



Is Real-Time Construction Verification a Reality?

No

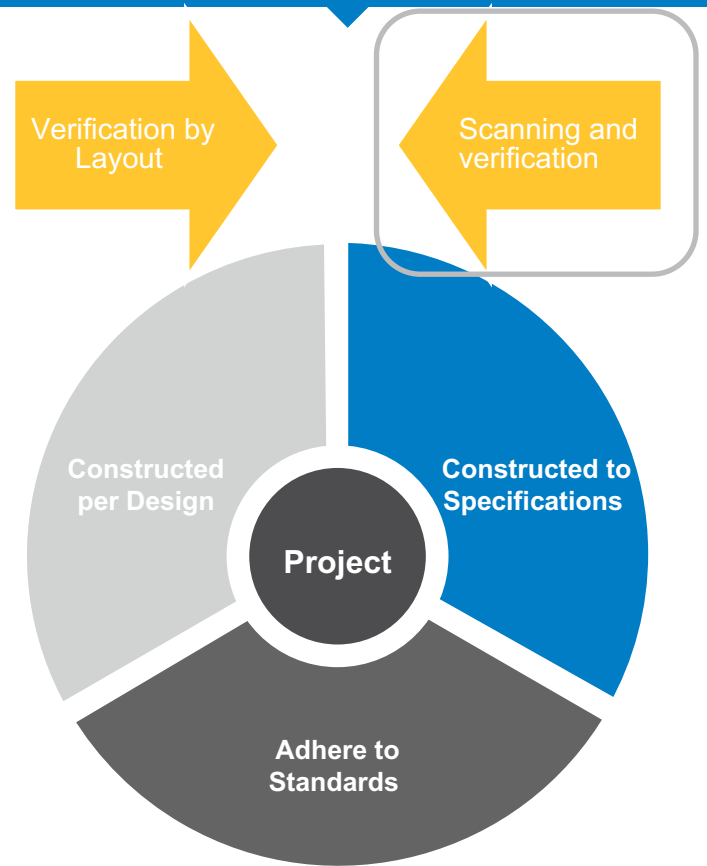
but I like to think we keep getting closer

Agenda:

- Construction Verification
 - What is it?
 - Why is it Important
- Adopting the kaizen approach
(Hardware / Software / Workflow)
- Future?



What Do We Mean By Construction Verification



Why Is Construction Verification Important ?



It helps to ensure that the construction **work is completed safely and to a high standard** of quality. This is important to protect the safety of workers and the public, and to ensure that the project will meet its intended purpose.



Construction verification helps to **identify any issues or problems with the construction work early on**, before they become more serious and costly to fix. This can help to prevent delays and cost overruns and ensure that the project is completed on time and within budget.

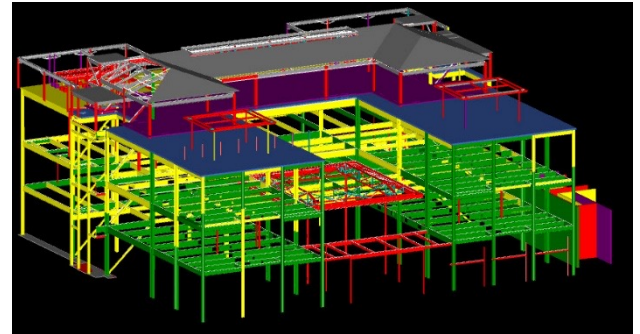


Construction verification can help to **protect the interests of the owner or client** by ensuring that they receive the quality of work they paid for. This can help to prevent disputes and legal issues down the line.



Steelwork Validation Example

- 500+ steel elements analysed
- More than 50% of steel was installed incorrectly
- Initial results found some steel members more than 70mm out of tolerance



The application of Kaizen

Standardizing processes: This involves developing standard operating procedures that eliminate variation and improve quality. By standardizing processes, organizations can reduce errors and improve efficiency.

Continuous training and development: This involves providing training and development opportunities to employees to improve their skills and knowledge. This can help employees to work more efficiently and effectively and can lead to better quality products or services.

Visual management: This involves using visual aids such as charts, graphs, and diagrams to communicate information about processes and systems. This can help to identify areas for improvement and make it easier for employees to understand and follow procedures.

Value stream mapping: This involves mapping out the entire process of delivering a product or service and identifying areas for improvement. This can help organizations to identify bottlenecks and eliminate waste, leading to improved efficiency and reduced costs.

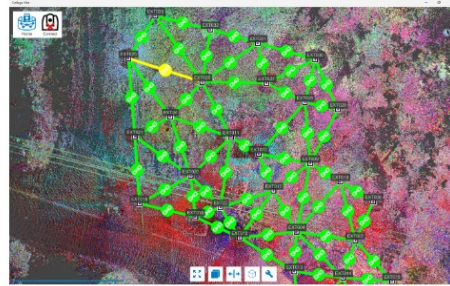
Kaizen is a Japanese term that means "continuous improvement." It is a philosophy that emphasizes the importance of making small, incremental improvements to processes and systems over time.

Continuously Improve The Construction Verification Process



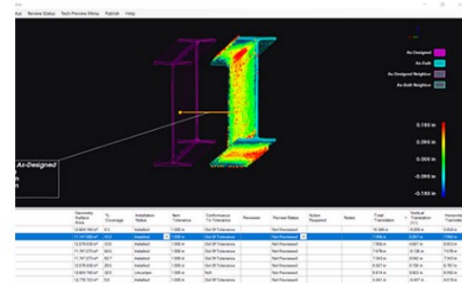
1. Layout / Scan

GTL-1200 Robotic Scanning Total Station



2. Process

Collage Site Software



3. Verify

Verity for Autodesk® Navisworks®

Solution Summary



- Collage Site is a registration product developed by ClearEdge3D that works alongside the GTL1200 and GLS2200.
- It has been designed to be run on a Windows based touchscreen tablet so that an operator can register and process the scans in the field as they are carrying them out.
- The tablet connects via Bluetooth and WIFI to control the devices and pulls the scan data from the GTL1200 or GLS2200.
- Collage Site utilises technology developed by Topcon to allow the ability to import 3D model files for on-tablet visual validation. (.OBJ, .FBX and .3DS currently supported).
- Collage Site allows for the export of point cloud data to a wide range of standard formats, (LAS, E57, PTS, CLR and RCS)



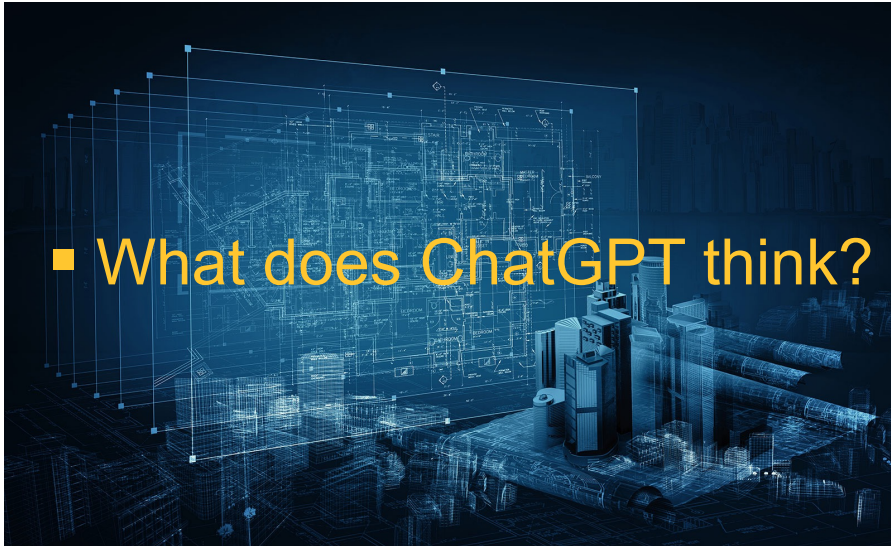


Is Near Real-Time Construction Verification a Reality?

Yes

but everyday we strive to improve it further.

The Future?



Building Information Modeling (BIM) is expected to play a significant role in the 4th industrial revolution as it enables the digitization and automation of the construction industry, leading to increased productivity, reduced costs, and improved safety. BIM, when combined with 3D laser scanning, allows for the creation of accurate and detailed digital representations of physical buildings and infrastructure, which can be used for design, construction, and maintenance purposes.



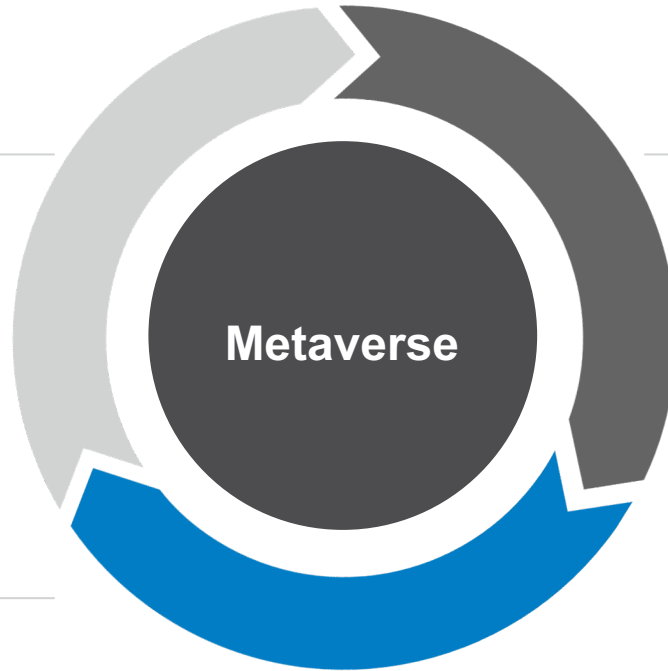
Digital twins, which are virtual replicas of physical objects or systems, can also be created using BIM and 3D laser scanning data, providing real-time information on the status and performance of buildings and infrastructure. These digital twins can be used to optimize energy efficiency, predict maintenance needs, and simulate various scenarios, allowing for better decision-making and more efficient operations.

In the context of the metaverse, BIM, 3D laser scanning, and digital twins can provide a wealth of information and data that can be used to create more accurate and immersive virtual environments. By integrating these technologies into the metaverse, users can experience virtual buildings and infrastructure that closely resemble their physical counterparts, enabling them to interact with and manipulate virtual spaces in new and exciting ways. Overall, the combination of BIM, 3D laser scanning, and digital twins has the potential to significantly enhance the capabilities and possibilities of the metaverse, creating new opportunities for innovation and growth.

The Future?

Virtual reality (VR) and augmented reality (AR) technology, which allows users to enter into and interact with the virtual world

Artificial intelligence (AI), which is used to create intelligent and responsive virtual environments.



Blockchain technology, which allows for the creation and exchange of virtual assets within the Metaverse.

Thank you!