RILA to assist in India's OLE ambition

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Global Business Development Manager Rail
Principle Consultant Rail

Fugro, Netherlands

BSC geomatics

Experience:

- 1982 – 2002 Dutch Railways / ProRail
  - Surveyor
  - Track engineer
  - Electrification engineer
  - QM geospatial aspects ProRail
- 2002 – 2009 DuraVermeer (Rail contractor)
  - Upgrading Utrecht – Amsterdam (track and electrification)
- 2009 – present Fugro
  - Mobile mapping development (RILA)
  - Business Development
  - Consultancy

Why electrify

Electric trains are:

Cheaper

20% to built

33% in maintenance

45% in fuel consumption

13% less wear to track because of weight

Cleaner

Do not pollute air

20-30% less carbon emission

Make less noise

Comfortable

Quieter and less vibration

Better service

Faster

Accelerate quickly

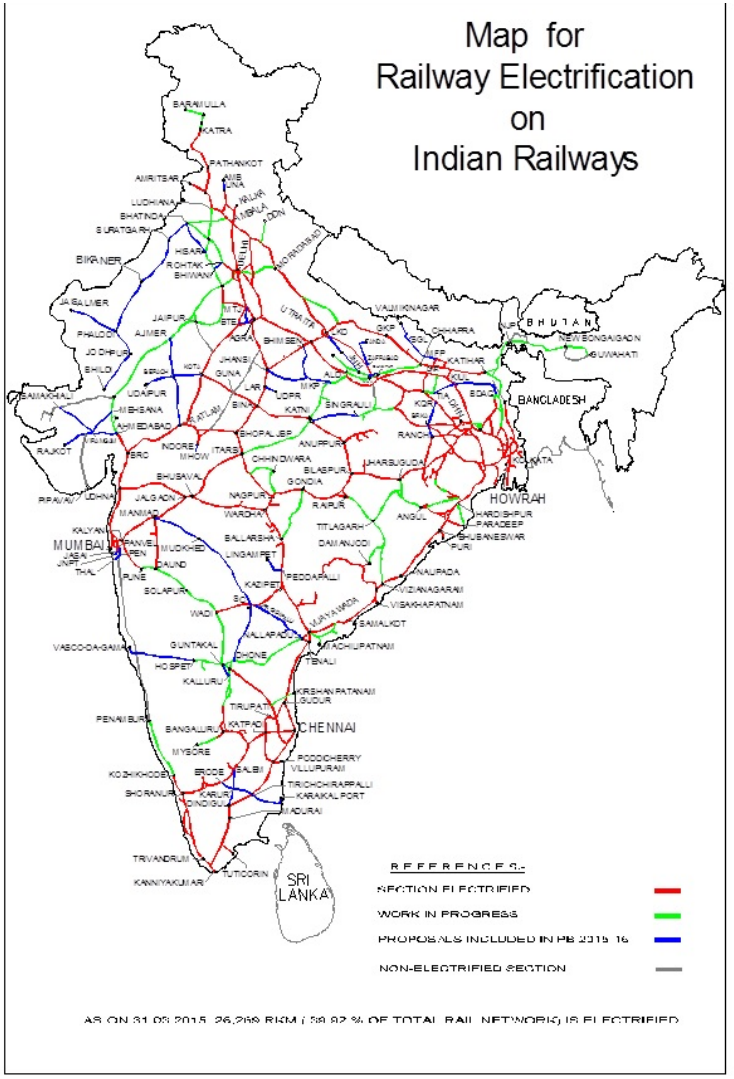
Electrification India

Mission or challenge:

To electrify 90% of Broad Gauge Network

4000 km p/y 2017-2018

6000 km per year subsequent years



Accurate 3D model for engineering

Consistent model fit for engineering purposes

Georeferenced

LiDAR and imagery

Colorized point cloud

Georeferenced video including rail survey data

Track engineering

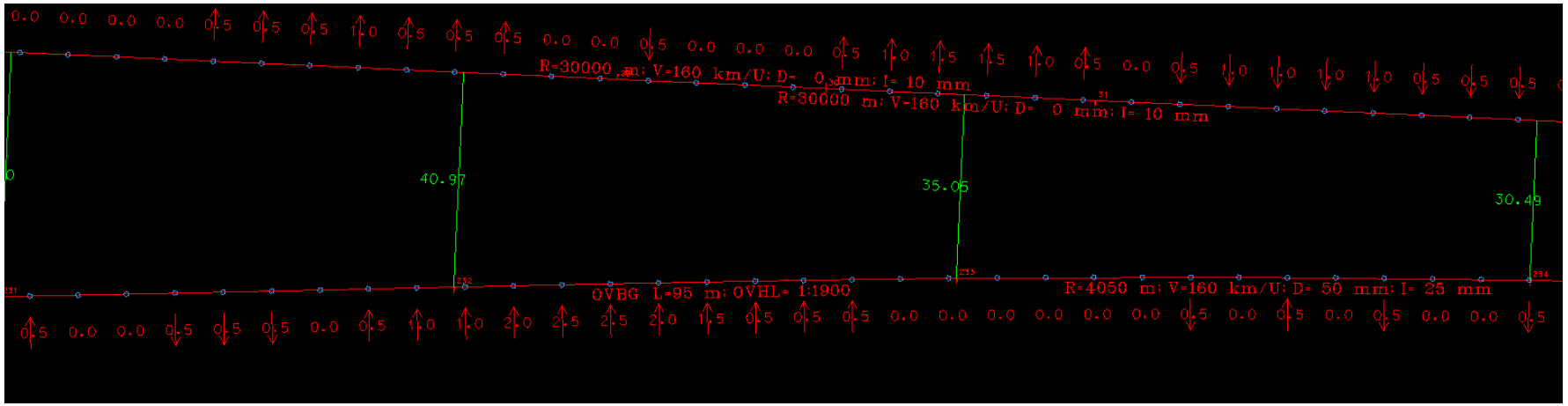
New alignment design why ?

- Route upgrade
  - Single to double track
  - Optimize geometry
- Trains run faster
  - Different geometry
  - Different super elevation
  - Different gradients
  - Different track distances

Increase travelers comfort

Significant decrease of maintenance costs

Expand life cycle of assets



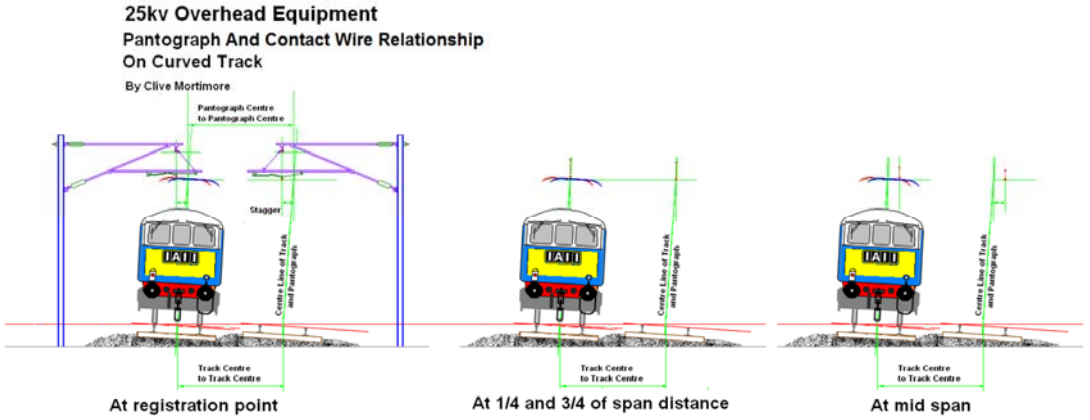
Electrification design

Input:

- Design standards OLE
- Track geometry (incl. super elevation)
- Constraints (S&C, over/under bridges, platforms)

Output:

- Location of feeder stations
- Locations of masts (spacing)
- Location of contact wire
- Location of catenary wire
- Length of droppers
- Type OLE support structure

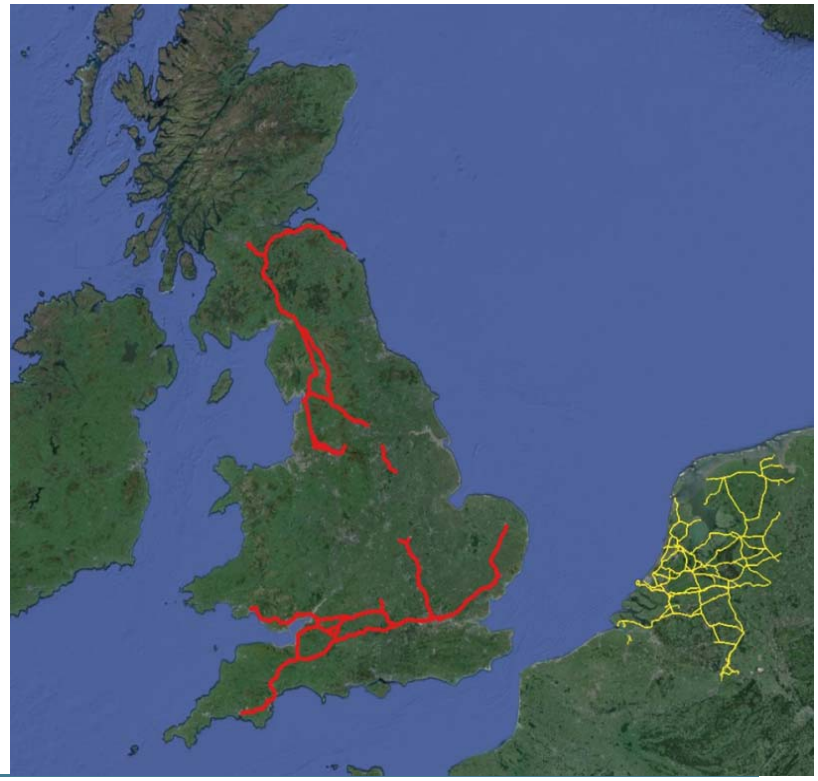


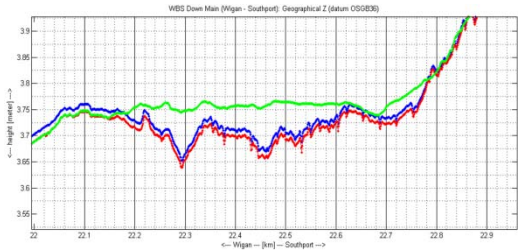
How to survey Railway corridor fast, efficient and accurate:

Track record

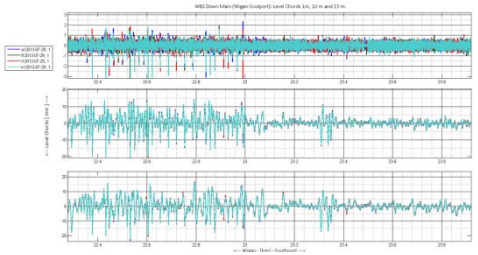
Operational since 2009 in The Netherlands and since 2013 in the UK

- o > 5,500 km of main lines for ProRail, The Netherlands
- o > 2,100 km of 3D model marshalling yards for ProRail, the Netherlands.
- o > 8,500 km of main lines for Network Rail, UK
- o > 70 km for Rail Net Denmark (pilot 2016)
- o > 800 km for Amtrak, USA (pilot 2016)
- o > 200 km for SNCF, France (pilot 2017)

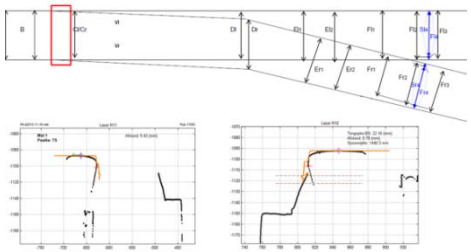




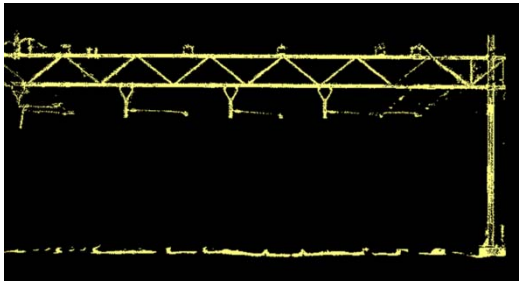
Absolute Track Position



Relative Track Geometry

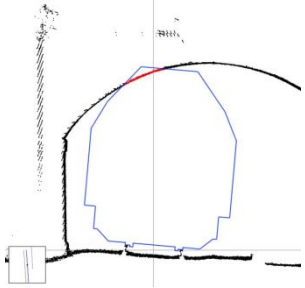


Rail and S&C wear



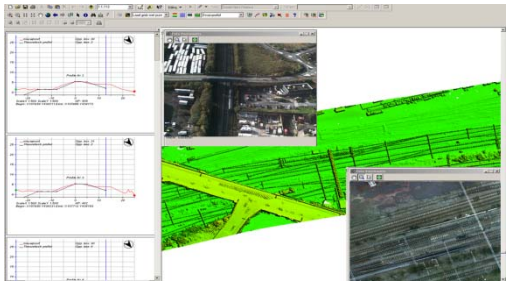
Track structures & vegetation

Track corridor video imagery



Gauging clearences

Tamping input data

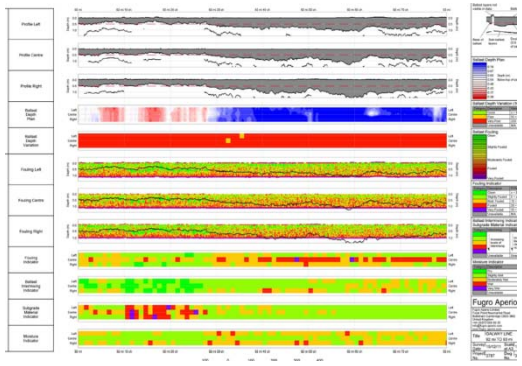


Digital ground models

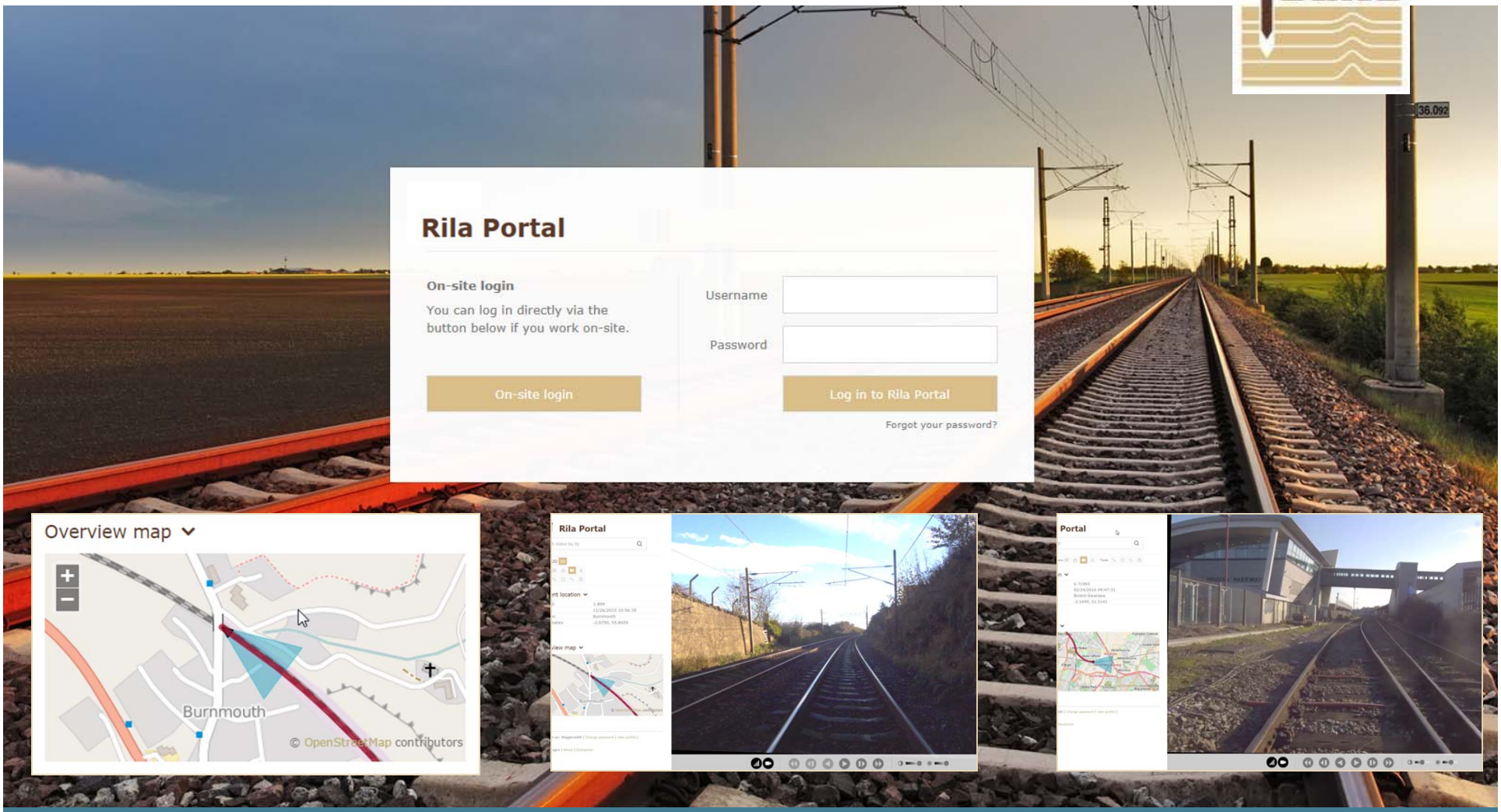
Aerial LiDAR and images

Geo Technical

Traditional surveys



Ground Penetrating Radar



Bringing the railway to your desktop

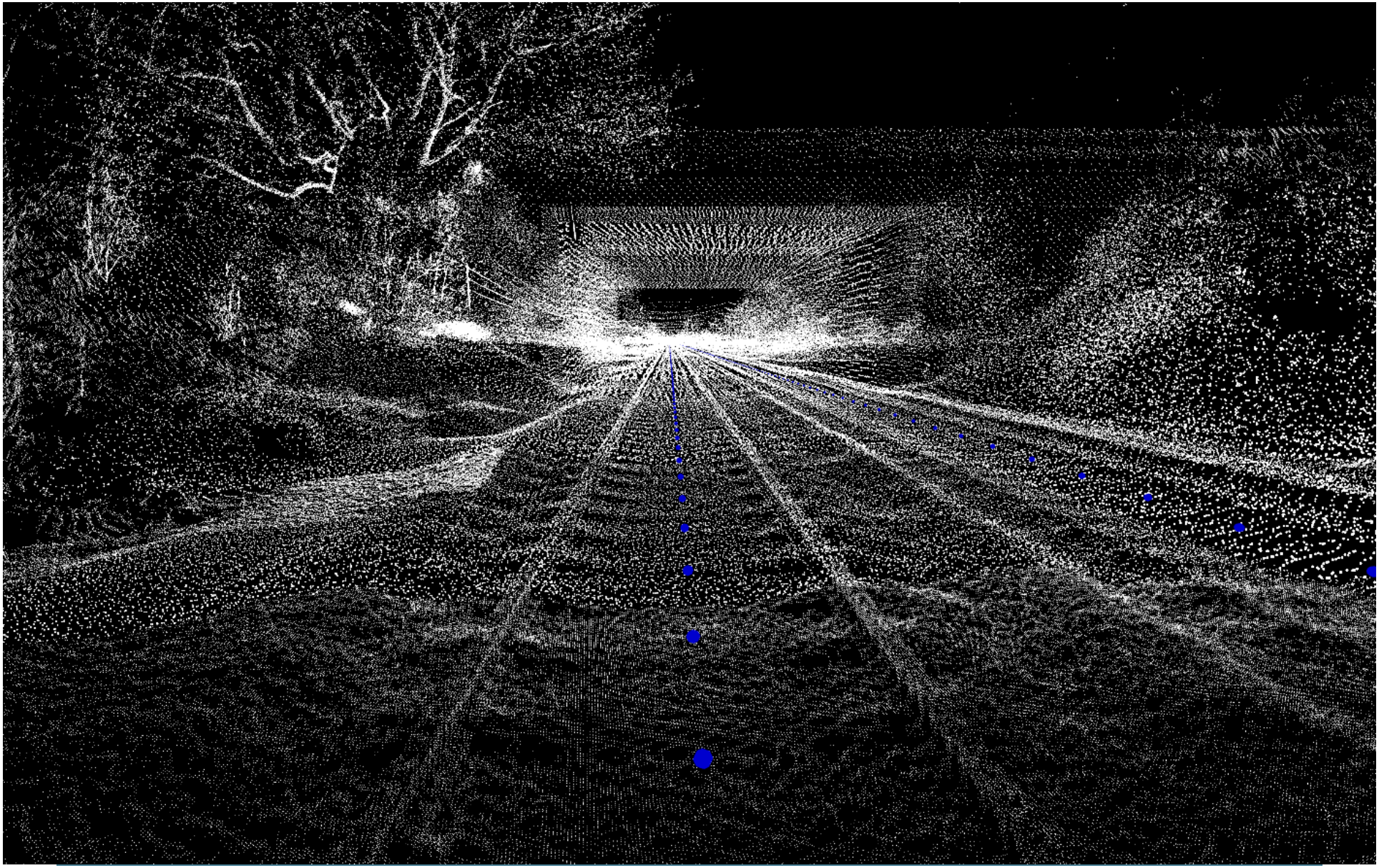
RILA Portal

Examples of data and information

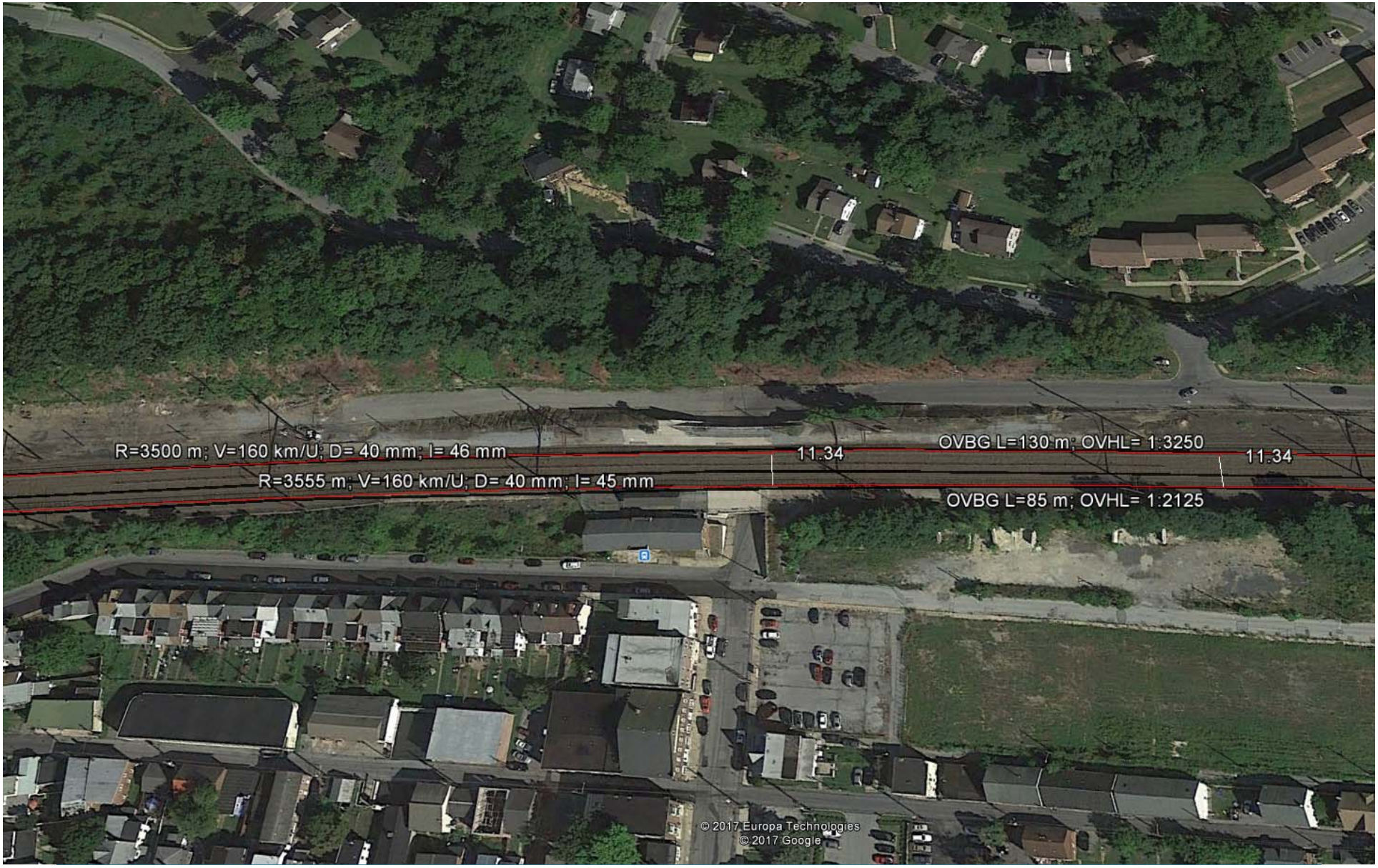
Imagery and point cloud

Imagery and track centerline

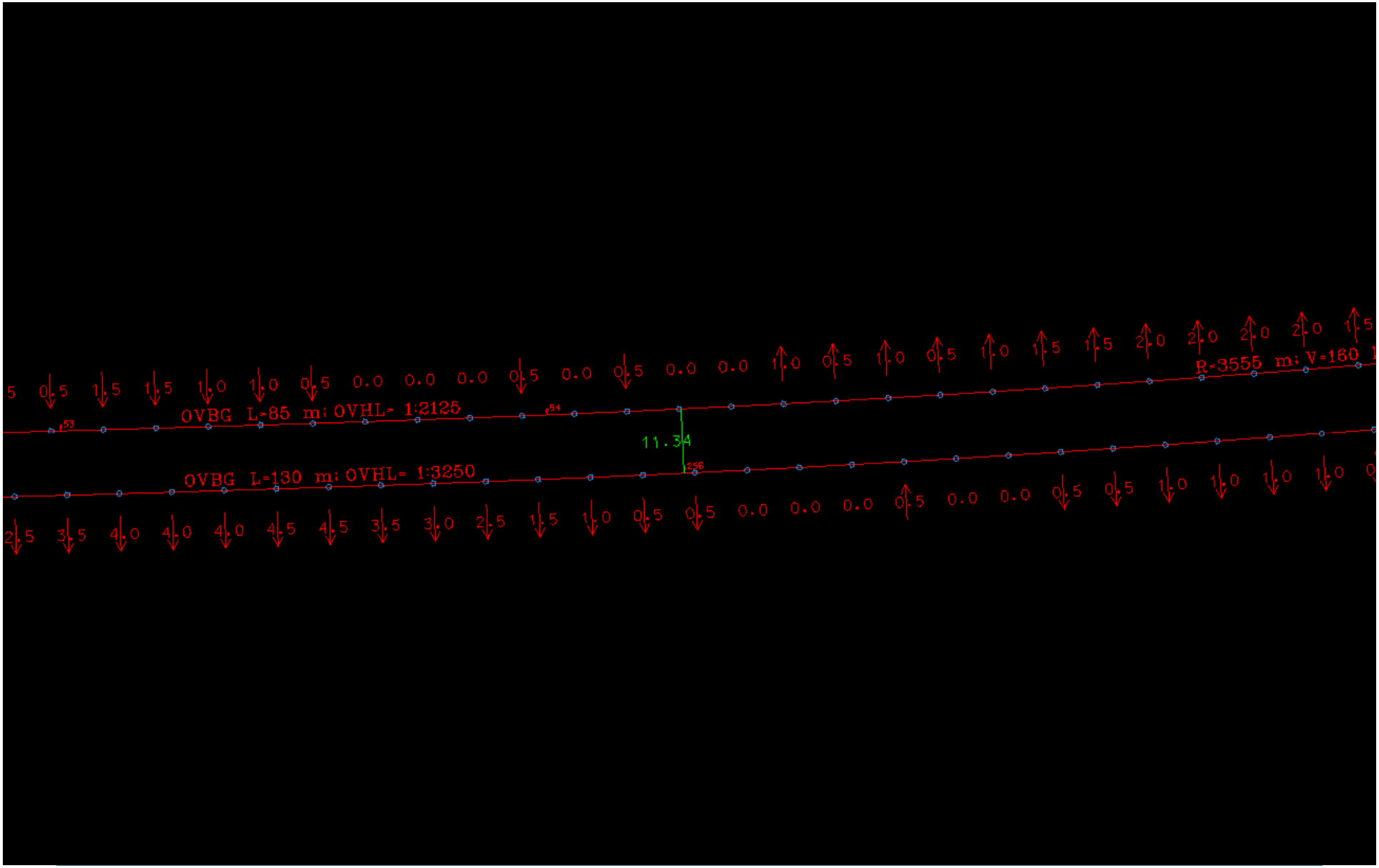
Point cloud and track centerline



Track geometry



Alignments



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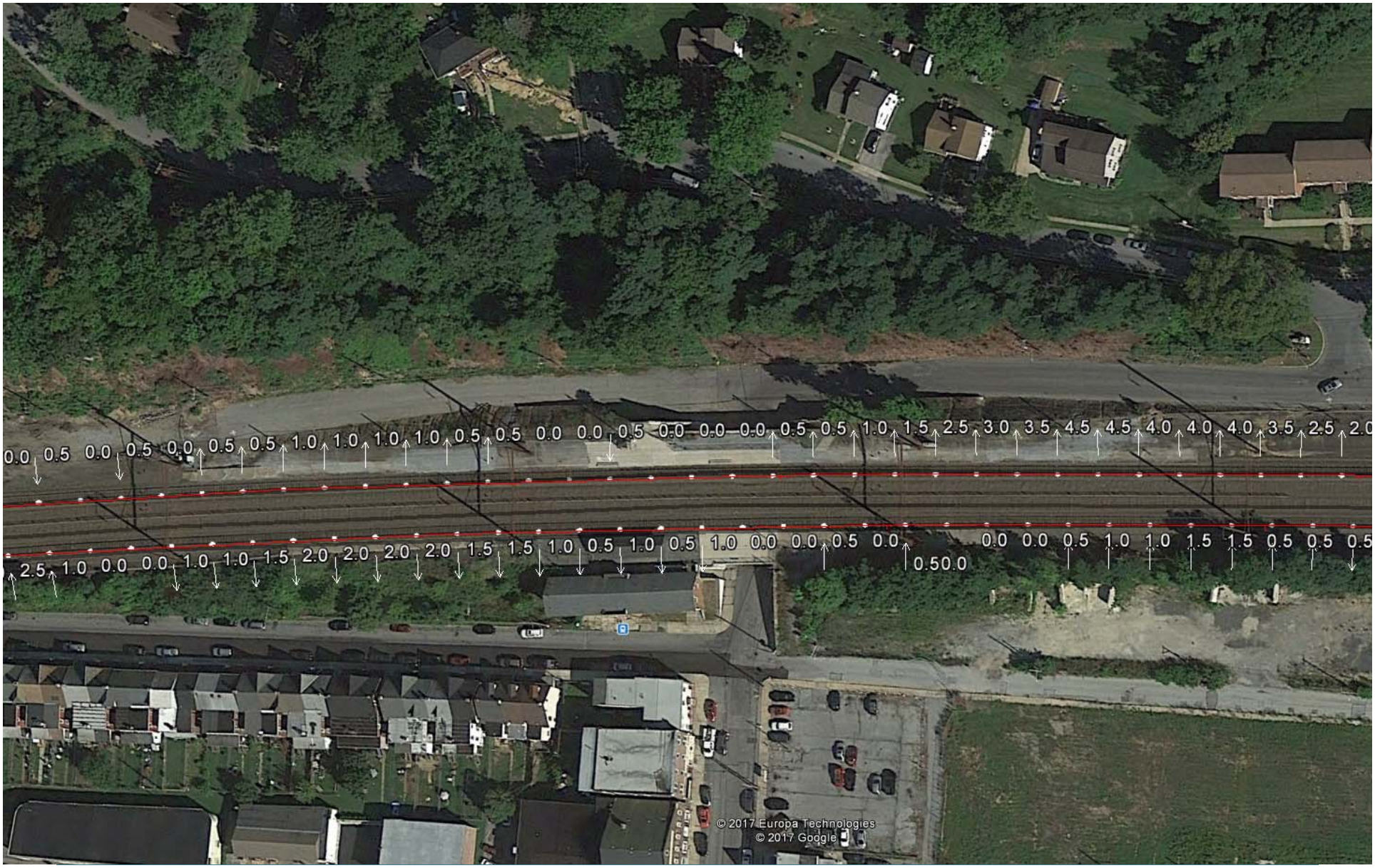
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2.5 1.0 0.0 0.0 1.0 1.0 1.5 2.0 2.0 2.0 2.0 1.5 1.5 1.0 0.5 1.0 0.5 1.0 0.0 0.0 0.5 0.0 0.50.0 0.0 0.0 0.5 1.0 1.0 1.5 1.5 0.5 0.5 0.5
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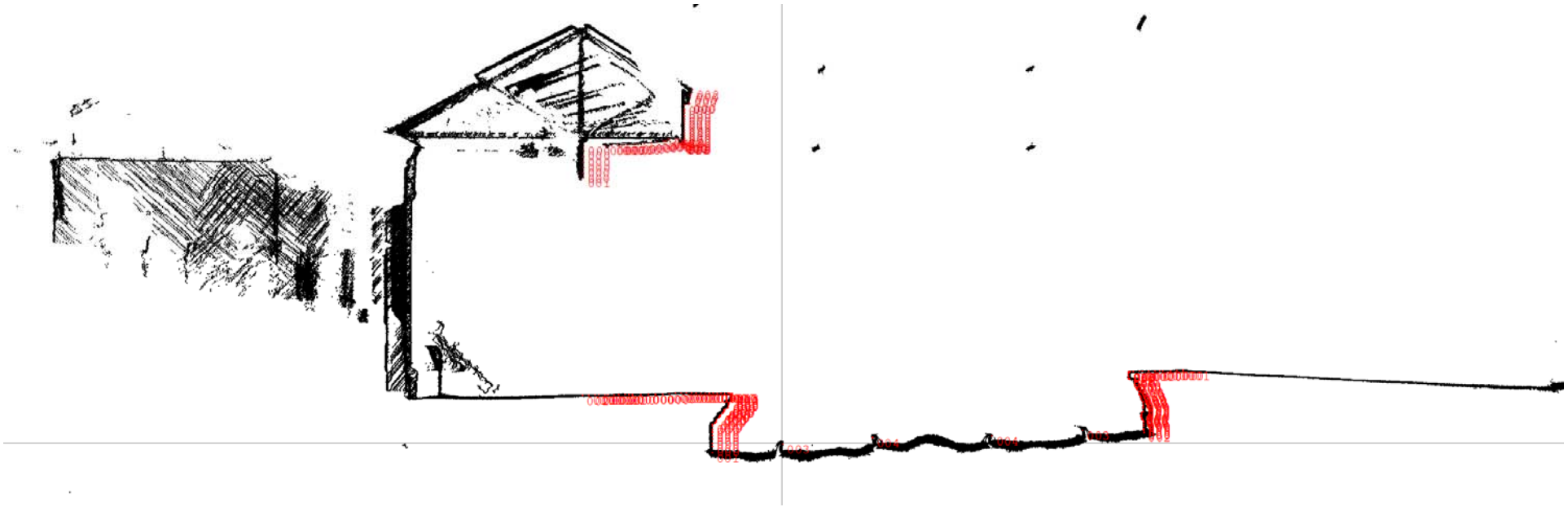
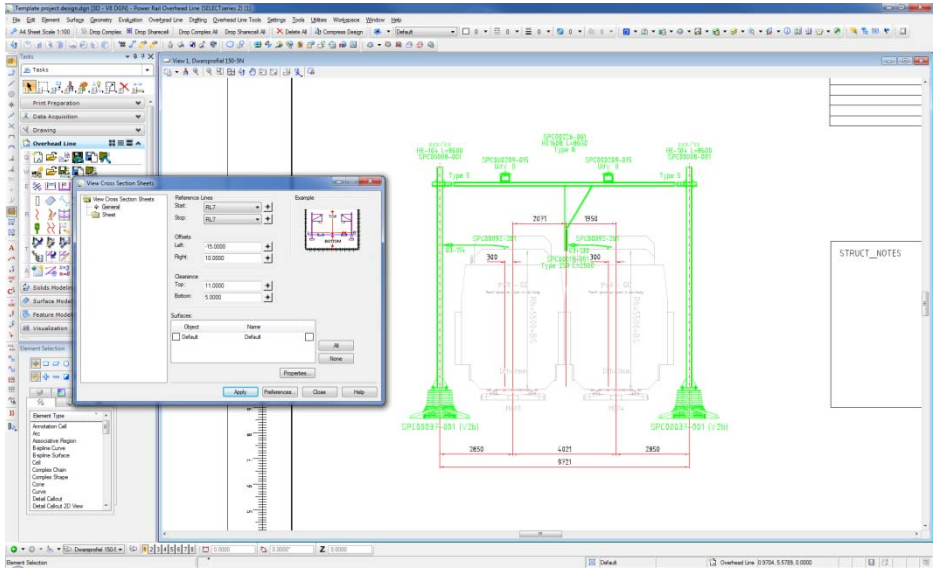
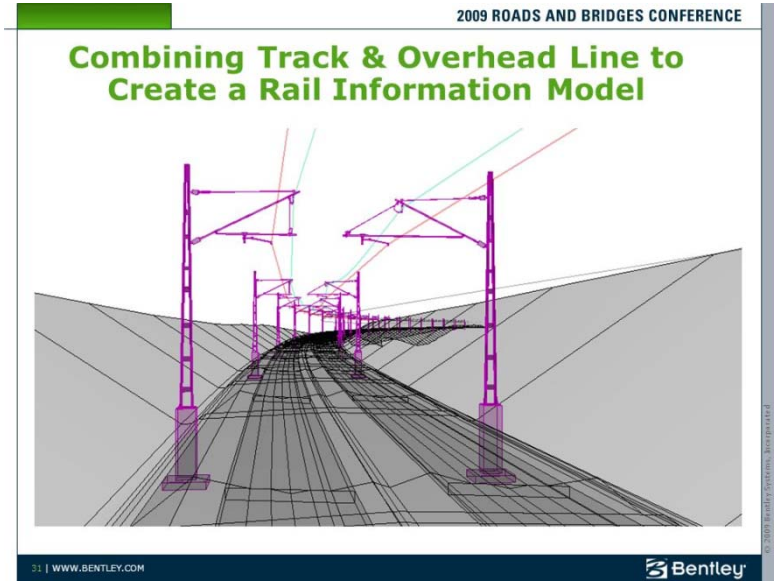
Video check and decision support

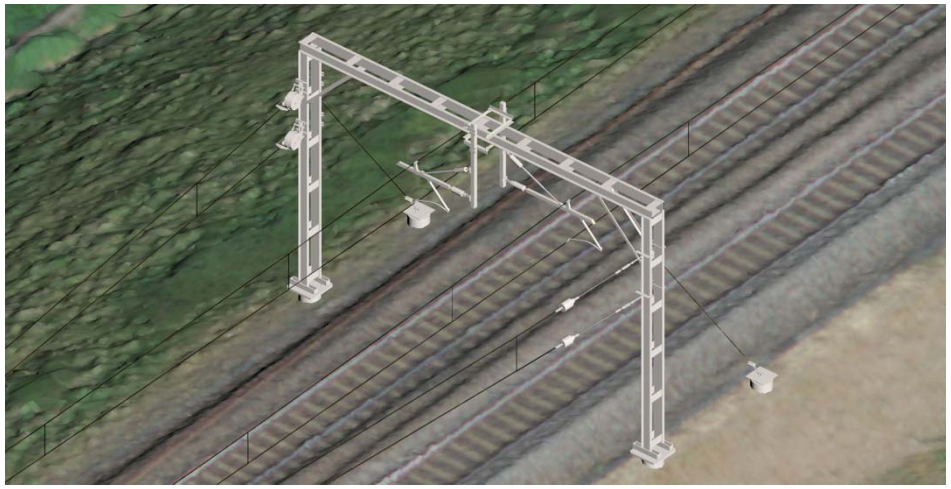
Platform gauging



Design software



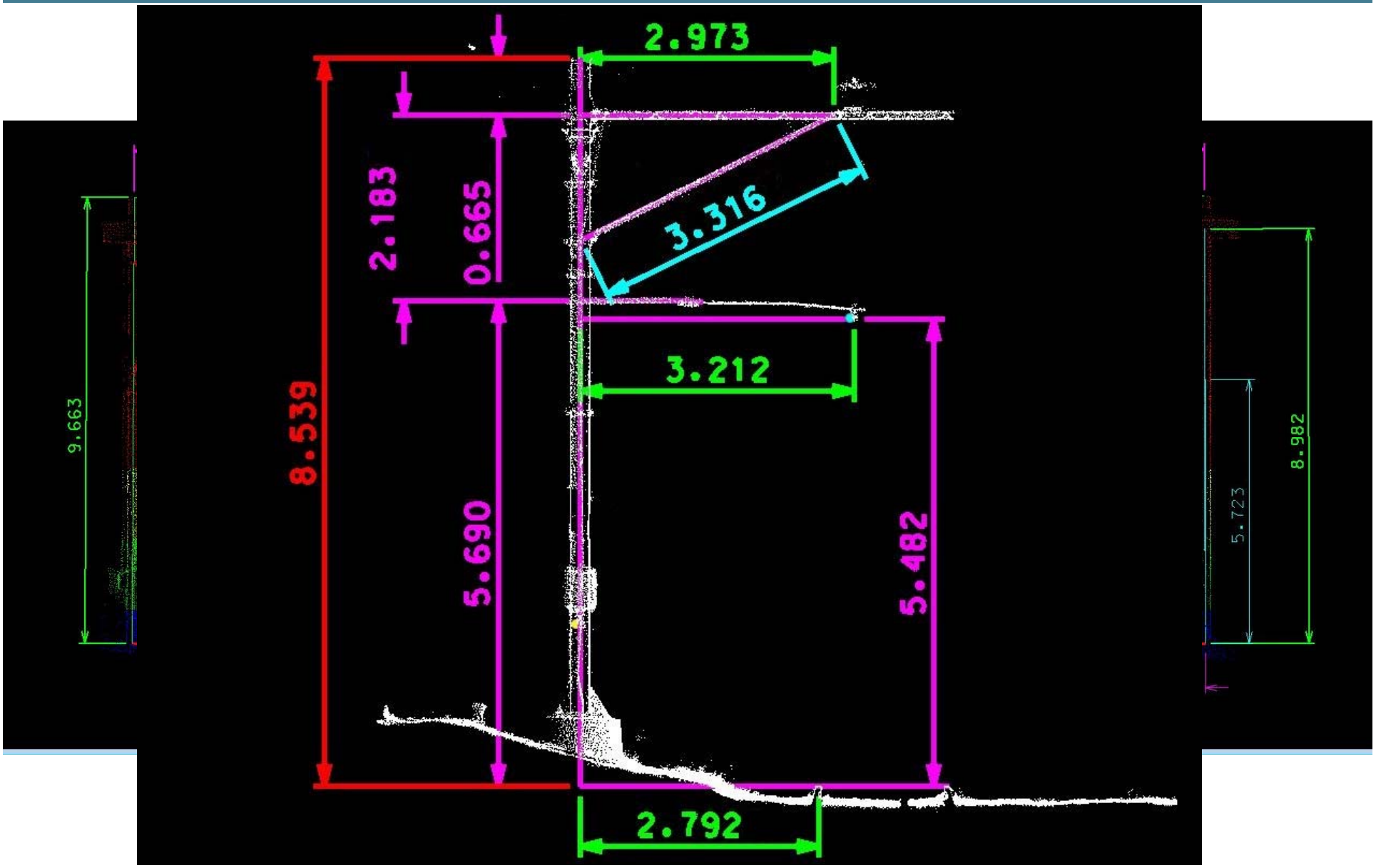




Construction

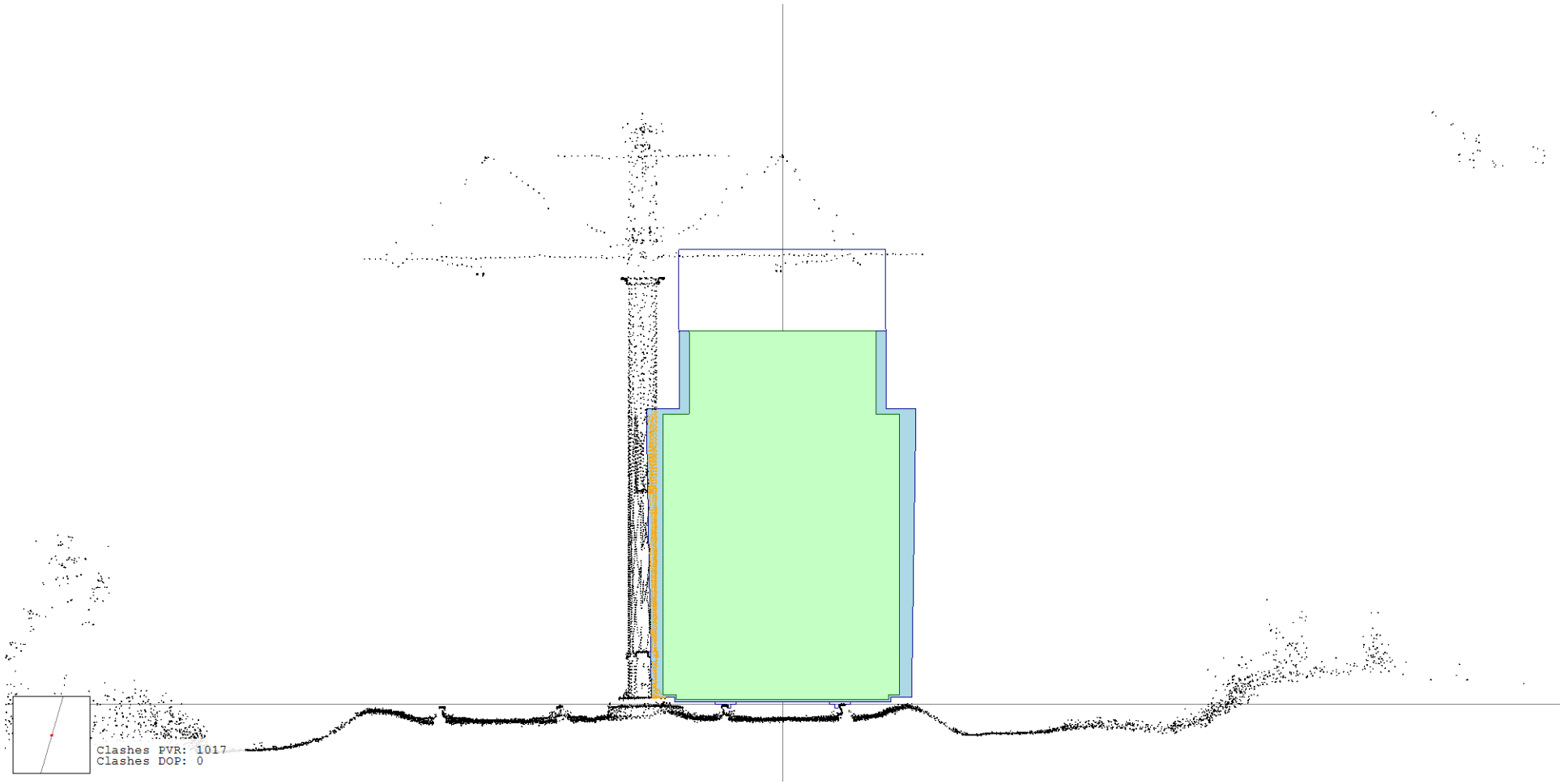
As built

Height and Stagger

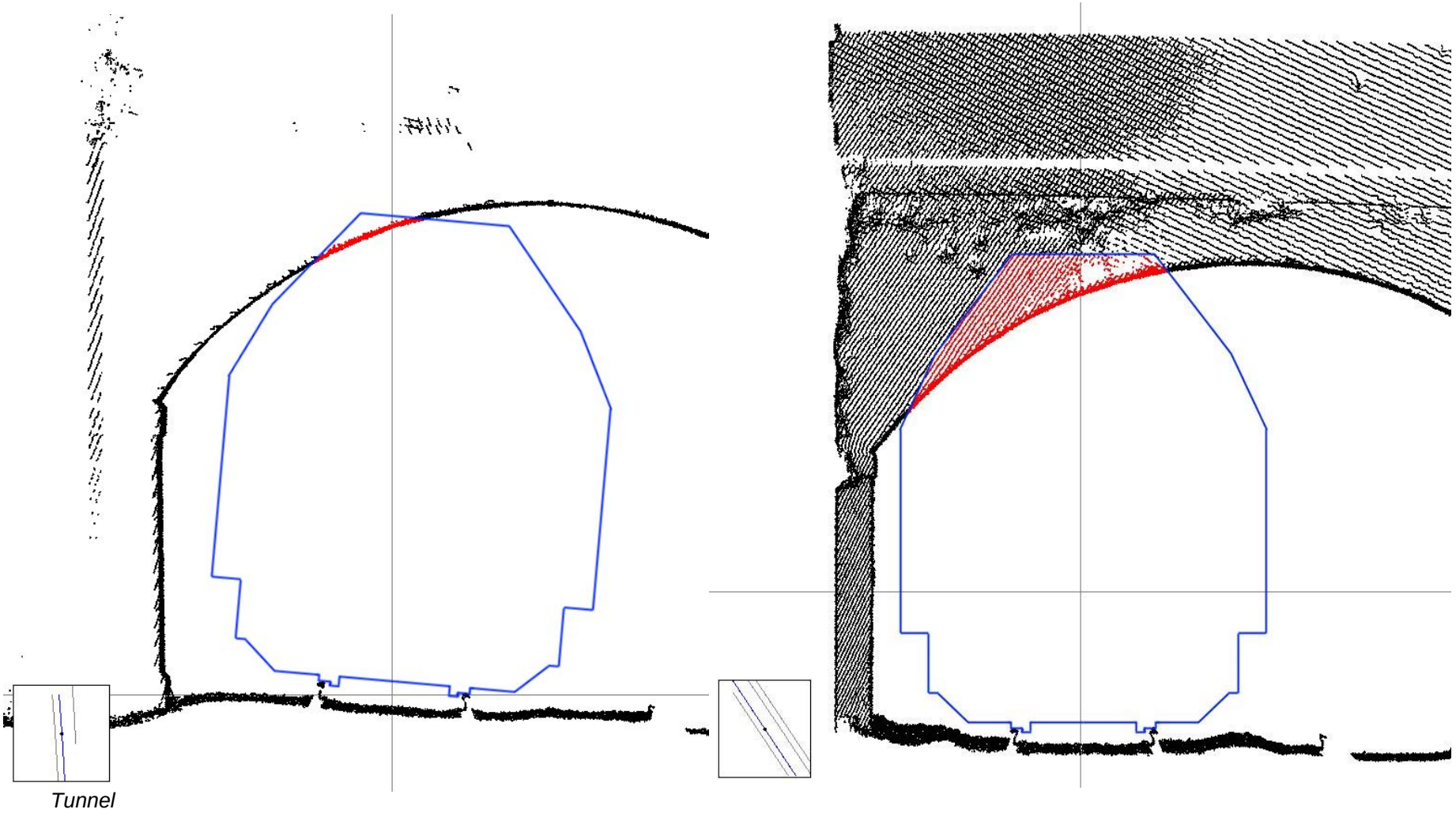


New trains

OLE clearance

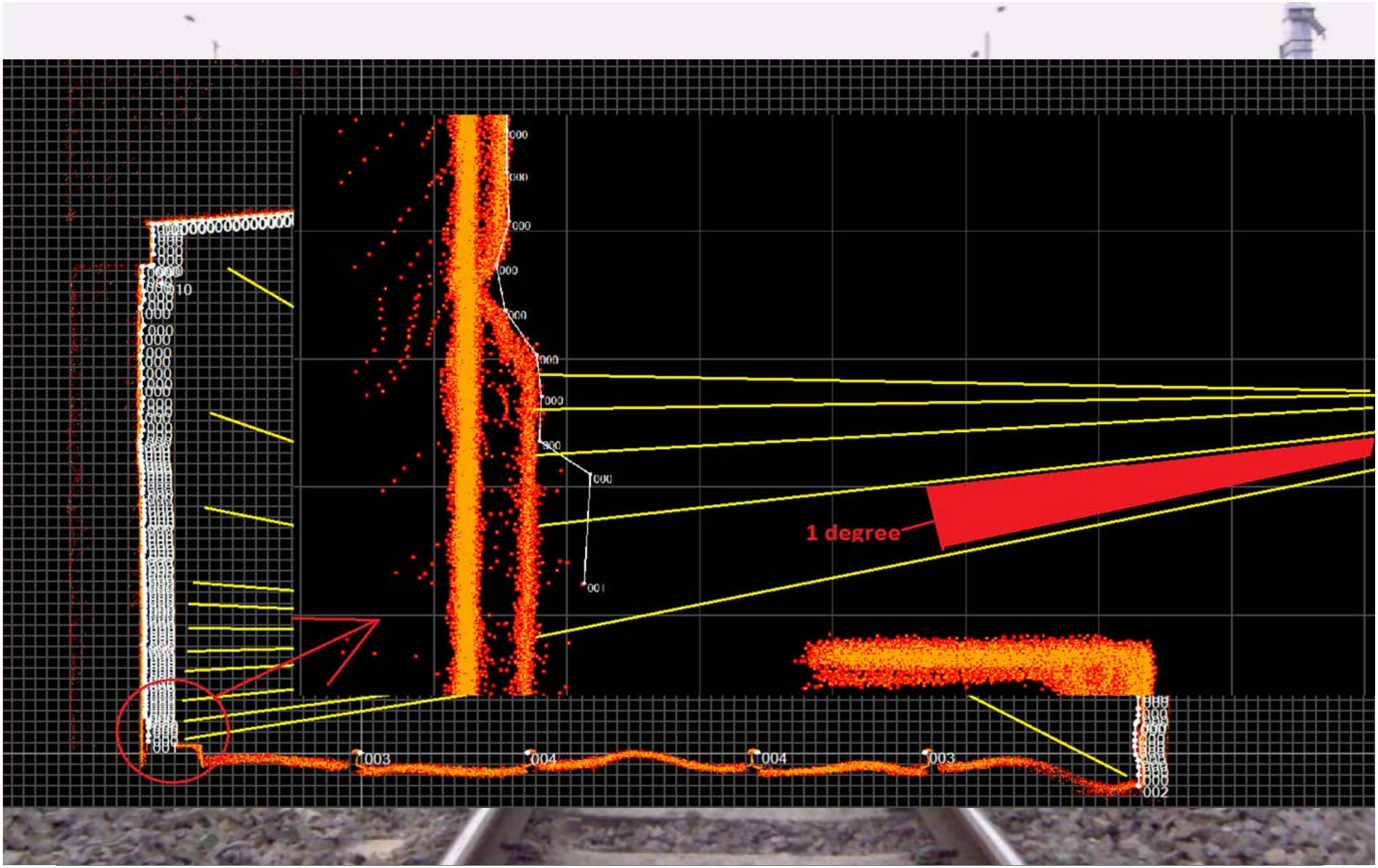


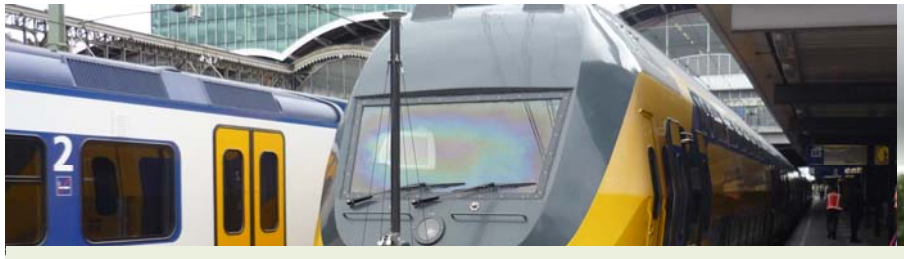
structure gauging



Tunnel

Object gauging





RILA Technology:

- **No staff on or near the track => increased safety performance;**
- **No possessions required => increased railway capacity;**
- **Rich data set: Survey once => use many times;**
- **High accuracy => highest levels of approvals;**
- **Affordable => cost reductions up to 90%.**


Client benefits

Safe (no boots on ballast, reduction by 97% *1)

Shorten survey turn around time (by 99% *1)

Extend engineering time (HOT UK, by 17 weeks)

Optimize geometry and reduce maintenance costs (10-20% *2)

Using prefab elements for OL construction

Reducing operation time of track machines, less possessions -> less disturbance to train traffic *2

Finish project before deadlines 15% per km *2

*1 SPI case studie MML
*2 European Railway Review

Thank you for your attention.

For more information, please contact:

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