

Category: 2 – Meeting the Challenge of a Difficult Job [Specialty Contractor]
Subcontractor: Weifield Group Contracting
Project Name: ECCV North & South Booster Pump Stations Project

The goal of the East Cherry Creek Valley (ECCV) Water & Sanitation District's North & South Booster Pump Stations project was to increase the ECCV district's water distribution by an additional ten million gallons/day (MGD) – to 20 MGD, total – in order to add more capacity to the system. The water transports 32 miles from the owner's Reverse Osmosis (RO) plant to their distribution facility – so this project needed to be done before the expansion to their new RO plant was built. Weifield assisted ECCV with upgrading their service which included increasing the capability of the medium voltage equipment due to increased motor horse power needed at both locations, constructing two new pump buildings, and installing two new medium voltage pumps at each station. The North Booster Pump Station also included a full-scale chemical system remodel which needed to be implemented with no interruption to existing operations.

Weifield worked with two utility companies to convert both 480V-operated pump stations to a 4,160V system – this transformation also required no interruption to existing operations. We also worked with ECCV and two different general contractors to relocate two existing motors from ECCV's Western Booster Pump Station to the manufacturer, where they would be refabricated prior to relocating them to the North BPS site. The upgraded motors would double the RO plant's output while eliminating the need to purchase new motors for its North site.

“Converting the new stations to 4,160V was new – but Weifield knew what they were doing and were forward-thinking, always anticipating challenges,” said Michelle Probasco, ECCV Project Engineer. “Every single thing about this project was a struggle, but Weifield alleviated a lot of that.”

Solutions of Special Projects

Although the North & South stations were being upgraded simultaneously, because they were 12 miles apart and for consistency in execution, Weifield assigned two different superintendents to oversee each station; however, we utilized the same internal project manager on both to ensure symmetry between sites.

“We had the advantage of having two field supervisors collaborate to come up with best practices for both sites, which is rare,” said Curtis Miller, Weifield Industrial & Infrastructure VP.

Since both sites had identical job scopes, Weifield staged the projects a month apart (South ahead of North) – and combined weekly scheduling meetings with both sites so that the North site could benefit from lessons learned at South.

There were different approaches from the two GC superintendents on the project which created consistency challenges; Weifield needed to install our medium voltage duct bank in segments around the GC installations and fill in additional segments when the GC was complete, as well as perform our own excavation and backfill—causing scheduling issues.

“Weifield definitely helped us to hit our project schedules,” said Ray Smith, Glacier Superintendent.

Site logistics quickly became an issue due to the installation of new water tanks at each site (a 2.5 MG tank at South and a 2 MG tank at North). We built the lid for each tank on the ground before hoisting it to the top of the tank—which took up space, on-site, and required us to relocate our office trailers and equipment to other areas. Specific scheduling was also needed to install the radar and ultrasonic leveling instruments.

“We also had a power outage due to the vista switch at the north site and we never got power back,” said Probasco. “Weifield came on a Saturday at night and figured out how to turn it back on—that was above and beyond, and it saved us.”

Safety Excellence

Due to the numerous excavations for the new influent piping and deep excavation for the building, there were safety risks with our electrical team installing our strategically-placed duct bank in-between other excavated areas to keep the project on schedule. With sandy soil

conditions, specialized shoring plates were needed to ensure safety of our crew. Weifield held daily huddles with our team to review the ever-changing conditions.

Weifield executed numerous shutdowns to complete the work successfully; many steps were required to maintain operations while upgrading the various pipelines, chemical systems, electrical, and SCADA systems. All steps need to be executed precisely and in sequence to result in a seamless process for the community and to maintain water quality.

Additionally, there was risk involved with all of the medium voltage work which Weifield mitigated by developing comprehensive Methods of Procedure (MOPs) outlining the detailed steps for phases involving medium voltage terminations, outages, and turning on the equipment. To ensure successful results, the overall project team needed to collaborate and add input for final approval two weeks prior to any shutdown and Weifield coordinated a preliminary review with our company safety director to ensure all safety protocols were met.

Maintaining virtually no impact to the current operations was a key goal for the project; Weifield Group provided temporary wiring for strategic moves to maintain facility operations while preserving safety measures for the owner's operations group and construction crews.

Construction Innovations/State-of-the-Art Advancement

In order to help recoup some of the time lost with earlier delays and expedite the schedule, Weifield utilized our Prefabrication shop to build service entrance conduits, which were then delivered by truck and hoisted into place via a crane. For the South site, the switch yard had a vista switch and a 5,000 kVA transformer for which our prefabrication team built very large underground conduit structure to interconnect the electrical equipment; the team also pre-built the cable tray supports and conduit stub-ups.

Planning at the South site was accelerated and manpower was cut in half due to Weifield's innovative plan to start North ahead of South. This allowed South to avoid some of the delays North experienced with tasks such as motors, earth work, and process piping tie-ins by capturing lessons learned and making early corrections.

“There were multiple start-ups and Weifield went above and beyond with a major coordination effort, as there were certain times we could and couldn’t run,” said Probasco. “With other electrical challenges – such as transformer at the South site being oversized and surge conditions appearing when power was restored -- Weifield was quick to rectify these issues so we could continue on.”

Excellence in Project Execution and Management/Team Approach

Each of the new pump stations was designed for three pumps – two new active pumps and one future pump. New buildings were constructed next to the existing buildings at each site to house the pump stations and new electrical rooms – each electrical room with its own HVAC system for cooling purposes due to the magnitude of electrical equipment.

Challenges arose around the interruption of the main electrical service to transfer the electrical from the existing buildings to the new buildings – this occurred over the course of a month and involved a lot of small steps. The new pump station needed to be up and running so it wouldn’t impact the old station – and before the new pump station could be taken online, the SCADA system also needed to be upgraded with a seamless transition.

“We had to move all of our dates due to other contractors falling behind, but the end date didn’t change. We also tag-teamed both sites; if South was slow, we went to do tasks at North. We met these challenges as a holistic team,” said Jeremy Peterson, Weifield Field Supervisor.

Additionally, the underground phase of the project involved some complex design to incorporate substantial rebar, tying in a lot of concrete work, and placing 4” and 5” conduit in the ground.

“It took true teamwork to get the thousands of feet of underground installed and tying all the rebar on 12” centers,” said Dustin Coca, Weifield Foreman. “You can build a building on top of our duct bank.”

Excellence in Client Service

Extensive value engineering occurred up front even though project was in budget, to help with any additional needs later on from the owner. Weifield built in consolidated areas for equipment to ensure access for personnel and traffic, and placed electrical areas in the tank areas for best accessibility. Weifield also incorporated the addition of cable tray for future expansion in the building (the design accommodated one additional future pump) – so that more pumps could be added with the expansion of the building down the road.

Weifield is also currently constructing ECCV’s state-of-the-art RO plant which will include natural and RO filtration, and ultraviolet/chlorine disinfection.

“We designed all of the medium voltage electrical pump stations – which was essentially two projects in one -- and Weifield did great work with our design,” said Shilpa Shivakumar, Environmental Engineer at CDM Smith. “Overall, Weifield was really great to work with and very responsive. They had a dedicated staff and worked together as a team quite well.”

“Weifield could shift on the fly, electrically – the availability of the staff was amazing, and overall, the whole team was really easy to work with. If there were issues, Weifield was quick to fix it. They just took care of it; we would not be where we are, without Weifield,” Probasco said.











