

BATTELLE HALL RENOVATION & EXPANSION COLUMBUS, OHIO

INTRODUCTION

Planning and managing a complex construction project will always present certain challenges. But set that same project in a busy convention hall that is continuously in use with a full calendar of events and those challenges increase exponentially.

When the leaders of the Greater Columbus Convention Center were weighing their options on how to keep their facility operating smoothly while renovating their ballroom, they approached Turner Construction to provide the solution.

Completed in early January 2010 at a cost of \$35.8 million, the Battelle Hall Renovation and Expansion required intelligent project planning, teamwork and effective communication to overcome multiple challenges.



Renovation & expansion balances the needs of the client and conventioners.

Turner was brought on as construction manager to oversee the Battelle Hall project and provide the balance between the needs of the client and the demands of the schedule – all while staying on task, meeting deadlines and staying within budget. Other members of the team include LMN Architects, Heapy Engineering, Resource International civil engineers and Walter P Moore, structural engineer.



The project involved a 51,000-square-foot expansion of an existing convention hall and 107,000-square-foot renovation. This included reconfiguration of the existing interior spaces to create a full service kitchen, renovation of existing vacant storage areas to add new meeting

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rooms and new vertical transportation from the garage below to the new 'front entrance' of the facility. Aesthetic upgrades to the ballroom included a unique ceiling design that offers flexibility to customize the look for each client.

New multi-level pre-function areas accommodate new event venues.

Renovations to the facility offer current and future users an inviting convention space, a functional way-finding through a complex campus of connected facilities and an attractive location for new and expanded events. The expansion included the north end for a multi-level pre-function space, additional vertical transportation for the hall users and a new south exterior glass curtain wall.

“The most difficult structural challenge was the addition of a large new 3,500-square-foot window wall on the south end of the ballroom,” said John Lyons, principal structural engineer. “This allows the occupants to enjoy a view of the city skyline – it contributes greatly to the sense of openness experienced by the ballroom guests.”



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Event attendees enjoy the openness and view from the newly renovated Battelle Grand Ballroom.



MEETING THE
CHALLENGE OF A
DIFFICULT JOB

Managing the reconfiguration of the ballroom – in which a large section of the mezzanine and the exterior precast wall was to be removed to make way for the installation of a glass curtain wall looking out toward downtown – presented unknown structural issues that could have caused the south end of the building to become unstable.

The removal of the south-end section of the mezzanine presented problems since the mezzanine itself was supporting the exterior precast concrete wall panels. Removing the mezzanine and precast wall panels would need to be well sequenced, engineered and planned. In removing that section, the teams knew they would temporarily weaken the entire structure.



Discovery of welded steel embeds in the existing exterior precast wall.

Early in the project, the team removed the interior finishes to reveal the support details and determine if there were hidden issues that could be resolved without causing a schedule impact. Upon removal of the interior finishes, the team discovered that the precast panels had steel embeds that

were welded together to form the shear reinforcement for the structure in the exterior wall system. Removal of the precast panels would mean the loss of the shear capacity of the structure and had the potential of creating an unstable structural environment.



The structural engineer, who was located in Atlanta, Georgia, was unable to be onsite regularly to resolve these types of issues. Supplied with photographic documentation and sketches, the structural engineer and project team would hold conference calls and discuss alternative design solutions and any subsequent revisions – allowing further insight to the structural details without the structural engineer being present.

In order to maintain the structural integrity of the facility, the structural engineer needed to develop a sequence-of-removal document and plan the installation of temporary and permanent supports. Forty tons of temporary bracing and stabilizing steel were designed, fabricated and installed to facilitate the removal of the mezzanine structure and the exterior precast wall panels. In addition, a 5,200-square-foot temporary weather-tight wall was erected to keep that section of the building safe from central Ohio’s damaging winter weather.

Further complicating matters, the removal of the precast paneling was within a half-inch to an existing glass curtain wall below. The 10,000-lb. precast wall panels were bolted to a special custom fabricated clamp, picked up by a crane, one by one, and removed a “caulk joint away” from the existing glass curtain wall below. The slightest deviation could have resulted in the accidental demolition of the existing glass curtain wall. The work had to be performed at night to minimize risk to the



Precision planning and execution led to successful removal of precast panels above the existing glass curtain wall.



public spaces and to allow for the adjacent parking garage to remain open for scheduled events. Through careful planning and execution, the glass curtain wall below was untouched and the precast panels were removed without incident.

Another big challenge was the expansion of the north end of the hall. The new structure would be built on an existing bridge deck over an active railroad track. It would span over the bridge deck creating expansion issues and dissimilar movement from motor vehicle traffic

and vibration on the bridge deck. The proximity of the new structure to the existing structures, and the public limited the ability to erect the structure.



Construction of the new north hall pre-function structure over the existing bridge deck and railroad track.





The existing structure was built adjacent to a bridge deck and separated with an expansion joint designed for motor vehicle traffic. The new structure was designed to bear the loads on either side of the expansion joint making erection of the structural members a challenging endeavor. The structural members that were to be installed south of the expansion were supported from the existing structural steel members with moment connections. The structural members north of the expansion were erected on the bridge deck and connected to the southern structure with slip connections. In addition, four escalators were installed across the expansion joint using similar structural techniques.



Double columns signify the separation between the bridge deck construction and expansion of the existing building structure.

INNOVATION IN
CONSTRUCTION
TECHNIQUES OR
MATERIALS

The project design team from Seattle, Washington, wanted to create a special and unique appearance for the interior that related to the previous, award-winning design concepts of the facility. The design team decided on a “Ceiling of Fins” concept. This innovation was partly to bring about a new look that could change the color and effect within the room, but also to pay tribute to the history of the facility and the area.



The design concept was created to match the roof lines of the convention center. Looking at an aerial view of the convention center's exterior, one notices a number of curved lines meant to resemble the number of trains and train tracks that once traveled



Designers replicate convention center roof lines for lighting design in the new Battelle Grand ballroom.

through the area, even below the very ground upon which the convention center sits. For the ceiling of the ballroom, the vision was to reproduce this look in a modern and aesthetically-pleasing appearance, paying homage to the area's historic past.

The project team took the design concept, shape and materials to produce a custom, cost-effective solution with easily-fabricated fixtures. A mock-up of the ceiling fins was developed and the design team was flown in from Seattle to review the progress and the finished look.



Pattern drawn on ballroom floor provided for accurate installation of the 1,250 lighted ceiling fins.

The installation of the fins was a challenge in keeping the different configurations organized during the planning phase. The fins were in three configurations: C-shape, closed-end and a fin that is filled with LED-lights. To ensure that all fins were placed and installed

properly, a pattern was drawn on the concrete floor of where each fin was to go, 35 feet overhead.



EXCELLENCE IN
PROJECT
MANAGEMENT

Using the pattern as a reference, a laser line was shot to the ceiling so the hanging hooks could be accurately installed – with hook configurations specific to the different types of fins.

In the end, 1,250 total ceiling fins were installed, with 350 of them having the LED-stripe lighting. At the touch of a button, the room can glow in solid reds, greens, blues or change to a rainbow appearance. Guests who rent the room can select the lighting appearance of the fins.



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Controlled by an intricate touch-screen panel, the system is sophisticated enough to

The artistic “Ceiling of Fins” lighting display offers guests a unique and memorable event experience.

act as a large television screen to show video or have a company logo floating across the ceiling during a business gathering.

Even though this project was not LEED Certified, a green building philosophy was directed and principles were followed to do what was right for the community and the environment. A contagious green interest was agreed upon among the project management team, contractors, subcontractors and suppliers to work together on the reclamation and recycling of construction debris.

One such example involved teaming with a farmer in southern Ohio. This proved to be an instance of two parties having a challenge and coming together to help each other toward a mutual solution. Large precast panels were removed from the work site and were slated for disposal.



At the same time, the farmer had a dilemma with rising waters from a bend in a river on his farm. Minor flooding and erosion had damaged the farmer's land and he was looking for a method to stop the destruction. A creative and equitable solution was presented. The farmer took the precast panels – creating a dam along the riverbanks where the flooding occurred. By thinking creatively and making an extra effort, construction waste materials were spared from the landfill and the farmer's land has been spared from further erosion damage.

Another green initiative was recycling the massive amount of carpeting that had to be removed. Nearly 465,000-square-feet of carpet had to be pulled up and replaced. All of the old carpet was recycled and, again, spared from the landfill.

The Turner management team was keen to be on the lookout for any and all materials that could be recycled or re-used. Other materials that were recycled include the structural steel, steel doors and frames slated for replacement, ceiling tiles, CMU blocks removed during demolition, copper wiring and piping removed to allow for installation of new systems and fluorescent ballasts for light fixtures.

Adhering to LEED standards may have taken a little more time and effort. And it may have been a bit more costly. But everyone involved agreed that it was the right thing to do. All parties were striving for excellence when it came to the finished look of Battelle Hall. And all parties agreed that treating the environment the right way was a part of that overall look.



EXCELLENCE IN
CLIENT SERVICE

Safety was another area in project management where Turner was focused on excellence. Although this was a technically complex project within a crowded and busy work site, there were zero “loss time” incidents during the 15 months of construction. The project field team performed regular weekly inspections for safety concerns and each potential issue was brought to the supervisor’s attention.

Routinely, onsite workers dealt with their issues with real solutions that they developed with the project team. Once a resolution was fully developed, it was shared with the entire team in project meetings. In addition to the onsite project staff, the local Turner safety director visited the project monthly and held meetings to review any safety concerns that were typical to the work taking place at that time.

When the project began, the project team, design team and owner’s group recognized that the facility had some functionality issues that could be resolved during the project. The teams also knew that if these problem areas were not addressed during this project, they could present issues in the near future, necessitating further construction or renovations.

The issues ranged from way-finding, logistics, security, vertical transportation, existing unused space and others. Just as they were tasked to do, the project team was able to creatively address design and functionality issues rather than demolish the structure and build a new facility.



This resulted in a 60 percent scope increase. But even though the project was greatly expanded, the teams maintained the original schedule. The convention center facility has a very busy schedule – one that the teams knew they would have to accommodate by having the room ready for scheduled convention/exhibitor events. They did just that while taking on the extra tasks that were presented as the project unfolded.

Another example of solving problems that were only revealed after the project began involved unifying multiple fire alarm systems. These were installed over the years in each renovation the facility experienced, and since the alarms were located in different areas of the structure, there was no uniformity. The team felt that the disparity could cause problems if a fire broke out in the building. The alarms were replaced with a single unified system and synced to provide emergency alarm for a safer public gathering place in those first critical moments of an evacuation.

For this project, high marks for client service were earned by pointing out and then solving previously-unknown problems, accommodating the group's schedule and enhancing the appearance and safety of the group's facility. The leadership of the Greater Columbus Convention Center was very pleased with the outcome of Battelle Hall.

“As the project evolved, we were able to integrate Battelle Hall into the fabric of the convention center by building new entrances and creating a grand three-level connection to the convention center,” said Bill Jennison, executive director of the Franklin County Convention Facilities Authority.



New two-story window provides natural lighting and view of Arena District.

“Key to the repositioning of this space was the two-story window wall that was built overlooking the Arena District. These structural changes were also among the most challenging components of the project.

The construction management, design and engineering team did an outstanding job of accomplishing these major changes without serious disruption to the ongoing activities of the convention center.”

The construction management, design and

With added functionality, flexibility and aesthetics, Battelle Hall has been transformed into one of the premier gathering spots in the city of Columbus.

“Customer response to the new Battelle Grand has been overwhelmingly positive,” Jennison said. “Usage in the first year has exceeded expectations. The center now has the correct mix of banquet, meeting and exhibition space needed to attract and retain conventions, trade shows, meetings and sporting events for Columbus.”