**Category 4: Best Building Project - Specialty Contractor (Under $2 Million)**

**Contractor: Duro Electric**

**Project Name: Chung Tai Zen Center**

Duro Electric was proud to partner with Adolfson & Peterson on the Chung Tai Zen Center, a showcase building for architectural detail and aesthetics located in Boulder, CO. Chung Tai has several Zen Center’s for the Buddhist community across the United States, offering a variety of activities such as workshops and daily mediation. The mission of Chung Tai is to promote Buddhist virtues of compassion, equality, harmony, and wisdom. This was multi-build project consisting of a monastery, residence, and Zen gardens. Senior Project Manager, Jade Mercer and Superintendent, Talbot Holmes of A&P, worked closely with Senior Project Manager, Brian Simpson, and Foreman, Jon Forde of Duro Electric, to ensure a successful project delivery in August 2021. After over 11,000 electrical labor hours the project was completed at approximately $1.8M.

**Project Challenges and Solutions**

The project’s unique style and architectural details required all electrical systems to be concealed creating a sleek, minimalistic design. The challenge involved installing lighting fixtures in a manner that concealed the fixture while continuing to provide adequate lighting to the area being illuminated. Each fixture had to be installed in a manner that allowed the light to appear as a glow, rather than coming directly from the fixture itself. Faux beams made up of cross laminated timbers (CLT) were run throughout the main building including the central corridor, dining hall, and mediation hall concealing the recessed light fixtures. Each fixture was installed in a 6” space between two beams. This provided just enough room for an electrician to get their arms inside the space for installation. The bottom of the light sat about an inch inside the beam, allowing the light to reflect off the wood as well as conceal the fixture.

Another challenge involved the installation of the large cloud light fixtures in the meditation hall and dining hall. Radiant heat flooring was installed throughout the building capped with gypcrete and wood planking. The design of the flooring system would not accommodate the weight of heavy equipment which created obstacles when installing the 7’x14’ cloud lights. Due to the restrictions on the floor weight capacity, aerial lifts could not be used for the lighting installation. Each light fixture had to be assembled on the ground and then lifted 25’ in the air by a rope on the scaffolding for installation. Due to the size and weight of the fixtures, the sides of the scaffolding were used to rest the fixture on. To avoid damage to any of the fixtures, foam pool noodles were used to wrap the rails of the scaffolding. The cloud lights were installed with the light facing the wood ceiling to create a soft natural light illuminating from the fixture.

Working in areas with physically limited space created additional challenges for the Duro crew. Nearly half of the electrical labor hours were spent inside the ceilings and crawl spaces with no more than 3’ of working head height. Working in such a constricted area made it difficult to transport materials and tools throughout the space, crawling on their hands and knees the task took longer than anticipated. Duro Electric Apprentice, Amelia Holleman, identified a creative way to increase productivity and efficiency within the crawlspace. She used a $7 plastic sled to carry her materials behind her throughout the crawl spaces, eliminating the need to travel back and forth gathering tools and materials. Her solution to the problem significantly reduced the labor hours necessary to perform the work and increased safety awareness while reducing strain and sprain hazards.

**Project Safety and Environmental Sustainability**

Chung Tai Zen Center was completed with a total of 11,762 labor hours without a single recordable incident. Duro Electric’s HR and Safety departments teamed up to implement a “Safety Roadshow,” where members from each department visited each job site to discuss safety measures, efforts, and have open discussion with crews about the importance of safety. This process helped employees further understand the integral role safety plays on project site.

The COVID-19 pandemic did not fall far behind the beginning of this build. Duro took quick action to respond and comply with local and state requirements by quickly implementing strict protocol to protect all workers. The project management team worked closely with Safety and HR departments to keep them aware of any sick employees. Protocol required any employee experiencing symptoms be removed from the jobsite immediately to protect the rest of the crew and other trades on site. As COVID began to impact the availability of PPE or causing shipping delays, the Duro prefabrication team made face coverings out of Duro t-shirts, as recommended by the CDC. To determine employee satisfaction and comfortability, opinion surveys were administered on Duro’s response to the pandemic.

Job Hazard Analysis were coordinated by the project management team. Safety audits were routinely conducted to help identify and address safety concerns and employees were encouraged to communicate any near misses of potential hazards to the project leaders. There was a high level of communication between Duro and A&P to identify and address jobsite safety concerns and work practices for high-hazard tasks. Duro created specific Methods of Procedure (MOP) for equipment shutdowns and change-overs. These processes created a greater level of understanding and coordination among the various project teams.

During the initial site-planning meetings, A&P, Duro Electric, the fire department, and mechanical contractor for the project, met to review emergency procedures for the site. Duro’s safety manager was instrumental in helping to create a site-specific confined space rescue plan that was inclusive of all trades and met the fire department’s requirements.

The Zen Center is located on protective wetlands and adjacent to a school. Situational awareness was imperative to the protection and sensitivity of the environment and the safety of the students. While students were present in the area, all contractors practiced a zero overhead lifting policy. Additionally, while practicing efforts to protect the wetlands and surrounding wildlife, all scrap materials and trash were cleaned up immediately and disposed of in appropriate receptacles. Initial design proposals were reviewed to relocate the pond’s observation deck to utilize the boulders already on site and avoid any additional tree removal. Environmental sustainability was a leading factor for the design and coordination of this project.

**Construction Innovations and Techniques**

Duro’s prefabrication department was utilized to save time and space for this project. Coordination between the field and prefab shop allowed systems and fixtures to be put together, wired, and tested according to project specifics. The shop would then ship the prepared materials to the job for installation. Between prefabrication and an onsite crew mix of Apprentices, Journeyman and Foreman, Duro was able to save $3.40/hour of labor costs.

BIM modeling technology was used to look ahead at potential issues and conflicts with mechanical duct, piping, and electrical systems in crawl spaces and ceilings. Conflicts with lighting and sprinkler system were identified and remedied before installation. Additionally, BIM modeling was used to layout all lighting fixtures, in exposed wood ceilings, so the CLT panels could be designed and built with holes pre-drilled for the electrical installations.

















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