

The Ultimate Guide to 3D Technology in Concrete Construction Workflows

Fix Concrete Slabs Before They Cure



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Introduction

It wasn't too long ago that concrete contractors had to hire third parties to validate the accuracy of their pours. This process meant waiting until the concrete was sufficiently cured, waiting for the results of FF/FL measurements to be calculated, and then having to fix any issues – all this was once considered unavoidable.

Fortunately, technology has developed to the point where putting up with these inefficiencies is no longer necessary.

With 3D laser scanning, contractors can identify any high or low points minutes after the concrete slab has been poured and screeded. In many cases, crews can then smooth over those areas while the concrete is still workable. When the rework is complete, the slab can be scanned again to ensure that specified FF/FL numbers have been achieved.

The result is faster quality verification, reduced time on site, project costs kept to a minimum, and the team has documentation and images proving that the slab complies with FF/FL standards.

3D laser scanning streamlines concrete workflows in ways that traditional methods cannot, including:

- **Same-Day Assessment:** With laser scanners, the flatness and levelness analysis can be performed the same day a slab is poured. Other methods require the concrete to be cured before doing so.
- **Speed:** Traditional methods (dipsticks, straightedge tests, wheel-based profilers, etc.) are slow and tedious, and floor analysis can take up to 48 hours to complete. Laser scanners, by contrast, generate a 3D heatmap of the slab in minutes.
- **Accuracy:** While a laser scanner produces a precise, complete visual representation of the site, traditional measurement data is incomplete due to a limited number of measurement points, increasing risk that mistakes are not caught.
- **Verifiable:** With traditional methods, the results can vary from person to person, with no true record of where the measurements were taken spatially. Laser scanning provides a 3D-documented result, allowing for independent investigation and data testing.
- **Less Rework:** With traditional methods, there is no way to know if the rework has truly corrected the error, making multiple rounds of rework likely. With 3D data capture technology, you can be confident that only one round of rework is required, as you can scan the fixes immediately after they have been made.



Concrete Workflow Using a 3D Reality Capture Solution (FARO Focus Laser Scanner + BuildIT Construction Software)

Step 1. Pour the Concrete

As the field crew prepares the job site and readies the concrete, those operating the Laser Scanner can determine where, and how many times, they will need to scan the slab. These pre-scan tasks can be performed before the concrete is poured, or while pouring/smoothing work is in progress.



“We are scanning during the pour, we can address issues real-time, providing that feedback to the team, and pointing out potential issues that could affect our FF and FL numbers.”

Josh Englebrecht

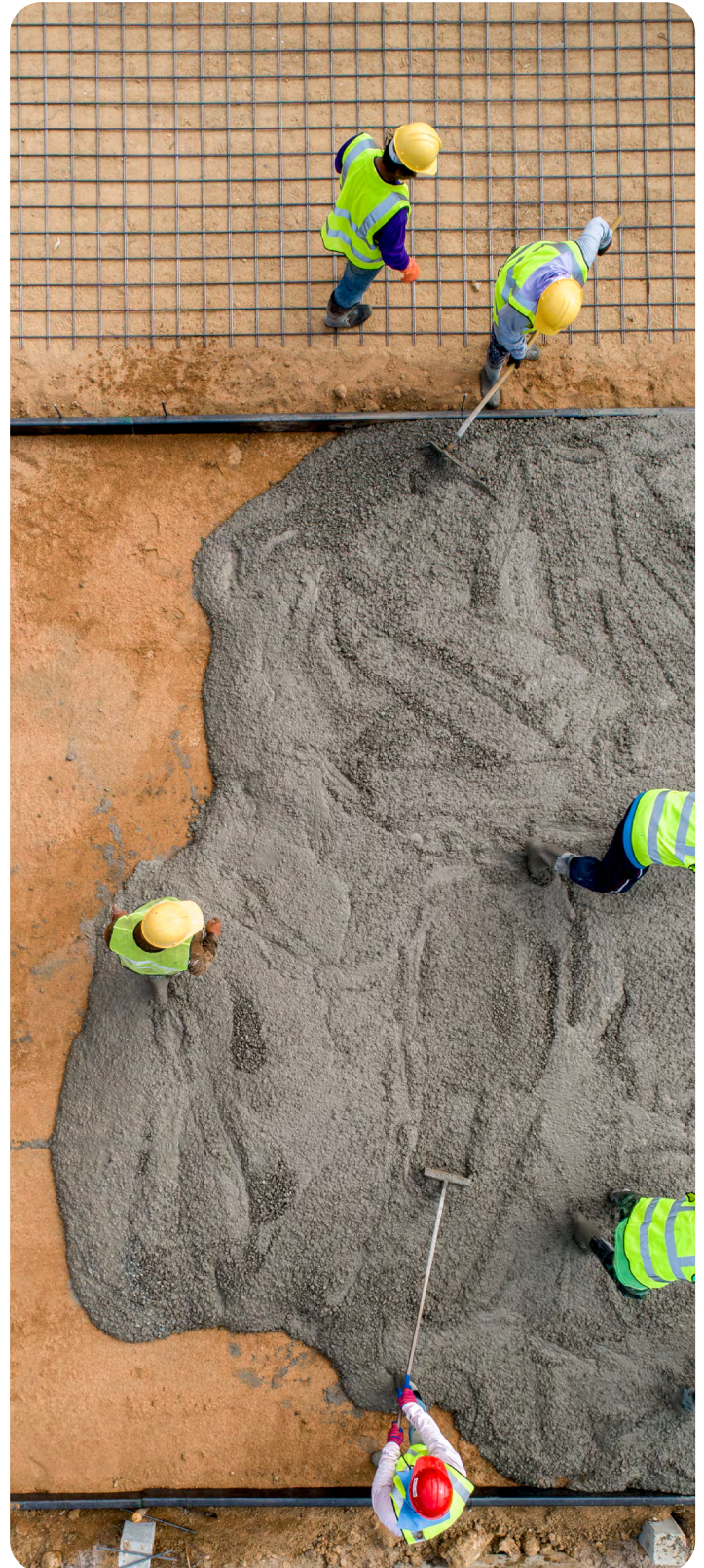
Field Technology Engineer, DHL Construction

Step 2. Scan the Concrete Slab

Set up the FARO Focus Laser Scanner at the determined position. Select the appropriate resolution depending on the device's distance from the slab and perform the scan. Repeat this process as often as needed to ensure sufficient coverage of the poured slab, but often only one scan is needed.

It is possible to reduce the number of scan positions needed by raising the height of the scanner above the slab. Collecting data from a higher elevation will improve the quality of data at the other end of the slab from the scanner.

The scanner can be controlled remotely by smartphone or tablet if it is elevated beyond reach using the built-in Wi-Fi.



TOTAL TIME SAVED: Around 12 hours



Product Profile – FARO Focus Laser Scanner

FARO Focus Laser Scanners are specifically designed for both indoor and outdoor measurements. The device captures real world information that can be used to analyze, collaborate, and make decisions to improve and maintain project and product quality. Check out the FARO Focus Laser Scanner [Tech Sheet](#).

Step 3. Compile Scan Data into 3D Model

Once the scans are complete, do the following:

- Transfer the captured reality data into a folder on your laptop hard drive
- Open BuildIT Construction Software
- Bring the captured data into the software

The software compiles the required information from the scan(s) and renders them into a high-definition 3D model.

Use the interactive workbench to **analyze FF/FL rapidly** and identify any out-of-tolerance areas. The results of the analysis can be displayed as a **3D color heatmap** of the concrete slab, making clear where any dips or bulges are located.

The entire process takes about 10 to 20 minutes.



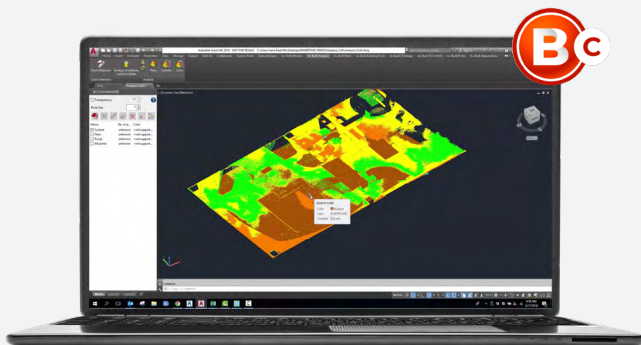
TOTAL TIME SAVED: 10 - 12 hours



“Our teams have confidence in the new technology ... Better yet, they know immediately they’ve delivered a high-quality slab that will pass any third-party review. We have F-number documentation to prove it.”

Thomas Rogers

VDC Field Manager, McCarthy Building Companies, USA



Product Profile – BuildIT Construction Software

BuildIT quickly and easily performs construction QA/QC analyses using 3D scan data, reducing prolonged hours of manual validation. Check out the BuildIT Construction Software [Tech Sheet](#).

Step 4. Adjust the Workable Concrete

Thanks to the BuildIT Construction Software, operators can easily identify – with pinpoint accuracy – any swells and dips in the concrete slab.

Armed with this data, the team can perform the following tasks:

- Direct the finishing crew to patch up bulges and swells in the still-workable concrete*
- For larger slabs, the scan data helps ensure that future rework gets done right the first time
- For slabs of all sizes, the concrete can be re-scanned, re-worked, and repeated until specified F numbers are reached

3D data capture technology allows you not only to meet the **ASTM International Standard**, but also local specifications and requirements, anywhere in the world.

This ultimately **saves you time and labor costs**, reduces waste, and allows post-slab construction work to begin sooner.

(*Only applicable for slabs of certain sizes)



TOTAL TIME SAVED: 24 - 48 hours



“Multiple tests have shown a 1% difference only between traditional dip-stick measurements and scan analysis. But the answer is available now within minutes instead of hours.”

Thomas Rogers

VDC Field Manager, McCarthy Building Companies, USA



The FARO Advantage

- Dipsticks and other traditional methods only tell you about FF/FL along a straight-line measurement. The FARO Focus Laser Scanner provides information about the full slab, so more informed decisions can be made.
- The FARO Focus Laser Scanner takes 3D measurements while the concrete is still workable, meaning you can rework identified areas the same day that you pour.
- Traditional methods like the dipstick can add thousands of dollars to a project budget, the job can take several days to deliver a report, and there's no guarantee that the corrections you've made will achieve FF/FL standards the first time.
- The laser scanner approach to concrete slab workflow drastically reduces the total job time, which translates into significant cost savings.

The Value of FARO for Concrete Floor Flatness

A new laser scanner might seem like a capital expense you aren't sure you can justify right now. But 3D scan data isn't just for building concrete slabs. The scanner and software solution are applicable to any construction project where you need better data to make faster decisions. From verifying the accuracy of construction to documenting existing conditions and even creating Digital Twins for project closeout, laser scanning is a versatile technology for your construction projects.

The more you use FARO solutions, the more value they will bring to your business.

Let's say you're a contractor that completes two projects per month. By performing a single scan and analyzing the results while the concrete is still wet, you can save 90% of the rework costs associated with waiting until the concrete cures and fixing problem areas identified with a 3rd party.

And that's for a small- to medium-sized business. Large construction firms might complete 10 (or more) times the number of building projects in a month. And the more frequently you use the laser scanner, the greater the value you have from a better understanding of the quality of work, timeliness of information, and reduced rework costs.



The Difference Is Clear

Traditional methods to concrete workflows add hours, if not days, to a concrete project, and there is a high probability that delays will occur. Not only that, but the use of traditional FF/FL assessments take longer to complete and add an extra step to the process.

By contrast, the 3D data capture method:

- Shaves hours off FF/FL analysis tasks
- In some cases, finishing work can take place not long after the concrete is poured
- The team knows where any rework needs to take place quickly, and can use the laser scanner to make certain they've done so

FARO has rewritten the rules of how concrete floors are finished, and with its innovation, time savings, and cost reduction, the 3D data capture method is destined to become a common practice in the industry.

[Schedule a Consultation](#)

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