

## **Lake County High School Addition and Renovations**

**Adolfson & Peterson Construction, Megan Bond; 303-326-5842; mbond@a-p.com**

### **CATEGORY 09 - Best Building Project (\$10 -\$40 Million - General Contractor)**

**Elevating expectations.** No two words summarize the Lake County High School project more accurately than these. Using teamwork, the team was able to overcome a \$4 million budget problem, a tight schedule, working on an occupied campus in a remote area, and extreme altitude and weather. Leveraging a history of collaboration spanning 29 years and 15 other projects, A&P and H+L worked seamlessly to bring a community torn over whether to approve the bond for a much-needed 21st-century learning environment. Building close relationships with the Owner's Representative Consilium Partners and with major subcontractors, the team was able to complete the project on time and budget despite the harsh building environment.

The project included demoing the north classroom wing, adding a new exit and entry stair at the north, as well as renovating 60,000 sf of common areas, including the auditorium, cafeteria, kitchen, a gutted and re-planned administrative office and athletic facilities.

The 61,000-sf expansion included adding a two-story high school wing and a one-story junior high school wing, allowing 7th and 8th grades to move from the overcrowded middle school. Remaining portions of the building were dressed up with new exterior skin and an entry tower with a secured vestibule at the east side, to replace the existing main entry. The team replaced the original 'accordion roof' with a new roof over the student commons area, bringing new life to an outdated and poorly functioning critical space. The project was awarded LEED® Gold Certification, and the school is now outfitted with security cameras, 65-inch LCD screens in each classroom and new furniture.

### **Solutions of Special Problems**

**Fast-Track Auditorium Renovation:** Although design did not begin until first quarter 2013, it was important to the District that the auditorium be completely renovated in time for a holiday

program that December. Going through the same design advisory group meetings as the rest of the project to ensure function and needs were met and investigative work in the summer, A&P didn't receive permits until August 26, leaving roughly 12 weeks to complete renovations. Further complicating things, the auditorium scope only called for a new ceiling finish; however, after extensive abatement, A&P had to rebuild the entire ceiling, recreating the original design without drawings.

To complete the auditorium on time, A&P managed it separately from the rest of the project. While demolition and site work was happening on site, we managed theatrical vendors, seating vendors, crews of painters and finishers inside to complete the work completely out of sync with the rest of the project.

**Weather Protection to Ensure Quality:** Situated at an elevation of roughly 10,200 feet, Leadville is the highest incorporated city in the US. With an average of 278 days annually with freezing temperatures, standard means and methods were challenged and required far more substantial protection of the work environment, materials and workers on site. This included budgeting and spending approximately \$400k for snow removal, extensive tenting and heat.

**Local Environment:** The 1960s original structure did not support the local environment wind and snow loads. For both the new construction and renovation areas, the exterior was replaced with a structural steel system, complete with steel structure and steel stud framing. Foundation walls were poured in place, and the scope included board formed concrete walls.

### **Excellence in project execution and management/team approach**

An error in the master planning budget failed to account for nearly 15,000 sf of existing space, starting the project off with a \$4,000,000 budget hurdle. To help, the team collaborated closely to develop VE options that reduced the budget by \$1,974,085. With this effort, along with owner contingency and some additional grant funding, the project was fully funded and able to move forward.

One significant change involved evaluating the exterior enclosure. The conditions encountered made it difficult and expensive for temporary heating. The team used exterior walls with

Thermax insulation to get the building enclosed faster and exterior skin materials that did not require any temporary heat, reducing the cost of temp heating and general conditions by approximately \$162,000.

The following illustrates some other key VE options and their cost savings:

<b>Description</b>	<b>Cost Savings</b>
Used alternate exterior rain screen panels	\$249,560
Provided skylights at cafeteria roof in lieu of creating a new clerestory in structure	\$234,390
Analyzed and minimized the exterior skin while maintaining program and tall interior spaces	\$157,920
Analyzed exterior wall system to maximum enclosure speed and reduce temporary heat	\$162,000
Light fixture package optimization with designers (maintained LED and quality levels)	\$99,555
Timed installation of native seeding to reduce the permanent irrigation system requirements	\$94,775
Used cedar planks on forms in lieu of pre-fabricated formliner system	\$89,280
Used alternate metal deck product that met acoustical requirements	\$56,317
Optimized the amount of casework for program use and function	\$54,798
Optimized Service and distribution specifications, locations and layout	\$48,000
Used induction roofing system in lieu of fully adhered roofing system for constructability	\$38,000
Shared Risk of certain winter conditions with owner and their contingency	\$35,000
Reduced a number of sanitary sewer connections by re-routing	\$27,337
Used 60 mil roofing in lieu of 80 mil	\$25,000
Optimized corridor ceiling tile NRC for use	\$24,048
Used alternate ceiling manufacturer in Music rooms while maintaining acoustical properties	\$19,320

### **Construction innovations/state-of-the-art advancements**

Due to funding grant constraints and requirements, the project was conceptualized, programmed, designed and substantially complete within 18 months. To meet the fast-track schedule, A&P used lean construction techniques, including cart-mounted piping, prefabricated conduits and piping and a “nothing hits the floor” policy. By reducing the amount of assembly work done onsite, as well as improving the ability to move materials, we were able to improve efficiencies, keep the number of workers on an already congested site lower and improve safety.

For example, all bathroom sinks were preplumbed at the subcontractor's facility and were brought in on rolling carts. Workers onsite were able to roll the carts directly to where the sinks needed to be installed and connect to the wall and plumbing. This allowed assembly to be done out of the winter elements and reduced the number of people needed for transporting and installing.

Due to phased construction in an occupied school, A&P did not have full access to the building at all times. To keep on schedule and keep staff, students and workers separated and safe, the team developed a detailed phasing plan identifying specific access routes to portions of the building and created openings in existing masonry walls, allowing access from inside the construction area. Once complete, the masonry walls were patched back to match existing and access was re-established from inside the facility.

### **Environmental/Safety**

This project involved 265,509 man-hours with no lost time accidents or OSHA-recordable accidents. The project presented a number of safety challenges, including so much snow the school district cancelled school for only the second time in 100 years, but the work never stopped. The climate also presented limited amounts of daylight, unpredictable weather and frost issues that could easily result in a slip and fall. To combat these, we focused heavily on snow removal and keeping access points clear. A&P expedited roof installation, structural studs and insulation to also help create an enclosure.

Due to the altitude, the safety plan directly impacted A&P's means and methods. This included a period of time to acclimatize to the altitude by scheduling low grade physical work for the first few days while being monitored for unusual fatigue, light-headedness, nausea and dehydration. Water stations were located throughout the site and frequent breaks were encouraged.

In addition to being fully occupied, the school was also located across the street from the only community hospital. During steel erection, we coordinated activities with the hospital to ensure our crane was not in the flight path of any emergency helicopter flights.

### **Excellence in client service and/or contribution to community**

The project was funded through a Colorado Department of Education – Building Excellent Schools Today (BEST) Grant and an approved matching bond initiative by local voters in 2012. In this small and passionate community, the political climate was divided and the matching bond that passed was far from a landslide. With numerous community members opposed to the bond, the district requested complete transparency. To answer this call, the team developed a communication plan including public meetings and project access and worked with local media to invite community members in for regular site tours.

Additionally, we carefully tracked the stimulus the project brought to Leadville and regularly reported to citizens. By project end, the school brought more than \$1.28 million back into the local community. This included meals purchased by workers (\$67,000); hotels/rental homes (\$282,000); fuel (\$121,000); other local business expenses (print shops, etc.) (\$394,000); and all local subcontractors, materials, supplies and temp laborers (\$420,000).

The project team also led twice a month site tours for community members complete with site safety training and the proper PPE. These tours included detailed descriptions of construction design, progress and materials used as well as high-level budget updates of how their tax dollars were being spent.









