University of Northern Colorado Campus Commons

Adolfson & Peterson Construction (AP)

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3 - Meeting the Challenge of a Difficult Job General Contractor

Why this project should win an ACE Award and why this project is unique

This project is unique because of its highly sophisticated performance space and the project specific complexity in building it. This project was built into a hill and up against UNC's active student center. The goals of creating an impressive facility to welcome campus visitors, bringing together departments scattered across campus and becoming a student hub for support was only a portion of the building's focus – the University also made Campus Commons a showcase for their music, theater and art programs. This highly sophisticated performance facility required over 190 miles of electrical, AV and special systems wire which all necessitated clearances for signal interference so the facility would sound and perform like the unprecedented facility it was designed to be. Surrounding the performance hall includes theatrical support facilities such as chorus rooms and green rooms, rehearsal rooms, an art gallery, a multipurpose room, office space and a catering kitchen. In addition to the system intricacies to make a state-of-the-art performance space, the many levels these spaces require (which includes an orchestra pit, seating balcony, and numerous catwalk levels), building this highly sophisticated space truly became building a ship in a bottle.

On top of the complex theater rigging and the bones within the space to make it function, the interior finishes include 640 seats from Canada made of walnut wood, walnut wood veneer from China laminated to the walls and acoustic reflectors, and reclaimed rail car wood flooring that wrapped the showcase social stair in the lobby. Each of the Canadian seats are slightly different size widths in order to optimize sight lines and seat counts and have unique supply air diffusers for controlling air without disturbing sound requirements while placing a very high importance on occupant comfort. Each of the wood sheets were also perfectly matched and positioned so the finish or grains would look cohesive and seamless.

Excellence in Project Execution and Management/Team Approach:

AP worked with the design team throughout preconstruction to evaluate design options. “The AP team has been very engaged during our preconstruction phase, promptly responding to requests for cost and constructability information. We’ve gotten a lot of value from their participation. Most notably, the construction team offered the solution for constructing the seating slab to be constructed of a concrete structural slab which maintained a minimum slab thickness of 14” - Chris Wineman, Principal Semple Brown Design.

This massive concrete slab would later hold the seats and other finishes referenced above and because of the underslab displacement air diffusers as well as the aisle lighting, this allowed the construction team to preplan logistics to create a smooth transition into construction. As construction of this area further commenced, the originally selected seating supplier went out of business and required the entire project team to realign their decision on selecting a new seating vendor and therefore the coordination of the aisle lighting and in slab air diffusers were critical. The construction team implemented 3D scanning to provide an exact built to the new seating supplier which allowed the team to fully understand the complex radii, levels, and sight lines to better position the seats for optimum viewing pleasure.

Meeting flexible space needs was also required in the lobby. The day-lit, 2-story lobby creates an indoor courtyard for the campus, providing a range of student hang-out options as well as a pie café. The lobby floor can be cleared for banquets or receptions, and daily allows students and staff members to mingle and interact. The lobby is organized around a “social stair” that links the floor levels and the glass handrails and glazed meeting room walls that ring the lobby allow any event to be instantly visible and recognizable.

Solutions of Special Projects:

The site was built on a 39-foot grade change, requiring excavation of over 30,000 cu-yd of material. Because of this slope, the team built 56 retaining concrete walls, some 30 feet high. Since the building occupied most of the site, the project required a meticulous step-by-step

laydown and staging plan. Keeping a temporary access road for deliveries helped with logistics while also ensuring safety for the campus population and minimizing disruptions.

Project elements required expertise to create a unique sequencing of the superstructure. The 55-foot masonry walls on the theater's house side and the 65-foot walls on the stage side both had to stay open ended on one side each requiring the use of cable bracing until steel could be flown in to make the balcony and the stage roof. The beams had to be threaded through coordinated holes in the CMU.

Compound radius shaping of the walls provide the ideal geometric shape for acoustical optimum in the performance hall. The utilization of prefabrication and building complex geometrical objects in controlled environments allowed the project team to maintain a level of accuracy and quality. The use of BIM and coordinating everything from above ceiling to below-grade as well as and mockups executed pinpoint-accuracy required in this type of construction. The team also utilized 3D laser-scanning to ensure the precise quality of wall shaping to validate the shaping for acoustics.

Standing backstage, there is an elaborate weighted pulley system to raise and lower backdrops, equipment, scenery, lighting and even people. The 38 weighted arbors, each with the capability of lifting 2,400 pounds each, needed to be installed precisely to prevent the collision of theater elements. No-fly zones were created using BIM to effectively coordinate the space. This mindfulness of the system's multiple components ensured the 18,870 lineal feet of aircraft cable in the stage fly system wouldn't break or conflict with another system's component to keep what truly is a living moving theatrical machine functional for decades to come.

Construction Innovations/State-of-the-Art Advancement:

When building the auditorium's interior, the team used an elaborate dance floor scaffold system customized from the back entrance of the performance hall on the second floor and spanned to the front of the stage at a height of nearly 35' to provide a working surface platform. This scaffold was rated for a staggering 3,155 lbs and for holding scissor lifts and snorkel lifts to be used to complete all of the high structure and finish work.

75-foot steel fabricated trusses required boom lifts for installation which were flown in with a crane through the roof of the auditorium weighing 23,000 pounds. The return air duct 35’ long pieces were also flown in from the same hole in the structure in two pieces weighing 5,600 pounds each.

Lastly, another innovation was the project team used 2” high density foam placed on grid level which is elevated 55’ from the stage level below. The very experienced theatrical consultants had never seen the lighter foam be used this way before. This allowed all of the trades at the grid level and stage level to work simultaneously and therefore created schedule efficiencies.

Environmental/Safety:

Modeled logistical plans off Google Earth assisted with planning pedestrian paths, traffic dynamics, parking changes and staging of construction activity for the busy campus site and the 125 onsite workers. An under-road pedestrian tunnel had to be temporarily closed and pedestrian traffic re-routed. This was not an easy task – the tunnel is adjacent to a large electrical panel that serves power to three different buildings. The team had to take down power and use a temporary generator between Christmas and New Year’s Eve in order to get power lines to the new building. The team kept student safety as a top priority during this process and scheduled the closure around the academic calendar.

An underground detention stormwater system had to be installed. To construct this structure, the City storm main running through the site had to be relocated. The team built a permanent dome structure, which holds 234,000 gallons of water, to contain stormwater.

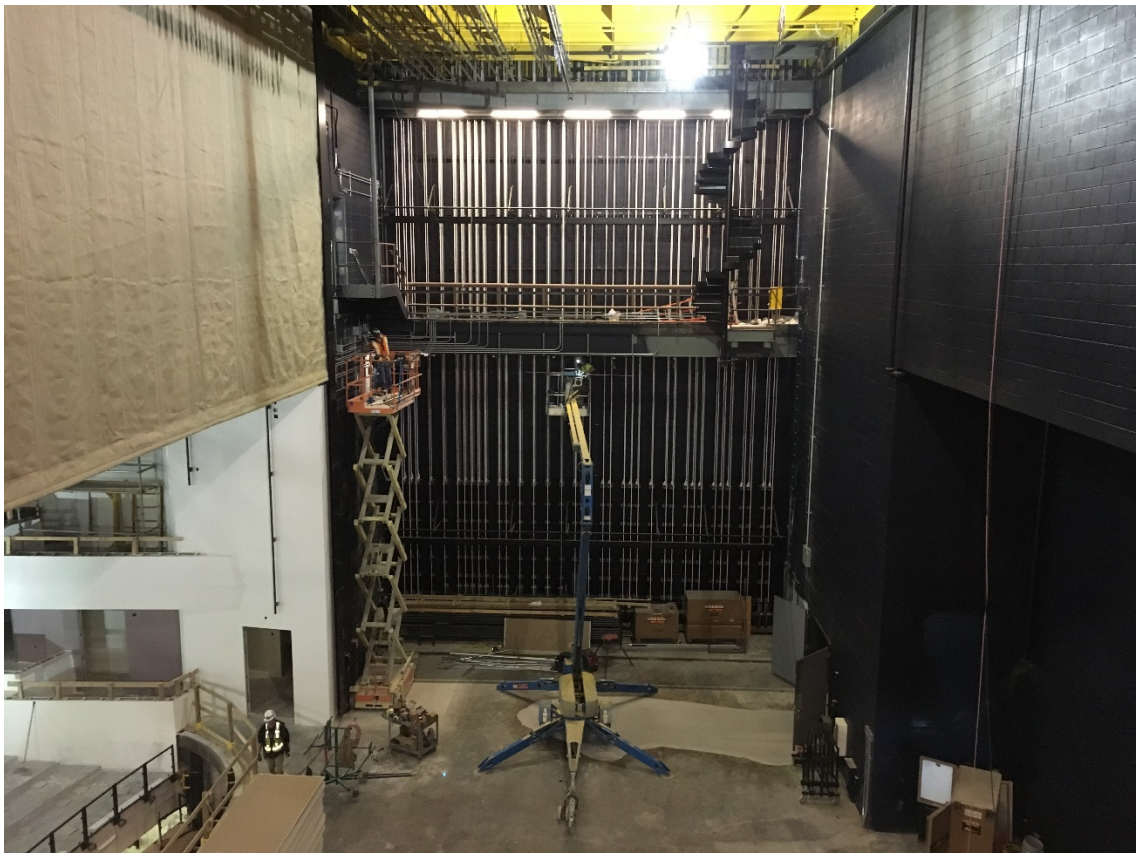
Contribution to the Community:

Coordinating over 10,000 campus visits by prospective students, the campus now has a functional and impressive space for large-scale admission events. The new facility is also a central point and resource center for the 13,000 students and 800 faculty who call UNC home.

“Campus Commons signifies how UNC is facing the future: with student support, a welcoming presence, cool art, beautiful music and really good pie.” - University of Northern Colorado website

Excellence in Client Service

“I appreciate AP’s collaborative approach. It is obvious that this approach extends into their relationships with Subcontractors which ultimately results in a higher quality project for an owner. They do a great job of keeping the team informed on the issues and providing multiple options of how to deal with the issues. Ultimately though, they understand that they need to take responsibility for the final solution. I would be pleased to work with this team on future projects.” - Nate Reinhard, UNC Planning & Construction

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