LEICA GEOSYSTEMS

LASER SCANNING REALITY CAPTURE SOLUTIONS FOR CONSTRUCTION

Increase Profitability by Reducing Rework

PART OF HEXAGON

Leica Geosystems

On a typical construction project, rework accounts for 12 to 15 percent of the cost of construction.

With laser scanning reality capture, you can reduce your rework to 1 to 3 percent or less.

REALITY CAPTURE:

1. Digitally captures a physical reality to document a space for renovation/retrofit
2. Progressively captures construction for documentation and/or validation
3. Bridges the gap between the field and office and reduces rework by identifying construction problems before they occur

Laser scanning reality capture can help you save hundreds of thousands of dollars on change orders, keep projects on schedule and provide valuable information for all stakeholders. These benefits lead to higher profitability and more repeat business.

LASER SCANNING IS A PROVEN REALITY CAPTURE SOLUTION

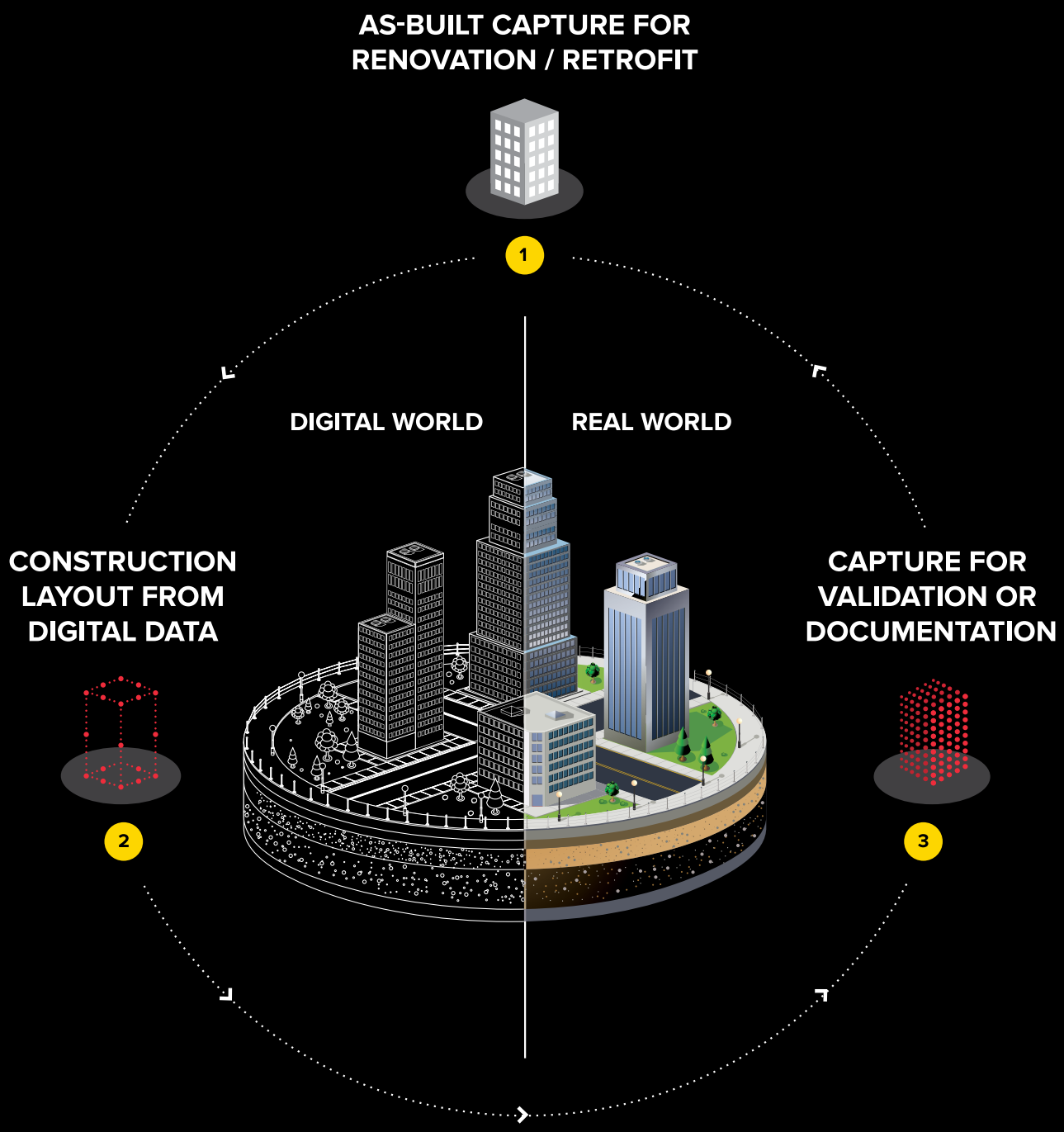
THE TOP SEVEN MOST COMMON APPLICATIONS FOR REALITY CAPTURE IN CONSTRUCTION:

PRE-DESIGN / PRE-CONSTRUCTION

1. Renovation As-Built: Capture existing conditions for modeling and design
2. Structure As-Built: Capture interior structure after demolition for building system coordination

DURING CONSTRUCTION / PROGRESSIVE CAPTURE

3. Pre-Fabrication As-Built: Capture exterior of structure for pre-fabrication of building skin
4. Concrete Slab Flatness: Scan slabs for flatness and analysis (FF/FL)
5. Pre-Pour As-Built: Capture prior to concrete pour to compare with model to detect deviations
6. Milestone Capture: Capture behind walls, above ceilings and under slabs for archival documentation/risk mitigation and validation
7. Communication: Share point cloud data on any device with all stakeholders regardless of experience


AS-BUILT CAPTURE FOR
RENOVATION / RETROFIT
1
DIGITAL WORLD
REAL WORLD
CONSTRUCTION
LAYOUT FROM
DIGITAL DATA
2
CAPTURE FOR
VALIDATION OR
DOCUMENTATION
3

PRE-DESIGN / PRE-CONSTRUCTION: INFORM YOUR MODEL WITH POINT CLOUDS

Starting with an accurate as-built is a crucial first step in eliminating rework and change orders downstream in construction.

A laser scanner measures and records x,y,z points of whatever it sees and “freezes” the site in time in its current form. The resulting data, in the form of a point cloud, can then be brought into CAD or BIM software and used to develop extremely accurate existing condition drawings and models.

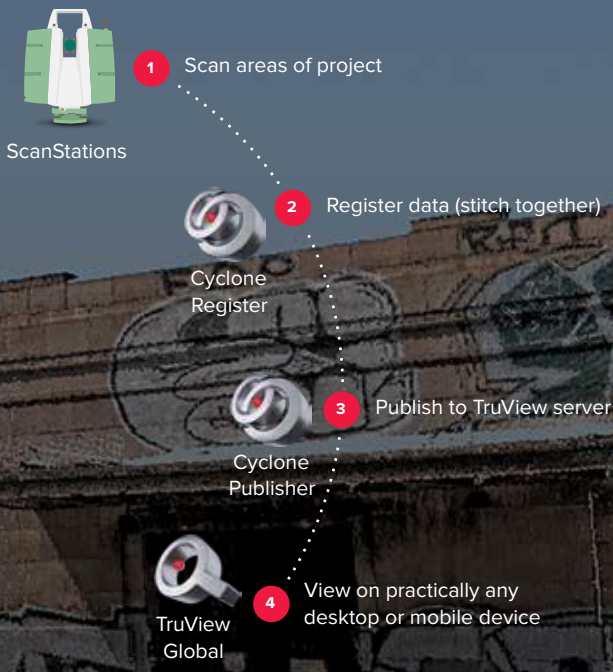
The point cloud data from a high-quality laser scanner is so complete that it provides the team with details all the way down to the bolt patterns on steel pipe fittings. Many software packages have built-in libraries where actual sizes of steel and/or pipes can be identified and modeled directly from the point cloud.

Libraries of shapes or grouped models can be made and used throughout the site. The point cloud can also be used to create paths with the correct clearances to remove large equipment from the site once construction is complete.

UBIQUITOUS POINT CLOUD SHARING

BENEFITS:

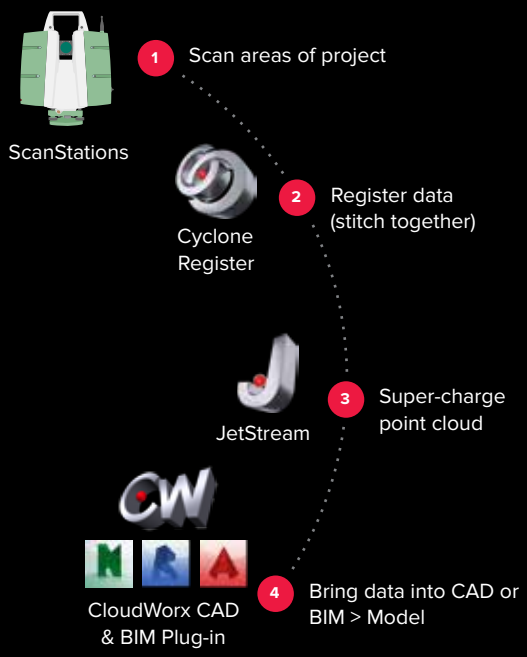
- View and measure point clouds
- Conduct mobile visual deviation detection
- Conduct mobile virtual safety inspections
- View on practically any device
- No CAD, BIM or point cloud expertise needed

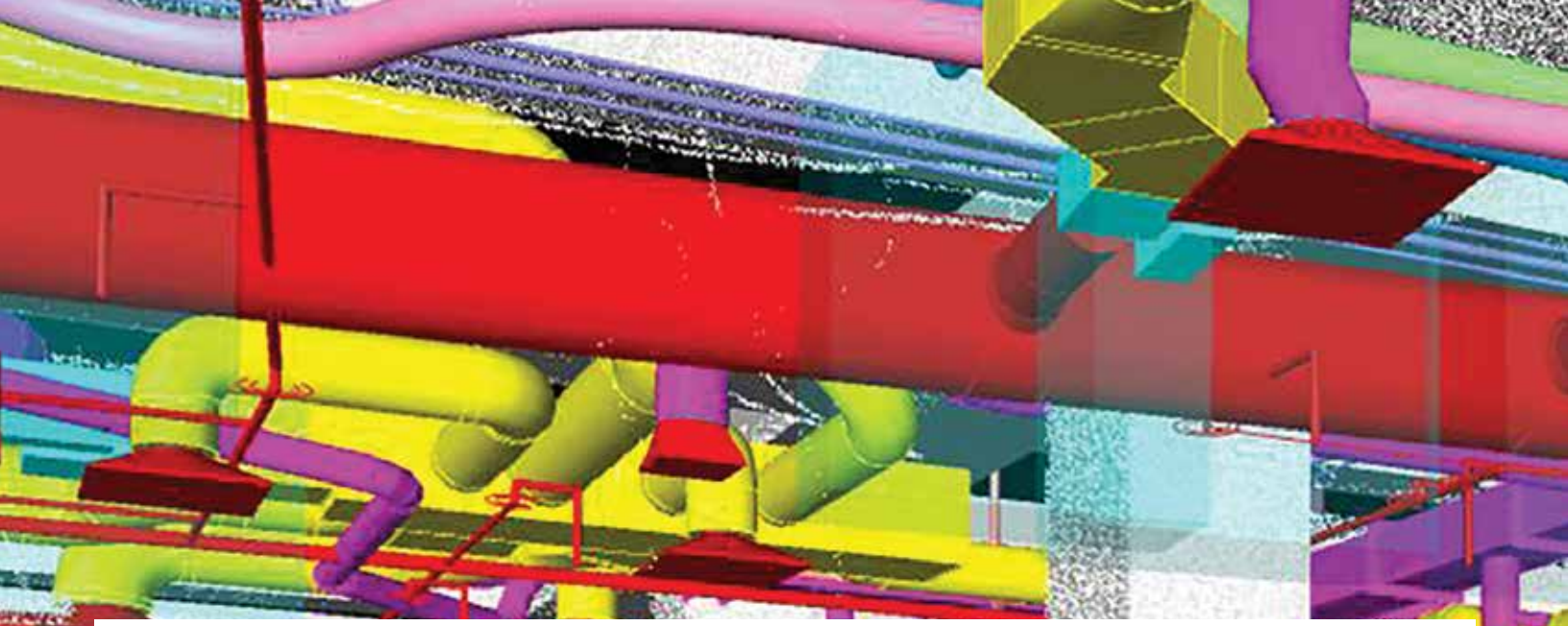


FEATURE-RICH EXPERT WORKFLOW

BENEFITS:

- Comprehensive feature-rich point cloud management
- CAD & BIM plug-ins with production point cloud tools
- Fully automated feature extraction tools for AutoCAD and Revit
- Powerful tools for 3D steel and piping
- Ultra-fast point cloud server - fully interoperable





DURING CONSTRUCTION / PROGRESSIVE CAPTURE: VALIDATE CONSTRUCTION WITH POINT CLOUDS

Laser scanning is the fastest and most accurate way to capture the complete jobsite so work can be evaluated on a monthly, weekly or even daily basis to assure the best quality construction.

The process is easy:

1. Scan all areas of the construction site to be documented or analyzed.
2. Compare the scan data to the design to verify that all components are installed in the correct place. If any errors are discovered, you can address them digitally before they become costly issues affecting multiple trades.
3. Use laser scanning to quickly assess the slab flatness of concrete floors, easily calculate the extents of any areas that need to be adjusted and accurately determine the volume of material needed so that you can achieve more accurate material orders and less waste.

Reality capture software and smart hardware/ software integrations make it easy to use point clouds for quality assurance and construction validation.

- For the most powerful point cloud management tools, use Leica Cyclone software as a scalable solution that accommodates any scan project, from small interior renovations to high rise buildings to large infrastructure projects that span an entire city.
- Display point clouds with no regeneration time in the ultra-high speed server JetStream.
- Access TruView Global in any browser to share point clouds with other stakeholders in a non-BIM environment from desktop or mobile devices.

AUTOMATE QA[1] PROGRAMS WITH SIMPLE SOFTWARE SOLUTIONS

State-of-the-art automated deviation detection is a key factor in improving profit margins by reducing rework.

- Use Cyclone Register in conjunction with JetStream Server to achieve automatic registration and visual alignment, add survey control, generate comprehensive error reports, store multiple user coordinate systems for easy insertion of the point cloud data into CAD models and achieve ultra-fast point cloud regeneration time in CAD and BIM software.
- Use Leica CloudWorx for Navisworks and Revit plug-ins to perform object-level automated clash and “anti-clash” between point clouds and models with issue management so that you can easily identify and correct problems before they affect the construction schedule.

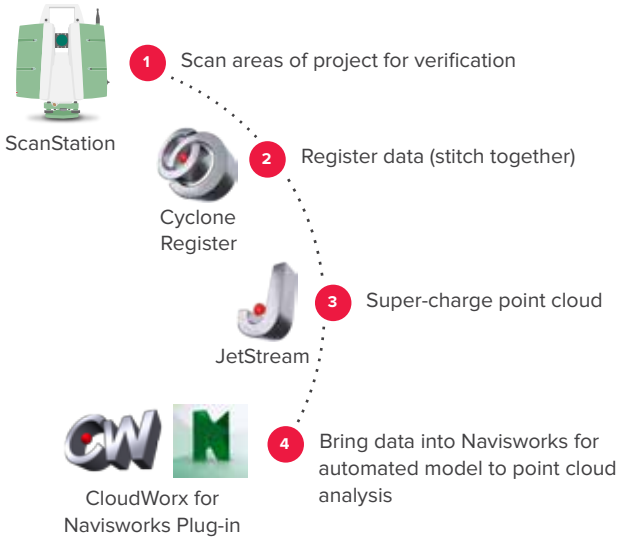
Say goodbye to using tape measures, ladders and clipboards to measure in the field. The rich detail provided by point clouds allows you to truly understand the real world conditions compared to design intent models and automatically detects hidden problems. Powerful tools enable you to create slices and limit boxes, cloud color mapping control, and TruSpace panoramic views. These and other benefits can empower you to increase productivity by 50% or more over the built-in capabilities of Navisworks and Revit.

1 quality assurance

DEVIATION DETECTION WORKFLOW

BENEFITS:

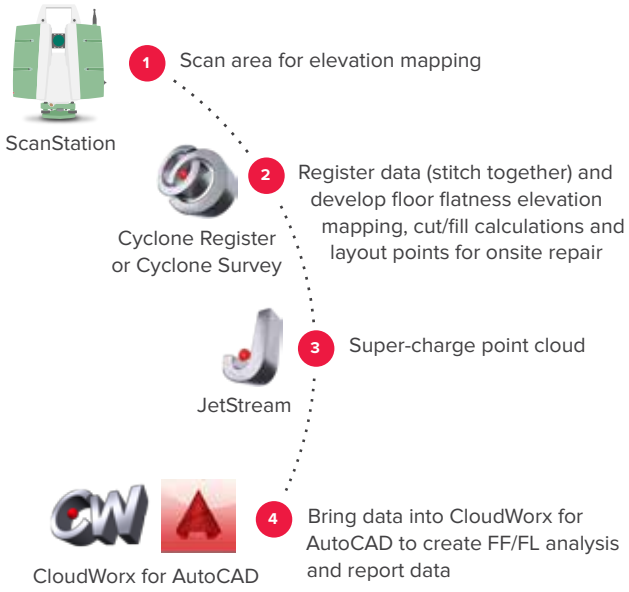
- Automated point cloud to model deviation detection
- Comprehensive, feature-rich point cloud management
- Ultra-fast point cloud server - fully interoperable
- Deviation detection status management



SLAB FLATNESS WORKFLOW

BENEFITS:

- Dramatically reduces amount of time required to capture measurements
- Enables FF/FL calculations directly from scan data
- Creates visual data that can be read by experts and novices
- Provides easy and high-accuracy analysis for increased confidence



MAKE REALITY CAPTURE A REALITY FOR YOUR COMPANY

Recent advances in hardware and software along with new hardware/software integrations make laser scanning easy to incorporate into construction projects with confidence.

GET STARTED WITH REALITY CAPTURE IN THREE EASY STEPS

STEP 1:
Contact your local Leica Geosystems reality capture specialist to discuss your needs and explore solutions.

STEP 2:
Schedule a live demonstration of ultra-precise, professional grade laser scanning technology and workflows.

STEP 3:
Obtain custom fit solutions with fully integrated workflows designed for your business.

CONTACT OUR REALITY CAPTURE EXPERTS TODAY FOR GUIDANCE IN FINDING THE BEST STARTING POINT FOR YOUR COMPANY TO INCREASE PRODUCTIVITY, QUALITY AND PROFITABILITY.

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DEDICATED LASER SCANNERS (SCANSTATIONS)

- Collect data at lightning speed (up to one million measurement points per second)
- Quickly capture large areas and dome scans
- Are ideal for general contractors or subcontractors with a variety of scanning needs

INTEGRATED LASER SCANNERS (MULTISTATIONS)

- Collect data at 1,000 points per second
- Use familiar total station orientation and relocation methods for setup and scanning with no post-processing requirements
- Are ideal for concrete contractors or other subcontractors who need layout and scanning flexibility