Attachment E

Fairfield Public Schools

Energy Conservation Program

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October 10, 2006
Updated – January 1, 2011

Program Overview

1. Energy Conservation Program.
2. Preventative Maintenance Programs.
3. Tools for Schools Program.
4. United Illuminating Company Program.
5. Energy Solutions Program.
6. Johnson Controls Incorporated Program.
7. EnerNOC Demand Response Program (in Conjunction with the United Illuminating Company)
8. State of Connecticut Reimbursements and Grants.
9. Town and Board of Education Cooperative Efforts.
10. Training Programs.

Energy Conservation Program

Fairfield Public Schools has a district-wide energy conservation program in place. The cost of energy is a major item in all school budgets. It takes a lot of systems and equipment to keep school buildings running all day and night. This includes the occupied and unoccupied modes.

Examples of Energy Management Policies:

- Establish specific goals and objectives.
- Monitor each building's energy use.
- Conduct energy audits in all buildings.
- Reward schools that decrease energy use.
- Install energy efficient equipment.
- Institute performance contracting when replacing equipment.

Energy Conservation Program

Some of the examples of our Energy Conservation Programs at the **new and renovated** schools are:

- Energy Efficient Equipment
- Lighting Controls and Systems
- Windows with Day Lighting
- Plumbing Fixtures
- Dual Fuel Systems
- Boiler Room Equipment
- Controls Integration
- Motion Detectors
- After Hour Setback Devices
- Timing Devices

Energy Conservation Program

Some of the examples of our Energy Conservation Programs at **all schools** are:

- External Electrical Power Systems
- Internal Electrical Power Systems
- Fire Alarm Systems
- Recycling
- Cleaning Materials
- Pest Control
- Field Treatments
- Preventative Maintenance
- IAQ Repairs and fixes to HVAC Equipment

Energy Conservation Program

Fairfield Public Schools has several interesting energy conservation projects at our schools that involve students and training. Examples of these projects are as follows:

Photovoltaic Cells

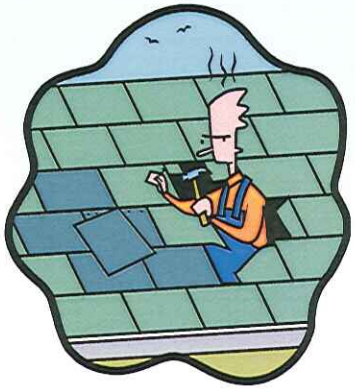
Solar Panels

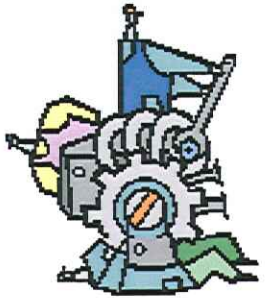
Natural Gas Buses

Hydrogen Fuel Cell

Preventative Maintenance

- Preventative Maintenance is the act of servicing or replacing worn or damaged individual parts and components of a system before their inevitable failure causes a total breakdown of the system.
- A good preventative maintenance practice interrupts the cycles that perpetuate high energy use and short equipment life cycles.





Preventative Maintenance Programs

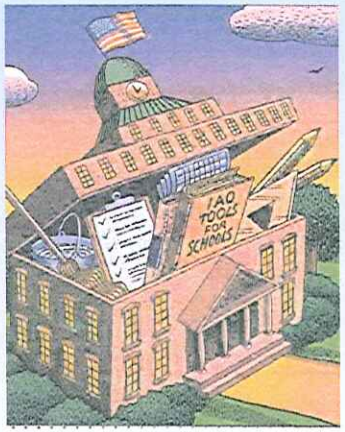
Program	Status
Building Envelope Systems	Complete and working – 2004
Code and Life Safety Systems	Complete and working – 2003
Roof Systems	Complete and working – 2004
Emergency Generators	Complete and working – 2006
HVAC Indoor Air Quality	Complete and working – 2004
HVAC Cleaning	Complete and working – 2006
Equipment Integration Systems	Complete and working – 2004
Windows and Window Systems	Complete and working – 2005
Instructional Equipment	Complete and working – 2007
Plumbing Systems	In progress – 2010
Electrical Systems	Complete and working – 2002

Preventative Maintenance Programs

Program	Status
Flooring Systems	Complete and working – 2002
Large spaces of Assembly Professionally Cleaned	Future program - 2011
Window Cleaning	Future program – 2011
Low Voltage Systems	Complete and working - 2008
Playgrounds	Complete and working – 2003
Radon Systems	Complete and working – 2003 & 2008
Security Systems	Complete and working – 2007
Fire Alarm Systems	Complete and working – 2002
Door and Door Hardware Systems	Complete and working - 2003

Tools for Schools

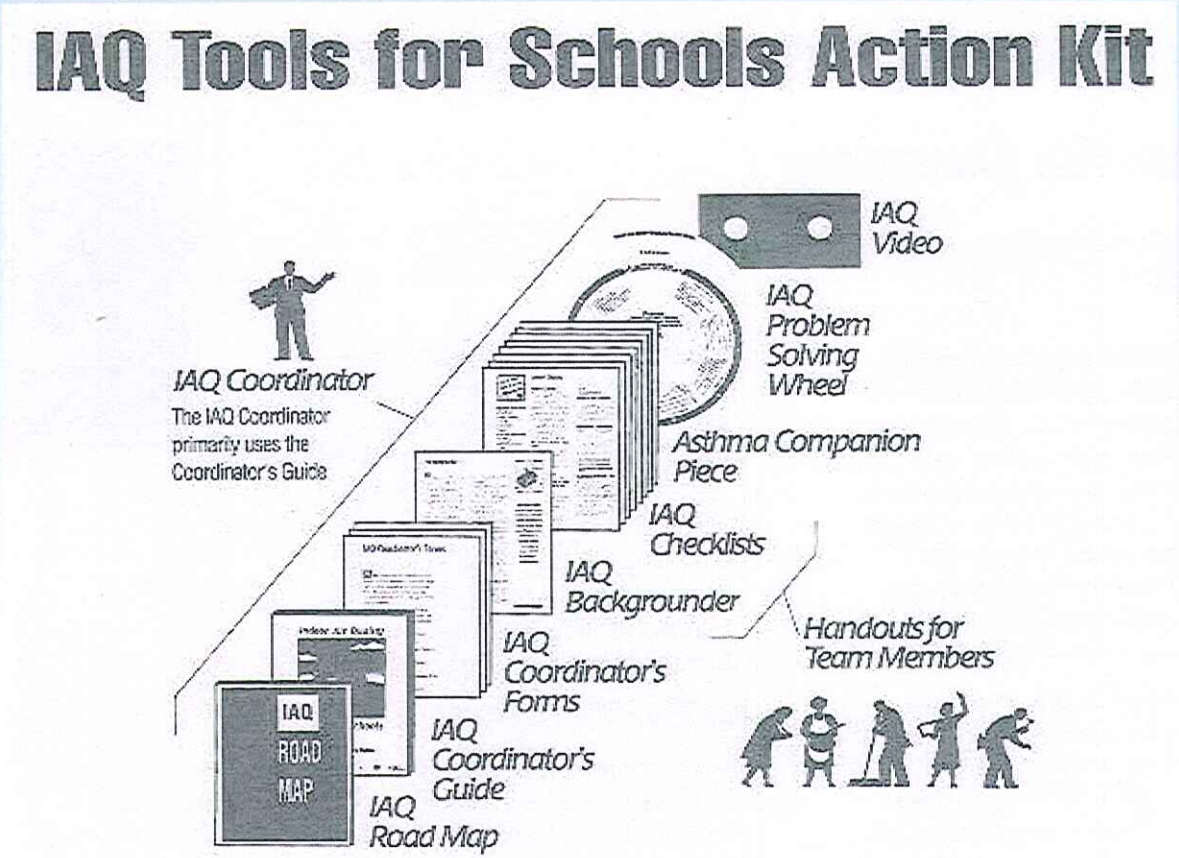
- Tools for Schools is a program that is now being used in the Fairfield Public Schools. This program originated from the Indoor Air Quality Tools for Schools Action Kit which has been developed by the Environmental Protection Agency.



- Indoor air quality may have an immediate impact on the student's and the staff's overall health. Some of the indoor air quality problems include:

- Improperly maintained ventilation systems.
- Chemical pollutants from building, or building maintenance and/or science and art classes.
- Allergens from classroom animals or other pests.
- Mold growth from standing water in pipes, etc.

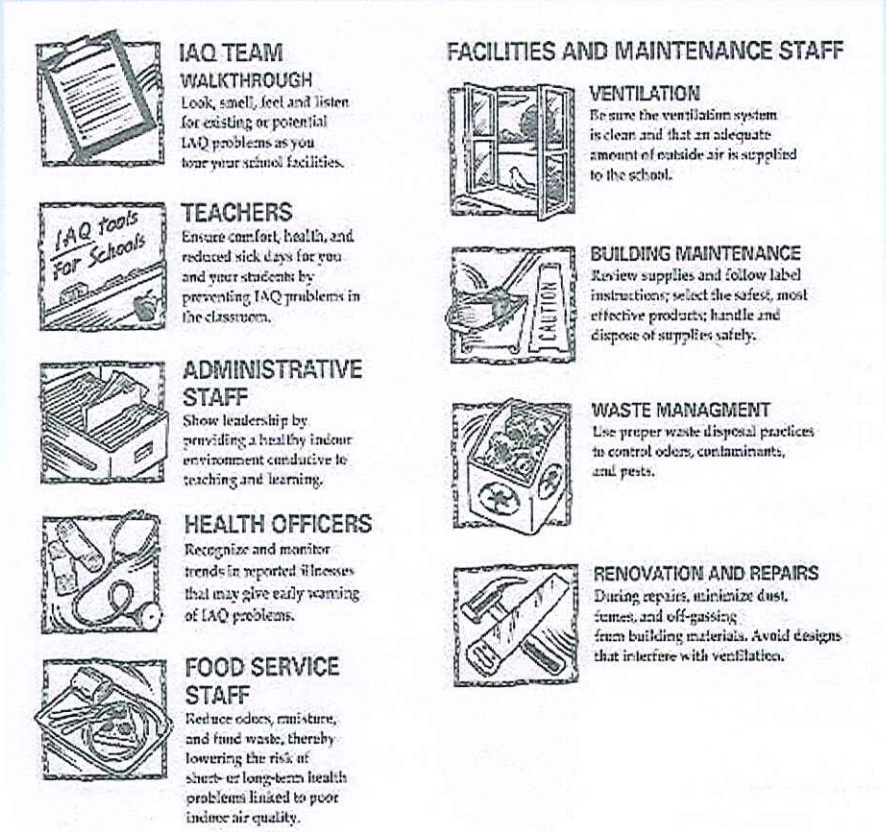
Tools for Schools



Example of the IAQ Tools for Schools Action Kit

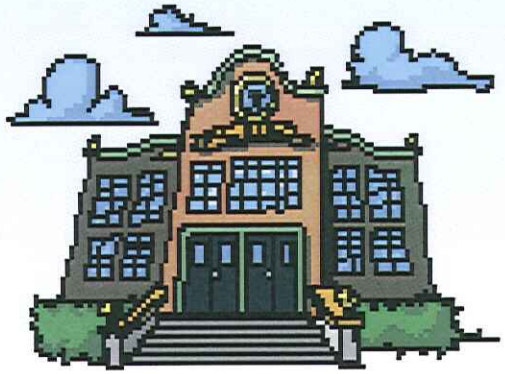
Tools for Schools

- Fairfield Public Schools has formed a "Tools for Schools" team at each school. These teams are responsible for ensuring that the "Tools for Schools" program is implemented properly.
- Because IAQ problems can occur anywhere in the building, the team should include staff, as shown here, as well as parents and students.

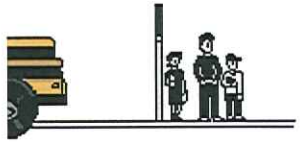


Tools for Schools

- In addition to creating a healthier environment in our school buildings throughout our district, the "Tools for Schools" program will help promote energy efficiency in many ways.
- For example -
  - The design of the ventilation system which should be controlled and modified when necessary.
  - The renovation work to the buildings, such as re-roofing or installing new windows.



"Our goal is to improve the air quality in all of the buildings within the school district while maintaining energy efficiency."



United Illuminating Co. Incentives

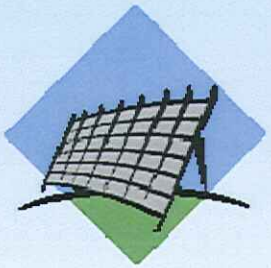
- The Fairfield Public Schools' administration has taken advantage of incentives offered by the State's Energy Conservation and Load Management Fund to make improvements for our newly constructed and renovated schools.
- In order to do this, the United Illuminating Co. provided funding, through their Municipal Energy Blueprint Program, which allowed the school district to install energy efficient equipment.
- By taking advantage of these incentives and complying with the blueprint program, Fairfield Public Schools will see immediate savings as well as savings over the next 20 or so years. In addition, the United Illuminating Co. gave the town of Fairfield incentive checks for six school projects.

United Illuminating Co. Incentives

FAIRFIELD PUBLIC SCHOOLS
UNITED ILLUMINATING COMPANY INCENTIVE AWARDS

SCHOOL	TOTAL INCENTIVE	AVOIDED CONSUMPTION-kWh	AVOIDED ANNUAL COST	AVOIDED DEMAND-KW
McKinley Elementary	$ 31,041.00	201,411	$ 22,000.81	34
Roger Ludlowe Middle	$ 68,959.00	1,384,789	$ 151,265.21	341
Burr Elementary	$ 40,000.00	312,756	$ 34,163.40	117
Fairfield Ludlowe High	$ 54,418.00	282,768	$ 30,887.71	109
Fairfield Warde High	$ 60,935.00	458,492	$ 50,082.64	167
Tomlinson Middle	$ 74,527.00	320,152	$ 34,971.29	141
Stratfield Elementary	To	Be	Determined	
Fairfield Woods Middle	To	Be	Determined	
TOTALS	$ 329,880.00	2,960,368	$ 323,371.06	909

United Illuminating Co. Incentives



Examples of the equipment:

Lighting	T-8 or t-5 fluorescent lamps with electronic ballasts increase lighting efficiency.
Automatic Sensor Controls	Sensor controls on the lighting system automatically turns the lights on/off when someone enters or leaves the room.
High Efficient Cooling Equipment with Variable Speed Drives	This equipment varies the speed of the fan motors or compressor pumps so they provide enough cooling or heating power to satisfy the demand on the system.
Premium Efficient Motors	These motors are designed to use less energy than standard efficient motors.

Energy Solutions Program

The Fairfield Public Schools has taken advantage of a subsidy program from the United Illuminating Company and have signed contracts on June 6, 2006 with Energy Solutions, LLC to design and reduce utility costs for our older schools by:

1. Providing occupancy light switch sensors.
2. Improving the energy efficiency of lighting.
3. Providing control cycling on refrigeration equipment.
4. Reducing corridor lighting where applicable.

This will have an immediate impact on our overall utility costs by reducing our monthly utility bills by approximately **$8,445.00**.

Energy Solutions Program

Audit Findings: Lost Energy Expense Risk Assessment®

	Lighting Sensors	Outdoor Lighting Fixtures	Lighting Fixtures Retrofit	Lighting Fixtures Upgrades	Refrigeration Control Upgrades
Elementary Schools					
Burr Elementary School					
Dwight Elementary School					
Holland Hill Elementary School					
Jennings Elementary School					
McKinley Elementary School					
Mill Hill Elementary School					
North Stratfield Elementary School					
Osborn Hill Elementary School					
Riverfield Elementary School					
Sherman Elementary School					
Stratfield Elementary School					
Middle Schools					
Fairfield Woods Middle School					
Roger Ludlowe Middle School					
Tomlinson Middle School					
High Schools					
Fairfield Ludlowe High School					
Fairfield Warde High School					

Key:
= no opportunity for energy expense reduction.
= no opportunity for energy expense reduction right now (re-audit in 24 months).
= opportunity for energy expense reduction RIGHT NOW.

Energy Solutions Program

Audit Findings: Lost Energy and Resulting Expenses (revised 6-28-06)

School	Annual kWhs	Annual Expense*
Elementary Schools		
Burr Elementary School	-	-
Dwight Elementary School	42,478	$ 5,310.00
Holland Hill Elementary School	31,786	$ 3,973
Jennings Elementary School	23,110	$ 2,889
McKinley Elementary School	8,706	$ 1,088
Mill Hill Elementary School	50,541	$ 6,318
North Stratfield Elementary School	41,369	$ 5,171
Osborn Hill Elementary School	27,370	$ 3,421
Riverfield Elementary School	42,179	$ 5,272
Sherman Elementary School	58,422	$ 7,303
Stratfield Elementary School	31,327	$ 3,916
Middle Schools		
Fairfield Woods Middle School	49,678	$ 6,210
Roger Ludlowe Middle School	46,270	$ 5,784
Tomlinson Middle School	63,304	$ 7,913
High Schools		
Fairfield Ludlowe High School	152,928	$ 19,116
Fairfield Warde High School	141,278	$ 17,660
Total	810,746	$ 101,343

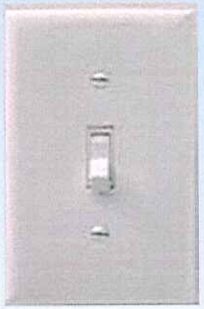
* Assuming a cost per kWhr of $0.12500. kWhr costs vary by school. This is an estimated average from United Illuminating.

Additional expenses not reflected:

- Expenses increase as electric rates increase.
- Lamp replacement and related soft costs.
- Air conditioning expenses are reduced since the new systems emit less heat.

Energy Solutions Program

Out with the Old



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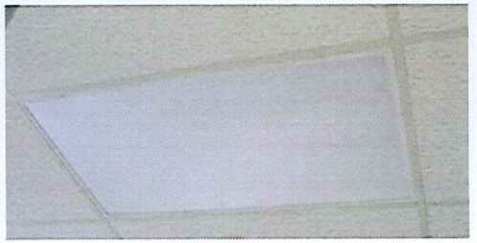
In with the New



Energy Solutions Program

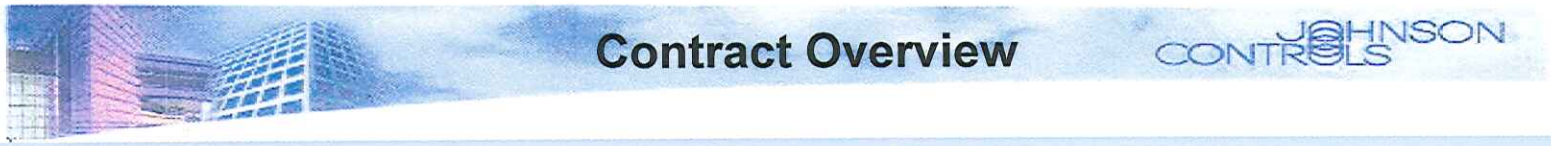
This program is combined with the United Illuminating incentive and allows the customer to upgrade the schools with the necessary equipment with no expense to the district.

There are four primary **Benefits** to this program.

1. Significant cost reductions.
2. Reduced pollution.
3. Improved lighting in the school buildings.
4. No outlay of additional funds are necessary.

Fairfield Public Schools will see immediate savings, as well as savings over the next 20 or so years.

Johnson Controls, Inc.



Contract Overview

The School District, along with the Town of Fairfield, signed a 10-year Performance Contract on September 8, 1999. The service agreement commenced on the substantial completion date of January 2, 2001 and will end on January 2, 2011. This contract guarantees that the Town and Schools will **save $7,180,153** over a ten-year period.

Some of the energy conservation and facility improvement measures implemented are as follows:

- HVAC Conversions
- AHU's Replacements
- AHU's Refurbishment
- Condensing Unit Replacements
- Exhaust Fans Added
- Boiler Replacement
- Emergency Generators Added
- Air Compressors Replacement
- Refurbishment
- Variable Speed Drives
- Dual Fuel Burner Replacements
- Above Ground Fuel Tank Added
- Lighting Retrofit & Lighting Controls
- Maintenance Mgmt. System (CMMS)
- Metasys Direct Digital Control (DDC)
- Building Automation System

Johnson Controls, Inc.

Johnson Controls, Inc. offers result oriented service.

- Master Planning of Deferred Maintenance

- Reactive
- Preventative
- Predictive
- Proactive

- Analysis of Lifecycle Costs

- Comprehensive Coverage

- Temperature Control
- Mechanical/Electrical Systems
- Fire and Safety
- Security
- Lighting
- Building Automation

- Result

- Maximize systems performance and help achieve operational goals

Johnson Controls, Inc.

Board of Education
Guarantee Performance Contract
Results through Guarantee Year 9 Ending as of December 2009

Project Time Period	Guaranteed Savings	Actual Savings	Over/Guarantee
Construction Phase & First Year of the PC	$603,217	$626,273	$23,056
Year 2	$548,506	$606,851	$58,345
Year 3	$551,789	$622,884	$71,095
Year 4	$555,169	$641,095	$85,926
Year 5	$558,642	$695,831	$137,189
Year 6	$560,905	$762,409	$201,504
Year 7	$564,551	$766,227	$201,676
Year 8	$568,313	$784,876	$216,563
Year 9	$572,188	$701,344	$129,156
Total	**$5,083,280**	**$6,207,790**	**$1,124,510**

Source: Johnson Controls Performance Contract Cost Avoidance Report Year 9 of 10 – Prepared on April 16, 2010

EnerNOC Demand Response Program

(in Conjunction with the United Illuminating, Co.)

The EnerNOC Demand Response Program provides energy reductions when demand is highest, relieving peak demand in a cost-effective and environmentally friendly way.

The EnerNOC Demand Response Program works with the grid operators and utilities to lower peak demand through demand response. They pay commercial, institutional, and industrial facilities to reduce electricity, whether in response to grid instability or an emergency such as a transmission line failure, to provide relief to the grid when it's needed most.

Currently, we have five schools approved for this program. EnerNOC has installed free pulse metering devices at each facility to monitor energy consumption. They notify us when our local utility or grid operator initiates a demand response event and we respond by reducing our energy usage at our locations. EnerNOC then provides us with payments for supporting our local grid.

EnerNOC Demand Response Program

(in Conjunction with the United Illuminating, Co.)

FAIRFIELD PUBLIC SCHOOLS
SITE NAMES & ESTIMATED CAPACITY (kW)

Site Name	Site Address	Estimated Capacity (kW)
McKinley Elementary School	60 Thompson Street. Fairfield. CT 06825	100
Fairfield Ludlowe High School	785 Unquowa Road. Fairfield. CT 06824	100
Fairfield Warde High School	755 Melville Avenue. Fairfield. CT 06825	200
Roger Ludlowe Middle School	689 Unquowa Road. Fairfield. CT 06824	200
Tomlinson Middle School	200 Unquowa Road. Fairfield. CT 06824	100

EnerNOC Demand Response Program

(in Conjunction with the United Illuminating, Co.)

FAIRFIELD PUBLIC SCHOOLS
GENERATOR SPECIFICATIONS

LOCATION	GENERATOR MAKE	KW	MODEL	SERIAL	ATS MAKE	MODEL	SERIAL	FUEL CAP (Gallons)
Fairfield Ludlowe High	Elliott/Magnatek	200	200 RD	BU01J933	ASCO			550
Fairfield Ludlowe High	Clark Perkins		PDFP-L6YN					275
Fairfield Warde High	Detroit Spectrum	600	600 DS	2002237	Spectrum			1250
Roger Ludlowe Middle	Detroit Spectrum	420	400 DSE	0751980	Spectrum	SCT-AMTA-600S	KO750702	750
Burr Elementary	Spectrum	200	200 DFGC-4246	A040598469				366
McKinley Elementary	Clark Perkins		PDFP-L4YN					285

School Construction Project Reimbursements

The State Department of Education reimburses districts for school construction projects on an individual basis. When implementing a district-wide construction plan, an individual project grant application is required for each facility. The reimbursement percentage rate for each town is determined by the Town's equalized grand list divided by the Town's population, multiplied by the Town's per capita income and divided by the State's per capita income.

Below is a summary of the required steps for a construction grant reimbursement request:

1. The application process – An ED-049 application needs to be filed.
2. Final Plans – A PREP meeting is required to review all design professional plans.
3. Approval of Final Plans – An ED-042 form needs to be filed.
4. Change Orders – All change orders with applicable back-up are to be submitted. An ED-042 CO needs to be filed.
5. Progress Payments – An ED-046 is to be filed to request a payment.
6. Annual Project Expenditure – An ED-046 needs to be filed.
7. Closing Project- Final Grant Application – An ED-049F needs to be filed.
8. Audit is performed to complete the process.

School Construction Project Reimbursements

New construction as well as renovation projects, allows the Fairfield Public School district to become more energy efficient. Examples of how these projects help with energy efficiency are as follows:

- The new construction work is done to current codes which will increase the energy efficiency.
- Renovation codes require that window replacements have thermal insulated panes.
- New roofing codes require increased insulation for energy efficiency as well improved drainage functions.
- Ceiling and lighting replacements improve energy efficiency.
- HVAC integration improves the heating and air conditioning function which improves energy efficiency while improving indoor air quality.
- Integration of the equipment controls program into new buildings improves energy efficiency.

School Construction Project Reimbursements

FAIRFIELD PUBLIC SCHOOLS
CONSTRUCTION PROJECT SUMMARY

SCHOOL	TOTAL PROJECTED STATE REIMBURSEMENT	TOTAL PAYMENTS RECEIVED TO DATE
McKinley Elementary School	$4,946,954	$4,946,954
Burr Elementary School	$4,876,899	$4,633,046
Roger Ludlowe Middle School	$9,331,117 *	$8,864,561
Fairfield Ludlowe High School	$6,125,704 *	$4,805,782
Fairfield Warde High School	$8,065,509 *	$7,513,832
Tomlinson Middle School	$6,980,816 **	$6,681,999
Sherman Elementary School - Annex Building	$445,702	$378,472
Osborn Hill Elementary School - Annex Building	$396,313	$341,911
Stratfield Elementary School	$1,882,121	$1,831,240
Fairfield Woods Middle	TBD	TBD
Total - All Major Projects:	**$43,051,135**	**$39,997,797**

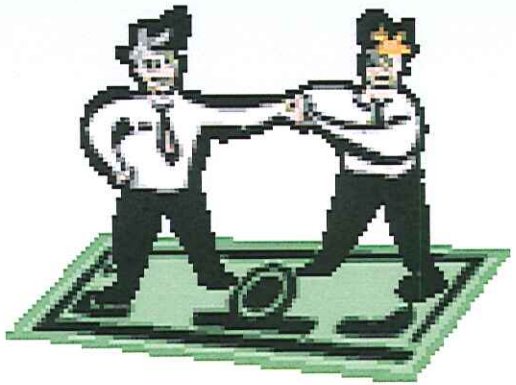
* The Open Choice Bonus is not included.

** The Open Choice Bonus and the Pre-1950 Square Footage Adjustment is included.

Fairfield Board of Education and Town of Fairfield Cooperative Efforts

In conjunction with the First Selectman's office, the Board of Education has entered into an agreement to combine like services across the district to improve energy efficiency.

A task force meets regularly to discuss work efforts, projects, budget items and also to review new ideas or new energy efficient projects/technology that may be available.



Fairfield Board of Education and Town of Fairfield Cooperative Efforts

Town of Fairfield Support Efforts to the Board of Education

1. Demolition and removal of:
   - Old portable classrooms
   - Over grown trees and bushes
   - Old playgrounds
   - Building equipment beyond our scope or ability

2. Support and extra work force for:
   - Snow removal issues
   - Storage of large materials
   - Transportation issues

3. Weekend and Holiday events at school:
   - Election day
   - Conservation day
   - Earth day
   - Street marching

4. Street work, sidewalks and curbs:
   - Major paving projects
   - Sidewalk repairs/replacement
   - Safety items for streets around schools
   - Handicap ramps at street
   - Exterior lighting

Fairfield Board of Education and Town of Fairfield Cooperative Efforts

Town of Fairfield Support Efforts to the Board of Education

-continued-

5. Fields, courts and parks:
   - Striping, markings and nets
   - Major field repairs
   - Grounds and landscaping
   - Safety
6. Playgrounds:
   - Digging and preparation
   - Concrete equipment
   - Supervision
   - Trucks for wood fiber chips delivered
   - Storage of equipment and delivery
7. Communication:
   - Sharing contacts for work
   - Combining efforts for projects
   - Design ideas for problem areas/ projects
   - Johnson Control Inc. Contract
   - Combining efforts and staff for emergencies

Fairfield Board of Education and Town of Fairfield Cooperative Efforts

Board of Education Support Efforts to Town of Fairfield

1. Reservations for weekend and Holiday events:
   - Athletics
   - Fundraisers
   - Not-for-profit
   - For-profit
   - Custodians for events
2. Indoor air quality issues:
   - Employees
   - Human Resources
   - Police Department
   - Fire Department
3. Expert Licensed Maintenance Workers:
   - HVAC Technician
   - Plumber
   - Electrician
4. Communication:
   - Sharing contacts for work
   - Combining efforts for projects
   - Design ideas for problem areas/projects
   - Johnson Control Inc. Contract
   - Combining efforts and staff for emergencies
5. Major Projects:
   - Solar panels – Fairfield Woods Middle School
   - Hydrogen fuel cells – Roger Ludlowe Middle School and Fairfield Ludlowe High School
   - Natural gas buses (district-wide)
   - Photovoltaic – Fairfield Woods Middle School

Training Programs

Professional Development:

- Caring for and maintaining a large school district requires considerable expertise to maintain energy efficiency. We know that school buildings need attention on a regular basis. Therefore, hiring qualified maintenance and custodial staff is a key element to any organization.
- A great deal of time, management and money go into maintaining a qualified staff. Coordination, scheduling and coverage is a must when the goal is energy conservation among multiple buildings. Therefore, it is worthwhile to do all you can to retain staff and offer continuous professional development.

Training Programs

Staff Training:

- We do not hire staff to be students, however, we are happy when they are learning. The staff is hired to provide a service to the district by ensuring that the school system operates in a safe and efficient manner. Training staff to perform their work properly, efficiently and safely is very cost effective in the long run. Training staff is a necessary tool to meet the changing facility needs of all buildings. The skills and knowledge of each and every employee relates to the overall well being of the organization.

Training

Program	Status
IAQ issues and ventilation issues	Complete
Proper cleaning methods	Complete
Building odors	Complete
Dealing with staff complaints	Complete
Asbestos awareness	Complete
Chemical awareness	Complete
Hazardous spills	Complete
Personal protective equipment	Complete
Roofs	Complete
Windows	Complete
General safety training	Complete
HVAC equipment controls	Complete
CPR and AED	Complete