



London 11<sup>th</sup> April 2018

# OuluZone – Workshop of infra-BIM and automation

Rauno Heikkilä, Tanja Kolli  
Structures and Construction Technology,  
University of Oulu



# Objective of Speedway- open BIM Game

- The objective of open BIM Speedway Game is to produce a workshop for professionals working in the infrastructure area.
- The workshop provides the professionals the latest knowhow, challenges and future needs in the field of the open BIM & Automation.
- The other goal is to develop the teaching and collaboration of the infra-BIM and automation between the organizations
- The idea of Game: Design – Start a building – Evaluation
- Tools: design programs, infrakit, machineries, automation, Ouluzone

Goal of game: the importance of excellent design





# Content of the workshop:

- What is the current status in open Infra BIM Finland
- Common infraBIM Requirements (YIV2015)
- Inframodel Data Exchange
- InfraBIM Glossary and Terms
- Infrakit as cloud service tool

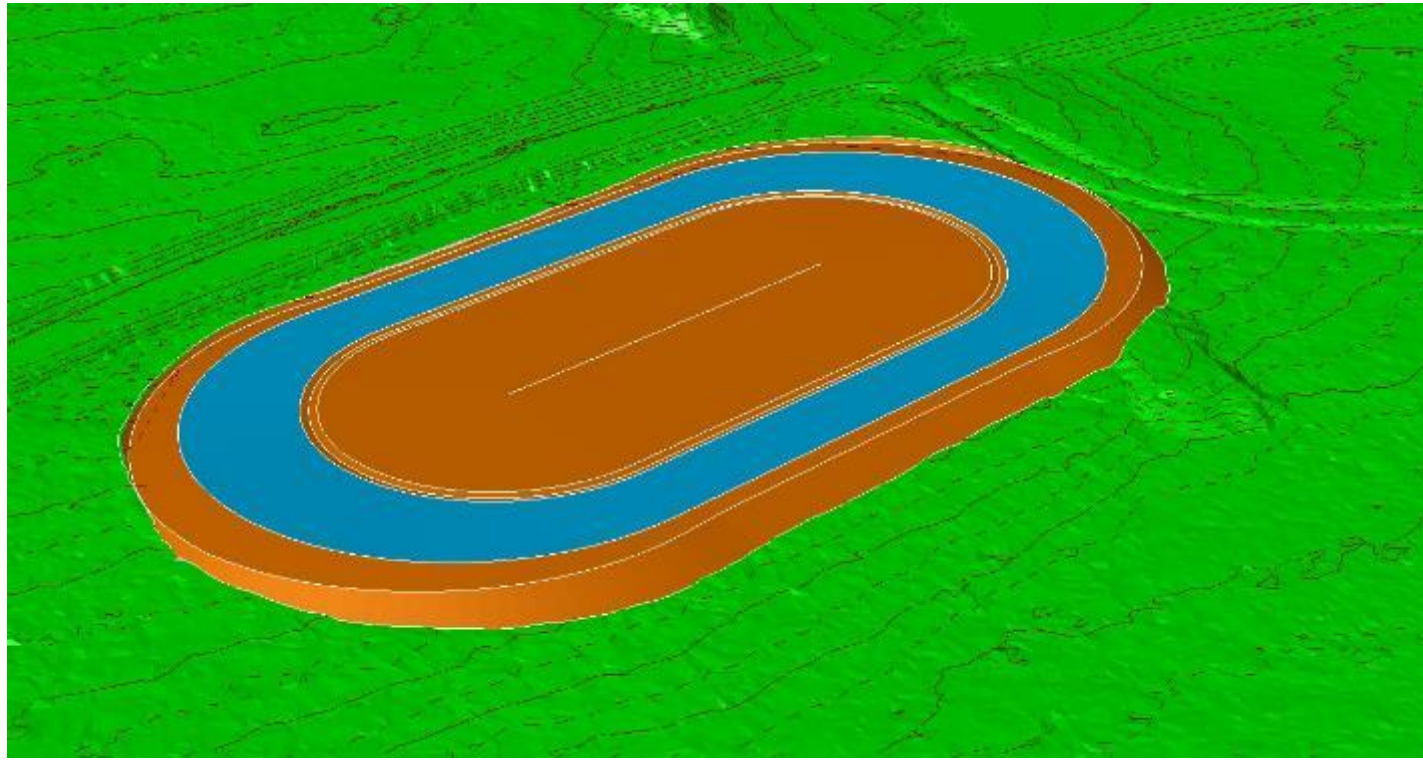


# Location of Speedway track in OuluZone

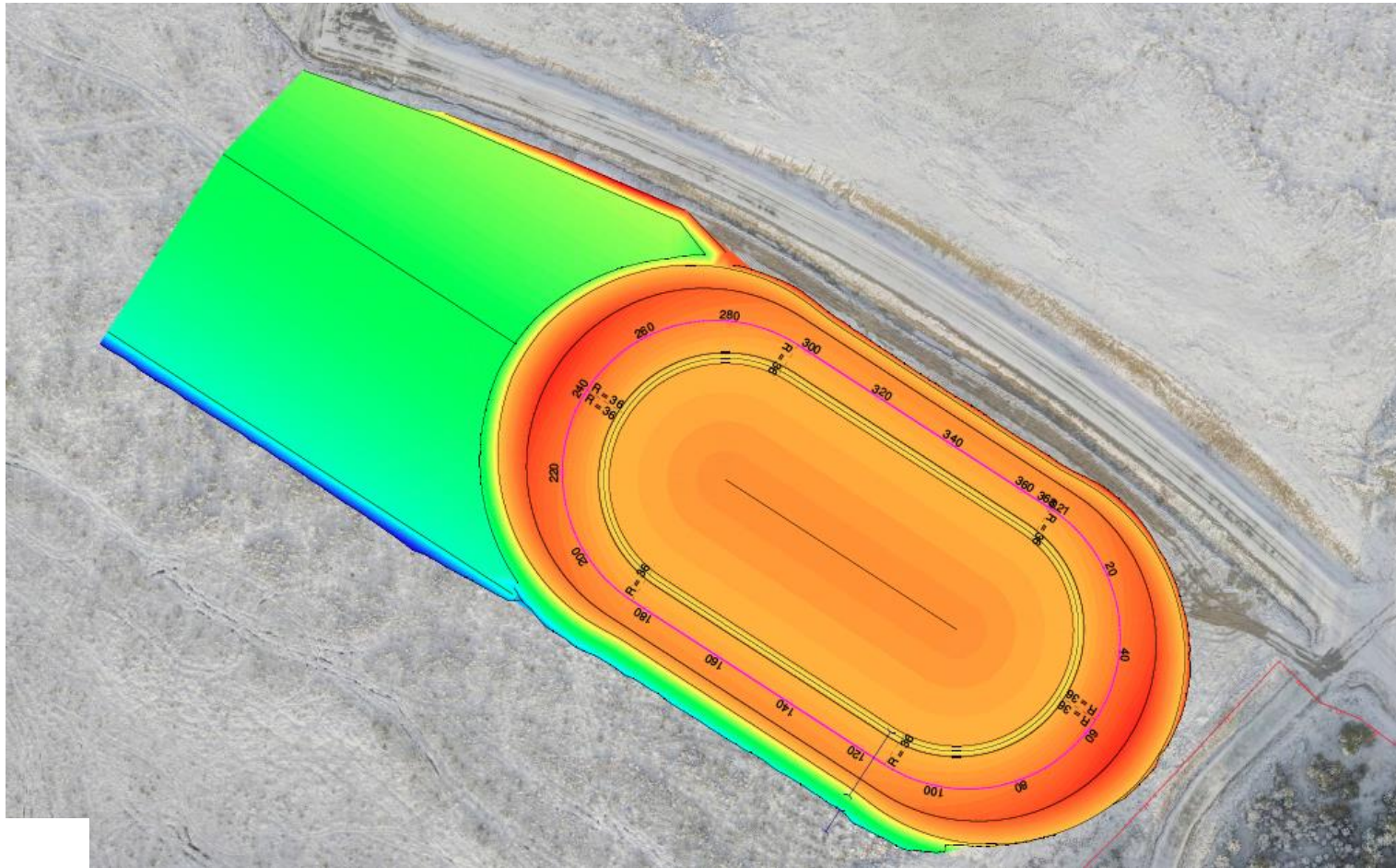


# Geometry of Speedway track

- Total length 440 m, straight 65 m
  - Width: straight 12 m, and curve 18 m
  - Angle of bank: straight +20 cm, and curve +70 cm
- Earth moving 7848 m<sup>3</sup>
- Filling 7727 m<sup>3</sup>
- Remaining earth moving 100 m<sup>3</sup>



# Speedway track, earth moving plan



# Planned Schedule during the Workshop -week

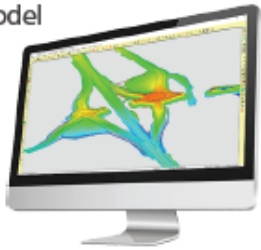
- Monday
  - Lectures about open infraBIM
- Tuesday: practical training
  - Workshop at OuluZone
- Wednesday: problems
  - Workshop at OuluZone
- Thursday: more responsibilities
  - Workshop at OuluZone
- Friday
  - Feedback from workshop



# Automation system and Operation model

## Designer\*

- Infrakit
- BIM Coordinator
- Design Model → As-Planned Model
- Combination Model
- Desing Changes
- As-Built Model



## Project Owner\*

- Infrakit
- Design Approvalment
- Quality Control
- Preparedness Tracking
- Transparency



**Open infraBIM Cloud**  
Common Data Base  
Data Management  
Data Sharing  
Collaboration

DATA SHARE

DATA SHARE

DATA SHARE

DATA SHARE

DATA SHARE

## Site Foreman\*

- Xsite® PAD
- Infrakit
- Work Planning
- Quantity Management
- Preparedness Tracking
- Quality Control
- As-Built Surveying



## Surveyor\*\*

- Xsite® PAD
- Infrakit
- 3D-Win Model tool
- BIM Coordinator
- Surveying
- Machine Control Model
- Surveying Model
- As-Built Data



## Machinery\*\*\*

- Xsite® PRO 3D
- Infrakit
- Machine Control Model
- As-Built Surveying
- Machine Work Time
- Efficiency





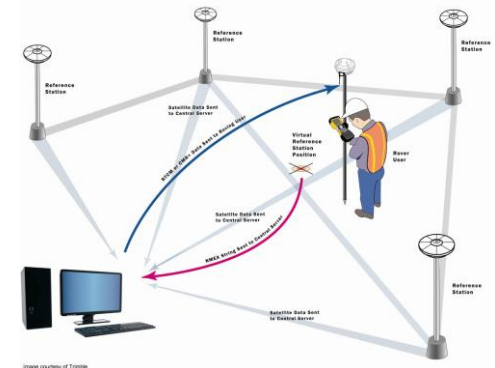
# Working machines

- Two excavators (OSAO), Scanlaser 3D-guidance system
- Wheel loader (OSAO), Scanlaser 3D-guidance system
- Three trucks (OSAO), Infrakit-Android-application



# Automation system in the OuluZone

- RTK-GNSS-base station
- 3-4 kpl reference points around the Speedway track
- Machines 3D-guidance systems (Scanlaser)
- Infrakit-cloud service
  - Android-guidance systems in trucks
  - Tablets for construction leaders
  - laptops
  - RTK-GNSS- tablet
- Leica-robot tacheometer
- Trimble R10 –RTK-GNSS-system + infrakit
- Video-camera connection
- Drone-monitoring





# Rules of the workshop:

- Lectures about YIV2015 before workhsop will be needed
- Participants will be divided in small groups
- Each group will be visited in task point
- First day will be learning
- Second day will be problems that may hapen on the construction site
- Third day will be will be operating by participants with the help of experts.
- The feedback from participants are needed to improve the workshop.



# Tasks for students during the workshop

1. Construction head manager
2. Site foreman
3. Designer
4. BIM-coordinator
5. Excavators, trucks, and wheel loader drivers
6. Surveyor
7. Construction consultant
8. Construction security officer
9. Speedway Project owner
10. Drone-monitoring





# Learning outcomes

- Knowhow the value of using YIV2015 and Inframodel
- Know how what are the novel tools in construction site
- Identify the value of use infrakit as tool to share real-time information
- Understand how the quality is improved when using automation
- Be able to evaluate and consider their own interest in open BIM & automation

