Trimble Connect

Connecting Field to Office

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Introduction
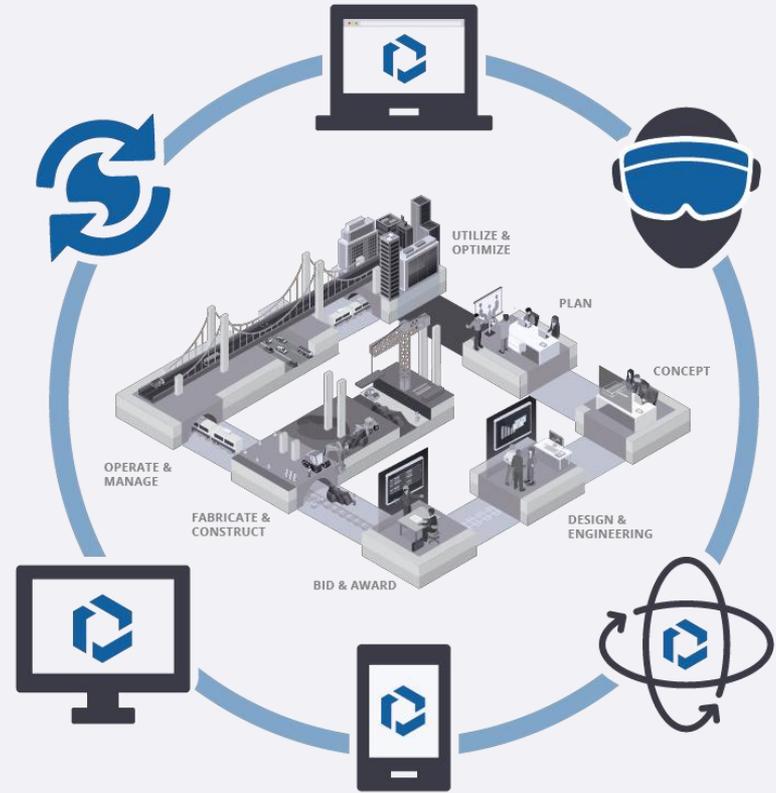
What is Trimble Connect?

"**Trimble Connect** is a common data environment (CDE) and open collaboration platform that connects the right people to the right data at the right time."

Many Trimble software users utilize Trimble Connect already and this is a differentiator for our hardware division.

*Our productive combination of client **tools and applications** provide a continuous experience for optimal collaboration and productivity.*

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

AR+MR Applications
- Augmented Reality visualization (works with your IOS or Android mobile device)
- Mixed Reality visualization (works with Trimble XR10 or HoloLens 2)

Visualizer Tool
- Innovative Virtual Reality solution

Sync Tool
- Keeps files synchronised with multiple projects in Trimble Connect

Building Construction Field Systems

Field Layout

3D Capture

Mixed Reality

Construction Robotics

Design

As-builts, Issues

Trimble Connect

Model Formats

- IFC (2x3), IFC ZIP (.ifcZIP), IFC XML (.ifcXML)

- DWG (.dwg - AutoCAD 2013 and below)

- TRB

- SKP

- RVT (Revit 2019 and later)*

- Tekla (.tekla)

- NWC, NWD**

* Revit files can be added to the project on the project page in Trimble Connect for Windows, or using the Trimble Connect for Revit add-in.

 ** The Navisworks integration is still in Beta phase. During the Beta phase, some models might not be rendered correctly, or some properties might be incomplete.

Views, ToDos, & Annotations

- Projects, Data, Folders
- File Versioning
- Permissions
- Upload & Download
- Invite Users
- Teams / Groups
- Comments
- 2D Viewer
- 3D Viewer
- Clashsets
- ToDos, BCF Topics
- Views
- Annotations
- Associated Data
- Activity Feed
- Email Notifications
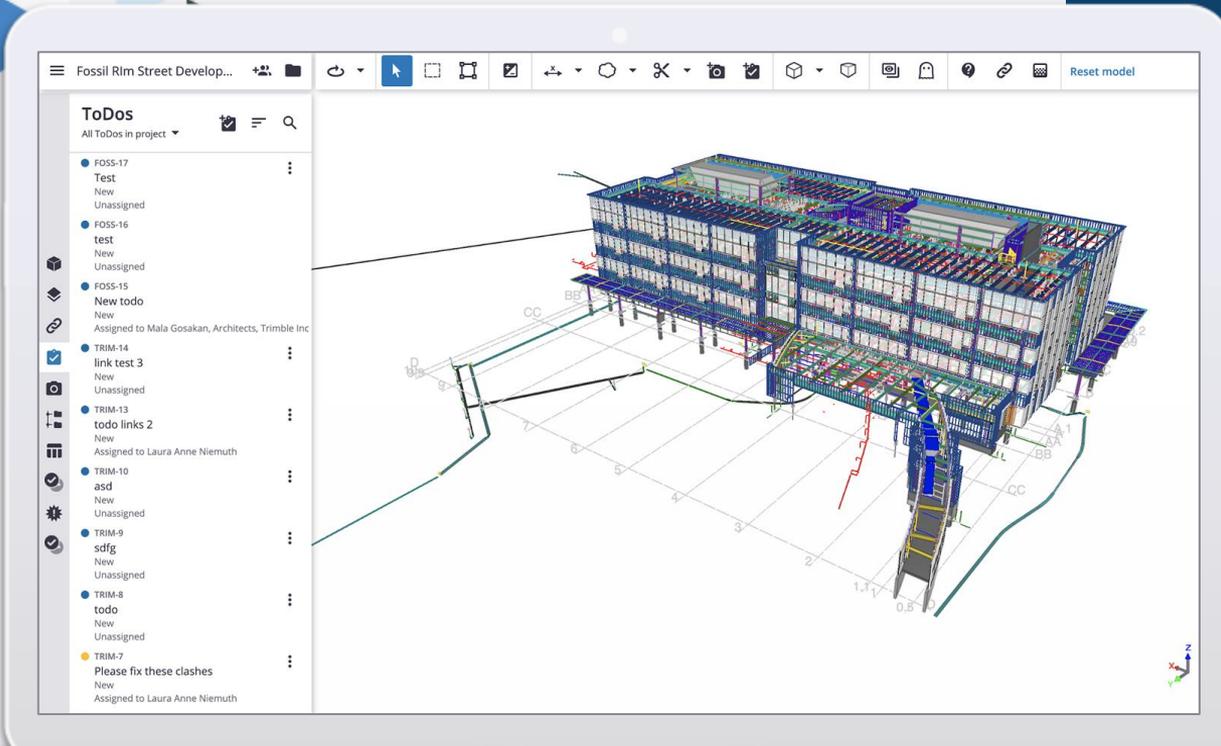- Project Settings
- Releases
- Offline Capable
- Analytics
- Tags

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02

Constructible Workflows

Integrating with Trimble Connect for
Improved Project Workflows

Seamless Integration

Its seamless integration within the Field software make Trimble Connect a valuable tool within its Connected Construction Goals. We use it for more than just a cloud storage space.

- Use it for QA/QC purposes in the field.

- Use it as a daily report log on what the field users layout day to day.

- Use it to help keep up with the revision histories.
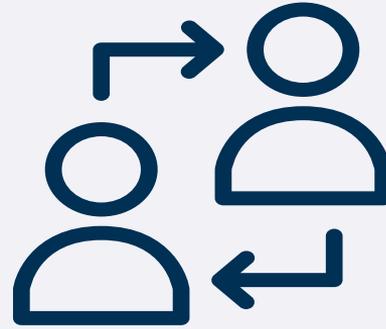
How to Transfer?

- Connect Sync
  - Set to automatically sync
  - Push/pull rule setting
- FieldLink Save As full project
- OneDrive or other folder sync
- Data: SIM card, hotspot or trailer WiFi

TFLX Files

See layout progress in real-time on Connect

- View what has and hasn't been laid out
    - Mobile, web or desktop
    - Any user (free, business, premium)
- Green indicates it was laid out within tolerance and red outside
- Field Reports, layout reports, inspection, etc are all transferred.
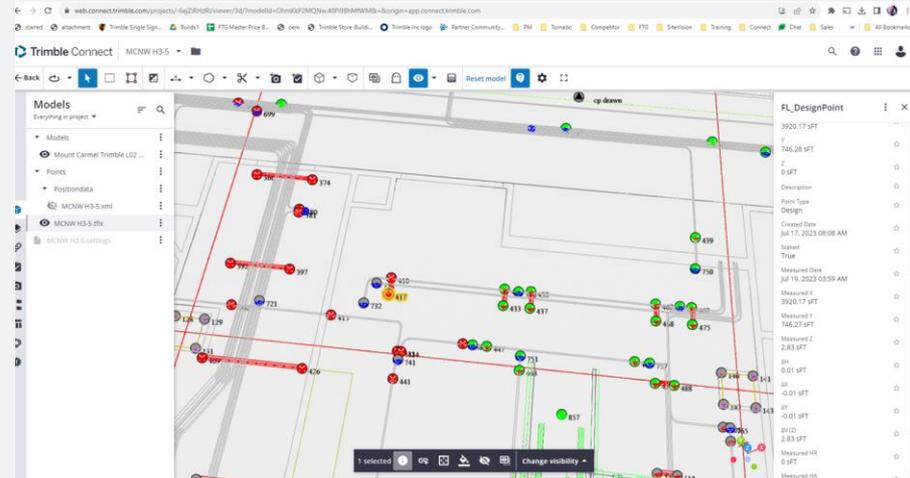
Data Tables

The Data Table is a tool that allows to colorize, sort, order and filter objects based on object attributes. Sort based on:

- Staked/layout status, time, horizontal offset, X,Y,Z, layer, etc

- Save table across projects

- Export CSV/excel for Pivot sort

BCF Topics

BIM Collaboration Format (BCF) is an open industry standard from buildingSMART International. It enables sharing issues between applications that support the standard, creating connected workflows.

- Track issues across platforms in relation to jobsite/models

    - Images with context model & site

- Import/export BCF topics
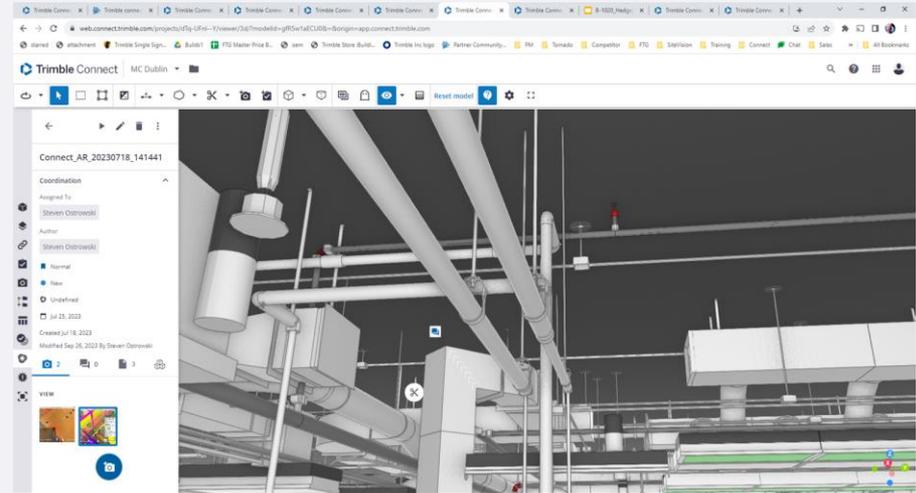
03

Connect AR & Connect MR

Bringing the model to the Field

What is Connect AR?

- 1:1 scale augmented reality view of your model
- Specifically targeting AEC workflows:
  - Pre-construction coordination
  - Construction checking
  - Post-construction QA/QC
- A step change in effectiveness compared to traditional mobile model viewing or paper plans
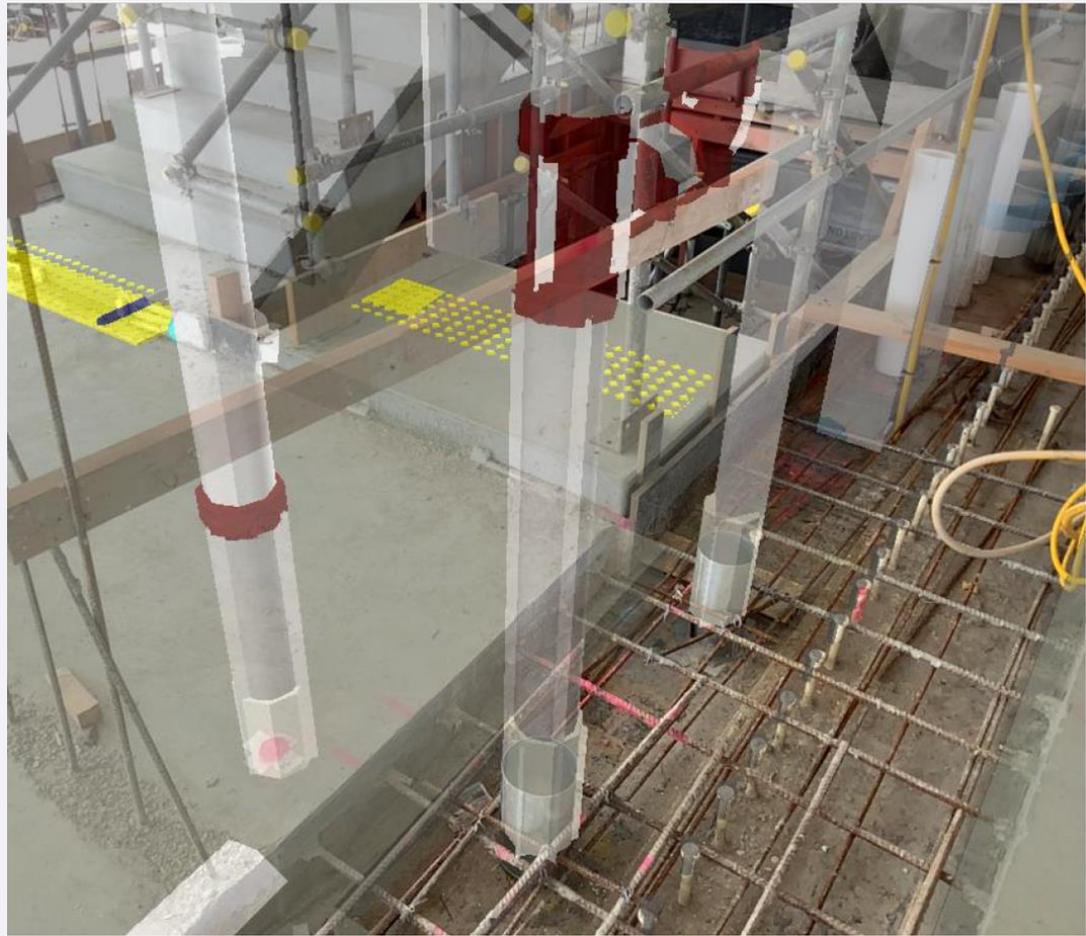
What is Connect AR?

- All AR enabled iOS and Android mobile devices supported
- Works on both Phones and Tablets
- Supports all common BIM formats via Trimble Connect:
  - Navisworks
  - Revit
  - IFC
  - SketchUp
  - DWG
  - TRB
  - Tekla

Supported Devices

Trimble Connect AR runs on iOS & Android mobile devices:

Android

- powered by the Android operating system version 9.0 and later that are supported by the Google AR technology. There are over 400 devices which are Google AR Services compatible.

- Refer to the list that Google maintains to check if your device is supported: https://developers.google.com/ar/devices

iOS

- powered by iOS 13 and later, from iPhone 6s and later and iPad (2017) and later.

Trimble Connect AR App

DESIGN REVIEW
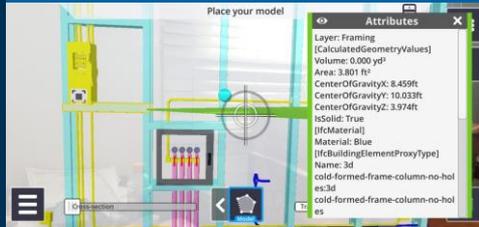
PREFAB & MANUFACTURING

2D & 3D COMPARISON
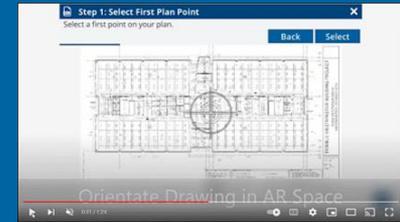
CONSTRUCTION VALIDATION

QA/QC WORKFLOWS

COLLABORATION TOOL
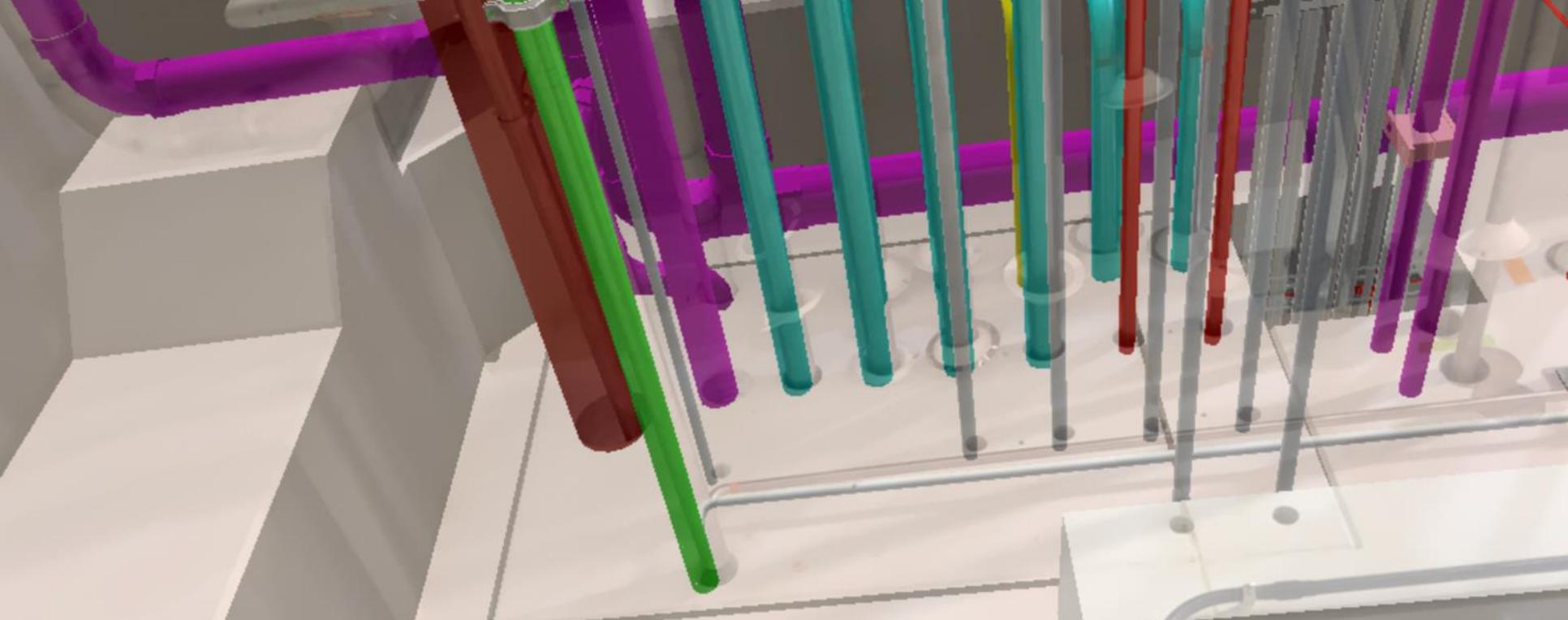
02 Feature Overview

Feature Overview

Connect AR

⊕ **Model Placement**

Position AR models on your job site with QR markers

🔍 **Visualization Tools**

Explore accurately positioned models in their real world context with Transparency, Cross Section & Fish Bowl tools
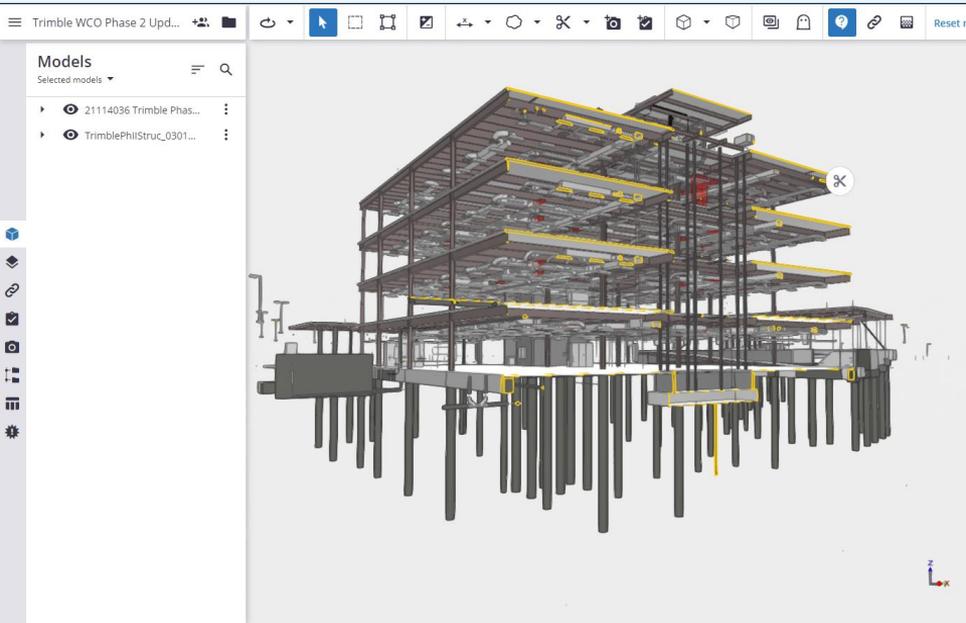
Feature Overview

Connect AR

Capture ToDo's

Capture and share your augmented reality view to communicate identified issues

Connect Integration

Manage models and collaborate with your team with Trimble Connect

Feature Overview

Connect AR

Measurements

Measure and record progress and as-built information, including positions, lengths and areas

Offline Support

Work offline then sync your data to Trimble Connect

Mixed Reality Solution for Construction

XR10

Features

- All of the benefits of HoloLens 2, plus:
- Hard Hat impact/electrical protection:
  - ANSI/ISEA Z89.1-2014 Type 1, Class E (USA)
  - CSA Z94.1 (Canada)
  - EN 397:2012 + A1:2012 (European Union)
  - AS/NSZ 1801 (Australia / New Zealand)
  - GB2811-2017 (China)
  - *Japan in progress (Will ship ANSI in interim)
- Intrinsic safety:
  - UL Class I, Div II: ANSI/UL 60079-0 (International)
  - *No ATEX (EU intrinsic standard)
- Visor Basic Impact Certifications
- Mobilus bone-conduction Bluetooth headset for audio-out up to 115dB
- Industry standard accessory mounts (for earmuffs, chin straps, etc.)
- 180° flip-up visor
- Improved drop resistance

Mixed Reality in Construction

Architects

Design Review
Stakeholder Buy-In

GC's

Model Coordination
Preconstruction
Training
Model Sequencing
3D Task
Management

Pre-Fabricators

Design Review
Guided Assembly
Remote Assistance

Subcontractors

Preconstruction
Model Sequencing
Guided Install
Remote Assistance
3D Task
Management

Maintenance

Hidden As-Built View
3D View of IoT Data
3D Task
Management
Remote Assistance

Mixed Reality Value Proposition

For contractors that need to **visualise and review the 3D design** directly on a physical environment **using holographic data**.

Our mixed reality solutions **visualise 3D content on a job site** to review design ideas in 3D, **collaborate with others** (both collocated and remote) while immersed in the design, overlay both the model and the **real world for visualisation**, and use the immersive interaction as an "instruction guide" for field installation**.**

04

Connect Customer Stories

Real use cases for Trimble Connect

Southbase Construction

- **Role:** General Contractor

- **Use Case:** On-site coordination

- **Problem?:** Reviewing and resolving design issues in real time

"If we do find an issue on site. We'll go out on site, we'll scan the nearest QR code, and from there we can figure out what we need to do. If we need to move a service, or part of the structure needs to change, then from there we can solve that problem. It's much easier than doing it on 2D drawings or in the office." **-George Bushell, Site Engineer l Southbase**
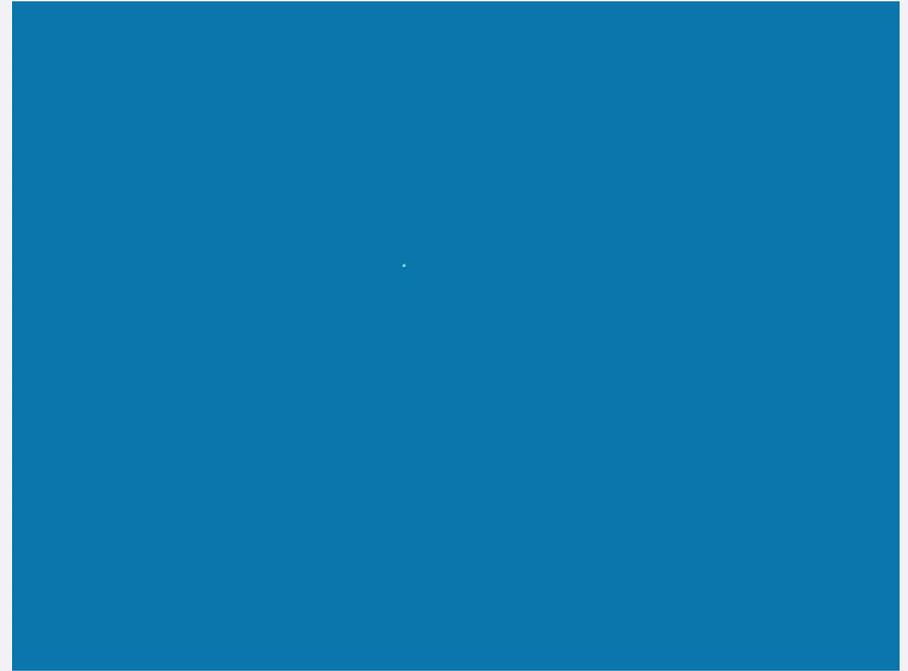
Miron Construction

- **Role:** General Contractor

- **Use Case:** Installation verification

- **Problem?:** Sub-contractors not installing MEP equipment per the coordinated design

*"It is easy to set up on the front end and has paid off exponentially in the field because it works like it is supposed to work," **-Sam Tijan, Virtual Construction Specialist l Miron***
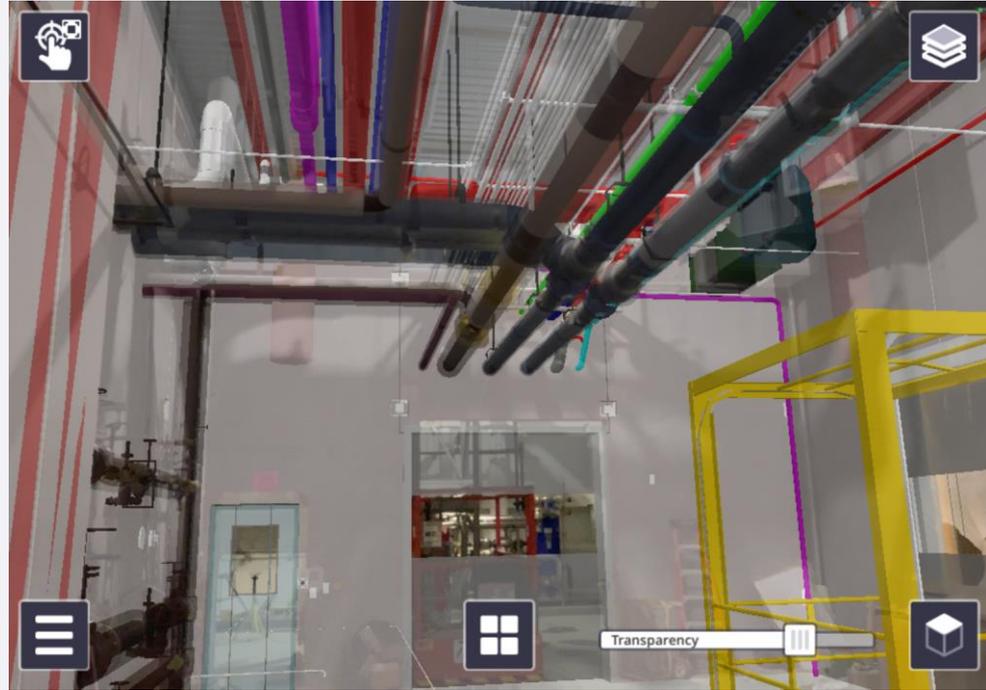
Miron Construction

- By viewing the 3D model as an overlay on the real site, issues can be easily identified

- Once identified, issues can be visually conveyed to sub contractors immediately on site

"The intriguing thing is we can validate these processes very easily when we overlay the model. We can see the pipes lined up in the model with what is actually being assembled in the field. Prior to having this tool, we didn't have a way to convey this visually to our contractors." **-Kacie Hokanson, Virtual Construction Specialist l Miron**

McCorvey Companies

- **Role:** Sheet Metal Contractor

- **Use Case:** Connecting Field & office

- **Problem?:** Lack of communication, job tracking, integration to Office 365, resource costs and drilling into concrete

"At McCorvey Companies we believe in a saying called "lean and mean" FieldLink and the speed at which we can layout and install has helped us add new meaning to that saying. " *-Mitchell Batten, Layout & Scanning Manager*