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School Looks Ahead to Future Growth

IAQ and Sustainability are Features of the School

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HONOLULU — Iolani School may be one of the finest K-12 schools in the United States, and it's located on some prime real estate too: Oahu, Hawaii. From its academic program to its mechanical and IAQ systems, the independent school continues to challenge itself to stay on the forefront of technology and education.

In 2003, the school completed construction of the first phase of a campus master plan — the largest capital project in the school's history. The next phase is now being developed.

Teachers and administrators at Iolani School have developed a curriculum that teaches not only the basics (reading, writing, and mathematics), but is also said to teach the 1,800-plus students how to develop thinking, reasoning, and problem-solving skills; “to explore conceptual frameworks, to see the connectedness of bodies of knowledge, to hone verbal skills, and to discover individual creativity.”

Class sizes are small, with an estimated student-teacher ratio of 11:1, depending on the class; Kindergarten classes tend to be among the smallest.

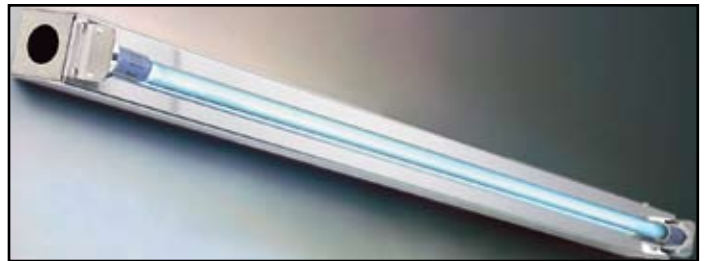
The school also claims to have one of the highest teacher retention rates among independent schools in the country. Part of the overall success must be due to the administration's willingness to look into technical building solutions to create a better learning environment.

CAPITAL IDEAS

With the 2003 completion of the Weinberg Classroom/Kozuki Stadium/Multipurpose Complex, Iolani School finished the first phase in a 20-year master plan to enhance facilities on this 20-acre campus, said Hawaiian Electric Co. (HECO).

“Most notable improvements include 32 classrooms, four physics suites, a biology laboratory, a computer laboratory, a meeting room that comfortably seats 400 people, parking for 350 cars, office space, an athletic stadium, open space, an environmentally friendly campus-wide chilled-water loop for air conditioning, and handicap access,” the school said.

One of the oldest schools in Hawaii — it was founded in 1863 — the school's aesthetic design reflects the school's roots as an Anglican school founded by English clergy during Hawaii's monar-



Iolani School started researching the potential of UV light in 1996, by installing UVC lights in a single air-handling unit. The test unit achieved a 99.8 percent reduction in mold levels after being treated with UVC light.



The school's Weinberg Classroom/Kozuki Stadium/Multipurpose Complex project was completed in 2003, finishing the first phase in a 20-year master plan to enhance facilities on this 20-acre campus.

chy period. The project's goal was to implement sustainable design strategies and technology without changing the look of the school.

Sustainability and efficiency were key for the complex's main buildings: the 74,000-square-foot Weinberg Classroom building and the 174,000-square-foot Kozuki Stadium/Multipurpose Complex.

“More than 75 percent of the occupied space in this complex incorporates daylighting,” said HECO. The system combines aluminum light shelves, light pipes, low-e glass, VAV, and DDC systems to enhance energy performance.

The Kozuki Stadium/Multipurpose structure contains parking for 350 cars, bleacher seating for approximately 1,200, and a central ice storage plant designed to expand in phases, to eventually accommodate the entire campus.

SUSTAINABILITY AND IAQ

To help reduce the cooling load, large asphalt areas were replaced by concrete or landscaping to reduce heat islands, and creeping fig was planted around building exteriors. Combined, these efficiency measures now save the school 28 percent annually on electricity costs, said HECO, “which translates into nearly \$32,000 per year.”

Iolani School also incorporated many other sustainable strategies. Fifty-eight percent of the construction materials (including 90 percent of the structural steel) used to build the Weinberg Classroom/Kozuki Stadium/Multipurpose Complex were made of post-consumer or post-industrial content.

“Indoor environmental quality has also been improved at the complex, since low-VOC products were installed throughout the buildings,” the utility explained. “Low-VOC sealants, carpets, sheet vinyl, vinyl tiles, and paints were used in areas and corridors frequented by students, faculty, and staff.”

Ultraviolet-C (UVC) lights were first researched by the school in 1996, when they were installed on a trial basis in an air-handling system for enhanced IAQ and mold control — no small order in Hawaii, where mold will grow on almost anything. Initial before-and-after testing, performed in conjunction with HECO, showed that the test unit achieved a 99.8 percent reduction in mold levels after being treated with UVC light.



The Iolani School is one of the oldest schools in Hawaii, having been founded in 1863. The design reflects its roots as an Anglican school founded by English clergy, during Hawaii's monarchy period.

MOLD, STUDENTS, AND FACULTY

Since then, 20 UVC lamps (from Steril-Aire) were installed in six air-handling units (AHUs) serving a 35,000-square-foot office and classroom building. The AHUs total 45,000 cfm. The lamps last 1.5 years, with a replacement cost of approximately \$1,300 per year, according to HECO.

“The installation eliminated mold growth and odor, there were fewer complaints of respiratory problems, and the facility manager is very satisfied.” Maintenance savings are estimated at \$8,000 per year for a/c coil cleaning and mold remediation.

“After installing UVC, we were able to eliminate this expense,” said Lloyd Stern, maintenance superintendent for the school. Ten years later, Iolani is using the devices throughout the campus to keep new and existing AHUs and fan coils clean.

“We have virtually eliminated mold and organic buildup in the a/c systems,” says Stern. “There is no sign of mold

growth and none of the associated odors. By restoring system efficiency in this way, the lights also help to reduce HVAC energy costs. And we still haven't had to clean the coils.”

“While the maintenance and energy savings are beneficial, IAQ is the main issue for us,” Stern said. “Poor IAQ can result in [student and teacher] absenteeism, litigation, and worse — and many schools have paid the price. You ultimately save money by delivering clean air.”

Iolani School operates the lights on a 24/7 basis for optimum protection of students, faculty, and staff. Maintenance entails the periodic changeout of the tubes. ■

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