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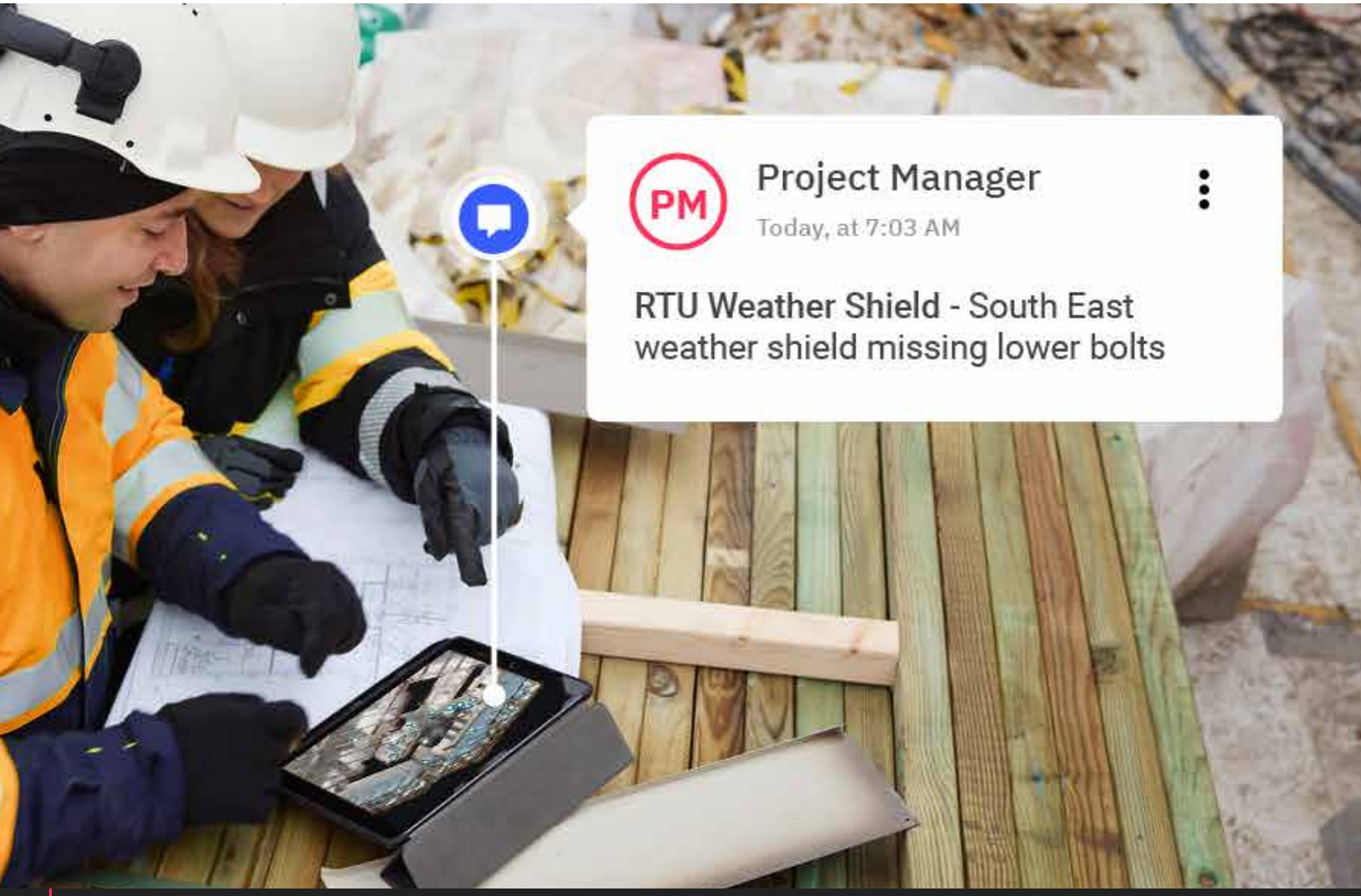

Reality Capture Checklist: Digitize QA/QC workflows to reduce rework.

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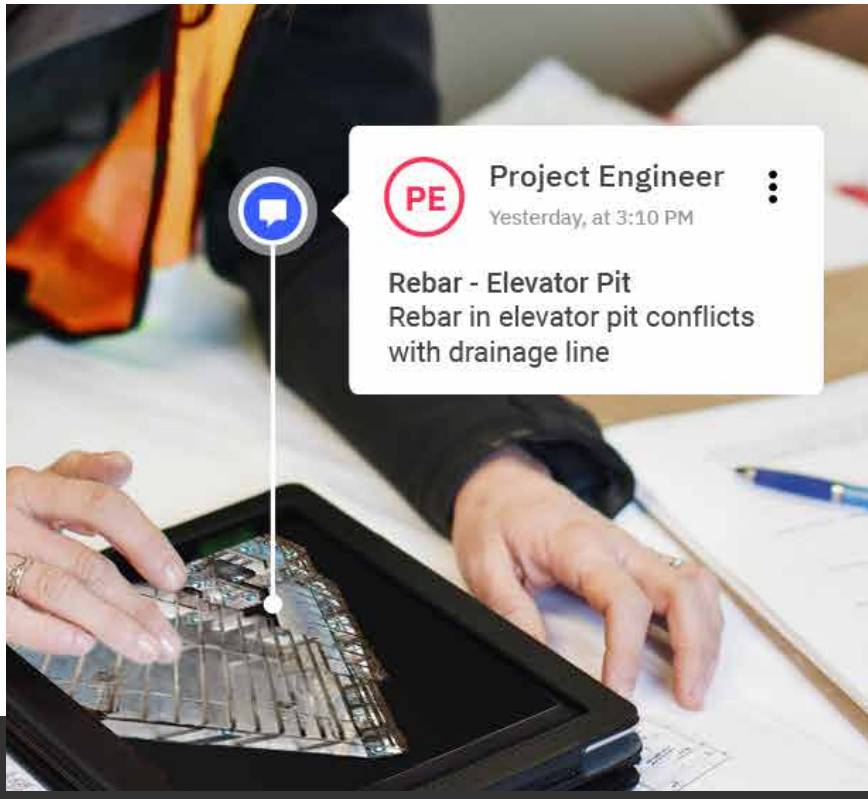
Quality assurance (QA) and quality control (QC) play a crucial role in ensuring the safety and integrity of construction projects. However, manual processes can result in errors, miscommunication, and rework, leading to unnecessary expenses and project delays. **Digitizing workflows with reality capture can help construction companies increase productivity, reduce rework, and stay competitive**.

By adding reality capture to each QA/QC checkpoint, teams can create digital twins of construction projects that offer a complete picture accessible from any device. Remote inspections become more effective, removing the distractions of construction in progress and allowing project teams to quickly provide feedback. This approach reduces unnecessary site visits, lowering safety risks and the project's overall carbon footprint. **In fact according to Matterport's ESG report, each digital twin avoids 0.15 tonnes of CO_2e from being emitted, equivalent to 444 miles of driving**.

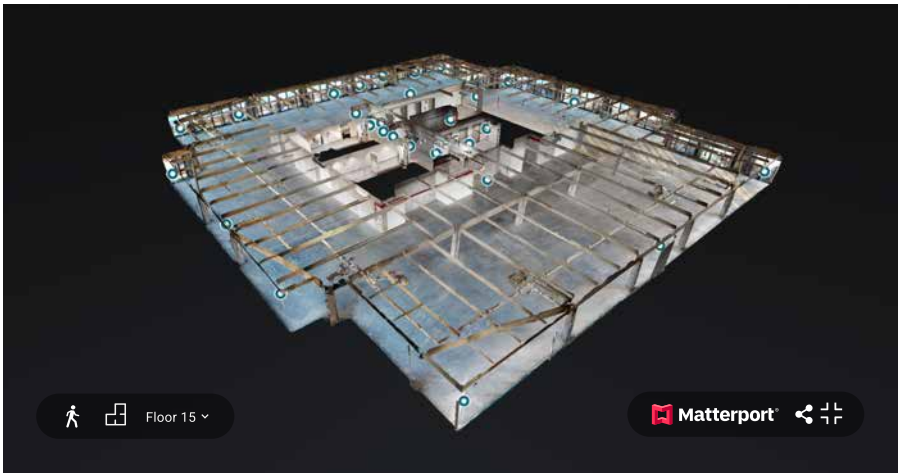


Rework by the Numbers

Navigant Construction Forum found 9% of a project's combined costs are due to rework. A significant portion of this rework (52%) is caused by poor project data and miscommunication, according to Autodesk. As a result, ***teams that are not well-connected or use outdated information end up wasting around 35% of their time on less effective activities****, leading to a massive $280 billion in rework expenses per year.*

However, implementing reality capture can often be seen as challenging. Contractors may perceive it as an additional burden rather than an asset due to the lengthy scan times and large file sizes of traditional survey grade scanners. To overcome this challenge, Matterport provides a quick and user-friendly workflow—including choosing a capture method with the right balance of speed and detail—that is crucial for the scanning team to gather the necessary documentation to share with stakeholders, without disrupting the job site. **By making it simple to collaborate directly on a photorealistic digital twin, scanning at each QA/QC checkpoint helps reduce miscommunication and provides insight to resolve issues faster.**

To ensure reality capture is integrated into critical QA/QC stages, use the checklist on the following page as a starting point. While every project is unique, these checkpoints can guide your scanning strategy and help you resolve issues faster.



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Reality Capture Phases for QA/QC

Use this checklist to ensure reality capture is added to each of these critical stages of QA/QC. While every project is unique and has different milestone points, this list can help guide your scanning strategy. Print it to share with project teams, or include these steps in your project management software or current workflows.

- [ ] Pre-Demo
- [ ] Foundation Completion
- [ ] Layout Review
- [ ] Structural Embed Placement
- [ ] Structural Steel Connection Points
- [ ] Rebar in Concrete Slabs
- [ ] Topping Out
- [ ] Hanger Placement Verification
- [ ] Floor Installation
- [ ] Dry Wall Stud Placement
- [ ] HVAC Installation
- [ ] Pipe Installation
- [ ] Mechanical Completion
- [ ] Electrical Completion
- [ ] In-wall documentation before enclosure
- [ ] Architectural Punch List
- [ ] Handover / Completion

When should you scan your job site?

There are many checkpoints throughout the building process when project managers perform QA/QC to ensure the quality of the work and validate that teams can move on to the next phase. Use this checklist as a starting point for your project management team to build a reality capture practice that increases productivity and adds a layer of documented visibility and collaboration to help you resolve issues faster.

Best practices for digitizing QA/QC with reality capture.

1. Determine the needs of your project.
2. Establish how reality capture fits into your QA/QC workflows.
3. Make it easy for stakeholders to adopt digital twins.
4. Train teams on a successful scanning methodology
5. Share and collaborate.
6. Document milestones for future reference.

Best Practices for digitizing QA/QC with reality capture.

1. Determine the needs of your project.

Before you begin scanning, it's crucial to understand the project's requirements and deliverables. Do you need a visual record for documentation? Is millimeter accuracy important enough for the time required to scan each phase? Don't assume that precision accuracy is always a must-have. A job site is constantly changing, so consider the tradeoffs between capture technologies. Survey-grade scanning produces higher density and improved accuracy but is more expensive, time-consuming, and requires technical training. The Matterport Pro3 LiDAR is fast, easier to use, and less expensive but has slightly reduced accuracy. **Matterport's digital twin platform is built with documentation and collaboration at its forefront, to provide the visual clarity you need for faster decision-making, making it an ideal option for QA/QC workflows**. Another option that can scale with your needs is outsourcing reality capture to a professional. This is valuable when the job site is across the globe, and scans need to be completed rapidly.

2. Establish how reality capture fits into your QA/QC workflows.

Review your current QA/QC process and where reality capture can add value, like your inspection and test plan (ITP). **3D scanning of your building should occur before and after each QA/QC checkpoint to allow teams to virtually inspect, create issues and RFIs as needed, and resolve any problems before approval and sign-off**.

Pick a reality capture technology that integrates with your project management and design software across the project lifecycle. Some use cases will involve visual comparisons, while others require exporting point clouds, transferring huge files, and comparing them to the design model to verify if the construction aligns with the original design intentions. For example, if you use Autodesk Construction Cloud, you will want easy access to point clouds and BIM files in Autodesk Docs and Revit and the ability to document issues and RFIs in Autodesk Docs and Build. Directly accessing a photorealistic Matterport digital twin in your existing project dashboards ensures teams and sub-contractors communicate with clear visual site context.

CORGAN

Corgan streamlines validation with point clouds in Autodesk.

Corgan validates as-builts by overlaying point clouds of their design and construction models using Autodesk tools, including Revit and Navisworks.

> *"When we have construction models that require validation, we can easily import Matterport .OBJ files into Navisworks," Sosas said. "**In the design phase, we can bring the files into Revit and easily orbit around the Matterport 3D digital twin**, cutting section views and modeling as-built conditions."*

Monica Sosas
Project Manager, Senior Associate
Corgan

3. Make it easy for stakeholders to adopt digital twins.

For a new technology and process to be adopted, start with a pilot to prove a success, then host trainings and visit project teams to show them how reality capture and digital twins will save them time and headaches. Making the hardware and software simple to adopt will help your teams see the benefits immediately. **Matterport Pro3 is a logical choice for your 3D scanner, due to its lower entry cost and ease of use with little training**. You can also hire a professional technician to scan your job sites to scale with each project quickly. Matterport's digital twin platform removes hurdles like installing new programs and slow-loading files, helping your teams quickly reach their "aha" moment. After scanning a space with Matterport, show project stakeholders how easy it is to virtually walk through a job site from any location on any device in a web browser.

4. Train teams on a successful scanning methodology.

Ensure that everyone involved in the project understands the camera's capabilities and follows a sound scanning methodology. This included limiting error propagation by closing the loop, ensuring sufficient overlap between scan points, and scanning under door frames to help connect scans. While it is helpful for the building site to be well-lit, avoid bright midday light for best results, helping avoid reflective surfaces appearing differently and improving the quality of lighting. Mark up windows and mirrors in the capture app as soon as possible to improve registration. To help ensure alignment in vast, open buildings, place scan markers around the space and use Matterport's Assisted Alignment to help position models in various third-party software tools.

TAKENAKA

Takenaka Corporation shows the value of digital twins across Japan.

Masahiro Sakaue, BIM Promotion Department, whose role is to promote the latest solutions discovered by the Global Research & Innovation Team at Takenaka Corporation, explains,

> *"We introduce new technologies by hosting in-house seminars and visiting branch offices around Japan. While other new technologies are sometimes used only once and fail to penetrate,* ***Matterport has been a rare case that has spread rapidly based on success and word of mouth****."*

Masahiro Sakaue
BIM Promotion Department
Takenaka

5. Share and collaborate.

Collaboration is vital for successful QA/QC. **Use Matterport notes and tags to create a virtual punch list and communicate with project teams on issues that arise**. These annotations can be tied to a specific virtual layer in a Matterport digital twin, keeping them in their categories to show particular tasks for each trade or highlight safety hazards before visiting the job site. If you already use technology for your QA/QC process, make it easy to reference the reality capture from your current workflow with links or direct integrations to your construction project management software.

6. Document milestones for future reference.

Finally, it's essential to document milestones throughout the project. Once the phase is complete, scan again to document the milestone for future reference. Documentation in a timestamped, photorealistic 3D model is a valuable tool for insurance purposes and to avoid potential disputes or legal repercussions. **Capturing completed work helps reduce risk and gives contractors and owners an accurate project record at each critical milestone**. Capturing the completion of a project is an added benefit for future renovation or adjustments by having a clear record of what was installed and knowing exactly what is behind the walls.

Gilbane

See how Gilbane uses digital twins to support collaboration and accountability:

> *"...when we have multi-site programs, Matterport technology delivers a huge benefit. We can easily toggle between digital twins and sites to examine aspects of bigger issues that impact multiple locations. As a result, team members can resolve questions together on one quick phone call," says Vande Boom. "**Matterport really helps with accountability as we move through design and build phases, saving us roughly 25% to 30% in time and money**."*

Joel Vande Boom
Director of Strategic Projects
Gilbane Construction

Conclusion

Scanning job sites for QA/QC is crucial to any construction project. Remember to determine your project's needs, train your team on scanning methodology, connect to existing workflows, share and collaborate, and document milestones for future reference. By following these best practices, you can ensure that your QA/QC workflow includes the visual clarity your teams need to make decisions faster and reduce project delays.

Talk to a Matterport expert today to learn more about our solutions for architecture, engineering, and construction.