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Renown COVID Surge Facilities Task Force

Spring, 2020

Renown Regional Medical Center - Tahoe Tower and Mill St. Parking Garage

In March of 2020, Ainsworth Associates Mechanical Engineers had the honor of being involved in the COVID Surge Facilities Task Force at Renown Regional Medical Center in Reno, NV. The task force was assigned with converting the lower two levels of the Renown Mill Street Parking Garage to overflow hospital space in just two weeks which included both design and construction. The function of the conversion was to provide the medical center with an overflow care facility in efforts to prepare for a possible surge of patients due to the spread of the SARS-CoV-2 virus. The project had a near-impossible deadline with the first level to be turned over to the nursing staff in seven days with the second level ready seven days after that. Each floor of the garage was comprised of approximately 80,000 square feet of dirtied and abused surfaces from fifteen years of heavy vehicle traffic. The location was chosen due to the proximity to the main hospital which allows for rapid patient transport to/from the primary life-saving facilities of the Tahoe Tower. As the patient bed layout evolved around the multitude of services required for patient care, each floor was designed to house over 700 patients. This 1,400 person addition essentially doubles the facility's bed count in an effort to stay ahead of the pandemic and outfit the region's largest healthcare provider.


Original State of the Mill St. Garage

The team of facility staff-members, contractors, and engineers was led by the Renown Facilities Department who quickly converted the Facilities Building into a central command for on-site collaboration and decision making. The design and construction team comprised team members that had worked together at the facility for decades. Architecture was handled by in-house Renown professionals and mechanical and electrical design was provided by Ainsworth Associates Mechanical Engineers and PK Electrical, respectively.

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Duct Material Staging

The construction team was led by Clark/Sullivan Construction (who originally constructed the garage) with Curtis Bros, Mt. Rose Heating & Air, Savage & Son, and Intermountain Electric handling the various sub-trades. QCS provided HVAC controls and RSAnalysis provided air balancing. The mechanical team's long history of collaboration and teamwork on countless successful Northern Nevada construction projects allowed for a team environment that put the needs of the Client above all else.

As resources and shipping lanes across the nation were becoming crippled due to the pandemic, the availability of materials and equipment drove the early design of the facility while prep work and staging began immediately. Providing a clean and safe healthcare environment usually warrants months of heavy collaboration and the team had only weeks to design and implement the project while putting the normal "patient-first" mentality at the forefront of every decision. A decision was made quickly that the facility would be designed for 100% outside air negative pressure with typical patient room air change rates. The HVAC is served by twelve Greenheck propane direct fired make-up air units with evaporative cooling for a simple and easy to maintain system with built in redundancy. To keep the campus and surrounding neighborhoods protected, all building air is exhausted to the roof of the structure and into the atmosphere via Greenheck utility set exhaust fans. Direct communication with the factory via Norman S. Wright Mechanical Equipment Corporation allowed for an accurate and reliable delivery timeline to be integrated into construction activities for a phased build. Mt. Rose Heating & Air had the man power and machinery to convert over 80,000 pounds of sheet metal to a large galvanized spiral duct system that was installed tucked into the facility's structural beam bays for the delivery of conditioned air to a comfortable and well ventilated built indoor environment. Power to HVAC equipment was brought over from the adjacent Central Utility Plant, another driving factor in the choosing of the garage structure as a location for the emergency conversion project.

Greenheck Make-Up Air Unit

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Construction of the Building's Exhaust System

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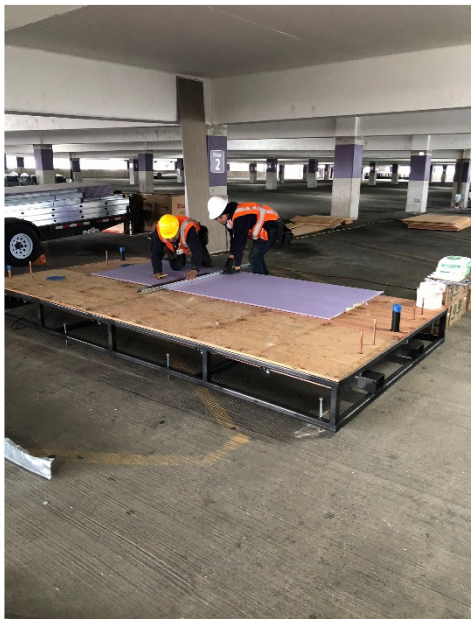
Preparing for the large quantity of occupants required porta-potty type restroom services that were installed connected to the building's exhaust system for odor control. In addition to a large quantity of patients, the make-shift hospital was also geared up for the resultant team of medical workers. The need to protect our front-line healthcare workers and maintain a sanitary environment required plumbing services beyond porta-potties such as flush toilets and hot water. Domestic water was already located in the vicinity of the garage for landscaping risers and a new feed was brought to the building with proper backflow protection. Two propane fired water heaters were located on the equipment level. Since the building's area drain system was already connected to sanitary sewer, the team converted this drainage system to a wet-vent type sewer riser system for the flush toilets. Hot water handwashing stations were located strategically on both levels and a two-stall restroom module with changing rooms was provided on the equipment and staging level for the staff break room. The need for creative plumbing solutions was addressed quickly by Savage & Son, Nevada's oldest plumbing contractor. The restroom modules were pre-fabricated at Savage's shop which involved a pre-plumbed platform that could be fork-lifted into place with fixtures, flooring, walls, lighting, and exhaust provided in later stages. The restroom modules are served domestic hot water by a hot water circulation system.



Pre-Fabricated Plumbing Platform

PEX piping was utilized for water distribution due to its quick install and easy rigging. All plumbing materials were provided by Western Nevada Supply. Most plumbing piping is located within the condition spaces and the team remains prepared to heat trace the minimal amount of exposed piping come winter time should the need arise.

Toilet Room

Hand Washing Station

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In addition to the two lower floors converted to patient area, the third level received an employee break room for respite. The fully outfitted break room includes DX split system heat pumps for full heating and air conditioning, the aforementioned two-stall restroom module, walls, windows, paint, carpet and was even out-fitted with a small kitchenette, television, and convenience outlets for device charging.

Employee Break Room and Water Heaters

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In addition to the HVAC and electrical services, the project received a heavy dose of collaboration amongst medical IT, interiors, furnishings, linens, and a significant amount of medical supplies ranging from mobile nursing workstations to mobile drug dispensary and bottled medical gases. The extremely clean and well-furnished emergency hospital was completed and delivered to the medical staff on time. Ainsworth Associates Mechanical Engineers provided full time on-site design services and had a team of engineers providing support and quality control on the project remotely. The team will continue to be involved in the building operations of the facility for documentation purposes and to assist when the pandemic resides and the facility gets returned to its normal state. The rapidly constructed temporary hospital facility reflects a commitment to the community that Renown Regional Medical Center has demonstrated since the 1950's. The project is a true reflection of challenges that can be overcome when a community works together towards a common goal for the greater good. Ainsworth Associates Mechanical Engineers could not be prouder to have been involved in such a critical and successful project.

Greenheck Make-Up Air Unit

Sani-Hut Exhaust

A Battle Born Facility

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Patient Care Areas and Support Services