

## **Category 2: Meeting the Challenge of a Difficult Job – Specialty Contractor**

**Specialty Contractor: Intermountain Electric, Inc.**

**Project Name: Western Sugar Processing Facility Upgrades**

Short and Sweet: Racing to Transform a Sugar Beet Processing Facility

Upon descending to the lowest, split-level floors of the Western Sugar Processing Facility in Fort Morgan, Colorado, one would at first be struck by the century old structure that holds the building together, and then taken aback by the buzz of countless trades busily weaving their own craft into the place. Originally built in 1906, set on the rolling plains of eastern Colorado, this sugar beet processing plant became the hub of an industrious agricultural region. In the summer of 2016, though, the facility was experiencing a revival that would allow it to continue to produce something truly sweet for the local communities and Rocky Mountain region consumers: agricultural commerce.

The purpose of this project was to dramatically update the aged equipment in the Western Sugar facility. From the moment it was conceived, the clock was already ticking. Western Sugar Cooperative (WSC), the owner of this empire, selected Logical Systems, Inc. (LSI) as their construction manager for this project, who, in turn, put their faith in Intermountain Electric, Inc. (IME) to complete an intensive scope of work, not only to the quality required by a food handling plant, but within a very strict timeframe. After all, the year's crop of sugar beets was not simply going to wait for the facility to be ready – LSI and IME had to keep up with the tempo of the earth itself.

In a time span of 3 months, IME was tasked with installing power, controls, and structured cabling to the entirety of the building. With 110 years between the first crop of sugar beets processed there and IME's entrance into the facility, our team found itself working with both relic machinery and state-of-the-art process equipment. In a deeply intricate maze of pipes and conduits that clearly showed their age, IME had to find a way to connect "A to B", without any

as-builts of the existing infrastructure and without any indication as to the precise route that should be taken. Being handed schematic suggestions of where our team should start and end a cable or a conduit became the most information we could ask for. The rest of the route was left up to the IME team to plan and install. Through it all, the common denominator was time.

Beyond the near complete lack of drawings in such an immense and complicated facility, IME was placed in the same restricted space as a substantial number of other trades. With the sort of work that our team needed to complete, such as pulling into place immense cable, sized such that the minimum bending radius was 43", it became crucial to understand where every other individual on the project was working. By careful coordination with all other parties on site, particularly WSC themselves, IME was able to direct our workforce in an ideal manner to avoid overcrowding any single work area at a given time. Furthermore, having a full understanding of which new process equipment and instrumentation was ready for IME's connections led to an incredibly smooth management of manpower over the life of the project.

To accomplish this, IME opted to place 30 personnel onsite during the day and 15 at night. Not only did night work allow IME to maintain the ever-aggressive schedule set forth by LSI and the sugar beet crop itself, but the fact that no other trades chose to work night shifts meant that our team was able to complete vital yet space-consuming work without interfering with the progress of the project as a whole. This approach to workforce coordination made IME's efforts not only more efficient, but also ensured a higher quality product and safer environment.

With such a short period in which to complete nearly 25,000 manhours of installation for power, controls, low voltage and various other scopes of work, IME was challenged to keep our schedule from the very outset. Beyond coordinating with other trades, IME needed to find a way to stay ahead of the approaching harvest that would require the facility to go back online. As scope was slowly added and modified in the process of this progressive design-build project, it became necessary to source materials quickly while remaining cost effective. Others working in the plant couldn't afford to wait on IME, so we couldn't afford the delays of long lead items. Strong vendor relations and diligent material sourcing allowed IME to do just this: procure the right equipment, at the right time, for the right value.

As on all projects, IME was committed to maintaining a high standard for safety, achieved through daily hazard analyses, weekly site wide safety meetings, and careful coordination between all trades. We incorporated the safety program of WSC and LSI within our own, ensuring that our workforce was adhering to the most stringent of policies at all times. Due in part to this, as well as assigning a dedicated onsite safety professional to the IME team, we completed our scope of work free of any accidents. The level of communication and care between trades and stakeholders truly made the difference. With the commitment of every individual, IME employees and otherwise, we were able to send every individual home safely every day.

Based out of the Denver metro area, IME's differentiating capabilities are punctuated by our ability to prefabricate portions of our conduits and other assemblies in our own warehouse. This technique, paired with careful BIM modeling of a project, has been proven to maximize field efficiencies and allow onsite personnel to complete work in less time and with less exposure to safety risks. However, this project presented an unprecedented difficulty for IME in regards to prefabrication. That challenge was, again, the complete lack of as-built drawings of the century-old Western Sugar Processing Facility.

With no time available to use laser scanning technology in order to capture the layout of the existing infrastructure, IME took an old-fashioned approach. Having only an indication of the terminations of each cable and control system, the process of meshing our new installations with the aged ones began with field personnel planning the electrical routing. The path was made clear by placing elevated strings in the facility prior to construction work beginning. This required not only a vision of how our installations would run from one location to another, but how they would have to bend and move to accommodate the other systems already in place as well as those that soon would be, all while staying within the materials' limits of deflection and support.

Based on these proposed locations, IME's BIM team was able to begin building a detailed, three-dimensional model. Not only did this design support from our BIM team serve to provide plans to the field where there were none before, but it also enabled us to utilize the full strength of our prefabrication capabilities. With several hundred support systems being built in our warehouse, we were able to hasten the schedule of the project and reduce exposure to safety and quality risks

for our onsite personnel. IME's prefabrication approach meant that our work in the facility itself could be focused, instead, on the complex placement of our conduit and cable tray paths. By taking a sequential approach to placing our work IME was able to build complex routes without interfering with the installations of other trades. The success here came through understanding both the required end result and how our work would interact with other systems.

As work progressed in the facility, though, the coordination between all parties only increased. Despite the lack of initial drawings, IME partnered with other trades to produce a single, comprehensive 3D model of the facility. Every new piece of pipe or conduit, each new process system, and all controls and meters were brought together digitally to create a new representation of this project that took so many individuals of such diverse expertise to complete. Not only have these as-builts of additional infrastructure been an important deliverable to WSC, but they've also served as a tool for the progressive design and installation within the plant. Understanding what we had built thus far facilitated the process of moving forward more efficiently and effectively.

IME's ability to complete the base scope, along with additional electrical work, and continual drive the overall progress of the project schedule has proven successful to all stakeholders. Not only were the intensive and deeply needed electrical upgrades installed safely and to the quality demanded by the food industry, but IME, LSI and WSC were able to ensure that the facility would be poised and ready for the September sugar beet harvest. All it really took, though, was the right team and some sweet collaboration.











