

CE Digital Drop In – emerging technologies

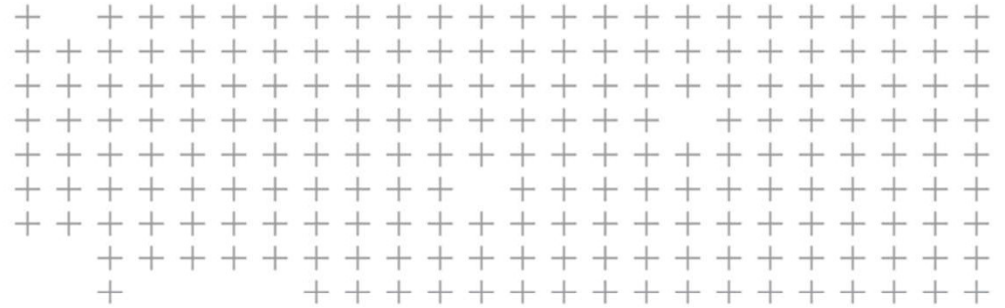
Duncan Reed, Digital Construction Process Manager, Trimble
16th October 2020





Introduction and Agenda

- Chartered Civil Engineer
- Design Manager
- Worked at contractors Tilbury Douglas, Clugston Construction and Balfour Beatty
- Joined Tekla in 2013
- Tekla re-branded as Trimble in 2016
- Trimble Connect – Collaboration
- Trimble SiteVision – Augmented Reality
- Trimble XR10 – Mixed Reality
- Trimble and Boston Dynamics



Open collaboration – the place to start

 **Trimble Connect**

Trimble Connect overview



Web Browser Application

- Project creation and administration
- 2D & 3D viewing



Windows Application

- Highest 3D graphics performance for the largest models
- Workflow integration with sequencing for HoloLens



Mobile Application

- Optimized UI for small-screen, touch-screen operation
- Empowering field users for productivity



HoloLens Application

- Market-leading Augmented Reality solution



Powered by
Trimble
Cloud

Digital Realities



Virtual Reality

Replacing your environment with digital content



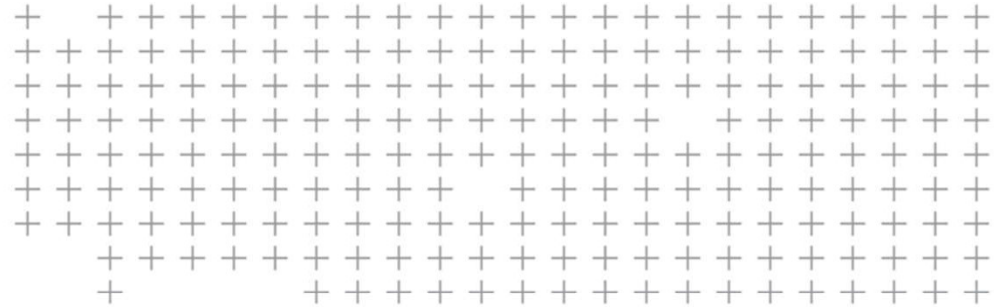
Augmented Reality

Enhancing your environment with digital content



Mixed Reality

Merging the digital and the physical environments

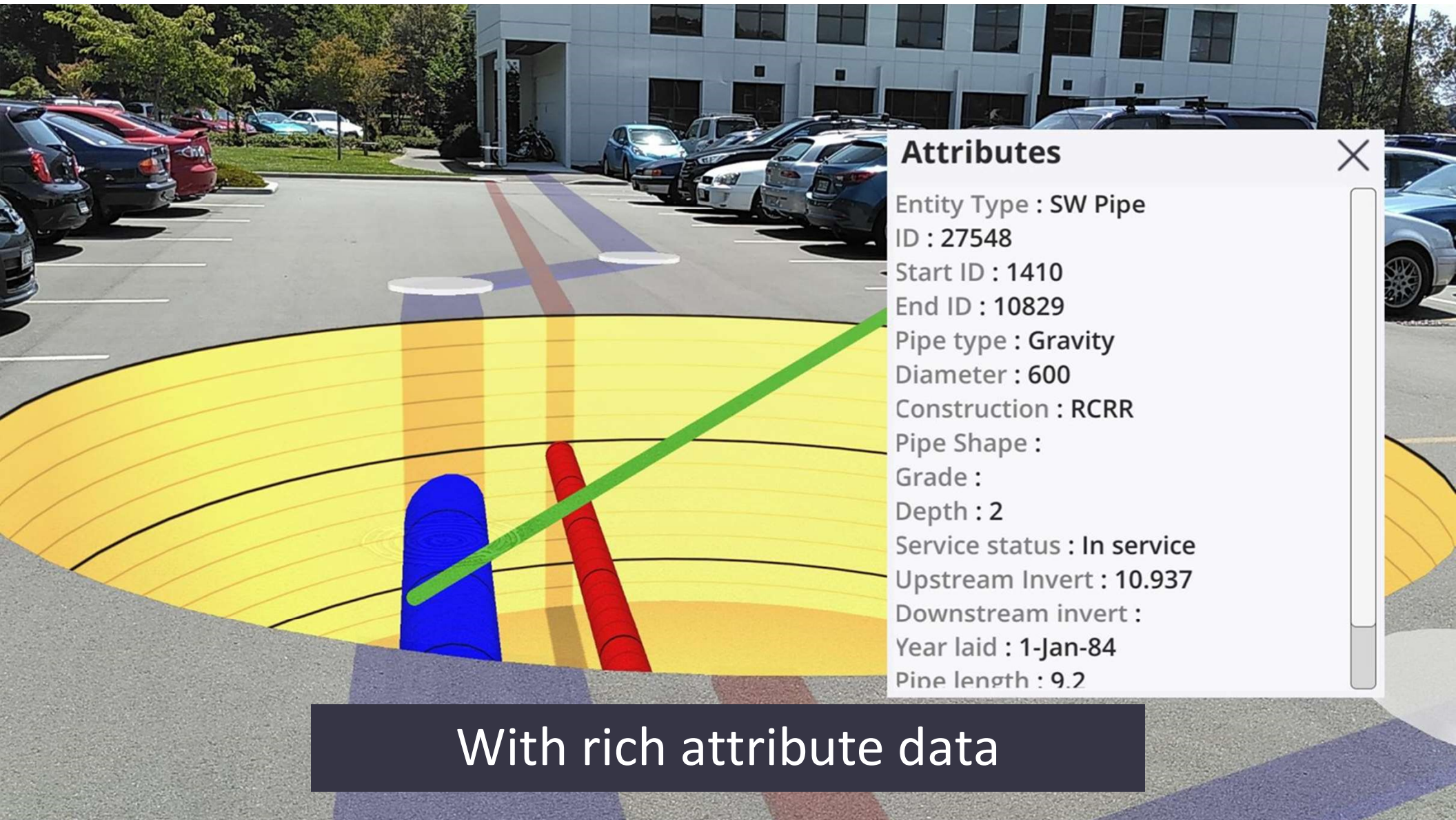


Thanks to Dr Marianna Kopsida, Advanced Solutions Manager 3D, Trimble Geospatial

Trimble SiteVision - Augmented Reality



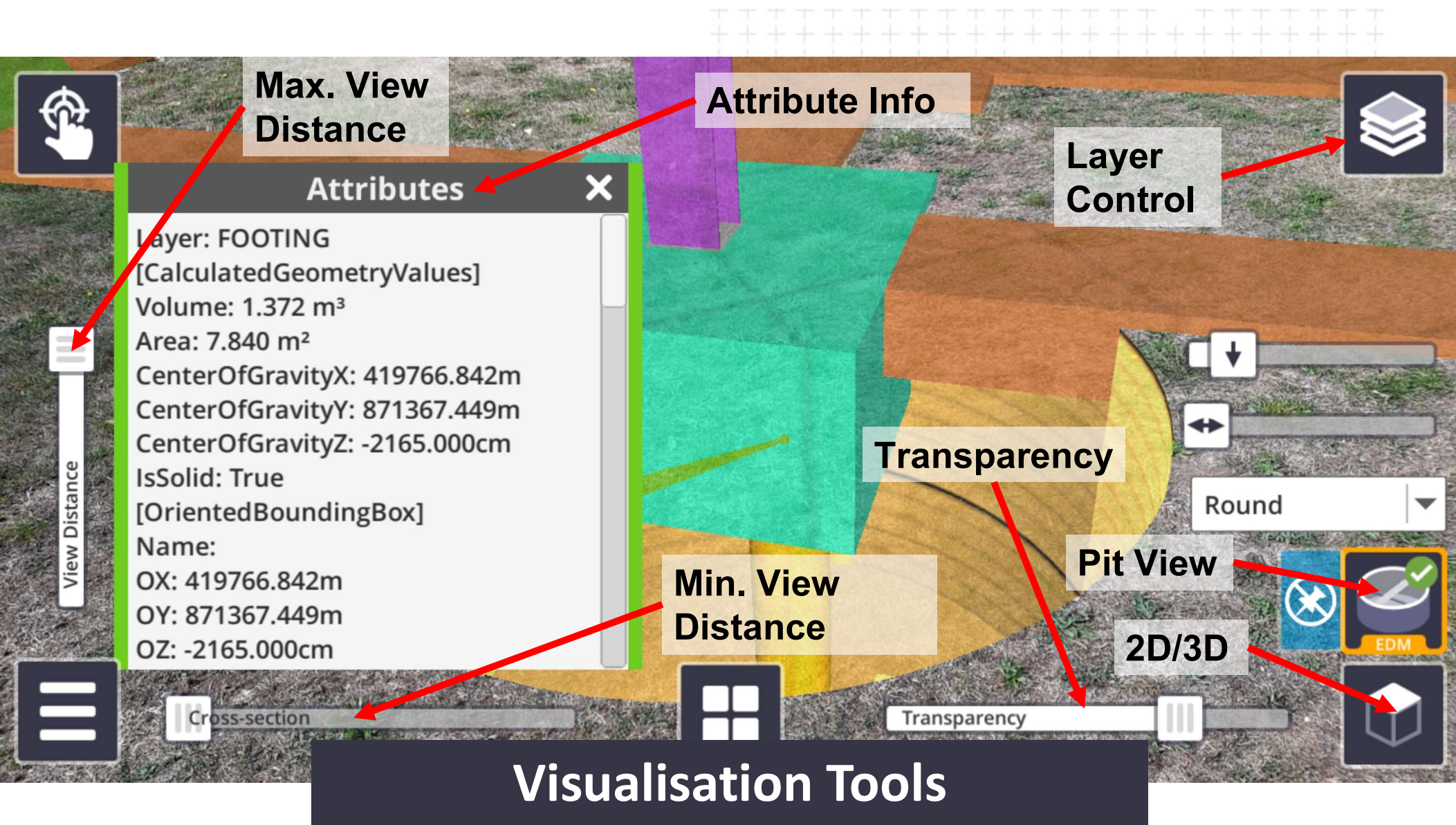
Integrating GNSS and Augmented Reality



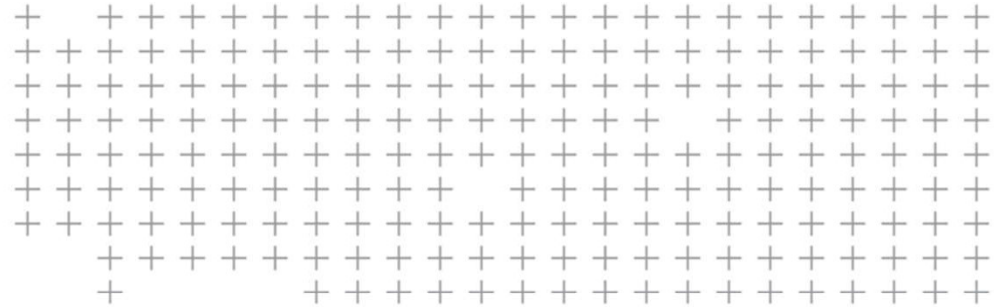
Attributes

Entity Type : SW Pipe
ID : 27548
Start ID : 1410
End ID : 10829
Pipe type : Gravity
Diameter : 600
Construction : RCRR
Pipe Shape :
Grade :
Depth : 2
Service status : In service
Upstream Invert : 10.937
Downstream invert :
Year laid : 1-Jan-84
Pine length : 9.2

With rich attribute data







Thanks to Dr Marianna Kopsida and Steve Jackson, Technical Manager, Trimble

Trimble XR10 – Mixed Reality

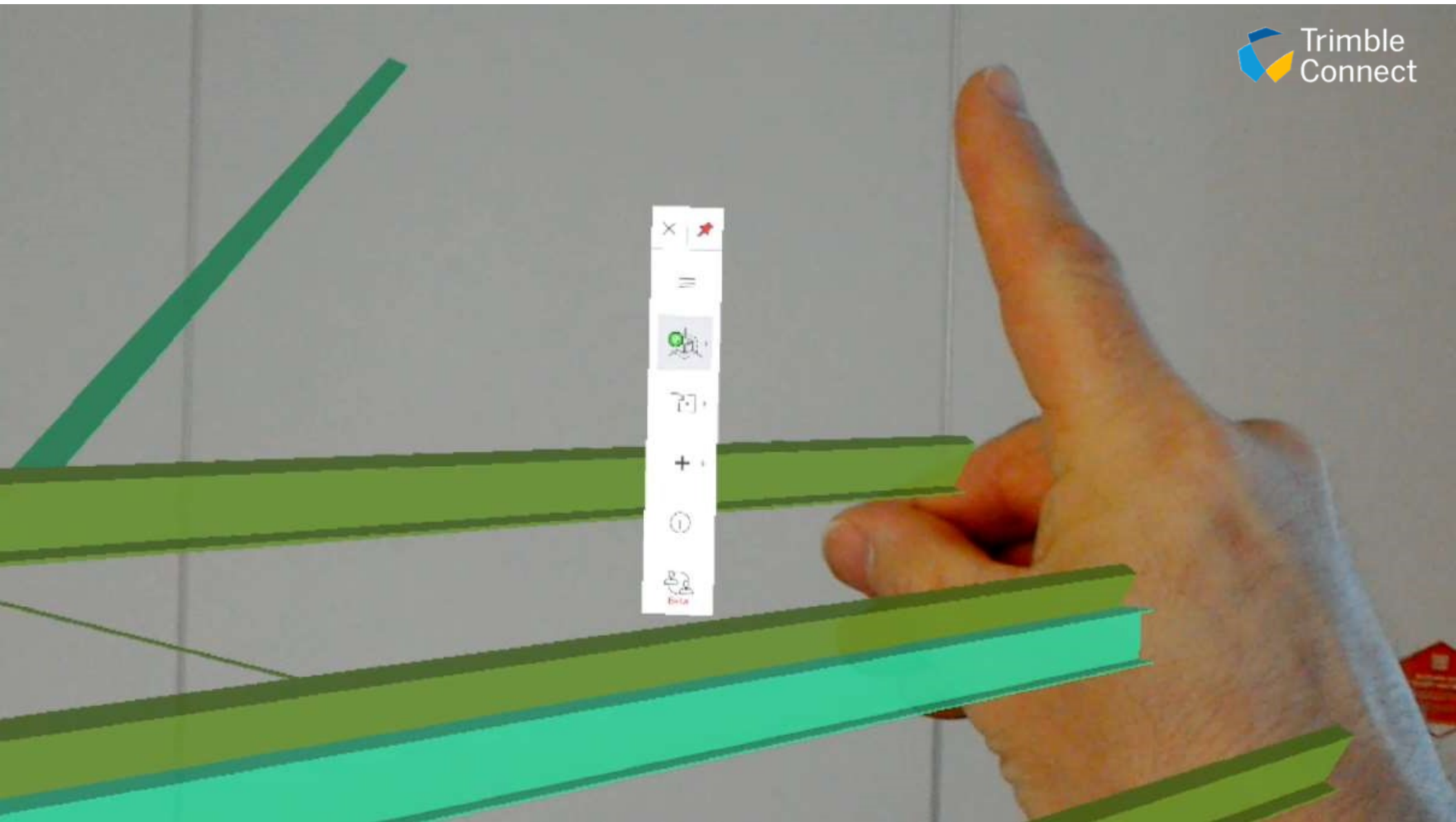
Trimble XR10 with TCH

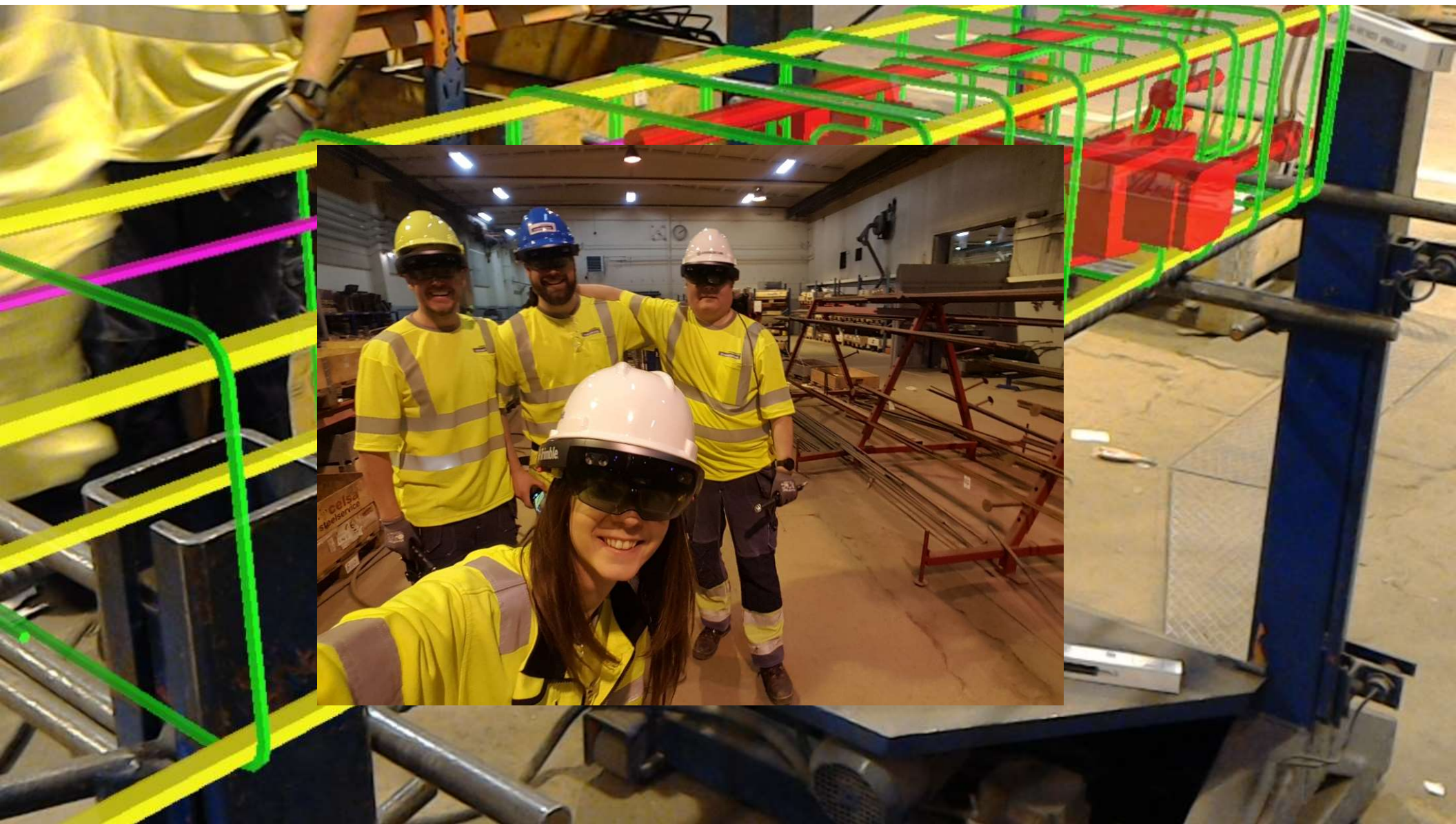


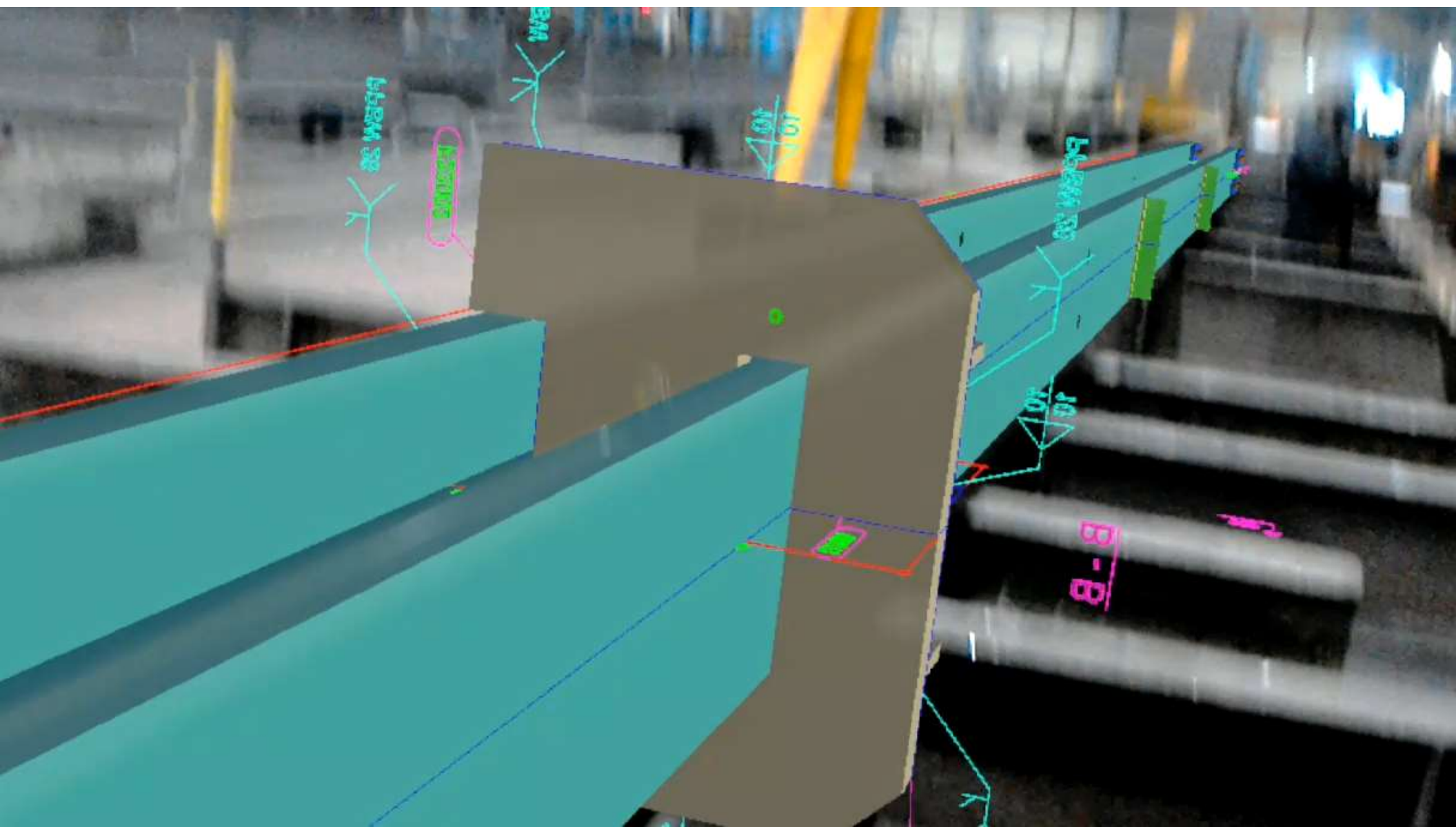


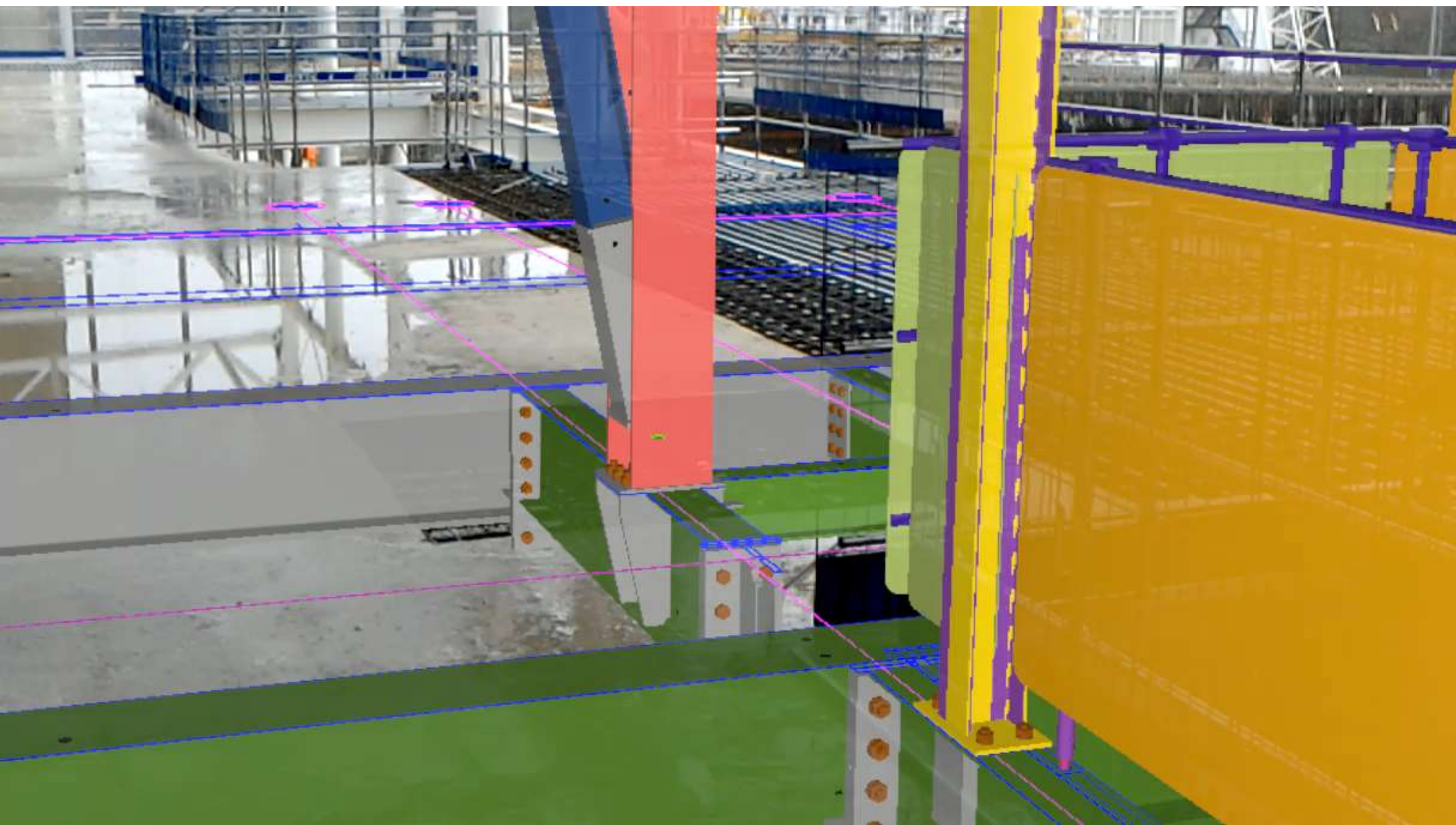
New Zealand 1997

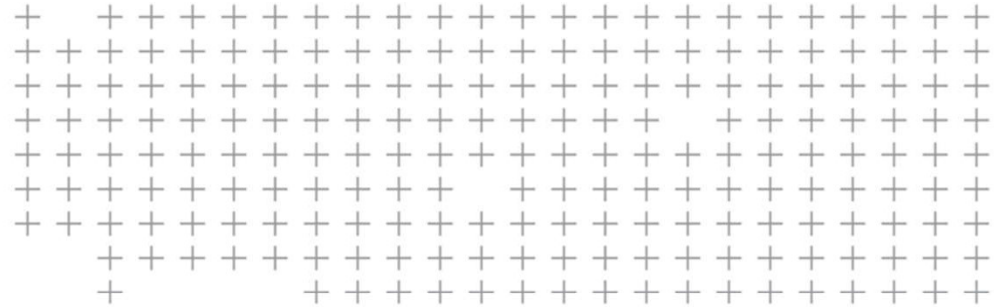
Trimble patents a GPS-driven,
hardhat-integrated, augmented
reality headset











Thanks to Aviad Almagor, Senior Director, Emerging Technologies

Trimble and Boston Dynamics



Bio-Inspired Robots
Mobile – Ruggedized - Terrain agnostic – Spatially Aware

Scanning

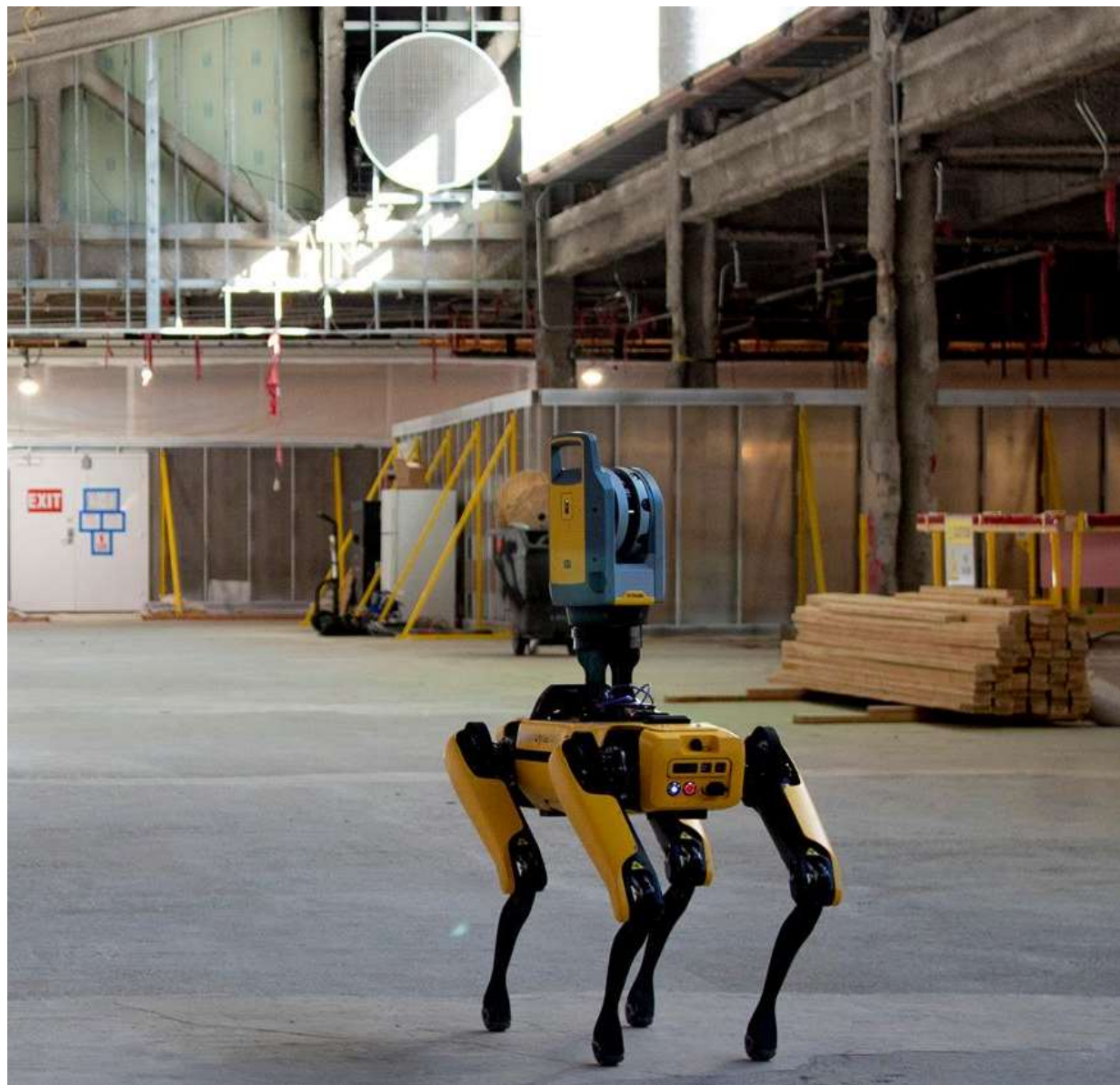
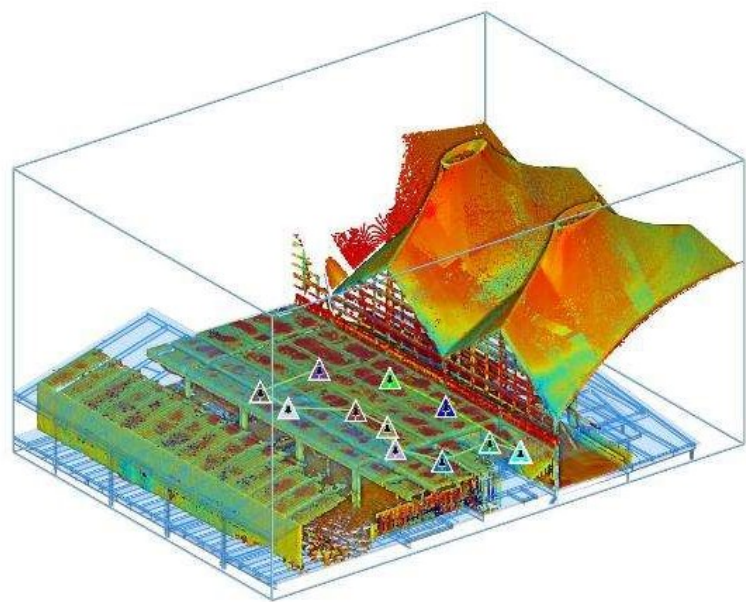
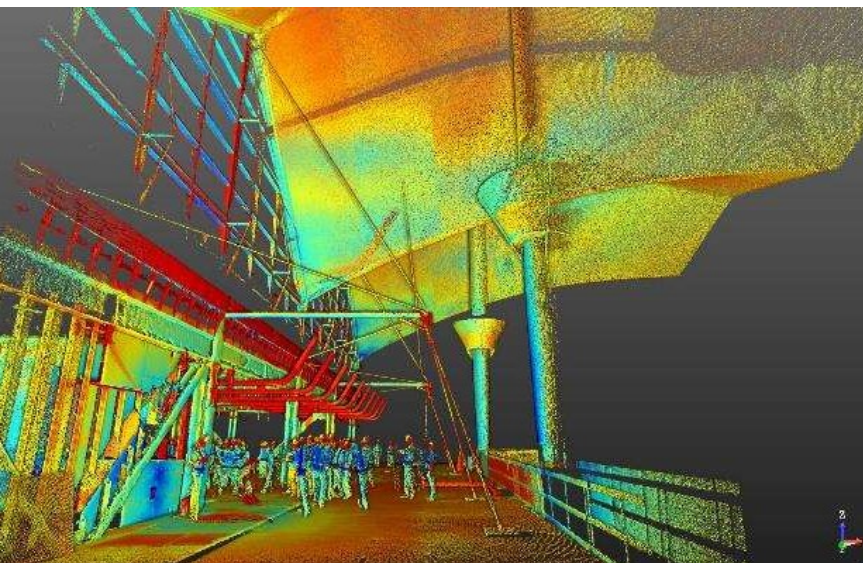
As-built

Production Control

Quality Control

Deformation





Controlling Spot with BCI

The Basics

Unity as the development platform
Python interface that allows
interaction between the Spot SDK
(Python) and Unity (C#)

mapping of BCI gestures to Spot
commands (turn, move, sit, stand).

A future gRPC implementation will
remove the need for Python





Vision:

***Connect the Digital to
the Physical***

***Connect the right data
to the right people at
the right time***





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 **Thank You**