vSite
by vGIS Inc.

Case Study | ISL Engineering

Improving design accuracy and shortening review cycles

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vGIS Inc.
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Summary

ISL Engineering, a leading Canadian civil engineering firm, faces a common challenge across the industry with traditional 2D design reviews, notably being difficulties visualizing complex projects, miscommunication, and costly late stage design changes.

The ISL Engineering Field Team Using vSite AR
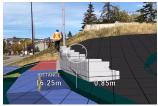Photographer: Alex Pym, ISL Innovation Coordinator

In late 2024, ISL trialed and implemented vSite technology on a large, multidisciplinary project. vSite is an augmented reality platform that has opened the door to process transformation. By overlaying 3D design models onto real-world views, the technology enables enhanced visualization, early error detection, and real-time collaboration. ISL looks forward to leveraging vSite to improve design accuracy in real-world conditions, shorten review cycles, and increase client satisfaction through clear, immersive project design reviews. The technology is also being explored for site-based data collection and construction documentation, expanding its value across project phases.

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ISL Team using Trimble GNSS receiver with vSite AR
Photographer: Alex Pym, ISL Innovation Coordinator

Background

ISL Engineering is a prominent Canadian firm known for its expertise in civil engineering design and construction management. With over 550 employees, ISL undertakes a wide spectrum of projects ranging from highways and bridges to urban development.

ISL continually invests in Technology and Innovation. This involves piloting new technologies that might streamline project workflows, enhance safety, and improve client satisfaction. Over the last few years, the AEC industry has seen a surge in digital tools designed to address the limitations of traditional paper-based methods, especially in areas like design reviews, construction management, and on-site coordination.

Augmented reality (AR) is seen as a technology that can address some of the persistent bottlenecks in ISL's design workflow. After evaluating multiple platforms and experiencing the tool first hand at Autodesk University, ISL decided to trial and adopt **vSite** by **vGIS Inc.,** an AR software solution that overlays 3D design models onto real-world environments via tablets or mobile devices. ISL has taken notice that the industry is swiftly moving toward more collaborative and immersive design review processes and believes early adoption of AR tools will offer a competitive edge and improved project delivery.

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Challenge

ISL's traditional design review workflow is rooted in traditional 2D drawings typically generated from CAD software. While many in the engineering field are well-versed in interpreting these drawings they can still pose challenges for large, complex and multidisciplinary projects. Roads, bridges, and civil infrastructure often involve intricate designs with multiple layers—utilities, surface features, safety barriers, and more—that can be difficult to fully grasp using conventional paper prints or PDF markups. This reliance on two-dimensional representation can create several interconnected issues.

1. **Data Visualization:** First, the firm encounters consistent difficulties in visualizing three-dimensional designs during internal reviews and client presentations. Even a detailed CAD plan broken into numerous cross-sections and elevation views cannot always convey the real-world appearance or spatial relationships of a complex project. Bridges, for instance, involve multiple structural components such as abutments, piers, decks, and reinforcement details. Trying to mentally combine all these elements from multiple 2D drawings can lead to oversights or misunderstandings, especially for stakeholders without a technical background. This can lead to increased rework and associated cost during construction.

2. **Alignment:** Second, because everyone involved in the design process interprets 2D drawings slightly differently, miscommunications sometimes emerge. A particular slope or grading detail might appear one way on paper, but it could conflict with existing site conditions once the project moves into the field. These discrepancies often required last-minute design modifications that added cost and time to the project. According to a 2019 study in the Journal of Information Technology in Construction (ITcon), up to 40% of construction rework can be traced to design miscommunication and inadequate documentation.

3. **Design Adherence:** Third, site reviews typically involves visiting the proposed construction location with paper drawings in hand. For projects in northern Canada or areas with harsh climates, cold weather or uneven terrain made this approach cumbersome. It was difficult to align the flat drawings with the real environment, and participants often struggled to visualize precisely how the design would fit into the existing terrain or infrastructure. This issue is particularly acute for complex sites with multiple constraints, such as wetlands or built-up urban environments, where even slight inaccuracies in design assumptions could have significant consequences for safety and budget adherence.

Visualizing underground utilities in augmented reality

4. **Quality Control:** Finally, design flaws or overlooked conflicts were rarely discovered until the construction phase, when they became far more expensive and time-consuming to fix. Costs associated with delays, rework, and potential legal disputes can escalate quickly. For instance, a seemingly minor oversight in a highway design—like misplacement of a drainage culvert—can lead to severe flooding, necessitating remediation that costs far more than correcting it at the design stage. With these inefficiencies in mind, ISL recognized that an AR-based solution could help close the gap between initial design intent and the tangible conditions on the ground. This aligns with ISL's strategic BIM plan. *Building Information Modelling (BIM)*

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Solution

ISL sees **vSite** by **vGIS Inc.** as a way to address these pain points within its design review and collaboration processes. The vSite platform offers an augmented reality interface that superimposes 3D design models onto the real-world environment using mobile devices such as iPads.

Viewing vSite on iPad Pro | Photographer: Alex Pym

This immersive approach has the potential to transform the way ISL teams assess design feasibility. By placing the 3D model directly into the context of the actual site, participants can identify potential conflicts quickly. For example, if a retaining wall clashes with roadway lighting, or fails to properly support water run off, the change of perspective for designs improves the likelihood of this being caught early in design. AR technology effectively merges the digital model with on-site reality, making any inconsistencies stand out in a manner that even the most detailed 2D diagram fails to capture.

Beyond direct design visualization, vSite also supports collaborative features that facilitate real-time feedback. Participants on-site can mark concerns directly in the AR view, capture screenshots, and share them with off-site colleagues or clients who could not attend the visit. These collaborative capabilities streamline the communication loop, reducing the time typically spent collecting notes, converting them into more official documentation, and circulating them among the project team.

For larger and more complex projects, such as highway expansions that involve multiple stakeholders (including municipal governments, private developers, and community groups), vSite serves as a communication bridge. Because the software is intuitive and does not require extensive training for basic viewing, stakeholders from diverse backgrounds—engineers, planners, public officials, and community members—can experience and evaluate the proposed design together. This inclusive approach fosters transparency and consensus-building, areas often cited as critical for project success in major infrastructure initiatives.

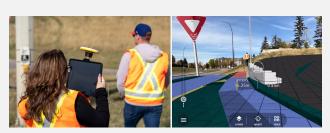vSite AR visualizes BIM designs in real-time | Photographer: Alex Pym

Benefits

ISL's progress toward integrating vSite technology has the potential to transform the design review process and aligns with the company's strategic vision of becoming a leader in AEC and BIM.

The most immediate effect was an **enhanced design understanding** for everyone involved. Instead of poring over numerous plan sheets contributors could see a life-sized model of a highway, bridge, or drainage system in the actual site context. ISL found that the AR solution levels the playing field for all stakeholders and improves contributors ability to understand and place the design in the real world. In this way, clashes and issues are more likely to be detected earlier in the project life cycle. In this trial and implementation, AR allowed the project teams to virtually step into their as-built projects before construction even began. This clarity not only built trust but also reduced the likelihood of last-minute design changes driven by misunderstandings about project scope or appearance.
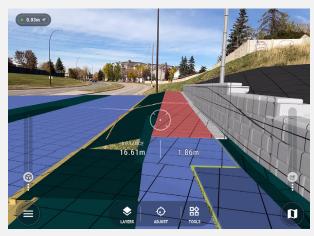
In parallel, ISL sees value in vSite to support the **early detection of design errors**. Because vSite highlights clashes or spatial discrepancies early on, the project team could make adjustments long before those issues escalated into costly construction setbacks. Uncovering a mistake at the 30% or 60% design stage is substantially cheaper and less disruptive than discovering it once excavation, concrete pouring, or utility relocation is already underway.

Another related outcome was **improved design accuracy and quality**. Conducting on-site reviews using AR allowed engineers, technologists and project managers to refine

Photographer: Alex Pym

design elements according to real-world constraints. For instance, if the alignment of a retaining wall needed to be adjusted for drainage or for alignment with existing infrastructure, they could verify the change immediately by overlaying the revised model on the site. ISL sees significant value in the ability to create a continuous feedback and design iteration cycle, connecting the field and the office seamlessly. The firm believes that continued investment in this space will lead to higher quality deliverables, fewer surprises in construction and improved convergence on design solutions with on-site validation.

Viewing project plans in the field with vSite AR.

Finally, these improvements are anticipated to translate into **increased client satisfaction**. AR-based design reviews tend to engage clients more deeply, as the technology offers an intuitive and visually striking experience. Clients can walk through a future highway or stand beneath a to-be-constructed bridge on a tablet screen, seeing how the structure integrates with the surrounding landscape. This sense of immersion and "realness" fosters confidence that the project team understands client needs and site conditions. It also shortens the time it takes to get approvals, as fewer concerns remain unaddressed or unclear.

Conclusion

ISL Engineering's piloting and implementation of vSite underscores the transformative power of augmented reality in the AEC industry. Shifting from reliance on 2D drawings to immersive 3D overlays solved a host of long-standing problems: design misinterpretations, communication gaps, cumbersome site visits, and late-stage discovery of costly errors. By placing the engineering team and clients literally "inside" the design before it's built, vSite fosters clearer understanding, faster decision-making, and stronger collaboration.

Looking ahead, ISL plans to explore additional ways vSite can advance its operations, including better utility mapping and preliminary site data capture, as well as for construction documentation and contract administration. These expansions promise to deepen the firm's expertise in next-generation construction technologies, ensuring that ISL remains a go-to solution provider for clients who demand both technical excellence and innovative thinking. In an industry increasingly defined by rapid technological shifts, ISL's experience shows how embracing augmented reality can propel an organization into a new era of design reviews, fostering safer, more efficient, and more successful projects.

ISL

Integrated Expertise.
Locally Delivered.

- ○ Enhanced Design Understanding
- ○ Early Detection of Design Errors
- ○ Improved Design Accuracy
- ○ Increased Client Satisfaction

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These results highlight how vSite transforms infrastructure projects by streamlining workflows, enhancing situational awareness, and mitigating risks. Its survey-grade accuracy and real-time data visualization ensure that critical project elements are executed with precision, fostering greater efficiency and collaboration across teams.

By unifying data from BIM, GIS, and reality capture into a single interactive view, vSite empowers project teams to confidently address challenges with agility and accuracy.

As demonstrated in this project, vSite is an indispensable tool for delivering infrastructure projects safely, efficiently, and with simplified documentation, setting a new standard for project excellence.
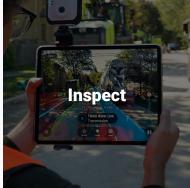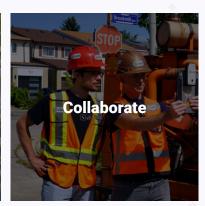
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The vSite platform standardizes data collection, improves speed and accuracy of documentation, and enables real-time insights.

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