# Green Needham Collaborative

May 4, 2010

Mr. Tom O'Rourke
Green Business Awards Committee
Newton-Needham Chamber of Commerce
281 Needham St.
Newton, MA 02464

Dear Tom,

I would like to nominate the **Town of Needham's Public Facilities Department** for a Green Business award. The Department consists of two divisions, one for public construction and one for operations.. Both have been leaders in implementing green business practices. Their combined, collaborative efforts are ensuring that the Town is building energy efficient facilities with effective operations in mind, seamlessly bringing those facilities online while at the same time investing in operational improvements that reduce costs and increase efficiency in the Town's older facilities.

Within the last year, the Public Facilities Department's **Construction Division** has completed and commissioned two new buildings, the High Rock School (renovation and expansion) and the Public Services Administration Building (new construction). These two facilities are the most energy-efficient buildings the Town has built to date, the results of a cycle of continuous improvement over the last ten years which has seen the town reconstruct two elementary schools, the library and the high school in addition to these two buildings.

At the **High Rock School**, an original 1950's structure was gutted, renovated and expanded to serve as a single-grade school for 400 Needham sixth-graders. The building incorporates features not found on the elementary schools completed just five years previously, including higher amounts of roof insulation, window shadings and split-light controls to maximize the use of daylight. The building is targeted to reach a lighting performance of 1.0 – 1.1 watts/square foot, an approximately 20% improvement over the previously-built schools. Significant improvements were made in the HVAC systems, including 88-90% efficient boilers, variable speed hot water pumps and demand ventilation.

The Public **Services Administration Building** incorporated many similar energy saving features in its design. Its signature distinction, however, is the use of a geothermal ground-source heat pump system for heating and cooling the facility. 16 closed-loop geothermal wells dug to a depth of 500 feet deliver 50° F water to heat exchangers which either source or sink heat from the rooms to provide heating in the winter and cooling in the summer. The ground source heat pumps are equipped with variable flow drives, saving energy by scaling back water flow when the building is lightly loaded or unoccupied. The five Variable Air Volume (VAV) that distribute fresh air throughout the perform a similar energy-saving function by scaling back the ventilation when the building is less occupied. The building ventilation system incorporates an

Energy Recovery Unit which uses building air to pre-heat or pre-cool incoming fresh air, reducing the energy needed by the ventilation system 50 – 70%.

The use of geothermal heating and cooling for the new PSA Building is only one example of the proactive approach of the Department to using **renewable energy**. They were an early and enthusiastic collaborator with Green Needham in the development of a **wind feasibility study** to evaluate the potential for wind power at Needham's Recycling and Transfer Station. With the passage of enabling zoning this week at Town Meeting and the private funding raised by Green Needham, the Town will undertake the procurement and erection of a meteorological tower this summer to conduct the wind analysis. A parallel collaboration with Green Needham has identified the additional **potential for 1 MW of solar PV** at the RTS. The Department also installed a **2kW solar array** at the new High Rock school, acquired by matching funds in collaboration with Green Needham through the Solar Challenge program.

Over the last several years, new leadership at the **Operations Division** has focused on better data collection and analysis and developed a much closer collaboration with the Construction Division. This has resulted in a **more effective handoff to operations upon the completion of construction**. The new buildings and their systems are operating much more efficiently on day one than their predecessors. One of the schools completed in 2004 was actually using much more energy than expected. That fact was uncovered by the energy tracking system and then addressed, but by that time several years had gone by. With the new commissioning and integration process, those once-typical startup problems will be significantly reduced.

The Facilities Department's Operations Division has focused on the basics of **tightening the building envelope** in the Town's older schools and buildings, and retrofitting energy control systems. With a commitment from the Town Manager and the Superintendent of Schools to reduce energy use in municipal and school buildings by 5%, the Operations Division has been able to develop a partnership with School Principals and other users that has helped identify and prioritize maintenance efforts that improve energy use. Thermostats have been set to 68 in winter and 75 in summer. Energy Control systems have been replacement at most schools and an $86,000 EECBG stimulus grant is allowing a system upgrade at one of the older schools.

The focus on basic maintenance has not prevented the Department from implementing creative solutions and piloting new approaches. A **fuel catalyst** for the Town's remaining oil-fired systems has reduced oil consumption by over 10%. A **remote lighting control system** is being piloted for outdoor lighting at the High School and will be implemented town-wide if successful. A pilot of a **new type of air filter** claiming a 40% savings through lower energy use and less frequent replacement is being piloted at one elementary school and will be deployed system-wide if successful. The Department has also enrolled two building generators in a **demand response** program. Since these generators are in a school, they will be particularly effective during summer peak system demand when the school is unoccupied.

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The combination of moving away from fixed price suppliers, lower energy costs and early results from the new facilities and the energy efficiency investments in all buildings combined to result in a **projected savings of $1.1 million** in energy costs in fiscal 2010 over budgeted amounts. The financial flexibility generated by these savings are invaluable to the community in this difficult economic environment and are also providing needed relief in planning for FY 2011 and beyond. And while lower prevailing energy costs are expected to comprise a significant portion of the overall savings**, the impact of the operational improvements and the newer facilities is only expected to increase in coming years,** regardless of the price of energy.

Thank you for your consideration of my nomination of the Town of Needham's Public Facilities Department for a Newton-Needham Chamber of Commerce 2010 Green Business Award. Unfortunately, as you know, I will be at the CFA Institute Annual Conference on May 18th and will not be at this year's lunch where the awards will be made. However, I look forward to a recap at our next Environmental Committee meeting after the event.

Sincerely yours,

Michael J. Greis
Chair, Green Needham Collaborative