

MTech Mechanical
Craig Hospital Expansion & Renovation
Best Building Project – Specialty Contractor (Over \$10 Million)

In June 2014, we watched as Amy Van Dyken-Rouen returned to her home state of Colorado, however not quite as she had hoped. The six-time Olympic gold medalist swimmer, severed her spine in an ATV accident and headed to Craig Hospital to begin extensive rehabilitation. She says she decided to come to Craig Hospital in Englewood because, "it's the best of the best."

Craig Hospital is a world renowned center for specialty neurorehabilitation, exclusively devoted to patients with a spinal cord injury and/or brain injury. Many of these injuries are sustained through traumatic accidents occurring while driving, skiing or during other activities. Craig provides a comprehensive system of inpatient and outpatient medical care, rehabilitation, and long-term follow-up services. Over the past five decades, Craig has helped more than 31,000 patients. Each year, they come into contact with an average of 500 inpatients, and 1,400 outpatients that they help to adapt to life after an injury.

Checking In. While Van Dyken-Rouen got to work on her rehabilitation, Craig Hospital was in the middle of its own transformation. MTech Mechanical was selected by GE Johnson Construction to not only be the mechanical contractor for the project but also to join the Craig Family. It was immediately apparent that this project would be unlike any other; hospital staff, construction staff and even patients would be working together and building bonds. MTech's experience on other hospital projects provided the skills necessary to complete the project, but our team's dedication to the hospital's mission won us the opportunity to be involved. The project began in January 2013 with a goal of renovating the current facility and adding a new addition to the existing occupied hospital with minimal disruption to patients and staff. This 3 ½ year plan also allowed Craig to change the existing shared bedroom layout to single bed occupancy to allow patients to have the privacy needed during their intense healing process.

Renovation / Rehabilitation. The mechanical scope of work for the project included substantial upgrades to the existing building's mechanical systems as well as increased capacity to serve the additional square footage. The project was broken down into 7 primary phases of construction:

underground utilities, a new 4-story addition, a 4th floor added to the existing building and remodel of floors 3, 2, 1, and the basement.

The first phase of construction challenged MTech right away in routing the new underground steam utilities. We were tasked with installing underground piping running from neighboring Swedish Hospital, across the campus and into the basement of Craig. The routing of this new piping required us to be welding and working in the main basement corridor and the only access from Craig to Swedish, which is critical in the case of any emergencies because Craig does not perform any surgical operations.

MTech developed a complex method of procedure with the hospital staff to ensure constant accessibility for their patients, it required two-way radios for nursing staff and the project team as well as two means of infection barrier protection. The barriers would prevent any construction debris and particles from getting to the existing occupied spaces.

After the steam was routed to the existing mechanical room, MTech needed to add the new equipment for the building addition while keeping the existing equipment operational to service the hospital until it could be phased out. This required a lot of thought, investigation and strategy to maximize installation efficiency and avoid rework at a later date. MTech and Shaffer Baucom Engineering, the mechanical engineer, met weekly during the construction process to discuss, review and even re-design the final layout based on the existing conditions.

Field measurements of existing systems were relayed back to our Virtual Construction / BIM team to build into the model. This allowed us to create a virtual model of the mechanical room showing the new work and the existing constraints. MTech worked with suppliers to select equipment that would meet the design intent but also fit within the space and maintenance clearances. The coordination and install was within 1/4" in multiple areas so every detail and logistic had to be reviewed in detail. The final mechanical room is a source of pride for not only our team but the Craig facilities staff, it has been described as "a behind the scenes show piece."

The new addition is directly north of the original building and includes 84,000 square feet of patient rooms, administrative offices and the new PEAK Center featuring two rehabilitation pools. One is a warm therapy pool for training, stretching and water exercises while the other is a

HydroWorx pool that includes underwater cameras and a treadmill that raises and lowers into the pool for walking and working on range of motion therapy. The pool area has a dedicated natatorium style air handler to serve the space as well as in floor radiant heat and ceiling radiant heaters above the dry off area and locker rooms.

Making New Strides. The PEAK Center is a two-story gym where the patients perform the majority of their rehab and training. This is not your standard gym. Craig's goal for patients of "optimizing your recovery and creating a lifelong plan for health and wellness," is completed through the use of specialized gym equipment. When entering the gym, patients can be seen using the zero-gravity machines and robotic walkers, but what is not so obvious are the highly controlled and coordinated duct systems above the ceilings, within the walls, and even in the floors. The gym is conditioned with a variable air volume (VAV) system with hot water re-heat from the ceiling and custom baseboard radiant heaters that contour to the curving serpentine wall. Temperature control was especially critical in the pool and gym areas because spinal injury patient's nervous system does not always have the ability to regulate their body temperature when working out or getting in and out of a pool.

After completing the new addition, the project team began an intricate patient coordination process. We proposed as part of our safety protocol and our Infection Control Risk Assessment process, to create a "buffer floor" between the construction activities and the patients and staff. This buffer floor was put in place to minimize the activity, noise and disruption that could affect a patient's rest and recovery. Patients would be moved from the 3rd floor into the new addition so we could begin construction of the 4th floor "pop-top." The vacated 3rd floor created an empty barrier between construction and the patients still on the 2nd floor.

With the sequencing of the floors in the remodel, we had to make sure all occupied areas would have working mechanical systems while other areas would be renovated. Through weekly meetings between the construction team and the hospital team we were able to create area maps for each sub phase of construction and made the best arrangements possible for the patients. To help minimize disruption, all noise-creating activities were scheduled for certain times during the day, dedicated entrances/exits were created for construction and any disruptions to any systems were done during overnight shifts.

Through the coordination of these phases, we were able to work with GE Johnson and the hospital to not only help manage the progress of the schedule, but add an entire kitchen remodel to our team's scope of work. As a team we were able to finish this additional work within an 8-month window and not add any additional general or mobilization costs to the owner since we were able to meet the original completion date for the hospital.

Working in occupied areas is always a reason for heightened safety awareness, but for Craig Hospital, it was essential. In addition to the usual safety protocol, MTech felt it was necessary for our employees to truly understand the environment in which we would be working. All employees and subcontractors on our team were completed an additional orientation specific to our trade and our impact on those around us. Just as we were excited to learn all about the hospital's process, the staff was eager to learn about us. It was not uncommon to find several staff members joining the construction crews for morning stretch-and-bends. With more than 78,000 field man-hours spreading over 3 ½ years, MTech is extremely proud of our safety efforts.

Walking Out the Door. The construction team has been embraced by the patients and staff known as the Craig Family. From smiles and waves in the hallways, to seeing several wheelchairs parked with patients peering out on the famous Liniger Bridge, Craig Hospital has been an inspiration to us and each of the team members working on this project. Working a hospital renovation is always difficult but finishing a project has never been so rewarding because of the teamwork, long hours and extra effort exerted by MTech. We are confident our efforts have left a lasting impact on a truly special project. To quote a slogan seen around the halls, Craig Hospital, "we've got your back!"











