



**WILLIAMSTOWN ELEMENTARY SCHOOL  
WILLIAMSTOWN, MA**

**MARGO JONES ARCHITECT  
88,000 SQUARE FEET**

The project is an 88,000 square foot, two story elementary school building. The building contains classrooms, a gymnasium, an auditorium, kitchen and cafeteria, media center, and administrative office space.

Significant energy savings were realized from the advanced mechanical systems (energy recovery for all of the classroom ventilation air, CO2 controlled ventilation for the gym and auditorium, and an efficient boiler plant).

The energy performance of the building was simulated using the Carrier HAP program in order to qualify for a grant from the Massachusetts Technology Collaborative photovoltaic array. These simulations showed that the school as-built was 31.4% better in terms of annual energy cost (with oil estimated at \$1.00/gallon and electric at \$0.104/kWh) than the code building, 12.3% better in terms of electric kWh savings, 48.9% better in terms of oil consumption, and 33% better in terms of source energy savings. Source energy, in kBtuh/year, was calculated from site energy assuming 28% electric generation and transmission efficiency.

Heating is provided by three cast-iron modular combination gas/oil fired boilers. Inactive boilers are isolated from the loop to reduce standby losses. The main and spare primary circulators operate with variable speed controls to save energy. Hydronic baseboard radiation is provided in most classrooms.

Two packaged enthalpy-type energy recovery units provide a total of 22,000 cfm (11,000 cfm each) of ventilation air for the classroom spaces. Enthalpy wheel heat exchangers recover approximately 80% of the sensible and latent energy from the leaving exhaust air to preheat and humidify the incoming air. DX cooling coils provided for a pre-cooling of the ventilation air. Economizer operation is provided by slowing down the wheel rotational speed.

