

SCITUATE PUBLIC SCHOOLS  
RECENT ENERGY CONSERVATION MEASURES

1. High School

- a. Lighting Replacement, Large Gym and Small Gym: In December 2006 we took advantage of National Grid incentive program and replaced all 62 gym lights with lower wattage lights. Replaced 400 watt metal halide high bay lights with 200 watt fluorescent lights. Motion sensors also installed to shut off lights when gyms are unoccupied. Savings is estimated at 41,000 kwh per year which currently equates to approximately \$5,000 per year.
- b. Lighting replacement, 12 classrooms: During the high school renovation, budget constraints had prevented replacement of dilapidated lighting fixtures in 12 of the classrooms at the high school (in the 2<sup>nd</sup> floor history and english wings). As part of the same energy incentive program that involved replacement of the gym lights, we also replaced these dilapidated classroom lights with state of the art fixtures that are lower wattage than the removed fixtures. Motion sensors were also installed to shut off the lights when a room is unoccupied. A happy Ms. Judy Kalla, English teacher, stated she has been waiting 18 years for these lights.
- c. Automated Controls: This fall, we hired our DDC contractor to add an Ethernet card to the DDC (direct digital controls) system for our HVAC plant. This now gives the Facilities Manager access to the DDC from his office PC via an internet connection, facilitating immediate access to HVAC controls throughout the building.
- d. Oil Consumption Reduction: This heating season, by selectively shutting off the boilers overnight and over weekends (when overnight temps were above freezing) we saved a significant amount of fuel oil. During the 05-06 heating season we first refilled our oil tank on Dec 7, whereas this year we did not do so until Dec 27.

2. Gates School

- a. Steam Zone Valves: Early 2006, we identified 2 main zone valves for the steam system that had not been functioning for many, many years. As a result, steam was circulating throughout the A-wing all night, weekends, and vacations when it should only have been circulating on occasion when it was called to maintain minimum night setback temperature. We replaced these 2 valves and can now control the steam circulation to A-wing to maintain minimum temperatures in unoccupied mode.
- b. Pneumatic Controls Repaired: At the same time as we were replacing the zone valves for A-wing, we were also repairing many of the pneumatic automated controls for the building. Many of the controls were broken down so that ventilation units in many classrooms throughout the school were running around the clock. By repairing the pneumatic control systems, we are now able to run the school on an occupied/unoccupied

schedule that successfully lowers the building temperature overnight to 60 degrees, stops the exhausting of warm air, and shuts dampers to block entry of outside air.

- c. Replace Gym Lights: In December 2006 we took advantage of National Grid incentive program to replace all 36 400-watt metal halide lights with brighter 200 watt fluorescent lights. Motion sensors also installed to shut off lights when gym is unoccupied. Savings is estimated at 33,246 kwh per year which currently equates to approximately \$3,700.

### 3. Jenkins School

- a. Automated Controls: In January 2007, we completed installation of a new (JACE) controller for the HVAC DDC (direct digital controls) which controls all the heating and ventilation equipment in the building.
  - i. Features of the JACE controller give us better direct control of the HVAC. In addition, it has given us accessibility to the DDC system through the internet so that the Facilities Manager can monitor and adjust the HVAC controls from his office (or any other place with internet access).
    - 1. One example of this advantage is that in the event of a school closing due to snow, the Facilities Manager or school custodian can access the program on-line from home and set the building DDC to remain in unoccupied mode for the day, rather than follow the programmed schedule to run the HVAC as for a normal school day.
    - ii. Moreover, the JACE controller allows the DDC/HVAC service company to access the DDC on-line from their offices for service calls and thus reducing the need for site visits.
    - iii. In installing the new JACE controller, we resolved many issues of exhaust fans running unnecessarily, which is expected to significantly reduce natural gas consumption by the heating boilers.

### 4. Wampanoag School

- a. Automated Controls: Because of an antiquated, dilapidated control system, building Exhaust Fans were running uncontrolled, frequently exhausting warm building air overnight during winter. We hired a mechanical contractor to install a new master control board fitted with controls for all the exhaust fans and tying it to a time clock which shuts off exhaust fans on a daily/weekly occupied/unoccupied schedule. Fuel oil savings expected to be at least \$8,000 per year.

### 5. Modular buildings at Cushing and Hatherly Schools

- a. Digital Thermostats: Each of the 6 modular buildings has its own electric powered HVAC unit (with air conditioning). Each HVAC unit had been controlled by a simple wall thermostat which could result in the HVAC units running in occupied mode 24/7. We replaced these 6 thermostats

with 6 digital thermostats that allow us to program each modular building on an occupied/unoccupied schedule for each day of the entire year as well as at room temperature setpoints that cannot be adjusted by the occupants.

6. Rentar Fuel Catalysts: We are currently involved in an experimental program installing Rentar Fuel catalysts on 3 of our heating boilers (1 at Gates and 2 at Cushing). The catalyst atomizes the oil immediately before it sprays into the boiler and increases the BTU output. Several Massachusetts districts, including Plymouth have begun to install Rentars. The vendor assures us of at least 10% fuel savings.
7. Controls on drink vending machines: In December 2006, we took advantage of an incentive program from the electric company and installed Vending Misers on the 7 drink vending machines at all schools except the high school (different program) which shut off compressors in the vending machines when a motion sensor does not detect movement for 30 minutes. Electricity savings from this effort is estimated at \$178 per machine per year, for a total of \$1,246 per year.
8. Energy 3<sup>rd</sup> party contracts
  - a. Natural Gas: In FY 2005, for the first time, participating in a competitive bid process organized by the South Shore Collaborative, we entered into contract with a 3<sup>rd</sup> party supplier (Amerada Hess) of natural gas, fixing the price at highly competitive rate (\$0.9045/therm).<sup>1</sup> In Summer 2006, we repeated the process and on 11/1/06 entered into a new 2-year contract with the same company fixing the rate at \$1.0893/therm for the first year. (Note that this is only for the supply portion of the invoice; Bay State Gas still charges for the delivery portion, which increases as regulated by the state.)
  - b. Electricity: We currently participate in a fixed rate, 3<sup>rd</sup> party contract with Constellation New Energy, managed by Mass Municipal. At the completion of that contract in December 2007, we shift to a new contract with Transcanada Power at a fixed rate of 9.035 ¢/kwh for 2 years, also organized by the South Shore Collaborative. (Note that this is only for the supply portion of the invoice; NGRID still charges for the delivery portion, which increases as regulated by the state.)
  - c. Heating Oil: We participate in a competitive bid contract managed by Plymouth County Commissioners. The price of oil charged by the winning contractor is established as the markup amount specified by the bidder which is added to the price of oil per gallon published each Monday in the Journal of Commerce.

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<sup>1</sup> On 10/31/06 this contract expired and the supply rate changed to \$1.5961 (11/1 – 11/30), \$1.331 (12/1 – 12/31/05), \$1.304 (1/1/06 – 1/31), \$1.221 (2/1 – 10/31/06), after which the new contract began at \$1.0893.

9. Bay State Gas Partners In Energy Program: We are currently involved in a program with Bay State gas to identify and implement opportunities for savings in natural gas consumption throughout the district. The program involves Bay State Gas providing matching funds up to \$7,500 to fund an energy efficiency study by an engineer of our choice. After that, Bay State Gas will fund the implementation of the efficiency measures recommended by the engineer, up to an amount of \$100,000 per meter. On 12/7/06, we escorted the Bay State Gas representative on a survey of our facilities. We are now in the process of obtaining an engineer and preparing a funding proposal.
  
10. Electric Company Rebate Program: We are having discussions with a company representing ISO New England (the manager of the New England electric power grid) which offers a quarterly rebate on electricity charges for participating in a Demand Response program. Participation in this program involves our commitment to shutting off certain equipment in the event of crisis peak demands on the power grid.