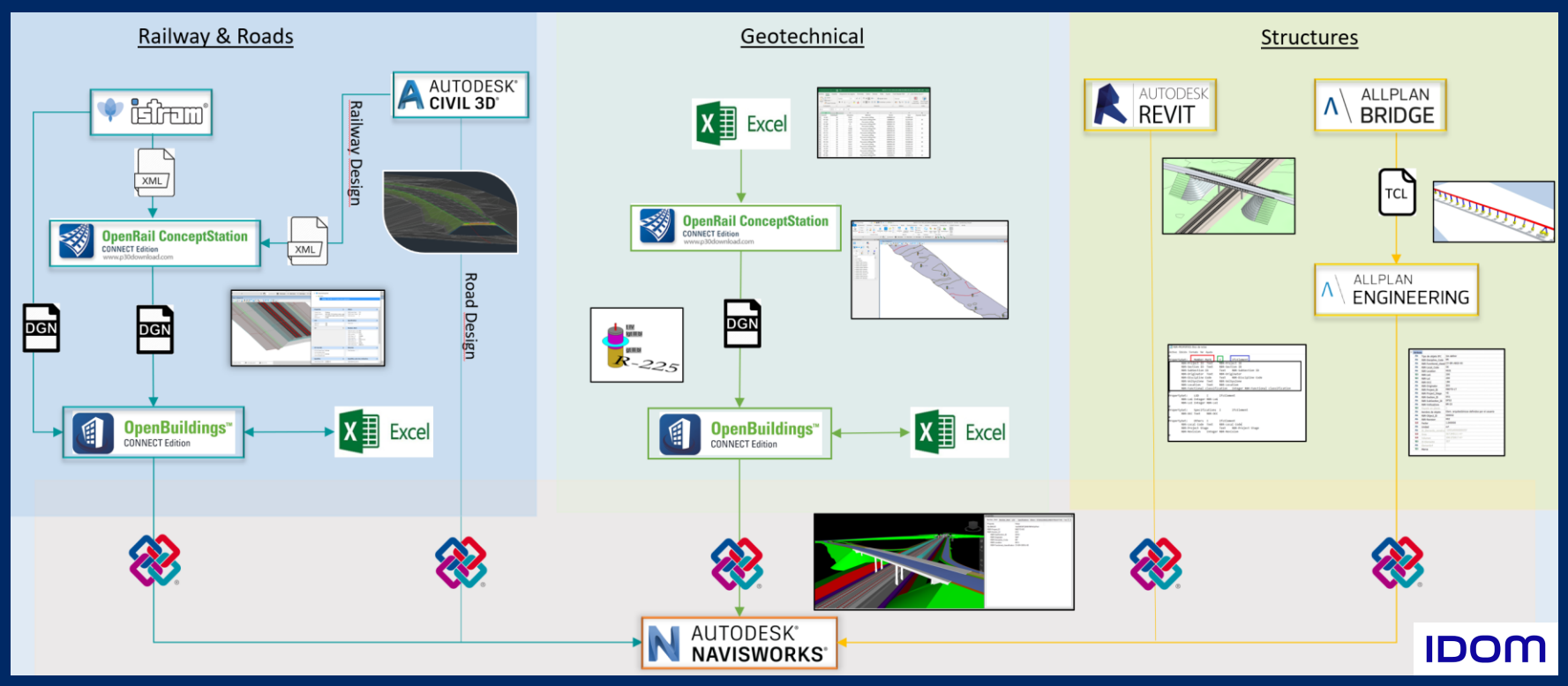
BIM process – rasējumi un modeļi



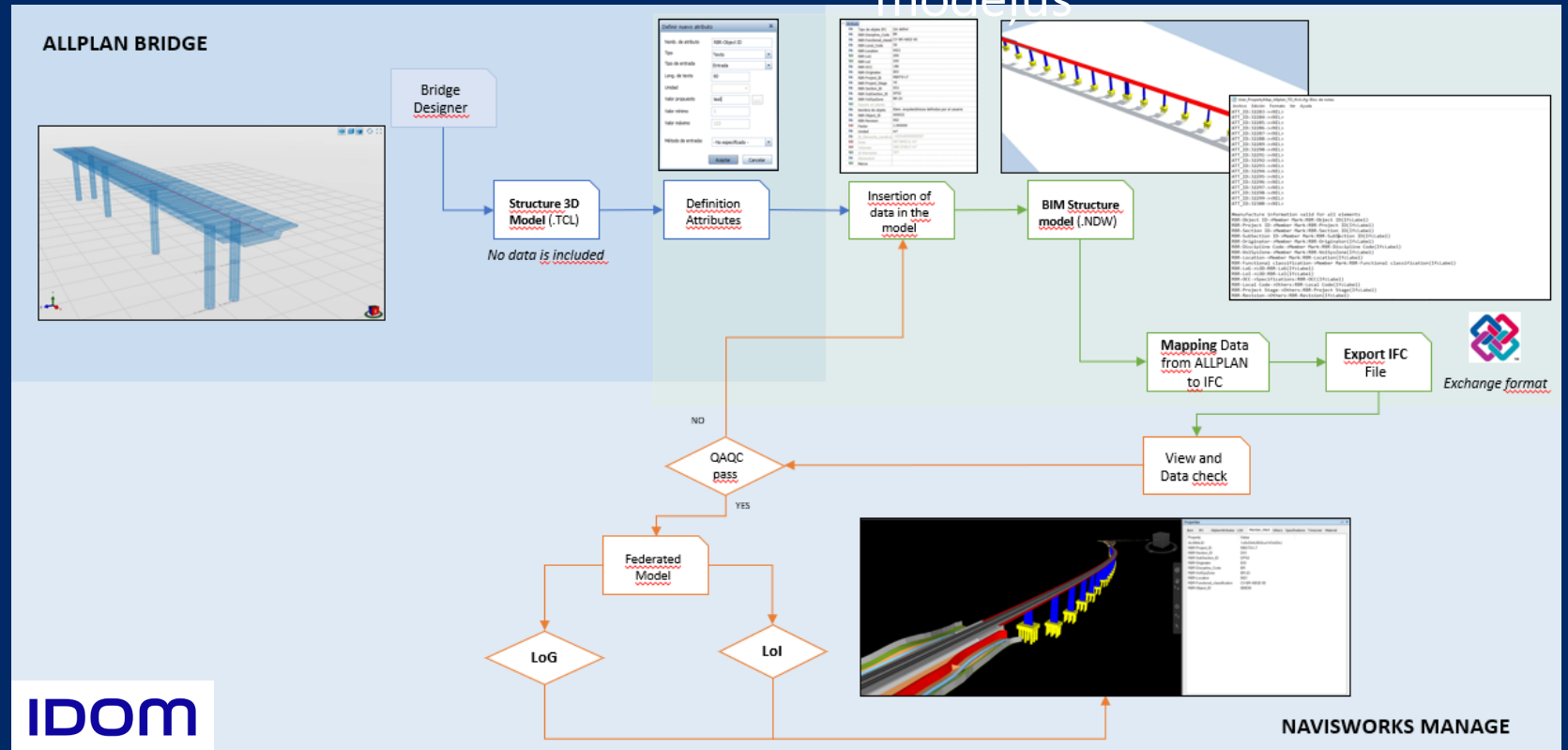
Properties					
Item	AllplanAttributes	RBR-DATA	Material	TimeLiner	IFC
Property			Value		
GLOBALID			1xQhCN\$FDEDP5FZSd2_nY3		
RBR-OCC			300		
RBR-Object_ID			STR-DCK-001		
RBR-Material_Designation			C45/55		
RBR-Material_Description			Post-tensioned Concrete		
RBR-Product_Name			Varies		
RBR-Product_Description			Varies		
RBR-Pr_Code			Varies		
RBR-Type_number			Varies		
RBR-Units			Varies		
RBR-Exposure			XC4/XD3/XF4		
RBR-Concrete_Volume			9474.36 m³		
RBR-Steel_Mass			2694373.80 kg		
RBR-Steel_Mass-Prestressing			604871.80 kg		
RBR-Reinforcement_Ratio			285.0 kg/m³		
RBR-Reinforcement_Ratio-Prestressing			65.00 kg/m³		
RBR-Project_ID					
RBR-Section_ID					
RBR-SubSection_ID					
RBR-Originator					
RBR-VolSysZone					
RBR-Location			0011		
RBR-Discipline_Code			BR		
RBR-Local_Code			SK		
RBR-Project_Stage			MD		
RBR-Revision			001		
RBR-LoG			300		
RBR-Lol			300		
RBR-Design Life			100		
RBR-Start_Kilometre					
RBR-End_Kilometre					
RBR-Functional_classification					
RBR-Position			North		
RBR-Type			Post-tensioned Slab		
RBR-Depth			Variable 4.15 - 11.15 m		



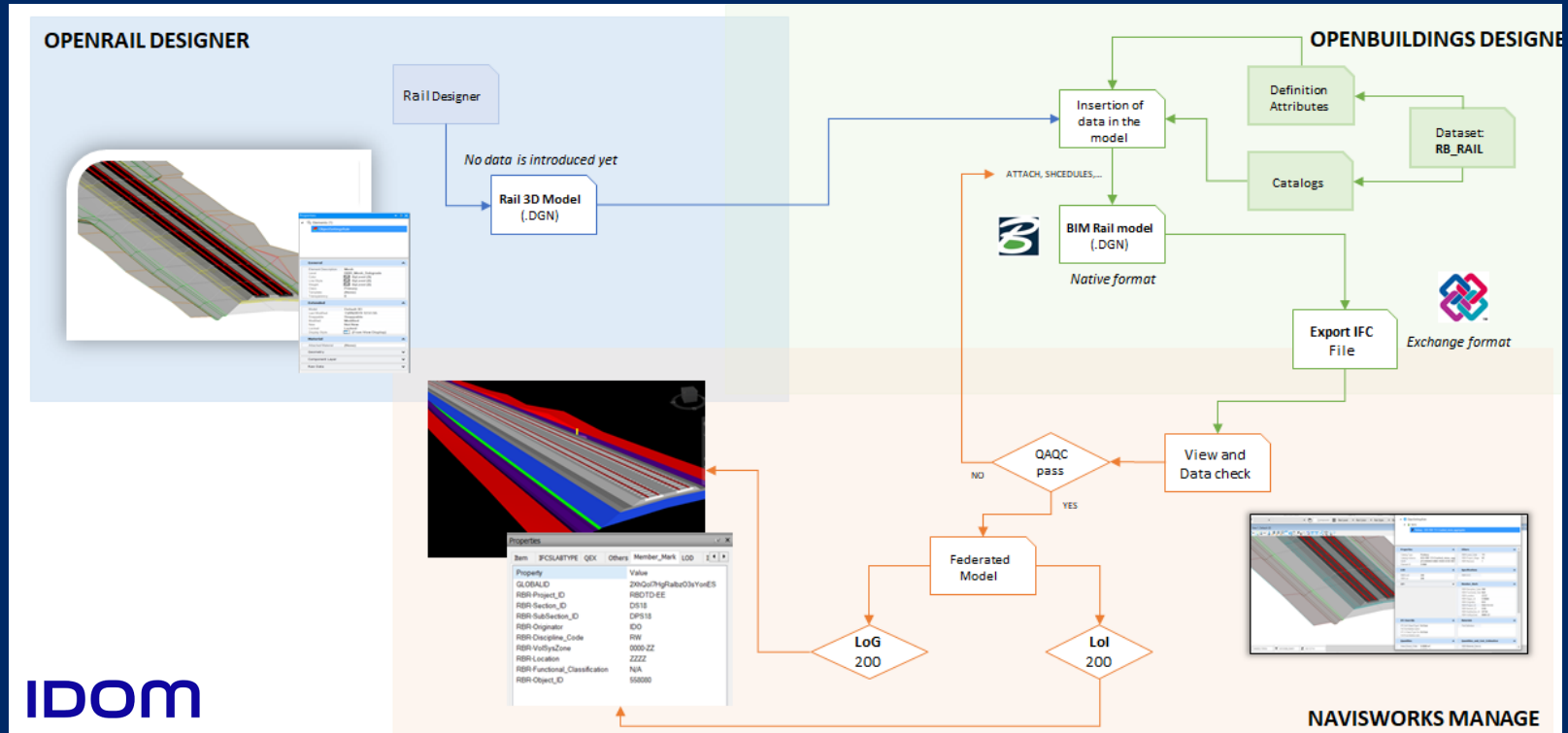
Disciplīnu modeļi – darbapļūsma, lai radītu BIM modelus

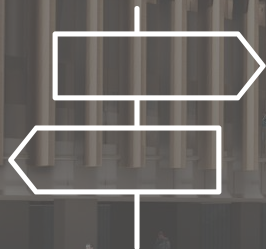


Disciplīnu modeļi – darbapļūsma, lai radītu BIM modeļus



Disciplīnu modeļi – darbapļūsma, lai radītu BIM modeļus





Atziņas

RIX Airport
Station

Atziņas

01



Skaidra prasību definēšana

BĪP

Tam ir jāatspoguļo BIM PIP un līgumā iesaistītajām pusēm tas ir jāapstiprina projekta sākuma fāzē, bet projektam progresējot, tas ir jāpārskata un jāatjauno ar aktuālo informāciju.

02



Sekot līdzī progresam

Pasūtītāja uzdevums

Pasūtītājam ir jāseko līdzī progresam. Pasūtītājam ir jābūt iesaistītam un jābūt attiecīgām zināšanām Pasūtītājam ir jāsaprot, kas tiek piegādāts.

03



Visiem ir jāmacās

Pasūtītājs un piegādātājs

Visu pušu iesaistītajām komandām ir jāmacās, Sākuma fāzes un pilotprojekti kalpo kā mācību process tālākām attīstības fāzēm.

04



Pieprasīt rezultātus

Līgums ir jāpilda

«...mēs tā parasti nedarām...» nav pieļaujams. Ja līguma prasība ir ievērot BĪP, tad tas ir jādara. Abām pusēm jāievēro līgumsaistības.

Atziņas

05



Elastība

Līdz zināmai robežai

Pārāk liela elastība, ļauj lietas interpretēt, bet kopīgi risinājumi ir jāatrod.

Komunikācija ir ļoti svarīga.

06



Kopaina

Pasūtītājam ir skaidri jāsaprot, kāpēc tas tiek darīts

Projektētāji un būvnieki mainās, bet pasūtītājam ir jāzin kāpēc tas ievieš digitalizāciju un kā šī informācija tiks izmantota.

07



BIM nav viens pats

AIM, GIS, etc.

Aktīvu vadības sistēmas, GIS, projektu plānošana un vadība. Dažādu sistēmu lietošana dažādiem mērķiem, bet izmantojot vienu un to pašu informāciju.

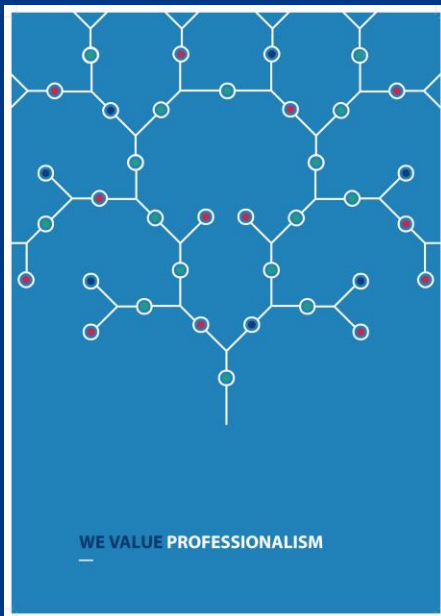
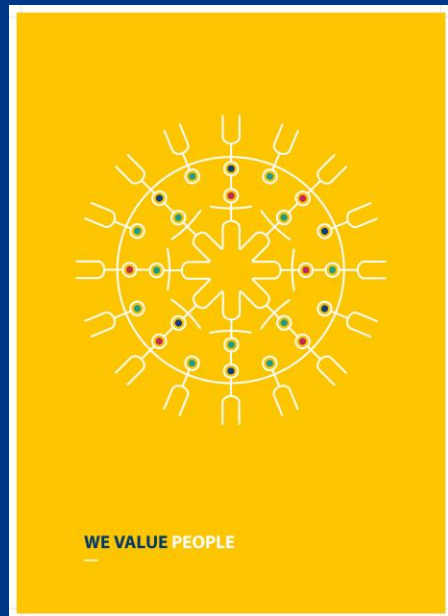
08



Tas nav vienkārši

Jaunas lietas ir sarežģītas

Tas prasa laiku un resursus. Ir ļoti viegli pazaudēt mērķi un padoties. Pareizie cilvēki ļoti palīdz, bet lielākā daļa sākumā pretojas. Pareizos cilvēkus ir ļoti grūti atrast.



Paldies!

