

FARO Feature on Construction QC - BIM

Using BIM for Construction QA/QC

What if it's Simpler than Imagined?

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The Construction industry's lukewarm reception towards technology is a challenge that is well documented, and one that has held the market back from its full potential over the last couple of decades. According to KPMG's Global Construction Survey ¹, where over 200 major project owners and contractors rated themselves on technology adoption, only 8% of these companies emerged as "cutting-edge visionaries".

While this minority group adeptly made use of various solutions such as project management information systems (PMIS), automated digital workflows, data and analytics, and Building Information Modeling (BIM), most others have remained conservative, choosing to rely on 'tested and proven' methods of project management. Often, companies cite lack of certainty in reaping the full benefits of new technology, vis-à-vis the costs and risks involved. For some others, it is the mere reluctance of stepping out of one's comfort zone that hinders innovation.

Digitization & BIM Implementation

That said, market observers believe that a new day is dawning for the industry, as companies increasingly recognize the positive impact that digital technology has on the full life cycle of a building, beyond its construction stages. Government bodies around the world have begun promoting and mandating the use of BIM², in hopes of transforming industry practice, improving productivity levels, as well as boosting integration and collaboration across the construction value chain.

In essence, BIM is a digital representation of the physical and functional characteristics of a project, which forms a reliable basis for decisions during the project's life cycle – right from the conceptual stage through preliminary and detailed design phases, to construction and as-built (or maintenance and occupancy management) stages. This information can be shared with various project member groups on demand, providing greater transparency and traceability across stages. But perhaps most attractive of all, BIM implementation offers project owners tangible benefits such as shorter project timelines, less material wastage, and increased profitability.



The Concept of Traceable Construction™ – an overview of traceability across the construction value chain.

Concept of Traceable Construction™ Explained

The transparency and traceability of a construction project offer great benefit to all project participants in terms of time and money. These factors are also essential for successful lean projects.

Today, project owners have access to efficient, forward-looking solutions that address a diverse range of needs in the various life phases of a building – whether it be **design**, **build**, or **operate**.

- **On-site Capture:** High-speed data acquisition, on-site registration, and survey control
- **As-built Model & Design:** Plan and design building projects based on as-built conditions
- **Design Layout:** Speed up workflow by projecting virtual templates for pre-fabrication or at construction sites
- **Quality Control:** Perform immediate, real-time build and verify analysis throughout the entire project
- **Data Connect & Share:** Communicate data across a building's life phases

¹ KPMG, [Global Construction Survey: Building a technology advantage](#), September 2016

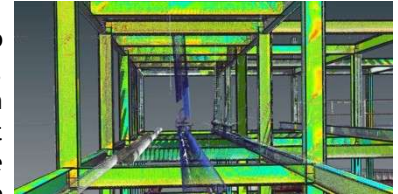
² Geospatial World, [BIM adoption and implementation around the world: Initiatives by major nations](#), 5 April 2017

An Easier Approach to QA/QC in Construction

Responding to the industry's need for a simpler and better way to harness the capabilities of BIM, software developers today offer construction professionals the ability to continuously monitor a project with real-time comparisons against CAD designs. Project owners and contractors can now confidently manage all quality assurance and quality control processes on a single platform, throughout building and facility lifecycles.

Validate to Design Models

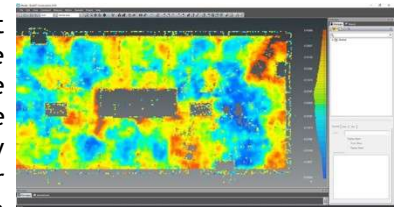
The ability to ensure buildings and structures are constructed exactly to design specifications is of paramount importance to architecture, engineering and construction (AEC) professionals. By comparing 3D scan data with design models at each stage, project owners can detect incorrect placements or missing features (e.g. walls, columns, beams, pipes) before it is too late. This reduces prolonged hours of manual validation to mere minutes, making construction QA/AC analysis a breeze.



Validate 3D scans to digital design files with a 3D analysis

Tolerance Evaluation

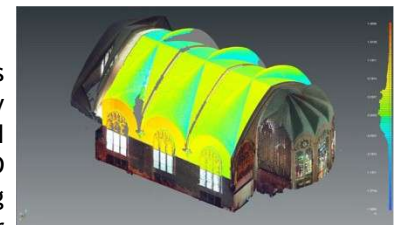
Keeping projects on schedule and minimizing any wastage within a project are also high priorities for AEC professionals. While cost and schedule overruns are the norm in the construction sector, companies should not be resigned to accepting them. Today, it is possible to perform accurate measurements quickly and easily on key elements of a project, as frequently as is necessary. Contractors can routinely inspect construction work for adherence to building standards, whether for floor flatness/levelness, beam camber, or wall plumbness. In the grand scheme of things, these measurement tasks can help accelerate project schedules and reduce expensive scrap and rework.



Perform full digital tolerance evaluation of any project feature, such as floor flatness.

Positioning and Monitoring

Beyond performing quality checks on building structures, project owners will find BIM useful for liability documentation, risk mitigation, and quality prefabrication. Comprehensive software solutions are now even equipped to verify shifts and movements, displaying changes over time with 4D analysis. AEC professionals can monitor adjacent buildings during construction and evaluate any site deformation (measure movement or settling over time). Additionally, companies can project design templates for prefabricated parts and assemblies with the help of a laser projector, or position structural elements and prefabricated parts in real time using laser trackers or total stations.



Compare scans over time to capture structural changes (such as shift or drift) with 4D monitoring.

The FARO BuildIT Construction Software is a platform that seamlessly integrates the functions described above. The software enables laser scanner users to perform immediate, real-time build, and verify analysis throughout an entire project, facilitating a new level of cost management and operational efficiency.

Shaking the Reputation

Slowly but surely, the Construction industry will make headway in shedding its image as one of the least digitized sectors. As various members of the AEC profession open up to technology adoption, equipment and software providers will offer even more solutions to meet the industry's needs, so that what seems impossible today may quickly become tomorrow's reality.

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