

Category: 6 – Best Building Project – SUB (\$6-10M)

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**Project Name: RTD Commuter Rail Maintenance Facility
PCL Construction – General Contractor**

With over 100 miles of track, Denver's existing light rail transit system connects communities through quick and reliable transportation, providing access from the Jefferson County Building in Golden to Aurora's City Center; from Lone Tree and the Denver Tech Center to Downtown Denver. As the population of the Metro Denver area has increased, so has the demand for effective public transportation solutions. The Regional Transportation District's (RTD) FasTracks initiative, passed in 2004, guaranteed expansion of RTD's existing light rail transit system and incorporated commuter rail transit as a more cost effective means to reach more cities. The Commuter Rail Maintenance Facility (CRMF) was born from a critical element required to successfully launch and sustain a new commuter rail transit system: ensure the safe and consistent operation of passenger trains and track system. The CRMF is a 24/7 facility responsible for repair, maintenance, testing, cleaning, operation and storing of the RTD commuter rail fleet. Situated on 30 acres, this 3-level, 197,183sf, maintenance facility with 6 points of entry and 1,000 feet of trestle track, will support and monitor operation of the Gold Line, Northwest Rail alignments, East Corridor and the North Metro commuter rail lines.

The CRMF is a significant piece of the multibillion FasTracks Eagle P3 project which connects Denver to east, north and northwest metro cities and Denver International Airport. The CRMF project is one of a kind. No other facility of this magnitude is being built in the United States and globally organizations are watching for a successful outcome for possible duplication. The facility will house the train maintenance and repair bays; operations control center; electrical, mechanical, carpentry and welding workshops on various levels; administrative space; training rooms; and locker rooms. The CRMF is the central nervous system of the FasTracks Commuter Rail Transit System.

Solutions of Special Projects:

As a true Design/Build project, the team was challenged with coordination on all sides of the design by incorporating; architectural, mechanical systems, electrical systems and all other trades. Weekly meetings were held with all designers and contractors to address items which may need to be integrated into the drawings as well as address trade collision. The design process took just over 24 months for 100% drawings. An early foundation package was submitted in order to start dirt work and underground conduit installed while design was being completed. This allowed us to mobilize approximately a month and a half ahead of complete site mobilization.

In the beginning, Mother Nature took the project by storm and virtually turned the site into a giant mud puddle. Following weeks of recurring, record-setting rain storms, excessive water and saturated soils brought installation of underground ductbank to a halt, directly impacting progress. Through Building Information Modeling and off site prefabrication of ductbank sections, the underground schedule was fully recovered.

Excellence in project execution team approach:

A 20% Small/Disabled/Minority/Women Business Enterprise (SDMW/BE) participation goal offered opportunities for multiple SDMW/BE firms to work on the CRMF project. Specific scopes of work with clear lines of demarcation were established for electrical and low voltage system design, telecommunication/data system, paging system, and the procurement and setting of switchgear and generators. Subcontractor SDMW/BE worked as an extension of our team, coordinating, communication, constructing and integrating their scope of work with the overall building and systems. Additionally, they adopted and adhered to the project safety requirements which were more stringent than OSHA. Through development of new, as well as utilization of existing, mentor-protégée relationships, our SDMW/BE partners performed 30% of the electrical and low voltage work, exceeding the goal by 10%.

Construction Innovations:

The CRMF project has been registered for LEED Silver certification. To optimize energy performance, Dynalectric installed a lighting control system throughout the 197,183sf facility, promoting unlit unoccupied areas. To take advantage of the bright Colorado sunlight, the structure design incorporated double pane skylights so that natural daylight could be harvested in the maintenance bays, providing an additional energy savings.

The facility has a new Vertical Lift Module System which electronically categorizes each tool, part, and stock availability. The system tracks the location of the fork lift through a fiber optic line in the concrete to direct the driver to the exact location on the shelf where the tool/part is on the warehouse shelving. This system improves efficiency in locating items, improves productivity and minimizes downtime of equipment. An attribute of the system is accurate stock availability, whereby the system sends notification when long lead items are in short supply.

The facility also houses a closed circuit video surveillance on each of the rail systems in order to monitor each of the rail lines the CRMF supports. The control room has the ability to provide dual monitoring, both on the wall and multiple screens on individual line work stations. Safety is important not only during the construction of the CRMF, but for the general public when utilizing the RTD system. The CRMF control room will monitor the rail lines on a 24/7 basis.

During the planning and layout of the site, the project team incorporated field personnel, BIM/CAD drafters, and Prefabrication (Prefab) Departments. Involving these departments early on allowed us to keep material off the site and assemble components efficiently in a controlled environment. This effectively reduced the amount of manpower required on-site, ultimately creating a safer work environment. Materials were delivered on an as needed basis, maintaining a site free of clutter and debris. Dynalectric applied prefabrication efforts into the underground ductbanks, lighting fixtures, ETS boxes for the catenary lines, Unistrut trapeze hangers, conduit racks, and devices throughout the facility.

The underground prefabrication consisted of (20) 4" conduit runs spanning across over 400' and into two (2) individual 10' x 10' x 10' vaults with the span of over 600' of additional conduit in

each direction on each vault. Underground prefabrication consisted of separate ductbanks fed from four (4) pieces of distribution equipment; from a 300KVA generator and to three (3) Xcel Energy transformers and connection cabinets. With over 1,000 light fixtures throughout the facility, prefabrication of the whips, ballasts, and hangers was a must to augment productivity in the field.

With our BIM/CAD and Prefab Departments working together, we were able to prepare workable schematic drawings with the size, length, and connection point for each fixture. We then turned them over to our Prefab Department to build each fixture in a controlled environment, ensuring the quality of each fixture. This process also enabled us to maintain a low composite rate by performing these tasks off site on a Davis Bacon job. Through all our prefab efforts and “out of the box” thinking, approximately 1,800 hours were saved on the project with prefab applications alone.

Safety:

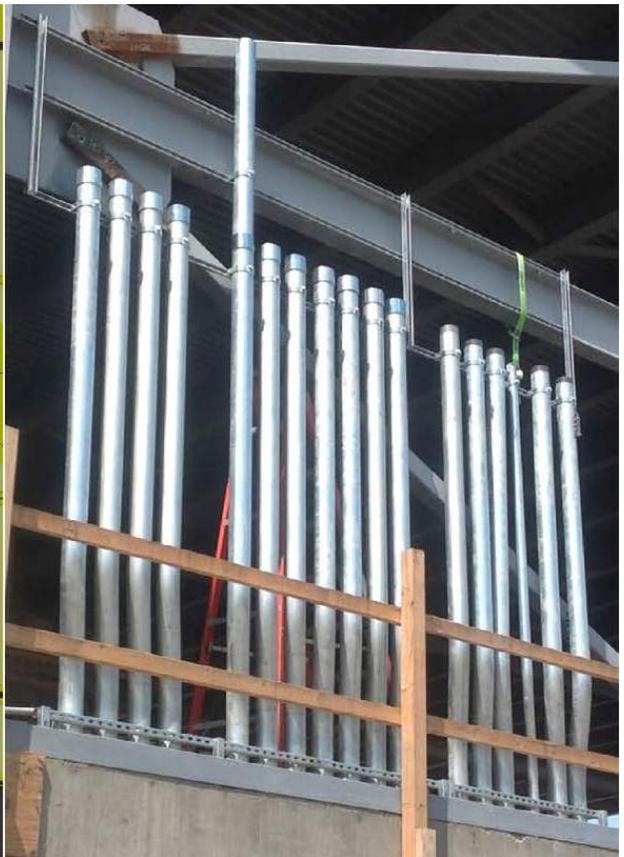
Safety, quality and productivity must be integrated in order to efficiently meet and exceed the expectations of our customers. Our site specific safety program incorporated our management, supervision and field electrician’s accountability and commitment to the safety of our personnel. Each work day started with a safety tool box talk and was followed up after the lunch break to reaffirm the safety issues which may have been present with the day’s activities. This facility has multiple levels in the Maintenance Bay and Expansion spaces so safety education and awareness when utilizing equipment in these areas was critical to achieve a Zero Accident workplace.

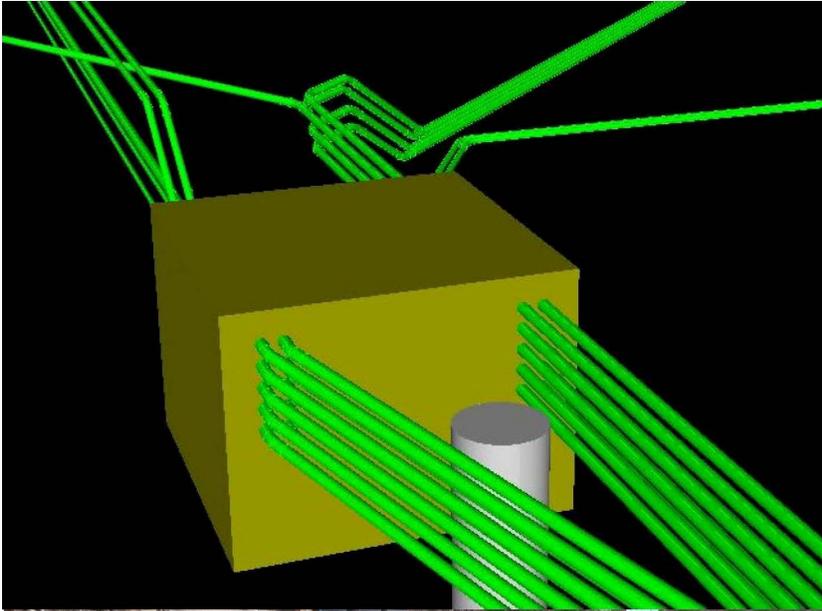
The Dynalectric CRMF crew performed over 63,358 hours with zero recordable injuries and one first aid only incidence; calculating to zero lost time on the project. Integrating safety with not only our employees, the General Contractor, and the multitude of other trades on-site was a group effort and one not taken lightly. Each individual was responsible for their own safety and for those working around them. It is our culture to ensure every employee returns home in the same condition as they left that day – no one is exempt.

Excellence in Client service:

As a Design-Build project, collaboration and communication with our customers was the cornerstone of success for CRMF. Understanding the present and future needs of RTD and the end-user groups, the design team as well as our trade partners, made it possible to keep the design process and construction activities on schedule and greatly reduced re-design or re-work. This facility will be viable for years to come, providing a safe mode of transportation to the Denver Metro Area. In December 2013, we were awarded the “Subcontractor Quality Crew-of-the Month” by PCL Construction. Dynalectric strives to be an example to all trades on every project through our dedication to quality and safety.

Today, through the existence of the CRMF, communities throughout the metropolitan area will be connected to cities from Denver to east, north and northwest metro cities and Denver International Airport. The RTD FasTracks initiative has enabled the public to look towards utilizing a rail system which will be a safe, reliable and an economical mode of commuting. The CRMF is here to sustain the commuter rail transit system now and well into the future.







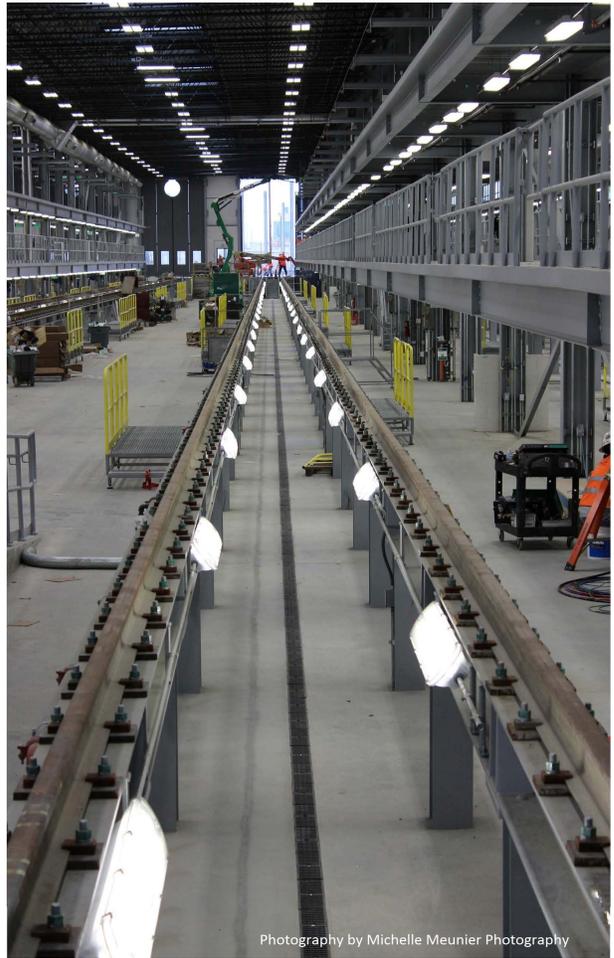
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