



## Cardiff-by-the-Sea Branch Library

Encinitas, CA

The Cardiff Library is a new six thousand three hundred square foot library facility situated in the sleepy beach community in northern San Diego County. The new facility is one of the first Sustainable Design buildings in San Diego County. The architecture, using unique locations and orientations of the windows and clerestory spaces, provides natural lighting to the building while maintaining an energy efficient building envelope.

The mechanical system is a state of the art displacement ventilation design popular in Europe and new to North America. This is a novel approach to ventilation – thermal displacement instead of mixing – for cooling and heating. Slightly cooled supply air enters near the floor level at a low velocity through various customized diffusers, gently flooding the occupied space so that the warmer room air – plus any dust, pollen, germs or other impurities in it – rises to the upper unoccupied level and is returned and filtered or exhausted through the economizer system. In comparison, the supply air for a standard air-conditioning system is cooled considerably more before entering the room at the ceiling, supplied at a relatively high velocity to mix with the room air, which re-circulates contaminants before the stale air is returned.

The library's 18-ton, variable-air-volume cooling unit has an enthalpy-integrated economizer that measures the temperature and humidity of both the outside air and the return air to determine which source will save the most energy. The economizer can be used more often since the supply air only needs to be cooled to 65°F, not 55°F as with a standard air-conditioning system. Complementary measures include high-performance glazing and roof overhangs. The library, which opened on March 22, 2003, is 12.5% more energy efficient than required under California's Title 24 standards.

