

**PROFESSIONAL ACADEMIES MAGNET
AT LOFTEN HIGH
NEW CLASSROOM AND MULTIPURPOSE BUILDING
ENERGY CONSERVATION FEATURES**



The new classroom and multipurpose building at the Professional Academies Magnet at Loften High was completed in January 2008. The building houses a two-story classroom wing with sixteen classrooms representing 400 student stations and an adjacent multipurpose/dining room and kitchen.

Several energy conservation features have been incorporated into the construction of this building. These design strategies are divided into those that are site-related, the construction of the building shell, and the building systems, including mechanical, electrical, and plumbing systems.

The building is oriented along an east-west axis in order to maximize glass areas on the north and south exposures. In this orientation, shading of the facade is more readily achievable, thus reducing the heat gain on the building. The two-story portion of the building minimizes the impact on the site and maximizes the available open space. The use of durable, drought-resistant native landscaping and bahia sod reduces the demand for irrigation water usage. Many of the plantings were provided by the school's student horticulture program.

The building's shell includes the roofing system, the exterior wall system, and the glazing system. The roofing system is a composite of shingles over a waterproof membrane, plywood, rigid insulation, and metal decking. The light gray color of the shingles increases the reflectivity of the sun, thus reducing the heat load on the building. The rigid insulation provides an insulation factor of R-20, which is above minimum standards.

The exterior wall system consists of stucco over concrete block with foam-filled insulation. The insulation value of the wall system is R-14.2, which is above minimum standards. All exterior walls, including all windows and other penetrations, are sealed in order to prevent the loss of conditioned air and infiltration of hot humid air.



The glazing system is ¼" thick bronze-tinted glass. The tinting reduces solar heat gain and glare by increasing the reflectivity of the sun's rays.

Many of the materials specified for the construction of the building are made of either recycled or regional products. This translates into a reduction in the energy needed to build the building and reduces the load on landfills that accept construction debris.



Savings within the building systems begin with the mechanical equipment. This system consists of individual heat pumps for each classroom and one outside air unit that serves all the classrooms. The high-efficiency heat pump has an SEER rating of 13.5 and the high-efficiency fresh air unit has an SEER rating of 13.9, both above minimum standards. Each heat pump is equipped with a programmable thermostat. During occupied times, the units are set for 74° cooling and 68° heating. During unoccupied times, the units are set at 78° cooling and 64° heating. The fresh air unit utilizes a time clock to provide dehumidified fresh air into each classroom only during occupied times. Better indoor air quality is achieved with the provision of fresh air while saving energy by turning the unit off when the building is unoccupied.

Other factors that contribute to improved indoor environmental quality are the use of materials emitting low levels of volatile organic compounds (VOC's). Many chemicals used in adhesives, paints, carpet systems, cabinets, and wood products have a negative impact on the indoor environment by "off-gassing" these chemicals into the air. All adhesives, paints, coatings, and wood used in this building are "low-emitting" products. There is no carpet in the building.

An improved lighting system with automatic controls offers savings within the electrical system. Each classroom is equipped with low energy fluorescent fixtures which are controlled by motion sensors. The motion sensors turn lights on when the room is occupied and off when the room is unoccupied. The multipurpose room is equipped with similar fluorescent fixtures operated by a programmable timer, which turns lights off at a designated time. An override allows the lights to be turned on for after-hours use. All "exit" signs throughout the building are equipped with energy efficient LED lamps.



The plumbing system incorporates fixtures that conserve water. Waterless urinals are installed in the boys' restrooms, and automatic shut-off faucets are installed in all restrooms. In the kitchen, a high-efficiency, gas-fired tankless water heater only heats water when a flow is detected. A circulating pump that helps provide instantaneous hot water for dishwashing is controlled by a programmable timer and shut off at night.



All of the energy saving features incorporated into the new classroom/multipurpose building are designed to reduce operating costs, protect the environment, and provide a learning environment that is respectful of the health, safety, and comfort of its occupants. The 3-5% additional cost for high efficiency equipment is paid back by the 5-10% savings realized in energy cost.

More Photos



Exterior
From
west



Loften High Classroom &
Multipurpose Building /
Exterior from east



Loften High Classroom &
Multipurpose Building /
Exterior Details



Loften High Classroom
& Multipurpose
Building / Interior of
Multipurpose Room



Exterior of rear of
Multipurpose Room



Loften High Classroom & Multipurpose Building / Interior of Classroom



Interior of Multipurpose room



Loften High Classroom & Multipurpose Building / Interior of Kitchen

Interior of Stairs



Exterior from east



Loften High Classroom & Multipurpose Building / Exterior of southeast corner