



How San Francisco Waldorf High School Became One of the Greenest Schools in the Country

PROJECT:
Waldorf High School
San Francisco, CA

PEERLESS PRODUCTS:
Cerra 10
Cerra Perf Wall Mount

LIGHTING DESIGN:
Angi Xanders, Xanders Design Group

ARCHITECT:
David Bushnell, 450 Architects
San Francisco, CA

LIGHTING REPRESENTATIVE:
16500
Oakland, CA

PHOTOGRAPHY:
Mark Darley Photography

San Francisco Waldorf High School's new home in the city's West Portal neighborhood, the product of an extensive renovation of a 1970s call center, is a national model not only for learning, but also energy efficiency and green design practices. The two-story 23,000-sq.ft. building, packed with sustainable design features provided by 450 Architects, has applied for the U.S. Green Building Council's LEED Gold Certification.

The importance of lighting was quickly recognized by 450 Architects, which collaborated with Xanders Design Group to provide a lighting design that would minimize energy consumption, maximize flexibility, be simple and stylish in design, and blend well with the architecture.

The main entry, previously dark and enclosed, now opens to a large, welcoming lobby with plenty of daylight. The large lunch room, admitting daylight through clerestory windows, was transformed into a multipurpose room. Existing private offices remained as faculty offices and equipment storage. And large open office spaces were split into classrooms with high ceilings, taking advantage of existing openings to add daylight and views.

In these and other spaces, achieving the conflicting demands of high visual comfort and extreme efficiency posed by the LEED rating system required extraordinary creativity and integration with both daylight and lighting controls. Each space would have to be precisely illuminated with no excess watts, resulting in a complex lighting design featuring a variety of lamps, ballasts and circuiting.

The classrooms proved particularly challenging. The design team wanted to use two rows of luminaires—the typical approach for lighting the common 30-ft. classroom size—but the Waldorf's classrooms are as wide as 42 ft. with 13.5-ft. ceilings.

"Three rows of luminaires would typically be used in such large rooms, but the high ceilings allowed for an increase in the number of lamps per luminaire and increased suspension length," says Angi Xanders, principal of Xanders Design Group.

The designers chose Peerless Lighting's Cerra luminaire for its combination of high performance, minimalist styling and cost effectiveness. The number of lamps in each luminaire was increased from two to three and the luminaires were mounted 10 ft. from

the floor, enabling row spacing of 20 ft. on center. Because of the viewing angle into the bottom of the luminaires, the luminaires were specified with semi-specular baffles to reduce luminaire brightness and eliminate glare.

"Aesthetically, we preferred Cerra for its clean lines, its simple and contemporary style, and the fact that it wouldn't compete with the architecture."

"Cerra outperformed other luminaires that were similar in style; the light distribution was better and the efficiency was higher for this demanding application," says Xanders. "Aesthetically, we preferred Cerra for its clean lines, its simple and contemporary style, and the fact that it wouldn't compete with the architecture."

Avoiding the addition of a third row of luminaires dramatically reduced energy consumption and capital costs. The overall design achieved a lighting power



WALDORF SCHOOL—CONTINUED

density of less than 1W/sq.ft. while meeting the demanding visual needs of a Waldorf classroom.

Daylight and luminaire control also played important roles in the design. Fortunately, the existing building already had large windows to admit daylight, but with a dark film that obstructed daylight penetration; new operable casements with clear glass windows were installed in existing and some new locations.

While studies have demonstrated that daylight improves learning and can increase light levels, daylight does not by itself save energy. For this to occur, a daylight control system was installed, combined with automatic shutoff controls intended for energy code compliance to produce high total energy savings that were critical to the project.

In the classrooms, the Peerless Cerra luminaires were placed parallel to the windows, with the row closest to the window controlled by a photosensor installed between the window and first row of luminaires.

When light levels rise or fall above a target light level, continuous-dimming ballasts modulate light output to maintain the target. These controls work with an occupancy sensor which shuts off the lighting when the space is unoccupied; the combined result is ongoing high energy savings.

Thanks to highly efficient luminaires, advanced lighting control and plenty of daylight, San Francisco Waldorf High School is now one of the greenest schools in the country where students benefit from high visual comfort, glare and eyestrain reduction, and optimal ceiling and workplane uniformity.



ABOUT THE DESIGNERS

David Allen Bushnell, AIA, LEED Accredited Professional, Principal

Mr. Bushnell has practiced architecture in San Francisco, New York, Seattle and Switzerland for over 20 years. Prior to founding 450 Architects, David has been responsible for the design and construction administration for a variety of projects, including educational, institutional, industrial and commercial buildings, housing, large and small scale renovations, and the seismic upgrade of unreinforced masonry buildings. His work as project architect and designer have included several award winning projects, including the SFUSD Argonne Child Development Center and James Lick Middle School with 450 Architects, Queens Borough Public Library and Nassau Community College with Polshek & Partners, commercial office buildings with Kohn Pedersen Fox, the Hawaii Convention Center with LMN, and several housing projects in Switzerland. In addition to his architectural practice Mr. Bushnell is involved in advocating sustainable design, has served as a visiting critic and lecturer at several universities, and has taught design at the Swiss Institute of Technology (ETH) in Zurich.



Angi Xanders

Ms. Xanders has been in the lighting industry for 19 years. After attending Indiana University and Herron School of Art, she began her career as an Applications Engineer for a manufacturer's representative in the Midwest. She relocated to the Bay Area in 1996 to work for an exterior lighting manufacturer, and joined Peerless shortly after. In 2005, she started a lighting design firm working primarily on high-end lofts, hospitals and schools. She has recently returned to Peerless in Design & Tech Support.

Angi was President of the IES Golden Gate Section, and held the IIDA Chair from 1999–2006. She has won lighting design awards for her work on Pier One San Francisco, The San Francisco Ferry Building, and Westfield Mall, and received a National Preservation Award for the rehabilitation of the Ford Assembly Building in Richmond, CA. She has taught several lighting courses at the Pacific Energy Center and received her Lighting Certification in 1998.