

Porter Adventist Hospital

Category 2- Meeting the Challenge of a Difficult Job- Specialty Contractor

Intermountain Electric, Inc. (“IME”)

For the better part of a century, Porter Adventist Hospital has been serving Denver and the surrounding communities, being named among the “Top 10% in the Nation for Critical Care” multiple years in a row. Maintaining a high standard of excellence that is nationally recognized is no easy feat, so when the opportunity arose to update some of the hospital’s facilities, Porter Hospital leadership knew it would require the right construction team to execute the project with the highest level of care.

Regardless of experience and planning, construction is an industry plagued with daily challenges. It’s the nature of the beast. So, despite extensive planning and the team’s best efforts, when you are updating a facility that has been in service since 1930, with multiple renovations over the years, the complications can become substantial. Add in the necessity of remaining operational during construction, and you have the promise of a very difficult endeavor. Such was the case when the South Denver hospital made the decision to move forward with their plan to update a large portion of their existing facilities in 2016.

A winning team- planning and forethought

Before even being named to the project team, IME took to planning with a dedicated group of individuals including our Director of Construction, multiple superintendents, and our BIM department. The intention being that understanding the project and pre-planning much of the design would set IME apart from the competition when the selection for the electrical partner was made. For months, the team poured over the plans and designs and worked through constructability timelines and possible issues. The effort paid off; IME was awarded the project in early 2017.

IME was tasked with updating the old electrical infrastructure including the Central Utility Plant, and the power supply to a wide range of the main hospital’s facilities. The scope included retrofitting main areas in the North Wing and the Radiology suite. Other areas in the hospital

were demolished to the point that all new electrical systems were designed from scratch to fit the new space that had been created. These areas consisted of the new café, four new OR rooms, the morgue, and multiple new office/ meeting spaces.

After the award, the project team continued designing and planning for months before construction could begin. Starting with the initial meetings between Porter Hospital leadership and Saunders Construction, IME called in our BIM Department to do infrared scanning of each of the future construction areas to create a point cloud of the existing spaces in order understand the physical constraints and form the logistic plan of the cutovers.

Cutovers- transitioning from old to new with surgical precision

For three long months this process went on, the IME team working tirelessly to plan each procedure down to the last detail. During that time, providing power to critical systems and uninterrupted functionality of facilities remained the top priority.

The majority of this pre-planning stage was dedicated to the numerous cutovers required to complete the update. This meant creating a MOP or Method of Procedure for each cutover of the electrical system components from the old outdated equipment to the newly designed and installed system, while minimizing impact to hospital staff.

For example, further into the project, one of the main cutovers required over 30 meetings and a year of planning. This particular cutover of the entire North Wing also affected nearly every area of the hospital including over 100 electrical panels, dozens of patient rooms and required a crew of 45 men to perform. Limiting the amount of time during this outage was crucial to keeping the functionality of the hospital intact. Crews worked tirelessly overnight on the weekend to complete the work within the timeline that worked for hospital staff. According to the plan, the duration of the hospital shut down was to last no longer than 39 hours. Because of the extensive planning and coordination, IME crews completed the entire cutover and re-energization in just under 34 hours, 5 hours ahead of schedule. Amazingly, this was also after the start of the shutdown was delayed due to hospital staff wrapping up a crucial surgery. For

two hours crews, cranes, and leadership all waited patiently for the successful conclusion to the surgery before they could even begin the evening's work.

Also performed during the cutover of the North Wing, was an improvement that IME discovered during the cutover planning. It was found that IME could provide Porter Hospital with independent control of various areas of the campus medium voltage distribution. The existing setup consisted of one feed from their main primary distribution switchgear into all three of the transformers supplying power to the North Wing, CCU, ICU, and Radiology Suite; meaning if you shut down the primary feed, it would shut down all three transformers. IME was able to provide a switch that would allow each of the transformers to be sectionalized and worked on independently.

Modern Solutions for Outdated Equipment

Early in the project, the decision was made that traditional trenching was out of the question due to the building's age and existing unknown infrastructure. The solution to this difficult problem came in the form of hydrovac trenching; a process that involved pumping vast quantities of water into pre-dug channels in order to liquify the compacted dirt to then be vacuumed out. IME coordinated an enormous amount of hydrovac trenching both outside the hospital as well as multiple indoor facilities in order to make room for the new electrical conduit systems. This was a very effective and safe way of excavating while keeping many fuel lines and lifesaving equipment feeds intact.

However, when trenching began, a spiderweb of unknown infrastructure began to emerge. Cabling, old dilapidated conduit and abandoned piping were found. Before construction could continue, a new priority emerged. The hospital, the IME team and Saunders Construction all agreed that there was a need to determine the identity of the underground network of piping including the abandoned portions. IME was happy to help, as this identification process would allow later construction efforts more accuracy and less confusion; taking heed in the old adage, "leave it better than you found it."

Construction Innovations/ State-of-the-Art Advancement

Also due to the advanced age of the hospital, records of past construction were infuriatingly inaccurate and incomplete. Hence, IME BIM team became an integral asset throughout the project in mitigating the almost constant design changes due to unaccounted for existing conditions.

Much the same as the mystery contents found when hydrovac trenching, when demolition of the existing facilities began, it was evident that the inaccuracies of the as built drawings would be dictating the day to day activities of the project. Each time IME began to demo a new area in anticipation of updating the systems, significant discrepancies between the drawings and the existing conditions were uncovered. Thus, a new process was formed. IME began each new area with a fully developed plan for carefully demolishing, documenting, proposing changes, and gaining approval to proceed. This drastically slowed down all progress. To combat the delay created by this process, IME brought on a full-time project engineer for dedicated documentation for the changing conditions. The addition of this crucial personnel acted as a bridge for onsite crew and the BIM team and allowed the project to develop with little to no delay, and IME was able to provide Porter with a complete set of as built drawings for future use.

Safe Practices, Safety Apps

Adding to the complexity, working within a functional healthcare facility dictates more than a few extra hoops to jump through to keep things running safely. Working through multiple departments simultaneously, the IME site team needed to mitigate the many by-products of an active job site that might compromise a clean hospital. Dust, noise, vibration and demolished refuse removal needed to be addressed with sensitivity and care in mind for IME employees, hospital staff and patients. Site supervision kept crews on track with daily safety meetings and updates. Thanks in part to this daily focus on safety, IME site employees and leadership devoted over 52,000 manhours to this project with zero recordable incidents, and zero lost time accidents, and completely injury free! The other factor attributed to this safety success was the multiple real time safety apps that IME was designing and testing during the development of this project. From apprentices to superintendents, our mobile app-based Safety Department is at the forefront of how safety is addressed within the construction industry.

Excellence in Client Service

Because of our dedicated team and the attention to detail when planning the many crucial aspects to this project, IME was happy to celebrate the successful completion of this project in October of 2018. In partnership with the hospital and Saunders construction, the realization of this project elevated Porter Hospital to a new level of patient care for the South Denver Area for years to come.









