

How John Holland turns site reality into action on complex infrastructure projects, with Spatial Intelligence

A Tier One contractor uses Spatial Intelligence to verify design against as-built, catch clashes at the cheapest possible moment and create a Defensible Record across complex hospital and stadium projects



John Holland is using Spatial Intelligence to verify what is built against what was designed, catching clashes at the design stage and creating a Defensible Record that holds up at handover and years beyond. Mitchell Erickson, Group Manager for Digital Engineering, puts it plainly.

“One of the most significant challenges delivery teams have throughout the industry is the availability of information, and the timing of that information being accessible.”

Mitchell Erickson

Group Manager, Digital Engineering, John Holland

Key facts

Project profile

- **Company:** John Holland Group
- **Project types:** Healthcare, stadiums, transport infrastructure
- **Featured projects:** Sydney Football Stadium, major hospital, Adelaide infrastructure project
- **Key challenges:** Manual documentation, late clash detection, maintaining design-reality alignment

Results

- Reduced manual site documentation burden
- Created defensible 3D as-built records
- Enabled rapid virtual progress verification for clients
- Resolved coordination issues and clashes at the least-cost stage

The challenge

For more than 75 years, John Holland Group has been delivering some of Australia and New Zealand's most complex infrastructure projects. As technology and client expectations have evolved, so has the scale and complexity of projects.

Equipping the John Holland team with the tools and capabilities to meet and exceed the requirements of projects including the Melbourne Metro Tunnel and healthcare facilities like Sydney Children's Hospital meant shifting beyond legacy, high-risk manual documentation approaches.

The old way was slow and fragile. Site supervisors carried ring binders of PDFs, checklists and forms. Manual annotation took hours, and by the time records were complete, site conditions or design specifications had often already moved on. When clients, auditors or disputes required proof of what was built and by whom, evidence had to be reassembled from fragmented sources.

Key challenges:

- **Manual documentation burden**
ring binders, PDFs, multi-colour markers and hours of annotation
- **Delayed information**
design changes during construction were difficult to communicate to all parties quickly
- **Rework from late clash detection**
coordination issues discovered on site, costing time and materials
- **Fragmented evidence**
no single source of truth to close the loop on project documentation for clients and stakeholders
- **Limited client visibility**
verification of progress required site visits



The solution

Reality capture has become, in Mitchell's words, a "significant bonus to the way our construction teams capture information." Cupix was first adopted on complex hospital projects and on a major infrastructure project in Adelaide, where it is now central to tracking site activities and to client communication.

"It gives our site team members the ability to track and record key pieces of install," Mitchell says.

The physical load on site supervisors and project managers is lighter. Instead of the traditional stack of ring binders, someone walks the site with a 360 camera and the scans flow automatically into the project's Common Data Environment. Hours of manual markup after site visits are no longer part of the job.

"The ability to have a 3D capture of site installation is a genuine value add to our business."



Detect issues before they become defects

Cupix correlates site scans to real-world coordinates in three dimensions. Those scans overlay the BIM model to track progress through time, check accuracies and tolerances, and quantify the work of specific subcontractors and trades to validate milestone and progress payment obligations. This is Risk Detection applied to the build itself.

Sydney Football Stadium coordination

On what looked like a "simple structure with the finished façade cladding, does not tell the complexity of the structure," Mitchell Erickson's Digital Engineering team used BIM coordination with Cupix's reality capture to examine aspects impossible to read from 2D plans, including access requirements, service locations and structural alignment.

This enabled issues to be resolved at the design stage, with "reviews captured with the site delivery teams on screen," rather than risking rework or post-completion rectification.

Sydney Football Stadium coordination

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“This would have been difficult to pick up until site installation and then cost and reworks ensue, whereas the teams can mitigate that risk before site tasks become an issue.”

Linking design intent to site reality: Cupix connects John Holland’s BIM model repository to current project data.

The team can:

- Hundreds of hours saved per year in travel and site visits
- Check tolerances and accuracies
- Validate subcontractor milestones to support progress payments
- Send issues directly to the design team via Revizo integration

“When you do a 3D capture on site and use that to update your model, you actually get a validated installed model of what has actually been installed. That’s a great closing out of the loop.”

The Defensible Record

Cupix correlates site scans to real-world coordinates in three dimensions. Those scans overlay the BIM model to track progress through time, check accuracies and tolerances, and quantify the work of specific subcontractors and trades to validate milestone and progress payment obligations. This is Risk Detection applied to the build itself.

Accountability

Trust is everything in construction. Integrating as-built reality capture with the detailed 3D BIM model gives clients enhanced visibility, without the need for regular site visits.

Operational handover

At project completion, Cupix helps integrate BIM, progress scans and as-built imagery into an accurate as-built model with attached warranties and specifications.

“Buildings don’t have a five-minute lifespan, so should an item fail further down the track, it can actually be retraced, replaced with minimal impact to other services and other systems.”

“John Holland is looking to grow its digital engineering offering across the lifecycle of our projects, and having tools like Cupix enabling our project teams to add efficiency gains into their daily tasks, and ensuring project information is available and able to be interrogated, is where we want to be.”

Mitchell Erickson

Group Manager, Digital Engineering,
John Holland

The result

John Holland is expanding the use of Cupix across all its projects to enhance its digital-first strategy for engineering, delivery and close-out of complex projects. John Holland has an engineering base with digital delivery to help and support clients that may not have a mature digital framework to support project delivery, while also helping them develop and grow these capabilities within their businesses.

Outcomes:

Documentation burden removed

- Site supervisors no longer carry ring binders or spend hours on manual markup
- 360 scans automatically populate the Common Data Environment
- Time savings let teams focus on coordination, not paperwork

Early issue detection

- Caught hydraulic riser and façade bracket conflicts during design coordination
- Eliminated potential rework by moving risers before installation
- Maintained project schedule without costly on-site corrections

Client transparency without site visits

- Clients verify progress virtually, building trust through visibility
- Enables remote stakeholder engagement on sensitive projects
- Provides defensible proof when questions arise

Protected project teams

- Time-stamped, geo-tagged records for claims and audits
- Validated installed models, distinct from design intent where reality has moved
- Clear accountability for who did what, when and where

Better operational handover

- Accurate as-built models with warranties and specifications attached
- Facility owners can retrace and replace failed items years later
- Minimises impact on other systems during maintenance



Looking ahead

John Holland's digital engineering approach, grounded in Cupix's Spatial Intelligence, exemplifies its commitment to delivering projects with safety, quality and lifecycle thinking embedded from design through to handover and beyond. By making reality capture a standard practice, the team creates value for every stakeholder, from the design office to the site, and through to the boardroom and the occupants.

