Case Study: Maintaining a Safe and Clean Environment During Hospital Construction

Sacred Heart Hospital Curtain Wall Replacement - Phase I - Eau Claire, WI
June 2013

“I really like The Samuels Group’s team approach. They are outstanding coordinators, from pricing out the project to managing subcontractors. They have kept disruptions to an absolute minimum and are very careful about controlling contamination and dust.”

Mark Preston, Construction Coordinator
Sacred Heart Hospital - Eau Claire, WI
The exterior facade of Sacred Heart Hospital was dated in appearance, inefficient in energy consumption, and needed to be replaced. The director of construction management, Mr. Mark Preston, said “This is a crucial project, but how do we remove and replace the entire exterior shell of this hospital while maintaining operations in a clean and safe environment?” Sacred Heart Hospital turned to The Samuels Group as a partner to guide them through the complex process (which impacted several aspects of operations). The hospital is now beginning to enjoy a new modern, attractive and efficient curtain wall that also contributes to overall better patient care and employee satisfaction.

HOSPITAL BACKGROUND
Sacred Heart Hospital was first occupied in 1964. The 10-floor facility covers 625,441 SF and is licensed for 344 beds. The hospital includes patient rooms, surgery rooms, cath labs, oncology, OB, dialysis, interoperative MRI and CT, a helicopter pad, a complete inpatient behavior health (psychiatric) unit, administrative offices, storage, and utility/clean rooms. The hospital, nearly 50 years old, had an aged appearance and Sacred Heart desired a more modern-day look. In addition to cosmetic issues the existing glass had aluminum framing, with no thermal break or insulation value, which caused condensation and icing in the winter. A failing HVAC system also contributed to this issue.

CURTAIN WALL PROJECT DESCRIPTION
This phased project is replacing a 9-story curtain wall system and includes the demolition and replacement of exterior veneer curtain wall structures, glass and metal panels, and glazing. It also replaces the associated HVAC system. The Samuels Group provided budgeting, scheduling, mock-ups, and preconstruction services to support architectural design, and construction management services. This complex project requires extensive schedule coordination and a concise sequence to the flow of work. Each bay had a 21-work day turnaround time and a punchlist to complete before it could be turned over for occupancy. The process for Phase I is outlined below:

- Curtain wall demolition; temporary window enclosures installed.
- New frames installed to close off room and keep negative pressure for infection control.
- Remove all interior casework against wall. New support system for case work, new induction units, new control system, studs and drywall.
- After window installed, new casework installed.
- Painting, finishes, and crystallized floor finished.
- Hospital terminal cleaned and re-commissioned room for occupancy.
Solutions

The Samuels Group understands that hospital operations must continue during construction and patient care is a top priority. They also understand the significance of maintaining a clean and safe environment during hospital construction. The Samuels Group met with the Sacred Heart team, and together, they worked on a process that would successfully address the hospital’s concerns.

Maintaining Operations

When collaborating with the project architect, The Samuels Group was given two options to construct the curtain wall...vertical or horizontal. It was decided the best approach to help maintain operations during the curtain wall replacement project was to phase its construction into three parts and build it vertically. This option was easier to install, allowed more rooms to remain operational (because only a few rooms were out of service at a time vs. an entire floor), and it was most cost effective because scaffolding was only required by bay vs. around the entire building. The Samuels Group has demonstrated significant coordination skills in phasing this project as there is no down time between the phases. This was accomplished by working with 75% drawings to keep the project moving forward.

Communication was crucial during this project. The Samuels Group held combined weekly “disruption avoidance” meetings with the owner, construction team, and departmental staff. Discussion items often revolved around coordination efforts relating to moves, crane usage (required shut-down of certain areas) and electrical/mechanical outages and progress updates. This type of communication helped achieve better communication and team cooperation.

Maintaining a Clean Environment

This project affected so many areas simultaneously so stringent infection control practices were vital to maintaining operations and preserving a clean environment to provide health care during construction. Significant practices included:

Selecting a Qualified Curtain Wall Manufacturer

It was crucial that the right curtain wall manufacturer was selected. The owner, architect, and The Samuels Group analyzed four manufacturers and put them through an intense interview process which resulted in selecting EFCO.

Infection Control

Construction activities have the potential to release dust, bacteria, and mold-spores into the air. It was important to assess the risk of infection in every individual area of hospital construction because each had different requirements or risk levels. A few measures that were implemented to control infection were:

- Particle counts to ensure barriers were effective in controlling particle dust throughout patient rooms.
- Temporary walls were built inside every room to maintain life safety measures.
- Negative pressure anti-rooms were set up inside (on room side of construction) with negative pressure fan to maintain negative pressure and prevent construction particles from entering hospital.
- Cleanliness. All crews regarded cleanliness as a high priority. Work areas, equipment and crews were vacuumed off, shoes were cleaned, carts covered, walk off mats placed, floor machines were utilized, etc. It was not acceptable to see a track in the hallway or a dirty piece of equipment.

“Maintaining a clean environment throughout this project is a top priority,” said Marge McFarlane, Safety Coordinator at Sacred Heart Hospital. “I understand we have a job to get done within schedule and in budget, but my patients must be kept safe. The Samuels Group has done an excellent job and have been very responsive to any issues that have surfaced.”
MAINTAINING A CLEAN ENVIRONMENT

Noise and Vibration Control
While maintaining operations during construction, it is unlikely that there will be no disruption due to noise and vibration. To address this issue, The Samuels Group proactively set assigned times that hammering and drilling could be performed. To help minimize disruptions, the patients were notified in advance of possible inconvenience. They also received patient comfort packages, earplugs and white noise machines were delivered to their rooms.

Debris Management
Strict policies were implemented in removing debris throughout the occupied spaces. Designated routes and elevator were used for removal of debris, debris and material carts had to be wiped down and covered before leaving any construction space, and if it was wet outside, the cart had to be wiped to a dry state to avoid tracking in water.

Proactive Response to Unforeseen Issues
Issues can happen on the job site and how your contractor handles them can make a big difference. The Samuels Group tries to plan for these issues and asks the “what if” questions. “We knew there was potential for inclement weather or high winds on this project,” says Mike McQuillan, Project Superintendent. “So, we set up precautionary protection to further prevent the chance of elements entering the hospital. In addition to the scaffolding and containment wall, we used metal panels to seal openings from the elements. These panels were cost effective and can be used over and over.”

MAINTAINING A SAFE ENVIRONMENT

A Proactive Construction Safety Program
The Samuels Group’s Experience Modification Rate (EMR) is .68, a rate well below the national average of 1.0 and one of the lowest in the industry. This rate was achieved through safety-minded employees and a proactive Safety Program that is applied (without compromise) to every associate and subcontractor. The program was applied to this project and has played a significant role in maintaining a safe work environment.

Unique Partnering Relationship with OSHA
The U.S. Department of Labor’s Occupational Safety and Health Administration and the Wisconsin Occupational Safety and Health Consultation Program established a strategic partnership with The Samuels Group Inc. to reduce workers’ exposure to hazards and the likelihood of serious injuries at the Sacred Heart Hospital Curtain Wall Replacement Project.

Collaboration with Hospital Security and Safety
This team is responsible for security, fire, and weather safety. Interior life safety checks were completed at the construction site each day. Brian Hedrington, Safety/Security Supervisor, stated that “The Samuels Group is a top-notch construction company. They are a great crew that puts safety first. Sacred Heart Hospital has 372 fire extinguishers, but The Samuels Group brings their own, maintains them, and trains their crews on how to use them. They really put emphasis on fire safety.”

“This voluntary strategic partnership is focused on identifying and controlling hazards, improving safety and health programs, promoting a cooperative relationship between labor and management, and encouraging employee participation in achieving a safe and healthful workplace,” said Mark Hysell, OSHA’s area director in Eau Claire.
Solutions

Maintaining a Safe Environment

Scaffolding Safety
The Samuels Group contracted with Infinity Scaffold for scaffolding design and construction for this project. Infinity Scaffold, a full service scaffold company located in St. Paul, Minnesota, has provided knowledgeable and dependable designs to facilitate safe working platforms for this project. “With a majority of the curtain wall being constructed off them, scaffold safety remains our highest priority,” said Samuels Group Safety Director, Tim Vick. The Samuels Group is constantly reviewing these installations for proper use and compliance with safety directives.

Scaffolding Enclosure Product Selection
The Samuels Group continuously looks for ways to do things more efficiently. Their approach was no different on the Curtain Wall Replacement project at Sacred Heart Hospital. As work crews are replacing the outside of the building in vertical sections, two patient rooms wide, a cost effective solution was identified for the scaffold enclosure...during the winter months, the negative air that was pulled from the hospital was used to heat the scaffolding. In the summer months it would cool.

Project Superintendent, Mike Mcquillan, selected a heavy duty product (called Geo-Tarps) from Eagle Industries after the first enclosure material showed early signs of failure. The new system, consisting of reinforced translucent tarps fastened to the scaffold structure, provides better light filtering, transfers less wind noise and lasts considerably longer. The scaffold system is enclosed to protect the building interior from wind and rain during demolition; however, workers noticed an added benefit...cooler temperatures inside the enclosure compared to surrounding roof temperatures. Although the atmosphere inside the enclosure is far from being considered “air conditioned,” the heat index has been consistently lower than on the surrounding rooftops. This has allowed crews to continue to safely work full shifts during extremely hot conditions. No lost time has been reported on this job due to the summer of 2012’s extreme heat and no heat related injuries were reported. In fact, one contractor commented that this was the only project they did not have to shut down due to the weather. “We can’t give all the credit to the enclosure because as part of the hospital infection and dust control requirements, rooms that are under construction are negatively pressurized using air locks and exhaust fans,” stated Mike McQuillan. Typically this inside air is exhausted to outside at a loss but due to this project’s vertical arrangement, air is vented through the scaffold enclosure. “By taking advantage of this scenario we have increased worker productivity, safety, and maintained our schedule despite the summer’s heat,” Mike states.

Education and Signage
To maintain a Hospital environment, with occupied rooms adjacent to construction, it takes competent leadership and excellent attention to detail. Continued education for Samuels Group employees, as well as the hospital staff, is a key component to maintaining the highest level of service to patients and visitors. This project is constantly moving throughout the facility and proper signage has become a big part of our Hazardous Communication Plan.
**CONCLUSION**

Construction will always be a part of the hospital environment whether building new or renovating. It is crucial that all parties involved understand the impact of hospital construction and how to keep operations moving smoothly while preserving a clean and safe healthcare environment during construction.

The Samuels Group thoroughly understands this concept and has provided leadership and demonstrated forward thinking proficiencies throughout this project. By utilizing the expertise of its staff, focusing on infection control and safety, and using effective methods of communication, The Samuels Group successfully met the challenges and concerns of Sacred Heart Hospital. Phase I of the curtain wall project was completed with minimal disruption to hospital operations while maintaining a clean and safe environment.