

ACE Awards 2017

Category 9. Best Building Project – General Contractor (\$10-40 million)

General Contractor – GH Phipps Construction Company

Project Name – Colorado College Tutt Library Addition and Renovation

Some Improvements add up to Net-Zero

Libraries have historic roots back to 2500 BC. Rulers, kings, presidents and institutions all advanced libraries for millennia, but perhaps the most significant impact on the physical library began in the 1960's with computers and digitization. In 1962 Colorado College completed a new library facility. Focus, at that time, was on individual study space and limiting distractions. This thought likely drove the original design's use of infrequent 9 *inch* wide x 9 foot tall windows offering tiny slices of the beautiful Colorado outdoors.

Well...times have changed: In 1970 Colorado College implemented the Block Program where students plunge into a different subject every three and a half weeks rather than balancing several courses throughout a semester; campus enrollment has greatly increased; today's students collaborate. In addition, Colorado College has adopted the challenge of Carbon Neutrality by 2020. The old Tutt Library could no longer meet these demands. The college understood the challenge so they "booked" GH Phipps Construction Company as their trusted CM/GC.

The project's ACE worthy challenges are numerous: A tight, center-of-campus location; a shored city street and an adjacent historic building; tying the addition to the existing building that has a floor to floor height of only 11' (9'-4" clear); an aggressive schedule shortened to accommodate abatement and moving of ½ million books (both out & in); doubling the seating capacity; adding 10 times the windows; AND eliminating the building's carbon footprint (Net-Zero).

The scope and execution was one of the most challenging projects in our 65 year history. The staff's, students', and alumni's joy at its success – priceless!

Project Execution and Teamwork

The project is part of a long-range goal to modernize the campus and make the library more accommodating to the school's academic schedule and student body. The design, led by Pfeiffer Partners Architects of Los Angeles, remodeled the library existing 63,000-sf while adding 25,000-sf, including a 9,700-sf fourth floor addition to house the new Center for Immersive Learning and Engaged Teaching. An adjacent annex library building was used as swing space for administration and historic collections prior to being razed in the final months of the schedule.

The complexity of the short schedule required meticulous teamwork throughout. The “bookend activities” below affected the actual time available for construction. It began with the 2016 Graduation Ceremony conducted, as tradition, on the Quad lawn next to the library in the morning. No work could be done before graduation but by afternoon that same day the site was fenced, several major trades had mobilized and an army of book movers had descended. A required temporary loading dock was built so the ½ million books could be rolled out unimpeded by construction. The Quad lawn had 2 drill rigs and 10 support vehicles drilling the new geothermal field of 80 – 6” diameter – 400 lf deep holes.

Two months prior to the project's completion, 50% of the new building had to be finished so that the books could be rolled back in and personnel housed in the annex could be moved into the completed space. The annex building was razed and the ground returned to the campus Quad lawn ready for the start of fall classes.

Innovations

The original 63,000 sf cast-in-place pan deck was a perfect example of the 1960s “Modern” architecture, with clean exposed concrete ceilings that drove a very tight floor to floor height, tiny vertical windows and uniform precast skin panels attached to the structure. Many innovative solutions were used to work around these constraints.

11' Floor to Floor Height: New construction of an institutional building generally has at least a 12' 6” floor to floor height. To accommodate the original building's tighter 11' constraint in the addition, the project utilized BIM modeling of all above-ceiling items

including steel beam design review. Where vertical constraints were determined steel beams were narrowed to address the problem.

Access Flooring: The original structure remained exposed but to hide modern day electrical and communications needs an access floor was required. A very low 3” height was needed due to the already low ceiling constraint, but a concrete pan strength was required to support heavy bookcases. The solution became even more elegant at the building’s new windows. Entire 11’ x 10’ precast skin panels were removed and replaced with thin frame glazing. The window frame resting on the structure is, therefore, below the access flooring line so the glass appears frameless at the floor.

Organic designs are a “knock-out” but not easy to knock out. A product called Swiss Pearl, a durable, bold exterior skin product that offers stunning visual impact, was used on the Tutt Library. Coupled with Tutt’s complex design, shapes and colors, it’s a real “knock-out” visually. However, with 3 shades of colors, 4 different height dimensions, 30 different widths, both vertical and angled edges **and** progressively changing gaps between pieces, it was not an easy process. There are few identical connection conditions in the entire Swiss Pearl installation. In fact, at one point the architect, while in Los Angeles viewing the live stream of the project 1000 miles away, noticed an installer had picked the wrong color. The call came even before the installer had finished with that piece.

Large areas of Rulon wood ceiling also have an “organic” feel. Different sizes of wood panels have few 90 degree angles and adjacent surfaces meet off-set from each other, not flush, unusual in our world of 2’x2’ drop-in ceilings where everything is uniform and flat. The increased level of difficulty for installation had to be carefully planned since the drop ceilings were left to complete close to the move-in date with little time to recover.

Dimmable Skylight: A major architectural feature of the original building was a large skylight covering a two story atrium. This skylight was to be surrounded by the new 4th floor. Building around the skylight would create a deep opening that would potentially collect snow drifts difficult to mitigate. During the design phase, the idea to roof over the skylight and replace its clear glass with translucent glass and utilize dimmable LED lighting to simulate the light levels of the outdoors was accepted. Less energy was used by the LED lights than the heating and cooling requirements of the open solution.

Environmental

In 2009, Colorado College adopted the challenge of campus-wide carbon neutrality by 2020. Tutt Library is now the largest academic library to achieve net-zero construction in the nation. In total, the revitalized library has 94,317-sf of net-zero energy space, incorporating geothermal heating and cooling, LED lighting, 115-kilowatt rooftop solar array, 400-kilowatt offsite solar array, green roof-top garden, and 130-kilowatt combined heat and power system (heat recovery). All existing windows were replaced and building insulation improved. The additions also included a 14” deep rain-shield utilizing the Swiss Pearl skin. The rain shield stands apart from the actual insulated skin and reduces the effect of sun, rain, snow and wind on a building's energy use.

Tutt Library has already received a 2017 Innovation Award, due to the net-zero energy use, from the National Association of College and University Business Officers.

Trees at Colorado College are protected. Just prior to starting the project the few trees that had to be cut down since they were within the building addition's footprint were ceremonially blessed and the wood repurposed.

Safety

Safety awareness is heightened at Colorado College's densely occupied year-round campus. The site is a major thoroughfare for students so signage was an important part of student education. Abutting all four sides of the site are fully occupied buildings and a major city street, leaving little space for laydown areas, trailers and facilities for workers.

GH Phipps develops site-specific safety plan booklets for all projects, and the one for this project was especially detailed. On the inside front cover was a drawing of the job site so all workers were aware of the detailed site boundaries; at the end of the booklet, was a list of Colorado College's Construction Rules of Conduct, which covered everything from the requirement to stay within the job site limits to designated parking areas. After 54,000 hours by GH Phipps personnel there were no lost time accidents.

Excellence in Client Service and/or Contribution to Community

The library has been technologically transformed, with a data visualization lab, space for new and emerging technology, a Geospatial Information Systems laboratory, and an experimental classroom equipped with teaching technology. Robust wireless accessibility meets current and anticipated future demands. Visually the building touches people with natural light, mountain views, rooftop terraces and gardens, and a café with patio seating. Finally, the unseen accomplishment of the building's energy efficiency and power creation can be an example to transform the carbon equation for similar institutional buildings.

GH Phipps has worked on the Colorado College campus for over 50 years and is honored to be part of the NEW Tutt Library, where many of the improvements add up to Net-Zero.











