



A E D I S ARCHITECTURE & PLANNING

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FOR IMMEDIATE RELEASE

LEYVA MIDDLE SCHOOL ADMINISTRATION BUILDING TO BECOME FIRST NET ZERO ENERGY / NET ZERO EMISSIONS PUBLIC SCHOOL BUILDING IN CALIFORNIA

Evergreen School District will save more than \$9,000 per year in energy costs and provide a valuable lesson in sustainability by maximizing the building's green potential

The Evergreen School District in southeastern San Jose is using innovative green building design as a strategy to keep its budget in the black in a tough economy.

The District, with its design team of AEDIS Architecture & Planning, Integrated Design Associates (IDeAs) and Capital Engineering Consultants, Inc. (CECI), has designed its new George V. LeyVa Middle School Administration Building to generate more than 100 percent of its own energy, establishing it as California's first "net zero energy" public school facility and—more importantly—saving the school district more than \$9,000 annually in energy costs from this campus alone.

An increasing number of California schools, in response to the state budget crisis and growing concern over the environment, are making efforts to reduce their total energy use and production of greenhouse gasses. In fact, a small number are even striving to go "grid neutral." A grid neutral building is one that produces as much *electricity* as it consumes, but it still may use carbon-producing natural gas. The LeyVa Administration Building, more than being grid neutral, will be "net zero energy/net zero emissions." By using no gas-fired equipment, the building will produce no carbon emissions, and more than 100 percent of its total energy use will be offset by its own electricity, produced by solar photovoltaic (PV) panels.

The building is also being designed toward LEED® (Leadership in Energy and Environmental Design) Gold specifications. If certified, it would become the first LEED Gold certified public school building in California (*according to the U.S. Green Building Council's Certified Projects List as of Aug. 13, 2009*).

The Evergreen School District for years has been working to reduce its energy costs, one of the larger line items in its budget. Spending capital funds to make its structures as energy efficient as possible is an important part of the District's cost-reduction strategy—but spending money to save money is a concept that can be difficult for the community to understand, especially in the current economic environment. "The perception is that green schools cost more than conventional schools," says Assistant Superintendent Kathy Gomez, "but Evergreen understands that investing in sustainable design technologies now is actually a fiscally responsible strategy." The District's initial costs for the Administration Building's PV panels after PG&E rebates will amount to \$215,646, or 3.7 percent of the project's \$5,850,000 construction budget. "The business case for making the building net zero energy," says Gomez, "is that it will not just lower our energy bill, but it also will allow us to put those savings straight back to the top line of our operations budget for maintaining programs for kids."

Says Pat Waite, Chairman of the Board for *Going Evergreen*, a community sustainability initiative: "Some might say the need for green schools is not that urgent, but that is not true. Kudos to the

Evergreen School District on this initiative, which demonstrates real leadership and community partnering.”

At the state level, school buildings must meet specific energy requirements. The LeyVa Administration Building design team was able to determine in the early planning phase that it could beat California Title 24 energy requirements for the building using standard construction materials and practices, but the team’s goal was to maximize the structure’s sustainability. “In the initial stages, we realized the building was taking on a shape and orientation that lends itself to real sustainable design,” says AEDIS Principal John Diffenderfer, AIA, LEED® AP. “So, we approached the District to study just how far we could push this building’s performance without significantly increasing its cost.”

Using tools such as energy modeling (a computer simulation of the building’s sustainability options and their effect on the structure’s energy performance), the design team was able to make the 9,200-sq.-ft. Administration Building 41 percent more energy efficient than required by Title 24 **and** make it capable of generating up to 8 percent surplus energy, which will be used to further reduce the campus’ total energy costs. The building’s sustainable technologies include PV panels, extensive use of daylight harvesting, high-efficiency lighting and HVAC (heating, ventilation and air conditioning) systems, a cool roof, a super-insulated building envelope and highly efficient windows. These features are explained in detail on the “LeyVa Green Facts” page.

Part of a five-phase modernization project at LeyVa Middle School, the Administration Building will begin construction in Spring 2010 and is targeting a completion date of Spring 2011.

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About AEDIS Architecture & Planning:

AEDIS Architecture & Planning designs transformative and sustainable architectural projects by creating trusted partnerships with our clients, consultants and employees. In our 55 years of business, AEDIS has completed more than 3,000 major projects—several of which have won awards for their creative, practical design solutions. Our 60 design professionals share the belief that exceptional client satisfaction is driven by service. Our approach to design has earned us significant repeat business and has helped us become the 6th largest design firm in Silicon Valley. Fifty percent of AEDIS’ professional staff have achieved LEED® (Leadership in Energy and Environmental Design) Accredited Professional certification, giving us the collective vision to create structures that maximize the environmental, social and financial benefits of green design and construction. Several of our projects are being designed to LEED or CHPS (the Collaborative for High-Performance Schools) specifications.

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About Integrated Design Associates, Inc. (IDeAs):

Integrated Design Associates provides electrical engineering, lighting, low voltage systems and daylighting design services. We believe that sustainable building design starts from the beginning with successful team collaboration and a focus on integration of all building systems and components. In order to understand the overall picture, our staff has training in architecture, mechanical engineering, plumbing engineering, landscape architecture, civil engineering and structural engineering. In addition to having expertise in electrical systems and lighting design, IDeAs is a member of the U.S. Green Building Council. Over 90% of our design staff are LEED® Accredited Professionals. We have designed high-performance CHPS school buildings, and we have helped our clients qualify for energy efficiency and renewable energy utility rebates. Our goal is to continuously improve our designs, and design sustainable systems, thereby improving the environment that we live in, one building at a time.

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About Capital Engineering, Inc. (CECI):

Capital Engineering Consultants, Inc. (CECI) has been providing mechanical engineering services successfully since 1947 and has developed into one of the foremost mechanical engineering firms in the western United States. CECI maintains a staff of 70, which includes 16 registered professional engineers, 15 LEED® Accredited Professionals and several LEED-trained professionals. The firm is recognized for its value engineering expertise and innovative energy conserving mechanical systems designs for new and existing buildings. Experience encompasses more than 5,000 educational facilities with construction values in excess of \$4 billion completed under the State School Building Program. CECI has created an in-house team focused exclusively on sustainability and the programs associated with high-performance schools. We are dedicated to the goals of sustainable design and construction.

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LeyVa Middle School Administration Building Green Facts:

GEORGE V. LEYVA MIDDLE SCHOOL ADMINISTRATION BUILDING

1865 Monrovia Drive
San Jose, CA 95122

SUSTAINABLE DISTINCTIONS:

- Targeting LEED® Gold certification. If certified, 1st LEED Gold public school structure in California (according to U.S. Green Building Council's *Certified Projects List*, as of Aug. 13, 2009)
- 1st Net Zero Energy California public school structure
- 1st Net Zero Emissions California public school structure

SUSTAINABLE ELEMENTS:

- **Rooftop solar photovoltaic panels.** The building's PV panels will offset 108 percent of the building's energy use and costs. The surplus 8 percent will be used to further reduce the campus' energy bill.
- **Daylighting.** "Every occupied space in the Administration Building has daylight, which essentially eliminates the need to have the lights on during the day," says Diffenderfer, who also chairs the American Institute of Architects Santa Clara Valley Committee on the Environment. "And if you're not using the lights, you're also not generating additional heat, reducing your AC load. In fact, except for a few days out of the year, the building won't need AC at all." Daylighting in the Administration Building is accomplished through multiple energy-efficient windows and skylights.
- **High-efficiency lighting systems.** In addition to high-efficiency fluorescent lighting, the project also includes daylight controls and occupancy sensors. During sun-drenched morning, noon and afternoon hours, the daylight harvesting system keeps lights turned off, thereby reducing both energy costs and heat gain inside the building. During darker periods, such as early mornings, overcast days and evenings, the daylight sensors automatically turn on the

electric lights inside the building to maintain task-specific visual comfort levels in all occupied areas. After normal hours of operation, or when no one is in an office, hallway, or common area, lights automatically switch off. They can be automatically overridden with a local light switch or occupancy sensor input. An additional benefit of an ultra-high-efficiency lighting system, explains IDeAs Principal David Kaneda, P.E., LEED AP, is that the Administration Building will already be in compliance with stricter lighting standards that the Obama administration recently announced will take effect in 2012.

- **Energy management system.** The Administration Building's systems will be connected to the District-wide energy management system, which will schedule, monitor and control the mechanical and exterior lighting systems.
- **High-efficiency HVAC (heating, ventilation, air conditioning).**
 - **Variable refrigerant flow HVAC.** The project is using a newly introduced "variable refrigerant flow" HVAC system, which allows simultaneous heating and cooling with a single outdoor unit and multiple indoor units. The system is able to transfer heat from warm spaces (such as the computer server room) and distribute that heat to other rooms with minimal power consumption. "The system provides excellent comfort while keeping running costs to a minimum by controlling each zone individually and shutting off those zones that are unoccupied," says Capital Engineering Consultants Principal Stephen Myers.
 - **Displacement ventilation.** This relatively new technology will be used in the teachers' lounge. The system is more energy-efficient and quiet than traditional ventilation systems. It also distributes air more efficiently, leading to improved indoor air quality. Fresh air is heated or cooled to 65 degrees F and supplied near the floor using a very low-velocity/variable-speed supply fan. As the air picks up heat from computers and occupants, it warms, slowly rises and exits near the ceiling.
 - **Relief openings with motorized dampers.** These have been placed high on the walls to promote natural ventilation and to relieve hot air during the cooling season.
 - **Ceiling fans.** The gentle air movement created by the building's ceiling fans will provide extended comfort range during the cooling season, allowing air conditioning use to be delayed. The ceiling fans can be run in reverse in the winter to bring warm air in the high ceiling closer to the occupants below, reducing heating needs.
 - **Point-of-use electric hot water heaters.** These save energy by eliminating losses associated with storage-tank type heaters.
 - **High-efficiency restroom exhaust fans.** Ultra-high-efficiency motors make these fans up to 20 percent more efficient than standard fans.
- **Cool roof.** The building's "cool roof," will reflect about 70 percent of the sun's energy back into the atmosphere (reflectance) and release about 90 percent of the roof's trapped heat (emittance), both of which greatly reduce heat transfer to the building interior and the need to cool it.
- **High-performance building envelope.** The design team maximized the energy efficiency of the building envelope (all components of a building that enclose heated or cooled space) by using more (and better) insulation.
- **High-efficiency windows.** All windows and skylights are made of "spectrally selective, low-e" glazing, which keeps you warmer in the winter, cooler in the summer. It also blocks levels of heat-generating infrared light, while allowing visible light to pass through. The design team is also looking at window overhangs, which reduce solar heat gain.
- **Energy kiosk.** Each building on the LeyVa Middle School campus will have an energy management system that will report its energy-use to an "energy kiosk," a 42-inch flat-screen monitor that will be located in the Administration Building's communications hub. The kiosk will record and meter the energy being used to power each building's lighting and receptacles,

as well as the campus HVAC and communication systems. The kiosk also will record the real-time and historical output of the PV system. Students will be able to see, for example, that the Administration Building's energy usage is being completely offset by its photovoltaics.

KILLOWATT USAGE & COST SAVINGS:

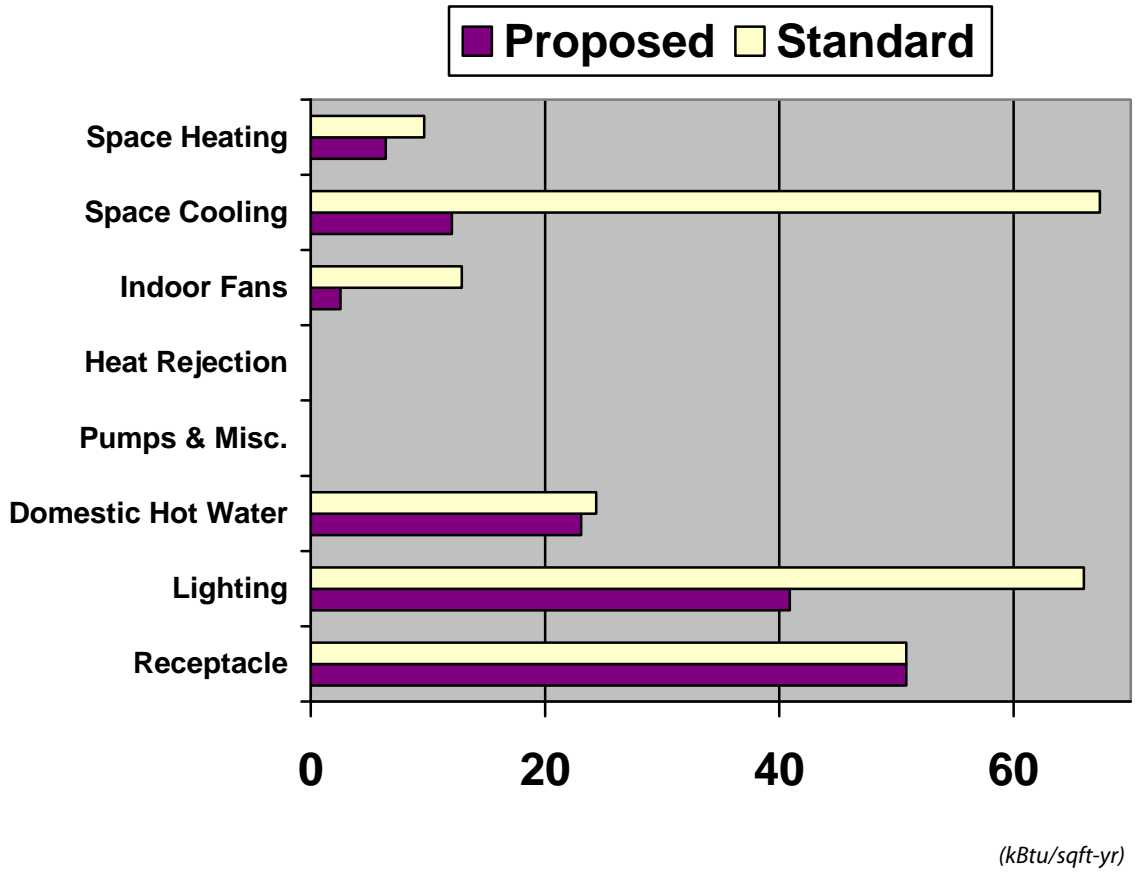
- 2009 kilowatt hour usage: 181,741kWh (whole school)
- Estimated 2010 kilowatt hour usage: 129,844kWh (whole school)
- Estimated PV System Electrical Generation: 51,897kWh

- 2009 electricity cost: \$30,143 (whole school)
- Estimated 2010 electricity cost: \$22,073 (whole school)
- **Total estimated savings on electricity: \$8,800***

- New Admin. Bldg.'s Estimated Energy Use: 37,013kWh

ANNUAL ENERGY USE SUMMARY

Charts provided by Capital Engineering Consultants, Inc. (CECI)



ENERGY COMPONENT	Standard Design	Proposed Design	Title 24 Compliance Margin
Space Heating	9.69	6.40	+3.29
Space Cooling	67.36	12.06	+55.30
Indoor Fans	12.88	2.53	+10.34
Heat Rejection	0.00	0.00	0.00
Pumps & Misc.	0.00	0.00	0.00
Domestic Hot Water	24.36	23.09	+1.27
Lighting	66.00	40.88	+25.12
Receptacle	50.83	50.83	0.00

Totals

231.13

135.81

95.32

Percent better than standard

41.2%