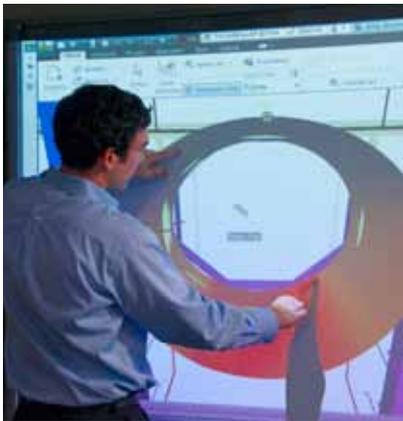


Turner Construction Company

Innovation, technology and teamwork



Brian Krause works with a 3D model on a SMART Board™ interactive whiteboard.

“SMART Boards have changed our meetings. We’re able to get on topic, pull up a 3D model, show the problem and quickly get others on board.”

Dan Gramer, National Manager, Integrated Building Solutions

Problem – Unanticipated construction issues cause scheduling delays and cost overruns.

Solution – Building Information Modeling (BIM) and SMART solutions are used to resolve issues and build digitally first.

Results – Collaboration and productivity have dramatically increased. Less time is spent solving problems in the field, and schedules are more reliable. In a recent Seattle-based project, Turner saved the owner over US\$2 million, thanks to its new technology-enabled process.

Innovation has been crucial to Turner Construction Company’s philosophy since 1902, when Henry Turner pioneered the use of reinforced concrete on New York City subway stairs. Throughout its history, the company has applied new ideas and methodologies to its processes, building unique structures that clients can be proud of.

That pursuit of innovation has contributed to Turner’s ongoing success. As the largest general builder in the United States, Turner has worked on some of the world’s most challenging buildings, including New York’s Yankee Stadium, the Burj Khalifa in Dubai and Taipei 101.

Identifying the challenge

Turner focuses its innovative energy on a fundamental challenge – resolving unexpected construction issues that can bring the building process to an expensive halt. “Surprises aren’t good on a construction project,” says Brian Krause, National Manager, Integrated Building Solutions. In the construction business, surprises usually cause scheduling delays and cost overruns.

Crafting the solution

Turner has implemented a strategy that enables the building team to build digitally first, significantly reducing the element of surprise. Using a combination of Building Information Modeling (BIM) and SMART solutions, teams can anticipate construction issues before they occur. During the project coordination process, Turner staff lead regular meetings in iRooms – interactive workspaces equipped with a computer and two SMART Board interactive whiteboards. The interactive whiteboards provide a large

area to view BIM models, interact with the digital models and keep everyone focused on the issue at hand.

Taking a visual, collaborative approach

The SMART Board interactive whiteboards also foster the kind of teamwork approach Turner finds essential to their process. “A big part of Building Information Modeling is the collaboration that occurs within the team,” says Vice President, General Manager, Jack Beaudoin. “Collaboration is furthered because of SMART solutions and because of the software.”

The BIM process provides teams with a dynamic, 3D digital model of a building, displaying information such as projected cost and time. Coordinating a project with BIM and SMART solutions allows everyone, from trades people to architects, to easily see and focus on problem areas where different elements of the building clash.

“SMART Boards have changed our meetings,” says Dan Gramer, National Manager, Integrated Building Solutions. “We’re able to get on topic, pull up a 3D model, show the problem and quickly get others on board. Everyone in the room can quickly understand what the issue is and collaborate on resolving it.”

This teamwork-based strategy is having a positive impact on both efficiency and quality at Turner, reducing the time spent fixing problems in the field. “The amount of field labor on the jobsite significantly goes down, and we end up with a more reliable schedule,” says Gramer. “That gives us a more reliable, more deliverable product.”



Turner staff lead a coordination meeting in one of their iRooms.

Working together remotely

All team members are expected to play an active role in the process, even if they are dispersed in different locations. "Very seldom these days do we have all contractors from one area working on that one project," says Krause. By connecting to a meeting via SMART Bridgit™ conferencing software, remote team members can view documents displayed in the iRoom on their own personal computer or iPad. On their own monitor or device, they can make digital notes that are visible on the interactive whiteboard in the iRoom.

Streamlining the process

– from start to finish

After constructability issues are resolved, Turner teams continue to use SMART solutions throughout their workflow process. "Once both parties have agreed on a solution, they sign off on the plan right on the screen," says Gramer. The meeting facilitator uses the SMART Board interactive whiteboard to capture meeting notes made in digital ink, save the image as

a PDF and e-mail it to the team. All agreements and resolutions are on everyone's computers when they get back to their desks.

Using BIM and SMART solutions paid off recently for Turner during the preconstruction phase of a project managed by the Seattle Port Authority – the Sea-Tac airport car rental facility. The project coincided with an economic downturn, and was soon at risk of being shut down for budgetary reasons. The facility's design was complex and demanding, due in part to two helix-shaped parking ramp structures. Once Turner staff spotted a significant constructability issue in the ramps, they tackled the problem in the iRoom.

"We built it in a 3D model and worked through it with the owner, the architect and the engineer," says Gramer. "We were able to express constructability issues that helped designers optimize the design, such that the owners still got what they wanted. If we hadn't caught the issue until it got to the field, who knows

how much it would have cost." In the end, Turner saved the Port Authority more than US\$2 million. "For any project," says Gramer, "that's a notable amount."

Increasing productivity

– quantifiable results

Resolving issues digitally on projects like the Sea-Tac airport car rental facility has significant implications for Turner. "Being able to provide feedback that helps optimize the construction process saves us all money and gives us the ability to deliver a project on time," says Gramer. "Plus, it brings our repeat clients back to us."

The results of Turner's technology-enabled process are also quantifiable. "We did a study over a number of our projects using BIM and not using BIM; using technology and not using technology," says Krause. "In the mechanical trade alone just from coordination and clash detection, they've become significantly more productive."

Turner's success in resolving constructability issues and maximizing field productivity keeps the company motivated to continue pushing the boundaries of technological innovation. Turner staff tend to be early technology adopters, and they recently installed the latest SMART Board interactive whiteboard system – the 885i5 model – in the iRoom at their Seattle office. "It's a game changer in terms of what we're seeing from companies like SMART," says Beaudoin. "They're providing technologies to enhance the use of BIM. These collaboration tools allow a team to work better together, and when teams work better together we have much better results."

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