



Ogden High School

Active Beams Bring Modern Comfort to Historic "Hollywood" High School

Ogden High School is a four-story, art deco high school first built in 1936. Listed on the National Historic Registry, character permeates the facility, which has been featured in several Hollywood films,

"Ogden High School is ranked the third most beautiful school, architecturally, in the nation."

— www.ohs.ogden.k12.ut.us

such as Three O-Clock High (1987) and Drive Me Crazy (1999).

In 2006, the school initiated plans to renovate the existing cafeteria and build a new commons area while maintaining the historic façade of the building. Active beams were installed in these spaces as they allowed the design team to work around significant mechanical constraints; keeping the historic footprint of the school undisturbed while delivering optimal comfort levels.

Project Summary

PRICE PRODUCTS

Active Beams

PROJECT HIGHLIGHTS

Location: Ogden, Utah
Project Type: Commercial, New Construction
Project Cost: \$48.8 Million
Year Completed: 2009
Dining Area Square Footage: 2,900 ft²
Commons Area Square Footage: 5,100 ft²

DESIGN TEAM

Architect: EDA Architects Inc.
Mechanical Engineer: Colvin Engineering Assoc.
Price Representative: Midgley-Huber, Inc.

The Challenge

Balance Comfort & Aesthetics in an Historic Landmark

Built in 1936, Ogden High School relied on noisy unit ventilators for cooling. With no central air distribution system in the building, there was little or no ceiling space in which ductwork could be incorporated.

The Historic Landmark Committee overseeing the project mandated that the famed art deco façade of the building be maintained. This meant that the extensive renovations required to lower ceilings and allow ductwork for an all-air system in the existing cafeteria would not be possible.

For the new Commons Area, which was an addition to the existing building, the architect opted for a two- to three-storey glass curtain wall through which the original façade of the building could still be appreciated.



Hydronic Test Chamber,
Price Research Center North

The hydronic test chamber allows Price to perform mock-ups of beam systems. Price designs, tests, and manufactures custom beam systems all in one North American facility.

The temperature extremes in Salt Lake City meant that comfort would be a significant concern. With these areas accommodating 600-800 people at one time, the design team wanted to ensure that the students were not left with a hot, uncomfortable space.

The Solution

Unsurpassed Modern Comfort

Active chilled beams from Price were utilized for the project because they were able to meet the comfort requirements of the space without disrupting the aesthetic of the building. Due to the temperature extremes and the expansive glass curtain wall in the Commons Area, the design team had approached the project with limited options and significant concerns about comfort in the space.

The engineer's recommendation to employ active beams, however, addressed the design team's concerns and they opted to move forward with the selection. This would vastly reduce the ducting requirements while also saving energy and ensuring occupant comfort.

The renovations were completed in early 2009, with occupants reporting that they love how quiet the system is and are impressed with the high levels of thermal comfort and the virtual elimination of cold drafts. Greg Brooks of EDA Architects described the impact of chilled beams on the space as "...incredible – you can walk

"...incredible – you can walk down the corridors of the high school and feel cool air 100 feet before you get to [the] Commons. It is a very comfortable cool – you forget about [the] mechanical system."

– Greg Brooks of EDA Architects



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The piping requirements for active beams were easily incorporated into the existing structure of the cafeteria and the need for extensive renovation related to ductwork was eliminated. In the Commons Area, the beams were attractively integrated into the 16-foot high cloud ceiling.

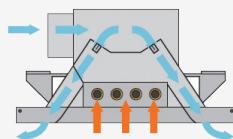


A hybrid technology, Beams require a smaller footprint and are ideal for retrofit applications with limited ceiling space.

The system has proven to be extremely low maintenance, which was an important consideration for the school custodians.

The renovation and addition were designed to embody LEED principals and the beams were part of a hybrid approach that also incorporated a radiant floor system. The architect, engineer and contractor worked collaboratively to create a space that far exceeded the expectations of all involved.

Flow Visualization ACBL-HE 2 Way



The ACBL-HE induces room air through the heat exchanger, mixes it with supply air, and delivers the combined air streams into the occupied zone.

Features of the ACBL-HE:

- 1 way and 2 way air pattern
- Adjustable mounting brackets
- Perforated or grille face
- Pressure port for air-side balancing and flow verification
- Pressure tested to 450 psi [3.1 MPa]
- Vent and drain
- Suitable in both new buildings and historic retrofits.



Active Beams were strategically positioned along the perimeter to manage the skin loads off the large glass curtain wall.

ACBL-HE



The Price High Efficiency Active Beam is a very versatile hydronic/air system, available in 24" widths and in 1 or 2 way discharge.

Benefits of Beams:

Energy Efficiency

Using beams to satisfy sensible room loads greatly reduces the supply air volume required (typically by 60-80%). This leads to reduced fan power requirements and energy savings.

Quiet Operation

The reduction in air-side mechanical equipment inherent of a hydronic system results in a quieter, more comfortable occupant experience.

Smaller Footprint

The reduction in ductwork, results in the ability to reduce plenum heights. This allows beam systems to be installed in tight spaces, creating the potential for lower construction costs, and higher ceilings.

Reduced Maintenance

Due to the reduction in moving parts and mechanical equipment, beams typically have lower maintenance costs than all-air systems.

Design Team Profile

Colvin Engineering Associates, Inc.

A mechanical engineering firm in Salt Lake City, Utah, Colvin Engineering Associates, Inc., is known for energy efficient designs. A number of their projects have received several regional and national awards for energy conservation and innovative systems. They have completed hundreds of commercial, institutional and manufacturing projects across the United States, utilizing a wide array of design elements such as indirect/direct evaporative cooling, under floor air distribution systems, displacement ventilation, radiant panel systems, and chilled beams to achieve conservation goals.

EDA Architects, Inc.

EDA Architects, Inc. (EDA) has over 50 years of experience in planning and design work for clients throughout the Intermountain West. EDA provides a broad range of architectural services, including master planning, programming, architecture, and interior design. The firm is committed to a highly interactive and integrated design process through which they and their clients are challenged to create places that enhance lives and make a lasting contribution

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